

Engine Control Unit MS 7.4

www.bosch-motorsport.com



- ▶ Optimized for low and high pressure injection
- ▶ Data logger included
- ▶ Optional combustion chamber pressure determination
- ▶ 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)
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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
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Ignition	8 integrated power stages up to 20 A, alternatively up to 12 drivers for use with external power stages
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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	
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	
1 Realtime Ethernet SERCOS	
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
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Outputs signals	5 x MUX outputs for internal signals like flywheel, knock signals, cylinder pressure
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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
USB flash drive	F 02U V01 342-02
USB connector cable to flash drive	F 02U V01 343-01

Mating Connectors (not included)

Life (red)	AS-6-18-35SN
Actuator (blue)	AS-6-18-35SB
Combined (orange)	AS-6-18-35SC
Sensor (yellow)	AS 6-18-35SA

Software Options (not included)

Gear Control Package I	Gear control Mega-Line functionality, has to be used with Mega-Line components
Gear Control Package II	Gear control Bosch Motorsport functionality

Gear Control Package III	Gear control coordination to external GCU systems
Combustion chamber pressure determination	On request

Installation Notes

Inspection services	Recommended after 250 h or 2 years, internal battery to be replaced during service
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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 514-01**

Software Options

Gear Control Package I
Order number **F 02U V02 263-01**

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

Gear Control Package III
Order number **F 02U V02 265-01**

Combustion Chamber Pressure Determination
Order number **on request**

Ethernet Telemetry
Order number **F 02U V02 138-01**

Represented by:

Europe:
Bosch Engineering GmbH
Motorsport
Robert-Bosch-Allee 1
74232 Abstatt
Germany
Tel.: +49 7062 911 9101
Fax: +49 7062 911 79104
motorsport@bosch.com
www.bosch-motorsport.de

North America:
Bosch Engineering North America
Motorsport
38000 Hills Tech Drive
Farmington Hills, MI 48331-3417
United States of America
Tel.: +1 248 876 2977
Fax: +1 248 876 7373
motorsport@bosch.com
www.bosch-motorsport.com

Latin America:
Robert Bosch Ltda
Motorsport
Av Juscelino Kubitscheck de
Oliveira 11800
Zip code 81460-900
Curitiba - Parana
Brasilia
Tel.: +55 41 3341 2057
Fax: +55 41 3341 2779

Asia-Pacific:
Bosch Engineering Japan K.K.
Motorsport
18F Queen's Tower C, 2-3-5 Minato Mirai
Nishi-ku, Yokohama-shi
Kanagawa 220-6218
Japan
Tel.: +81 45 650 5610
Fax: +81 45 650 5611
www.bosch-motorsport.jp

Australia, New Zealand and South Africa:
Robert Bosch Pty. Ltd
Motorsport
1555 Centre Road
Clayton, Victoria, 3168
Australia
Tel.: +61 (3) 9541 3901
motor.sport@au.bosch.com