CX1000/CX1020 First Steps

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Inhaltsverzeichnis

CX1000/CX1020 First Steps

1. 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.

Liability Conditions

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.

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. None of the statements of this manual represents a guarantee (Garantie) in the meaning of § 443 BGB of the German Civil Code or a statement about the contractually expected fitness for a particular purpose in the meaning of § 434 par. 1 sentence 1 BGB. 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.

Safety Instructions

Safety Rules

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.

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.

Personnel Qualification

This description is only intended for the use of trained specialists in control and automation engineering who are familiar with the applicable national standards.

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.

Danger	
⚠	This symbol is intended to highlight risks for the life or health of personnel.

Warning	
⚠	This symbol is intended to highlight risks for equipment, materials or the environment.

Note	
ℹ	This symbol indicates information that contributes to better understanding.

Documentation Issue Status

Version	Changes
1.1	figures for installation position changed
1.0	revised version
0.2	preliminarily version

2. Fitting and wiring

Mechanical Assembly of the base module

The installation of the modules takes place in three steps:

1. The Sequence of the Modules

The CPU basic module with system interfaces, which are factory-installed on the left side, is extended with the power supply unit on the right and with the fieldbus connection (master or slave) left side if available. The mounting of an filedbus module is described on the next page.

2. Assembly with Other Modules

The attachment of the individual modules is done by simple plugging them together (FIG. 1). Care must be taken that the plug of the PC104 interface is not damaged.
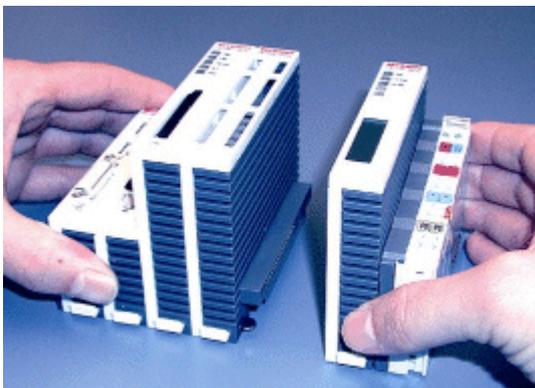When correctly assembled, no significant gap can be seen between the attached housings.

FIG. 1: Engaging of the Modules

3. Engaging on the top-hat rail

On the bottom of the modules, there is a white tension strap, which is connected with a latching mechanism. These tension straps must be pulled down before attaching to the mounting rail. This can be done with a slotted screwdriver and a small rotation. (FIG. 4). After engaging the module on the top-hat rail successfully (FIG. 5), the tension straps must be shifted into the starting position again (FIG. 6).
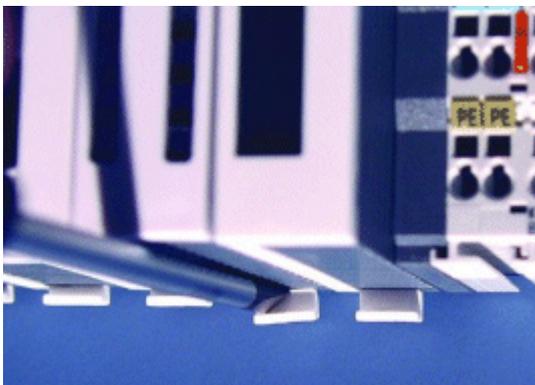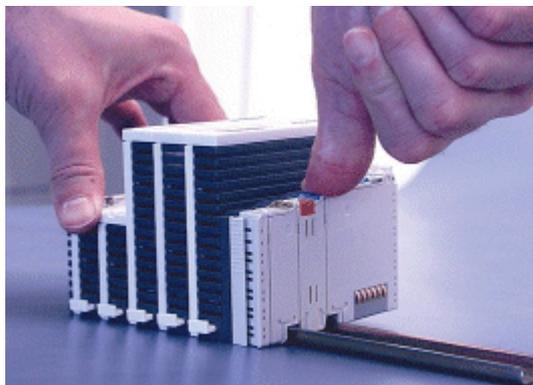

