

Engine Control Unit MS 6.4

www.bosch-motorsport.com



- ▶ Optimized for low and high pressure injection
- ▶ HP package for flat and V-engines inclusive
- ▶ Measurement with 41 analog inputs
- ▶ Multiple Software options available

The MS 6.4 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 6.4 to support complex or unusual engine or chassis configurations.

Application

High pressure injection	Integrated power stages for the use of: 4 cylinders up to 12,500 rpm 6 cylinders up to 9,500 rpm 8 cylinders up to 8,500 rpm (depending injection types and pressure ranges)
HP package for flat and V-engines inclusive (2nd Bank, MSV2, cylinder 7&8, external cylinder 9-12)	
Low pressure injection	Max. 12 cylinders up to 12,500 rpm, high impedance injectors only

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

VVT

Turbo control

Traction control

Launch control

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 41

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

High pressure injection Integrated power stages for the use of:

4 cylinders up to 12,500 rpm
6 cylinders up to 9,500 rpm
8 cylinders up to 8,500 rpm
(depending injection types and pressure ranges)

Booster extension (HPI5)

Application notes avl. for Bosch HDP5- and Hitachi Gen3 pumps. Hitachi Gen1 notes on request. Additional booster connectable to support 9 to 12 cylinders or to realize higher rpm

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)
2 x high pressure pump with MSV control
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
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Mating Connector 105 pins	F 02U B00 712-01
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Software Options (not included)

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
Customer Code Area	Enable Customer Code Area
Ethernet Telemetry	Communication via Ethernet Telemetry Modem

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 6.4**Order number **F 02U V02 019-06****Software Options****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****Customer Code Area**Order number **F 02U V02 137-01****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	Torque-structure based	Torque structure based	Torque structure based	Torque structure based
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.	

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