



FORD FIESTA ST 2013 1.6 ECOBOOST-SCTI PACKAGE



The Ford Fiesta ST 2013 1.6 EcoBoost-SCTi package is a fully programmable replacement for the factory fitted ECU in Ford Fiesta ST models.

This product is designed primarily as an engine control system and may not fully integrate with all OE systems. In particular the starting, fuel supply, and alternator systems' operation may differ and require modifications to vehicle wiring. Refer to the Operation section of this document for details.

► LICENCING

To load the package onto the ECU, the **M1 Licence - Ford Fiesta ST 2013 1.6 EcoBoost-SCTi** (part number 23006) is required.

► VEHICLE COMPATIBILITY

This product includes CAN messaging for basic OE vehicle integration. It caters for OE vehicle systems such as power steering, ABS, and dashboards. Not all OE functions are reproduced.

This product offers configurable closed loop alternator control for PWM field winding control.

⇒ OE Ford Fiesta alternators are not controlled by this subsystem, and will default to 13.5V.

► FEATURES

- Fully integrates with these original systems: direct injection, stability, dash, power steering, and ABS. **Lambda control is supported with optional LTC and Bosch LSU4.9 sensor.**
- Pre-configured sensor calibrations for Original Equipment (OE) sensors and engine triggers.
- Pre-configured control of primary (Direct Injector) fuel system.
- Optionally configurable secondary (Port Injector) fuel control with a tuneable balance table.
 - ⇒ Only saturated (high-ohm) secondary injectors are supported in this hardware. Peak-hold (low-ohm) secondary injectors are not supported.
- Pre-configured reference mode for engine synchronisation and control of 2 camshafts with tuneable inlet and exhaust timing tables.
- Pre-configured physical settings for engine displacement, fuel density, stoichiometric ratio, fuel pressure, and primary injector linearisation, which allow for simplified engine start-up prior to tuning.
- Pre-configured CAN messaging for OE systems including ABS / VSC, dashboard and power steering.
- Configurable control of OE coolant fan with temperature thresholds.
- Pre-configured transient fuelling compensation using physical modelling of fuel film for direct injectors.

- Pre-configured wheel speed detection via CAN from OE ABS system, allowing gear detection via engine speed / wheel speed estimate.
- Pre-configured on-board knock control for each cylinder with up to 2 OE knock sensors and selectable centre frequency.
- Pre-configured camshaft control for inlet and exhaust cams.
- Configurable boost control with single wastegate actuator. Single and dual solenoids supported.
- Configurable anti-lag for single turbo variants with ignition timing limit, fuel volume trim, ignition cut, fuel cut, engine speed limit, boost aim and throttle aim tables.
- Configurable closed loop alternator system for PWM field winding control.
 - ⇒ OE Ford alternators are not controlled by this subsystem, and will default to 14.0V.
- Gearbox position detection via sensor or engine speed / wheel speed.
- Gearbox shift request via up shift switch / down shift switch or gear lever force sensor.
- Gearbox shift control with ignition cut and engine speed matching.
- GPS acquisition and logging via CAN or RS232.
- Intercooler temperature and spray control.
- Lap distance, time and number via BR2 or switched input, with split and sector options.
- Configurable launch control with tables.
- Race time system with tables for ignition timing trim, fuel mixture aim, boost limit, and throttle limit.
- Engine Load Average channel with tables for engine speed limit, ignition timing trim, fuel mixture aim, boost limit, and throttle limit.
- Engine run time total for engine hour logging.
- Configurable security for multiple users with differing access options.
- ECU CAN Receive from a defined ID base address for data reception from MoTeC devices.
- 6 configurable driver switches, 4 rotary switches and 4 CAN switches each with 9 positions that can be simultaneously mapped to launch control, pit switch, anti-lag, traction, race time reset, engine speed limit maximum, throttle pedal translation, fuel volume trim, ignition timing, fuel mixture aim, boost limit, traction aim, and traction control range.
- Pulsed tachometer output with configurable output pin and scaling.
- Transmission pump output with transmission temperature threshold and hysteresis control.
- Traction control with tables for aim main, aim compensation, control range.
- Optional channels for additional sensors via input pin and/or CAN message, including:
 - Airbox Mass Flow, Temperature and Pressure
 - Ambient Pressure and Temperature
 - Air Conditioner Refrigerant Pressure
 - Air Conditioner Request
 - Boost Pressure
 - 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 Collector, Bank 1 and 2 Collector, and Cylinders 1 to 4.
 - Exhaust Lambda via LTC, LTCN, or PLM for Collector, Bank 1 and 2 Collector, and Cylinders 1 to 4
 - Fuel Pressure and Temperature
 - Fuel Tank Level
 - Gear Position
 - Gear Lever Force
 - Gear Neutral Switch
 - Gear Shift Request
 - Intercooler Temperature
 - Steering Angle and Pressure
 - Transmission Temperature
 - Turbocharger Speed
 - G-Force (acceleration) - Longitudinal, Lateral, Vertical
 - Wheel Speed Front Left, Front Right, Rear Left, and Rear Right

