



Installation- and Operating instructions for
USB-Extender-Rx
CU8850-0000

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BECKHOFF

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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.

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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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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.



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

This symbol indicates information that contributes to better understanding.

Product Description

Product Overview

View of the CU8850-0000
USB-Extender-Rx



The USB specification allows a distance of 5 m between the PC and the USB devices. A further 5 metres of cable can be added by using a USB hub. In the construction of machines and plants, larger distances must be bridged without having to insert a USB hub every 5 metres. The CU8800 USB Extender sends the USB signal via a CAT5 cable that can be up to 50 m long to the CU8850 USB Extended receiver, which converts the signal back to USB. Data rates of up to 12 Mbit/s can be transmitted. Both USB Extender boxes are designed for DIN rail mounting.

Other outstanding features are:

- user-friendly installation via integrated top hat rail adapter
- 24 V_{DC} supply voltage – the standard in industrial environments
- 12 Mbit, and 1.5 Mbit support for compatibility to all USB1.1 standards
- standard CAT5 network cable for extension
- compact industrial design
- clear quick diagnosis by separate LEDs for power supply in and out

Power supply

Additional 24 V_{DC} power supply

Normally the USB-Extender-Rx CU8850 is powered via the USB-extension. The device can also be powered by an additional power supply **(X10)**.

If a USB device needs more than the specified max. of 300mA, the additional power supply **must** be connected.

The pins have to be connected as shown on the front panel of the CU8850-device.



Power Supply

UL requirements

For the compliance of the UL requirements the USB-Extender-Rx should only be supplied

- by a 24 V_{DC} supply voltage, supplied by an isolating source and protected by means of a fuse (in accordance with UL248), rated maximum 4 Amp.
- by a 24 V_{DC} power source, that has to satisfy NEC class 2. A class 2 power supply shall not be connected in series or parallel with another (class 2) power source!



Danger

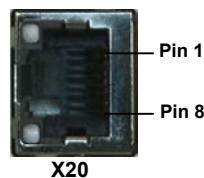
To meet the UL requirements, the USB hub CU8800-0000 must not be connected to unlimited power sources!

Data Connectors

The CU8850 has two kinds of connectors: RJ45 and USB type A. The pin layouts are described below.

RJ 45 Port (X20) (standard CAT5-cable)

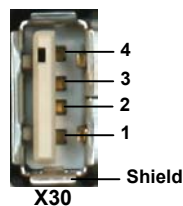
RJ 45 Port



Pin	Signal	Belegung
1	15 V	15 V +
2	GND	GND
3	TX	USB TX
4	RX	USB RX
5	RX	USB RX
6	TX	USB TX
7	15 V	15 V +
8	GND	GND

USB Typ A Port (X30) (standard-cable)

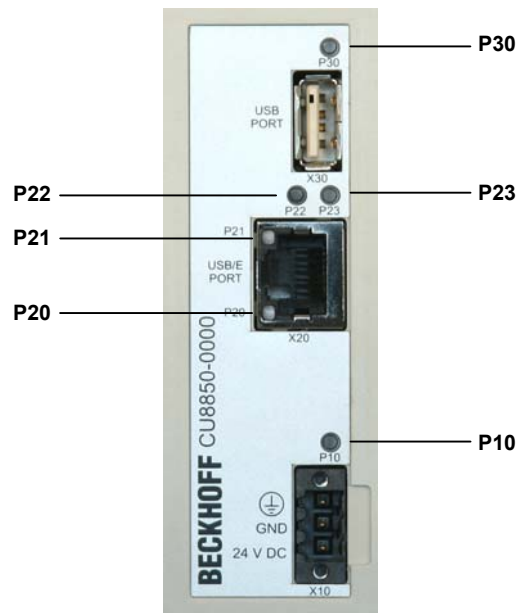
USB Typ A Port



Pin	Signal
1	VCC
2	Data -
3	Data +
4	GND
Shield	Shield

LED Diagnostics

LED Diagnostics



The following table shows the possible states for the LEDs:

