

EMBEDDED IPCs

INSTRUCTIONS FOR USE | C6 P34 PANEL

Original manual
Document 20199071 EN 02



Preface

The described hard- and software are developments of the KEB Automation KG. The enclosed documents correspond to conditions valid at printing. Misprint, mistakes and technical changes reserved.

Signal words and symbols

Certain operations can cause hazards during the installation, operation or thereafter. There are safety informations in the documentation in front of these operations. Security signs are located on the device or machine. A warning contains signal words which are explained in the following table:

DANGER	Dangerous situation, which will cause death or serious injury in case of non-observance of this safety instruction.
WARNING	Dangerous situation, which may cause death or serious injury in case of non-observance of this safety instruction.
CAUTION	Dangerous situation, which may cause minor injury in case of non-observance of this safety instruction.
NOTICE	Situation, which can cause damage to property in case of non-observance.

RESTRICTION

Is used when certain conditions must meet the validity of statements or the result is limited to a certain validity range.

	Is used when the result will be better, more economic or trouble-free by following these procedures.
--	--

More symbols

- ▶ This arrow starts an action step.
- / - Enumerations are marked with dots or indents.
- => Cross reference to another chapter or another page.



Note to further documentation.
www.keb.de/service/downloads



Laws and guidelines

KEB Automation KG confirms with the EC declaration of conformity and the CE mark on the device nameplate that it complies with the essential safety requirements.

The EC declaration of conformity can be downloaded on demand via our website. Further information is provided in chapter "Certification".

Warranty and liability

The warranty and liability on design, material or workmanship for the acquired device is given in the general sales conditions.



Here you will find our general sales conditions.
www.keb.de/terms-and-conditions



Further agreements or specifications require a written confirmation.

Support

Through multiple applications not every imaginable case has been taken into account. If you require further information or if problems occur which are not treated detailed in the documentation, you can request the necessary information via the local KEB Automation KG agency.

The use of our units in the target products is outside of our control and therefore lies exclusively in the area of responsibility of the customer.

The information contained in the technical documentation, as well as any user-specific advice in spoken and written and through tests, are made to best of our knowledge and information about the intended use. However, they are regarded as being only informal and changes are expressly reserved, in particular due to technical changes. This also applies to any violation of industrial property rights of a third-party. Selection of our units in view of their suitability for the intended use must be done generally by the user.

Tests can only be done within the intended end use of the product (application) by the customer. They must be repeated, even if only parts of hardware, software or the unit adjustment are modified.

Copyright

The customer may use the instructions for use as well as further documents or parts from it for internal purposes. Copyrights are with KEB Automation KG and remain valid in its entirety.

This KEB product or parts thereof may contain third-party software, including free and/or open source software. If applicable, the license terms of this software are contained in the instructions for use. The instructions for use are already available to you, can be downloaded free of charge from the KEB website or can be requested from the respective KEB contact person.

Other wordmarks or/and logos are trademarks (™) or registered trademarks (®) of their respective owners.

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Glossary

0V	Earth-potential-free common point	KEB product	The KEB product is subject of this manual.
1ph	1-phase mains	KEB-I/O EtherCAT SPS	Small control system from the KEB-I/O system
3ph	3-phase mains	KEB-I/O EtherCAT System	I/O module family
AC	AC current or voltage	Manufacturer	The manufacturer is KEB, unless otherwise specified (e.g. as manufacturer of machines, engines, vehicles or adhesives).
Application	The application is the intended use of the KEB product.	MCM	American unit for large wire cross sections
ASCL	Asynchronous sensorless closed loop	MTTF	Mean service life to failure
AWG	American wire gauge	NN	Sea level
B2B	Business-to-business	PE	Protective earth
CAN	Fieldbus system	PELV	Protective Extra Low Voltage
CODESYS	Operating system of the standard control and programming environment	PFD	Term used in the safety technology (EN 61508-1...7) for the size of error probability
CODESYS Safety-PS	Safety programming system	PFH	Term used in the safety technology (EN 61508-1...7) for the size of error probability per hour
COM-BIVERT	KEB drive converters	PLC	Programmable logic controller
COMBIVIS	KEB start-up and parameterizing software	POU	Program Organization Unit
Customer	The customer has purchased a KEB product from KEB and integrates the KEB product into his product (customer product) or resells the KEB product (dealer)	RJ45	Modular connector with 8 lines
DC	DC current or voltage	Safety Package	Plug in for COMBIVIS studio 6 with safety functionally
DIN	German Institut for standardization	Safety PLC	Safety programmable logic controller
EMC	Electromagnetic compatibility	Safety PLCopen	Library of the certified basic level safety blocks
Emergency stop	Shutdown of a drive in emergency case (not de-energized)	SELV	Safety Extra Low Voltage (<60V)
Emergency switching off	Switching off the voltage supply in emergency case	SIL	The security integrity level is a measure for quantifying the risk reduction. Term used in the safety technology (EN 61508 -1...7)
EN	European standard	USB	Universal serial bus
End customer	The end customer is the user of the customer product.		
EtherCAT	Real-time Ethernet bus system of the company Beckhoff		
Ethernet	Real-time bus system - defines protocols, plugs, types of cables		
FE	Functional earth		
FSoE	Functional Safety over Ethernet		
GND	Reference potential, ground		
Head module	Description for the bus coupler or small control in the KEB-I/O EtherCat system		
HMI	Human machine interface (touch screen)		
IEC	International standard		
IP xx	Degree of protection (xx for level)		

Standards for control & automation

DGUV regulation 3	Electrical installations and equipment
DIN 46228-1	Wire-end ferrules; Tube without plastic sleeve
DIN 46228-4	Wire-end ferrules; Tube with plastic sleeve
DIN IEC 60364-5-54	Low-voltage electrical installations - Part 5-54: Selection and erection of electrical equipment - Earthing arrangements, protective conductors and protective bonding conductors (IEC 64/1610/CD)
DIN VDE 0100-729	Low-voltage electrical installations - Part 7-729: Requirements for special installations or locations - Operating or maintenance gangways (IEC 60364-7-729); German implementation HD 60364-7-729
EN 1037	Safety of machinery - Prevention of unexpected start-up; German version EN 1037
EN 55011	Industrial, scientific and medical equipment - Radio frequency disturbance characteristics - Limits and methods of measurement (IEC/CISPR 11); German version EN 55011
EN 55021	Interference to mobile radiocommunications in the presence of impulse noise - Methods of judging degradation and measures to improve performance (IEC/CISPR/D/230/FDIS); German version prEN 55021
EN 60204-1	Safety of machinery - electrical equipment of machines Part 1: General requirements (VDE 0113-1, IEC 44/709/CDV)
EN 60439-1	Low-voltage switchgear and controlgear assemblies - Part 1: Type-tested and partially type-tested assemblies (IEC 60439-1); German version EN 60439-1
EN 60529	Degrees of protection provided by enclosures (IP Code) (IEC 60529)
EN 60664-1	Insulation coordination for equipment within low-voltage systems Part 1: Principles, requirements and tests (IEC 60664-1)
EN 60721-3-1	Classification of environmental conditions - Part 3-1: Classification of groups of environmental parameters and their severities - Section 1: Storage (IEC 104/648/CD)
EN 60721-3-2	Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 2: Transportation and handling (IEC 104/670/CD)
EN 60721-3-3	Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities; section 3: Stationary use at weatherprotected locations; Amendment A2 (IEC 60721-3-3); German version EN 60721-3-3
EN 61000-2-1	Electromagnetic compatibility (EMC) - Part 2: Environment - Section 1: Description of the environment - Electromagnetic environment for low-frequency conducted disturbances and signalling in public power supply systems
EN 61000-2-4	Electromagnetic compatibility (EMC) - Part 2-4: Environment; Compatibility levels in industrial plants for low-frequency conducted disturbances (IEC 61000-2-4); German version EN 61000-2-4
EN 61000-4-2	Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test (IEC 61000-4-2); German version EN 61000-4-2
EN 61000-4-3	Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test (IEC 61000-4-3); German version EN 61000-4-3
EN 61000-4-4	Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test (IEC 61000-4-4); German version EN 61000-4-4
EN 61000-4-5	Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement

EN61000-4-6	techniques - Surge immunity test (IEC 61000-4-5); German version EN 61000-4-5 Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields (IEC 61000-4-6); German version EN 61000-4-6
EN61000-4-34	Electromagnetic compatibility (EMC) - Part 4-34: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests for equipment with mains current more than 16 A per phase (IEC 61000-4-34); German version EN 61000-4-34
EN 61131-2	Programmable controllers - Part 2: Equipment requirements and tests (IEC 61131-2)
EN61373	Railway applications - Rolling stock equipment - Shock and vibration tests (IEC 61373)
EN61439-1	Low-voltage switchgear and controlgear assemblies - Part 1: General rules (IEC 121B/40/CDV); German version FprEN 61439-1
EN61508-1...7	Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 1...7 (VDE 0803-1...7, IEC 61508-1...7)
EN61800-2	Adjustable speed electrical power drive systems - Part 2: General requirements - Rating specifications for low voltage adjustable frequency a.c. power drive systems (VDE 0160-102, IEC 61800-2)
EN61800-3	Speed-adjustable electrical drives. Part 3: EMC requirements and specific test methods (VDE 0160-103, IEC 61800-3)
EN61800-5-1	Adjustable speed electrical power drive systems - Part 5-1: Safety requirements - Electrical, thermal and energy (IEC 61800-5-1); German version EN 61800-5-1
EN61800-5-2	Adjustable speed electrical power drive systems - Part 5-2: Safety Requirements - Functional (IEC 22G/264/CD)
EN62061	Safety of machinery - functional safety of electrical, electronic and programmable electronic safety-related systems (VDE 0113-50, IEC 62061)
EN ISO 13849-1	Safety of machinery - safety-related parts of control systems - Part 1: General principles for design (ISO 13849-1); German version EN ISO 13849-1
UL61800-5-1	American version of the EN 61800-5-1 with „National Deviations“

1 Basic Safety Instructions

The COMBICONTROL is designed and constructed in accordance with state-of-the-art technology and the recognised safety rules and regulations. However, the use of such devices may cause functional hazards for life and limb of the user or third parties, or damages to the system and other material property.

The following safety instructions have been created by the manufacturer for the area of electric drive technology. They can be supplemented by local, country- or application-specific safety instructions. This list is not exhaustive. Non-observance of the safety instructions by the customer, user or other third party leads to the loss of all resulting claims against the manufacturer.

NOTICE



Hazards and risks through ignorance.

- ▶ Read the instructions for use !
- ▶ Observe the safety and warning instructions !
- ▶ If anything is unclear, please contact KEB Automation KG !

1.1 Target Group

This manual is written for design, project planning, servicing and commissioning experts. Qualified personnel for the purpose of this instruction manual must have the following qualifications:

- Knowledge and understanding of the safety instructions.
- Knowledge of automation technology.
- Knowledge of functional safety.
- Skills for installation and assembly of electrical equipment.
- Detection of hazards and risks of the electrical drive technology.
- Understanding of the function in the used machine.
- Knowledge of the operation of the Windows operating system.
- Knowledge of *DIN IEC 60364-5-54*.
- Knowledge of *EN 60204-1*
- Knowledge of national safety regulations (e.g. *DGUV regulation 3*).

1.2 Transport, storage and proper use

The transport is carried out by qualified persons in accordance with the environmental conditions specified in this manual. The devices shall be protected against excessive strains.



Electronic devices contain electrostatic sensitive components.

- ▶ Avoid contact.
 - ▶ Wear ESD-protective clothing.
-

Do not store the devices

- in the environment of aggressive and/or conductive liquids or gases.
- with direct sunlight.
- outside the specified environmental conditions.

1.3 Installation

⚠ DANGER



Do not operate in an explosive environment!

- ▶ The device is not intended for the use in potentially explosive environment.
-

To prevent damages to the device:

- Make sure that no components are bent and/or isolation distances are changed.
- The device must not be put into operation in case of mechanical defects. Non-compliance with the applicable standards.
- Do not allow moisture or mist to penetrate the unit.
- Avoid dust permeating the device. Allow for sufficient heat dissipation if installed in a dust-proof housing.
- Note installation position and minimum distances to surrounding elements. Do not cover the ventilation openings.
- Mounting according to the specified degree of protection.
- Make sure that no small parts fall into the device during assembly and wiring (drilling chips, screws etc.). This also applies to mechanical components, which can lose small parts during operation.
- Check the reliable fit of the device connections in order to avoid contact resistances and sparking.
- The safety instructions are to be kept!

1.4 Electrical connection

ATTENTION

In order to prevent malfunctions or unpredictable conditions, observe the following instructions:

- ▶ For any work on the device switch off the supply voltage.
- ▶ Never bridge upstream protective devices (also not for test purposes).
- ▶ Install all required covers and protective devices for operation.
- ▶ The electrical installation shall be carried out in accordance with the relevant requirements.
- ▶ Cable cross-sections and fuses must be dimensioned according to the design of the machine manufacturer. Specified minimum / maximum values may not be fallen below /exceeded.
- ▶ With existing or newly wired circuits the person installing the units or machines must ensure the EN requirements are met.
- ▶ When using components without isolated inputs/outputs, it is necessary that equipotential bonding exists between the components to be connected (e.g. by the equipotential line). Disregard can cause destruction of the components by equalizing currents.

1.5 Start-up and operation

When the device is installed in machines, start-up (i.e. commencement of the intended operation) is prohibited until it is determined that the machine complies with the machine directive; Account is to be taken of [EN 60204-1](#).

- During operation, all covers and doors shall be kept closed.
- Use only approved accessories for this device.
- Never touch terminals, busbars or cable ends.

1.6 Maintenance

The following maintenance work has to be carried out when required, but at least once per year by authorized and trained personnel. Check unit for loose screws and plugs and tighten if necessary.

- ▶ Check unit for loose screws and plugs and tighten if necessary.
- ▶ Clean the device from dirt and dust deposits. Depending on the device, pay particular attention to ventilation slots or cooling fins.
- ▶ Examine and clean extracted air filter and cooling air filter of the control cabinet.

1.8 Repair

In case of malfunction, unusual noises or smells inform a person in charge!

⚠ DANGER



Unauthorized exchange, repair and modifications!

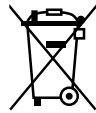
Unpredictable malfunctions!

- ▶ The function of electronic devices can be influenced by the setting and parameterization. Never replace without knowledge of the application.
- ▶ Modification or repair is permitted only by KEB Automation KG authorized personnel.
- ▶ Only use original manufacturer parts.
- ▶ Infringement will annul the liability for resulting consequences.

1.7 Disposal

Electronic devices of the KEB Automation KG are exclusively professional devices for further industrial processing (so-called B2B devices).

Manufacturers of B2B devices are obliged to take back and recycle devices manufactured after 14.08.2018. These devices may not be disposed at the collection centres of public sector disposal organisations.



If no deviating agreement has been made between the customer and KEB or no deviating mandatory legal regulation exists, KEB products marked in this way can be returned. Company and keyword to the return point can be taken from the list below. Shipping costs are paid by the customer. Thereupon the devices will be professionally recycled and disposed.

The entry numbers are listed country-specific in the following table. The corresponding KEB return addresses can be found on our website.

Withdrawal by	WEEE-Reg.-No.	Keyword
Austria		
KEB Automation GmbH	ERA: 51976	Stichwort „Rücknahme WEEE“
France		
RÉCYLUM - Recycle point	ADEME: FR021806	Mots clés „KEB DEEE“
Germany		
KEB Automation KG	EAR: DE12653519	Stichwort „Rücknahme WEEE“
Italy		
COBAT	AEE: (IT) 19030000011216	Parola chiave „Ritiro RAEE“

The packaging must be feed to paper and cardboard recycling.

2 System Description

The fanless Panel IPC family C6 P34 PANEL is based on the sixth generation Core, i5 of the Intel® Skylake™ H platform.

The „all in one“ motherboard provides four Ethernet 10/100/1000Mbps ports, that supports Jumbo Frame and Wake on Lan functionalities, three USB 3.0 ports, two USB 2.0 port, a serial RS232 interface, a DVI-D video output and a SATA III CFast slot with rear external access, an mSATA connector for a SATA III SSD, one SATA III connector for 2.5“ SSD/HDD, up to 32 GB RAM with two DDR4 SODIMM modules and an internal connector for additional serial, USB or Ethernet interfaces.

The C6 P34 PANEL family is available with 16 million color LED Backlight TFT LCDs from 12.1“ to 24“, in 4:3, 5:4 and Wide aspect ratio, with Aluminium or Aluminium True flat front panels, 5 wires resistive touchscreen and an additional USB 2.0 port on front. As an alternative, the systems with 12.1“, 15“, 17“ and 19“ LCD can have a Stainless Steel True Flat front panel. All version with Wide LCDs are also available with aluminium and glass TrueFlat Multitouch front panels, with projected capacitive touchscreen.

C6 P34 PANEL systems have an isolated 24 VDC power supply input.

2.1 Key features

- Fanless Panel/Box IPCs (Oper-ating temperature 0...50°C)
- Intel® Skylake H (35/45W) platform:
 - Intel® Core™ i5-6440EQ 2,7Ghz (3,4Ghz Turbo), 4 cores, 4 threads, 6MB smart cache
- RAM System memory 4GB
- Optional 1 x PCI (only S1)
- Mass storage: 1 x CFast, 1 x mSATA SSD and 1 x 2,5“ HDD/SSD with SATA III interface
- DVI-D video
- Isolated 24V DC power supply input
- Kit for ATX mode power supply functionality

2.2 Supported Operating Systems

C6 P34 PANEL supports the following Operating Systems:

- Microsoft Windows Embedded Standard 7P 32
- Microsoft Windows 10 1809 LTSC

2.3 KEB Standards

KEB has set the electronic and mechanical design standards for Panel PC, Box PC and Monitor families to guarantee maximum flexibility, higher safety and continuity to customers.

2.3.1 Front Panel in different variants

- Aluminum with USB port.
- Aluminum True Flat with glass projected capacitive multitouch-screen.

A unique cut-out for each different size of LCD to ensure:

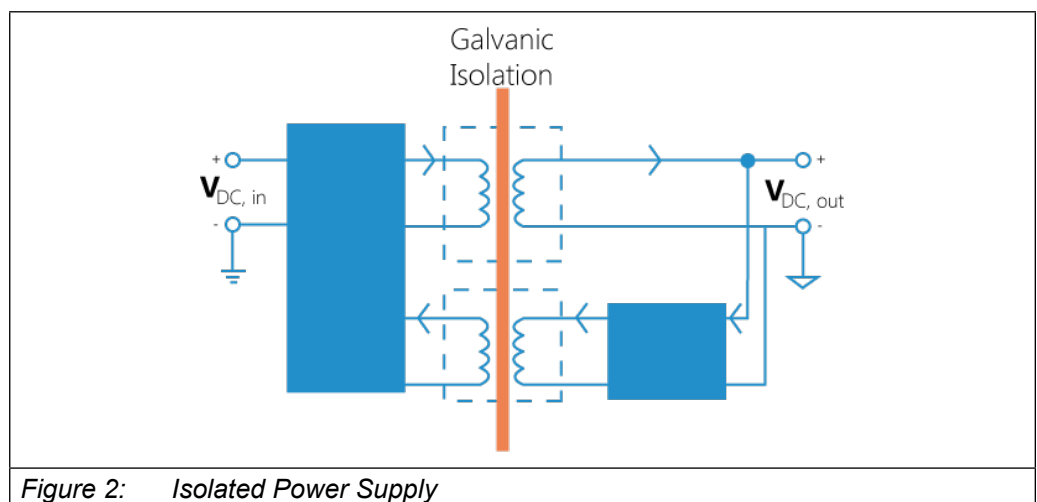


This PC family is compatible with KEB Cut-Out: a unique cut-out for each different size of LCD to ensure interchangeability among different Panel PC and Monitor families and future mechanical compatibility, facilitating the user in updating its fleet.

2.3.1.1 Power supply with galvanic isolation

Isolated Power supply with galvanic isolation to prevent:

- Common mode noise at low/medium frequencies on the power supply line
- Ground loop noise
- Extra-voltage caused by lightning
- Power supply with grounded positive terminal (e.g. Japan)



2.3.1.2 Key system identity

Non-volatile memory for system identification data storage.

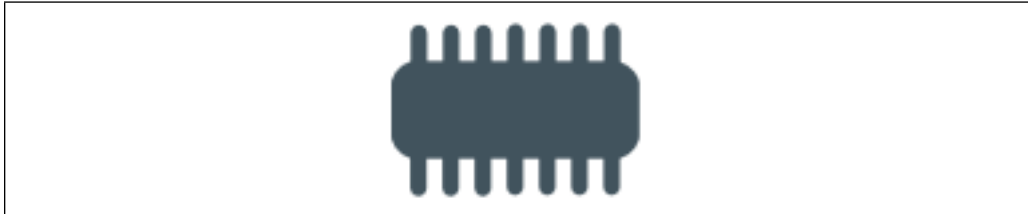


Figure 3: Non-volatile memory

2.3.2 Fanless

A special attention has been given to the thermal aspects of the system in order to avoid the use of fans, with the target of reducing the amount of moving parts and the incidence of failure in the life of the system.

2.3.3 LCD LED backlight

LCD with LED backlight technology; the system is equipped only with the new generation LCD with LED technology.

2.3.4 Mass Storage


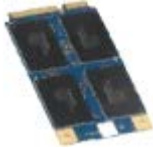
<p>CFast, 1 x bootable CFast SATA III slot on board with external access</p>	
<p>Internal SSD mSATA, 1 x mSATA SATA III internal connector for direct insertion of mSATA SSD</p>	


Figure 4: Mass storage

2.3.5 Extension slot & add-on

The system can be optionally equipped with KEB design add-on cards. They provide additional resources for the system.






<p>Add-on</p>	<p>Position A, one board between: 1 x RS232/422/485 optoisolated (DB15M) + 1 x USB 2.0</p>
---------------	--

Table 1: Expansion slot & add-on

<p>1 x RS232/422/485 optoi-solated (DB15M) + 1 x USB 2.0</p>	
<p>Figure 5: Add-on</p>	

2.4 Package

C6 P34 PANEL package consists of:

<p>C6 P34 PANEL</p>	
<p>n.1 Power supply plug (pre-installed on the system)</p>	
<p>n.1 Power supply cover (DC systems only)</p>	
<p>Depending of LCD size: n.9 (7+2 spare) clamps with grub screw. (on 10.4" – 12.1" – 15.0" models) n.10 (8+2 spare) clamps with grub screw. (on 15.6" – 17.0" models) n.12 (10+2 spare) clamps with grub screw. (on 18.5" – 19.0" – 21.5" models)</p>	
<p>n.2 hex key</p>	
<p>Figure 6: Package</p>	

2.5 Front panels

The system is available with two different kinds of frontal panel:

- Full aluminum.
- Aluminum True Flat Mul-titouch P-CAP touchscreen.



Figure 7: Full aluminium front panel detail

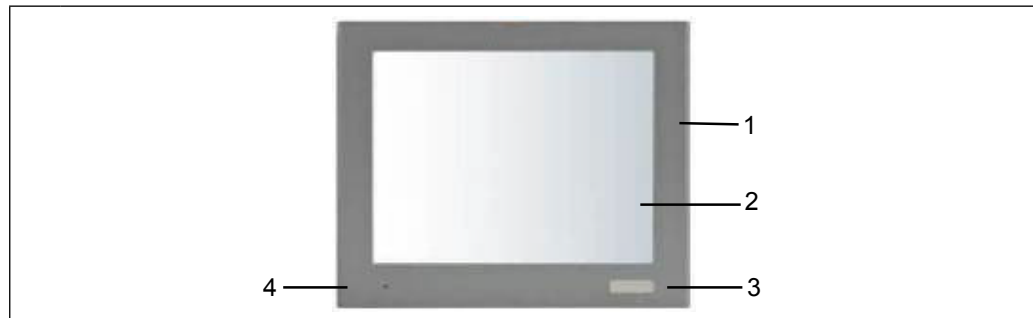


Figure 8: Capacitive front panel detail

2.6 Resistive front panel

C6 P34 PANEL (resistive) is available in the following sizes:

- 12.1"
- 12.1" wide
- 15.0"
- 15.6" wide
- 17.0"
- 18.5" wide
- 19.0"
- 21.5" wide
- 24.0" wide



1	Full aluminium front panel
2	Touchscreen display
3	IP66 protected USB
4	On/Off/Standby/UPS LED

Figure 9: Full aluminium front panel detail (in the figure is shown as an example a 15.0" display)

The full aluminium front panel has a “step” between the front panel and the touchscreen.