▶ OPERATION

When the M142 ECU is installed according to the included wiring pinout, this package mimics most aspects of OE operation as follows.

Start System

The OE vehicle utilises either a conventional ignition key or an immobiliser key fob to control power supply to the ECU and to crank the engine. The M142 package does not interact with the OE starting system, so modification to the OE wiring harness may be required if the package is not used with a purpose-built wiring harness for racing applications.

Air Conditioner

A function group is provided for direct wiring to air conditioner components, including refrigerant pressure sensor and air conditioner compressor clutch. Enable conditions cater for multiple choices including throttle position, engine speed, and temperatures. For these functions to be available the vehicle wiring may need to be modified, and inputs and outputs defined.

Power Steering

No user interaction or settings are required.

ABS / Stability

While this product uses some sensor information provided by these systems (for example wheel speeds) no further interaction occurs.

Accelerator Pedal

Ford Fiesta OE systems use a pedal with two outputs: a pulse width output which is wired direct to the ECU, and a voltage output which is wired to the IPC (instrument panel cluster), and then transmitted to the ECU via CAN messaging. The M142

solution requires both signals to be wired directly to the ECU as detailed in the included pinouts.

As many racing applications make use of pedal boxes with two voltage outputs, this is also catered for in the package. Refer to help content in the Throttle Pedal Sensor group of the package.

Coolant Shutoff and Coolant Bypass

Ford 1.6 SCTi engines have a shutoff valve and a bypass valve which may be used to alter cooling system behaviour. Settings for these devices are found in the Ford Fiesta ST Coolant Shutoff and Ford Fiesta ST Coolant Bypass groups of the M1 package.

Turbocharger Wastegate and Bypass

Ford 1.6 SCTi engines have a conventional wastegate solenoid and a compressor bypass valve. Settings for the wastegate are found in the Boost group, while settings for the bypass are found in the Turbocharger Bypass group of the M1 package.

Low pressure fuel pump (lift pump)

Ford Fiesta ST vehicles control the low pressure fuel pump (lift pump) via an FPDM (fuel Pump Driver Module). This device is not controlled in this package, so a normal low pressure pump and relay should be substituted.

Power Relays

Ford Fiesta ST vehicles control the PCM relay from the ECU. When the M142 ECU is installed according to the included wiring pinout, these outputs may be configured from the ECU Power Relay group of the M1 package.

Some variants of the vehicle may control these relays independently, so actual behaviour may not always match the settings in the M1.

