Industriestraße 7 · 65366 Geisenheim · Germany
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Technical Data Sheet
OPUS A6 STANDARD Basic

17.01.2018
Errors and technical changes excepted

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1 Notes and Warnings

⚠ Attention!

This description is not a substitution for the concerned product's documentation. Please do read the documentation including the manuals carefully before dealing with this product. If the safety instructions in the documentation are not followed dangerous situation can occur that can result in damages, injuries and/or death by high voltage or wrong handling. In case you do not have the correct documentation you can order it by contacting ***dl-opus-info@topcon.com***. Only properly trained personnel with the correct qualification are allowed to handle the device.

⚠ Attention!

Do not open the housing to avoid danger to high voltages. Before touching the electric assemblies make sure that the electricity is switched off completely. If the front pane is broken the device needs to be taken out of service due to risk of injury. If perceivable damages on the device exist that can compromise the functionality, it must be taken out of service due to the danger of malfunctions. These particularly include damages to the LCD display, damages to the keyboard, damages that compromise the protection level and damages to the encoder knobs.

Please note:

All content is subject to change without notice. Errors and omissions excepted.

Mounting and Handling

1. Do not use the cable as a handle to carry the device.
2. Mounting in clean working environment only. Dust and oil can harm the electric contacts and compromise the functionality.
3. Do not mount the device under the use of violence because it can cause damage.
4. The device must be mounted by trained personnel only into especially designed and tested systems.
5. The device must not be opened or disassembled.
6. The device is to be cleaned with a moist fuzz free cotton cloth. If necessary a mild cleaning agent can be used. Do not use acid or abrasive cleaning agents.
7. The device is to be stored in a cool and dry environment and to be protected against sun shine.
8. If the environmental temperature is beneath 10°C the reaction time of the display increases.

2 General Information

Order Numbers

This documentation is valid for **OPUS A6** order numbers as follows:

	OPUSA6S**N**2CANB000	OPUSA6S**N**2CDSB000	OPUSA6S**N**2ISOB000
OPUS Projektor	•		
CoDeSys		•	
ISO-VT			•

The neutral (N) versions will substitute the portrait (P) and landscape (L) versions.

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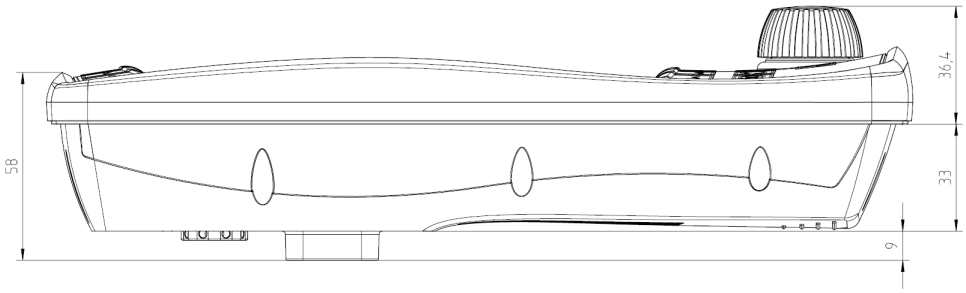
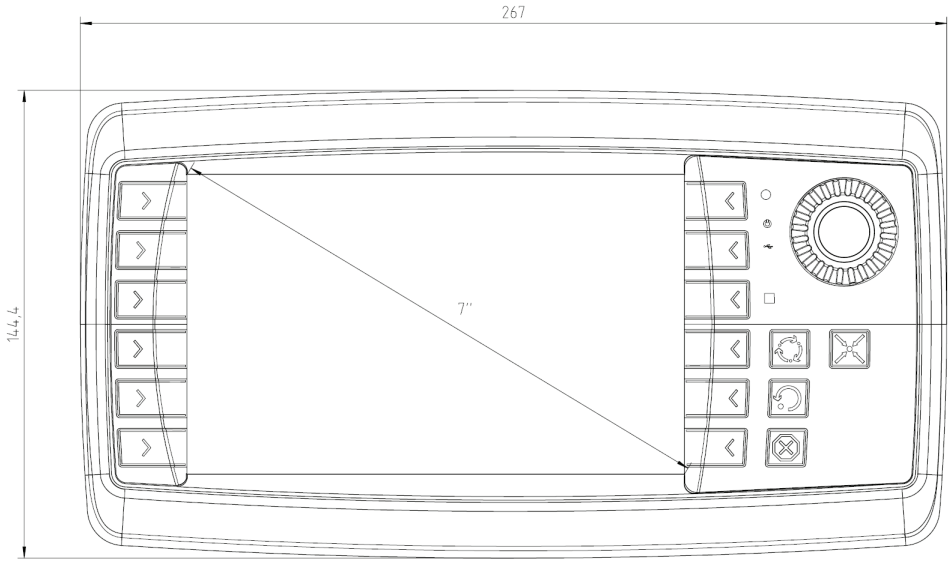
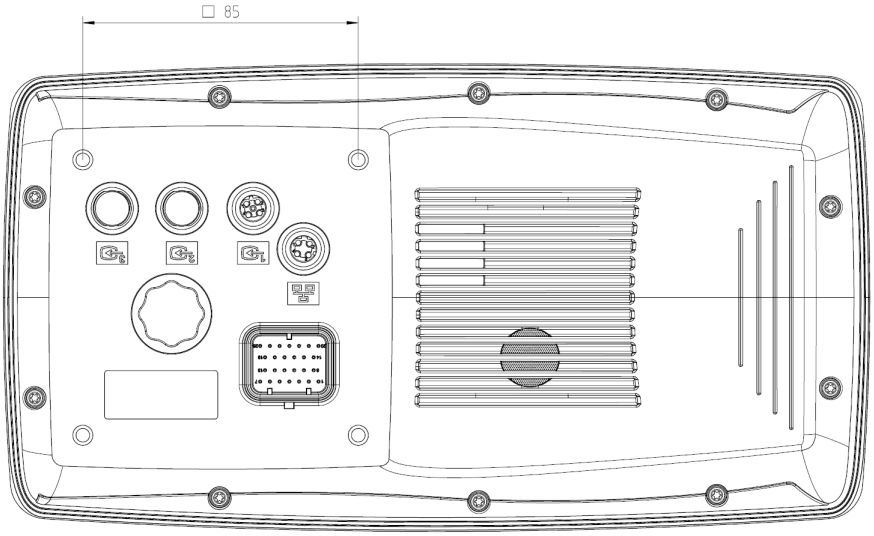
Dimensions