LED	Assignment	Status	Meaning
P10	Power Supply	off	No power supply connected
		lights green	24 V _{DC} connected
P20	USB Suspend	Off	USB is operational
		Lights	USB is in suspend mode/ no device connected
P21	USB 15 V	Off	No 15 V supplied
		Lights	15 V supplied to USB extension
P22	USB Device Full-Speed	Off	Full-speed device connected
		Lights	No device connected
P23	USB Device Low-Speed	Off	Low-speed device connected
		Lights	No device connected
P30	Current load at USB Port	lights green	Current < 500 mA
		lights red	Current > 500 mA

Installation Instructions

Please also refer to chapter *Fehler! Verweisquelle konnte nicht gefunden werden.*

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, the unit 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:

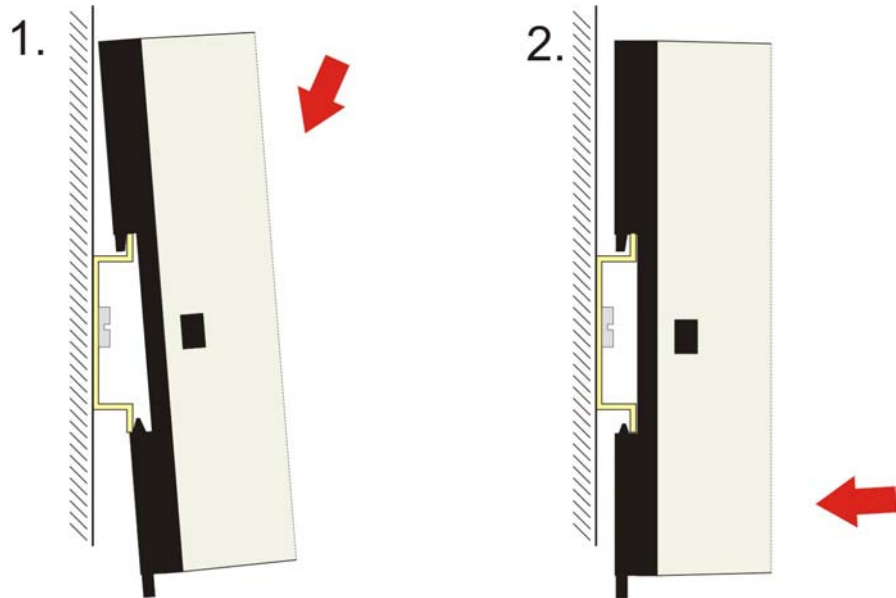
1. Remove packaging.
2. Do not discard the original packaging. Keep it for future relocation.
3. Check the delivery for completeness by comparing it with your order.
4. Please keep the associated paperwork. It contains important information for handling the unit.
5. Check the contents for visible shipping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

Mounting/ Unmounting

The CU8850 can be snapped onto a 35 mm mounting rail conforms to EN 50022.

