

BECKHOFF New Automation Technology

Manual | EN

CU8210-D004-0101

LTE USB Stick for North America



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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 applicable national standards.

It is essential that the documentation and the following notes and explanations are followed when installing and commissioning the components.

It is the duty of the technical personnel to use the documentation published at the respective time of each installation and commissioning.

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.

Disclaimer

The documentation has been prepared with care. The products described are, however, constantly under development.

We reserve the right to revise and change the documentation at any time and without prior announcement.

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, EP1456722, EP2137893, DE102015105702

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1.1 Representation and structure of warnings

The following warnings are used in the documentation. Read and follow the warnings.

Warnings relating to personal injury:

⚠ DANGER

Hazard with high risk of death or serious injury.

⚠ WARNING

Hazard with medium risk of death or serious injury.

⚠ CAUTION

There is a low-risk hazard that can result in minor injury.

Warnings relating to damage to property or the environment:

NOTE

There is a potential hazard to the environment and equipment.

Notes showing further information or tips:



This notice provides important information that will be of assistance in dealing with the product or software. There is no immediate danger to product, people or environment.

1.2 Documentation issue status

Version	Modifications
1.0	First version
1.1	Chapter "Technical data" revised

2 For your safety

Read the chapter on safety and follow the instructions in order to protect from personal injury and damage to equipment.

Limitation of liability

All the components are supplied in particular hardware and software configurations appropriate for the application. Unauthorized modifications and changes to the hardware or software configuration, which go beyond the documented options, are prohibited and nullify the liability of Beckhoff Automation GmbH & Co. KG.

In addition, the following actions are excluded from the liability of Beckhoff Automation GmbH & Co. KG:

- Failure to comply with this documentation.
- Improper use.
- Use of untrained personnel.
- Use of unauthorized replacement parts.

2.1 Intended use

With the CU8210-D004-0101 4G USB stick, Beckhoff Industrial PCs can be equipped with a GSM/UMTS/LTE modem and subsequently connect to a mobile communication network. The USB stick can also receive and send text messages using the Short Message Service (SMS).

The 4G USB stick was developed for a work environment that conforms to protection class IP20. This involves finger protection and protection against solid foreign objects up to 12.5 mm, but not protection against water. Operation of the devices in wet and dusty environments is not permitted, unless specified otherwise. The specified limits for electrical and technical data must be adhered to.

The 4G USB stick is used to:

- equip Industrial PCs with an internet connection in rural areas without a comprehensive wired infrastructure;
- establish a mobile communication connection between devices over long distances,
- or to reach difficult to access machine or plants such as wind turbines more easily. In addition, service technicians can check the status of a plant with the help of a direct connection to the Device Manager or a remote connection.

Improper use

The 4G USB stick is not suitable for operation in the following areas:

- areas in which the use of radio devices is prohibited.
- Potentially explosive atmospheres.
- Areas with an aggressive environment, e.g. aggressive gases or chemicals.
- applications that require real-time communication via radio.

2.2 Staff qualification

All operations involving Beckhoff software and hardware may only be carried out by qualified personnel with knowledge of control and automation engineering. The qualified personnel must have knowledge of the administration of the Industrial PC and the associated network.

All interventions must be carried out with knowledge of control programming, and the qualified personnel must be familiar with the current standards and guidelines for the automation environment.

2.3 Safety instructions

The following safety instructions must be followed during installation and working with networks and the software.

Mobile communication

- Make sure that a minimum distance of 20 cm is maintained to people during operation.
- The USB stick can be impaired in the vicinity of metal constructions or plants that emit electromagnetic waves. Plan the distances and use the USB stick in such a way that the connection between the USB stick and the mobile communication network is as unobstructed as possible.
- Do not allow any dust, liquids or vapors that could damage the USB stick to get inside it. Use the USB stick together with the CU8210-M001-01x0 cabinet dome in order to protect it against environmental influences.

Working with networks

- Restrict access to all devices to an authorized circle of persons.
- Change the default passwords to reduce the risk of unauthorized access.
- Protect the devices with a firewall.
- Apply the IT security precautions according to IEC 62443, in order to limit access to and control of devices and networks.