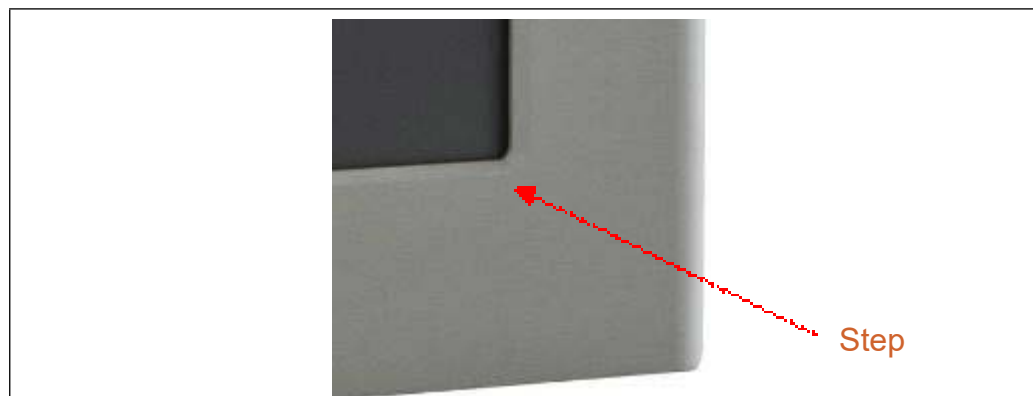
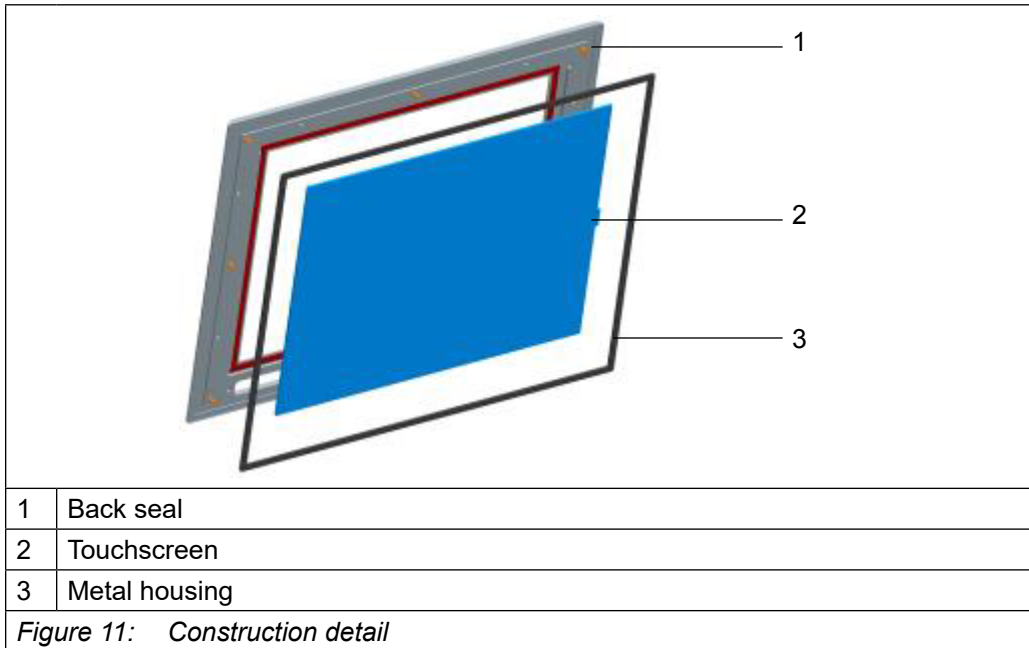


Figure 10: Front panel „Step“ detail

Features	
Index of protection	IP66
Back Seal type	EPDM
Metal housing	EN AW-5754, H22 EN 485-1

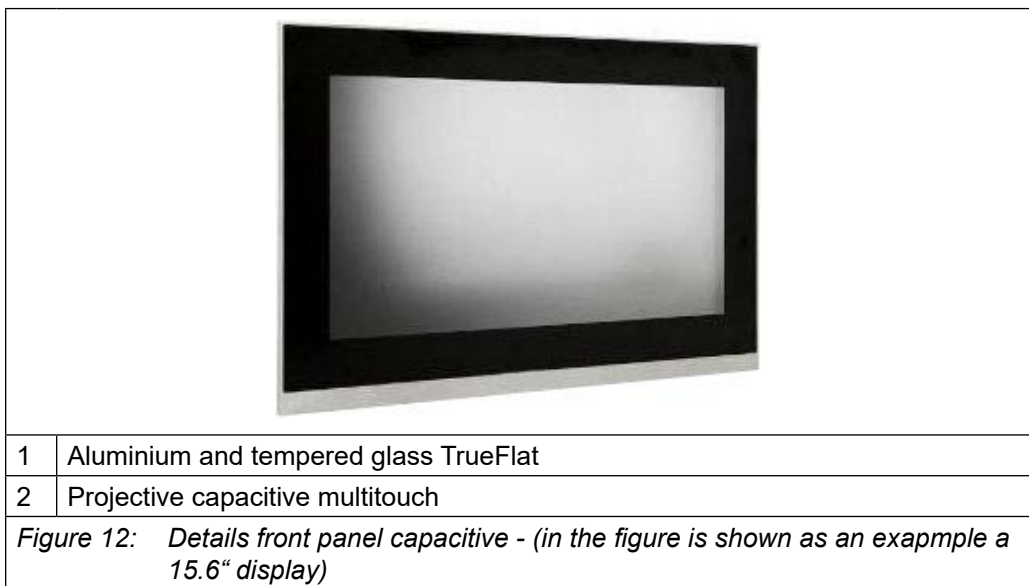
Table 2: Full aluminium features



2.6.1 Capacitive front panel

C6 P34 PANEL capacitive (aluminum and glass front panel with true flat technology with multitouch touchscreen) is available in the following sizes:

- 12.1" wide
- 15.6" wide
- 18.5" wide
- 21.5" wide
- 24.0" wide



The front panels with true flat technology contain a projective capacitive multitouch touchscreen that is handled by a USB controller within the system.

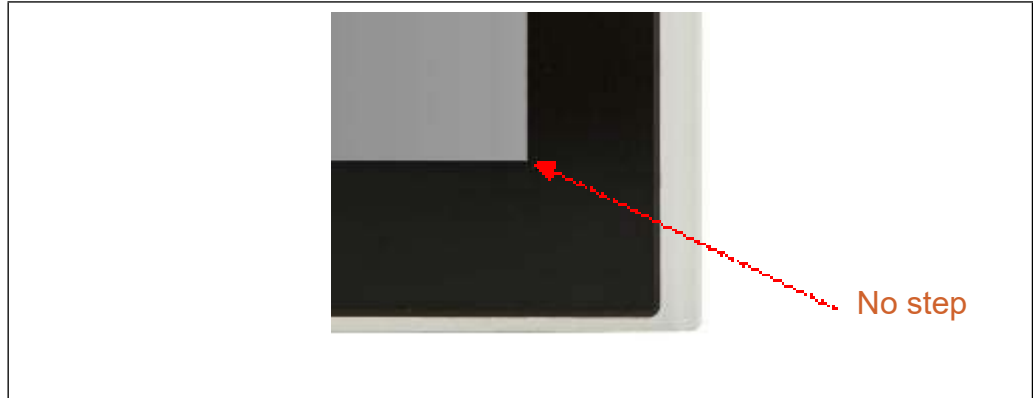
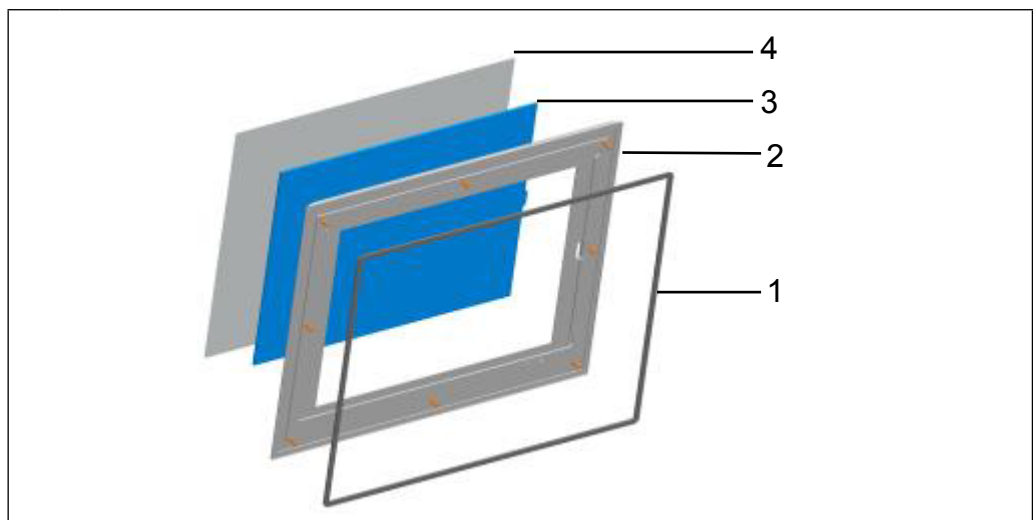


Figure 13: Capacitive front panel „No step“ detail

Features	
Index of protection	IP66
Seal type	EPDM
Front laminate	Glass
Metal housing	Aluminium alloy 5754

Figure 14: Features front panel capacitive



1	Back seal
2	Metal housing
3	Touchscreen
4	Cover glass

Figure 15: Construction detail

2.6.2 Front USB 2.0

The USB 2.0 port on the front side of the panel is protected by anti-flame silicone rubber cover. The silicone rubber is soft enough, to guarantee an IP66 degree of protection, when completely closed.



Figure 16: Frontal USB detail

2.6.3 Opening the cover



- | | |
|---|--|
| 1 | With your finger, pull the cover at the shown position. |
| 2 | Then, press the cover up/down edges, which assumes the required IP66 degree of protection. |
| 3 | Please verify that all edges perfectly adheres the hole. |

Figure 17: Frontal USB detail

2.6.4 LCD aspect ratio

There are different LCD aspect ratios depending of the frontal panel sizes:

Panel size	Aspect ratio
12.1"	4 : 3
15.0"	4 : 3
17.0"	5 : 4
19.0"	5 : 4
12.1" wide	16 : 10
15.6" wide	16 : 9
18.5" wide	16 : 9
21.5" wide	16 : 9
24" wide	16 : 9

Table 3: LCD aspect ratio



Figure 18: 4:3 aspect ratio example



Figure 19: 5:4 aspect ratio example



Figure 20: 16:9 aspect ratio example

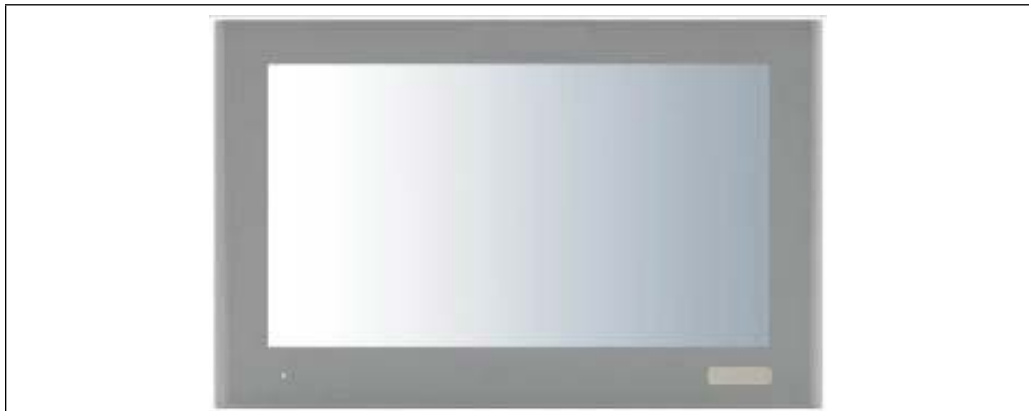
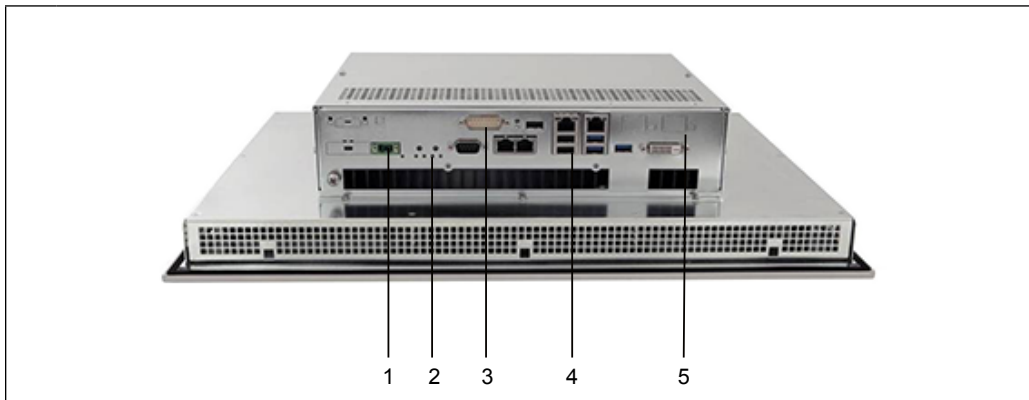


Figure 21: 16:10 (Wide) aspect ratio example

2.7 Rear panel areas

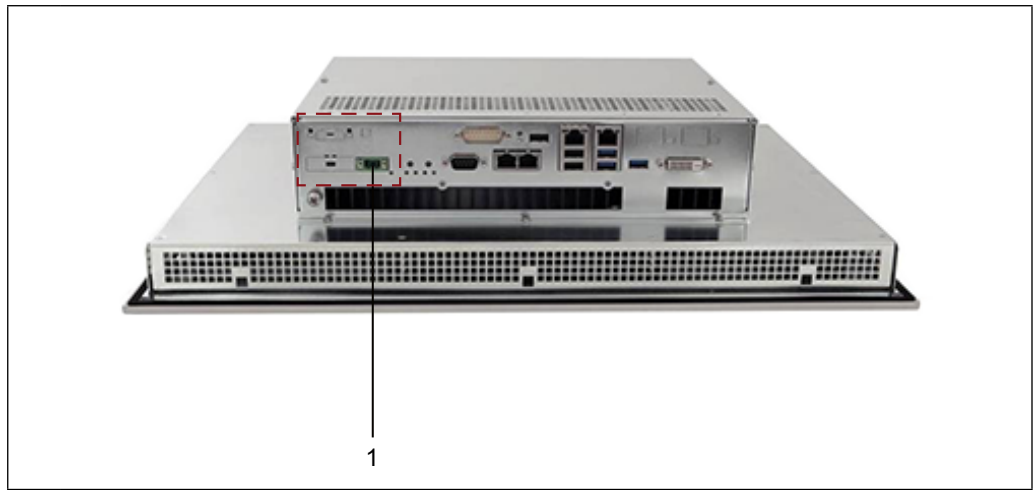
On the rear side of the panel we will find the following areas:



1	Power supply / Power button / GND area
2	Buttons / LEDs area
3	Extension area
4	Connectors area
5	RVL / LAN area

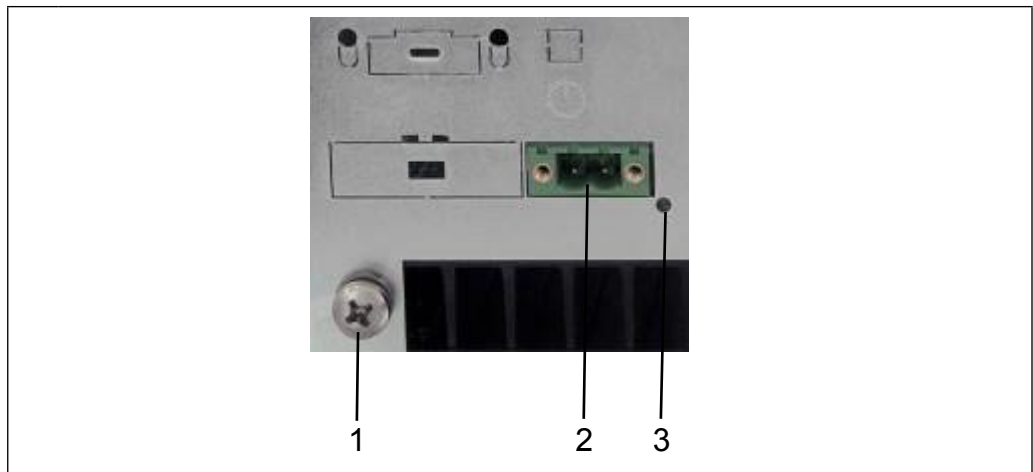
Figure 22: Rear panel areas

2.7.1 Power supply area



1	Power supply area
<i>Figure 23: Power supply area</i>	

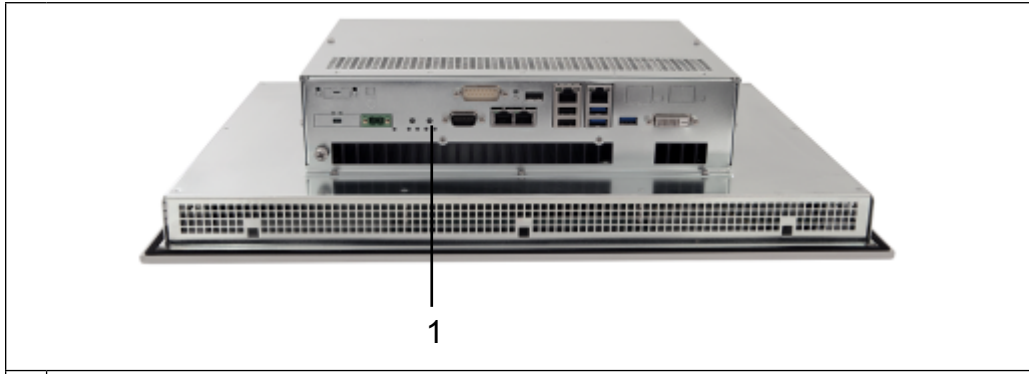
The power supply area accommodates the following connectors / LEDs:



1	Screw for equipotential bonding
2	DC power input
3	UPS status LED

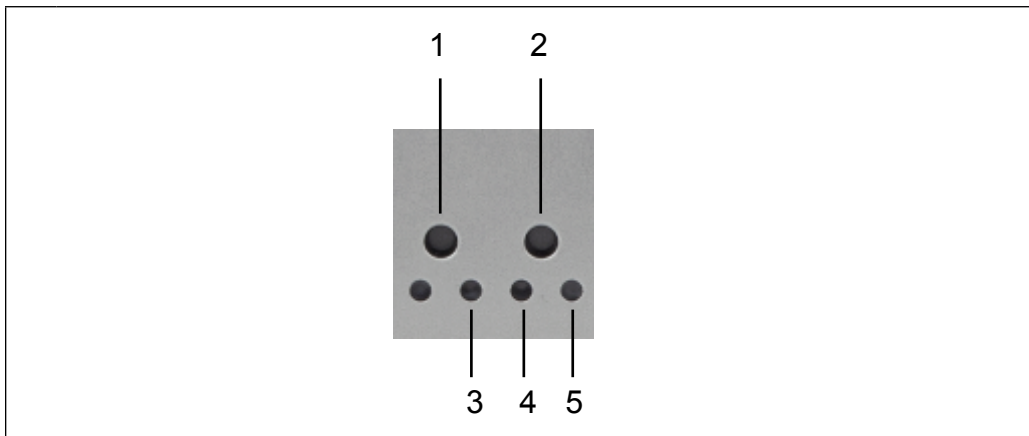
Figure 24: DC power supply detail

2.7.2 Buttons / LEDs area



1	Buttons / LEDs area
<i>Figure 25: Buttons / LEDs area</i>	

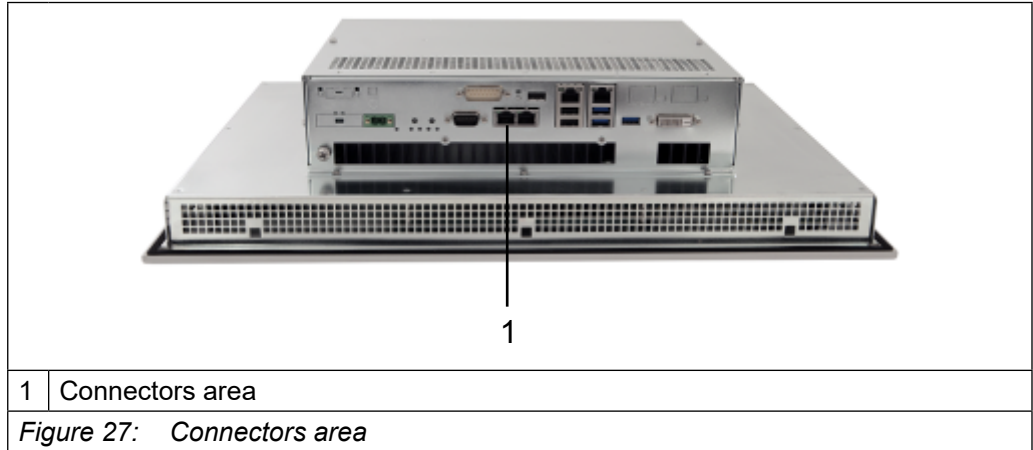
The buttons / LEDs area accom-modates the following buttons / LEDs:



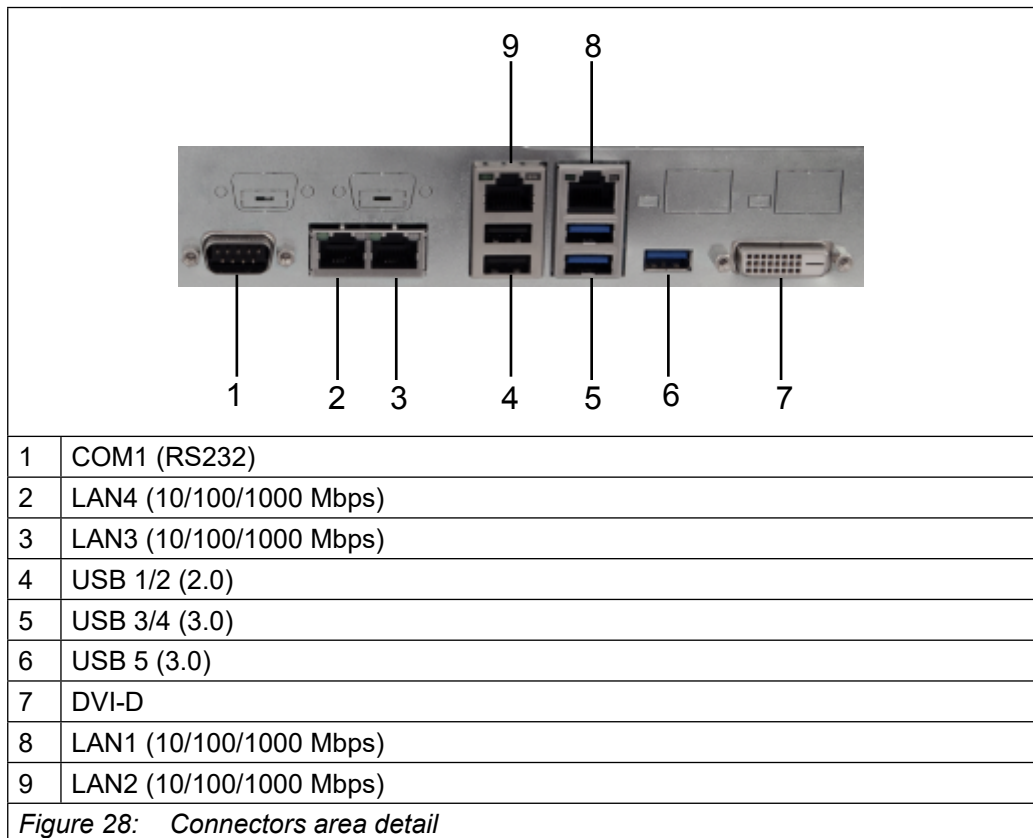
1	Watchdog Reset
2	Reset
3	Temperature LED
4	HD LED
5	On/Off/Stanby/UPS

Figure 26: Buttons / LEDs area detail

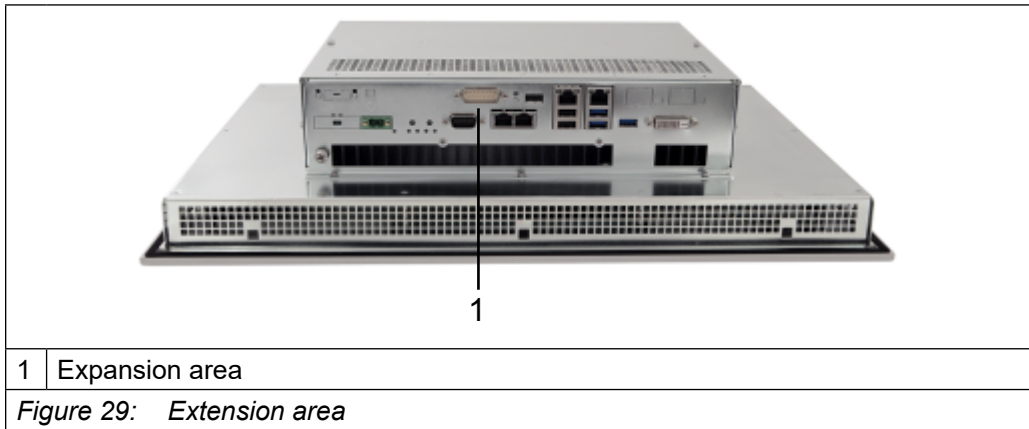
2.7.3 Connectors area



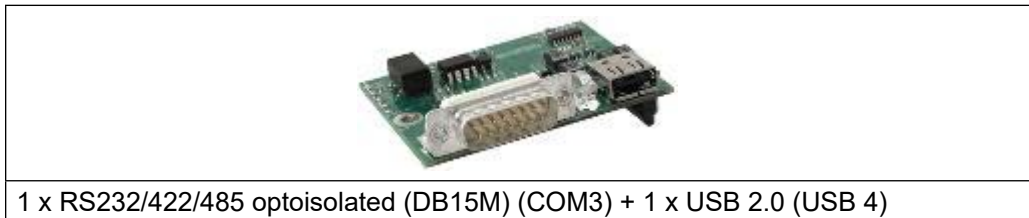
The connectors area accommodates the following connectors:



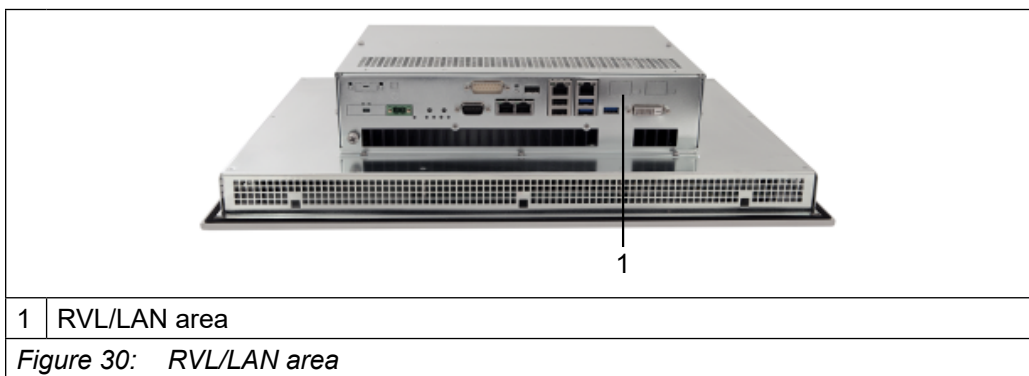
2.7.4 Extension area



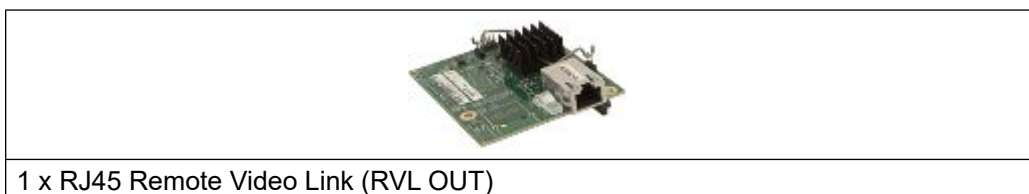
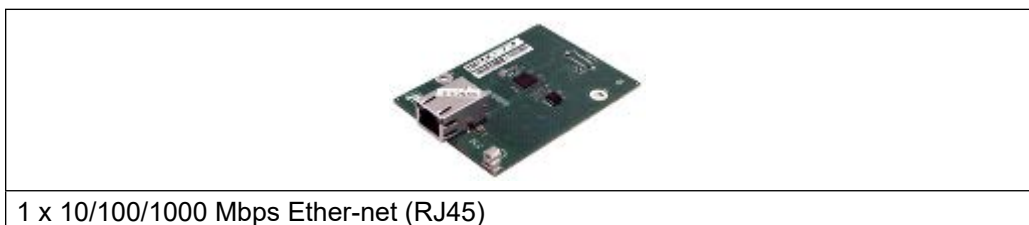
The extension area can accommodate the following ports:



2.7.5 RVL / LAN area



The expansion area can accommodate the following ports:



2.7.6 Micro-UPS

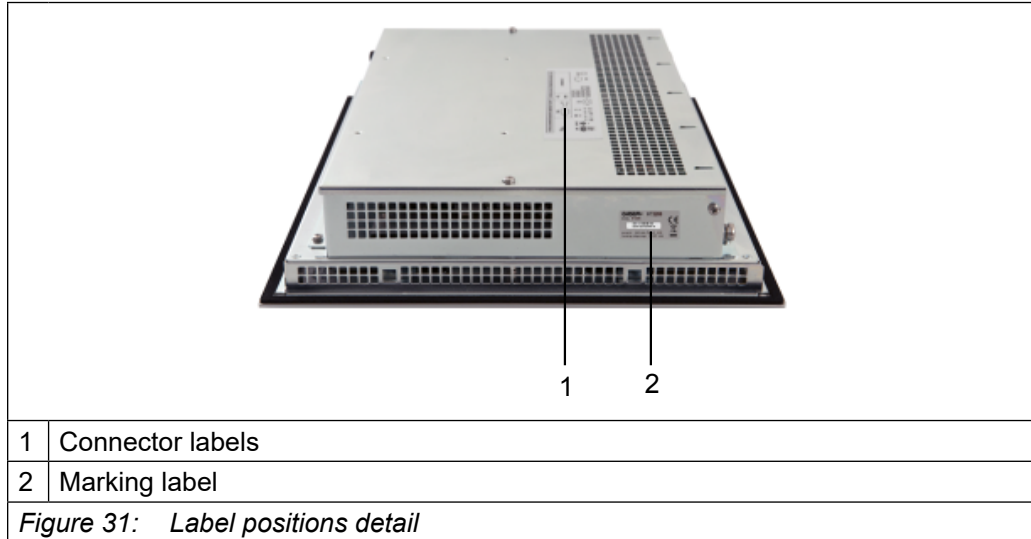
UPS (uninterruptable Power Supply) devices are normally used to provide the continuity in the power supply circuitry to electronic devices where the electronics itself or the user’s application hosted by the devices is critical from the possibility of a sudden loose of power. The Mirco-UPS is designed to be used in combination with CONTROL Soft PLC. The Micro-UPS module is installed on the internal power supply unit.


Energy storage	4 super-capacitors 28F 2.7V connected in series.
Charging time	15s
Typical operating time	Greater than 500ms
Maintenance	None
Installation	Built-in electronics and super-capacitors
Local memory directly managed by the power supply	Non volatile 512KB MRAM for Soft PLC retain feature; real available memory 64KB for RETAIN segment + 128KB for PERSISTENT segment
System’s actions taken when in UNDER_VOLTAGE	LCD is switched OFF USB power supply is switched OFF
Handling of retentive data in CONTROL runtime implementation	When receiving the UNDER_VOLTAGE signal the CPU starts a 20ms timer. When the timer is elapsed the system checks again the UNDER_VOLTAGE. If the signal is still active the system checks for the MICRO_UPS_VCAP_OK. If this signal is high the super-capacitors are ready and the peripherals are switched off (see previous point). The memory data block (128KB) is copied the MRAM memory. In case the super-capacitors are not ready, no data is saved to avoid possible data corruption. The data saving process can be estimated never exceeding 250ms at maximum. After the data copy has been completed if the UNDER_VOLTAGE signal is still active the system is turned off; if the UNDER_VOLTAGE signal is OFF the system is restarted automatically. In case of a shutdown command the data is saved and the system turned off. Note: Sleep mode is not supported.
User’s application compatibility	Applications can subscribe Micro-UPS “power-down event” form Micro-UPS APIs. Note: No shutdown command is sent to the OS, hence no files nor databases can be automatically closed without proper handling of the event. Note: If CONTROL runtime has to manage retain variables the user’s “event-application” must work on a priority level greater than 10. Note: Please contact KEB support for further details about APIs availability and use.

Table 4: Micro-UPS data

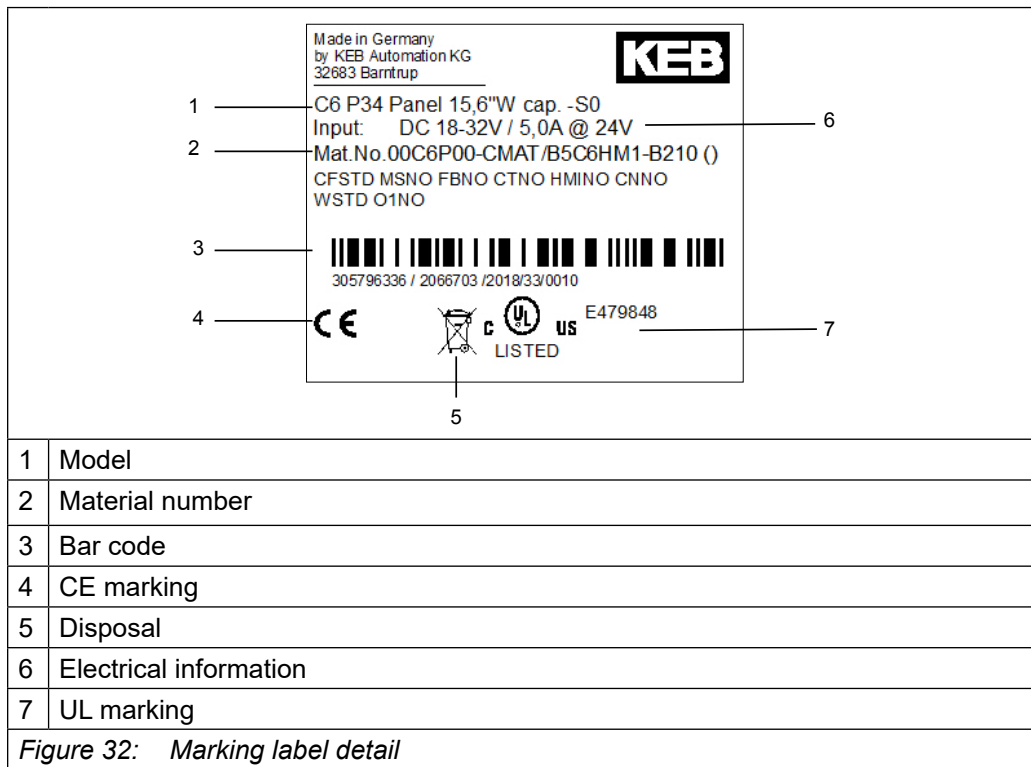
2.7.7 KEB Version

On the rear of the panel the following labels are present.



 Label positions may be different depending on display size.

2.7.7.1 Marking label



2.7.7.2 Connectors label

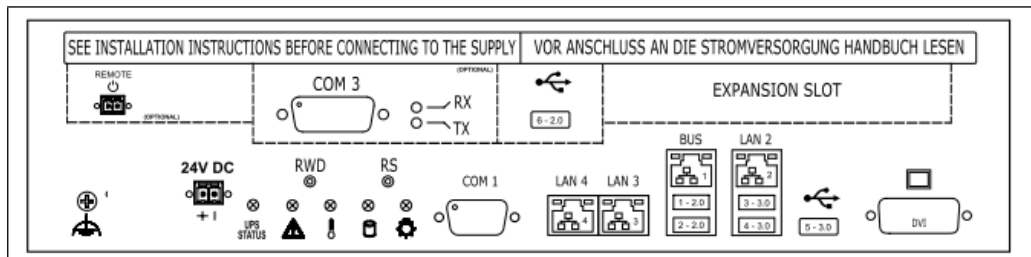
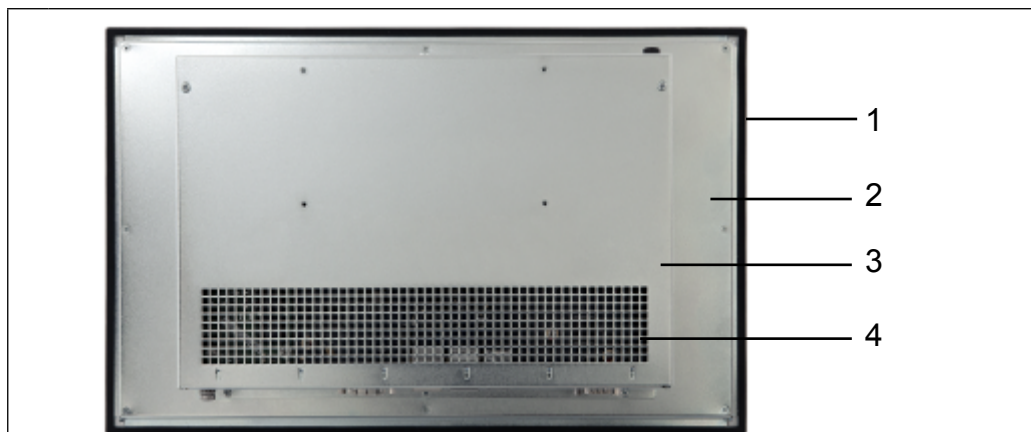


Figure 33: Connectors label

2.8 Rear view



1	Mounting seal
2	LCD housing
3	PC housing
4	Aeration holes

Figure 34: Rear view

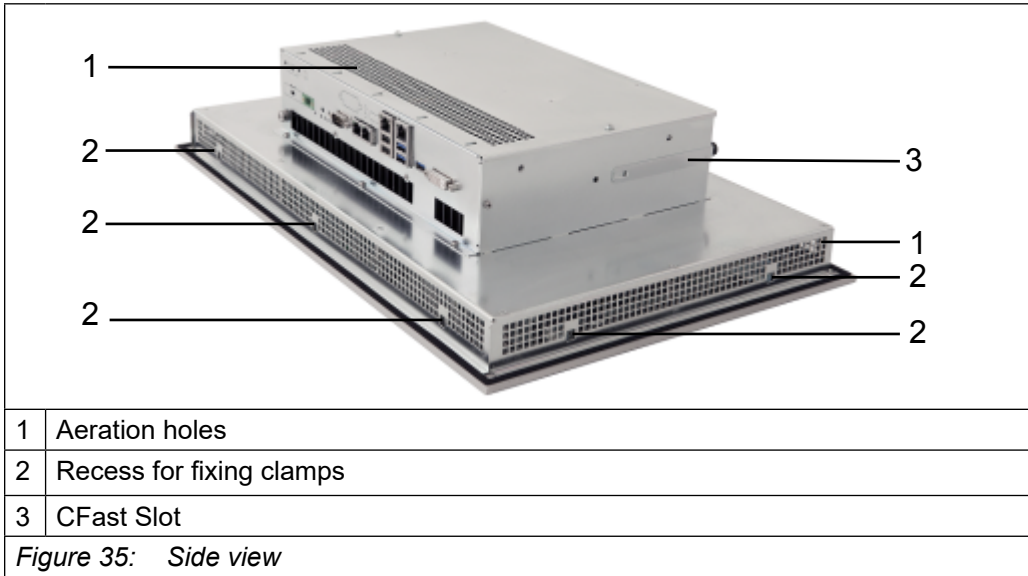


Rear panels may be different depending on display size.



UPS battery pack fixing points position may vary depending on display size.

2.9 Side view



2.10 Touchscreen

C6 P34 PANEL capacitive is provided with a 5-wire touchscreen with a controller integrated on the motherboard.

Touchscreen is available in different technologies.

C6 P34 PANEL capacitive is available only with projective capacitive multi-touchtouchscreen.

2.10.1 Standard tecnology

Touch surface is made of PET hard coated Film (Hardness: 3H).

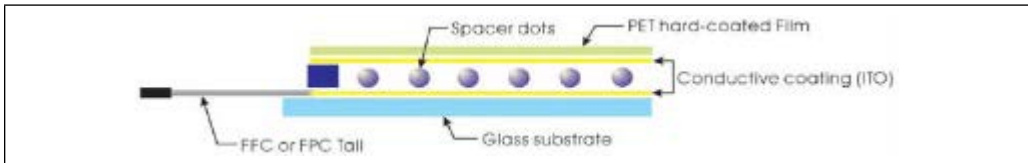


Figure 36: Standard tecnology

2.10.2 Multi Touch tecnologia

Tempered glass and aluminium frame for the capacitive front panel:

- Projected capacitive touchscreen (P-CAP).
- Up to 4 finger operation.
- Gestures support.



Figure 37: Capacitive front panel detail

3 Installation and connection

3.1 Preparation for installation

3.1.1 Select the mounting location

- Avoid direct sunlight exposure.
- Make sure that C6 P34 Panel is properly (ergonomically) accessible to the operator.
- Choose a suitable mounting height.
- Ensure that the aeration holes are not covered.

3.2 Checking the package contents

- Check the package content for visible signs of transport damage and for completeness.
- In the case of damaged parts, contact your KEB representative. Do not install parts that were damaged during the shipment.

3.3 Checking the operating conditions

- Read carefully the standards, approvals, EMC parameters and technical specifications for operation of the device. This information is available in the following sections:
 - a) Certificates and approvals.
 - b) Electromagnetic compatibility .
- Check the mechanical and climatic ambient conditions for operation of the device.
- Follow the instructions for local use of the device.
- Adhere to the permissible rated voltage and the associated tolerance range.

3.4 Mounting position

in general C6 P34 Panel device is suitable for installation in several mounting conditions, such as:

- Mounting cabinets
- Control cabinets
- Switchboards
- Consoles

However, some important mounting rules must be followed, in order to avoid thermal and mechanical problems.

WARNING

For installation in control cabinets and in particular, in closed containers, make sure the ambient temperature complies with the requirements!

3.5 Damage due to overheating

- All C6 P34 PANEL systems are designed for vertical mounting position.
- A inclined installation reduces the thermal convection by C6 P34 PANEL and the maximum permissible ambient temperature for operation. Please contact KEB for details. C6 P34 PANEL may otherwise be damaged and its certifications and warranty will be void.
- The ambient temperature must be between 0°C to +50°C measured 5 cm from all openings of the system where there is air entrance.
- Provide space around the system for air recirculation and heat exchange.
- Keep at least 7 cm of space behind (z) and to the sides (x) of the PC cell, while above (y) and below (y) the PC cell are needed 10cm.
- Make sure that the grids on PC cell for air exchange are free from objects and cables and far from other obstacles to the air flow.
- For example, when the system is installed in cabinets with no air-conditioning, it is necessary to ensure the exchange of air from outside through at least two openings:
- An opening should be placed under the PC cell, it must be large enough to allow the correct air flow from outside that is required to be within the limits specified in the section on temperature.
- A sufficient size opening must be positioned above the PC cell to allow the outflow of the hot air outside.
- It is possible to use one or more lateral openings instead of the two above mentioned, subject to the condition that their vertical dimension is long enough to ensure the heat required exchange.
- When the system is placed in air conditioned cabinets, the conditioning system must provide the air circulation with proper ventilation.
- When the system is installed in closed cabinets, it is still necessary to ensure that the maximum ambient temperature is +50°C.
- Mounting angle:
 - a) The system is intended to be mounted vertically.
 - b) For inclinations of more than 10° and up to 20° is necessary to decrease the maximum operating temperature of 5°C.
 - c) For other installation modes contact KEB Automation KG.



For installation in control cabinets and, in particular, in closed containers, make sure the recommended ambient temperature is maintained.

3.6 Checking installation distances

To ensure adequate aeration it is necessary leaving the following open spaces around the system:

- X direction 7 cm (min.) for each side.
- Y direction 10 cm (min.) for each side.
- Z direction 7 cm (min.).



Mounting the clamps requires a space at least 20 mm on the outer perimeter of the frame display.

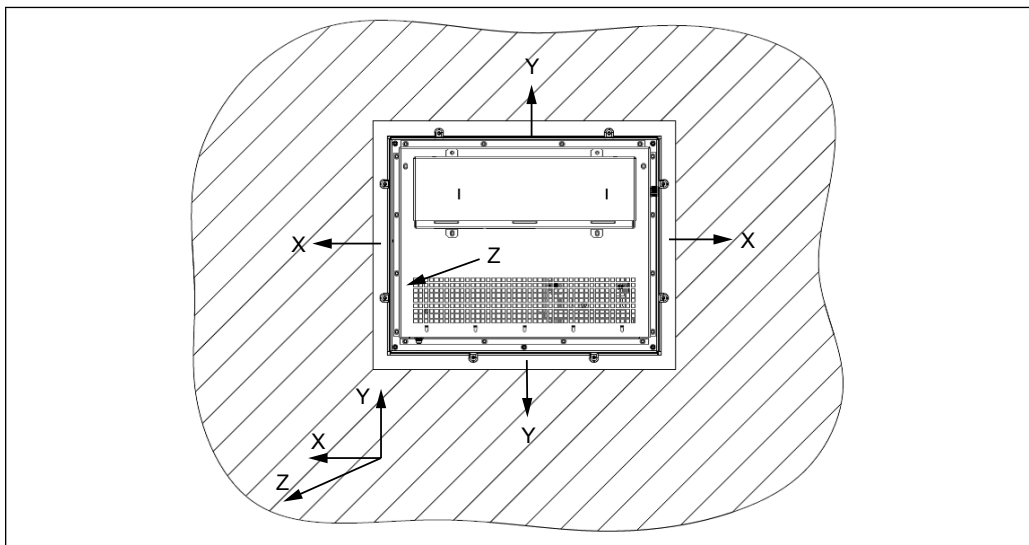


Figure 38: Installation Panel distances

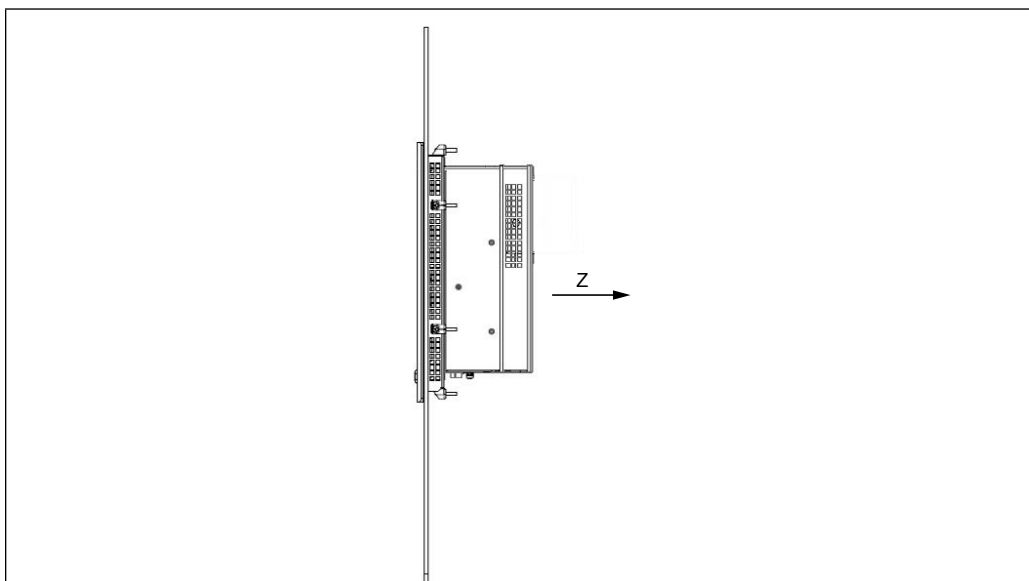


Figure 39: Installation Panel distances

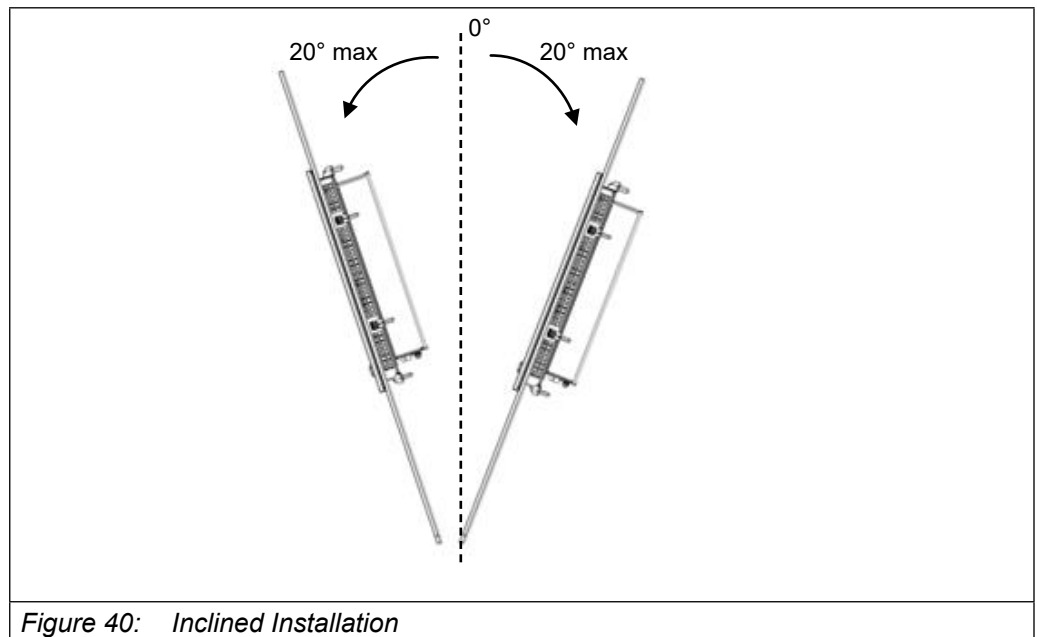


Figure 40: Inclined Installation

3.7 Preparing the mounting cut-out

In order to ensure a proper mounting of the panel, the material of the mounting cut-out must be sufficiently stable.

To obtain the degree of protection described below, the material of the mounting panel must not deform due to the use of clamps on the operator panel.

3.7.1 Degrees of protection

The degree of protection of the system (IP) is intended only for the front panel of C6 P34 PANEL and is guaranteed only if the following conditions are satisfied:

- Material thickness at the mounting cut-out for IP66 protection: 2mm to 6 mm.
- Deviations of the plane of the mounting cut-out limits: ≤ 0.5 mm.
This condition must be satisfied even when the C6 P34 PANEL is installed.
- Allowed surface roughness in the area of the seal: ≤ 120 microns (Rz 120).

3.8 Dimensions

This section shows the dimensions of the systems.

3.8.1 C6 P34 Panel resistive

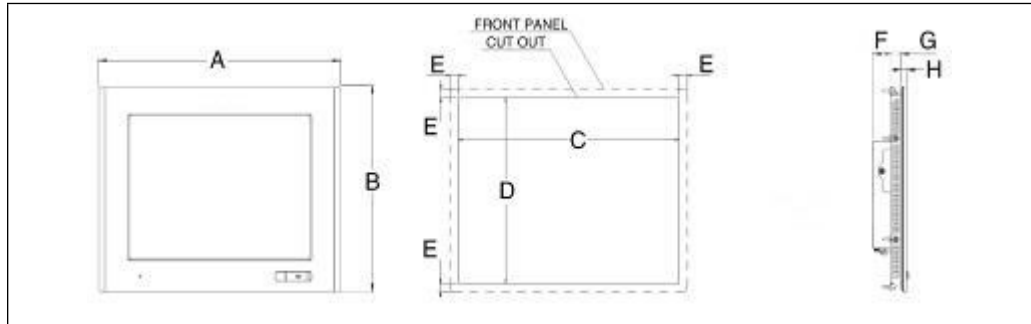


Figure 41: C6 P34 Panel resistive dimensions

LCD resistive	A	B	C	D	E	F (S0/S1)	G	H
12.1"	335	270	315	250	10	70/100	19	5
12.1" W	331	234	313	216	9	70/100	21	5
15.0"	390	315	370	295	10	70/100	19	6
15.6"	430	275	410	255	10	70/100	19	6
17.0"	455	355	435	335	10	70/100	21	6
18.5" W	500	320	480	300	10	70/100	21	6
19.0"	490	388	470	368	10	70/100	23	6
21.5" W	579	367	559	347	10	70/100	23	6
24.0" W	640	402	620	382	10	70/100	21.3	8

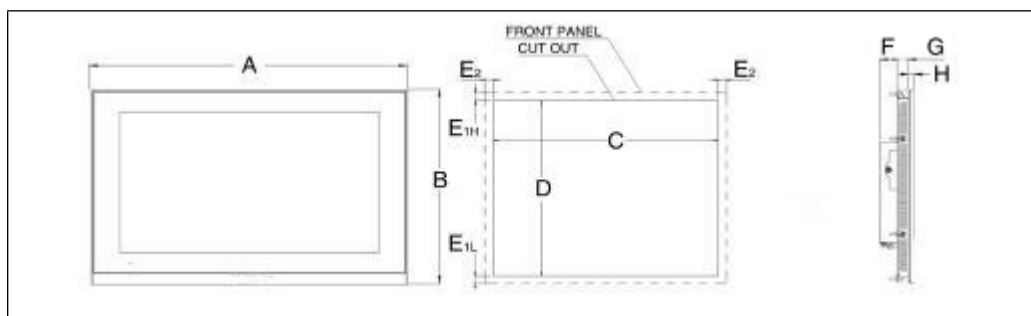


Figure 42: C6 P34 Panel capacitive dimensions

LCD resistive	A	B	C	D	E1L:E1H/E2	F (S0/S1)	G	H
12.1" W	331	234	313	218	9	70/100	22	5
15.6" W	433	280.5	410	255	10	70/100	36	6
18.5" W	503	320.5	480	300	10	70/100	35	6
21.5" W	581.5	367.5	559	347	10	70/100	35	8
24.0" W	640	402	620	382	10	70/100	35	8

3.9 Mounting the device (Panel version)

3.9.1 Position of the mounting clamps



- To obtain the declared degree of frontal protection for the system, it is necessary to respect the positions of the clamps shown below.
- The table below shows the number and the position of the clamps for each C6 P34 PANEL size.

