



## Technical Data Sheet

### OPUS A8 ECO Basic





## 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 **opus-support@topcon.com**. Only properly trained personnel with the correct qualification is allowed to handle the device.

### Attention!

Do not open the housing to avoid danger to high voltage. 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.
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 system.
5. The device may 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 may 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 sunshine.
8. If the environmental temperature is beneath 10°C the reaction time of the display increases.

## 2 General Information

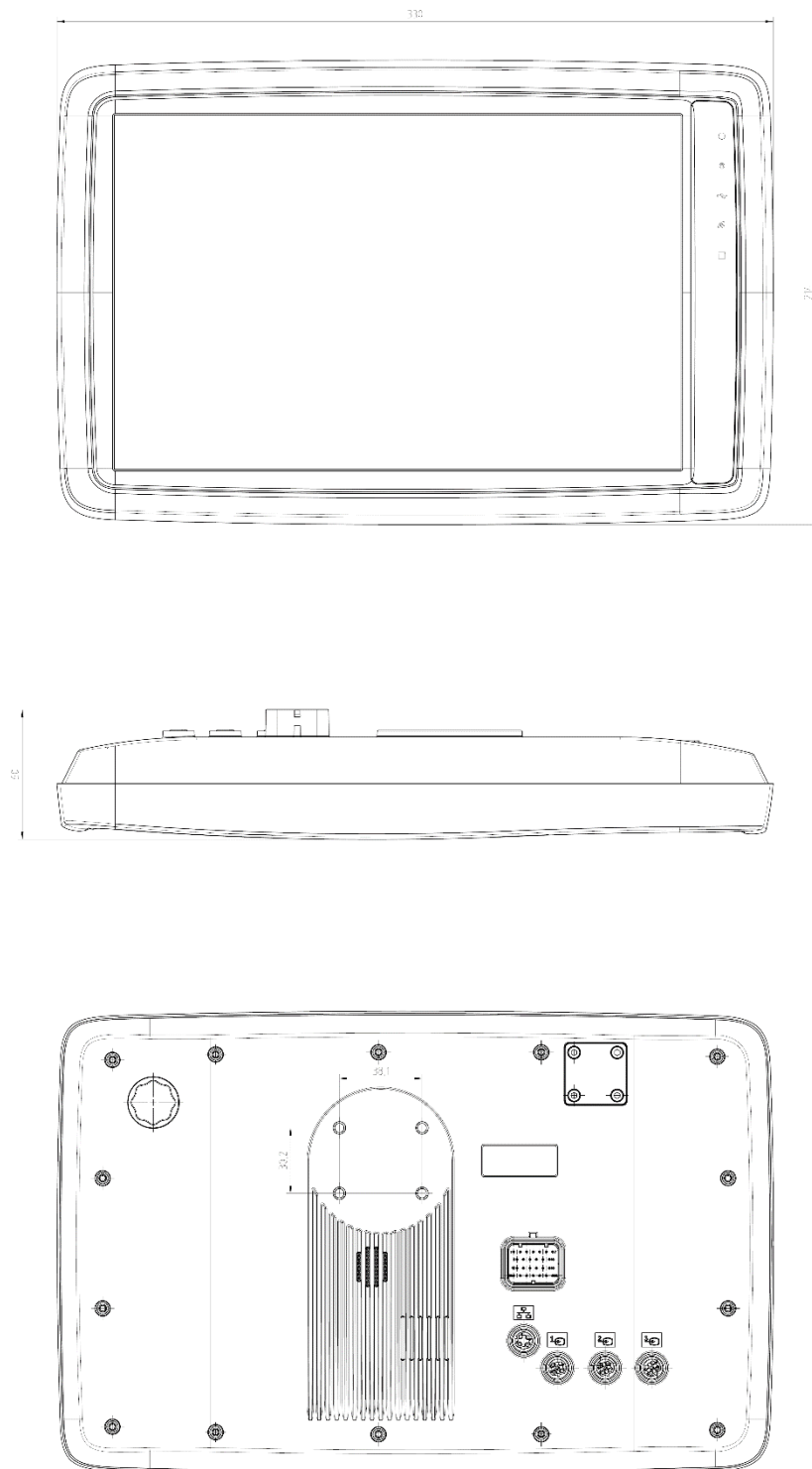
### Order numbers

This documentation is valid for OPUS A8 order numbers as follows:

OPUSA8EN1**CAN**B000   OPUSA8EN1**CDS**B000   OPUSA8EN1**CWV**B000

**OPUS Projektor**  
**CODESYS®**  
**CODESYS®**  
**mit WebVisu**





### Housing

Aluminum back-housing, plastic front-housing, colored light grey (RAL 7035) with black rubber frame

### Mounting

- Landscape or portrait
- Standalone
- In-dash



### 3 Display

Type:	TFT Color Graphic LCD with LED backlight	Colors:	16.7 Mio.
Size:	12.1", 261 mm (W) x 163 mm (H)	Brightness:	typ. 51000 cd/m <sup>2</sup>
Resolution:	1280 x 800 px (WXGA), 16:10	Contrast Ratio:	typ. 750:1

### 4 Input Devices

Touch PCT

Indicators and Sensors Light sensor  
1 Multicolor LED  
3 Status LEDs

### 5 Electronics

#### Processor platform

CPU: NXP I.MX6<sup>®</sup>solo, 800 MHz  
Mass storage: 4 GByte (minus space for OS & application)  
RAM: 512 MByte  
RTC: Buffered by gold cap

Buzzer 80 dB @ 1kHz in 1 m distance

Operating frequency range 840 Hz bis 6 kHz

#### 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 48 V for max. 2 min.  
Inverse polarity protection up to -48 V DC for max. 5 min.

