EM112

Specifications

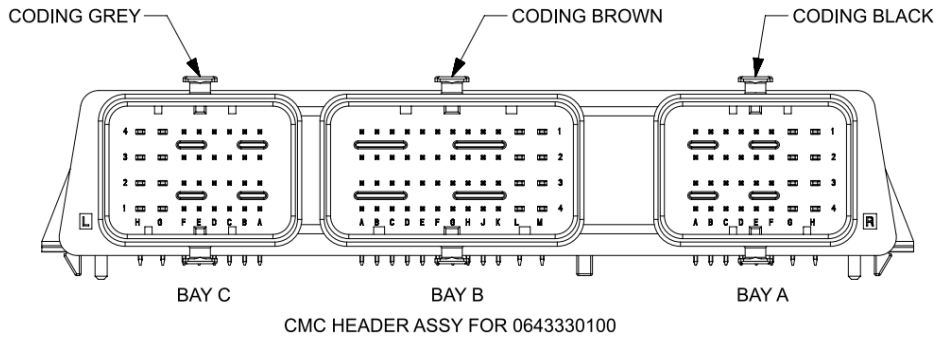
Parameter	Value
Operating Voltage	4V – 35V
Power Consumption	≈ 330mA @ 14V
Outputs	
8 Ignition Coil Drivers	20A peak, may be used as low side outputs OR may be set to 5V logic
8 Injector Drivers	3A peak, programmable peak and Hold
8 PWM ½ bridges	4 x 10A peak, 4 x 3A peak may be used as high side outputs
8 PWM Low side drivers	3A PWMs 4 with recirculation diodes
2 Low side drivers	6A (Lambda Heaters)
1 low side	1A main relay optional
4 Sensor Supply	5V 100mA each
Inputs	
20 Analogue Inputs	0-5V 12bit
12 Timing Inputs	6 Logic level, 6 Software selectable logic or VR
2 Differential inputs	
2 Wideband Lambda Inputs	ADV / Bosch LSU 4.9 OR LSU 4.2 Software selectable
2 Narrowband Lambda Inputs	
2 Battery sense inputs	
2 Knock Inputs	
Internal	
3-Axis G sensor and Yaw	
Internal Barometric	
Battery Volts	
ECU temperature	
Comms	
3 CAN Bus	CAN 2.0B, 120 Ohm terminated
1 LIN Bus	
PC Comms	Ethernet
Internal Logging Memory	256MByte up to 1ms resolution
Metrics	
Anodised Aluminium Case	Sealed against water and dust ingress
Size	138 x 186 x 36mm
Weight	480g

Connectors

ID	Connector	Loom/Mating Connector
A	Molex 64333-0100	Molex 64319-3211 (32 pin)
B		Molex 64320-1319 (48 pin)
C		Molex 64319-1218 (32 pin)

Pin Out

Pin Identification:



Connector	A (32pin Black 64319-3211)		
Pin	**Name**	**Software Code**	**Notes**
A1	Wideband Lambda B 4	A29	
B1	Wideband Lambda B 3	A28	
C1	Wideband Lambda B Heater	O36	
D1	PWM Low Side Driver 7	O14 P7	
E1	PWM Low Side Driver 8	O15 P8	
F1	Fuel Injector Driver 5	O28	
G1	Bridge Driver A-	O13 P6	
H1	Ignition Coil Driver 4	O4	
A2	Wideband Lambda B 2		
B2	Wideband Lambda B 1		
C2	LIN Bus		
D2	MAP Input	A05	Selectable 47K pull up or down or gain 48
E2	Timing Input 2	T2	
F2	Fuel Injector Driver 6	O26	
G2	Bridge Driver A+	O12 P5	
H2	Ignition Coil Driver 3	O3	
A3	Knock Input B +	A02+	
B3	Knock Input B -	A02-	
C3	Timing Input 1	T1	
D3	Analogue Ground 4		
E3	5V Sensor Supply 3		
F3	Fuel Injector Driver 7	O32	
G3	Analogue Input 20	A20	
H3	Ignition Coil Driver 5	O5	
A4	Active Throttle Feedback 2	A09	Selectable 47K pull up or down
B4	Active Throttle Feedback 1	A10	Selectable 47K pull up or down
C4	Analogue Ground 2		
D4	Coolant Temp Input	A11	Fixed 2K2 pull up
E4	Air Inlet Temp Input	A08	Fixed 4K7 pull up
F4	Fuel Injector Driver 8	O31	
G4	Power Return		
H4	Ignition Coil Driver 6	O6	