LCD size	Clamp	Quantity	Clamp position
15.0"		8	
15.6"			
17.0"			
18.5"			10
19.0"			
21.5"		14	
24.0"		14	


Table 5: Position of the mounting clamps

3.9.2 Tools to tighten the mounting clamps

- 1.5 mm provided hexagonal key.

Tool required	Action
	
Cross screwdriver 2.5 mm	Fix the clamps

3.9.3 Procedure




Insert C6 P34 PANEL into the mounting cut-out from the front.

Figure 43: Installation



Insert fixing clamps into fitting holes of the panel housing.

Figure 44: Installation

 Mounting the clamps requires a space at least 20 mm on the outer perimeter of the frame display.



Insert the fixing clamps into the housings of the device.

Figure 45: Installation



Tighten the fixing clamps with the hex key provided with (14 x 91 x 1.5 mm).

Figure 46: Hex key detail



Adhere to the permissible torque when tightening the threaded pin of the mounting clamp: 0.2 Nm.



Repeat steps 2 and 3 for all fixing clamps.

Figure 47: Installation

3.9.4 Grounding and bonding

Whenever two electrical devices are connected to each other both may have a different potential to ground. The longer the distance between them the higher might be the difference of potential. Influenced by the current which is circulating between these devices, signals may be disturbed until complete loss of connection or hardware may be destroyed. Therefore it is necessary to have a good equipotential system which can be achieved by the following measures:

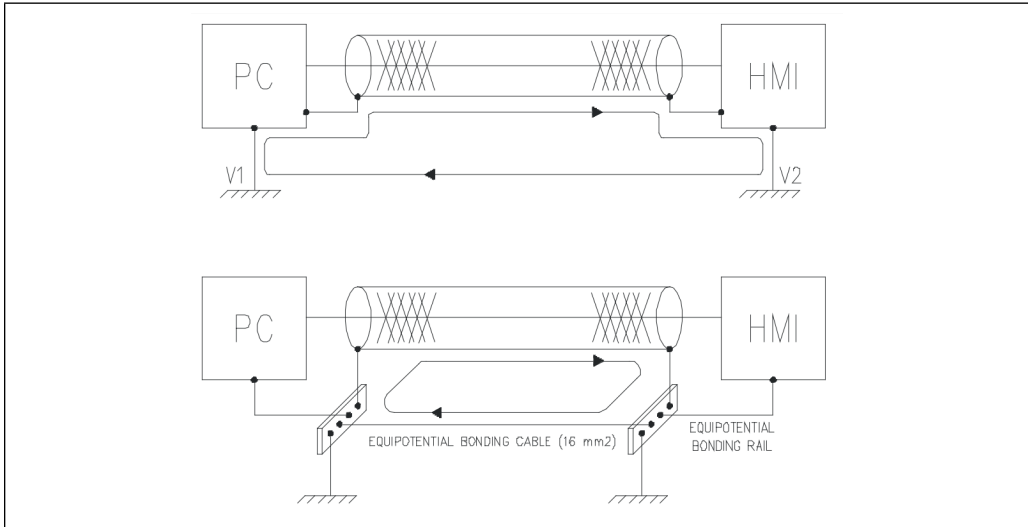


Figure 48: Power supply diagram

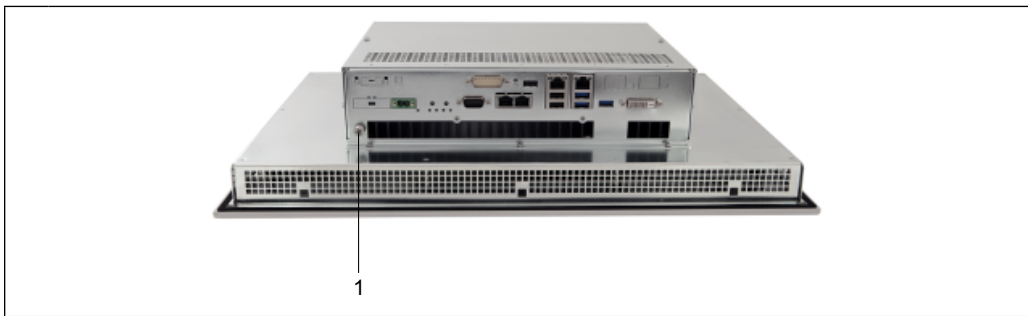


It is suggested to connect the system to the ground wire by means of suitable wiring (AWG14 or greater cross sections are suggested).

Use an equipotential bonding wire (16mm²) to connect the equipment' ground to the C6P34 PANEL ground.

Connect the equipotential screw to the equipotential bonding rail on both sides before connecting the cable to the interfaces.

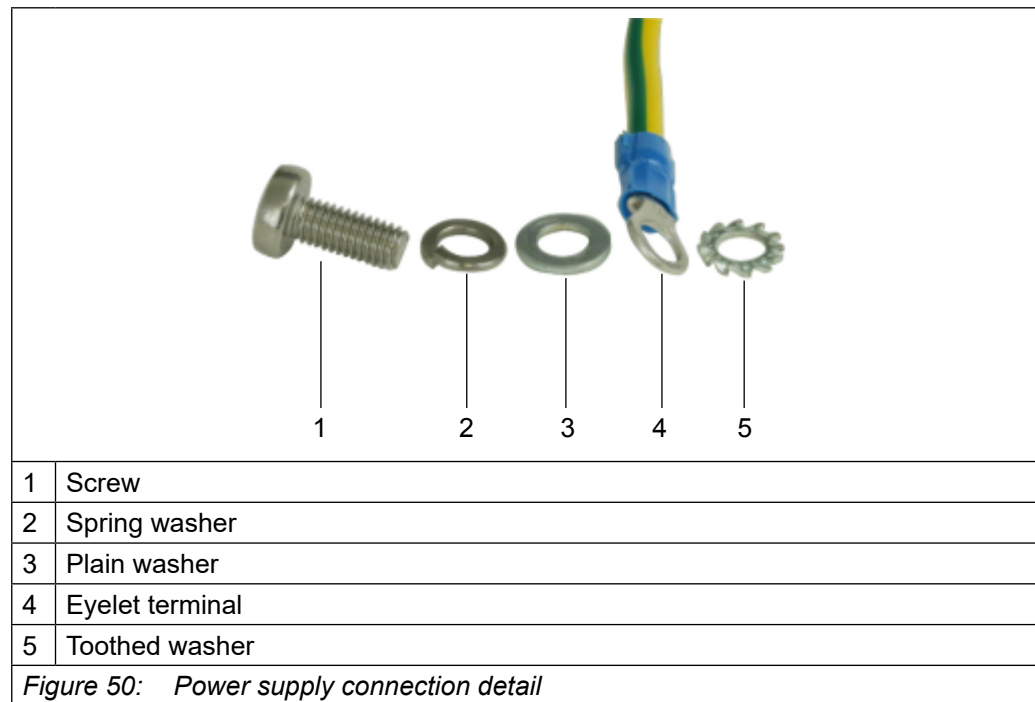
- Use an equipotential bonding cable (16mm²) to connect the equipment' ground to the C6 P34 PANEL ground.
- Connect the data cable screens to the equipotential bonding rail on both sides before connecting the cable to the interfaces.



1 On the rear, locate the equipotential screw.

Figure 49: Grounding

Insert the earthing eyelet terminal between the washers in the following sequence:



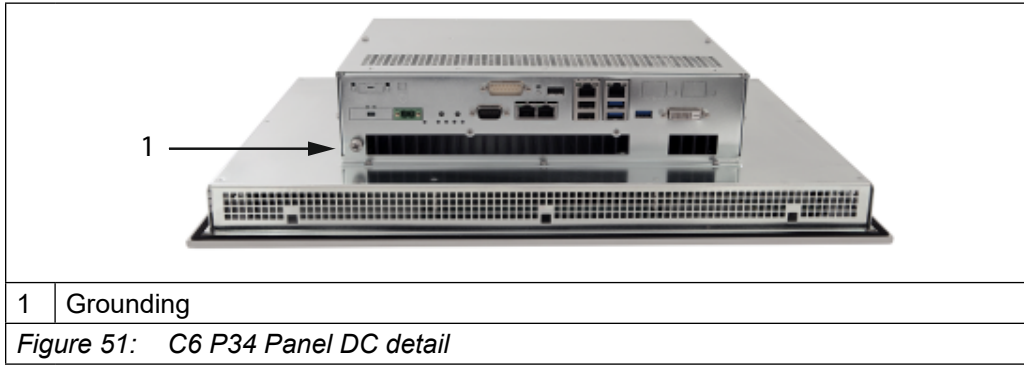
3.9.5 Power supply insulation

The C6 P34 PANEL power supply is galvanically isolated which means its output is electrically separated from its input. This feature has many benefits:

- Increases the noise immunity of the system
- Avoids input short circuits in systems with the power supply grounded
- Breaks ground loops which may cause interferences in the video signals.

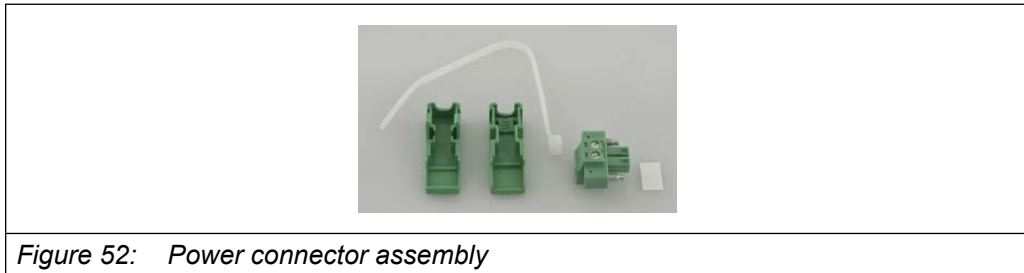
3.9.6 Power supply connection

- The device has to be connected to a 24 VDC (18-32VDC) power supply which satisfies the requirements of safe extra low voltage (SELV) in accordance with IEC/EN/DIN EN/UL60950-1.
 - Remove the two poles plug connector from the system.
 - Connect the positive and the negative poles (also refer to the label on the back of the system) to their respective terminals of the two pole plug connector. Use wires with a cross-section of 1.5 mm² (AWG16). Always check that the voltage drop along the supply wiring is not excessive and the input voltage remains above the minimum required (18VDC) in the worst load condition.
 - Connect the ground cables (PE) to the earthing points.

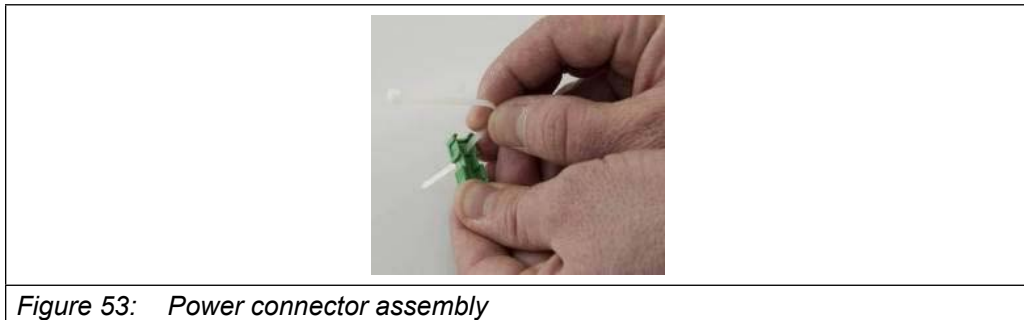


3.9.7 Power connector assembly

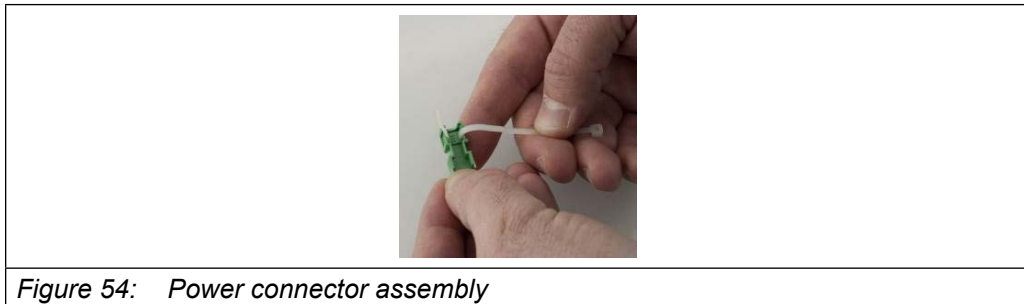
The device is equipped with a connector socket to be installed on the two poles power connector. To properly assemble the connector please follow these instructions:



- Insert the cable tie in the cup as shown in the picture.



- Slide the cable tie as shown in the picture.



- Place the two poles plug connector in the connector housing as shown in the picture.

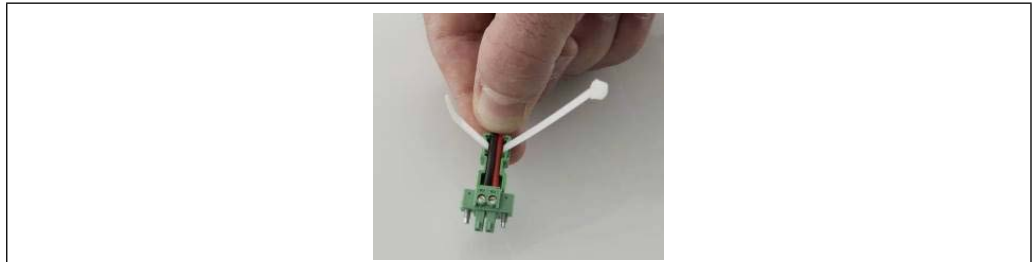


Figure 55: Power connector assembly

- Tighten the cable tie.

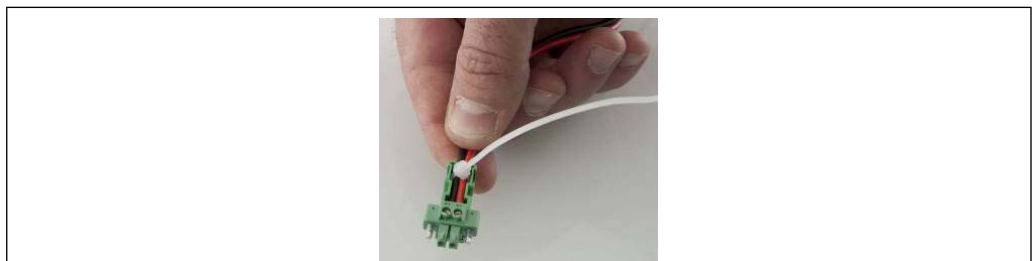


Figure 56: Power connector installation

- Cut the excess part.

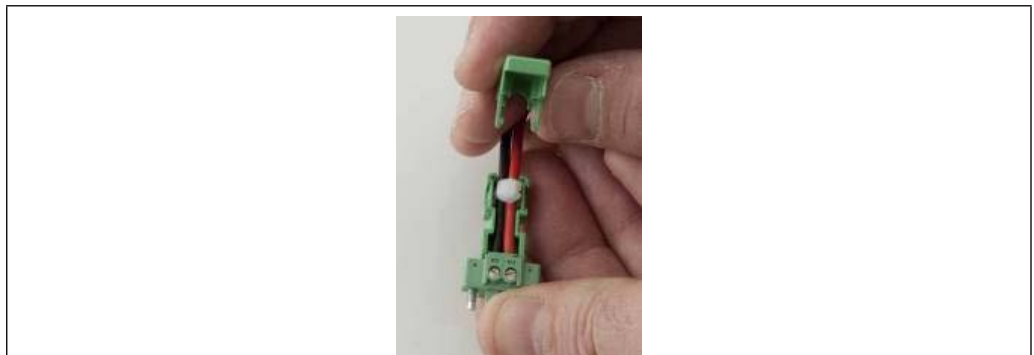


Figure 57: Power connector installation

- Insert the white label and close the power connector as shown in the picture.



Figure 58: Power connector installation

- Example of a correctly installed power connector.

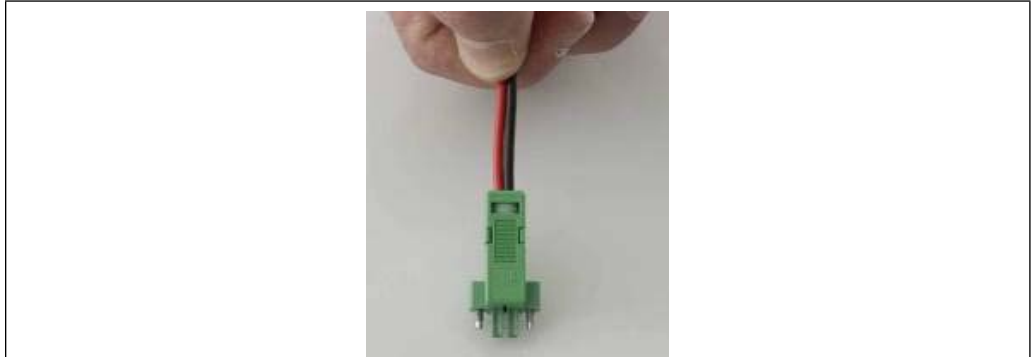


Figure 59: Power connector assembly

3.9.8 Power on

- Connect the ground wire to the C6 P34 Panel.
- Fix the power connector as indicated in the picture.

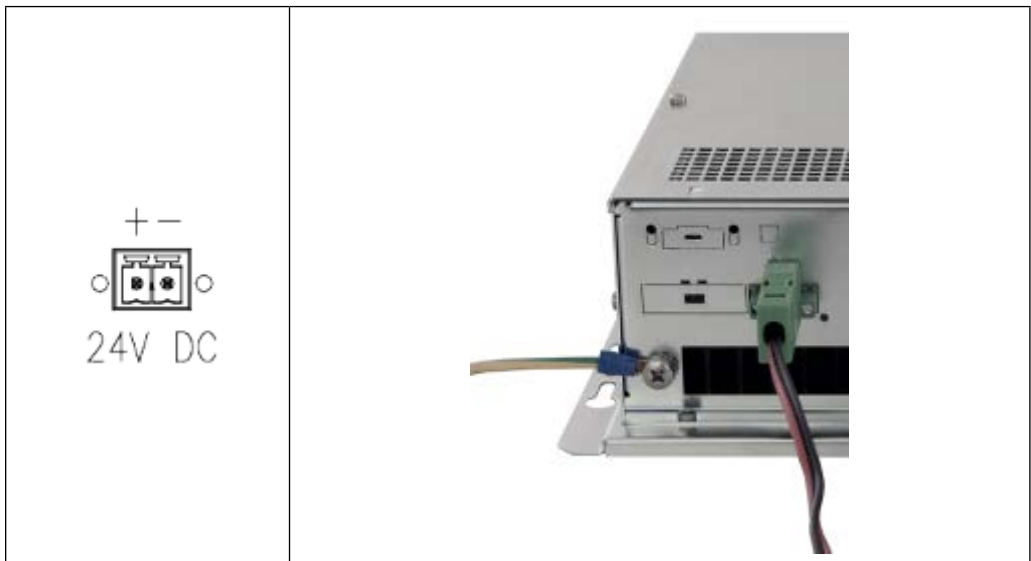


Figure 60: Power on DC

- The power supply LED turns green, indicating that there is power taken from the input connector.



1	Power supply LED
<i>Figure 61: Power on DC</i>	

- The system begins bootstrap.
- Both the On/Off/Standby/UPS LEDs located on the front panel and on the rear of the system (DL2) will turn on.



1	Front On/Off/Standby/UPS LED
2	Rear On/Off/Standby/UPS LED

Figure 62: Power on DC

- The two LEDs light yellow for less than a second, then a persistent green light indicates normal operation.

3.9.8.1 Power Supply LED

System power state	Green	Yellow	Notes
ON	ON	OFF	Power is taken from the input power supply.
OFF	OFF	OFF	No power supply.
Battery fault	OFF	ON	Check the battery connection.
UPS active	Blinking	OFF	Power is taken from the battery pack.
<i>Table 6: Power supply LED</i>			

3.9.8.2 Front On / Off / Standby - Rear On / Off / Standby LED

System power state	Green	Yellow	Notes
OFF	OFF	OFF	The system is not powered.
Suspend to disk	OFF	ON	It is safe to turn off power supply. Operating system shutdown procedure is terminated.
Full on or suspend to RAM	ON	OFF	System core is full-on or it is in a low power state keeping current session information into RAM.
UPS	Blinking	OFF	System core is full-on. Main power is missing and UPS (optional) is powering the system.
3.9.8.3 Front On / Off / Standby - Rear On / Off / Standby LED			

4 Operating Systems

4.1 KEB Windows Images (Windows Embedded Standard 7 / Windows 10)

4.1.1 Introduction

KEB has created a "Windows Embedded Standard 7" (WES7) / Windows 10 (Win10) image for C6 E22 / C6 P3x with special features that support the work with the devices.

4.1.2 User Accounts

There are two user accounts implemented in the KEB image: AutoLogon and remote. The following table shows the details for the accounts:

Account	AutoLogon	remote
Administrator	Yes	Yes
Password	No	remote
Remote access	Not possible	Yes
Intention	Automatic logon after reboot	Remote Desktop connection

Table 7: User Accounts

WARNING

The default password for "remote" account should be changed to an individual password for security reasons.

The AutoLogon should be continuously used as the standard logon, because only a logon without password reaches immediate start of Control and HMI application after boot of the device, which is generally the desired behavior for a machine control device. Since in WES7 / Win10 a remote logon as account without password is not possible, there is no security risk regarding the missing password for AutoLogon.

Of course own user accounts can be created, but this is not the default approach destined by KEB.

4.1.3 Ethernet Address

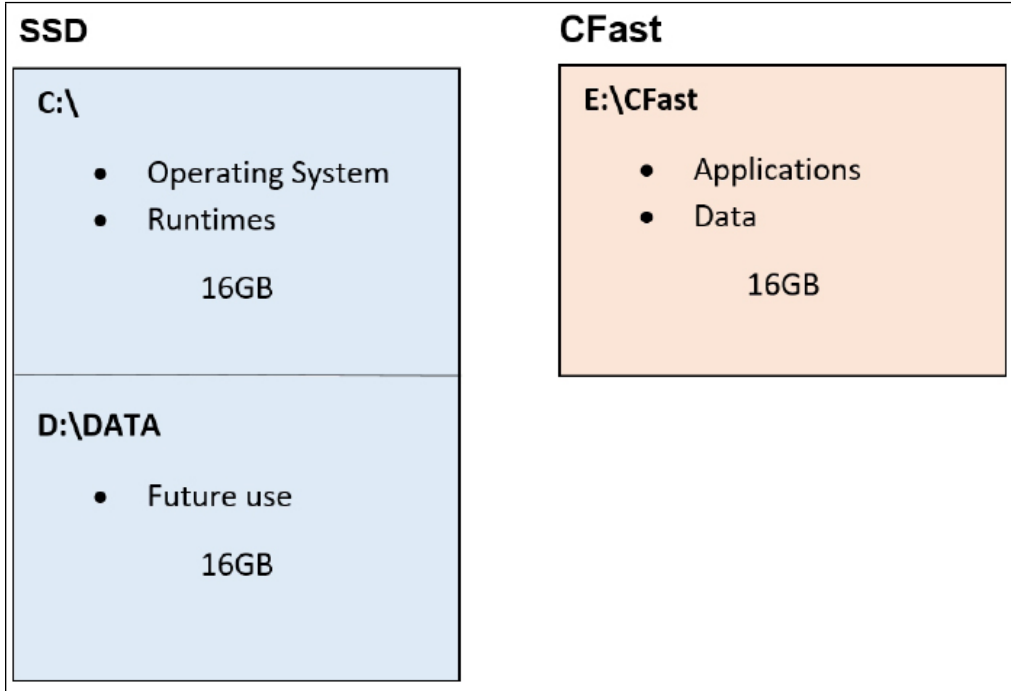
The C6 E22 / C6 P3x are configured to obtain an IP address from a DHCP server. If no DHCP server is available in the network the device uses the IP address 192.168.0.100. Thus it is also possible to connect directly to the device without a network infrastructure with a development PC by configuring the Ethernet adapter of the development PC with another 192.168.0.xxx address.