3 Product overview

The 4G USB stick is equipped with a GSM/UMTS/LTE modem, which makes a wireless connection to a mobile communication infrastructure possible. Industrial PCs that require a mobile communication connection can be retrofitted with the 4G USB stick.

The USB stick is available in three different country versions and enables global use for industrial applications. The USB stick is downwardly compatible and supports the 2G and 3G band.

The USB stick enables the exchange of data at a transfer rate of up to 150 Mbit/s (DL) and 50 Mbit/s (UL) and can also be controlled with the help of AT commands.

The equipment of the USB stick includes:

- a USB interface for the supply of power and data transmission,
- a slot for a Mini-SIM (2FF)
- a built-in main and diversity antenna
- two CRC9 (TS-5) interfaces for external antennas.

3.1 Structure

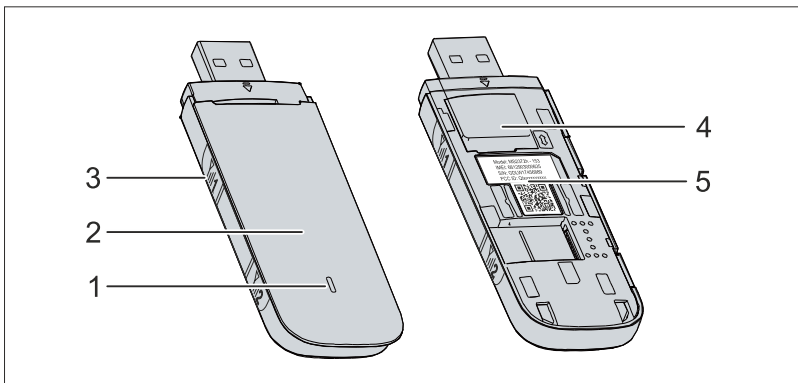


Fig. 1: Structure of a CU8210-D004-0101 4G USB stick.

Table 1: Legend for the configuration.

No.	Component	Description
1	Diagnostic LED [► 15]	The diagnostic LED indicates the status of the USB stick and, for example, whether the USB stick is switched on, whether a network is within range or whether the USB stick has already established a connection.
2	cover	The SIM card slot is located under the cover.
3	External antenna	Interface for the connection of an external antenna. A total of 2 CRC9 (TS-5) interfaces are available.
4	Installing a SIM card [► 12]	Slot for the SIM card.
5	Name plate	The name plate can be used for the identification of the model and is located under the cover.

3.2 System requirements

Table 2: System requirements - CU8210-D004-0101.

Operating system	Version
Windows	Windows 7 (32 and 64-bit) Windows 10 (32 and 64-bit)
TwinCAT/BSD	TwinCAT/BSD v.12.1

4 Installing a SIM card

NOTE

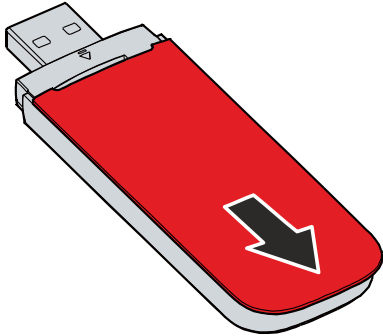
Short circuit

The SIM card or the USB stick can be damaged. Do not remove the SIM card during operation and switch the Industrial PC off.

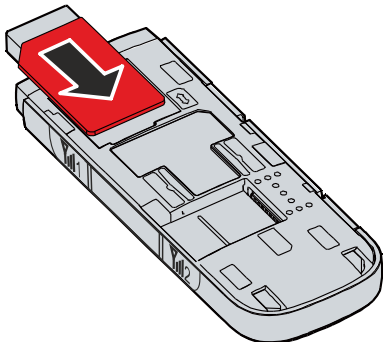
In this work step we show you how to install a SIM card in the USB stick. Use the Mini-SIM card format. You can also use a Micro or Nano-card with an appropriate adapter.

Proceed as follows:

1. Push the cover of the USB stick back and remove it.



2. Push the SIM card into the SIM card slot with the chip facing downwards. The diagonal edge points towards the USB plug.



3. Place the cover on the USB stick and push it forwards until it engages again.
⇒ In the next step you can establish a connection to the mobile communication network.

