

Instruction handbook

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BAUMÜLLER

**Control system
PCC-04**



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GENERAL

1.1 Information on this Instruction handbook

This Instruction handbook provides important information on handling the device. A prerequisite for safe work is compliance with all specified safety notes and procedural instructions.

Additionally, the valid accident prevention regulations and general safety regulations applicable to the scope of application the device must be complied with.

Read this Instruction handbook, particularly the safety notes chapter, completely before beginning any work on the device. This Instruction handbook is part of the product and must be kept accessible to personnel at all times in the immediate vicinity of the device.

1.2 Key to symbols

Warning notes

Warning notes are identified by symbols in this Instruction handbook. The notes are introduced by signal words that express the extent of the danger.

It is imperative that these notes be complied with and are conscientiously regarded in order to prevent accidents, personal injury and material damage.

**DANGER!**

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

**WARNING!**

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

1.3 Limitation of liability



CAUTION!

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



NOTICE!

...indicates a hazardous situation which, if not avoided, may cause material damage.

Recommendations



NOTE!

...highlights useful hints and recommendations, as well as information for the efficient and trouble-free use.

1.3 Limitation of liability

All specifications and notes in this Instruction handbook were compiled taking into account the applicable standards and regulations, the state of the art and our knowledge and experience of many years.

The manufacturer assumes no liability for damages due to:

- noncompliance with the Instruction handbook
- usage for other than the intended purpose
- usage by untrained personnel

The actual scope of delivery can vary in case of optional equipment, laying claim to additional order options, or on account of the latest technical changes to the explanations and representations described herein.

The user bears the responsibility for performing service and commissioning in accordance with the safety regulations of the applicable standards and all other relevant governmental or local regulations referring to the dimensioning and protection of conductors, grounding, disconnectors, overcurrent protection, etc.

The person who carried out the mounting or installation is liable for any damage, which incurred when assembling or connecting the device.

1.4 Copyright protection

The Instruction handbook must be treated confidentially. It is to be used exclusively by personnel who work with the device. The consignment of the Instruction handbook to third persons without the written permission of the manufacturer is prohibited.

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**NOTE!**

Please note, that BAUMÜLLER is not responsible to examine whether any (industrial property) rights of third parties are infringed by the application-specific use of the BAUMÜLLER products/components or the execution.

1.5 Spare parts

**WARNING!**

False or flawed spare parts can lead to damage, malfunction or complete failure, thus endangering safety.

Therefore:

- Only use original spare parts of the manufacturer.

Procure spare parts through an authorized dealer or directly from the manufacturer.

See also [▶Accessories and Spare parts◀](#) from page 69.

1.6 Disposal

Insofar as no take-back or disposal agreement has been made, please disassemble units correctly and properly recycle the constituent parts.

See also [►Disposal◄](#) on page 71.

1.7 Guarantee provisions

The guarantee provisions are stated in a separate document of the sales documents.

The devices described herein may only be operated in accordance with the stipulated methods, procedures and conditions. Anything else not presented here, including the operation of devices in mounted positions, is not permitted and must be cleared with the plant on a case-by-case basis. If the devices are operated in any other manner than as described within this Instruction handbook, then all guarantee and warranty rights are rendered null and void.

1.8 Customer service

Our customer service is available to provide you with technical information.

Info on the responsible contact persons is available at all times via telephone, fax, mail or the Internet.

1.9 Terms used

The term „device“ is also used in this documentation for this Baumüller product „**Control system PCC-04**“.

1.10 Applicable documents

Components of other manufacturers are integrated into the device. For these purchased parts, hazard assessments have been performed by the respective manufacturers. The compliance of the design construction with the applicable European and national regulations has been declared for the components by the respective manufacturers.

1.11 List of associated documentations

	Doc. No.	Part No. German	Part No. English
Application handbook Control system PCC-04	5.16008	462103	462104
Application handbook EtherCAT	5.10030	440084	

2

SAFETY

This section provides an overview of all of the important safety aspects for optimum protection of personnel as well as for the safe and problem-free operation.

2.1 Contents of the Instruction handbook

Each person who is tasked with performing work on or with the device must have read and understood the Instruction handbook before working with the device. This also applies if the person involved with this kind of device or a similar one, or has been trained by the manufacturer.

2.2 Changes and modifications to the device

In order to prevent hazards and to ensure optimum performance, no changes, additions or modifications may be undertaken on the device that have not been explicitly approved by the manufacturer.

2.3 Appropriate Use

The device is conceived and constructed exclusively for usage compliant with its intended purpose described in this Instruction handbook.



WARNING!

Danger arising from usage for an unintended purpose!

Any usage that goes beyond the intended purpose and/or any non-compliant use of the device can lead to dangerous situations.

Therefore:

- Only use the device compliant with its intended purpose.
- Observe all specifications of this Instruction handbook.
- Ensure that only qualified personnel work with/on this device.
- Ensure that the power supply complies with the stipulated specifications.
- The device may only be operated in a technically flawless condition.

2.4 Responsibility of the operating company

The device will be used in commercial areas. Thus, the proprietor of the device is subject to the legal work safety regulations.

Along with the notes on work safety in this Instruction handbook, the safety, accident prevention and environmental protection regulations valid for the area of application of this device must be complied with. Whereby:

- The operating company must inform himself about the applicable work health and safety regulations and ascertain, in a hazard assessment, any additional hazards that could arise from the special working conditions in the use area of the device. These must then be implemented in the form of operating instruction for operation of the device.
- This Instruction handbook must be kept accessible to personnel working with the device at all times in the immediate vicinity of the device.
- The specifications of the Instruction handbook must be adhered to completely and without exception.
- The device may only be operated in a technically faultless and operationally safe condition.

2.5 Protective equipment

Protection classification	
box	IP 20

2.6 Training of the personnel

**WARNING!****Risk of injury due to insufficient qualifications!**

Improper handling can lead to significant personal injury and material damage.

In this Instruction handbook, the following qualifications are stipulated for various areas of activity:

- **Operating personnel**

- The drive system may only be operated by persons who have been specially trained, instructed and authorized.
- Troubleshooting, maintenance, cleaning, maintenance and replacement may only be performed by trained or instructed personnel. These persons must know the Instruction handbook and act accordingly.
- Commissioning and training may only be performed by qualified personnel.

- **Qualified personnel**

- Electrical engineers authorized by Baumüller Nürnberg GmbH, and qualified electricians of the customer or a third party who have learned to install and maintain Baumüller drive systems and are authorized to ground and identify electrical power circuits and devices in accordance with the safety engineering standards of the company.
- Qualified personnel have had occupational training or instruction in accordance with the respective locally applicable safety engineering standards for the service and use of appropriate safety equipment.

2.7 Fire fighting



DANGER!

Risk of fatal injury from electrical current!

There is a risk of electric shock if an electrically-conductive, fire-extinguishing agent is used.

Therefore:

- Use the following fire-extinguishing agent:



ABC powder / CO₂

2.8 Safety equipment



WARNING!

Risk of fatal injury due to non-functioning safety equipment!

Safety equipment provides for the highest level of safety in a facility. Even if safety equipment makes work processes more awkward, under no circumstances may they be circumvented. Safety can only be ensured by intact safety equipment.

Therefore:

- Before starting to work, check whether the safety equipment is in good working order and properly installed.

2.9 Behavior in hazardous situations or at accidents

Preventive measures

- Always be prepared for accidents or fire!
- Keep first-aid equipment (e.g. first-aid kits, blankets, etc.) and fire extinguishers readily accessible.
- Train personnel so that they can handle the accident signalling systems, first aid equipment and life saving equipment.

And if something does happen: respond properly

- Stop operation of the device immediately with an EMERGENCY Stop.
- Initiate first aid measures.
- Evacuate persons from the danger zone.
- Notify the responsible persons of the site.
- Alarm medical personnel and/or the fire department.
- Keep access routes clear for rescue vehicles.

2.10 Signs and labels

The following symbols and information signs are located in the working area. They refer to the adjacencies, where they were affixed.



WARNING!

Risk of injury due to illegible symbols!

Over the course of time, stickers and symbols on the device can become dirty or otherwise unrecognizable.

Therefore:

- Maintain all safety, warning and operating labels on the device in easily readable condition.



Electrical voltage

Only qualified personnel may work in work areas that identified with this.

Unauthorized persons may not touch working materials marked correspondingly.

3

TECHNICAL DATA

3.1 Dimensions / Weight

The following table shows the main device dimensions. In order to make the required cut-outs use the drawings in [▶Mounting◀](#) from page 25.

	Dimension (Width x Height x Depth)	Weight
PCC-04, BoxPC Special	78 mm x 202 mm x 163 mm Height with wall holder: 258 mm	2 kg
PCC-04, BoxPC Standard	93 mm x 202 mm x 163 mm Height with wall holder: 258 mm	approx. 2,3 kg

3.2 Operating conditions

3.2 Operating conditions

3.2.1 Power supply requirements

A power supply of 24 V_{DC} is required for the **PCC-04**. This may be either a standard power supply or an uninterruptible DC power supply.

In the following table the presumable current ratings for different configurations are listed.

Processor	Rated output current of power supply
Intel® Atom™ Bay Trail E3845 Standard	5.8 A
Intel® Atom™ Bay Trail E3845 Special	5.8 A
Intel® Atom™ E3827	
Intel® Core™ i3-4010U	##PM## A
Intel® Core™ i5-4030U	##PM## A

3.2.2 Required environmental conditions

	Intel® Core™ (in preparation)	Intel® Atom™
Transportation temperature range	- 20°C to + 80°C	
Storage temperature range	- 20°C to + 80°C	
Operation temperature range	0°C to + 40°C	0°C to + 55°C 0°C to + 65°C at C-version (BMP-04-0000-CC-2-S5-00-12C0-2230-10)
Operation climatic class EN 60721-3-3	3K2	
Humidity (operation) EN 60721-3-3	relative humidity: 5 % to 95 %, no condensation	
Shock test according to IEC 60068-2-27	15g, 11 ms, pulse and 25g, 6 ms pulse	
Resistance to vibration EN 60068-2-6	Frequency range 1: 2 ... 9 Hz	
	Amplitude: 3.5 mm	
	Frequency range 2: 9 ... 200 Hz	
	Acceleration: 1.0g	

3.3 Electrical data

Rated voltage supply	24 V _{DC}
Voltage supply, range	18 ... 36 V (minimum for start-up: 19 V)
Typical current consumption	2,8 A
Peak current	3,1 A
Connection voltage supply	Combicon, 2-pole
Conductor cross-section	2.5 mm ²
Torque	0.9 Nm
RTC	approx. 10 years

3.4 Computer data

Operating system	Windows Embedded Standard 7			
Processor	1.7 GHz Intel® Core™ i3-4010U	1.9 GHz Intel® Core™ i5-4300U	1,9 GHz Intel® Atom™ Bay Trail E3845	1,7 GHz Intel® Atom™ E3827
Thermal design power (TDP)	15 W	15 W	10 W	8 W
Number of cores	2	2	4	2
RAM	4 GB DDR3L RAM			
Memory	SSD	SSD	SSD; extensibility: CFast	SSD

Interfaces

USB	2x USB 3.0, 2x USB 2.0 optional	1x USB 3.0, 3x USB 2.0
RS232/422/485	1x	
RS-232		1x (optional)
Ethernet 10/100/1000 MBit/s (RJ45)	2x	
3rd Ethernet (optional)	The third Ethernet interface is implemented via a mini PCI express card. This Interface is made accessible at the interface steel plate.	
Display port	Displayport Intel Core: DVI-I	1x
CFast adapter	1x (optional)	

DESIGN AND FUNCTION

The **Control system PCC-04** is an industrial PC with a modular design.

Standard hardware features are:

- 24-V DC-operation
- Operation without fans
- 1 USB 3.0 and 3 USB 2.0 connections at Intel® Atom™ processors or
2 USB 3.0 and 2 USB 2.0 connections optional at Intel® Core™ processors
- 1 RS232/422/485 interface (RS232, 9-pole D-SUB-connector)
- 1 COM connection (RS-232, 9-pole D-SUB-connector, optional)
- Two integrated 10/100/1000-Ethernet connections with independent MAC-addresses
- 1 additional Ethernet connection via a Mini PCI Express card (optional)
- LEDs for the current supply (PWR) and SSD access (HDD)
- DVI-D video output or Display port
- CFast adapter for a CFast card (not compatible to SD / MMC memory card).
(available for BoxPC special only)

4.1 Type plate

On the type plate the type code of the device also can be found.

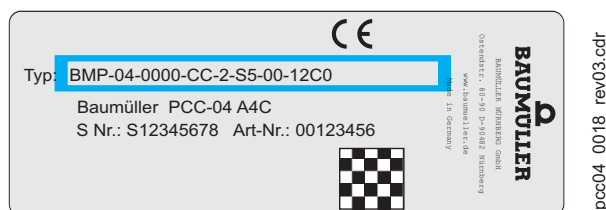


Figure 1: Type plate



NOTE!

At some mounting kinds it can happen, that the type plate covers the operating system. Take this information of the plates down before mounting. It is recommended to make an accordant note on the inside cover page of the Instruction handbook.

4.2 Type code

Type code format

BMP-XX-XXXX-XX-X-XX-XX-XXXX-XXXX-XX

In the following table the type code is explained:

BMP- <u>XX</u> -XXXX-XX-X-XX-XX-XXXX-XXXX-XX	Device series Baumüller PC-based control
BMP- <u>XX</u> -XXXX-XX-X-XX-XX-XXXX-XXXX-XX	Basic device version 04: PCC-04, industry PC with Intel® Dual Core Processor or Intel® Atom Quad Core Processor or Intel® Atom Dual Core Processor
BMP-XX- <u>XXXX</u> -XX-X-XX-XX-XXXX-XXXX-XX	Device type 0000: Box-PC
BMP-XX-XXXX- <u>X</u> -X-XX-XX-XXXX-XXXX-XX	Hardware configuration mainboard A: BSM SBC-12.1 IB897 + Atom E3845 (standard-version) B: BSM SBC-12.2 IB897 + Atom E3827 C: BSM SBC-12.2-S IB897 + Atom E3845 (C-version) D: BSM SBC-8.2I B908 + i3-4010 E: BSM SBC-8.1I B908 + i5-4300
BMP-XX-XXXX- <u>XX</u> -X-XX-XX-XXXX-XXXX-XX	Hardware configuration processor B: Intel Atom Dual Core E3827 with 2 x 1.7 GHz C: Intel Atom Quad Core E3845 with 4 x 1.9 GHz D: Intel Core i3-4010U with 2 x 1.7 GHz (in preparation) E: Intel Core i5-4300U with 2 x 2.9 GHz (in preparation) F: Intel Core i7
BMP-XX-XXXX-XX- <u>X</u> -XX-XX-XXXX-XXXX-XX	Hardware configuration RAM 2: 4 GB RAM
BMP-XX-XXXX-XX-X- <u>XX</u> -XX-XXXX-XXXX-XX	Hardware configuration Hard Disk 1 Mx: mSATA-Memory Module with 2 ^x GB Sx: SSD with 2 ^x GB
BMP-XX-XXXX-XX-X-XX- <u>XX</u> -XXXX-XXXX-XX	Hardware configuration Hard Disk 2 Fx: CFast card with 2 ^x GB
BMP-XX-XXXX-XX-X-XX-XX- <u>XX</u> XX-XXXX-XX	Hardware configuration option 12:CFast card slot + third Ethernet interface

BMP-XX-XXXX-XX-X-XX-XX-XXXX-XXXX-XX

Optional equipment

Cx: Temperature range 0 to 65°C
 xL: company-specific print label

BMP-XX-XXXX-XX-X-XX-XX-XXXX-XXXX-XX

Software configuration image version

2230: System image v2.2.3.0

BMP-XX-XXXX-XX-X-XX-XX-XXXX-XXXX-XX

Software configuration license

1x: Tech-Lib license

4.3 LEDs

There are two LEDs on the bottom of the **PCC-04** at Hardware configuration option **12** (type code BMP-04-XXXX-XX-X-XX-XX-**12XX**-XXXX-XX).