▶ **EXAMPLE M142 PINOUT — FORD FIESTA 1.6 GTDI****M142 Connector A – 34 Way**

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

Pin	Designation	Full Name	OE Pin	Function	Description
A01	AT5	Analogue Temperature Input 5		1k Pull up to SEN_5V_C	Transmission Temperature Sensor
A02	AT6	Analogue Temperature Input 6		1k Pull up to SEN_5V_C	
A03	AV15	Analogue Voltage Input 15			
A04	AV16	Analogue Voltage Input 16			
A05	AV17	Analogue Voltage Input 17			
A06	INJ_D1A_NEG	Direct Injector 1A -			Fuel Cylinder 1 Output -
A07	INJ_D1A_POS	Direct Injector 1A +			Fuel Cylinder 1 Output +
A08	INJ_D1B_POS	Direct Injector 1B +			
A09	INJ_D1B_NEG	Direct Injector 1B -			
A10	SEN_5V0_C1	Sensor 5.0V C			Spare Supply voltage for sensors
A11	LA_NB1	Lambda Narrow Input 1			
A12	LA_NB2	Lambda Narrow Input 2			
A13	KNOCK3	Knock Input 3			
A14	KNOCK4	Knock Input 4			
A15	DIG2	Digital Input 2			
A16	DIG3	Digital Input 3			
A17	DIG4	Digital Input 4			
A18	SEN_5V0_C2	Sensor 5.0V C			Spare Supply voltage for sensors
A19	SEN_5V0_B2	Sensor 5.0V B			Supply voltage for Linear sensors
A20	LIN	LIN Bus			
A21	RS232_RX	RS232 Receive			
A22	RS232_TX	RS232 Transmit			
A23	DIG1	Digital Input 1			
A24	BAT_NEG3	Battery Negative			Battery Negative
A25	BAT_NEG4	Battery Negative			Battery Negative
A26	SEN_0V_C1	Sensor 0V C			Spare Signal Ground
A27	SEN_0V_C2	Sensor 0V C			Spare Signal Ground
A28	CAN3_HI	CAN Bus 3 High			
A29	CAN3_LO	CAN Bus 3 Low			
A30	CAN2_HI	CAN Bus 2 High			
A31	CAN2_LO	CAN Bus 2 Low			
A32	BAT_NEG5	Battery Negative			Battery Negative
A33	SEN_0V_B1	Sensor 0V B			Signal Ground for Linear sensors
A34	SEN_0V_A1	Sensor 0V A			Signal Ground for Reference and Cam sensors

M142 Connector B – 26 Way

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

Pin	Designation	Full Name	OE Pin	Function	Description
B01	OUT_HB9	Half Bridge Output 9			
B02	OUT_HB10	Half Bridge Output 10			
B03	UDIG8	Universal Digital Input 8			Engine Oil Pressure Low Switch
B04	UDIG9	Universal Digital Input 9			Airbox Mass Flow PWM Signal
B05	UDIG10	Universal Digital Input 10			
B06	UDIG11	Universal Digital Input 11			
B07	UDIG12	Universal Digital Input 12			
B08	INJ_LS5	Low Side Injector 5			
B09	INJ_LS3	Low Side Injector 3			
B10	AV9	Analogue Voltage Input 9			Boost Pressure Sensor
B11	AV10	Analogue Voltage Input 10			Gear Sensor
B12	AV11	Analogue Voltage Input 11			Gear Lever Sensor
B13	BAT_POS	Battery Positive			ECU Battery Voltage
B14	INJ_LS6	Low Side Injector 6			ECU Power Relay Output
B15	INJ_LS4	Low Side Injector 4			
B16	AV12	Analogue Voltage Input 12			
B17	AV13	Analogue Voltage Input 13			
B18	AV14	Analogue Voltage Input 14			Air Conditioner Refrigerant Pressure Sensor
B19	BAT_POS	Battery Positive			ECU Battery Voltage
B20	OUT_HB7	Half Bridge Output 7			
B21	OUT_HB8	Half Bridge Output 8			
B22	INJ_D2A_NEG	Direct Injector 2A -			Fuel Cylinder 2 Output -
B23	INJ_D2A_POS	Direct Injector 2A +			Fuel Cylinder 2 Output +
B24	INJ_D2B_POS	Direct Injector 2B +			
B25	INJ_D2B_NEG	Direct Injector 2B -			
B26	SEN_5V0_A	Sensor 5.0V A			Supply voltage for Reference and Cam sensors (if required)

