

Vehicle Control Unit VCU

www.bosch-motorsport.com



- ▶ 667 MHz Dual Core Processor exclusively for customer code execution (MATLAB based)
- ▶ Identical, dedicated 667 MHz Dual Core Processor exclusively for logging purposes
- ▶ High Speed Logging 200 kHz of 6 analogue inputs (optional)
- ▶ Real time Ethernet SERCOS 3
- ▶ Event logging, Configurable pre-event logging

The Vehicle Control Unit (VCU) is a highly powerful processing unit for customer-developed functions integrating a flexible logging device with high speed logging capability of up to 200 kHz.

The processing cores feature floating-point arithmetic and a high-end FPGA for ultimate performance and flexibility. The customer software development process is based on MATLAB/Simulink to significantly speed up algorithm development (automatic code and documentation generation).

It offers real time Ethernet functionality to exchange e.g. data used in control algorithms between devices (guaranteed latency time 1 ms).

This device comes without software, all software is developed by the customer with the exception of drivers and low-level functions like pin setup, diagnostics, etc.

Functions

Processor for customer code	667 MHz Dual Core
Processor for logger	667 MHz Dual Core
Configurable math channels	
User configurable CAN in/out messages	
Sampling rate logger	1 ms

Optional: Sampling rate high speed logger	5 μ s
Online data compression	
Logging rate	Max. 500 kB/s
Internal storage capacity	6 GB
LTE Ethernet telemetry support	
RS232 interface for GPS	

Technical Specifications

Mechanical Data

Size	166 x 121 x 41 mm
Weight	\leq 660 g
Protection classification	IP67
Operating temperature internal	-20 to 80°C
3 motorsport connectors, 198 pins in total	
Max. vibration	Vibration profile 1 (see Appendix or www.bosch-motorsport.com)

Electrical Data

Supply voltage	5 to 18 V
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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 optional I/O Package, see below

Inputs

Analog channels 0 to 5 V, 0.5 % precision between 0.2 and 4.8 V, switchable pull-up	20
Digital PWM inputs f _{max} =30 kHz Hall-type speed measurement possible, Switchable pullup 2.15 kOhm, (required for Hall), Tooth count differential provided	8
Digital PWM inputs f _{max} =30 kHz Hall- and DF11 type speed measurement possible, Fix pullup 2.15 kOhm (required for Hall), Tooth count differential provided	4
Thermocouple	4 universal
Bosch Laptrigger	1
TimeSync master and slave (specific to Bosch measurement system)	1
Internal measurement	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

Outputs

PWM High side	2*; 7.5 A each, PWM, 50 Hz
PWM low side	4*; 2.2 A each, PWM, 10kHz

*: can be enhanced by optional I/O Package, see below

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 optional I/O Package, see below

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 Free	
System Configuration tool Race-Con	Configurable flywheel- and trigger disc geometries, calibration and online measurement

High Speed Logging Package (not included)

6 ANA	0 to 5 V, 200 kHz logging rate
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I/O Package (not included)**Communication**

4 CAN

Inputs

Analog channels 0 to 20 V, 0.5 % precision between 0.8 and 19.2 V, switchable pull-up	4
Digital PWM inputs f _{max} =30 kHz Hall-type speed measurement possible, Fix pullup 2.15 kOhm (required for Hall), Tooth count differential provided	4
LVDT	4

Outputs

Digital output	4 "TTL" out, 10 kHz, PWM, 250 mA each
PWM High side	2; 7.5 A each, PWM, 50 Hz
PWM low side	4; 2.2 A each, PWM, 10kHz