At Hardware configuration option **00** (type code BMP-04-XXXX-XX-X-XX-XX-**00XX**-XXXX-XX) the two LEDs are on the front.



Figure 2: LED arrangement

LED	Display	Description
PWR	green	If 24 V _{DC} are available and the main switch is on.
HDD	red flashing	Displays an activity on the hard disk drive.

TRANSPORT AND PACKING

Safety notes for the transport



NOTICE!

Damage due to unauthorized transport!

Transport handled by untrained personnel can lead to a substantial amount of material damage.

- The unloading of the packages upon delivery as well as the in-house transport should only be done by trained personnel.
- Contact Baumüller Nürnberg GmbH sales office if necessary.



WARNING!

Danger of physical impact!

Secure devices against falling down.

Therefore:

- Use appropriate means of transport.

5.1 What to observe when transporting

For initial transport of a device, it is packed at the manufacturer's plant. If the device must be transported, ensure that the following conditions are met throughout the entire transport:

- Climate class, refer to [►Required environmental conditions◄](#) auf Seite 16
- Temperature range, refer to [►Required environmental conditions◄](#) auf Seite 16

5.2 Transport inspection

Upon receiving the delivered goods, immediately examine them for completeness and transport damage.

If there is visible transport damage on the outside, proceed as follows:

- Do not accept the delivery or conditionally accept it with reservations.
- Note the extent of the damage on the transport documents or on the delivery note of the shipping agent.
- Immediately file a complaint with the freight carrier. Have the complaint confirmed in writing and immediately contact the responsible representative of Baumüller Nürnberg GmbH.



NOTE!

The device may not be operated if there is visible transport damage!

5.3 Unpacking

After having received the packaged device:

- Avoid forceful transport agitation and hard jolts, e.g. when putting an item down.

If no transport damage is visible:

- Open the packaging of the device.
- Verify the delivery scope based on the delivery note.

File a claim with the responsible Baumüller representative if the delivery is incomplete.



NOTE!

Claim each individual deficiency as soon as it has been detected. Damage claims can only be validly asserted within the claim registration period.

5.4 Disposal of the packaging

The packaging consists of cardboard, plastic, metal parts, corrugated cardboard and/or wood.

- When disposing of the packaging, comply with the national regulations valid at the use area.

MOUNTING

According to the ordered configuration there are different mounting possibilities for the **PCC-04**.

**NOTE!**

Mounting shall only be performed by employees of the manufacturer or by other qualified personnel.

**WARNING!****Danger as a result of mechanical effects!**

Secure devices against falling down.

Therefore:

- Use appropriate means of transport.

**NOTICE!****Danger due to electrostatic discharge.**

The connecting terminals of the device are partially at risk due from ESD.

Therefore:

- Please heed the respective notes.

6.1 Preparing the mounting

At the installation of the **PCC-04** in a control cabinet the following general provisions must be observed:

- Check the working clearance in the control cabinet. In general, keep at least 5 cm space on each side.
- Drill and cut the holes, before starting with the installation. Assure that components, which were installed, are protected against damages.



CAUTION!

Eye injury due to flung particles.

Metal particles are flung when making the drill holes and the cutout sections.

Therefore:



Wear safety goggles!

- Load-bearing parts must be at least 1.63 mm thick, in order to provide a proper stability.
- The space all-round the heatsink (on the rear of the **PCC-04**) must be adequate and the air inlets as well as the air outlets must provide adequate cooling.



NOTICE!

PCC-04 must be installed with an adequate space around the heatsink, so that the environmental temperature of the operating limit values are not exceeded (see [▶Operating conditions](#) from page 16). Fans can be installed in the control cabinet if required.

Possibly, an exceeding of the system temperature limits can cause a power reduction of the single or of all components. Therefore, the temperature in the environment of the installation must be within the system temperature limits of the **PCC-04**.

6.2 Wall mounting

Use this kind of mounting to install the **PCC-04** in a control cabinet. The **PCC-04** is mounted on the rear on an even surface. The device is attached via two drill holes. The mounting surface must be even and vibrations may not occur.

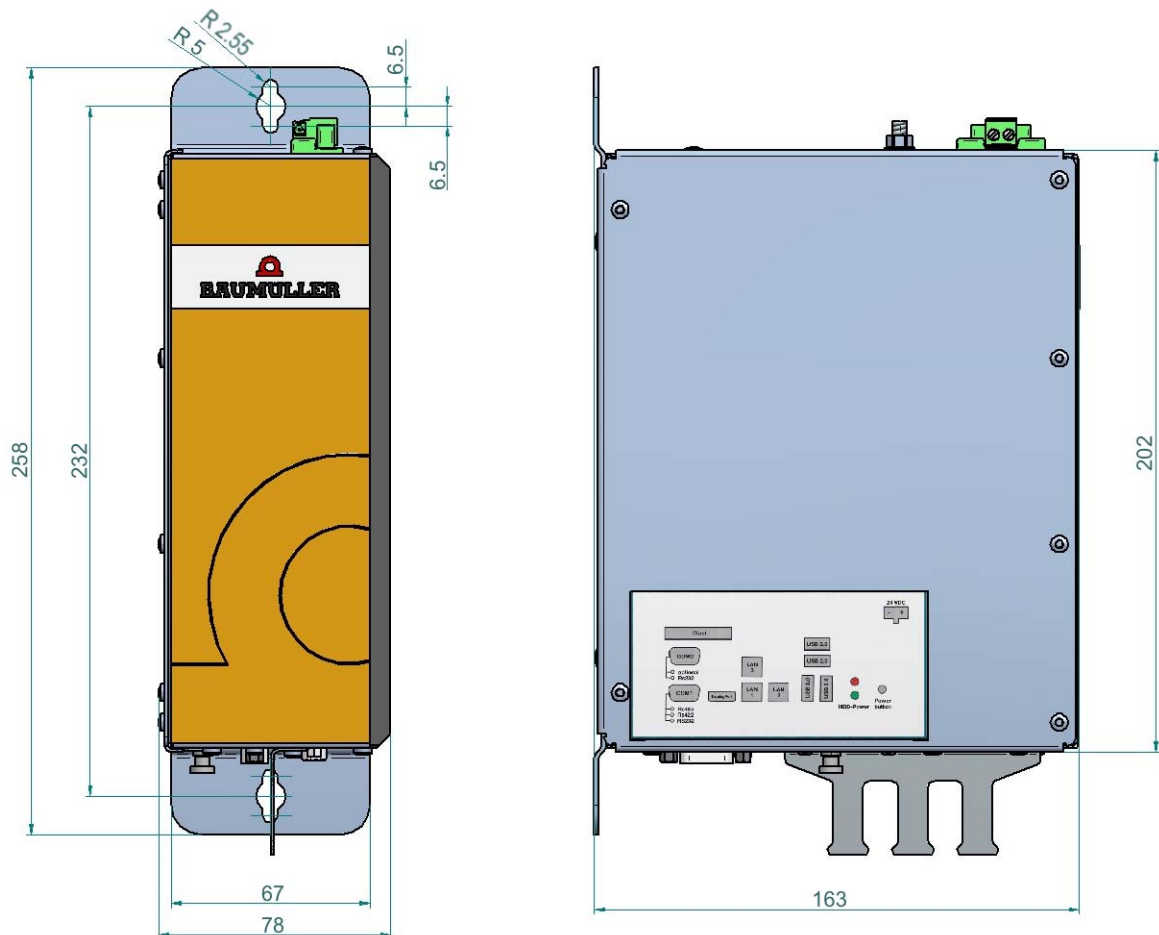


Figure 3: Wall mounting of BoxPC Special, width of the case: 78 mm
type code BMP-04-XXXX-XX-X-XX-XX-12XX-XXXX-XX

6.2 Wall mounting

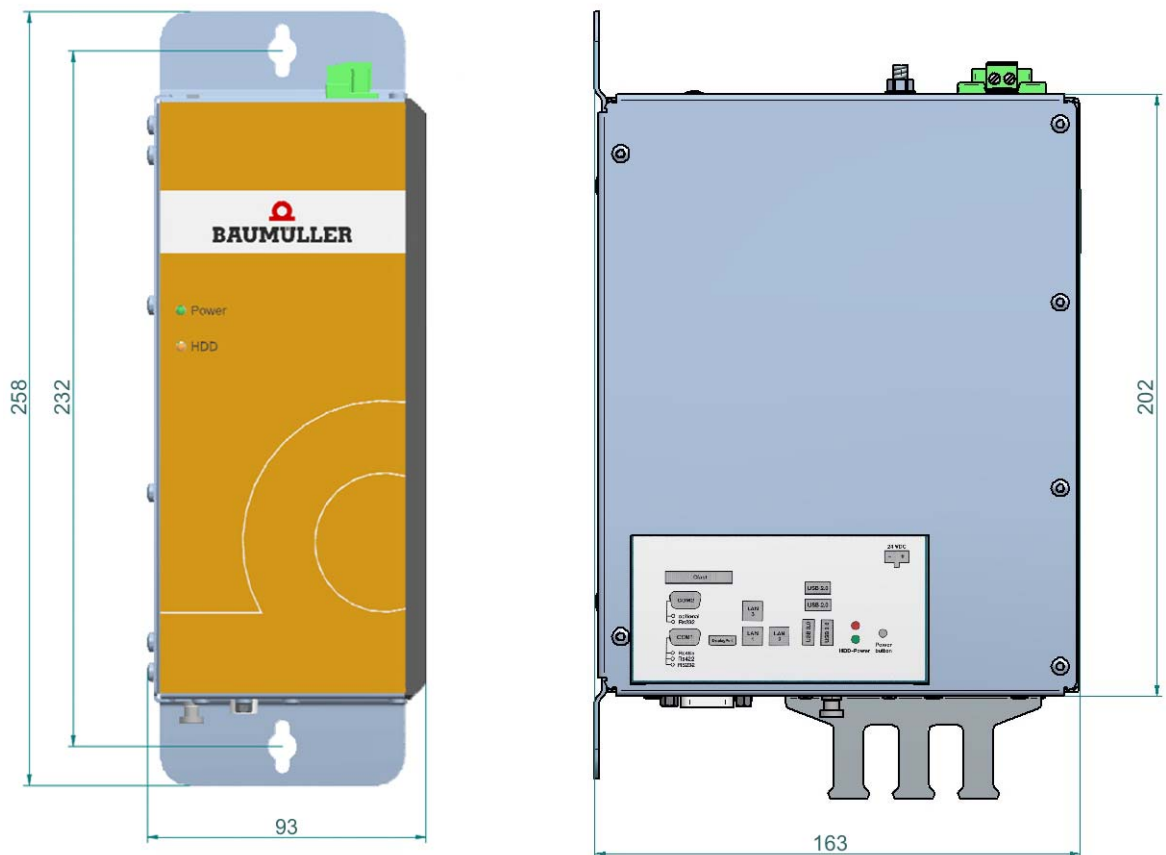


Figure 4: Wall mounting of BoxPC Standard, width of the case: 93 mm

Proceed as follows for wall mounting a **PCC-04**:

- 1 Use the **PCC-04** as a pattern and mark the positions of the drilling holes on the mounting surface.



NOTICE!

The device must be mounted vertically as shown in [▶Figure 3◀](#) or [▶Figure 4◀](#).

- 2 Use mounting material, which is adequate for the mounting surface and attach the **PCC-04** firmly to the wall. The size of the mounting material may not be greater than 5 mm. Assure, that the mounting material is at the thin end of the drilling holes.
- 3 Tighten the fastening screws, but do not tighten the mounting material too firmly.

7

INSTALLATION

After mounting the **PCC-04** the required cable connection must be made. The cables are connected on the top side (voltage supply) and on the lower side (interfaces) of the **PCC-04**.

Safety notes



NOTE!

The installation may be performed by employees of the manufacturer or by other qualified personnel only.

