Engine Control Unit MS 6 CUP EVO

Features

▶ Delivery for OEM with project-specific program status

▶ HP package for 4-cylinder engines

▶ Supports Customer Code Area CCA

▶ 8 GB memory

▶ SENT sensor support

The MS 6 CUP EVO engine control unit manages gasoline engines up to 4 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 CUP EVO to support complex or unusual engine or chassis configurations.

Application

High pressure injection
• Max. 4 cylinders up to 12,500 rpm

Low pressure injection
• Max. 4 cylinders up to 12,500 rpm

Ignition
• 4 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 rl

• 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 1 electronic throttle control

Integrated support of manual gearshift

Electronic throttle control

Variable Valve Timing VVT

Turbo control

Traction control

Launch control

LTE Ethernet telemetry support

Internal logger Recording 1
• 4 GB memory
• 100 free configurable channels, 20 Hz sampling rate
• FULL_LOG_1 (1,500 channels/1 kHz sampling rate on Recording 1) optional

Internal logger Recording 2
• 4 GB memory
• 200 free configurable channels, 50 Hz sampling rate
• FULL_LOG_2 (1,500 channels/1 kHz sampling rate on Recording 2) optional

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

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℃

Electrical Data

Power supply	6 to 18 V
CPU	Dual Core 667 MHz, FPGA

Inputs

26 analog inputs

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

6 internal measurements

1

1 x ambient pressure

1 x acceleration 6-axis

2 x ECU temperature

2 x ECU voltage

4 function related inputs

1 x Thermocouple exhaust gas temperature sensor (K-type)

1 x Lambda interface for LSU 4.9 sensor type

2 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 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

15 function related outputs

High Pressure Injection

4 x controls, magnetic injectors
1 x high pressure pump with MSV control

Low Pressure Injection

4 x controls, high impedance injectors

Ignition

4 x controls, IGBT or BJT, coils with integrated amplifier

1 x 8.5 A H-bridge reserved for electronic throttle

1 x 4 A pwm lowside switch for Lambda heater

13 freely configurable outputs

2 x 8.5 A H-bridge

1 x 4 A pwm lowside switch

2 x 3 A pwm lowside switch

5 x 2.2 A pwm lowside switch

3 x 1 A pwm lowside switch

3 outputs 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

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.

Legal Restrictions

The sale of this product in Mexico is prohibited. Due to embargo restrictions, sale of this product in Russia, Belarus, Iran, Syria, and North Korea is prohibited.

1

Upgrades

CCA Hardware Upgrade per device

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

FULL_LOG_1

Extension for Recording 1
- 1,500 channels
- 1 kHz sampling rate

FULL_LOG_2

Extension for Recording 2
- 1,500 channels
- 1 kHz sampling rate

Gear Control

Project individual option

Innovation License Device

Activation of a set of additional functions for a single device:
- Crank rotation direction detection (using sensor DG23i)
- Using a 2nd crank backup sensor
- Crank-Pre-set, quick start based on previous crank stop position
- Far-Bank, 2nd injector per cylinder possible
- Cam-only-synchronisation, engine run without crank sensor signal (specific cam trigger wheel needed)

Innovation Package Project

Innovation Package Project has the same content as Innovation License Device, but license is valid for the whole project instead of a single device

DATA_USB

Data copy to USB flash drive

Ordering Information

Engine Control Unit MS 6 CUP EVO
Order number **F02U.V03.111-01**

Rugged USB flash drive
Order number **F02U.V03.534-01**

Connector for USB flash drive on car loom side
Order number **F02U.002.996-01**

Adapter cable to PC USB-Port
Order number **F02U.V01.343-01**

Software Options

CCA Hardware Upgrade 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
Order number **on request**

Innovation License Device
Order number **F02U.V02.510-01**

Innovation Package Project
Order number **F02U.V02.511-01**

DATA_USB
Order number **F02U.V03.476-01**

Accessories

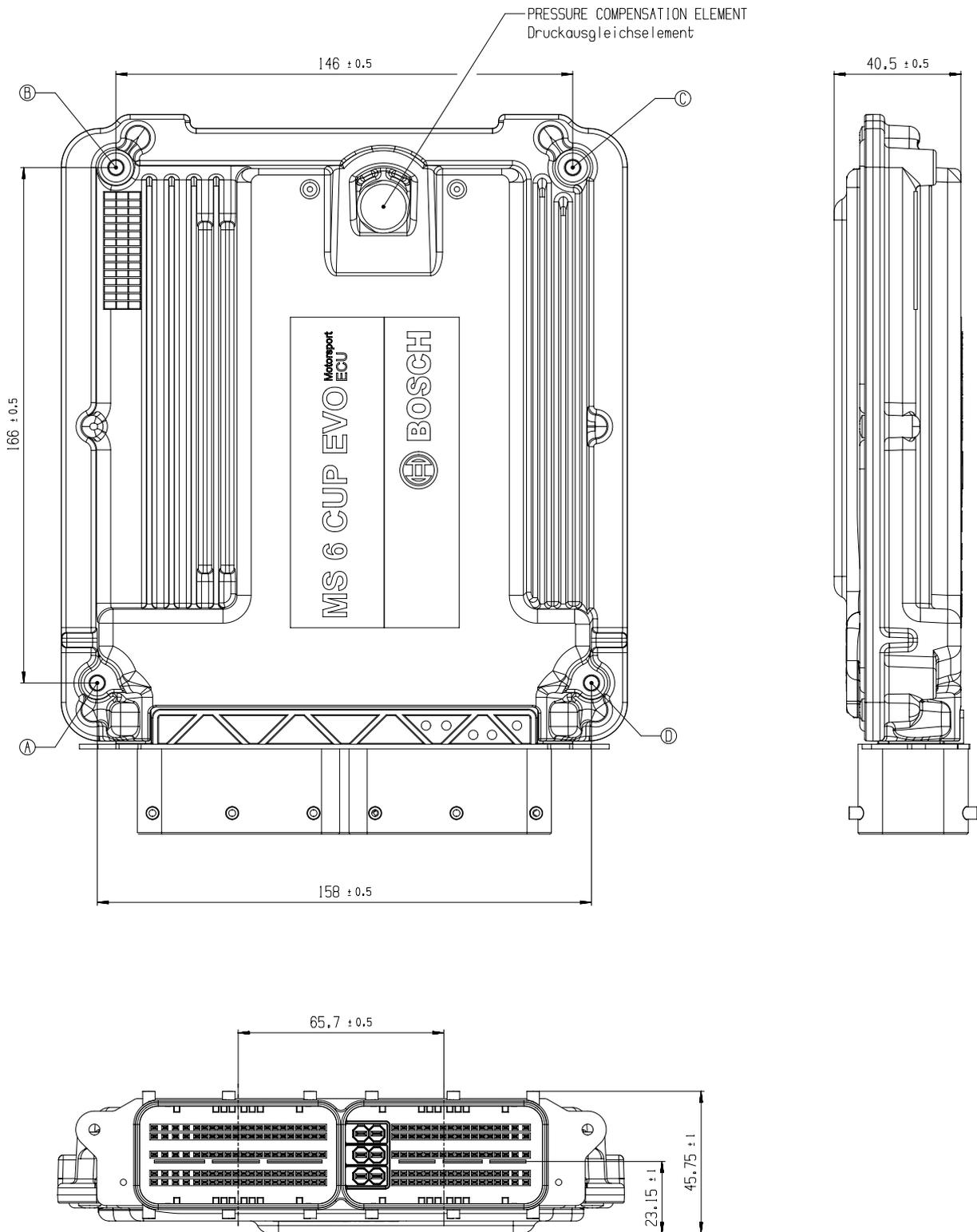**Breakout Box BOB MS 6 EVO**
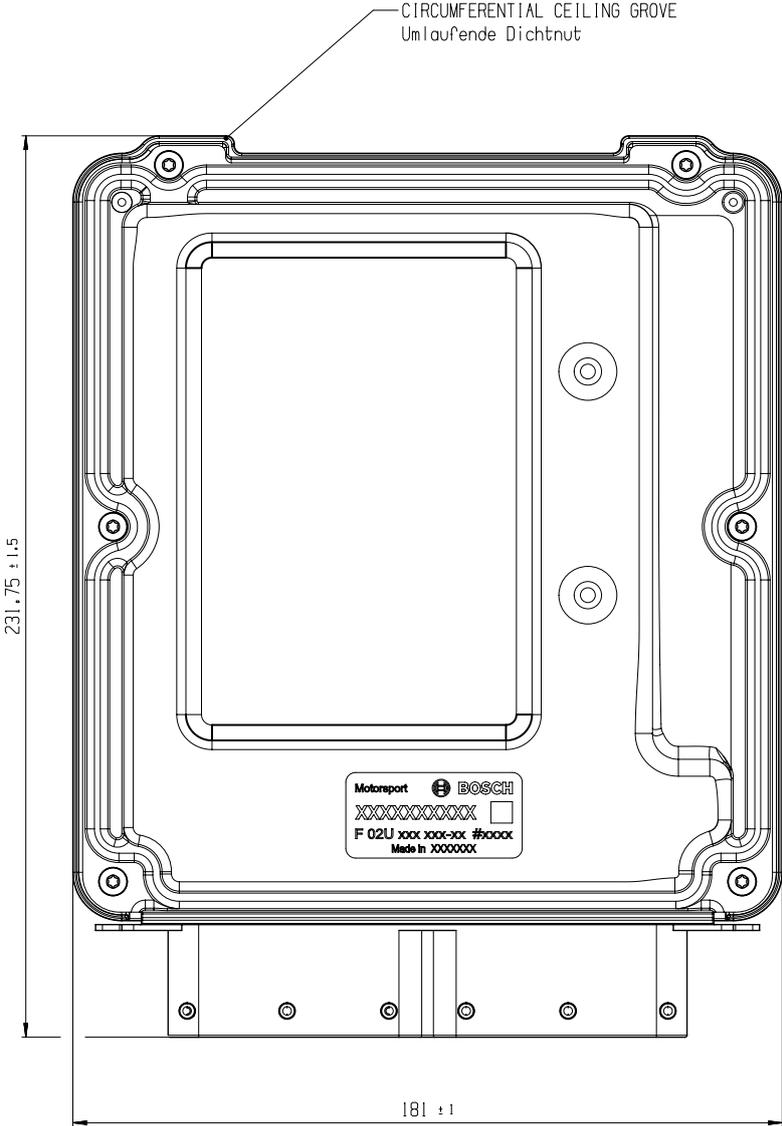Order number **F02U.V02.294-02**

Mating Connector 91 pins
Order number **F02U.B00.711-01**

Mating Connector 105 pins
Order number **F02U.B00.712-01**

1

Dimensions

PRESSURE COMPENSATION ELEMENT
Druckausgleichselement

146 ± 0.5

40.5 ± 0.5

166 ± 0.5

MS 6 CUP EVO Motorsport ECU

BOSCH

158 ± 0.5

65.7 ± 0.5

45.75 ± 1

23.15 ± 1

CIRCUMFERENTIAL CEILING GROVE
Umlaufende Dichtnut

231,75 ± 1.5

Motorsport   Ⓟ BOSCH
XXXXXXXXXX   ☐
F 02U xxx xxx-xx #xxxx
Made in XXXXXXX

181 ± 1

1

Engine Control Unit MS 6.1 EVO

Features

▶ Optimized for low-pressure injection

▶ Measurement with 21 analog inputs

▶ Supports Customer Code Area CCA

▶ 4 GB memory plus 4 GB upgrade

▶ SENT sensor 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 rl
- 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
Variable Valve Timing 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 Recording 1 enabled
- 100 free configurable channels, 20 Hz
- FULL_LOG_1 (1,500 channels/1 kHz sampling rate on Recording 1) optional
- FULL_LOG_2 (4 GB memory/1,500 channels/1 kHz sampling rate on Recording 2) optional

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

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℃

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

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. Due to embargo restrictions, sale of this product in Russia, Belarus, Iran, Syria, and North Korea is prohibited.