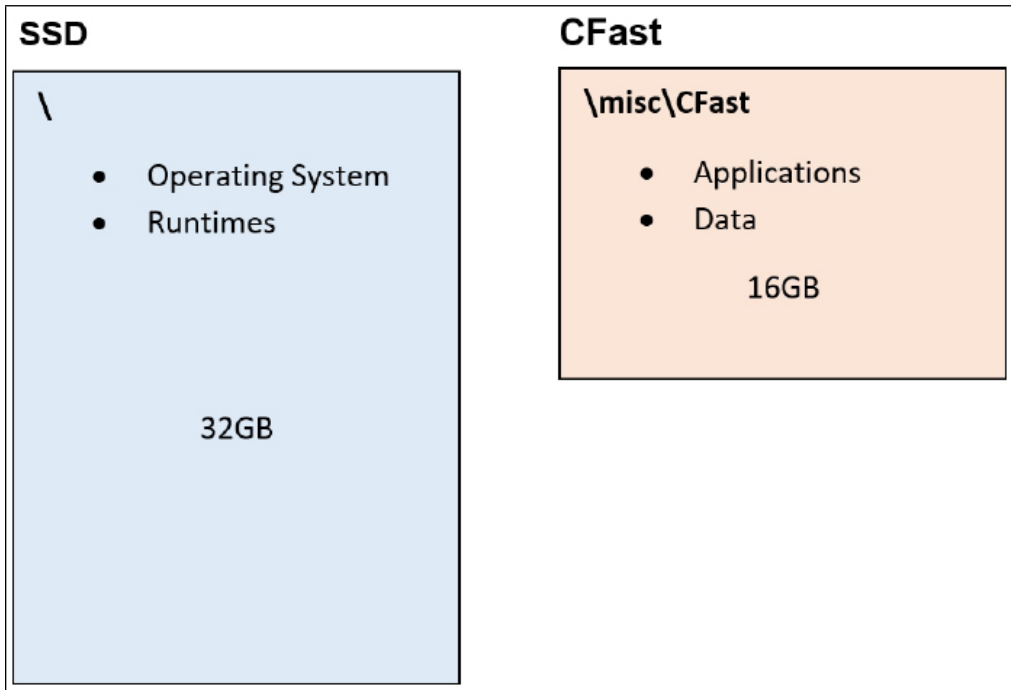
Switching to the IP address 192.168.0.100 by the device can take several minutes because the device waits this time for the possible DHCP address assignment.

4.1.4 Usage of storage memories

The C6 E22 C6 P3x is delivered with two hard disk drives, a SSD and a CFast card. In Win7 Image the SSD is divided into two volumes C:\ and D:\ of its half size each. On C:\ the Operating System and the runtimes (Control, HMI, Connect) are located. D:\ is reserved for future use.



The SSD is not divided in Win10.



The applications and data are separated and located on the CFast (E:\). Since the CFast is easy to remove, the applications can easily be transmitted to an exchange device.

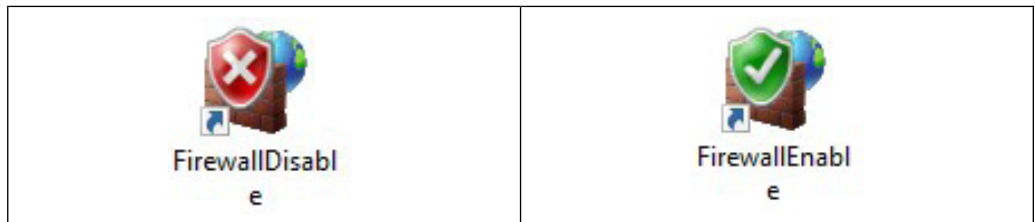
4.1.5 Firewall

The Windows-firewall is enabled in the delivery state. This protects the device against many types of network based attacks. KEB has configured the Windows firewall that all foreseen network connections are allowed. The Control runtime and the HMI runtime are allowed to open all network ports because for both programs a rule in the firewall exists.

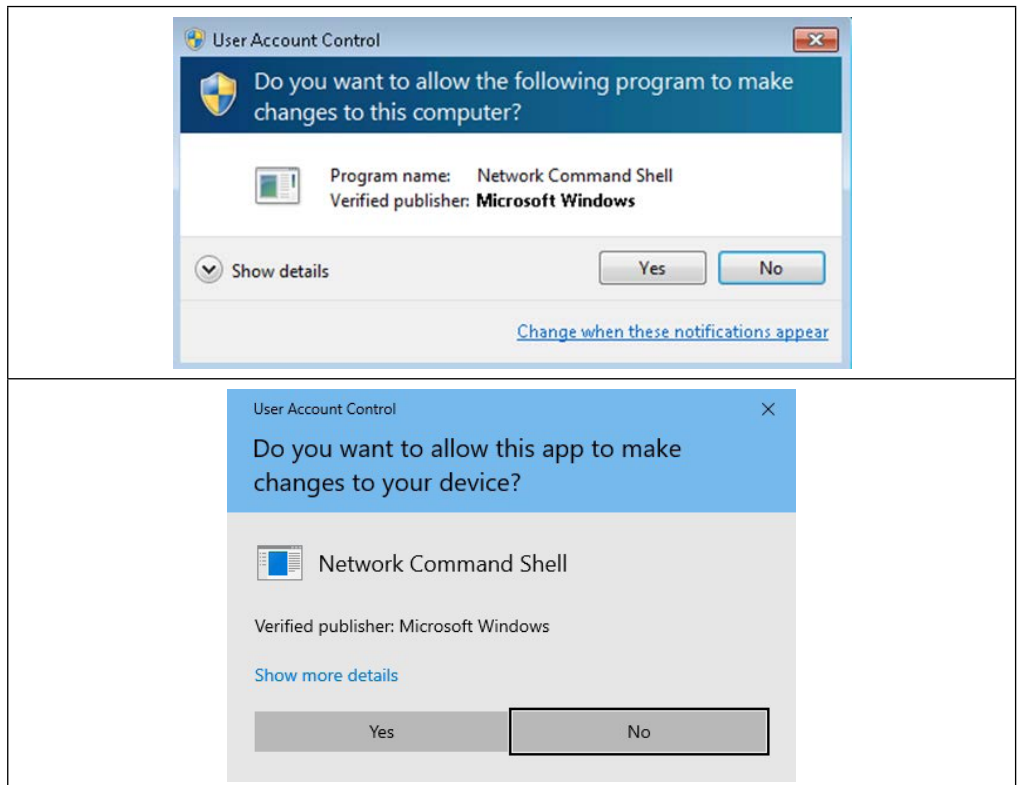


This is the recommended way to configure a firewall: allow (trusted) programs to open any port instead of allow ports to be opened by any program.

However, in case of assumption that the firewall blocks desired network communication there is an easy way to disable the firewall completely for testing. On the desktop you find a "FirewallDisable" shortcut which does this and also a shortcut for enabling the firewall again.



The commands need "elevated rights". Confirm the question from the User Account Control with "Yes":





It is not recommend to disable the firewall permanently. If the test with disabled firewall confirms that the desired network commu-
 nication is possible, an appropriate rule should be implemented
 in the firewall configuration (preferred for a program instead of a
 port) and the firewall should be activated again. How to implement
 firewall rules can be referred on the appropriate web sites from Mi-
 crosoft for Windows 7 / Windows 10.

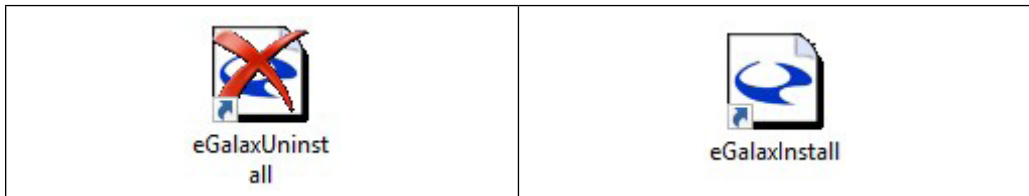
4.1.6 eGalax Touch Driver

The eGalax driver is installed on all C6 E22 / P3x devices, except the panel devices with capacitive touch. This driver supports all touch controllers of C6 E22 / P3x panel devices and external C6 monitors from KEB. But it does not support Multi-Touch functionality. Multi-Touch functionality is only possible with capacitive panel devices and requires the WES7/Win10 internal Microsoft Touch driver.

This driver, in turn, is not able to operate resistive touch displays. The following table gives an overview:

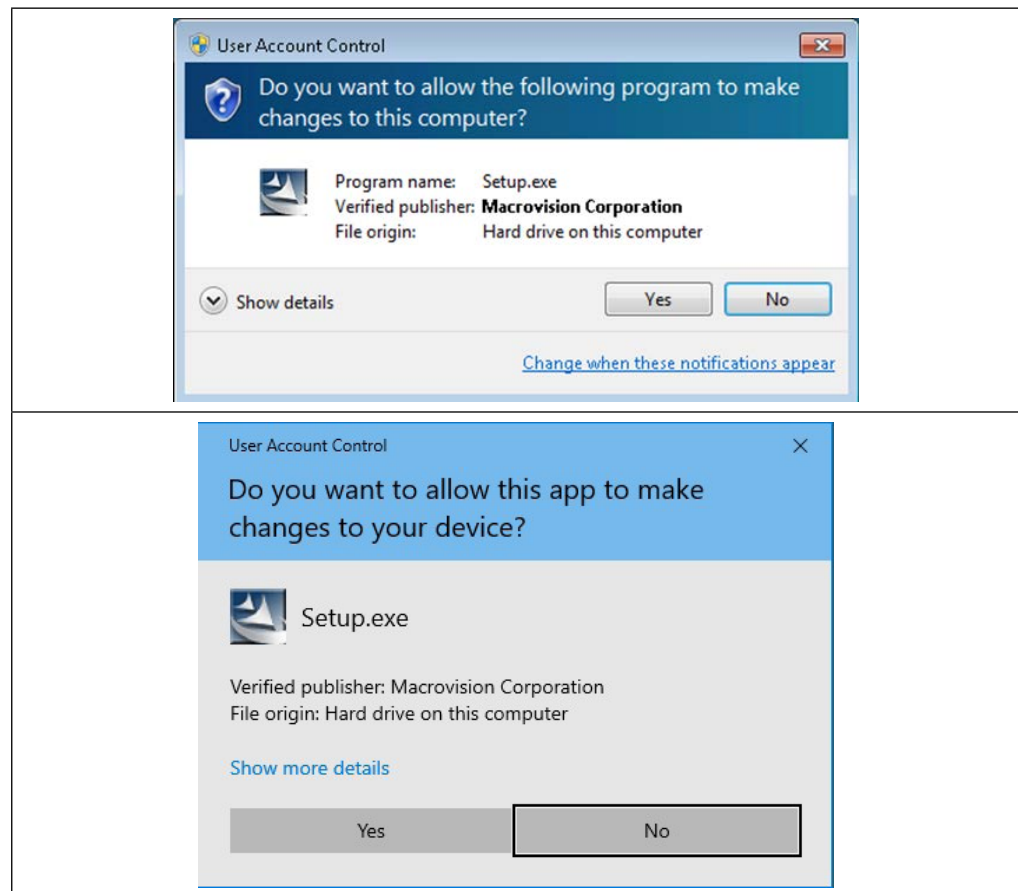
	Resistive	Capacitive
Single Touch	eGalax driver	eGalax driver
Multi Touch	Not possible	Microsoft touch driver

The appropriate driver is installed on C6 E22 / C6 P3x panel devices. For Box and Bookmount devices, this preselection could not be done at the factory because the used external C6 monitor is not known at the time of production. Thus the eGalax driver is installed on those devices. If they are used in combination with capacitive C6 monitors (and Multi Touch functionality is desired at all) it is necessary to uninstall the eGalax driver. The Microsoft touch driver becomes active than automatically after 2 reboots. To uninstall the eGalax driver you find an “eGalaxUninstall” desktop shortcut which does this and also a shortcut for installing the eGalax again.



Since the used touch technology is predetermined for C6 E22 / C6 P3x panel devices, the desktop shortcuts are not placed on the desktop on these devices.

The commands need “elevated rights”, thus please confirm the question from the User Account Control with “Yes”:



Reboot the device twice finish the switch to the Microsoft driver.

4.2 Windows Updates

The Windows Update service is disabled by KEB because it influences the realtime behavior of the system.

KEB recommends to enable the Enhanced Write Filter (EWF) for volume C:\ to protect the Operating System against any change and damage in productive phase, thus windows updates would be discarded anyway.

⚠ WARNING

Necessity of windows updates for security reasons depends on an overall concept of security for the field of application and is the responsibility of the user of this device.

4.3 EWF implementation in the Windows Embedded Standard 7 images

All the KEB Windows Embedded Standard 7 images have a built-in support for Enhanced Write Filter (EWF).

EWF protects a volume from write access.

Its two major components are the EWF Overlay and the EWF Volume:

- **EWF Overlay:** EWF protects the contents of a volume by redirecting all write operations to another storage location. This location is called an overlay. An EWF overlay can be in RAM, or on another disk partition. An overlay is conceptually similar to a transparency overlay on an overhead projector. Any change that is made to the overlay affects the picture as it is seen in the aggregate, but if the overlay is removed, the underlying picture remains unchanged.
- **EWF Volume:** In addition to the EWF overlay, an EWF volume is created on the media in unpartitioned disk space. This EWF volume stores configuration information about all of the EWF-protected volumes on the device, including the number and sizes of protected volumes and overlay levels. Only one EWF volume is created on your device, regardless of how many disks are in the system. If your media does not support multiple partitions, you can save the EWF configuration information in the system's registry (RAM Reg Mode, KEB's choice)

EWF was configured by KEB with the RAM Reg Mode to protect the C: volume. So, the overlay is in RAM and the EWF volume location is in system registry.

If EWF is activated, each write operation for C: is redirected to an overlay in the RAM memory. no data will be permanently stored into C.

In case of a reboot or of a system restart after a power failure, the overlay will be reset and all the data written in the previous session will be lost. The view of volume C: will be the same after each restart.

If no persistent volume C: is available, at least one other volume (a separate D: partition, another storage device, a network share) must be created that contains persistent data for the application.

This second volume will not be protected from power failures, but will not contain information that is vital for system booting.

On KEB Windows Embedded Standard 7 images, EWF is disabled by default at shipment and it must be enabled by the customer, in case it is needed.

4.4 KEB Write Filter Manager (KEB-WF_MGR)

4.4.1 Introduction

KEB Write Filter Manager bases on the Enhanced Write Filter (EWF) from Microsoft for Windows Embedded Standard 7 (WES7).

4.4.2 How EWF works

EWF protects a volume from write access. This is realized by an EWF overlay: EWF protects the contents of a volume by redirecting all write operations to another storage location. This location is called an overlay. An EWF overlay can be in RAM, or on another disk partition. An overlay is conceptually similar to a transparency overlay on an overhead projector. Any change that is made to the overlay affects the picture as it is seen in the aggregate, but if the overlay is removed, the underlying picture remains unchanged. When EWF is enabled for a volume, every write operation to that volume will be redirected to an overlay in RAM and no data will be persistently stored into the volume. In case of a reboot or of a system restart after a power failure, the overlay will be reset and all the data written in the previous session will be lost. The view of the volume will be the same, after every reboot. Thus the content of the volume is protected by any damage which can be caused by power fails otherwise.

4.4.3 Protectable Volumes

Volume	Protectable	Intention
C:\	Yes	Holds the operating system (including the registry) and the installed programs. Should be protected to ensure that the system never becomes unbootable.
D:\DATA	No	For free data storage, future use
E:\CFAST	Yes	Holds the Control and HMI applications. Should be protected to ensure that the applications never become invalid.

Table 8: Volume protection

4.4.4 KEB EWF configuration

On KEB devices RAM overlay is used and the EWF configuration is stored in the registry of the WES7 operating system, which resides with the operating system on volume C:\. This implies that changes to the EWF configuration are only possible if the EWF for volume C:\ is disabled or the changes to C:\ will be committed. Otherwise they will be discarded after a reboot. The following table shows the dependencies between the volumes:

		Registry Drive (holds the registry): C:\								
		Status	EWF enabled				EWF disabled			
		Boot Command (Boot) Command	ENABLE	DISABLE	COMMIT	NO_CMD	ENABLE	DISABLE	COMMIT	NO_CMD
Dependent Drive: e.g. E:\	EWF enabled	Enable	in this state	for drive C:	not available in this		state	for drive C:	in this state	
		Disable			x	-	x			x
		Commit			x	x	x			x
		Commit and Disable live			x	x ¹⁾	x			x
	EWF disabled	Enable	not available	not available	x	-	x	not available	not available	x
		Disable			not available in this		state			
		Commit			not available in this		state			
		Commit and Disable live			not available in this		state			

- x possible
- not possible
- x¹⁾ possible, but EWF enabled again after reboot

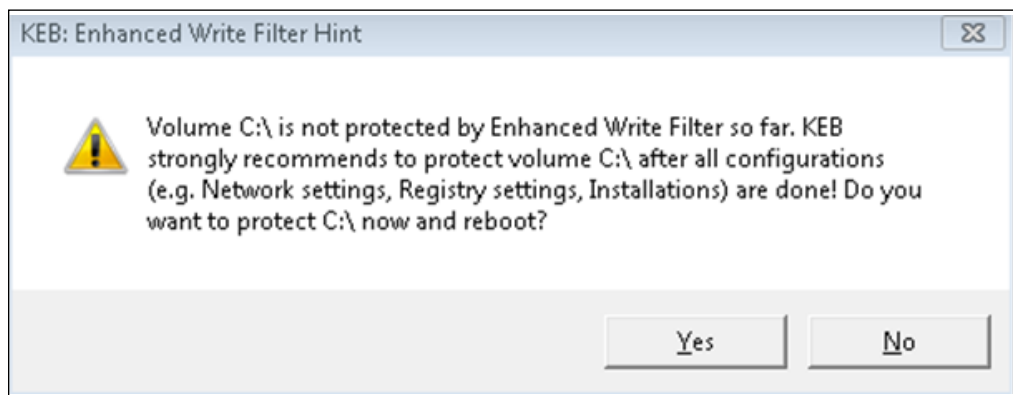


These dependencies are handled by the KEB_WF_Mgr internally. Therefore it is not necessary to understand this table completely or to use it as a reference when using the EWF. But keep in mind that there are dependencies because some internal operations of the KEB_WF_Mgr has to be confirmed by the user.

4.4.5 Delivery state of EWF on KEB devices

On KEB Windows Embedded Standard 7 image, EWF is disabled by default at shipment because some settings has to be made on the drive respective in the registry by the user (e.g. IP address setting).

Every time WES7 starts with EWF disabled for volume C:\ the user is reminded to enable the EWF by the following message box:



After all settings to the registry are done you can directly activate the EWF for volume C:\ by clicking 'Yes'. The device will reboot immediately and the EWF is enabled for volume C:\.

If you click "No" the message box is closed but will be appear again after the next reboot.

Please note that the volume E:\ which holds the application data is not protectable by this way.

4.4.6 Using KEB_WF_Mgr

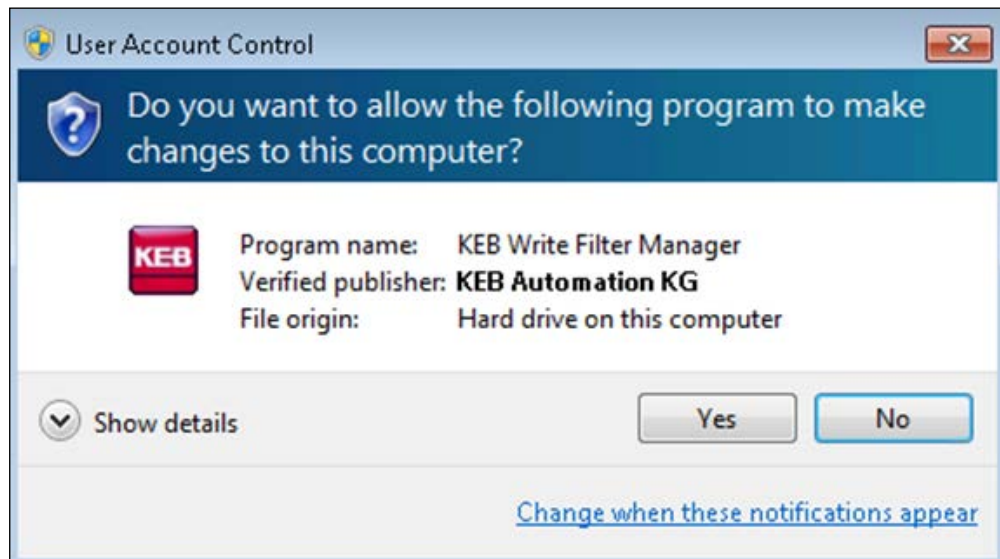
To disable EWF or to enable it for other volumes, KEB_WF_Mgr should be used (the use of the command line program "ewfmgr" from Microsoft is not recommended by KEB).

Start the KEB_WF_Mgr by double-click the icon on the desktop:

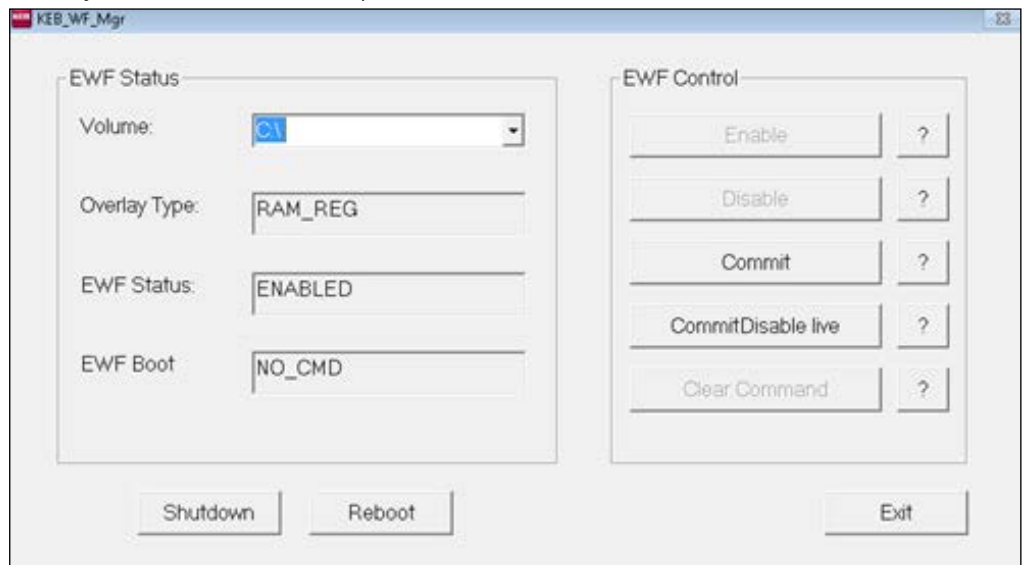


Then the desktop link will start the program which resides in the path „C:\Program Files\KEB\IPCTools“.

The program needs "elevated rights". Please confirm the question from the User Account Control with "Yes":



The program's GUI appears with volume C:\ (provided that EWF for volume C:\ has already been activated before).



Under the Volume: you see the states of the selected volume as read-only fields:

- **Overlay Type:** On KEB devices always RAM-REG
- **EWF Status:** Current status of the EWF
- **EWF Boot:** Command which will be performed with the next reboot

On the right side you see the EWF Control commands, each with a help button aside (the commands which are not available in the current constellation are greyed and disabled):

- **Enable:** Enables a currently disabled overlay on the specified EWF-protected volume. This function requires a reboot.
- **Disable:** Disables a currently enabled overlay on the specified EWF-protected volume. This function requires a reboot.



This function is not available at all for the volume C:\ which holds the registry, because the change in the registry for the new state of EWF cannot become persistent. Use 'CommitDisable live' instead to disable EWF for C:\

- **Commit:** Commits all current level data in the overlay to the EWF-protected volume. This function requires a reboot. After the reboot the EWF status of the volume is still "ENABLED".
- **CommitDisable live:** Immediately commits all current level data to the EWF-protected volume and then disabled EWF. This function does NOT require a reboot.

⚠ WARNING

All changes on the volume since the last reboot become effective. Do not execute this if you are not sure about the extent of the changes.

⚠ WARNING

The changes become effective immediately with reboot. It is not possible to undo this command with "Clear Command".

- **Clear Command:** Clears a pending command for the volume that would have occurred on the next restart.

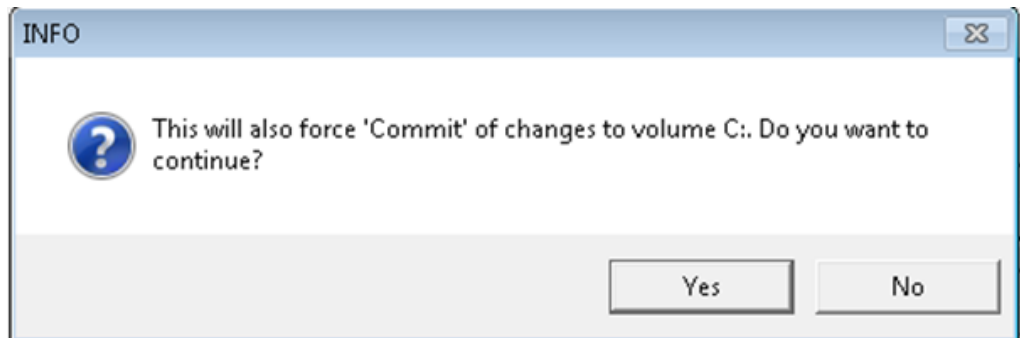
4.4.7 Dependent Volumes (typically E:\)

As mentioned above, other volumes (in the following, typically E:\ which is the CFast on KEB devices) are dependent from volume C:\ to change their configuration because they are stored in the registry located on C:\ and thus the registry is protected against any changes, if EWF is activated for C:\

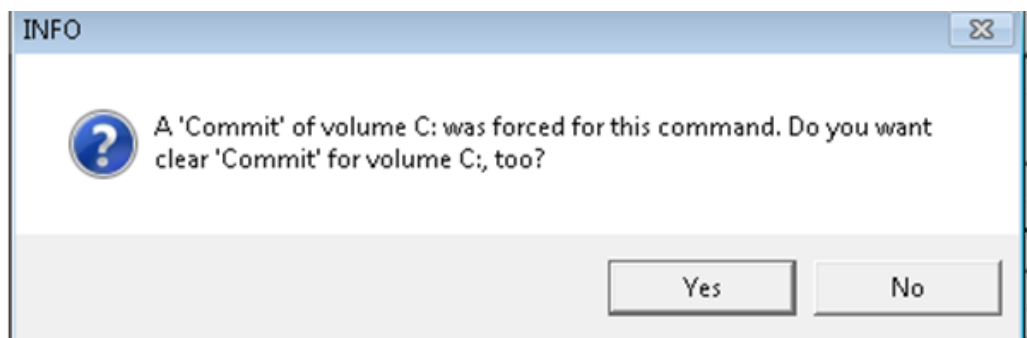
If EWF is deactivated for C:\ all commands for the dependent volumes can be used independently.