Connector	B (48pin Brown 64320-1319)		
Pin	**Name**	**Software Code**	**Function**
A1	Ethernet Tx +		
B1	Ethernet Tx -		
C1	Ethernet Rx +		
D1	Ethernet Rx -		
E1	CAN 2 High		120 Ohm terminated
F1	CAN 2 Low		
G1	CAN 1 High		120 Ohm terminated
H1	CAN 1 Low		
J1	CAN 3 High		120 Ohm terminated
K1	CAN 3 Low		
L1	PWM Low Side Driver 10	O17 P10	
M1	PWM Low Side Driver 9	O16 P9	
A2	5V Sensor Supply 2		
B2	Timing Input 12	T12	
C2	Timing Input 11	T11	
D2	Timing Input 10	T10	
E2	Timing Input 9	T9	
F2	Analogue Ground 5		
G2	Timing Input 5	T5	
H2	Timing Input 6	T6	
J2	5V Sensor Supply 4		
K2	Analogue Ground 6		
L2	Secondary 12V Supply	A13	
M2	Main Relay		1A with block diode
A3	Differential Analogue Input B-	A03	
B3	Differential Analogue Input B+	A03	
C3	Accelerator Pedal Input 1	A07	Selectable 47K pull up or down
D3	Accelerator Pedal Input 2	A06	Selectable 47K pull up or down
E3	Lambda Input 1	A04	Selectable 47K pull up or down
F3	Lambda Input 2	A30	Selectable 47K pull up or down
G3	Analogue Input 27	A27	Fixed 47K pull up
H3	Analogue Input 26	A26	Fixed 47K pull up
J3	Analogue Input 25	A25	Fixed 47K pull up
K3	Analogue Input 24	A24	Fixed 47K pull up
L3	PWM Low Side Driver 12	O19 P12	
M3	PWM Low Side Driver 11	O18 P11	
A4	Differential Analogue Input A-	A01	
B4	Differential Analogue Input A+	A01+	
C4	Bridge Driver C+	O22 P15	
D4	Bridge Driver C-	O23 P16	
E4	Bridge Driver D+	O21 P14	
F4	Bridge Driver D-	O20 P13	
G4	Timing Input 7	T7	
H4	Timing Input 8	T8	
J4	Analogue Input 16	A16	Fixed 47K pull up
K4	Analogue Input 31	A31	Fixed 1K pull up
L4	Power Return		
M4	Main 12V Supply	A14	Bridge power

