

# Engine Control Unit MS 6.1 EVO



- ▶ Optimized for low pressure injection
- ▶ Measurement with 21 analog inputs
- ▶ Supports Customer Code Area CCA
- ▶ 4 GB memory plus 4 GB upgrade
- ▶ SENT support

The MS 6.1 EVO 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 EVO 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

### 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 rI
- 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 electronic throttle control

Integrated support of manual gearshift

Electronic throttle control      Optional, see Upgrades

VVT	Optional, see Upgrades
Turbo control	Optional, see Upgrades
Traction control	Optional, see Upgrades
Launch control	Optional, see Upgrades

LTE Ethernet telemetry support

### Internal logger

- 4 GB memory on partition 1 (standard)
- Plus 4 GB memory on partition 2 (optional)
- 100 free configurable channels, 50 Hz

### Logging rate

- 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 6-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

### 18 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

8 x digital, e.g. SENT

### 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

#### 28 function related outputs

Low Pressure Injection

12 x 2.2 A controls, high impedance injectors

Ignition

12 x 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

### Norms

#### Product Safety

EN IEC 62368-1:2020+A11:2020

#### Materials

REACH - Nr. 1907/2006

#### EMC

UNECE10:rev.6/AMD1:2020

KN41

ISO11452-2

ISO11452-4

ISO10605

ISO7637-2

ISO7367-3

ISO16750-2

US FCC: Title 47, Part 15 Subpart B

ICES-003

#### Testing

SAEJ1211

### Communication

2 Ethernet

3 CAN

1 LIN

1 USB

8 SENT

1 RS232

1 Time sync synchronization Ethernet

3 Communication 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.

#### 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

### Legal Restrictions

The sale of this product in Mexico is prohibited.

### Upgrades

#### Engine Function Package 1

- Electronic Throttle Control
- VVT
- Turbo Control

#### Engine Function Package 2

- Traction Control
- Launch Control

#### Measurement Package

##### 17 Additional analogue inputs

- 7 x no integrated pull-up
- 1 x option for angle synchronous measurement, no integrated pull-up
- 1 x fixed 3.01 kOhm pull-up
- 8 x switchable 3.01 kOhm pull-up

**Extension** of the use of 8 digital channels as analogue / digital inputs (shared)

##### 1 Additional function related inputs

- 1 x Thermocouple K-type

#### Hardware Upgrade for CCA per device

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

#### FULL\_LOG\_1

Extension for Partition 1

- 1,500 channels
- fastest sampling 1,000 Hz or 1 syncro

#### FULL\_LOG\_2

Activation of Partition 2

- 1,500 channels
- 4 GB memory
- fastest sampling 1,000 Hz or 1 syncro
- long-term recording
- own data protection code

#### USB\_DATA

- Rugged USB flash drive Bosch File System (BFS) format, works with Bosch File System (BFS) preformatted USB flash drive only
- Adapter cable to PC USB-Port
- Mating connector for USB flash drive on car loom side
- SW licence USB-Port unlocked

#### Gear Control Package 1

Gear control MEGA-Line functionality, has to be used with MEGA-Line components (License model via MEGA-Line)

-- 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 Time
- 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 6.1 EVO

