Installation- and Operating instructions for

CU8801-0000

USB2.0-Extender-Tx

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BECKHOFF

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1 Foreword

1.1 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.

1.1.1 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.

1.1.2 Trademarks

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1.1.3 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.
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The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

1.1.5 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.

1.1.6 Delivery conditions

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

1.2 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	**Acute risk of injury!** If you **do not** adhere the safety advise adjoining this symbol, there is immediate danger to life and health of individuals!

WARNING	**Risk of injury!** If you **do not** adhere the safety advise adjoining this symbol, there is danger to life and health of individuals!

CAUTION	**Hazard to individuals!** If you **do not** adhere the safety advise adjoining this symbol, there is obvious hazard to individuals!

Attention	**Hazard to devices and environment** If you **do not** adhere the notice adjoining this symbol, there is obvious hazard to materials and environment.

Note	**Note or pointer** This symbol indicates information that contributes to better understanding.

1.3 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 (see chapter Maintenance)
- 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
- none of the safety and warning notes attached to product are removed, and that all notes remain legible.

2 Product Description

2.1 Product Overview

The Beckhoff CU8801-0000 USB2.0-Extender-Tx allows to extend the limits of USB cable length. Standard USB cable are specified for cable length up to 5 meters. For some industrial applications there is need for longer distances. This box can extend the distance up to 50 meters. This box sends the USB signals from input port to the receiver unit. Other outstanding features are:

- User-friendly installation via integrated DIN rail adapter

- No power supply needed – the box is supplied by USB (5V DC)

- 480 Mbit, 12 Mbit, and 1.5 Mbit support for compatibility to USB2.0 standard

- Standard CAT5 network cable for extension

- Compact industrial design.

2.2 Connections

2.2.1 Power Supply
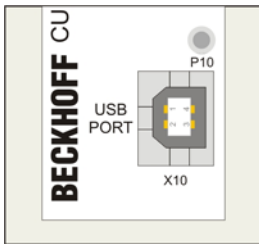
The USB2.0-Extender-Tx does not need any additional power supply. The power supply (5 V DC) is realized by the USB connector. The LED **P10** lights green when power supply is connected.

Note	**First establish USB connection** The USB connection between the Industrial PC and the CU8801-0000 should be established before switching the PC on, otherwise over-current messages can be displayed.

Attention	**UL Requirements** To meet the UL requirements, the USB hub CU8801-0000 must not be connected to unlimited power sources!

2.2.2 Data Connections

There are two kind of connectors: USB Port type B and RJ45 connector. The pins are described below:

USB type B Port (X10) (standard cable)
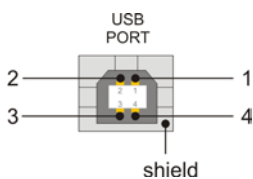
Pin	Assignment
1	VCC
2	Data -
3	Data +
4	GND
Shield	Shield

RJ 45 Port (X20) (standard CAT5 cable)

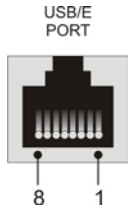| Pin	Assignment
1	MX0+
2	MX0-
3	MX1+
4	MX1-
5	MX2+
6	MX2-
7	MX3+
8	MX3-

2.3 LED-Diagnostics
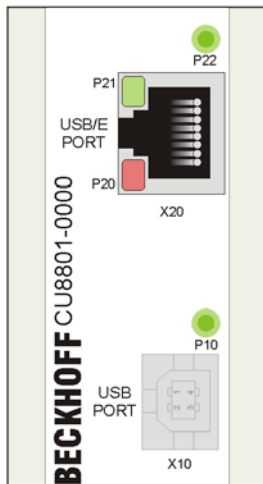
LED	Allocation	State	Meaning
P10	Power supply	off	no power supply
		lights green	5 V_{DC} connected via USB-Port
P20	Connection	off	no connection
		lights green	USB connection established between transmitter and receiver
P21	Activity	off	no data traffic
		lights yellow	data traffic between USB device and Host
P22	Host	off	no USB device connected or not identified
		lights green	connected USB device identified from Host

3 Installation

3.1 Transport and Unpacking

The specified storage conditions must be observed (see chapter Technical Data).

