

User Manual - TRANSLATION**POLARIS PROFESSIONAL****POLARIS Panel PC Professional 15" up to 24"****Type B7-72V1-....****ATEX****Zone 2 / 22**

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Appendix - Declaration of Conformity

1. Basic Safety Instructions

1.1 Notes on this manual



Please read carefully before commissioning the devices.

The user manual is a constituent part of the product. It must be kept in the direct vicinity of the device and accessible at all times to installation, operating and maintenance personnel.

It contains important notes, safety instructions and test certificates which are necessary for perfect functioning when the devices are being operated and handled.

The user manual is written for all people who carry out assembly, installation, commissioning and maintenance work on the product, whereby the directives and standards applicable to areas with a gas or dust atmosphere (99/92/EC, EN 60079-17, EN 60079-19, IEC 60079-17, IEC 60079-19) must be observed when doing such work.

Familiarity with and strict adherence to the safety instructions and warnings in this manual are essential for safe installation and commissioning. Careful handling and consistent observation of these instructions can prevent accidents, personal injuries and damage to property.

The illustrations in these operating instructions serve to make the information and descriptions more clear. They are not necessarily true to scale and may deviate slightly from the actual construction of the device.

Safety instructions and warnings are specially highlighted in this manual and marked by symbols.

DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

ATTENTION

ATTENTION identifies a potentially damaging situation which, if not avoided, could damage the equipment or something in its environment.



Important instructions and information on effective, economical and environmentally compatible handling.

1.1.1 Languages

The original user manual is written in German. All other available languages are translations of the original user manual.

The user manual is available in German and English. If you require any other languages, please ask BARTEC or request them when placing the order.

1.1.2 Changes to the document

BARTEC reserves the right to alter the contents of this document without notice. No guarantee is given for the correctness of the information. In case of doubt, the German safety instructions shall apply because it is not possible to rule out errors in translation or in printing. In the event of a legal dispute, the "General Terms and Conditions" of the BARTEC group shall apply in addition.

The respective up-to-date versions of data sheets, manuals, certificates, EC Declaration of Conformity may be downloaded at www.bartec-group.com under products and solutions in the area "Automatic Technology" or ordered 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 Use in Accordance with the Intended Purpose

1.3.1 Exclusive Purpose

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

The POLARIS PROFESSIONAL Panel PCs have been designed specially for use in hazardous (potentially explosive) areas in Zone 2 and Zones 22.

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

1.3.2 Improper 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 intended purpose.

1.4 Owner's/Managing Operator's Obligations

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 Instructions

1.5.1 General Safety Instructions

- ▶ 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 Safety Instructions for Operation

1.6.1 Upkeep

For electrical systems the relevant installation and operating regulations must be complied with (e.g. Directive 99/92/EC, Directive 94/9/EC and the national applicable ordinances, EN 60079-14, IEC 60079-14, and the DIN VDE 0100 series)!

The disposal of this equipment must comply with the national regulations on the disposal of waste.

1.6.2 Maintenance

Regular servicing is not necessary if the equipment is operated correctly in accordance with the installation instructions and environmental conditions. In this context, please refer to Chapter "Maintenance, Inspection, Repair".

1.6.3 Inspection

Under EN 60079-17, EN 60079-19, IEC 60079-17 and 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.

1.6.4 Repairs

Repairs on explosion-protected operating equipment may be done only by authorised persons working in accordance with the latest developments in technology and using original spare parts. The applicable regulations must be observed.

1.6.5 Commissioning

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

1.7 Ex Protection Type, Certification and Standards

Markings specifying Ex protection and certification are put on the device. For Ex protection markings, see Chapter 3 "Technical Data".

The POLARIS PROFESSIONAL Panel PCs conform to Directive 94/9/EC for devices and protective systems for use to their intended purpose in potentially explosive areas (ATEX Directive). For the standards conformed to, see Chapter 3 "Technical Data".

1.8 Warranty

WARNING

It is not permissible to make any modifications or implement any conversions unless the manufacturer gives his approval in writing.

If components other than those specified are used, protection against explosion can no longer be assured. It cannot be guaranteed that parts procured from other suppliers have been designed and produced in conformance to safety requirements and with the necessary stress tolerance.

- ▶ Contact the manufacturer to obtain approval before making any modifications or conversions. Use only original spare parts and original expendable parts.



The manufacturer grants a complete guarantee only and exclusively for the spare parts ordered from him, the manufacturer.

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).

We guarantee the POLARIS and its accessories for a period of 1 year starting on the date of delivery from the Bad Mergentheim factory. This guarantee covers all parts of the delivery and is restricted to the replacement free of charge or the repair of the defective parts in our Bad Mergentheim factory. As far as possible, the delivery packaging should be kept for this purpose. In the event of such a claim, the product must be returned to us after written arrangement. The customer cannot claim to have the repairs done at the site of installation.

2. Product Description

2.1 Definition

The **POLARIS PROFESSIONAL Panel PC** Series are the all-rounders for machine-oriented operation and observation in hazardous areas. The Panel PCs have a high-resolution display with a touchscreen of up to 24" and offer the optimum interface and brilliant images for every application.



Illustration 1: POLARIS PROFESSIONAL Panel PC series

The POLARIS PROFESSIONAL Panel PC series is open to a great number of software applications. The pre-installed, multi-lingual Windows® 7 Ultimate operating system (optional Windows® 10 IoT LTSC) allows the use of its standard visualisation or the BMS-Graf-pro 7 visualisation software from BARTEC.



Illustration 2: Visualization software BMS-Graf-pro Version 7

This is facilitated by a faster Intel® Atom™ E3845, 4 x 1.91 GHz, which allows an excellent execution of extensive applications locally too. Robust hard disks or solid-state drives are available as storage media also.

Ethernet (copper or fibre optic), USB, PROFIBUS-DP, serial interfaces and optional WLAN offer reliable interfaces to the control system or to the control in safe areas.

High-quality keypads in various languages and a variety of mouse versions enhance the operating comfort.



Illustration 3: Keyboard and Trackball

The use of the power-limited USB interface (max. 100 mA), socket type A allows data to be transferred easily, stored, and saved for system restoration by means of a BARTEC recovery stick. (Do not insert the memory stick in an explosive atmosphere, see chapter "Power-limited USB interface for memory stick" on page 40.)

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 ceiling 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.



Illustration 4: Turn-key system solution in stainless steel enclosure "Exclusive"

2.2 Schematic diagram

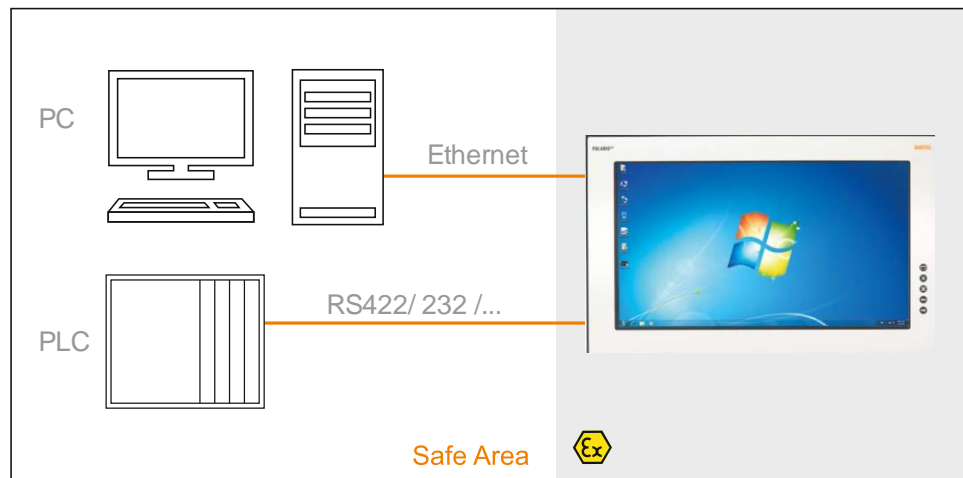


Illustration 5: System configuration with Touch operation

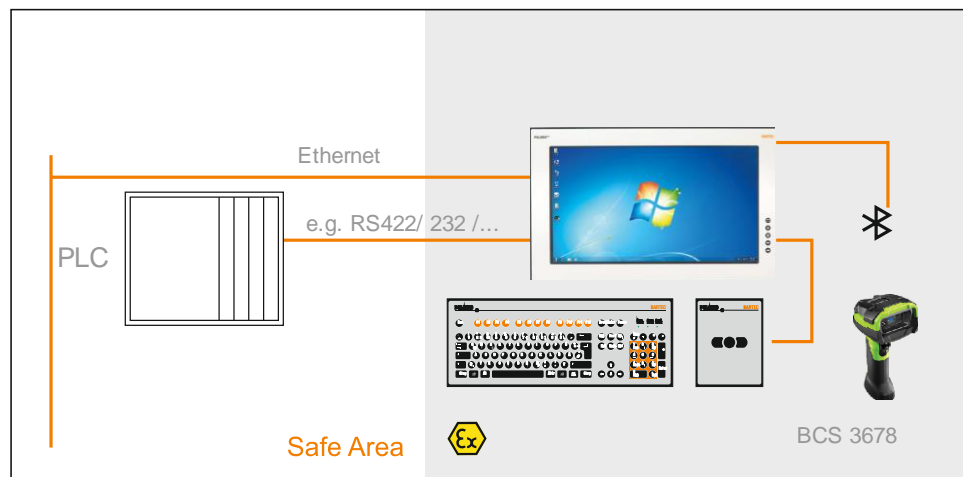





Illustration 6: System configuration with external keyboard and mouse

3. Technical Data

3.1 POLARIS Panel PC Professional


3.1.1 Explosion Protection

Type	B7-72V1-....
Ex protection type ATEX	 II 3G Ex nA IIC T4 Gc resp.  II 3D Ex tc IIIC T120 °C Dc
Standards	EN 60079-0:2012 +A11:2013 EN 60079-15:2010 EN 60079-31:2014 EN 60079-18:2015
Specific conditions	<ul style="list-style-type: none"> - Do not connect or open terminal compartments while the voltage supply is active. - Always use a cable gland when inserting external cables and connectors into the junction box. - There must be equipotential bonding along the entire course of the installation. - Make sure there are no high-energy charging mechanisms at the user interface on the display units or accessories (e.g. pneumatic particle transport) during use. <p>Zone 22 Dust:</p> <ul style="list-style-type: none"> - The IP protection rating must be ensured by fitting the devices into IP enclosures.
Directives	94/9/EG 2004/108/EG
Product marking	


3.1.2 General data

Construction	Front panel fitting; Optional turn-key system solutions in a stainless steel enclosure as wall, floor or ceiling mounting versions.
Computer capacity	Intel® Atom™ E3845, 4 x 1.91 GHz RAM: 4 GB or 8 GB 100 GB HD or 128 GB SSD (MLC)
Operating system	Windows® 7 Ultimate Windows® 10 IoT LTSC Open platform for customer-specific visualization software, e. g. ProTool, WIN CC flexible, etc.
Interface (basic version)	1 x Ethernet 100/10BaseT 1 x RS422 1 x USB 1 x USB socket, type A (power limited) 2 x PS/2 for POLARIS, zone 2, keyboard and mouse
Optional interface modules	1 x Ex d USB connection (e. g. connection by means of WLAN)
Display	Antireflection coating glass pane Optional touchscreen
Power supply	AC 90 V to 253 V \pm 10 %, 50 Hz to 60 Hz DC 24 V \pm 10 %
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	IP65 IP54
Optional approved accessories	<ul style="list-style-type: none"> - Keyboard - Mouse variants - Memory stick - WLAN


3.1.3 Characteristics POLARIS Panel PC 15" Professional

Display 	15" graphics-capable TFT display XGA resolution 1024 x 768 pixels - 16.7 million colours Brightness 350 cd/m ² Visible surface approx. 304 x 228 mm Contrast 400:1
Backlighting	CFL 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
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. 12 kg