7.1 Interfaces

7.1.1 BoxPC Standard (width 93 mm)

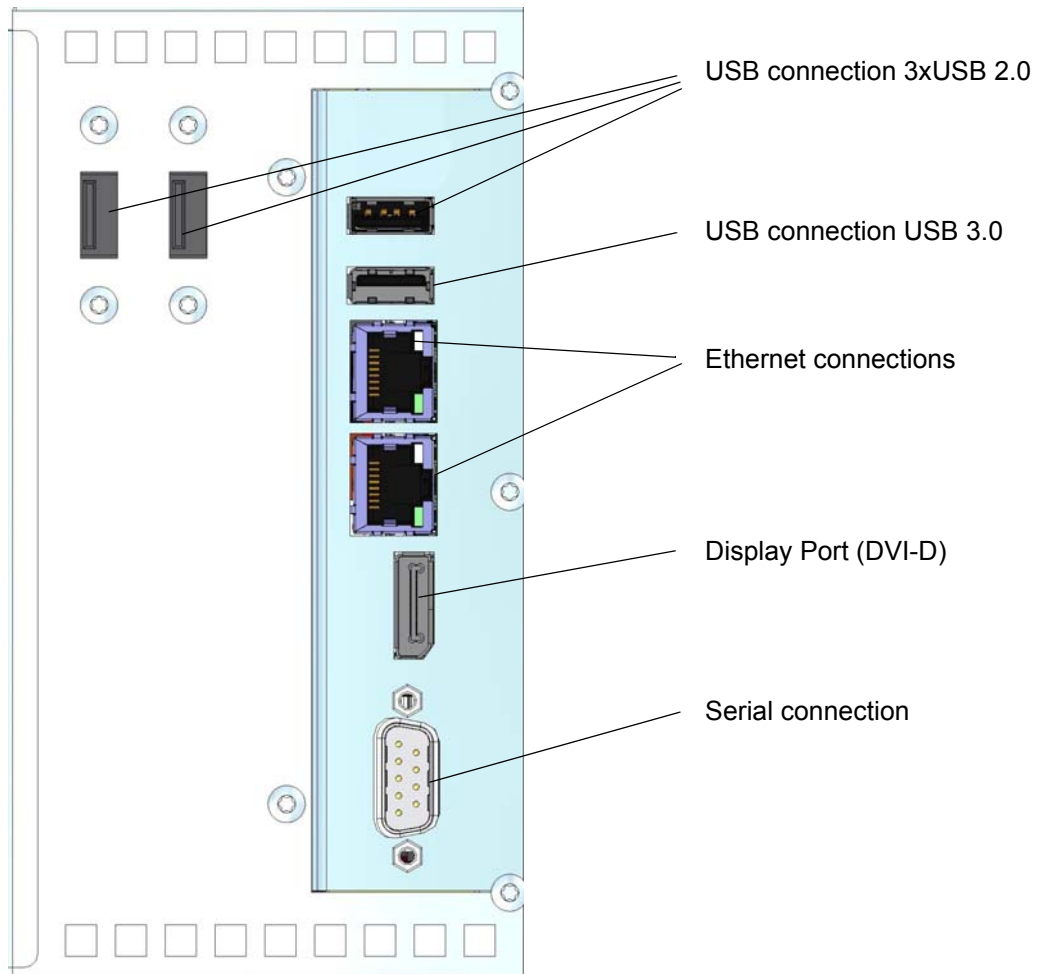


Figure 5: Interface connections

7.1.2 BoxPC Special (width 78 mm)

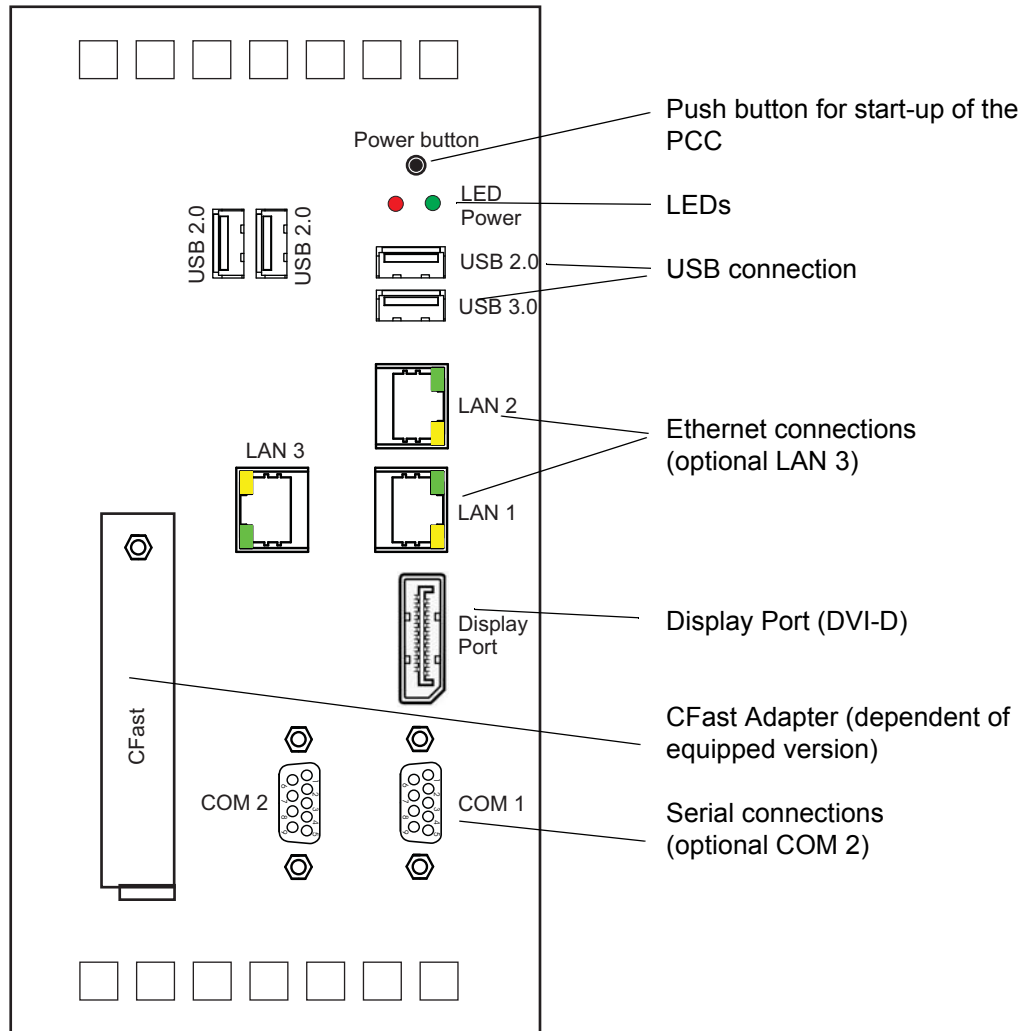


Figure 6: Interface connections

7.1.3 Communication interfaces

The communication between the **PCC-04** and other devices is enabled via different interfaces and the connections. The **PCC-04** provides the following connections:

- On the lower side of the **PCC-04** are two or three RJ45 connections. Via these connections the computer can communicate with a 10/100/1000 Ethernet network/EtherCAT network.
LAN2: ETH: **Ethernet** interface
LAN1: ETH: **EtherCAT** interface
LAN3: optional Ethernet interface
- **Serial**: Serial devices are connected to a 9-pole D-SUB connection.
- **USB**: USB devices are connected with connectors of the type A.
The types with Intel® Atom™-processors (type key BMP-04-XXXX-**B** and BMP-04-XXXX-**C**) have an USB 3.0 connection and three USB 2.0 connections.
The types with Intel® Core™-processors (type key BMP-04-XXXX-**D** and BMP-04-XXXX-**E**) are in preparation.
Display port: Via this connection the **PCC-04** is connected to an external digital display with the accordant interface.
- **DVI-D**: Can be adapted to a suitable adapter at the display port.

7.1.4 External display

An external display can be connected to the **PCC-04**.

The types with Intel® Atom processors (type key BMP-04-XXXX-**B** and BMP-04-XXXX-**C**) are provided with the display port (see [▶Figure 6◀](#) on page 31). By using a suitable adapter the DVI-D connection can be adapted as well.

The types with Intel® Core processors (type key BMP-04-XXXX-**D** and BMP-04-XXXX-**E**) are provided with a DVI-D connection (in preparation).



NOTE:

The following adapter was tested and released by Baumüller.
Delock adapter display port 1.2 connector > DVI socket 4K active black
(Delock part no. 62599 / Baumüller part no. 00463673)
If another adapter is used no warranty for the function is assumed.

An EDID display (extended display identification data) transfers its performance features to the device driver which isn't the case at other devices. In each case other settings can be defined via the Intel Graphics Media Accelerator. (see [▶Intel® Graphics Control Panel user interface◀](#) from page 52 onwards).



NOTE:

The **PCC-04** DVI-D port only supplies digital signals; therefore, connecting an analog display to the DVI-D port using a VGA to DVI adapter will not work.

7.2 Using CFast® cards

The card in the CFast® slot of the **PCC-04** can be exchanged although it is voltage-carrying.

In order to install a CFast® card the following steps must be executed:



NOTICE!

CFast® cards are treated like a hard disk and therefore cannot be exchanged while it is voltage-carrying. Ejecting a CFast® card before switching off the **PCC-04** can lead to loss of data.

- 1 Unscrew the cover on the lower side of the **PCC-04** and remove the cover (see below)

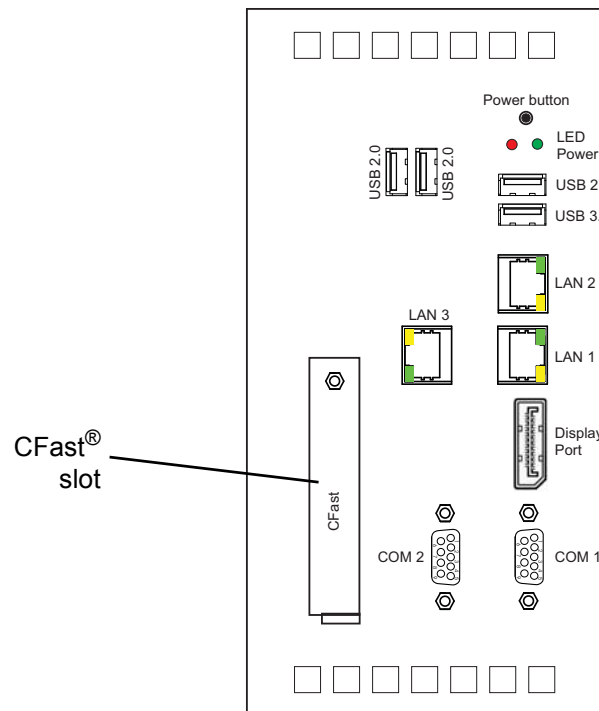


Figure 7: CFast® slot

- 2 Put the CFast® card into the slot. The card must be plugged in such a way so that the lip seal points towards the plug. Plug the card in a straight line into the slot until it was correctly located.
- 3 Then the cover can be remounted and screwed together again

To remove a card from slot use a small pointed pliers and carefully pull the card straightly out of the slot.

7.3 Power supply

Power supply recommendations

The **PCC-04** requires a 24V_{DC} power source. This can be either a standard power supply or a DC UPS. The following table provides expected amperage requirements for different configurations.

Processor	Power supply output rating
Intel® Atom™ Bay Trail E3845 Standard	5.8 A
Intel® Atom™ Bay Trail E3845 Special	5,8 A
Intel® Atom™ E3827	
Intel® Core™ i5-4300U	##PM## A
Intel® Core™ i3-4010U	##PM## A



NOTE!

The **PCC-04** is set to automatically power-up and boot after a valid power connection is made (default setting BIOS). To change this setting see [▶Boot options◀](#) on page 65.

Connect 24 V DC power (see below) to the included removable power connector. This connector supports wire sizes from 0.2 to 2.5 mm² (24 to 12 AWG). Tighten the wire retaining screws using 0.5 Nm torque.

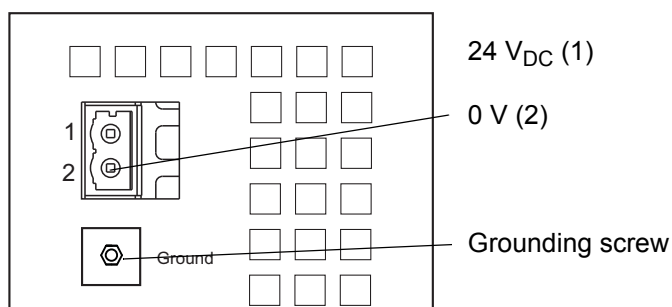


Abbildung 8: Spannungsanschluss **PCC-04**

Grounding screw

The ground screw provides an earth ground for the **PCC-04**.



NOTICE!

Circuit ground (0 V) and earth ground are tied together. This grounding scheme may not meet SELV and PELV European standards.

OPERATION

General



WARNING!

Risk of injury due to improper operation!

Improper operation can result in severe personal injuries or material damage.

Therefore:

- Carry out all operating steps as per the details in this Instruction handbook.
- Before starting work assure that all covers and safety equipment is installed and operate properly.
- The control cabinet, where the device was placed, shall protect against touching of the conductive parts.
Keep all doors of the control cabinet shut during operation.



NOTICE!

The environmental conditions do not comply with the requirements.

Unspecified environmental conditions can cause material damage.

Therefore:

- The environmental conditions must be complied to during operation (see [►Required environmental conditions](#)◀ on page 16).

8.1 Power switching on

After the correct connecting of all components and periphery devices the voltage can be applied. The **PCC-04** automatically booted up.

Power button (available only at version with type code BMP-04-0000-CC-2-S5-00-12C0-2230-00):

With the power button next to the LEDs the **PCC-04** can be switched on as well in case in the BIOS the automatically booting up was switched off (also see [▶Power on after power fail options◀](#) from page 65).

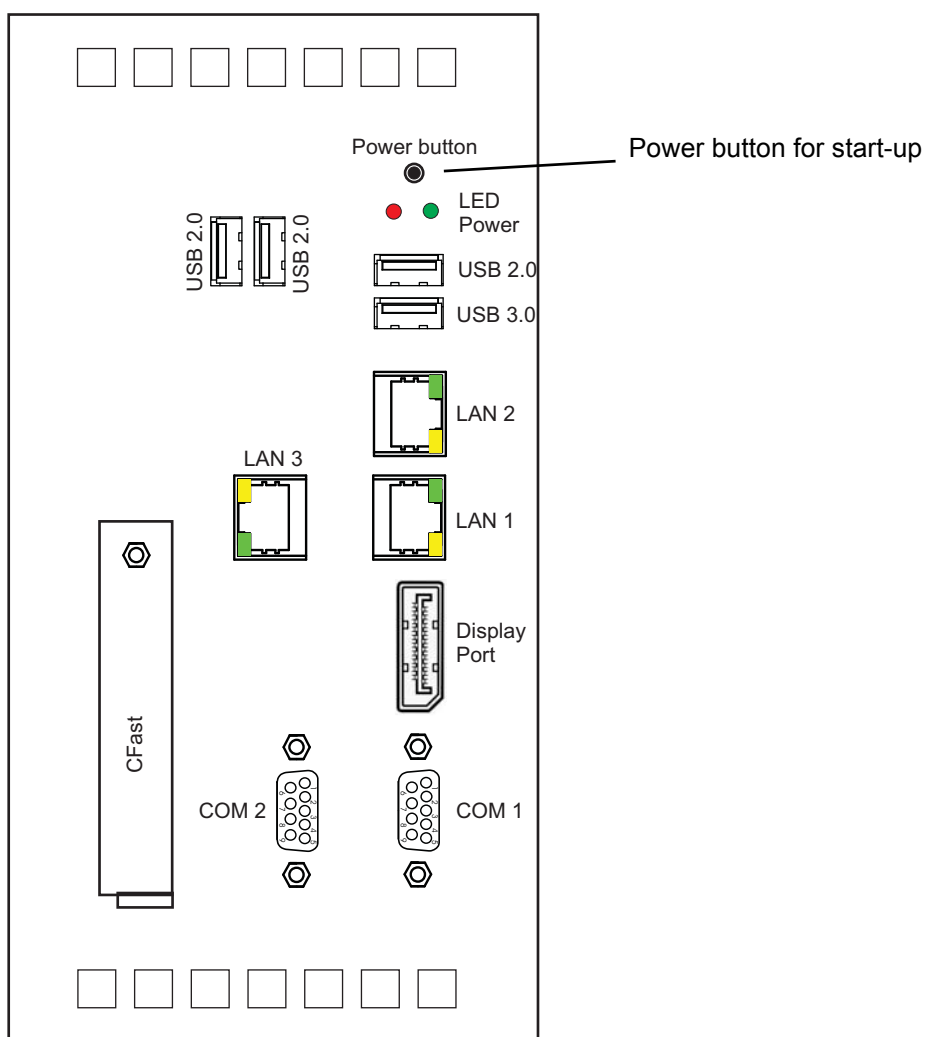


Figure 9: Power button



NOTE!

