BARTEC

User Manual - TRANSLATION

POLARIS REMOTE

POLARIS Zero Client 12,1" W / 15" / 17,3" / 19,1" / 24"

Typ 17-71V1-….

ATEX / IECEx / CSA

Zone 1 and Zone 21

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1. Basic safety instructions ... 1
1.1 Notes on this manual ... 1
1.1.1 Languages ... 2
1.1.2 Changes in the document ... 2
1.2 Handling the product ... 2
1.3 Intended use ... 2
1.3.1 Exclusive purpose ... 2
1.3.2 Unintended use ... 3
1.4 Duties of the operator ... 3
1.5 Safety information ... 3
1.5.1 General ... 3
1.6 General safety information for operation ... 3
1.6.1 Maintenance ... 3
1.6.2 Servicing ... 4
1.6.3 Inspection ... 4
1.6.4 Repairs ... 4
1.6.5 Commissioning ... 4
1.7 Labelling, test certificate and standards ... 4
1.8 Warranty ... 4

2. Product description ... 6
2.1 Definition ... 6
2.2 Schematic design ... 7

3. Explosion protection and approvals ... 8

4. Technical data ... 10
4.1 General Data ... 10
4.1.1 Characteristics POLARIS Zero Client 12.1" W ... 11
4.1.2 Characteristics POLARIS Zero Client 15" / POLARIS Zero Client 15 " Sunlight ... 12
4.1.3 Characteristics POLARIS Zero Client 17.3" ... 13
4.1.4 Characteristics POLARIS Zero Client 19.1" ... 14
4.1.5 Characteristics POLARIS Zero Client 24" ... 15
4.2 Keyboard ... 16
4.2.1 Explosion Protection ... 16
4.2.2 General data ... 16
4.2.3 Characteristics enclosure for keyboard ... 17
4.3 Finger mouse, Trackball, Touchpad and Joystick ... 17
4.3.1 Explosion protection ... 17
4.3.2 General Data ... 18
4.3.3 Variants ... 18
4.4 Ex i Memory Stick ... 19
4.4.1 Explosion Protection ... 19
4.4.2 General Data ... 19
4.5 USB Smart Device ... 20
4.5.1 Explosion protection Explosion protection Technical data ... 20
4.5.2 Electric data (USB standard) ... 21
4.5.3 Technical data (Bluetooth) ... 21
4.5.4 Technical data (WLAN) ... 21
4.6 Product Labelling ... 22

5. Transport, Storage, Scope and Assembly ... 23
5.1 Transport ... 23
5.2 Intermediate Storage ... 23
5.3 Scope of delivery ... 23
5.3.1 Accessories optional ... 23
5.4 Assembly ... 24
5.4.1 Installation options ... 24

6. Installation ... 25
6.1 Requirements ... 25
6.2 Mechanical Installation ... 26
6.2.1 Installation in 2G-/2D-enclosure ... 26

6.2.2 Installation as a System Solution in the Stainless Steel Enclosure "Exclusive II" 28
6.2.3 Floor mounting (Stainless steel enclosure "Exklusive II": 29
6.2.4 Wall mounting (Stainless steel enclosure "Exklusive II": 29
6.2.5 Table mounting swivel/tilt (Stainless steel enclosure "Exclusive II") 30
6.3 Electrical Installation 31
6.3.1 Installation guidelines 31
6.4 Terminal compartments 32
6.5 PE conductor connection 33
6.6 Ex e terminal compartments 34
6.6.1 Cable entries 34
6.6.2 Supply voltage terminal assignment) 35
6.6.3 Ethernet terminal assignment 35
6.6.4 RS422 interface 36
6.6.5 USB interface 36
6.6.6 2 x Ethernet terminal assignment 37
6.6.7 Exe Universal Power Supply for Scanner Series BCS 36xx IS 38
6.7 Ex i terminal compartment 39
6.7.1 Connection of Ex i keyboard to the POLARIS (optional) 39
6.7.2 Ex i USB interface for BARTEC Ex i memory stick 40
6.7.3 Connection of a BARTEC BCS 160ex hand scanner (optional) 40
6.7.4 Connection Universal Power Supply Exi for BARTEC BCS 36xxex Series 41
6.7.5 Replacement 160ex with connector to Universal Power Supply Exi 41
6.7.6 Fibre-Optic Port (optional) 42
6.8 EMC (Electromagnetic Compatibility) 43
6.8.1 Voltage Supply (AC- and DC-Variants) 43
6.8.2 Back-up fuse 44
6.8.3 Interference suppression 44
6.8.4 Shielding 45
6.8.5 Connection of shielding 45
6.8.6 Examples of Shielding Connections 45
6.8.7 Ethernet cable 46

7. Commissioning 47
7.1 Final Inspection 47

8. Operation 48
8.1 Operating system 48
8.1.1 General remarks 48
8.1.2 Functions of the ZeroClient Concept 48
8.1.3 ZeroClient Shel 49
8.1.4 Tile Quick Start Bar 50
8.1.5 Info-Center 51
8.1.6 Widgets 51
8.1.7 Tile-System menu 53
8.1.8 Application 53
8.1.9 System Functions 54
8.1.10 Switching to Administrator Mode 54
8.1.11 Language Switching 55
8.2 ZeroClient Control Center 56
8.2.1 "Apps" Tab" 56
8.2.2 Structure of the element list 57
8.2.3 Applications 57
8.2.4 Inserting a New Application 58
8.2.5 Editing Applications 60
8.2.6 Deleting Applications 60
8.2.7 System Functions 60
8.2.8 Editing System Functions 61
8.2.9 Widgets 62
8.2.10 "UWF" Tab 63
8.3 Network setup 65
8.4 Setting up RDP connections 71
8.4.1 Enabling RDP connections in the Zero Client Control Centre 71
8.4.2 File storage 72

8.4.3 Settings for automatic login ... 73
8.4.4 Checking the UWF status ... 73
8.4.5 RDP settings ... 74
8.4.6 Checking the UWF status ... 77

9. Recovery ... 78
9.1 Bartec Recovery Solution ... 78
Start of the device in the Recovery mode ... 78
Recovery surroundings ... 78
Recovery application ... 79
Restoration in the work state ... 80
Finish the recovery ... 82
9.1.1 Recovery Stick ... 83
9.1.2 Recovery stick image ... 83

10. Faults and troubleshooting ... 84

11. Maintenance, inspection, repair ... 85
11.1 Maintenance intervals ... 85
11.2 Inspection ... 85
11.3 Maintenance and repair work ... 85
11.3.1 Instructions for Repairs ... 86

12. Disposal ... 86

13. Dispatch and packaging instructions ... 86

14. Accessories, spare parts ... 87

15. Order numbers ... 88

16. Owen Notes ... 89

17. Additional information ... 91

18. Declaration of conformity ... 92

1. Basic safety instructions

1.1 Notes on this manual

Read carefully before putting the devices into operation.

The user manual is a fixed part of the product. It must be kept in the direct vicinity of the device and the installation, operating and service staff must have access to it at all times.

The user manual contains important information, safety instructions and test certificates which are necessary for the perfect function of the device in operation.

The user manual is directed at all individuals concerned with the commissioning, handling and servicing of the product. The applicable guidelines and standards for areas with gas and dust atmosphere (2014/34/-EU, EN/IEC 60079-17 and
EN/IEC 60079-19) must be observed when conducting this work.

Knowledge of the safety and warning information in this user manual and the strict compliance with it is essential for safe installation and commissioning. Accidents, injuries and material damage can be avoided by circumspect handling and systematically following the instructions.

The examples, tables, and figures provided in this user manual are for illustration purposes. Due to the different requirements of the respective application, the BARTEC company cannot assume responsibility or liability for actual use based on the examples and figures.

The BARTEC company reserves the right to carry out technical changes at any time.

In no event will BARTEC company be responsible or liable for indirect or consequential damages resulting from the use or application of this user manual.

Safety instructions and warnings are specially highlighted in these operating instructions and marked by symbols.

⚠ DANGER

DANGER describes a directly imminent danger. If not avoided, death or severe injury will be the consequence.

⚠ WARNING

WARNING describes a possibly imminent danger. If not avoided, death or severe injury may be the consequence.

⚠ CAUTION

CAUTION describes a possibly imminent danger. If not avoided, mild or slight injury may be the consequence.

ATTENTION

ATTENTION describes a possibly damaging situation. If not avoided, the plant or objects in its vicinity may be damaged.

Important information on effective, economical & environmentally compliant handling.

1.1.1 Languages

The original user manual with safety information is written in English. All other available languages are translations of the original user manual.

The user manual is available in German and English. If further languages are required, these must be requested from BARTEC or stated on placing an order.

1.1.2 Changes in the document

BARTEC reserves the right to change the content of this document without notification. No warranty is assumed for the correctness of the information. In cases of doubt, the German safety instructions apply because it is not possible to rule out errors of translation or printing. In the case of legal disputes, the "General Terms and Conditions of Business" of the BARTEC GmbH also apply.

The current versions of the datasheets, operating instructions, certificates and EU declarations of conformity can be downloaded from www.bartec.de or may be requested directly from BARTEC GmbH.

1.2 Handling the product

The product described in these operating instructions has been tested and left the factory in perfect condition as regards meeting safety requirements. To maintain this condition and ensure that this product operates perfectly and safely, it may be used only in the manner described by the manufacturer. Appropriate transportation, suitable storage and careful operation are also essential for the perfect and safe operation of this product. The POLARIS must be installed properly and securely if it is to work perfectly and correctly.

The safe and perfect mounting of the POLARIS is a precondition for faultless and correct operation.

1.3 Intended use

1.3.1 Exclusive purpose

It is used exclusively in combination with operating devices which satisfy the requirements for Overvoltage Category I.

The POLARIS REMOTE series have been designed specially for use in hazardous (potentially explosive) areas in Zone 1 or Zones 21.

It is essential to observe the permissible operational data for the device being used.

1.3.2 Unintended use

Any other use is not in accordance with the intended purpose and can cause damage and accidents. The manufacturer will not be liable for any use beyond that of its "Exclusive II" intended purpose.

1.4 Duties of the operator

The owner/managing operator undertakes to restrict permission to work with the POLARIS to people who:

- are familiar with the basic regulations on safety and accident prevention and have been instructed in the use of the POLARIS;
- have read and understood the documentation, the chapter on safety and the warnings.

The owner/managing operator must check that the safety regulations and accident prevention rules valid for the respective application are being observed.

1.5 Safety information

1.5.1 General

- Take the device out of the hazardous area before wiping it with a dry cloth or cleaning it!
- Do not open devices in a hazardous area.
- The general statutory regulations or directives relating to safety at work, accident prevention and environmental protection legislation must be observed, e.g. the German industrial health and safety ordinance (BetrSichV) or the applicable national ordinances.
- In view of the risk of dangerous electrostatic charging, wear appropriate clothing and footwear.
- Avoid the influence of heat that is higher or lower than the specified temperature range.
- Protect the device from external influences! Do not expose the device to any caustic/aggressive liquids, vapours or mist! In the event of malfunctioning or damage to the enclosure, take the device out of the potentially explosive area immediately and bring it to a safe place.

1.6 General safety information for operation

1.6.1 Maintenance

The pertinent erection and operating provisions for electrical systems must be observed! (e.g. Directive RL 2014/34/EU, BetrSichV and nationally applicable ordinances EN 60079-14, IEC 60079-14 and the series DIN VDE 0100)!

Observe the national waste disposal regulations when disposing of materials.

1.6.2 Servicing

No constant servicing will be necessary if operated correctly under consideration of the assembly instructions and environmental conditions. See Chapter "Service, inspection, repair" in this respect.

1.6.3 Inspection

According to EN/IEC 60079-17 and EN/IEC 60079-19, the operator of electrical systems in potentially explosive atmospheres is obliged to have these inspected by an electrician to ensure correct condition.

1.6.4 Repairs

Repairs to explosion-proof equipment may only be performed by persons authorized by BARTEC, who must employ the latest technological practices, observe the manufacturer's instructions and use only original spare parts. The applicable regulations are to be observed here.

1.6.5 Commissioning

It must be checked that all components and documents are available before commissioning.

1.7 Labelling, test certificate and standards

The device features an explosion protection label, as well as a test certificate. For an explanation of the symbols and information used, see chapter 4 "Technical data".

The POLARIS REMOTE series complies with Directive 2014/34/EU on equipment and protective systems intended for use in potentially explosive atmospheres (ATEX Directive). For information on standards that must be observed, see chapter 3 "Explosion protection and approvals".

1.8 Warranty

WARNING

Explosion protection cannot be guaranteed if non-specified components are used.

- ▶ Do not make any changes or perform any reconstruction work on the device.
- ▶ Use only original spare parts.

The manufacturer provides a full warranty exclusively for the spare parts it supplies. When using parts from third parties, there is no guarantee that they have been designed or manufactured to handle the requisite stress or offer the requisite degree of safety.

As a fundamental rule, our "General Conditions of Sale and Delivery" apply. These are made available to the owner/managing operator at the latest on formation of a contract. Guarantee and liability claims for personal injury and damage to property are excluded if they are due to one or more of the following reasons

- Use of the POLARIS for a purpose other than that for which it is intended.
- Incorrect installation, commissioning, operation and maintenance.
- Non-compliance with the instructions in the manual with respect to transport, storage, assembly, commissioning, operation and maintenance.
- Structural modifications without our prior authorisation.
- Inadequate monitoring of components that are subject to wear
- Repairs done incorrectly.
- Disasters due to the effects of foreign matter or Act of God (events outside human control).

BARTEC grants a warranty period of one year on the POLARIS series, starting from the BARTEC delivery date. The warranty period for accessories is 1 year from the date of delivery. This warranty covers all parts of the delivery and is limited to the free-of-charge replacement of or repair of the defective parts by BARTEC. The packaging supplied should ideally be retained for this purpose (return shipping). If necessary and following written consultation, the products should be sent to us with an RMA form. No claims may be submitted for repair work to be performed at the installation location.

2. Product description

2.1 Definition

POLARIS ZeroClient is **a** Security and reliability are particularly important quality features of software solutions in many areas. Increasing demands on the availability of industrial HMIs and the reduction of maintenance and administration costs lead to the increasing use of centralised systems that can share the required performance and capacities. The BARTEC ZeroClient is designed as a robust solution for such networked systems of this kind with increased security and availability criteria.

Abbildung 1: Übersicht

The ZeroClient is a workplace client with reduced configuration tasks and security risks. The client protocol (RDP) contained in the ZeroClient is used for the interaction of the device with the external or company network. The ZeroClient does not perform any processing tasks itself, but enables remote access to an industrial server. Therefore, it is ready for use as delivered without any great work required on the part of the administrator. As the actual data processing is done by the industrial server, it is ensured that the ZeroClient is now able to cope with its task due to higher demands.

Bartec’s ZeroClient solution is a comprehensive combination of operating system, configuration tool (ZeroClient Control Center) and integrated user interface (ZeroClient Shell).

Touchscreen and high quality keyboards in different national languages and different mouse versions extend the operating comfort.

The front-panel mounting design makes installation easy. On request, the devices are also available as a ready-made system solution in a stainless steel enclosure for wall, floor or table mounting.

For particularly harsh areas of use with temperatures as low as down to -40 °C, we equip the POLARIS series with electrical heating. On request, we produce customised solutions with more command and signalling devices.

2.2 Schematic design

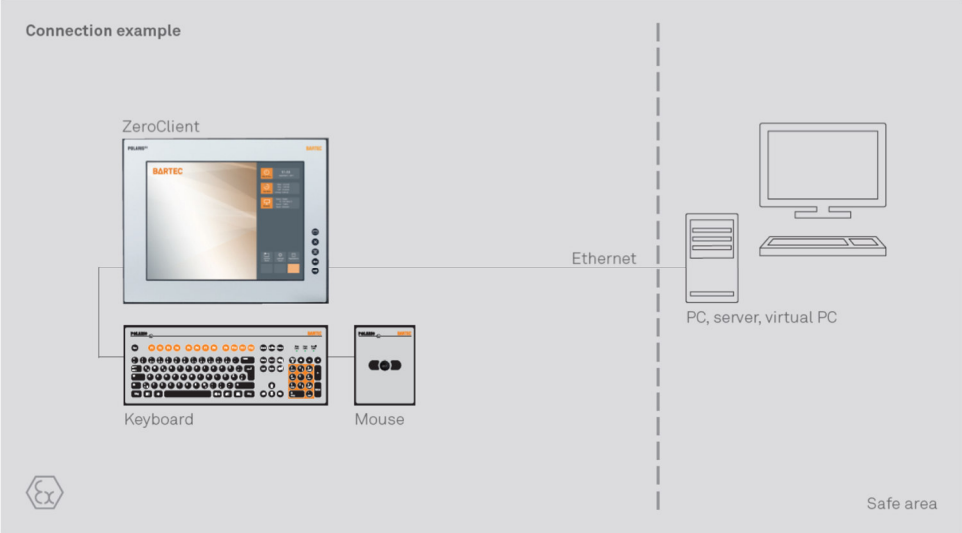


Illustration 1: Simple system structure

3. Explosion protection and approvals

POLARIS REMOTE Zero Client Type 17-71V1-….	
ATEX	
Ex protection type	II 2G Ex db eb mb q [ib op pr] IIC T4 Gb II 2D Ex mb tb IIIC T120°C Db -20 °C ≤ Ta ≤ 60 °C
Certification	IBExU 05 ATEX 1117 X
Standards in accordance with EMC Directive 2014/34/EU	EN 60079-0:2012+A11:2013 EN 60079-1:2014 EN 60079-5:2015 EN 60079-7:2015 EN 60079-11:2012 EN 60079-18:2015 EN 60079-28:2015 EN 60079-31:2014
IECEx	
Ex protection type	Ex db eb qb [ib op pr] IIC T4 Ex tb IIIC T120 °C
Certification	IECEx IBE 11.0007X
Standards in accordance with EMC Directive 2014/34/EU	IEC 60079-0:2011 Edition: 6 IEC 60079-1:2014-06 Edition: 6 IEC 60079-5:2015 Edition: 4 IEC 60079-7:2015 Edition: 5 IEC 60079-11:2011 Edition: 6 IEC 60079-18:2015 Edition: 4 IEC 60079-28:2015 Edition: 2 IEC 60079-31:2013 Edition: 2
Special conditions	The intrinsically safe circuits and the enclosure are galvanically connected. The equipotential bonding must be guaranteed at the installation of the intrinsically safe circuits. High charging mechanisms at the operation surface of the Visual units respectively accessories (for example pneumatic particle transport) must be excluded at the application. The degree of protection (IP code) must be ensured by the installation of the units in enclosures (IP code).
CSA	
Ex protection type	Class I, Zone 1 (A)Ex d e q [ib op pr] IIC T4; Gb Class II, Zone 21 (A)Ex tb IIIC T120 °C; Db
Certification	CSA 15.70010166

Further test certificates	
INMETRO	11/UL-BRHZ-0131X
Customs Union Russia (EAC)	TC RU C-DE.GB06.B.00334
Korea	KTL 14-KB4BO-0258X
India	CCEs P261984
More test certificates	www.bartec.de
EU-conformity	
RoHS-Directive	2011/65/EU
Standards in accordance with EMC Directive 2014/30/EU	EN/IEC 61000-6-2:2005 EN 61000-6-4:2007 + A1:2011 IEC 61000-6-4:2006 + A1:2010 EN 60529:1991 + A1 2000 + A2 :2013 IEC 60529:1989 + A1 1999 + A2 :2013
Electrical safety	EN/IEC 61010-1:2010
Product labelling	CE 0044

4. Technical data

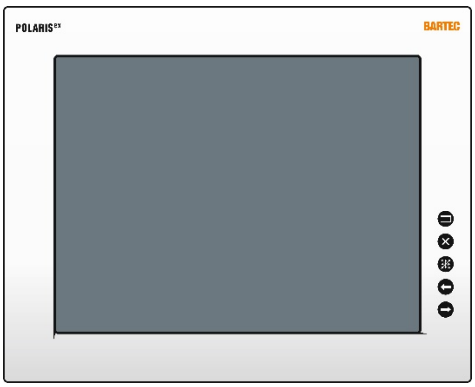
4.1 General Data

Construction	Front panel fitting; Optional turn-key system solutions in a stainless steel enclosure as wall, floor or table mounting versions.
Operating system	Windows® 10 IoT Enterprise 1809 LTSC
Interface (basic version)	1 x Exe Ethernet 100/10BaseT (optional LWL) 1 x Exe USB 1 x Exe RS422 1 x Exi USB 2 x Exi for PS/2 for intrinsically safe keyboard and mouse
Optional interface modules	1 x Ex i Supply module for hand-held scanner
Display	Antireflection coating glass pane Optional touchscreen
Max. power consumption	P_{max} < 100 W depending on the version
Relative air humidity	5 to 95 % non-condensing
Vibration	0.7 G/1 mm; 5 Hz-500 Hz pulse in all 3 axes
Schock	15 G, 11 ms pulse in all 3 axes
Material Front Rear panel	 Polyester foil on anodised aluminium plate (conditionally UV-resistant) galvanised sheet steel, bichromated
Protection class Front Rear site	 IP66 IP54
Optional approved accessories	Keyboard Mouse variants Exi memory stick Smart Device

4.1.1 Characteristics POLARIS Zero Client 12.1" W

Display	12.1" graphics-capable TFT display WXGA resolution 1280 x 800 pixels 262.144 colours Brightness 400 cd/m^2 Visible surface approx. 246 x 166 mm Contrast 1200:1
Backlighting	LED technology, Service life approx. 50,000 hours (at +25 °C)
Permissible ambient temperature Storage/Transport Operation	 -20 °C to +50 °C 0 °C to +50 °C
Power supply	DC 24 V ±10 %
Dimensions (width x height x depth)	400 mm x 246 mm x approx. 130 mm
Wall cut-out (width x height)	386 mm x 226 mm ± 0.5 mm
Weight	approx. 14 kg

4.1.2 Characteristics POLARIS Zero Client 15" / POLARIS Zero Client 15 " Sunlight

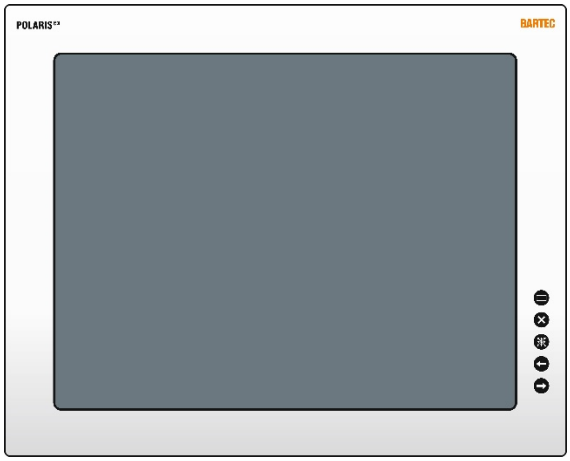


Display **15“ Sunlight**	15" graphics-capable TFT display XGA resolution 1024 x 768 pixels 16,7 million colours Visible surface approx. 304 x 228 mm Contrast 700:1 Brightness 350 cd/m² Brightness 1000 cd/m² (suitable fordaylight)
Backlighting	LED technology, Service life approx. 50,000 hours (at +25 °C)
Permissible ambient temperature Storage/Transport Operation	 -20 °C to +50 ° 0 °C to +50 °C
Permissible ambient temperature for 15“ Sunlight Storage/Transport Operation	 -20 °C bis +60 °C) -20 °C bis +60 °C)
Power supply	AC 90 V to 253 V ± 10 %, 50 Hz to 60 Hz DC 24 V ±10 %
Dimensions (width x height x depth)	411 mm x 332 mm x approx. 135 mm
Wall cut-out (width x height)	394.5 mm x 315.5 mm + 0.5 mm
Weight	approx. 23 kg