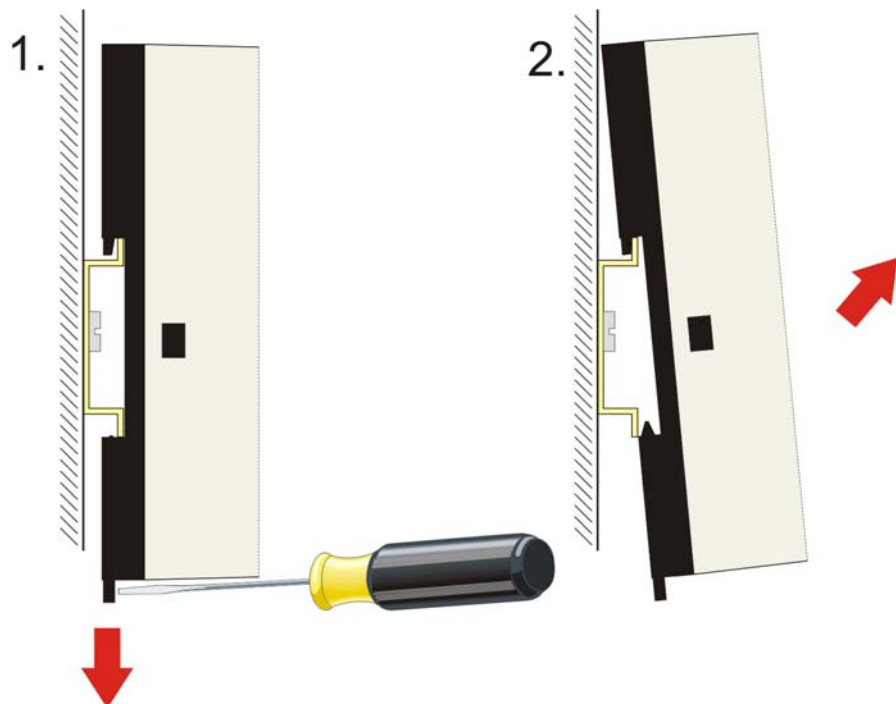
Mounting the
USB-Extender-Rx

Just push the unit on the lower side under the rail (**fig. 1**) and snap in the upper side (**fig. 2**) as shown below:



Unmounting the
USB-Extender-Rx

To release the CU8850 USB-Extender-Rx from the mounting rail push up the unit (**fig. 1**) and pull off the device from the rail (**fig. 2**):



**Warning**

Connecting devices

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!

Connecting cables

The connectors are documented in the section [Product Description](#).

When connecting the cables to the CU8850 USB-Extender-RX, 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 CU8850 and to the devices that are to be connected.
- Reconnect all devices to the power supply.

Check voltage rating and connect

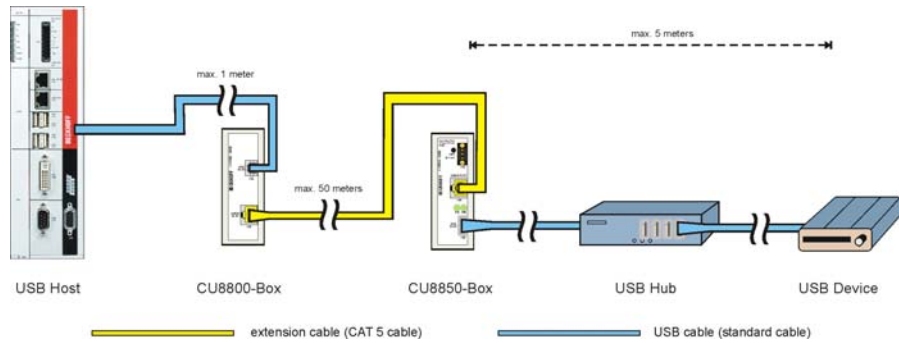
1. Check that the external power supply is providing the correct voltage.
2. Connect the unit to your external 24 V_{DC} power supply.

Operating Instructions

Architecture Description

Within the USB-Extender-TX (CU8800) and USB-Extender-RX (CU8850) 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.