For commissioning it is recommended to connect a USB keyboard, mouse and screen to the **PCC-04**.

8.2 First start

8.2.1 Software license and activation

Use of the Microsoft® operating system **Windows 7** is subject to the licensing limitations specified by the Microsoft Software License.

Baumüller Nürnberg GmbH is not responsible and cannot be held liable for proper use of the operating system or any other software installed on the computer.

EULA (End user License Agreement) is on the system partition and can be consulted there. Please, note that!

Additional details are included in the Microsoft Software License and are also available at www.microsoft.com. The Windows product key is on a sticker that is affixed to the **PCC-04**.

The standard version of **PCC-04** is delivered with activated Windows® Embedded Standard 7.

8.2.2 Firmware and software updates

It's possible that from time to time updates of firmware and software are provided in the **PCC-04** products.

From time to time, Baumüller Nürnberg GmbH may make updates available for the firmware and software utilities. Automatically updates are switched off and may not be made by the user.

8.2.3 Start screen

The **PCC-04** boots after switching on the 24 V_{DC} power supply.

First of all the BIOS is displayed then Windows 7 Embedded is started from the system data storage (CompactFlash® card).

BIOS start screen The BIOS-Start-Screen starts with „American Megatrends Inc.“ and after a blank line is continued with „Version 2.16.1242“. These issues are eliminated after the following hardware test:

- The break key normally is on the top right side of the keyboard. It interrupts a procedure and the BIOS-version can be checked. Continue with any key.



NOTE!

At the first booting up the BIOS starts at first, then Windows and then automatically Windows is started once more. This can last a few seconds.

See Application Manual **PCC-04** for further procedure.

8.3 Touchkit

PCC-04 computers equipped with a display include Touchkit, a software utility to configure the operation of the touch screen. This utility provides multiple touch screen calibration methods as well as modes for pointer (mouse) operation and audio touch acknowledgment.

- 1 To start Touchkit utility do one of the following:
 - Double-click the “eGalaxTouch” icon ((see [▶Touchkit \(eGalaxTouch\) icon](#) on page 50).
 - Click the “Start” key, navigate to the “All Programs, eGalaxTouch” folder and then click the “Configure Utility” icon
- 2 The dialog „Touchkit USB Controller ... general“ is opened. All installed Touchscreen controller are displayed.



NOTE!

The default controller for the **PCC-04** is **USB Controller**.

- 3 If multiple controllers are installed, click the icon of the controller to be modified before clicking the required tab.

8.3.1 Touchkit setting

The “Setting” tab allows modification of the audio acknowledgment and mouse mode features..

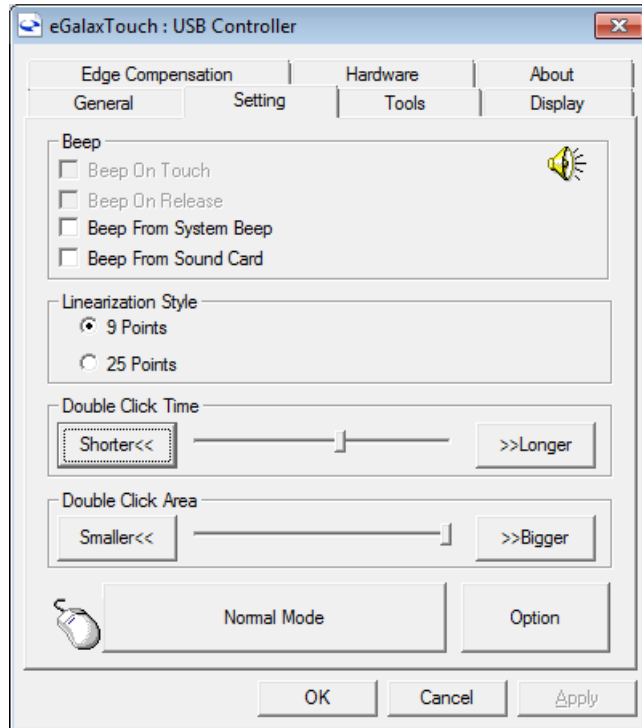


Figure 10: Dialog „Settings Touchkit“

Audio acknowledgment

For a **PCC-04** with audio capability, four different modes are available when an audio acknowledgment to a screen touch is desired. Click the desired check box to activate the desired mode.

- Beep On Touch: A beep is sounded when the screen is touched.
- Beep On Release: A beep is sounded when the screen touch is released



NOTE!

If Beep on Touch and Beep on Release are checked, every touch will generate two beeps.

- Beep From System Beep: Sound is generated from internal speaker (not applicable to **PCC-04**).
- Beep From Sound Card: Sound is generated from an external speaker.

The frequency and duration of the beep can be modified using the two sliders.

- Frequency: Move the slider to the left for a lower tone; to the right for a higher tone.

- **Duration:** This adjusts the time between beeps when Beep On Touch and Beep On Release are both checked. Move the slider to the left for the beep occur immediately upon the release. Move the slider to the right for the beep to be delayed to a maximum of 1 second after the release.

Linearization Style

Normal calibration uses four touch points to calibrate the screen. A greater accuracy of the calibration can be achieved if more touch points are used in the calibration. Chose a linearization style of either 9 or 25 points. To start the linearization function, click the "Tools" tab and then click the "Linearization" key.

Double Click Time

To adjust the time span that two touches are recognized as a double-click. This range is approximately 0.25 to 1 second.

Double Click Area

This adjusts the size of the area allowed for the second click relative to the first click.

Mouse modes

Mouse modes allow configuration of mouse (touch) behavior. One of five modes can be active (in [▶Figure 11◀](#) on page 41 shows the key with "Normal Mode" active). The available modes are:

- **Normal Mode:** emulates normal mouse key behavior
 - A touch and release acts as a click and release.
 - A touch, drag and release acts as a click, drag and release.
 - A constant touch behaves like a mouse button held down. If the Enable Auto Right Click function is checked, it will act as a right-click.
- **Click on Touch:** emulates a left mouse button click when the screen is touched
- **Click On Release:** emulates a left mouse button click when the screen is touched and released.
- **Click On Touch Without Moving cursor:** moves the cursor to the touched position and acts as a normal left click but will not perform a drag to another screen position.
- **Click On Release Without Moving cursor:** emulates a left mouse button click when a screen touch is released, but the cursor doesn't move to the touched point until the touch is released.

Although the modes are predefined, each mode can be manually modified by clicking the “Option” key.

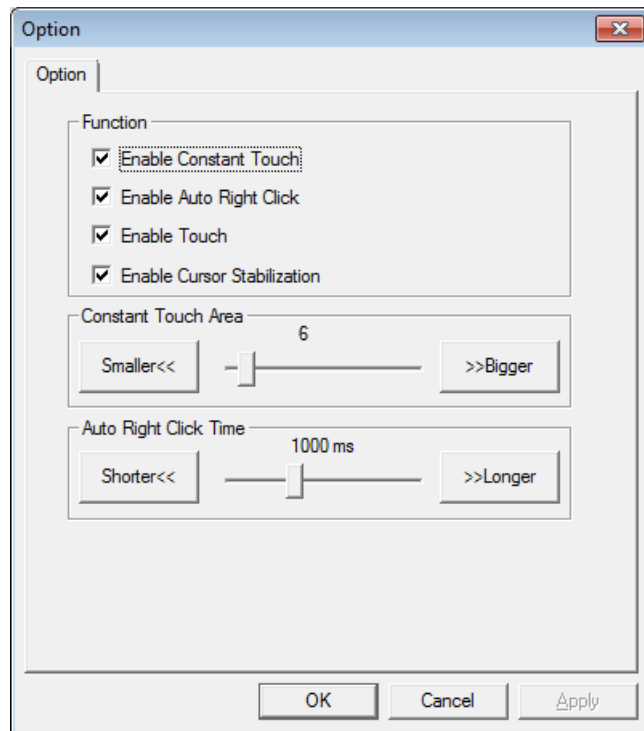


Figure 11: Mouse mode „Option dialog box“

Click the check box of the desired functionality.

- Enable **Constant Touch**: Enables the “Constant Touch Area” slider to increase/decrease movement granularity (values are displayed in pixels). Unchecked provides smooth movement while checked with the slider to the right provides the coarsest movement.
- Enable **Auto Right Click**: Enables the “Auto Right Click Time” slider to set the time required by which a touch is recognized as a right click. This requires the “Auto Right Click” option to be activated using Touchmon.
- Enable **Touch**: Enables or disables the touch feature of the touch screen.
- Enable **Cursor Stabilization**: When checked, this creates a slight lag in the cursor when following linear movement.
- **Constant Touch Area**: Sets the granularity of the Constant Touch function.
- **Auto Right Click Time**: Sets the required touch time span when using the Auto Right Click function is enabled.

8.3.2 Touchkit Tools

The “Tools” tab provides access to multiple tools for calibration and testing of the touch screen functionality.

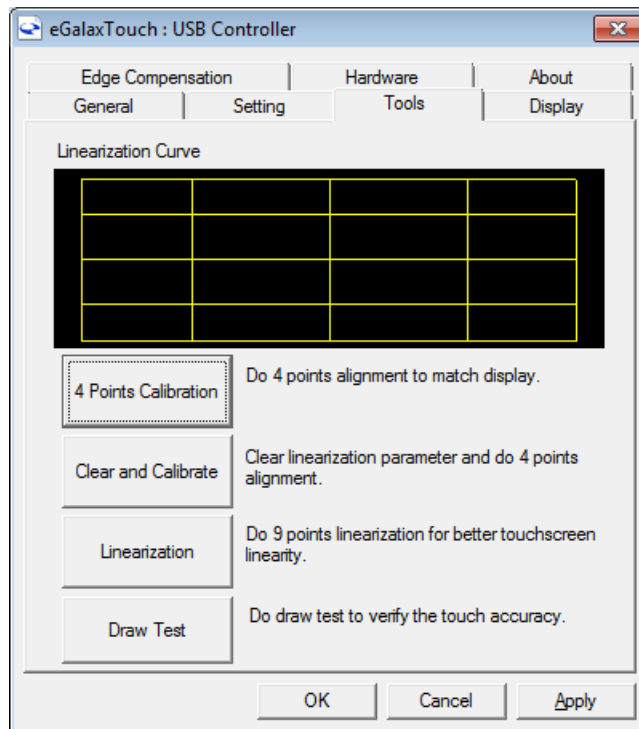


Figure 12: „Touchkit Tools“ dialog box

4 Points Calibration

Basic calibration can be completed using this utility. Click the “4 Points Calibration” key to start. The display will change to a white screen with four blinking touch points..

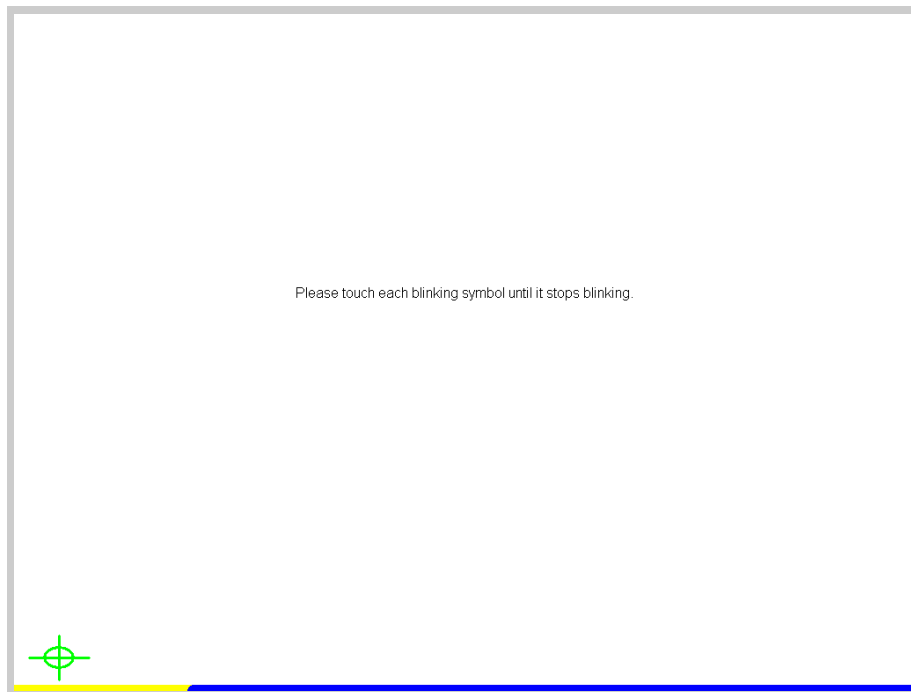


Figure 13: 4 Points Calibration screen

Touch and hold each point until the point stops blinking. If a touch point is not touched within 30 seconds, the utility is closed, returning to the “Touchkit... Tools” dialog box. A progress bar at the bottom of the screen indicates the time remaining.

Clear and Calibrate

Click the “Clear and Calibrate” key to erase a linearization. This also starts the “4 Points Calibration” utility. Always use this key if changing from a linearization to a calibration to ensure the linearization doesn't effect the calibration.

Linearization

Linearization is another method of calibrating a touch screen. It functions the same way as the 4 Points Calibration but uses more touch points for finer calibration.

Linearization can be performed using either 9 or 25 points. Select the number of points by clicking the “Setting” tab and clicking either the “9 Points” or “25 Points” radio key (see [>Linearization Style<](#) on page 40).

Click the “Linearization” key to start the utility. The display will change to a white screen with either 9 or 25 blinking touch points.

