



Operating Instructions

Industrial Box PC

R. STAHL HMI Systems GmbH
Adolf-Grimme-Allee 8
D 50829 Cologne

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Publisher

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R. STAHL HMI Systems GmbH
Adolf-Grimme-Allee 8
D 50829 Cologne

Head office: Cologne
Court of registration: District court Cologne, HRB 30512
VAT number: DE 812 454 820

Phone: (switchboard) +49 (0) 221 76 806 - 1000
(hotline) - 5000
Fax: - 4100
E-mail: (switchboard) office@stahl-hmi.de
(hotline) support@stahl-hmi.de

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Formatting conventions

The markings in these operating instructions refer to specific features that must be noted.

In detail, these are:

 DANGER	This sign alerts users to hazards that will result in death or serious injury if ignored.
 WARNING	This sign alerts users to hazards that may result in death or serious injury if ignored.
 CAUTION	This sign alerts users to hazards that may damage machinery or equipment or result in injury if ignored.
 CAUTION	Information highlighted by this symbol indicates measures for the prevention of damage to machinery or equipment.
 NOTICE	Information highlighted by this symbol indicates important information of which particular note should be taken.
 DOCUMENTATION	Information highlighted by this symbol refers to a different chapter or section in this manual or other documentation or a web-page.

Warning


	<p style="text-align: center;">Warning !</p> <p>In ambient temperatures exceeding +45 °C the surface of the devices may heat up. Caution when touching !</p>
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1 Foreword

These operating instructions are intended for the safe and correct installation of the Industrial Box PCs.

 **NOTICE**

For the correct operation of all associated components please note, in addition to these operating instructions, all other operating instructions enclosed in this delivery as well as the operating instructions of the additional equipment to be connected !

2 Function

The type IBPC-5x1 Industrial Box PCs are powerful, reliable Thin Clients for installation in industrial areas (Non-Ex).

The devices feature two GbE network adapters and solid state flash memory. They are hardware-compatible to R. STAHL's Remote HMI systems.

The user-friendly software ensures smooth operation.

2.1 Scope of delivery

- 1x Industrial Box PC type IBPC-5x1
- 2x foot
- 1x power supply adapter with power line
- 1x recovery USB stick
- 1x operating instructions

3 Technical data

Function / Equipment	IBPC-5x1
General information	
HMI-type	Industrial Box PC
Electrical data	
AC rated operational voltage	230 V
Voltage range AC	100 – 240 V
Power consumption AC 1	1.2 A
Frequency range	50 – 60 Hz
Rated operational power	40 W
Power supply	only via external power supply adapter (included in delivery)
Processor type	AMD GX-222GC
Processor details	2.2 – 2.4 GHz; dual core, 10W TDP
Graphics controller	integrated AMD Radeon R5E graphics (655 / 800 MHz)
Main memory	4 GB (DDR3 / 1600)
Data memory	32 GB
Memory technology	Flash drive (solid state drive - SSD, MLC)
Operating system	Windows 10 IoT Enterprise 2016 LTSB (64 bit)
Language support	via operating system
Image	Remote firmware
Ethernet / Data	2 x 10/100/1000 Mbit
Ethernet note	PXE- & WoL Support, Teaming Support
USB interface	4 x USB 2.0
Display interface	1x DVI-I 1 x display port (DP V1.2)
Maximum resolution	DVI: 1920 x 1200 DP: 3840 x 2160
Audio interface	Line in / out
Audio details	Realtek ALC 671, 5.1 channel, high definition audio
Ambient conditions	
Ambient temperature, operation	0 °C ... +35 °C / [32 °F ... +95 °F]
Temperature note 1	+50 °C / [+122 °F] with optional fan
Condensation	not permitted during operation
Mechanical data	
Dimensions (WxHxD)	250 mm x 52 mm x 191 mm / [0.82 ft x 0.17 ft x 0.63 ft] (without feet)
Mounting position	vertical or horizontal
Weight	1.0 kg / [2.21 lbs]

4 Conformity to standards

The Industrial Box PCs comply with the following standards and directive:

Electromagnetic compatibility	
EMC directive	
2014/30/EU	Classification
EN 61000-6-2 : 2005	Immunity
EN 61000-6-3 : 2007 + A1 : 2011	Emitted interference
EN 61000-3-2 : 2014	Limiting values for harmonic current emissions
EN 61000-3-3 : 2013	Limiting values for voltage changes / fluctuations
EN 55022 : 2010	Information technology devices - Radio interference properties - Limiting values
EN 55024 : 2010	Information technology devices - Interference resistance properties - Limiting values
Low voltage directive	
2006/95/EC	Classification
IEC 60950-1 : 2005 + Am 1 : 2009	Information technology devices - Safety (General Requirements)
RoHS directive	
2011/65/EU	Classification
EN 50581 2012 :	Technical documentation evaluating electric and electronic equipment with regards to hazardous substances.