M142 Connector C – 34 Way

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

Pin	Designation	Full Name	OE Pin	Function	Description
C01	OUT_HB2	Half Bridge Output 2			Throttle Servo Bank 1 Motor Output
C02	SEN_5V0_A	Sensor 5.0V A			Supply voltage for Reference and Cam sensors (if required)
C03	IGN_LS1	Low Side Ignition 1			Ignition Cylinder 1 Output
C04	IGN_LS2	Low Side Ignition 2			Ignition Cylinder 2 Output
C05	IGN_LS3	Low Side Ignition 3			Ignition Cylinder 3 Output
C06	IGN_LS4	Low Side Ignition 4			Ignition Cylinder 4 Output
C07	IGN_LS5	Low Side Ignition 5			
C08	IGN_LS6	Low Side Ignition 6			
C09	SEN_5V0_B	Sensor 5.0V B			Supply voltage for Linear sensors
C10	BAT_NEG1	Battery Negative			Battery Negative
C11	BAT_NEG2	Battery Negative			Battery Negative
C12	IGN_LS7	Low Side Ignition 7			Air Conditioner Clutch Output
C13	IGN_LS8	Low Side Ignition 8			
C14	AV1	Analogue Voltage Input 1			Throttle Servo Bank 1 Position Sensor Main
C15	AV2	Analogue Voltage Input 2			Inlet Manifold Pressure Sensor
C16	AV3	Analogue Voltage Input 3			Throttle Servo Bank 1 Position Sensor Tracking
C17	AV4	Analogue Voltage Input 4			Throttle Pedal Sensor Main
C18	OUT_HB1	Half Bridge Output 1			Throttle Servo Bank 1 Motor Output
C19	INJ_D3A_POS	Direct Injector 3A +			Fuel Cylinder 3 Output +
C20	INJ_D3B_POS	Direct Injector 3B +			
C21	INJ_D4A_POS	Direct Injector 4A +			Fuel Cylinder 4 Output +
C22	INJ_D4B_POS	Direct Injector 4B +			
C23	INJ_LS1	Low Side Injector 1			Boost Actuator Output
C24	INJ_LS2	Low Side Injector 2			
C25	AV5	Analogue Voltage Input 5			Throttle Pedal Sensor Tracking (if not OE)
C26	BAT_POS	Battery Positive			ECU Battery Voltage
C27	INJ_D3A_NEG	Direct Injector 3A -			Fuel Cylinder 3 Output -
C28	INJ_D3B_NEG	Direct Injector 3B -			
C29	INJ_D4A_NEG	Direct Injector 4A -			Fuel Cylinder 4 Output -
C30	INJ_D4B_NEG	Direct Injector 4B -			
C31	OUT_HB3	Half Bridge Output 3			Fuel Pressure Direct Pump Output
C32	OUT_HB4	Half Bridge Output 4			Fuel Pressure Direct Pump Output
C33	OUT_HB5	Half Bridge Output 5			Inlet Camshaft Bank 1 Actuator Output
C34	OUT_HB6	Half Bridge Output 6			Exhaust Camshaft Bank 1 Actuator Output

M142 Connector D – 26 way

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

Pin	Designation	Full Name	OE Pin	Function	Description
D01	UDIG1	Universal Digital Input 1			Engine Speed Reference
D02	UDIG2	Universal Digital Input 2			
D03	AT1	Analogue Temperature Input 1		1k Pull up to SEN_5V_A	Inlet Manifold Temperature Sensor
D04	AT2	Analogue Temperature Input 2		1k Pull up to SEN_5V_A	Coolant Temperature Sensor
D05	AT3	Analogue Temperature Input 3		1k Pull up to SEN_5V_B	Airbox Temperature Sensor
D06	AT4	Analogue Temperature Input 4		1k Pull up to SEN_5V_B	Engine Oil Temperature Sensor
D07	KNOCK1	Knock Input 1			Knock Sensor 1
D08	UDIG3	Universal Digital Input 3			Inlet Camshaft Bank 1 Position
D09	UDIG4	Universal Digital Input 4			Exhaust Camshaft Bank 1 Position
D10	UDIG5	Universal Digital Input 5			
D11	UDIG6	Universal Digital Input 6			Throttle Pedal Sensor Tracking (if OE)
D12	BAT_BAK	Battery Backup			
D13	KNOCK2	Knock Input 2			Knock Sensor 2
D14	UDIG7	Universal Digital Input 7			
D15	SEN_OV_A	Sensor 0V A			Signal Ground for Reference and Cam sensors
D16	SEN_OV_B	Sensor 0V B			Signal Ground for Linear sensors
D17	CAN1_HI	CAN Bus 1 High			MoTeC 1 Mbit/sec CAN bus
D18	CAN1_LO	CAN Bus 1 Low			MoTeC 1 Mbit/sec CAN bus
D19	SEN_6V3	Sensor 6.3V			
D20	AV6	Analogue Voltage Input 6			Fuel Pressure Direct Sensor
D21	AV7	Analogue Voltage Input 7			
D22	AV8	Analogue Voltage Input 8			Fuel Pressure Sensor
D23	ETH_TX+	Ethernet Transmit+	Ethernet Green/White		Ethernet Green / White
D24	ETH_TX-	Ethernet Transmit-	Ethernet Green		Ethernet Green
D25	ETH_RX+	Ethernet Receive +	Ethernet Orange/White		Ethernet Orange / White
D26	ETH_RX-	Ethernet Receive-	Ethernet Orange		Ethernet Orange