4.1.3 Characteristics POLARIS Zero Client 17.3"

Display	17.3" graphics-capable TFT display WSXGA resolution 1920 x 1080 pixels 16,7 million colours Brightness 400 cd/m² Visible surface approx. 382 x 215 mm Contrast 600:1
Backlighting	LED technology, Service life approx. 50,000 hours (at +25 °C)
Power supply	AC 90 V to 253 V ± 10 %, 50 Hz to 60 Hz DC 24 V ±10 %
Permissible ambient temperature Storage/Transport Operation	 -20 °C to +50 °C 0 °C to +50 °C
Dimensions (width x height x depth)	503 mm x 314 mm x approx. 135 mm
Wall cut-out (width x height)	489 mm x 301 mm +0.5 mm
Weight	approx. 33 kg

4.1.4 Characteristics POLARIS Zero Client 19.1"



Display	19.1" graphics-capable TFT display SXGA resolution,1280 x 1024 pixels 16,7 million colours Brightness 300 cd/m^2 Visible surface approx. 380 x 305 mm Contrast 1300:1
Backlighting	CFL technology, Service life approx. 40,000 hours (at +25 °C)
Permissible ambient temperature Storage/Transport Operation	 -20 °C to +50 °C 0 °C to +50 °C
Power supply	AC 90 V to 253 V ± 10 %, 50 Hz to 60 Hz DC 24 V ±10 %
Dimensions (width x height x depth)	498 mm x 400.5 mm x approx. 135 mm
Wall cut-out (width x height)	484 mm x 386.5 mm + 0.5 mm
Weight	approx. 33 kg

4.1.5 Characteristics POLARIS Zero Client 24"

Display	24" graphics-capable TFT display WSXGA resolution 1920 x 1080 pixels 16,7 million colours Brightness 300 cd/m^2 Visible surface approx. 521 x 299 mm Contrast 3000:1
Backlighting	LED technology, Service life approx. 40,000 hours (at +25 °C)
Permissible ambient temperature Storage/Transport Operation	 -20 °C to +50 °C 0 °C to +50 °C
Power supply	AC 90 V to 253 V ± 10 %, 50 Hz to 60 Hz DC 24 V ±10 %
Dimensions (width x height x depth)	644 mm x 406 mm x approx. 135 mm
Wall cut-out (width x height)	630 mm x 392 mm + 0.5 mm
Weight	approx. 38 kg

4.2 Keyboard

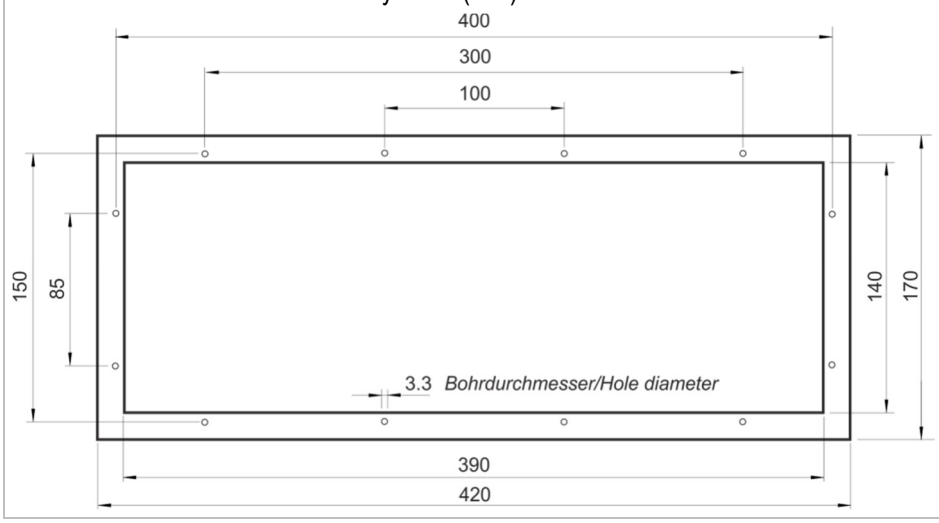
4.2.1 Explosion Protection

Type	17-71VZ-40..
Ex protection type ATEX	II 2G Ex ib IIC T4 Gb II 2D Ex ib IIIC T120°C Db -20 °C ≤ Ta ≤ +60 °C (50°C)
Certification	IBExU 05 ATEX 1117 X
Ex protection type IECEx	Ex ib IIC T4 Gb Ex ib IIIC T120 °C Db
Certification	IECEx IBE 11.0007X
Ex protection type	Class I, Zone 1 (A)Ex ib IIC T4; Gb Class II, Zone 21 (A)Ex ib IIIC T120 °C; Db
Certification	CSA 15.70010166
More test certificates	www.bartec.de

4.2.2 General data

Construction	Front panel fitting
Material	Polyester foil on aluminium sheet (conditionally UV-resistant)
Protection class (front)	IP65
Dimensions (width x height)	420 mm x 170 mm
Wall cut-out (width x height)	391 mm x 140 mm
Installation depth	18 mm
Weight	approx. 700 g
Other features	Keyboard available in various languages

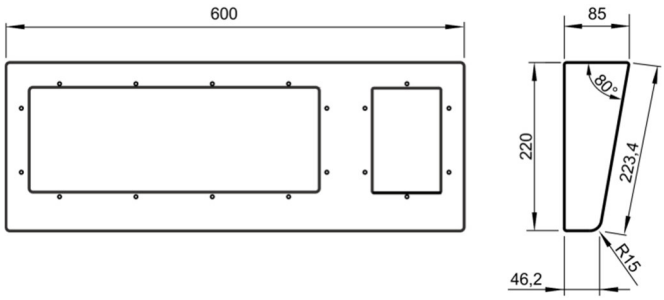
Dimensions and wall cut-out for keyboard (mm)



4.2.3 Characteristics enclosure for keyboard

Order no.	05-0041-0277
Material	Stainless steel 1.4301; AISI 304
Dimensions (width x height x depth)	600 mm x 85 mm x 220 mm
Protection class	IP65

Dimensions (mm)



4.3 Finger mouse, Trackball, Touchpad and Joystick

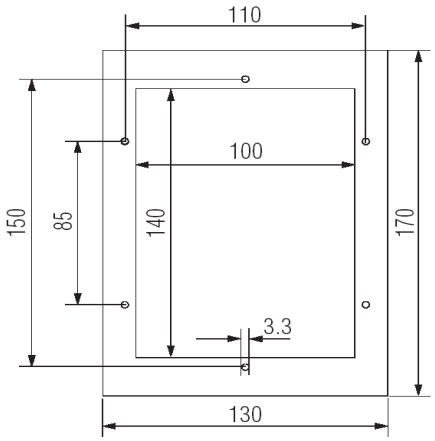
4.3.1 Explosion protection

Ex protection type ATEX	II 2G Ex ib IIC T4 Gb II 2D Ex ib IIIC T120°C Db -20 °C ≤ Ta ≤ +60 °C (50°C)
Certification	IBExU 05 ATEX 1117 X
Ex protection type IECEx	Ex ib IIC T4 Gb Ex ib IIIC T120 °C Db
Certification	IECEx IBE 11.0007X
Ex protection type	Class I, Zone 1 (A)Ex ib IIC T4; Gb Class II, Zone 21 (A)Ex ib IIIC T120 °C; Db
Certification	CSA 15.70010166
More test certificates	www.bartec.de

4.3.2 General Data

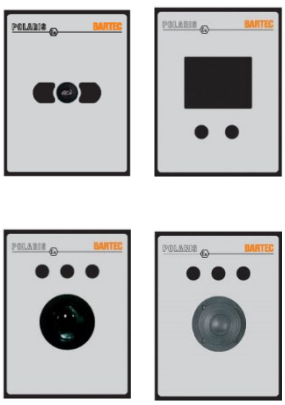
Construction	Front panel fitting
Material	Polyester foil on aluminium sheet (conditionally UV-resistant)
Protection class	
Fingermouse/Joystick/Touchpad	IP65 front site
Trackball Static	IP65 front site
Dynamic	IP51 front site
Dimensions (width x height)	130 mm x 170 mm
Wall cut out (width x height)	100 mm x 140 mm

Dimensions and wall cut-out (mm)



All hole diameter: 3.3 mm

4.3.3 Variants



Finger mouse	Type 17-71VZ-1000
Installation depth	15 mm
Weight	approx. 270 g
Touchpad	Type 17-71VZ-2000
Installation depth	15 mm
Gewicht	approx. 250 g
Trackball	Type 17-71VZ-3000
Installation depth	43 mm
Weight	approx. 500 g
Joystick with button	Type 17-71VZ-9000
Installation depth	43 mm
Weight	approx. 500 g

4.4 Ex i Memory Stick

4.4.1 Explosion Protection

Type	17-71VZ-5000/0100
Ex protection type ATEX	II 2G Ex ib IIC T4 Gb -20 °C ≤ Ta ≤ 60 °C (50°C)
Certification	IBExU 05 ATEX 1117 X
Standards	EN 60079-0:2012 EN 60079-11:2012
Ex protection type IECEx	Ex ib IIC T4
Certification	IECEx IBE 11.0007X
Standards	IEC 60079-0:2011 Edition: 6 IEC 60079-11:2011 Edition: 6

4.4.2 General Data

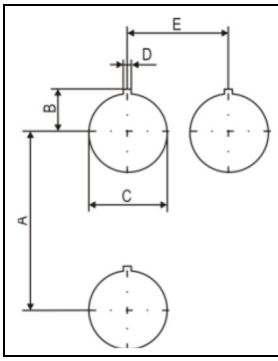
Product type	USB flash drive
Dimensions (length x width x depth)	approx. 92 mm x 22 mm x 7.2 mm
Weight	28 g
Material Enclosure	Anodised aluminium
Use	Data backup stick

4.5 USB Smart Device

4.5.1 Explosion protection Explosion protection Technical data

Fastening	M30 x 1,5 (suitable for fixing holes 30,3mm with recess for anti-twist safeguard)
Installation	Wall thickness 1mm to 6mm impact resistance: 7Nm
Torque of panel nut	2,8 to 3,4 Nm
Material	Enclosure thermoplastic

Dimensions



	mm	in
A	70	2.8
B	16,5	0.65
C	Ø $30{,}3^{+0,3}$	Ø $1.9^{+0,01}$
D	3	0.12
E	40	1.6

Fixing hole of the size Ø 30,3 mm (1.9 in) with recess for anti-twist safeguard, typical position on top (12 o`clock position).

Minimum distances of the fixing holes:

- horizontal 40 mm (1.6in)
- vertical 70 mm (2.8 in)

Recommended distance for mushroom push button, shock switch as well as selector switch with protective collar: 100 mm (3.9 in

4.5.2 Electric data (USB standard)

USB-connection	Colour	Function
1	RD	V+
2	WH	Data- USB-data signal
3	GN	Data+ USB-data signal
4	BK	V-

Bluetooth

4.5.3 Technical data (Bluetooth)

Bluetooth	4.0
Downward compatible	2.0/2.1/3.0
Range	Up to 10m (open terrain)
For more technical data see description of the bluetooth-stick manufacturer.	

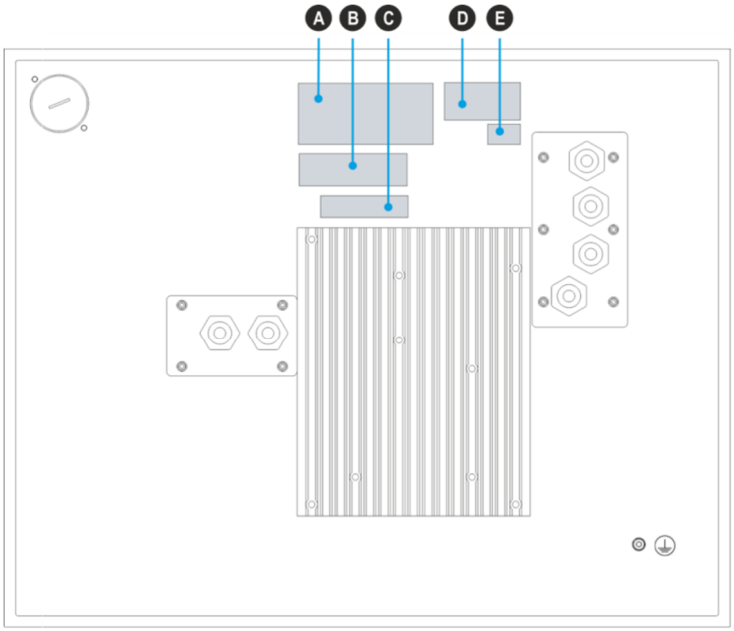
WLAN

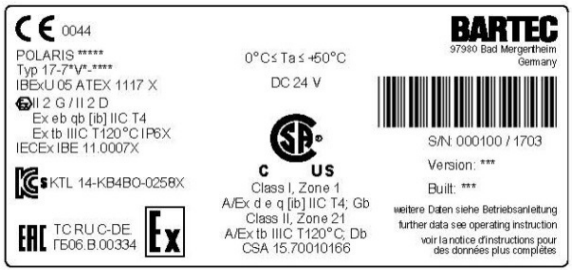
For the wireless network connection.

4.5.4 Technical data (WLAN)

Wifi - standard	IEEE802.11n IEEE802.11g IEEE802.11b
Transfer rate	max. 150 Mbit/s
WLAN - frequency	2.4 GHz
For more technical data see description of the W-LAN-stick manufacturer.	

4.6 Product Labelling



A **Example: Type label with label ATEX and IECEx**	
B **IMMETRO type label**	
C **Warnings on the device**	
D **Warning on terminal compartment**	
E **Licence sticker**	depending on the operating system
F **Test sticker**	

5. Transport, Storage, Scope and Assembly

5.1 Transport

A written report of any transport damage or missing items must be given to the appointed forwarder and to BARTEC GmbH immediately on receipt of the delivery.

Damage caused by incorrect storage and transport shall not fall within the warranty provisions of BARTEC GmbH.

COUTION

This device is heavy (14-38 kg).

There is a risk of injury if it is lifted or moved incorrectly.

▶ You will need help from others when transporting it.

5.2 Intermediate Storage

ATTENTION

Damage to property through incorrect storage!

▶ Comply with the correct storage temperatures.

▶ Keep the POLARIS free of moisture.

5.3 Scope of delivery

1 x POLARIS REMOTE Zero Client
1 x Reinforcement frame
1 x Set of mounting clamps
1 x User manual POLARIS REMOTE – POLARIS Zero Client

Not enclosed:

– Assembly Material,
– Cable for voltage supply and data line

5.3.1 Accessories optional

– Enclosure and supporting system for wall, floor and table mounting
– Keyboard, finger mouse, touchpad, trackball, joystick, fibre optic converter

5.4 Assembly

Before assembling the device, make sure you have all the components and documents.

Required Tools:	POLARIS (mounting clamps)	1 x hex key 3 mm 1 x slotted screwdriver
	POLARIS termination-compartments	1 x hex key 2,5 mm 1 x slotted screwdriver
	POLARIS accessories	1 x socket wrench 5.5mm
	System solution in an "Exklusive II" enclosure	(to fix the supporting system in place)

5.4.1 Installation options

The POLARIS can be installed directly in:

- Enclosures
- Switch cabinet doors
- Operating consoles

The POLARIS series are mounted by fitting them into front panels, which can be done with very little effort. On request, we supply the operating devices as ready-to-use system solutions in stainless steel enclosures for mounting onto walls, floors or tables.

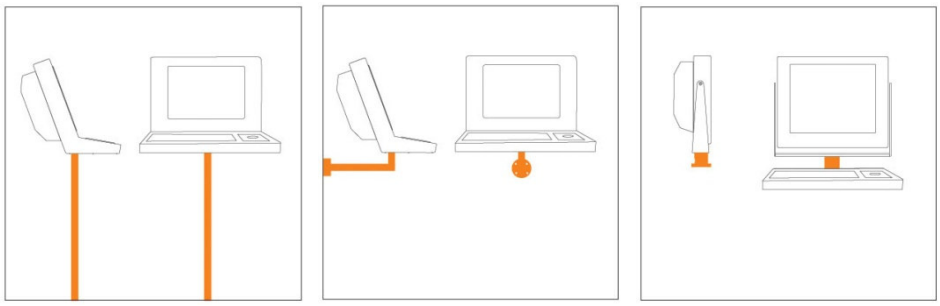


Illustration 2: Examples of floor, wall and table mounting in an "Exclusive II" enclosure

6. Installation

We recommend setting up and testing the entire system before its ultimate installation in the ex-area. If a long connection cable is not available, please use a patch cable to test the basic functions.

DANGER

Electrostatic charging through a stream of particles.

There is a risk of fatal injury in an explosive atmosphere!

- ▶ Make sure there are no highly energetic charging mechanisms at the user interface on the display unit or its accessories.
- ▶ Do not install the device in the stream of particles.

DANGER

No PE connection. Risk of fatal injury in an explosive atmosphere!

- ▶ The POLARIS must be integrated in the equipotential bonding.

The POLARIS Series is approved for an ambient temperature of from 0 °C to +50 °C or from -20 °C to +60 °C and a relative air humidity of from 5 to 95 % without condensation.

6.1 Requirements

- The place where the POLARIS is installed must have sufficient mechanical stability/fastening.
- The enclosure intended for accommodating the POLARIS must be designed to bear the device's weight.
- If a supporting system is used, the surface underneath and the means of fastening the supporting system must be designed to bear the weight of the POLARIS

Selecting the location

COUTION

Pay attention to wall and ground condition!

A sufficiently stable wall (e.g. concrete or limestone) or floor (e.g. concrete) must be selected for securing the load-bearing system.

- ▶ The structural stability of the wall or floor must be able to bear 4 times the weight of the POLARIS as system solution.
- ▶ The support arm system must be assembled using suitable mounting materials (M12) (e.g. dowels or stud bolts).

- Choose the optimum height for operating the POLARIS.
- Ensure good lighting conditions for a perfectly legible display (no direct exposure to the sun's rays).

- Do not mount in direct proximity to switching or current changing devices.
- The POLARIS must be heated when at temperatures below 0°C. We furthermore recommend protecting the display from the cold, e.g. with a door on the front of the enclosure.

Outdoor Installation

ATTENTION

Damage from condensation or overheating!

- ▶ Avoid direct sunlight!
  Remedy: e.g. shelter with sufficient air circulation.
- ▶ Remove condensation on the POLARIS immediately.
- ▶ A POLARIS built into an enclosure must be heated and not removed from the mains.
- ▶ Equip the protective housing with breather.

6.2 Mechanical Installation

⚠ COUTION

This device is heavy (14-38 kg).

There is a risk of injury if it is lifted or moved incorrectly.

- ▶ You will need help from others when transporting it.

Only qualified personnel, i.e. trained skilled specialists will have the necessary specialised know-how to be able to perform all the mechanical work. Familiarity with and the technically perfect implementation of the safety instructions described in this manual are preconditions for safe installation and commissioning.

6.2.1 Installation in 2G-/2D-enclosure

In order to guarantee the IP degree of enclosure protection = IP54 for installation in 2G enclosures of Ex e type of protection (e.g. control equipment), and = IP6X for installation in 2D enclosures in areas where combustible dusts exist - with "protection through the enclosure" type of protection - the reinforcement frame should be used for fastening on the front side.

A reinforcement frame is inserted between the retaining brackets and the enclosure material for good transmission of the clamping force. This ensures even transmission of force.

For POLARIS built into the enclosure door:

The open door must be supported and secured during the installation and servicing phase. Otherwise the wall thickness specified may lead to the door sagging slightly when open.

DANGER

If there is no reinforcement frame, it will not be possible to maintain the IP protection. There is a risk of fatal injury in an explosive atmosphere!

- ▶ Only use enclosure with at least 2 mm wall thickness.
- ▶ Insert the reinforcement frame between the holder and the enclosure.

Reinforcement frame for maintenance of Protection Class IP65	
POLARIS 12.1" W	05-0205-0007
POLARIS 15" /15" Sunlight	05-0205-0009
POLARIS 17.3"	05-0205-0013
POLARIS 19.1"	05-0205-0010
POLARIS 24"	05-0205-0012

Fit the reinforcement frame

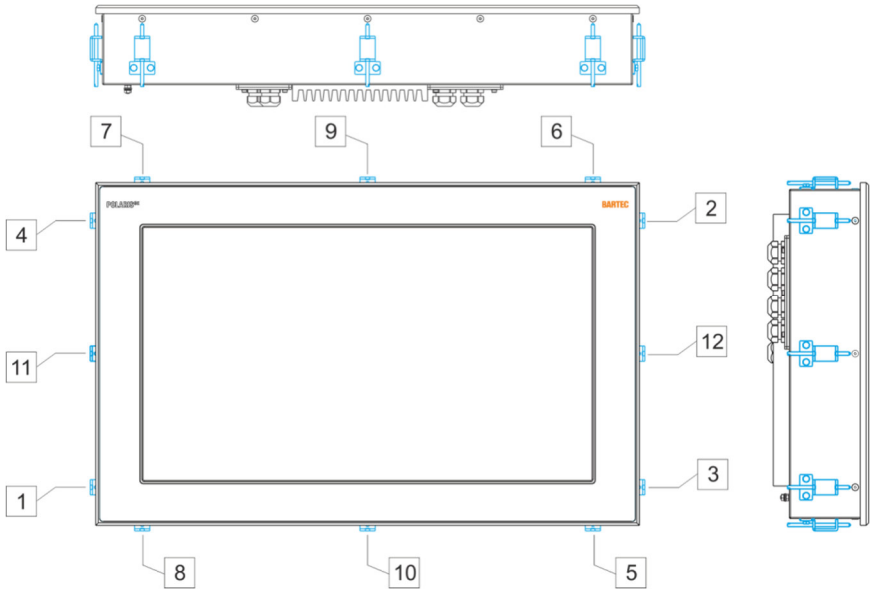


Illustration 3: Minimum installation depth and mounting reinforcement frame

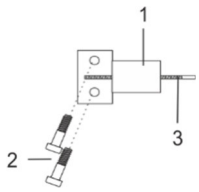
Work steps

(1) Insert the POLARIS into the cut-out in the enclosure.