3.1.4 Characteristics POLARIS Panel PC Professional 15" Sunlight

Display 	<ul style="list-style-type: none"> - 15" graphics-capable TFT display - XGA resolution - 1024 x 768 pixels - 16.7 million colours - Brightness 1000 cd/m² - Visible surface approx. 304 x 228 mm Contrast 700:1
Backlighting	LED technology, Service life approx. 50,000 hours (at +25 °C)
Permissible ambient temperature Storage/Transport Operation	-20 °C to +60 °C -20 °C to +60 °C
Dimensions (width x height x depth)	411 mm x 322 mm x approx. 135 mm
Wall cut-out (width x height)	394,5 mm x 315,5 mm ± 0.5 mm
Weight	approx. 12 kg

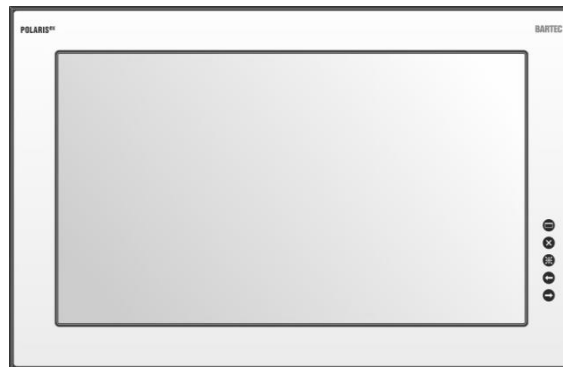
3.1.5 Characteristics POLARIS Panel PC Professional 17.3"

Display 	17.3" graphics-capable TFT display Full HD resolution 1920 x 1080 pixels 16.7 million colours Brightness 400 cd/m ² Visible surface approx. 302 x 215 mm Contrast 600:1
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
Dimensions (width x height x depth)	503 mm x 314 mm x ca. 135 mm
Wall cut-out (width x height)	489 mm x 300 mm + 0,5 mm
Weight	approx. 15 kg

3.1.6 Characteristics POLARIS Panel PC Professional 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
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. 15 kg

3.1.7 Characteristics POLARIS Panel PC Professional 24"



Display	24" graphics-capable TFT display Full HD 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
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. 21 kg



3.2.3 Characteristics Enclosure for mouse and 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) 	

3.3 Finger mouse, Trackball, Touchpad and Joystick

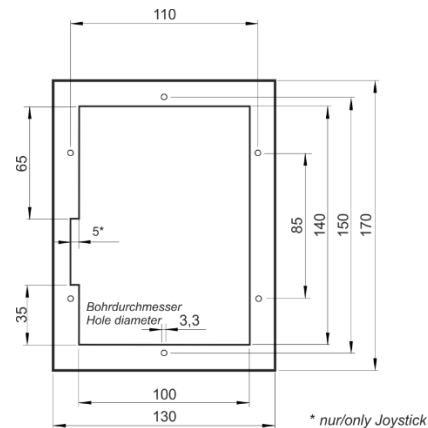
3.3.1 Explosion protection

Ex protection type ATEX	II 3G Ex nA IIC T4 Gc
	II 3D Ex tc IIIC T120°C Dc
Standards	EN 60079-0:2012 + A11:2013 EN 60079-15:2010 EN 60079-31:2014

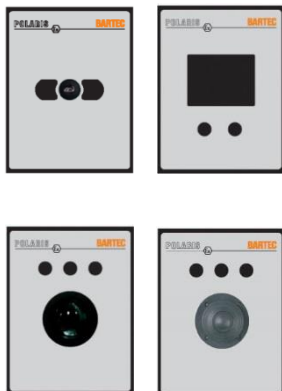
3.3.2 General Data

Construction	Front panel fitting
Material	Polyester foil on aluminium sheet (conditionally UV-resistant)
Protection class Mouse, Joystick, Touchpad Trackball static dynamic	IP65 (front side) IP65 (front side) IP51 (front side)
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)



3.3.3 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

3.4 USB Smart Device

3.4.1 Explosion protection

Type	17-71VZ-A0x0/0000
Ex protection type ATEX	<div>II 2G Ex eb mb IIC T4 Gb</div> <div>II 2D Ex tb IIIC T120 °C Db</div>
Certification	IBExU 05 ATEX 1117 X
Kennzeichnung IECEx	<div>Ex eb mb IIC T4</div> <div>Ex tb IIIC T120 °C</div>
Certification	IECEx IBE 11.0007X
Possible ambient temperature	-20 °C up to + 60 °C
Protection class	IP 66 (threaded base)



Suitable for the installation in 2G-, 2D-, 3G- or 3D enclosure. Connection via USB Ex-e.

3.4.2 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)

3.4.3 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



3.4.4 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

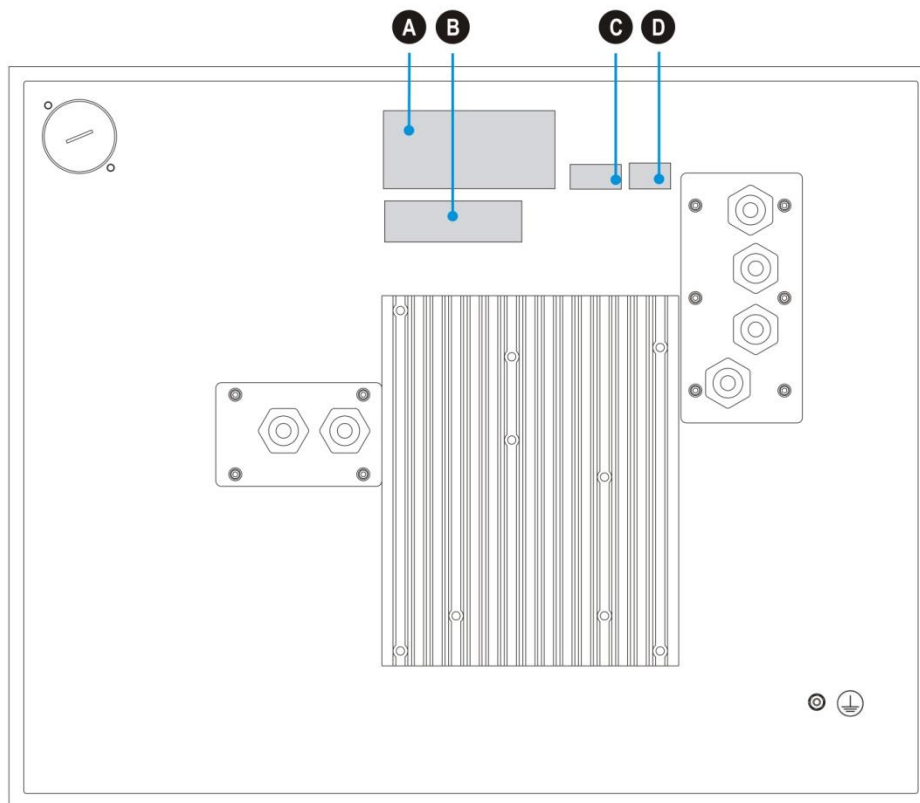
For the wireless network connection.



3.4.5 Technical data (WLAN)

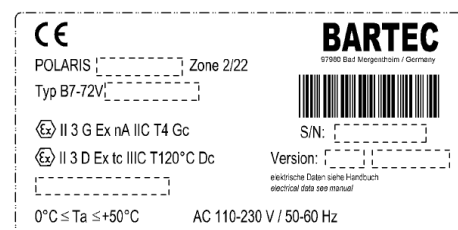
WiFi - standard	IEEE802.11n IEEE802.11g IEEE802.11b
Transfer rate	max. 150 Mbit/s
WLAN - frequency	2.4 GHz
For more technical data see description of the W-LAN-stick manufacturer.	

3.5 Product Labelling



A

Example:
 Type label with label
 ATEX



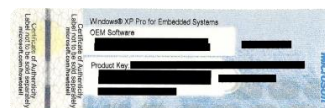
B

Warnings on the device



C

Licence sticker



D

Test sticker



4. Transport and Assembly

4.1 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.



CAUTION

This device is heavy (12-21 kg).

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

- ▶ Two people are needed for assembly/disassembly.

4.2 Intermediate Storage

ATTENTION

Damage to property through incorrect storage!

- ▶ Comply with the correct storage temperatures.
- ▶ Keep the POLARIS free of moisture.

4.3 Scope of delivery

1 x POLARIS PROFESSIONAL Panel PC Zone 2 / 22

1 x Reinforcement frame

1 x Set of mounting clamps

1 x User manual POLARIS PROFESSIONAL Panel PC Zone 2 / 22

4.3.1 Accessorial optional

Optional:	Keyboard, finger mouse, touchpad, trackball, joystick Enclosure and supporting system for wall, floor and table mounting
Not enclosed:	Assembly material Cable for voltage supply and data line(s)

4.4 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 PE connection	1 x ring spanner 7 mm
	POLARIS accessories	1 x socket wrench 5.5 mm
	System solution in an "Exclusive" enclosure	1 x hex key 5 mm (to fix the supporting system in place)

4.4.1 Installation options

The POLARIS can be installed directly in:

- Enclosures
- Switch cabinet doors
- Operating consoles

POLARIS Panel PCs 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 ceilings.

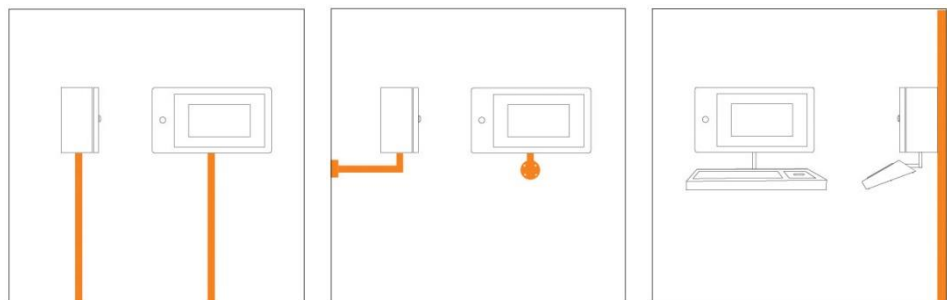


Illustration 7: Examples for standard mounting as front panel fitting

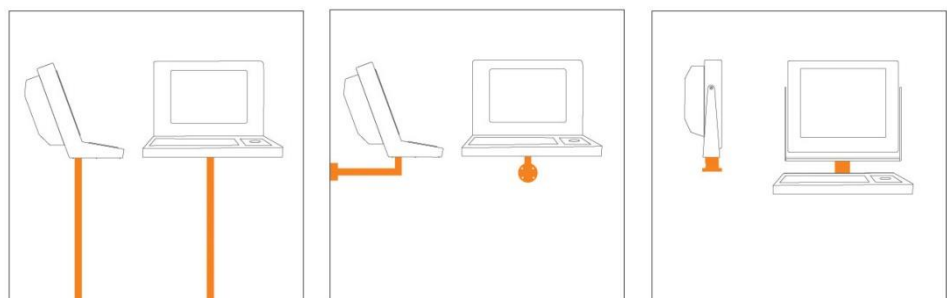


Illustration 8: Examples of floor, wall and table mountin

5. 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.

5.1 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

CAUTION

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.
- Only install the POLARIS in conjunction with the reinforcement frame in an IP65 enclosure. Failure to comply with this can lead to water penetrating and damaging the device.

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.

5.2 Mechanical Installation

CAUTION

This device is heavy (12-21 kg).

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

- ▶ Two people are needed for assembly/disassembly.



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.

Danger

Sealed Screw Plug! The device is locked ex works.

When opening, the explosion protection is lost and there is a danger to life in an explosive atmosphere!

- ▶ Do not open the Screw plug!

5.2.1 Installation in 3G-/3D enclosure

In order to guarantee the IP degree of enclosure protection = IP54 for installation in 3G enclosures of Ex e type of protection (e.g. control equipment), and = IP6X for installation in 3D 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.

