Collision Avoidance System CAS-M 3 EVO

- Approaching vehicle tracking
- Left/right passing alerts
- Improves visibility of objects in rain, mist or darkness
- Full Bosch Motorsport tool integration

The Collision Avoidance System-Motorsport 3 EVO (CAS-M 3 EVO) features a high-performance Bosch Motorsport **Display Unit** for fast video processing (right in the picture), and a **Rear Module**, composed from a Bosch mid-range radar sensor for a wider field of view in close-up range and a fast response high definition camera (left in the picture).
The CAS-M 3 EVO system provides real time visualization and warns the driver about approaching or overtaking cars via intuitive marking of the cars on the display. It helps prevent the most common collisions and allows drivers to focus on the race. With a momentary glance, the driver can tell how many cars are following and their classification depending on distance and relative speed. The radar tracks up to 40 objects and marks up to four objects on the display. In addition, bright flashing LEDs alert the driver when any car attempts a passing maneuver. All of these features work at night or in the rain when visibility is typically poor. Furthermore, the real time gap of a marked object is measured and can be provided over CAN or Ethernet.
The CAS-M 3 EVO system is fully integrated in the Bosch Motorsport Tool environment and can be configured with RaceCon.

Application

Range	95 m
Horizontal field of view	
Radar	85° from 0 to 29 m
	70° from 29 to 46 m
	50° from 46 to 73 m
	42° from 73 to 78 m
	20° from 78 to 95 m
Camera	78°
Number of tracked objects	Max. 40
Number of displayed classified objects	Max. 4
Display format	7”
Display resolution	800 x 480 pixel
User configurable CAN in/out messages	
User configurable LEDs	

Technical Specifications

Mechanical Data

Display Unit	
Size	198 x 134 x 35 mm
Weight	830 g
Protection Classification	IP67
Operating temperature internal	-20 to 85°C
Max. vibration	Vibration profile 1 (see Downloads or www.bosch-motorsport.com)
Rear Module	
Size	120 x 150 x 115 mm
Weight	880 g
Protection classification	IP67
Operating temperature	0 to 70°C (rearview camera internal temperature*)
Max. vibration	Vibration profile 1 (See Downloads or www.bosch-motorsport.com)

*If the temperature limit is reached, forced air cooling of the camera is recommended.

Electrical Data

Supply voltage (Display and Rear Unit)	6 to 18 V
Current consumption	
Display Unit	2 A (at 12 V)
Rear Module	0.7 A (at 12 V)

Communication

Display Unit	
CAN	1x private CAN for radar, 1x CAN
Ethernet	1x private 1GBase-T Ethernet for camera, 1x 100Base-T Ethernet
Time sync synchronization Ethernet	1
Rear Module	
CAN	1x private CAN for radar
Ethernet	1x private 1GBase-T Ethernet for camera

Software Tools (free download)

Data analysis tool	WinDarab 7 Light
System configuration tool	RaceCon

Connectors and Wires

Display Unit	
Motorsport connector on device	AS212-35PN
Mating connector AS612-35SN	F02U.000.443-01
Rear Module	
Motorsport connector on device	AS212-35PN
Mating connector AS612-35SN	F02U.000.443-01

Pin Configuration

Display Unit		Rear Module for Vehicle Harness
Pin No.		Pin No.
1	GigEthernet_TR3_N (private Eth camera **PEC**)	14
2	GigEthernet_TR3_P (PEC)	1
3	GigEthernet_TR2_N (PEC)	2
4	GigEthernet_TR2_P (PEC)	3
5	GigEthernet_TR1_N (PEC)	4
6	GigEthernet_TR1_P (PEC)	5
7	GigEthernet_TR0_N (PEC)	6
8	GigEthernet_TR0_P (PEC)	7
9	Ethernet_TXP	n/a - Connect to Bosch System Ethernet BSE
10	Ethernet_RXP	n/a - Connect to BSE
11	Ethernet_RXN	n/a - Connect to BSE
12	CAN_High_Vehicle	n/a - Connect to Bosch System CAN
13	+12 V KL30	n/a - Connect to Vehicle System Power **VSP**
14	+12 V KL15	n/a - Connect to VSP
15	GND KL31	n/a - Connect to VSP
16	GND KL31	n/a - Connect to VSP
17	Time_Sync	n/a – Connect Display to Bosch Logging System Time Sync
18	ETH_Screen	n/a - Connect to BSE
19	Ethernet_TXN	n/a - Connect to BSE
20	CAN Low Vehicle	n/a - Connect to Bosch System CAN
21	CAN High Radar (private CAN radar **PCR**)	11
22	CAN Low Radar (PCR)	12