3.1.1 Transport

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

⚠ **Attention**	**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.

3.1.2 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.

If you notice any shipping damage or inconsistencies between the contents and your order, you should notify Beckhoff Service.

3.2 Mounting/ Demounting

The USB-Extender-Tx CU8801-0000 can be snapped onto a 35 mm mounting rail conforms to EN 50022:
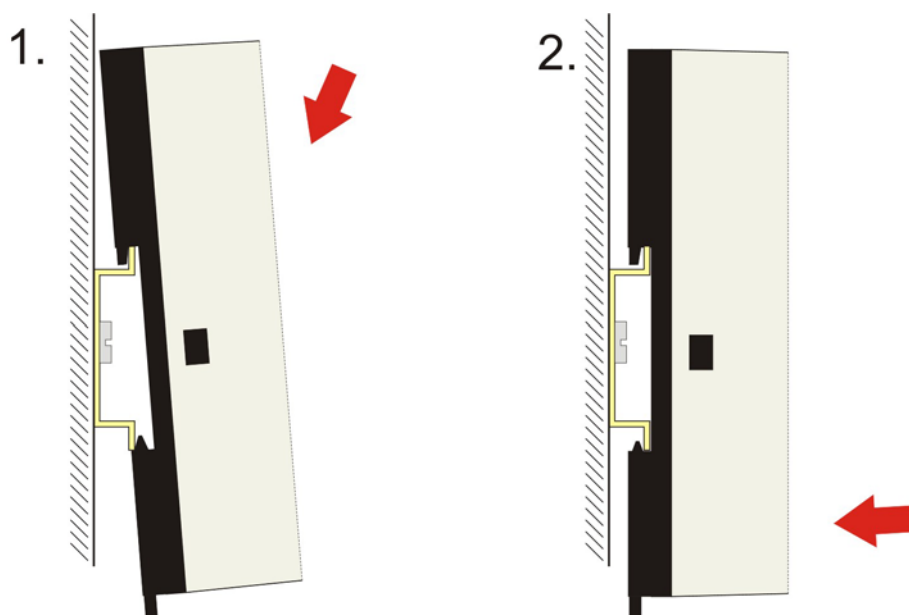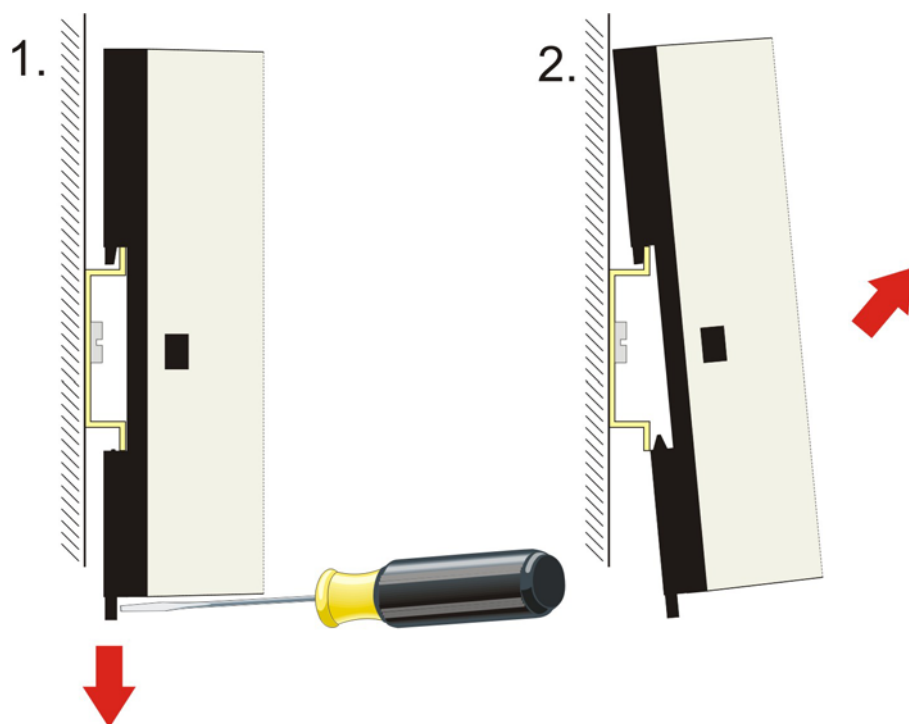

To release the CU8801-0000 from the mounting rail:

1. first pull the lug at the bottom of the hub downwards by using a screw driver (**1**)

2. then pull the hub from the mounting rail (**2**).