FIG. 4: Tension straps down

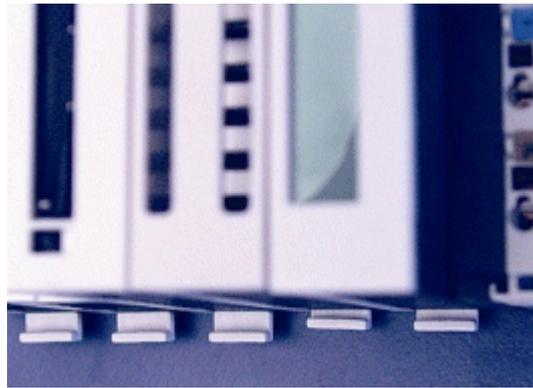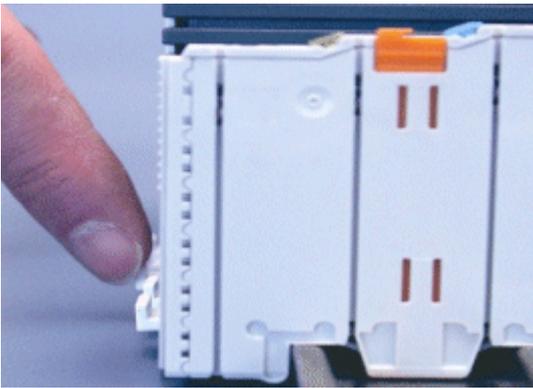
FIG. 5: Engaging on the top-hat rail

FIG. 6: Tension straps back in starting position   FIG.7: Tension straps not engaged / engaged

Note:
A locking mechanism prevents the individual housings from being pulled off again. More detailed information about disassembling the CX configuration from the top-hat rail can be found on the page decommissioning.

By lowering the front surfaces, which contain the interfaces, installation can easily be done in a standard terminal box of 120 mm height.

Installation position for CX1000:

Warning	
⚠	The CPU module installed on a top-hat rail may be operated only in case of ambient temperatures up to 55°C. The orientation in which the device is fitted must be selected in such a way that cooling air can flow vertically through the ventilation holes. The images show the permitted (FIG. 8 and FIG.9) as well as a forbidden installation positions (FIG. 10). **Observe minimum clearance!** Mounting must provide a clearance of 30 mm both above and below a CX1000 device combination to ensure adequate ventilation of the CPU base module and the power supply unit.

FIG. 8: Allowable installation position

FIG. 9: Allowable installation position

FIG. 10: Unallowable installation position

Installation position for CX1020:

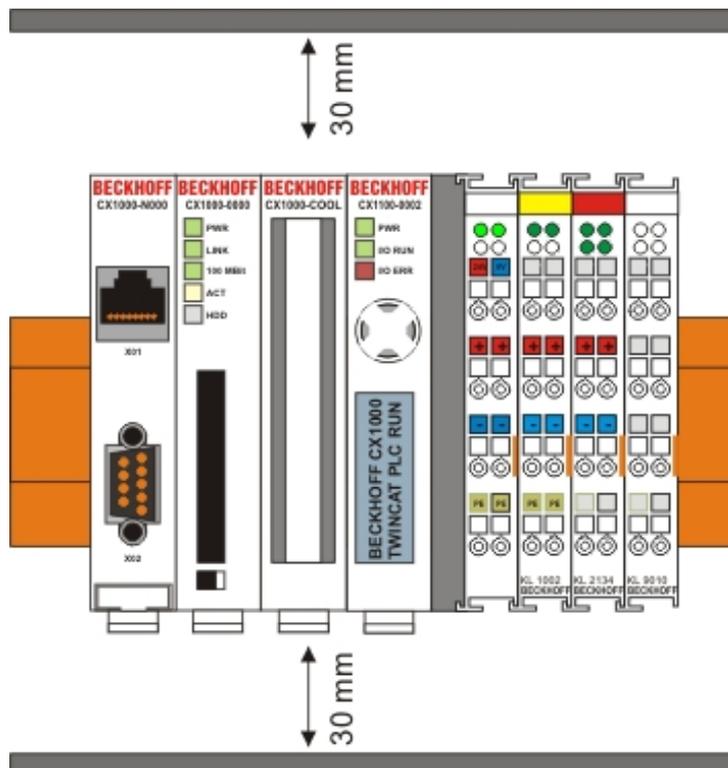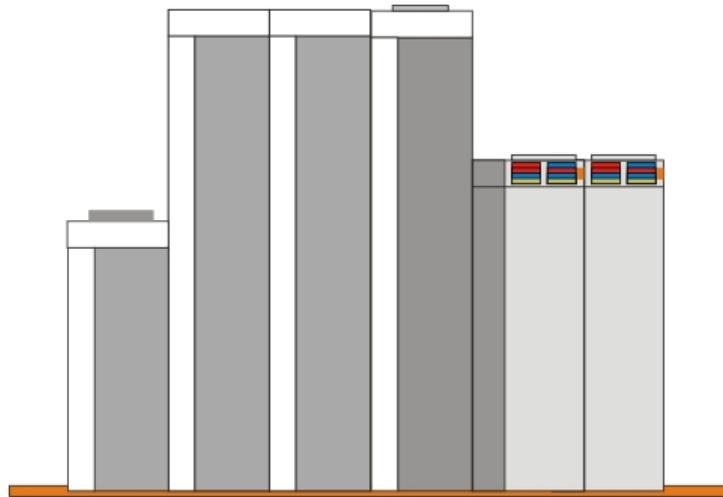| Warning	
⚠	The CPU module installed on a top-hat rail may be operated only in case of ambient temperatures up to 55°C. The orientation in which the device is fitted must be selected in such a way that cooling air can flow vertically through the ventilation holes. The images show the permitted (FIG. 8) as well as two forbidden installation positions (FIG. 9 and FIG. 10). ### Observe minimum clearance! Mounting must provide a clearance of 30 mm both above and below a CX1020 device combination to ensure adequate ventilation of the CPU base module and the power supply unit.

