

**BECKHOFF** New Automation Technology

Manual | EN

# CU8210-D001-0200

WLAN USB 2.0 stick for ARM devices with Windows CE, for Europe, China





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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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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

## 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-D001-0200 WLAN stick, Beckhoff Industrial PCs can be equipped with a WLAN module and subsequently connected to a network.

The WLAN 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 WLAN stick is used:

- to equip Industrial PCs with a network connection without a comprehensive cable-based infrastructure, or
- to reach difficult to access machine or plants more easily.

### Improper use

The WLAN 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.

### **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

With the CU8210-D001-0200 WLAN stick, Beckhoff Industrial PCs can be equipped with a WLAN module and operated under Windows CE in client mode.

The WLAN stick offers the encrypted exchange of data at a transfer rate of up to 150 Mbit/s and supports 20 MHz and 40 MHz transmission bandwidths. The WLAN stick supports the IEEE 802.11 b/g/n specifications. The WLAN stick is backward compatible and enables communication with older devices.

The WiFi Direct standard is not supported. This means that no connection can be established between two WLAN end devices without a central access point.

#### 3.1 Structure

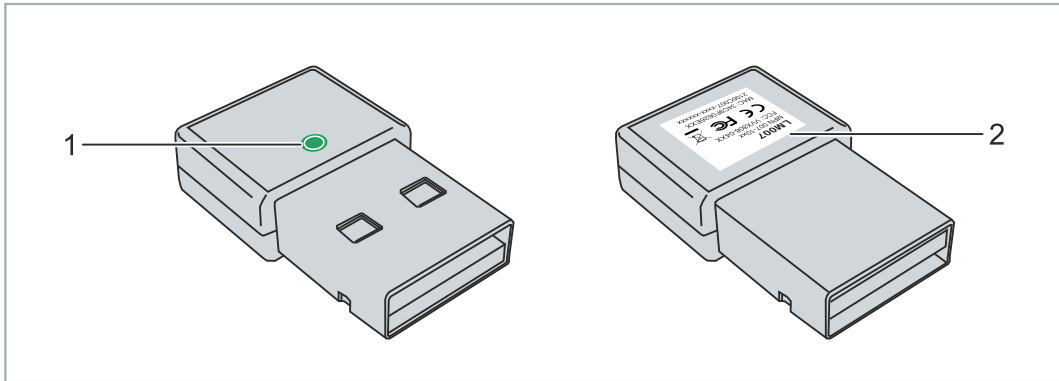


Fig. 1: Structure of a CU8210-D001-0200 WLAN stick.

Table 1: Legend for the configuration.

No.	Component	Description
1	Diagnostic LED [► 18]	The LED is located under the plastic. The diagnostic LED indicates the status of the WLAN stick and, for example, whether the WLAN stick is switched on or is connected to a network.
2	Name plate	The name plate can be used for the identification of the model. The MAC address can be found here.

### 3.2 Name plate

The WLAN sticks are available in two versions, which differ only in the type of certification. Depending on the certification, the sticks can be used in certain regions or countries.

The name plate makes it easier to find a stick with the appropriate certification for a region or country. The name plate is located on the housing of the WLAN stick:

- The marking LM007 corresponds to the CU8210-D001-0200 WLAN stick, which is suitable for operation in Europe, China.

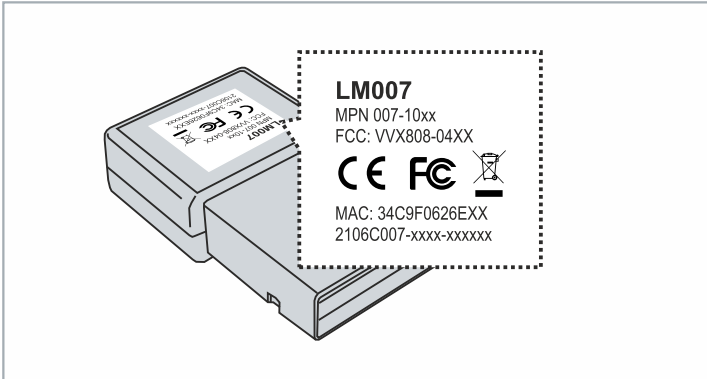


Fig. 2: CU8210-D001-0200 Name plate.

In addition, the MAC address of the WLAN stick is shown on the name plate and a list of certificates on the USB plug.

