



Installation and Operating instructions for

# Panel PC CP77xx

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**BECKHOFF**



# Table of contents

<b>1. Foreword</b>	<b>3</b>
Notes on the Documentation	3
Liability Conditions	3
Trademarks	3
Patent Pending	3
Copyright	3
State at Delivery	3
Delivery conditions	3
Description of safety symbols	4
Basic safety measures	5
Operator's obligation to exercise diligence	6
National regulations	6
Procedure in the event of a fault	6
Operator requirements	6
UL-Certificate of Compliance	6
<b>2. Product Description</b>	<b>7</b>
Appropriate Use	7
Connections	7
Pin assignment	7
Connector description	8
Serial interface	8
Power supply	8
Network interfaces	8
Protective Earthing	8
Connecting cables	8
RS 232-adaptor cable	8
Ethernet patch cable and network connectors, optional	8
<b>3. Installation Instructions</b>	<b>9</b>
Transport and Unpacking	9
Transport	9
Unpacking	9
Assembly	10
Assembly dimensions	10
Connecting the Panel PC	11
Connecting cables	11
Protective Earthing	11
<b>4. Operating Instructions</b>	<b>12</b>
Switching the Panel PC on and off	12
Operation	12
Keyboard codes	12
Compact Flash memory card	14
Servicing and maintenance	15
Cleaning the Panel PC	15
Servicing	15
Replacement of the Battery	15
Emergency procedures	15
Shutting down	15
Disposal	15
<b>5. Troubleshooting</b>	<b>16</b>
Fault correction	16
<b>6. Beckhoff Support and Service</b>	<b>17</b>
Beckhoff branches and partner companies	17
Beckhoff company headquarters	17

<b>7. Appendix</b>	<b>18</b>
Technical data	18
Approvals	18
FCC: Federal Communications Commission Radio Frequency Interference Statement	18
FCC: Canadian Notice	18

# Foreword

## Notes on the Documentation

This description is only intended for the use of trained specialists in control and automation engineering who are familiar with the applicable national standards. It is essential that the following notes and explanations are followed when installing and commissioning these components.

The responsible staff must ensure that the application or use of the products described satisfy all the requirements for safety, including all the relevant laws, regulations, guidelines and standards.

## Liability Conditions

The documentation has been prepared with care. The products described are, however, constantly under development. For that reason the documentation is not in every case checked for consistency with performance data, standards or other characteristics. In the event that it contains technical or editorial errors, we retain the right to make alterations at any time and without warning. No claims for the modification of products that have already been supplied may be made on the basis of the data, diagrams and descriptions in this documentation.

All pictures shown in the documentation are exemplary. Illustrated configurations can differ from standard.

## Trademarks

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Other designations used in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owners.

## Patent Pending

The EtherCAT Technology is covered, including but not limited to the following patent applications and patents: EP1590927, EP1789857, DE102004044764, DE102007017835 with corresponding applications or registrations in various other countries.

The TwinCAT Technology is covered, including but not limited to the following patent applications and patents: EP0851348, US6167425 with corresponding applications or registrations in various other countries.

## Copyright

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## State at Delivery






All the components are supplied in particular hardware and software configurations appropriate for the application. Modifications to hardware or software configurations other than those described in the documentation are not permitted, and nullify the liability of Beckhoff Automation GmbH & Co. KG.

## Delivery conditions

In addition, the general delivery conditions of the company Beckhoff Automation GmbH & Co. KG apply.


## Description of safety symbols

The following safety symbols are used in this operating manual. They are intended to alert the reader to the associated safety instructions.


 <b>DANGER</b>	<b>Acute risk of injury!</b>  If you <b>do not</b> adhere the safety advise adjoining this symbol, there is immediate danger to life and health of individuals!
 <b>WARNING</b>	<b>Risk of injury!</b>  If you <b>do not</b> adhere the safety advise adjoining this symbol, there is danger to life and health of individuals!
 <b>CAUTION</b>	<b>Hazard to individuals!</b>  If you <b>do not</b> adhere the safety advise adjoining this symbol, there is obvious hazard to individuals!
 <b>Attention</b>	<b>Hazard to devices and environment</b>  If you <b>do not</b> adhere the notice adjoining this symbol, there is obvious hazard to materials and environment.
 <b>Note</b>	<b>Note or pointer</b>  This symbol indicates information that contributes to better understanding.

