



M182 ECU



MoTeC's unique M1 technology redefines the meaning of customisation, delivering total control without compromise, while highly advanced security strategies make these ECUs ideal for both category managed and unrestricted applications.

The M142 and M182 are Diesel/Direct Injection ECUs that offer full control for most modern, high pressure injectors, without the need for additional amplifier boxes.

► FEATURES

- Small and light in robust magnesium enclosure
- 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 logs)
- 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

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

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

- 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

- 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

Injector

- Direct Injector Outputs: 12
- Low Side Injector Outputs: 6
- Injector max hold current: 12 A
- Injector max voltage: 90 V

Ignition

- Outputs: 12

Auxiliary Outputs

- Half Bridge: 10

Inputs

- Universal Digital: 12
- Digital: 4
- Analogue Voltage: 17
- Analogue Temperature: 6
- Knock: 4
- Lambda (narrow band): 2

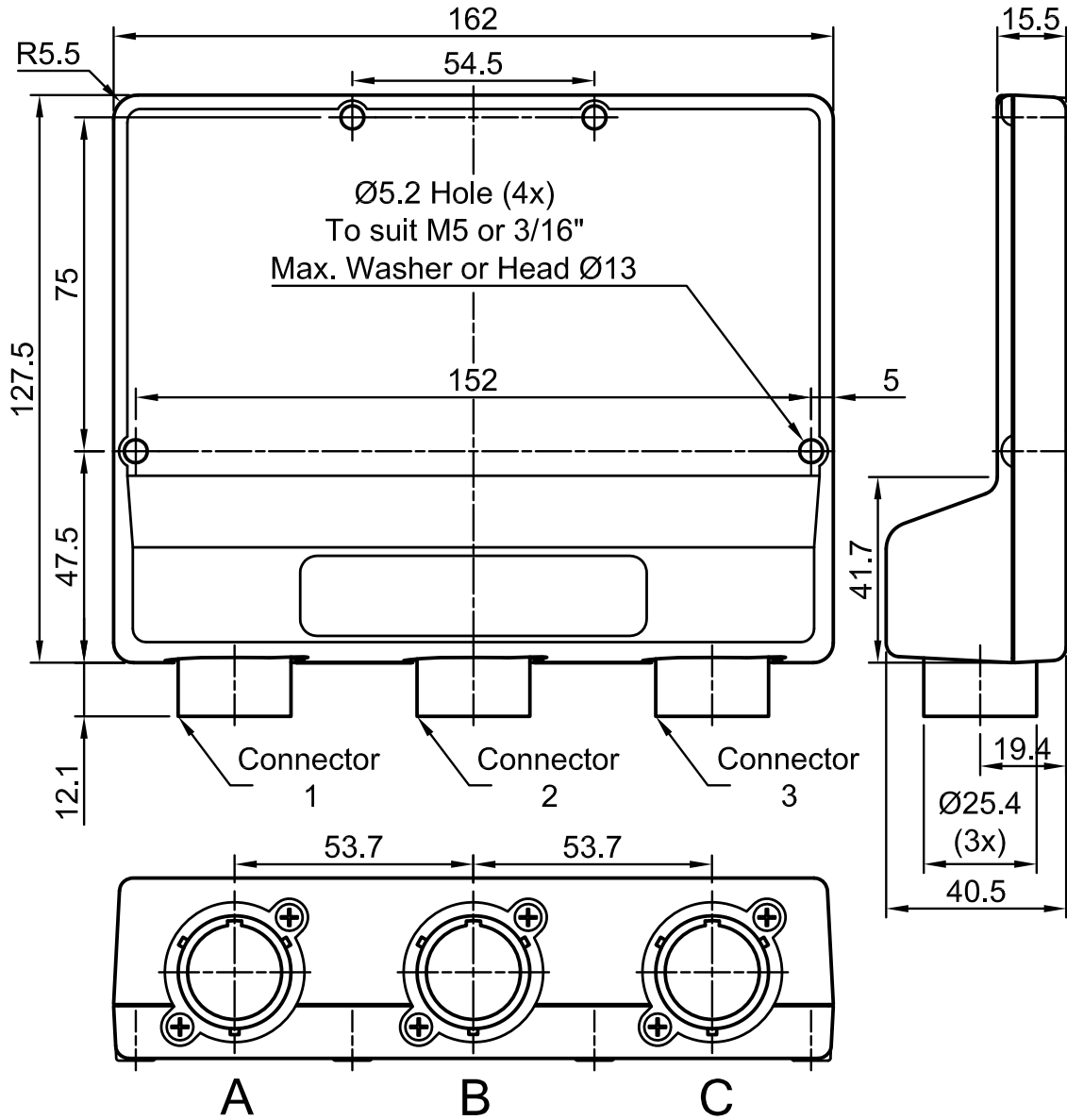
Data

- CAN bus: 3
- RS232: 1
- LIN: 1
- Logging Memory: 250 Mb

Physical

- Dimensions: 162 x 127.5 x 40.5 mm
- Weight: 540 g
- Autosport connectors:
 - 1 x 55 pin green
 - 1 x 26 pin red
 - 1 x 55 pin red

► DIMENSIONS AND MOUNTING



► M182 PINOUT

M182 Connector A — 55 way

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

| Pin Number | Designation | Full Name | OE Pin | Function | Description |