5 Marking

Manufacturer	R. STAHL HMI Systems GmbH
Type designation	IBPC-5x1-*
CE classification:	CE 0158

5.1 Use

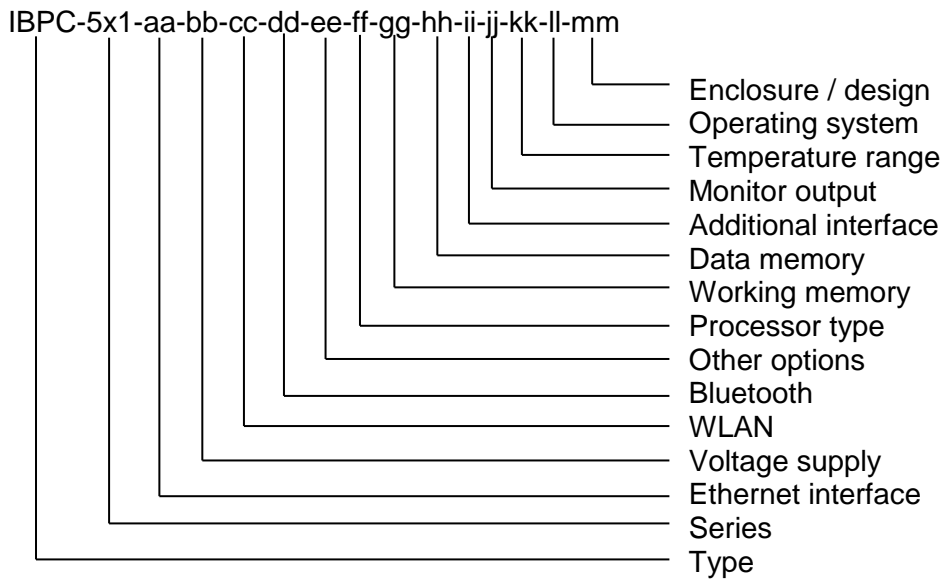
This device may be operated in the following countries:

Austria	Belgium	Bulgaria	Croatia
Cyprus	Czech Republic	Denmark	Estonia
Finland	France	Germany	Great Britain
Greece	Hungary	Iceland	Ireland
Italy	Latvia	Liechtenstein	Lithuania
Luxemburg	Malta	The Netherlands	Norway
Poland	Portugal	Romania	Slovakia
Slovenia	Spain	Sweden	Switzerland
Turkey			

For up-to-date information on possible operating restrictions refer to the appropriate authority in each country. Should your country not be among those listed, please check with the appropriate regulating authority whether the product may be used in your country.

6 Type code

6.1 IBPC-5x1-* (Thin Client)



Product type:

Product key structure	Description
	Version with
IBPC-5x1- 2TX -bb-cc-dd-ee-ff-gg-hh-ii-jj-kk-ll-mm	Copper Ethernet interface 2x 10/100/1000Base-TX
IBPC-5x1-aa- AC -cc-dd-ee-ff-gg-hh-ii-jj-kk-ll-mm	Power supply 100 - 240 VAC, 50 - 60 Hz
IBPC-5x1-aa-bb- W00 -dd-ee-ff-gg-hh-ii-jj-kk-ll-mm	no WLAN
IBPC-5x1-aa-bb-cc- B0 -ee-ff-gg-hh-ii-jj-kk-ll-mm	no Bluetooth
IBPC-5x1-aa-bb-cc-dd- X0 -ff-gg-hh-ii-jj-kk-ll-mm	Place holder
IBPC-5x1-aa-bb-cc-dd-ee- P2 -gg-hh-ii-jj-kk-ll-mm	AMD GX Processor
IBPC-5x1-aa-bb-cc-dd-ee-ff- R3 -hh-ii-jj-kk-ll-mm	4 GB main memory
IBPC-5x1-aa-bb-cc-dd-ee-ff-gg- M4 -ii-jj-kk-ll-mm	32 GB Solid State Drive
IBPC-5x1-aa-bb-cc-dd-ee-ff-gg-hh- I0 -jj-kk-ll-mm	no optional interface
IBPC-5x1-aa-bb-cc-dd-ee-ff-gg-hh-ii- DV -kk-ll-mm	DVI monitor interface
IBPC-5x1-aa-bb-cc-dd-ee-ff-gg-hh-ii-jj- O8 -ll-mm	0 – 35 °C
IBPC-5x1-aa-bb-cc-dd-ee-ff-gg-hh-ii-jj-kk- S5 -mm	Windows 10 IoT Enterprise
IBPC-5x1-aa-bb-cc-dd-ee-ff-gg-hh-ii-jj-kk-ll- E000	Standard

7 Safety information



Read the safety information listed in section 7.1 carefully to avoid injury and damage to equipment!