Rear Module		Display Unit for Vehicle Harness
1	GigEthernet_TR3_P (private Eth camera PEC)	2
2	GigEthernet_TR2_N (PEC)	3
3	GigEthernet_TR2_P (PEC)	4
4	GigEthernet_TR1_N (PEC)	5
5	GigEthernet_TR1_P (PEC)	6
6	GigEthernet_TR0_N (PEC	7
7	GigEthernet_TR0_P (PEC)	8
8	+12 V Ubat	n/a - Connect to VSP
9	+12 V Ubat	n/a - Connect to VSP
10	+12 V Ubat (opt. to display)	13 (opt. if KL30 not connected)
11	CAN High Radar (PCR)	21
12	CAN Low Radar (PCR)	22
13	n.c.	
14	GigEthernet_TR3_N (PEC)	1
15	GigEthernet Screen	
16	n.c.	
17	CAN Screen	n/c
18	GND	
19	+12 V Ubat (opt. to display)	13 (opt. if KL30 not connected)
20	GND	n/a - Connect to VSP
21	GND (opt. to display)	15 (opt. if KL31 not connected)

22	GND (opt. to display)	15 (opt. if KL31 not connected)

Communication

Display Unit	
CAN	1x private CAN for radar, 1x CAN
Ethernet	1x private 1GBase-T Ethernet for camera, 1x 100Base-T Ethernet
Time sync synchronization Ethernet	1
Rear Module	
CAN	1x private CAN for radar
Ethernet	1x private 1GBase-T Ethernet for camera

Installation Notes

The rear unit must be mounted 90° to the vehicles vertical and horizontal axis and within ± 200 mm of the vehicle lateral centerline.

Mounting distance of radar over ground: 300 to 1,000 mm

To achieve the expected performance from the radar sensor, it must have a clear and unobstructed view. There should be no material over the radar sensor and the sensor should be allowed a clear 180 degree field of view.

Consider the maximum vibration limits for the mounting position of the rear module. The system is approved referred to vibration profile 1, see Downloads or www.bosch-motorsport.com.

Check the radar sensor for travel inside the radar bracket. In this case, remove the radar sensor and check the locking pins at both sides of the sensor. Due to vibrations, these pins can be deformed. Exceeding travel of the sensor can damage the electric contacts.

The system needs yaw rate and vehicle speed information.

Cat 6 A standard for Gigabit Ethernet.

This product may contain open source software. Information about license terms and other obligations is given in the manual.

For the private CAN network between display and rear module, no termination resistor is needed in the wiring harness. There are pre-installed termination resistors in the radar sensor and the display.

Safety Notes

It is not permitted to use the system as mirror replacement.

Legal

The CAS-M 3 radar sensor is based on the Bosch Engineering MRRe14HBW radar sensor. The MRRe14HBW is frequency certified for the following countries:

Country
Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Iceland, Liechtenstein, Norway, Switzerland
USA
Canada
Japan
Australia
New Zealand
United Kingdom

If the MRRe14HBW and hence the CAS-M 3 radar sensor SCU is not operated within this context, it lies within the customer's responsibility to ensure compliance of the application with national regulations and standards, e.g., electromagnetic compatibility and radio spectrum matters.
Link to the up-to-date EU Declaration of Confirmity DoC:
http://eu-doc.bosch.com
(Please enter the model MRRe14HBW on which CAS-M sensors are based on to find the correct DoC in the database.)

Legal Restrictions

Due to embargo restrictions, sale of this product in Russia, Belarus, Iran, Syria, Libya, Afghanistan, and North Korea is prohibited.