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Upgrades

Engine Function Package 1

- Electronic Throttle Control
- VVT
- Turbo Control

Engine Function Package 2

- Traction Control
- Launch Control

Measurement Package

17 Additional analog 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

CCA Hardware Upgrade per device

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

FULL_LOG_1

Extension for Recording 1
- 1,500 channels
- 1 kHz sampling rate

FULL_LOG_2

Activation of Recording 2
- 1,500 channels
- 1 kHz sampling rate
- 4 GB memory

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 a set of additional functions for a single device:
- Crank rotation direction detection (using sensor DG23i)
- Using a 2nd crank backup sensor
- Crank-Preset, quick start based on previous crank stop position
- Far-Bank, 2nd injector per cylinder possible
- Cam-only-synchronisation, engine run without crank sensor signal (specific cam trigger wheel needed)

Innovation Package Project

Innovation Package Project has the same content as Innovation License Device, but license is valid for the whole project instead of a single device

DATA_USB

Data copy to USB flash drive

1

Ordering Information

Engine Control Unit MS 6.1 EVO
Order number **F02U.V03.113-01**

Rugged USB flash drive
Order number **F02U.V03.534-01**

Connector for USB flash drive on car loom side
Order number **F02U.002.996-01**

Adapter cable to PC USB-Port
Order number **F02U.V01.343-01**

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**

CCA Hardware Upgrade 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**

DATA_USB
Order number **F02U.V03.476-01**

Accessories

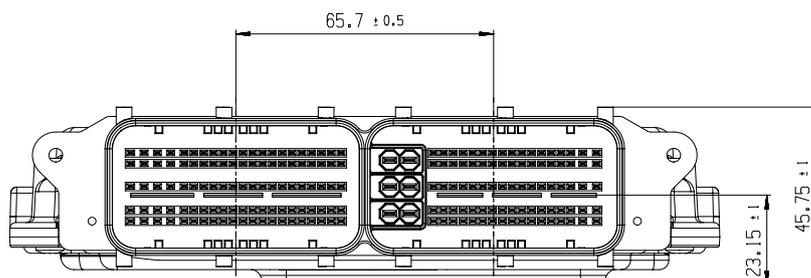**Breakout Box BOB MS 6 EVO**
Order number **F02U.V02.294-02**

Mating Connector 91 pins
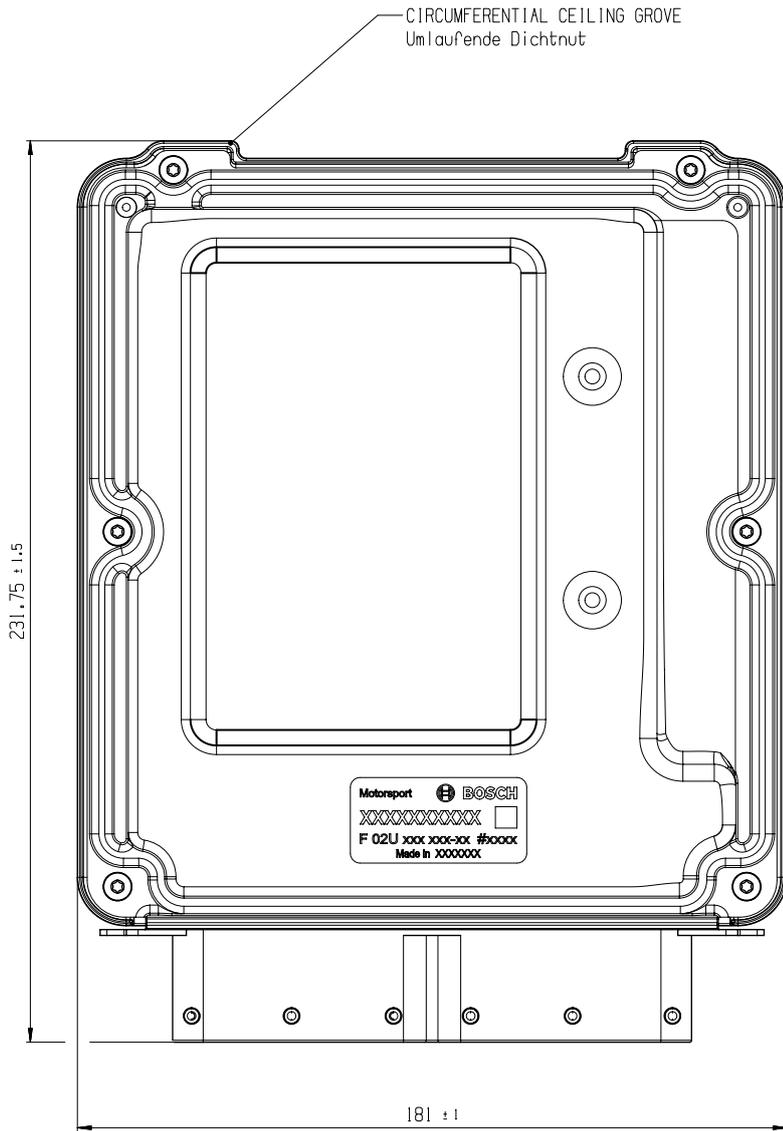Order number **F02U.B00.711-01**

Mating Connector 105 pins
Order number **F02U.B00.712-01**

Dimensions

1

CIRCUMFERENTIAL CEILING GROVE
Umlaufende Dichtnut

231.75 ±1.5

Motorsport 🔵 BOSCH
XXXXXXXXXX ☐
F 02U xxx xxx-xx #xxxx
Made in XXXXXXX

181 ±1

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Engine Control Unit MS 6.2 EVO

Features

▶ Optimized for low-pressure injection

▶ Measurement with 38 analog inputs

▶ Supports Customer Code Area CCA

▶ 4 GB memory plus 4 GB upgrade

▶ SENT sensor support

The MS 6.2 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 6.2 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 rl
- 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

Variable Valve Timing VVT

Turbo control

Traction control

Launch control

LTE Ethernet telemetry support

Internal logger
- 4 GB memory on Recording 1 enabled
- 100 free configurable channels, 20 Hz
- FULL_LOG_1 (1,500 channels/1 kHz sampling rate on Recording 1) optional
- FULL_LOG_2 (4 GB memory/1,500 channels/1 kHz sampling rate on Recording 2) optional

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

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

8 analog/digital inputs (shared)

8 x option for angle synchronous measurement / digital (e.g. SENT)

6 internal measurements

1 x ambient pressure

1

1 x acceleration 6-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

28 function related outputs

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

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

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. Due to embargo restrictions, sale of this product in Russia, Belarus, Iran, Syria, and North Korea is prohibited.

Upgrades

CCA Hardware Upgrade per device

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

FULL_LOG_1

Extension for Recording 1
- 1,500 channels
- 1 kHz sampling rate

FULL_LOG_2

Activation of Recording 2
- 1,500 channels
- 1 kHz sampling rate
- 4 GB memory

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 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 a set of additional functions for a single device:
- Crank rotation direction detection (using sensor DG23i)
- Using a 2nd crank backup sensor
- Crank-Pre-set, quick start based on previous crank stop position
- Far-Bank, 2nd injector per cylinder possible
- Cam-only-synchronisation, engine run without crank sensor signal (specific cam trigger wheel needed)

Innovation Package Project

Innovation Package Project has the same content as Innovation License Device, but license is valid for the whole project instead of a single device