⚠ DANGER

If there is no reinforcement frame, it will not be possible to maintain the IP protection in 3G-/3D enclosures. 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 15" / 15" Sunlight	05-0205-0009
POLARIS 17.3"	05-0205-0013
POLARIS 19.1"	05-0205-0010
POLARIS PC 24"	05-0205-0012

Fit the reinforcement frame

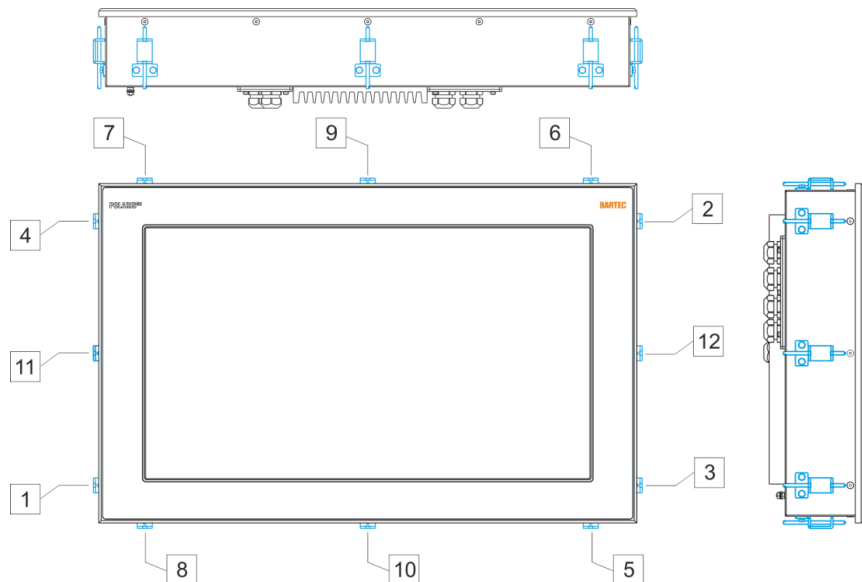
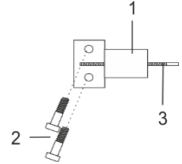


Illustration 9: Minimum installation depth and mounting reinforcement frame

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 terminal screw (3) on the reinforcement frame in the order 1 to 12 to a torque of 1.02 Nm.

	Number of mounting clamps	
	POLARIS 15"/17.3"/19.1"	12 pieces
	POLARIS 24"	14 pieces



Always tighten the mounting clamps crosswise.

5.2.2 Installation as a System Solution in the Stainless Steel Enclosure

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

Selecting the location

CAUTION

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 (Stainless steel enclosure "Exclusive II")

- (1) Prepare supply and data line(s).
- (2) Prepare installation on the basis of the drilling template (see illustration 6 - 8).
- (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.

Floor mounting (Stainless steel enclosure "Exclusive II")

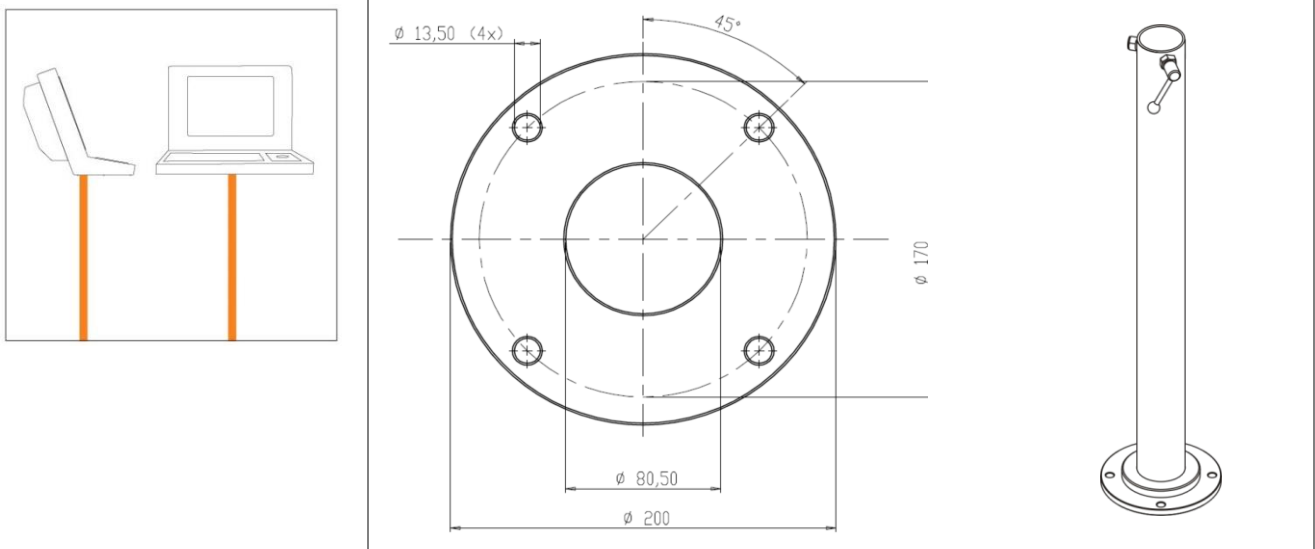


Illustration 10: Drilling pattern - supporting system for floor mounting

Wall mounting (Stainless steel enclosure "Exclusive II")

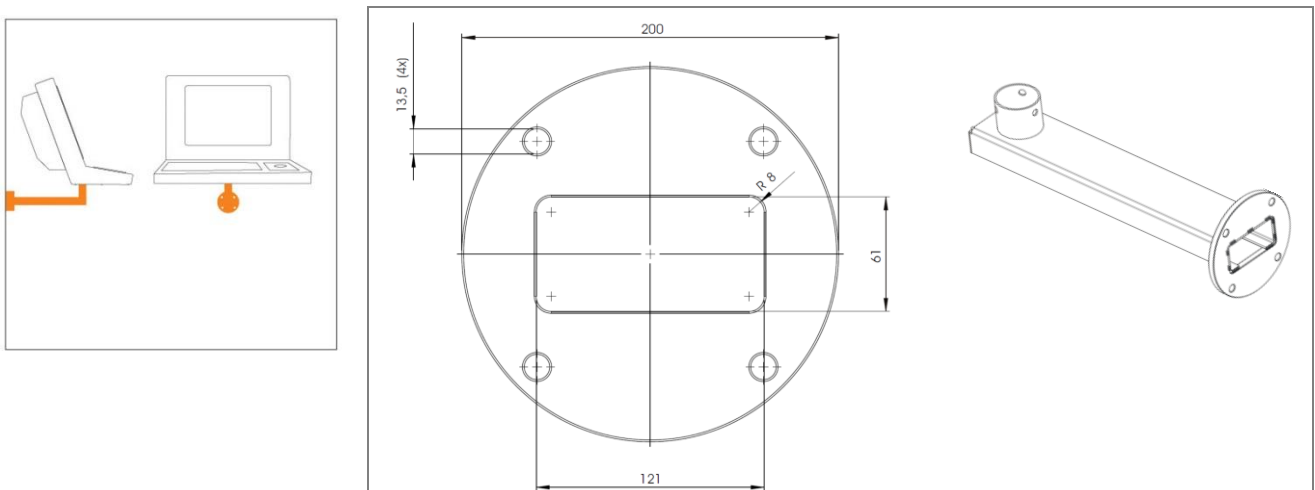


Illustration 11: Drilling pattern - supporting system for wall mounting

5.2.3 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.

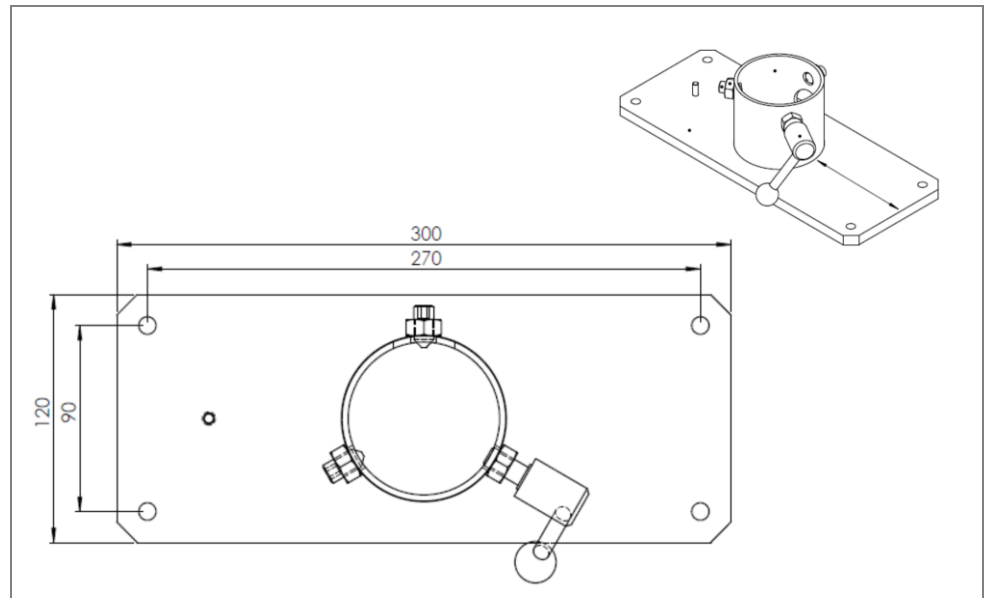
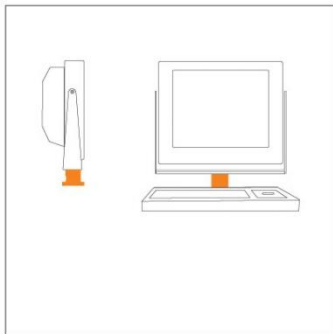


Illustration 12: Drilling pattern - supporting system for table mounting

Rotating

The POLARIS is fixed using two side T screws.

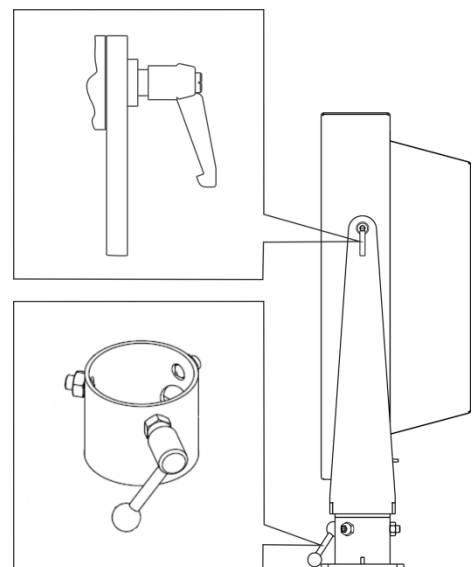
The angle of rotation can be changed once the screws have been loosened

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



5.3 Electrical Installation

5.3.1 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.
- Any unused cable glands on the 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 protection circuit is galvanically connected to earth, equipotential bonding is required throughout the entire installation.
- 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.).

5.4 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.

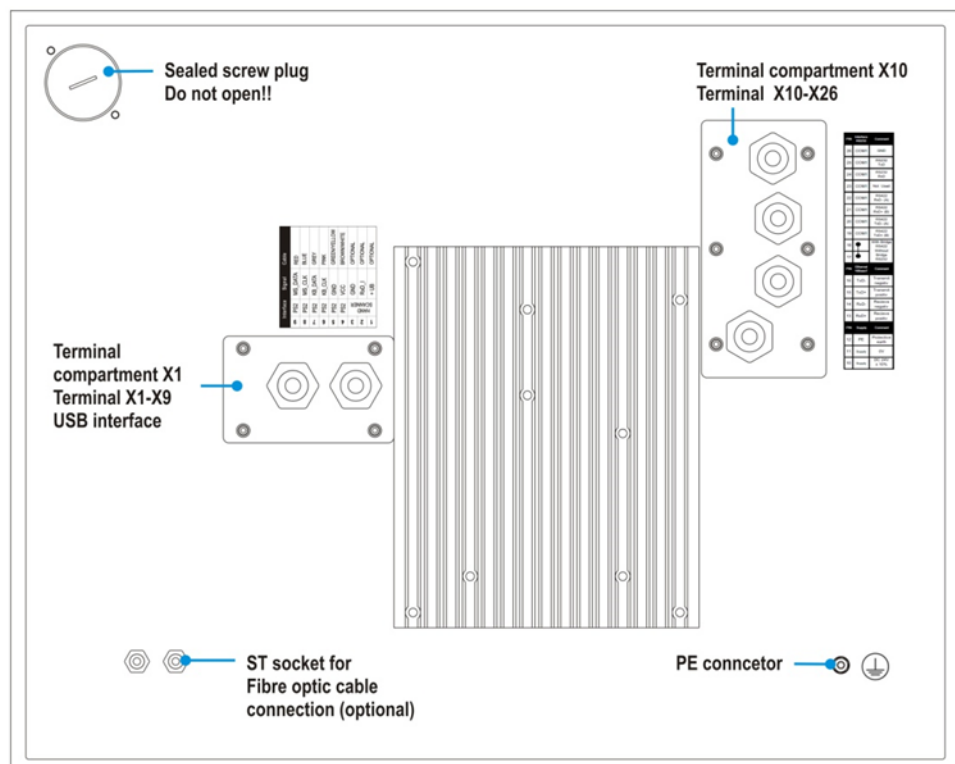


Illustration 13: Pin assignment POLARIS

5.5 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).
- ▶ Secure PE conductor connections against self-loosening.