7.1 General safety information

- For the installation and operation of the device, please note the information on ambient conditions and the chapter headed "Commissioning".
- When replacing the lithium battery on the mainboard, please follow the instructions in the chapter headed "Replacing the lithium battery".
- Caution: system components may heat up.
- The activities described in these instructions require special care.
- Repairs may only be carried out by authorised, qualified staff. Faulty pairs may result in risks to life (electrical shock, energy risk, fire risk) or damage to the device.
- Operate the device only when it is closed.

7.1.1 Power line and power adapter

- The power line included in the delivery meets the requirements of the country in which you have purchased the device. Make sure the power cable is approved for use in the country in which you are using it.
- The power cable of the power adapter must only be connected to a socket if the device is connected.
- Do not use the power adapter with other devices.
- Only use the power adapter intended for the device.
- Ensure that the power consumption of the power adapter does not exceed that of the electric circuit to which it is connected.
- On/off switches do not isolate the device from the line voltage. For a complete separation from the line voltage you need to pull the plug from the socket.


7.1.2 Transporting the device

- Transport all devices individually and only in their original packaging or in a different kind of packaging that provides protection against shock and impact.
- Unpack the devices at the point of installation only.
- If the device is brought in from a cold environment to the operating room, condensation might form. Before operating the device, wait until it has acclimatised and is absolutely dry.

7.1.3 Cleaning the device

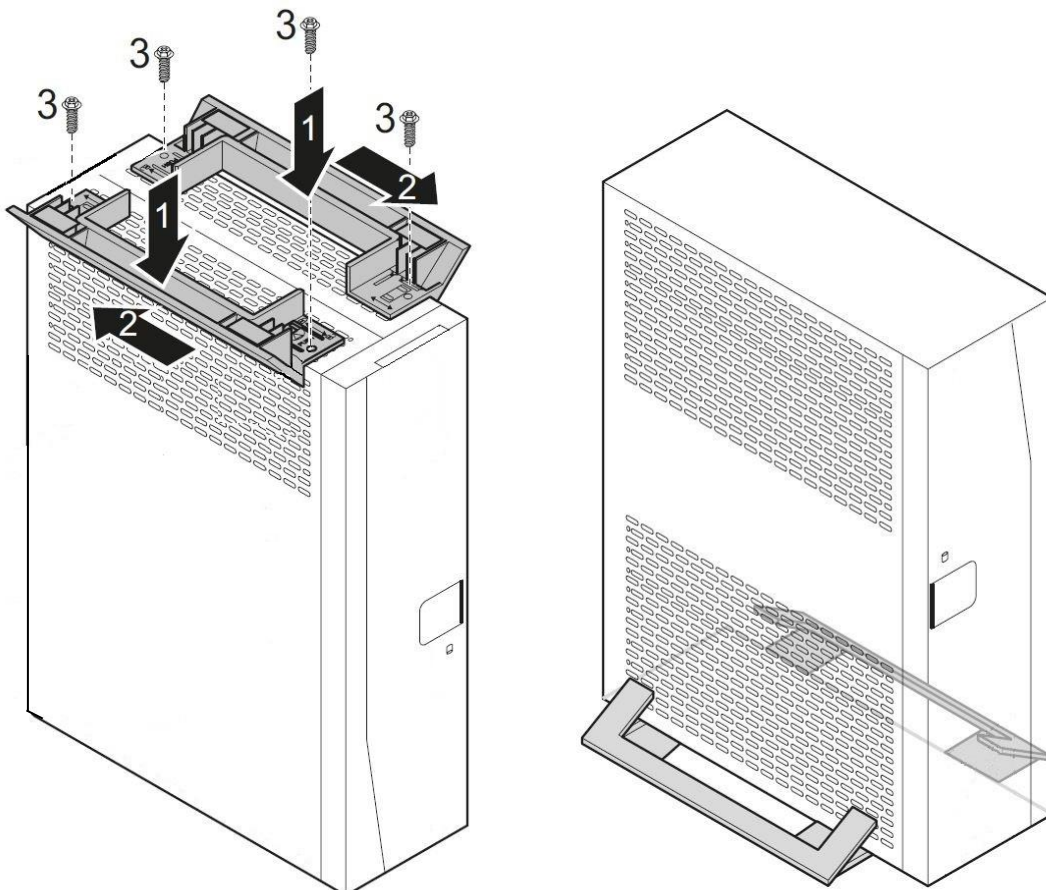
- Switch off the device and all devices connected to it, and pull the plug from the socket.
- The inside of the enclosure may only be cleaned by authorised qualified personnel.
- Do not use abrasive or plastics-dissolving cleaning agents (alcohol, thinner or acetone).
- Under no circumstances use water. Intruding water may carry substantial risks for the user (e.g. electric shock).
- Make sure that no liquid reaches the inside of the devices.
- Clean the outside of the enclosure with a dry cloth. If the device is very dirty you may use a damp cloth that you have immersed in a mild soapy water solution and wrung out well.