Housing

Front cover: PC/ABS, coloured light grey (RAL 7035) with black rubber frame.

Back cover: Aluminium die cast, coloured light grey (RAL 7035).

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Mounting

- Landscape or portrait
- Standalone
- In-dash

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3 Display

Type:	TFT Color Graphic LCD with LED backlight	Colors:	16,7 Mio
Size:	7", 152 mm (W) x 91 mm (H)	Brightness:	typ. 500 cd/m²
Resolution:	800 x 480 px (WVGA), 15:9	Contrast Ratio:	typ. 600:1

4 Input Devices

Left Keypad
- 6 keys with tactile feedback
- Multi color backlight
- Lifetime 1.000.000 actuations

Right Keypad
- 6+4 keys with tactile feedback
- Multi color backlight
- Lifetime 1.000.000 actuations

Indicators and Sensors
- Light sensor
- 1 Multicolor-LED
- 2 Status-LED's

Encoder
- Optical encoder with 16 mechanical detents and push function
- Lifetime: 1 million cycles

5 Electronics

Processor platform

CPU:	Freescale I.MX6® solo, 800 MHz
Mass storage:	2 GByte
RAM:	512 MByte
RTC:	Buffered by gold cap

Speaker
- 80 dB @ 1kHz in 1 m distance

Power supply

System supplied through terminal 30 (battery +, see pinout) and 31 (battery -, see pinout).
Terminal 15 (ignition) to be used to switch on/off.

Operating voltage range: 9 … 36 V DC

Short circuit protection.

Over-voltage protection up to 48V for 3 minutes.

Inverse polarity protection up to -48 V DC.

Current consumption (without external load), max.

