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**Notes on this handbook**
This device handbook contains information which is specific to the product and which is valid at the time of printing.
This equipment manual is only complete in conjunction with the product-related hardware and software user manuals required for the individual application.

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## Change log

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.8</td>
<td>24.06.2015</td>
<td>Draft</td>
</tr>
<tr>
<td>0.9</td>
<td>02.07.2015</td>
<td>Preliminary version</td>
</tr>
<tr>
<td>1.0</td>
<td>09.02.2016</td>
<td>First version</td>
</tr>
</tbody>
</table>

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1. General information

This user handbook is intended for use by qualified professionals and contains information on the assembly, installation, start-up and maintenance of the device.

1.1. Notes on the handbook

This user handbook is a component of the product and applies to the Ethernet Terminal ET2115.

It contains information on the following topics:

- Applications
- Safety
- Mechanical design
- Electrical design
- Connections
- Start-up
- Upkeep and maintenance
- Decommissioning
- Disposal

Always keep this user handbook available alongside the product.

1.2. Symbols and visual depictions

The following symbols and visual depictions will be used in this handbook:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>→ …</td>
<td>List entry</td>
</tr>
<tr>
<td>▶ …</td>
<td>Individual instruction or list of instructions which can be carried out in any order.</td>
</tr>
<tr>
<td>1. …</td>
<td>List of instructions which must be carried out in the order given.</td>
</tr>
<tr>
<td>2. …</td>
<td></td>
</tr>
<tr>
<td>☑</td>
<td>Additional product information</td>
</tr>
</tbody>
</table>
Design of warnings:

<table>
<thead>
<tr>
<th>WARNING</th>
<th>Danger type and source</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Short description and possible consequences</td>
</tr>
<tr>
<td></td>
<td>▶ Preventive measures</td>
</tr>
</tbody>
</table>

| Optional: additional symbols |

1.3. Hazard categories and indications

The following indications are used in the case of warning messages so as to ensure your personal safety and avoid any damage to property.

The indications have the following meanings:

<table>
<thead>
<tr>
<th>DANGER</th>
<th>Serious injury or death</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non-compliance with the safety features will result in death or serious injury.</td>
</tr>
<tr>
<td></td>
<td>▶ Take preventive measures.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WARNING</th>
<th>Possible serious injury or death</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non-compliance with the safety features may result in death or serious injury.</td>
</tr>
<tr>
<td></td>
<td>▶ Take preventive measures.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAUTION</th>
<th>Possible minor injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non-compliance with the safety features may result in minor injuries.</td>
</tr>
<tr>
<td></td>
<td>▶ Take preventive measures.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NOTE</th>
<th>Possible damage to property</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non-compliance with the safety features may result in damage to property.</td>
</tr>
<tr>
<td></td>
<td>▶ Take preventive measures.</td>
</tr>
</tbody>
</table>

Further information

1.4. Qualified personnel

The installation, start-up and maintenance of the device must be carried out by qualified personnel. For the purposes of this documentation and the safety instructions contained therein, “qualified personnel” means trained staff with the authorisation to assemble, install, start up, earth and identify devices, systems and electrical circuits in accordance with standards set in safety engineering and who are familiar with safety concepts in automation engineering.
1.5. **Duty of care**

The user or processor (OEM) must ensure the following:

- The device must only be used according to regulations.
- The device must only be used in good working order.
- The user handbook must always be kept legible and fully available.
- Only sufficiently qualified and authorised personnel may carry out the assembly, installation, start-up and maintenance of the device.
- This authorised personnel must receive regular training on all relevant occupational health and safety and environmental protection issues and must be fully familiar with the content of this user handbook, particularly the sections regarding safety features.
- Any markings or identification labels and safety and warning signs on the device must not be removed and must be kept legible at all times.
- The national and international regulations regarding the operating of machinery and facilities where the device is being used must be observed at all times.
- The user must always be kept abreast of any current relevant information regarding the device and its use or operation.

1.6. **Intended use**

The device is part of a modular automation system for industrial control applications within the medium to high performance range.

The automation system is designed for use within overvoltage category I (IEC 364-4-443) systems for controlling and regulating machinery and industrial processes in low-voltage installations in accordance with the following general parameters:

- Maximum rated supply voltage of 1,000 V AC (50/60 Hz) or 1,500 V DC
- For use in maximum category 2 pollution environment (EN 60950)
- For use up to a maximum altitude of 2,000 m above msn.
- For indoor use only in areas not exposed to direct UV radiation
- Max. ambient temperature inside and outside the control cabinet in accordance with the technical data (see “Technical data”)

Qualified project planning and design, proper transport, storage, installation, use and careful maintenance are essential to the flawless and safe operation of the automation system. The automation system may only be used within the scope of the data and applications specified in this documentation and associated user manuals.

