

Engine Control Unit MS 6.1



- ▶ Optimized for low pressure injection
- ▶ Basic number of low pressure control functions
- ▶ Basic number of engine functions
- ▶ Measurement with 21 analog inputs
- ▶ Multiple Software options available

The MS 6.1 engine control unit manages gasoline engines up to 12 cylinders. As a member of our MS 6 family it features a powerful digital processing core with floating point arithmetic and a high-end FPGA for ultimate performance and flexibility. The MS 6 family utilizes a new software development process based on MATLAB/Simulink which significantly speeds algorithm development by using automatic code and documentation generation. Custom functions can be quickly and easily generated. The flexible hardware design allows the MS 6.1 to support complex or unusual engine or chassis configurations.

Application

Low pressure injection

- Max. 12 cylinders up to 12,500 rpm, high impedance injectors only

Ignition

- 12 x ignition control, IGBT or BJT, coils with integrated amplifier

Physical engine model for fast application

- determine engine load by throttle position or air pressure signals
- mixture control and basic ignition guided by main signal relative load rI
- Subsystems pit speed-, launch-, rpm-limiter and ASR are integrated inside torque control
- Separated power cut functions to assist various gear cut systems
- Diagnostics
- Integrated safety strategy for 2 electronic throttle controls

Integrated support of manual gearshift

Electronic throttle control

Variable Valve Timing VVT

Turbo control
Traction control
Launch control
LTE Ethernet telemetry support
Internal logger
• 4 GB memory on partition 1 (standard)
• Plus 4 GB memory on partition 2 (optional)
• 100 free configurable channels, 20 Hz
Logging rate
• Usage of all features: 300 kB/s
• Primary logging use case: 600 kB/s
• Logging data download rate: up to 4 MB/s
Logger Options
See Upgrades

Technical Specifications

Mechanical Data

Aluminum housing	
2 Bosch connectors	196 pins in total
Size	226 x 181 x 44 mm
Weight	1,086 g
Protection Classification	IP54
Temp. range (at internal sensors)	-20 to 80°C

Electrical Data

Power supply	6 to 18 V
CPU	Dual Core 667 MHz, FPGA

Inputs

21 analog inputs
6 x reserved for electronic throttle controls

- 3 x no integrated pull-up
- 3 x option for angle synchronous measurement, no integrated pull-up
- 4 x fixed 3.01 kOhm pull-up
- 5 x switchable 3.01 kOhm pull-up

6 internal measurements

- 1 x ambient pressure
- 1 x acceleration 3-axis
- 2 x ECU temperature
- 2 x ECU voltage

8 function related inputs

- 1 x Thermocouple exhaust gas temperature sensors (K-type)
- 2 x Lambda interfaces for LSU 4.9 sensor types
- 1 x Lap trigger/beacon input
- 4 x Knock sensors

10 digital inputs

- 1 x switchable Hall or inductive sensor for flywheel measurement
- 2 x Hall sensor for sync wheel detection
- 4 x switchable Hall or DF11 sensors for camshaft position or wheel speed
- 2 x switchable Hall or inductive sensors for turbo speed measurement
- 1 x digital switch for engine ON/OFF

Sensor supplies and screens

- 4 x sensor supplies 5 V / 50 mA
- 3 x sensor supplies 5 V / 150 mA
- 7 x sensor grounds
- 2 x sensor screens

Outputs

28 function related outputs

- Low Pressure Injection
 - 12 x 2.2 A controls, high impedance injectors
- Ignition
 - 12 x control, IGBT or BJT, coils with integrated amplifier
- 2 x 8.5 A H-bridge reserved for electronic throttle
- 2 x 4 A pwm lowside switch for Lambda heater

19 freely configurable outputs

- 1 x 8.5 A H-bridge
- 2 x 4 A pwm lowside switch
- 4 x 3 A pwm lowside switch
- 8 x 2.2 A pwm lowside switch
- 4 x 1 A pwm lowside switch

3 output signals

- 1 x engine rpm

- 1 x flywheel
- 1 x trigger wheel

Software Tools (free download)

- Data Analysis tool WinDarab V7
- System Configuration tool RaceCon 2.7.0.9 or later

Mating Connectors (not included)

- | | |
|---------------------------|-----------------|
| Mating Connector 91 pins | F02U.B00.711-01 |
| Mating Connector 105 pins | F02U.B00.712-01 |

Communication

- 2 Ethernet
- 3 CAN
- 1 LIN
- 1 USB
- 1 RS232
- 1 Time sync synchronization Ethernet
- 3 Network screens

Installation Notes

- Maintenance Interval: 220 h or a maximum of two years
- Depending on your experiences with calibration of ECUs, we recommend calibration support from Bosch Motorsport.
- Please remember that the mating connectors and the programming interface MSA-Box II are not included and must be ordered separately.

Upgrades

Engine Function Package 1

- Electronic throttle control, VVT, Turbo control

Engine Function Package 2

- Traction and launch control

Measurement Package

- Increase to 41 analog inputs

Logger Package I

- Extension for Partition 1: up to 720 channels, fastest sampling 1,000 Hz or 1 syncro, (max number of 1,080 channels to respect)

Logger Package II

- Partition 2: 720 channels, 1 GB memory, fastest sampling 1,000 Hz or 1 syncro, long-term recording, own data protection code (max number of 1,080 channels to respect)

Logger Package III

- Copy data of partition 1 to USB data stick

Gear Control Package 1

- Gear control MEGA-Line functionality, has to be used with MEGA-Line components (License model via MEGA-Line) [included for base versions beginning with MS6A_BASE_0800 or comparable]

-- Link to MEGA-Line Support Request --

-- Link to MEGA-Line License Request Form --

Gear Control Package 2

Gear control Bosch Motorsport functionality

SW Package MS 6 Drag 1

Launch Timer

Launch Distance

Torque Pre-Control

Launch RPM Control

Universal Outputs for Time/Distance Controls

SW Package MS 6 Drag 2 (requires Drag 1 License)

Acceleration Sensor MM5.10 included

Time/Distance Boost Control

Driveshaft Speed Control

Driveshaft Gradient Control

Acceleration Control

Wheelie Control

Innovation License Device

Activation of engine speed functions* and near/far injection function per unit

Innovation Package Project

Activation of engine speed functions* and near/far injection function per project version

*Engine speed functions: second or backup engine speed sensor, quick engine start, detection of engine reverse rotation

Ordering Information

Engine Control Unit MS 6.1

Order number **F02U.V01.961-04**

System Configuration Tool RaceCon

Order number **free download at our homepage**

Software Options

Engine Function Package 1

Order number **F02U.V02.001-01**

Engine Function Package 2

Order number **F02U.V02.002-01**

Measurement Package

Order number **F02U.V02.000-01**

FULL_LOG_1

Order number **F02U.V01.993-01**

FULL_LOG_2

Order number **F02U.V01.998-01**

USB_DATA C 65

Order number **F02U.V02.082-01**

Gear Control Package 1

Order number **please contact Mega-Line**

Gear Control Package 2

Order number **F02U.V02.108-01**

Innovation License Device

Order number **F02U.V02.510-01**

Innovation Package Project

Order number **F02U.V02.511-01**

Accessories

Breakout Box BOB MS 6

Order number **F02U.V02.294-01**

Mating Connector 91 pins

Order number **F02U.B00.711-01**

Mating Connector 105 pins

Order number **F02U.B00.712-01**

Modas Sport

Order number **free download at our homepage**

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