8 Installing the device

 NOTICE	For sufficient ventilation of the enclosure and to prevent overheating the device may only be operated with attached feet. If the device is mounted inside a cabinet or similar, you must ensure sufficient ventilation.
	Attach the feet for vertical or horizontal operation.
	When connecting many cables to the device a firm stand is vital to prevent the device from tipping over.

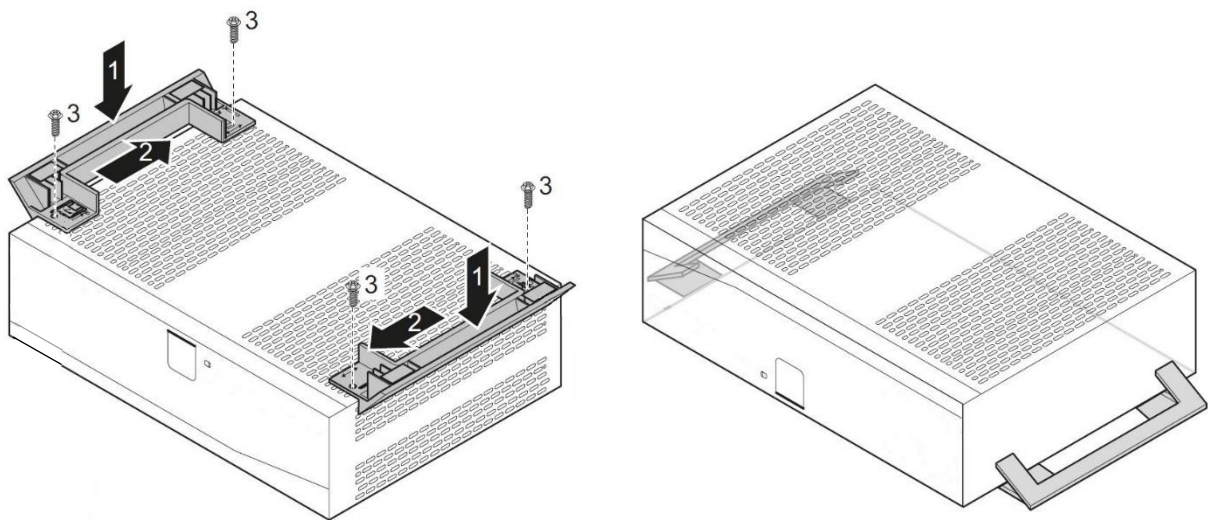
8.1 Vertical operation

- Attach the feet only at the positions shown in the illustrations.
- Detach the cables, if necessary.
- Place the device on its top (narrow side) as shown on a stable, plane and clean surface.
- Hook the feet into the intended openings in the enclosure (1).
- The feet have lock symbols indicating the direction in which to slide the foot when mounting / dismounting it.
 - attach and lock foot into position = slide to the left (closed lock)
 - unlock and detach foot = slide to right (open lock)
- Repeat for each foot:
 - Use both hands to press the outer elements of the foot evenly onto the enclosure and slide the foot in the direction of the arrow (2) until it clicks into position.
- To prevent inadvertent detachment of the feet they can also be secured with two type M2.5 x 5 screws. These are not included in the delivery.
- Fix the feet into position with the screws (3).
- Position the device on the feet.
- Re-connect any disconnected cables.