## Basic safety measures

Before the Panel PC is switched off, software that is running must be properly closed. Otherwise it is possible that data on the storage medium is lost. Please read the section [Switching the Panel PC on and off](#).

 <b>Warning</b>	<b>Switch off all parts of the equipment, then uncouple the Panel PC</b>  Before opening the housing, and whenever the Panel PC is not being used for control purposes (such as during functional checks after a repair), all parts of the equipment must first be switched off, after which the Panel PC is to be disconnected from the equipment.
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Disconnect the device by unplugging the connectors on the rear side of the Panel PC. Items of equipment that have been switched off must be secured against being switched on again.

 <b>Warning</b>	<b>Do not exchange any parts when under power</b>  When components are being fitted or removed, the supply voltage must be switched off. Fitting work on the Panel PC can result in damage: <ul style="list-style-type: none"><li>• if metal objects such as screws or tools fall onto operating circuit boards</li><li>• if connecting cables internal to the Panel PC are removed or inserted during operation.</li></ul>
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## Operator's obligation to exercise diligence

The operator must ensure that

- the product is only used as intended (see chapter [Product Description](#))
- the product is in a sound condition and in working order during operation
- the product is operated, maintained and repaired only by suitably qualified and authorized personnel
- the personnel is instructed regularly about relevant occupational safety and environmental protection aspects, and is familiar with the operating manual and in particular the safety notes contained herein
- the operation manual is in good condition and complete, and always available for reference at the location of the product.



Note

**Do not open the housing of the Panel PC!**

For technical support contact [Beckhoff Service](#).

## National regulations

Depending on the type of machine and plant in which the Industrial PC is used, national regulations governing the controllers of such machines will apply, and must be observed by the operator. These regulations cover, amongst other things, the intervals between inspections of the controller. The operator must initiate such inspections in good time.

## Procedure in the event of a fault

In the event of faults at the Industrial PC, the list in the section [Troubleshooting](#) can be used to determine the measures to be taken.

## Operator requirements

Anyone who uses the Industrial PC must have read these operating instructions and must be familiar with all the functions of the software installed on the Industrial PC to which he has access.

## UL-Certificate of Compliance



**Underwriters  
Laboratories Inc.**

We herewith confirm that the Panel PC CP77xx of Beckhoff Automation GmbH meets the requirements of the Underwriters Laboratories Inc.® (UL)-standard:

*Certificate Number:* 280607 – E220403  
*Report Reference:* E220403, April 16th, 2007  
*Issue Date:* 2007 June 28

### Standards for Safety

The correspondance of the mentioned product with these requirements is proved by the fact that this product meets with the following single standards:

- UL 60950-1, 1st Edition, 2006-07-07 (Information Technology Equipment – Safety - Part 1: General Requirements)
- CSA C22.2 No. 60950-1-03, 1st Edition, 2006-07 (Information Technology Equipment - Safety - Part 1: General Requirements)



# Product Description

## Appropriate Use

The CP77xx Panel PC is designed for industrial application in machine and plant engineering. In addition to the integrated PC, a TFT display, touch screen/ pad (optional) and a PC keyboard (optional) are accommodated in an aluminium housing. The Panel PC is installed via the 4 mounting holes in the backplane or the pivot arm adapter (optional).

Do not use the Panel PC in areas of explosive hazard

**The Panel PC must not be used where there is a risk of explosion.**

## Connections

Panel PC CP77xx connections



### Pin assignment

X 100  
Serial interface



SG 12POL M16-built-in-PCB-sold. IP67  
BINDER (BINDER 09-0463-90-19 prod. 723 M16X0,75)

For connecting use the provided [RS 232-adapter cable](#).