Ordering Information

Collision Avoidance System CAS-M 3 EVO
Order number **F02U.V02.648-03**

Accessories

Display Unit
Order number **F02U.V02.660-03**

Rear Module
Consisting of parts (A) to (E)
Order number **F02U.V02.630-02**

Radar Bracket (A)
Order number **F037.D00.084-01**

Radar Unit (B)
Order number **F02U.V02.647-01**

Camera Unit (C)
Order number **F02U.V02.799-01**

Wiring Harness (D)
Order number **F02U.V02.802-01**

Interface Module (Housing and Electronics) (E)
Order number **F02U.V02.639-01**

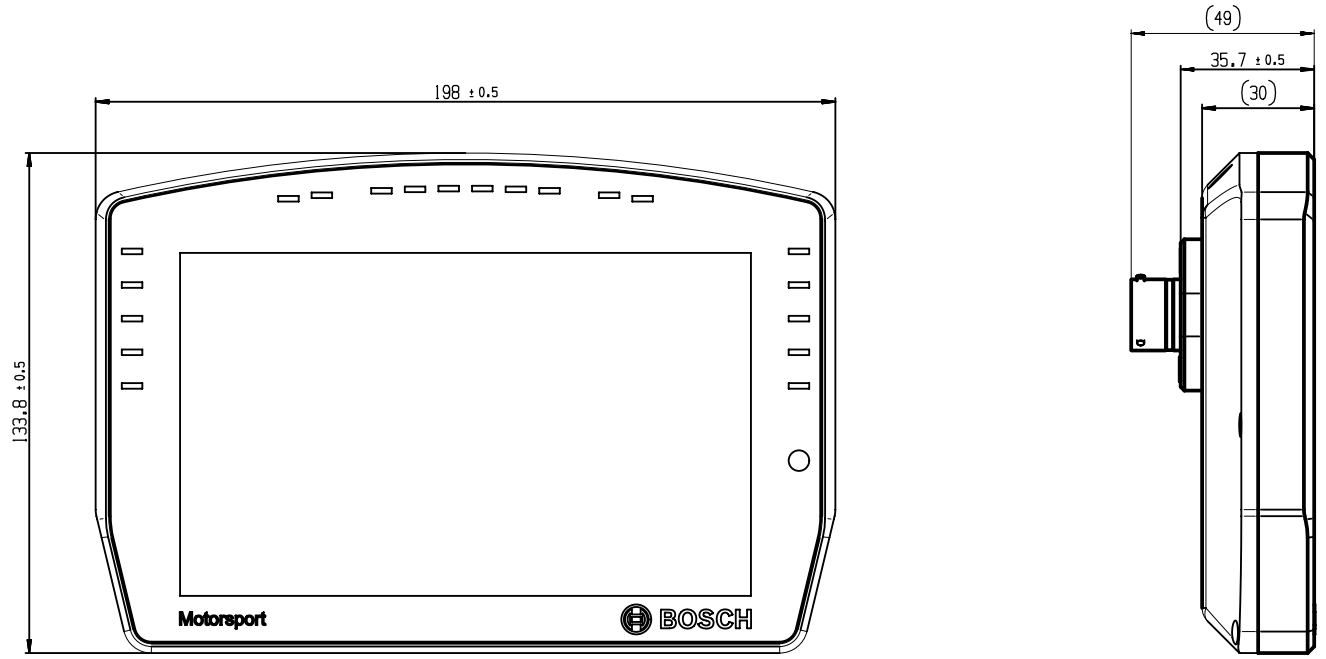
Inertial Measurement Unit MM7.10
Order number **F02U.V03.092-01**

Inertial Measurement Unit MM7.10
Wire with motorsport connector
Order number **F02U.V03.092-02**