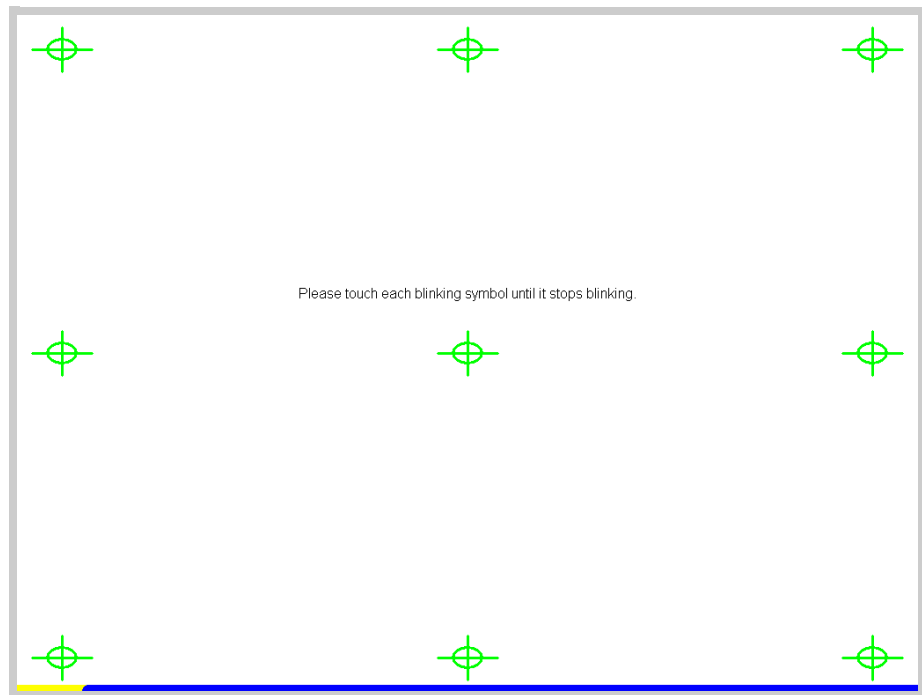


Figure 14: 9 Points Calibration screen

Touch and hold each point until the point stops blinking. If a touch point is not touched within 30 seconds, the utility is closed, returning to the "Touchkit... Tools" dialog box. A progress bar at the bottom of the screen indicates the time remaining.

Draw Test

To verify the calibration and other settings of the touch screen, click the "Draw Test" key. This utility opens a scratch pad for testing purposes. Touch the screen and perform typical operations to evaluate the touch screen calibration and settings.

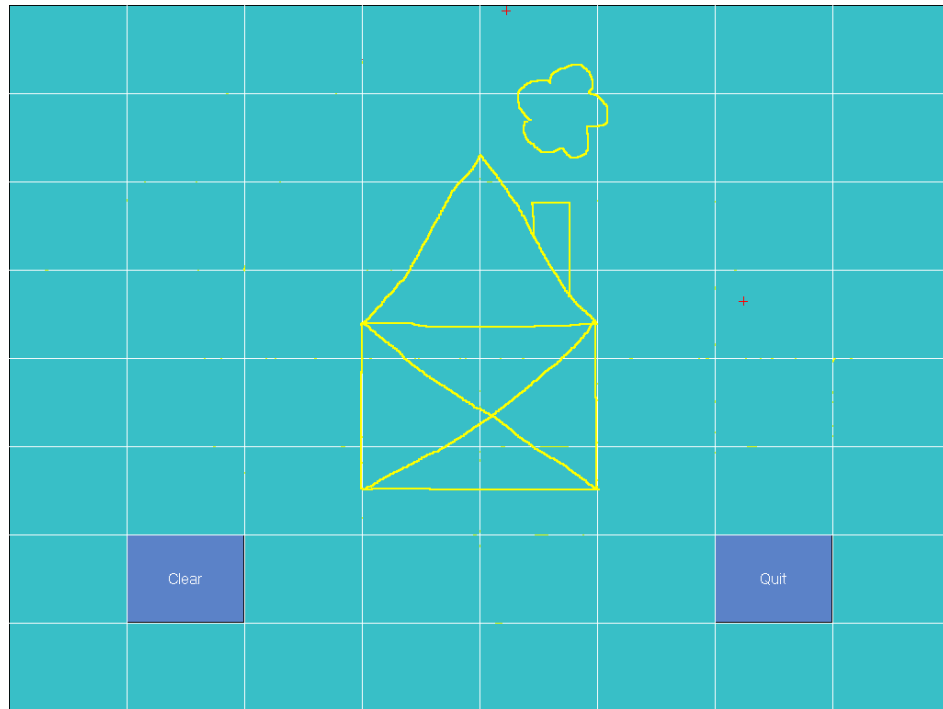


Figure 15: Draw Test screen

8.3.3 Touchkit Edge Compensation

The “Edge Compensation” tab sets the cursor overshoot and undershoot touch points along the edge of the screen. This helps to compensate for the difficulty sometimes experienced in touching the edge of a screen.

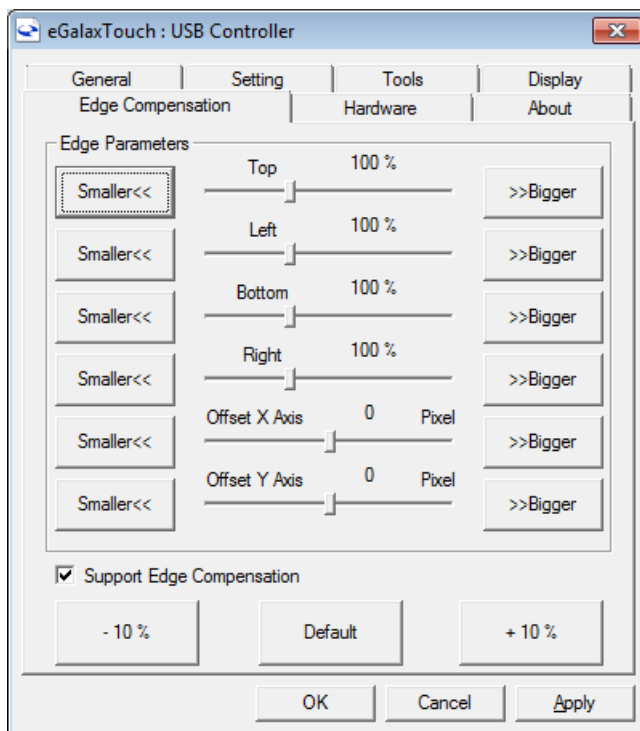


Figure 16: “Touchkit... Edge Compensation” dialog box

Individual adjustment can be made along each edge on a percentage basis. 100% is at the edge of the screen, 50% is approximately 0.5 in. before an edge (on the screen) and 200% past an edge where the cursor is not visible. In addition, the cursor display position can be shifted along either the X or Y axis, displayed by pixel.

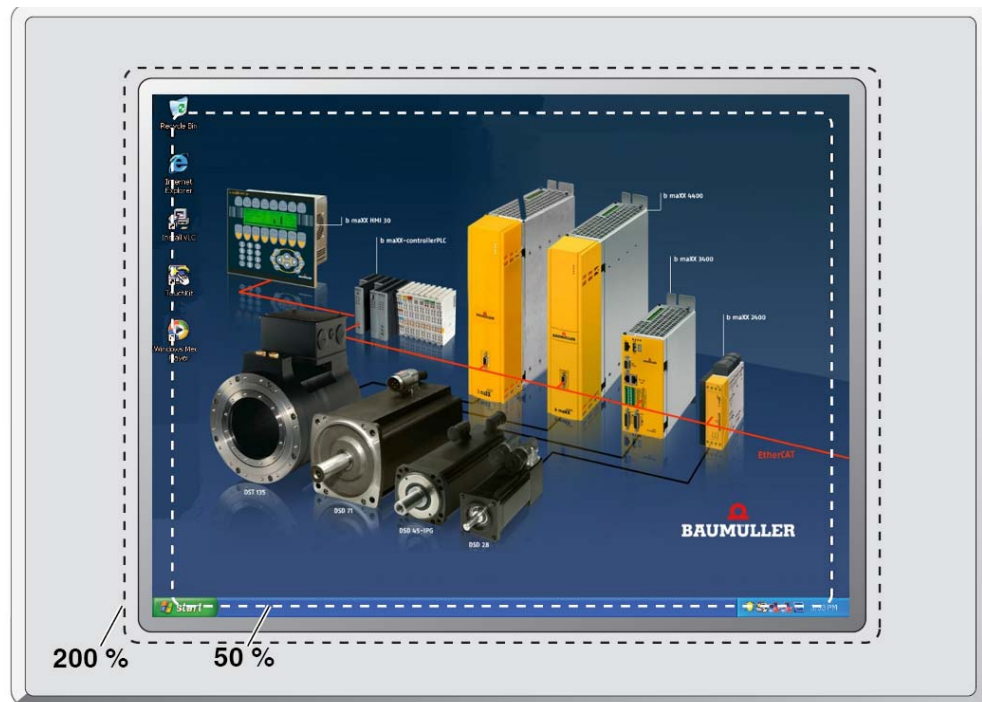


Figure 17: Example Edge compensation

Click the “Support Edge Compensation” key to activate/deactivate the edge compensation utility.

To adjust all edges of the display “in,” click the “-10%” key. Each successive click brings the edge in 10%. To adjust all edges outward, click the “+10%” key. The relative position of each edge is shown on the sliders above. To return all sliders to 100%, click the “Default” key.

8.3.4 Touchkit Hardware

The “Hardware” tab displays controller and firmware information about the touch screen. This information may be required if problems occur.

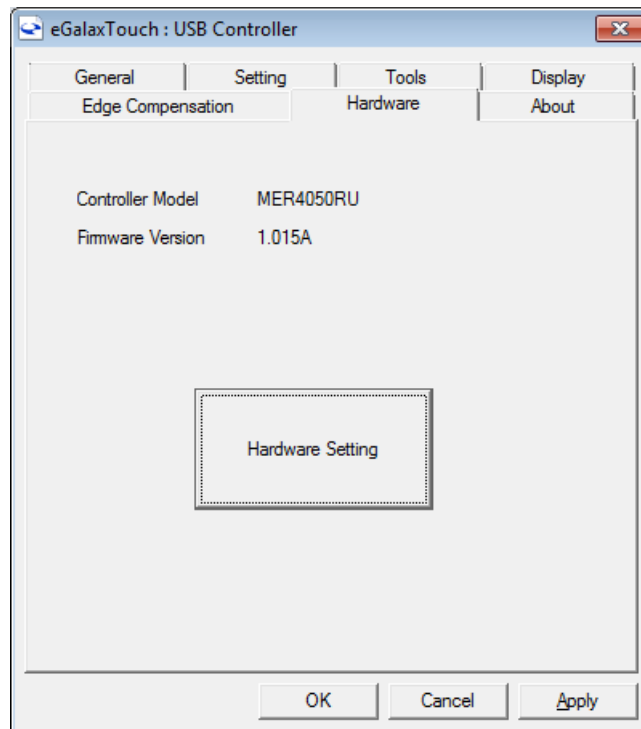


Figure 18: „Touchkit Hardware“ dialog box

Click the “Hardware Setting” key to open the “MERCURY - Hardware Configuration” dialog box.

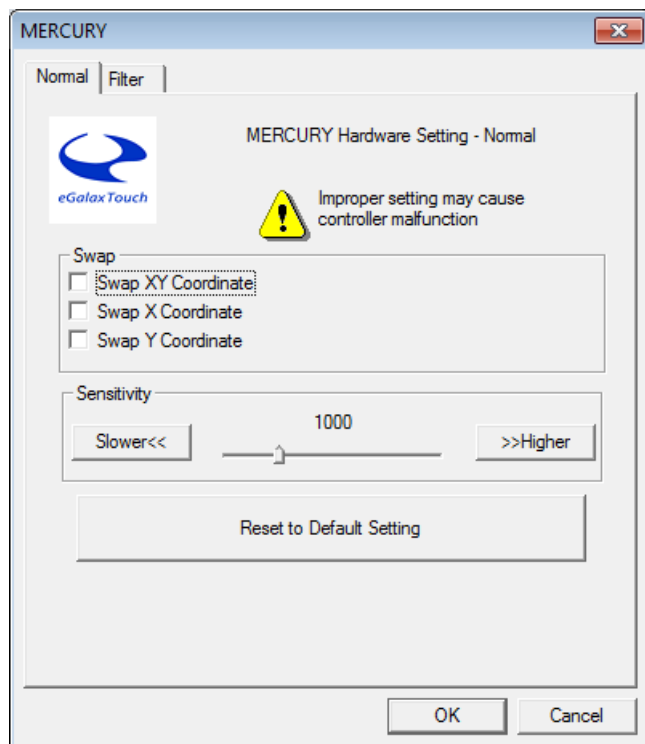


Figure 19: „MERCURY - Hardware-Configuration“ dialog box

Sliders are available to adjust the sensitivity and delay time of touches. Lower sensitivity allows a lighter touch on the screen. Values range between 80 and 255.

Shorter delay time provides a quicker reaction to touches. Values range from 0 to 2550 μ s. Click the “Reset ...” key to return the sensitivity and delay time values to the factory defaults.

8.3.5 Touchkit „About“

The „About“ tab displays information concerning the touch screen driver.

8.3.6 Touchkit (eGalaxTouch) icon

Touchkit tools are also available as menu options from the notification area (system tray) icon.

- Right-click the eGalaxTouch icon.

If the icon is not in the notification area, click the “Start” key and:

- navigate to the “All Programs, eGalaxTouch” folder and then click the “TouchMon” icon.



NOTE!

Multiple methods are available to emulate a right mouse click.

- Enable “Auto Right Click” in the Touchkit utility. This allows a constant touch to “call” a right click.
- Enable “Display key” in the Touchkit utility displays a mouse in the lower right corner of the screen. Click the mouse to alternate between right and left click of the mouse.
- Touch the “Right Click” key in the OnScreen tools palette.

Right-click the icon in the notification area and to display the menu.