The automation system must only be used:

- As intended
- In a technically perfect condition
- Without any unauthorised modifications
- By qualified users

- Observe the rules of the employer’s liability insurance association, the technical inspectorate, and the VDE (Association of German Electrical Engineers) or corresponding country regulations.
The device is intended for installation into a suitable cut-out on industrial machines and systems in indoor areas.

- When installing the device, check that the seal profiles are undamaged.
- For operation, refer to the applicable statement of ambient conditions (see “Technical data”).

1.7. Transport and storage

The device is susceptible to impacts, heavy vibration, moisture and extreme temperatures.

Transport and storage
- Protect the device against major mechanical stresses during transport.
- Always pack the device in its original packaging for transport.
- For storage, refer to the applicable statement of ambient conditions (see “Technical data”).
- Protect the device against condensation and damp.

Operation
- If the device has been stored or transported in cold weather or under conditions or large fluctuations in temperature, do not start to operate it until it has acclimatised to room temperature for the place it is used.
- If condensation is present, wait at least 12 hours before starting to operate the device.

1.8. Unpacking

Or receipt of the device, a check must be made that it is complete and undamaged.

1. Check the packaging for external damage.
2. If the packaging is seriously damaged or if damage to the contents is evident: Do not proceed further with opening the packaging, instead immediately inform the transport company and your supplier.
3. Remove the packaging and keep it safe for subsequent transport.
4. Check the contents for evidence of damage in transport.
5. Check the contents for completeness against the order documentation and keep all the delivery documentation for future reference. The delivery documentation contains important information about the device and is part of the product.
6. If you discover damage in transport or the contents do not match the order: Inform the supplier immediately.
2. Safety

Safety-related systems
The use of PLC in safety-related systems requires specific measures. Wherever a PLC is to be used in a safety-related system, the user must be given comprehensive advice by the PLC manufacturer in addition to information on any available standards or regulations regarding safety installations.

▶ Before starting any work on devices, switch off all power feeds, including to peripherals.
▶ Keep all ventilation holes unobstructed.

Failure in certain components in an electronic control system may result in uncontrolled and/or unpredictable operational behaviour.

▶ All types of failure must be considered at the system level and the associated preventative measures identified.
▶ If necessary, request information from your automation system provider.

2.1. Safety instructions

The device may be operated only when it is in good working order. Exposed sharp edges pose an injury risk.

▶ If you discover damage to the front glass of the device, do not continue to operate the device.
  Immediately disconnect it from the power supply.

Working on the device
Do not start work on the device until all necessary safety precautions have been taken. Take precautions to avoid unforeseeable functional events and movements of the system.

1. Bring the system into a safe condition.
2. Switch the system and the device off.
3. Secure the system against being switched on again.
4. Disconnect the device from the system.

The casing of the device must not be opened.

▶ If work on the internal parts of the device is necessary, contact the manufacturer (see “Addresses”).
3. Product description

The Ethernet Terminal ET2115 is an input device with a display for connection to a control system for machines or systems.

The control system automatically controls and regulates industrial processes in low-voltage systems in real time. The CODESYS 3.5 (IEC 61131-3) development environment from 3S-Smart Software Solutions is used for programming the device.

The Ethernet Terminal is specially configured for CODESYS visualisation and operation in machines and systems. The terminal shows the CODESYS Web visualisation or CODESYS Target visualisation, irrespective of whether the visualisation originates from a Berghof PLC control unit or some other CODESYS control unit.

The Ethernet Terminal ET2115 can be connected via Ethernet interfaces.

The device connection area for all external connections is located at the rear. The device is intended for installation in a pre-prepared installation cut-out on a flat panel.

All connections are of the plug-in type.
3.1. Overview

Fig. 1: Overview ET2115 (rear view)

<table>
<thead>
<tr>
<th>Item</th>
<th>Designation</th>
<th>Item</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Display 15.6 inch</td>
<td>X100</td>
<td>Power supply</td>
</tr>
<tr>
<td>2</td>
<td>Earth connection</td>
<td>S1</td>
<td>Function button (do not use this - it is for use only by Berghof Service Engineers)</td>
</tr>
<tr>
<td>X3</td>
<td>USB 2.0</td>
<td>LED</td>
<td>LEDs: PWR, Run/Stop, Error</td>
</tr>
<tr>
<td>X4</td>
<td>Ethernet (ETH0)</td>
<td>µSD</td>
<td>MicroSD card slot (for future applications)</td>
</tr>
<tr>
<td>X8</td>
<td>Debug interface (do not use this - it is for use only by Berghof Service Engineers)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3.2. Scope of delivery and accessories

Scope of delivery

→ Device
→ 2-pin plug connector for power supply
   Weidmüller BLZF 3.50/02/180F

Accessories

→ E-I/O plug, 2-pin, black (order no. 15743)

3.3. Product features

Installation

The device is designed for installation in a front panel or in a control panel in a rough industrial environment.