Otherwise, if EWF for C:\ is enabled, the following rules are effective:

- **Enable and Disable:** if one of these commands is used the following message box asks if the Commit command for C:\ should also be set. It is recommended to confirm with "Yes" because otherwise the Enable or Disable has no effect. The message is not displayed if the boot command for C:\ "Commit" is already present.



- The **Clear Command** can reset the Commit without any dependency, but for Enable/Disable it asks to clear the implicitly set of Commit for volume C:\, too:

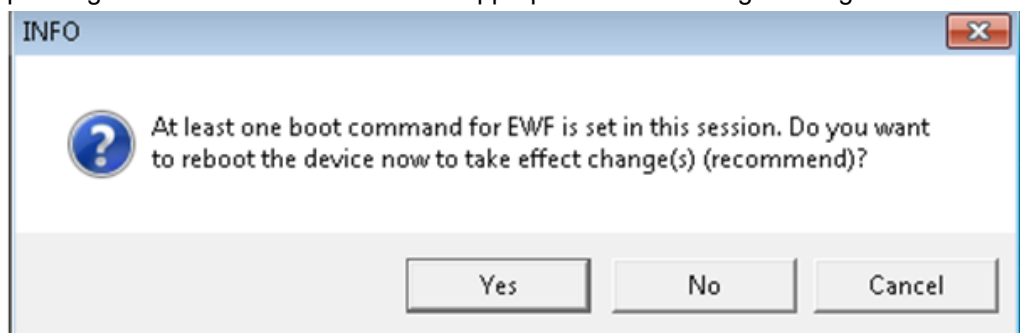


Normally you should confirm with “Yes” because the Commit for volume C:\ was only set to take effect for the change of E:\.

4.4.8 Leave the KEB_WF_Mgr

A Shutdown or Reboot of the device can be initiated directly from the KEB_WF_Mgr to take effect for pending boot commands by using the particular buttons.

The program can also be left by the Exit button. In this case the program checks for pending boot commands and shows if appropriate the following message box:



It is recommended to choose “Yes” to ensure that no subsequent changes of the system are committed accidentally; which could be happened if you quit the message box with “No”.

If you choose “Cancel” the exit of the program is discarded and you can continue to work in the KEB_WF_Mgr.

4.5 KEB UWF Manager

4.5.1 Introduction

The KEB UWF Manager offers a simple interface to use Microsoft's Unified Write Filter in Windows 10.

4.5.2 Functioning of the UWF

UWF protects your volume from write access by redirecting all write commands to a virtual overflow. The virtual overflow is a temporary memory, which is either in RAM or directly on the volume and which is cleared when the device is restarted. Any change made to the overflow affects the image, but if the change is undone, the image remains unchanged.

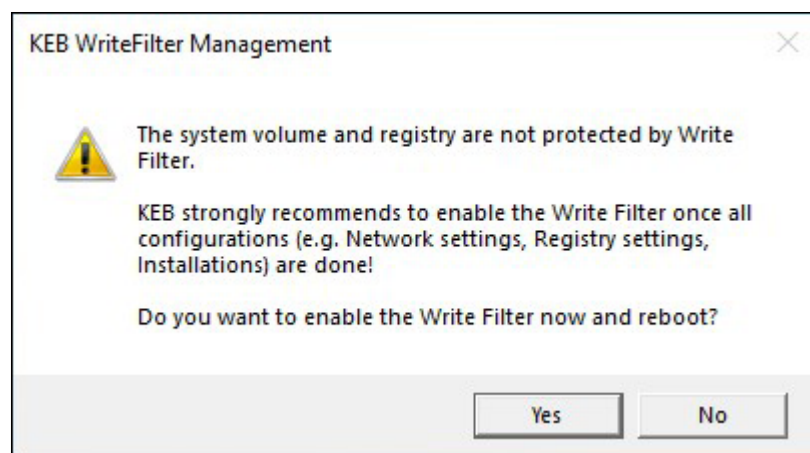
If the UWF is enabled for a volume, no data are permanently stored on this volume. In case of a restart or power failure, the overflow will be reset and all data from the previous session will be lost. The view will be the same after each reboot and is therefore protected against damage that can be caused by a power failure.

4.5.3 KEB UWF Configuration and usage

To protect the system on volume C:\ including the registry, the overflow is configured with 4096 MB on the hard disk as standard.

KEB recommends the use of a write filter in order to increase the longevity of the devices and the data integrity. UWF Manager is disabled at the time of delivery, in order that the user can make changes during the start-up process.

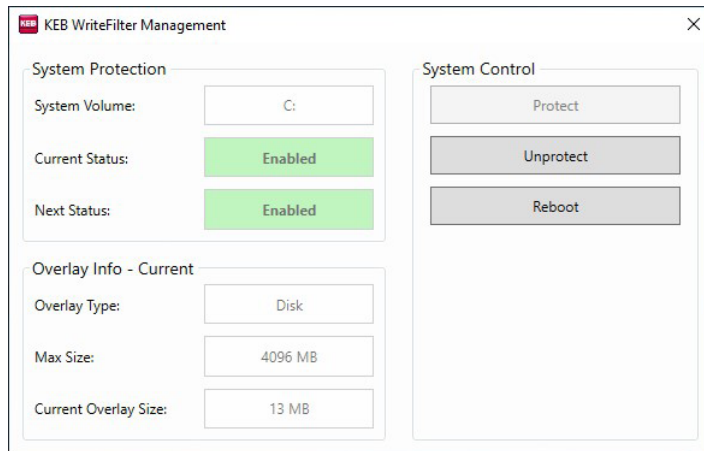
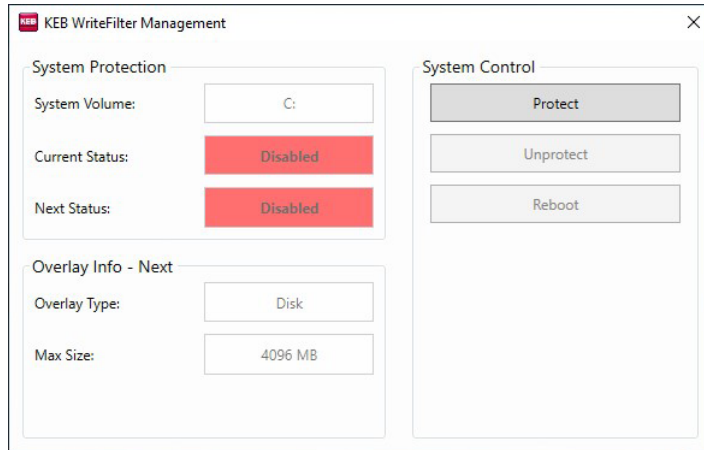
Each time the device boots up with disabled UWF, the user is reminded to activate the write filter. As soon as the start-up is completed, the user can activate the write filter directly by clicking "Yes".



To activate the UWF Manager or to display more information about the current protection status, the KEB UWF Manager should be used, because it provides a more intuitive configuration option compared to the command line tool provided by Microsoft.

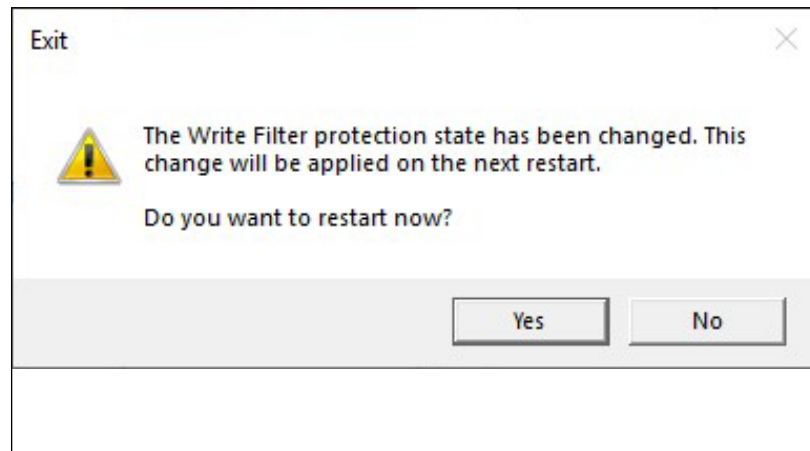
A shortcut to the KEB UWF Manager can be found on the desktop and can be executed by double click. Please note that this tool requires elevated rights, the popup window of the user account control must be confirmed with "Yes".

The program interface appears and you can protect (Protect) or not protect (Unprotect) your system. Furthermore, after activating the write filter, the overflow info (Overlay Info - Current) is displayed including type, maximum size and current usage.



Depending on the current status of the UWF Manager, the user can protect or unprotect the system by using the buttons on the right. Both actions require a restart. If the state has changed, the "Reboot" button can be used to restart the system and to activate the set state.

In case of a state change without restart, the tool reminds the user to restart the system when leaving.



4.6 KEB Linux Image

4.6.1 Introduction

KEB has created a Linux image for C6 E22 / P3x with special features that support you in the work with the device.

4.6.2 Service User Accounts

KEB Linux image has got a service account which can be used to change device settings.

Account	service
Password	service

After login to the device with the service user account the following menu is shown:

```
C6E22LX login: service
Password:
Last login: Tue Oct 29 10:13:22 2019
Welcome to service shell of host: C6E22LX

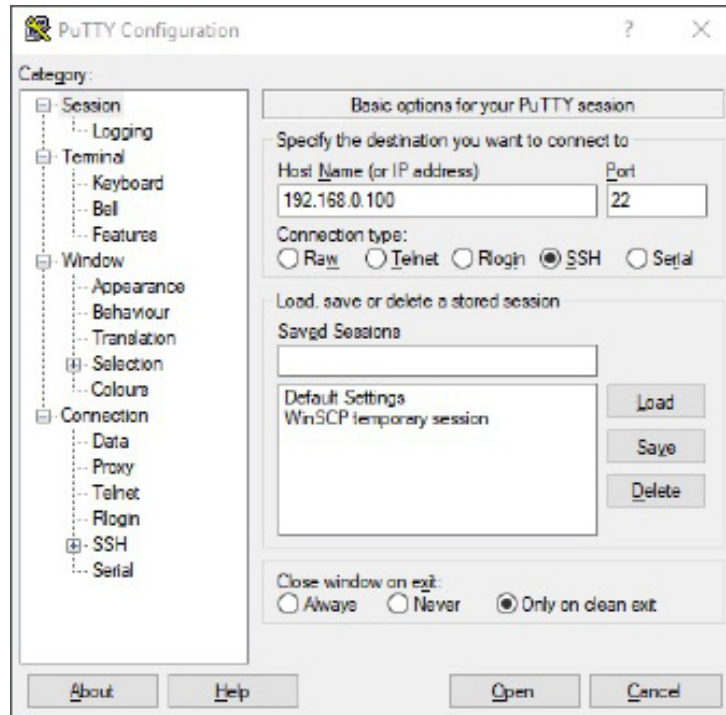
Please, select operation from list below:
 1) Show/change IP address
 2) Change hostname
 7) Show version information
 8) Change password
 9) Reboot PLC
 0) Exit
```



WARNING

The default password for the service user account should be changed to an individual password for security reasons!

The C6 E22 / C6 P3x Linux is configured to use the IP address 192.168.0.100. This also makes it possible to set up a remote connection to the device with a development PC, e.g. if no display unit is available. To do this, configure the Ethernet adapter of the development PC with another address 192.168.0.xxx and connect to the device with Putty as service user:



4.6.3 Change password for service user

To change the password, proceed as follows:

- Login as user “service”
- Select menu “8) Change password”
- Follow the instructions:
 - Enter old password
 - Enter new password twice. It must fulfill conditions regarding length and complexity
- Reboot the device

4.6.4 Ethernet IP Address

To switching the Ethernet address the service user menu “1) Show/change IP address”. The current IP address is shown and following sub menu occurs:

```
Current IP address: 192.168.0.100
Changing IP address:
  1) Switch network to DHCP
  2) Switch network to default static IP
  3) Switch network to static IP
  0) Back to main menu
```

Choices:

1.	Switch network to DHCP, to switch to dynamic network configuration (DHCP).
2.	Switch network to default Static IP, to switch to default static IP 192.168.0.100/24.
3.	Switch network to static IP for static network configuration.

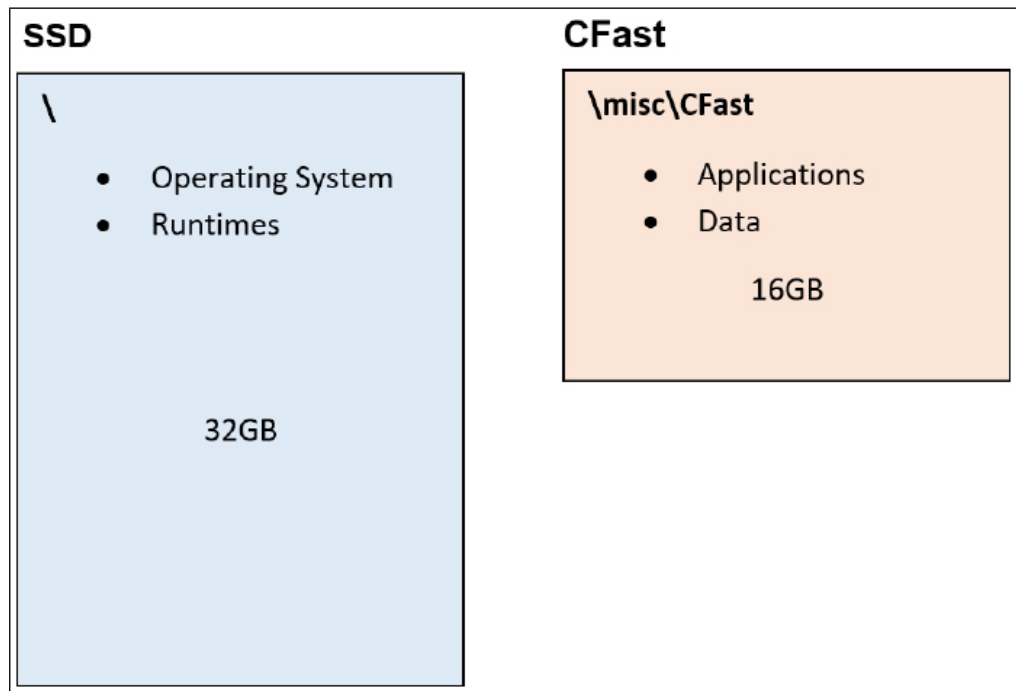
The set e.g. the IP address 172.17.131.100 and the mask 255.255.255.0 must be entered as followed:

172.17.131.100/24

The value 24 for mask means 24 set bits in the mask beginning from left. Accordingly, 8 bits on the right are not set.

4.6.5 Usage of storage memories

The C6 E22 / P3x Linux is delivered with two hard disk drives, a SSD and a CFast card. On the SSD the Operating System and the runtimes (Control, CNC Kernel etc.) are located. The applications and data are separated and located on the CFast. Because the CFast is easy to remove the applications can be transferred to an exchange device easily.



4.7 Common (Windows and Linux)

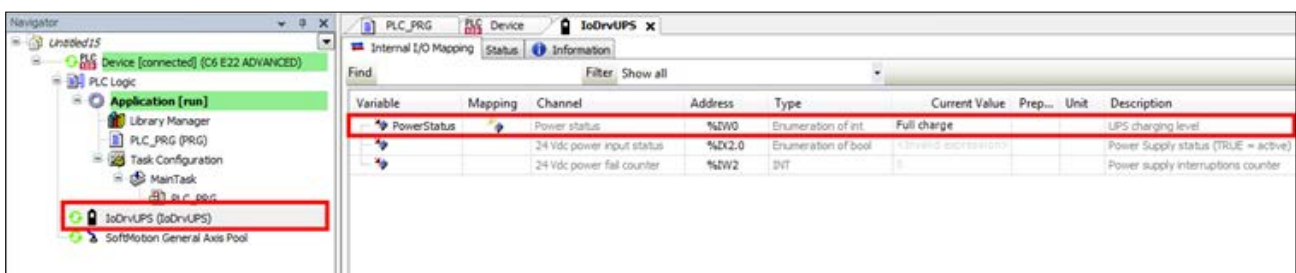
4.7.1 Micro-UPS Handling

As also mentioned in the hardware related parts of this manual all C6 E22 / P3x devices are equipped with a micro-UPS to ensure storage of Retain and Persistent variables of the Control application in case of power lost.

To avoid inconsistent data sets, the Retain and Persistent variables will be stored only if the μ USV is charged completely. Otherwise the capacity could not be sufficient to store all variables and the consistency of the data set cannot be ensured.

The charging time of the micro UPS is about 15 s for C6 E22 / P3x devices, thus normally the micro UPS is always charged until the Control application is started after a restart of the device. But for security and to keep the Control application easy portable to devices this longer charging time the charging level should be evaluated in the Control application.

For this an “Internal I/O Mapping” named “IoDrvUPS” is automatically available with the C6 E22 / P3x device in KEB COMBIVIS studio 6.

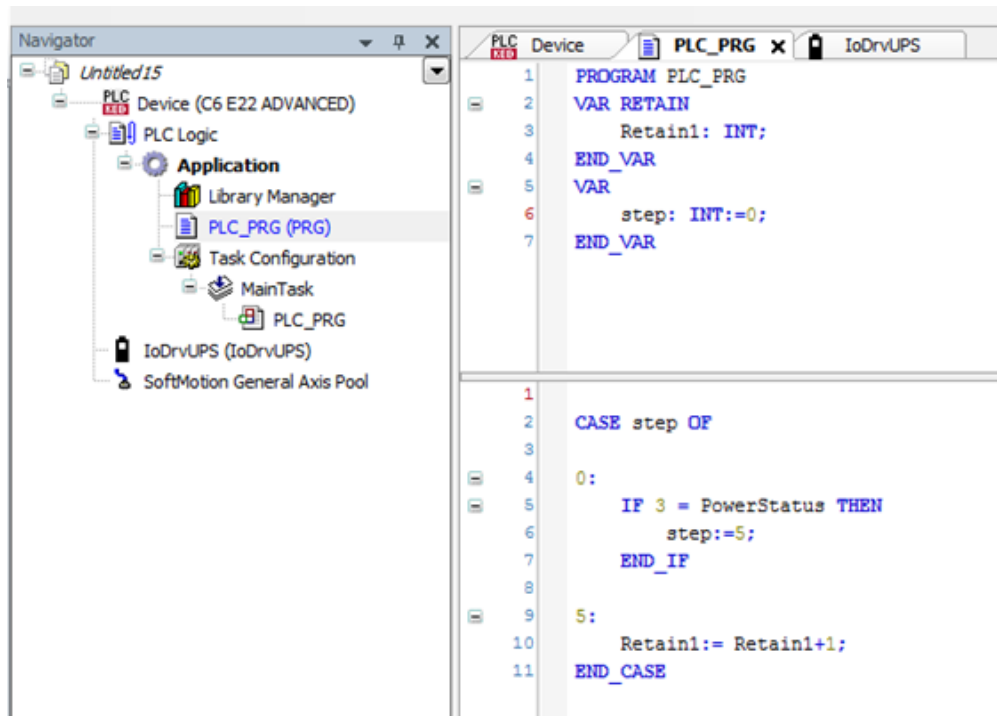


To evaluate the „Power status“ inside the Control application a variable has to be defined, e.g. „PowerStatus“.

The values of Power status are:

0	Unit isn't available (must not appear on functional C6 E22 / P3x)
1	Low charge
2	Half charge
3	Full charge

The Machine application should wait until the micro-UPS is fully charged before any operation is performed which changes Retains or Persistents. This can be achieved with an implementation comparable with the following example:



The other "Internal I/O Mapping" variables "24 Vdc power input status" and "24 Vdc power fail counter" cannot be used in a sensible manner, because the PLC is configured to stop after a short voltage drop already.

4.7.2 Ip-Scan

Ip-Scan is an IP address scanner from KEB to find other KEB devices in the network. This requires that Ip-Scan runs also on the device which should be found. The C6 E22 / P3x should be detectable by the Ip-Scan (also integrated in COMBIVIS studio 6). The Ip-Scan starts automatically after booting on the device.

Ip-Scan is not yet available on C6 E22 / P3x Linux!

4.7.3 Serial interface

The C6 E22 / C6 P3x can be equipped with an (optional) serial interface (COM ports). The following table gives an overview:

	C6 E22		C6 P33	C6 P34
	Bookmount	Panel/Box		
COM1	----	RS232	----	RS232
COM3	opt. RS232/ RS422/RS485	opt. RS232/ RS422/RS485	opt. RS232/ RS422/RS485	opt. RS232/ RS422/RS485

By default the COM port is configured to the RS232 protocol. RS422/RS485 is also possible for some devices.

In order to enable activate ports and to switch the protocol setting, it is necessary to enter the BIOS. This is done by pressing the "F2" key during start-up. You can change the settings by navigating to "Advanced/Super IO Configuration" for C6 E22 or "Advanced/F81866 Super IO Configuration" for C6 P3x. There you find the settings for the COM ports.



The names of the COM ports differ within the BIOS. In the C6 E22 BIOS, "COM1" is designated as "COM A" and "COM3" as "COM C". In C6 P3x BIOS, COM ports are called "Serial Port x", but with the same number.

Navigate to the "Mode" setting for the COM port and change it to "RS422" or "4-Wire RS485". Leave the BIOS with "F10" key to save the changes.

In Windows and/or the COMBIVIS studio 6 application no changes are necessary.

5 Mass Storage & Expansions

5.1 Mass storage

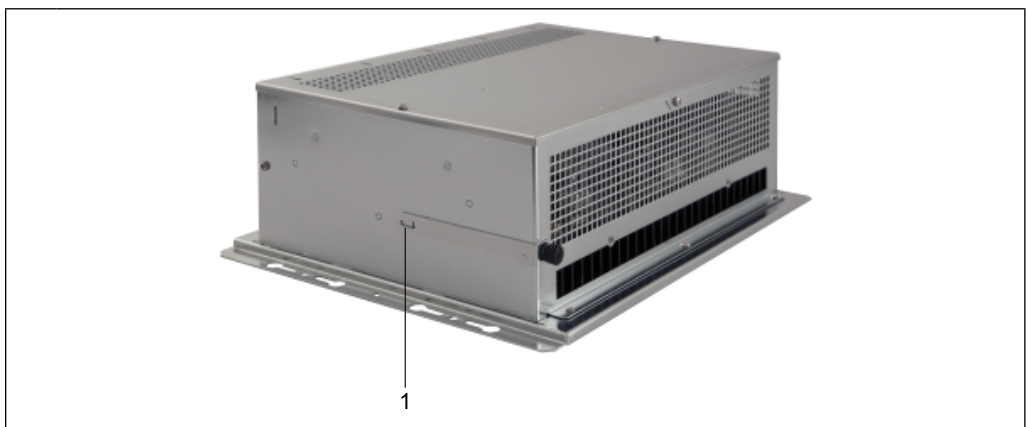
- CFast SATA III
- SSD mSATA III

5.1.1 CFast

C6 P34 PANEL can accommodate a CFast card.

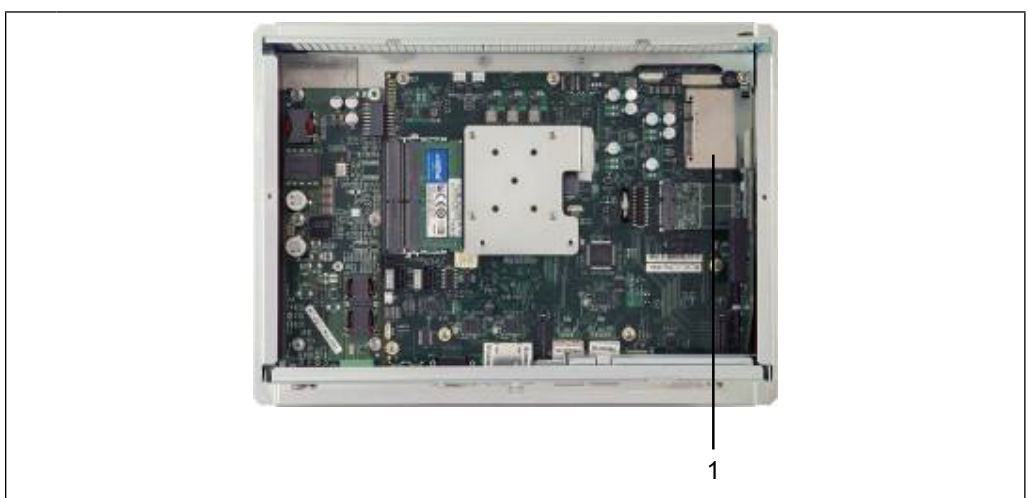


Figure 63: CFast detail



1 Slot for CFast

Figure 64: Slot for CFast



1 Slot for CFast

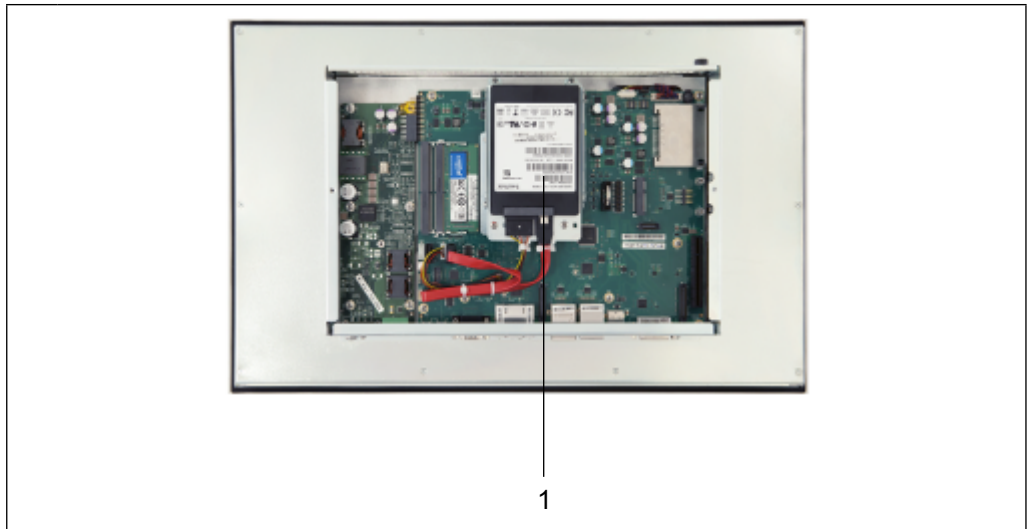
Figure 65: CFast

5.1.2 SSD mSATA

C6 P34 PANEL can equipped with one SSD mSATA.