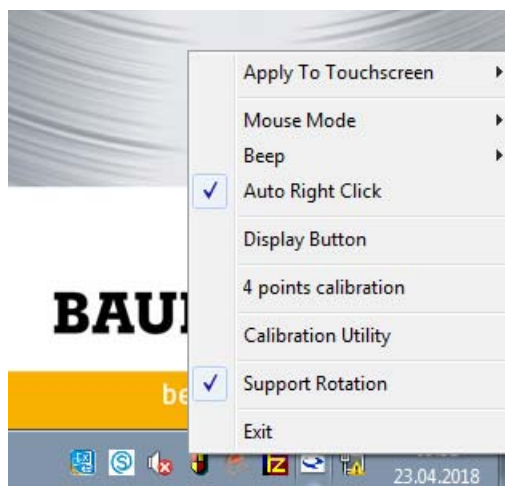


Figure 20: Touchkit-menu

Touchkit menu functions

Menu	Function
Apply to Touchscreen	Selects the touchscreen controller. The PCC-04 uses a controller called "USB Controller".
Mouse Mode	Selects the mouse mode (see ▶Mouse modes◀ on page 40).
Beep	Selects the Beep mode (see ▶Audio acknowledgment◀ on page 39).
Auto Right Click	When checked, touch the screen for an extended time period simulates a right click (see ▶Mouse modes◀ on page 40).
Display key	When checked a mouse icon appears on the display screen showing the active mouse button in red. Touch the icon to change the active mouse key
4 Points calibration	Launches the "4 Points Calibration" utility (see ▶4 Points Calibration◀ on page 43).
Calibration Utility	Opens the "Touchkit: USB Controller... Tools" dialog box (see ▶Touchkit Tools◀ on page 42).
Support Rotation	When checked, the touch screen orientation is corrected to match the display orientation. (Note that this must be active for the "Auto Right Click" function to work.)
Exit	Closes the Touchkit utility.

8.4 Intel® Graphics Control Panel user interface

The **PCC-04** uses the Intel® Graphics Media Accelerator video driver and has a variety of customization features available, including multiple displays.



NOTE!

In firmware version 2.3.0.0 the Intel® Graphics Media Accelerator video driver is deactivated because of real time influences.

The setting of the user interface is done with the standard tools of Windows® (see Windows help) in firmware version 2.3.0.0.

In all other firmware versions the Intel® Graphics Media Accelerator is available.

8.4.1 User interface

To access the video driver controls:

- Right-click the desktop, move the pointer over “Graphics Options...” and navigate to the desired option. This provides a quick path to the required setting.

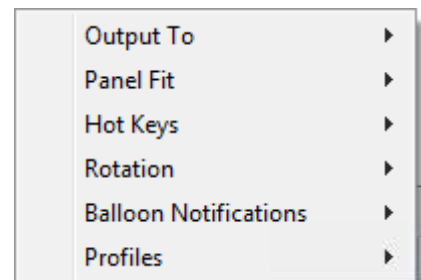
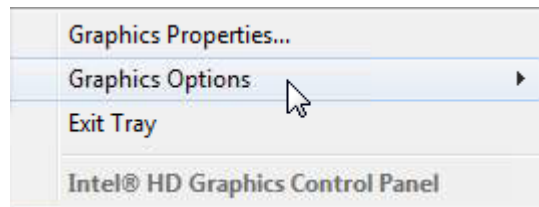


Figure 21: Graphic Media Accelerator direct select options

- Click on the symbol Intel video driver in the information range (system tray) and then on the menu item "Graphics Properties"

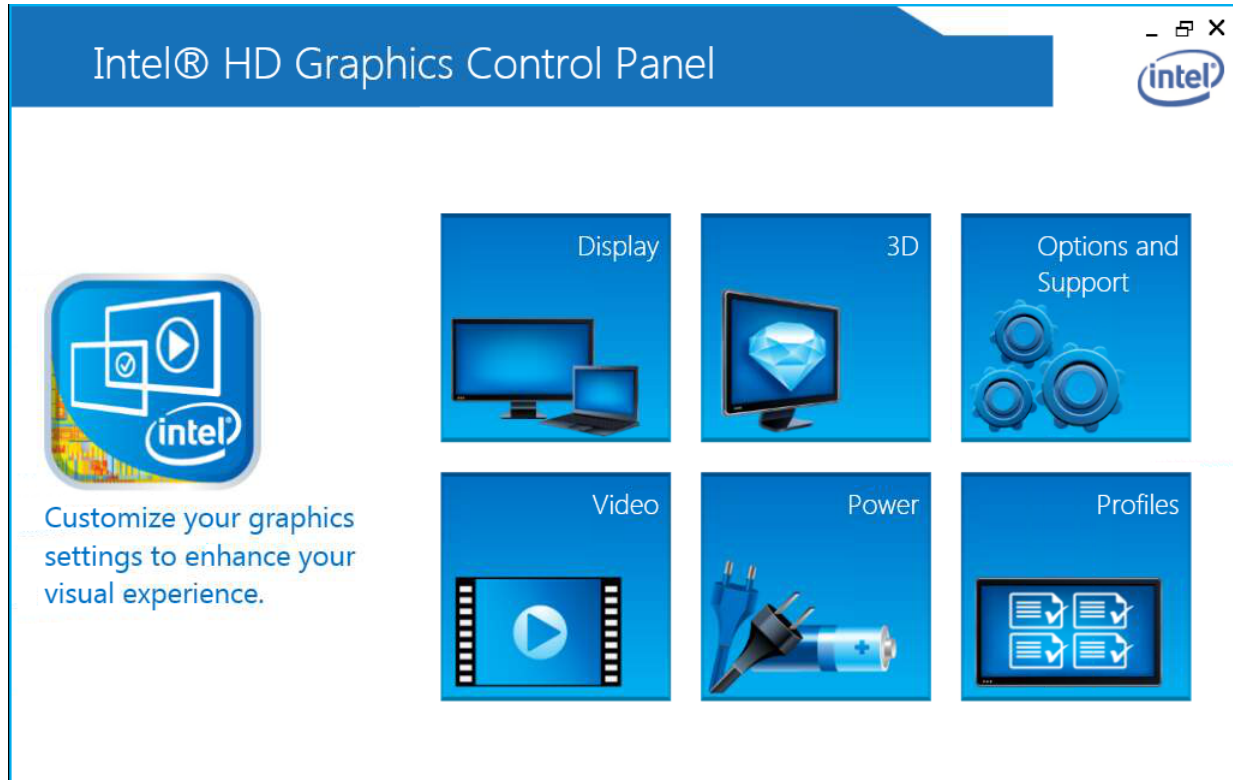


Figure 22: Graphics Control Panel main user interface screen

8.4.2 Single Display configuration

In order to set the connected displays press by using the left mouse button on "Display".

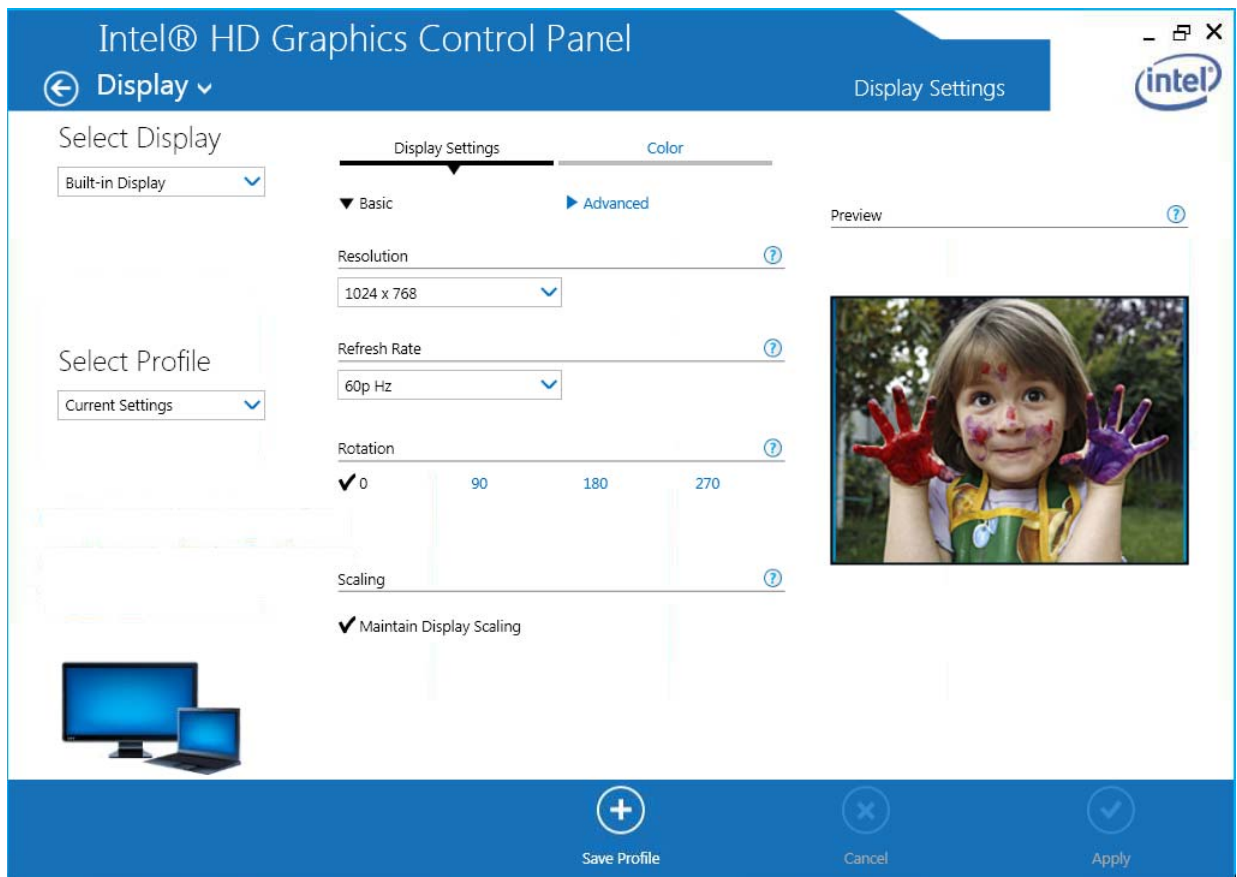


Figure 23: Display settings

The screen of the user interface can be divided into an upper and a lower range. In the upper range the configuration possibilities are to be found. The configurations can be saved as profiles. The profiles can be called up again if they are required later.

Within the lower range are some additional tools as well as the buttons "Save Profile", "Cancel" and "Apply".



NOTE!

A context-sensitive help can be called up by a click with the right mouse button within the accordant range.

Display-settings

On the left side the screen resolution, the refreshing rate, the turning and the scaling of the screen is set.

Transit the parameterization via the "Apply" button to the selected display.

Color setting

Click on the right side on the register card "Color" to receive setting options referring to the color, brightness and contrast.

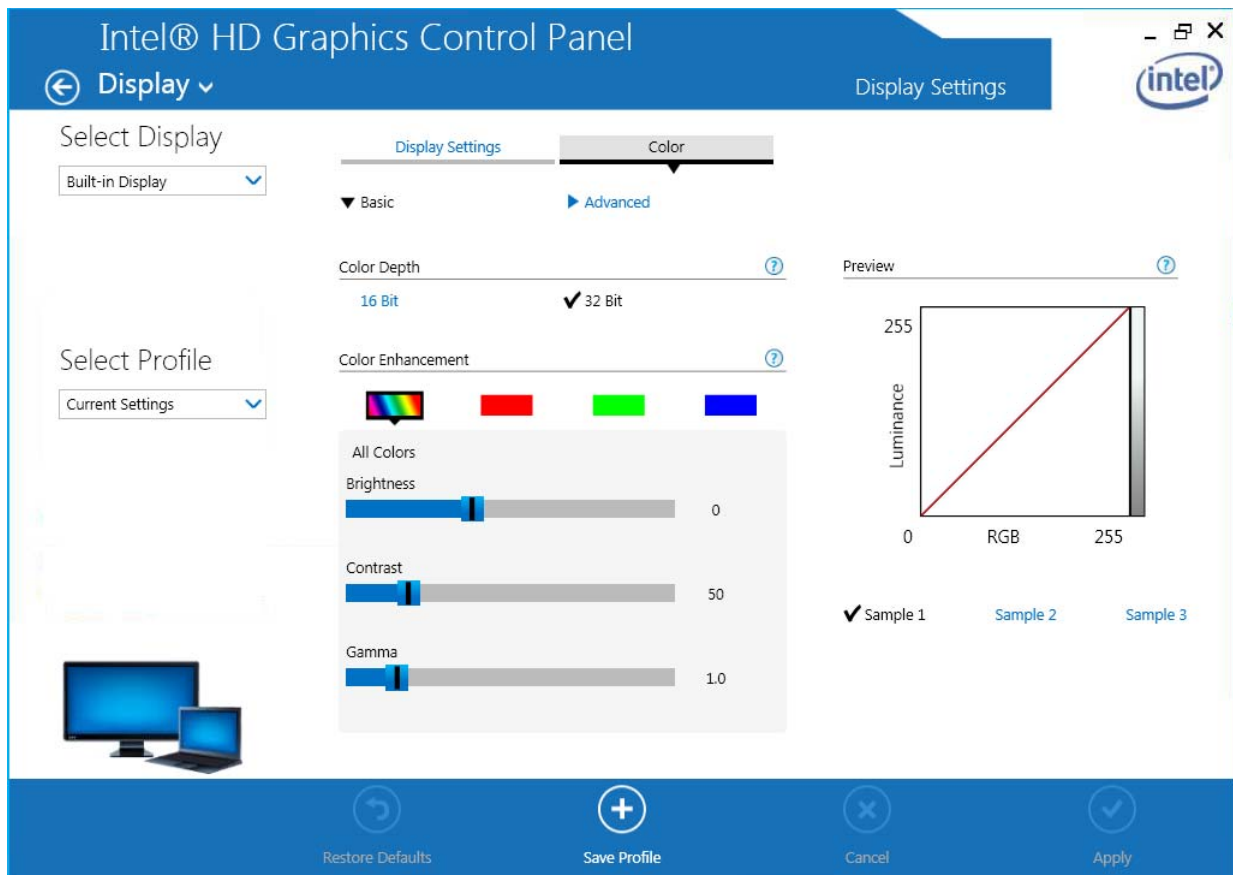


Figure 24: Color correction

Accept the parameterization via the "Apply" button for the selected display.

8.4 Intel® Graphics Control Panel user interface

8.4.3 Adjusting 3D-operation

Click on the "3D" button to configure the 3D settings.

