Technical Data Sheet
OPUS A3 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 dl-opus@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 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 A3 order numbers as follows:

<table>
<thead>
<tr>
<th>Wachendorff Projektor</th>
<th>CoDeSys</th>
<th>ISO-VT</th>
<th>Landscape</th>
<th>Portrait</th>
<th>Neutral with touch</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPUSA3EN1CANB000</td>
<td>✔</td>
<td></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>OPUSA3EN1CANT000</td>
<td>✔</td>
<td></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>OPUSA3EN1CDST000</td>
<td>✔</td>
<td></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

Older versions:

<table>
<thead>
<tr>
<th>Landscape</th>
<th>Landscape with touch</th>
<th>Portrait</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

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

Housing
Plastic housing, colored light grey (RAL 7035) with black rubber frame.

Mounting
- Landscape or portrait
- Standalone
- In-dash
3 Display

<table>
<thead>
<tr>
<th>Type:</th>
<th>TFT Color Graphic LCD with LED backlight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size:</td>
<td>4.3&quot;, 95 mm (W) x 53 mm (H)</td>
</tr>
<tr>
<td>Resolution:</td>
<td>480 x 272 px (WQVGA), 15:9</td>
</tr>
<tr>
<td>Colors:</td>
<td>16.7 Mio.</td>
</tr>
<tr>
<td>Brightness:</td>
<td>typ. 400 cd/m²</td>
</tr>
<tr>
<td>Contrast Ratio:</td>
<td>typ. 400:1</td>
</tr>
</tbody>
</table>

4 Input Devices

- **Indicators and Sensors**
  - Light sensor
  - 1 Multicolor-LED

- **Touch**
  - Analog resistive
  (OPUSA3EL1CANT000 and OPUSA3EL1CDST000 only)

5 Electronics

**Processor platform**

- **CPU**: Freescale I.MX35®, 532 MHz
- **Mass storage**: 512 MByte (approx. 450 MB for customer use)
- **RAM**: 128 MByte
- **RTC**: Buffered by battery

**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 max. 2 minutes.
- Inverse polarity protection up to -48 V DC for max. 5 minutes.

<table>
<thead>
<tr>
<th>Power Mode</th>
<th>Current at 13.5 V DC</th>
<th>Current at 27 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>On</td>
<td>430 mA</td>
<td>240 mA</td>
</tr>
<tr>
<td>Low-power</td>
<td>160 mA</td>
<td>90 mA</td>
</tr>
<tr>
<td>Sleep</td>
<td>90 mA</td>
<td>55 mA</td>
</tr>
<tr>
<td>Off</td>
<td>&lt; 3 mA</td>
<td>&lt; 3 mA</td>
</tr>
</tbody>
</table>
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 Full speed

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

8 Software

Operating System Linux, kernel 2.6.28

Application Programming
• Wachendorff
  Projektor Tool
• Optional:
  Codesys-Tools (3.5)
• Optional: ISO-VT
• Optional: C/C++
9 Testing and Verification

CE-Compliance

*EU Directive 2004/108/EC (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 6k5 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
## 10 Pinout

### Main connector pinout

<table>
<thead>
<tr>
<th>Pin. No.</th>
<th>Assignment</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VCC</td>
<td>supply voltage +; terminal 30</td>
</tr>
<tr>
<td>2</td>
<td>Ignition Input</td>
<td>ignition input; terminal 15</td>
</tr>
<tr>
<td>3</td>
<td>GND</td>
<td>supply voltage -; terminal 31</td>
</tr>
<tr>
<td>4</td>
<td>CarGND</td>
<td>Car ground</td>
</tr>
<tr>
<td>5</td>
<td>n. c.</td>
<td>Not connected</td>
</tr>
<tr>
<td>6</td>
<td>n. c.</td>
<td>Not connected</td>
</tr>
<tr>
<td>7</td>
<td>n. c.</td>
<td>Not connected</td>
</tr>
<tr>
<td>8</td>
<td>CAN1H</td>
<td>CAN 1 high</td>
</tr>
<tr>
<td>9</td>
<td>CAN1L</td>
<td>CAN 1 low</td>
</tr>
<tr>
<td>10</td>
<td>CAN2H</td>
<td>CAN 2 high</td>
</tr>
<tr>
<td>11</td>
<td>CAN2L</td>
<td>CAN 2 low</td>
</tr>
<tr>
<td>12</td>
<td>USB_VCC</td>
<td>USB +5V DC supply</td>
</tr>
<tr>
<td>13</td>
<td>USB_GND</td>
<td>USB supply ground</td>
</tr>
<tr>
<td>14</td>
<td>USB_D-</td>
<td>USB Data line -</td>
</tr>
<tr>
<td>15</td>
<td>USB_D+</td>
<td>USB Data line +</td>
</tr>
<tr>
<td>16</td>
<td>RS232_RxD</td>
<td>RS232 receive data</td>
</tr>
<tr>
<td>17</td>
<td>RS232_TxD</td>
<td>RS232 transmit data</td>
</tr>
<tr>
<td>18</td>
<td>RS232_GND</td>
<td>RS232 ground</td>
</tr>
<tr>
<td>19</td>
<td>n. c.</td>
<td>Not connected</td>
</tr>
<tr>
<td>20</td>
<td>n. c.</td>
<td>Not connected</td>
</tr>
<tr>
<td>21</td>
<td>n. c.</td>
<td>Not connected</td>
</tr>
<tr>
<td>22</td>
<td>n. c.</td>
<td>Not connected</td>
</tr>
<tr>
<td>23</td>
<td>SERV_EN</td>
<td>service enable</td>
</tr>
<tr>
<td>24</td>
<td>n. c.</td>
<td>Not connected</td>
</tr>
<tr>
<td>25</td>
<td>n. c.</td>
<td>Not connected</td>
</tr>
<tr>
<td>26</td>
<td>n. c.</td>
<td>Not connected</td>
</tr>
</tbody>
</table>

### View on rear side of the A3

```
1 2 3 4 5 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26
```
11 Mounting accessories (not included)

Standalone mounting adaptor for RAM® mounting system (OPUSA3ZBAH001)

- Material: PC+ABS
- Dimensions: 74x84x42 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) (OPUSBERM004)

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

In-Dash mounting frame (OPUSA3ZBEB002)

- Material: PC+ABS
- Dimensions: 144x101x35 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)