Vehicle Control Unit MS 50.4P incl. CCA HW Upgrade

▶ 866 MHz Dual Core Processor exclusively for vehicle control functionality (MATLAB based)

▶ Identical, dedicated 866 MHz Dual Core Processor exclusively for logging purposes

▶ High Speed Logging 200 kHz of 6 analog inputs (optional)

▶ Real time Ethernet SERCOS 3

▶ Event logging, Configurable pre-event logging

The VCU MS 50.4P (Performance) 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) – including extensive simulation capabilities.
The device offers real time Ethernet functionality to exchange e.g. data used in control algorithms between devices (guaranteed latency time 1 ms).

Copy data of partition 1 to USB data stick

LTE Ethernet telemetry support

RS232 interface for GPS

Customer Code Area CCA

Provides the option to run customer developed software code on Bosch device

Multi CCA

Enables the use of an extra core to utilize more computing power in the device for running a second customer model

Application

Processor for customer code	866 MHz Dual Core
Processor for logger	866 MHz Dual Core
Configurable math channels	
User configurable CAN in/out messages	
Online data compression	

Internal logger
- 1,500 channels
- 4 GB memory on partition 1
- 16 GB memory on partition 1 (optional)
- 4 GB memory on partition 2
- Fastest sampling 1 ms or 1 syncro
- Optional: Sampling rate high speed logger 5 µs
- Long-term recording
- Own data protection code

Logging rate
- Usage of all features: 800 kB/s
- Primary logging use case: >1,500 kB/s
- Logging data download rate: up to 7.5 MB/s

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 www.bosch-motorsport.com)
Operating temperature internal	0 to 85°C
Operation outside the temperature limits can be tested on request during the manufacturing tests.	

Electrical Data

Supply voltage	5 to 18 V

Inputs

20 Analog channels 0 to 5 V, 0.5 % precision between 0.2 and 4.8 V, switchable pull-up

8 Digital PWM inputs f_max=30 kHz Hall-type speed measurement possible,
Switchable pullup 2.15 kOhm, (required for Hall), Tooth count differential*

4 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 universal Thermocouple

1 Bosch Laptrigger

1 TimeSync master and slave (specific to Bosch measurement system)

Internal measurements:

1 ambient pressure
1 ECU temperature
20 supply voltage
20 supply current
1 battery voltage (external VCU supply)
1 external VCU supply current
4 HS output current
3-axis acceleration plus roll/pitch/yaw rate

Outputs

PWM High side	2*; 7.5 A each, PWM, 50 Hz
PWM Low side	4*; 2.2 A each, PWM, 10 kHz
*can be enhanced by Upgrade I/O Package	

Power Supplies

12 V, 400 mA each	5*
Switchable 5 V/12 V, 400 mA each	5*
Max overall current	4 A on all 12 V 2 A on all 5 V
Precision 12 V ± 1 % on the pin Precision 5 V ± 0.1 % on the pin	
Sensor ground	20
*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

2 Realtime Ethernet SERCOS3

4 CAN*

1 LIN

1 USB

1 RS232 interface for GPS

1 Time sync synchronization Ethernet

*can be enhanced by Upgrade I/O Package

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

The sale of this product in Mexico is prohibited.

Upgrades

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 x12 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 two measure e.g. shaft torsion.

PERF_LOG_1

Increase logging partition 1 from 4 GB to 16 GB memory

High Speed Logging Package

6 ANA	0 to 5 V, 200 kHz logging rate

CCP_MASTER

Enables CCP/XCP master functionality to request data from foreign devices via CAN/CCP protocol or XCP over Ethernet (UDP). (ASAP2 file from ECU manufacturer required)

Real Time Ethernet

Enables the VCU to operate as a real time Ethernet master or slave. Guaranteed latency time of 1 ms. Ideal for time critical data transfer as needed in online control algorithms involving data from different devices.
Two interfaces allow for a ring topology (redundancy in case the RTE line experiences damage).
The VCU features a reasonable set of SERCOS3 instructions although not the full SERCOS3 standard is implemented. The ECU side can act as a SERCOS3 master; the logger side can act as a SERCOS3 slave.