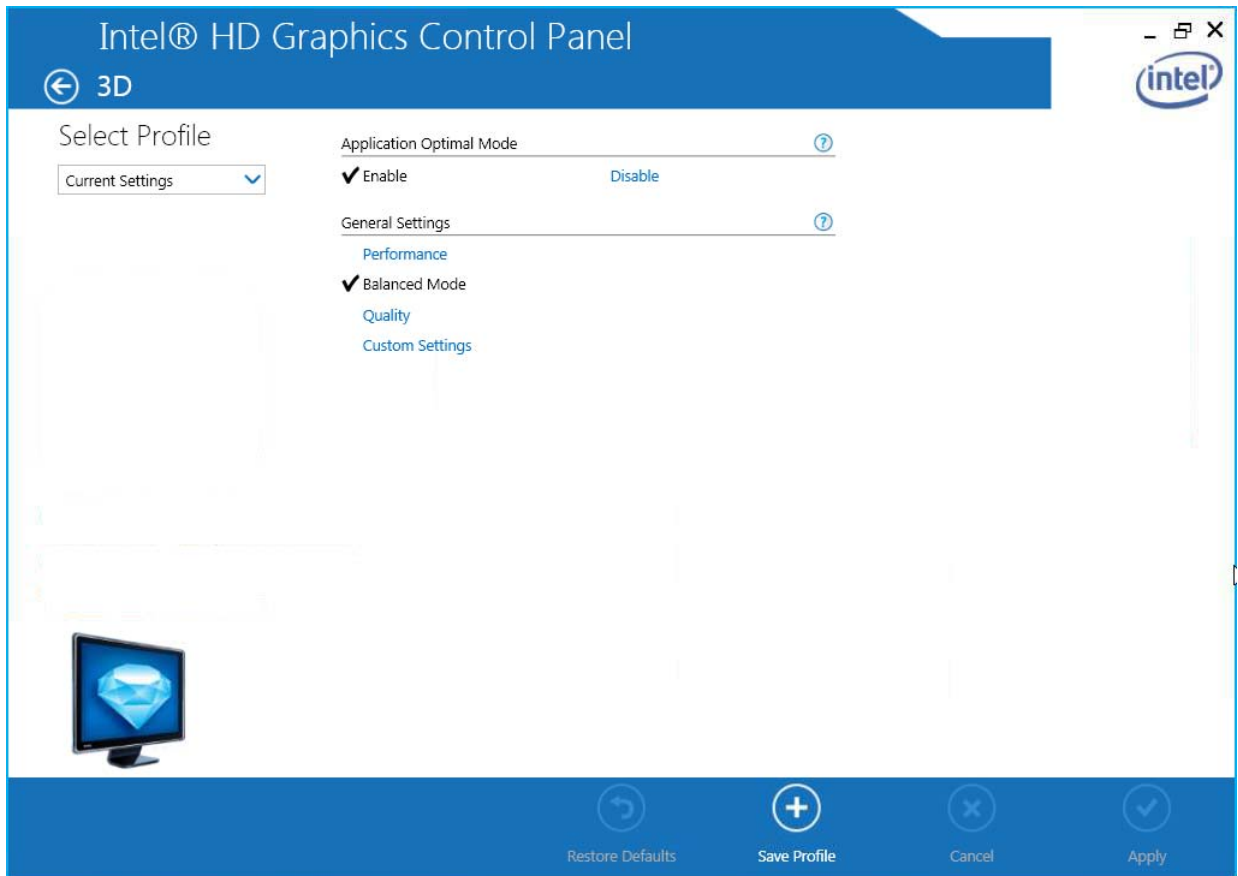


Figure 25: Dialog „3D“

8.4.4 Configuration video overlay

Click on the "Video" button to open the "Video" dialog.

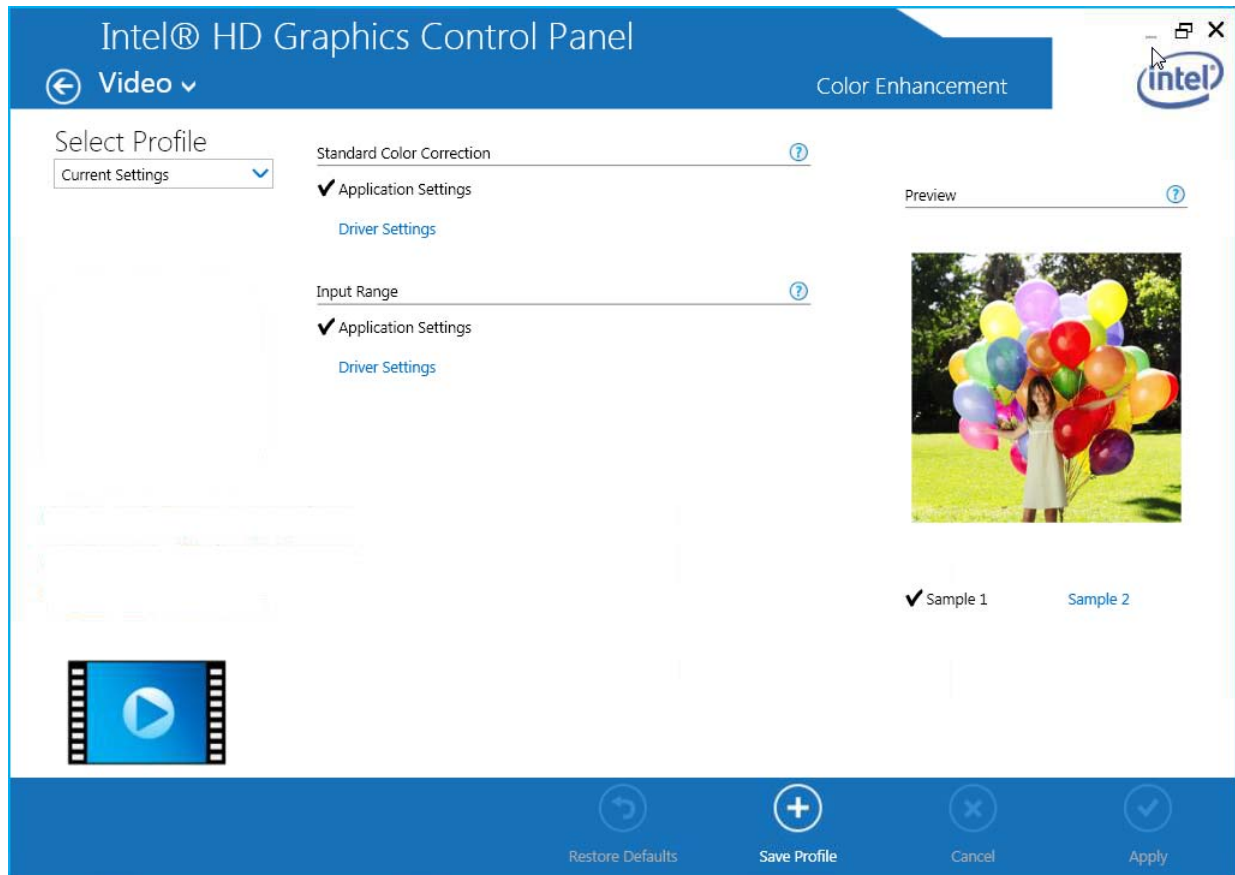


Figure 26: Dialog „Video“

Using the settings referring to the video overlay within an independent pop-up window changes on a running video reporting can be made.

8.4.5 Profiles

The selected configuration can be saved as profiles. The profiles can be called up as required. Thereby the saved settings are activated without the parameters having to be set individually.

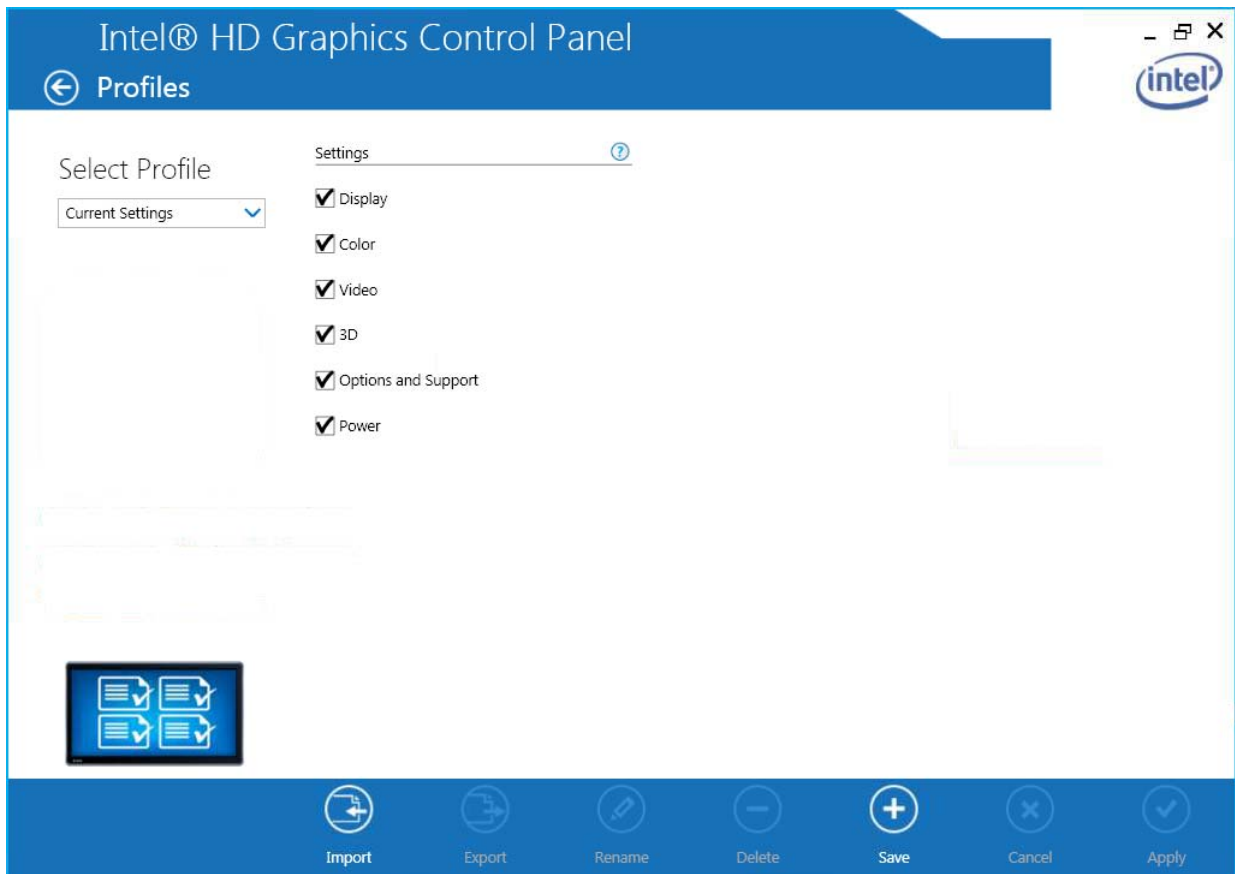


Figure 27: Dialog „Profiles“

The configuration of a display is saved as profile:

- 1 Carry out the relevant configuration settings.
- 2 Enter a name in the field "Current Settings".
- 3 Click on the "Save Profiles" button to save the profile.

In the following is explained how to call up a saved scheme:

- Click on the symbol in the information range (system tray) in the task bar and then click on the menu point "Select Profile".
- Go to the right mouse button on the desktop and then click on "Select profile".

An application can be started automatically when calling up the scheme on request. Mark the accordant checkbox and then select the accordant application.

8.4.6 Hot Keys

The Intel® graphic driver is available of predefined and assignable hot keys to select an active display and its degree value for the turn at the beginning. Assignment can be changed as explained in the following:

- 1 Click on the "Options and Support" button

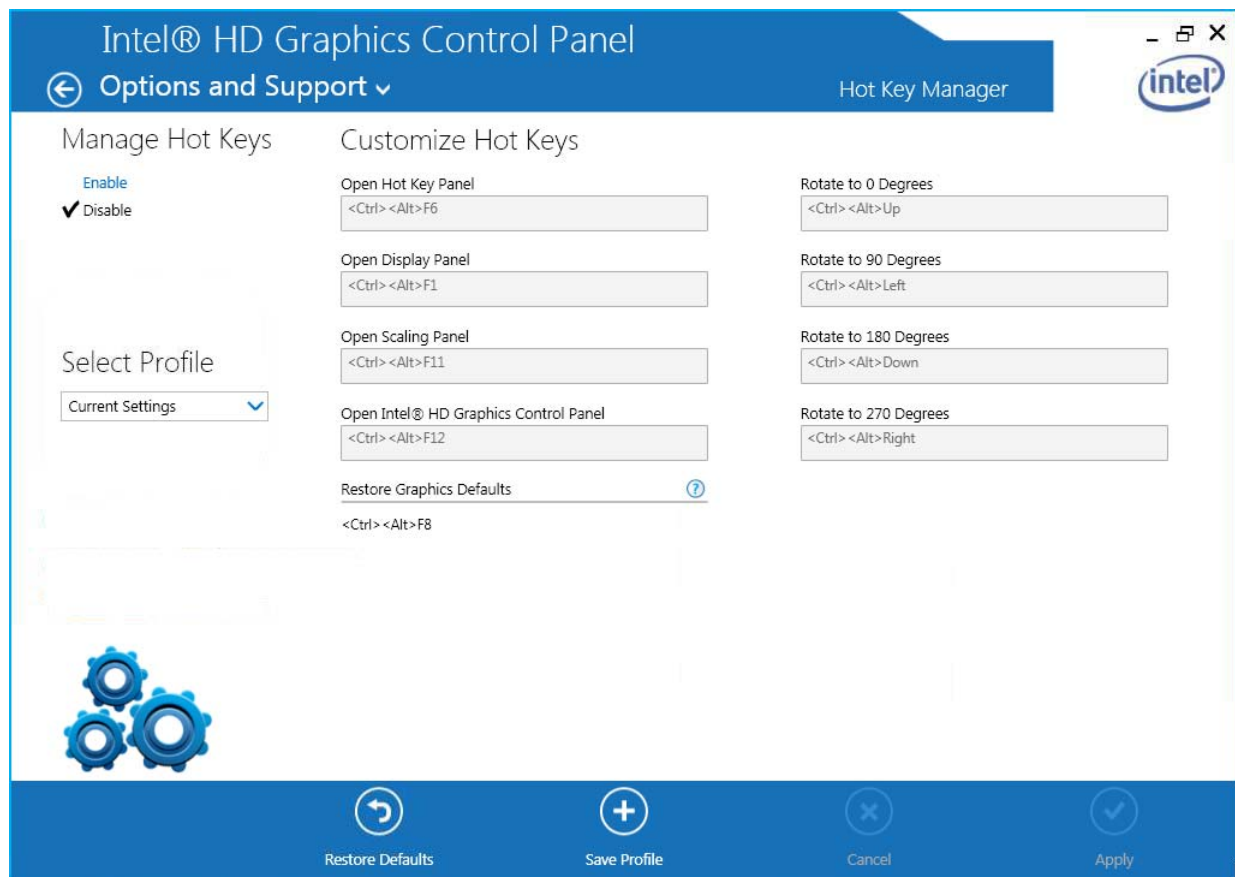


Figure 28: Modification of hot key shortcuts



NOTE!

At the login procedure to the system the hot keys were switched off.

