

**Pinout Euro-4 – Right Connector (Black) - (May 2012)**

PIN	NAME	SENSORS	DESCRIPTION
A1	AGND		Ground for analogue sensor
A2	GND		Digital ground; recommended for CAN bus
A3	GND		Digital ground; recommended for EM3 / EM4
A4	AGND		Ground for analogue sensors
B1	TMP	Spare temp	NTC temperature sensor input; 3.16 kOhm pull-up
B2			NTK lambda sensor (-VS/-IP; sensor connector pin #6)
B3	VREF4 *)		VREF PPS; 5 V reference voltage for primary sensors (pref PPS)
B4	AGND		Ground for analogue sensors (recommended for PPS)
C1	LNR8	Spare 8	Spare analogue sensor input; 0.5 volts, 47 kOhm pull-up
C2	WREN		Write enable (WREN); for CAN 1
C3			NTK lambda sensor (VS; sensor connector pin #5)
C4	CAN1L		CAN negative; PC communication line
D1	IGNSW		Ignition switch input; commands main relay on J1
D2	LNR7	Spare 7	Spare analogue sensor input; 0.5 volts, 47 kOhm pull-up
D3	VREF2 **)		VREF2; 5V reference voltage for secondary analogue sensors
D4	CAN1H		CAN positive; PC communication line
E1	PPS2	Pedal	Pedal position sensor (secondary trace); spare linear input; pull-down
E2	PFUEL	Fuel press	Fuel pressure sensor input
E3			NTK lambda sensor (RC; sensor connector pin #4)
E4	CAN2L		CAN2 negative; data exchange bus, not terminated
F1	LNR9	Spare 9	Spare analogue sensor input; 0.5 volts, 47 kOhm pull-up
F2	PPS1	Pedal	Pedal position sensor (primary trace) ; spare linear input, pull-down
F3	CAN2H		CAN2 positive; data exchange bus, not terminated
F4			NTK lambda sensor (IP; sensor connector pin #3)
G1	LNR3	Spare 3	Spare analogue sensor input; 0.5 volts, 47 kOhm pull-up
G2	LNR4	Spare 4	Spare analogue sensor input; 0.5 volts, 47 kOhm pull-up
G3	LNR6	Spare 6	Spare analogue sensor input; 0.5 volts, 47 kOhm pull-up
G4	LNR5	Spare 5	Spare analogue sensor input; 0.5 volts, 47 kOhm pull-up
H1	LNR2	Spare 2	Spare analogue sensor input; 0.5 volts, 47 kOhm pull-up
H2	LNR1	Spare 1	Spare analogue sensor input; 0.5 volts, 47 kOhm pull-up
H3	EM3	Second cam	Digital input for second cam sensor (inductive or Hall effect)
H4	EM4	Third cam	Digital input for third cam sensor (inductive or Hall effect)
J1	OUT-R	Main relay	Switch for main relay; controls power supply to L3, L4 and engine
J2			NTK lambda sensor heater (PWM; sensor connector pin #1)
J3	HE4	Speed / switch	Rear left wheel speed sensor input – Hall effect
J4	HE5	Switch, in	Programmable input switch; see ECU Setup Map
K1	OUT-L10	Switch, out	Programmable low power output switch; see ECU Setup Map
K2	OUT-L9	Switch, out	Programmable low power output switch; see ECU Setup Map
K3	HE6	Switch, in	Programmable input switch; see ECU Setup Map
K4	HE7	Switch, in	Programmable input switch; see ECU Setup Map
L1	OUT-H8	Switch / PWM	Programmable high power output switch; see ECU Setup Map
L2	OUT-H7	Switch / PWM	Programmable high power output switch; see ECU Setup Map
L3	VBATT-IN	Battery Key	Switched power supply from main relay
L4	VBATT-IN	Battery Key	Switched power supply from main relay
M1	STEP D		Stepper motor driver, step C
M2	STEP A		Stepper motor driver, step B
M3	STEP B		Stepper motor driver, step A
M4	STEP C		Stepper motor driver, step D