X 101  
Power supply



SG 4POL M12-built-in-PCB-sold. IP67  
BINDER (BINDER 09-3431-90-04 prod. 763 M12X1)

Pin	Signal	Pin	Signal
1	+ 24V	3	GND
2	NC	4	NC

X 102, X 103  
Network



RJ-45 connector (Ethernet 10/ 100 Mbit)

Pin	Signal	Pin	Signal
housing	screen	5	term*
1	TD +	6	RD -
2	TD -	7	term*
3	RD +	8	term*
4	term*		

\*) terminated 100 Ω

## Connector description

### Serial interface

Serial interface  
COM1

The Panel PC is equipped with a COM1 (**X 100**) serial interface (Type RS232) for the connection of serial peripheral devices. The protection class of the circular plug-in connector accords to the IP67-standard.

### Power supply

Power supply

The power supply for the Panel PC is established via the Cage clamp socket (**X 101**). The protection class of the circular plug-in connector accords to the IP67-standard.

### Network interfaces

Network

The RJ-45 sockets (**X 102**, **X 103**) enable connection of the Panel PC to an Ethernet network.

While using the FBS-RJ45-8-GS-connector (534494, Fa. Festo AG & Co.KG) the protection class accords to the IP67-standard.

### Protective Earthing

Protective Earthing

The low resistance protective earthing connection is established via the ground bolt, which is located at the rear of the housing.



## Connecting cables

One RS 232-adapter cable and one 4-pole power supply connector are provided with the Panel PC. Optional two network connectors RJ45 IP67 and prefabricated Ethernet cable sets are available.

### RS 232-adapter cable

RS 232-adapter cable



The provided RS 232-adapter cable with the marking C9900-K234 allows connecting serial peripheral devices with SUB-D-connector to the Panel PC.

#### Pin assignment:

12-pol. Cable connector	9-pol. Sub-D-connector	Signal
A	1	DCD
B	6	DSR
C	2	RxD
D	7	RTS
E	3	TxD
F	8	CTS
G	4	DTR
H	9	RI
J	5	GND
K	-	n.c.
L	-	n.c.
M	-	n.c.
screen	screen	screen

### Ethernet patch cable and network connectors, optional

Ethernet patch cable

The following Ethernet patch cable are available:

Patch Cable	Cable CAT 5, Connector RJ45, second cable end RJ45 IP67
C9900-K605	Patch cable CAT 5, length 5 m
C9900-K606	Patch cable CAT 5, length 10 m
C9900-K607	Patch cable CAT 5, length 15 m
C9900-K608	Patch cable CAT 5, length 20 m
C9900-K609	Patch cable CAT 5, length 25 m
C9900-K610	Patch cable CAT 5, length 50 m

RJ45 network connectors

Two RJ45 IP65 network connectors for individual patch cable assembly can be ordered using the order option C9900-K557.

# Installation Instructions

## Transport and Unpacking

The specified storage conditions must be observed (see chapter [Technical data](#)).

### Transport

Despite the robust design of the unit, the components are sensitive to strong vibrations and impacts. During transport, your Industrial PC should therefore be protected from excessive mechanical stress. Therefore, please use the original packaging.



### Warning

Danger of damage to the unit!

If the device is transported in cold weather or is exposed to extreme variations in temperature, make sure that moisture (condensation) does not form on or inside the device.

Prior to operation, the unit must be allowed to slowly adjust to room temperature. Should condensation occur, a delay time of approximately 12 hours must be allowed before the unit is switched on.

### Unpacking

Proceed as follows to unpack the unit:

1. Remove packaging.
2. Do not discard the original packaging. Keep it for future relocation.
3. Check the delivery for completeness by comparing it with your order.
4. Please keep the associated paperwork. It contains important information for handling the unit.
5. Check the contents for visible shipping damage.
6. If you notice any shipping damage or inconsistencies between the contents and your order, you should notify Beckhoff Service.

