M130 HYDROSPACE S4 PWC KIT

MoTeC's M130 Hydrospace S4 plug-in kit is a fully programmable direct replacement for the factory-fitted ECU.

No rewiring is necessary, the kit plugs into the stock wiring harness using the original sensors and fuel system. All original functions are maintained.

11303 KIT CONTENTS

- 13130M — M130 ECU MARINE
- 61261 — M130 HYDROSPACE S4 ADAPTOR KIT , contains:
  - 41200 — IGN MODULE BOSCH 200 (2 CHANNEL)
  - 61225 — CABLE NETWORK RJ45 1.5M
  - 61258 — HYDROSPACE S4 M130 ADAPTOR LOOM
  - 61263 — M130 HYDROSPACE S4 MOUNTING KIT

FEATURES

- Improved RPM limiting allows for higher top speed in rough water.
- Programmable launch control with Ignition Timing, Fuel Volume Compensation, Engine Speed Limit, Ignition Cut Request and Boost Aim tables.
- Tunable fuel and ignition mapping for performance improvements.
- Integrated fully tuneable knock control on individual cylinders (knock sensor required).
- Dual tuning maps – Fuel Mixture Aim, Ignition Timing, Boost Aim, Engine Speed Limit switchable by Engine Mode (A / B) Switch.
- Boost control for turbo wastegates.
- Anti-Lag control for turbo systems with Ignition Timing, Fuel Compensation, Ignition Cut Request, Engine Speed Limit, and Boost Aim tables.
- Anti-Cavitation timer system with Ignition Timing Compensation table.
- Dual Engine Efficiency Maps – Inlet Manifold Pressure and Throttle Position.
- Race Time system with compensation tables for Ignition Timing, Fuel Aim, and Boost Aim.
- Auxiliary Time system with tables for Ignition Timing Compensation, Fuel Volume Compensation, and Fuel Mixture Aim Compensation.
- 4 optional outputs for PWM control of added actuators:
  - Duty Cycle tables using Engine Speed and Throttle or Manifold Pressure Axes.
  - Activation based on Inlet Manifold Pressure or Throttle Position.
  - Aux Output 1 includes tables for Ignition Timing Compensation, Fuel Volume Compensation, and Fuel Mixture Aim Compensation.
- Physical settings for engine displacement, fuel density, stoichiometric ratio, fuel pressure, and injector linearisation allow for simplified engine start-up prior to tuning.

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- GPS receive configurable via CAN through MoTeC Serial-to-CAN (STC) device for speed and track mapping.
- Engine Load Average channel with Engine Speed Limit table and compensation tables for Ignition Timing, Fuel Aim and Boost Aim.
- Optional exhaust lambda input via MoTeC Lambda-to-CAN (LTC) or Professional Lambda Meter (PLM) for fuel tuning.
- Configurable Gauge Mode Button for Launch activation.
- Engine Run Time Total for engine hour logging.
- Configurable security for multiple users with differing access options.
- Optional inputs for additional sensors, including:
  - Airbox Temperature
  - Engine Oil Temperature
  - Engine Oil Pressure
  - Exhaust Temperature
  - Fuel Temperature
  - Fuel Pressure
  - Jet Nozzle Pressure
  - Jet Nozzle Angle
  - Jet Intake Pressure
  - Vehicle Acceleration Longitudinal, Lateral and Vertical
- Level 1 data logging included in standard package price (predefined channels at up to 10Hz for diagnostic analysis)
- Level 2 logging available as an upgrade (up to 200 configurable channels at up to 200Hz, 120MB)
- Configurable warning light output with alerts from Coolant Temperature, Engine Speed, Oil Temperature, Oil Pressure, Exhaust Manifold Temperature, Fuel Pressure and Knock.

OPERATION

The M130 Marine ECU engine control functionality is the same as the standard factory ECU; all normal operations of the PWC are possible. MoTeC has added a launch control function using the blue button on the left side handlebar (see Gauge Mode Button). Once optimised by the tuner, this allows for precise and powerful launch performance.

Communications

The standard Hydrospace does not include an instrument cluster. MoTeC has added provision in the Adaptor Loom for CAN devices. This may be used for exhaust mixture monitoring via an LTC (Lambda-to-CAN) device, or connected to a display such as a MoTeC CDL3 or C125. An SLM (Shift Light Module) may also be controlled via the display device.

