

**BECKHOFF** New Automation Technology

Manual | EN

# CU8210-D004-0200

LTE USB stick for USA, Canada, Europe, Taiwan, Australia, New Zealand





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# 1 Notes on the documentation

This description is intended exclusively for trained specialists in control and automation technology who are familiar with the applicable national standards.

It is absolutely necessary to comply with the documentation and the following notes and explanations when installing and commissioning the components.

The trained specialists must always use the current valid documentation.

The trained specialists must ensure that the application and use of the products described is in line with all safety requirements, including all relevant laws, regulations, guidelines, and standards.

## Disclaimer

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

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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:****NOTICE**

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" adapted

## 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-D004-0200 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 or CU8210-M002-0100 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 suitable for worldwide use, please note the regionally required radio certificates before commissioning. 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 nano-SIM (4FF)
- a slot for a microSD card

#### 3.1 Structure

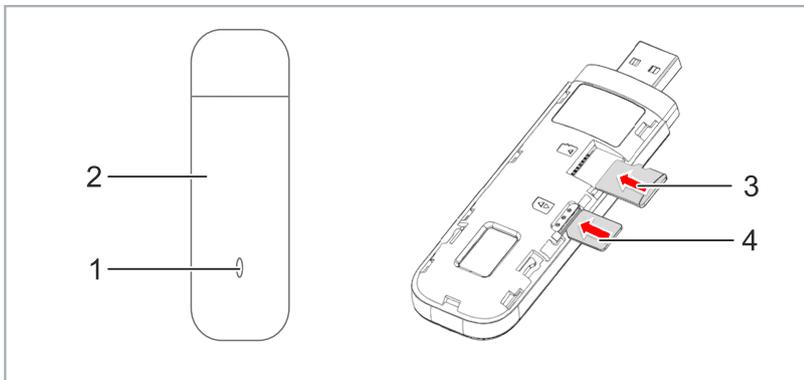


Fig. 1: Structure of a CU8210-D004-0200 4G USB stick.

Table 1: Legend for the configuration.

No.	Component	Description
1	<a href="#">Diagnostic LED [► 19]</a>	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	MicroSD card	Slot for microSD card as removable data storage device. Cards up to 32 GB are supported.
4	Nano-SIM	Slot for the SIM card.

## 3.2 System requirements

Table 2: CU8210-D004-0200 System requirements.

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

## 4 Insert SIM and microSD card

### NOTICE

#### Short circuit

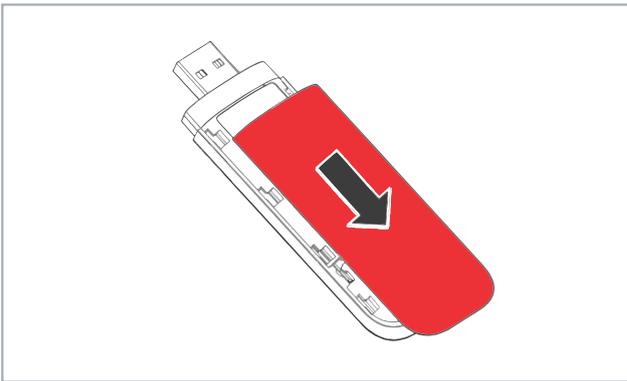
The SIM card or the USB stick can be damaged. Do not remove the SIM card during operation and switch the Industrial PC off.

In this work step we show you how to insert a SIM and microSD card in the USB stick. Use the nano-SIM card format for the SIM card slot.

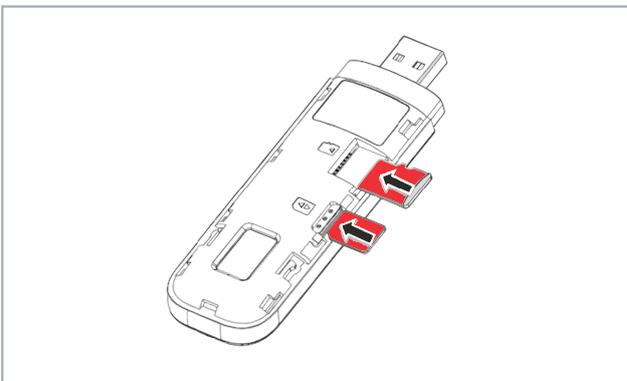
If you insert a microSD card into the USB stick, the stick can also be used as a removable data storage device. microSD cards with up to 32 GB storage capacity are supported.