Inertial Measurement Unit MM7.10
Wire with open end

Order number **F02U.V03.092-90**

Dimensions



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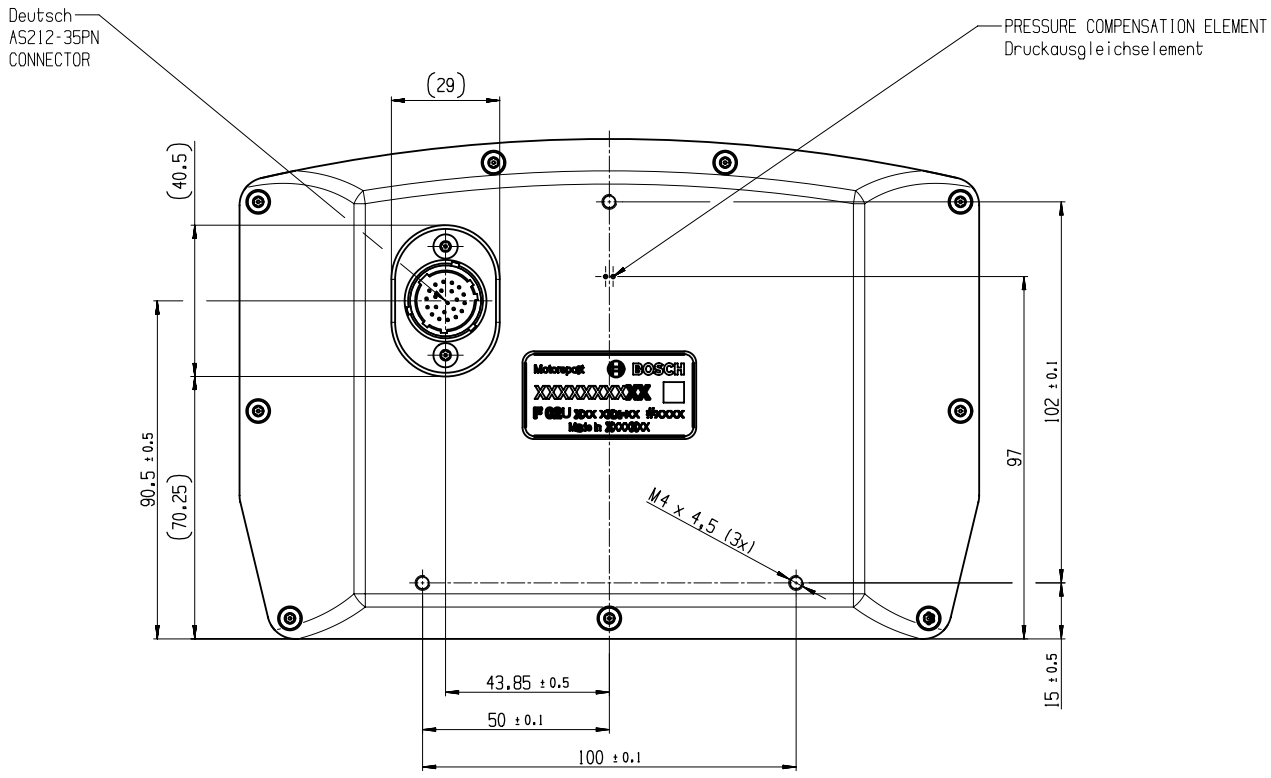
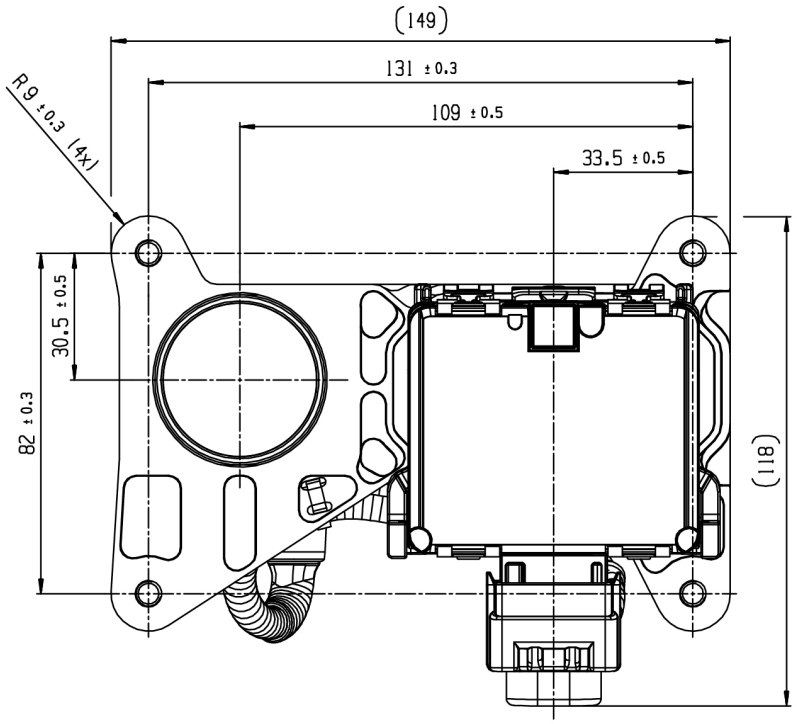
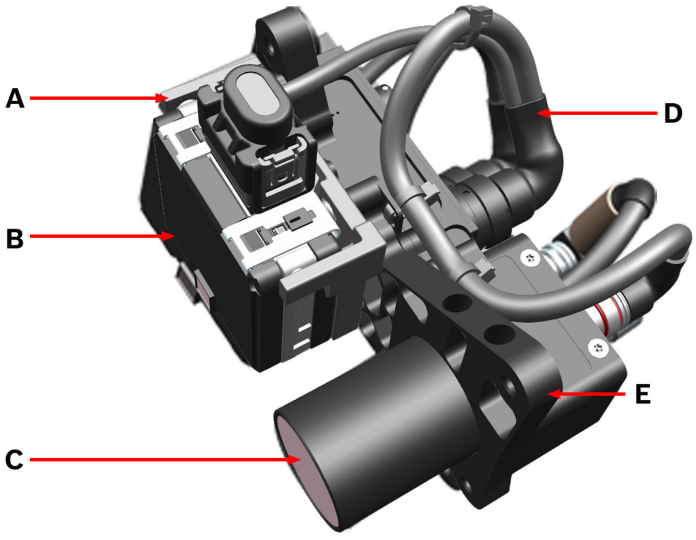


Display



Rear Module



A: Radar Bracket
B: Radar Sensor
C: Camera
D: Wiring Harness for Radar and Camera
E: Interface Module (Housing and Electronics)

Spare Parts of the Rear Module

Represented by:

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www.bosch-motorsport.de

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