FIG. 8: Allowable installation position
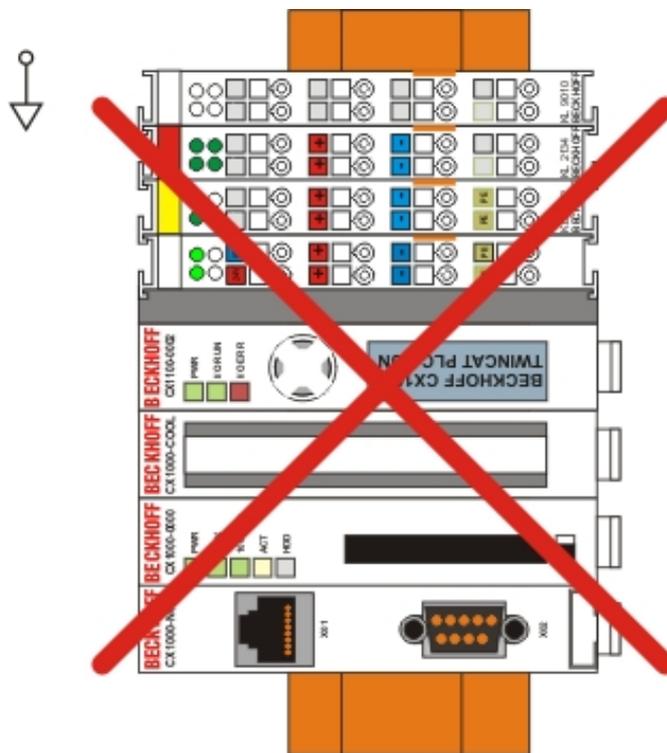