▶ **EXAMPLE M182 PINOUT — FORD FIESTA 1.6 GTDI****M182 Connector A – 55 way**

Mating Connector: Autosport 55 way Green (Deutsch) AS6-16-35SD – MoTeC #65032

Pin	Designation	Full Name	OE Pin	Function	Description
A01	INJ_D1A_POS	Direct Injector 1A +			Fuel Cylinder 1 Output +
A02	INJ_D2A_POS	Direct Injector 2A +			Fuel Cylinder 2 Output +
A03	INJ_D2B_POS	Direct Injector 2B +			
A04	INJ_D4A_POS	Direct Injector 4A +			Fuel Cylinder 4 Output +
A05	INJ_D1B_POS	Direct Injector 1B +			
A06	LA_NB2	Lambda Narrow Input 2			
A07	LA_NB1	Lambda Narrow Input 1			
A08	SEN_5V0_C1	Sensor 5.0V C			Spare Supply voltage for sensors
A09	SEN_5V0_C2	Sensor 5.0V C			Spare Supply voltage for sensors
A10	INJ_D4B_POS	Direct Injector 4B +			
A11	INJ_D1A_NEG	Direct Injector 1A -			Fuel Cylinder 1 Output -
A12	INJ_D1B_NEG	Direct Injector 1B -			
A13	AV11	Analogue Voltage Input 11			Gear Lever Sensor
A14	DIG2	Digital Input 2			
A15	RS232_RX	RS232 Receive			
A16	SEN_5V0_C3	Sensor 5.0V C			Spare Supply voltage for sensors
A17	INJ_D6A_POS	Direct Injector 6A +			
A18	SEN_0V_C1	Sensor 0V C			Spare Signal Ground
A19	SEN_0V_C2	Sensor 0V C			Spare Signal Ground
A20	SEN_0V_C3	Sensor 0V C			Spare Signal Ground
A21	DIG1	Digital Input 1			
A22	LIN	LIN Bus			
A23	RS232_TX	RS232 Transmit			
A24	CAN2_HI	CAN Bus 2 High			
A25	INJ_D6B_POS	Direct Injector 6B +			
A26	INJ_D2A_NEG	Direct Injector 2A -			Fuel Cylinder 2 Output -
A27	AV15	Analogue Voltage Input 15			
A28	AV16	Analogue Voltage Input 16			
A29	AV17	Analogue Voltage Input 17			
A30	DIG3	Digital Input 3			
A31	CAN2_LO	CAN Bus 2 Low			
A32	INJ_D3A_POS	Direct Injector 3A +			Fuel Cylinder 3 Output +
A33	INJ_D2B_NEG	Direct Injector 2B -			
A34	AV13	Analogue Voltage Input 13			
A35	AV12	Analogue Voltage Input 12			