Stainless steel enclosure "Exclusive II"

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

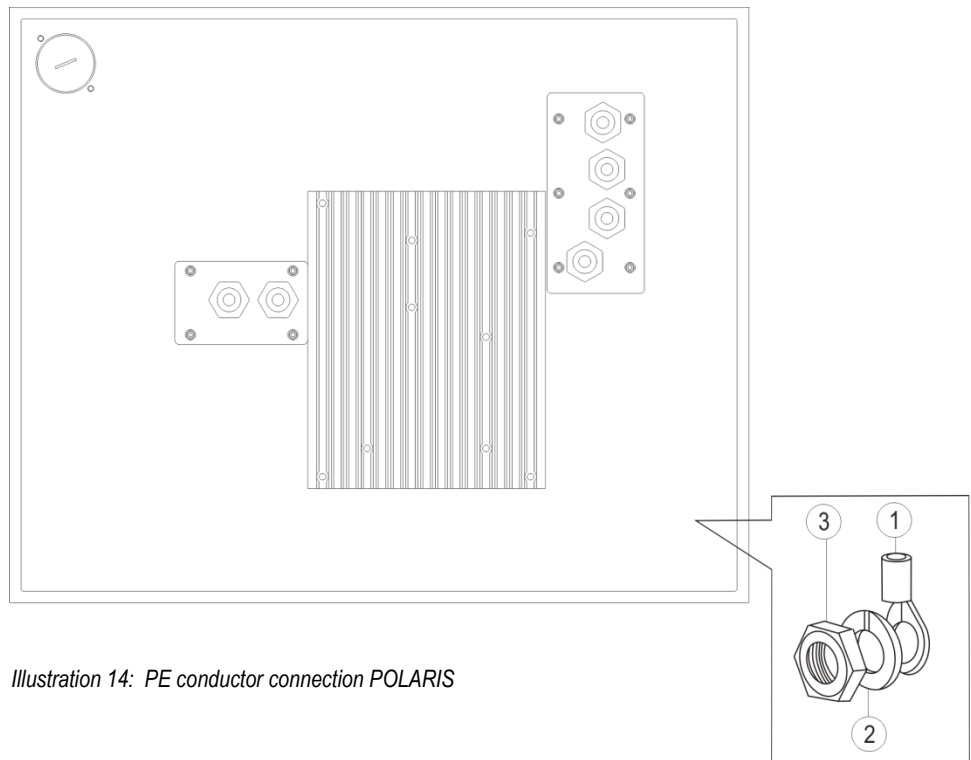


Illustration 14: PE conductor connection POLARIS

Work steps

- (1) Washer on to earthing stud.
- (2) Push non-sheathed cable with PE cable lug (1) on to earthing stud.
- (3) Washer then position spring washer (2) on threaded bolt and secure with hexagonal nut (3), max. torque: 2.9 Nm.
- (4) 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)

5.6 Terminal compartment X10

5.6.1 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

If the power supply is active there is a danger of life 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.

5.6.2 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	+	DC 24 V ± 10 %
X11	Supply	-	0 Volt
X12	Supply	PE	Protective earth

5.6.3 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

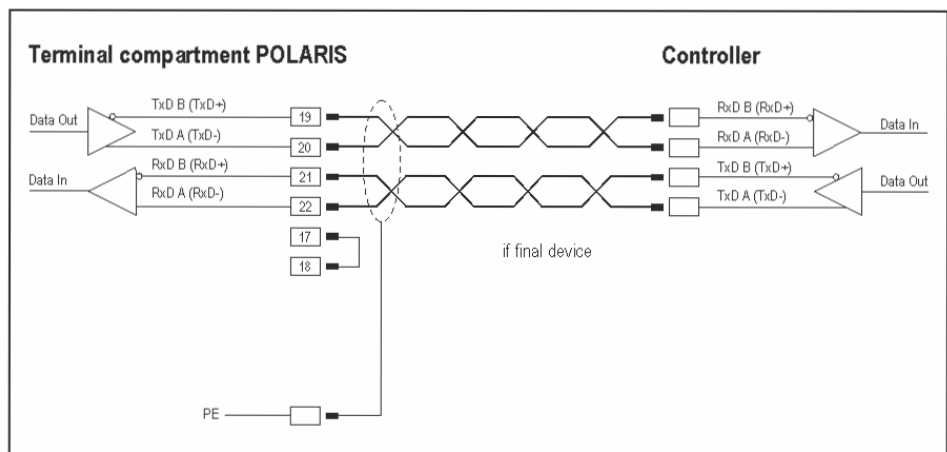
Assignment RJ45 plug for Ethernet to POLARIS Panel PC terminal block

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	

5.6.4 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 cable	Input
X21	Interface COM 1	RxD B (RxD+)	Receiving cable	Input
X22	Interface COM 1	RxD A (RxD-)	Receiving cable	Input

Connection PLC with RS422 interface to POLARIS.



Maximum length of the data line 1,000 m.



Setting of the terminal resistors at the start and end of the bus line is not necessary in most cases due to internal EMC measures. Depending on local circumstances, the data transmission may worsen in individual cases.

The appropriate pin assignment of the controller can be found in the manufacturer's interface description.

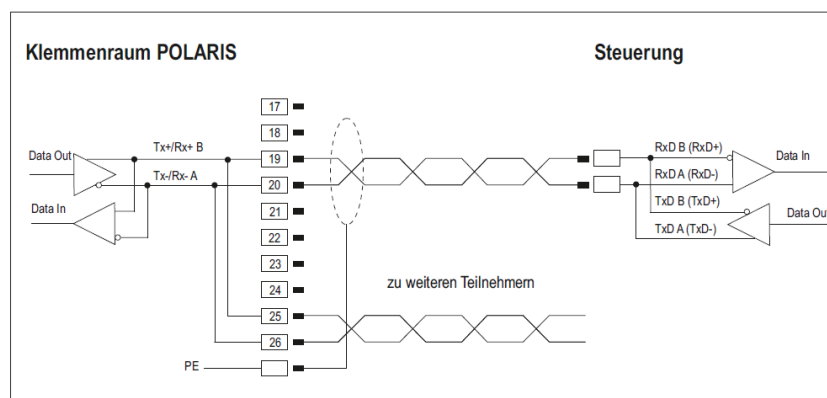


Under Os Windows 7 or 10 is only a point to point connection possible.

5.6.5 RS485 interface

Configuration RS485			
Klemme	Schnittstelle	Signal	Bemerkungen
X17	N.C.		
X18	N.C.		
X19	Interface COM 1	TxD B (TxD+)	to PLC
X20	Interface COM 1	TxD A (TxD-)	
X21	N.C.		
X22	N.C.		
X23	N.C.		
X24	N.C.		
X25	Interface COM 1	RxD B (RxD+)	to next POLARIS
X26	Interface COM 1	RxD A (RxD-)	

Connection PLC with RS485 to POLARIS



Maximum length of the data line 1,000 m



The appropriate pin assignment of the controller can be found in the manufacturer's interface description.

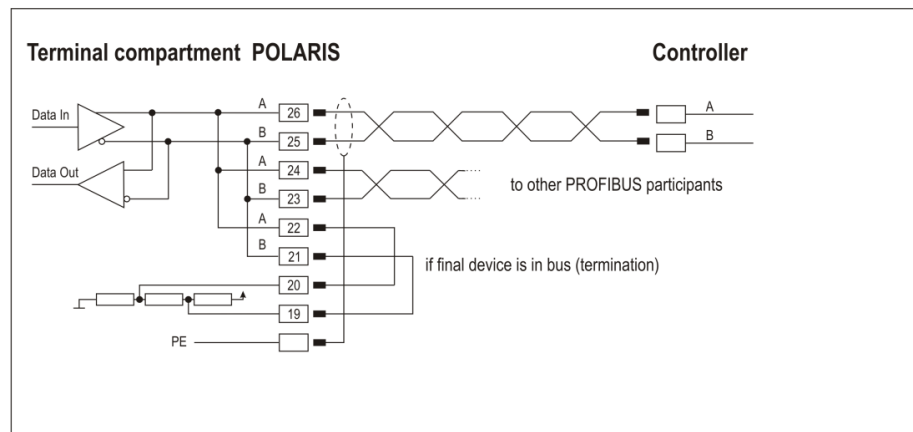
5.6.6 BARTEC PROFIBUS-DP Interface (optional)


The interface PROFIBUS-DP (BARTEC) may only be applied in combination with visualization software BMS-Graf-pro 7.

Configuration PROFIBUS-DP (BARTEC)

Terminal	Interface	Signal	Remarks
X17	not connected		
X18	not connected		
X19	Interface COM 1	Termination B2	Bridge for terminating network(B1-B2)
X20	Interface COM 1	Termination A2	Bridge for terminating network (A1-A2)
X21	Interface COM 1	Termination B1	Bridge for terminating network (B1-B2)
X22	Interface COM 1	Termination A1	Bridge for terminating network (A1-A2)
X23	Interface COM 1	Out B	Signal B Output
X24	Interface COM 1	Out A	Signal A Output
X25	Interface COM 1	In B	Signal B Input
X26	Interface COM 1	In A	Signal A Input

Connection of a controller via a PROFIBUS-DP interface of the POLARIS.



► Maximum line length: see PNO specification.



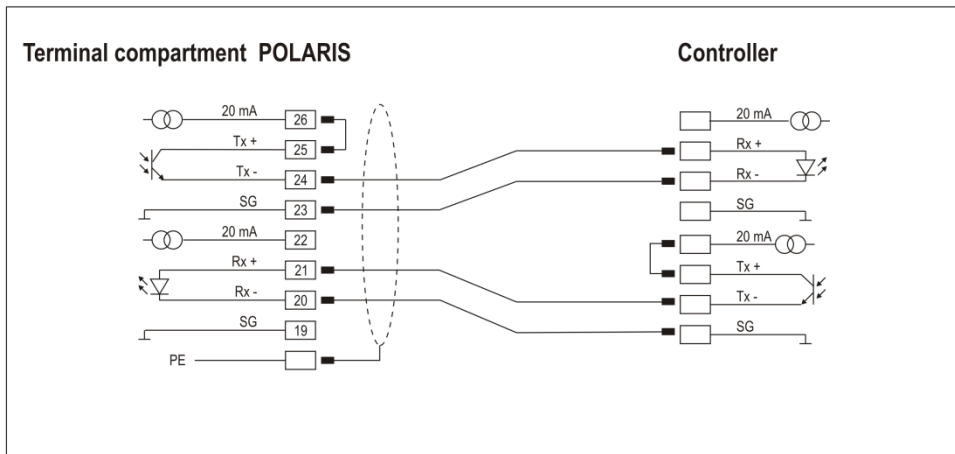
Pins 26-24-22, 25-23-21 are already connected inside.

See the interface description from the controller manufacturer for the relevant pin assignment of the controller.