#### 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 away from the USB plug.



3. Push the microSD card into the microSD card slot with the contacts facing down.
  4. 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.

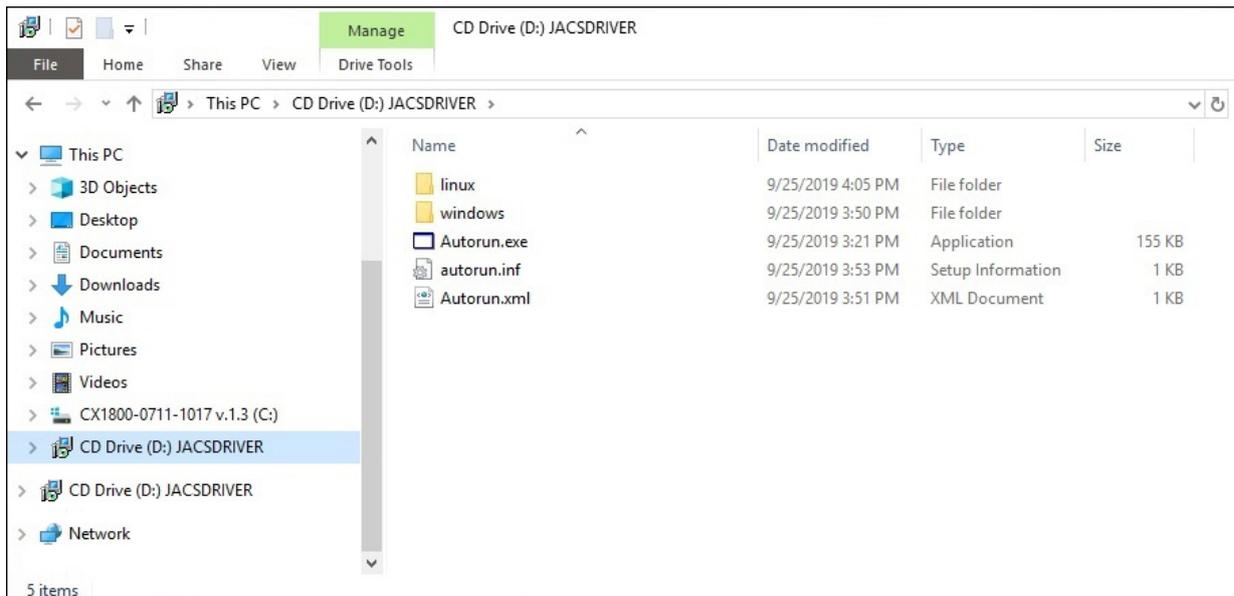
## 5 Configuration

### 5.1 Installing the driver

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

**Proceed as follows:**

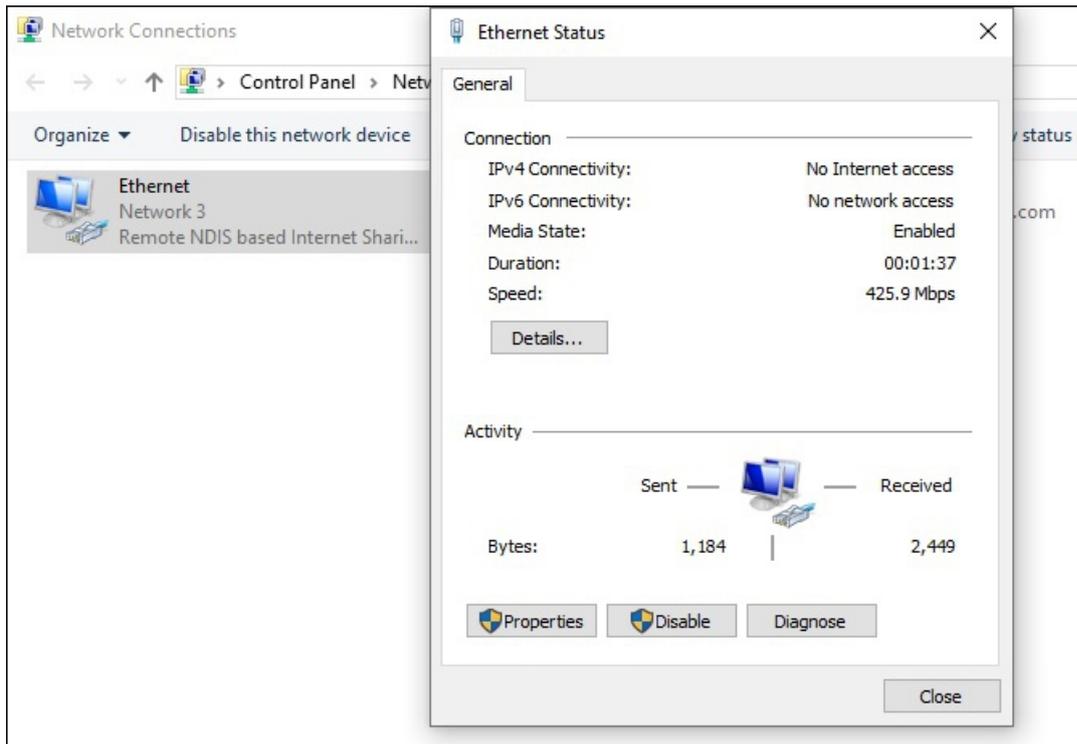
1. Connect the USB stick.
2. The USB stick is recognized as a CD drive.
3. Run the *Setup.exe* file to start the installation.



4. After installation, new devices are detected.



⇒ The drivers have been installed successfully if a new network interface appears.