Pin	Designation	Full Name	OE Pin	Function	Description
A36	INJ_D6A_NEG	Direct Injector 6A -			
A37	DIG4	Digital Input 4			
A38	BAT_BAK	Battery Backup			
A39	CAN3_HI	CAN Bus 3 High			
A40	INJ_D3B_POS	Direct Injector 3B +			
A41	AV14	Analogue Voltage Input 14			Air Conditioner Refrigerant Pressure Sensor
A42	INJ_D3A_NEG	Direct Injector 3A -			Fuel Cylinder 3 Output -
A43	INJ_D4A_NEG	Direct Injector 4A -			Fuel Cylinder 4 Output -
A44	INJ_D5B_NEG	Direct Injector 5B -			
A45	INJ_D6B_NEG	Direct Injector 6B -			
A46	CAN3_LO	CAN Bus 3 Low			
A47	INJ_D5A_POS	Direct Injector 5A +			
A48	INJ_D5B_POS	Direct Injector 5B +			
A49	INJ_D3B_NEG	Direct Injector 3B -			
A50	INJ_D4B_NEG	Direct Injector 4B -			
A51	INJ_D5A_NEG	Direct Injector 5A -			
A52	IGN_LS12	Low Side Ignition 12			
A53	IGN_LS9	Low Side Ignition 9			
A54	IGN_LS10	Low Side Ignition 10			
A55	IGN_LS11	Low Side Ignition 11			

M182 Connector B – 26 way

Mating Connector: Autosport 26 way Red (Deutsch) AS6-16-26SN – MoTeC #65034

Pin	Designation	Full Name	OE Pin	Function	Description
B_A	OUT_HB1	Half Bridge Output 1			Throttle Servo Bank 1 Motor Output
B_B	OUT_HB2	Half Bridge Output 2			Throttle Servo Bank 1 Motor Output
B_C	OUT_HB3	Half Bridge Output 3			Fuel Pressure Direct Pump Output
B_D	OUT_HB4	Half Bridge Output 4			Fuel Pressure Direct Pump Output
B_E	OUT_HB5	Half Bridge Output 5			Inlet Camshaft Bank 1 Actuator Output
B_F	OUT_HB6	Half Bridge Output 6			Exhaust Camshaft Bank 1 Actuator Output
B_G	BAT_NEG1	Battery Negative			Battery Negative
B_H	BAT_POS1	Battery Positive			ECU Battery Voltage
B_J	BAT_POS2	Battery Positive			ECU Battery Voltage
B_K	BAT_POS3	Battery Positive			ECU Battery Voltage
B_L	BAT_POS4	Battery Positive			ECU Battery Voltage
B_M	OUT_HB10	Half Bridge Output 10			
B_N	OUT_HB9	Half Bridge Output 9			
B_P	OUT_HB8	Half Bridge Output 8			
B_R	OUT_HB7	Half Bridge Output 7			
B_S	INJ_LS4	Low Side Injector 4			
B_T	INJ_LS6	Low Side Injector 6			
B_U	INJ_LS1	Low Side Injector 1			Boost Actuator Output
B_V	INJ_LS2	Low Side Injector 2			
B_W	BAT_NEG2	Battery Negative			Battery Negative
B_X	BAT_NEG3	Battery Negative			Battery Negative
B_Y	BAT_NEG4	Battery Negative			Battery Negative
B_Z	BAT_NEG5	Battery Negative			Battery Negative
B_a	INJ_LS5	Low Side Injector 5			
B_b	INJ_LS3	Low Side Injector 3			
B_c	BAT_NEG6	Battery Negative			