### 3.3 System requirements

Table 2: CU8210-D001-0200 System requirements.

Operating system	Version
Windows	Windows CE6
	Windows CE7

## 3.4 WLAN principles

WLAN (Wireless Local Area Network) is a radio technology that makes wireless networks and wireless internet access possible. WLAN, which is defined by the IEEE 802.11 standards family, can be configured in the following mode:

### Infrastructure network

The main difference between wireless infrastructure networks and wireless ad hoc networks is that the PCs in a wireless infrastructure network can access the Internet via an access point.

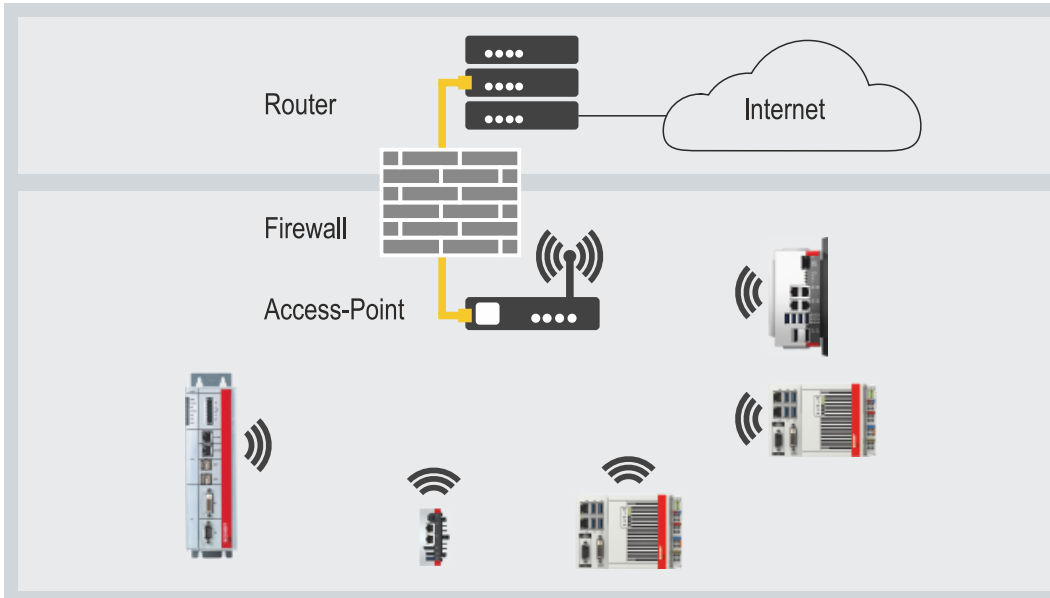


Fig. 3: Example of an infrastructure network.

Pay attention to security when setting up an infrastructure network, because a connection to the internet is a potential weak point in the network infrastructure.

### Encryption

WLAN encryption is an important security setting and you must ensure that no unauthorized user can log on and use the network resources. The WLAN stick supports the WPA2 (Wi-Fi Protected Access) security mechanism,

where a key that is used to encrypt the data is defined in the access point or router. This key must be entered in the clients' settings and must match the defined key.

Encryption with WEP is obsolete and can be decrypted in a short time.

### Frequency range

If several WLANs are operated within a small radius, mutual interference can occur because both WLANs work in the same frequency range or the distance between the channels is too small.

This can affect the connection quality in terms of reliability and data transfer rate.

If there are persistent disturbances, select a different channel to prevent frequency sharing.