Current consumption (without external load), max

Power Mode	Current at 13,5 V DC	Current At 27 V
On	≤ 1,6 A	≤ 0,7 A
Low-power	Depending on configuration	
Sleep	≤ 0,2 A	≤ 0,1 A
Off	≤ 2 mA	≤ 4 mA



## 6 Interfaces

### CAN Bus

2 x CAN-Interface 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, 1 Mbit/s)

### RS232

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

### USB 2.0

Main connector: 1 x Full speed OTG

### Inputs

2 configurable analog/digital inputs  
Input impedance: > 3 kOhm  
Resolution: 12 bit (1028 digits, 1 digit ~3 mV)  
Input range: 0 ... 12 V or 4-20 mA or 0-20 mA  
Max. protectable input voltage: 36 VDC  
Protection: Short circuit protection  
Frequency: Max. signal frequency 50 Hz  
Input 1 max. signal frequency 10 kHz

### Outputs

1 digital output  
Short circuit protection Up to 36 V  
 $I_{max}$  300 mA open drain at 12 V  
 $R_{DS, on}$  < 1 Ohm  
 $R_{DS, off}$  > 100 kOhm

### Video Interface

Inputs: 1 x analog  
 $V_{ss}$  1 V  
Camera supply: 12 VDC  
Max. current: 500 mA

### Ethernet Interface

1 x 10/100 Mbit/s Base T

## 7 Connectors

### Connectors

**Main** Typo-AMP 1437288-6  
Mating connector (customer)  
Typo-AMP 3-1437290-7  
Mating crimp contact (customer)  
Typo-AMP 3-1447221-4  
Dummy Plug (customer)  
Typo-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-Gx1-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



## 8 Software

Operating System      Linux Kernel 3.0.0 or higher

---

Application Programming      

- OPUS Projektor
- COESYS 3.x
- C/C++

## 9 Testing and Verification

### CE-Compliance

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

- *EN ISO 13766-1*: Earth-moving and building construction machinery – Electromagnetic compatibility (EMC) 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*

---

### 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

According to

- *ISO 16750-3*: Road Vehicles – Environmental condition 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

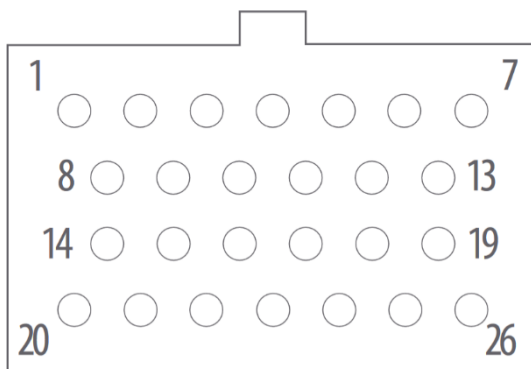


## 10 Pinout

### 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	grounding
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 ground
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 ground
19	n.c.	not connected
20	A/DI1	analog/digital input 1, full freq.
21	A/DI2	analog/digital input 2
22	n.c.	not connected
23	SERV_EN	service enable
24	n.c.	not connected
25	DO1	digital output 1
26	n.c.	not connected

View on rear side of the OPUS A8



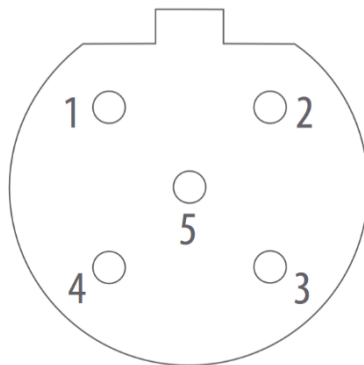
OPUS displays in the industrial sector are only intended to use with cable length less than 30 meters.



## Video connector pinout

Round connector, 5 pins, M12	
1	VidSig+
2	n.c.
3	Camera+
4	Camera-
5	VidSig GND

Video connector, M12, female, 5 pins, b-coded,  
View on rear side of the OPUS A3

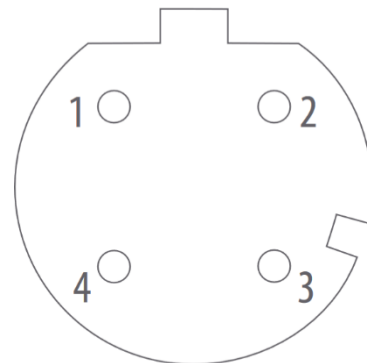


Recommended mating connector type according  
to IEC 61076-2-10:  
MM 005-Gx1-B  
x) A, C, I, P, R or S-type

## Ethernet connector pinout

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

Ethernet connector, M12, female, 4 pins, d-coded,  
view on rear side of the OPUS A3



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