



## M170 ECU



**MoTeC's M1 ECU range begins a new era in engine control. The M1's unique technology redefines the meaning of customisation, delivering total control without compromise. Highly advanced security strategies make these ECUs ideal for both category managed and unrestricted applications.**

### ► FEATURES

- Small and light in robust magnesium enclosure
- Port injection injector type
- Large logging memory
- Latest generation high performance processor
- Suitable for modern engines with DBW, Cam Control and multiple CAN buses
- Advanced logging features, high speed, multiple logs (with access logins)
- I/O expansion using E816, E888 expanders
- Flexible tuning software
- Robust and comprehensive security features
- Programmable injector drive characteristics
- Programmable digital input system for Ref/Sync, wheel speeds etc.
- Programmable trigger levels, diagnostics
- All Low Side and Half Bridge outputs have PWM capability

### ► CONFIGURATION

The M1 series ECUs come with three configuration options.

#### **Locked Configuration**

A locked configuration is appropriate when an ECU contains specific firmware to suit the application. The user can tune the engine in the normal way but the ECU cannot be re-configured for another application.

#### **Standard Configuration**

The standard configuration allows the user to load a selection of firmware packages available from MoTeC. They incorporate different levels of functionality and the user can choose one to suit their requirements. Additional packages can be loaded into the ECU as and when requirements change.

#### **Open Configuration**

The open configuration provides a fully flexible ECU solution that can be precisely tailored to individual requirements. Third party developers can be trained to use MoTeC M1 Build software to develop their own control strategies.

Intellectual property is protected by the M1 ECU's security system and remains with the ECU owner.

## ▶ SECURITY

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The M1's advanced security system is based on public-key cryptography, the cornerstone of secure internet transactions, so it is virtually impossible to change the ECU function without authorised permission.

Security is enforced by the ECU and protected by a microprocessor with integrated measures to prevent tampering.

A password feature grants different levels of access for different users e.g. an engine tuner, a drive train tuner, and a data analysis engineer.

This is also suitable for Control ECUs. Scrutineering teams can have access to extra information and are able to lock down selected parts of the ECU, while other team members can access selected tuning parameters.

## ▶ CATEGORY MANAGEMENT

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The combination of an advanced security strategy, configurable firmware and a high performance processor make the M1 ECU an ideal choice for categories with restrictions in place for either performance parity or cost containment. Firmware can be written specifically for the category, limiting the functionality to the class requirements.

Multiple data logging sets are available, which can be partitioned with restricted access to allow generation of both judicial (scrutineering) and team data from the same device. The M1 ECU's security system prevents unauthorised access to data and implementation of unspecified functionality.

## ▶ UPGRADES

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- Various Logging Options are available.
 

The logging licence determines the number of channels and the sample rates available, there are 3 levels available:

  - Logging Level 1 Licence
 

Comes standard with the product. This diagnostic logging includes a fixed log set and rate.
  - Logging Level 2 Licence
 

Is an optional upgrade which includes one fixed log set, 200 channels (including diagnostics) and a maximum 200 Hz sample rate.
  - Logging Level 3 Licence
 

Is an optional upgrade which includes eight fixed log sets, 2000 channels and a maximum 1000 Hz sample rate.
- Configuration:
  - Locked Configuration
  - Standard Configuration
  - Open Configuration

## ▶ SOFTWARE

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- Microsoft Windows™ based software
- PC Tuning software 'Tune' - Used to tune fuel and ignition, set up sensors, outputs and available functions
- PC Software 'Build' - Used to create a custom software package with user specific functions

## ▶ BASIC SPECIFICATIONS

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### Injector

- Peak and Hold Injector Outputs: 8
- Low Side Injector Outputs: 2

### Ignition

- Outputs: 8

### Auxiliary Outputs

- Half Bridge: 6

### Inputs

- Universal Digital: 8
- Analogue Voltage: 8
- Analogue Temperature: 4
- Knock: 2