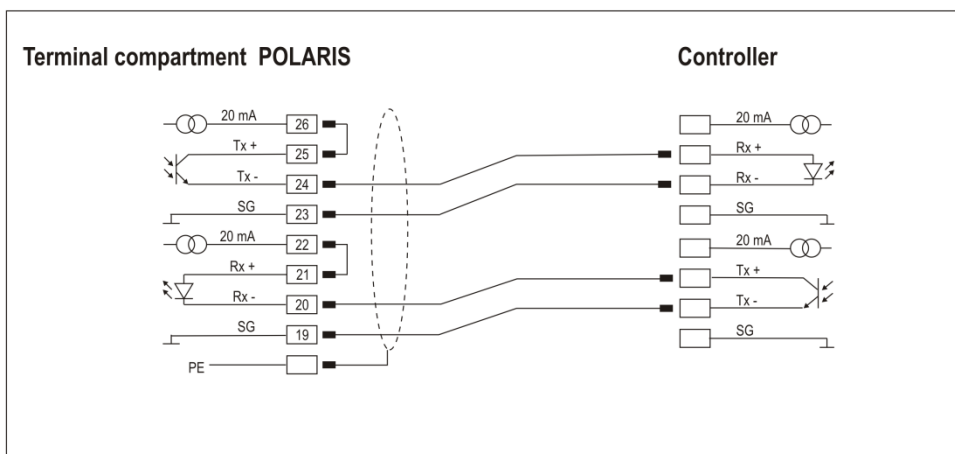
5.6.7 TTY interface (optional)

Configuration TTY			
Terminal	Interface	Signal	Remarks
X17	Not connected		
X18	Not connected		
X19	Interface COM 1	GND	Signal ground for receiver
X20	Interface COM 1	Rx-	Cathode
X21	Interface COM 1	Rx+	Anode
X22	Interface COM 1	20 mA	Signal power source for receiver
X23	Interface COM 1	GND	Signal ground for transmitter
X24	Interface COM 1	Tx-	Emitter
X25	Interface COM 1	Tx+	Collector
X26	Interface COM 1	20 mA	Signal power source for transmitter

The transmitter is active and the receiver is passive in both the POLARIS and the control.



In the POLARIS the transmitter and receiver are active. The control is completely passive.



- Maximum line length depending on baud rate of up to 1,000 m.

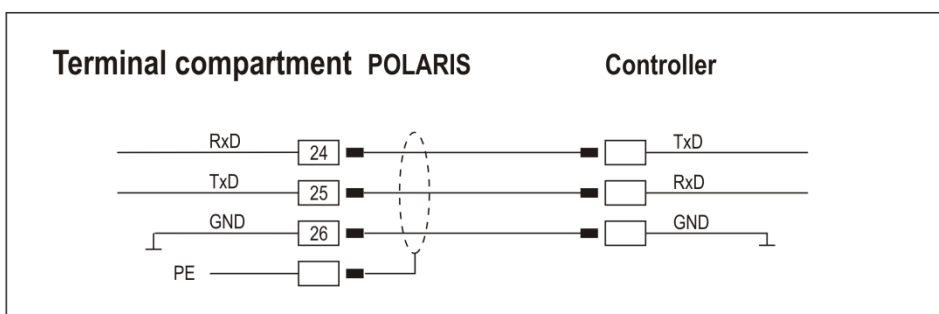


See the interface description from the controller manufacturer for the relevant pin assignment of the controller.

5.6.8 RS232 interface (optional)

Configuration RS232			
Terminal	Interface	Signal	Remarks
X17	Not connected		
X18	Not connected		
X19	Not connected		
X20	Not connected		
X21	Not connected		
X22	Not connected		
X23	Not connected		
X24	Interface COM 1	RxD	Receive
X25	Interface COM 1	TxD	Transmit
X26	Interface COM 1	GND	Signal ground

Connection of a controller via RS232 interface of the POLARIS.



- Maximum length of the data line 15 m.

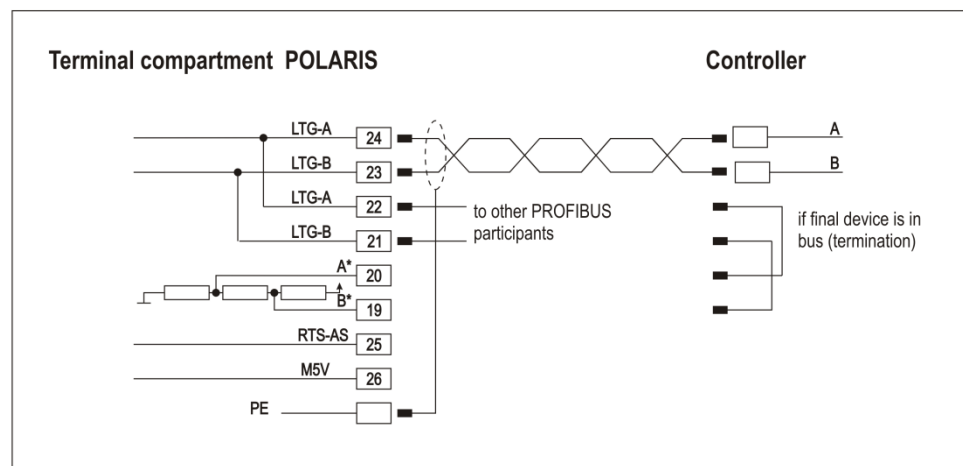


See the interface description from the controller manufacturer for the relevant pin assignment of the controller.

5.6.9 Siemens PROFIBUS-DP interface (optional)

Configuration Siemens PROFIBUS (supported only WinCC flexible)			
Terminal	Interface	Signal	Remarks
X17	Not connected		
X18	Not connected		
X19	Interface COM 1	B*	Termination
X20	Interface COM 1	A*	Termination
X21	Interface COM 1	LTG-B	Out B
X22	Interface COM 1	LTG-A	Out A
X23	Interface COM 1	LTG-B	In B
X24	Interface COM 1	LTG-A	In A
X25	Interface COM 1	RTS-AS	
X26	Interface COM 1	M5V	

Connection of a controller via a Siemens PROFIBUS-DP interface of the POLARIS.



► Maximum line length: see PNO specification.




Pins 24-22, 23-21 are already connected inside.

See the interface description from the controller manufacturer for the relevant pin assignment of the controller.

5.6.10 USB interface (onto terminals optional)

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:

	Plug Typ A	Socket Typ A								
	<table><tr><td>4</td><td>3</td><td>2</td><td>1</td></tr></table>	4	3	2	1	<table><tr><td>1</td><td>2</td><td>3</td><td>4</td></tr></table>	1	2	3	4
	4	3	2	1						
	1	2	3	4						
Plug Typ B	Socket Typ B									
<table><tr><td>1</td><td>2</td></tr><tr><td>4</td><td>3</td></tr></table>	1	2	4	3	<table><tr><td>2</td><td>1</td></tr><tr><td>3</td><td>4</td></tr></table>	2	1	3	4	
1	2									
4	3									
2	1									
3	4									

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.

5.6.11 Interface RS232/USB (optional)

Configuration RS422/USB				
Terminal	Interface	Signal		
X17 - X18	not connected			
X19	COM 1	TxD B (TxD+)	Transmission cable	Input
X20	COM 1	TxD A (TxD-)	Transmission cable	Input
X21	COM 1	RxD B (RxD+)	Receiving cable	Input
X22	COM 1	RxD A (RxD-)	Receiving cable	Input
X23	USB	VCC	+5 V	
X24	USB	Data-	USB data signal	
X25	USB	Data+	USB data signal	
X26	USB	GND		

5.7 Terminal compartment X1

5.7.1 Cable entries

When connecting cables and leads to supplies / communications equipment in the Ex area, Ex certified cable entries must be used which are suitable for the respective type of cable and lead. You must include a suitable sealing element so that an IP rating of at least IP 54 is maintained.

DANGER

Do not connect cables and leads while the power supply is active.

Danger to life exists in an explosive atmosphere!

► Disconnect the device before beginning any work.

DANGER

Accessories which have not been approved jeopardise the explosion protection.

Danger to life exists in an explosive atmosphere!

► Only use POLARIS accessories!

5.7.2 Connection of a keyboard to the POLARIS (optional)

PS/2 for input devices				
Terminal	Interface	Colour	Signal	Remarks
X4	PS/2	WH/BN	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	BU	MS_CLK	Mouse clock signal
X9	PS/2	RD	MS_DATA	Mouse data signal

- Make the connection between the POLARIS Panel PC and the 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)

5.7.3 Power-limited USB interface for memory stick

USB socket, 4-pole, Type A

The power-limited USB interface (max. 100 mA), socket type A allows data to be transferred easily, stored, and saved for system restoration by means of a BARTEC recovery stick.

DANGER

Do not insert the memory stick in an explosive atmosphere.

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

- ▶ While the memory stick is inserted, the terminal compartment must remain closed during operation in an explosive atmosphere.
- ▶ If the USB port is extended by means of a USB extension cable, the memory stick must be secured against being pulled out.

5.7.4 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 +80 °C 0 °C bis +55 °C
Multi-mode Converter Range Fibre type Min. transmitting power Min. sensitivity Wave length Plug connector	MS400161 up to 2 km 62.5/125 µm or 50/125 µm 19 dBm 31 dBm 1310 m ST
Single-mode Converter Range Fibre type Min. transmitting power Min. sensitivity Wave length Plug connector	MS400163 up to 15 km 9/125 µm 15 dBm 31 dBm 1310 m ST

The POLARIS fibre-optic connection 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)

5.8 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.

5.8.1 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 Panel PC	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)	

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

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



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.

5.8.2 Back-up fuse

In the DC variant The POLARIS PROFESSIONAL Panel PC series is protected internally by a 4 A time-lag fuse and in the AC variant it is protected by a 1.6 A time-lag fuse. The fuse may be triggered in the case of voltage dips or undervoltage.

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 protecting the POLARIS with an upstream fuse to prevent blowing the fuse inside the device. Only BARTEC can change the internal fuse.

Upstream fuse for AC: 1.6 A quick-acting (since June 2015: 2.5 A)
DC: 4 A quick-acting.

The I² value must be taken into consideration for other versions of fuses.

5.8.3 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.

5.8.4 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.

5.8.5 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).

5.8.6 Examples of Shielding Connections

Double-sided shield connection on the connecting cables:

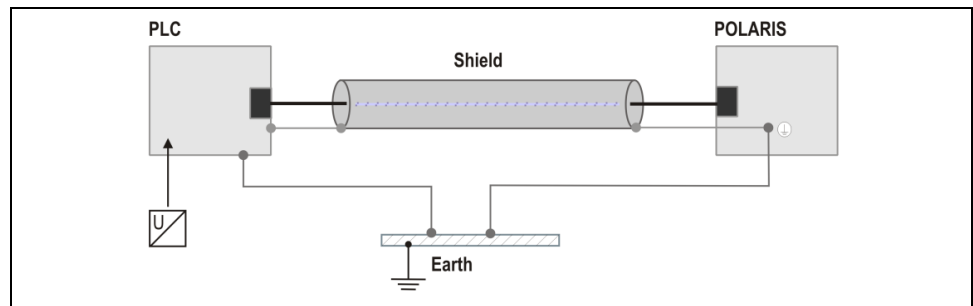


Illustration 15: Example of double-sided shield connection

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:

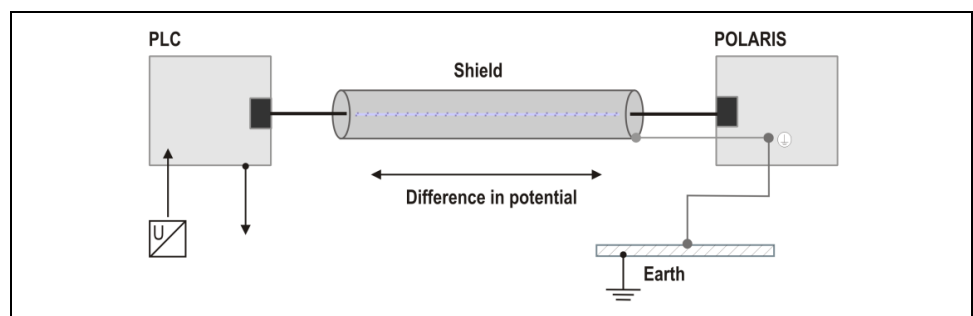


Illustration 16: Example of single-sided shield connection

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.