## 4 Configuration

### 4.1 Installing the driver

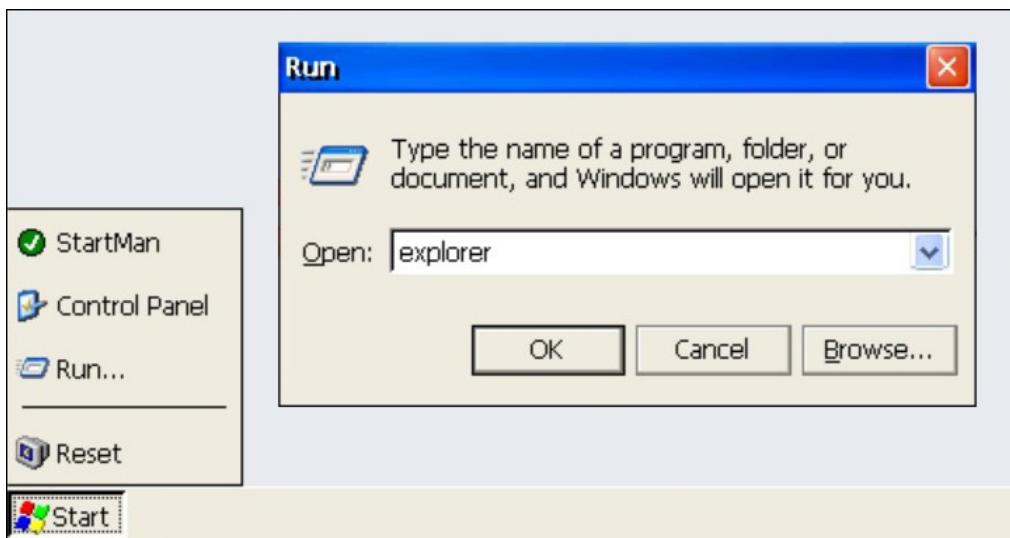
In order to use the WLAN stick under Windows CE, the appropriate driver must first be installed. To do this, the driver files must first be copied to an industrial PC with Windows CE and then the Cabinet file must be executed.

Requirements:

- Driver: provided by Beckhoff Service.
- Make sure that the WLAN stick is not yet connected to the Industrial PC.

Install the driver as follows:

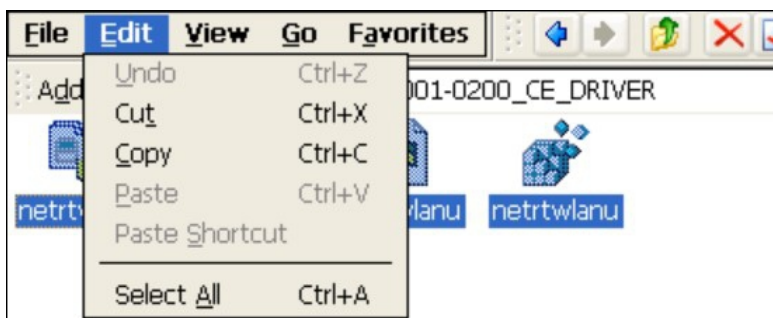
1. Copy the driver to an external data carrier, for example to a USB stick.
2. Insert the USB stick, click **Start > Run** and type "explorer" in the window **Run** to start the explorer.



3. Select the data carrier on which the driver is located. In this example it is a USB stick with the drive name **Hard Disk2**.



4. Copy the four files into the Temp folder of the industrial PC.



5. Run the cabinet file **netrtwlanu** with a double click.



6. Install the driver into the directory *\Hard Disk\System*.



- ⇒ After installation, plug the WLAN stick into the industrial PC. After a short time, a network icon will appear in the taskbar. Double-click the icon to display the settings and the 2.4 GHz WLAN networks within range. In the next step, you can connect to a WLAN within range (see: [Connecting to WLAN \[▶ 15\]](#)).

## 4.2 Connecting to WLAN

After installation, plug the WLAN stick into the industrial PC. After installing the appropriate drivers, a network icon will appear in the taskbar. Double-click the icon to display the settings and the 2.4 GHz WLAN networks within range.

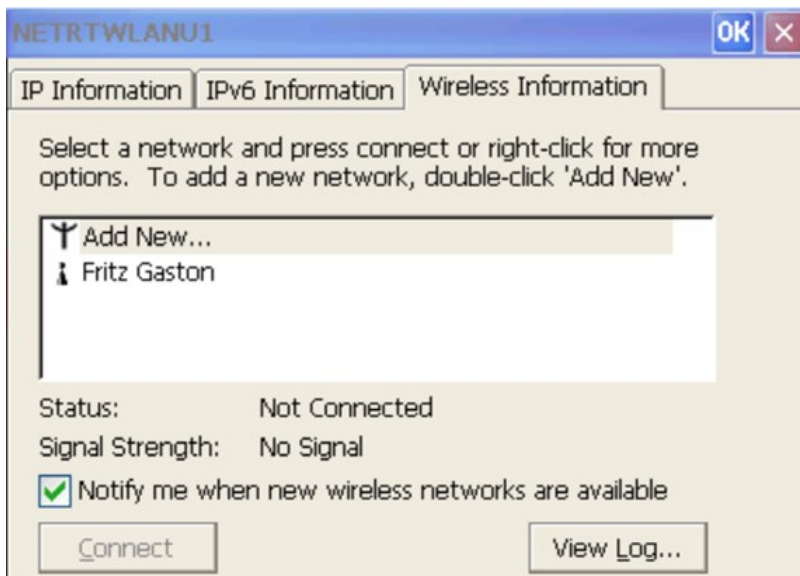
The drivers of the WLAN stick do not support Wi-Fi Direct functions. For this reason, the WLAN stick cannot be connected to the virtual access point from Beckhoff, which is based on Wi-Fi Direct.