DATA_USB

Data copy to USB flash drive

Ordering Information

Engine Control Unit MS 6.2 EVO
Order number **F02U.V03.115-01**

Rugged USB flash drive
Order number **F02U.V03.534-01**

Connector for USB flash drive on car loom side
Order number **F02U.002.996-01**

Adapter cable to PC USB-Port
Order number **F02U.V01.343-01**

Software Options

CCA Hardware Upgrade 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**

DATA_USB
Order number **F02U.V03.476-01**

Accessories

Breakout Box BOB MS 6 EVO
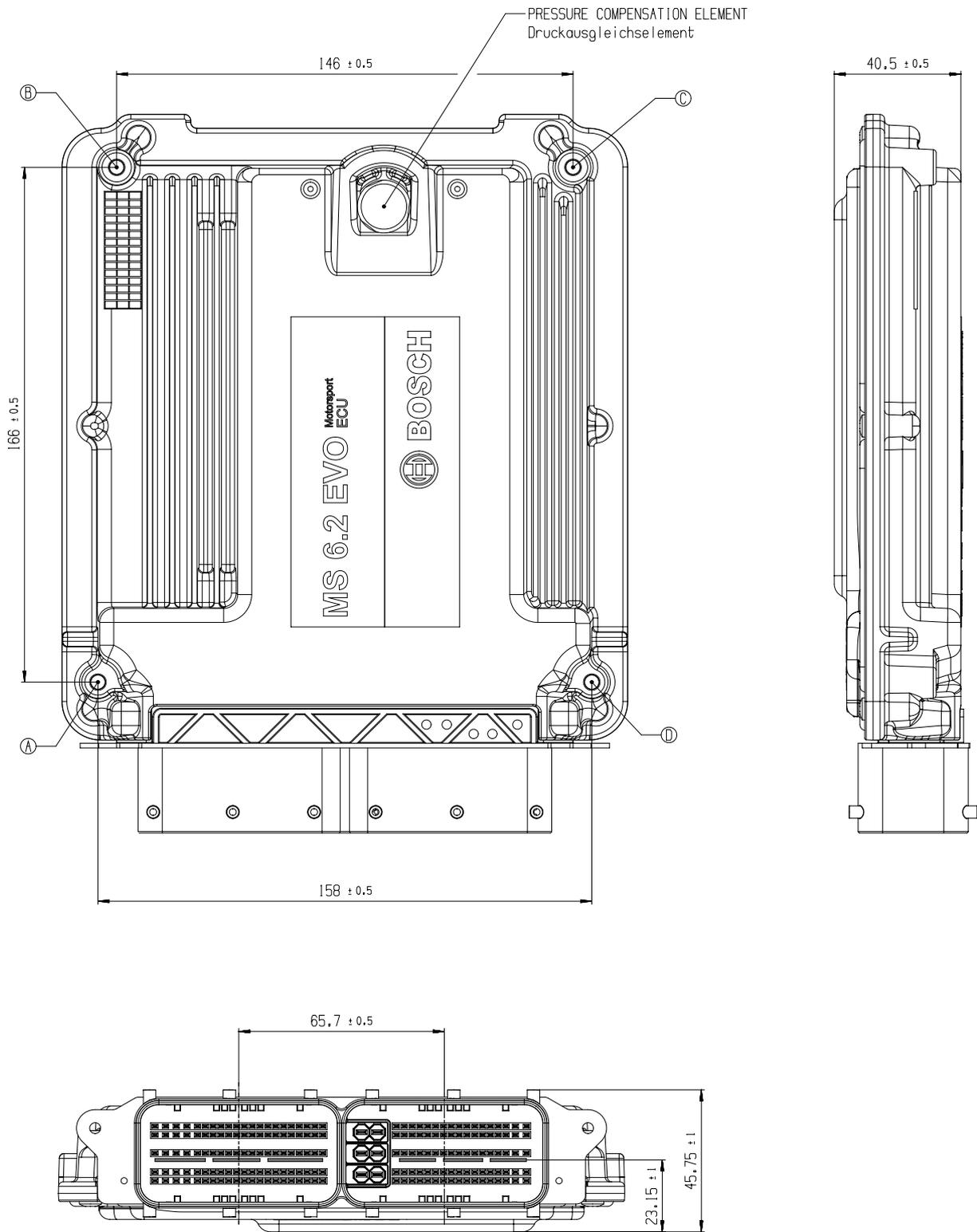Order number **F02U.V02.294-02**
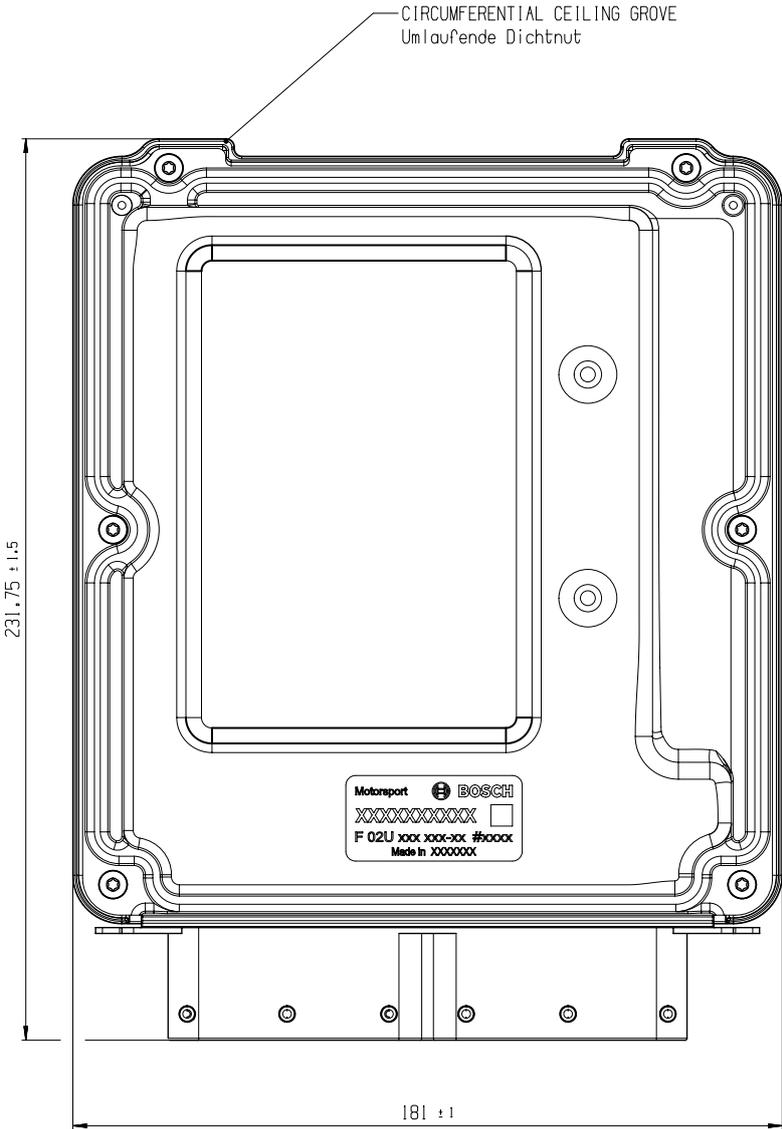
Mating Connector 91 pins
Order number **F02U.B00.711-01**

Mating Connector 105 pins
Order number **F02U.B00.712-01**

1

Dimensions

PRESSURE COMPENSATION ELEMENT
Druckausgleichselement

146 ± 0.5

Ⓑ

Ⓒ

40.5 ± 0.5

166 ± 0.5

MS 6.2 EVO Motorsport ECU

BOSCH

Ⓐ

Ⓓ

158 ± 0.5

65.7 ± 0.5

45.75 ± 1

23.15 ± 1

1

CIRCUMFERENTIAL CEILING GROVE
Umlaufende Dichtnut

231.75 ± 1.5

Motorsport ⊕ BOSCH
XXXXXXXXXX □
F 02U xxx xxx-xx #xxxx
Made in XXXXXXX

181 ± 1

1

Engine Control Unit MS 6.3 EVO

Features

▶ Optimized for low- and high-pressure injection

▶ Measurement with 21 analog inputs

▶ Supports Customer Code Area CCA

▶ 4 GB memory plus 4 GB upgrade

▶ SENT sensor support

The MS 6.3 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 6.3 EVO 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 on injection types and pressure ranges)

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 rl
- 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

Variable Valve Timing VVT

Turbo control

Traction control

Launch control

LTE Ethernet telemetry support

Internal logger
- 4 GB memory on Recording 1 enabled
- 100 free configurable channels, 20 Hz
- FULL_LOG_1 (1,500 channels/1 kHz sampling rate on Recording 1) optional
- FULL_LOG_2 (4 GB memory/1,500 channels/1 kHz sampling rate on Recording 2) optional

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

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

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

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

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

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.

1

Legal Restrictions

The sale of this product in Mexico is prohibited. Due to embargo restrictions, sale of this product in Russia, Belarus, Iran, Syria, and North Korea is prohibited.

Upgrades

High Pressure Injection Package

Enables the control of a 2nd high pressure pump

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

CCA Hardware Upgrade per device

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

FULL_LOG_1

Extension for Recording 1
- 1,500 channels
- 1 kHz sampling rate

FULL_LOG_2

Activation of Recording 2
- 1,500 channels
- 1 kHz sampling rate
- 4 GB memory

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 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 a set of additional functions for a single device:
- Crank rotation direction detection (using sensor DG23i)
- Using a 2nd crank backup sensor
- Crank-Pre-set, quick start based on previous crank stop position
- Far-Bank, 2nd injector per cylinder possible
- Cam-only-synchronisation, engine run without crank sensor signal (specific cam trigger wheel needed)

Innovation Package Project

Innovation Package Project has the same content as Innovation License Device, but license is valid for the whole project instead of a single device

DATA_USB

Data copy to USB flash drive

1

Ordering Information

Engine Control Unit MS 6.3 EVO
Order number **F02U.V03.110-01**

Rugged USB flash drive
Order number **F02U.V03.534-01**

Connector for USB flash drive on car loom side
Order number **F02U.002.996-01**

Adapter cable to PC USB-Port
Order number **F02U.V01.343-01**

Software Options

High Pressure Injection Package
Order number **F02U.V01.999-01**

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

CCA Hardware Upgrade 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**

DATA_USB
Order number **F02U.V03.476-01**

Accessories
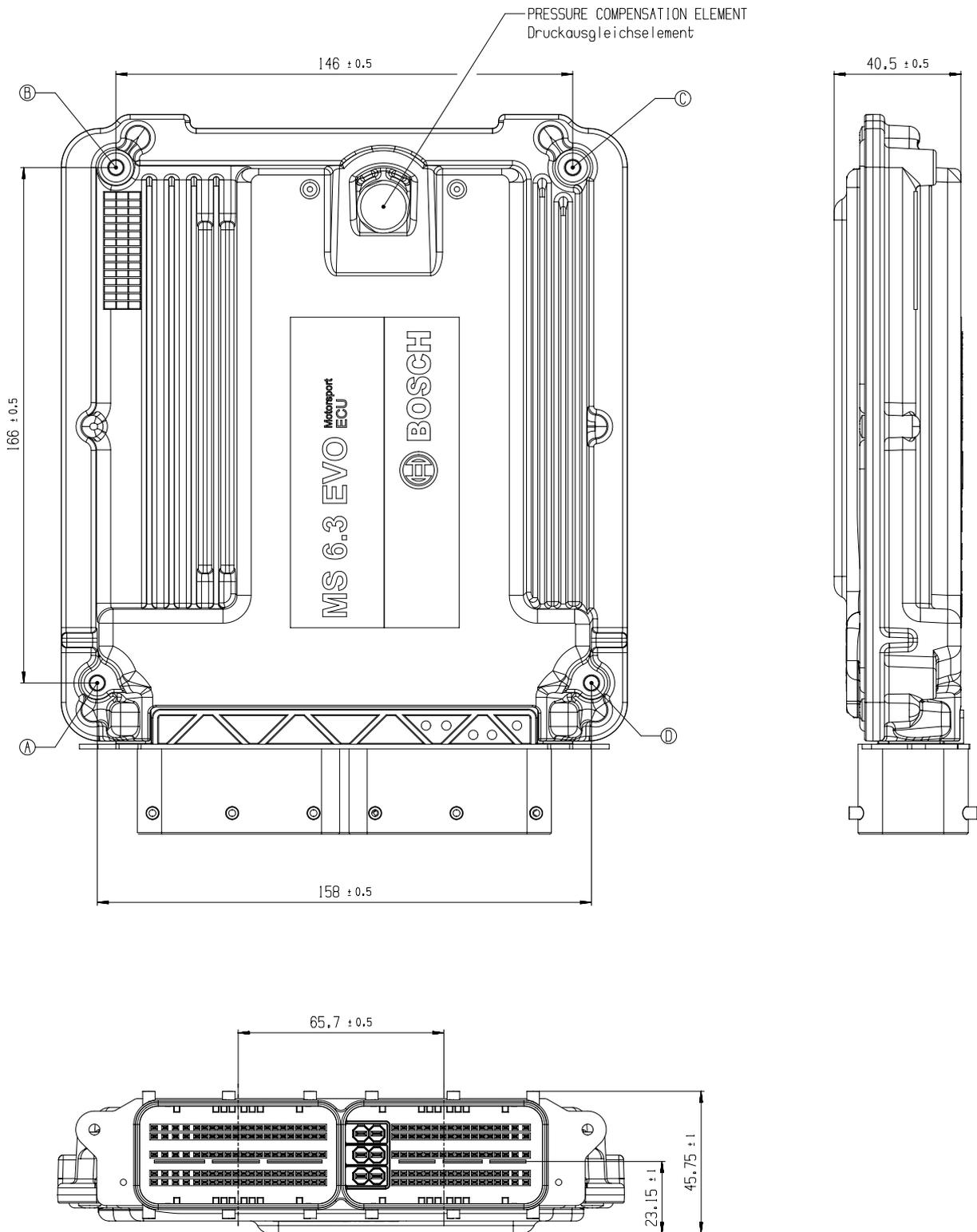
Breakout Box BOB MS 6 EVO
Order number **F02U.V02.294-02**
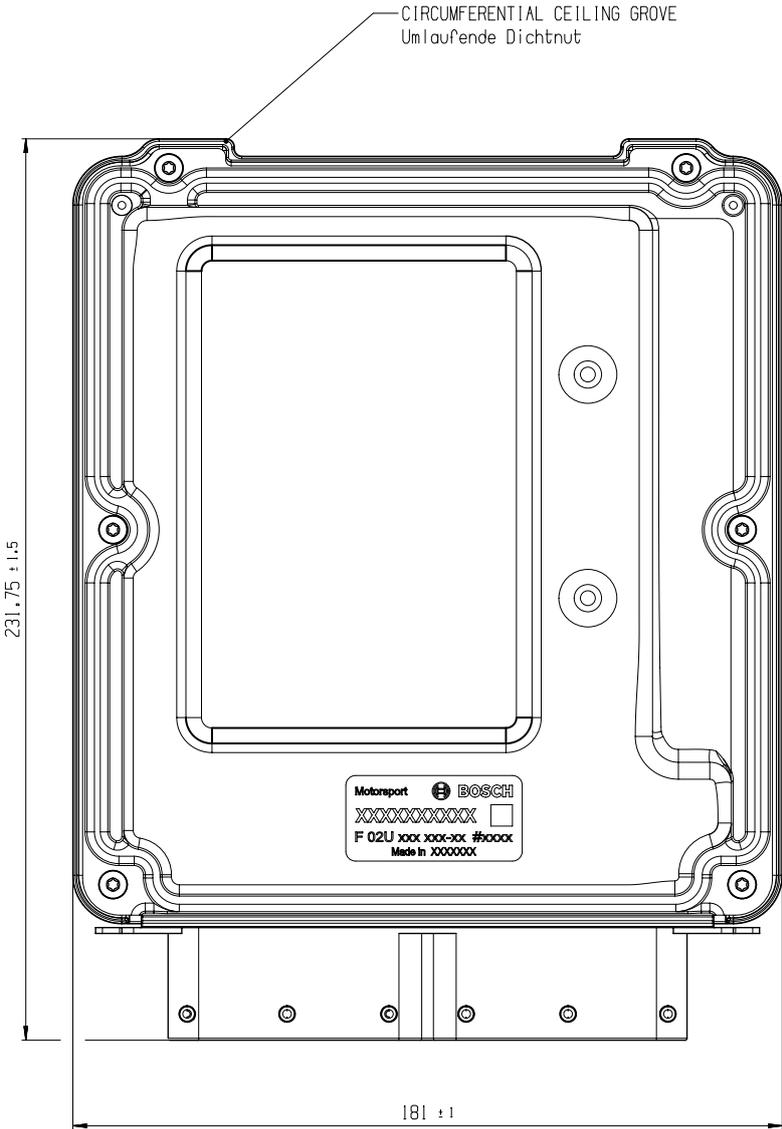
Mating Connector 91 pins
Order number **F02U.B00.711-01**