Power Control Strategy

The Hydrospace S4 uses an ignition lanyard which powers up the craft. With the lanyard inserted, pressing the Start button on the left side handlebar will start the engine, and either pressing the red button or removing the lanyard will stop the engine.

➪ The lanyard should always be removed when the engine is stopped to avoid flattening the battery.

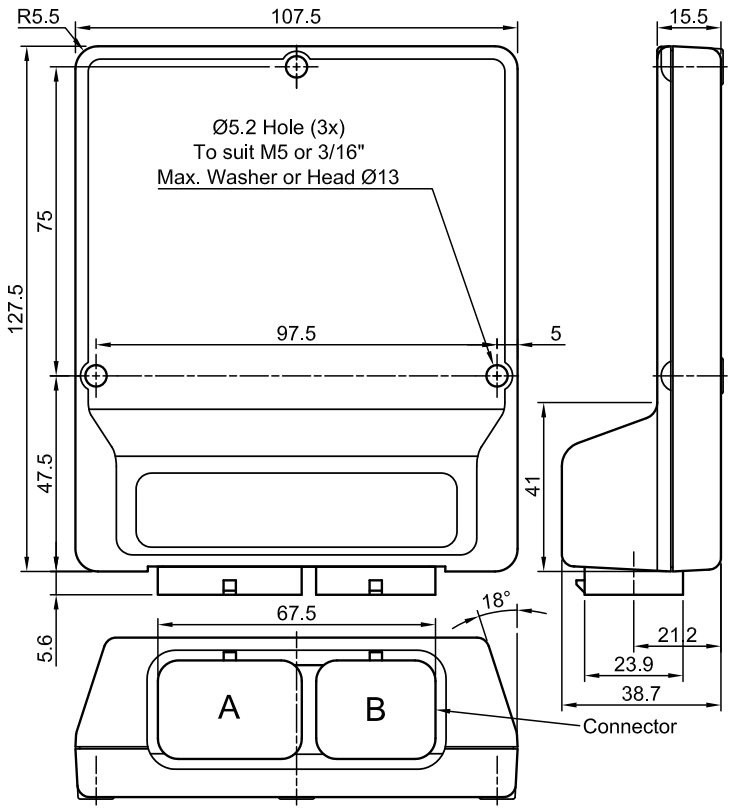
Gauge Mode Button

The existing left handlebar includes an unused blue push button which MoTeC has designated for Launch Control. Full throttle can be applied prior to a race start to build up turbo boost, while engine RPM is controlled by the Launch Engine Speed Limit table. When the blue button is released, full power is delivered very quickly resulting in rapid acceleration.

➪ The original blue button is wired through a temperature switch. This switch is mounted in the exhaust manifold prior to the turbo and will trip at 70 °C,which would disable the Launch Mode function. This is impractical for race conditions. To ensure that Launch Mode is available at all times, install a bypass plug to short circuit the two pins of the temperature switch connector (same connector as a Bosch injector).