Requirements:

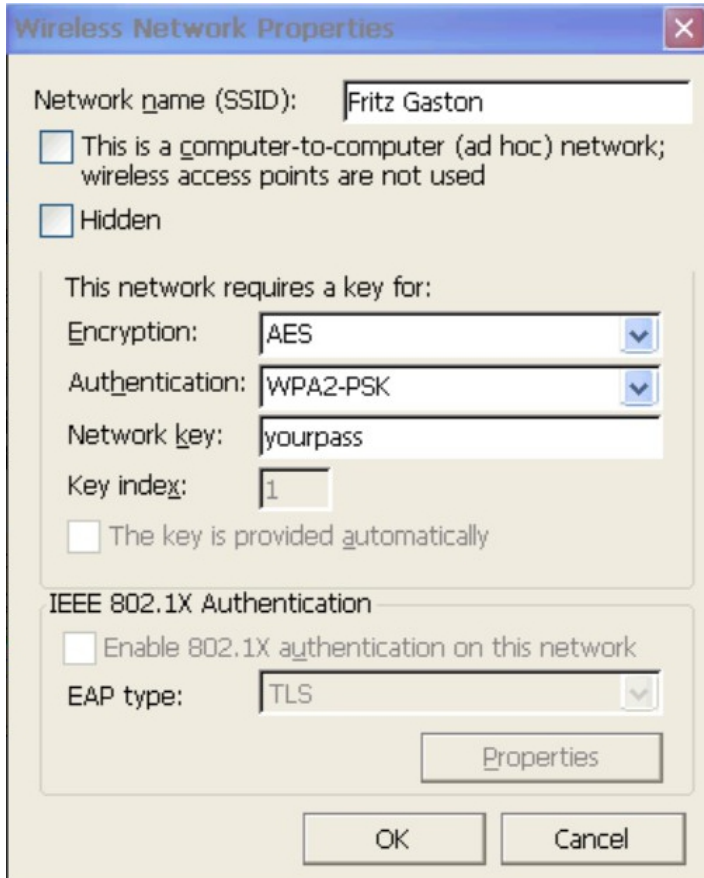
- Existing WLAN with configured access point.
- WLAN key (password).

**Proceed as follows:**

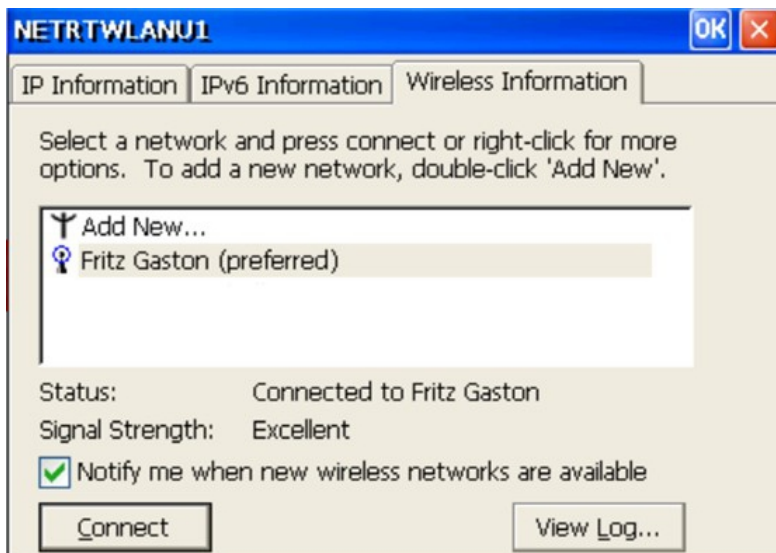
1. Double-click the network icon in the taskbar to open the WLAN network settings.
2. Click the **Wireless Information** tab, select the appropriate network (SSID) and click **Connect**.