8.2 Horizontal operation

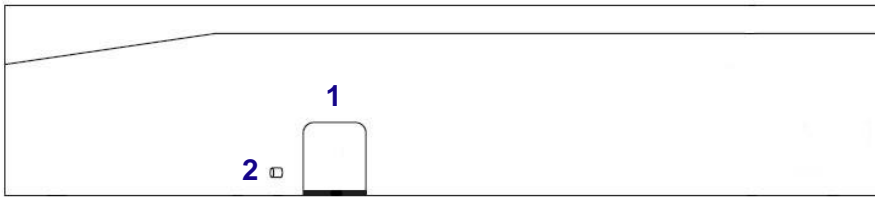
- Attach the feet only at the positions shown in the illustrations.
- Detach the cables, if necessary.
- Place the device on its right-hand side as shown on a stable, plane and clean surface.
- Hook the feet into the intended openings in the enclosure (1).
- The feet have lock symbols indicating the direction in which to slide the foot when mounting / dismounting it.
 - attach and lock foot into position = slide to the left (closed lock)
 - unlock and detach foot = slide to right (open lock)
- Repeat for each foot:
Slide the foot in the direction of the arrow (2) until it clicks into place.
- To prevent inadvertent detachment of the feet they can also be secured with two type M2.5 x 5 screws. These are not included in the delivery.
- Fix the feet into position with the screws (3).
- Position the device on the feet.
- Re-connect any disconnected cables.



9 Commissioning

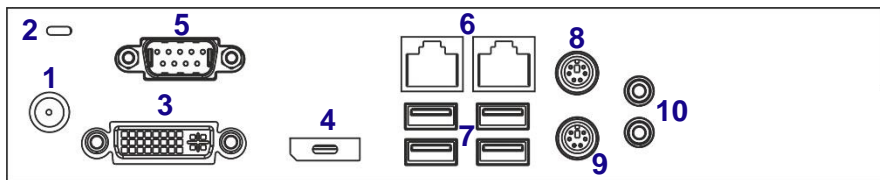
9.1 Connections

9.1.1 Front



Number	View	Meaning
1		On / off switch
2		Display flash memory or hard disk access

9.1.2 Back



Number	View	Connection	Meaning
1		Voltage connector	Connection for power supply adapter (DC IN)
2		-	Security lock mechanism
3		DVI-I connector	DVI screen connection
4		Display port	Display port
5		9-pin sub-D plug (male)	Serial interface RS-232
6	 1.....8	2x RJ-45 connector	Ethernet copper LAN connection
7		4x USB-A connector	USB interfaces, connection type A
8		PS/2 socket	Mouse connection
9		PS/2 socket	Keyboard connection
10		TRS socket (stereo) 2 x 3.5 mm	Audio line in (top) / out (bottom) interface

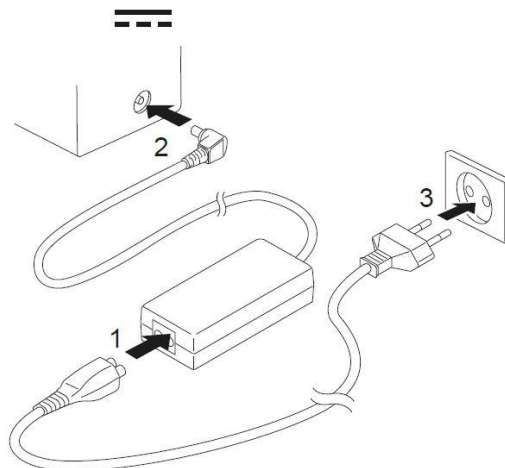
9.2 Connection of external devices

NOTE

- Read the documentation for the external device before connecting it.
- To ensure proper function of your device, either use only the included connection cables or only other connection cables of equivalent quality.
- With the exception of USB devices, when connecting external devices the mains plugs must be disconnected.
- Neither connect or disconnect cables during thunderstorms.
- When disconnecting a cable, always do so by pulling at the plug. Do not pull the cable !

9.2.1 Power supply adapter

- Connect the power line (1) to the power supply adapter.
- Connect the power supply adapter cable (2) to the voltage connector (DC IN) of the Box PC.
- Connect the power supply line (3) to the mains.



9.2.2 Monitor

- Prepare the monitor as described in its operating instructions (e.g. connect cables).
- Connect the data line to the required monitor interface (DVI or display port) of the Box PC.
- Connect the monitor's power line to a grounded socket with earth contact.

9.2.3 Keyboard

- You can connect a USB or PS/2 keyboard to the Box PC.
- Use only the keyboard cable included in the delivery.

9.2.3.1 USB keyboards

- Plug the USB plug of the keyboard cable into one of the 4 USB interfaces of the Box PC.