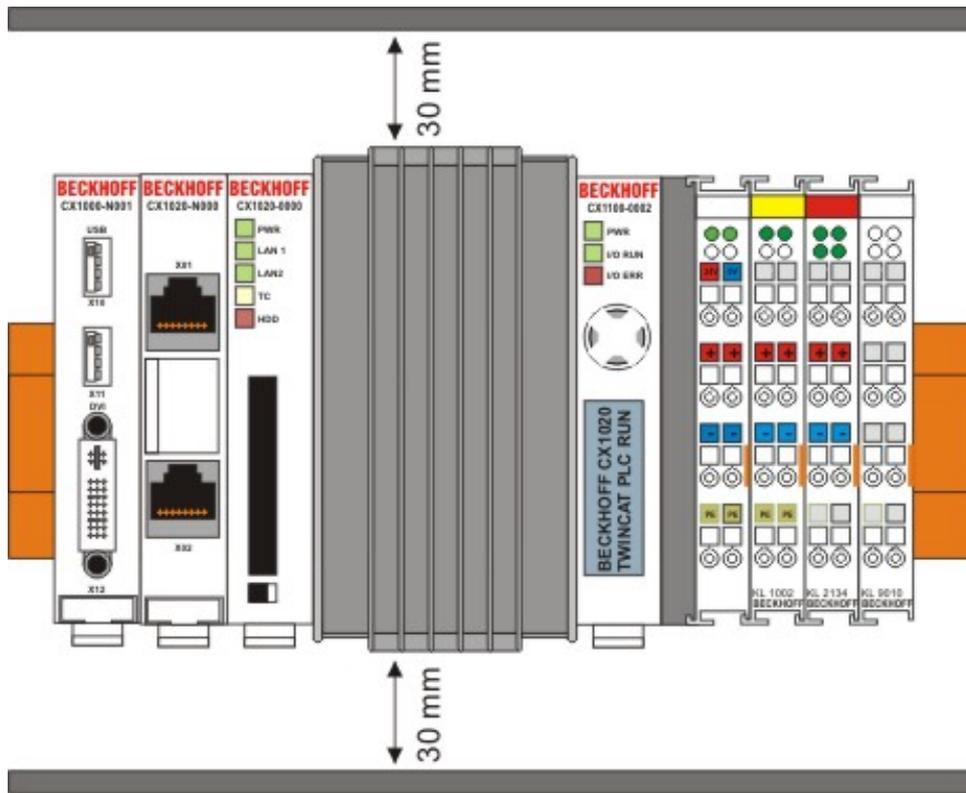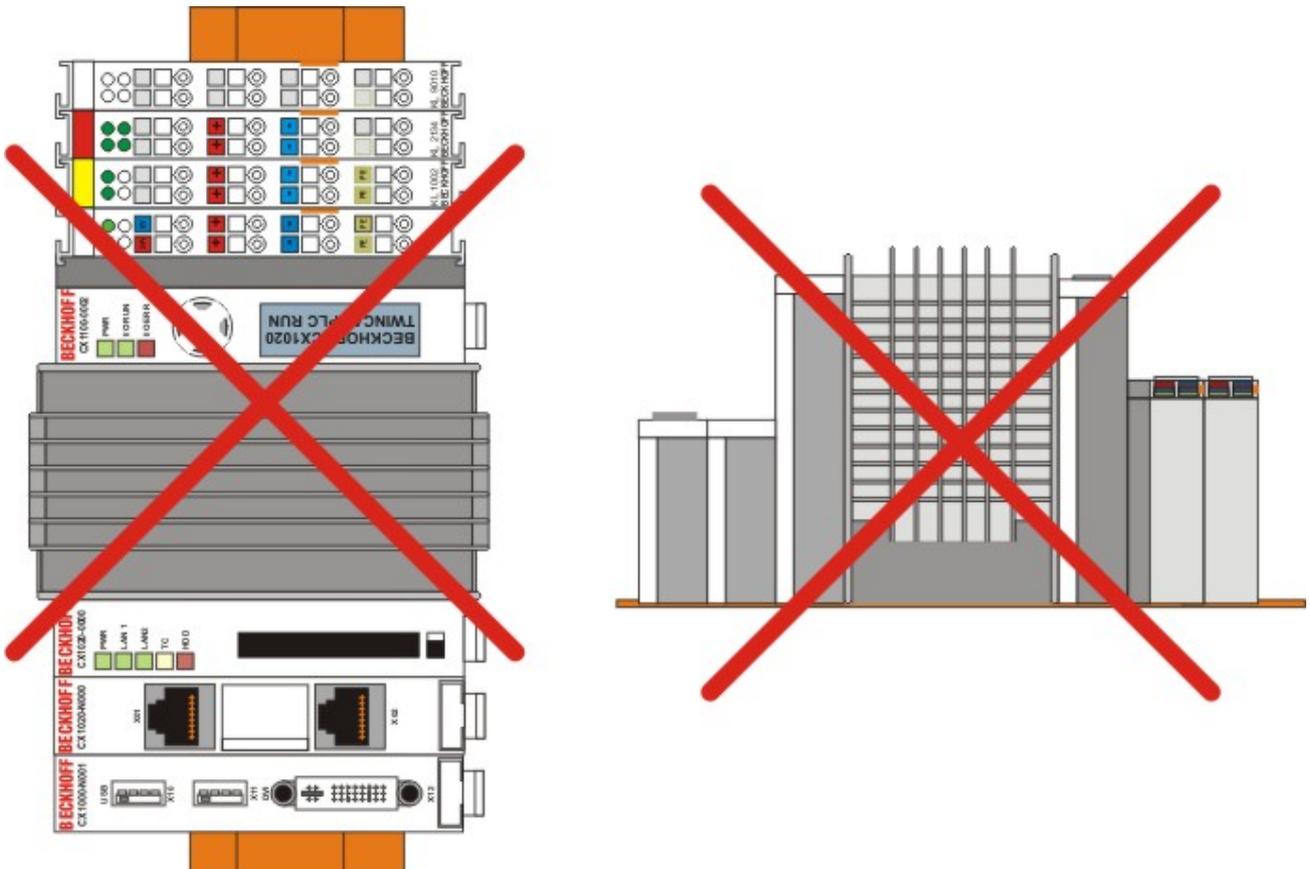