Mating Connector 105 pins
Order number **F02U.B00.712-01**

1 **Dimensions**

PRESSURE COMPENSATION ELEMENT
Druckausgleichselement

146 ± 0.5

40.5 ± 0.5

166 ± 0.5

158 ± 0.5

MS 6.3 EVO Motorsport ECU

BOSCH

65.7 ± 0.5

45.75 ± 1

23.15 ± 1

CIRCUMFERENTIAL CEILING GROVE
Umlaufende Dichtnut

231,75 ±1,5

Motorsport ⊕ BOSCH
XXXXXXXXXXX
F 02U xxx xxx-xx #xxxx
Made in XXXXXXX

181 ±1

1

Engine Control Unit MS 6.4 EVO

Features

▶ Optimized for low- and high-pressure injection

▶ Measurement with 38 analog inputs

▶ Supports Customer Code Area CCA

▶ 4 GB memory plus 4 GB upgrade

▶ SENT sensor support

The MS 6.4 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 6.4 EVO 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 on injection types and pressure ranges)

High Pressure Injection Package inclusive
Enables the control of a 2nd high pressure pump

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 rl
- 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

Variable Valve Timing VVT

Turbo control

Traction control

Launch control

LTE Ethernet telemetry support

Internal logger
- 4 GB memory on Recording 1 enabled
- 100 free configurable channels, 20 Hz
- FULL_LOG_1 (1,500 channels/1 kHz sampling rate on Recording 1) optional
- FULL_LOG_2 (4 GB memory/1,500 channels/1 kHz sampling rate on Recording 2) optional

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

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℃

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

1

13 x switchable 3.01 kOhm pull-up

8 analog/digital inputs (shared)

8 x option for angle synchronous measurement / digital (e.g. SENT)

6 internal measurements

1 x ambient pressure

1 x acceleration 6-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

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

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.

1

Please remember that the mating connectors and the programming interface MSA-Box II are not included and must be ordered separately.

Legal Restrictions

The sale of this product in Mexico is prohibited. Due to embargo restrictions, sale of this product in Russia, Belarus, Iran, Syria, and North Korea is prohibited.

Upgrades

CCA Hardware Upgrade per device

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

FULL_LOG_1

Extension for Recording 1
- 1,500 channels
- 1 kHz sampling rate

FULL_LOG_2

Activation of Recording 2
- 1,500 channels
- 1 kHz sampling rate
- 4 GB memory

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 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 a set of additional functions for a single device:

- Crank rotation direction detection (using sensor DG23i)
- Using a 2nd crank backup sensor
- Crank-Pre-set, quick start based on previous crank stop position
- Far-Bank, 2nd injector per cylinder possible
- Cam-only-synchronisation, engine run without crank sensor signal (specific cam trigger wheel needed)

Innovation Package Project

Innovation Package Project has the same content as Innovation License Device, but license is valid for the whole project instead of a single device

DATA_USB

Data copy to USB flash drive

Ordering Information

Engine Control Unit MS 6.4 EVO
Order number **F02U.V03.114-01**

Rugged USB flash drive
Order number **F02U.V03.534-01**

Connector for USB flash drive on car loom side
Order number **F02U.002.996-01**

Adapter cable to PC USB-Port
Order number **F02U.V01.343-01**

Software Options

CCA Hardware Upgrade 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**

DATA_USB
Order number **F02U.V03.476-01**

Accessories

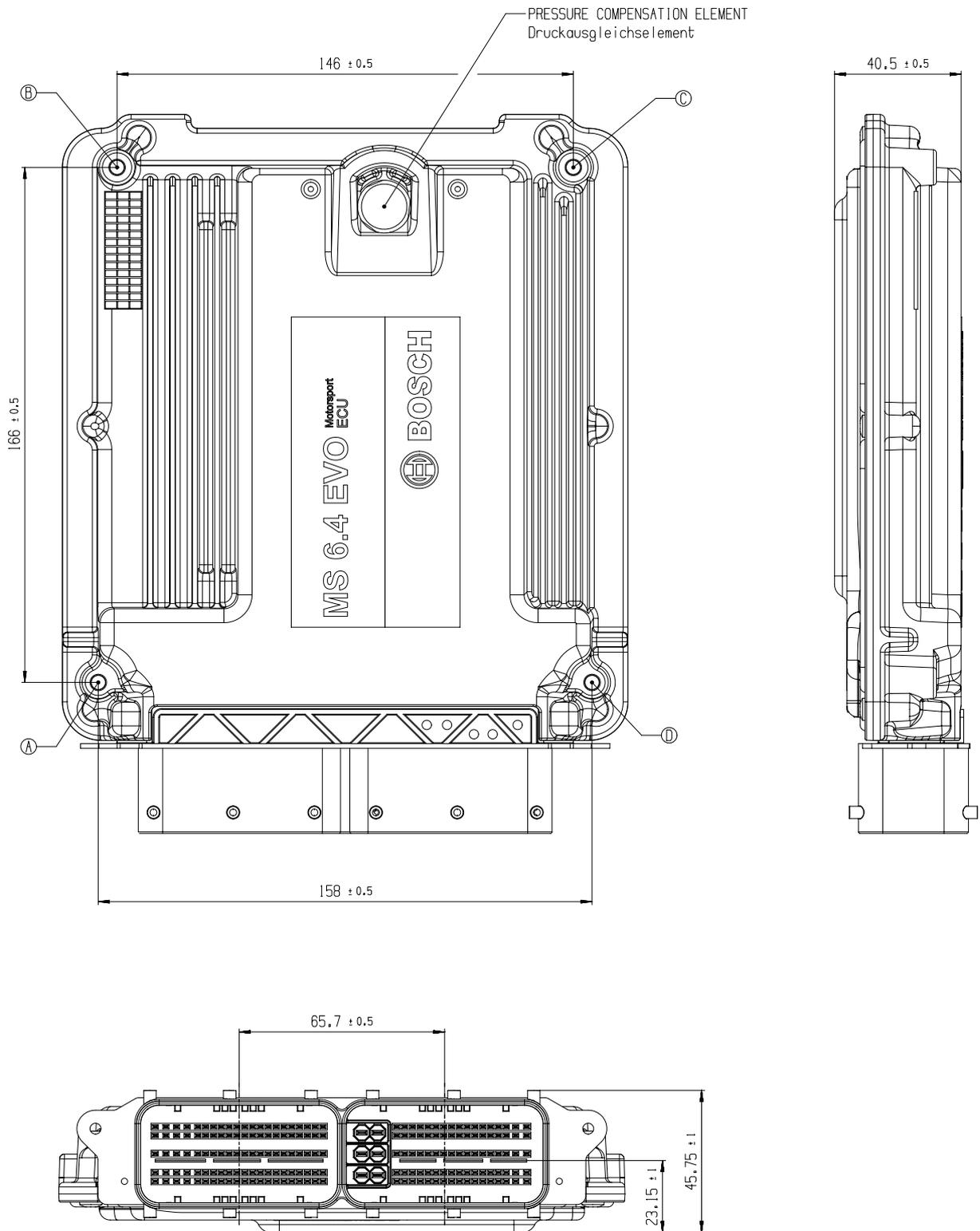**Breakout Box BOB MS 6 EVO**
Order number **F02U.V02.294-02**

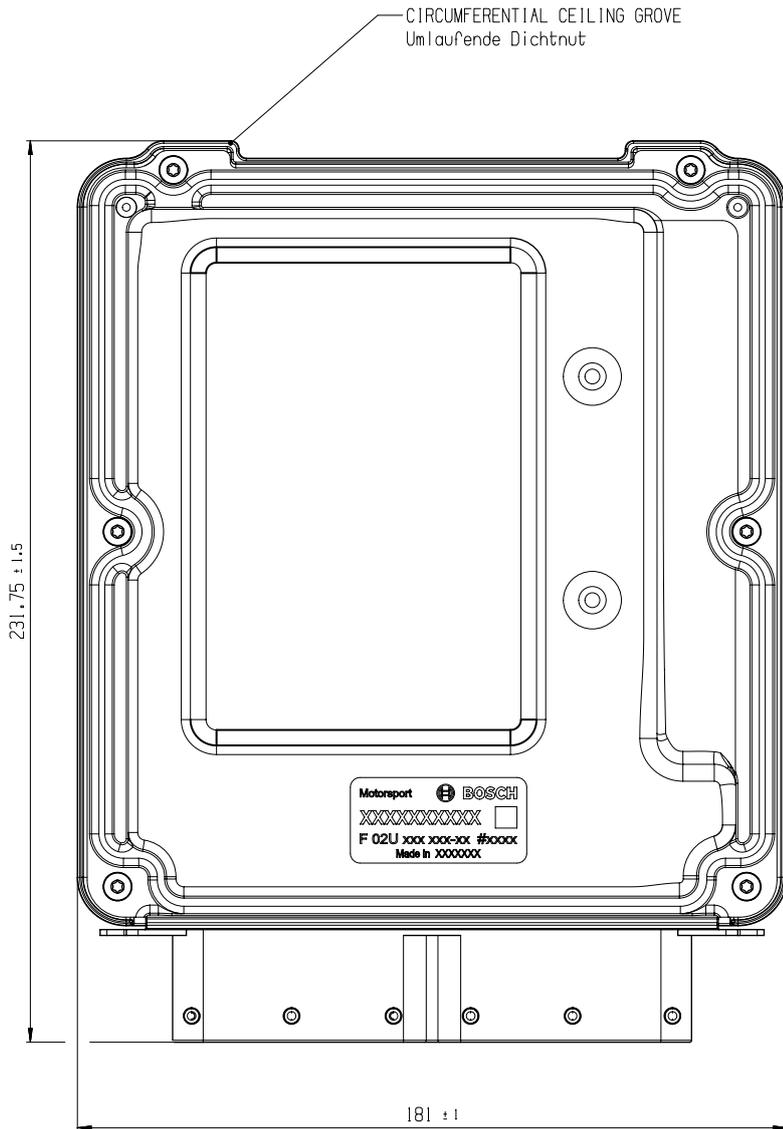**Mating Connector 91 pins**
Order number **F02U.B00.711-01**