Processor

In its the basic configuration the device is equipped with an 800 MHz ARM® CPU with a Cortex™-A9 core.

Ethernet

The device has two 10/100 Mbit/s Ethernet interfaces.
The Ethernet interface is used for standard Ethernet connections. TCP/IP and UDP/IP protocols permit flexible connections to visualisation software, higher-level control units and to the IT infrastructure.

USB

The USB host interface allows a wide range of peripherals to be connected to the device. This allows a USB stick to be used for updating the application or for downloading data directly.

USB sticks with FAT/FAT32 formatting are supported.
If you require support for other USB formats, please contact our Technical Support.

Summary of features

→ ARM® CPU with Cortex™-A9 single-core (800 MHz)
→ 1 USB host interface (USB 2.0)
→ 1 Ethernet 10/100 Base T interface
→ 1 µSD card slot
4. Installation

4.1. Preparation for installation

The device is intended for installation from the front into a rectangular cut-out on a panel. The support material must be rigid and be from 1 to 4 mm thick.

![Dimensions diagram]

Fig. 2: Dimensions

Requirements:

- To allow sufficient air circulation, it must be ensured that the device has a clear space of at least 20 mm all round at the rear.
- The max. ambient temperature inside the control cabinet must not exceed 55 °C in operation.
- The support material for the installation cut-out must be flat, sufficiently stable, and be from 1 to 4 mm thick.

NOTE

Damage to the device!
Installation on uneven support material can lead to mechanical stresses and cracks in the front face or malfunctioning of the touch screen.

- Make sure that the mounting points of the device are all in a common plane, with no more than maximum ±0.5 mm variation.
Cut a rectangular installation cut-out in the support material:
Height: 260 mm
Width: 402 mm
Max. corner radius: 3.0 mm

Thickness of the support material:
Optimally: 2.0–3.0 mm
Max.: 4.0 mm
4.2. Installation

Fig. 4: Insertion into the installation cut-out

Requirements:

➔ The securing clips must not be attached to the device.

1. Making sure the alignment is correct, push the device evenly into the installation cut-out.

<table>
<thead>
<tr>
<th>NOTE</th>
</tr>
</thead>
</table>

**Damage to the device!**

If installation is performed carelessly the device can fall out of the installation cut-out or be damaged.

- Do not tilt the device.
- Restrain the device against falling until the securing clips have been secured.
2. Make sure the device lies flush all round.

![Inserting the securing clips (rear view)](image)

Fig. 5: Inserting the securing clips (rear view)

3. Secure the device with 2 securing clips: Insert the securing clips into the cover at diagonally opposite points and tighten the screws finger-tight.

![Tightening the securing clips](image)

Fig. 6: Tightening the securing clips

4. Insert the remaining 6 securing clips and tighten all 8 screws equally.
5. Connection

**WARNING**

Uncontrolled and unpredictable operational behaviour!
Failure of certain components in electronic control systems may result in uncontrolled and unpredictable operational behaviour.

- All types of failure and the associated protection systems must be taken into account at system level.
- Comply with all automation system manufacturer instructions.

5.1. Power supply

The device is powered by an external 24 V DC power supply. It is not designed to be connected to a DC mains supply.

- Before plugging in the device, ensure that the external power supply meets the required specifications (type K to 61131-2).

<table>
<thead>
<tr>
<th>External power supply (24 V DC)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Supply voltage</strong></td>
</tr>
<tr>
<td><strong>Ripple current proportion</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Power consumption</strong></td>
</tr>
</tbody>
</table>

**Internal power supply**

A power supply for the system electronics for an input voltage of 24 V DC (−15% / +20%) is integrated into the device. The power supply has integrated protection against reverse polarity and surge current protection (1.2 A).

**Installation**

- All connections and cables must be laid so as to prevent inductive and capacitive interference causing any damage to the device.
- Ensure that the infeed lines provide adequate current and voltage carrying capacity.
5.1.1. Connecting the power supply

**CAUTION**

**Live parts!**
- Before starting any work on the device, switch off all power feeds, including peripherals.

- Connect the power supply to plug X100 according to the following table.