FIG. 9: Allowable installation position

Mechanical mounting of the Fieldbus modules

The mounting of the Fieldbus modules takes place in several steps:

1. Remove cover at CX1000/CX1020 basic module

In order to be able to fasten the connection of the fieldbus connection to the CPU basic module, the cover must first be removed (FIG 1, 2). This can be achieved by a small pressure against the cover.
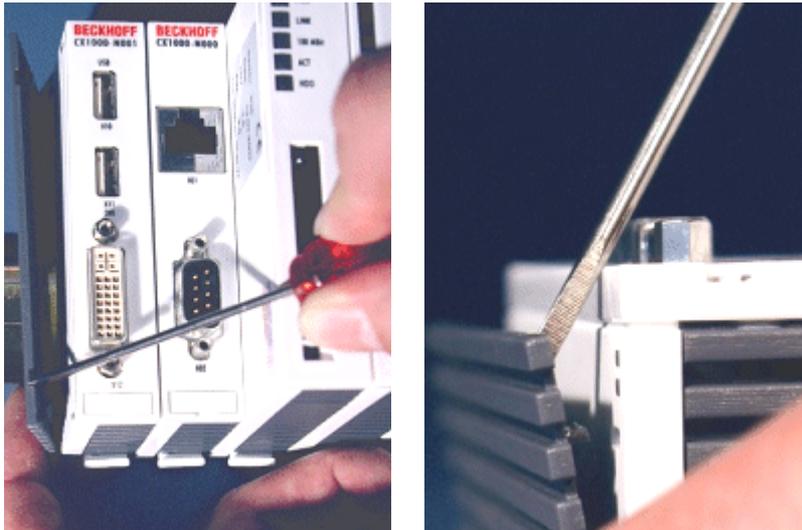

FIG.1+2: Remove Cover

2. Assembly with CX1000/CX1020 configuration

Because the CX1000 configuration is already on the top-hat rail, the fieldbus module first has to be pressed on the top-hat rail. For that purpose the locking of the latching mechanism with the white tension straps (pull down) is required.

The attachment of the individual modules is done by simple plugging them together (FIG. 3). Care must be taken that the plug of the PC104 interface is not damaged.
When correctly assembled, no significant gap can be seen between the attached housings. At the end the white tension strips must be shifted into the starting position again in order that the latching mechanism locks.

FIG. 3: Stick modules together   FIG. 4: Tension straps back in starting position

3. Attach Cover

If the connection area does not have a closing cover on the left-hand side, the cover that was previously removed should be pressed over the connections until it audibly engages.

Note:
If the CX1000/CX1020 configuration is not positioned on the top-hat rail it is possible to join the connection first with the CX1000/CX1020 configuration, as shown in FIG. 3, and then to clip the entire module onto the top-hat rail.

Note:
A locking mechanism prevents the individual housings from being pulled off again.

Electrical connection

Connecting devices

Also read the section Safety instructions regarding this subject.

Warning
⚠️   The power supply cable of the external power supply unit 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.