5.8.7 Ethernet

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.

6. Commissioning

For electrical systems the relevant installation and operating specifications (e.g. Directives 99/92/EC and 94/9/EC, BetrSichV and the applicable national ordinances, EN 60079-14, IEC 60079-14 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.

6.1 Final Inspection

Check the following requirements before commissioning the device:

Only open the 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.

- ▶ 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?
- ▶ 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.

7. 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.

7.1 Operating System

The POLARIS series devices have the Windows 7 Ultimate or the Windows 10 IOT Enterprise LTSC operating system pre-installed. According to the licence for Windows it is not permissible to use this system as an office PC.

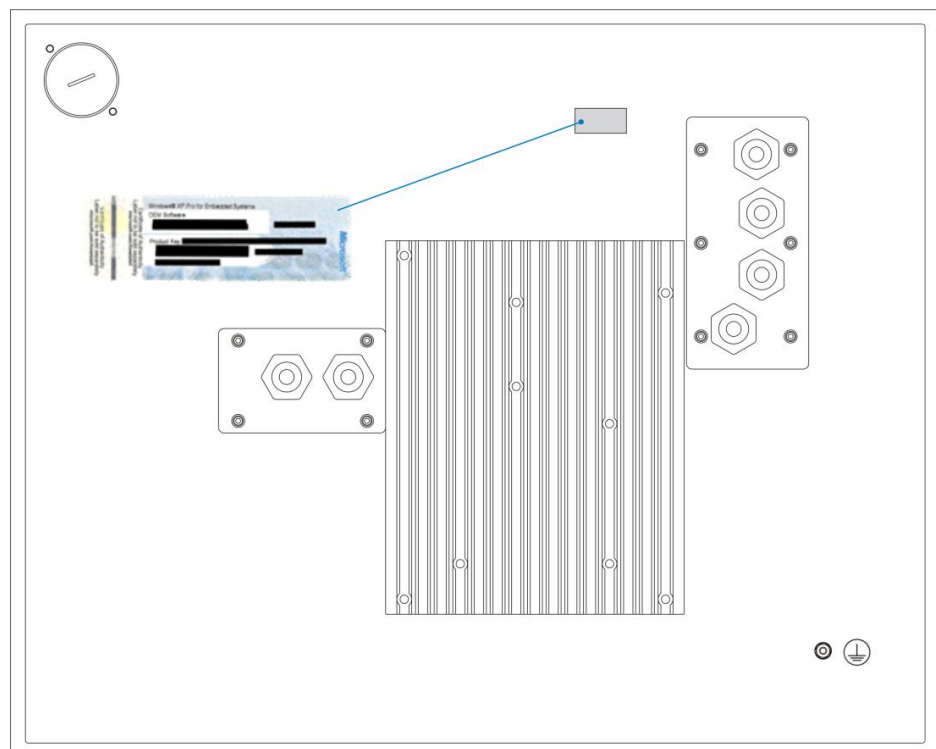


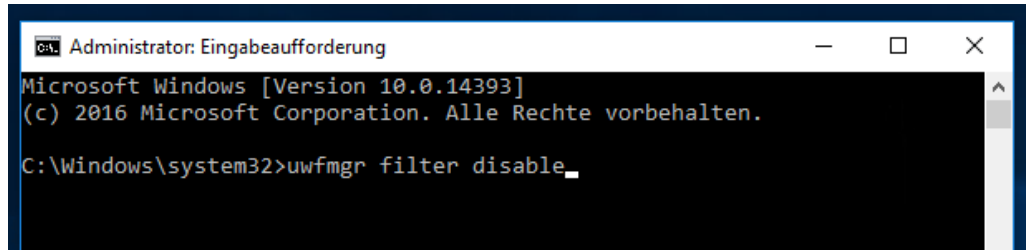
Illustration 17: License sticker example

7.2 Commissioning Software

7.2.1 Windows 10 IoT Enterprise LTSC

The devices are delivered with active writing filter (UWF). This UWF prevents that changes in the disk drive C: can be made.

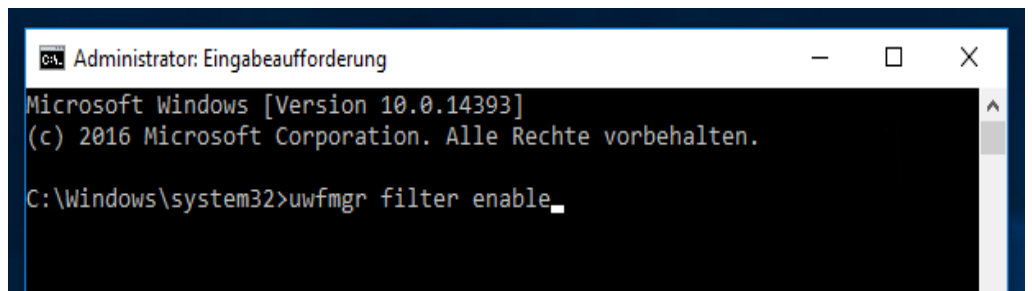
To carry out changes the UWF must be deactivated. Moreover Command Prompt (CMD) must be started as an administrator and „uwfmgr filter disable“ executed.



After a reboot the UFW is deactivated and changes in the system can be protected.

The turn on the UWF's is proceed as follows:

Start the Command Prompt (CMD) as an administrator. After the reboot of the device the command „uwfmgr filter enable“ activates the writing filter.



After the reboot the device is protected again.

Important:

- 1) To install a windows update, update a virus data bank and for changing other settings the UWF must be switched off. It can also cause problems if an applications package want to be saved on disk drive C:. In the worst case the RAM-Overlay (buffer of the changes of disk drive C:) can overrun which hinders the implementation of the applications.
- 2) Ist he UWF not activated switching off can lead to destruction of parts of the operating system up to the impossibility of another starting of the device.

7.2.2 Windows 7 Ultimate

By first introduction the operating system must be installed for the user, please follow the instructions on the screen.



The Windows 7 Ultimate operating systems do not support EWF!

7.3 On-board Bartec Recovery Solution

7.3.1 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.

7.3.2 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.

7.3.3 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.

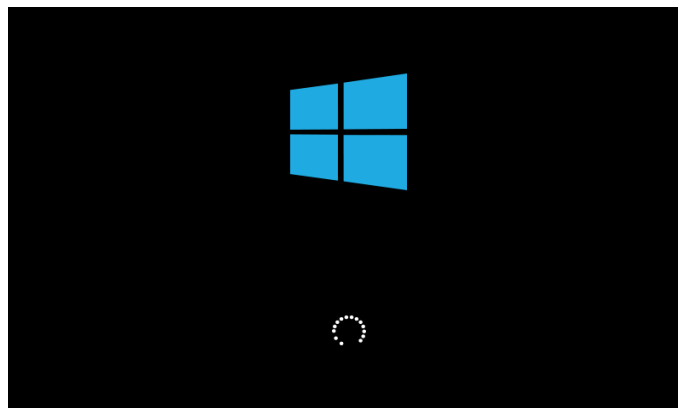


Illustration 18: Start Windows PE.

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.

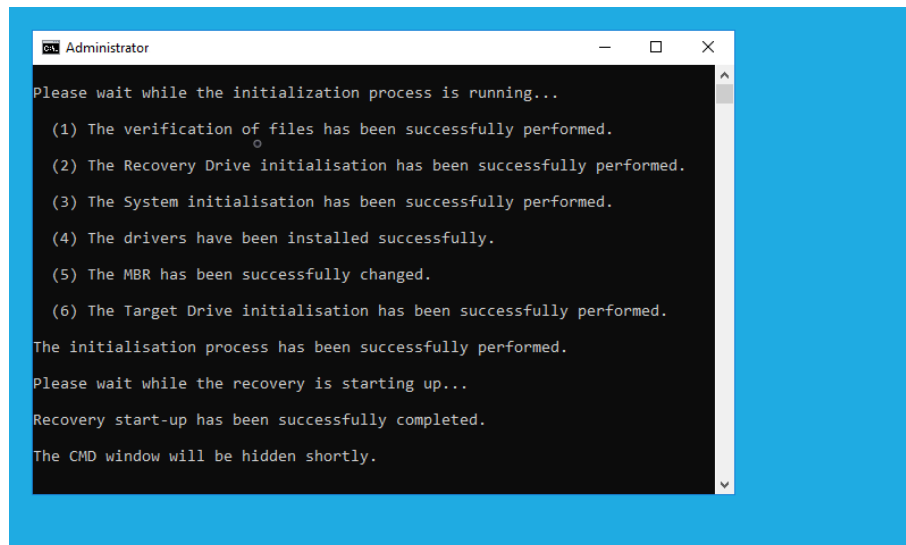


Illustration 19: CMD window with information

7.3.4 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.

In case of Windows 7 Embedded of operating system (Ultimate or standard) the licence terms on Windows 7 Embedded family are indicated in the window. In case of Windows 10 IoT of operating system the licence terms on Windows 10 IoT family are to be seen.

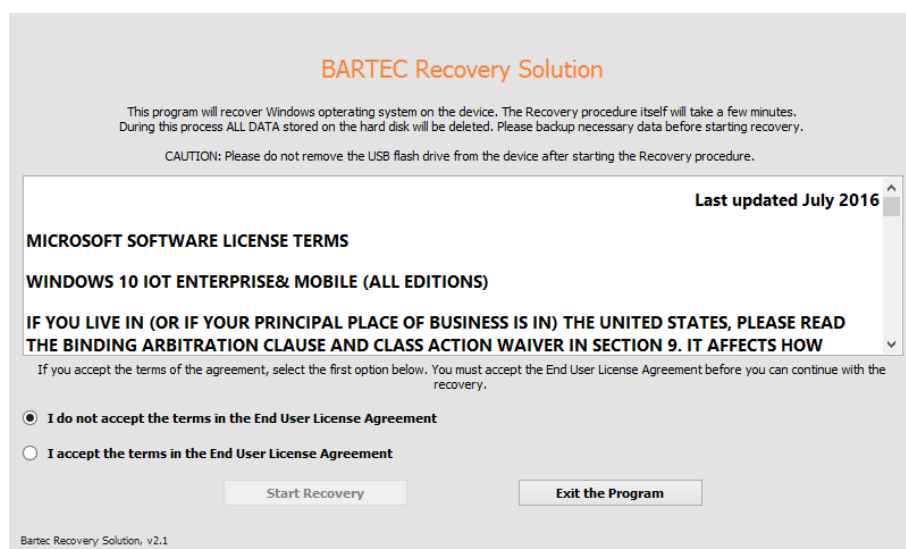


Illustration 20: Licence terms

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 21: Choice of functions



Device can be reset to factory settings

7.3.5 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.