3.3 Connecting devices

⚠️ **Attention**	**The power supply plug must be withdrawn** 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!

3.3.1 Connecting cables

The connections are documented in the section Product Description.

When connecting the cables to the CU8801-0000, proceed according to the following sequence:

- Switch off all the devices that are to be connected

- Disconnect all the devices that are to be connected from the power supply

- Connect all the cables between the CU8801-0000 and the devices that are to be connected

- Reconnect all devices to the power supply.

3.3.2 Connecting Power Supply

The power supply is realized by the USB connector.

|	
🛈 **Note**	**First establish USB connection** The USB connection between the Industrial PC and the CU8801-0000 should be established before switching the PC on, otherwise over-current messages can be displayed.

4 Operation

4.1 Architecture Description

Within the USB2.0-Extender-Tx (CU8801) and USB2.0-Extender-Rx (CU8851) the length of USB data transmission can be increased from 35 meters (1 host, 5 USB hubs and a device each connected with 5 meters of cable) up to 61 meters. Due to the USB signal runtime, it is not possible to connect more than one USB hub in the chain. The following picture shows the maximal length of connection.

4.1.1 Configuration
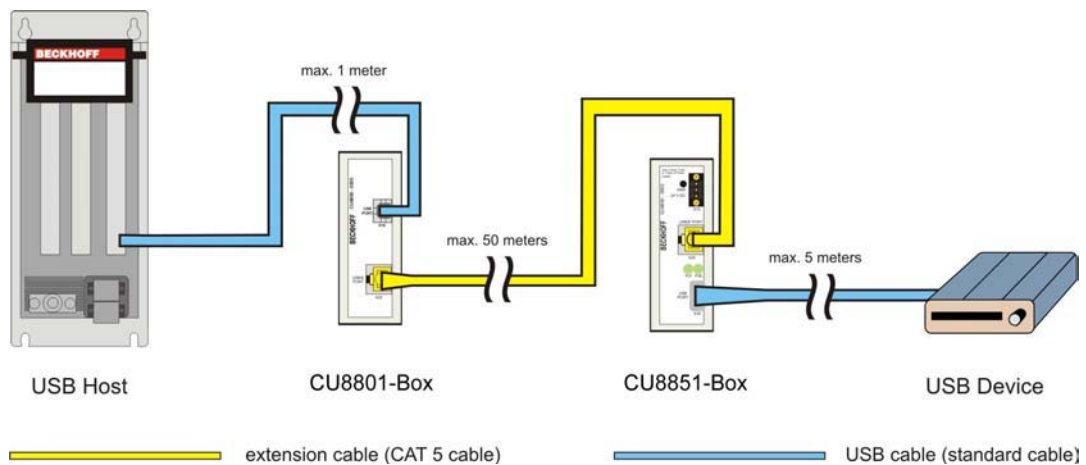
This configuration (1) contains no additional USB hub. The maximal distance of extension is 56 meters: 1 meter of cable to the extension box CU8801; up to 50 meters extension cable and 5 meters from extension box CU8851 to USB device.