In the next step you can use the tool **Beckhoff LTE Stick**, search for the LTE stick and set up the access point name (APN) of the network provider (see: [Set up Access Point Name \(APN\)](#) [► 15]).

## 5.2 Set up Access Point Name (APN)

Initially and once only, the USB stick must be given the access point name (APN), the access point of the network provider. You must ask your provider for the appropriate access point information. The tool **Beckhoff LTE Stick** is available for setting up the APN.

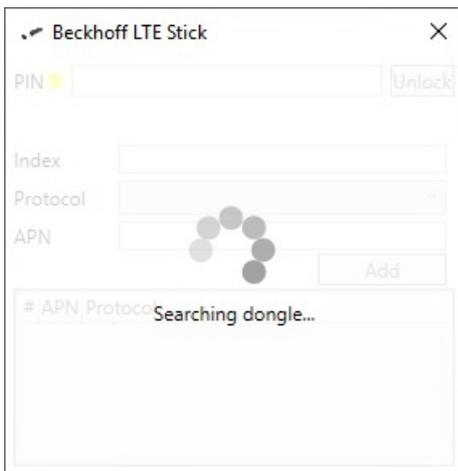
You can also set up the LTE stick using AT commands via a tool such as PuTTY (see: [Use AT commands](#) [► 18]).

Requirements:

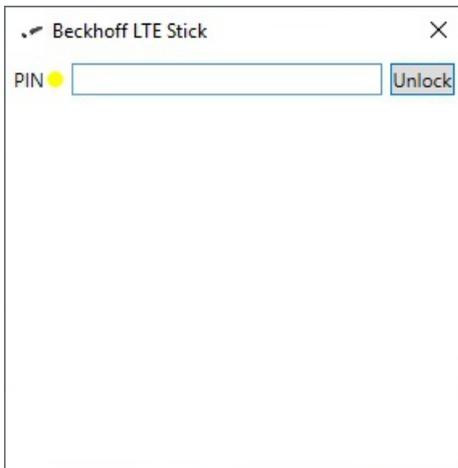
- Inserted SIM card.
- The **Beckhoff LTE Stick** tool. Provided by Beckhoff Service.

