

Engine Control Unit MS 6.4



- ▶ Optimized for low and high pressure injection
- ▶ HP package for flat and V-engines inclusive
- ▶ Measurement with 38 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

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 r/l

- 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

LTE Ethernet telemetry support

Internal logger

Partition 1, 1 GB memory, diagnostic channels, 100 free configurable channels,

fastest sampling 20 Hz,

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

38 analog inputs

- 6 x reserved for electronic throttle controls
- 10 x no integrated pull-up
- 4 x option for angle synchronous measurement, no integrated pull-up
- 5 x fixed 3.01 kOhm pull-up
- 13 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

9 function related inputs

- 2 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

38 function related outputs

- High Pressure Injection
 - 2 x high pressure pump with MSV control
 - 8 x high pressure injection for magnetic injectors
- Low Pressure Injection
 - 12 x 2.2 A low pressure injection for high impedance injectors
- Ignition

- 12 x ignition 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

Inspection services recommended after 220 h or 24 months, 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.

Upgrades

Hardware Upgrade for CCA per device

Provides the option to run customer developed software code on Bosch ECU

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 6.4

Order number **F02U.V02.019-07**

Engine Control Unit MS 6 RX

FIA-homologated version for WRX Championship

Order number **F02U.V02.570**

Conversion MS 6.4 to MS 6 RX

Order number **F02U.V02.571**

System Configuration Tool RaceCon

Order number **free download at our homepage**

Software Options

Customer Code Area

Order number **F02U.V02.137-01**

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**

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

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