9.2.3.2 PS/2 keyboards

- The Box PC will only recognise the PS/2 keyboard if it is connected with the Box PC switched off, and then switched back on again.
- Proceed as follows:
 - Switch off the Box PC.
 - Plug the keyboard cable plug into the PS/2 connector (9) of the Box PC.
 - Switch the Box PC back on.

9.2.4 Mouse

- You can connect a USB or a PS/2 mouse to the Box PC.

9.2.4.1 USB mouse

- Plug the USB plug of the mouse cable into one of the 4 USB interfaces of the Box PC.

9.2.4.2 PS/2 mouse

- The Box PC will only recognise the PS/2 mouse if it is connected with the Box PC switched off, and then switched back on again.
- Proceed as follows:
 - Switch off the Box PC.
 - Plug the mouse into the PS/2 connector (8) of the Box PC.
 - Switch the Box PC back on.

9.2.5 Network LAN

- Connect the power line to one of the two RJ45-LAN interfaces.

9.2.6 USB

- A great variety of external devices (e.g. printer, scanner, modem) can be connected to the USB interfaces.
- USB devices can be hot-plugged. This means that the cables of USB devices can be connected and disconnected to a Box PC even if it is switched on.
- For more information, refer to the USB devices' documentation.
- To ensure the transmission rate of USB 2.0, the cable between the external USB device and the USB interface of your device must be no longer than 3 m.
- Connect the USB cable to the external device.
- Connect the USB cable to one of the USB interfaces of the Box PC.

9.2.7 Serial interface

- The serial interface is for the connection of external serial devices.
- Connect the data cable to the external device.
- Connect the data cable to the serial interface of the Box PC.

9.2.8 Audio

- Connect the line out devices to the audio out interface (10, bottom) of the Box PC.
- Connect the line in devices to the audio in interface (10, top) of the Box PC.

10 Operation

10.1 Windows® 10 IoT Enterprise 2016 LTSB operating system

The operating system is based on Windows 10 for PC platforms with 64 bit x86 processors. For the LTSB (Long-Time-Service-Branch) versions, Microsoft guarantees 10 years of security updates and new builds with feature updates only every 2-3 years, with these being optional. The LTSB versions are ideal for industrial applications and feature additional security components such as write filters (UWF) and HORM (start of a system snapshot from the RAM plus write protection).


From 2016 LTSB onwards, Microsoft has tied its licensing model to the processor performance:

ENTRY for AMD® GX and ATOM™
 VALUE for Intel® Core i5™
 HIGH for Intel® Core i7™


The Box PC devices with Windows 10 IoT Enterprise 2016 LTSB operating systems have the license provided as part of the image, with the corresponding label affixed to the back of the device. When delivered, the devices have already been registered and activated.

The EOL (End of Life) date for Windows 10 IoT Enterprise 2016 LTSB for support and updates has been set by Microsoft to 2026-07-31.

10.1.1 Recovery

 NOTICE	If a Box PC is reset to the factory state (recovered) it will remain registered but will have to be reactivated. This requires an active internet connection to a Microsoft server.
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10.1.2 Proprietary Windows installations

 NOTICE	The Windows 10 IoT license key is tied to STAHL images. The installation of own Windows 10 IoT operating systems requires a separate license key. All necessary drivers are provided by R. STAHL HMI Systems GmbH. Please contact our Support department.
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10.2 Switching on the Box PC

- If necessary, switch on the monitor (see operating instructions for the monitor).
- Press the on/off switch at the front of the Box PC.
- The operating LED is lit, the Box PC starts up.

10.3 Switching off the Box PC

- Close down the operating system with the "Shut down" function in the Start menu.
- If the operating system does not automatically switch off the Box PC, press the on/off switch. Caution ! This may lead to a loss of data.
- When the Box PC is switched off, it uses a minimum of energy.
- If necessary, switch off the monitor (see operating instructions for the monitor).

10.4 Retrieving the BIOS set-up

- To retrieve the BIOS set-up, press the F2 key (repeatedly, if necessary) when the Box PC starts up.
- The *BIOS set-up* starts up. You can access further setting options in the BIOS set-up if you select one of the registers.

11 System modifications



Any changes to or repairs of the device may only be carried out by trained, qualified staff. Repairs made by unqualified staff will render the guarantee null and void, and may result in substantial risk for the user (electric shock, fire)!



Before opening the Box PC, please take note of the following:

- The Box PC must be switched off and must not be in energy saving mode.
- Pull the plug.
- Make sure you do not trap any cables when installing or removing any components.