Power Supplies

12 V, 400 mA each	5
Switchable 5 V/12 V, 400 mA each	5

Ordering Information

Vehicle Control Unit VCU
Order number **on request**

Software Options

Upgrade High Speed Logging Package
Order number **F 02U V02 779-01**

Upgrade I/O Package
Order number **F 02U V02 777-01**

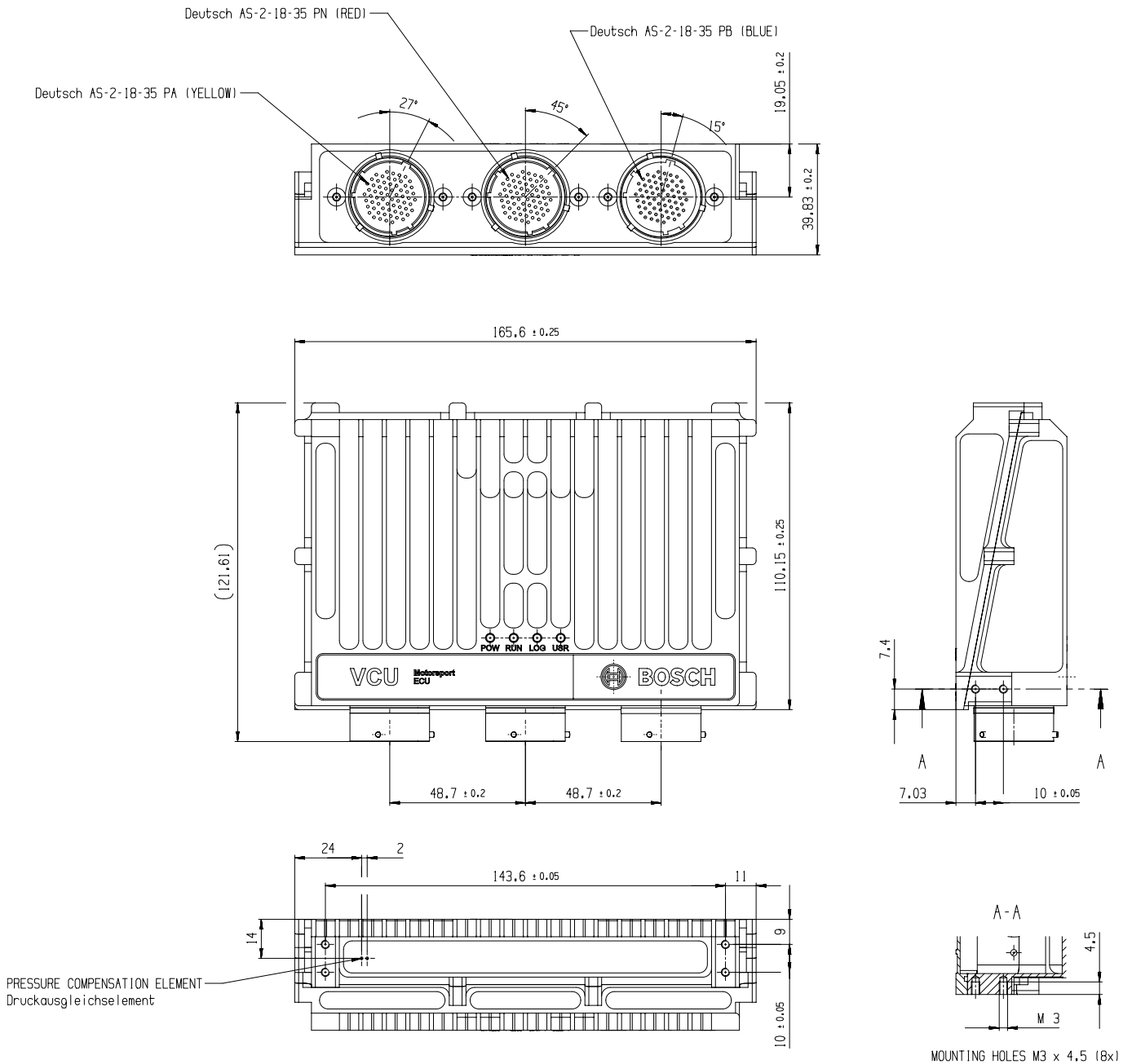
Upgrade Real Time Ethernet
Order number **F 02U V02 782-01**

Upgrade USB Stick
Order number **F 02U V02 214-01**

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

Upgrade CCP Master
Order number **F 02U V02 213-01**

Dimensions



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