---

**Fig. 7: Power supply plug X100**

### Power supply plug X100

<table>
<thead>
<tr>
<th>Pin</th>
<th>Designation</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>L0+ 24 V</td>
<td>Power supply 24 V DC (−15%/+20%), max. 0.6 A (peak current 1.2 A)</td>
</tr>
<tr>
<td>11</td>
<td>GND</td>
<td>M0 / GND</td>
</tr>
</tbody>
</table>

The following counterparts have been tested for the SC-SMT 3.5 (Weidmüller) plug-in connector and are approved for use with the device:

- BLZF 3.5/02/180 (F,LR,LH)SN
5.2. Data connections

5.2.1. Block circuit diagram

Fig. 8: Block circuit diagram
5.2.2. Ethernet

The on-board Ethernet adapter has one 10/100-Base-T RJ-45 port for connection to the network.

![Ethernet interface X4]

**Assignment of Ethernet interface plug X4**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Assignment</th>
<th>Pin</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TX+</td>
<td>5</td>
<td>NC</td>
</tr>
<tr>
<td>2</td>
<td>TX–</td>
<td>6</td>
<td>RX–</td>
</tr>
<tr>
<td>3</td>
<td>RX+</td>
<td>7</td>
<td>NC</td>
</tr>
<tr>
<td>4</td>
<td>NC</td>
<td>8</td>
<td>NC</td>
</tr>
</tbody>
</table>

**LEDs**

<table>
<thead>
<tr>
<th>LED</th>
<th>Colour</th>
<th>Meaning to IEEE 802.3 clause 25</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNK/RCV</td>
<td>yellow</td>
<td>Link, Data Receive&lt;br&gt;Flashing: connection active; data transfer in progress&lt;br&gt;Off: no connection established</td>
</tr>
<tr>
<td>SPEED</td>
<td>green</td>
<td>On = 100 Mbit/s&lt;br&gt;Off = 10 Mbit/s</td>
</tr>
</tbody>
</table>
5.2.3. USB

Devices with a USB interface can be connected to the USB host port (Rev. 2.0). Suitable USB device classes are:

- CODESYS user: only USB stick
- Linux level: USB stick or mouse

![USB Interface X3](image)

**Fig. 10: USB interface X3**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Assignment</th>
<th>Pin</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1</td>
<td>VCC</td>
<td>B3</td>
<td>D+</td>
</tr>
<tr>
<td>B2</td>
<td>D–</td>
<td>B4</td>
<td>GND</td>
</tr>
</tbody>
</table>

**NOTE**

Damage to USB stick and malfunction due to data loss!

Removing a USB stick while it is still in use and data are being transferred can render the USB stick unusable. Open files which cannot be accessed due to removal of the USB stick can block the device.

- Therefore ensure that all operations are complete before removing the USB stick.

**NOTE**

Damage to property and malfunctions due to data loss!

The USB interface is protected against overloading (> 0.5 A). In the event of a short circuit during operation, the control unit may trigger a reset of the system. Substantial property damage and damage to the USB device may ensue.

- Before using a USB device, check carefully its power requirements.

**NOTE**

Failures and malfunctions will occur if direct connections are made to signal earth!

- Use only USB devices that have no direct connection between signal earth and the housing.

The USB interface plug is designed to withstand 1,000 plugging and unplugging cycles.
6. Operation

6.1. Switching on and off

**NOTE**

**Damage or malfunction!**

- Do not insert, connect, undo or touch any connections whilst the device is in operation.
- Before starting any work on the device, switch off all power feeds, including those to any connected peripherals (sensors and programmable devices etc. with independent power supplies).

**NOTE**

**Damage to property!**

- Before connecting the power supply, ensure that all cabling and the polarity of all the connections are correct.

**Switching on**

The device does not have an on/off switch. The device starts automatically when the system is switched on or the power is connected.

**Switching off**

The device is switched off when the system is switched off or the power supply is disconnected.
6.2. Network start-up

The device must be connected to the network with the correct settings before it can be used.

NOTE

Damage to property!

Before connecting the power supply, ensure that all cabling and the polarity of all the connections are correct.

1. Supply the device with power (24 V).
   After the start the current network settings are displayed (server IP, IP address and network mask).

   ![Start page, with network settings](image)

   Fig. 11: Start page, with network settings

2. Press the "Configuration" button.
   A page with further information appears.

   ![Information page](image)

   Fig. 12: Information page
3. Press the “Next” button. 
   The page with the network settings of the device appears.

![Network settings of the device](image)

Fig. 13: Network settings of the device

4. If necessary, press the “Edit” button and change the network settings as required (IP address, network mask, gateway).