|------------|-------------|---------------------------|--------|----------|-------------|
| A01 | INJ_D1A_POS | Direct Injector 1A + | | | |
| A02 | INJ_D2A_POS | Direct Injector 2A + | | | |
| A03 | INJ_D2B_POS | Direct Injector 2B + | | | |
| A04 | INJ_D4A_POS | Direct Injector 4A + | | | |
| 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 | | | |
| A09 | SEN_5V0_C2 | Sensor 5.0V C | | | |
| A10 | INJ_D4B_POS | Direct Injector 4B + | | | |
| A11 | INJ_D1A_NEG | Direct Injector 1A - | | | |
| A12 | INJ_D1B_NEG | Direct Injector 1B - | | | |
| A13 | AV11 | Analogue Voltage Input 11 | | | |
| A14 | DIG2 | Digital Input 2 | | | |
| A15 | RS232_RX | RS232 Receive | | | |
| A16 | SEN_5V0_C3 | Sensor 5.0V C | | | |
| A17 | INJ_D6A_POS | Direct Injector 6A + | | | |
| A18 | SEN_0V_C1 | Sensor 0V C | | | |
| A19 | SEN_0V_C2 | Sensor 0V C | | | |
| A20 | SEN_0V_C3 | Sensor 0V C | | | |
| 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 - | | | |
| 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 + | | | |
| A33 | INJ_D2B_NEG | Direct Injector 2B - | | | |
| A34 | AV13 | Analogue Voltage Input 13 | | | |

| Pin Number | Designation | Full Name | OE Pin | Function | Description |
|------------|-------------|---------------------------|--------|----------|-------------|
| A35 | AV12 | Analogue Voltage Input 12 | | | |
| 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 | | | |
| A42 | INJ_D3A_NEG | Direct Injector 3A - | | | |
| A43 | INJ_D4A_NEG | Direct Injector 4A - | | | |
| 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 #65040

