

Technical Data Sheet OPUS A8 STANDARD Full



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.

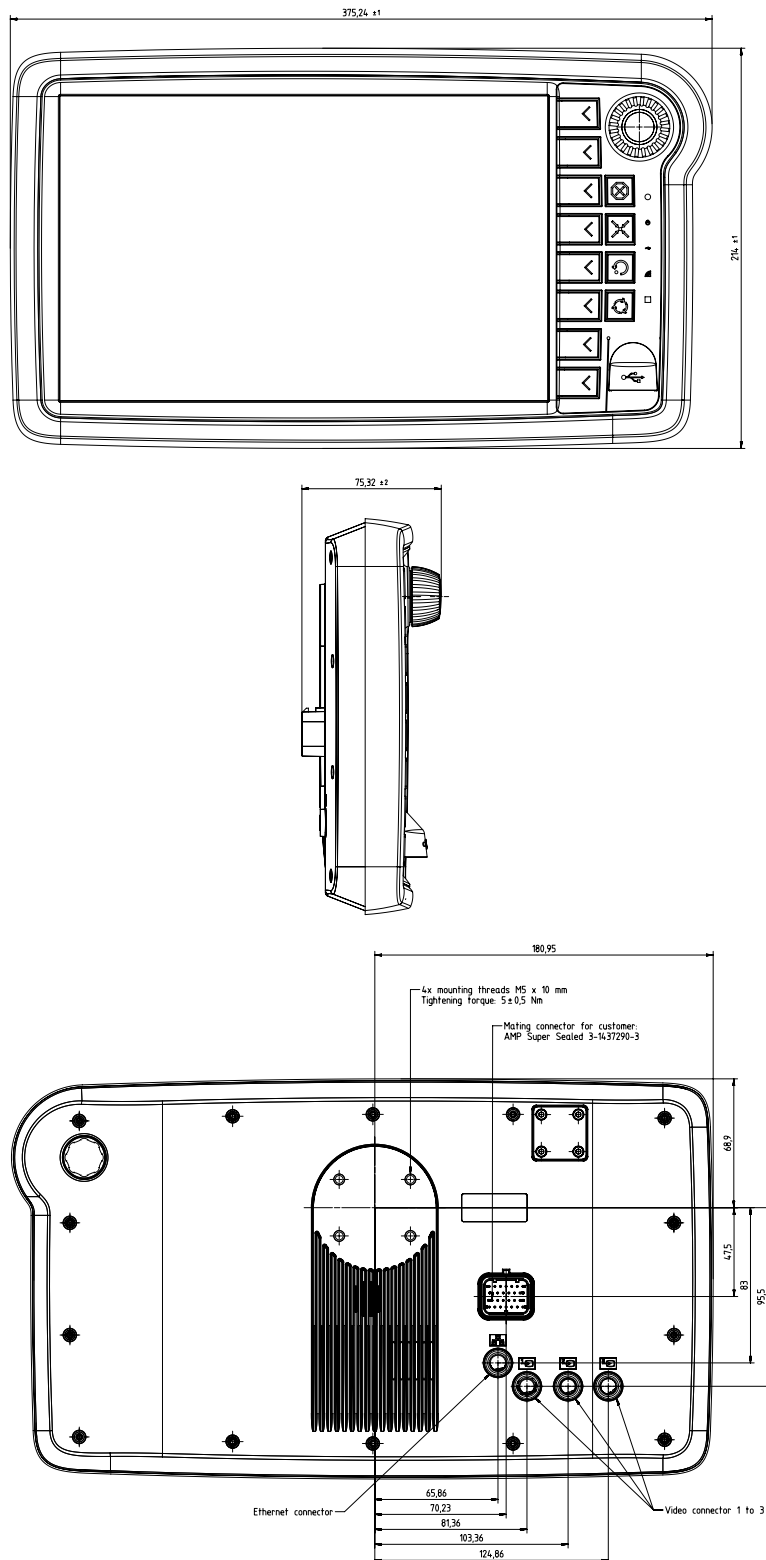
2 General Information

Order Numbers

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

| | OPUSA8SN1CANF000 | OPUSA8SN1CDSF000 | OPUSA8SN1UTXF000 |
|-----------------------|------------------|------------------|------------------|
| OPUS Projektor | • | | |
| CoDeSys | | • | |
| ISO-VT | | | • |

Dimensions



Housing

Aluminium 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. 1000 cd/m ² |
| Resolution: | 1280 x 800 px (WXGA), 16:10 | Contrast Ratio: | typ. 750:1 |

4 Input Devices

Touch PCT

Right Keypad

- 8+4 keys with tactile feedback
- Multicolor-LED backlight
- Lifetime 1.000.000 actuations