Figure 66: SSD detail



1	SSD mSATA
---	-----------



Figure 67: SSD mSATA

6 Maintenance and service

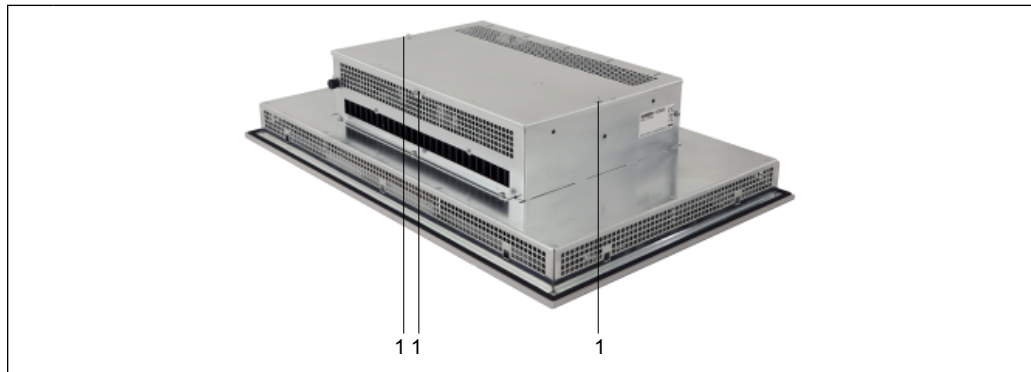
6.1 Removing the rear cover

⚠ WARNING

Only screws can be removed by the user.

Tool required	Action
 <p>Cross screwdriver 2,5 mm</p>	 <p>Srew / unscrew n.3 fixing screws</p>

- On the back of the system remove the 3 fixing screws of the cover.



1 | Screws to be removed

Figure 68: Removing the rear cover


- Remove the cover.



1 | Screws to be removed

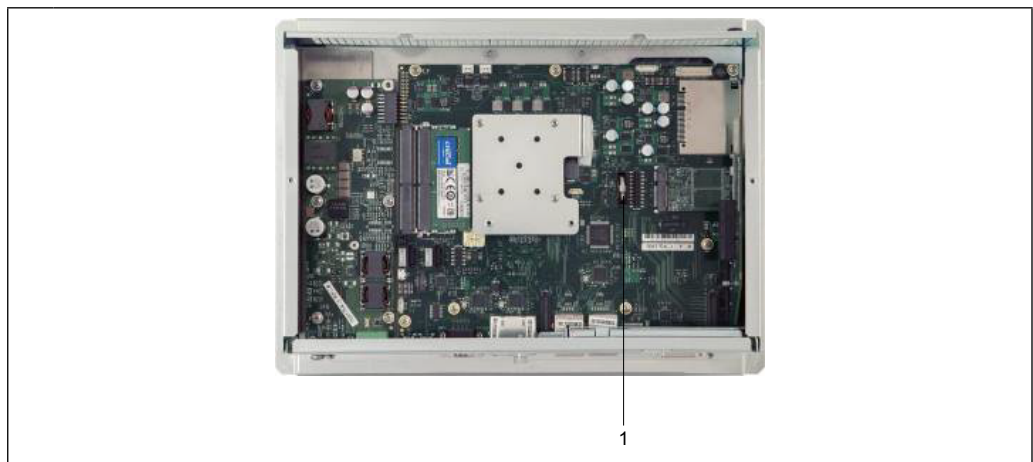
Figure 69: Removing the rear cover

6.2 Backup battery replacement (CR2032 3V)

Tool required	Action
 Plastic tool	Remove the battery and replace it with one of the same model (Lithium CR2032 3V Coin).

⚠ DANGER

Risk of explosion if the battery is replaced with an incorrect type. Dispose of used batteries according to the instructions.



1 Battery position

Figure 70: Battery replacement

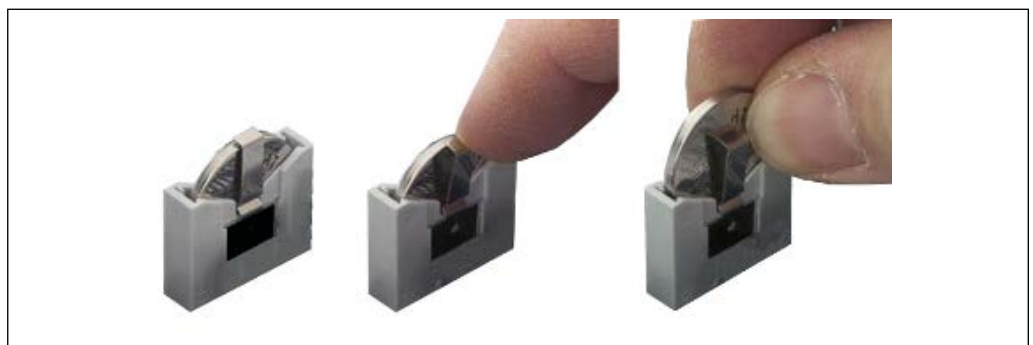
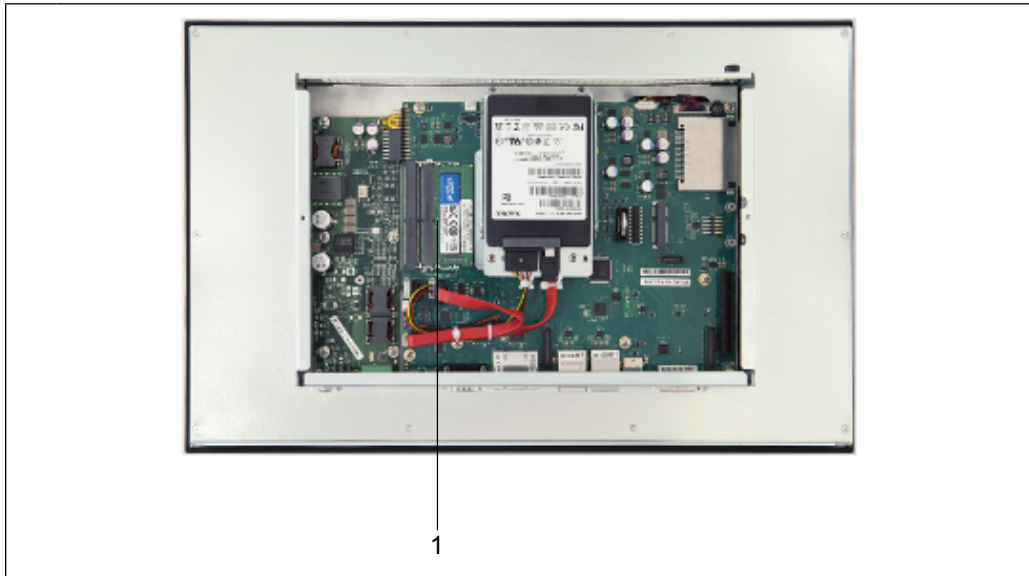


Figure 71: Battery replacement

- Gently remove the battery as illustrated in the pictures above.

6.3 RAM installation / removal



1 | RAM position

Figure 72: Installation / removal RAM

- Locate the RAM module.



Figure 73: Installation / removal RAM

- Expel the module by slightly opening the side fastening tabs of the plinth.

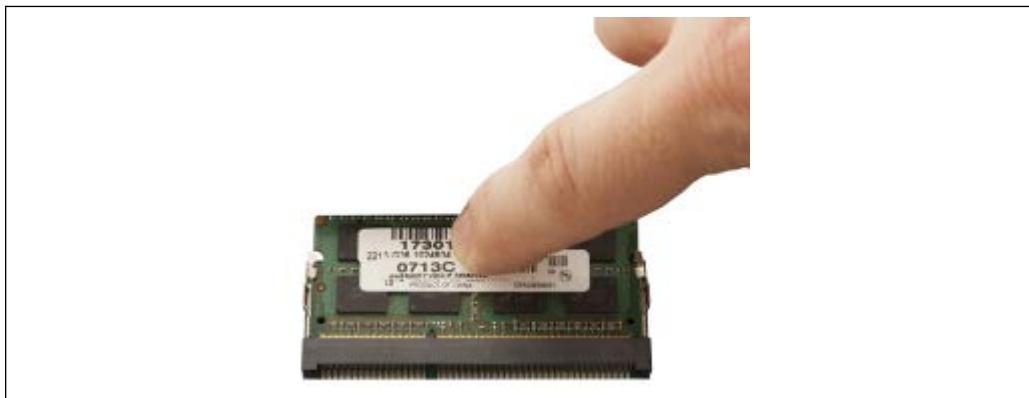


Figure 74: Installation / removal RAM

- For reinsertion, check the correct polarity of the module. When insertion is complete, check for proper closure of the side fastening tabs.

6.4 CFast installation / removal

⚠ WARNING

Only use KEB approved CFast cards for industrial application. All the CFast cards intended for other uses (digital cameras, consumer products) do not have the endurance, the performance and the security features (as data reliability in case of a sudden power-off) required for an industrial application.

The system can accommodate a CFast through a push-push connector.



Figure 75: CFast Slot detail

6.4.1 Installation

⚠ WARNING

Potential data loss
Do not remove the memory card while data is being accessed.
Data on the memory card is lost if you attempt to remove it while the system is accessing its data.

- Remove the cover as indicated in the figure.



Figure 76: CFast installation

- Insert the memory card into the slot as indicated in the figure. Pay attention to the beveled edge.
- Push the card all the way.

⚠ WARNING

Removing the system memory card while the project is running. If you remove memory card while a project is running, the project may stop.

6.4.2 Removal

- Push and release the memory card as indicated in the figure.



Figure 77: CFast removal



Figure 78: CFast removal

- Extract the memory card from the slot.

6.5 Touchscreen

6.5.1 Identification of the installed touchscreen

Some KEB systems can have a resistive or capacitive touchscreen option:

KEB	Resistive	Capacitive
Sensor type	Resistive (single touch point)	Capacitive PCAP (multiple touch points)
Simultaneous touch points	1	4 or more
Controller interface	Serial	USB
Windows Driver	eGalax	None
Sensor aspect	Plastic film	Glass sheet

6.5.2 Settings for a system with a resistive touchscreen

The touch screen has already been set and calibrated by KEB, so usually no setting is required. A calibration may be needed in some cases, like after reinstalling the operating system.

- To calibrate the touch screen, go to Control Panel or Click on the system tray icon and open the eGalax setup application.

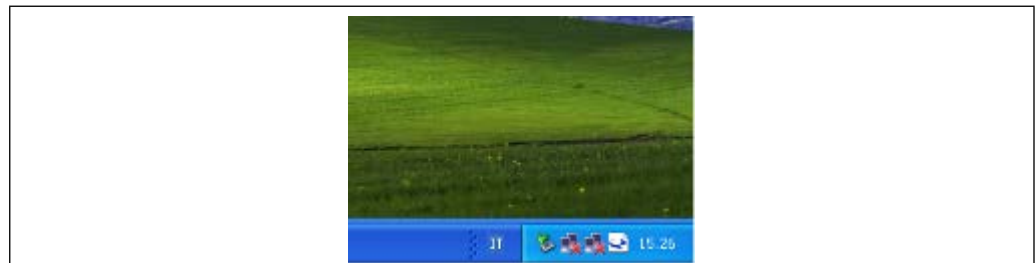
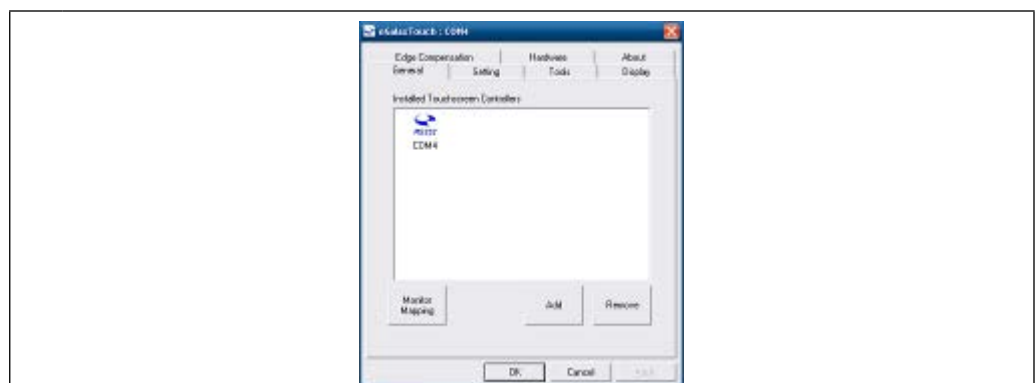
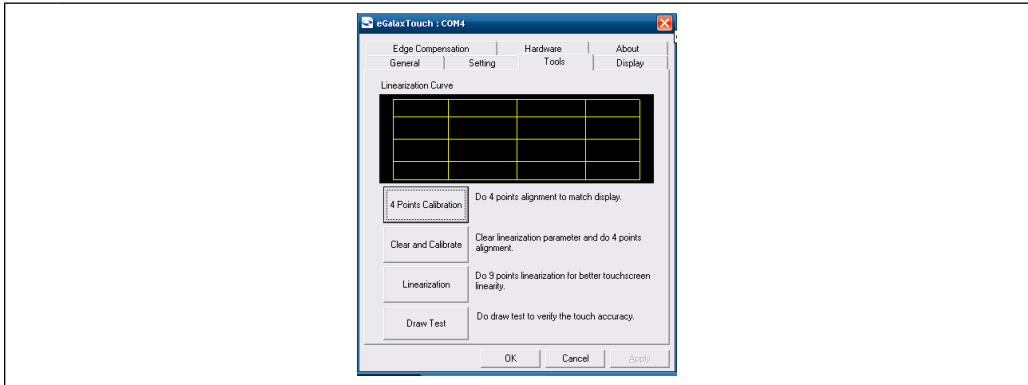


Figure 79: Calibration of the touchscreen



- Select the Tools tab



- Select '4 point calibration'.
- A more accurate option is available: 'Linearization'.

Figure 80: Calibration of the touchscreen



- User should follow the guide to touch and hold the blinking symbol in the calibration window until it shows "OK".

Figure 81: Calibration of the touchscreen

6.5.3 Setting of a system with capacitive touchscreen

The touch screen has already been set and calibrated by KEB, so usually no setting is required.

- No calibration is required.
- No third-party driver must be loaded.

6.5.4 Touchscreen Application Tips



Clean the front panel of the system with a soft damp cloth only.

6.5.4.1 Use large buttons and a simple interface

Avoid complex user operations like double-clicks, scroll bars, drop-down menus, use of multiple windows or dragging. Remember that not all the operations that can be done using a mouse are equally comfortable using a touch screen.

6.5.4.2 Give the user feedback as soon as the screen is touched.

An immediate feedback on a successfully touch operation is very important to the user. The feedback can be either visual (changing button aspect / 3D effects) or audio (“beep” or “click” on touch).

6.5.4.3 Turn the cursor off

It will help the user to focus on the entire screen, without being distracted by the cursor pointer.

6.5.4.4 Run your application full screen

Remove title and menu bars, to use the entire display area.

6.5.4.5 Avoid using a black background

Bright backgrounds, possibly containing a pattern, are the better choice for reducing glare and for hiding fingerprints.

⚠ WARNING

Do not use detergents, solvents, cleaners or objects that could scratch the surface.

Switch off the power before any cleaning operation.

6.6 Maintaining & cleaning

C6 P34 PANEL is designed for maintenance-free operation except for the replacing of the battery backup when necessary. It is recommended to clean the touchscreen with a damp cleaning cloth and a display cleaning solution.

6.6.1 Procedure

Proceed as follows:

- Switch off the C6 P34 PANEL device or lock the touch screen.
- Spray the cleaning solution onto a cleaning cloth.
- Do not spray directly onto the display.
- Clean the display from the screen edge inwards.

6.7 Recycling and disposal

C6 P34 PANEL can be recycled due to the use of materials with low environmental impact. Contact a certified disposal service company for environmentally sound recycling and disposal of your old devices.

7 Technical specifications

7.1 Block Diagram

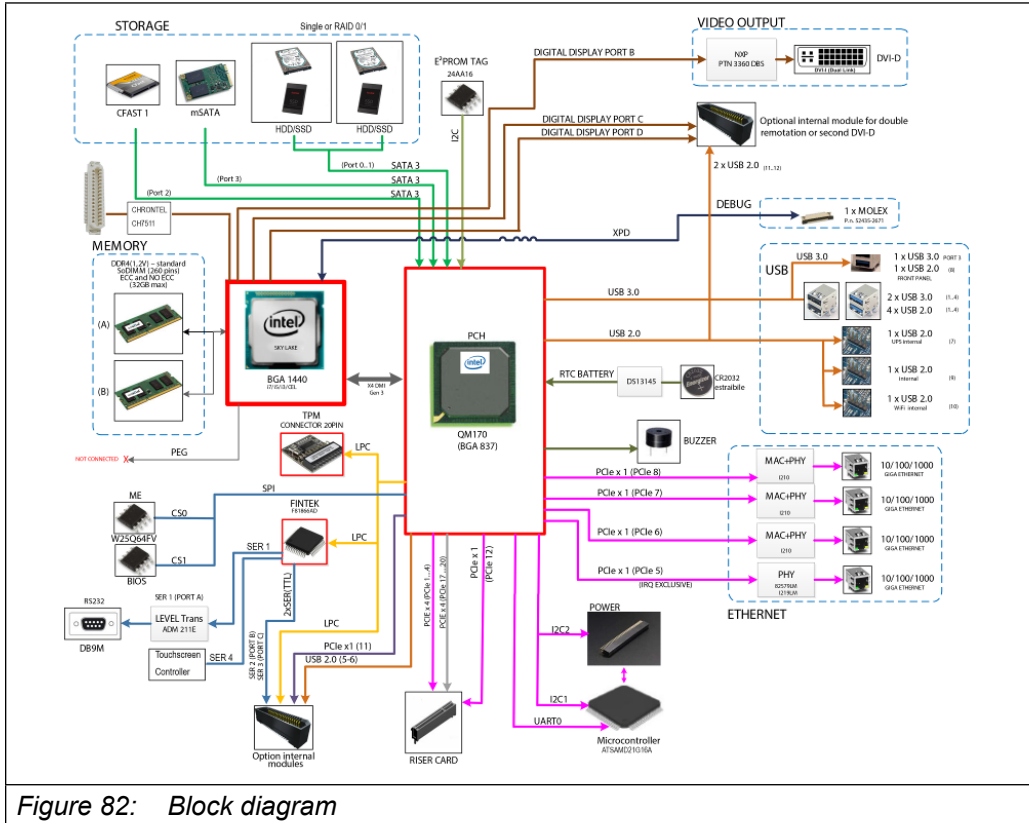


Figure 82: Block diagram

7.1.1 LCD characteristics



All displays are Color TFT-LCD with LED backlight designed for industrial application.

Size (inch)	12.1" SVGA	12.1" WXGA
Type		
Resolution (pxl x pxl)	800x600	1280x800
Colors	16.2M	16.2M
Pixel pitch (mm)	0,3075x0,3075	0,204x0,204
Backlight	LED	LED
Luminance (cd/m ²)	450	400
Contrast	700:1	1000:1
Viewing angle (°)	80°:80° (L/R)	88°:88° (L/R)
	65°:75° (U/L)	88°:88° (U/L)
Lifetime (min.)	50.000h	50.000h

Table 9: LCD characteristics

Size (inch)	15.0" XGA	15.6" WXGA (HD)
Type	Color LCD TFT	Color LCD TFT
Resolution (pxl x pxl)	1024x768	1366x768
Colors	16.2M	16.7M
Pixel pitch (mm)	0,297x0,297	0,252x0,252
Backlight	LED	LED
Luminance (cd/m ²)	500	400
Contrast	1500:1	900:1
Viewing angle (°)	85°:85° (L/R)	80°:80° (L/R)
	85°:85° (U/L)	80°:80° (U/L)
Lifetime (min.)	50.000h	70.000h

Table 10: LCD characteristics

Size (inch)	17.0" SXGA	18.5" WXGA(HD)
Type	Color LCD TFT	Color LCD TFT
Resolution (pxl x pxl)	1280x1024	1366x768
Colors	16.7M	16.7M
Pixel pitch (mm)	0,264x0,264	0,300x0,300
Backlight	LED	LED
Luminance (cd/m ²)	350	300
Contrast	1000:1	1000:1
Viewing angle (°)	85°:85° (L/R)	75°:75° (L/R)
	80°:80° (U/L)	70°:70° (U/L)
Lifetime (min.)	50.000h	50.000h

Table 11: LCD characteristics

TECHNICAL SPECIFICATIONS

Size (inch)	19.0" SXGA	21.5" FHD	24.0" FHD
Type	Color LCD TFT	Color LCD TFT	Color LCD TFT
Resolution (pxl x pxl)	1280x1024	1920x1080	1920x1080
Colors	16.7M	16.7M	16.7M
Pixel pitch (mm)	0,294x0,294	0,248x0,248	0,276x0,276
Backlight	LED	LED	LED
Luminance (cd/m ²)	350	300	300
Contrast	1500:1	5000:1	5500:1
Viewing angle (°)	85°:85° (L/R)	89°:89° (L/R)	89°:89° (L/R)
	85°:85° (U/L)	89°:89° (U/L)	89°:89° (U/L)
Lifetime (min.)	70.000h	50.000h	50.000h
<i>Table 12: LCD characteristics</i>			

7.1.2 C6 P34 PANEL resistive technical data

C6 P34 PANEL/S0 Basic System			Power (W)
Basic Configuration	LCD TFT 12.1" SVGA ▪ Touch-Screen ▪ Aluminum front panel ▪ Intel® Core i5-644EQ ▪ 2.70 GHz ▪ 4GB RAM ▪ fanless ▪ 24V DC isolated power supply ▪ 12 months warranty		69
C6 P34 PANEL/S1 BASIC SYSTEM			
Basic Configuration	LCD TFT 12.1" SVGA ▪ Touch-Screen ▪ Aluminum front panel ▪ Intel® Core i5-644EQ ▪ 2.70 GHz ▪ 4GB RAM ▪ fanless ▪ 24V DC isolated power supply ▪ 1 PCI slot ▪ 12 months warranty		75
	S0	S1	
Processor	•	•	Intel® Core™ i5-6440EQ ▪ 2,70 GHz (3.40 GHz Turbo) ▪ 6MB smart cache ▪ 4 cores, 4 threads ▪ Soldered on-board
Display	•	•	12.1" LCD TFT 4:3 ▪ SVGA, 800x600, 16M colors ▪ LED backlight, 450 cd/m2 ▪ Viewing angle L:R/U:L (typ.): 80°:80°/65°:75° Touch-Screen ▪ 5 wires resistive technology ▪ Controller integrated on board
	•	•	12.1" W LCD TFT 16:10 ▪ WXGA, 1280x800, 16M colors ▪ LED backlight, 400 cd/m2 ▪ Viewing angle L:R/U:L (typ): 88°:88°/88°:88° Touch-Screen ▪ 5 wires resistive technology ▪ Controller integrated on board
	•	•	15" LCD TFT 4:3 ▪ XGA, 1024x768, 16M colors ▪ LED backlight, 500 cd/m2 ▪ Viewing angle L:R/U:L (typ.): 85°:85°/85°:85° Touch-Screen ▪ 5 wires resistive technology ▪ Controller integrated on board
	•	•	15.6" W LCD TFT 16:9 ▪ 1366x768 (HD), 16M colors ▪ LED backlight, 400 cd/m2 ▪ Viewing angle L:R/U:L (typ): 80°:80°/80°:80° Touch-Screen ▪ 5 wires resistive technology ▪ Controller integrated on board
	•	•	17" LCD TFT 5:4 ▪ SXGA, 1280x1024, 16M colors ▪ LED backlight, 350 cd/m2 ▪ Viewing angle L:R/U:L (typ): 85°:85°/80°:80° Touch-Screen ▪ 5 wires resistive technology ▪ Controller integrated on board
	•	•	18.5" W LCD TFT 16:9 ▪ 1366x768 (HD), 16M colors ▪ LED backlight, 300 cd/m2 ▪ Viewing angle L:R/U:L (typ): 75°:75°/70°:70° Touch-Screen ▪ 5 wires resistive technology ▪ Controller integrated on board
	•	•	19" LCD TFT 5:4 ▪ SXGA 1280x1024, 16M colors ▪ LED backlight, 350 cd/m2 ▪ Viewing angle L:R/U:L (typ): 85°:85°/85°:85° Touch-Screen ▪ 5 wires resistive technology ▪ Controller integrated on board
	•	•	21.5" W LCD TFT 16:9 ▪ 1920x1080 (FHD), 16M colors ▪ LED backlight, 300 cd/m2 ▪ Viewing angle L+R/U+L (typ): 89°:89°/89°:89° Touch-Screen ▪ 5 wires resistive technology ▪ Controller integrated on board
	•	•	24" W LCD TFT 16:9 ▪ 1920x1080 (FHD), 16M colors ▪ LED backlight, 300 cd/m2 ▪ Viewing angle L:R/U:L (typ): 89°:89°/89°:89° Touch-Screen ▪ 5 wires resistive technology ▪ Controller integrated on board
<i>Figure 83: C6 P34 PANEL Technical data</i>			

