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. Our new 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 (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
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	2 partitions with 4 GB memory each, diagnostic channels, fastest sampling 1 kHz, digital filter respecting sampling theorem, use of 4 GB USB data stick

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°C
Max. Vibration	Vibration Profile 1 (see Appendix or www.bosch-motorsport.com)

Electrical Data

Power supply	6 to 18 V
CPU	Dual Core 1,000 MHz, FPGA

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

Inputs

Analog inputs	41
Combustion chamber pressure input	8
Selectable dig/ana inputs	8
Thermocouple	2 K-type
Lambda	2 LSU 4.9
Knock	4
Digital inputs	10
Digital switch Engine ON/OFF	1
Laptrigger input	1
Internal measurement	1 triax acceleration 1 ambient pressure 3 ECU temperature 10 ECU voltage (e.g. sensor supply) 6 ECU current (e.g. sensor supply)
Power supplies	4 sensor supplies 5 V, 50 mA 3 sensor supplies 5 V, 400 mA 1 sensor supply ubat, 250 mA 9 sensor grounds 2 sensor screens

Outputs

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
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)
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.
Ignition	Max. 12 cylinders and coils with integrated power stage, or max. 8 cylinders and coils without integrated power stage, 20 A
Further outputs	2 x 4 amp pwm lowside switch 2 x 3 amp pwm lowside switch for Lambda heater 6 x 3 amp pwm lowside switch 4 x 2.2 amp pwm lowside switch 2 x 1 amp pwm lowside switch low dump resistant 3 x 8.5 amp H-bridge (2 reserved for electronic throttle) 2 x high pressure pump with MSV control 4 x 12 mA for control of Moog valves
Outputs 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 7 Light
Data Application tool Modas Sport
System Configuration tool RaceCon

Environment (not included)

Programming interface cable	F 02U V02 327-01

Adapter cable to USB-port	F 02U V01 343-01
Rugged USB flash drive	F 02U V01 342-02
Connector for wiring harness	F 02U 002 996-01

Mating Connectors (not included)

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

Software Options (not included)

Gear Control Package I	Gear control Mega-Line functionality, has to be used with Mega-Line components (License model via Mega-Line) [included for base versions beginning with MS7A_BASE_0500 or comparable]
Gear Control Package II	Gear control Bosch Motorsport functionality
Gear Control Package III	Gear control coordination to external GCU systems [included for base versions beginning with MS7A_BASE_0400 or comparable]
Customer Code Area	Enable Customer Code Area
Combustion chamber pressure determination	On request
Knock detection and control based on combustion chamber pressure	On request

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.

Ordering Information

Engine Control Unit MS 7.4
Order number **F 02U V02 514-02**

Accessories

Breakout Box BOB 66-pole, Connector code blue
Order number **F 02U V02 295-01**

Breakout Box BOB 66-pole, Connector code orange
Order number **F 02U V02 296-01**

Breakout Box BOB 66-pole, Connector code yellow
Order number **F 02U V02 298-01**

Breakout Box BOB MS 7, Live-Connector code red
Order number **F 02U V02 293-01**

Software Options

Gear Control Package I
Order number **F 02U V02 263-01 (on request)**

Gear Control Package II
Order number **F 02U V02 264-01**

Gear Control Package III
Order number **F 02U V02 265-01 (on request)**

Customer Code Area
Order number **F 02U V02 137-01**

Cylinder pressure detection base package MS 7.x
Order number **F 02U V02 543-01**

Knock detection via cylinder pressure evaluation MS 7.x
Order number **F 02U V02 544-01**