(2) From the back, place the reinforcement frame over the POLARIS.

(3) Using the M4x12 (2) screws to fasten the mounting clamps (1) to the rear side of the POLARIS and tighten to 1.37 Nm.

(4) Tighten the clamping screw (3) of the mounting clamps (see illustration 7) to a torque of 1.02 Nm.



Number of retaining claws	
POLARIS 12,1"	6 pieces
POLARIS 15"	12 pieces
POLARIS 17,3"	12 pieces
POLARIS 19,1"	12 pieces
POLARIS 24"	14 pieces

Always tighten the mounting clamps crosswise.

6.2.2 Installation as a System Solution in the Stainless Steel Enclosure "Exclusive II"

The POLARIS is available as a ready-made system solution in a stainless steel enclosure e.g. "Exclusive II" for floor, wall or table mounting.

CSA approval

The CSA approval for the POLARIS series includes an POLARIS system solution in stainless steel enclosure "Exclusive II" for wall and floor mounting.

Other system solutions and mounting systems (e.g. table mounting) have **not** been tested and approved in accordance with CSA.

For POLARIS built into the enclosure door:

The open door must be supported and secured during the installation and servicing phase. Otherwise the wall thickness specified may lead to the door sagging slightly when open.

Selecting the location

⚠ COUTION

Pay attention to wall and ground condition!

A sufficiently stable wall (e.g. concrete or limestone) or floor (e.g. concrete) must be selected for securing the load-bearing system.

- ▶ The structural stability of the wall or floor must be able to bear 4 times the weight of the POLARIS as system solution.
- ▶ The support arm system must be assembled using suitable mounting materials (M12) (e.g. dowels or stud bolts).

Work steps

(1) Prepare supply and data line(s).

(2) Prepare installation on the basis of the drilling template (see illustration 9 - 10).

(3) Install supply and data line(s) in the base.

(4) Fasten the supporting system.

(5) Pull supply and data line(s) through the cable glands provided into the enclosure. Ensure there is sufficient length.

(6) Mount the enclosure on the supporting system.

(7) Open the terminal compartments on the POLARIS and feed the supply and data line(s) through the cable glands and wire them. Block unused terminal compartments with a blanking plug.

(8) Close the door of the "Exclusive II" enclosure.

6.2.3 Floor mounting (Stainless steel enclosure "Exklusive II":

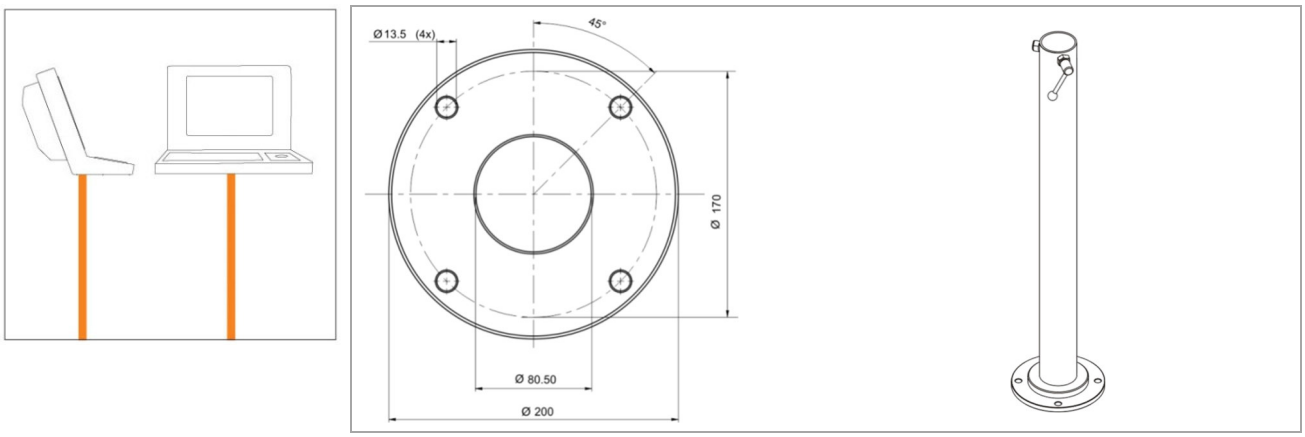


Illustration 4: Drilling pattern - supporting system for floor mounting

6.2.4 Wall mounting (Stainless steel enclosure "Exklusive II":

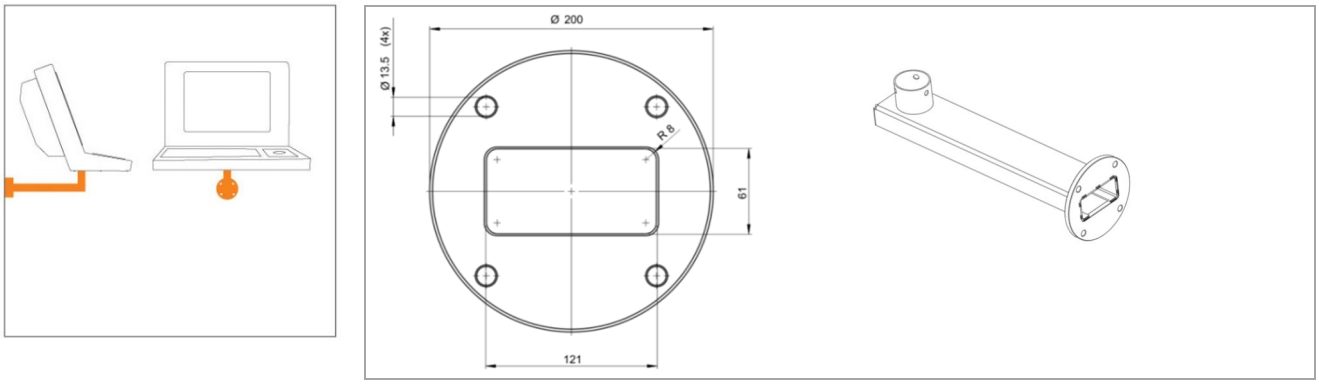


Illustration 5: Drilling pattern - supporting system for wall mounting

6.2.5 Table mounting swivel/tilt (Stainless steel enclosure "Exclusive II")

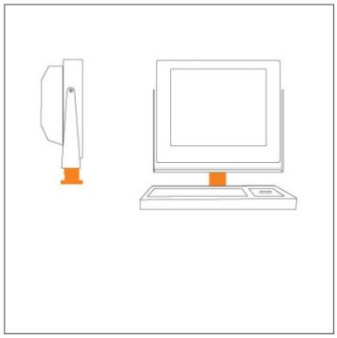
CAUTION

Movable enclosure parts on the swivel-mounted enclosure.
There is a risk of injury by hands being crushed.

- 3 people are needed for assembly/disassembly.
- When lifting the POLARIS, always pick up the swivel-mounted adapter and enclosure together.
- Hold up the POLARIS on both sides (two people), so that the third person can lay the supply and data line(s) in the supporting system. Make sure that your fingers do not get caught between the swivel adapter and the enclosure as you set up the POLARIS.

Zulassung CSA

Die Systemlösungen als Tischmontage ist nicht zugelassen und muss im Einzelfall separat geprüft werden.



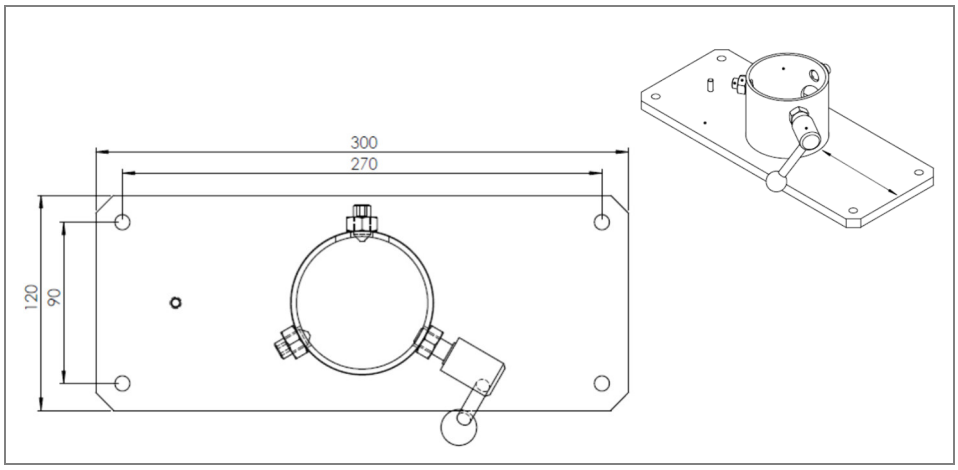


Illustration 6: Drilling pattern - supporting system for table mounting

Rotating

The POLARIS is fixed using two side T screws.

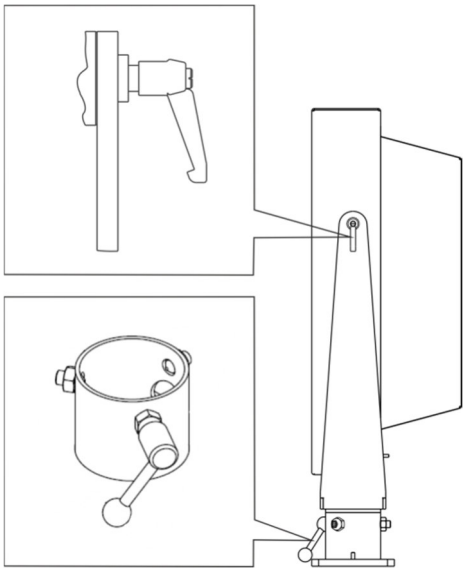
The angle of rotation can be changed once the screws have been loosened

Inclining

The POLARIS is fixed on the carrier system using two hexagon socket screws M10 and a T screw.

The angle of rotation can be changed once the screws have been loosened.

Tools: hex key 5 mm



6.3 Electrical Installation

6.3.1 Installation guidelines

Only qualified personnel, i.e. trained electricians will have the required specialised knowledge to be able to do all the electrical work.

Familiarity with and the technically perfect implementation of the safety instructions described in this manual are preconditions for safe installation and commissioning.

- The user may do only the wiring at the terminals that are accessible to him/her (Ex i and Ex e terminal compartment).
- Any unused cable glands on the Ex e terminal compartment should be closed using an approved blanking plug.
- More extensive dismantling work on the device may be done only by the manufacturer or by persons authorised by the manufacturer for this purpose. The device is factory-sealed. Never open it!
- The equipotential bonding connection point must be connected to the equipotential bonding conductor in the hazardous area. Since the intrinsically safe circuits are galvanically connected to earth, equipotential bonding is required throughout the entire installation of the intrinsically safe circuits.
- The safety and accident prevention regulations applicable to the respective individual case must be observed.
- Devices must be properly installed first before they may be operated.
- It must be possible at all times to disconnect the devices from the voltage supply (in fixed installations by means of an all-pole mains isolating switch or fuse).
- It must be ensured that the supply voltage agrees with the specifications in this user manual and the tolerances must be observed. Use smoothed direct current.
- Malfunctioning cannot be ruled out if levels exceed or drop below the specified tolerances.
- If there is a power failure or if the power supply is interrupted, make sure the system has not been put into a dangerous, undefined condition.
- EMERGENCY STOP mechanisms must remain effective throughout all modes and states of operation.
- Connection cables (particularly data transmission cables) must be selected and laid in a way that ensures that capacitive and inductive interference will not have any adverse effect on the equipment. Appropriate measures must be taken to handle line interruptions to prevent any undefined states occurring.
- Wherever malfunctioning can cause material damage or personal injuries, additional external safety circuits must be provided (e.g. limit switch, mechanical interlocking devices etc.).

6.4 Terminal compartments

DANGER

Sealed locking screw! The device is closed in the factory.

The explosion protection is lost if opened, and danger to life exists in an explosive atmosphere!

▶ Do not open the locking screw!

DANGER

Non-certified cable glands and non-sealed cable entries endanger the IP protection and accordingly the protection against explosions.

There is a risk of fatal injury in an explosive atmosphere!

▶ Use Ex-certified cable glands.

▶ Close non-sealed cable entries.

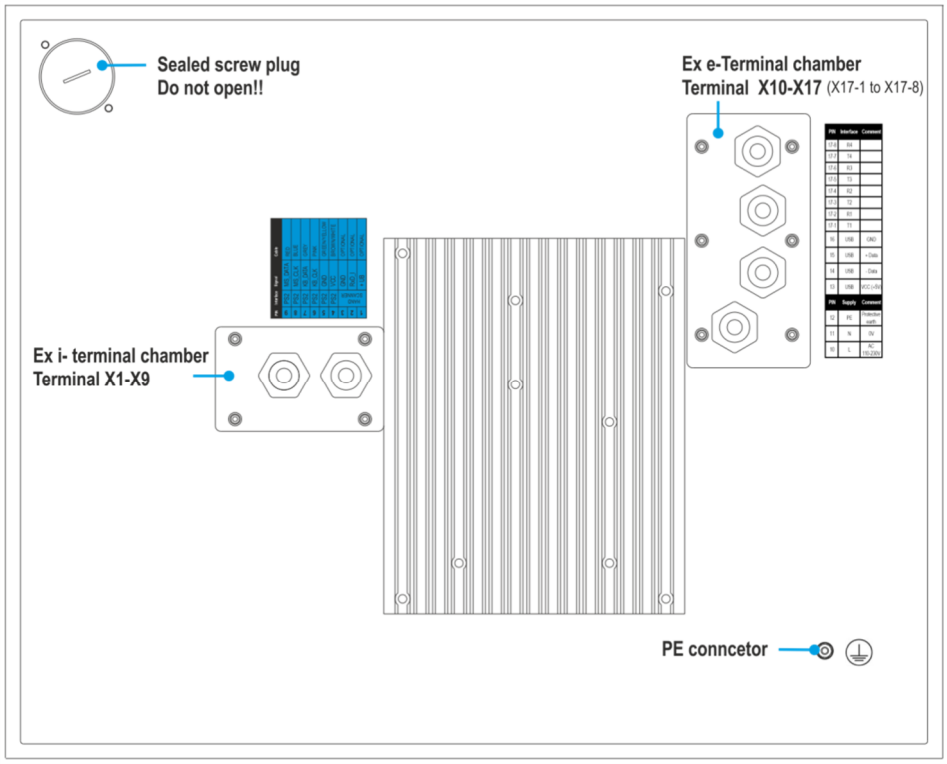


Illustration 7: Pin assignment POLARIS

All connection screws and terminals in the terminal compartment must be tightened with a torque spanner under consideration of the recommended torque of 0.4 Nm up to a max. 0.5 Nm.

6.5 PE conductor connection

DANGER

Death or danger of injury as a result of no PE conductor connection.
There is no explosion protection.

- ▶ Equipotential bonding with a core cross-section of at least 4 mm² is to be set up for the POLARIS (see Figure).

Stainless steel enclosure Exklusiv II

- ▶ Attach equipotential bonding to the enclosure.
- ▶ All moving parts must be earthed.
- ▶ Secure PE conductor connections against self-loosening.

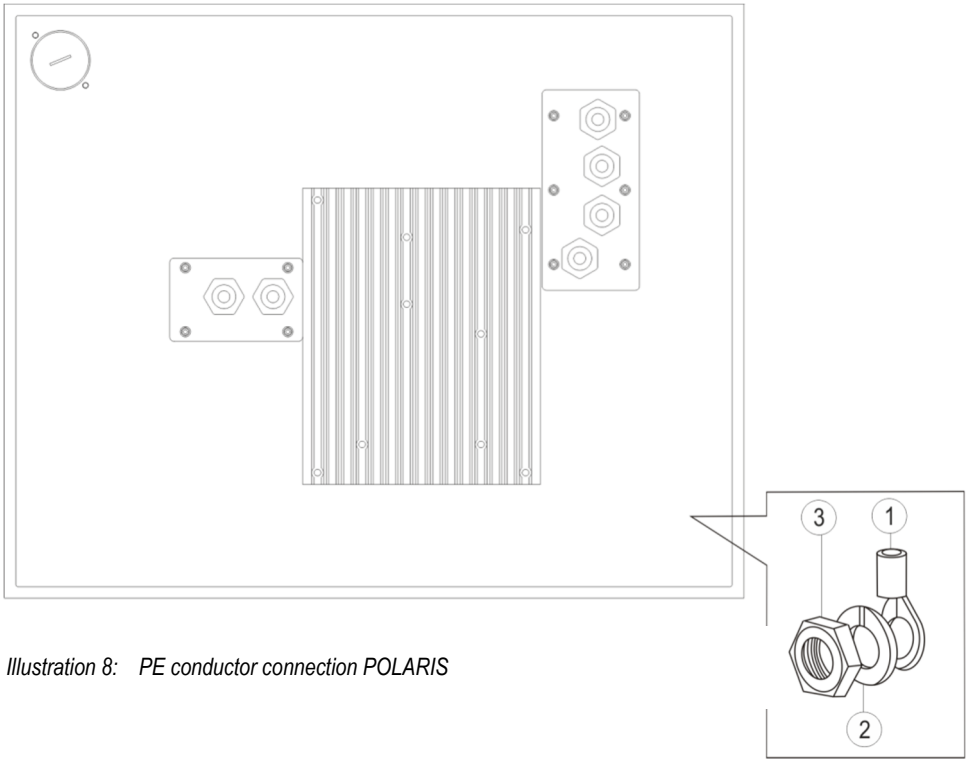


Illustration 8: PE conductor connection POLARIS

Work steps:

(1) Push non-sheathed cable with PE cable lug (1) on to earthing stud.

(2) Position spring washer (2) on threaded bolt and secure with hexagonal nut (3), max. torque: 2.9 Nm.

(3) Lay cable close to enclosure so that it cannot become loose.

ATTENTION

Device can be damaged by differences in potential!

- ▶ Avoid differences in potential (see Chapter 6.8.5)

6.6 Ex e terminal compartments

6.6.1 Cable entries

When connecting cables and leads to supplies / communications equipment in increased safety protected areas, Ex certified cable entries must be used which are suitable for each type of cable and lead. You must maintain the protection concept "e" and include a suitable sealing element so that an IP rating of at least IP 54 is maintained.

The terminal area of the M20 cable glands is printed on the cable glands.

A different terminal area may only be substituted with a cable gland that complies with the current version of the approval.

The assembly instructions and installation conditions for the cable glands must be observed.

Tightening torque of the cable glands:

Torque	Connecting thread	Nut
non-armoured cables	2.3 Nm	1.5 Nm
armoured cables	8 Nm	5 Nm

DANGER

Do not connect cables and leads when the power supply is active.
Danger to life exists in an explosive atmosphere!

- ▶ Disconnect the device before starting work.
- ▶ Only use certified cable glands that have been approved for the cable diameter of the connection cable.
- ▶ Unused cable glands must be sealed using an approved blanking plug.

6.6.2 Supply voltage terminal assignment)

Mains Connection Variant AC			
Terminal	**Interface**	**Signal**	**Remarks**
X10	Supply	L	AC 110 - 230 V ± 10 %
X11	Supply	N	Neutral
X12	Supply	PE	Protective earth

Mains Connection Variant DC 24 V			
Terminal	**Interface**	**Signal**	**Remarks**
X10	Supply	L	DC 24 V ± 10 %
X11	Supply	N	Neutral
X12	Supply	PE	Protective earth

6.6.3 Ethernet terminal assignment

Configuration Ethernet			
Terminal	**Interface**	**Signal**	**Remarks**
X13	Ethernet	RxD +	10BaseT Receive positive
X14	Ethernet	RxD -	10BaseT Receive negative
X15	Ethernet	TxD +	10BaseT Transmit positive
X16	Ethernet	TxD -	10BaseT Transmit negative

Assignment RJ45 plug for Ethernet to POLARIS terminal block

Connection RJ45		POLARIS
PIN	**Signal**	**Terminal**
1	TX+	X13
2	TX-	X14
3	RX+	X15
4	not used	
5	not used	
6	RX-	X16
7	not used	
8	not used	

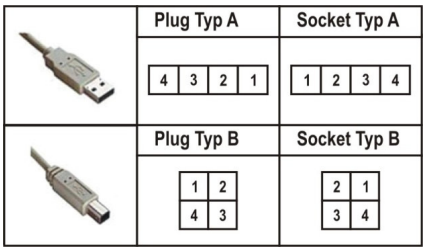
6.6.4 RS422 interface

Configuration RS422				
Terminal	**Interface**	**Signal**	**Remarks**	
X17 X18	Termination On/Off		Jumper between terminal X17 and X18 for activation of the terminator resistors	
X19	Interface COM 1	TxD B (TxD+)	Transmission cable	Input
X20	Interface COM 1	TxD A (TxD-)	Transmission cablel	Input
X21	Interface COM 1	RxD B (RxD+)	Receiving cable	Input
X22	Interface COM 1	RxD A (RxD-)	Receiving cable	Input

6.6.5 USB interface

Configuration USB		
Terminal	**Interface**	**Signal**
X17 - X22	not connected	
X23	USB	VCC +5 V
X24	USB	Data- USB data signal
X25	USB	Data+ USB data signal
X26	USB	GND

The individual conductors are colour-coded in a 4-wire USB cable as follows:



Panel PC	USB connection	Colour	Function
X23	1	RD	VCC (+5V)
X26	4	BK	GND
X25	3	GN	+ Data
X24	2	WH	- Data

The maximum length of a lead should not exceed 2 m.

Maximum current: 300 mA.

When configuration the HMI (Outside the Ex area) it is recommended to use an external USB HUB (USB 2.0) to work.