4.1.2 Configuration 2
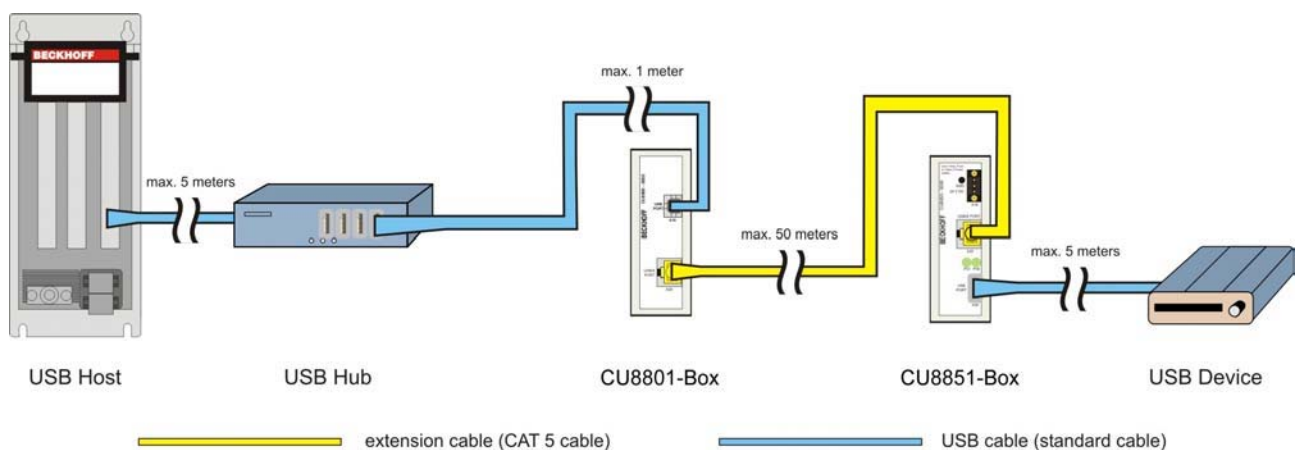
This configuration (2) contains an additional USB hub. The USB hub is connected directly to the host computer. The maximal distance of extension is 61 meters: 5 meters of cable from USB host to the USB hub; 1 meter cable to the extension box CU8801; up to 50 meters extension cable and 5 meters from extension box CU8851 to USB device.

4.1.3 Configuration 3
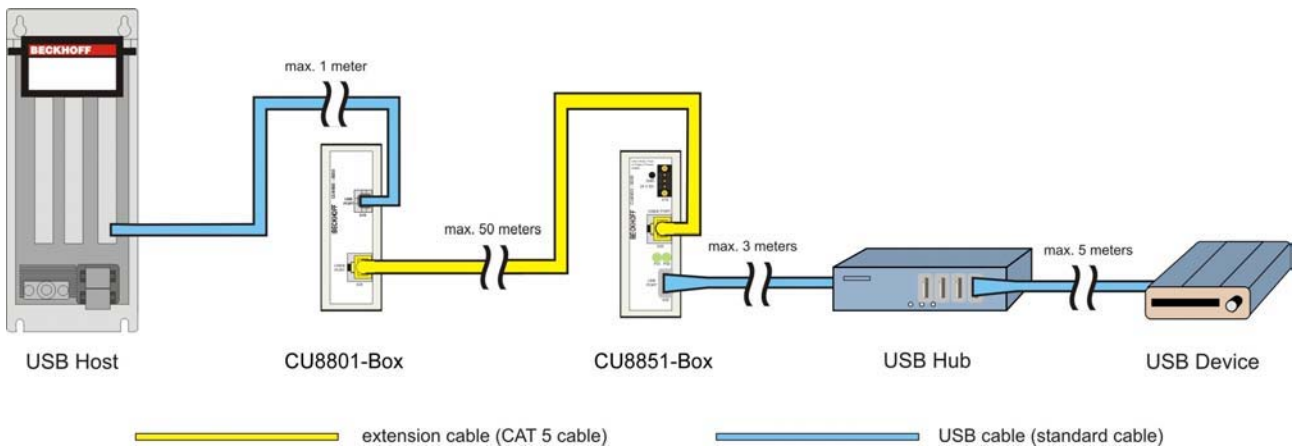
The third configuration (3) has nearly the same structure than configuration 2. The USB hub is connected after the extension. The maximal distance is also 61 meters: 1 meter of cable from USB host to the USB extension box CU8801; up to 50 meters extension cable; 5 meters from extension box CU8851 to USB hub and 5 meters of cable to the USB device.