USB Accessories

Rugged USB flash drive

Mating connector for USB flash drive on car loom side

Adapter cable to PC USB-port

Ordering Information

Vehicle Control Unit MS 50.4P incl. CCA HW Upgrade

Order number **F02U.V03.014-01**

Software Options

I/0 Package
Order number **F02U.V02.777-01**

PERF_LOG_1
Order number **F02U.V03.054-01**

High Speed Logging Package
Order number **F02U.V02.779-01**

CCP_MASTER
Order number **F02U.V02.213-01**

Real Time Ethernet
Order number **F02U.V02.782-01**

Accessories

Rugged USB flash drive
Order number **F02U.V01.342-03**

Mating 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**

Opening tool for shellsize 18
Order number **F02U.V01.394-01**

Breakout Box BOB 66-pole
Connector code: blue
Order number **F02U.V02.295-01**
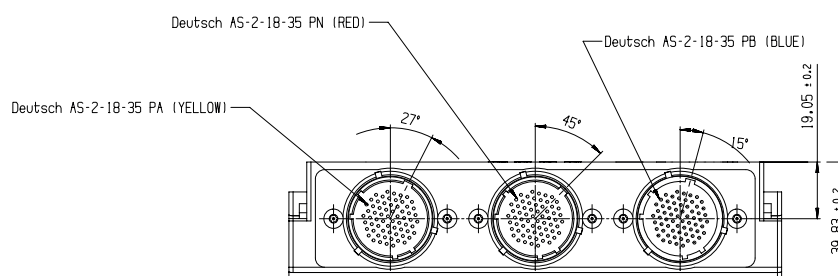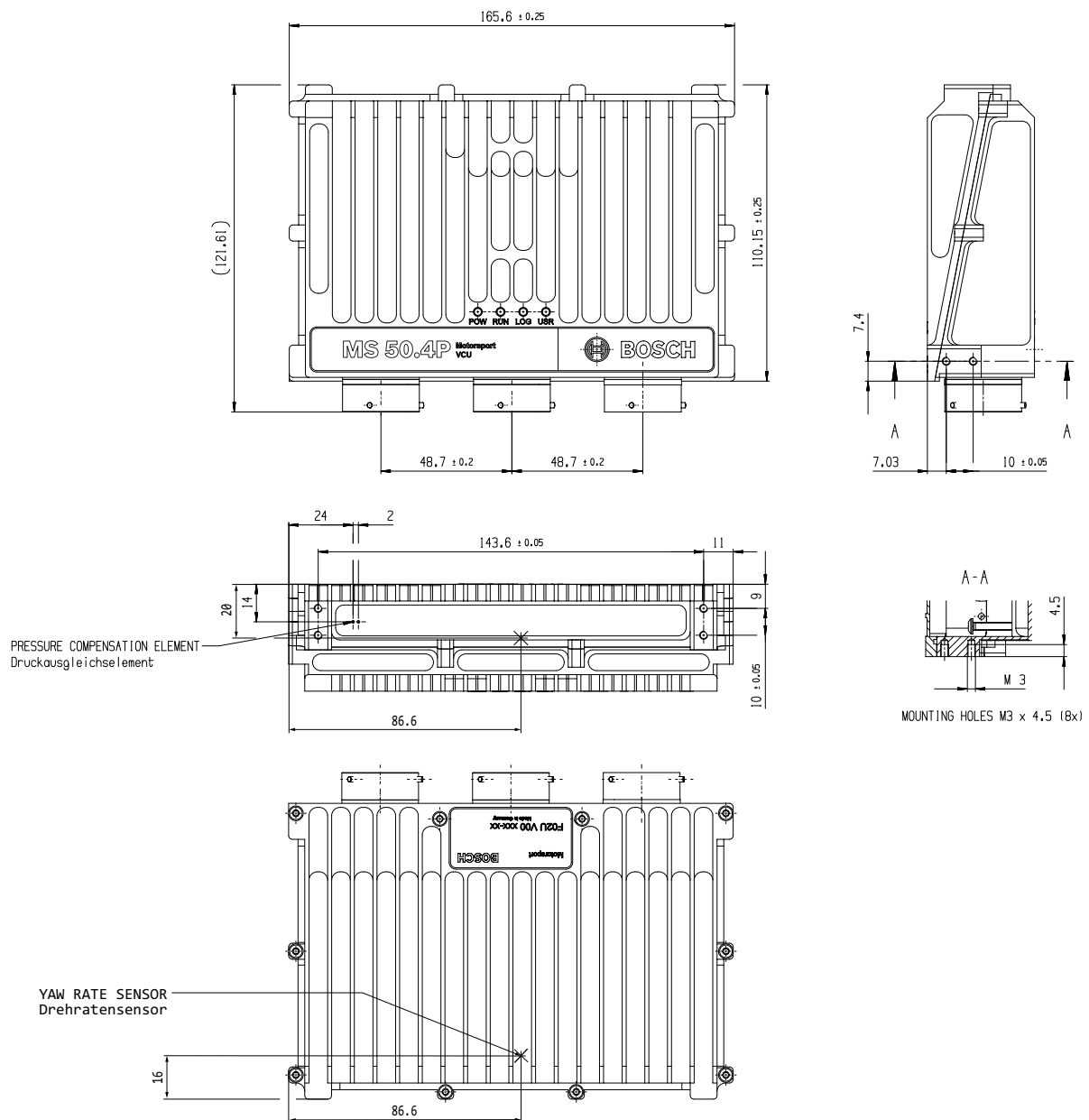
Breakout Box BOB 66-pole
Connector code: yellow
Order number **F02U.V02.298-01**

Breakout Box BOB MS 7
Connector code: red
Order number **F02U.V02.293-01**

Dimensions

Bosch Motorsport | Vehicle Control Unit MS 50.4P incl. CCA HW Upgrade

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PRESSURE COMPENSATION ELEMENT
Druckausgleichselement

MOUNTING HOLES M3 x 4.5 (8x)

YAW RATE SENSOR
Drehratensensor