**Proceed as follows:**

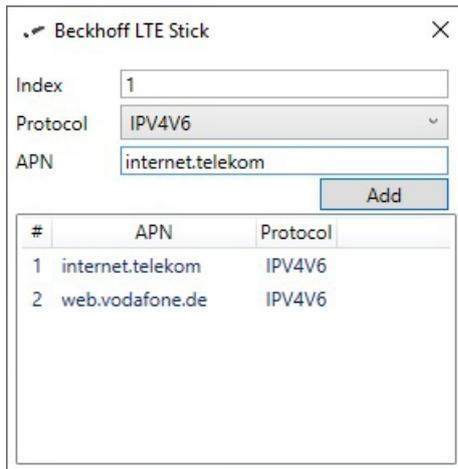
1. Run the program *bhf.ltestick.exe* as administrator.  
The tool scans the system for connected LTE sticks.



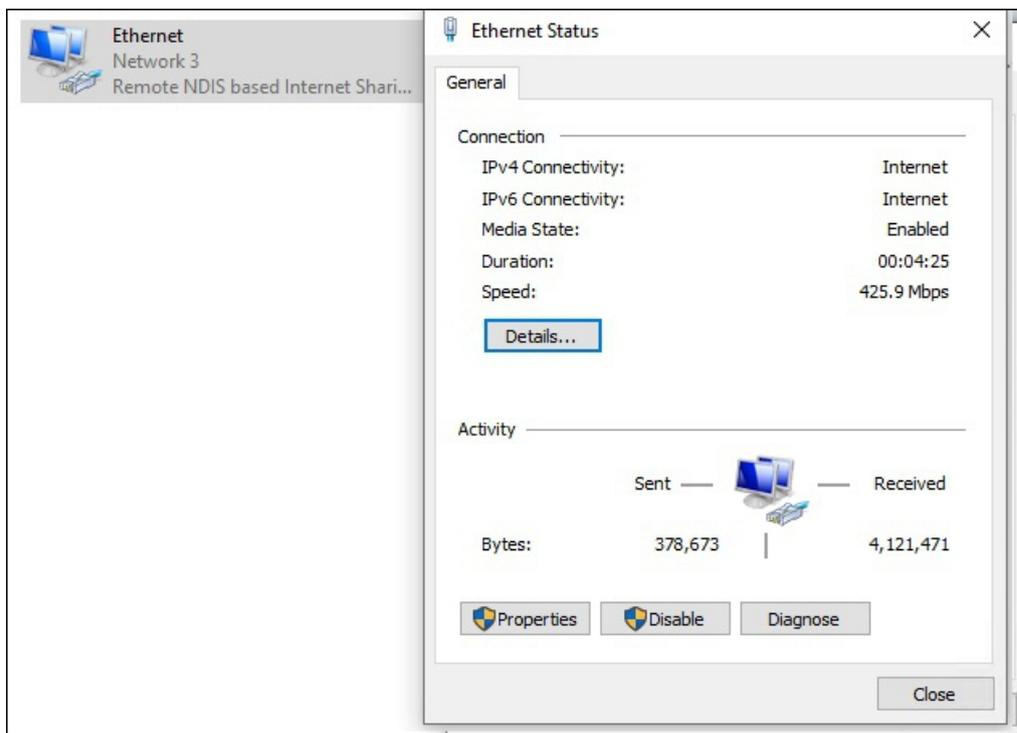
2. If the SIM card requires a PIN, you will be prompted to enter a PIN.



3. Enter the APN information of your provider and click on **Add**.



⇒ You can then close the tool. The APN information is now permanently stored in the stick. When restarting the system, depending on the provider, you may have to unlock the SIM card again using the PIN. You should therefore consider whether you want to or can switch off the PIN. Normally, however, the PIN also remains stored in the stick. The interface is now ready for use and the connection to the Internet is active.