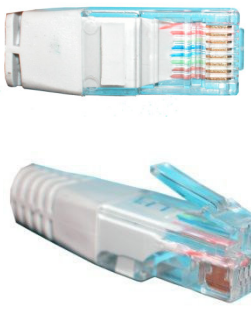
6.6.6 2 x Ethernet terminal assignment

Installation of a USB to Ethernet converter (No USB on Terminal)

Configuration Ethernet			
Terminal	**Interface**	**Signal**	**Remarks**
X13	Ethernet	RxD +	10BaseT Receive positive
X14	Ethernet	RxD -	10BaseT Receive negative
X15	Ethernet	TxD +	10BaseT Transmit positive
X16	Ethernet	TxD -	10BaseT Transmit negative

Configuration Ethernet 2 (USB to Ethernet Converter)			
Terminal	**Interface**	**Signal**	**Remarks**
X23	Ethernet	RxD +	10BaseT Receive positive
X24	Ethernet	RxD -	10BaseT Receive negative
X25	Ethernet	TxD +	10BaseT Transmit positive
X26	Ethernet	TxD -	10BaseT Transmit negative

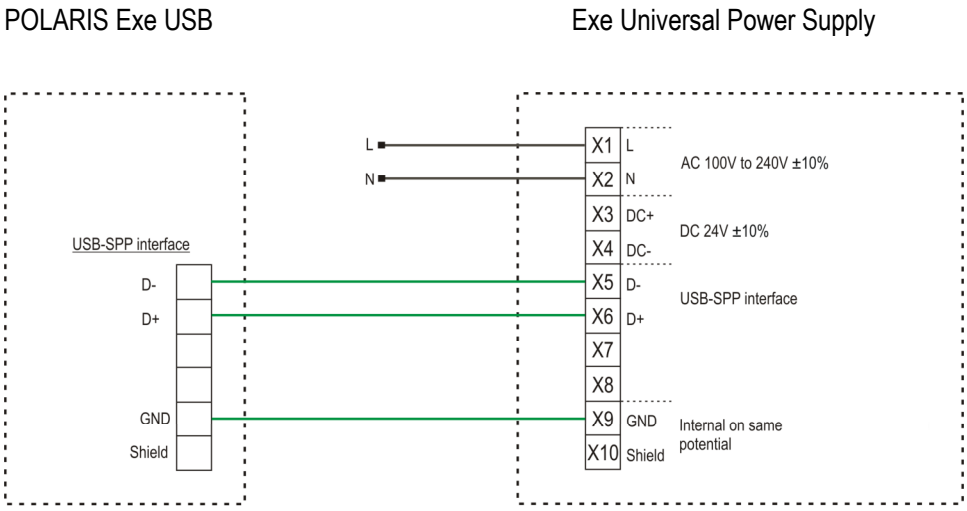
Assignment RJ45 plug for Ethernet to POLARIS terminal block



Connection RJ45		POLARIS
PIN	**Signal**	**Terminal**
1	TX+	X13
2	TX-	X14
3	RX+	X15
4	not used	
5	not used	
6	RX-	X16
7	not used	
8	not used	

6.6.7 Exe Universal Power Supply for Scanner Series BCS 36xx IS

Connation with Exe USB POLRIS.



6.7 Ex i terminal compartment

Do not connect the keyboard, mouse, trackball, touchpad, joystick or the hand scanner while the power supply is active.

DANGER

Accessories which have not been approved jeopardise the explosion protection. Danger to life exists in an explosive atmosphere!

▶ Only use POLARIS accessories!

The cover for the Ex i terminal compartment need not be used when deploying a protective enclosure with protection class of at least IP20.

6.7.1 Connection of Ex i keyboard to the POLARIS (optional)

PS/2 for input devices					
Terminal	**Interface**	**Colour**	**Signal**	**Remarks**	
X4	PS/2	WH/BR	VCC	Supply voltage	
X5	PS/2	GN/YE	GND	Mass connected to protective earth	
X6	PS/2	PK	KB_CLK	Keyboard	clock signal
X7	PS/2	GR	KB_DATA	Keyboard	data signal
X8	PS/2	BL	MS_CLK	Mouse	clock signal
X9	PS/2	RD	MS_DATA	Mouse	data signal

- Make the connection between the POLARIS Remote and the Ex i keyboard.
- Connection by means of a 1.80-metre-long connection cable
- Keyboard and mouse Type 05-0068-0163
- Keyboard and trackball/joystick Type 05-0068-0172
- Keyboard and touchpad Type 05-0068-0183

  (Optional: 3-metre-long connection cable)

6.7.2 Ex i USB interface for BARTEC Ex i memory stick

USB socket, 4-pole, Type A

ACHTUNG

Ex i-Schnittstelle ist nicht für USB-Geräte mit eigener Spannungsversorgung ausgelegt. Sachschäden durch unsachgemäße Handhabung!

▶ Keine USB-Geräte mit eigener Spannungsversorgung an Ex i-Schnittstelle anschließen.

Extension of the USB when using a protective enclosure (IP20)

The USB wall bushings on the protective enclosure must correspond at least to protection class IP20.

The following types of cable should be used for the extension (max. 2 m).

Cable name: Inline E258105 AWM STYLE 2725, 80°C 30V VW-1
28AWGX1P, 24AWGX2C; USB 2.0 High speed cable

6.7.3 Connection of a BARTEC BCS 160ex hand scanner (optional)

Do not connect the hand scanner when there is an active power supply.

Configuration of hand scanner connection (optional)

Terminal	Interface	Signal	Remarks
X1	Hand scanner	+UB	Supply voltage +5 V
X2	Hand scanner	RxD-I	Data input RS232-Signal
X3	Hand scanner	GND	Earth connected to protective ground

Intrinsically safe data and supply current circuits Terminal X1-X3	U_0	5.5	V
	I_0	440	mA
	P_0	1.25	W
	R_i	25	Ω
	C_0	55.8	µF
	L_0	0.2	mH

The BCS 160^{ex} hand scanner series can only be used with the original connection cable from BARTEC. (EOL 2019)

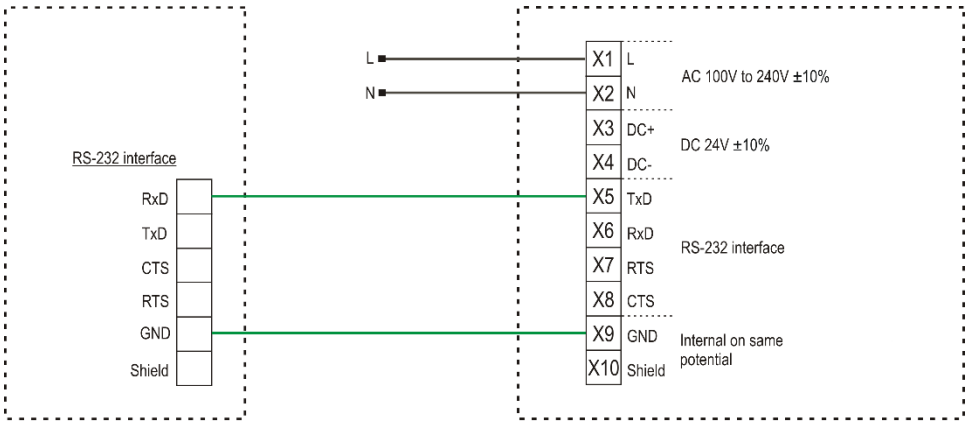
6.7.4 Connection Universal Power Supply Exi for BARTEC BCS 36xxex Series

Connection Universal Power Supply Exi (optional)			
Terminal	**Interface**	**Signal**	**Remarks**
X1	Hand scanner	+UB	Not connected
X2	Hand scanner	RxD-I	Data input RS232-Signal
X3	Hand scanner	GND	Earth connected to protective ground

Intrinsically safe data and supply current circuits Terminal X1-X3	U_0	5.5	V
	I_0	440	mA
	P_0	1.25	W
	R_i	25	Ω
	C_0	55.8	µF
	L_0	0.2	mH

POLARIS Exi

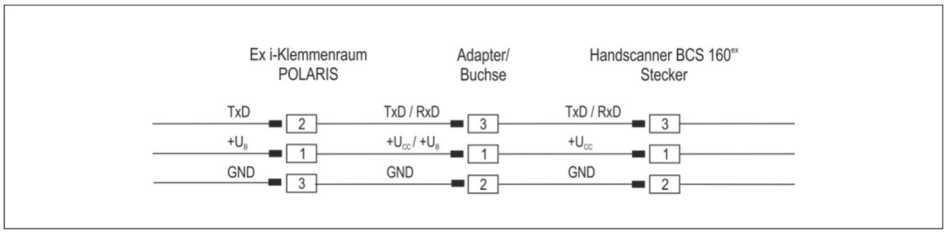
Exi Universal Power Supply



6.7.5 Replacement 160ex with connector to Universal Power Supply Exi

Terminal connection diagram:

BCS 160ex hand scanner to supply module by means of connector/adapter.



With an adapter cable type 05-0068-040 you can connect from the connector to the universal Power Exi for BCS 36 xx Series

6.7.6 Fibre-Optic Port (optional)

For the fibre-optic transmission a fibre-optic converter is used inside the POLARIS and it converts the Ethernet/IP to fibre-optic signals (Ethernet/IP Ex e connection is not required).

For transmission a converter of the same type is needed for the non-hazardous area. This is included in the scope of supply.

Technical Data

Connection of the POLARIS	ST connector
External fibre-optic converter	Connection of the ST connector/RJ 45 plug
Power supply	external power pack
Data rate	100 MBit/s
Permissible ambient temperatures Storage/transport Operation	 -20 °C bis +60 °C 0 °C bis +55 °C
Multi-mode Range Fibre type Min. transmitting power Min. sensitivity Wave length Plug connector	 up to 2 km 62.5/125 µm or 50/125 µm 19 dBm 31 dBm 1310 m ST (MS400161)
Single-mode Range Fibre type Min. transmitting power Min. sensitivity Wave length Plug connector	 up to 15 km 9/125 µm 15 dBm 31 dBm 1310 m ST (MS400163)

The POLARIS fibre-optic connection is approved for op pr. The following must be observed when installing.

⚠ DANGER

There is a risk of fatal injury in an explosive atmosphere!

- ▶ Protect the ST sockets from impact effects.
- ▶ Make sure the plug on the fibre-optic cable is connected or closed before you put the POLARIS into operation.
- ▶ The fibre optic cable must laid with protection. (e.g. robust cabling, protective tubes or cable channel)

6.8 EMC (Electromagnetic Compatibility)

This is a class A unit and can cause radio interference in residential areas; if it does, the owner/managing operator may be required to implement suitable measures and pay for loss or damage.

Only shielded conductors may be used as connecting conductors. This applies both to the data line and to all other conductors too.

The data lines must be stranded in pairs.
Example 2 x 2 x 0.75 mm² LIYCY TP.

As far as possible, separate conductors should be used for power supply and data

6.8.1 Voltage Supply (AC- and DC-Variants)

To supply voltage to the DC variant, it is necessary to use a regulated power supply unit with a power level of at least 5 A. The voltage supply at the place of installation may neither exceed nor drop below DC 24 V ± 10 %. Observe the voltage drop on the supply cable and correct if necessary.

The voltage drop in the DC variant of the supply line is calculated with the following formula:

ΔU	Voltage drop on the supply line at power supply voltage of DC 24 V	Max. 2.4 V
ΔU	Voltage drop on the supply line with maximum permissible mains adapter overvoltage DC 24 V +10 % (26.4 V)	Max. 4.8 V (until 10 % undervoltage is achieved)
I	Electricity for a POLARIS	At least 4 A
A	Cable cross-section of the supply line	
κ	Specific conductance of copper	$56\frac{m}{\Omega \cdot mm^2}$
l	Length of the supply line (consider both the outgoing and return line)	

$$R = \frac{l}{\kappa \cdot A} \quad R = \frac{\Delta U}{I} \qquad \Delta U = \frac{l}{\kappa \cdot A} \cdot I$$

If the voltage drop cannot be balanced out or the calculation produces excessive cable cross-sections, a separate mains adapter must be installed near the installation site.

Example: pressure-tight encapsulation or ex-free area on the outside of the building.

As a result of the connection of the power supply to the POLARIS, the earth for the power supply is connected to the PE. It is essential to ensure that the earth for the power supply on the POLARIS, if this is not electrically isolated, indicates no potential difference to the PE/PA.

6.8.2 Back-up fuse

The POLARIS Remote Zero Client is fused internally in the DC model with a 4 A slow-blowing fuse and with the AC model with a 1.6 A or 2.5 A slow-blowing fuse. The fuse may be triggered in the case of voltage breaks or under-voltage.

Internal fuse		I^2 value	External fuse	
Little fuse 1.6 A T	1500A@250VAC	6.83 A^2 s	Siba 1.6 A F	1500A@250VAC
			Siba 2.0 A F	1500A@250VAC
			Siba 2.5 A F	1500A@250VAC
Little fuse 2.5 A T	1500A@250VAC	22.29	Eska 1.6 A M	1000A@250VAC
			Eska 2 A M	1000A@250VAC

We recommend that the POLARIS is secured with a back-up fuse to avoid triggering the internal fuse in the device. The internal fuse can only be replaced by BARTEC.

Back-up fuse AC: 1.6 A slow-blowing (since June 2015: 2.5 A)
DC: 4 A quick-blowing.

The I^2 value is to be observed for other versions of the fuses.

6.8.3 Interference suppression

Certain basic measures must be taken to ensure freedom from interference when the POLARIS are installed:

- The interference voltages coupled into the device via power, data and signal line and the electrostatic voltage caused by contact are to be dissipated through the equipotential bonding.
- The installation point should be as far as possible away from fields of electromagnetic interference. This is especially important if there are frequency converters in the vicinity. Under certain circumstances will it be advisable to set up partitions to isolate the graphic display from interference.
- If inductive devices are fitted in the vicinity (e.g. contactor, relay or solenoid coils), especially if they are powered from the same source, protective circuits (e.g. RC elements) must be installed.
- Power supply and data cables must be laid so as to avoid interference. This can be achieved, for example, by avoiding laying such cables in close proximity to high-current carrying cables.

6.8.4 Shielding

- Only cables with braided shielding should be used (recommended cover density > 80%).
- Sheet shielding should not be used.
- Generally, connection of the shielding at both ends results in optimum damping of all interference frequencies.
- Connection of the shielding at one side only may be more advisable if a difference in potential exists and no equipotential bonding cable can be laid.

6.8.5 Connection of shielding

A low impedance connection to the circuit protective conductor is important to ensure a low current fault path. When sub-D connectors are used, the shielding should always be connected to the metal casing of the sub-D plug.

The plug casing of some controllers is not always well connected to earth. In such cases it may prove advantageous to insulate the shielding from the sub-D plug of the controller and connect it directly to the protective earth conductor by means of a cable that should be kept as short as possible (0.75 mm² …1.5 mm²).

6.8.6 Examples of Shielding Connections

ATTENTION

Device can be damaged by differences in potential!

▶ Avoid differences in potential.

Double-sided shield connection on the connecting cables:

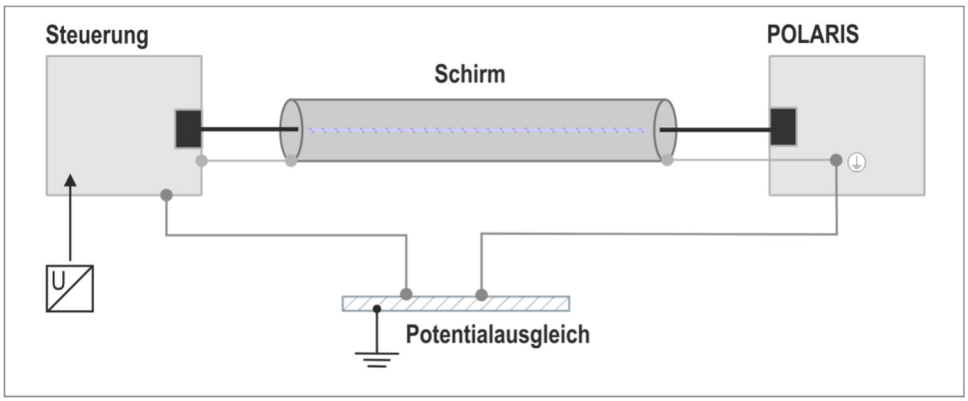


Illustration 9: Example of double-sided shield connection

Generally, connection of the shielding at both ends results in optimum damping of all interference frequencies. This method is to be recommended when there is good equipotential bonding between the individual units. In such cases it is possible to make use of the controller's voltage supply cable even if this is not electrically isolated.

Single-sided shield connection on the connecting cables:

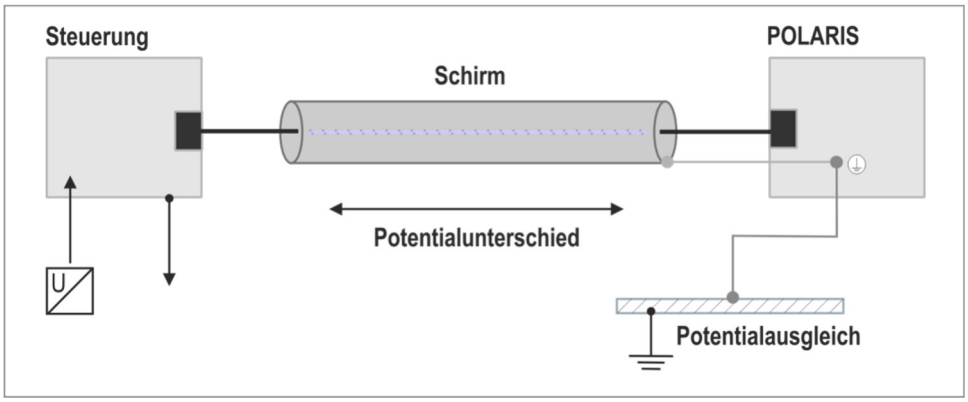


Illustration 10: Example of single-sided shield connection

Connection of the shielding at one end only is recommended when there is inadequate equipotential bonding, or none at all. In such cases an electrically isolated power supply unit must be used. Before the equipment goes into service the directions from the controller manufacturer regarding proper assembly and operation must be read carefully. They should then be applied taking full account of the recommendations we make here.

6.8.7 Ethernet cable

The Ethernet cable used an Industrial Ethernet cable (4-core, shielded CAT 5

As an example:

For highly flexible applications

Lapp: Type ETHERLINE® PN Cat.5 FD

For fixed application:

Eku: Type: Industrial Ethernet, 2YY(ST)CY 2x2x0,64/1,5-100GN

With 8- wire cable :

Unused wire must be grounded.

7. Commissioning

For electrical systems the relevant installation and operating specifications (e.g. Directives 2014/34/EU, BetrSichV and the applicable national ordinances, IEC 60 079-14 and the DIN VDE 0100 series) must be observed.

The operator of an electrical system in a hazardous environment must keep the operating equipment in an orderly condition, operate it correctly, monitor it and do the required maintenance and repairs.

Before commissioning the devices, check that all components and documents are there.

7.1 Final Inspection

Check the following requirements before commissioning the device:

Only open the ex e terminal compartment with terminals for the supply and data line(s) once it has been ensured that no potentially explosive atmosphere is present and that the power supply has been turned off.

POLARIS Remote

- Has the reinforcement frame between the bracket and enclosure been inserted?
- Is there no damage to seals, cable connections or glass panel?
- Are the supply and data line(s) correctly wired?
- Is the PE connection correctly earthed?
- Have the supply and data line(s) been tightened in the screw terminals?
- Are all terminal compartments closed?
- Have all cable glands been tightened and all open cable entries closed with blanking plugs?

Only start the POLARIS (if a potentially explosive atmosphere is present) once the final inspection has been carried out.

8. Operation

Once the final inspection has been carried out, the device can be put into operation.

The POLARIS series does not have any ON/OFF switch.

8.1 Operating system

After booting the device for the first time, it is necessary to have the configurations of the device set by the administrator.

ZeroClient is based on Windows 10 IoT Enterprise 1809 LTSC 32-bit full version. Two users are predefined in the operating system: "**Polaris**" and "**Kiosk**".

8.1.1 General remarks

The ZeroClient is a workplace client with reduced configuration tasks and security risks. The client protocol (RDP) contained in the ZeroClient is used for the interaction of the device with the external or company network. The ZeroClient does not perform any processing tasks itself, but enables remote access to an industrial server. Therefore, it is ready for use as delivered without any great work required on the part of the administrator. As the actual data processing is done by the industrial server, it is ensured that the ZeroClient is now able to cope with its task due to higher demands.

Bartec's ZeroClient solution is a comprehensive combination of operating system, configuration tool (ZeroClient Control Center) and integrated user interface (ZeroClient Shell).

8.1.2 Functions of the ZeroClient Concept

The "**Polaris**" user has administrator rights and thus has unrestricted access to the whole system. The administrator therefore has access to all operating system functions, applications and administration tools. The "**Polaris**" user must add the device to the company network with ZeroClient and possibly configure it according to company policies. If necessary, the "**Polaris**" user can adjust the ZeroClient Shell settings using the ZeroShell Control Center.

The "**Kiosk**" user has limited rights in the system (standard user). In addition, this user does not have access to a full Windows interface, as the account is set up in special Kiosk mode, the so-called single-app Kiosk mode. This mode permits a single application to be run. The ZeroClient Shell application is started as soon as the Kiosk user logs in. The "**Kiosk**" user cannot leave the ZeroClient Shell, and this prevents the user from accessing other desktop applications and system components.

The device contains a data carrier that is divided into two sections. The operating system is located on a read-only drive (C:). The ZeroClient Shell and the ZeroClient Control Center are located on the second open drive.

The write protection of the first drive consists of the Unified Write Filter (UWF) available for the embedded system. The UWF write protection thus protects the operating system against unintentional manipulation and changes by users or malware. All write operations on this drive are redirected to an overlay memory (RAM) during operation. The data stored in the overlay memory are reset on restart.

UWF is already set up on delivery (system drive protection is preset), but is in a deactivated state. It is recommended to activate the UWF immediately after configuring the network. The easiest and fastest way is to use the settings in the ZeroClient Control Center (see ZeroClient Control Center description).

8.1.3 ZeroClient Shel

The ZeroClient Shell is a proprietary alternative to the Windows Explorer desktop with integrated simple and secure management. The ZeroClient Shell represents the minimal configuration required for the user's workflow. The configuration comes with only a few features, such as access to terminal servers via Remote Desktop Protocol (RDP). However, the range of functions can be extended by administrators at any time.

8.1.4 Tile Quick Start Bar

In the middle area of the interface there is a tile quick start bar, which allows the user to start an application or execute a system function by clicking / touching. The tile appearance offers an intuitive operation of the device. All tiles are marked with a pictogram and a label. Each pictogram symbolically corresponds to an application or a system function. The tile quick start bar is designed for frequently used functions and applications and therefore contains up to five tiles.

Figure 2: ZeroClient Shell: Tile Quick Start Bar

The quick start bar contains three tiles on delivery: RDP client, virtual keyboard, and device restart. The administrator can configure the bar, add other applications and functions, and hide the existing ones.

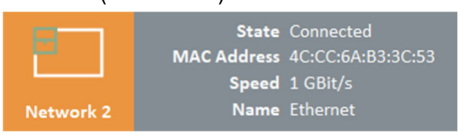
8.1.5 Info-Center

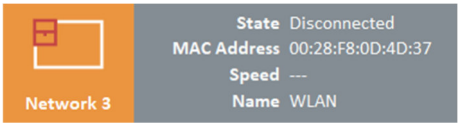
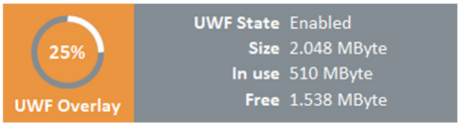
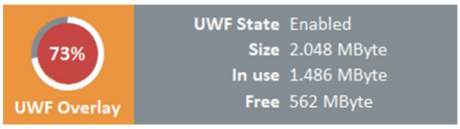
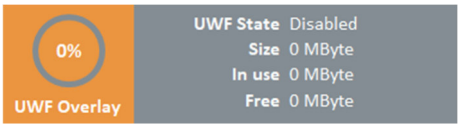
The ZeroClient Shell also has an Info Center. Other important applications, functions and in-box functionalities of the ZeroClient Shell can be accessed using the Info Center. The ZeroClient Shell displays the Info Center by clicking or swiping (on a touch screen device) from the right edge of the screen to the inside,.