Configuration



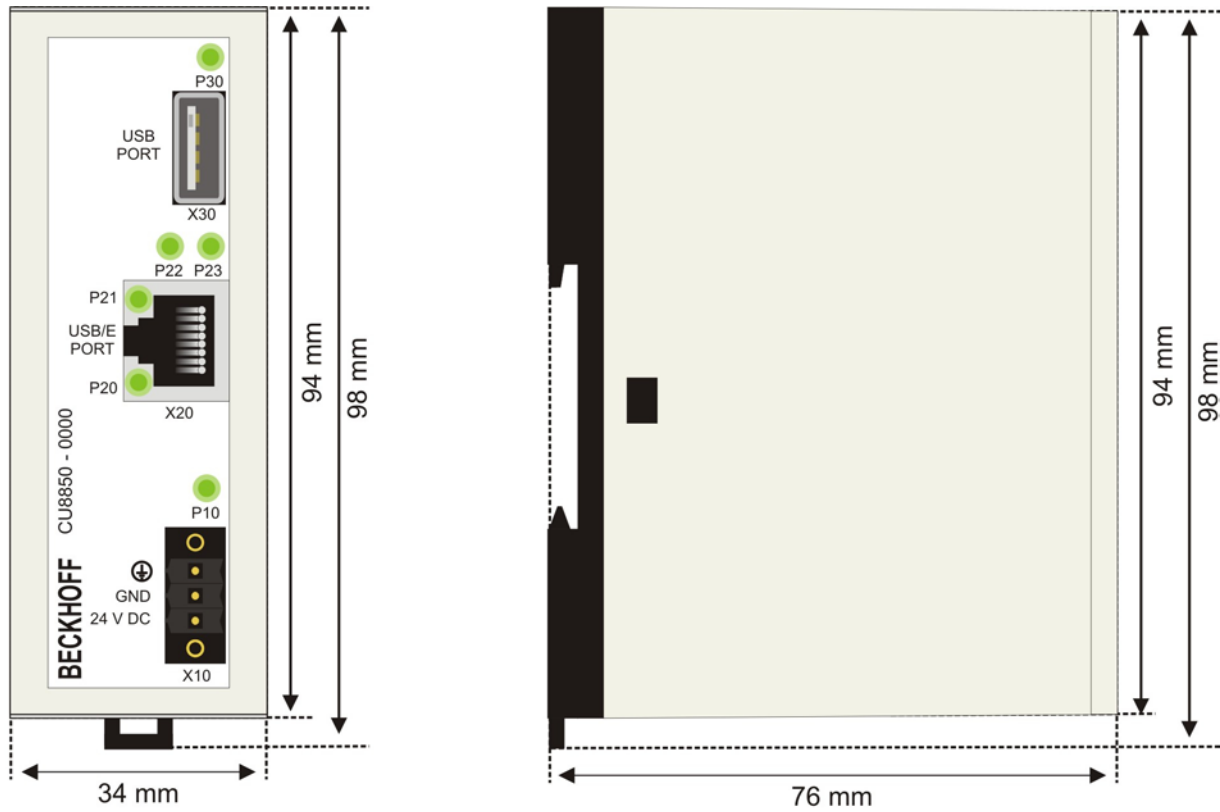
The USB hub has to be connected after the CU8850-Box.

The maximal distance is 56 meters: 1 meter of cable from USB host to the USB extension box CU8800; up to 50 meters extension cable; 5 meters from extension box CU8850 to the USB device via the USB hub.

Appendix

Assembly dimensions

The product is characterized by small overall installed size. With a height of approx. 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.



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You will also find further [documentation](#) for Beckhoff components there.

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

Technical data

Number of ports	USB Type A ports (upstream): 1 USB Extender Rx ports (RJ45): 1
Supported standard	USB 1.1
Supported baud rates	12 Mbit (Full Speed), 1.5 Mbit (Low Speed)
Status display	2 LEDs
USB extension wiring length	Maximum 50 meters
USB wiring length	Maximum 5 meters
Additional Power supply	24 V _{DC} (-15% to +20%), protected against polarity reversal. To meet the UL requirements use 4 A fuse or class 2 power supply!
Power output (USB)	Maximum 300 mA (without additional power supply) Maximum 500 mA (with connected additional power supply)
Power consumption device	Maximum 500 mW
	The following conditions must be observed during operation:
Environmental conditions	Ambient temperature: 0 to 55°C (operation) -25°C to +70°C (transport/ storage) Atmospheric humidity: Maximum 95%, non-condensing
Vibration/ Shock resistance	EN 60068-2-6 / EN 60068-2-27
EMC resistance burst/ ESD	EN 60000-6-2 / EN 60000-6-4
Protection class	IP20
Do not use the CU8850 in areas of explosive hazard	The DVI splitter may not be used in areas of explosive hazard.
Dimensions (W x H x D)	Approx. 34 mm x 100 mm x 76 mm (with mounting for DIN rail)
Weight	Approx. 95 g
Assembly	On 35 mm mounting rail conforms to EN 50022
Installation position	Any
Approvals	CE UL (for details see chapter UL requirements)

Approvals for USA and Canada

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.