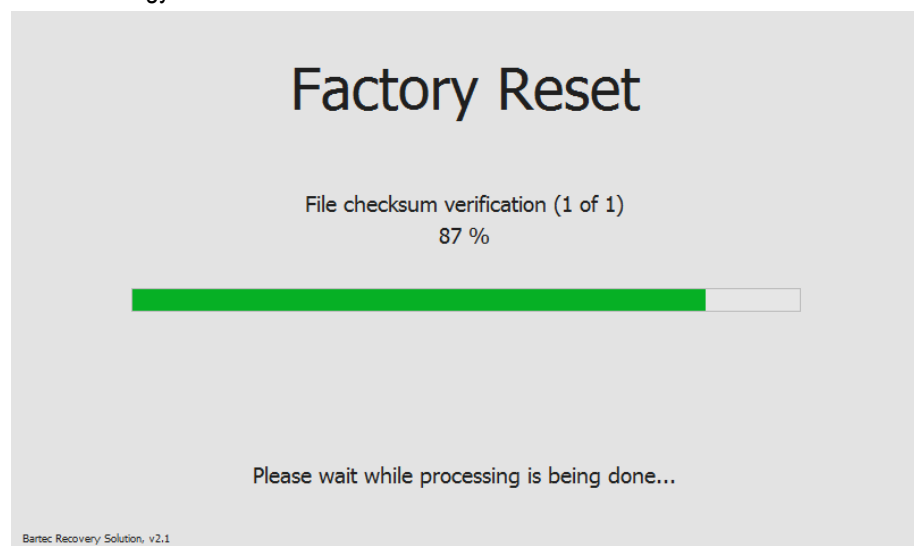


Illustration 22: Verify to the effigy file

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

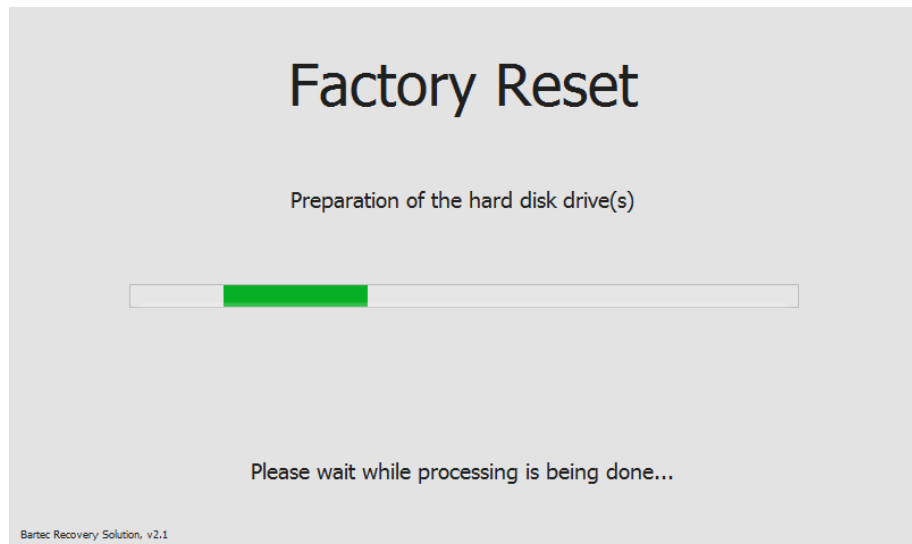


Illustration 23: Prepare the partition

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

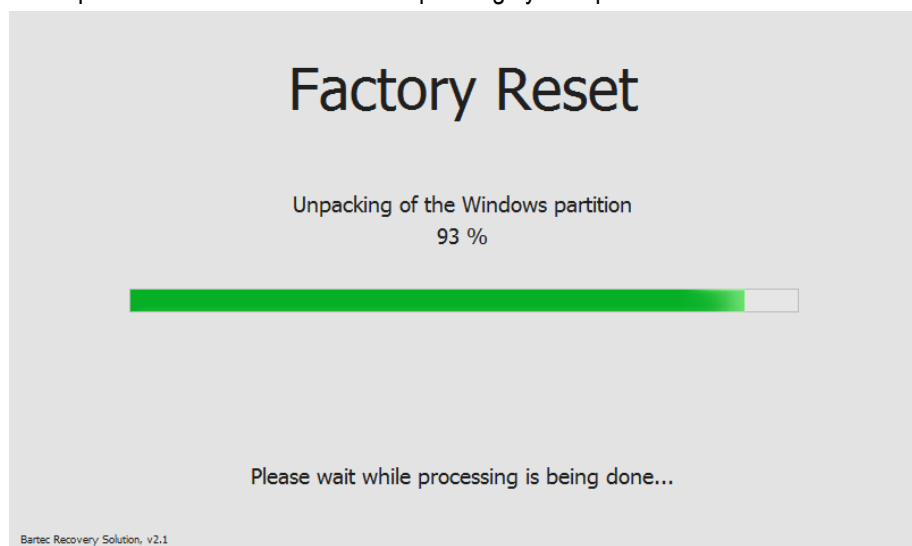


Illustration 24: Transferred by system files on operating system partition

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

7.3.6 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.

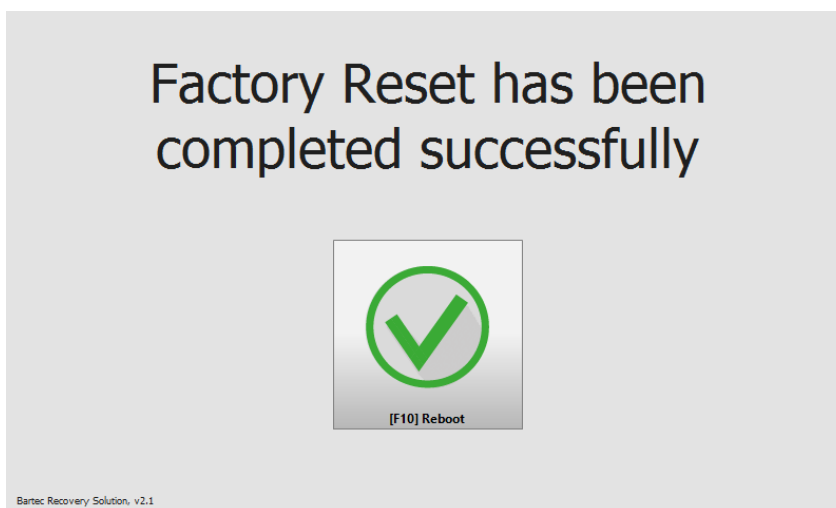


Illustration 25: Successful closure of the recovery process

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.

7.4 Recovery/Backup Function

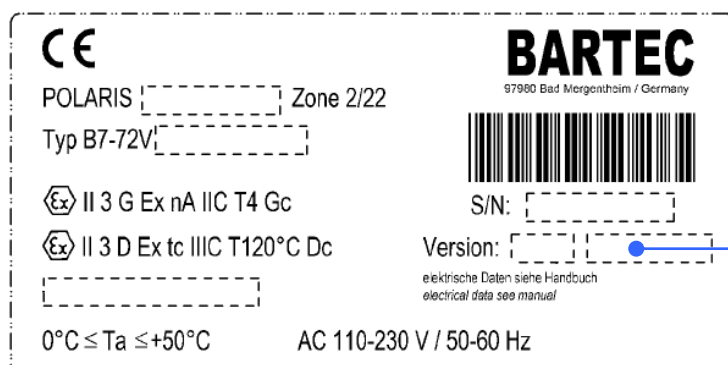
The POLARIS can be restored to delivery status by means of a BARTEC recovery stick.



The BARTEC recovery stick is not included in the scope of supply.
 It can be ordered from the contact address support-polaris@bartec.de

7.4.1 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

7.4.2 Backup



We expressly point out that it is the user's responsibility to make a backup of the POLARIS and all its functions!

We expressly recommend that such a backup of the POLARIS be saved on an external storage medium (USB stick [recovery stick], CD, DVD or suchlike) and/or in the company network!

7.4.3 Switching Off and Shutting Down

Irrespective of the application, the Microsoft Windows operating system saves important data in the working memory during system operation. Before the PC or the POLARIS is switched off, this data must be saved on the hard disk.

ATTENTION

Shutting down the POLARIS in an orderly fashion prevents malfunctioning in the operating system.

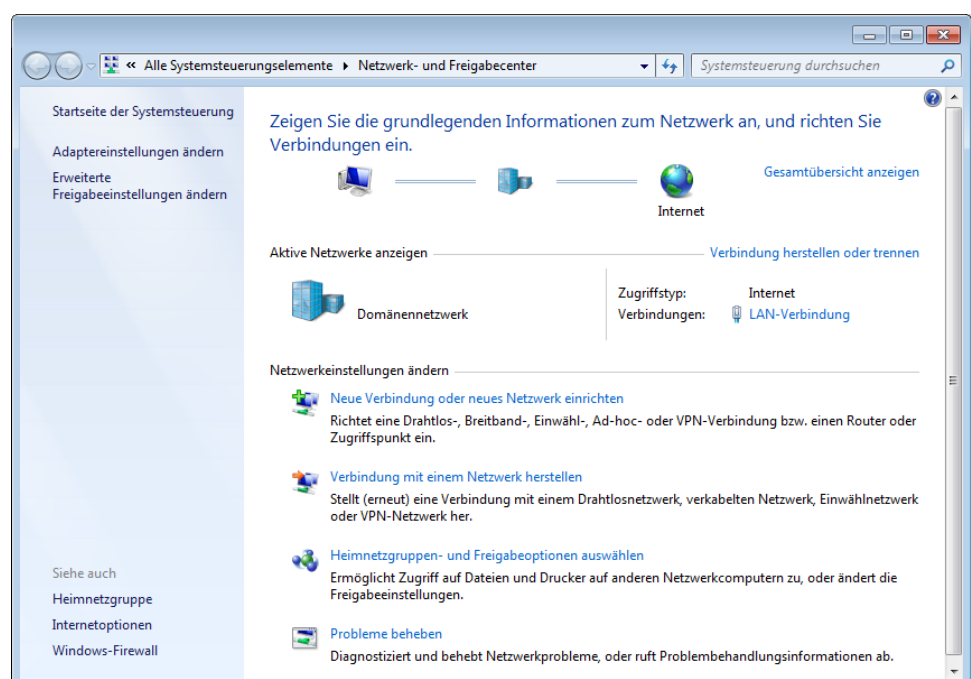
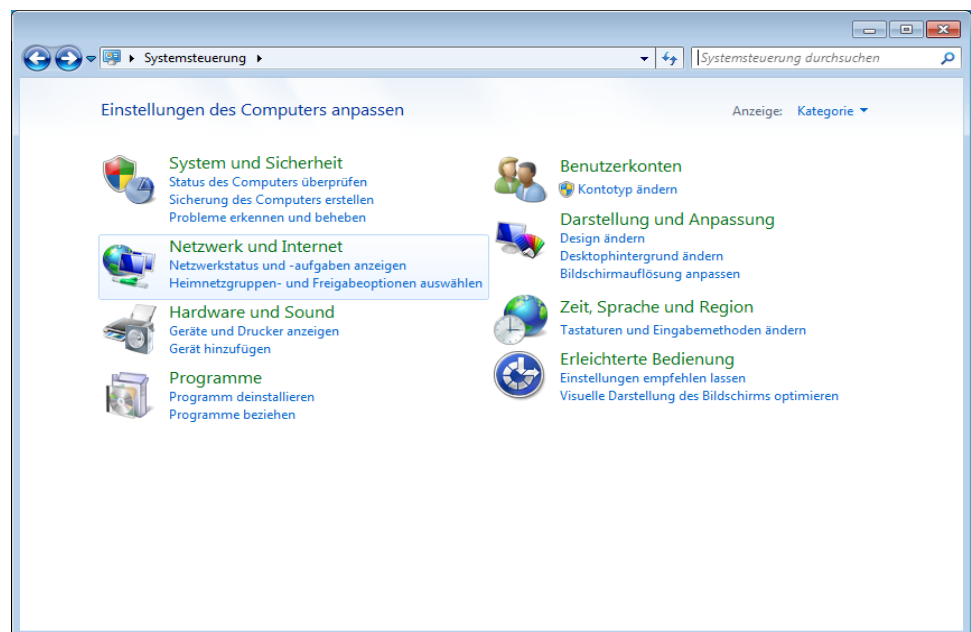
- ▶ Use the Windows button to shut down or switch off the POLARIS.
- ▶ Do not switch off the POLARIS until Windows informs the user that the data has been saved (appearance of the logout script).

7.5 Network (Ethernet) setup with Windows XP

7.5.1 Requirements

Network (Ethernet) setup: Physical connection (connection of Ethernet cable to a network (e. g. switch, hub, server))

- Go to Start ⇒ Control panel <double click>.
- Mark "Network connections" and activate with <double click>.
- Select LAN connection with < double click >.



- To select the function Internet Protocol click (figure 1) on sub item "Properties"
- With a < double click > on Internet Protocol (figure 2) the function is activated.