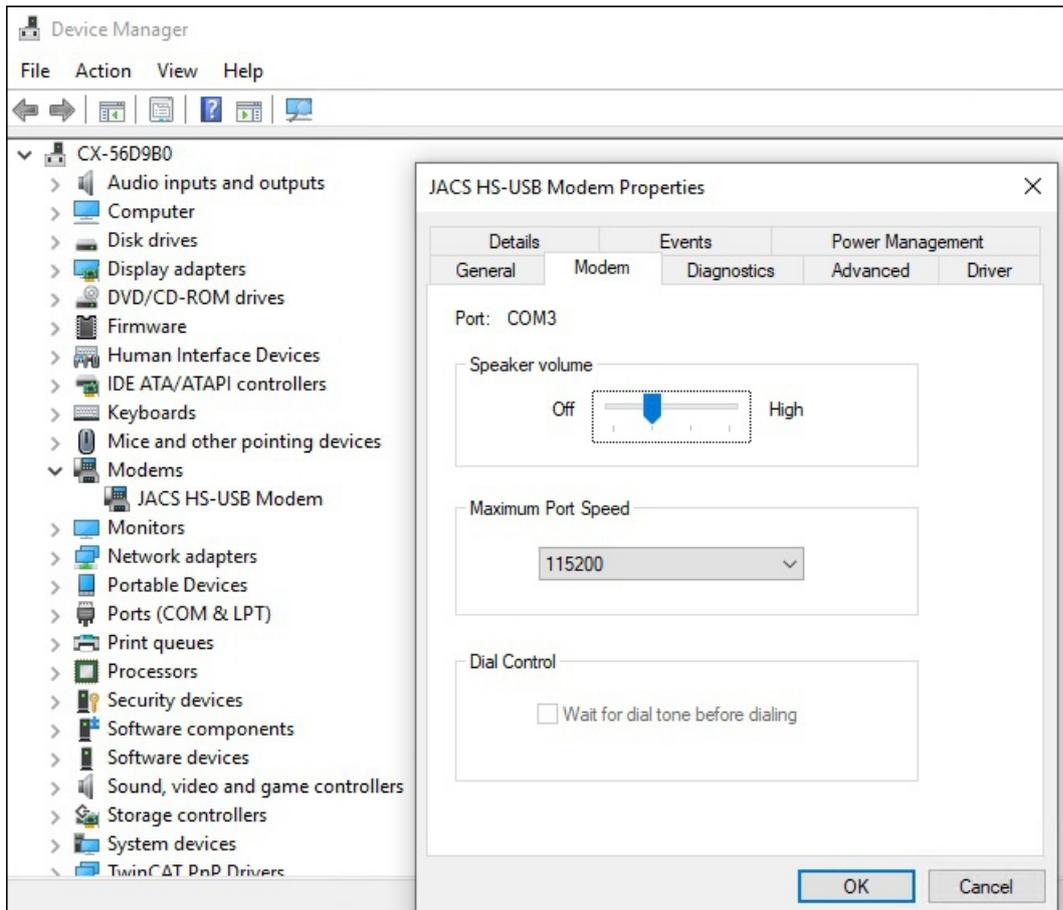


### 5.3 Use under TwinCAT

The LTE stick can also be used under TwinCAT, for example to send short messages (SMS) from TwinCAT with the aid of the **SendSMS** function block. This requires the COM port of the LTE stick, which can be viewed in the Windows Device Manager.

Proceed as follows:

1. Start the **Device Manager**.
2. Double-click on the device **ACS HS-USB Modem**.
3. Click the **Modem** tab. The COM port of the LTE stick is displayed at **Port..**



4. The LTE stick can be addressed under TwinCAT via this COM port.
- ⇒ In this case the COM port can be connected via the TwinCAT Function **TF6340**. The function **TF6350** brings the SMS functionality to the machine with the help of function blocks.

Expression	Type	Value
sText	STRING	'Please check machine #5, threshold is reached'
sSend	BOOL	FALSE
sNumber	STRING	'0170123456'
sBusy	BOOL	FALSE
sError	INT	0
RxBuffer	ComBuffer	
TxBuffer	ComBuffer	
fbLineCtrlAds	SerialLineControlADS	
bAdsError	BOOL	FALSE
nAdsErrorID	UDINT	0
bConnect	BOOL	TRUE
sNetId	T_AmsNetId	"
stSerialCfg	ComSerialConfig	
ComPort	UDINT	3

## 5.4 Use AT commands

The LTE stick can also be configured using AT commands via a tool such as PuTTY. The listing of the lower AT commands is not comprehensive and is limited to the most important commands.

