

Vehicle Control Unit MS 50.4



- ▶ 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 Partition 1) enabled
- PERF_LOG_1 (16 GB memory on Partition 1) optional
- FULL_LOG_2 (4 GB memory on Partition 2) enabled
- High Speed Logging Package (Sampling rate 5 μ s) 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°C

Electrical Data

Supply voltage	5 to 18 V
----------------	-----------

Inputs

20 x Analog 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 $\pm$ 1 % precision on the pin
 5 V $\pm$ 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

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)

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/O 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**

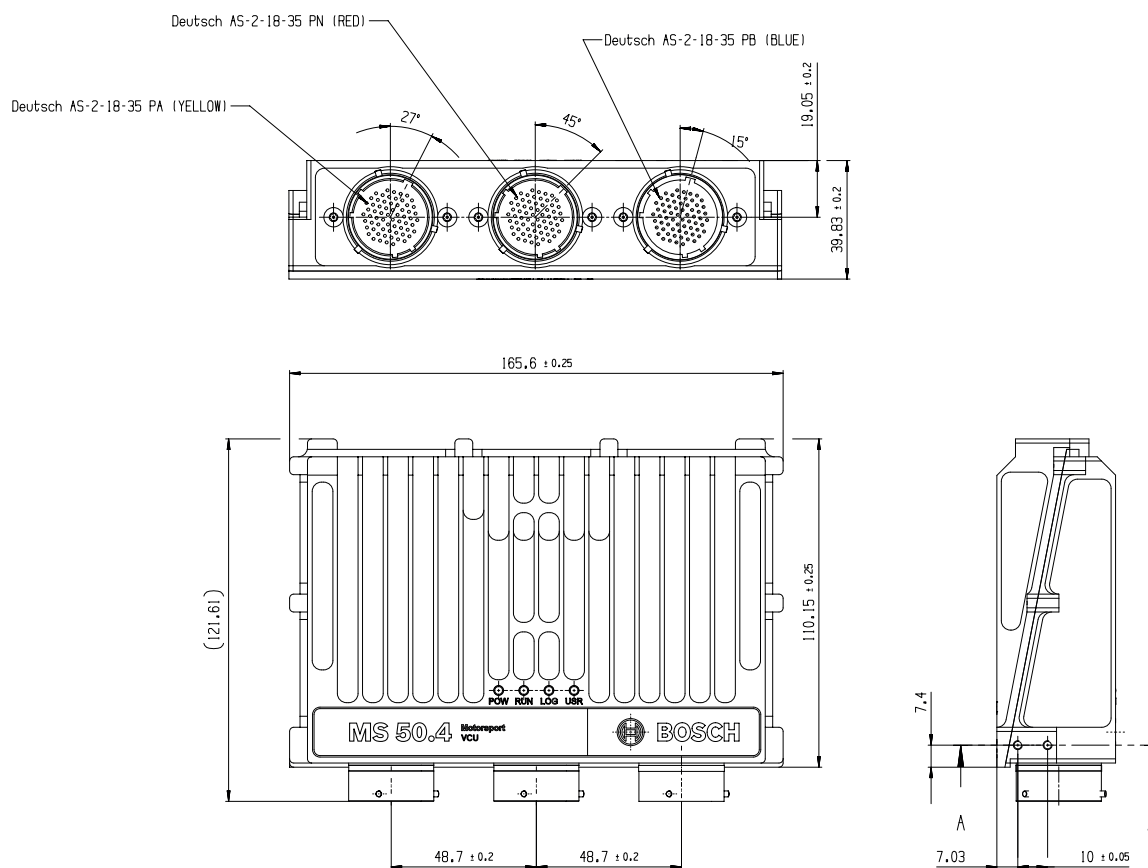
Accessories**Opening tool for shellsize 18**

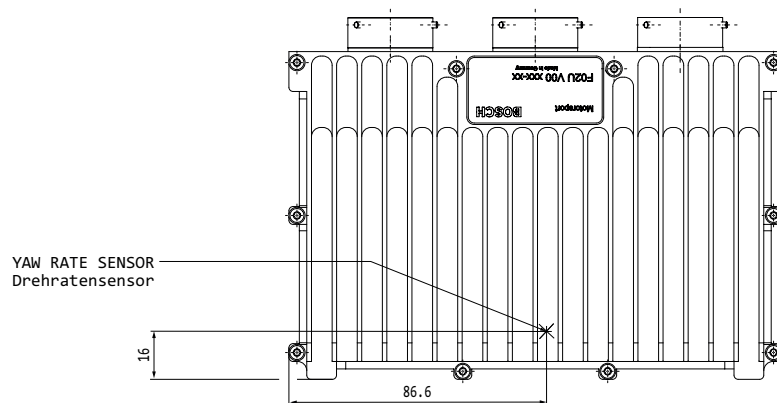
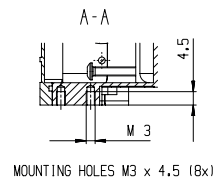
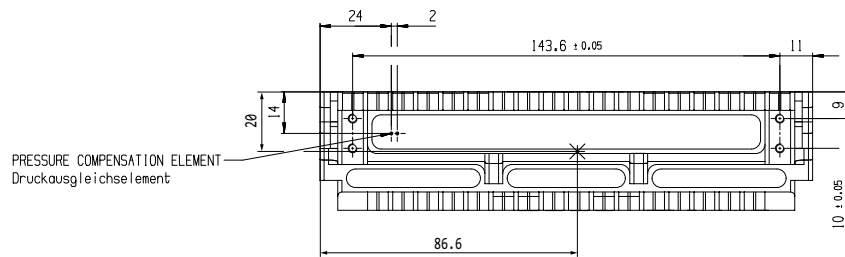
Order number **F02U.V01.394-01**

Breakout Box BOB MS 7

Connector code: red

Order number **F02U.V02.293-01**

Dimensions



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

Asia-Pacific:
Bosch Engineering Japan K.K.
Motorsports Department
1-9-32 Nakagawachuo, Tsuzuki-ku
Yokohama-shi
Kanagawa, 224-8601
Japan
Tel.: +81 45 605 3032
Fax: +81 45 605 3059
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