Check voltage rating and connect.
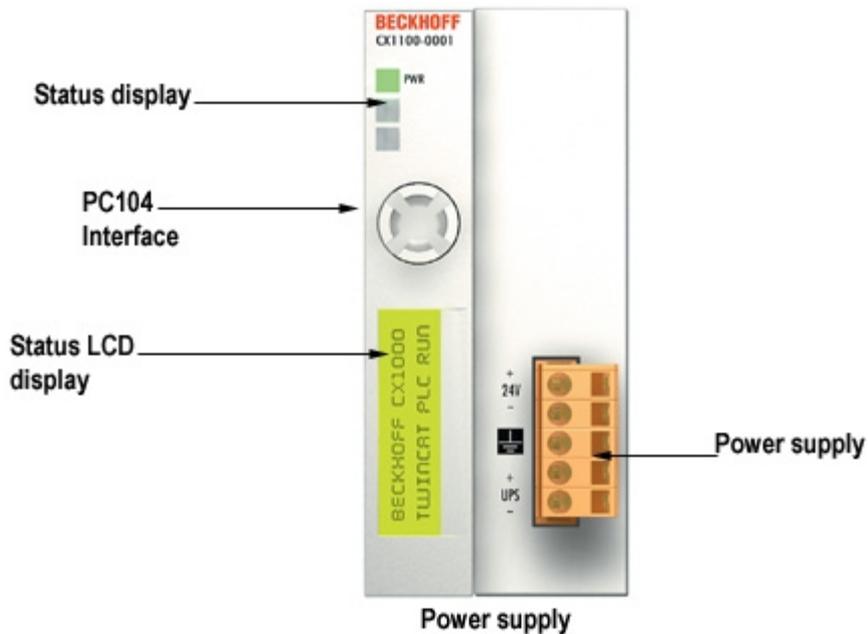
1. Check that the external power supply is providing the correct voltage.
2. Plug the power supply cable into the open pluggable connector or the cage clamp of the power supply unit (depending on the version) and connect it to your external 24 V power supply.

If the green power LED of the power supply unit and the CPU basic module lights up, the power supply is connected correctly.

CX1100-0001 Connections

This power supply unit does not have an I/O interface. The power supply is therefore connected through the 5-pin open pluggable connector. The power supply unit supplies all further system components with a voltage of 24 V DC (-15 %/+20%) via the PC104 bus. The dielectric strength of the power supply unit is 500 V_{rms}.
The integrated NOVRAM permits storage of process data that is safe against power failure.

Pin Allocation Open Style Connector:

Pin	Assignment
1	+24 V DC
2	0 V DC
3	GROUND
4	+UPS (+ 24 V DC)
5	-UPS (0 V DC)

LED:
With proper connection of the power supply unit and with power supply turned on, the power LED (PWR) lights up green. In the case of a short-circuit, it lights up red.

CX1100-0002 Connections

This power supply unit is equipped with an I/O interface, which permits connection of the Beckhoff Bus Terminals. The power is supplied via the upper spring-loaded terminals labelled "24V" and "0V".

The supply voltage feeds the CX system and supplies a voltage of 24 V DC (-15 %/+20%) to the Bus Terminals via the K-Bus. The dielectric strength of the power supply unit is 500 V_{rms}. Since the K-Bus does no more than pass data on, a further power supply is necessary for the Bus Terminals. This is provided by means of the power contacts, which are not connected to the power supply.

The integrated NOVRAM permits storage of process data that is safe against power failure.

Power supply with K-Bus

LED:

With proper connection of the power supply unit and with power supply turned on, the power LED (PWR) lights up green. In the case of a short-circuit, it lights up red.

The I/O LEDs display the operation status of the Bus Terminals. Error-free start-up of the configuration is signalled by the red "I/O ERR" LED being extinguished. If the "I/O ERR" LED blinks, an error in the area of the terminals is indicated. The error code can be determined from the frequency and number of blinks.

PE power contacts

The "PE" power contact must not be used for other potentials.

CX1100-0003 Connections

This power supply unit permits not only the connection of the Beckhoff Bus Terminals, but also the serial connection of the Beckhoff fieldbus box modules of the type extension box IExxxx. The power is supplied via the upper spring-loaded terminals labelled "24V" and "0V".

The supply voltage feeds the CX system and, over the K-Bus, the Bus Terminals. Since the K-Bus does no more than pass data on, a further power supply is necessary for the Bus Terminals. This is provided by means of the power contacts, which are not connected to the power supply.

Power supply with K-Bus/ IP-Link interface

Fieldbus connection:

Plug the IP link connector into the respective connections, i.e. one fibre-optic cable each into IN (x03) and OUT (x04). You then connect the other end with the corresponding IP link interface of the extension box. The connection must be made so that the output of the fieldbus connection is connected to the input of the extension box and vice versa.