## Assembly

### Assembly dimensions



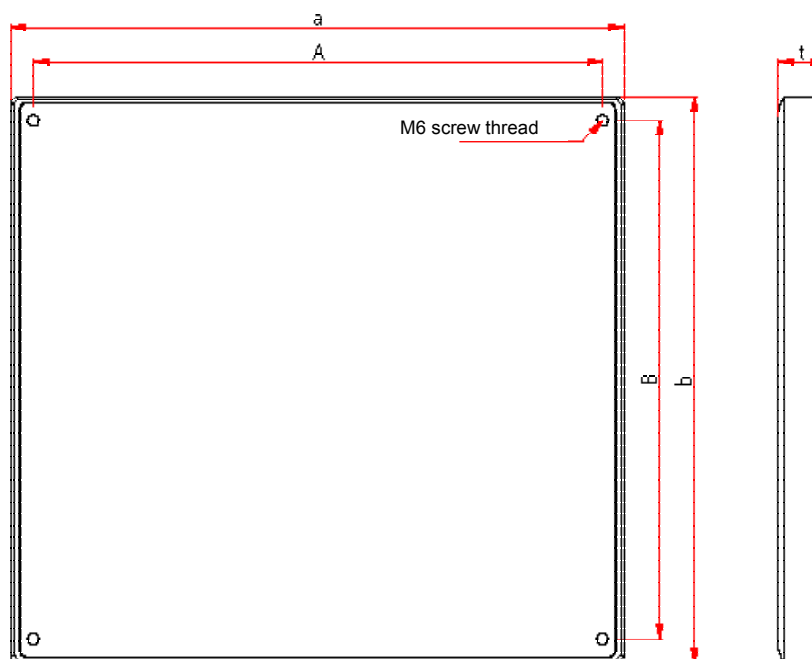
#### Warning

The assembly of the unit must take place with the orientation diagrammed here.

The figure shows the dimensions of the Panel PCs.

All dimensions are in mm.

#### Panel PC CP77xx



Dimensions		a	b	t	A	B
CP7709	6,5" display	267.9	173	38	241.9	149
CP7701	12" display	353.8	326.3	27.5	327.6	303.7
CP7702	15" display	426	395	28.5	399.8	367.4
CP7703	19" display	504	455	45	474	430

#### Panel PC CP771x

Dimensions		a	b	t	A	B
CP7719	6,5" display	267.9	213	38	241.9	189
CP7711	12" display	353.8	326.3	27.5	327.6	303.7
CP7712	15" display	426	395	28.5	399.8	367.4
CP7713	19" display	504	455	45	474	430

#### Panel PC CP772x

Dimensions		a	b	t	A	B
CP7729	6,5" display	336	213	38	310	189
CP7721	12" display	406	308.3	27.5	374.8	280.7
CP7721-0002	12" display	439.8	308.3	27.5	408.6	280.7
CP7722	15" display	515	370.2	28.5	483.8	342.6
CP7723	19" display	563	426	45	533	401

#### Panel PC CP773x

Dimensions		a	b	t	A	B
CP7731	12" display	406	370.2	27.5	379.8	342.6
CP7731-0002	12" display	426	370.2	27.5	399.8	342.6
CP7732	15" display	483	410.2	28.5	458.8	387.6
CP7733	19" display	504	535	45	474	510

**Danger****Warning**

## Connecting the Panel PC

The Panel PC must never be connected or disconnected in an area that is subject to explosion hazard! Risk of explosion!

The mains plug of the Panel PC must be disconnected!

Please read the documentation for the external devices prior to connecting them.

During thunderstorms, plug connector must neither be inserted nor removed.

When disconnecting a plug connector, always handle it at the plug. Do not pull the cable!

## Connecting cables

The connections are located at the rear of the Panel PC and are documented in the [Product Description](#) section.

When connecting cables to the Panel PC, please adhere to the following order:

- Disconnect the Panel PC from the power supply.
- Connect all cables at the Panel PC and at the devices to be connected.
- Ensure that all screw connections between connectors and sockets are tight!
- Reconnect all devices to the power supply.