\*) Maximum current draw 50 mA

\*\*\*) Maximum current draw 100 mA, no capacitive loads

**Pinout Euro-4 – Left Connector (Brown)**

PIN	NAME	Sensors	DESCRIPTION
A1	AGND		Ground for analogue sensors
A2	AGND		Ground for analogue sensors
A3	TAIR	Air temp	Air temperature sensor input; 3.16 kOhm pull-up
A4	TPS2	Second throttle	Spare analogue sensor input (TPS2); 47 kOhm pull-up
B1	AGND		Ground for analogue sensors
B2	HE1	Speed / switch	Front right wheel speed sensor input – Hall effect
B3	VREF3		VREFTPS; 5 V reference voltage for primary sensors (pref TPS)
B4	MAP	MAP	Manifold air pressure sensor input; 47 kOhm pull-up
C1	VREF1		VREF1; 5 V reference voltage for secondary analogue sensors
C2	HE2	Speed / switch	Front left wheel speed sensor input – Hall effect
C3	HE3	Speed / switch	Rear right wheel speed sensor input – Hall effect
C4	TPS1	Throttle	Throttle position sensor input (TPS1); 47 kOhm pull-up
D1	OUT-H5	Switch / PWM	Programmable high power output switch; see ECU Setup Map
D2	OUT-H6	Switch / PWM	Programmable high power output switch; see ECU Setup Map
D3	GNDKNK		Ground for knock sensors
D4	KNK2	Knock #2	Knock sensor 2 input
E1	ETB2	Drive-by-wire	Electronic throttle control module (M -)
E2	ETB1	Drive-by-wire	Electronic throttle control module (M +)
E3	TH2O	Water temp	Water temperature sensor input; 3.16 kOhm pull-up
E4	KNK1	Knock #1	Knock sensor 1 input
F1	OUT-L11	Switch, out	Programmable low power output switch; see ECU Setup Map
F2	OUT-L12	Switch, out	Programmable low power output switch; see ECU Setup Map
F3	POIL	Oil press	Oil pressure sensor input; 47 kOhm pull-up
F4	TOIL	Oil temp	Oil temperature sensor input; 3.16 kOhm pull-up
G1	OUT-H1	Injector driver	Driver OUT H1 – fuel injector 5; see ECU Setup Map
G2	OUT-H2	Injector driver	Driver OUT H2 – fuel injector 6; see ECU Setup Map
G3	GND		Digital ground for EM1 and EM2 speed sensors
G4	GND		Digital ground for Hall effect wheel speed sensors
H1	OUT-H3	Injector driver	Driver OUT H3 – fuel injector 7; see ECU Setup Map
H2	OUT-H4	Injector driver	Driver OUT H4 – fuel injector 8; see ECU Setup Map
H3	EM1	Crank sensor	Digital input for crankshaft sensor (inductive or Hall effect)
H4	EM2	Cam sensor	Digital input for primary cam sensor (inductive or Hall effect)
J1	INJ1	Injector driver	Fuel injector 1; see ECU Setup Map
J2	INJ4	Injector driver	Fuel injector 4; see ECU Setup Map
J3	IGN3	Coil driver	Ignition driver 3 (logic coils); see ECU Setup Map
J4	IGN4	Coil driver	Ignition driver 4 (logic coils); see ECU Setup Map
K1	INJ3	Injector driver	Fuel injector 3; see ECU Setup Map
K2	INJ2	Injector driver	Fuel injector 2; see ECU Setup Map
K3	IGN1	Coil driver	Ignition driver 1 (logic coils); see ECU Setup Map
K4	IGN2	Coil driver	Ignition driver 2 (logic coils); see ECU Setup Map
L1	GNDPW		Power ground on engine
L2	GNDPW		Power ground on engine
L3	GNDPW		Power ground on engine
L4	GNDPW		Power ground on engine
M1	IGN4PW	Coil driver	Ignition driver 4 (inductive coils); see ECU Setup Map
M2	IGN1PW	Coil driver	Ignition driver 1 (inductive coils); see ECU Setup Map
M3	IGN2PW	Coil driver	Ignition driver 2 (inductive coils); see ECU Setup Map
M4	IGN3PW	Coil driver	Ignition driver 3 (inductive coils); see ECU Setup Map

\*) Maximum current draw 50 mA

\*\*) Maximum current draw 100 mA, no capacitive loads

**Output Drivers – Low Power**

PIN	NAME	CONNECTOR	DESCRIPTION
K2	OUT-L9	Black	Selectable relay switch
K1	OUT-L10	Black	Selectable relay switch
F1	OUT-L11	Brown	Selectable relay switch
F2	OUT-L12	Brown	Selectable relay switch

**Output Drivers – High Power**

PIN	NAME	CONNECTOR	DESCRIPTION
D1	OUT-H5	Brown	Selectable high current output switch incl PWM feature
D2	OUT-H6	Brown	Selectable high current output switch incl PWM feature
L2	OUT-H7	Black	Selectable high current output switch incl PWM feature
L1	OUT-H8	Black	Selectable high current output switch incl PWM feature
G1	OUT-H1	Brown	Injector driver 5; possible output for 4-cyl setup, from firmware 300
G2	OUT-H2	Brown	Injector driver 5; possible output for 4-cyl setup, from firmware 300
H1	OUT-H3	Brown	Injector driver 5; possible output for 4-cyl setup, from firmware 300
H2	OUT-H4	Brown	Injector driver 5; possible output for 4-cyl setup, from firmware 300