| Pin Number | Designation | Full Name | OE Pin | Function | Description |
|------------|-------------|-----------------------|--------|----------|-------------|
| B_A | OUT_HB1 | Half Bridge Output 1 | | | |
| B_B | OUT_HB2 | Half Bridge Output 2 | | | |
| B_C | OUT_HB3 | Half Bridge Output 3 | | | |
| B_D | OUT_HB4 | Half Bridge Output 4 | | | |
| B_E | OUT_HB5 | Half Bridge Output 5 | | | |
| B_F | OUT_HB6 | Half Bridge Output 6 | | | |
| B_G | BAT_NEG1 | Battery Negative | | | |
| B_H | BAT_POS1 | Battery Positive | | | |
| B_J | BAT_POS2 | Battery Positive | | | |
| B_K | BAT_POS3 | Battery Positive | | | |
| B_L | BAT_POS4 | Battery Positive | | | |
| 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 | | | |
| B_V | INJ_LS2 | Low Side Injector 2 | | | |
| B_W | BAT_NEG2 | Battery Negative | | | |
| B_X | BAT_NEG3 | Battery Negative | | | |
| B_Y | BAT_NEG4 | Battery Negative | | | |
| B_Z | BAT_NEG5 | 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 Number | Designation | Full Name | OE Pin | Function | Description |
|------------|-------------|----------------------------|--------|-----------------------|-------------|
| C01 | IGN_LS4 | Low Side Ignition 4 | | | |
| C02 | IGN_LS3 | Low Side Ignition 3 | | | |
| 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 | | | |
| C07 | AV10 | Analogue Voltage Input 10 | | | |
| C08 | IGN_LS2 | Low Side Ignition 2 | | | |
| C09 | IGN_LS7 | Low Side Ignition 7 | | | |
| C10 | UDIG8 | Universal Digital Input 8 | | | |
| C11 | AV6 | Analogue Voltage Input 6 | | | |
| C12 | AV7 | Analogue Voltage Input 7 | | | |
| C13 | AV9 | Analogue Voltage Input 9 | | | |
| C14 | SEN_0V_A1 | Sensor 0V A | | | |
| C15 | SEN_0V_A2 | Sensor 0V A | | | |
| C16 | IGN_LS1 | Low Side Ignition 1 | | | |
| C17 | UDIG7 | Universal Digital Input 7 | | | |
| C18 | UDIG1 | Universal Digital Input 1 | | | |
| C19 | UDIG12 | Universal Digital Input 12 | | | |
| C20 | UDIG11 | Universal Digital Input 11 | | | |
| C21 | UDIG10 | Universal Digital Input 10 | | | |
| C22 | UDIG9 | Universal Digital Input 9 | | | |
| C23 | SEN_0V_B1 | Sensor 0V B | | | |
| C24 | CAN1_HI | CAN Bus 1 High | | | |
| C25 | UDIG3 | Universal Digital Input 3 | | | |
| C26 | ETH_RX- | Ethernet Receive- | | Ethernet Orange | |
| C27 | UDIG4 | Universal Digital Input 4 | | | |
| C28 | AV4 | Analogue Voltage Input 4 | | | |
| C29 | AV5 | Analogue Voltage Input 5 | | | |
| C30 | SEN_0V_B2 | Sensor 0V B | | | |
| C31 | CAN1_LO | CAN Bus 1 Low | | | |
| C32 | UDIG2 | Universal Digital Input 2 | | | |
| C33 | ETH_RX+ | Ethernet Receive+ | | Ethernet Orange/White | |
| C34 | ETH_TX- | Ethernet Transmit- | | Ethernet Green | |
| C35 | AV3 | Analogue Voltage Input 3 | | | |

| Pin Number | Designation | Full Name | OE Pin | Function | Description |
|------------|-------------|------------------------------|-------------------------|------------------------|-------------|
| C36 | AV2 | Analogue Voltage Input 2 | | | |
| C37 | AT1 | Analogue Temperature Input 1 | | 1k Pull up to SEN_5V_A | |
| C38 | AT3 | Analogue Temperature Input 3 | | 1k Pull up to SEN_5V_B | |
| C39 | AT2 | Analogue Temperature Input 2 | | 1k Pull up to SEN_5V_A | |
| C40 | UDIG5 | Universal Digital Input 5 | | | |
| C41 | ETH_TX+ | Ethernet Transmit+ | Ethernet Green/White | | |
| C42 | AV1 | Analogue Voltage Input 1 | | | |
| C43 | KNOCK3 | Knock Input 3 | | | |
| C44 | KNOCK2 | Knock Input 2 | | | |
| C45 | AT5 | Analogue Temperature Input 5 | | 1k Pull up to SEN_5V_C | |
| C46 | AT4 | Analogue Temperature Input 4 | | 1k Pull up to SEN_5V_B | |
| C47 | UDIG6 | Universal Digital Input 6 | | | |
| C48 | SEN_5V0_A1 | Sensor 5.0V A | | | |
| C49 | KNOCK4 | Knock Input 4 | | | |
| C50 | SEN_5V0_B1 | Sensor 5.0V B | | | |
| C51 | KNOCK1 | Knock Input 1 | | | |
| C52 | AT6 | Analogue Temperature Input 6 | | 1k Pull up to SEN_5V_C | |
| C53 | SEN_5V0_A2 | Sensor 5.0V A | | | |
| C54 | SEN_6V3 | Sensor 6.3V | | | |
| C55 | SEN_5V0_B2 | Sensor 5.0V B | | | |