## Protective Earthing

Protective Earthing

The low resistance protective earthing connection is established via the ground bolt, which is located at the rear of the housing.



# Operating Instructions

## Switching the Panel PC on and off

Switch on

The Panel PC does not have its own mains power switch. As soon as the power supply is switched on the Panel PC is activated.

Shutting down and switching off

Control software, as typically applied in Industrial PCs, enables the assignment of different rights to all users. A user who is not entitled to shut down the software may not switch off the Panel PC as an attempt to shut it down when the software is running could result in the loss of software data on the Compact Flash memory card (CF card).



**Warning**

### First shut down, then switch off the Panel PC!

If the Panel PC is shut down while the software is writing a file onto the CF Card memory card, the file will be destroyed. Control software typically writes something to the CF card every few seconds, so that the probability of causing damage by switching off while the software is running is very high.



**Warning**

When you have shut down the Panel PC, you have to switch off power supply for at least 10 seconds before rebooting the system. After resetting power supply the Panel PC will start booting automatically.

## Operation

Operation

The Panel PC's membrane keypad may only be actuated by fingertips.



**Note**

Attempts to actuate it with other objects can easily result in the destruction of the device. Neither may the membrane keypad be operated with a touch screen pen.

The touch screen may only be actuated by finger tips or with the touch screen pen. The operator may wear gloves but there must be no hard particles such as metal shavings, glass splinters embedded in the glove.

## Keyboard codes

Type-dependent number of keys

Depending on the precise type, the Control Panel can have fewer keys than those described here.

Operation



The cursor is the blinking character that marks the point at which the next character entered will be displayed. The cursor is also known as the insertion point. The cursor keys each move the cursor one place in the associated direction.



The Home key moves the cursor to the beginning of the line, while the End key moves it to the end of the line.



The *Pg Up* key scrolls one page back, the *Pg Dn* key scrolls one page forward.



The Tab key takes the cursor to the next input field, while Shift and Tab moves to the previous input field.



The mouse cursor can be moved over the screen with the aid of the touch screen or of the touch pad (optional). The keys correspond to the left and right hand keys of a Microsoft mouse.

The *Del* key deletes the character to the right of the cursor.



The *Ins* key causes characters to the right of the cursor to be overwritten. The overwrite mode is cancelled by pressing the key again.



*Print-Screen* prints a hard copy of a text screen on the printer.



The Pause key stops the computer until another key is pressed (only under MS-DOS).



Your input is confirmed with the Enter key.



Backspace deletes the character to the left of the cursor.



If the Shift key is pressed at the same time as another key, then instead of the numbers you obtain the character printed above the number, and you obtain upper case letters instead of lower case letters.



Pressing the *Caps Lock* key once activates and locks the *Shift* key. Pressing the *Shift* key cancels this function.



Rather like the effect of the *Shift* key, *Ctrl* and *Alt* also change the meaning of another key that is pressed at the same time.



This key brings up the Start menu of the operating system in use (Windows 95, 98, ME, NT, 2000, XP).



Pressing this key opens the property sheet of the active (or marked) object.



The *Esc* key has the effect of closing dialog windows and of interrupting some of the computer's working operations.



All other keys bring the character printed on them onto the display at the position of the cursor.



The meaning of the function keys, *F1* to *F10*, is determined by the software and is displayed at the bottom edge of the display.



The function of the special keys above the display is also determined by the software. The function is displayed at the top edge of the display. The special keys each have an orange LED controlled by the software.