Figure 3: ZeroClient Shell: Info Center

8.1.6 Widgets

Widgets are to be found in the top part of the Info Center. These are graphical help elements that provide a quick overview of system information. The widgets available in the ZeroClient Shell include the clock, the display of the network status or the current memory consumption of the device. The widget information can be displayed at any time. All widgets always show the current information, which is updated every second.

Widgets:	Function
Date and time: 	Display of the current time and date
Network (connected): 	Display of the current network state. The following information is displayed: - Connection state - MAC address of the adapter - Connection speed - Type of connection (e.g. Ethernet or WLAN)

Network (disconnected): 	The name of the network adapter is also displayed in the pictogram area (as it is stored in the operating system). The connection state can be easily derived from the pictogram: if the adapter is connected to the network, the connector symbol is green. Otherwise, the icon remains red.
System memory:  System memory (critical): 	Display of the total memory consumption. The following information (in MByte) is displayed: - Total size of the working memory - Memory in use - Available working memory The part of the used working memory is displayed as a percentage of the total size in the pictogram area. If the available working memory is no longer sufficient, the colour of the pictogram changes to red.
UWF state:  UWF state (critical):  UWF state (UWF inactive): 	Display of UWF state and RAM overlay. The following information (in MByte) is displayed: - State of the filter - Total size of the RAM overlay - RAM overlay in use - Available RAM overlay The pictogram area shows the part of the used overlay memory as a percentage of the total RAM overlay size. If the available overlay memory is no longer sufficient, the colour of the pictogram changes to red.

Info: If the device has more than one adapter, the network widgets for each adapter are displayed separately in the Info Center.

Info: If less than 64MByte RAM is free, a corresponding message is displayed on the ZeroClient Shell interface.

Info: If less than 32Mbyte of RAM is free, and therefore not sufficient, the device will be restarted automatically. The user will also be informed by a message.

Info: If the RAM overlay is occupied in excess of the set "UWFWarningOverlayThreshold", a corresponding message is displayed on the ZeroClient Shell interface.

Info: If the available overlay memory is no longer sufficient or is occupied in excess of the set "UWF Critical Overlay Threshold", the device will be restarted automatically. The user will be informed by a small message.

8.1.7 Tile-System menu

A tile system menu is located in the bottom area of the InfoCenter. It is a fixed part of the ZeroClient Shell. The buttons in the tile system menu allow access to other applications, system or ZeroClient Shell functions.

8.1.8 Application

The first button in the page frame system menu is "Applications" () - it switches the display of the Info Center or shows all applications available to the user:

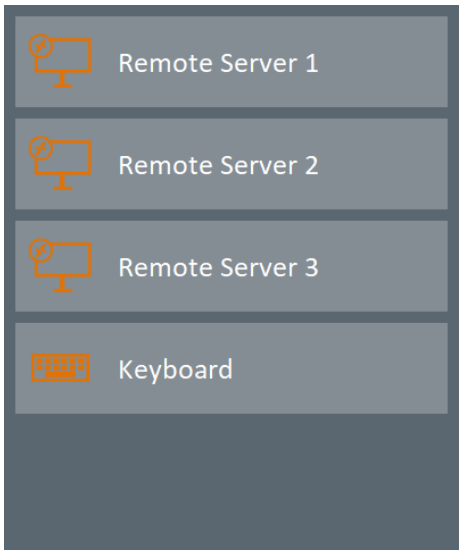


Figure 4: Info Center: List of Available Applications

8.1.9 System Functions

The "system functions" button () also switches the display of the Info Center or shows all system functions available to the user:

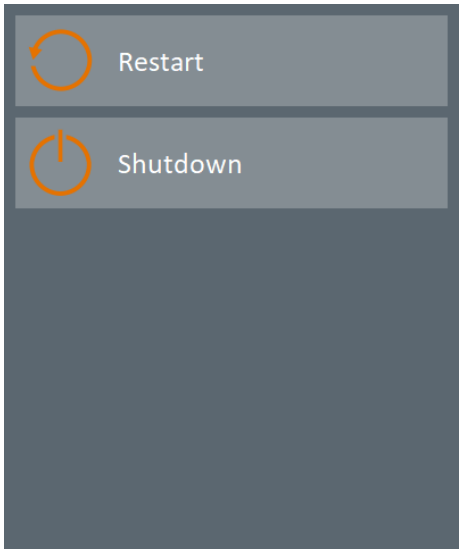


Figure 5: Info Center: List of Available System Functions

8.1.10 Switching to Administrator Mode

The "Switch to Administrator Mode" button () is intended for switching between users for service purposes. Switching to the administrator account is password-protected. The default password is "12345". When entering the password, the dialog shows "asterisks" instead of the password.

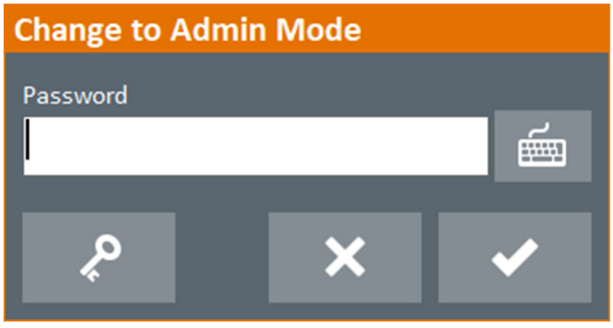


Figure 6: Password Entry Dialog

The "**Kiosk**" user logs out after successful entry, confirmation (button ) and checking the password. The operating system changes to so-called lock screen mode. Entering the password of the administrator account ("**Polaris**" user), enables the operating system to be unlocked for service again.

The mode is not switched if cancelled (button ) or an incorrect entry is made. An error message is displayed if an incorrect entry is made.

There is a button () that is responsible for password administration or password change in the left area of the password entry dialog. The current password is entered and the button clicked. In the new dialog a new password must be entered (to avoid typing errors, the new password must be confirmed in the last field). Finally, the ZeroClient Shell checks and verifies the entries.

In addition, the password entry dialog has its own keyboard. It can be accessed by pressing the corresponding button () (if a physical keyboard or Windows on-screen keyboard is not available). The embedded keyboard has the full English layout.

8.1.11 Language Switching

The language for texts and labels in the ZeroClient Shell interface is switched using via the button "Switch Language" (). The language is switched in the following dialog:

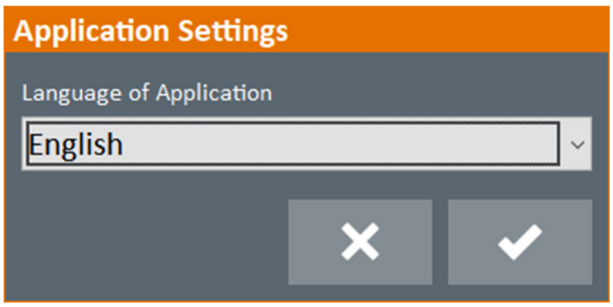


Figure 7: Language Switching Dialog

To switch a language, a language is selected in the selection box and the selection confirmed with the button
(). The selected or set language is effective immediately after confirmation.

If cancelled (button ) the language is not switched.

8.2 ZeroClient Control Center

The ZeroClient Control Center is available to the Polaris user for parameterisation of the ZeroClient Shell. The application allows the ZeroClient Shell interface to be precisely aligned to the needs in the categories applications, system functions and widgets. In addition, the ZeroClient Control Center offers the management of the UWF: switching the system on or off as well as putting it into service mode.

There is a menu bar in the top part of the application, which provides access to the above mentioned functionalities via the tabs. The tab already selected is highlighted in colour.

8.2.1 "Apps" Tab"

The tab contains all categories of the interface that are needed for the design of the ZeroClient Shell. The individual functionalities are grouped in the respective areas.

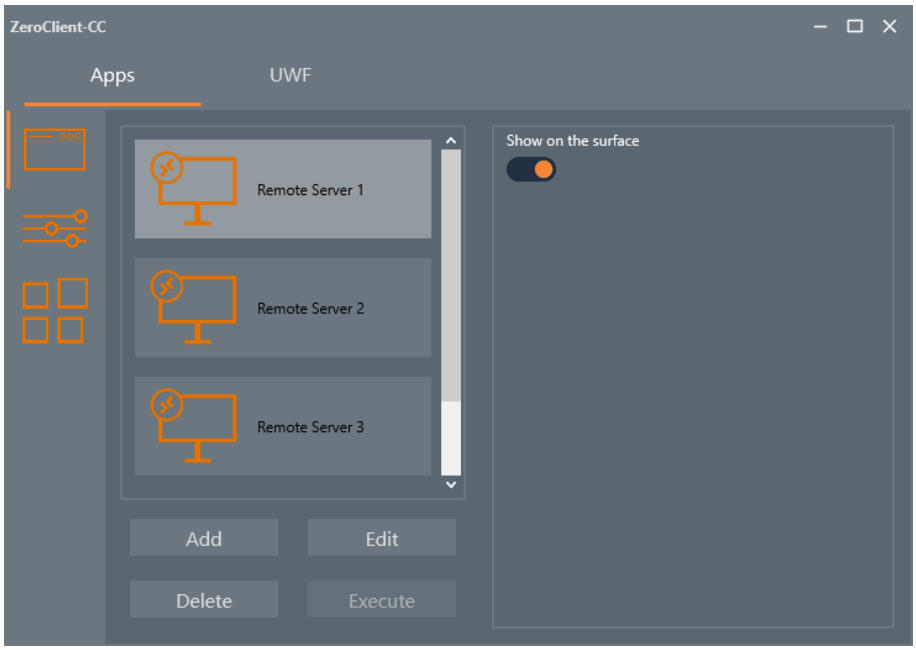


Figure 8: ZeroClient Control Center: Apps Applications

Switching between categories is done in the left horizontal navigation menu. The categories are displayed graphically in the form of pictograms. The category already selected is highlighted in colour.

Category / Pictogram	Function
Applications 	List of applications that are installed on the system and can be selected from the ZeroClient Shell. The administrator can manage the list of applications without restrictions or add, edit or remove applications.

System functions 	List of system functions (such as restarting the system). The system functions are an integral part of the ZeroClient. The administrator can therefore determine the placement of the system functions or show or hide the system functions.
Widgets 	List of widgets (such as monitoring of the RAM). The widgets are a fixed part of the ZeroClient. The administrator can therefore determine the placement of widgets or show or hide the widgets.

8.2.2 Structure of the element list

All available elements (applications, system functions or widgets - depending on the category) are listed on the left side of the application window. The order of the elements in the list can be adjusted using drag and drop if necessary. The buttons for adding, editing and deleting elements are located below the list. The right area contains the options for quickly adjusting the elements. The settings are saved automatically (without prompting). Currently only one option ("Show on the surface") is available - it allows the element on the interface to be shown or hidden.

8.2.3 Applications

On delivery, only a few applications that are necessary for commissioning are predefined in the ZeroClient. The administrator therefore has three RDP clients (the other connections can be created) and a virtual keyboard at his disposal.

Application / Pictogram	Function
RDP client 	Execution of the Windows RDP client (mstsc.exe) with appropriate configuration (per connection).
Virtual keyboard 	Execution of the Windows virtual keyboard (osk.exe) on systems without a physical keyboard.

8.2.4 Inserting a New Application

The administrator can add a new application to the ZeroClient at any time. This is done by clicking / touching the "Add" button. All relevant fields must be completed in the displayed form.

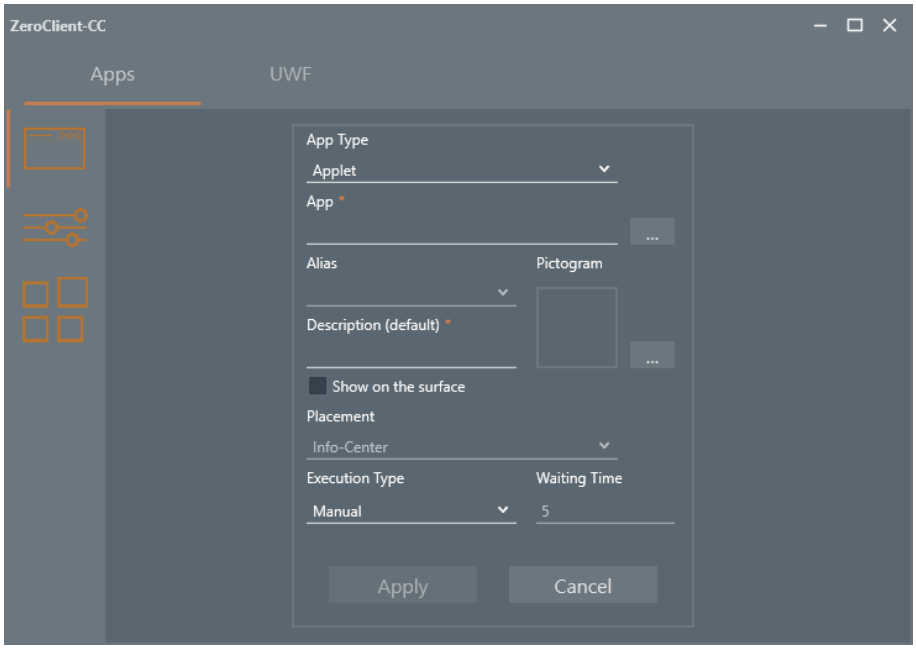


Figure 9: ZeroClient Control Center: Apps - Adding a New Application

“App Type" field - to specify the type of application that corresponds to the actual application type. The following types are supported by ZeroClient:

Applet - to run a Windows applet (e.g. "Date and Time")

Application - to run Windows desktop and console applications.

SnapIn - to run a SnapIn extension via MMC (Microsoft Management Console). This type is only intended for cases where the user may be allowed to change some settings of the operating system.

"App" field - to set the application path. The path can be entered manually or selected via the Windows dialog (by clicking / touching the button ...).

"Description" field - to set the displayed name of the application.

"Pictogram" area - to select the pictogram. The selection is made via the Windows dialog by clicking / touching the button ... .

NB: Two pictograms in the sizes 64x64 and 256x256 pixels are required as PNG files to display new applications on the ZeroClient Shell interface properly. The two pictograms

must first be copied to the D:\Bartec\ZeroClient\appsymbols directory and then selected from there.

NB: If the path is invalid or empty, a no image icon is displayed at the location ( ).

Checkbox "Show on the surface" - to define whether the application is shown on the ZeroClient Shell surface.

"Placement" field (selection box) - to determine in which area the application should be displayed. The field is only active if the checkbox "Show on the surface" is checked. The following variants are supported by ZeroClient:

Info Center - the application is only displayed in the float area of the interface.

Info Center and Tiles Area - the application is displayed in the float area as well as in the middle area of the interface (for frequently used elements).

"Execution Type" field - to determine how the application will be executed when the ZeroClient Shell is started. The following variants are supported by ZeroClient:

Manual - the application can be run manually by clicking / touching the corresponding button.

Automatic - the application is executed automatically by the ZeroClient Shell. If the application is closed, it can be executed again manually by clicking / touching the corresponding button.

"Waiting Time" field - to set the delay when the application is executed on starting the ZeroClient Shell interface. The field is only active if the "Execution Type" field is set to "Automatic".

After filling out the fields, the addition of the new application must be confirmed with the "Apply" button. After confirming the request, the new application will be added to the list.

If cancelled ("Cancel" button), the new application is not added.

8.2.5 Editing Applications

All applications in the application list can be edited if necessary. This is done by clicking / touching the "Edit" button. A form as shown in Figure 9 is displayed. The fields in the form are filled out as they are defined when the application is added. All fields can be edited.

After editing, the changes must be confirmed with the "Apply" button. After confirming the request, the changes are added to the list.

If cancelled ("Cancel" button), the changes are not applied.

8.2.6 Deleting Applications

Any application can be removed from the list. This is done by clicking / touching the "Delete" button. After confirming the request, the application is removed from the list.

8.2.7 System Functions

A list of selectable system functions supported by the ZeroClient is provided under the heading "System functions". System functions are not applications, but native system selections of the functionalities provided by the operating system.

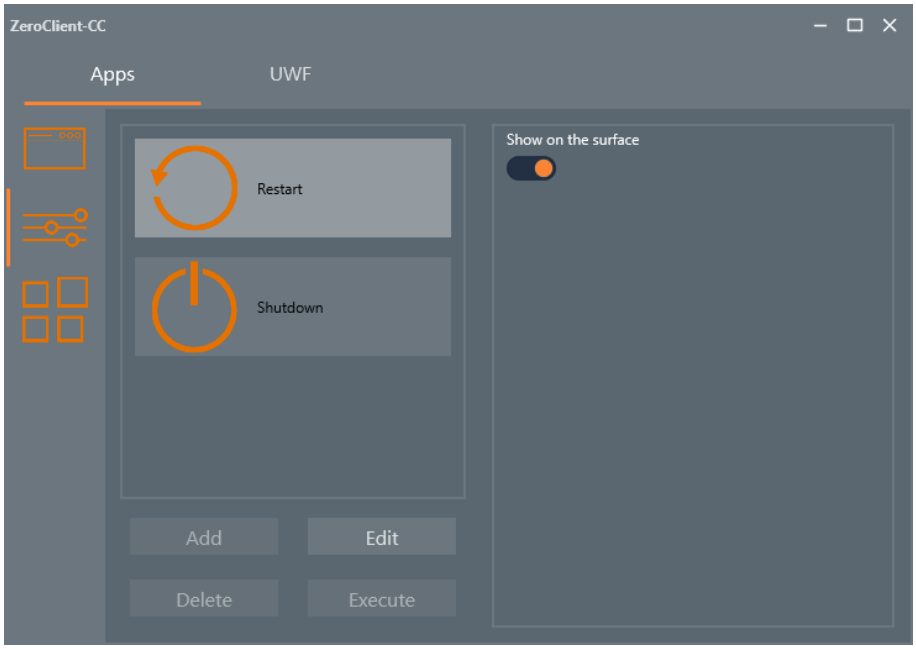


Figure 10: ZeroClient Control Center: Apps - System Functions

System function / Pictogram	Function
Restart 	Restarting or rebooting the system
Shutdown 	Shutting down or switching off the system

The system functions are very closely linked to the operating system and require native support of the ZeroClient. Therefore, the administrator has no possibility to define a new function. An already predefined function cannot be deleted from the list either.

8.2.8 Editing System Functions

The editing of a system function is also limited to a minimum. Editing is done by clicking / touching the "Edit" button. The limited form will be displayed.

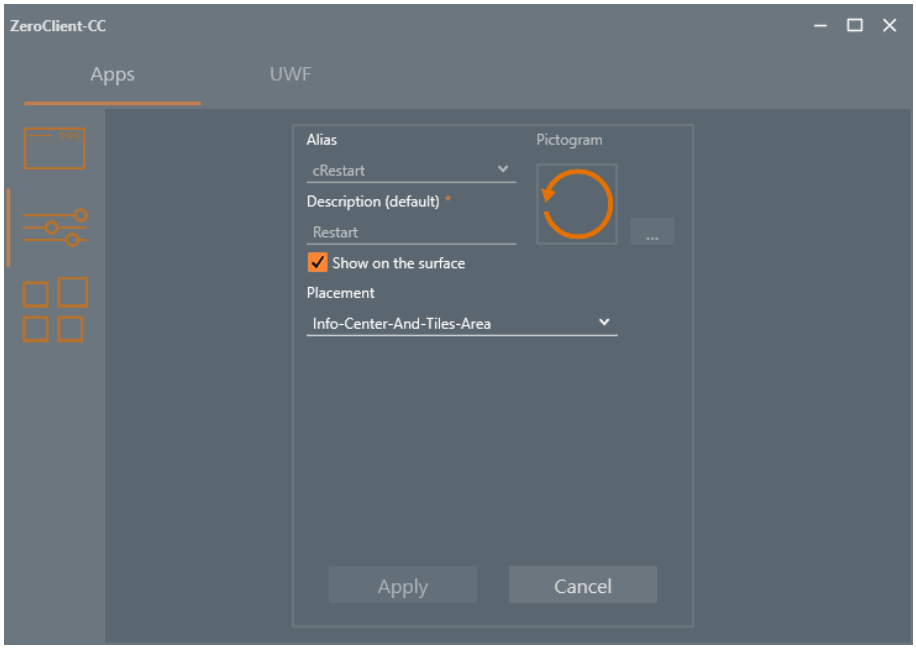


Figure 11: ZeroClient Control Center: Apps - Editing System Functions

The description or the name of the function is defined by so-called aliases. The actual description can be found in the corresponding language file. The "Alias" and "Description"

fields cannot be edited. The pictogram is also permanently linked to the function and is not editable.

However, the administrator can determine whether the functionality is displayed in the ZeroClient Shell interface ("Show on the surface" checkbox) or in which area of the ZeroClient Shell interface the function is displayed ("Placement" checkbox).

After editing, the changes must be confirmed with the "Apply" button. After confirming the request, the changes are added to the configuration.

If cancelled ("Cancel" button), the changes are not applied.

8.2.9 Widgets

The widgets available to the ZeroClient are listed in the last category. The widgets are only shown symbolically. The widgets are actually displayed in the ZeroClient Shell (see chapter 3.2.1).

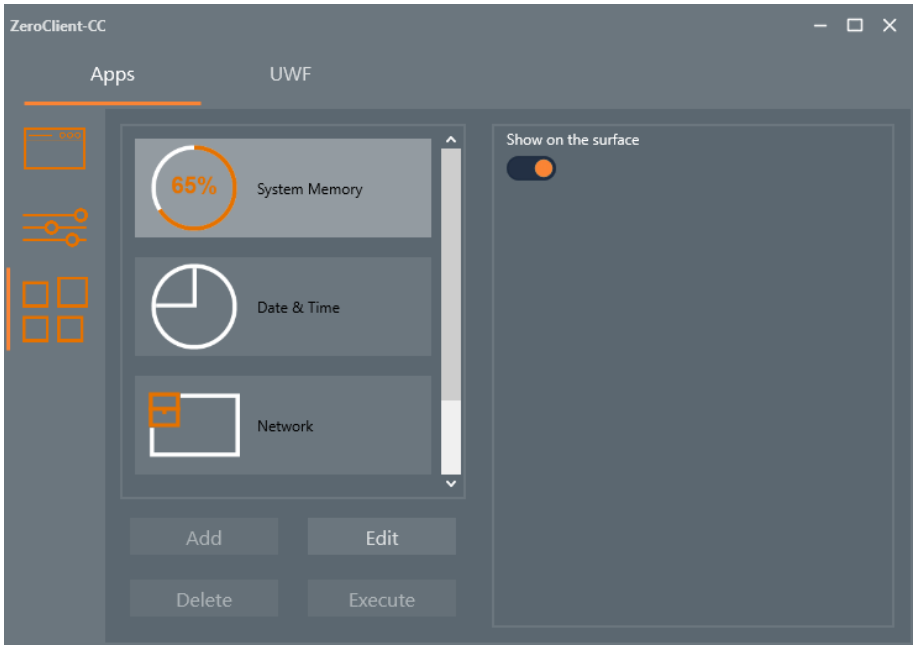


Figure 12: ZeroClient Control Center: Apps - Widgets

Similar to the "System functions" category, the administrator has no possibility to define new widgets or delete the existing ones.