- 2 Set "Manage Hot Keys" menu option to "Enable".
- 3 Scroll down in the list till to the required action. Write down the button combination of the hot key of the selected action.
- 4 In order to change the button combination of the hot key in the accordant point enter the new button combination.
- 5 Click on "Apply" button to save the new hot key combination in the current profile.
- 6 The new hot key combination can be saved as a new profile as well.

MAINTENANCE

General

**WARNING!****Risk of injury due to improper maintenance!**

Improper maintenance can result to serious personal injury and property damage.

Therefore:

- Before starting, ensure that there is sufficient room to carry out the work.
- Pay attention to order and cleanliness at the installation site! Components that are loosely stacked or lying around can cause accidents.

The **PCC-04** has several removable components.

**NOTE!**

To access components, it may be necessary to remove cables connected to the **PCC-04**

9.1 PCC-04 components

9.1.1 BoxPC Standard (width 93 mm)

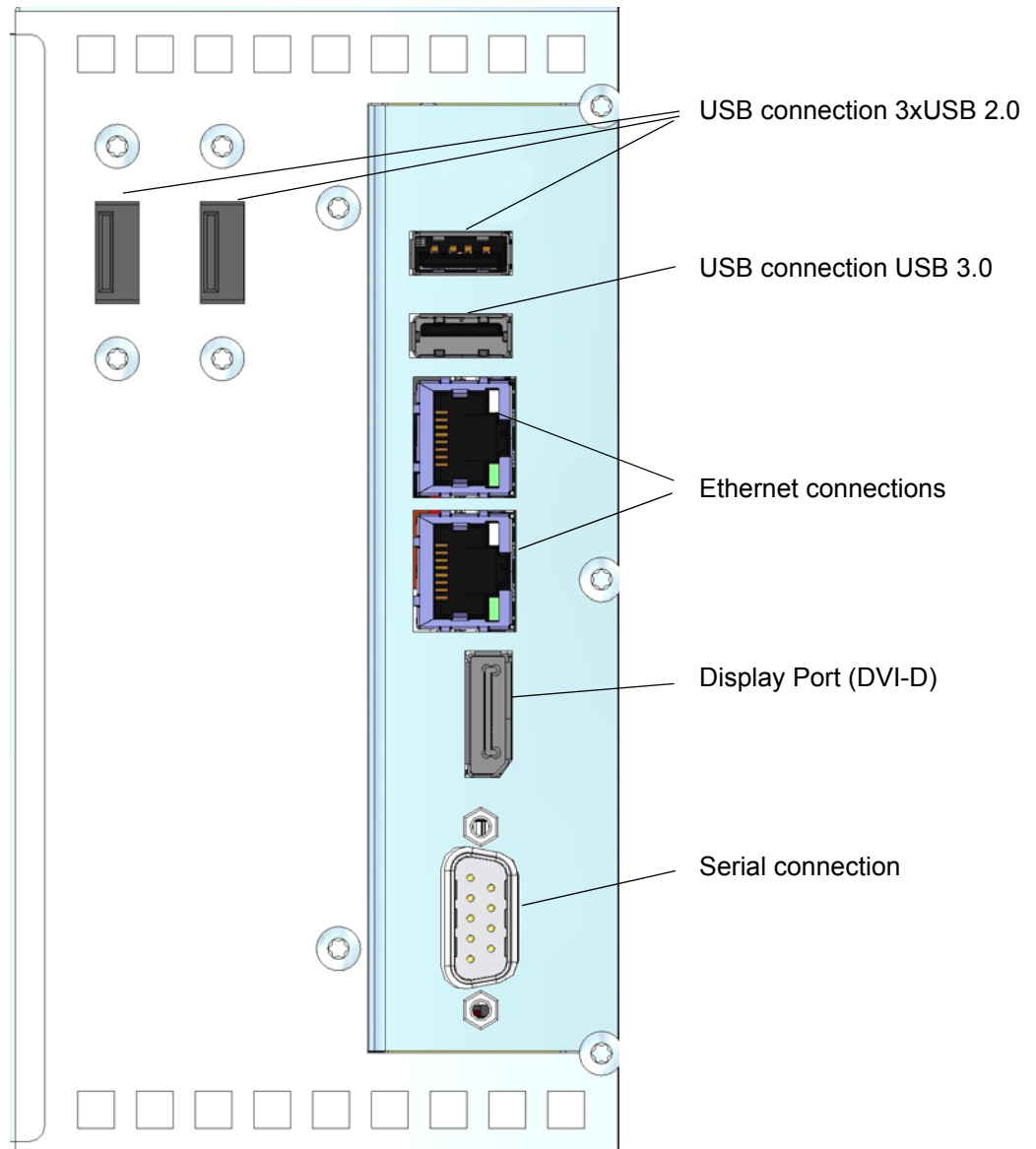


Figure 29: Interface connections

9.1.2 BoxPC Special (width 78 mm)

At the lower side of the **PCC-04** system module is a cover which is next to the plug connectors which was fixed with a screw. Under this cover is a CFast[®] slot.

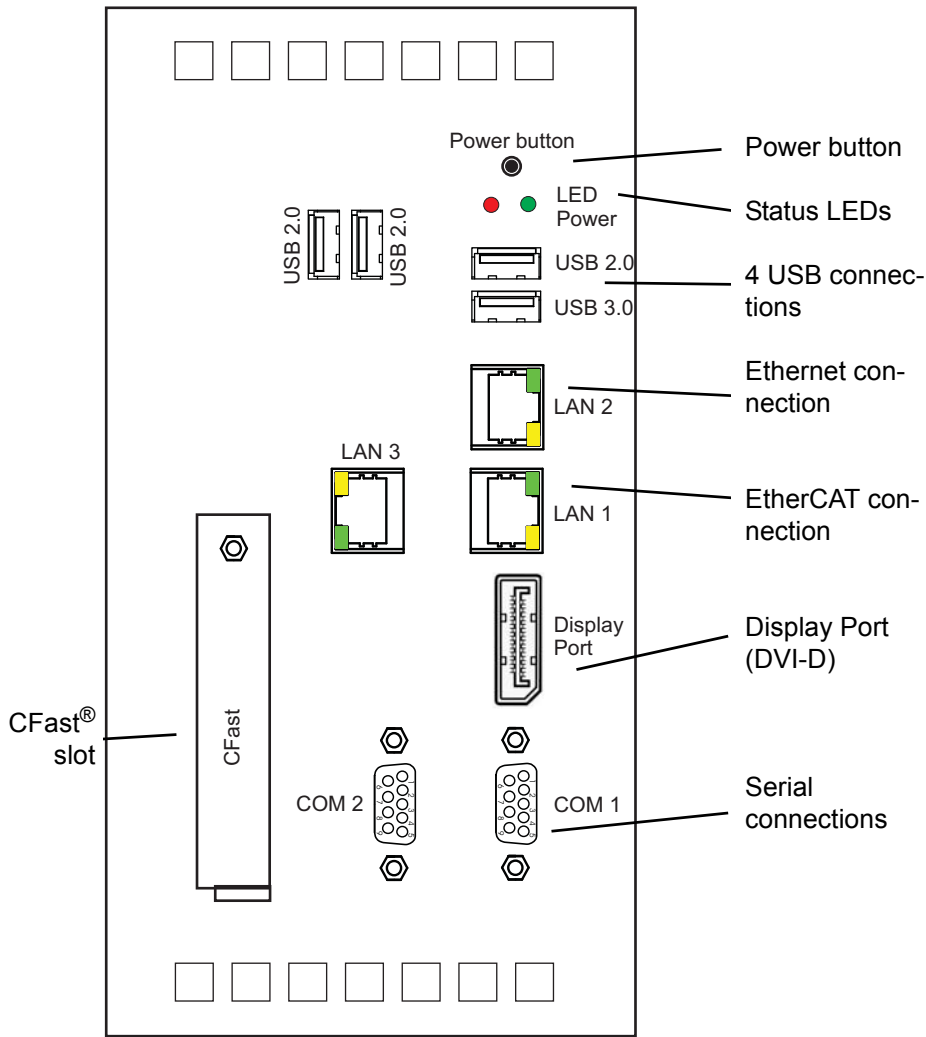


Figure 30: Connections at the bottom of the **PCC-04**

9.1 PCC-04 components

9.1.3 CMOS battery

On the processor's board is a CMOS battery.

Typical battery life:

Temperature	Storage only	1 shift production (8 h, 220 workdays/year)	2 shift production (16 h, 220 workdays/year)
-10 °C	3.9 years	4.8 years	6.5 years
+20 °C	6.7 years	8.4 years	11.2 years
+60 °C	6.5 years	8.1 years	10.8 years

In order to replace the battery the **PCC-04** must be sent back to company Baumüller.

9.1.4 Solid state drive (SSD)

The solid state drive (SSD) was permanently fixed over the power supply unit in the housing. If the SSD is defect the **PCC-04** must be send back to the company Baumüller in order to get replaced.

9.2 BIOS configuration

At the BIOS configurations no changes may be made as each change at the BIOS can influence the real-time capability of the system.

9.2.1 Boot options

When booting up it is very important that there is no booting-capable data medium in the CFast[®] adapter. If the system wasn't booted by the hard disk the control is inoperative.

9.2.2 Power on after power fail options

The **PCC-04** provides two turn-on options as soon as it was connected to the voltage supply. This is how to change the setting in the BIOS:

- 1 Let the **PCC-04** boot up or carry out a restart. As soon as the first black screen with white text appears press the button <Remove> every second to start the BIOS setup program (Aptio Setup Utility).
- 2 Select "Advanced"
- 3 Select "iSmart controller"
- 4 Select "Power-On after Power failure"
- 5 Select an option:
 - Disabled: This way the **PCC-04** remains turned off. The **PCC-04** boots up not until the power button was pressed (available only at version with type code BMP-04-0000-CC-2-S5-00-12CL-2230-00).
 - Enabled: This way the **PCC-04** is turned on and reboots if the voltage was applied again (standard setting).
- 6 Press the <Input > button to take over the changes.
- 7 Save and confirm the changes.

9.3 Repair

If the device is out of order, please contact your sales agency or:

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Ostendstr. 80 - 90
90482 Nürnberg
Germany

Tel. +49 9 11 54 32 - 0
Fax: +49 9 11 54 32 - 1 30

E-Mail: mail@baumueller.com
Internet: www.baumueller.com

TROUBLESHOOTING

General

**WARNING!****Risk of injury due to improper troubleshooting!**

Therefore:

- Only qualified personnel may work on this device!
- The personnel, working on the Industry PC must be familiar operating the device and of the safety instructions. The user must know how to react on error displays and error states, The user must have special knowledge of error displays reactions and of the error states.

PCC-04 will not start an operating system from a USB port.

- Contact technical support.



11

ACCESSORIES AND SPARE PARTS

This chapter lists the accessories and spare parts for the **PCC-04**. Our Product Management is looking forward to inquiries and suggestions concerning spare parts.

11.1 Video adapter (DisplayPort to DVI-D)

Delock Adapter Displayport 1.2 male connector > DVI female connector 4K active black
Art.-no. 00463673

11.2 Cable strain relief

Art.-no. 00463672

DISPOSAL

**NOTE!**

Baumüller products are not subject to the scope of the EU's Waste Electrical and Electronic Equipment Directive (WEEE, 2002/96/EC). Hence, Baumüller is not obligated to bear costs for return and disposal of waste electronic equipment.

**NOTE!****Avoid polluting the environment as a result of improper disposal.**

Therefore:

- Only dispose in compliance with the health and safety regulations.
- Take heed of any special local regulations. If you are unable to directly ensure safe disposal yourself, commission a suitable disposal contractor.
- In the event of a fire, hazardous substances could possibly be generated or released.
- Do not expose electronic components to high temperatures.
- Beryllium oxide is used as inner insulation, for example for various power semiconductors. The beryllium dust that is generated upon opening is injurious to the health.
Do not open electronic components.
- Dispose of capacitors, semiconductor modules and electronic scrap as special waste.

12.1 Disposal facilities/authorities



WARNING!

Danger as a result of faulty deinstallation!

The deinstallation and disposal requires qualified personnel with adequate experience.

Therefore:

- Only allow deinstallation and disposal to be performed by qualified personnel.

12.1 Disposal facilities/authorities

Ensure that the disposal is handled in compliance with the disposal policies of your company, as well as with all national regulations of the responsible disposal facilities and authorities. In case of doubt, consult the bureau of commerce or environmental protection authority responsible for your company.



APPENDIX A - DECLARATION OF CONFORMITY

EC - Declaration of Conformity
according to EMC Directive 2014/30/EU

Doc.-No: 5.16016.02
Date: 15-Oct-2019

The manufacturer: Baumüller Nürnberg GmbH
 Ostendstraße 80-90
 90482 Nürnberg, Germany

declares that the product:

Designation: Industrial PC PCC-04
 Type: BMP-04-XXXX-XX-X-XX-XX-XXXX-XXXX-XX
 Manufactured since: 01.07.2016

is developed, designed and manufactured in accordance with the EMC Directive 2014/30/EU.

Applied harmonized standards:

Standard	Title
EN 55022: Class A	Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement
EN 55024	Information technology equipment - Immunity characteristics - Limits and methods of measurement
EN 61000-6-2	Immunity standard for industrial environments
EN 61000-6-4	Emission standard for industrial environments

The products must be installed correctly and all notes and safety notes of the referring instruction handbook must be complied with, to guarantee the compliance to the guidelines.

Nürnberg / 15-Oct-2019
 Place / Date

The content of the Declaration of Conformity is subject to change. The current version can be obtained on request.



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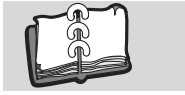


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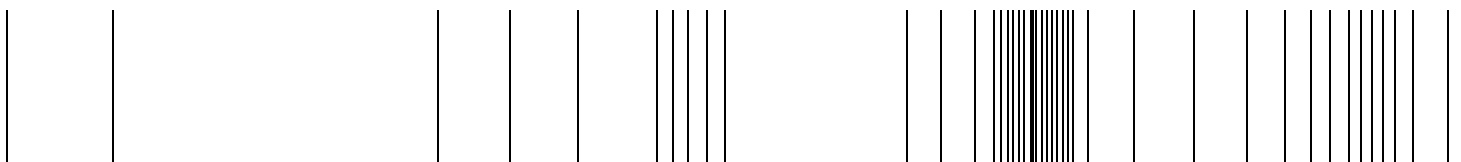
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Revision survey

Version	Status	Changings
5.16002.01	22.07.2016	First release
5.16002.02	10.07.2017	Hardware version with wider box, processors changed
5.16002.03	22.11.2018	Type code changed Ch. 8.3 Touchkit mew
5.16002.04	07.10.2019	Battery lifetime added

be in motion



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