M130 ECU DIMENSIONS

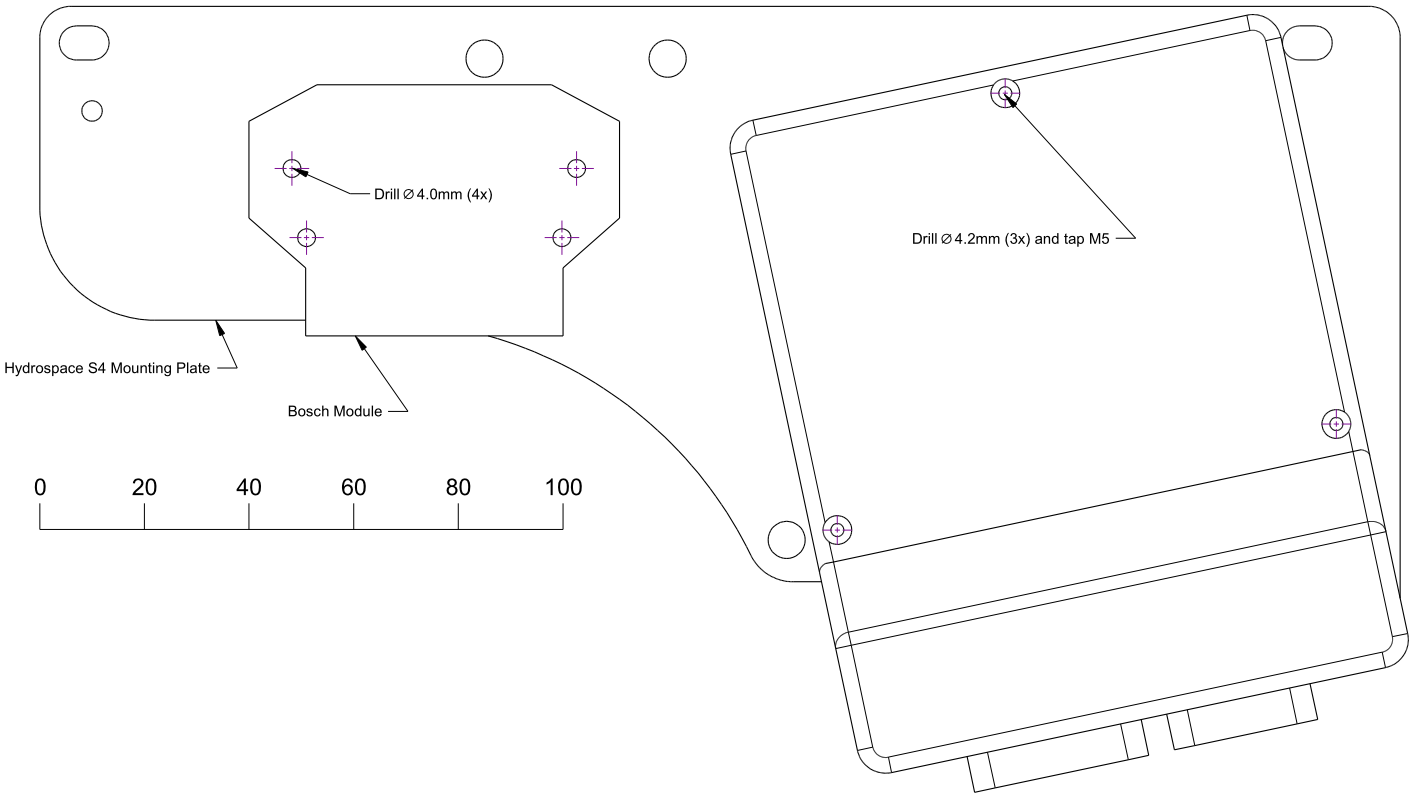
All dimensions are in mm.



INSTALLATION

The M130 Marine ECU replaces the factory ECU on a mounting plate beside the engine.

Mounting plate with ignition module and M130 ECU in place



1. Remove the factory ECU (3 x M4 bolts) and drill 7 holes into the existing mounting plate using the mounting plate template. The template is supplied on a 1:1 scale and can also be downloaded from motec.com.au (CDS11303-A Hydrospace S4 M130 Mounting Plate Template).

   4 holes are drilled to 4.0mm diameter to mount the BIM200 Ignition module. Three holes are drilled to 4.2mm diameter then tapped to M5 metric thread to mount the M130 ECU.

2. Fit the supplied Ignition Module to the mounting plate.

   ⇨ Note: This module generates significant heat and requires the use of dielectric grease between the module and mounting plate to ensure proper heat transfer. Firm fixing of the mounting bolts is also necessary for proper heat transfer.

3. Place the rubber backing pad on the plate and secure the M130 Marine ECU with three M5x25 stainless steel cap screws.

4. Finally, connect the adaptor loom harness between the M130 ECU and the factory wiring harness. The entire assembly can now be lowered into position beside the engine, and fixed into place with two M6 lock nuts.