Widgets are edited by clicking / touching the "Edit" button. This will display the simplified form where the administrator can only determine whether the widget is shown or hidden in the ZeroClient Shell interface ("Show on the surface" checkbox).

After editing, the change must be confirmed with the "Apply" button. After confirming the request, the changes are added to the configuration.

If cancelled ("Cancel" button), the change is not accepted.

8.2.10 "UWF" Tab

The UWF is already set up for the system drive when delivered. However, the UWF is in a deactivated state. If necessary, the protection or filter can be switched on or off from the ZeroClient Control Center.

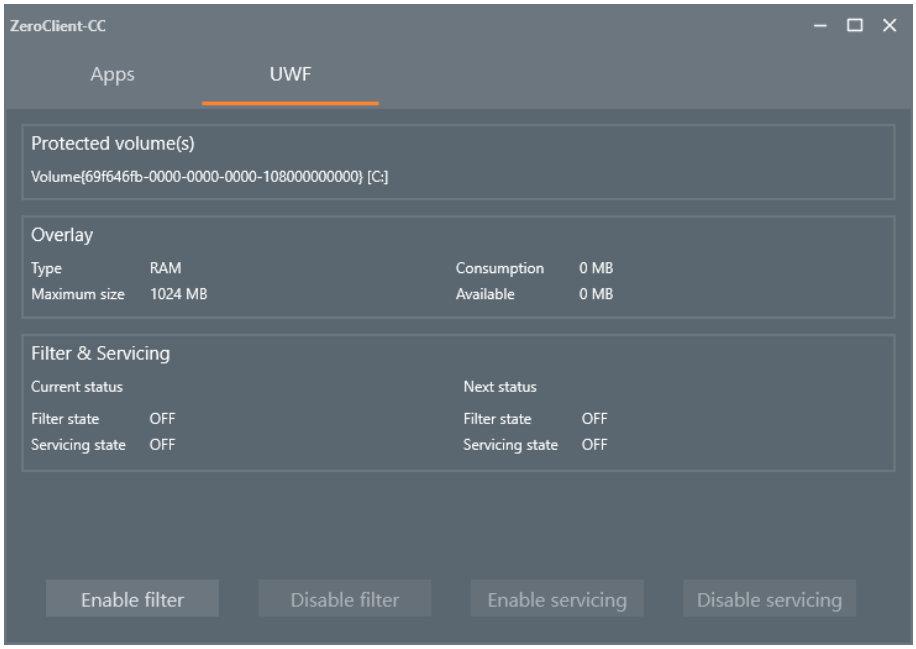


Figure 13: ZeroClient Control Center: UWF - UWF Protection as Delivered

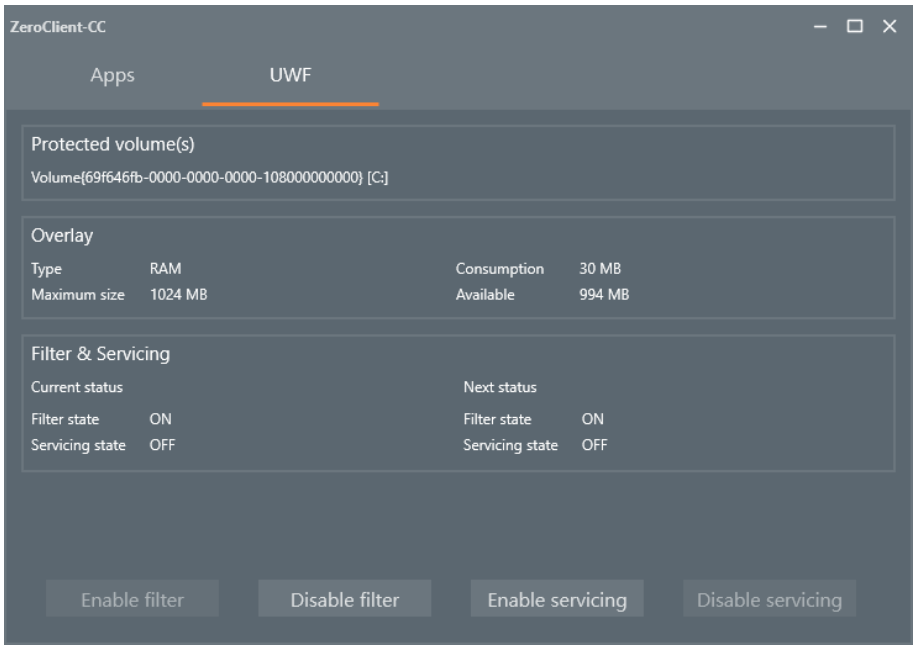


Figure 14: ZeroClient Control Center: UWF - System with Active UWF Protection

The "Protected volume(s)" field shows the drives that are already set up for protection. When delivered, the C: drive is already configured for protection.

The Overlay area provides information about the current UWF memory status. The Overlay type used is shown in the Type field. All ZeroClient devices use the "RAM" type, which redirects write accesses to the RAM. The total size of the RAM overlay is shown in the "Maximum size" field. The memory of the RAM overlay already occupied is shown in the "Consumption" field. The memory of the RAM overlay which is still available is shown in the "Available" field.

Info: More information about overlay memory can be found on the Microsoft website at the link: https://docs.microsoft.com/en-us/windows-hardware/customize/enterprise/uwfoverlay

The "Filter & Servicing" area displays information about the filter status of the current session and the filter status of the next session (after restarting).

The "Filter state" fields show the status of the filter (ON / OFF). The "Enable filter" and "Disable filter" buttons can be used to enable or disable the protection. The changes are only effective after restarting the system. If the protection is already active for the next session, the "Enable filter" button is inactive. Otherwise, the "Disable filter" button is inactive.

A UWF service mode is provided in the UWF design to install Windows updates (critical updates, security updates, and driver updates). When the UWF is active, system updates are normally disabled. When the UWF service mode is triggered, the operating system deletes the entire UWF overlay, restarts the device, disables the UWF filter, and checks for Windows updates. When servicing is complete, the UWF filter is re-enabled and UWF protection continues. If the UWF protection is already active for the next session, the "Enable servicing" button is active. Otherwise, the "Enable servicing" button is inactive. If the UWF service mode is activated by mistake, it can be undone using the "Disable servicing" button.

Info: More information about the UWF service mode is available on Microsoft's website at the link: https://docs.microsoft.com/en-us/windows-hardware/customize/enterprise/service-uwf-protected-devices

8.3 Network setup

The TCP/IP settings of all BARTEC panel PCs with Windows operating system are preconfigured for the DHCP network environments. The DHCP server therefore automatically assigns a valid IP address to the device. If the DHCP is already used in the network, the TCP/IP settings do not have to be changed on the device.

Info: If the network does not automatically assign TCP/IP settings, they must be entered manually. This also applies if the device must be assigned a fixed IP address outside of the DHCP range.

TCP/IP settings are changed in the operating system in the network settings dialog. The settings dialog can be accessed by clicking the Windows start button in the lower left corner of the desktop. To access the settings, the cog button must be selected in the start menu.

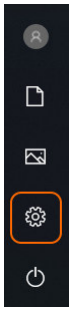


Figure 1. Start menu

In the opened Windows settings window, the option "Network & Internet" must be selected.

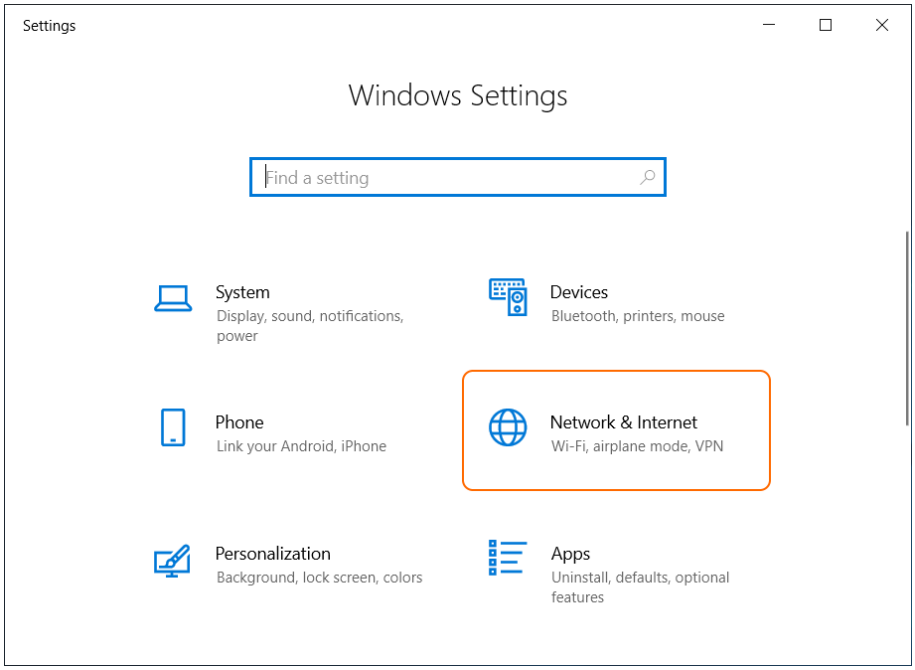


Figure 2. Windows settings

For an Ethernet connection, the "Ethernet" option must be selected in the left menu. The right area of the dialog shows the current status of all available Ethernet network adapters. Below the status display there are further options for configuring the connection or the network adapter. Continue by selecting the "Change adapter options" option.

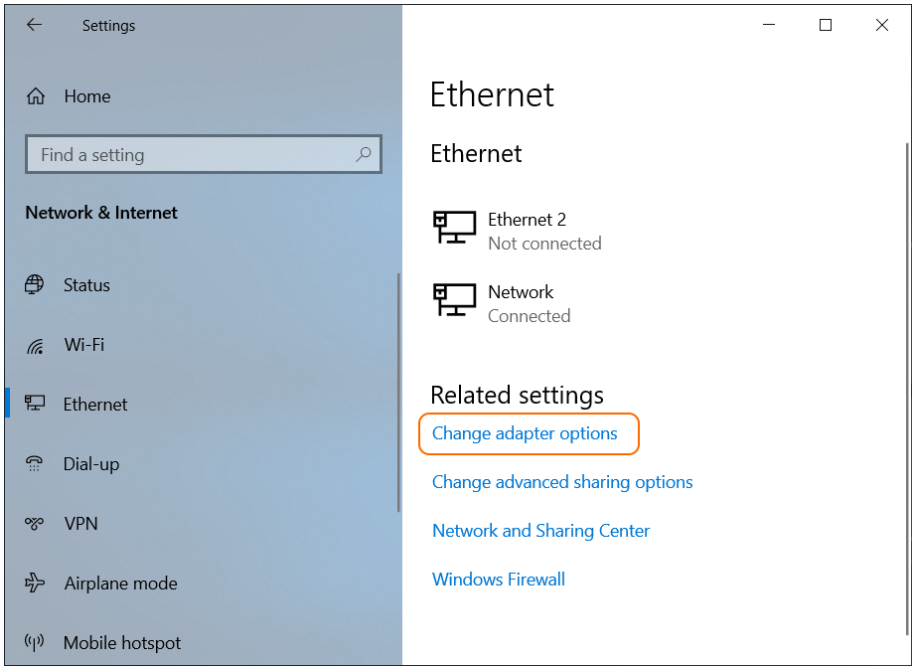


Figure 3. Windows settings: Ethernet

If you have a Wi-Fi connection (e.g. with a USB Wi-Fi smart device connected), you must select the "Wi-Fi" option in the left menu. The right area of the dialog shows the current status of the connected Wi-Fi network adapter.

If a connection has not yet been established, the option "Show available networks" must be selected.

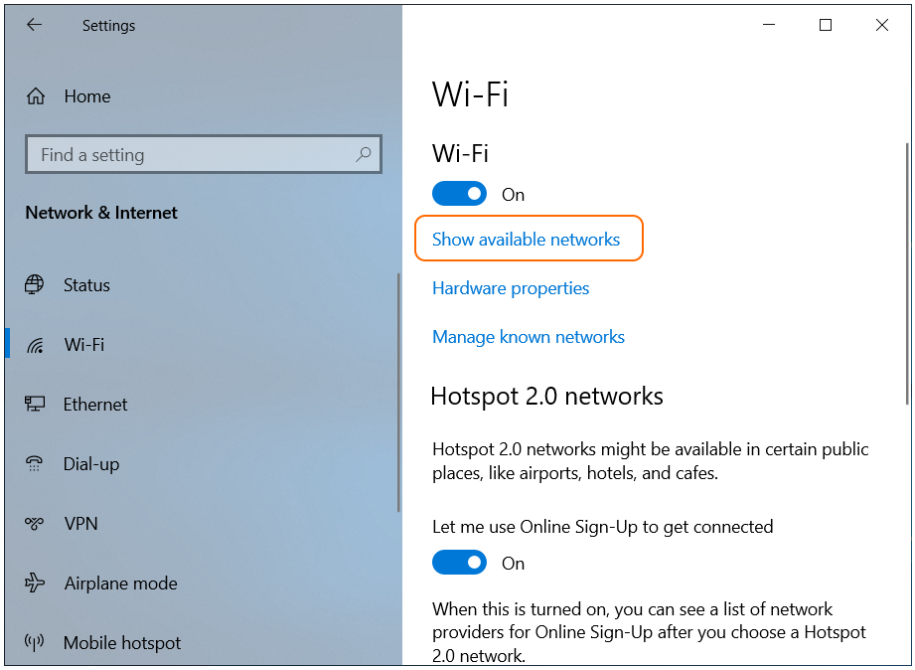


Figure 4. Windows settings: Wi-Fi

A new window with currently available Wi-Fi networks will appear in the lower right area (called the Windows notification area) of the desktop:

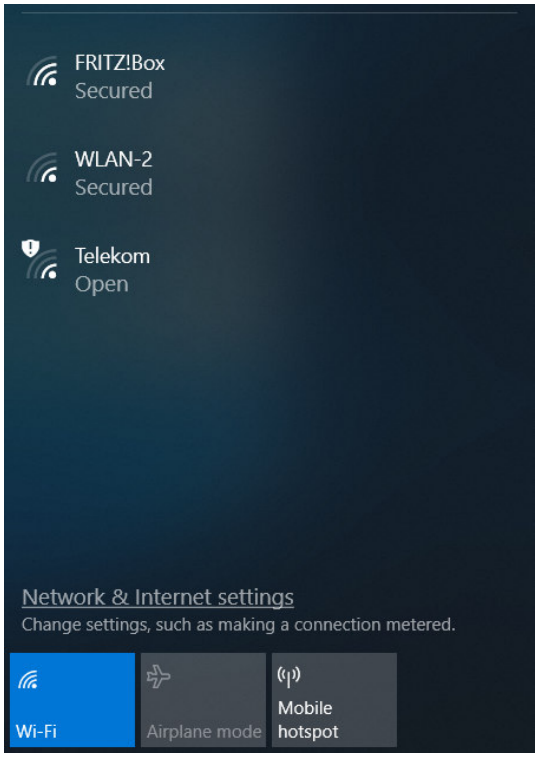


Figure 5 Windows notification area: WiFi

Here, the desired network or access point must be selected. After entering the password or security key (if necessary) and confirming the "Next" button, the connection to the access point is established.

If a Wi-Fi connection has already been established, further options for configuring the connection or the Wi-Fi network adapter are found in the lower section of the "Wi-Fi" dialog. Continue by selecting the "Change adapter options" option.

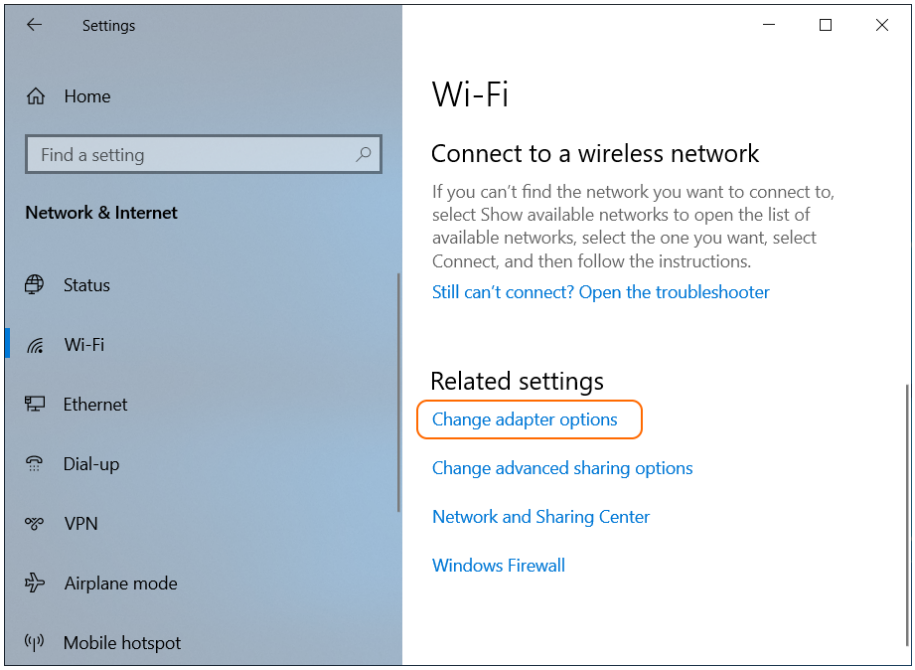


Figure 6. Windows settings: Wi-Fi (related settings)

The new "Network Connections" dialog shows all network adapters available to the device:

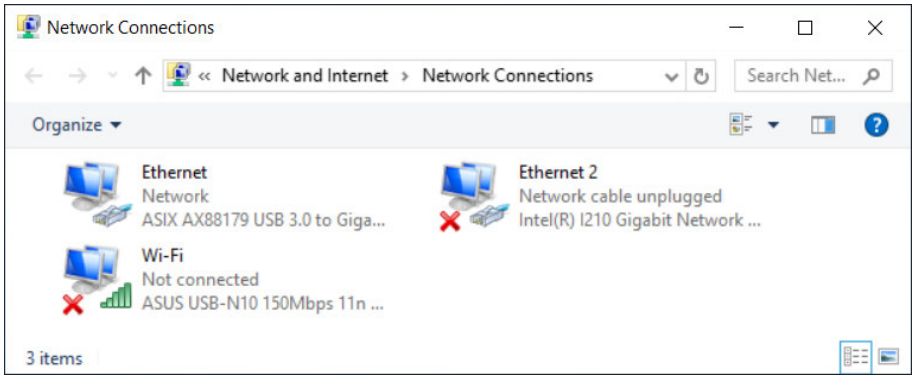


Figure 7. Network connections dialog

Info: Number of network adapters available to the device may vary depending on the device type and connected USB smart devices.

The desired network adapter must be selected in the dialog. Double-click the adapter symbol to open the status dialog of the selected adapter.

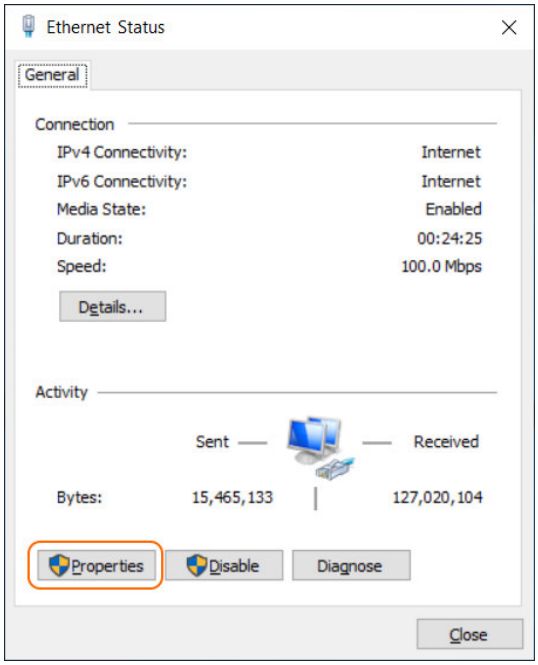


Figure 8. Network adapter connection status

All properties of the adapter are listed in the next dialog. Continue with the "Properties" button to the properties dialog.

In the properties dialog, select the TCP/IP protocol used (TCP/IPv4 or TCP/IPv6) and continue with the "Properties" button.

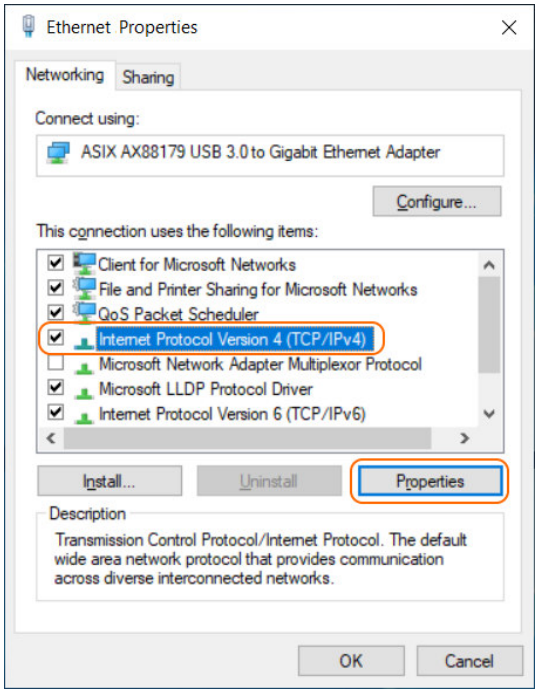


Figure 9. Network adapter properties

All devices with Windows operating system are set up for a network with an active DHCP server in delivered state. This means that the settings for the IP address and the address of the DNS server are set to "Obtain automatically".

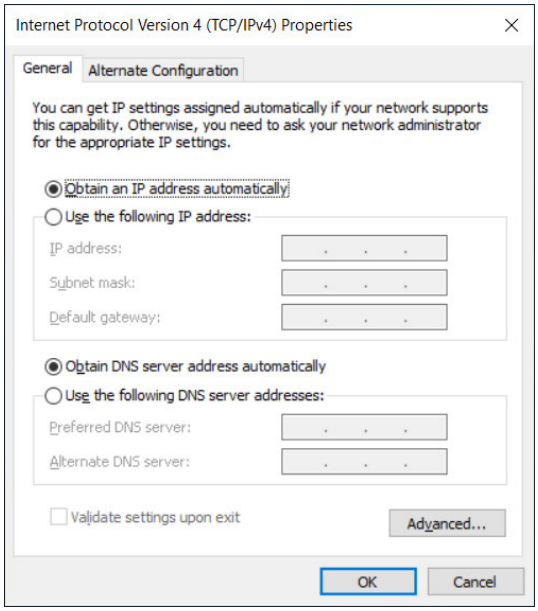


Figure 10. TCP/IPv4 protocol settings for the network adapter (factory default)

To change the IP address or to assign a fixed IP address, the "Use the following IP address" button must be clicked. The IP address, subnet mask and default gateway fields must be filled in manually. The "Use the following DNS server addresses" button must also be clicked. The IP address of the DNS server (and the IP address of the alternative DNS server if necessary) must also be filled in manually.