Mating Connector 105 pins
Order number **F02U.B00.712-01**

Dimensions

PRESSURE COMPENSATION ELEMENT
Druckausgleichselement

146 ±0.5

40.5 ±0.5

B

C

166 ±0.5

MS 6.4 EVO Motorsport ECU

BOSCH

A

D

158 ±0.5

65.7 ±0.5

45.75 ±1

23.15 ±1

1

CIRCUMFERENTIAL CEILING GROVE
Umlaufende Dichtnut

231.75 ±1.5

Motorsport ⊕ BOSCH
XXXXXXXXXX
F 02U xxx xxx-xx #xxxx
Made in XXXXXXX

181 ±1

1

Engine Control Unit MS 6.4P EVO

Features

▶ 866 MHz Dual Core Processor for projects with high performance demand

▶ Supports Customer Code Area CCA

▶ 4 GB memory plus 16 GB upgrade

▶ SENT sensor support

The MS 6.4P EVO engine control unit manages gasoline engines up to 12 cylinders. The MS 6 family provides high control performance, logging capabilities and an extensive feature set to improve performance in your application. It features a powerful digital processing core and a high-end FPGA for ultimate performance and flexibility. Custom functions can be provided quickly and easily as a service or implemented as customer code with MATLAB/Simulink. The MS 6 family is fully integrated into the Bosch Motorsport system architecture.
Hint: Specific Software Version for MS 6.4P EVO needed, not compatible with MS 6.4 EVO software.

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 on injection types and pressure ranges)

High Pressure Injection Package inclusive
Enables the control of a 2nd high pressure pump

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 rl
- 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

Variable Valve Timing VVT

Turbo control

Traction control

Launch control

LTE Ethernet telemetry support

Internal logger
- 4 GB memory on Recording 1 enabled
- 100 free configurable channels, 20 Hz
- FULL_LOG_1 (1,500 channels/1 kHz sampling rate on Recording 1) optional
- PERF_LOG_1 (16 GB memory on Partition 1) optional
- FULL_LOG_2 (4 GB memory/1,500 channels/1 kHz sampling rate on Recording 2) optional

Logging rates
- Usage of all features: 400 kB/s
- Primary logging use case: 800 kB/s
- Logging data download rate: up to 5 MB/s

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)	0 to 80°C

Electrical Data

Power supply	6 to 18 V
CPU	Dual Core 866 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

8 analog/digital inputs (shared)

8 x option for angle synchronous measurement / digital (e.g. SENT)

6 internal measurements

1 x ambient pressure

1 x acceleration 6-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

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

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.

1

Please remember that the mating connectors and the programming interface MSA-Box II are not included and must be ordered separately.

Legal Restrictions

The sale of this product in Mexico is prohibited. Due to embargo restrictions, sale of this product in Russia, Belarus, Iran, Syria, and North Korea is prohibited.

Upgrades

CCA Hardware Upgrade per device

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

FULL_LOG_1

Extension for Recording 1
- 1,500 channels
- 1 kHz sampling rate

PERF_LOG_1 (requires FULL_LOG_1)

Increase logging Partition 1 from 4 GB to 16 GB memory

FULL_LOG_2

Activation of Recording 2
- 1,500 channels
- 1 kHz sampling rate
- 4 GB memory

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

Specific project SW for MS 6.4P EVO, based on MS 6.4 EVO SW, offered as engineering service

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 a set of additional functions for a single device:
- Crank rotation direction detection (using sensor DG23i)
- Using a 2nd crank backup sensor
- Crank-Pre-set, quick start based on previous crank stop position
- Far-Bank, 2nd injector per cylinder possible
- Cam-only-synchronisation, engine run without crank sensor signal (specific cam trigger wheel needed)

Innovation Package Project

Innovation Package Project has the same content as Innovation License Device, but license is valid for the whole project instead of a single device

DATA_USB

Data copy to USB flash drive

1

Ordering Information

Engine Control Unit MS 6.4P EVO
Order number **F02U.V03.112-01**

Engine Control Unit MS 6 EVO RX
FIA-homologated version for WRX Championship
Order number **on request**

Rugged USB flash drive
Order number **F02U.V03.534-01**

Connector for USB flash drive on car loom side
Order number **F02U.002.996-01**

Adapter cable to PC USB-Port
Order number **F02U.V01.343-01**

Software Options

CCA Hardware Upgrade per device
Order number **F02U.V02.137-01**

FULL_LOG_1
Order number **F02U.V02.304-01**

PERF_LOG_1
Order number **F02U.V03.054-01**

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**

Specific project SW for MS 6.4 Performance, based on MS 6.4 SW, offered as engineering service
Order number **on request**

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**

DATA_USB
Order number **F02U.V03.476-01**

Accessories

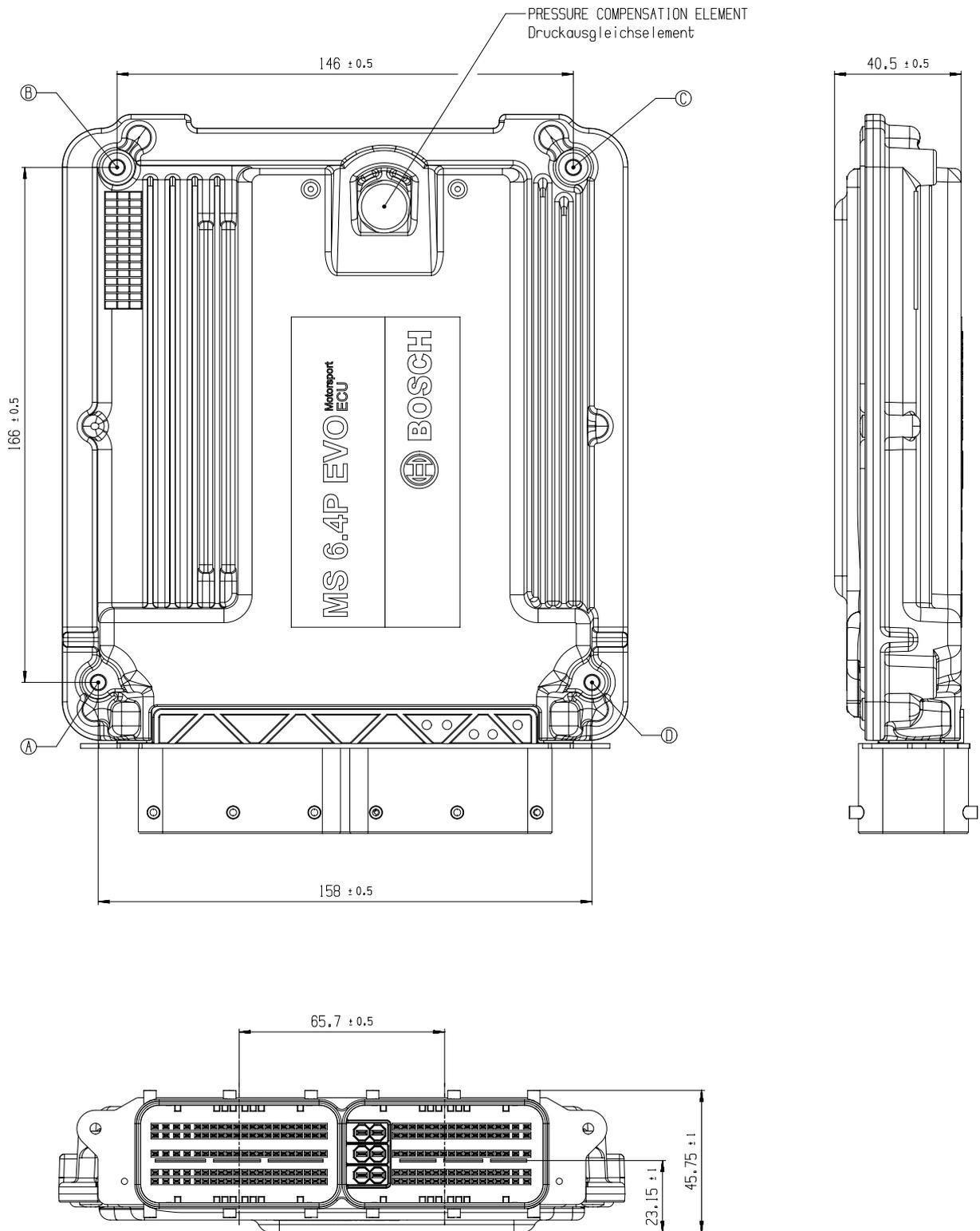**Breakout Box BOB MS 6 EVO**
Order number **F02U.V02.294-02**

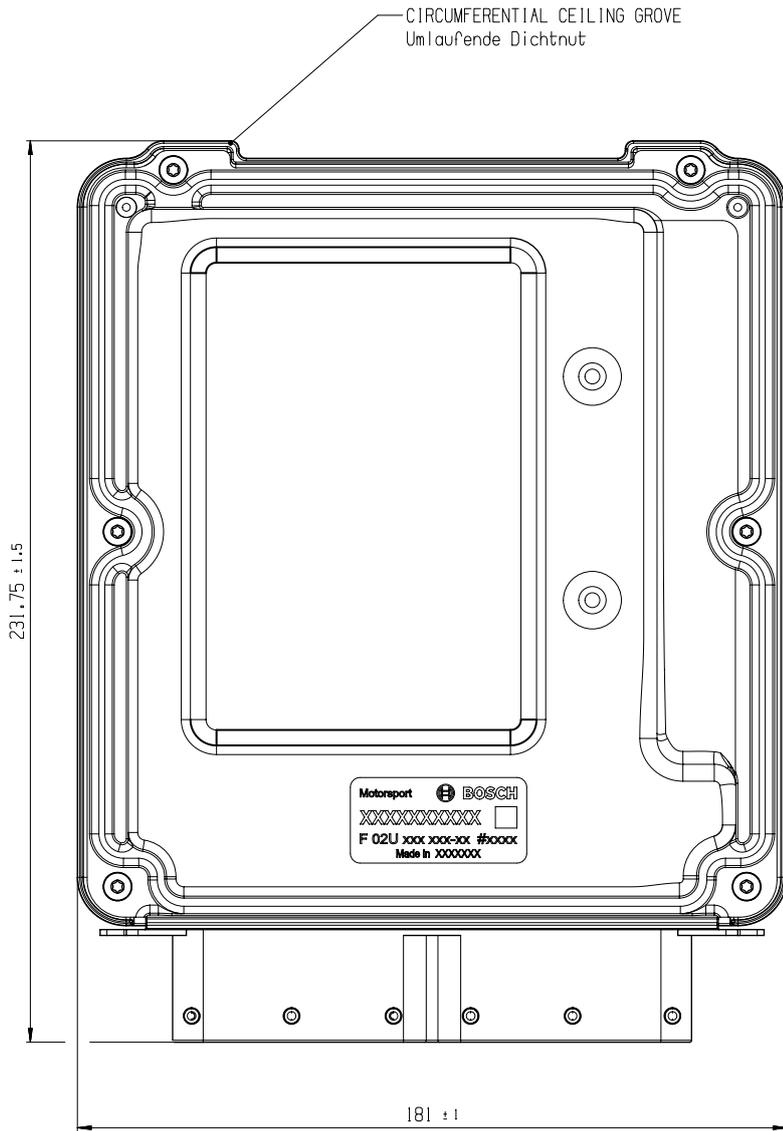**Mating Connector 91 pins**
Order number **F02U.B00.711-01**

