BOSCH

Engine Control Unit MS 7.4

▶ Optimized for low and high pressure injection

▶ Data logger included

▶ Gearbox control optionally included

▶ Gigabit data interface

The MS 7.4 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 7.4 to support complex or unusual engine or chassis configurations.

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 injection types and pressure ranges)

HP package for flat and V-engines inclusive (2nd Bank, MSV2, 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 without freewheeling

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

VVT

Turbo control

Traction control

Launch control

LTE Ethernet telemetry support

Internal logger
- 4 GB memory on partition 1
- 16 GB memory on partition 1 (optional)
- 4 GB memory on partition 2
- Diagnostic channels
- Use of 4 GB USB data stick

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	1,610 g
Protection Classification	IP67
Temp. range (at internal sensors)	-20 to 85℃
Max. Vibration	Vibration Profile 1 (see Appendix or www.bosch-motorsport.com)

Electrical Data

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

Inputs

41 analog inputs

8 analog/digital inputs (shared)

10 digital inputs

　1 x digital switch for engine ON/OFF

21 internal measurements

　1 x ambient pressure

　1 x acceleration 3-axis

　3 x ECU temperature

　10 x ECU voltage (e.g. sensor supply)

　6 ECU current (e.g. sensor supply)

17 function related inputs

　8 x combustion chamber pressure input

　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

Sensor supplies and screens

4 x sensor supplies 5 V / 50 mA	
3 x sensor supplies 5 V / 400 mA	
1 sensor supply ubat, 250 mA	
9 x sensor grounds	
2 x sensor screens	

Outputs

42 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 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

　4 x 12 mA for control of Moog valves

15 freely configurable outputs

　1 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

　2 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

Communication

1 Ethernet 1 Gbit
2 Ethernet 100 Mbit
2 Realtime Ethernet
3 CAN
1 LIN
1 USB
1 RS232
1 Time sync synchronization Ethernet
2 Network screens

Installation Notes

Maintenance Interval: 220 h or a maximum of two years
Depending on your experiences with calibration of ECUs, we recommend calibration support from Bosch Motorsport.
Please remember that the mating connectors and the programming interface MSA-Box II are not included and must be ordered separately.

Booster extension (HPI5)
Application notes avl. for Bosch HDP5- and Hitachi Gen3 pumps.
Hitachi Gen1 notes on request. Additional booster connectable to
support 9 to 12 cylinders or to realize higher rpm

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

Hardware Upgrade for CCA per device

Enable Customer Code Area

PERF_LOG1

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

Cylinder pressure detection base package MS 7.x

Knock detection via cylinder pressure evaluation MS 7.x

Adapter cable to USB-port	F02U.V01.343-01
Rugged USB flash drive	F02U.V01.342-02

Connector for wiring harness	F02U.002.996-01
Programming interface cable	F02U.V02.327-01

Mating Connectors

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

Ordering Information

Engine Control Unit MS 7.4
Order number **F02U.V02.514-02**

Software Options

Hardware Upgrade for CCA 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 MS 7.x
Order number **F02U.V02.543-01**

**Knock detection via cylinder pressure evaluation
MS 7.x**
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.V02.293-01**