5. Press the “Next” button. 
   The page with the settings for the server IP and Lifeguard appears.

![Setting the server IP](image)

Fig. 14: Setting the server IP

6. If necessary, press the “Edit” button and change the server IP as required.
7. Press the “Expert” button to change the Lifeguard setting. The page with the Expert settings appears.
   – or –
   Press the “Next” button and skip to the following page.

Fig. 15: Changing the Lifeguard setting

8. Depending on the controller version, press the “Change” button to change the Lifeguard setting:
   CODESYS V2: “Berghof VNC LG”
   CODESYS V3: “Ping LG”

9. Press the “Next” button to skip the following pages with until the page with the summary of the network settings appears.

Fig. 16: Summary of the network settings

10. If no settings were changed, press “OK”.
    The main screen of the device will appear.
    – or –
    Press the “Save” button.
    The settings will be saved and the device automatically restarts itself.

11. Connect the device to the controller, using the network cable.

The device is now configured and ready for use.
6.3. Operation

6.3.1. Status displays

The status display function is dependent on the software development environment used in conjunction with the device.

The operating status LEDs show the current status of the power supply, the module mode and any error messages.

Location of the operating status LEDs

The Run/Stop and Error LEDs display the system status.

![LEDs diagram](image)

Fig. 17: Location of the operating status LEDs

<table>
<thead>
<tr>
<th>LED</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PWR (green) shows that the power supply to the electronics is correct.</td>
</tr>
<tr>
<td>2</td>
<td>Run/Stop (yellow/green/red) shows the system statuses.</td>
</tr>
<tr>
<td>3</td>
<td>Error (red) shows the device has been stopped due to an error.</td>
</tr>
</tbody>
</table>

Meaning of the LED displays

- System statuses are shown using flashing signals on the Run/Stop LED in yellow.
- While the Run/Stop light is flashing yellow: the device is in use and must not be switched off.
- The device does not show warnings via the LEDs during start-up.
6.3.2. Function key S1

Fig. 18: Function key (S1)

The function key S1 is for use only by Berghof Service staff.

6.3.3. microSD card

**WARNING**
Serious injury as a result of uncontrolled and unpredictable operational behaviour!
Inserting or removing the microSD card can result in the device malfunctioning. Failure in electronic control systems may result in uncontrolled and unpredictable operational behaviour.

- Insert or remove a microSD card only when the device is switched off.

**NOTE**
Loss of data!
microSD cards do not have their own write protection system.

- Ensure that no data is deleted or overwritten by accident.

The microSD card slot is for use only by Berghof Service staff.
6.4. Troubleshooting

6.4.1. No network connection

- Check the cabling / switch.
- Check whether an IP address has been duplicated.
- Check the network settings on the PC: The subnet and the subnet mask settings must be the same as those for the controller.
- Check the firewall / anti-virus programs on the PC.
- Check the Lifeguard settings.
7. Maintenance/upkeep

Repairs and corrective maintenance may only be carried out by the manufacturer or authorised customer service centres.

7.1. Maintenance

**WARNING**

Uncontrolled and unpredictable operational behaviour!

Failures or malfunctions may result in uncontrolled and unpredictable operational behaviour.

- Do not insert, connect, undo or touch any connections whilst the device is in operation.
- Before starting any work on the device, switch off all power feeds, including those to any connected peripherals (sensors and programmable devices etc. with independent power supplies).

If the device is used correctly it should not require maintenance.
- Make sure all the ventilation holes are kept free of obstructions.
- Do not open the device. If work is required on the device necessary contact customer service.
7.2. Cleaning

**NOTE**

Damage to the front panel!
The front panel must not be exposed to any mechanical or chemical stress.

- Do not use any high-pressure cleaners or steam jets.
- Do not use any corrosive cleaning products, any thinners, any abrasive media or any hard objects.
- Do not apply any undue force to the front face.

- To avoid faults due to inadvertent activation, switch the device off before cleaning the front panel.
- Clean the surfaces using only a dry, lint-free cloth.

7.3. Chemical resistance

7.3.1. Resistance of the touch screen

The active area of the touch screen is resistant to the following chemicals when exposed to them for a period of up to an hour at a temperature of max. 21°C:

**Domestic and industrial chemicals**

- Detergent
- All-purpose cleaners
- Washing-up liquid
- Glass cleaner
- Hydrogen peroxide (3 %)
- Lysol
- Ethanol
- Isopropanol
- Acetone
- Methyl ethyl ketone
- Toluene
- Concentrated hydrochloric acid
- Petroleum
- White spirit
- Petrol
- Engine oil
- Diesel
- Gear oil
- Brake fluid
- Anti-freeze
- Hydraulic oil
Condiments

