

# Engine Control Unit MS 6.3



- ▶ Optimized for low and high pressure injection
- ▶ HP package for flat and V-engines optional
- ▶ Measurement with 21 analog inputs
- ▶ Multiple Software options available

The MS 6.3 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 6.3 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

- 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

VVT

Turbo control

Traction control

Launch control

LTE Ethernet telemetry support

### Internal logger

- 1 GB memory on partition 1
- diagnostic channels
- 100 free configurable channels
- fastest sampling 20 Hz
- digital filter respecting sampling theorem

### Logging rates

- 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

#### 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

- 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

#### High Pressure Injection Package

For flat- and V-engines (2nd Bank, MSV2, cylinder 7&8, external cylinder 9-12)

#### Measurement Package

Increase to 41 analog inputs

#### 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 6.3

Order number **F02U.V01.963-04**

##### System Configuration Tool RaceCon

Order number **free download at our homepage**

#### Software Options

##### High Pressure Injection Package

Order number **F02U.V01.999-01**

##### 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**

##### Customer Code Area

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

##### 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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