Mating Connector 105 pins
Order number **F02U.B00.712-01**

Dimensions

PRESSURE COMPENSATION ELEMENT
Druckausgleichselement

146 ± 0.5

166 ± 0.5

40.5 ± 0.5

158 ± 0.5

MS 6.4P EVO **Motorsport** ECU

BOSCH

65.7 ± 0.5

45.75 ± 1

23.15 ± 1

1

CIRCUMFERENTIAL CEILING GROVE
Umlaufende Dichtnut

231.75 ±1.5

Motorsport ⊕ BOSCH
XXXXXXXXXX
F 02U xxx xxx-xx #xxxx
Made in XXXXXXX

181 ±1

Engine Control Unit MS 7.8

Features

▶ Optimized for low- and high-pressure injection

▶ 5 CAN, 3 of them CAN-FD capable

▶ 4 x 8.5 A H-Bridge

▶ Gearbox control optionally included

▶ SENT sensor support

The MS 7.8 engine control unit manages gasoline engines up to 12 cylinders. The MS 7 line features a powerful digital processing core with floating point arithmetic and a high-end FPGA for ultimate performance and flexibility. The MS 7 line utilizes a software development process based on MATLAB/Simulink which significantly speeds up algorithm development by using automatic code and documentation generation. Custom functions can be generated quickly and easily. The flexible hardware design allows the MS 7.8 to support complex or unusual engine or chassis configurations.
Version MS 7.8-ADV was developed for use with Lambda Sensor LSU ADV (higher max. Hexagon temperature).

Application

High pressure injection
Integrated power stages for triple injection and use of:
- 4 cylinders up to 14,600 rpm
- 6 cylinders up to 9,700 rpm
- 8 cylinders up to 7,300 rpm

(for supply voltages >10 V, depending on injection types and pressure ranges)

HP package for flat and V-engines inclusive (2nd Bank, fuel control valve 2, external cylinder 9-12)

Low pressure injection
- Max. 12 cylinders up to 16,000 rpm, high impedance injectors only

Outputs can be used alternatively as low side switches 2.2 A with fast decay

Ignition
- 8 integrated power stages up to 20 A
- alternatively, up to 12 drivers for use with external power stages

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

Variable Valve Timing VVT

Turbo control

Traction control

Launch control

LTE Ethernet telemetry support

Internal logger
- FULL_LOG_1 (4 GB memory on Recording 1) enabled
- PERF_LOG_1 (16 GB memory on Partition 1) optional
- FULL_LOG_2 (4 GB memory on Recording 2) enabled
- DATA_USB (Data copy to USB flash drive) enabled

Logging rates
- Usage of all features: 400 kB/s
- Primary logging use case: >800 kB/s
- Logging data download rate: up to 6.2 MB/s

Technical Specifications

Mechanical Data

Milled aluminum housing	
4 motorsport connectors, 264 pins in total	
Size without connectors	198 x 180 x 42 mm
Weight	1,560 g
Protection Classification	IP67
Temp. range (at internal sensors)	-20 to 85℃
Max. Vibration	Vibration Profile 1 (see Downloads or www.bosch-motorsport.com)

Electrical Data

Power supply	6 to 18 V
CPU	Dual Core 1 GHz, FPGA

Inputs

46 analog inputs	

8 analog/digital/SENT inputs (shared)

12 digital inputs

4 x switchable Hall/inductive

4 x Hall

4 x switchable Hall/DF11

21 internal measurements

8 x ECU Current (Sensor Supply)

8 x ECU Voltage (Sensor Supply)

1 x Boost Voltage

1 x Booster Supply Voltage

1 x Dynpwr Supply Voltage

1 x Supply Current

1 x USB Current

18 function related inputs

8 x fast ADC for combustion chamber pressure input

2 x thermocouple exhaust gas temperature sensors (multi-type)

2 x Lambda interfaces for LSU 4.9 sensor types (LSU-ADV version available, see Ordering Information)

1 x digital switch for engine ON/OFF

1 x digital input for beacon receiver

4 x knock sensors

Sensor supplies and screens

8 x sensor supply 400 mA, switchable 5 V/Vbat with voltage and current sensing

8 x sensor grounds

2 x sensor screens

Outputs

38 function related outputs

High Pressure Injection

2 x high pressure pump with fuel control valve
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 power stage, or max. 8 cylinders and coils without integrated power stage, 20 A

2 x 8.5 A H-bridge reserved for electronic throttle

2 x 3 A pwm lowside switch for Lambda heater

15 freely configurable outputs

2 x 8.5 A H-bridge

2 x 4 A pwm lowside switch

6 x 3 A pwm lowside switch

4 x 2.2 A pwm lowside switch

1 x 1 A pwm lowside switch low dump resistant

5 output signals

5 x MUX outputs for internal signals like flywheel, knock signals, cylinder pressure

Adaptation and Documentation

Configuration
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 V7

System Configuration tool RaceCon 2.7.0.9 or later

Mating Connectors

LIFE (red)	AS618-35SN
Actuator (blue)	AS618-35SB
Combined (orange)	AS618-35SC
Sensor (yellow)	AS618-35SA

Communication

1 Ethernet 1 Gbit

3 Ethernet 100 Mbit

5 CAN, 3 of them CAN-FD capable

1 LIN

1 USB

8 SENT

1 Time sync synchronization Ethernet

2 Network screens

Installation Notes

Inspection services recommended after 220 h or 24 months, internal battery to be replaced during service.

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 cable are not included and must be ordered separately.

Legal Restrictions

The sale of this product in Mexico is prohibited. Due to embargo restrictions, sale of this product in Russia, Belarus, Iran, Syria, and North Korea is prohibited.

Upgrades

CCA Hardware Upgrade per device

Enable Customer Code Area

1

PERF_LOG_1

Increase logging Partition 1 from 4 GB to 16 GB memory

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

Accessories

- Rugged USB flash drive
- Mating connector for USB flash drive on car loom side
- Adapter cable to PC USB-Port
- Cylinder pressure detection base package
- Knock detection via cylinder pressure evaluation
- Programming interface cable

Ordering Information

Engine Control Unit MS 7.8
Order number **F02U.V03.249-02**

Engine Control Unit MS 7.8-ADV
Order number **F02U.V03.316-02**

Rugged USB flash drive
Order number **F02U.V03.534-01**

Connector for USB flash drive on car loom side
Order number **F02U.002.996-01**

Adapter cable to PC USB-Port
Order number **F02U.V01.343-01**

Software Options

CCA Hardware Upgrade per device
Order number **F02U.V02.137-01**

PERF_LOG_1
Order number **F02U.V03.054-01**

Gear Control Package 1
Order number **please contact MEGA-Line**

Gear Control Package 2
Order number **F02U.V02.264-01**

Cylinder pressure detection base package
Order number **F02U.V02.543-01**

Knock detection via cylinder pressure evaluation
Order number **F02U.V02.544-01**

Accessories

Breakout Box BOB 66-pole, Connector code blue
Order number **F02U.V02.295-01**

Breakout Box BOB 66-pole, Connector code orange
Order number **F02U.V02.296-01**

Breakout Box BOB 66-pole, Connector code yellow
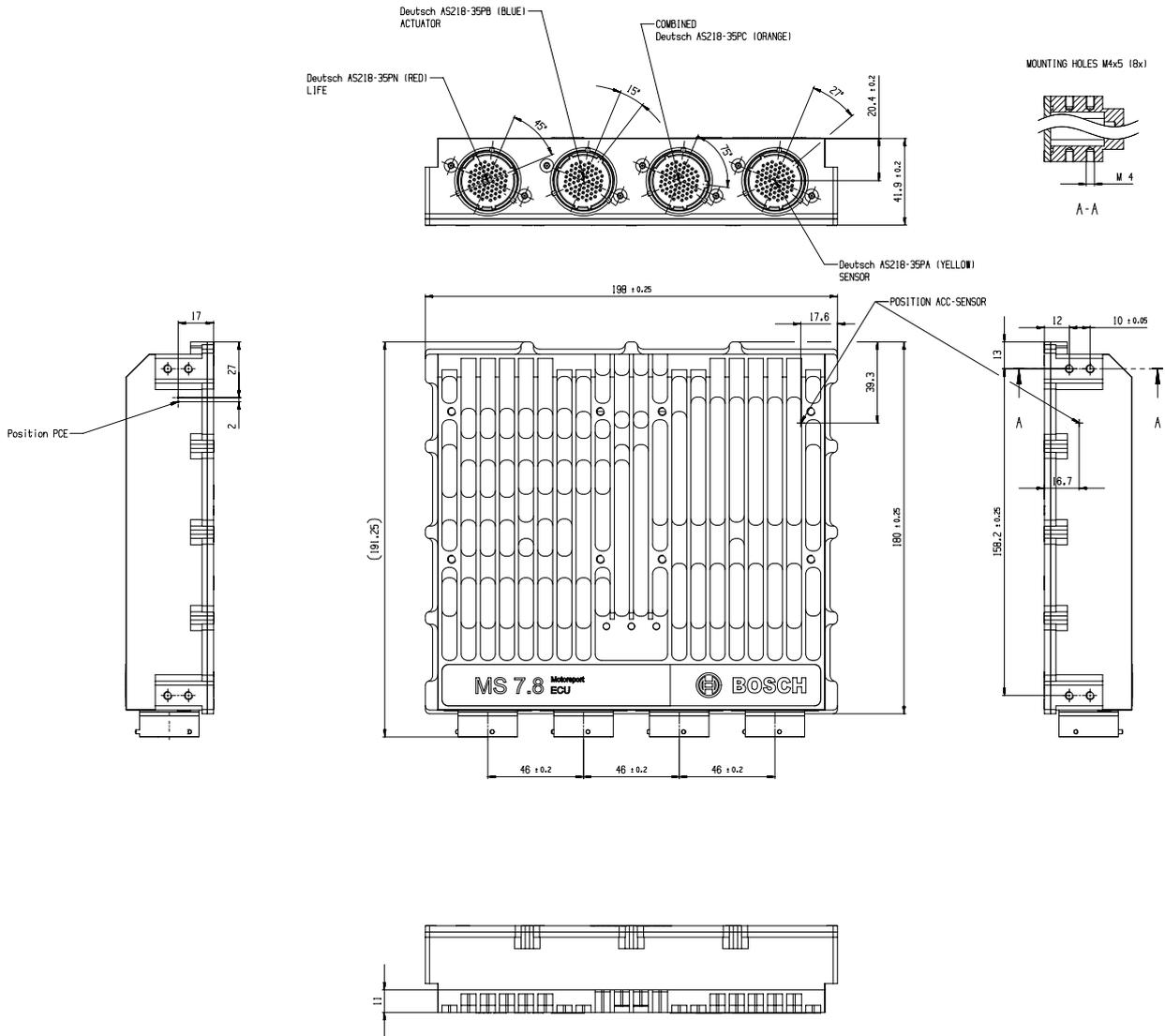Order number **F02U.V02.298-01**

Breakout Box BOB MS 7, LIFE-Connector code red
Order number **F02U.V02.293-02**

Programming interface cable
Order number **F02U.V02.327-01**

1

Dimensions

See Offer Drawing for further information

Engine Control Unit MS 25 Sport

Features

▶ 8 injection output stages

▶ For solenoid injectors

▶ 96 data inputs

▶ Software options available

The MS 25 Sport is an ECU for Diesel engines with up to 8 cylinders. It is developed for use with Bosch solenoid injectors. The MS 25 Sport utilizes a software development process based on MATLAB® & Simulink®.
The MS 25 Sport is able to operate in 12 V or 24 V systems. The base SW is able to control one hydraulic bank configuration with Fuel Metering Unit (FMU) and Pressure Control Valve (PCV).