Indicators and Sensors

- Light sensor
- 1 Multicolor-LED
- 3 Status-LED's

Encoder

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

5 Electronics

Processor platform

CPU: NXP I.MX6®, quad core, 1 GHz
 Mass storage: min. 8 GByte
 RAM: 1 GByte
 RTC: Buffered by gold cap

Speaker • 80 dB(A) in 1m distance @ 1 kHz

Power supply

Operating voltage range: 9 ... 36 V DC
 Protection: Short circuit protection
 Overvoltage resistance: 48V for max. 5 minutes
 Inverse polarity protection: Up to -48 V DC for max. 5 minutes

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 config | |
| Sleep | ≤ 0,2 A | ≤ 0,1 A |
| Off | ≤ 2 mA | ≤ 4 mA |

6 Interfaces

CAN Bus

- 2 x CAN-Interfaces
- ISO 11898, CAN-specification 2.0 B active
- Up to 1 Mbit/s (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 2.0

Main connector: 1 x High speed
On front: 1 x USB slot High speed

Inputs

4 configurable analog/digital inputs
Input impedance: > 3k Ohm
Resolution: 12 bit (4096 digits,
1 digit ~ 3 mV)
Input range: 0 ... 12V or 4-20 mA or
0-20 mA
Max. protectable
input voltage: 36 VDC
Protection: Short circuit protection
Frequency: Max. signal frequency

50 Hz

Outputs

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

Audio

- 1 x Audio output (left, right, GND)
- Output power: approx. 65 mW @ 32 Ohm

Video-Interface

Inputs: 3 x analog (2 live steams)
 V_{ss} : 1 V
Camera supply: 12 VDC
Max. current: 500 mA
Output: 1x camera control output
(open drain) for special
functionality
(mirror, shutter, heating
etc.)
Ampacity 300 mA

Ethernet-Interface

1 x 10/100 Mbit/s Base T

7 Connectors

Connectors

Main: Tyco-AMP 3-1437290-7
Video: M12 round connector, female, 5-pole,
B-coded acc. to EN 61076-2-101
Ethernet: M12 round connector, female, 4-pole,
D-coded acc. to EN 61076-2-101

8 Software

Operating System Linux Kernel

Application Programming • OPUS Projektor
 • Codesys-Tools
 • ISO-VT
 • C/C++

9 Testing and Verification

CE-Compliance

EU Directive 2014/30/EC (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 R10

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 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

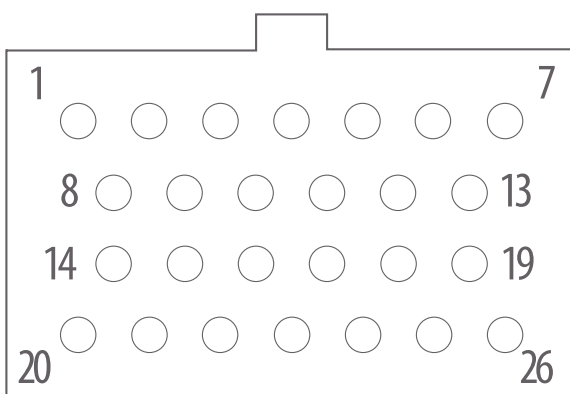
- *ISO 16750-4*: Road Vehicles – Environmental conditions and testing for electrical and electronic equipment – Climatic Loads
 - Operating Temperature Range: -30 ... +65°C
 - Storage Temperature Range: -40 ... +85°C
- *ISO 15003*: Agricultural Engineering – Electrical and electronic equipment – Testing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

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 | AUDIO_L | AUDIO_L |
| 6 | AUDIO_R | AUDIO_R |
| 7 | AUDIO_GND | AUDIO_GND |
| 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 | A/DI3 | analog/digital input 3 |
| 20 | A/DI1 | analog/digital input 1, full frequency |
| 21 | A/DI2 | analog/digital input 2 |
| 22 | A/DI4 or Wol | analog/digital input 4 |
| 23 | SERV_EN | service enable |
| 24 | DO3 | digital/analog output 3 |
| 25 | DO1 | digital output 1 |
| 26 | DO2 | digital output 2 |

View on rear side of the A8



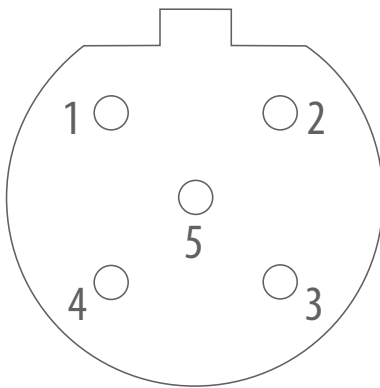
Video connector pinout

| 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 A8



Ethernet connector, M12, female, 4 pins, d-coded, view on rear side of the A8