- Lemon juice
- Tomato juice
- Mustard
- Tomato ketchup

7.3.2. Resistance of the front diaphragm

<table>
<thead>
<tr>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damage to the front diaphragm!</td>
</tr>
<tr>
<td>The front diaphragm is not resistant to the following chemicals and influences, and can be damaged by their effects:</td>
</tr>
<tr>
<td>Benzyl alcohol</td>
</tr>
<tr>
<td>Concentrated alkalis</td>
</tr>
<tr>
<td>Concentrated inorganic acids</td>
</tr>
<tr>
<td>Dichloromethane (methylene chloride)</td>
</tr>
<tr>
<td>High-pressure steam above 100 °C</td>
</tr>
<tr>
<td>long-term effects of direct sunlight</td>
</tr>
<tr>
<td>▶ Keep these substances away from the front diaphragm.</td>
</tr>
<tr>
<td>▶ Protect the display against direct sunlight.</td>
</tr>
</tbody>
</table>

The front diaphragm (Autoflex EB) is based on a polyester film with biaxial alignment. It is highly resistant to solvents.

In accordance with the standard DIN 42 115 part 2, the front diaphragm is resistant to the following chemicals, without any evident change or damage:

**Application of more than 24 hours**

- 1,1,1 trichloro ethane
- Aliphatic hydrocarbons
- Benzene
- Cyclohexanol
- Diethyl ether
- Ethanol
- Acetaldehyde
- Acetone
- Acetic acid < 50 %
- Sulphuric acid 30 %
- Diacetone alcohol
- 1,4 dioxane
- DS2 decontamination fluid
- Fabric conditioner
- Acetonitrile
- Alkali carbonate
- Ammonia < 32 %
- Sal ammoniac < 10 %
- Bichromate
- Caustic potash (potassium hydroxide) < 2 %
- Sodium hydroxide 50 %
- Refrigerant (Hysol X)
- Diesel oil
- Castor oil
- Silver nitrate 20 %

- Ethyl acetate
- Acetaldehyde
- Fluorochlorinated hydrocarbons
- Glycerine
- Isopropanol
- Methanol

- Ferric chloride < 30 %
- Formic acid (methane acid) < 50 %
- Hydrochloric acid < 10 %
- Hydrogen peroxide < 25 %
- Isophorone
- Methyl ethyl ketone (butanone)
- Nitric acid < 10 %
- Tetrahydrofuran
- Formaldehyde (37 %) in water

- Linseed oil
- Paraffin oil
- Petrol
- Silicone oil
- Turpentine substitute
- Universal brake fluid (e.g. Castrol Girling)
- Dibasic ester 6
- Skydrol 500B4
- Lixtop
- Potassium ferrocyanide

- Tetrachloroethylene (perchloroethylene)
- Toluene
- Triacetin
- Trichloroethylene
- Xylene

- Phosphoric acid < 30 %
- Potash
- Sodium hypochlorite < 20 %
- Sulphuric acid < 10 %
- Detergent
- Saturated seawater solution
Application of 24 hours at 50 °C

- Top Job
- Jet Dry
- Gumption
- Fantastic
- Formula 409
- Grape juice
- Milk
- Ariel
- Persil
- Wisk
- Lenor
- Downey
- Ajax
- Vim
- Domestos
- Vortex
- Windex

Application of less than 1 hour

- Glacial acetic acid (pure acetic acid)
8. Uninstallation

8.1. Uninstallation

1. Disconnect the device and its peripherals from the power supply.
2. Unplug all plug connectors and cables.

---

**NOTE**

**Damage to the device!**

If uninstallation is performed carelessly the device can fall out of the installation cut-out or be damaged.

- Do not tilt the device.
- Secure the device against falling, especially when taking it out of the installation cut-out.

---

3. Undo equally the screws of the 8 securing clips.

---

Fig. 19: Undoing the screws
4. Remove the 8 securing clips.

5. Push the device evenly forwards out of the installation cut-out.
9. Disposal

The device contains the following components which need to be disposed of separately:

- Metals
- Electronic components
- Battery

The following options are available for disposal of the device:

**Disposal by the manufacturer**
- At the end of the device's life cycle you can return it to the manufacturer for a set fee. The manufacturer will then deal with the recycling of the device.