Finally, the changes must be confirmed with the "OK" button.

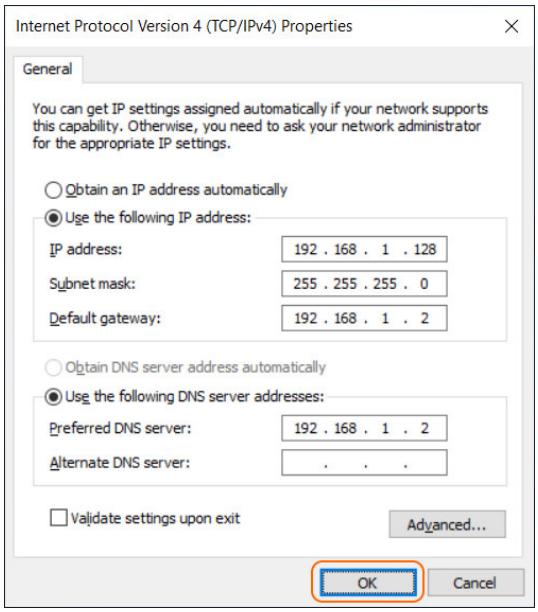


Figure 11. TCP/IPv4 protocol settings for the network adapter (manually changing IP or DNS server addresses)

8.4 Setting up RDP connections

8.4.1 Enabling RDP connections in the Zero Client Control Centre

In delivered state, up to three remote connections can be configured and activated "out-of-the-box" in the Zero Client Control Center. The RDP connections are located on the "Apps" tab under the "Applications" heading. The default names of the connections are "Remote Server 1", "Remote Server 2" and "Remote Server 3".

The "Remote Server 1" connection is already active on the Zero Client Shell interface. This connection is also pre-configured to start automatically when the Zero Client starts up.

The other two connections are disabled for the Zero Client Shell interface, but they can be enabled with the "Show on the surface" toggle switch.

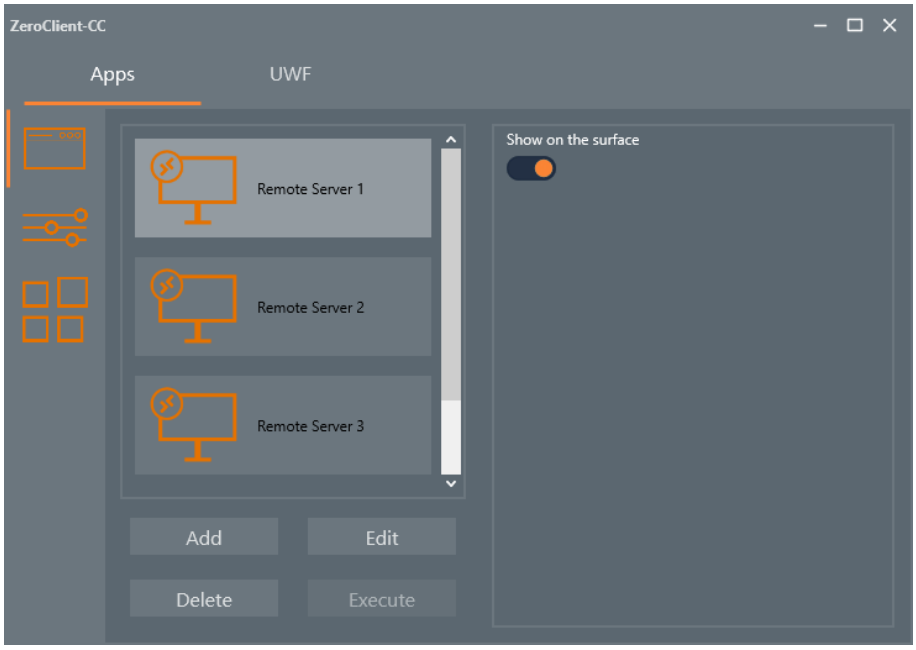


Figure 1. Zero Client Control Center: RDP connections

Further settings can be accessed by selecting the "Edit" button. In the displayed form, the RDP connection can be renamed or configured for automatic execution when the system is booted, for example.

After editing, the changes must be confirmed with the "Apply" button. After confirming the request, the changes are added to the list.

The changes are not applied on cancelling ("Cancel" button).

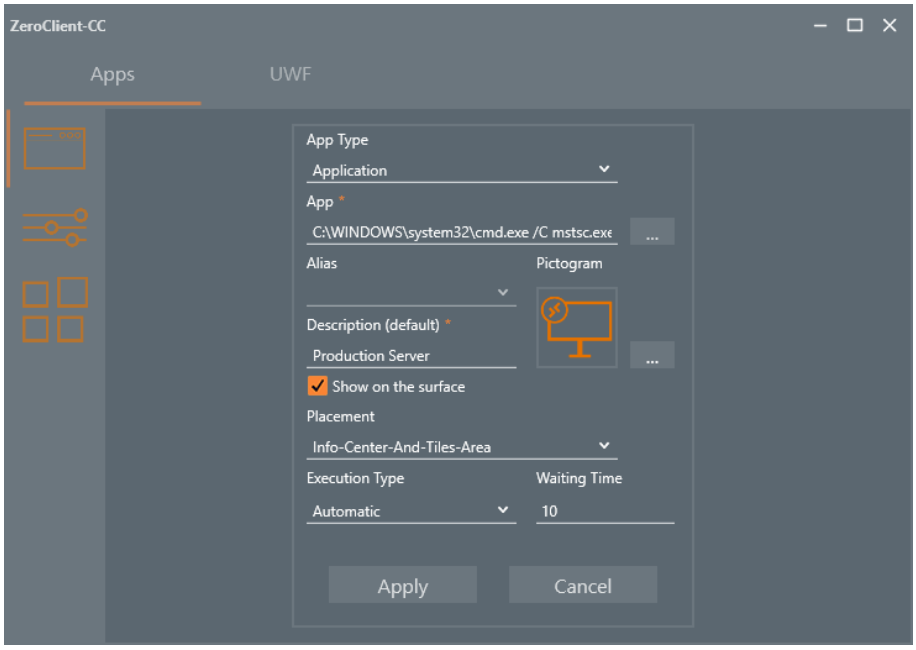


Figure 2. ZeroClient Control Center: editing the RDP connection

Info: All options of the editing form are described in detail in Section 8.2.5 "Editing Applications".

8.4.2 File storage

Each RDP connection has a remote desktop connection configuration file (.rdp file) linked with it, located on the D:\ drive under the path "D:\Bartec\ZeroClient\data".

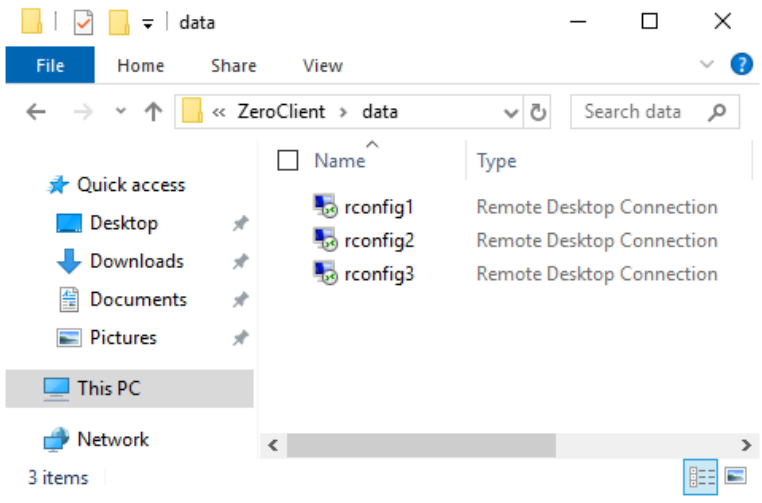


Figure 3. Explorer: storing .rdp files

Info: The "App" field of the edit form contains the path (C:\Windows\System32\mstsc.exe) to the RDP client. After this path, the path to the .rdp file is transferred to the RDP client as a parameter

The complete path is as follows: "C:\Windows\System32\mstsc.exe D:\Bartec\ZeroClient\data\rconfig*.rdp". If the configuration is saved in another file, the path must be adjusted accordingly.

8.4.3 Settings for automatic login

In the Zero Client Control Center, each RDP connection can be configured to run automatically on booting. To additionally enable automatic login to the server, some settings in the configuration file and in the system must be changed and saved (see section 8.4.4).

8.4.4 Checking the UWF status

The Unified Write Filter (UWF) must already be switched off before any change is made to the system settings so that the change can be saved permanently. To enable and disable the protection, you need administrator rights in the system. The change of the filter status can therefore only be made by the "Polaris" user.

The current UWF protection status can be viewed or modified in the Zero Client Control Center. If protection is active, the filter status of the current or next session will show ON. The 'Disable filter' button can be used to set the filter to inactive for the next session.

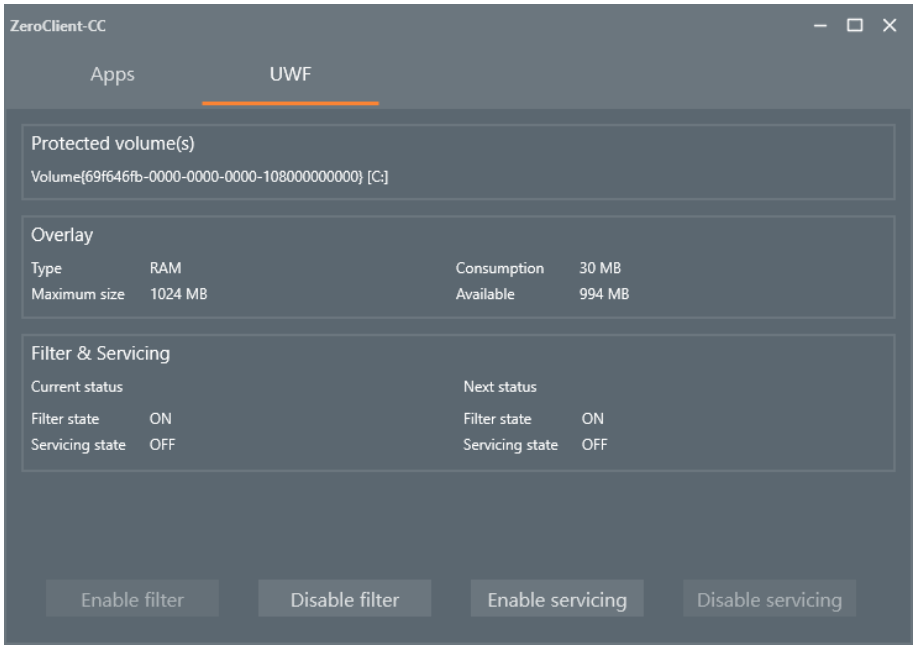


Figure 4. Zero Client Control Center: UWF system with active UWF protection

Info: The changes in protection are effective only after the system restart.

Info: All functions and fields of the UWF tab are described in detail in paragraph 8.2.10 " UWF tab".

8.4.5 RDP settings

When the connection is started, the RDP client's "Remote Desktop Connection" dialog appears first. To show the other options of the dialog, the "Show Options" button must be clicked.

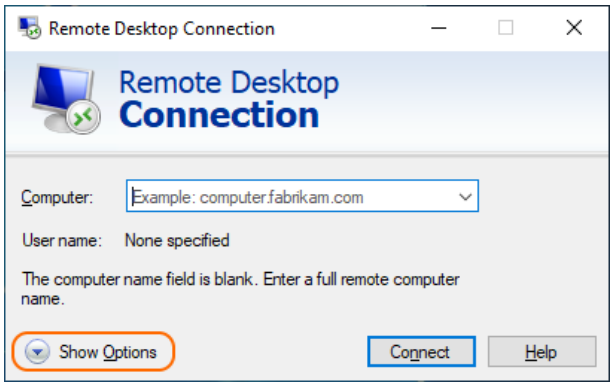


Figure 5. RDP client

The IP address or name of the remote computer must be entered in the "Computer" field. The user name (incl. domain if applicable) must be entered in the "User name" field. The checkbox "Allow me to save credentials" must be checked to save the credentials permanently.

After entering the IP address or the name of the remote computer, the configuration must be saved in the corresponding .rdp file. To do this, click the "Save" button in the lower part of the dialog.

Continue with the "Connect" button.

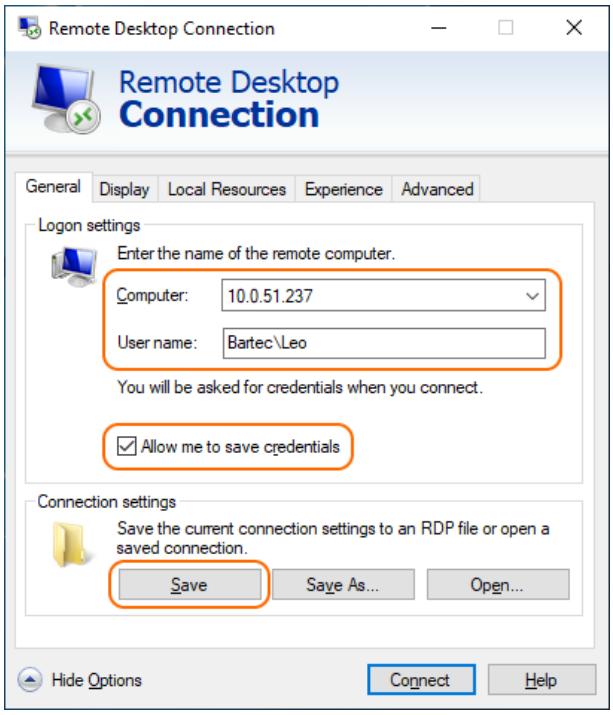


Figure 6. RDP client: advanced view

In delivered state, the RDP configuration files are not signed. If the files still do not have a digital signature, a dialog like the one shown in Figure 7 will appear when the connection is established. The "Don't ask me again for connections to this computer" checkbox must be checked so that the dialog is no longer displayed by the system,. Continue with the "Connect" button.

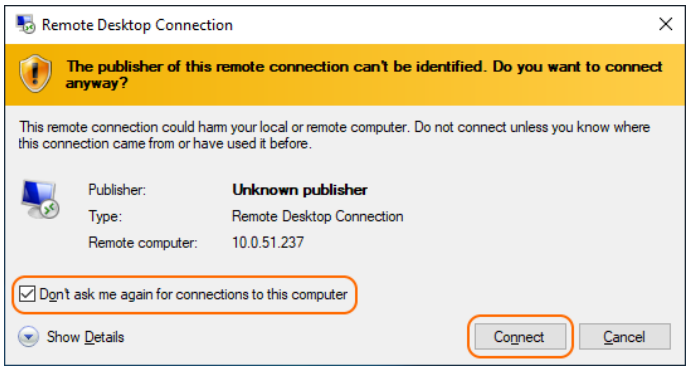


Figure 7. RDP client: security warning

Info: More information about "Digitally signing an RDP file" can be found on Microsoft's website under the link: https://docs.microsoft.com/en-us/windows-server/administration/windows-commands/rdpsign

If the "Allow me to save credentials" checkbox in the RDP client (see Figure 6) is checked, the system will prompt you to save the credentials. In the next dialog, data already entered, such as the IP address of the remote computer and the user name, will appear. The user's password must be entered in the empty field. With the option "Remember me" the login data can be saved permanently in the operating system database.

Info: When the login data is saved in the operating system database, the login information is saved linked to the user account. The login or password must therefore be entered by the "Kiosk" user.

After entering the password, check the option "Remember me" and continue with the "OK" button.

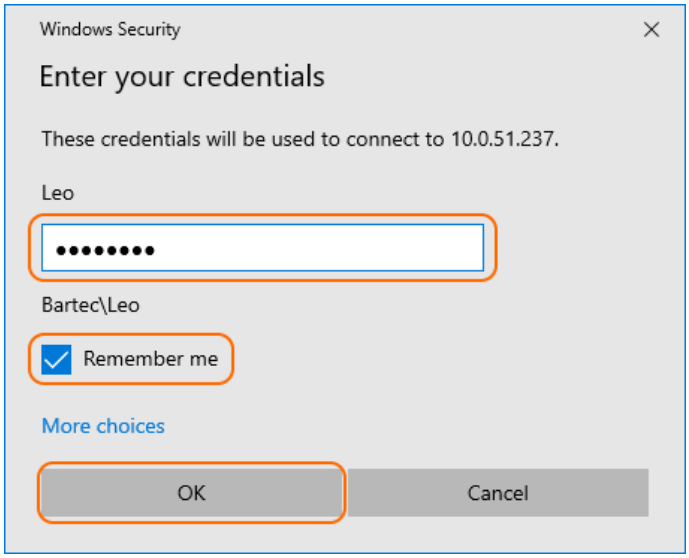


Figure 8. Saving login data

The RDP client now attempts to connect to the remote computer. It usually takes only a few seconds to establish the connection.

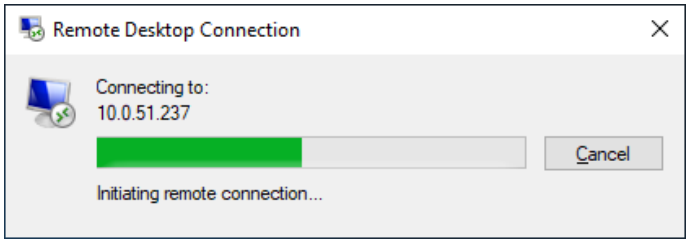


Figure 8. Establishing the connection

If the remote computer does not have a valid certificate from a public CA for its host name, a warning dialog appears when the connection is established (because the self-signed certificate is not accepted by the client). If there is no way to assign a new certificate to the remote desktop service, the RDP client allows you to bypass certificate validation. To do this, the option "Don’t ask me again for connections to this computer" must be checked in the dialog. After confirming the "Yes" button, the connection to the remote computer is successfully established.

Figure 9. Certificate validation dialog

8.4.6 Checking the UWF status

After establishing the connection or saving login data in the operating system database, the UWF protection must be reactivated. This can be done by the “Polaris” user in the Zero Client Control Center.

Info: The changes of protection are effective only after the system restart.

9. Recovery

9.1 Bartec Recovery Solution

The Bartec HMI Polaris Smart devices are equipped with an On-Board-Recovery solution. The Bartec Recovery is a software package preloaded on the devices which serves the disregard of the device in the work state. In case of a mistake every device can be booted up in the Recovery mode to move afterwards the operating system into the work state.

No other software is necessary for the restoration. The Recovery service already disposes of all necessary program routines or the Recovery-Wizard to play in the operating system anew. The process can be carried out any time if necessary also on site. The duration of the process amounts approx. 25 minutes.

Start of the device in the Recovery mode

To change in the Recovery mode, one must press the F6 key while booting up the device. This possibility is available for approx. 10 sec. During this time the announcement "**Press F6 key to start Bartec Recovery"** appears on the screen.

ATTENTION

All data on Windows partition are definitely extinguished during the recovery of process!

▶ All self-provided data or use data should be protected from starting the recovery.

For the Recovery mode the hard disk contains a hidden partition to the storage of the Recover engine and the image file (effigy of the operating system). If the Recovery partition exists not any more or is damaged, the device can be restored only from an external medium or USB Flash drive.

The hidden partition is approx. 10 GB. That's why the available storage space on the hard disk is lower than the given capacity.

Recovery surroundings

The Recovery mode bases on a slender Windows operating system or so-called PE surroundings (Windows Preinstallation Environment). Besides, Windows starts only with a basic equipment of services and drivers.

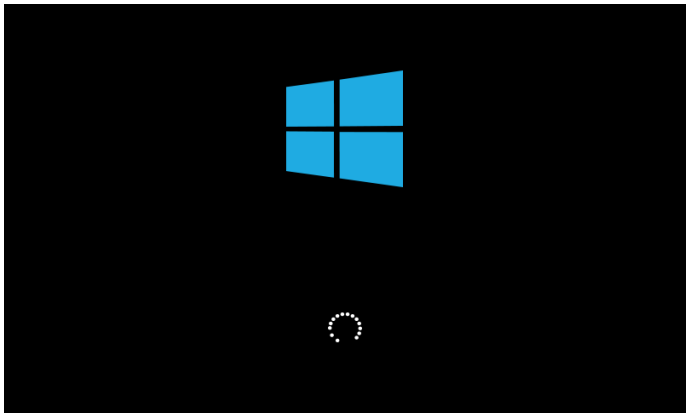


Illustration 11: Start Windows PE.

As soon as the surroundings are completely loaded and are ready for use, the Recovery engine will check in the background whether the applications necessary for the device, tools and drivers exist. All information about internal expiries is indicated in the window CMD.

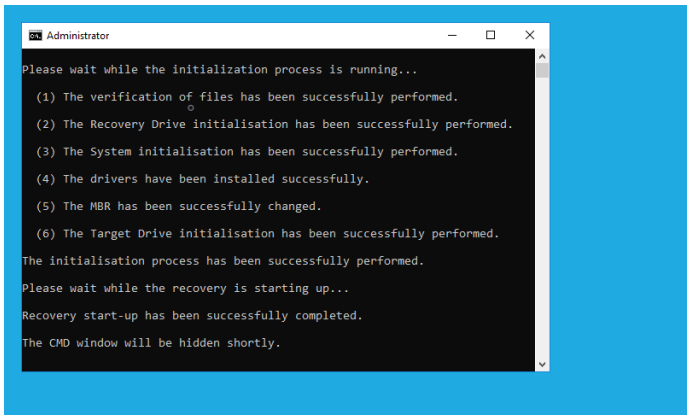


Illustration 12: CMD window with information

Recovery application

Should the check be concluded successfully, the Recovery application is begun (besides, the window CMD is automatically closed). Before the restoration of the device in the work state must be agreed Microsoft software Licence terms interactively.

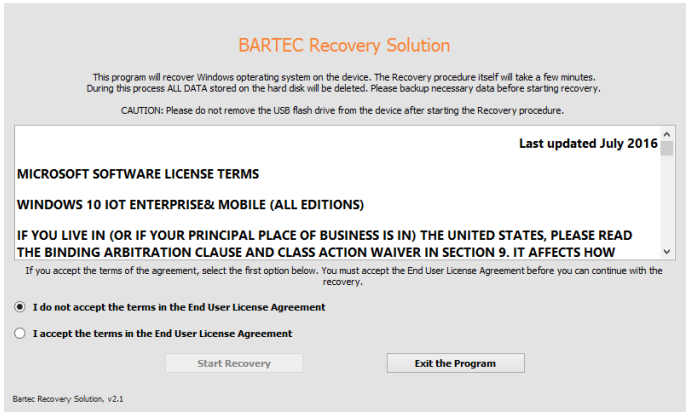


Illustration 13: Licence terms

To accept the licence terms, the option **"I accept the terms in the End User License Agreement"** must be activated or be selected. The button "Start Recovery" is released enclosed. With confirming the Recovery process is begun.