5 Configuration

5.1 Installing the driver

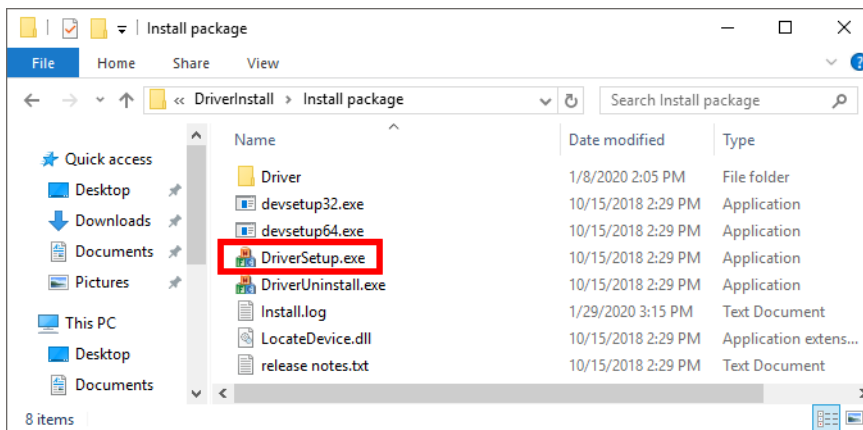
In this work step we show you how to install the driver for the 4G USB stick. Following the installation, a new network interface is created in Windows.

Requirements:

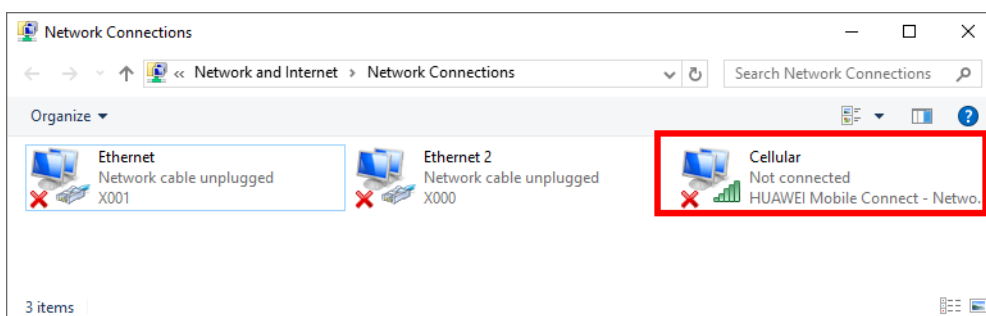
- Driver: Provided by Beckhoff Service.

Proceed as follows:

1. Make sure that the USB stick is not yet connected to the Industrial PC.
2. Run the *DriverSetup.exe* file to start the installation.



3. Following successful installation, an entry is made in the log file *Install.log*. The installation routine does not give any feedback about the success of the installation. The following message may appear after the installation: "This program might not have installed correctly". You can ignore this message.
 4. Connect the USB stick. The USB stick is ready for operation in the background following a short installation.
- ⇒ The driver has been successfully installed if a new interface for mobile connections appears.



In the next step you can start a mobile communication connection.

5.2 Establishing a mobile communication connection

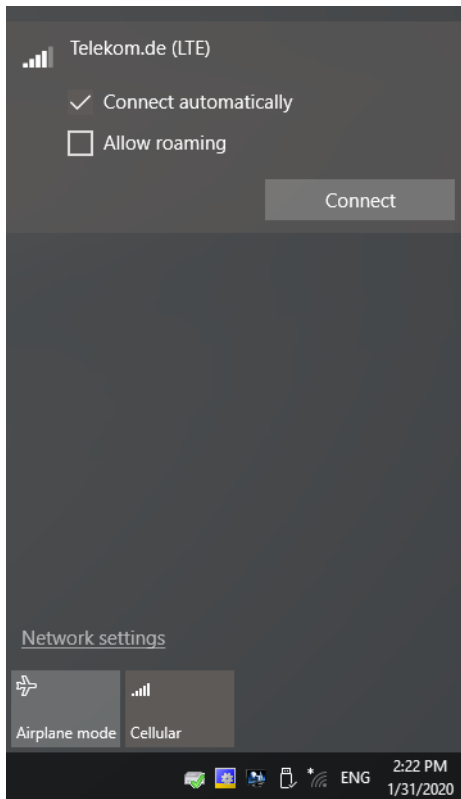
In this step we show you how to establish a mobile communication connection. You need a connection with a mobile communication provider, which will provide you with further access data.

