

Engine Control Unit MS 6.1

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- ▶ 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
Electrical Data	
Power supply	6 to 18 V
CPU	Dual Core 667 MHz, FPGA
Communication	
2 Ethernet	
3 CAN	
1 LIN	
1 USB	
1 RS232	
1 Time sync synchronization Ethernet	
3 Network screens	
Inputs	
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
Outputs	
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 794-05

Display DDU 9 F 02U V02 300-02

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"> • Incl. rugged USB flash drive • Incl. adapter cable to USB-port • Incl. adapter for wiring harness
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
Ethernet Telemetry	Communication via Ethernet Telemetry Modem
Innovation License Device	Activation of engine speed functions* per unit
Innovation Package Project	Activation of engine speed functions* per project version

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

Installation Notes

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

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 961-03**

Accessories

Breakout Box BOB MS 6

Order number **F 02U V02 294-01**

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**

Ethernet Telemetry

Order number **F 02U V02 138-01**





Innovation License Device

Order number **F 02U V02 510-01**

Innovation Package Project

Order number **F 02U V02 511-01**

Engine Control Units MS 6 Variations

Type	Engine Control Unit MS 6.1	Engine Control Unit MS 6.2	Engine Control Unit MS 6.3	Engine Control Unit MS 6.4
				
Max. cyl./bank	12/2	12/2	12/2	12/2
Control strategy	Physical engine model	Physical engine model	Physical engine model	Physical engine model
Lambda ctrl	Dual	Dual	Dual	Dual
Turbo boost ctrl	Opt	+	+	+
Knock ctrl	+	+	+	+
El. throttle ctrl	Opt	+	+	+
Traction ctrl	Opt	+	+	+
GDI support	-	-	+	+
Internal logger	+	+	+	+
Low pressure	+	+	+	+
High pressure	-	-	+	+
Engine function package I	Opt.	+	+	+
Engine function package II	Opt.	+	+	+
HP package	-	-	Opt.	+
Analogue inputs	21	41	21	41
Upgrade on 41 inputs	Opt.		Opt.	

Represented by:

Europe:
Bosch Engineering GmbH
Motorsport
Robert-Bosch-Allee 1
74232 Abstatt
Germany
Tel.: +49 7062 911 9101
Fax: +49 7062 911 79104
motorsport@bosch.com
www.bosch-motorsport.de

North America:
Bosch Engineering North America
Motorsport
38000 Hills Tech Drive
Farmington Hills, MI 48331-3417
United States of America
Tel.: +1 248 876 2977
Fax: +1 248 876 7373
motorsport@bosch.com
www.bosch-motorsport.com

Latin America:
Robert Bosch Ltda
Motorsport
Av Juscelino Kubitscheck de
Oliveira 11800
Zip code 81460-900
Curitiba - Parana
Brazilia
Tel.: +55 41 3341 2057
Fax: +55 41 3341 2779

Asia-Pacific:
Bosch Engineering Japan K.K.
Motorsport
18F Queen's Tower C, 2-3-5 Minato Mirai
Nishi-ku, Yokohama-shi
Kanagawa 220-6218
Japan
Tel.: +81 45 650 5610
Fax: +81 45 650 5611
www.bosch-motorsport.jp

Australia, New Zealand and South Africa:
Robert Bosch Pty. Ltd
Motorsport
1555 Centre Road
Clayton, Victoria, 3168
Australia
Tel.: +61 (3) 9541 3901
motor.sport@au.bosch.com