11.1 Notes on assemblies

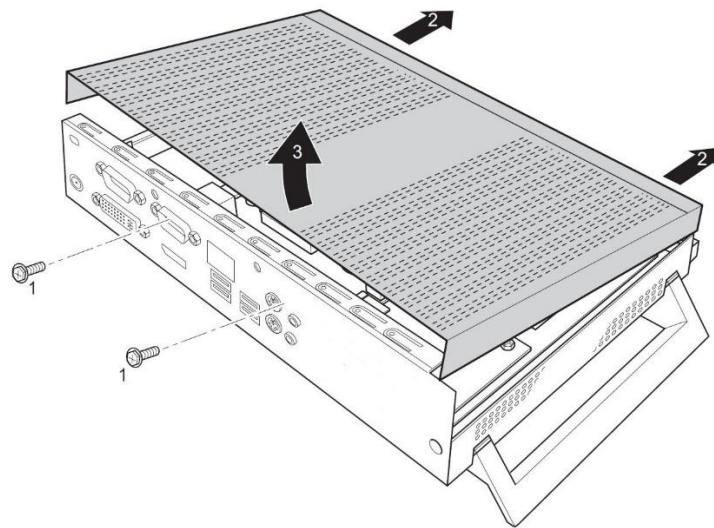
- Be careful with the locking mechanisms (detents and centring bolts) when you replace assemblies or assembly components.
- Please note that certain components on the mainboard may be very hot shortly after the Box PC has been active.
- To prevent damage to the assembly and its components and circuit paths, install and uninstall them very carefully.
- Do not use sharp objects (screw drivers) as levers.
- Assemblies with electrostatic sensitive components (ESD) may be marked with the label shown below.



- When handling ESD assemblies you must take note of the following:
 - you have to equalize your static potential (e.g. by touching a grounded object) before working with these assemblies.
 - Any tools or devices used must be free of static charge.
 - Touch the assemblies only at their edges or, if these exist, at points marked in green (touch points).
 - Do not touch any connection pins or circuit paths on the assembly.

11.2 Opening the enclosure

- Switch off the Box PC. The Box PC must not be in energy saving mode.
- Unplug the device from the mains.
- Only plug the device back into the mains after the enclosure has been closed again.
- Carefully open the enclosure, because there are electrical lines from the enclosure lid to the system which may rip.
- Remove any plugged lines that are in the way.
- Remove the screws on the back (1).
- Slide the enclosure lid in the direction of the arrow (2) and swing the lid open towards the front (3).



11.3 Closing the enclosure

- Place the lid back onto the enclosure and slide it towards the back.
- Fix the lid at the back of the Box PC with both screws.
- Make sure no lines are trapped between enclosure and components.
- Replug all lines you unplugged before.

11.4 Replacing the battery

A lithium battery provides the CMOS memory with power so that system information can be permanently stored. When the battery voltage is running low or running out, an error message will be issued. The lithium battery will then need to be replaced.

CAUTION

If the lithium battery is not replaced properly there is a risk of explosion !

