

# Engine Control Unit MS 6.1

www.bosch-motorsport.com



- ▶ 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
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### 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 rl
- Subsystems pit speed-, launch-, rpm-limiter and ASR are integrated inside torque control
- Separated power cut functions to assist several gear cut systems
- Diagnostics
- Integrated safety strategy for 2 electronic throttle controls

Integrated support of manual gearshift	
Electronic throttle control	Optional
VVT	Optional
Turbo control	Optional
Traction control	Optional
Launch control	Optional
Internal logger	Partition 1, 1 GB memory, diagnostic channels, 50 free configurable channels, fastest sampling 50 Hz, digital filter respecting sampling theorem
Logger options	See Software Options (not included)

## 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
<b>Electrical Data</b>	
Power supply	6 to 18 V
CPU	Dual Core 667 MHz, FPGA
<b>Communication</b>	
2 Ethernet	
3 CAN	
1 LIN	
1 USB	
1 RS232	
1 Time sync synchronization Ethernet	
3 Network screens	
<b>Inputs</b>	
Analog inputs	21 (41 opt.)
Internal measurement	1 triax acceleration 1 ambient pressure 2 ECU temperature 2 ECU voltage
Thermocouple	2 K-type
Lambda	2 LSU 4.9
Knock	4
Digital inputs	9
Digital switch Engine ON/OFF	1
Power supplies	4 sensor supplies 5 V, 50 mA 3 sensor supplies 5 V, 150 mA 7 sensor grounds 2 sensor screens
<b>Outputs</b>	
Low pressure injection	Max. 12 cylinders up to 12,500 rpm, high impedance injectors only
Ignition	Max. 12 cylinders, coils with integrated amplifier
Further outputs	2 x 4 amp pwm lowside switch 2 x 4 amp pwm lowside switch for Lambda heater 4 x 3 amp pwm lowside switch 8 x 2.2 amp pwm lowside switch 2 x 1 amp pwm lowside switch 2 x 1 amp pwm lowside switch low dump resistant

	3 x 8,5 amp H-bridge (2 reserved for electronic throttle) 12 x low pressure injection for high impedance injectors 8 x high pressure injection for magnetic injectors 12 x ignition control
Outputs signals	1 x flywheel 1 x trigger wheel 1 x engine rpm
Application	Configurable flywheel- and trigger disc geometries Selectable links between functions and in- or outputs
Function documentation	Automatically created during code generation
MatLab code generation	Support for customer own MatLab function development

**Software Tools (free download)**

Data Analysis tool WinDarab 7 Light

Data Application tool Modas Sport

System Configuration tool RaceCon

**Environment (not included)**

Programming interface MSA-Box II F 02U V00 327-03

Powerbox PBX 90 F 02U V01 794-01

Display DDU S2 PLUS F 02U V02 183-01

**Mating Connectors (not included)**

Mating Connector 91 pins F 02U B00 711-01

Mating Connector 105 pins F 02U B00 712-01

**Software Options (not included)**

Engine Function Package I Electronic throttle control, VVT, Turbo control

Engine Function Package II 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 synchro, (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 synchro, 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, USB-port unlocked <ul style="list-style-type: none"><li>• Incl rugged USB flash drive</li><li>• Incl. adapter cable to USB-port</li><li>• Incl. adapter for wiring harness</li></ul>
Gear Control Package I	Gear control Mega-Line functionality, has to be used with Mega-Line components
Gear Control Package II	Gear control Bosch Motorsport functionality
Gear Control Package III	Gear control coordination to external GCU systems

#### Installation Notes

Inspection services	Recommended after 220 h or 2 years, no components to replace
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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.

#### Ordering Information

##### Engine Control Unit MS 6.1

Order number **F 02U V01 961-01**

##### Software Options

##### Engine Function Package I

Order number **F 02U V02 001-01**

##### Engine Function Package II

Order number **F 02U V02 002-01**

##### Measurement Package

Order number **F 02U V02 000-01**

##### Logger Package I

Order number **F 02U V01 993-01**

##### Logger Package II

Order number **F 02U V01 998-01**

##### Logger Package III

Order number **F 02U V02 082-01**

##### Gear Control Package I

Order number **F 02U V02 107-01**





##### Gear Control Package II

Order number **F 02U V02 108-01**

##### Gear Control Package III

Order number **F 02U V02 109-01**

## Engine Control Unit MS 6 Variations

	Engine Control Unit MS 6.1	Engine Control Unit MS 6.2	Engine Control Unit MS 6.3	Engine Control Unit MS 6.4
				
Low pressure	+	+	+	+
High pressure	-	-	+	+
Engine function package I (Electronic throttle control, VVT, Turbo control)	Opt.	+	+	+
Engine function package II (Traction and launch control)	Opt.	+	+	+
HP package	-	-	Opt.	+
Analogue inputs	21	41	21	41
Upgrade on 41 inputs	Opt.	+	Opt.	+

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