7.1.3 C6 P34 PANEL capacitive technical data

C6 P34 PANEL capacitive/S0 BASIC System			Power (W)	
Basic Configuration	LCD TFT 12,1" SVGA ▪ Touch-Screen ▪ Aluminum front panel ▪ Intel® Core i5-664EQ 2,7 GHz ▪ 4GB RAM ▪ fanless ▪ 24V DC iso-lated power supply ▪ 12 months warranty		69	
C6 P34 PANEL-TF/S1 BASIC System				
Basic Configuration	LCD TFT 12,1" SVGA ▪ Touch-Screen ▪ Aluminum front panel ▪ Intel® Core i5-664EQ 2,7 GHz ▪ 4GB RAM ▪ fanless ▪ 24V DC isolated power supply ▪ 1 PCI slot ▪ 12 months warranty		75	
	S0	S1		
Processor	•	•	Intel® Core™ i5-6440EQ ▪ 2,70 GHz (3.40 GHz Turbo) ▪ 6MB smart cache ▪ 4 cores, 4 threads ▪ Soldered on-board	+0
Display	•	•	12.1" W LCD TFT 16:10 ▪ WXGA, 1280x800, 16M colors ▪ LED backlight, 400 cd/m2 ▪ Viewing angle L:R/U:L (typ): 88°:88°/88°:88° Touch-Screen P-CAP projected capacitive multitouch	-
	•	•	15.6" W LCD TFT 16:9 ▪ 1366x768 (HD), 16M colors ▪ LED backlight, 400 cd/m2 ▪ Viewing angle L:R/U:L (typ): 80°:80°/80°:80° Touch-Screen P-CAP projected capacitive multitouch	+1
	•	•	18.5" W LCD TFT 16:9 ▪ 1366x768 (HD), 16M colors ▪ LED backlight, 300 cd/m2 ▪ Viewing angle L:R/U:L (typ): 75°:75°/70°:70° Touch-Screen P-CAP projected capacitive multitouch	+11
	•	•	21.5" W LCD TFT 16:9 ▪ 1920x1080 (FHD), 16M colors ▪ LED backlight, 300 cd/m2 ▪ Viewing angle L+R/U+L (typ): 89°:89°/89°:89° Touch-Screen P-CAP projected capacitive multitouch	+22
	•	•	24" W LCD TFT 16:9 ▪ 1920x1080 (FHD), 16M colors ▪ LED backlight, 300 cd/m2 ▪ Viewing angle L:R/U:L (typ): 89°:89°/89°:89° Touch-Screen P-CAP projected capacitive multitouch	+26
RAM Memory	•	•	4 GB ▪ 1 module SODIMM DDR4-2133	-
expansions slots	•		No expansion slots	-
		•	1 x PCI half size ▪ on riser card ▪ expansion board with max consumption 5W	-

Figure 84: C6 P34 PANEL Technical data

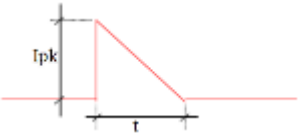
7.1.4 Technical specifications

Front panel	Aluminum ▪ KEB logo sticker
Touchscreen	5 wires resistive technology ▪ on board controller
Frontal protection	IP66
Power supply	Isolated ▪ Input voltage: 18...32V DC ▪ Micro UPS
Motherboard	Type "All-In-One" KEB 1351
	Watch dog Time programmable
Intel platform	Intel® Core™ i5-6440EQ ▪ 2.70 GHz (3.40 GHz Turbo) ▪ 6 MB smart cache ▪ 4 cores, 4 threads ▪ Soldered on - board
	Chipset Intel® HM170 PCH (Platform Controller Hub)
Operating System	Microsoft Windows Embedded Standard 7P 32
Other operating systems have not been certified by KEB.	
Software Remote assistance	KEB COMBIVIS connect Win32/64 runtime license with KEB sticker
Video controller	Intel® HD Graphics 510 integrated into Intel® Celeron™ microprocessor ▪ 950MHz
Video RAM (shared)	Dynamic Video Memory Technology ▪ Memory quantity is automatically selected by operating system
System memory	DDR4-2133 type ▪ 2 SODIMM modules ▪ min 4GB ▪ max 32GB
Mass storage	1 x onboard connector for direct insertion of mSATA SSD SATA 3
RAID controller	Integrated into chip Intel® HM170 PCH ▪ Raid 0, 1
TPM	2x10 (2,54) pin-strip connector for optional TPM module
CFast slot	1 x bootable CFast SATA 3 slot on board with external front access
Bus expansions slotson riser card (S1)	1 x PCI ▪ half size boards with 5W max consumption ▪ alternative to each other
Frontal access interfaces	1 x USB 2.0
Rear access interfaces	4 x Ethernet 10/100/1000 Mbps (RJ45)
	• 3 x Intel® I210
	• 1 x Intel I219LM
	3 x USB 3.0 (Type A)
	2 x USB 2.0 (Type A)
	1 x RS232 (DB9M)
Environmental specifications	1 x DVI-D Single Link (1920x1080 FHD max resolution)
	Operating temperature:
	0°...+50°C
	Storage temperature:
-20°...+60°C	
Humidity: 80% (non-condensing)	
Standard warranty	12 months ▪ Warranty management by KEB headquarters
<i>Figure 85: C6 P34 PANEL capacitive technical specifications</i>	

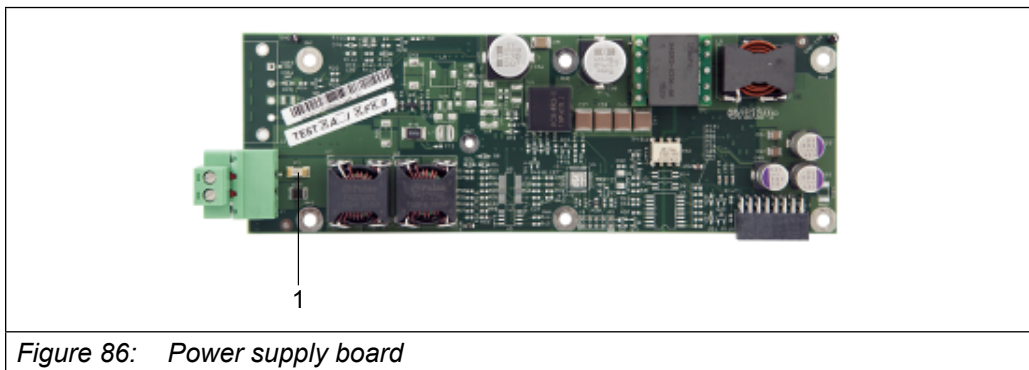
7.2 Power consumption

This paragraph contains the information needed to self-calculate the absorbed power of any system configuration.

7.2.1 Power supply technical data

Power supply	
Type	Isolated DC- DC
Isolation voltage	500 VAC
Input voltage	18+32V DC
Input protection	Reverse polarity circuitry
	Overvoltage
	12A soldered fuse
Power consumption	156W @ 24V (38W Typ.)
Inrush current impulse	
$I_{pk} : < 13A$ $t: 2.0\ ms$	
<i>Table 13: Battery technical data</i>	

The system is provided with a FAST FUSE 12A 125V SMD.
 The fuse can be replaced only in factory.



7.2.2 Battery technical data



Model	CR2032 MFR renata
Chemical System	Li / MnO ₂
Nominal Voltage	3 V
Rated Capacity	225 mAh
Temperature Range	-30°C - +70°C
Self Discharge at 23°C	< 1% / year
<i>Table 14: Battery technical data</i>	

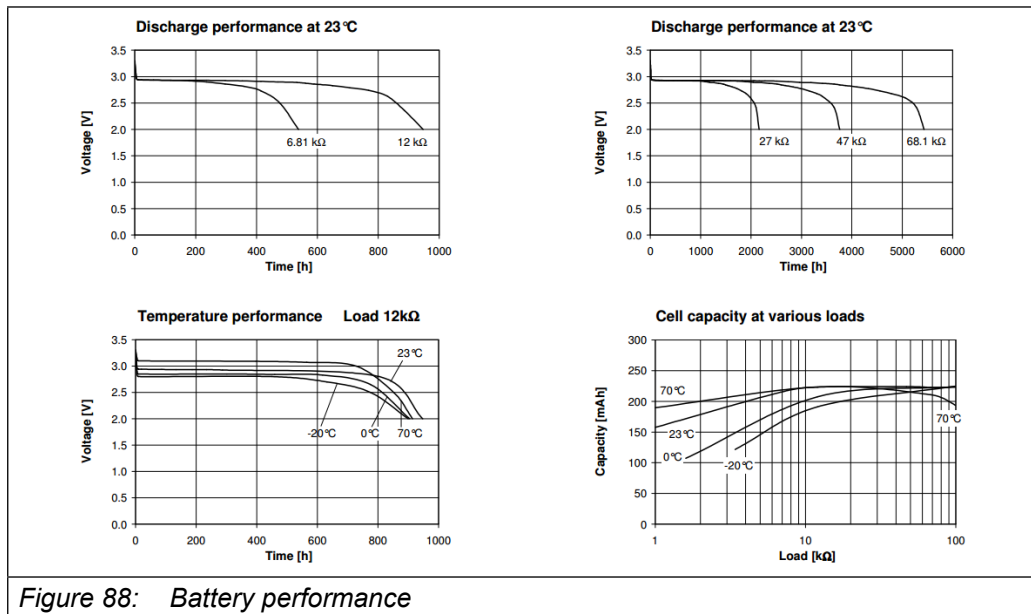


Figure 88: Battery performance

7.2.3 Dimension Drawings

	LCD TFT	A	B	C	D	E1L	E1H	E2	F (S0/S1)	G	H
Resistive	12.1"	335	270	315	250	10	10	10	70/100	19	5
	12.1"W	331	234	313	216	9	9	9	70/100	21	5
	15"	390	315	370	295	10	10	10	70/100	19	6
	15.6"W	430	275	410	255	10	10	10	70/100	19	6
	17"	455	355	435	335	10	10	10	70/100	21	6
	18.5"W	500	320	480	300	10	10	10	70/100	21	6
	19"	490	388	470	368	10	10	10	70/100	23	6
	21.5"W	579	367	559	347	10	10	10	70/100	23	6
Capacitive	24"W	640	402	620	382	10	10	10	70/100	21.3	8
	12.1"W	331	234	313	218	7	9	9	70/100	22	5
	15.6"W	433	280.5	410	255	15	10.5	11.5	70/100	36	6
	18.5"W	503	320.5	480	300	10	10.5	11.5	70/100	35	6
	21.5"W	581.5	367.5	559	347	10	10.5	11.5	70/100	35	8
	24"W	640	402	620	382	10	10	10	70/100	21	8
<i>Table 15: Dimension Drawings</i>											

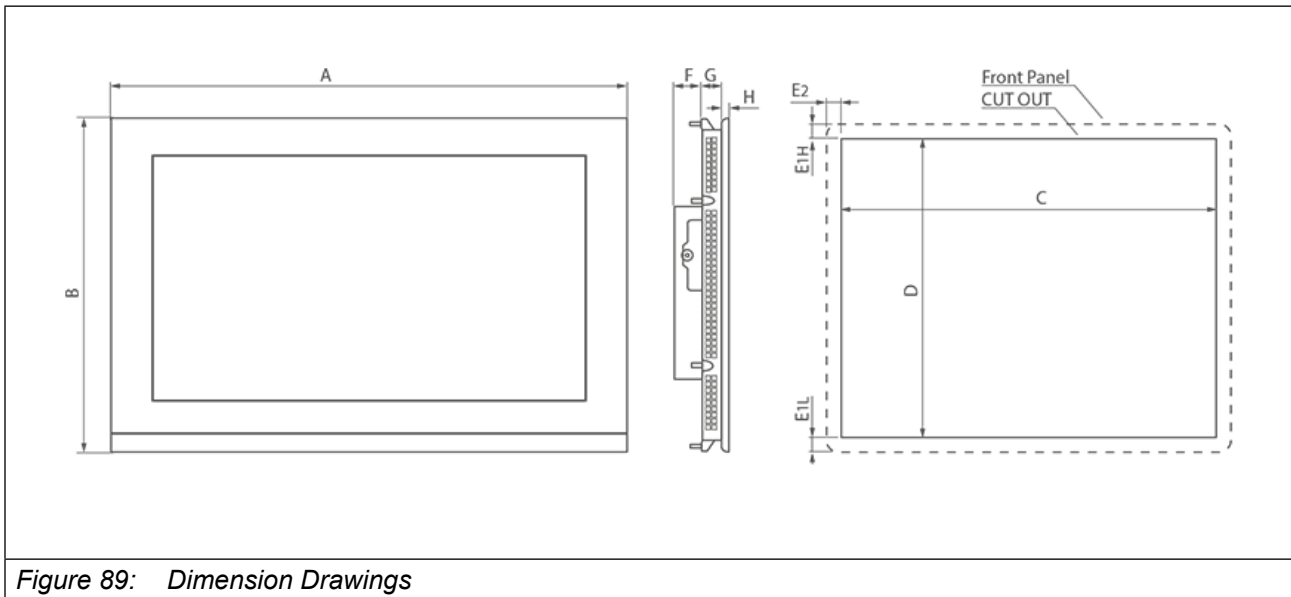


Figure 89: Dimension Drawings

7.3 Technical support and repairs

KEB offers wide-ranging, complete after-sales technical support. The staff who deal with this handle questions on the entire range of products skilfully, quickly, and efficiently.

You can phone our staff in the service department, and they will give you complete, prompt advice on how to resolve your problems.

telephone: +49 5263 401-0
 fax: +49 5263 401-116
 e-mail: COMBICONTROL@keb.de

8 Certification

8.1 Mark of conformity

The original EC-Declaration of Conformity and the associated documentation can be made available to the competent authorities. Please contact the Product Management, as necessary.

EU DECLARATION OF CONFORMITY

Document No. / month.year: ce_ca_remv-C6H-c_en.docx / 01.2023

Manufacturer:	KEB Automation KG Südstraße 38 32683 BARNTRUP Germany	
Product type	Control type	yy C6H xx – xxxx
	Control size	yy = 00 for Stand Alone PC or yy = 10 to FF for TouchPanel PC
	Voltage category	x = any letter or number 24 Vdc

The above given product is in accordance with the following directives of the European Union

Number:	EMC : 2014 / 30 / EU
Text:	Directive on the approximation of the laws of the Member States relating to electromagnetic compatibility.
Number:	Hazardous Substances: 2011 / 65 / EEC (incl. 2015 / 863 / EU)
Text:	Directive on the approximation of the laws of the Member States relating on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Responsible: KEB Automation KG
Südstraße 38
32683 BARNTRUP

Place, date Bartrup, 10. January 2023

Issued by:

i. A. W. Hovestadt / Conformance Officer	W. Wiele / Technical Manager

This declaration certifies the conformity with the named directives, but does not contain any assurance of quality.

The safety instructions, described in the instruction manual are to be followed.

KEB Automation KG, Südstr. 38, D-32683 Bartrup www.keb.de E-Mail: info@keb.de Tel.: +49 5263 401-0 Fax: -116

EU DECLARATION OF CONFORMITY



Annex 1

Document-No. / month.year: ce_ca_remv-C6H-c_en.docx / 01.2023

Product type	Control type	yy C6H xx – xxxx
	Control size	yy = 00 for Stand Alone PC or yy = 10 to FF for TouchPanel PC
	Voltage category	x = any letter or number 24 Vdc

The conformity of the above given product to the European Directive 2014/30/EU (for electromagnetic compatibility) is given by complete approval / testing to the following European harmonized standards. For not exceeding the required limits or minimum levels of immunity it is necessary to use observe the given wiring specifications from available instruction manual.

EN - Norm EN 55032 Version 2015	Text Electromagnetic compatibility of multimedia equipment – Emission Requirements
EN 61000 – 3 – 2 Version 2014	Electromagnetic compatibility – Part 3-2 Limits – Limits for harmonic current emissions (equipment input current ≤ 16A per phase)
EN 61000 – 3 – 3 2013 +A1: 2019	Electromagnetic compatibility – Part 3-3 Limits – Limits of voltage changes, voltage fluctuations and flicker in public low voltage systems, for equipment with rated current ≤ 16A per phase
EN 61000 – 6 – 2 Version 2019	Electromagnetic compatibility (EMC) – Part 6-2: Generic Standard – Immunity standard for industrial environment
EN 55024 Version 2010 + A1 - 2015	Information technology equipment – Immunity characteristics – Limits and methods of measurement

The conformity of the above given product to the European Directive 2011/65/EU with changes of 2015/863/EU (for restrictions of the use for certain hazardous substances in electrical and electronic equipment) is given by qualification of components and manufacturing process within the ISO 9001 QM system. The necessary information and declarations are documented and memorized.

The above given product was developed, manufactured and tested within an internal quality management system. This ISO 9001 QM system was approved by:

Notified body:	TÜV - CERT
Adress:	Zertifizierungsstelle des RWTÜV Steubenstrasse 53 D - 45138 Essen
No. of approval	041 004 500
Dated:	20.10.1994
Valid until:	December 2024

8.2 UL certifications

	Acceptance according to UL is marked at KEB inverters with the adjacent logo on the type plate.
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NRAQ.E479848 - Programmable Controllers

Programmable Controllers

See General Information for Programmable Controllers

KEB AUTOMATION KG E479848
 SUEDESTASSE 38
 32683 BARNTRUP, GERMANY

Investigated to ANSI/UL 508

Front-Panel Mounting Display, for use on a flat surface of a type 1 and 4X INDOOR enclosure, Model(s) aaC6AF1-44xx Where "a" may be any character for different sizes of panel display. Where ?xx? can be 02 or 05 representing SW Configuration.

aaC6AF1-45xx Where "a" may be any character for different sizes of panel display. Where ?xx? can be 02 or 05 representing SW Configuration.

Open type, Programmable controllers Model(s) 00C6CB1-0100, 00C6CB1-0200, 00C6CB1-0300, 00C6CB1-0400, 00C6CB1-0500, 00C6CB1-0600, 00C6CB1-0700, 00C6CB1-0800, 00C6CB1-0900, 00C6CB1-1000, 00C6CB1-1100, 00C6CB1-1200, 00C6CB1-1300, 00C6CB1-1400, 00C6CB1-1600, 00C6CB1-1700, 00C6CB1-1800, 00C6CB1-1900, 00C6CB1-2000, 00C6CB1-2100, 00C6CC1-0100, 00C6CC1-0200, 00C6CC1-0300, 00C6CC1-0400, 00C6CC1-0500, 00C6CC1-0700, 00C6CC1-0800, 00C6CC1-0900, 00C6CC1-1000, 00C6CC1-1100, 00C6CC1-1200, 00C6CC1-1300, 00C6CC1-1400, 00C6CC1-1500, 00C6CC1-1600, 00C6CC1-1800, 00C6CC1-1900, 00C6CE1-0100, 00C6CE1-0200, 00C6CF1-0200, 00C6CH1-0100, 00C6CJ1-0100, 00C6HA1-xxxx, 00C6HB1-xxxx

Programmable Controllers Model(s) 00C6CA1-0100 where xy may be 00,02,03,04,06,07,08,09 or 10.
 00C6CF1-0100 where xy may be 00,02,03,04,06,07,08,09 or 10.

Programmable controllers Model(s) aaC6HA1-xxxx Where "a" may be any character for different sizes of panel display.
 aaC6HB1-xxxx Where "a" may be any character for different sizes of panel display.

Investigated to UL 61010-1 and UL 61010-2-201

Programmable Automation Controller, PAC Model(s) C6 Smart, xxC6Gxx-xxxx

Investigated to UL 61010-1, 3rd Edition and UL 61010-2-201, 1st Edition

Front-Panel Mounting or Open type Industrial PC Model(s) 00C6HM1-xxxx Where "xxxx" is a 4 digit / letter combination for different software configurations.
 00C6HN1-xxxx Where "xxxx" is a 4 digit / letter combination for different software configurations.
 aaC6HM1-xxxx Where "a" may be any character for different sizes of panel display. Where "xxxx" is a 4 digit / letter combination for different software configurations.
 aaC6HN1-xxxx Where "a" may be any character for different sizes of panel display. Where "xxxx" is a 4 digit / letter combination for different software configurations.

Industrial PC Model(s) 00C6HL1-xxxx Where "xxxx" is a 4 digit / letter combination for different software configurations.
Industrial PC Model(s) 00C6HP1-xxxx Where "xxxx" is a 4 digit / letter combination for different software configurations.
 00C6HQ1-xxxx Where "xxxx" is a 4 digit / letter combination for different software configurations.

Programmable controllers Model(s) aaC6JF1-110x Where "a" may be any character for different sizes of panel display. Where ?x? is any digit representing Customer ID.
 aaC6JF1-111x Where "a" may be any character for different sizes of panel display. Where ?x? is any digit representing Customer ID.
 aaC6JF1-112x Where "a" may be any character for different sizes of panel display. Where ?x? is any digit representing Customer ID.

Investigated to UL 61010-1, 3rd Edition and UL 61010-2-201, 2nd Edition

Programmable Controllers, "Multi Fieldbus Interface C6 Remote I/OS" Model(s) 00C6CH1-0200, 00C6CH1-0300, 00C6CH1-0400, 00C6CH1-0500

Investigated to

Industrial PC Model(s) 00C6HC1-xxxx

Last Updated on 2020-03-11

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9 Change history

Version	Date	Description
00	2019-03	Pre-series
01	2020-06	Series version
02	2023-03	Review

Austria | KEB Automation GmbH

Ritzstraße 8 4614 Marchtrenk Austria
Tel: +43 7243 53586-0 Fax: +43 7243 53586-21
E-Mail: info@keb.at Internet: www.keb.at

Belgium | KEB Automation KG

Herenveld 2 9500 Geraardsbergen Belgium
Tel: +32 544 37860 Fax: +32 544 37898
E-Mail: vb.belgien@keb.de Internet: www.keb.de

Brazil | KEB South America - Regional Manager

Rua Dr. Omar Pacheco Souza Riberio, 70
CEP 13569-430 Portal do Sol, São Carlos Brazil
Tel: +55 16 31161294 E-Mail: roberto.arias@keb.de

Czech Republic | KEB Automation GmbH

Videnska 188/119d 61900 Brno Czech Republic
Tel: +420 544 212 008
E-Mail: info@keb.cz Internet: www.keb.cz

France | Société Française KEB SASU

Z.I. de la Croix St. Nicolas 14, rue Gustave Eiffel
94510 La Queue en Brie France
Tel: +33 149620101 Fax: +33 145767495
E-Mail: info@keb.fr Internet: www.keb.fr

Germany | **Geared Motors**

KEB Antriebstechnik GmbH
Wildbacher Straße 5 08289 Schneeberg Germany
Telefon +49 3772 67-0 Telefax +49 3772 67-281
Internet: www.keb-drive.de E-Mail: info@keb-drive.de

Italy | KEB Italia S.r.l. Unipersonale

Via Newton, 2 20019 Settimo Milanese (Milano) Italia
Tel: +39 02 3353531 Fax: +39 02 33500790
E-Mail: info@keb.it Internet: www.keb.it

Japan | KEB Japan Ltd.

15 - 16, 2 - Chome, Takanaawa Minato-ku Tokyo 108 - 0074 Japan
Tel: +81 33 445-8515 Fax: +81 33 445-8215
E-Mail: info@keb.jp Internet: www.keb.jp

P. R. China | KEB Power Transmission Technology (Shanghai) Co. Ltd.

No. 435 QianPu Road Chedun Town Songjiang District
201611 Shanghai P.R. China
Tel: +86 21 37746688 Fax: +86 21 37746600
E-Mail: info@keb.cn Internet: www.keb.cn

Poland | KEB Automation KG

Tel: +48 60407727
E-Mail: roman.trinczek@keb.de Internet: www.keb.de

Republic of Korea | KEB Automation KG

Room 1709, 415 Missy 2000 725 Su Seo Dong
Gangnam Gu 135- 757 Seoul Republic of Korea
Tel: +82 2 6253 6771 Fax: +82 2 6253 6770 E-Mail: vb.korea@keb.de

Russian Federation | KEB RUS Ltd.

Lesnaya str, house 30 Dzerzhinsky MO
140091 Moscow region Russian Federation
Tel: +7 495 6320217 Fax: +7 495 6320217
E-Mail: info@keb.ru Internet: www.keb.ru

Spain | KEB Automation KG

c / Mitjer, Nave 8 - Pol. Ind. LA MASIA
08798 Sant Cugat Sesgarrigues (Barcelona) Spain
Tel: +34 93 8970268 Fax: +34 93 8992035 E-Mail: vb.espana@keb.de

Switzerland | KEB Automation AG

Witzbergstrasse 24 8330 Pfaeffikon/ZH Switzerland
Tel: +41 43 2886060 Fax: +41 43 2886088
E-Mail: info@keb.ch Internet: www.keb.ch

United Kingdom | KEB (UK) Ltd.

5 Morris Close Park Farm Industrial Estate
Wellingborough, Northants, NN8 6 XF United Kingdom
Tel: +44 1933 402220 Fax: +44 1933 400724
E-Mail: info@keb.co.uk Internet: www.keb.co.uk

United States | KEB America, Inc

5100 Valley Industrial Blvd. South
Shakopee, MN 55379 United States
Tel: +1 952 2241400 Fax: +1 952 2241499
E-Mail: info@kebameric.com Internet: www.kebameric.com

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KEB Automation KG Suedstrasse 38 32683 Barntrup Tel. +49 5263 401-0 E-Mail: info@keb.de