**Crank and Camshaft Sensor Inputs – Hall effect or inductive**

PIN	NAME	CONNECTOR	DESCRIPTION
H3	EM1	Brown	Crankshaft speed sensor
H4	EM2	Brown	Camshaft synchronisation sensor
H3	EM3	Black	Spare cam sensor / Inductive speed sensor
H4	EM4	Black	Spare cam sensor / Inductive speed sensor

**Hall Effect Speed Sensor and Switch Inputs**

PIN	NAME	CONNECTOR	SET*	DESCRIPTION
B2	HE1	Brown	21	Switch / Speed Front Right; Hall effect speed sensors
C2	HE2	Brown	22	Switch / Speed Front Left; Hall effect speed sensors
C3	HE3	Brown	23	Switch / Speed Rear Right; Hall effect speed sensors
J3	HE4	Black	24	Switch / Speed Rear Left; Hall effect speed sensors
J4	HE5	Black	25	Switch
K3	HE6	Black	26	Switch
K4	HE7	Black	27	Switch

**Linear Analogue Sensor Inputs**

PIN	NAME	CONNECTOR	SET*	DESCRIPTION
H2	Linear 1	Black	1	Spare analogue sensor input; 0.5 volts, 47 kOhm pull-up
H1	Linear 2	Black	2	Spare analogue sensor input; 0.5 volts, 47 kOhm pull-up
G1	Linear 3	Black	3	Spare analogue sensor input; 0.5 volts, 47 kOhm pull-up
G2	Linear 4	Black	4	Spare analogue sensor input; 0.5 volts, 47 kOhm pull-up
G4	Linear 5	Black	5	Spare analogue sensor input; 0.5 volts, 47 kOhm pull-up
G3	Linear 6	Black	6	Spare analogue sensor input; 0.5 volts, 47 kOhm pull-up
D2	Linear 7	Black	7	Spare analogue sensor input; 0.5 volts, 47 kOhm pull-up
C1	Linear 8	Black	8	Spare analogue sensor input; 0.5 volts, 47 kOhm pull-up
F1	Linear 9	Black	9	Spare analogue sensor input; 0.5 volts, 47 kOhm pull-up
F2	PPS1	Black	10	Primary pedal position sensor; spare linear input, pull-down
E1	PPS2	Black	11	Secondary pedal position sensor; spare linear input; pull-down
C4	TPS1	Brown	12	Throttle position sensor input (TPS1); 47 kOhm pull-up
A4	TPS2	Brown	13	Spare TPS analogue sensor input; 0.5 volts, 47 kOhm pull-up
B4	MAP	Brown	14	Manifold air pressure sensor input; 0.5 volts, 47 kOhm pull-up
E2	Fuel P	Black	15	Fuel pressure sensor input; 0.5 volts, 47 kOhm pull-up
F3	Oil P	Brown	16	Oil pressure sensor input; 0.5 volts, 47 kOhm pull-up

**NTC Temperature Sensor Inputs**

<b>PIN</b>	<b>NAME</b>	<b>CONNECTOR</b>	<b>SET*</b>	<b>DESCRIPTION</b>
F4	TOIL	Brown	17	Oil temperature sensor input; 3.16 kOhm pull-up
A3	TAIR	Brown	18	Air temperature sensor input; 3.16 kOhm pull-up
B1	TMP	Black	19	NTC temp sensor input; 3.16 kOhm pull-up
E3	TH2O	Brown	--	Water temperature sensor input; 3.16 kOhm pull-up

**Analogue Sensor Inputs via CAN 2**

<b>ID</b>	<b>BYTE</b>	<b>NAME</b>	<b>SET*</b>	<b>DESCRIPTION</b>
0x500	0,1	Analogue 1	30	Spare analogue sensor input; 10 bit resolution
0x500	2,3	Analogue 2	31	Spare analogue sensor input; 10 bit resolution
0x500	4,5	Analogue 3	32	Spare analogue sensor input; 10 bit resolution
0x500	6,7	Analogue 4	33	Spare analogue sensor input; 10 bit resolution
0x501	0,1	Analogue 5	34	Spare analogue sensor input; 10 bit resolution
0x501	2,3	Analogue 6	35	Spare analogue sensor input; 10 bit resolution
0x501	4,5	Analogue 7	36	Spare analogue sensor input; 10 bit resolution
0x501	6,7	Analogue 8	37	Spare analogue sensor input; 10 bit resolution

SET\* = Key in number in ECU Setup Map to select channel.