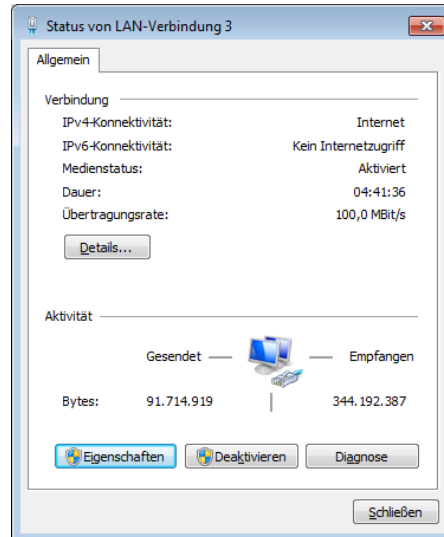


Figure 1

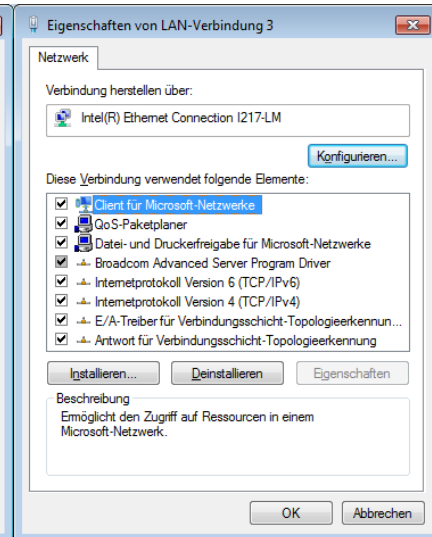


Figure 2

- The chart (figure 3) appears when the network and a DHCP server are available.
- Configuration example (figure 4) when no DHCP server is available (connection via switch or HUB).

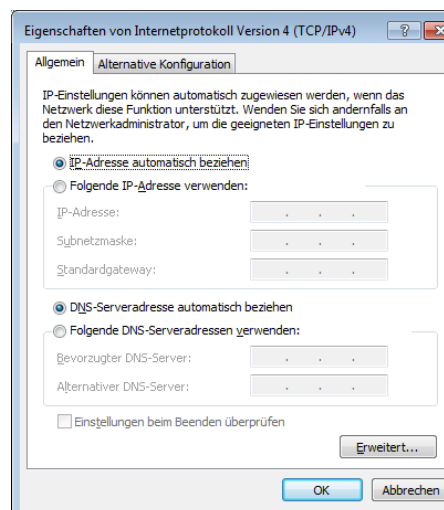


Figure 3

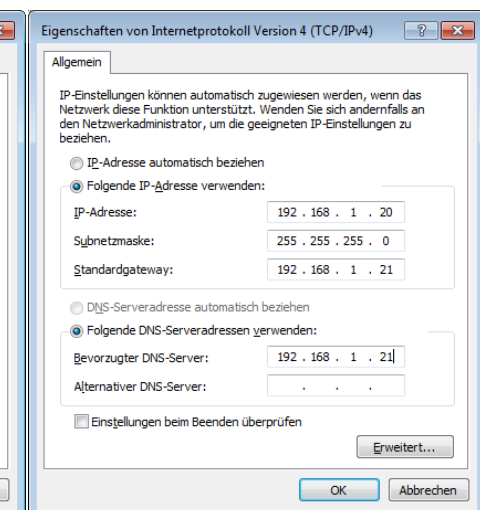


Figure 4

7.6 Touch Screen

In the device variants with touchscreen, the touchscreen software is pre-installed already. The touch screen software is available for download at:

<http://www.bartec.de/automation-download/>

8. 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 5.8
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.

9. 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.

9.1 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.

9.2 Inspection

Under EN 60079-17, EN 60079-19, IEC 60079-17 and 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.

9.3 Maintenance and Repair Work

Adhere to the applicable regulations under Directive 99/92/EC, EN 60079-17, EN 60079-19, IEC 60079-17 and 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.

9.3.1 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>

> Quality and culture

> RMA form

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

E-mail: services@bartec.de

Phone: +49 7931 597-444

10. 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.

11. 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.

12. Accessories, Spare Parts

Included in the scope of the delivery:

Name		Order no.
POLARIS Panel PC with Windows® XP Professional or Windows® 7		
Driver for Mainboard and Touch		
Mounting clamps		
Reinforcement frame	POLARIS Panel PC 15"	05-0205-0009
	POLARIS Panel PC 19.1"	05-0205-0010
	POLARIS Panel PC 24"	05-0205-0012

Accessories, Spare Parts for POLARIS PROFESSIONAL series

Name				Order no.
Keyboard in respective national language				B7-72VZ-40.0
Input devies	Mouse			B7-72VZ-1000
	Trackball			B7-72VZ-2000
	Touchpad			B7-72VZ-3000
	Joystick without button			B7-72V2-8000
	Joystick with button			B7-72V2-9000
Connection cable	for keyboard and mouse	1.8 m		05-0068-0163
		3.0 m		03-0068-0204
	for keyboard and trackball/joystick	1.8 m		03-0068-0172
		3.0 m		05-0068-0205
	for keyboard and touchpad	1.8 m		03-0068-0183
		3.0 m		03-0068-0206
USB Device WLAN	(Ex d socket necessary)			17-71VZ-6000/0100
BARTEC Recovery stick				on request
Enclosure "Exclusive"	POLARIS Panel PC 15"			03-8900-0224
	POLARIS Panel PC 19.1"			03-8900-0225
	POLARIS Panel PC 24"			on request
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
Label strip,	white DIN A4 sheet, for laser printer			03-8900-0224
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
Visualization software	BMS-Graf-Pro 7			17-28TF-0075
External converter	Converter external	RS232-RS422	Non Ex	03-9600-0258
MPI interface	Converter external	MPI - RS422	Non Ex	17-28TZ-0007
Original packing	POLARIS Panel PC 15"			04-9035-0007
	POLARIS Panel PC 19,1"			04-9035-0008
	POLARIS Panel PC 24"			on request

13. Order Numbers

POLARIS Panel PC 15" / Panel PC 19.1" / Panel PC 24"

Description	Code-no.	Interface	Code-no.	Operating System	Code-no.	Power	Code-no.	Computer capacity	Code-no.
PC 15" without Touchscreen	4	USB Ex e/RS422 (recommended version)	76	Windows 7 Ultimate 32bit inkl. Recovery (at 4 GB RAM)	S	AC	0	100 GB HD	0
PC 15" with Touchscreen	6								
PC 19" without Touchscreen	5			Windows 10 IOT LTSB 32bit inkl. Recovery (at 4 GB RAM)	K	DC	2	128 GB SSD	2
PC 19" with Touchscreen	7								
PC 17,3" without Touchscreen	E	Further Interface combinations on request	XX	Windows 10 IOT LTSB 32bit inkl. Recovery (at 4 GB RAM)	K	DC	2	128 GB SSD	2
PC 17,3" with Touchscreen	F								
PC 24" without Touchscreen	C			Windows 10 IOT LTSB 64bit inkl. Recovery (at 8 GB RAM)	L	DC	2	128 GB SSD Power Protected	5
PC 24" with Touchscreen	D								

Komplett-Bestellnummer B7-72V1- _0_ / _000_ _00

Bitte Kennziffer einsetzen. Technische Änderungen vorbehalten. Das Zubehör mit Bestellangaben finden Sie auf den Zubehörseiten

POLARIS Panel PC 15" Sunlight

Description	Code-no.	Interface	Code-no.	Operating System	Code-no.	Power	Code-no.	Computer capacity	Code-no.
PC 15" Sunlight with Touchscreen	6	USB Ex e/RS422 (recommended version)	76	Windows 7 Ultimate 32bit inkl. Recovery (at 4 GB RAM)	S	AC	0	100 GB HD	0
				Windows 10 IOT LTSB 32bit inkl. Recovery (at 4 GB RAM)	K			128 GB SSD	2
		Further Interface combinations on request	XX	Windows 10 IOT LTSB 32bit inkl. Recovery (at 4 GB RAM)	K	DC	2	128 GB SSD	2
				Windows 10 IOT LTSB 64bit inkl. Recovery (at 8 GB RAM)	L			128 GB SSD Power Protected	5

Komplett-Bestellnummer B7-72V1- _2_ / _000_ _00

Bitte Kennziffer einsetzen. Technische Änderungen vorbehalten. Das Zubehör mit Bestellangaben finden Sie auf den Zubehörseiten.

14. Additional Information

Resistance list – polyester front foil **POLARIS series**

BARTEC

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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 alcohol
 Cyclohexanone
 Glycol
 Glycerol
 Isopropanol
 Methanol

Hydrocarbons

Aliphatic hydrocarbons
 General
 Benzine
 Benzene
 Toluene
 Xylene

Chlorinated hydrocarbons

Chlorofluorocarbon
 Perchloroethylene
 III-trichloroethane
 Trichloroethylene

Ester

Ethyl acetate

Other organic solvents

Aether
 Dimethyl formamide
 Dioxane

Acids

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

Aldehydes

Acetaldehyde
 Formaldehyde

Caustic solutions

Ammonia < 2 %
 Caustic soda < 2 %

Saline solutions

Alkalicarbonate
 Bichromate
 Prussiate of potash

Different substances

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

Detergents, scavengers and cleaning agents

Potassium soap
 Detergent solutions (tenside)
 Fabric softeners

Technical oils and fats

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







(Where not stated otherwise: concentration = 100%)


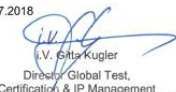
Polyester membranes have a limited resistance to UV light and should therefore not be exposed to direct sunlight for extended periods of time.

D:\BMS791.doc • Resistance list Polyester front foil • Revision 1 / Status: July, 18th 2006 • Technical data subject to change

Declaration of Conformity

POLARIS Panel PC

EU Konformitätserklärung EU Declaration of Conformity Déclaration UE de conformité		BARTEC BARTEC GmbH Max-Eyth-Straße 16 97980 Bad Mergentheim Germany		N° B1-72V0-7C0001_B	
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 für ATEX Zone 2/22		POLARIS for ATEX zone 2/22 Typ B7-72V0-****/**** Typ B7-72V1-****/**** Typ B7-72V2-****/**** Typ B7-72V3-****/**** Typ B7-72VZ-****/****		POLARIS pour ATEX zone 2/22	
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 EMV-Richtlinie 2014/30/EU RoHS-Richtlinie 2011/65/EU		ATEX-Directive 2014/34/EU EMC-Directive 2014/30/EU RoHS-Directive 2011/65/EU		Directive ATEX 2014/34/UE Directive CEM 2014/30/UE Directive RoHS 2011/65/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 60079-11:2012 EN 60079-15:2010 EN 60079-31:2014 EN 60079-18:2015		EN 61000-6-2:2005 EN 61000-6-4:2007 +A1 :2011 EN 60529 :1991 +A1 :2000 +A2 :2013			
Kennzeichnung		Marking		Marquage	
 II 3 G  II 3 D		Visualisierungseinheit Type B7-72V****/**** Ex nA IIC T4 Gc Ex tc IIIC T120 °C Dc			
 II 3 G  II 3 D		Zubehör Type B7-72VZ-****/**** Ex nA IIC T4 Gc Ex tc IIIC T120 °C Dc			
 II 3 G  II 3 D		USB Barrier für POLARIS Zone 2/22 Type B7-72VZ-D000 Ex mc [ic] IIC T4 Gc Ex mc [ic] IIIC T135 °C Dc			
The equipment is subject to special conditions for safe use specified in the user manual.					
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EU Konformitätserklärung EU Declaration of Conformity Déclaration UE de conformité		BARTEC BARTEC GmbH Max-Eyth-Straße 16 97980 Bad Mergentheim Germany		N° B1-72V0-7C0001_B	
Verfahren der internen Fertigungskontrolle		Procedure of internal control of production		Procédure de contrôle interne de fabrication	
<div style="text-align: center;">   </div> <div style="display: flex; justify-content: space-around;"> <div> Bad Mergentheim, den 17.07.2018 V. Müller VP Automation and Communication System </div> <div> V. Gitta-Kugler Director Global Test, Certification & IP Management </div> </div>					
03-0383-0364		Seite / page / page 2 von / of / de 2			

► All certificates see www.bartec-group.com

User Notes

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User Notes

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User Notes

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