Application

Engine layout	3, 4, 5, 6, 8, <3 on request
Injector type	Solenoid valve injectors
Control strategy	Quantity based
Hydraulic system	Fuel metering unit + Pressure control valve (2 bank optional)
Injection timing	2 pilot injections 1 main injection 2 post injections
Turbo boost control	Single or Bi-Turbo
Lambda measurement	Optional controls on request
Two bank hydraulic control	Optional
Traction control	Optional
Gear cut for sequential gearbox	Optional
Speed limiter	

Optional function packages available	
Calibration interface	CCP via CAN
Interface to Bosch Data Logging System	3 CAN interfaces
Max. vibration	Vibration Profile 1 (see Downloads or www.bosch-motorsport.com)

Technical Specifications

Mechanical Data

Aluminum product housing	Base plate with fluid cooling incl. pressure compensation element (PCE)
2 production type connectors with 192 pins	Separate coding each (192 x 1.2 mm pins)
Vibration damped circuit boards	Engine mountable with additional dampers
8 housing fixation points	
Size	260 x 250 x 81 mm
Protection classification	IP x 6k and IP x 9K
Weight	1,800 g
Temperature range	-40 to 85℃

Electrical Data

Power supply	12 or 24 V
1 internal atmospheric pressure sensor	
1 internal ECU temperature sensor for max. temperature	

Inputs

1 lambda interface LSU	LSU 4.9
7 general frequency inputs	4 wheel speed and one vehicle speed hall effect sensor inputs and 2 inductive turbo speed
1 input for inductive crankshaft sensor	Hall optional
1 input for Hall-effect camshaft sensor	Inductive optional
29 analog inputs	
14 digital inputs	

Sensor supplies and screens

3 sensor supply 5 V	

Outputs

8 injection power stages	3 banks for 8 cylinders
2 Fuel Metering Unit (High Pressure Pump)	2 bank system optional
2 Pressure Control Valve (Rail)	2 bank system optional
12 power stages (low side)	
1 power stage for lambda heater	

1

2 H-bridges	

Software

RaceCon Calibration Software	free download
WinDarab Analysis Software	free download

Optional Functionality

Traction control SW upgrade
2 bank hydraulic control SW upgrade

Environment (not included)

Programming interface MSA-Box II	F02U.V00.327-03

Mating connectors (not included)

Mating connector I CONNECTOR KIT; MS 25 SPORT - X1 (Vehicle)	F02U.V0U.147-01
Mating connector II CONNECTOR KIT; MS 25 SPORT - X2 (Engine)	F02U.V0U.148-01

Communication

3 CAN interfaces (dash, application, customer use)	J1939 optional
1 LIN	Optional
1 SENT	Optional

Installation Notes

Depending on your experiences with calibration of Diesel ECUs we recommend calibration support from Bosch Motorsport.

Please remember that mating connectors and the programming interface MSA-Box II are not included and must be ordered separately.

Legal Restrictions

The sale of this product in Mexico is prohibited. Due to embargo restrictions, sale of this product in Russia, Belarus, Iran, Syria, and North Korea is prohibited.

Ordering Information

Engine Control Unit MS 25 Sport
Order number **F02U.V0U.800-02**

Overview

1

Vehicle Control Unit MS 50.4

Vehicle Control Unit MS 50.4P incl. CCA

- 667 MHz Dual Core Processor exclusively for vehicle control functionality (MATLAB based)
- Identical, dedicated 667 MHz Dual Core Processor exclusively for logging purposes
- High Speed Logging 200 kHz of 6 analog inputs (optional)
- Event logging, Configurable pre-event logging

- 866 MHz Dual Core Processor exclusively for vehicle control functionality (MATLAB based)
- Identical, dedicated 866 MHz Dual Core Processor exclusively for logging purposes
- High Speed Logging 200 kHz of 6 analog inputs (optional)
- Event logging, Configurable pre-event logging

1

Vehicle Control Unit MS 50.4

Features

▶ 667 MHz Dual Core Processor exclusively for vehicle control functionality (MATLAB based)

▶ Identical, dedicated 667 MHz Dual Core Processor exclusively for logging purposes

▶ High Speed Logging 200 kHz of 6 analog inputs (optional)

▶ Event logging, Configurable pre-event logging

The VCU MS 50.4 is a highly powerful processing / logging unit for race applications.
Based on our broad base of platform function, we support you with customized VCU functions for a tailor-made solution.
In addition, you can quickly develop your individual customer software based on MATLAB/Simulink to significantly speed up algorithm development (automatic code and documentation generation, requires CCA package) – including extensive simulation capabilities.

Application

Processor for customer code	667 MHz Dual Core
Processor for logger	667 MHz Dual Core
Configurable math channels	
User configurable CAN in/out messages	
Online data compression	

Internal logger
- 1,500 channels
- FULL_LOG_1 (4 GB memory on Recording 1) enabled
- PERF_LOG_1 (16 GB memory on Partition 1) optional
- FULL_LOG_2 (4 GB memory on Recording 2) enabled
- High Speed Logging Package (Sampling rate 5 µs) optional
- DATA_USB (Data copy to USB flash drive) enabled

Logging rates

- Usage of all features: 600 kB/s
- Primary logging use case: >1,200 kB/s
- Logging data download rate: up to 6.2 MB/s

LTE Ethernet telemetry support
RS232 interface for GPS

Technical Specifications

Mechanical Data

Size	166 x 121 x 41 mm
Weight	≤ 660 g
Protection classification	IP67
3 motorsport connectors, 198 pins in total	
Max. vibration	Vibration profile 1 (see Downloads or www.bosch-motorsport.com)
Operating temperature internal	-20 to 80℃

Electrical Data

Supply voltage	5 to 18 V

Inputs

20 xAnalog channels 0 to 5 V, 0.5 % precision between 0.2 and 4.8 V, switchable pull-up
8 x Digital PWM inputs f_max=30 kHz Hall-type speed measurement possible, Switchable pullup 2.15 kOhm, (required for Hall), Tooth count differential*
4 x Digital PWM inputs f_max=30 kHz Hall- and DF11 type speed measurement possible, Fixed pullup 2.15 kOhm (required for Hall), Tooth count differential*
4 x universal Thermocouple
1 x Bosch Laptrigger
1 x TimeSync master and slave (specific to Bosch measurement system)
Internal measurements: 1 x ambient pressure 1 x ECU temperature 20 x supply voltage 20 x supply current 1 x battery voltage (external VCU supply) 1 x external VCU supply current 4 x HS output current 1 x 3-axis acceleration plus roll/pitch/yaw rate

Outputs

2* x 7.5 A each, PWM High side, 50 Hz
4* x 2.2 A each, PWM Low side, 10 kHz
*can be enhanced by Upgrade I/O Package

Sensor Supplies and Screens

5* x 12 V, 400 mA each
5* x Switchable 5 V/12 V, 400 mA each

4 A max overall current on all 12 V
2 A max overall current on all 5 V

12 V ± 1 % precision on the pin
5 V ± 0.1 % precision on the pin

20 x Sensor ground

*can be enhanced by Upgrade I/O Package

Adaptation and Documentation

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	
System Configuration tool RaceCon	Logger configuration, calibration, and online measurement

Connectors

Connector LIFE (red) AS018-35PN	Mating connector AS618-35SN (not included)
Connector SENS-A (yellow) AS018-35PA	Mating connector AS618-35SA (not included)
Connector SENS-B (blue) AS018-35PB	Mating connector AS618-35SB (not included)

Communication

3 Ethernet 100 Mbit

4 CAN (+4 with Upgrade I/O Package)

1 LIN

1 USB

1 RS232 interface for GPS or Telemetry, switchable depending on SW version

1 Time sync synchronization Ethernet

Installation Notes

Maintenance Interval: 220 h or a maximum of two years

Please remember that the mating connectors and the programming interface MSA-Box II are not included and must be ordered separately.

Legal Restrictions

The sale of this product in Mexico is prohibited. Due to embargo restrictions, sale of this product in Russia, Belarus, Iran, Syria, and North Korea is prohibited.

Upgrades

CCA Hardware Upgrade per device

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

Multi CCA Hardware Upgrade per device

Enables the use of an extra core to utilize more computing power in the device

I/O Package

Communication

4 CAN

Inputs

4 Analog channels
0 to 5 V,
0.5 % precision between 0.2 and 4.8 V, switchable pull-up

4 Digital PWM inputs
$f\_max = 30$ kHz
Hall-type speed measurement possible,
Fixed pullup 2.15 kOhm (required for Hall),
Tooth count differential**

4 LVDT, 5 pin configuration,
excitation frequency 1 to 20 kHz,
excitation voltage 0 to 5 V (rms)

Outputs

4 "TTL" Digital output, 10 kHz, PWM, 25 mA each

2 PWM High side; 7.5 A each, PWM, 50 Hz

4 PWM Low side; 2.2 A each, PWM, 10 kHz

Power Supplies

5 x 12 V, 400 mA each

5 switchable 5 V/12 V, 400 mA each

** The tooth count differential between any two of the PWM inputs is available to measure e.g., shaft torsion.

High Speed Logging Package

6 ANA	0 to 5 V, 200 kHz logging rate

CCP/XCP_MASTER

Enables CCP/XCP master functionality to request data from foreign devices via CAN/CCP protocol, XCP over Ethernet (UDP) or XCP via CAN.
(ASAP2 file from ECU manufacturer required)

1

Ordering Information

Vehicle Control Unit MS 50.4
Order number **F02U.V02.965-02**

Rugged USB flash drive
Order number **F02U.V03.534-01**

Connector for USB flash drive on car loom side
Order number **F02U.002.996-01**

Adapter cable to PC USB-Port
Order number **F02U.V01.343-01**

Breakout Box BOB 66-pole
Connector code: blue
Order number **F02U.V02.295-01**

Breakout Box BOB 66-pole
Connector code: yellow
Order number **F02U.V02.298-01**

Vehicle Control Unit MS 50.4 incl. CCA Hardware Upgrade
Order number **F02U.V03.012-01**