**Disposal in accordance with regional regulations**
- Dismantle the device and disassemble it completely into its component parts.
- Send the metal parts for metal recycling.
- Sort the electronic parts (circuit boards, drives etc.).
- Dispose of the electronic scrap in accordance with the national laws and regulations.
- Check that the battery is fully discharged.
- Dispose of the battery in accordance with the national laws and regulations, via an authorised collection point.
10. Technical data

<table>
<thead>
<tr>
<th>Ethernet Terminal</th>
<th>ET2115</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display</td>
<td>WXGA</td>
</tr>
<tr>
<td>Across diagonals</td>
<td>15.6&quot;</td>
</tr>
<tr>
<td>Item no.</td>
<td>222002100, 222002600</td>
</tr>
<tr>
<td>Resolution</td>
<td>1366 x 768 pixels</td>
</tr>
<tr>
<td>Colours</td>
<td>TFT: 16.7 M</td>
</tr>
</tbody>
</table>

**CPU**
- CPU: i.MX6 800 MHz / Single Core

**Dimensions and weight**
- Dimensions (WxHxD): 425 x 280 x 55 mm
- Weight: approx. 3 kg

**Operating conditions**
- Operating temperature: 0 °C to 55 °C (front and rear of the device; in compliance with installation requirements)
- Relative humidity: max. 85%, non-condensing

**Transport and storage**
- Operating temperature: –20 °C to +70 °C
- Relative humidity: max. 85%, non-condensing

**Operation**
- Installation: integral securing clips
- Certification: to product standards EN 61010-2-201, EN 61131-2
- Touch operation: Touch resistive

**Shock resistance**
- Vibration: sinusoidal (EN 60068-2-6) test: Fc 10…150 Hz, 10 m/s²
- Shock: 15 G (approx. 150 m/s²), 11 ms duration, sinusoidal half-wave (EN 60068-2-27)
  Test: Ea

**EMC, protection rating**
- Emitted interference: EN 61131-2
- Resistance to interference: EN 61131-2, industrial zone
- Protection class: III
<table>
<thead>
<tr>
<th>Ethernet Terminal</th>
<th>ET2115</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulation resistance</td>
<td>EN 61131-2; 500 V DC test voltage</td>
</tr>
<tr>
<td>Protection rating</td>
<td>IP20 (front IP65)</td>
</tr>
<tr>
<td><strong>Power supply (24 V power)</strong></td>
<td></td>
</tr>
<tr>
<td>Supply voltage</td>
<td>+24 V DC (−15 % / +20 %) SELV max. ripple component 5%</td>
</tr>
<tr>
<td>Power consumption</td>
<td>Max. 0.8 A, peak current 1.2 A at +24 V DC</td>
</tr>
<tr>
<td>Protection against reverse polarity</td>
<td>yes</td>
</tr>
<tr>
<td><strong>Ethernet interface</strong></td>
<td></td>
</tr>
<tr>
<td>No. / type of interface</td>
<td>1x 10/100 Base T</td>
</tr>
<tr>
<td>Connection system</td>
<td>RJ45</td>
</tr>
<tr>
<td>Protocols</td>
<td>TCP/IP</td>
</tr>
<tr>
<td><strong>USB interface</strong></td>
<td></td>
</tr>
<tr>
<td>No. / type of interface</td>
<td>1x host USB 2.0 / USB plug port A</td>
</tr>
<tr>
<td>No. plugging/unplugging cycles</td>
<td>max. 1,000</td>
</tr>
</tbody>
</table>
10.1. Identification plate

Fig. 22: ET2115 identification plate

<table>
<thead>
<tr>
<th>Item</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Device type description</td>
</tr>
<tr>
<td>2</td>
<td>Identification no. (article no., serial no. and version/as-delivered condition)</td>
</tr>
<tr>
<td>3</td>
<td>Production date</td>
</tr>
<tr>
<td>4</td>
<td>Manufacturer’s address</td>
</tr>
<tr>
<td>5</td>
<td>Mac addresses</td>
</tr>
<tr>
<td>6</td>
<td>Customer no.</td>
</tr>
<tr>
<td>7</td>
<td>Supply voltage and maximum current</td>
</tr>
<tr>
<td>8</td>
<td>QR-code (Identification no.)</td>
</tr>
<tr>
<td>9</td>
<td>CE mark</td>
</tr>
<tr>
<td>10</td>
<td>Manufacturer’s mark (trademark)</td>
</tr>
</tbody>
</table>

The ‘Version’ field (delivered version) specifies the ex works condition of the module.
10.2. Identification

The characteristics of the device can be decoded from the identification key.