## Compact Flash memory card

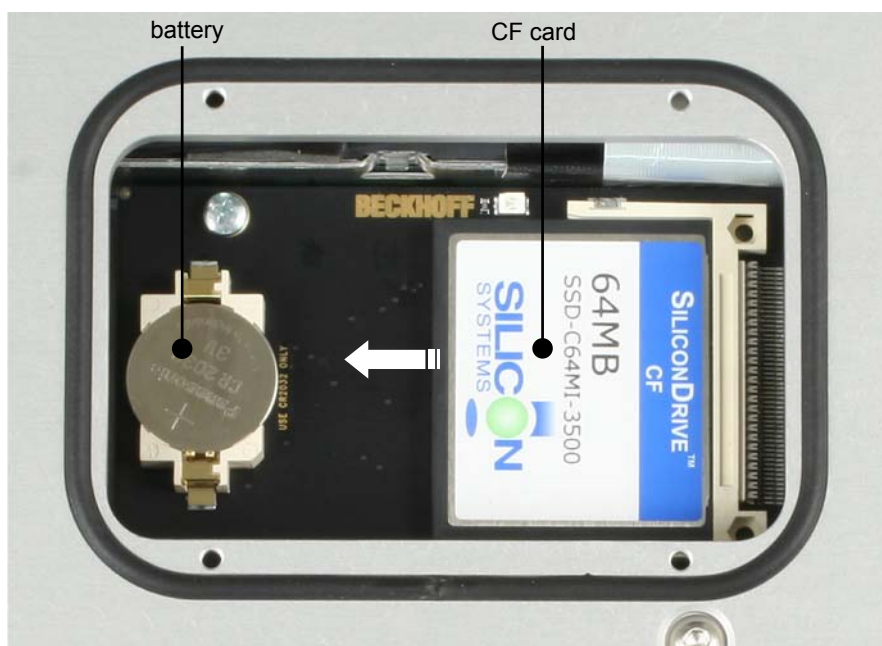
### Compact Flash card

A Compact Flash memory card (CF card) is located behind a cover at the rear of the Panel PC. It is provided to save the operating system. Only use memory cards with extended temperature ranges according to industrial standards!



### Removing the cover

To change the CF card, first of all unscrew the four screws (see above photo) with a crosstip screwdriver. The aluminium cover can be removed and enables access to the memory card and the battery (see below photo).



### Removing the CF card

The CF card can be removed with due care along the guides.



### Warning

**Avoid any use of force! Otherwise the contact pins may be damaged!**

### Insertion of CF card

Installation is in reverse of the above order. Make sure that the circumferential rubber seal fits correct while mounting the cover.



## Servicing and maintenance

### Cleaning the Panel PC

First switch off the Panel PC

Switch off the Panel PC and all devices connected to it, so that keys cannot be unintentionally actuated.

The front of the Panel PC can be cleaned with a soft, damp cleaning cloth. Do not use any aggressive cleaning materials, thinners, scouring material or hard objects that could cause scratches.

### Servicing

The Panel PC is maintenance-free.

### Replacement of the Battery



Note

A lithium battery is installed in the Panel PC to buffer data. This battery can be replaced and is located beside the CF card (see chapter [Compact Flash memory card](#)).

Article description: Battery 3V/ 225mAh 2032 coin cell.

## Emergency procedures

In case of fire, the Panel PC should be extinguished with powder or nitrogen.

## Shutting down

### Disposal

Dismantle the Panel PC

The device must be fully dismantled in order to dispose of it. The housing can be sent for metal recycling.

Observe national electronics scrap regulations

Electronic parts such as lamps and circuit boards must be disposed of in accordance with national electronics scrap regulations.

# Troubleshooting



**Note**

## Pixel errors

Pixel errors in the TFT display are production-caused and represent no complaint-reason!



**Note**

## Anomalies of the Touchscreen

Anomalies of the touchscreen sensor are production-caused and represent no complaint-reason!

## Fault correction

Fault	Cause	Measures
No Panel PC function	No power supply to Panel PC  Cable not connected	Check power supply cable  1. Correctly connect cable 2. Call Beckhoff Service
Panel PC boots, software starts, but control does not operate correctly	The cause of the error is in the software or in parts of the equipment outside the Panel PC	Call the manufacturer of the machine or the software
The Panel PC has only partial function, or only functions some of the time, for instance the picture is dark or absent	Faulty fluorescent bulb in the display  Defective components in Panel PC	Replace fluorescent tube in the display in accordance with description  Call Beckhoff Service

# Beckhoff Support and Service

Beckhoff and their partners around the world offer comprehensive support and service, making available fast and competent assistance with all questions related to Beckhoff products and system solutions.