PINOUTS

M130 Connector A — 34 way

Pin Number	Designation	Full Name	OE Pin	Function	Description
A01	OUT_HB2	Half Bridge Output 2	C33	Pop Off Valve	
A02	SEN_5V0_A	Sensor 5.0V A	C30	5V Supply for Throttle, MAP, CAM	
A03	IGN_LS1	Low Side Ignition 1	D07	BIM200 Channel 2	
A04	IGN_LS2	Low Side Ignition 2	D02	BIM200 Channel 1	
A05	IGN_LS3	Low Side Ignition 3	Not Used		
A06	IGN_LS4	Low Side Ignition 4	Not Used		
A07	IGN_LS5	Low Side Ignition 5	Not Used		
A08	IGN_LS6	Low Side Ignition 6	Not Used		
A09	SEN_5V0_B	Sensor 5.0V B	Not Used		
A10	BAT_NEG1	Battery Negative	C02	Vehicle Ground - BIM200 and Power Ground	
A11	BAT_NEG2	Battery Negative	C21	Vehicle Ground - LTC and Power Ground	
A12	IGN_LS7	Low Side Ignition 7	Not Used		
A13	IGN_LS8	Low Side Ignition 8	Not Used		
A14	AV1	Analogue Voltage Input 1	C12	Throttle Position	
A15	AV2	Analogue Voltage Input 2	C11	Inlet Manifold Pressure	
A16	AV3	Analogue Voltage Input 3	Not Used		
A17	AV4	Analogue Voltage Input 4	Not Used		
A18	OUT_HB1	Half Bridge Output 1	Not Used		
A19	INJ_PH1	Peak Hold Injector 1	C31	Fuel Cylinder 1 Output	
A20	INJ_PH2	Peak Hold Injector 2	C32	Fuel Cylinder 2 Output	
A21	INJ_PH3	Peak Hold Injector 3	Not Used		
A22	INJ_PH4	Peak Hold Injector 4	Not Used		
A23	INJ_LS1	Low Side Injector 1	C26	ECU Relay drive	
A24	INJ_LS2	Low Side Injector 2	C29	Wastegate Control	
A25	AV5	Analogue Voltage Input 5	Not Used		
A26	BAT_POS	Battery Positive	C09, C08 via Diode, L04	Switched Supply for for ECU, LTC	
A27	INJ_PH5	Peak Hold Injector 5	Not Used		
A28	INJ_PH6	Peak Hold Injector 6	Not Used		
A29	INJ_PH7	Peak Hold Injector 7	Not Used		
A30	INJ_PH8	Peak Hold Injector 8	Not Used		
A31	OUT_HB3	Half Bridge Output 3	C34	Fuel Pump Relay drive	
A32	OUT_HB4	Half Bridge Output 4	Not Used		
A33	OUT_HB5	Half Bridge Output 5	Not Used		
A34	OUT_HB6	Half Bridge Output 6	Not Used		

M130 Connector B — 26 way

Pin Number	Designation	Full Name	OE Pin	Function	Description
B01	UDIG1	Universal Digital Input 1	C15	Engine Speed	Crankshaft Position
B02	UDIG2	Universal Digital Input 2	C23	Engine Synchronisation	
B03	AT1	Analogue Temperature Input 1	C20	Inlet Manifold Temperature	
B04	AT2	Analogue Temperature Input 2	C13	Coolant Temperature	
B05	AT3	Analogue Temperature Input 3	C19	Temperature Switch	
B06	AT4	Analogue Temperature Input 4	Not Used		
B07	KNOCK1	Knock Input 1	J02	Ignition Knock Sensor Signal	
B08	UDIG3	Universal Digital Input 3	C08 via Diode	Ignition Switch Sense	
B09	UDIG4	Universal Digital Input 4	Not Used		
B10	UDIG5	Universal Digital Input 5	Not Used		
B11	UDIG6	Universal Digital Input 6	Not Used		
B12	BAT_BAK	Battery Backup	Not Used		
B13	KNOCK2	Knock Input 2	Not Used		
B14	UDIG7	Universal Digital Input 7	Not Used		
B15	SEN_0V_A	Sensor 0V A	C06	0V for Engine Speed Sensor	
B16	SEN_0V_B	Sensor 0V B	J01	0V for knock Sensor	
B17	CAN_HI	CAN Bus 1 High	L03	1M CAN bus to LTC	
B18	CAN_LO	CAN Bus 1 Low	L02	1M CAN bus to LTC	
B19	SEN_6V3	Sensor 6.3V	Not Used		
B20	AV6	Analogue Voltage Input 6	Not Used		
B21	AV7	Analogue Voltage Input 7	Not Used		
B22	AV8	Analogue Voltage Input 8	Not Used		
B23	ETH_TX+	Ethernet Transmit+	Ethernet Green/White		
B24	ETH_TX-	Ethernet Transmit-	Ethernet Green		
B25	ETH_RX+	Ethernet Receive+	Ethernet Orange/White		
B26	ETH_RX-	Ethernet Receive-	Ethernet Orange		

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