Order number **F02U.V03.113-01**

#### Software Options

##### Engine Function Package 1

Order number **F02U.V02.001-01**

##### Engine Function Package 2

Order number **F02U.V02.002-01**

##### Measurement Package

Order number **F02U.V02.000-01**

##### Hardware Upgrade for CCA per device

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

**FULL\_LOG\_1**

Order number **F02U.V02.304-01**

**FULL\_LOG\_2**

Order number **F02U.V02.305-01**

**Gear Control Package 1**

Order number **please contact Mega-Line**

**Gear Control Package 2**

Order number **F02U.V02.108-01**

**SW Package MS 6 Drag 1**

Order number **F02U.V0U.409-01**

**SW Package MS 6 Drag 2**

Order number **F02U.V0U.410-01**

**Innovation License Device**

Order number **F02U.V02.510-01**

**Innovation Package Project**

Order number **F02U.V02.511-01**

**Accessories**

**USB\_DATA**

Order number **F02U.V02.214-01**

**Breakout Box BOB MS 6 EVO**

Order number **F02U.V02.294-02**

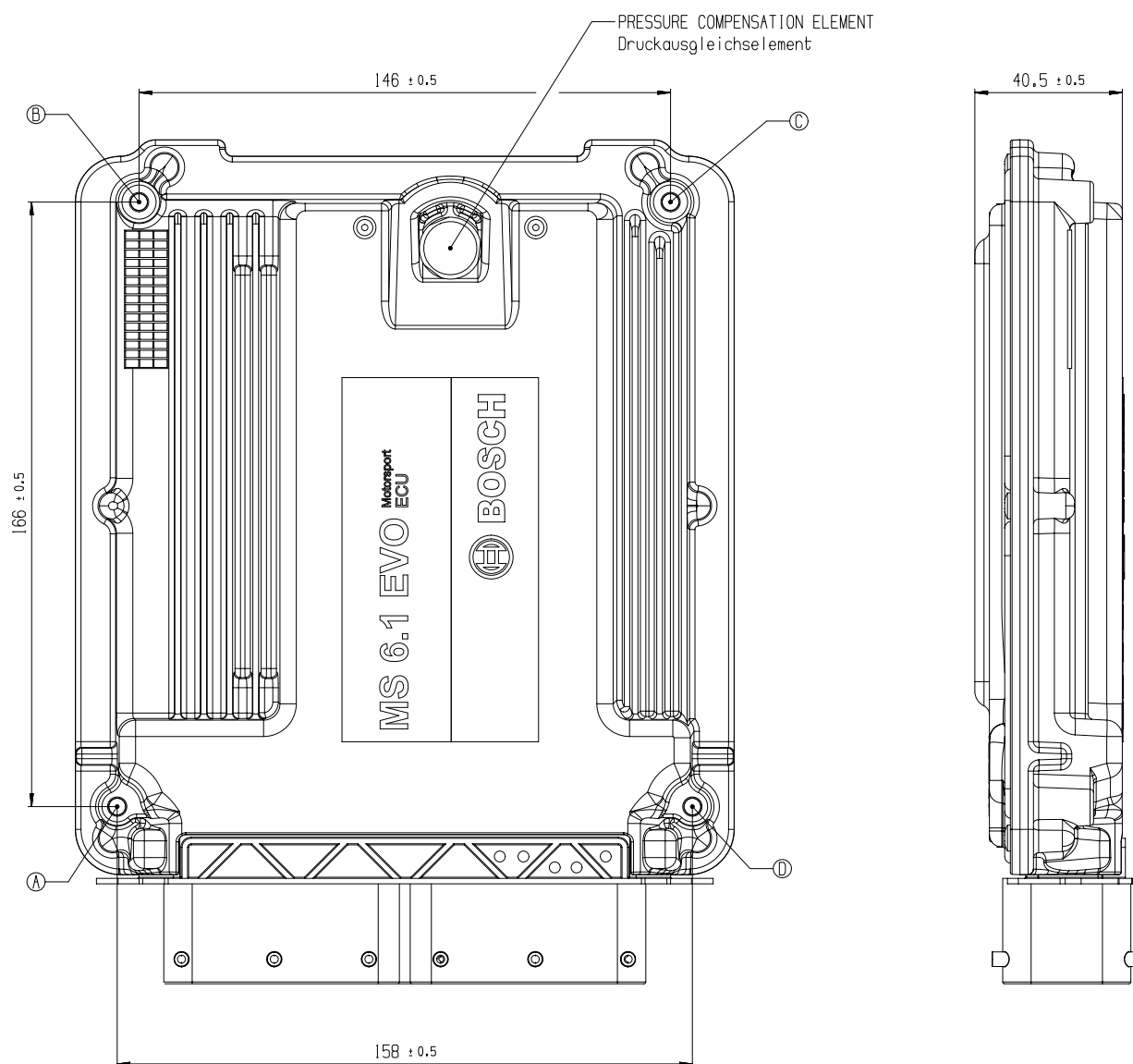
**Mating Connector 91 pins**

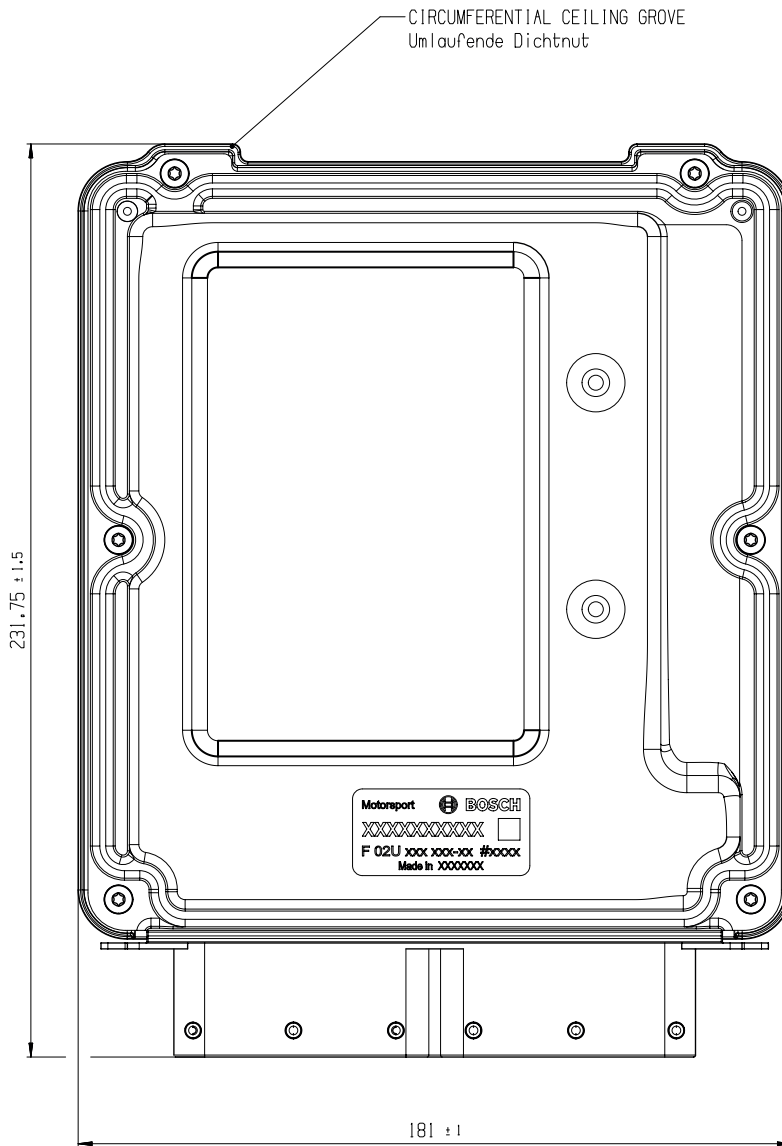
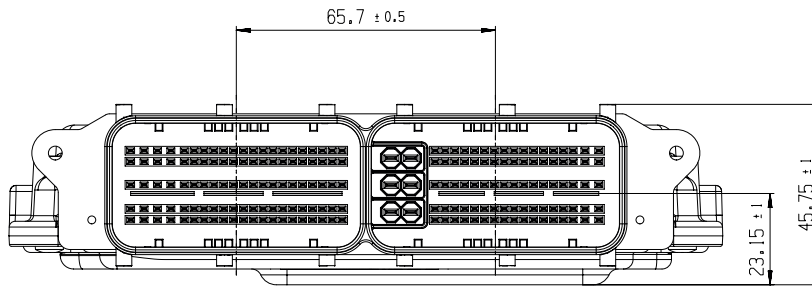
Order number **F02U.B00.711-01**

**Mating Connector 105 pins**

Order number **F02U.B00.712-01**

**Dimensions**





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