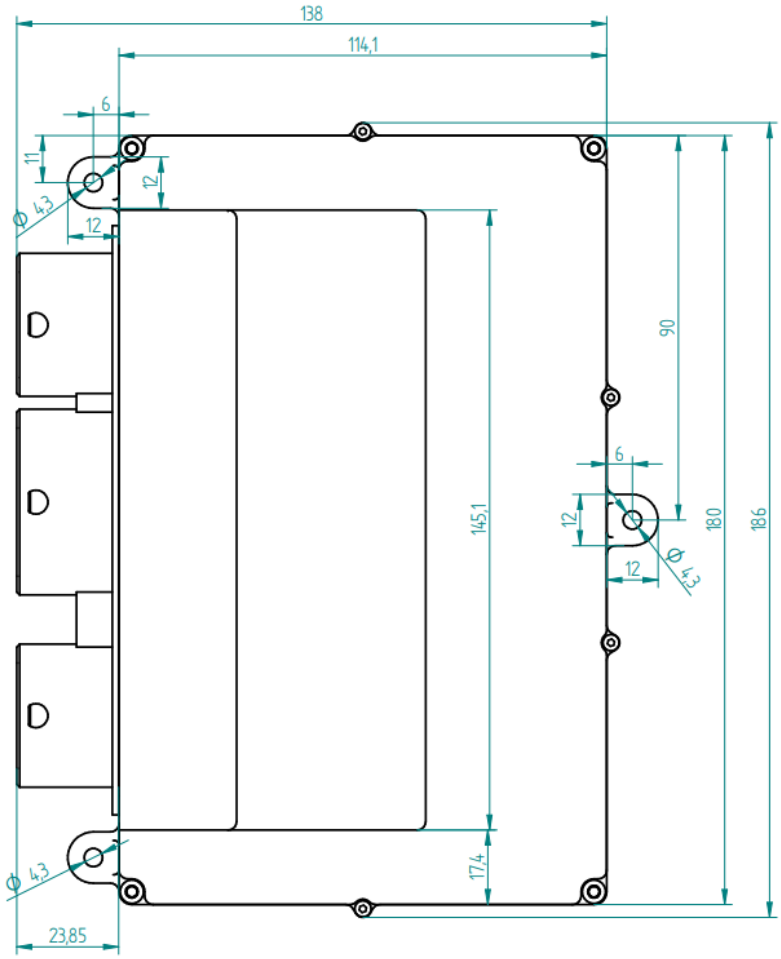
Connector	C (32pin Grey 64319-1218)		
Pin	**Name**	**Software Code**	**Function**
A1	Wideband Lambda A 3	A22	
B1	Wideband Lambda A 4	A21	
C1	Wideband Lambda A Heater	O35	
D1	PWM Low Side Driver 3	O10 P3	
E1	PWM Low Side Driver 4	O11 P4	
F1	Fuel Injector Driver 4	O27	
G1	Power Return		
H1	Ignition Coil Driver 4	O2	
A2	Wideband Lambda A 1	A22	Ri
B2	Wideband Lambda A 2	A21	
C2	Analogue Input 23	A23	Fixed 47K pull up
D2	MAF Input	A12	Selectable 47K pull up or down or gain 48
E2	Timing Input 4	T4	
F2	Fuel Injector Driver 3	O26	
G2	Main 12V Supply		
H2	Ignition Coil Driver 2	O2	
A3	Knock Input A -	A0	
B3	Knock Input A +	A0	
C3	Timing Input 3	T3	
D3	Analogue Ground 3		
E3	5V Sensor Supply 1		
F3	Fuel Injector Driver 2	O25	
G3	Bridge Driver B+	O8 P1	
H3	Ignition Coil Driver 3	O1	
A4	Active Throttle Feedback 4	A19	Selectable 47K pull up or down
B4	Active Throttle Feedback 3	A18	Selectable 47K pull up or down
C4	Analogue Ground 1		
D4	Analogue Input 17	A17	Fixed 4K7 pull up
E4	Analogue Input 15	A15	Fixed 47K pull up
F4	Fuel Injector Driver 1	O24	
G4	Bridge Driver B-	O9 P2	
H4	Ignition Coil Driver 1	O1	
-	Internal Barometric Sensor		
-	Internal ECU Temperature		
	3Axis G and Yaw		

High current pins marked **in bold**

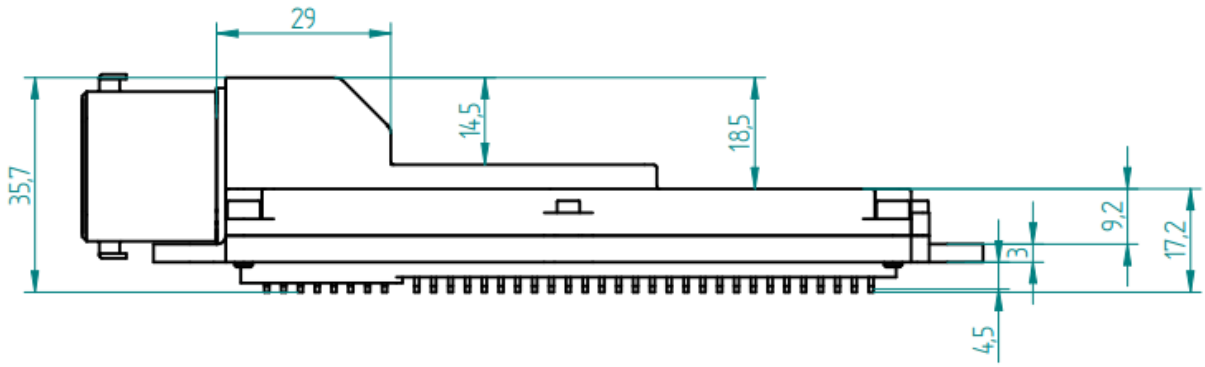
Software Codes: A = Analogue Input, O = Output, P = PWM Output, T = Timing Input

Dimensions

Top:



Side:



Recommended Mounting

Secured to mounting location using 3 case mounting lugs, via M4 anti-vibration mounts, at 10mm dia. Example part: 1008VD10

Airflow provided to side (Y dimension in below) of unit recommended.

Conductive path must be created from case to mounting chassis ground.

Directions for internal G and angular speed sensor