Requirements:

- Connection with a mobile communication provider.
- Industrial PC with already installed drivers (see: [Installing the driver \[► 13\]](#))

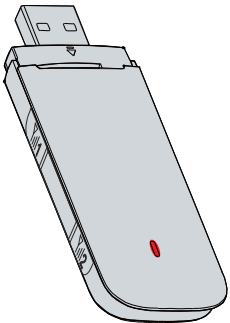
Proceed as follows:

1. Click the network symbol at the bottom right in the taskbar to display the available connections.



2. Choose the appropriate connection and click **Connect**.
 3. You have to enter a PIN if the SIM card is protected by one.
- ⇒ Depending on the mobile communication provider, you must configure the connection in a browser and enter additional access data. The access data will be provided to you by the mobile communication provider.

6 Diagnostic LED

Display	Flashing code	Description
	red	No signal
	yellow	Weak signal
	green	Strong signal
	white	The software of the 4G USB stick is being updated

7 Technical data

Table 3: Technical data, dimensions and weights.

	CU8210-D004-0101
Dimensions (W x H x D)	88 mm x 28 mm x 11.5 mm
Weight	approx. 30 g

Table 4: Technical data, general data.

	CU8210-D004-0101
Type	4G USB-2.0 stick
LTE	R9
HSPA+/HSDPA/HSUPA/WCDMA	R8
4G band	B1/B2/B4/B5/B7/B12/B28
3G band	B1/B2/B4/B5
2G band	850/900/1800/1900
Output power	LTE +23 dBm (Power Class 3) HSPA+/HSUPA/HSDPA/WCDMA +24 dBm (Power Class 3)
Sensitivity	LTE according to 3GPP TS 36.101 (R9) WCDMA/HSPA/HSPA+ according to 3GPP TS 25.101(R8)
Data transfer rate	LTE DL 150 Mbit/s, UL 50 Mbit/s DC-PA+ DL 42 Mbit/s, UL 5.76 Mbit/s HSPA+ DL 21 Mbit/s, UL 5.76 Mbit/s
Power supply	5 V
Operating systems	Windows 7/10, TwinCAT/BSD
SIM card	USIM card, format: Mini-SIM (2FF)
Internal antenna	supports antenna diversity for 3G/4G
External antenna (optional)	2 CRC9 (TS-5) interfaces
Telecommunication services	Short Message Service (SMS)
Diagnostic LED	1 network status

Table 5: Technical data, approvals.

	CU8210-D004-0101
Approvals	Northamerica

Table 6: Technical data, environmental conditions.

	CU8210-D004-0101
Ambient temperature during operation	-20...+55 °C
Ambient temperature during storage	-40...+70 °C
Protection class	IP 20

7.1 Dimensions

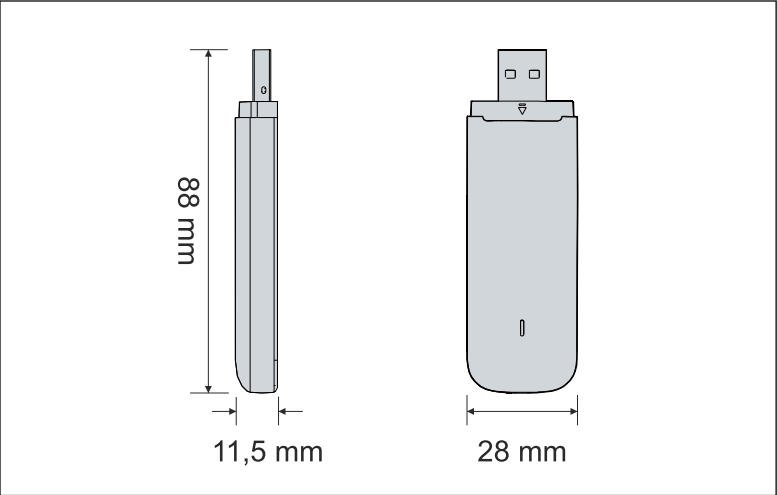


Fig. 2: CU8210-D004-0101 dimensions.

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