4.1.4 Configuration 4
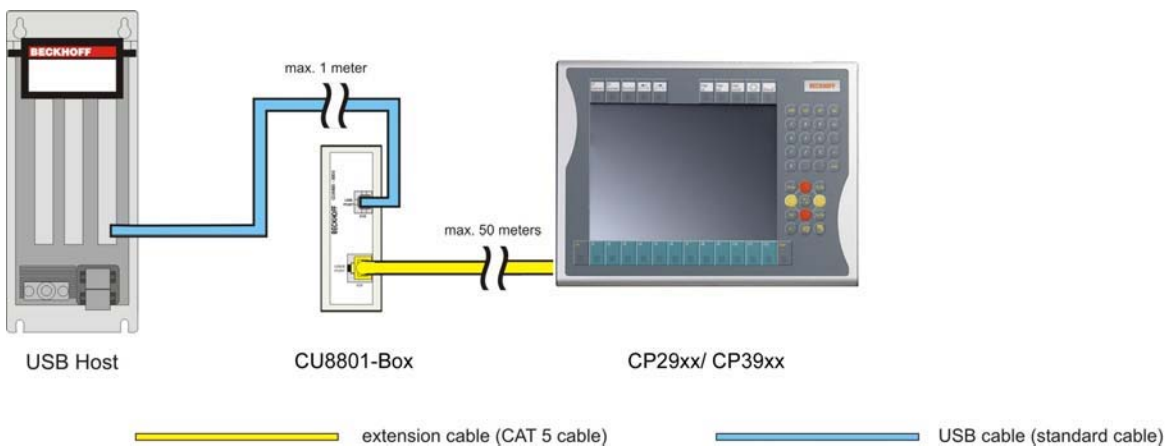

This configuration shows a CP29xx/ CP39xx Control Panel connected to the CU8801 extension box. The maximal distance of extension is 51 meters: 1 meter of cable from the host computer to the CU8801 extension box; up to 50 meters extension cable to the Control Panel.

4.2 Maintenance

4.2.1 Cleaning

	Disconnect power supply Switch off the device and all connected devices, and disconnect the device from the power supply.
DANGER	

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

4.2.2 Maintenance

The CU8801-0000 USB2.0-Extender-Tx is maintenance-free.

4.3 Shutting down

4.3.1 Disposal

	Observe national electronics scrap regulations Observe the national electronics scrap regulations when disposing of the device.
Note	

In order to dispose of the device, it must be removed and fully dismantled:
- Housing components (polycarbonate, polyamide (PA6.6)) are suitable for plastic recycling
- Metal parts can be sent for metal recycling
- Electronic parts such as disk drives and circuit boards must be disposed of in accordance with national electronics scrap regulations.