<table>
<thead>
<tr>
<th>Unit type</th>
<th>Unit family</th>
<th>Screen size</th>
<th>Screen format</th>
<th>Resolution</th>
<th>Processor core</th>
<th>Clock frequency</th>
<th>Touch points</th>
<th>Touch</th>
</tr>
</thead>
<tbody>
<tr>
<td>ET = Ethernet Terminal</td>
<td>21</td>
<td>15 inch (15.6)</td>
<td>W = wide 16:9</td>
<td>Q = QVGA</td>
<td>S = single</td>
<td>0.8 GHz</td>
<td>S = single</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>empty = 4:3</td>
<td>V = VGA</td>
<td>D = dual</td>
<td>1.0 GHz</td>
<td>D = double</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>S = SVGA</td>
<td>L = dual &quot;light&quot;</td>
<td></td>
<td>M = multi</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X = XGA</td>
<td>Q = quad-core</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SX = SXGA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>UX = UXGA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>QX = QXGA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Fig. 23: ET2115 identification key
11. Standards and certificates

11.1. Standards

**Applicable directives**
→ EMC directive 2014/30/EC

**Applicable standards**
→ PLC standard EN 61131-2:2008-4
→ Safety provisions DIN EN 61010-2-201
11.2. UL certificate

CERTIFICATE OF COMPLIANCE

Certificate Number: 2015-12-23-E242595
Report Reference: E242595-D1001-1A0/CO-UL
Issue Date: 2015-12-23

Issued to: BERGHOF AUTOMATION GMBH
Applicant Company: Harrestrasse 1
ENNINGEN, BADEN-WUERTTEMBERG 72800 GERMANY

Listed Company: Same as Applicant

This is to certify that representative samples of Programmable controller
ET2115W X TS 0.8S followed by 3 letter code

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety:
CANS/CSA-C22.2 No. 61010-1, 3rd Edition, Revision date July 1, 2015

Additional Information: See the UL Online Certifications Directory at www.ul.com/database for additional information.

Only those products bearing the UL Certification Mark should be considered as being covered by UL’s Certification and Follow-Up Service.

Look for the UL Certification Mark on the product.

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

Fig. 24: UL certificate page 1 of 2
The devices are authorised to use the following mark:

![cULus mark]

Fig. 25: cULus authorisation

The devices have been awarded cULus authorisation according to standard UL 61010-2-201 NRAQ/7.

Link:
- [http://database.ul.com/cgi-bin/XYV/cgifind.new/LISEXT/1FRAME/index.html](http://database.ul.com/cgi-bin/XYV/cgifind.new/LISEXT/1FRAME/index.html)
- UL File Number: E242595
11.3. Declaration of conformity


We hereby declare, that the following described modules in their conception, construction and form are in compliance with the listed directives and standards. In case of any alteration of the modules, not certified by us, this declaration is void.

Hersteller / manufacturer
Berghof Automation GmbH
Harretstrasse 1
D-72800 Eningen

Produktbezeichnung / product name
ET2115 W X TS 0.8 XXX

Produktzahl / product number
2220020000 222002100 222002400 222002600

Es wird die Übereinstimmung mit folgenden EG-Richtlinien und Normen erklärt:
The requirements of the following EC directives and standards are met:

Angewandte Richtlinien / applied directives
EMV Richtlinie
2014/30/EU

Angewandte Normen / applied standards
Produkt-Norm
DIN EN61131-2:2008-04
Grundnorm Störausendung
DIN EN61000-6-3:2012-11
Wohnbereich
Sicherheitsbestimmungen für elektr.
Mess-, Steuer- und Regelgeräte
DIN EN 01010-2-201:2014-01

Datum
26.01.2016

Signatures:
Stefan Steinhor
Geschäftsführer Berghof Automation GmbH
Chief Executive Officer Berghof Automation GmbH

Uwe Mänzow
Projektleiter
Project Manager
11.4. Information on copyright and software licence

The firmware of the devices contains der free software. Parts of this software are available under the following OpenSource licences, amongst others:

→ GNU General Public License (GPL)
→ GNU Lesser General Public License (LGPL)
→ Mozilla Public License (MPL)
→ FreeType License (FTL)

The source code of the free software may be requested from Berghof Customer Service within three years pf delivery of the device, at cost price.
12. Customer services / addresses

Repairs and corrective maintenance may only be carried out by the manufacturer or authorised customer service centres.

12.1. Customer services

Berghof Automation GmbH
Harretstr. 1
72800 Eningen
Germany
T +49.7121.894-183
F +49.7121.894-100
e-mail: support-controls@berghof.com
www.berghof.com

12.2. Addresses

CAN in Automation; international manufacturer and user organisation for CAN users in automation:
CAN in Automation e.V. (CiA)
Am Weichselgarten 26
91058 Erlangen
headquarters@can-cia.de
www.can-cia.de

EtherCAT Technology Group
ETG Headquarters
Ostendstraße 196
90482 Nuremberg
info@ethercat.org
www.ethercat.org

Beuth Verlag GmbH, 10772 Berlin
or
VDE-Verlag GmbH, 10625 Berlin

VDE Verlag GmbH, 10625 Berlin
or
Internet research: www.iec.ch
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