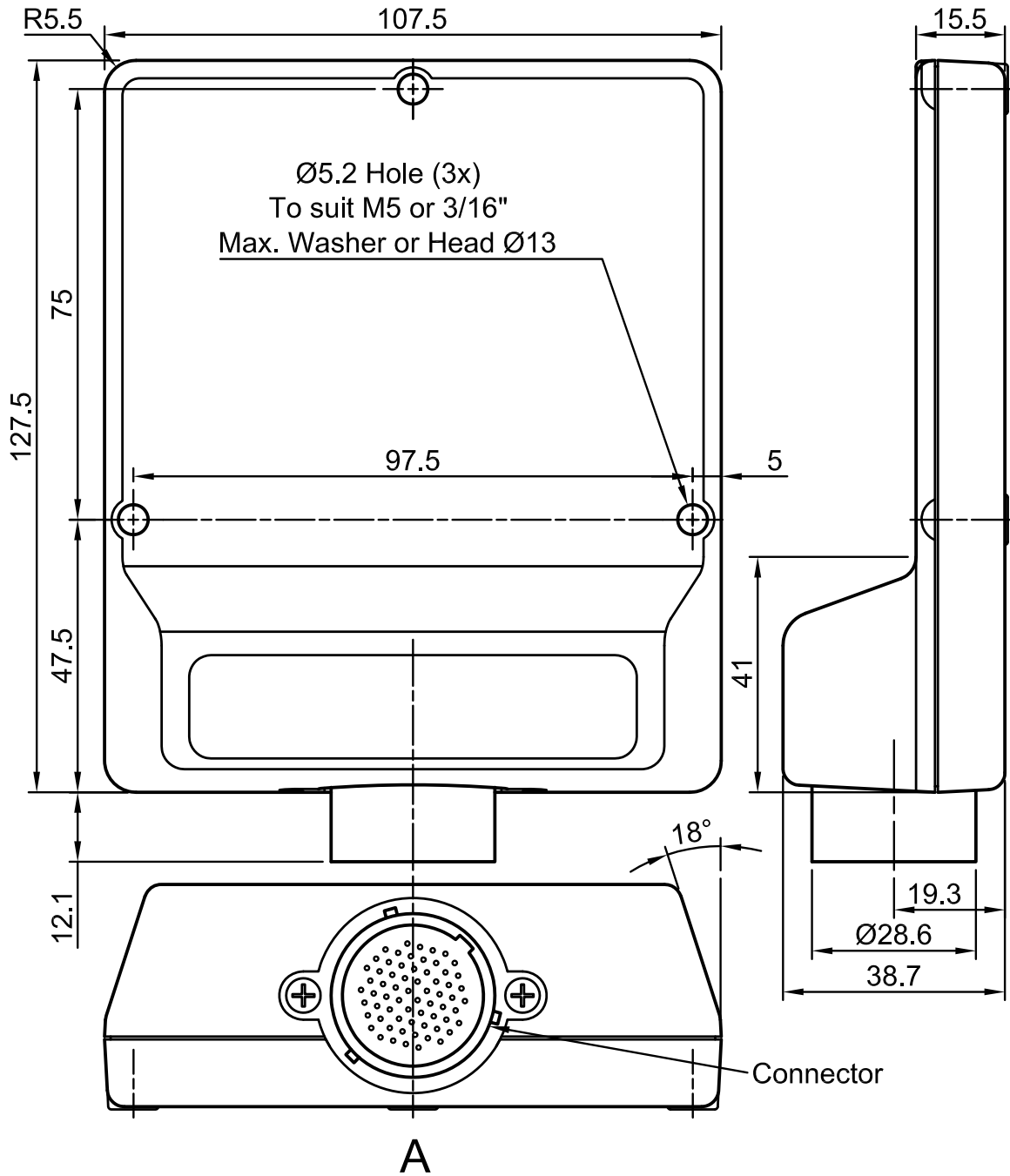
### Data

- CAN bus: 1
- Logging Memory: 250 Mb

### Physical

- Dimensions: 107.5 x 127.5 x 38.7 mm
- Weight: 315 g
- Connector:
  - 1 x 66 pin Autosport connector