Power Mode	Current at 13,5 V DC	Current at 27 V
On	≤ 1000 mA	≤ 600 mA
Low-power	Depending on config	
Sleep	≤ 100 mA	≤ 65 mA
Off	≤ 2 mA	≤ 2 mA

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6 Interfaces

CAN Bus

2 x CAN-Interfaces according to ISO 11898, CAN-specification 2.0 B active, up to 1 Mbit/s (default 250 Kbit/s, 500 Kbit/s, 750 Kbit/s and 1 Mbit/s)

RS232

1 x RS232-Interface
Type: EIA232 (only RxD, TxD, GND)
Speed: max. 115 Kbps

USB

Host 2.0
Main connector: 1 x High speed

Video-Interface

Inputs:	1x analog
V_{ss} :	1 V
Camera supply:	12 VDC
Max. current:	500 mA
Output:	1x camera control output (open drain) on each interface for special functionality (mirror, shutter, heating etc.), Ampacity: 300mA

Ethernet-Interface

1 x 10/100 Mbit/s Base T

Audio

1 Audio output (left, right, GND)

AC97 compatible

Output power: approx. 65 mW @ 32 Ohm

7 Connectors

Connectors

Main: Tyco-AMP 1437288-6

Mating connector (customer)
Tyco-AMP 3-1437290-7

Mating crimp contact (customer)
Tyco-AMP 3-1447221-4

Dummy Plug (customer)
Tyco AMP 4-1437284-3

Video: M12 round connector, female, 5-pole, B-coded, acc. to EN 61076-2-101

Recommended mating connector type according to IEC 61076-2-10: MM 005-G**x**1-B
x) A, C, I, P, R or S-type

Ethernet: M12 round connector, female, 4-pole, D-coded acc. to EN 61076-2-101

Recommended mating connector type according to IEC 61076-2-10: MM 004-Gx1-D
x) A, C, I, P, R or S-type

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8 Software

Operating System	Linux Kernel 3.0.0 or higher
Application Programming	• OPUS Projektor • Codesys-Tools (3.5) • ISO-VT • C/C++

9 Testing and Verification

CE-Compliance

EU Directive 2014/30/EU (EMC) according to

- *EN 12895*: Industrial Trucks – Electromagnetic compatibility
- *EN 13309*: Construction machinery – Electromagnetic compatibility of machines with internal electrical power supply
- *EN ISO 14982*: Agricultural and forestry machinery - Electromagnetic compatibility - Test methods and acceptance criteria

E1 - Type approval

EU Directive ECE R 10.4

Protection Level (IP Code)

IP 65 and IP 66 according to *ISO 20653*: Road Vehicles – Degrees of protection (IP-Code) – Protection of electrical equipment against foreign objects, water and access

Electrical

12 and *24V-Systems* according to *ISO 16750-2*: Road Vehicles – Environmental conditions and testing for electrical and electronic equipment – Electrical loads

- *ISO 15003*: Agricultural Engineering – Electrical and electronic equipment – Testing resistance to environmental conditions

Mechanical

- *ISO 16750-3*: Road Vehicles – Environmental conditions and testing for electrical and electronic equipment – Mechanical loads, Code L
- *ISO 15003*: Agricultural Engineering – Electrical and electronic equipment – Testing resistance to environmental conditions
  - Mechanical Shock: Level 2
  - Random Vibration: Level 2
  - Sinusoidal Vibration: Level 2

Climate

- *ISO 16750-4*: Road Vehicles – Environmental conditions and testing for electrical and electronic equipment – Climatic Loads
  - Operating Temperature Range: -30 … +65°C
  - Storage Temperature Range: -40 … +85°C
- *ISO 15003*: Agricultural Engineering – Electrical and electronic equipment – Testing resistance to environmental conditions

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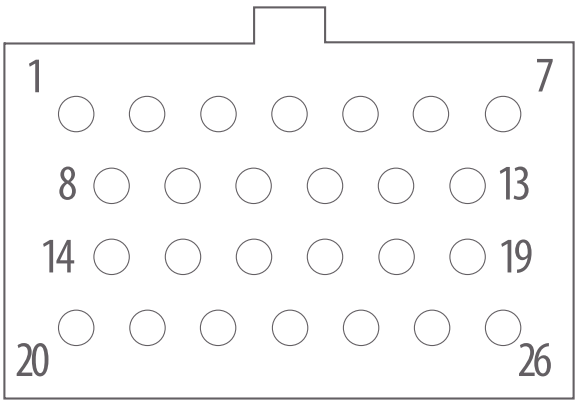
10 Pinout