LED:

With proper connection of the power supply unit and with power supply turned on, the power LED (PWR) lights up green. In the case of a short-circuit, it lights up red. The I/O LEDs display the operation status of the Bus Terminals. Error-free start-up of the configuration is signalled by the red "I/O ERR" LED being extinguished. If the "I/O ERR" LED blinks, an error in the area of the terminals is indicated. The error code can be determined from the frequency and number of blinks.
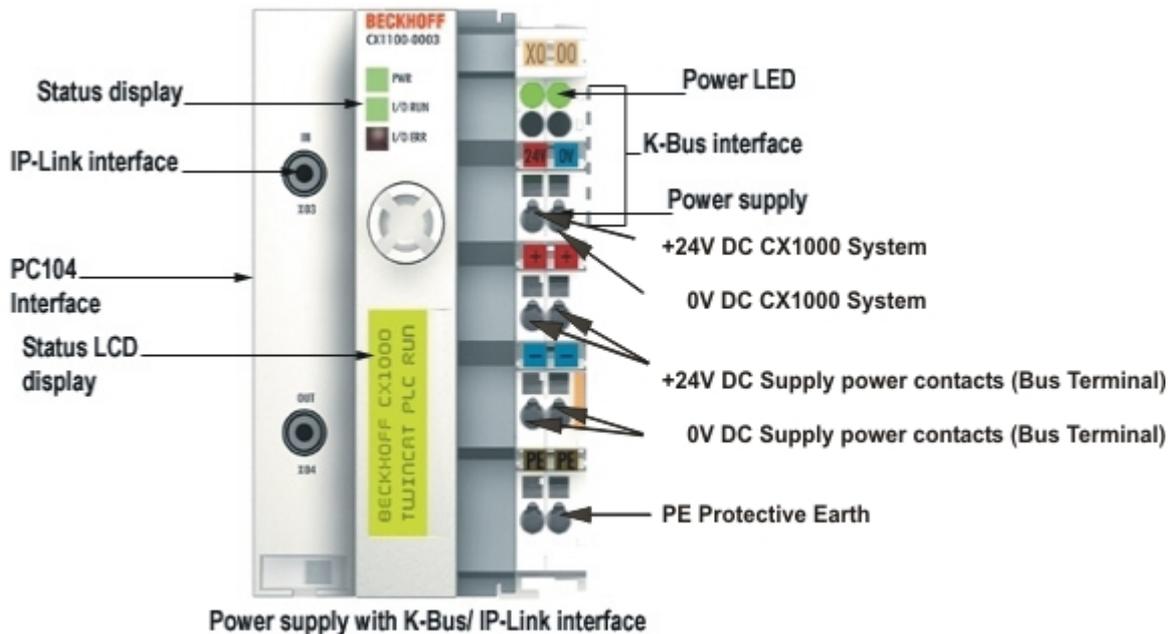
PE power contacts

The "PE" power contact must not be used for other potentials.

3. Setup monitor

Display settings

The CX1000 supports the display resolutions 640 x 480 dpi (VGA), 800 x 600 dpi (SVGA) and 1024 x 768 dpi (XGA).

A TFT display with DVI interface can be connected directly to the DVI-I port of the CX1000. Additionally, the connection of a standard CRT monitor is possible with a via DVI to VGA adaptor (part number: CX1900-0101).

The display settings for resolution and refresh rate have to take place inside the CX1000 Registry.

1. Go to *Start | Run...*

2. Type "regedit" at the appearing 'Open' dialog

3. Navigate to HKEY_LOCAL_MACHINE -> SOFTWARE -> GEODE and double-click on the value name 'Resolution' which is listed on the dialog on the right.

Different resolutions correlate with their applicable refresh rates. The 'Resolution' string value has to contain the refresh rate value.