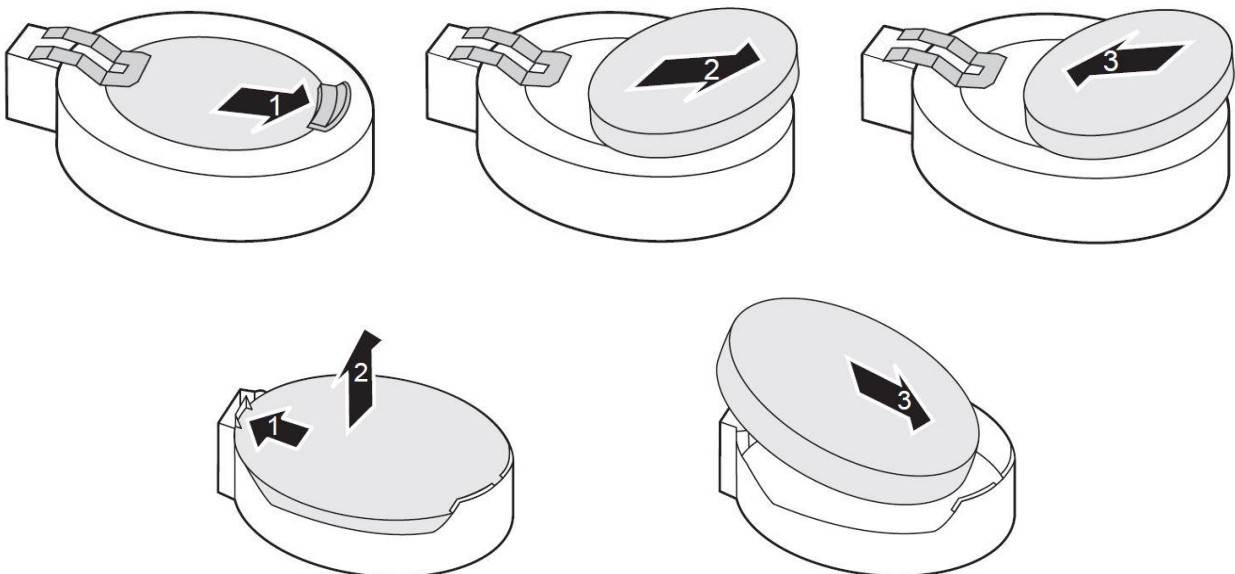
NOTICE

The lithium battery must only be replaced with an identical type or one recommended by the manufacturer.

Do not dispose of the battery as household waste. It will be taken back by the manufacturer, shop or their representatives free of charge to be recycled or disposed of.

When replacing the lithium battery, you have to ensure correct polarity: the positive pole goes on top.

- There are different versions of the lithium battery bracket with identical functionality.
- Push the detent in the direction of the arrow (1).
- The battery is ejected slightly from its bracket.
- Remove the battery (2).
- Slide the replacement battery of an identical type into the bracket (3) and push down until it locks in place.



12 Disposal

Disposal of old electric and electronic devices, packaging and used parts is subject to regulations valid in whichever country the device has been installed.

For countries under the jurisdiction of the EU the corresponding WEEE directive applies.

The Box PCs are classified according to the table below:

	old	new
Directive	WEEE I Directive 2002/96/EC	WEEE II Directive 2012/19/EU
Valid	until 2018-08-14	from 2018-08-15
Category	9 Monitoring and control devices	SG5 Small devices <50 cm

We shall take back our devices according to our General Terms and Conditions.

12.1 RoHS directive 2011/65/EC

The revision of RoHS directive 2002/95/EC and the resulting revised version 2011/65/EC extends its scope to all electric and electronic products.

The devices meet the requirements of RoHS Directive 2011/65/EU dated 03.01.2013.

13 Declaration of EC conformity

EG/EU-Konformitätserklärung
EC/EU Declaration of Conformity
Déclaration de Conformité CE/UE



R. STAHL HMI Systems GmbH • Adolf-Grimme-Allee 8 • 50829 Köln, Germany
 erklärt in alleiniger Verantwortung, *declares in its sole responsibility, déclare sous sa seule responsabilité,*

dass das Produkt: Bedien- und Beobachtungsgeräte
that the product: *Operating and Monitoring Devices*
que le produit: *Consoles de commande et de visualisation*

Typ(en), type(s), type(s): **IBPC-4x1-...**
IBPC-5x1-...

mit den Anforderungen der folgenden Richtlinien und Normen übereinstimmt.
is in conformity with the requirements of the following directives and standards.
est conforme aux exigences des directives et des normes suivantes.

Richtlinie(n) / Directive(s) / Directive(s)	Norm(en) / Standard(s) / Norme(s)
2014/30/EU 2014/30/EU 2014/30/UE	EMV-Richtlinie EMC Directive Directive CEM
	EN 61000-6-2 :2005-08 EN 61000-6-3:2007 +A1:2011 EN 61000-3-2 :2014 EN 61000-3-3: 2013 EN 55022 : 2010 EN 55024 : 2010
Produktnormen nach Niederspannungsrichtlinie: <i>Product standards according to Low Voltage Directive:</i> <i>Normes des produit pour la Directive Basse Tension:</i>	IEC 60950-1:2005 (Second Edition), Am 1: 2009
Produktnormen nach RoHS-Richtlinie (2011/65/EU): <i>Product standards according to RoHS Directive:</i> <i>Normes des produit pour la Directive RoHS:</i>	EN 50581:2012

Köln, 2018-08-21

Ort und Datum
Place and date
Lieu et date

i.V.
J. Düren
 Technical Director

i.V.
A. Jung
 Ex Representative

14 Release notes

The chapter entitled "Release Notes" contains all the changes made in every version of the Operating Instructions.

Version 01.00.00

- First edition

R. STAHL HMI Systems GmbH
Adolf-Grimme-Allee 8
D 50829 Cologne

Phone: (switchboard) +49 (0) 221 76 806 - 1000
(hotline) - 5000
Fax: - 4100
E-mail: (switchboard) office@stahl-hmi.de
(hotline) support@stahl-hmi.de

www.r-stahl.com
www.stahl-hmi.de