Software Options

CCA Hardware Upgrade per device
Order number **F02U.V02.137-01**

Multi CCA Hardware Upgrade VCU per device
Order number **F02U.V03.222-01**

I/0 Package
Order number **F02U.V02.777-01**

High Speed Logging Package
Order number **F02U.V02.779-01**

CCP/XCP_MASTER
Order number **F02U.V02.213-01**

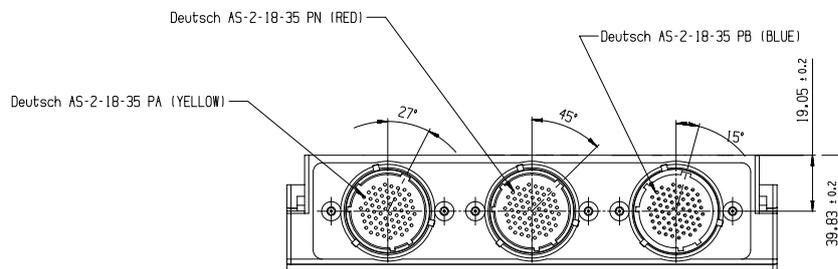**Accessories**

Opening tool for shellsize 18
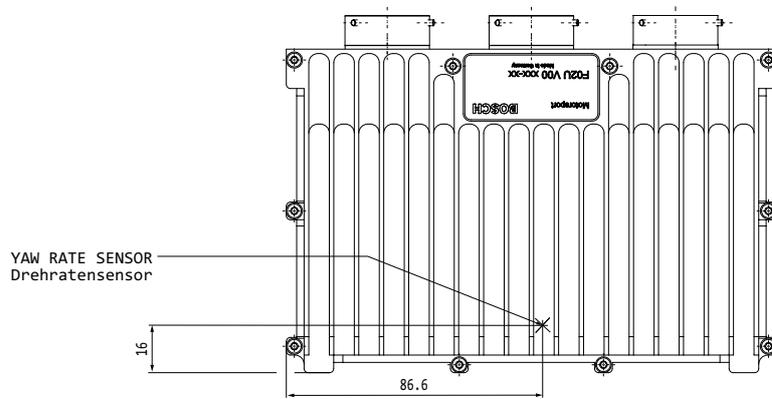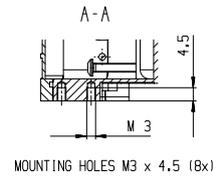Order number **F02U.V01.394-01**

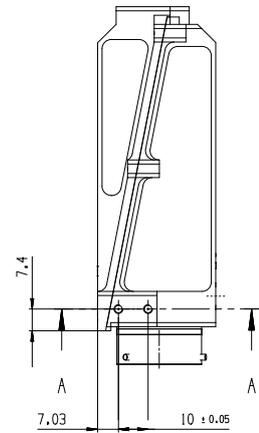**Breakout Box BOB MS 7**
Connector code: red
Order number **F02U.V02.293-01**

Dimensions

1

165.6 ±0.25

(121.61)

110.15 ±0.25

POW RUN LOG USR

MS 50.4 Motorsport
VCU

BOSCH

48.7 ±0.2   48.7 ±0.2

7.4

A   A

7.03   10 ±0.05

24   2

143.6 ±0.05   11

20 14   9

PRESSURE COMPENSATION ELEMENT
Druckausgleichselement

86.6   10 ±0.05

A-A

4.5

M 3

MOUNTING HOLES M3 x 4.5 (8x)

F02U V00 xxx-xx
Made in Germany

BOSCH
Motorsport

YAW RATE SENSOR
Drehratensensor

16

86.6

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1
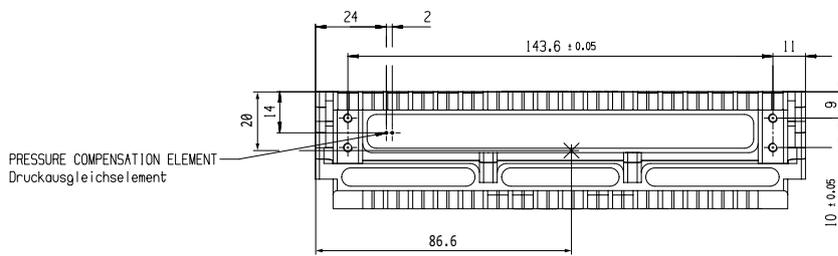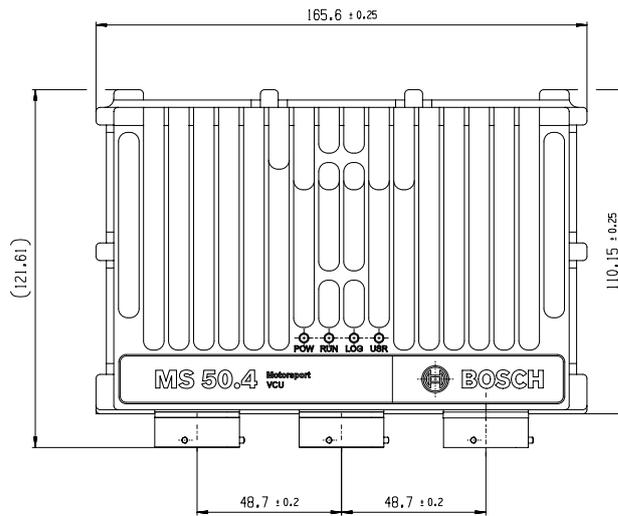
Vehicle Control Unit MS 50.4P incl. CCA

Features

▶ 866 MHz Dual Core Processor exclusively for vehicle control functionality (MATLAB based)

▶ Identical, dedicated 866 MHz Dual Core Processor exclusively for logging purposes

▶ High Speed Logging 200 kHz of 6 analog inputs (optional)

▶ Event logging, Configurable pre-event logging

The VCU MS 50.4P (Performance) is a highly powerful processing / logging unit for race applications.
Based on our broad base of platform function, we support you with customized VCU functions for a tailor-made solution.
In addition, you can quickly develop your individual customer software based on MATLAB/Simulink to significantly speed up algorithm development (automatic code and documentation generation) – including extensive simulation capabilities.

Application

Processor for customer code	866 MHz Dual Core
Processor for logger	866 MHz Dual Core
Configurable math channels	
User configurable CAN in/out messages	
Online data compression	

Internal logger
- 1,500 channels
- FULL_LOG_1 (4 GB memory on Recording 1) enabled
- PERF_LOG_1 (16 GB memory on Partition 1) optional
- FULL_LOG_2 (4 GB memory on Recording 2) enabled
- High Speed Logging Package (Sampling rate 5 µs) optional
- DATA_USB (Data copy to USB flash drive) enabled

Logging rates
- Usage of all features: 800 kB/s
- Primary logging use case: >1,500 kB/s
- Logging data download rate: up to 7.5 MB/s

LTE Ethernet telemetry support

RS232 interface for GPS

Customer Code Area CCA
Provides the option to run customer developed software code on Bosch device

Multi CCA
Enables the use of an extra core to utilize more computing power in the device for running a second customer model

Technical Specifications

Mechanical Data

Size	166 x 121 x 41 mm
Weight	≤ 660 g
Protection classification	IP67
3 motorsport connectors, 198 pins in total	
Max. vibration	Vibration profile 1 (see Downloads or www.bosch-motorsport.com)
Operating temperature internal	0 to 85°C
Operation outside the temperature limits can be tested on request during the manufacturing tests.	

Electrical Data

Supply voltage	5 to 18 V

Inputs

20 Analog channels 0 to 5 V, 0.5 % precision between 0.2 and 4.8 V, switchable pull-up

8 Digital PWM inputs f_max=30 kHz Hall-type speed measurement possible,
Switchable pullup 2.15 kOhm, (required for Hall), Tooth count differential*

4 Digital PWM inputs f_max=30 kHz Hall- and DF11 type speed measurement possible,
Fixed pullup 2.15 kOhm (required for Hall), Tooth count differential*

4 universal Thermocouple

1 Bosch Laptrigger

1 TimeSync master and slave (specific to Bosch measurement system)

Internal measurements:
1 x ambient pressure
1 x ECU temperature
20 x supply voltage
20 x supply current
1 x battery voltage (external VCU supply)
1 x external VCU supply current
4 x HS output current
1 x 3-axis acceleration plus roll/pitch/yaw rate

Outputs

2* x PWM High side; 7.5 A each, PWM, 50 Hz

4* x PWM Low side; 2.2 A each, PWM, 10 kHz

*can be enhanced by Upgrade I/O Package

Sensor Supplies and Screens

5* x 12 V, 400 mA each

5* x Switchable 5 V/12 V, 400 mA each

4 A max overall current on all 12 V
2 A max overall current on all 5 V

12 V ± 1 % precision on the pin
5 V ± 0.1 % precision on the pin

20 x Sensor ground

*can be enhanced by Upgrade I/O Package

Adaptation and Documentation

Function documentation	Automatically created during code generation
MatLab code generation	Support for customer own Mat-Lab function development

Software Tools (free download)

Data Analysis tool WinDarab 7	
System Configuration tool RaceCon	Logger configuration, calibration, and online measurement

Connectors

Connector LIFE (red) AS018-35PN	Mating connector AS618-35SN (not included)
Connector SENS-A (yellow) AS018-35PA	Mating connector AS618-35SA (not included)
Connector SENS-B (blue) AS018-35PB	Mating connector AS618-35SB (not included)

Communication

3 Ethernet 100 Mbit

4 CAN (+4 with Upgrade I/O Package)

1 LIN

1 USB

1 RS232 interface for GPS or Telemetry, switchable depending on SW version

1 Time sync synchronization Ethernet

Installation Notes

Maintenance Interval: 220 h or a maximum of two years

Please remember that the mating connectors and the programming interface MSA-Box II are not included and must be ordered separately.

Legal Restrictions

The sale of this product in Mexico is prohibited. Due to embargo restrictions, sale of this product in Russia, Belarus, Iran, Syria, and North Korea is prohibited.

Upgrades

I/O Package

Communication

4 CAN

Inputs

4 Analog channels
0 to 5 V,
0.5 % precision between 0.2 and 4.8 V, switchable pull-up

4 Digital PWM inputs
f_max=30 kHz
Hall-type speed measurement possible,
Fixed pullup 2.15 kOhm (required for Hall),
Tooth count differential**

4 LVDT, 5 pin configuration,
excitation frequency 1 to 20 kHz,
excitation voltage 0 to 5 V (rms)

Outputs

4 "TTL" Digital output, 10 kHz, PWM, 25 mA each

2 PWM High side; 7.5 A each, PWM, 50 Hz

4 PWM Low side; 2.2 A each, PWM, 10 kHz

Power Supplies

5 x12 V, 400 mA each

5 switchable 5 V/12 V, 400 mA each

** The tooth count differential between any two of the PWM inputs is available two measure e.g. shaft torsion.

PERF_LOG_1

Increase logging Partition 1 from 4 GB to 16 GB memory

High Speed Logging Package

6 ANA	0 to 5 V, 200 kHz logging rate

CCP/XCP_MASTER

Enables CCP/XCP master functionality to request data from foreign devices via CAN/CCP protocol, XCP over Ethernet (UDP) or XCP via CAN.
(ASAP2 file from ECU manufacturer required)

1

Vehicle Control Unit MS 50.4P incl. CCA
Order number **F02U.V03.014-01**

Rugged USB flash drive
Order number **F02U.V03.534-01**

Connector for USB flash drive on car loom side
Order number **F02U.002.996-01**

Adapter cable to PC USB-Port
Order number **F02U.V01.343-01**

Breakout Box BOB 66-pole
Connector code: blue
Order number **F02U.V02.295-01**

Breakout Box BOB 66-pole
Connector code: yellow
Order number **F02U.V02.298-01**

Software Options

I/0 Package
Order number **F02U.V02.777-01**

PERF_LOG_1
Order number **F02U.V03.054-01**

High Speed Logging Package
Order number **F02U.V02.779-01**

CCP/XCP_MASTER
Order number **F02U.V02.213-01**

Accessories

Opening tool for shellsize 18
Order number **F02U.V01.394-01**

Breakout Box BOB MS 7
Connector code: red
Order number **F02U.V02.293-01**

Dimensions

1

MS 50.4P Motorsport VCU — BOSCH

PRESSURE COMPENSATION ELEMENT
Druckausgleichselement

YAW RATE SENSOR
Drehratensensor

MOUNTING HOLES M3 x 4.5 (8x)

A-A
M 3

1