E.g. for a resolution of

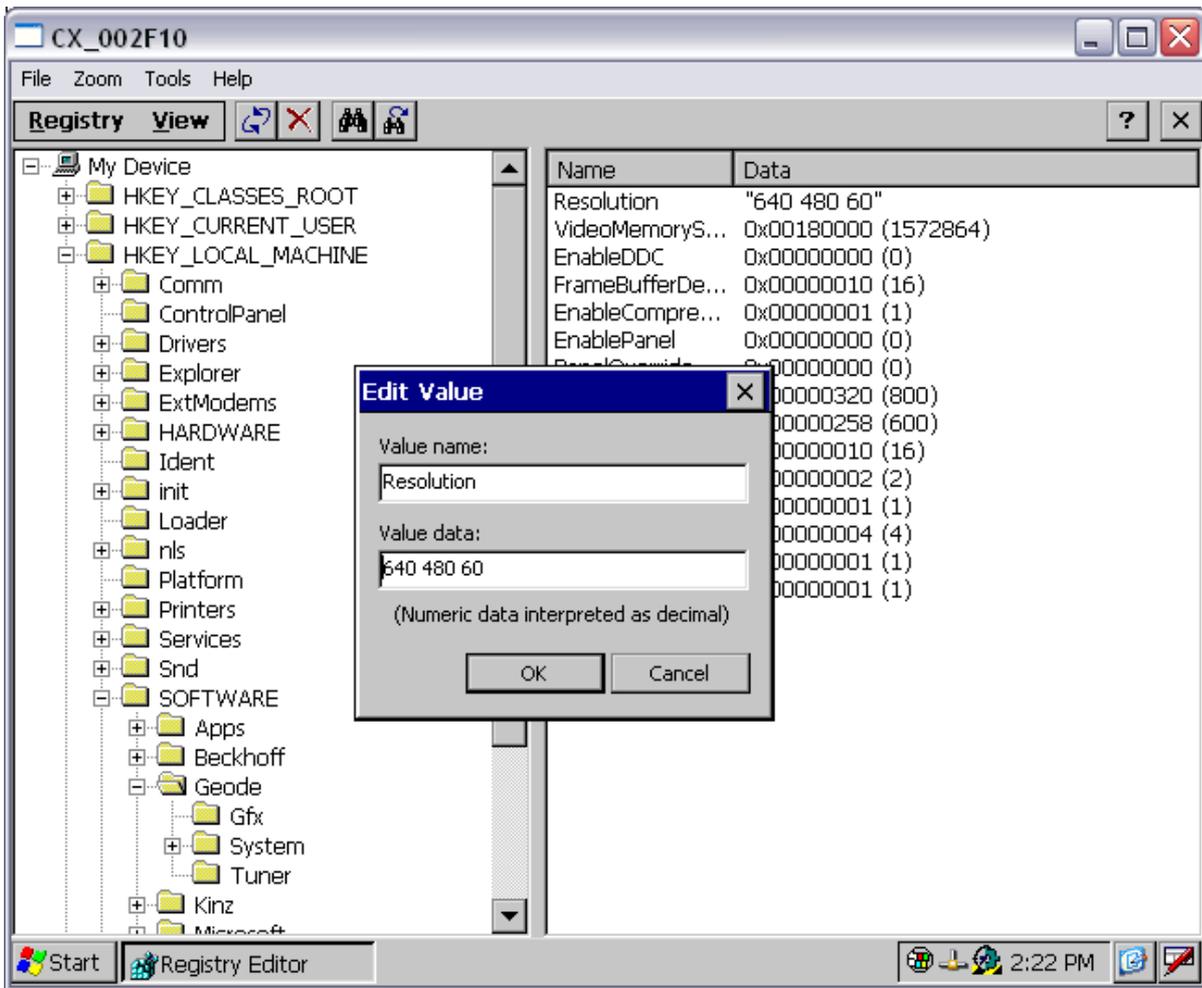640 x 480 (VGA) [default], please enter the following value: 640 480 60

800 x 600 (SVGA), please enter the following: 800 600 60

1024 x 768 (XGA), please enter the following: 1024 768 50

If you have a Windows CE based CX and the wrong resolution is currently configured, you can change the settings from a host system by using the CERHOST utility like done for the sample picture shown below.

Exit the Registry Editor afterwards and execute *Start | Suspend* for activation of the changed settings.

4. Appendix

Accessories

Compact flash cards

order number	Description
CX1900-0015	128 MByte compact flash card type I
CX1900-0017	256 MByte compact flash card type I
CX1900-0021	512 MByte compact flash card type I
CX1900-0023	1 GByte compact flash card type I
CX1900-0025	2 GByte compact flash card type I
CX1900-0027	4 GByte compact flash card type I

Connectors and Adaptors

order number	Description
CX1900-0101	DVI-to-VGA passive Adaptor for connecting a standard desktop VGA monitor to the CX1000 system – singles out the VGA signals of the DVI-I interface of the CX1000-N001 module – 29-pin male DVI-A connector (bottom) to 15-pin female connector (top) – weight approx. 40 g – dimensions (W x H x D) 40 x 42 x 15 mm

Labelling Tags

order number	Description
CX1900-0200	Universal plastic labels for the CX1000 system (package contains 1000 labels) – snaps into the premoulded spots on the CX1000 components – labelling can be done with a X-Y plotter – dimension of the single label 15 x 5 mm – material: white coloured plastic – Murrplastik type KMR 5/15, order number 86401014

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