5 Dimensions

The product is characterized by small overall installed size. With a height of 100 mm, the module dimensions exactly match those of the Beckhoff Bus Terminals. Together with the lowered connector surfaces, this means that it can be used in a standard terminal box with a height of 120 mm.
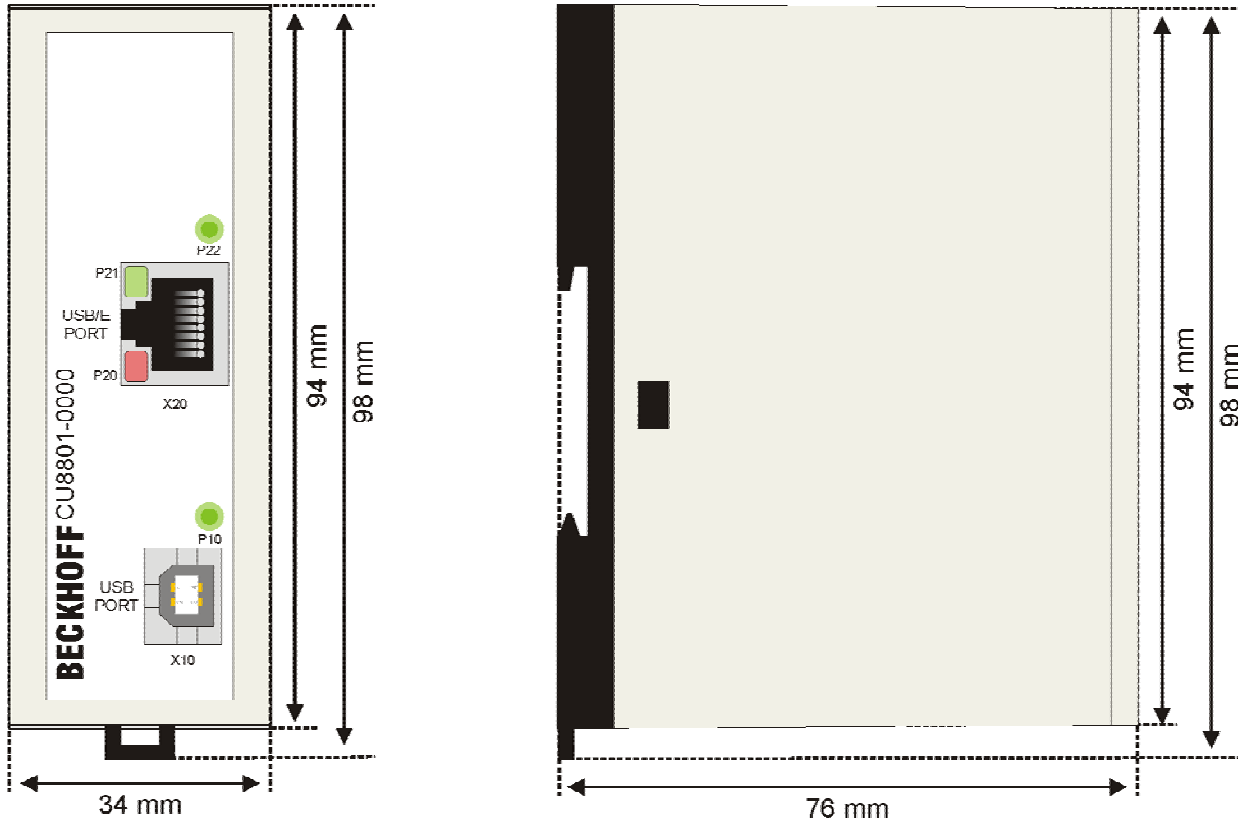
6 Technical Data

Product name	CU8801-0000
Number of USB type B ports (upstream)	1
Number of USB–Extender-Tx ports (RJ45)	1
Supported standard	USB 2.0 backward compatible
Supported baud rates USB	480 Mbit, 12 Mbit, 1.5 Mbit
Status display	4 LEDs
USB extension wiring length	maximum 50 meters
USB wiring length	maximum 1 meter
Power supply	by USB (5 V DC)
Max. current input from 5 V USB	maximum 500 mA @ 5 V DC
Current consumption from 5 V USB	maximum 25 mA @ 5 V DC
Current output over USB/E	maximum 150 mA @ 15 V DC
Dimensions (W x H x D)	app. 34 mm x 100 mm x 76 mm (with lug for mounting rail release)
Weight	app. 95 g
Permissible ambient temperature	0°C to +55°C (operation) -25°C to +70°C (transport/ storage)
Permissible relative humidity	5% to 95%, no condensation
EMC resistance burst / ESD	EN 60000-6-2 / EN 60000-6-4
Vibration / Shock resistance	EN 60068-2-6 / EN 60068-2-27
Assembly	on 35 mm mounting rail conforms to EN 50022
Installation position	any
Protection class	IP20
Approvals	CE, UL (in preparation)

7 Appendix

7.1 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.

7.1.1 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. You will also find further documentation for Beckhoff components there.

7.1.2 Beckhoff company headquarters

Beckhoff Automation GmbH
Eiserstraße 5
33415 Verl
Germany

Phone: + 49 (0) 5246/963-0
Fax: + 49 (0) 5246/963-198
E-mail: info@beckhoff.de
Web: http://www.beckhoff.de/

Beckhoff Support
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- and extensive training program for Beckhoff system components

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Fax: + 49 (0) 5246/963-9157
E-mail: 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

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

7.2 Approvals for USA and Canada

7.3 FCC Approval for USA

FCC: Federal Communications Commission Radio Frequency Interference Statement
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.

	Technical modifications
i **Note**	Technical modifications to the device may cause the loss of the FCC approval.

7.4 FCC Approval for Canada

FCC: Canadian Notice
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.