Engine Control Unit MS 7.8

- 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 Partition 1) enabled
- PERF_LOG_1 (16 GB memory on Partition 1) optional
- FULL_LOG_2 (4 GB memory on Partition 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°C
Max. Vibration	Vibration Profile 1

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

Generally blocked are direct and indirect business involving high risk destinations, including Russia, Belarus, Cuba, Iran, North Korea, Syria, Libya, Afghanistan, and certain non-governmental controlled Ukrainian regions. This list may change as geopolitics evolve.

Upgrades

CCA Hardware Upgrade per device

Enable Customer Code Area

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**

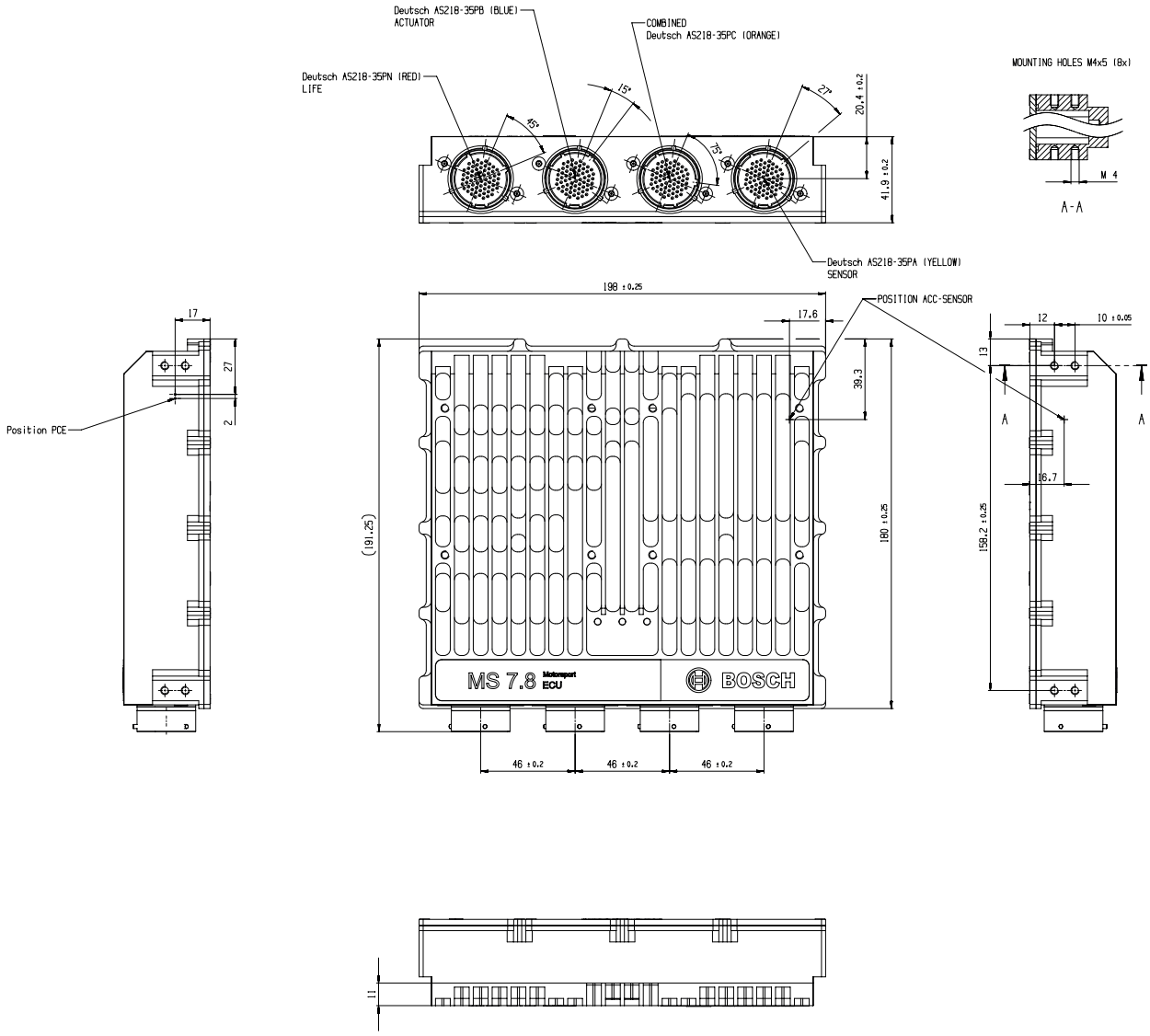
Breakout Box BOB 66-pole, Connector code orange
Order number **F02U.V02.296-01**

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**

Dimensions



See Offer Drawing for further information

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