M182 Connector C – 55 way

Mating Connector: Autosport 55 way Red (Deutsch) AS6-16-35SN – MoTeC #68090

Pin	Designation	Full Name	OE Pin	Function	Description
C01	IGN_LS4	Low Side Ignition 4			Ignition Cylinder 4 Output
C02	IGN_LS3	Low Side Ignition 3			Ignition Cylinder 3 Output
C03	IGN_LS8	Low Side Ignition 8			
C04	IGN_LS6	Low Side Ignition 6			
C05	IGN_LS5	Low Side Ignition 5			
C06	AV8	Analogue Voltage Input 8			Fuel Pressure Sensor
C07	AV10	Analogue Voltage Input 10			Gear Sensor
C08	IGN_LS2	Low Side Ignition 2			Ignition Cylinder 2 Output
C09	IGN_LS7	Low Side Ignition 7			Air Conditioner Clutch Output
C10	UDIG8	Universal Digital Input 8			Engine Oil Pressure Low Switch
C11	AV6	Analogue Voltage Input 6			Fuel Pressure Direct Sensor
C12	AV7	Analogue Voltage Input 7			
C13	AV9	Analogue Voltage Input 9			Boost Pressure Sensor
C14	SEN_OV_A1	Sensor 0V A			Signal Ground for Reference and Cam sensors
C15	SEN_OV_A2	Sensor 0V A			Signal Ground for Reference and Cam sensors
C16	IGN_LS1	Low Side Ignition 1			Ignition Cylinder 1 Output
C17	UDIG7	Universal Digital Input 7			
C18	UDIG1	Universal Digital Input 1			Engine Speed Reference
C19	UDIG12	Universal Digital Input 12			
C20	UDIG11	Universal Digital Input 11			
C21	UDIG10	Universal Digital Input 10			
C22	UDIG9	Universal Digital Input 9			Airbox Mass Flow PWM Signal
C23	SEN_OV_B1	Sensor 0V B			Signal Ground for Linear sensors
C24	CAN1_HI	CAN Bus 1 High			MoTeC 1 Mbit/sec CAN bus
C25	UDIG3	Universal Digital Input 3			Inlet Camshaft Bank 1 Position
C26	ETH_RX-	Ethernet Receive-	Ethernet Orange		Ethernet Orange
C27	UDIG4	Universal Digital Input 4			Exhaust Camshaft Bank 1 Position
C28	AV4	Analogue Voltage Input 4			Throttle Pedal Sensor Main
C29	AV5	Analogue Voltage Input 5			Throttle Pedal Sensor Tracking
C30	SEN_OV_B2	Sensor 0V B			Signal Ground for Linear sensors
C31	CAN1_LO	CAN Bus 1 Low			MoTeC 1 Mbit/sec CAN bus
C32	UDIG2	Universal Digital Input 2			
C33	ETH_RX+	Ethernet Receive+	Ethernet Orange/White		Ethernet Orange / White
C34	ETH_TX-	Ethernet Transmit-	Ethernet Green		Ethernet Green
C35	AV3	Analogue Voltage Input 3			Throttle Servo Bank 1 Position Sensor Tracking

Pin	Designation	Full Name	OE Pin	Function	Description
C36	AV2	Analogue Voltage Input 2			Inlet Manifold Pressure Sensor
C37	AT1	Analogue Temperature Input 1		1k Pull up to SEN_5V_A	Inlet Manifold Temperature Sensor
C38	AT3	Analogue Temperature Input 3		1k Pull up to SEN_5V_B	Airbox Temperature Sensor
C39	AT2	Analogue Temperature Input 2		1k Pull up to SEN_5V_A	Coolant Temperature Sensor
C40	UDIG5	Universal Digital Input 5			
C41	ETH_TX+	Ethernet Transmit+	Ethernet Green/White		Ethernet Green / White
C42	AV1	Analogue Voltage Input 1			Throttle Servo Bank 1 Position Sensor Main
C43	KNOCK3	Knock Input 3			
C44	KNOCK2	Knock Input 2			Knock Sensor 2
C45	AT5	Analogue Temperature Input 5		1k Pull up to SEN_5V_C	Transmission Temperature Sensor
C46	AT4	Analogue Temperature Input 4		1k Pull up to SEN_5V_B	Engine Oil Temperature Sensor
C47	UDIG6	Universal Digital Input 6			
C48	SEN_5V0_A1	Sensor 5.0V A			Supply voltage for Reference and Cam sensors (if required)
C49	KNOCK4	Knock Input 4			
C50	SEN_5V0_B1	Sensor 5.0V B			Supply voltage for Linear sensors
C51	KNOCK1	Knock Input 1			Knock Sensor 1
C52	AT6	Analogue Temperature Input 6		1k Pull up to SEN_5V_C	
C53	SEN_5V0_A2	Sensor 5.0V A			Supply voltage for Reference and Cam sensors (if required)
C54	SEN_6V3	Sensor 6.3V			
C55	SEN_5V0_B2	Sensor 5.0V B			Supply voltage for Linear sensors