All other pictures in the instructions refer to Recovery of Windows 10 IoT Enterprise of operating system. In case of the restoration of Windows 7 Embedded Ultimate or standard of operating system the pictures look similar. Besides, all background expiries are identical, with the differences it is only about inscriptions.

The operation (navigating over window, selecting and activation of tax elements etc.) takes place via keyboard input and mouse or Track ball-Clicks as well as by Touch.

In the next window all available Recovery functions are listed. In the upper area of the window there is information about the operating system which is played in by the Recovery programme. In the middle area there are the Recovery functions. Should all conditions be given, the function is active. Otherwise the function remains inactive.

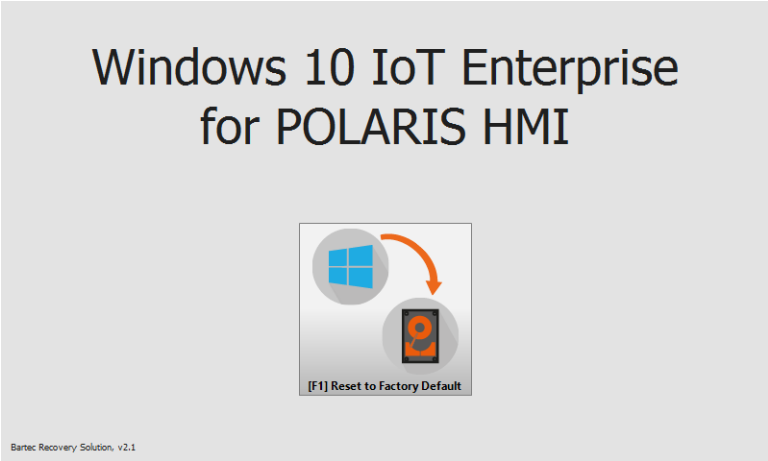


Illustration 14: Choice of functions

Device can be reset to factory settings

Restoration in the work state

With confirming the function with all matching background processes is begun immediately or without following security queries.

ATTENTION

With starting the restoration of the operating system in the work state all data on the operating system partition get lost!

▶ Contents and format of all other partitions on the hard disk are preserved consistently.

In the upper area of the window the inscription of the well-chosen function is indicated. In the next line – the inscription of the already running background process. Should a process be computable, the proportional issue appears in the next line how far the process is already concluded. As a rule all time-luxurious processes are computable. The progress beam in the middle of the window returns the graphic picture of the percent value. For the processes without percent issue the progress beam is indicated in the uncertain form.

ATTENTION

All background processes are automated completely, therefore no intervention is necessary. In addition, some background processes run in s. g. Single fashion or they are sensitive to the other parallel processes and to Interrupts of external periphery devices!

- ▶ To avoid the interruptions of all kind, should take place during the process no keyboard input, mouse, track ball-Clicks as well as no touching of the screen.

The Recovery begins with verifying (Calculate and comparisons of the test sum) to the available effigy file.

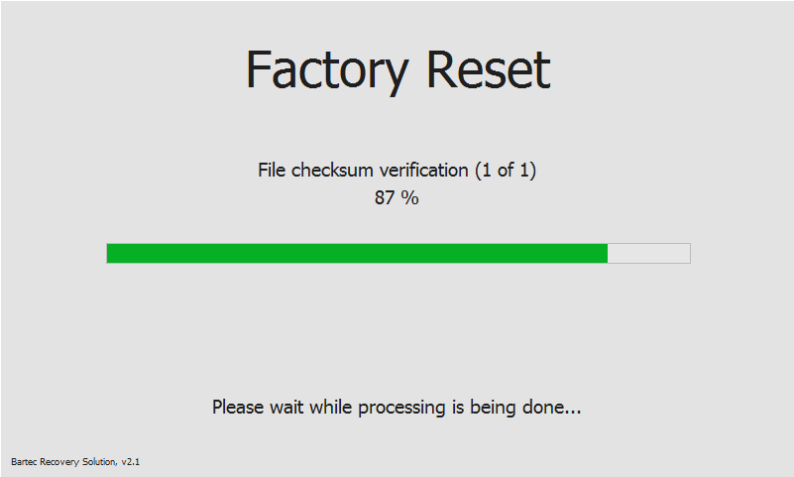


Illustration 15: Verify to the effigy file

After the successful check, the formatting of the operating system partition is begun.

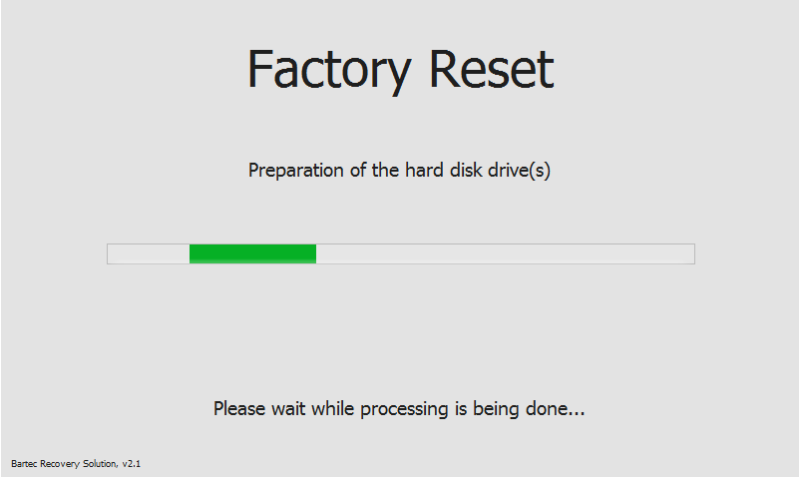


Illustration 16: Prepare the partition

After preparing the partition all files from the effigy image stored on the Recovery partition are unpacked and transferred on the operating system partition.

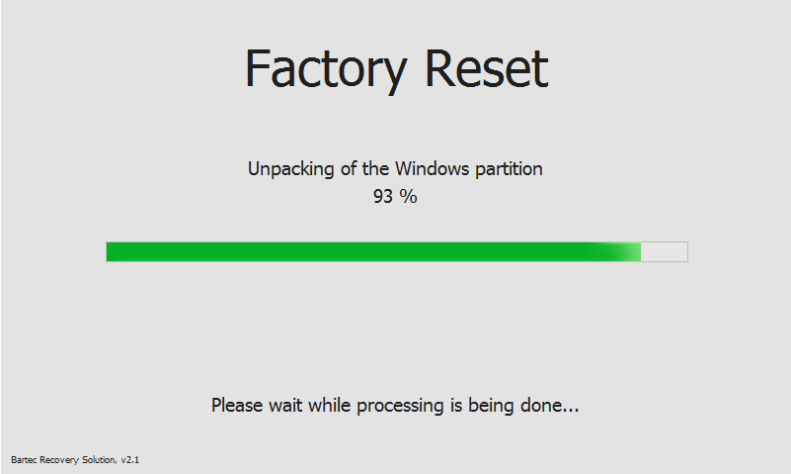


Illustration 17: Transferred by system files on operating system partition

Transferring of system files is the last process with the Widerherstellung of the operating system in the work state.

Finish the recovery

After the Recovery process is completely concluded, it is indicated suitable information in the window. A button in the middle of the window closes the Recovery surroundings and the device restart.

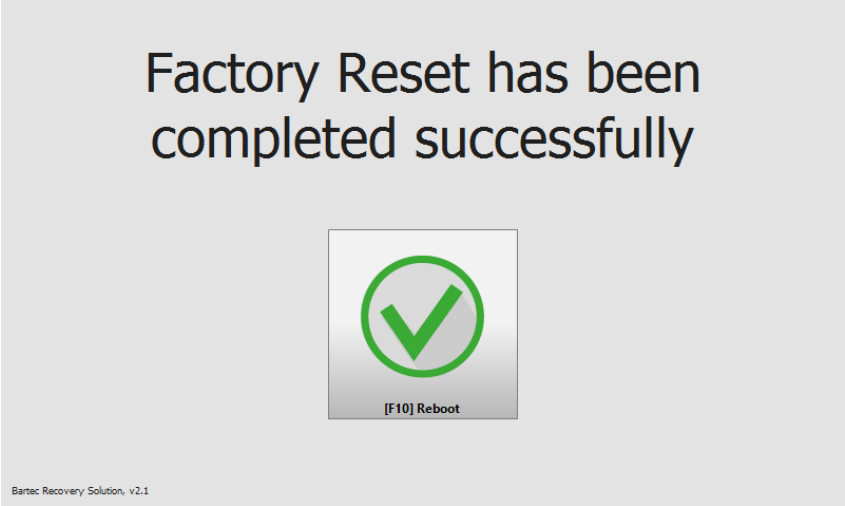


Illustration 18: Successful closure of the recovery process

After the new start of the device the operating system partition is active again and this restored operating system is begun.

The first start (so called: Ridge time boat) of the put back operating system can last some minutes. On this occasion, it is about two phases. During the first phase components of the device are recognised the hardware and are integrated into the operating system. During the second phase the final settings are put. Between the phases or within the phase the device is automatically restarted several times.

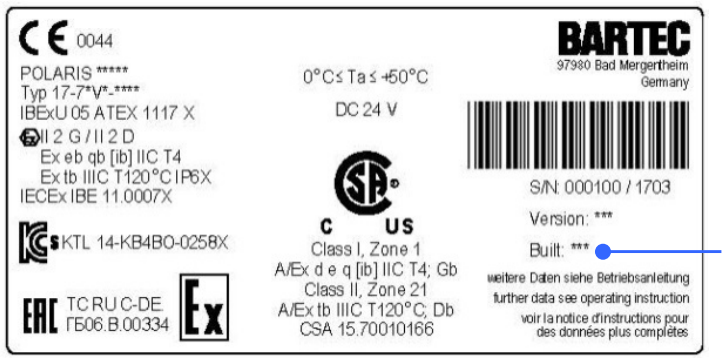
9.1.1 Recovery Stick

The POLARIS can be restored to delivery status by means of a recovery stick.

The recovery flash drive is not included in the scope of supply.
If necessary, contact the following contact address: support-polaris@bartec.de

9.1.2 Recovery stick image

The recovery stick image for the POLARIS Panel PC can be found on the POLARIS type label.



Addition
e. g. Built 384

10. Faults and troubleshooting

Fault	Possible cause	Remedy
Nothing is shown on the display	No power supply present	Check connection of the power supply
	External back-up fuse has tripped	Check fuse
	Internal fuse has tripped	Return to the manufacturer
	Backlighting faulty	Return to the manufacturer Replace the backlighting
	Device malfunction	Return to the manufacturer
No current consumption	No power supply present	Check connection of the power supply
	External back-up fuse has tripped	Check the fuse
	Internal fuse has tripped	Return to the manufacturer
	Device malfunction	Return to the manufacturer
Display turns on and off constantly	Power supply is too low.	Check diameter and length of cable. see Chapter 6.8
Display always has stripes.	Display is defective or the device doesn't boot up.	Return to the manufacturer
Dark background	The backlighting is coming to the end of its service life.	Return to the manufacturer Replace the backlighting
	Power Save activated	Press any button.
Touchscreen not working	Driver deactivated Driver not installed	Check driver installation or install a driver.
Mouse cursor and point of contact on the screen do not agree	Touchscreen calibrated incorrectly.	Calibrate touchscreen.

11. Maintenance, inspection, repair

Only trained and qualified personnel may commission and do maintenance work on the POLARIS! Trained qualified personnel are people who are familiar with the installation, assembly, commissioning and operation of the POLARIS, have been instructed about the risks and have the appropriate qualifications by virtue of the work they do.

11.1 Maintenance intervals

The mechanical status of the devices should be checked at regular intervals. The length of the maintenance intervals depends on the ambient conditions. We recommend checking at least once a year. Regular maintenance is not necessary if operated appropriately in conformance with the installation instructions and with due consideration to the ambient conditions.

⚠ DANGER

Prevent electrostatic charging in hazardous (potentially explosive) areas.

There is a risk of a fatal injury in an explosive atmosphere!

▶ Take devices out of hazardous areas before wiping them dry or cleaning them!

ATTENTION

There is a risk of condensation forming when installed outside. Damage to property may occur if this is not checked!

▶ Regularly check the POLARIS for the formation of condensation.

11.2 Inspection

Under EN/IEC 60079-17 and EN/IEC 60079-19 the owner/ managing operator of electrical installations in hazardous areas is obliged to have these installations checked by a qualified electrician to ensure that they are in a proper condition.

11.3 Maintenance and repair work

Adhere to the applicable regulations under EN/IEC 60079-17 and EN/IEC 60079-19 when servicing, doing maintenance work on and testing associated operating equipment!

Assembly/disassembly, operating and maintenance work may be done only by trained specialists. The statutory rules and other binding directives on workplace safety, accident prevention and environmental protection must be observed.

11.3.1 Instructions for Repairs

If you wish to send in a defective device for repair, please read the RMA procedure guidance first. Then fill in and sign the RMA (Return Merchandise Authorisation) form and send it to our "Retouren Center".

E-Mail: services@bartec.de

Fax: +49 7931 597-119

We cannot guarantee any contractually agreed processing times for devices that are sent in without an RMA number.

The RMA guide and the RMA form are available on our homepage for downloading.

http://www.bartec.de

Have you any questions? Write us an e-mail or call us.

E-Mail: services@bartec.de

Phone: +49 7931 597-444

12. Disposal

The component of the POLARIS contains metal, plastic parts and electronic components.

Our devices are intended as professional electric devices for business use only, referred to as B2B devices under the WEEE-Directive. The WEEE directive sets the framework for waste electric and electronic equipment handling procedures which are to apply throughout the EU. This means that you are not permitted to dispose of this equipment in normal household refuse. It should not be given to the collection sites set up by the public waste management authorities either but instead it should be disposed of in a separate collection in an environmentally sound manner.

Any product we supply can be returned by our customers to us when the time has come to dispose of it. We will ensure that it is disposed of in accordance with the respective applicable statutory regulations.

The sender pays the costs of the dispatch/packaging.

13. Dispatch and packaging instructions

ATTENTION

Sensitive Devices! Damage to property due to incorrect packaging!

- ▶ Take the device's maximum weight into account when selecting the packaging and mode of transport.
- ▶ Use the original packaging for transportation.

14. Accessories, spare parts

Included in the scope of the delivery:

Name		Order no.
POLARIS Zero Client with Windows® 7 Embedded		
Mounting clamps		
Reinforcement frame	POLARIS Series 12.1"	05-0205-0007
	POLARIS Series 15"	05-0205-0009
	POLARIS Series 19.1"	05-0205-0010
	POLARIS Series 17.3"	05-0205-0013
	POLARIS Series 24"	05-0205-0012

Accessories/spare parts for POLARIS Panel PCs:

Name			Order no.
Keyboard in respective national language			17-71VZ-40.0
Input devices	Mouse		17-71VZ-1000
	Trackball		17-71VZ-2000
	Touchpad		17-71VZ-3000
	Joystick with button		17-71V2-9000
Connection cable	for keyboard and mouse	1.8 m	05-0068-0163
		3.0 m	05-0068-0204
	for keyboard and trackball/joystick	1.8 m	05-0068-0172
		3.0 m	05-0068-0205
	for keyboard and touchpad	1.8 m	05-0068-0183
		3.0 m	05-0068-0206
Ex i-Memory stick			17-71VZ-5000/0100
Enclosure	POLARIS Serie 12.1" W		on request
Without bracket	POLARIS Serie 15" / 15" Sunlight		05-0041-0354
	POLARIS Serie 19.1"		05-0041-0353
	POLARIS Serie 17.3"		on request
	POLARIS Serie 24"		05-0041-0406
Support system	Stand for floor mounting		05-0005-0050
	Support arm for wall mounting		05-0005-0058
	Stand for desk mounting		05-0005-0070
Enclosure for keyboard and mouse			05-00410277
Mounting clamps	4 pieces		05-0091-0111
	6 pieces		05-0091-0112
LAN STP cable	CAT.7 4x2x23 AWG, outer diameter: 7.9 mm		02-4082-0002
	CAT.7 4x2x22 AWG, outer diameter: 18 mm; armoured		02-4082-0004
BCS 160ex	Hand scanner		17-21BA-M3.S
Fibre optic converter			on request
Original packing	POLARIS Series 12.1" W		04-9035-0007
	POLARIS Series 15" / 15" Sunlight		04-9035-0007
	POLARIS Series 19,1"		04-9035-0008
	POLARIS Series 17.3"		on request
	POLARIS Series 24"		on request

15. Order numbers

Order details

1	7	-	7	1	V	1	-	*	*	7	6	/	Y	0	0	0	/	*	2	0	0
								A	A									B			

AA	Designation **40** – ZeroClient 15" without touchscreen **60** – ZeroClient 15" with touchscreen **62** – ZeroClient 15" Sunlight with touchscreen **50** – ZeroClient 19.1" without touchscreen **70** – ZeroClient 19.1" with touchscreen **F0** – ZeroClient 17.3" W with touchscreen **C0** – ZeroClient 24" W without touchscreen **D0** – ZeroClient 24" W with touchscreen
B	Version **0** – AC 90 to 253 V **2** – DC 24 V
	Please insert code number. Subject to technical changes. Accessories with order details can be found on the accessory pages.

Order number

ZeroClient 12.1" W with Touchscreen

1	7	-	7	1	V	1	-	B	4	3	6	/	Y	0	0	0

16. Owen Notes

17. Additional information

Resistance list – polyester front foil
POLARIS series

BARTEC

The polyester front foil material used for the POLARIS series in accordance with DIN 42115, section 2, is resistant against the testing material specified as follows:

Alcohols
Ethyl acohol
Cyclohexanone
Glycol
Glycerol
Isopropanol
Methanol

Aldehydes
Acetaldehyde
Formaldehyde

Caustic solutions	
Ammonia	< 2 %
Caustic soda	< 2 %

Hydrocarbons
Aliphatic hydrocarbons
General
Benzine
Benzene
Toluene
Xylene

Saline solutions
Alkalicarbonate
Bichromate
Prussiate of potash

Different substances	
Molecular chlorine	
Liquid cresolphenole soaps	
Oxygen	
Tricresyl phosphate	
Water	< 100 °C
Hydrogen peroxide	< 25 %

Chlorinated hydrocarbons
Chlorofluorocarbon
Perchloroethylene
III-trichloroethane
Trichloroethylene

Ester
Ethyl acetate

Detergents, scavengers and cleaning agents
Potassium soap
Detergent solutions (tenside)
Fabric softeners

Other organic solvents
Aether
Dimethyl formamide
Dioxane

Technical oils and fats
Cutting emulsion
Diesel oil
Varnish
Heating oil
Paraffin oil
Ricinus oil
Silicone oil
Turpentine oil and turpentine oil substitute

Acids	
Formic acid	< 50 %
Acetic acid	
Phosphoric acid	< 30 %
Hydrochloric acid	≤ 10 %
Nitric acid	≤ 10 %

(Where not stated otherwise: concentration = 100%)

Polyester membranes have a limited resistance to UV light and should therefore not be exposed to direct sunlight for extended periods of time.

18. Declaration of conformity

EU Konformitätserklärung
EU Declaration of Conformity
Déclaration UE de conformité

Nº 11-71V0-7C0001_D

BARTEC GmbH
Max-Eyth-Straße 16
97980 Bad Mergentheim
Germany

Wir	We	Nous
	BARTEC GmbH,	
erklären in alleiniger Verantwortung, dass das Produkt	declare under our sole responsibility that the product	attestons sous notre seule responsabilité que le produit
POLARIS Serie	**POLARIS serie**	**POLARIS sèrie**
	Typ 17-71V0-**/****** **Typ 17-71V1-****/****** **Typ 17-71V2-****/****** **Typ 17-71V3-****/****** **Typ 17-71V6-****/****** **Typ 17-71VZ-****/******	
auf das sich diese Erklärung bezieht den Anforderungen der folgenden **Richtlinien (RL)** entspricht	to which this declaration relates is in accordance with the provision of the following **directives (D)**	se référant à cette attestation correspond aux dispositions des **directives (D)** suivantes
ATEX-Richtlinie 2014/34/EU	**ATEX-Directive 2014/34/EU**	**Directive-ATEX 2014/34/UE**
EMV-Richtlinie 2014/30/EU	**EMC-Directive 2014/30/EU**	**Directive-CEM 2014/30/UE**
RoHS-Richtlinie 2011/65/EU **RED-Richtlinie 2014/53/EU**	**RoHS-Directive 2011/65/EU** **RED-Directive 2014/53/EU**	**Directive-RoHS 2011/65/UE** **Directive RED 2014/53/UE**
und mit folgenden Normen oder normativen Dokumenten übereinstimmt	and is in conformity with the following standards or other normative documents	et est conforme aux normes ou documents normatifs ci-dessous

EN 60079-0:2012+A11 :2013
EN 60079-1:2014
EN 60079-5:2015
EN 60079-7:2015
EN 60079-11:2012
EN 60079-18:2015
EN 60079-28:2015
EN 60079-31:2014
EN 61000-6-2:2005
EN 61000-6-4:2007 +A1 :2011
EN 60529 :1991 +A1 :2000 +A2 :2013
EN61010-1 :2010
EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + AC:2011 + A2:2013
EN 62479 :2010
EN 62311 :2008
EN 300 328 V 2.1.1 (2016-11)
EN 55022 :2010 / AC :2011
EN 55024 :2010 / A1 :2015
EN 55032 :2012 / AC : 2013
EN 55032 :2015 / AC : 2016
EN 61000-3-2 :2014
EN 61000-3-3 :2013
EN 301 489-1 V2.1.1. (2017-02)
EN 301 489 -17 V3.1.1 (2017-02)

EU Konformitätserklärung
EU Declaration of Conformity
Déclaration UE de conformité

N° 11-71V0-7C0001_D

BARTEC GmbH
Max-Eyth-Straße 16
97980 Bad Mergentheim
Germany

Kennzeichnung	Marking	Marquage

Visualisierungseinheit
II 2G Ex db eb mb q [ib op pr] IIC T4 Gb
II 2D Ex mb tb IIIC T120° C Db

Zubehör
II 2G Ex ib IIC T4 Gb
II 2D Ex ib IIIC T120° C Db

USB Smart Device
II 2G Ex mb IIC T4 Gb
II 2D Ex mb IIIC T120° C Db

The marking is variable on type and components used

Verfahren der EU-Baumuster-prüfung / Benannte Stelle	Procedure of EU-Type Examination / Notified Body	Procédure d'examen UE de type / Organisme Notifié

IBExU 05 ATEX 1117 X
0637 IBExU, Fuchsmühlenweg 7, 09599 Freiberg, D

CE 0044

Bad Mergentheim, den 07.12.2017

i.V. Nader Halmuschi
Head of BU

i.V. Gitta Kugler
Director Global Test, Certification & IP Management

All certificates see www.bartec.de