## Beckhoff branches and partner companies

Please contact your Beckhoff branch office or partner company for [local support and service](#) on Beckhoff products!

The contact addresses for your country can be found in the list of Beckhoff branches and partner companies: [www.beckhoff.com](http://www.beckhoff.com). You will also find further [documentation](#) for Beckhoff components there.

## Beckhoff company headquarters

Beckhoff Automation GmbH & Co. KG  
Huelshorstweg 20  
33415 Verl  
Germany

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Fax: + 49 (0) 5246/963-198  
E-mail: [info@beckhoff.de](mailto:info@beckhoff.de)  
Web: <http://www.beckhoff.de/>

## Beckhoff Support

Support offers you comprehensive technical assistance, helping you not only with the application of individual Beckhoff products, but also with other, wide-ranging services:

- world-wide support
- design, programming and commissioning of complex automation systems
- and extensive training program for Beckhoff system components

Hotline: + 49 (0) 5246/963-157  
Fax: + 49 (0) 5246/963-9157  
E-mail: [support@beckhoff.com](mailto:support@beckhoff.com)

## Beckhoff Service

The Beckhoff Service Center supports you in all matters of after-sales service:

- on-site service
- repair service
- spare parts service
- hotline service

Hotline: + 49 (0) 5246/963-460  
Fax: + 49 (0) 5246/963-479  
E-mail: [service@beckhoff.com](mailto:service@beckhoff.com)

If servicing is required, please quote the **project number** of your product.

# Appendix

## Technical data

Dimensions	<b>Dimensions (W x H x D):</b>	see section <a href="#">Assembly dimensions</a>
Operation in areas that are subject to explosion hazard	<b>The Panel PC must not be used where there is a risk of explosion.</b>	
Environmental conditions	<b>The following conditions must be observed during operation:</b>	
	<b>Ambient temperature:</b>	0 to 55°C
	<b>Atmospheric humidity:</b>	Maximum 95%, non-condensing
Shock resistance	<b>Sinusoidal vibration:</b> (EN 60068-2-6)	10 to 58 Hz: 0.035 mm 58 to 500 Hz: 0.5 G (~ 5 m/ s <sup>2</sup> )
	<b>Impact:</b> (EN 60068-2-27)	5 G (~ 50 m/ s <sup>2</sup> ), duration: 30 ms
Protection class	<b>Panel PC:</b>	IP65
	<b>Ethernet Connector:</b>	IP65
Power supply	<b>Supply voltage:</b>	24 V <sub>DC</sub> (20.4 – 28.8 V <sub>DC</sub> )
	<b>Power consumption till CP77xx-xxxx-0020:</b>	approx. 18 W with 6.5" display approx. 22 W with 12" display approx. 33 W with 15" display approx. 40 W with 19" display
	<b>Power consumption CP77xx-xxxx-0030/-0040:</b>	approx. 41 W with 12" display approx. 45 W with 15" display approx. 50 W with 19" display
EMC compatibility	<b>Resistance to interference:</b>	conforms to EN 61000-6-2
	<b>Emission of interference:</b>	conforms to EN 61000-6-4
Transport and storage	The same values for atmospheric humidity and shock resistance are to be observed during transport and storage as in operation. Suitable packaging of the Panel PC can improve the resistance to impact during transport. The ambient temperature during storage and transport must be between -20°C and +65°C.	



Note

**Pixel errors in the TFT display are production-caused and represent no complaint-reason!**

## Approvals

### FCC: Federal Communications Commission Radio Frequency Interference Statement

FCC Approval for USA

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

### FCC: Canadian Notice

FCC Approval for Canada

This equipment does not exceed the Class A limits for radiated emissions as described in the Radio Interference Regulations of the Canadian Department of Communications.