Main connector pinout

Pin. No.	Assignment	Description
1	VCC	supply voltage +; terminal 30
2	Ignition Input	ignition input; terminal 15
3	GND	supply voltage - ;terminal 31
4	CarGND	Car GND
5	n. c.	Not connected
6	n. c.	Not connected
7	n. c.	Not connected
8	CAN1H	CAN 1 high
9	CAN1L	CAN 1 low
10	CAN2H	CAN 2 high
11	CAN2L	CAN 2 low
12	USB_VCC	USB +5V supply
13	USB_GND	USB supply GND
14	USB_D-	USB Data -
15	USB_D+	USB Data +
16	RS232 RxD	RS232 receive data
17	RS232 TxD	RS232 transmit data
18	RS232 GND	RS232 GND
19	n. c.	Not connected
20	n. c.	Not connected
21	n. c.	Not connected
22	n. c.	Not connected
23	SERV_EN	service enable
24	n. c.	Not connected
25	n. c.	Not connected
26	n. c.	Not connected

View on rear side of the A6



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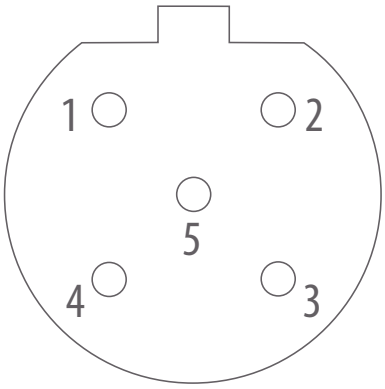
Video connector pinout

	Round Connector, 5 pins, M12
1	VidSig+
2	Mirror
3	Camera+
4	Camera -
5	VidSig GND

Ethernet connector pinout

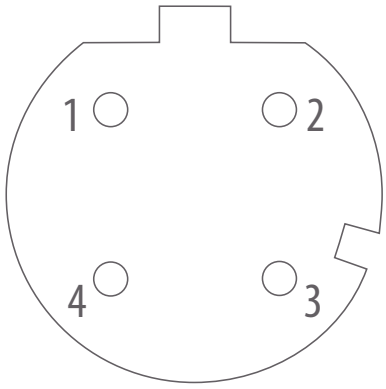
	Round Connector, 4 pins, M12, acc. To IEC 61076-2-101
1	TD+
2	RD+
3	TD-
4	RD-

Video connector, M12, female, 5 pins, b-coded,
view on rear side of the A6



Recommended mating connector type according to IEC 61076-2-10:
MM 005-G**x**1-B
x) A, C, I, P, R or S-type

Ethernet connector, M12, female, 4 pins, d-coded,
view on rear side of the A6



Recommended mating connector type according to IEC 61076-2-10:
MM 004-G**x**1-D
x) A, C, I, P, R or S-type

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11 Mounting accessories (not included)

Standalone mounting adaptor for RAM® mounting system (OPUSA6ZBAH001)

Material	PC+ABS
Dimensions	106x116x49 mm (WxHxD)
Operating Temperature	-30 … +75 °C
Storage Temperature	-40 … +85 °C
Max mounting torque	2.5 ± 0.2 Nm

Mounting kit (RAM® Mount 1,5", adapter cover) (OPUSBERM006)

1x RAM® - 101 U
1x Adapter for RAM® mounting system
4x Screw cover
7x Cylinder head bolt M5x12 DIN 912

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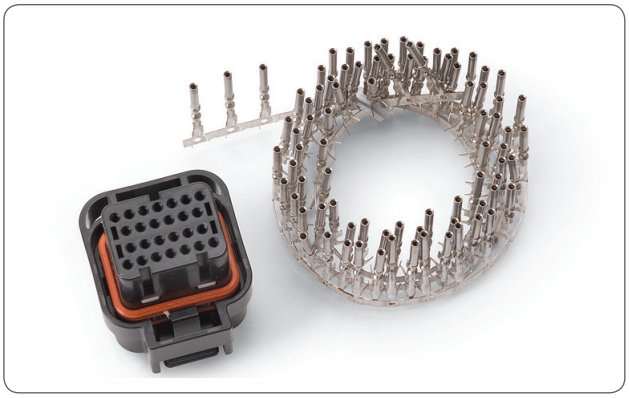
In-Dash mounting frame (OPUSA6ZBEB001)

Material	PC+ABS
Dimensions	270x147x46 mm (WxHxD)
Operating Temperature	-30 … +75 °C
Storage Temperature	-40 … +85 °C
Max mounting torque	2.5 ± 0.2 Nm

Delivery includes highlighted part only.
Please follow the instructions for in-dash mounting.

26 pin connector, contact pins, dummy plugs (OPSVF26001)