Check whether the SIM card is already unlocked:

```
AT+CPIN?
```

Output:

```
+CPIN: SIM PIN Card is still locked.
```

```
+CPIN: READY Card is no longer locked.
```

Enter the PIN if the SIM card still needs to be unlocked:

```
AT+CPIN=<your pin>
```

If the SIM card is unlocked, the PIN request can be deactivated by the following command:

```
AT+CLCK="SC",0,"<your pin>"
```

To reactivate the PIN request after a reboot of the stick:

```
AT+CLCK="SC",1,"<your pin>"
```

Assign a new PIN:

```
AT+CPWD="SC","<pin old>","<pin new>"
```

Show APNs already registered on the stick:

```
at +cgdcont?
```

Output:

```
+CGDCONT:
```

```
1,"IPV4V6","internet.telekom","0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0",0,0,0,0
```

```
+CGDCONT:
```

```
2,"IPV4V6","internet.beckhoff","0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0",0,0,0,0
```

Enter new APNs:

```
at+cgdcont= Index(max24),"IP","your apn"
```

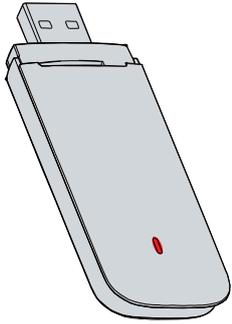
Example:

```
at+cgdcont=1,"IPV4V6","internet.telekom"
```

Delete APN:

```
at+cgdcont=<select Index>
```

## 6 Diagnostic LED

Display	Flashing code	Description
	Off	No power supply / flight mode.
	Red	Boot up / modem searches for network (2G/3G/4G).
	Green	Modem registered in 2G/3G network, in idle state without data exchange.
	Blue	Modem registered in 4G network, in idle state without data exchange.
	Green, flashing	Modem exchanges data in the 2G/3G network.
	Blue, flashing	Modem exchanges data in the 4G network
	All colors, flashing Red > Green > Blue	Software is updating, no internet access.

## 7 Technical data

Table 3: Technical data, dimensions and weights.

	<b>CU8210-D004-0200</b>
Dimensions (W x H x D)	97 mm x 30 mm x 14 mm
Weight	approx. 30 g
Type	4G USB stick
Chipset	Qualcomm MDM 9X07
LTE	R9
HSPA+/HSDPA/HSUPA/WCDMA	R8
4G band	LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B12/B14/B17/B20/B66 LTE-TDD: B38/B39/B40/B41
3G band	B1/B2/B4/B5/B8
2G band	850/900/1800/1900
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: nano-SIM (4FF)
Internal antenna	supports antenna diversity for 3G/4G
Telecommunication services	Short Message Service (SMS)
Diagnostic LED	1 network status

Table 4: Technical data, approvals.

	<b>CU8210-D004-0200</b>
Approvals	USA, Canada, Europe, Taiwan, Australia, New Zealand

Table 5: Technical data, environmental conditions.

	<b>CU8210-D004-0200</b>
Ambient temperature during operation	-20...+60 °C
Ambient temperature during storage	-20...+60 °C
Protection class	IP 20

## 8 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.

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You will also find further documentation for Beckhoff components there.

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- design, programming and commissioning of complex automation systems
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e-mail: [service@beckhoff.com](mailto:service@beckhoff.com)

### Beckhoff Headquarters

Beckhoff Automation GmbH & Co. KG

Huelshorstweg 20  
33415 Verl  
Germany

Phone: +49 5246 963-0  
e-mail: [info@beckhoff.com](mailto:info@beckhoff.com)  
web: [www.beckhoff.com](http://www.beckhoff.com)

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Beckhoff Automation GmbH & Co. KG  
Hülshorstweg 20  
33415 Verl  
Germany  
Phone: +49 5246 9630  
[info@beckhoff.com](mailto:info@beckhoff.com)  
[www.beckhoff.com](http://www.beckhoff.com)