► DIMENSIONS AND MOUNTING



▶ **M170 PINOUT****M170 Connector A — 66 way**

Mating Connector: Autosport 66 way Red - (Deutsch) AS6-18-35SN – MoTeC #65035

Pin Number	Designation	Full Name	OE Pin	Function	Description
A01	IGN_LS1	Low Side Ignition 1			
A02	IGN_LS8	Low Side Ignition 8			
A03	IGN_LS7	Low Side Ignition 7			
A04	IGN_LS3	Low Side Ignition 3			
A05	IGN_LS2	Low Side Ignition 2			
A06	AV3	Analogue Voltage Input 3			
A07	AV4	Analogue Voltage Input 4			
A08	OUT_HB2	Half Bridge Output 2			
A09	OUT_HB1	Half Bridge Output 1			
A10	IGN_LS4	Low Side Ignition 4			
A11	SEN_0V_A	Sensor 0V A			
A12	AV5	Analogue Voltage Input 5			
A13	UDIG7	Universal Digital Input 7			
A14	BAT_NEG1	Battery Negative			
A15	BAT_NEG2	Battery Negative			
A16	SEN_5V0_A	Sensor 5.0V A			
A17	IGN_LS5	Low Side Ignition 5			
A18	AV2	Analogue Voltage Input 2			
A19	BAT_NEG3	Battery Negative			
A20	BAT_NEG4	Battery Negative			
A21	BAT_NEG5	Battery Negative			
A22	UDIG8	Universal Digital Input 8			
A23	BAT_POS	Battery Positive			
A24	INJ_PH5	Peak Hold Injector 5			
A25	IGN_LS6	Low Side Ignition 6			
A26	AV1	Analogue Voltage Input 1			
A27	SEN_0V_B	Sensor 0V B			
A28	AT1	Analogue Temperature Input 1		1k Pull up to SEN_5V_B	
A29	KNOCK1	Knock Input 1			
A30	AT3	Analogue Temperature Input 3		1k Pull up to SEN_5V_A	
A31	CAN_LO	CAN Bus 1 Low			
A32	BAT_POS	Battery Positive			
A33	INJ_PH1	Peak Hold Injector 1			
A34	SEN_5V0_B	Sensor 5.0V B			

Pin Number	Designation	Full Name	OE Pin	Function	Description
A35	AV7	Analogue Voltage Input 7			
A36	AV6	Analogue Voltage Input 6			
A37	SEN_6V3	Sensor 6.3V			
A38	AT2	Analogue Temperature Input 2		1k Pull up to SEN_5V_B	
A39	AT4	Analogue Temperature Input 4		1k Pull up to SEN_5V_A	
A40	CAN_HI	CAN Bus 1 High			
A41	BAT_POS	Battery Positive			
A42	INJ_PH6	Peak Hold Injector 6			
A43	INJ_LS1	Low Side Injector 1			
A44	AV8	Analogue Voltage Input 8			
A45	UDIG4	Universal Digital Input 4			
A46	UDIG3	Universal Digital Input 3			
A47	ETH_TX-	Ethernet Transmit-	Ethernet Green		
A48	ETH_TX+	Ethernet Transmit+	Ethernet Green/White		
A49	UDIG1	Universal Digital Input 1			
A50	INJ_PH2	Peak Hold Injector 2			
A51	INJ_LS2	Low Side Injector 2			
A52	UDIG5	Universal Digital Input 5			
A53	UDIG6	Universal Digital Input 6			
A54	BAT_BAK	Battery Backup			
A55	ETH_RX+	Ethernet Receive +	Ethernet Orange/White		
A56	UDIG2	Universal Digital Input 2			
A57	INJ_PH7	Peak Hold Injector 7			
A58	OUT_HB5	Half Bridge Output 5			
A59	OUT_HB3	Half Bridge Output 3			
A60	KNOCK2	Knock Input 2			
A61	ETH_RX-	Ethernet Receive-	Ethernet Orange		
A62	INJ_PH8	Peak Hold Injector 8			
A63	INJ_PH3	Peak Hold Injector 3			
A64	OUT_HB6	Half Bridge Output 6			
A65	OUT_HB4	Half Bridge Output 4			
A66	INJ_PH4	Peak Hold Injector 4			