3. Enter the password for the network and click **OK**.

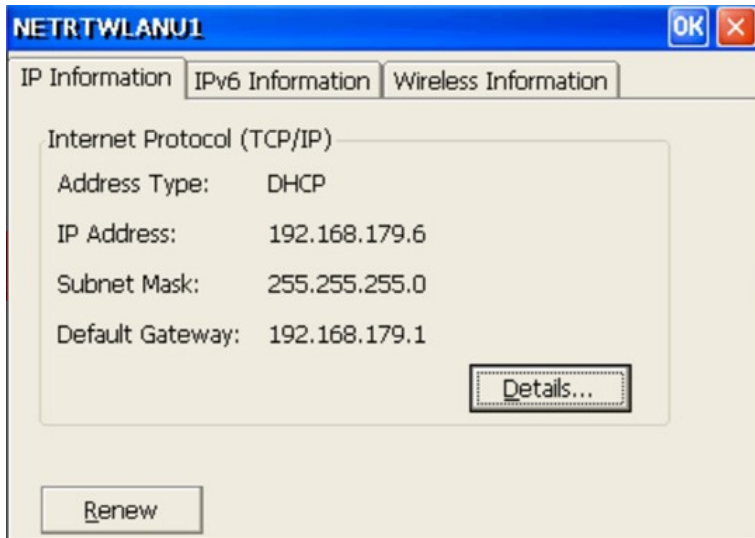


4. The connection is being established. The status is changed and the icon of the network is displayed with a blue circle.

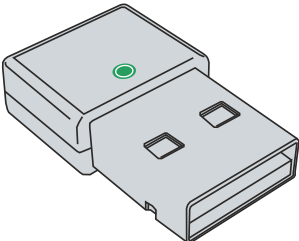




- ⇒ By default, DHCP is preset. If you are working with fixed IP addresses, the settings for this can be changed under the other two tabs.



## 5 Diagnostic LED

Display	Error code	Description
	Off	No connection.
	Lights up green	Connection established.

## 6 Technical data

Table 3: Technical data, dimensions and weights.

	<b>CU8210-D001-0200</b>
Dimensions (W x H x D)	14.4 mm x 5.8 mm x 23.4 mm
Weight	approx. 2.2 g

Table 4: Technical data, general data.

	<b>CU8210-D001-0200</b>
Chipset	Realtek
Number of transmitters	1 transmitter, 1 receiver
Standards	IEEE 802.11 b/g/n
Data transfer rate	1,2,5.5,6,11,12,18,22,24,30,36,48,54,60,90,120, and maximum 150 Mbit/s
Encryption	WEP, WPA/WPA2 (TKIP/AES)
Modulation method	BPSK/ QPSK/ 16-QAM/ 64-QAM
Frequency band	2.4 GHz ISM Band
RF Output Power (Tolerance $\pm 2$ dBm)	17 dBm - 802.11b 15 dBm - 802.11g 13 dBm - 802.11n
Receiver sensitivity	-80 dBm - 802.11b -70 dBm - 802.11g -64 dBm - 802.11n

Table 5: Technical data, approvals.

	<b>CU8210-D001-0200</b>
Approvals	Europe, China

Table 6: Technical data, environmental conditions.

	<b>CU8210-D001-0200</b>
Ambient temperature during operation	-20 °C ... +85 °C ambient temperature 5 to 90 % (non-condensing)
Ambient temperature during storage	-40 °C ... +80 °C ambient temperature 5 to 90 % (non-condensing)
Protection class	IP 20

## 6.1 WLAN channels

Depending on the target market, there are differences in the number of WLAN channels to be used. The channel identifiers, channel frequencies and regulation ranges of each 22 MHz-wide channel are shown in the following table.

Table 7: WLAN channels depending on the target market.

Channel	Frequency (MHz)	Europe and most of the World	North America
1	2412	X	X
2	2417	X	X
3	2422	X	X
4	2427	X	X
5	2432	X	X
6	2437	X	X
7	2442	X	X
8	2447	X	X
9	2452	X	X
10	2457	X	X
11	2462	X	X
12	2467	X	
13	2472	X	
14	2484		

## 6.2 Dimensions

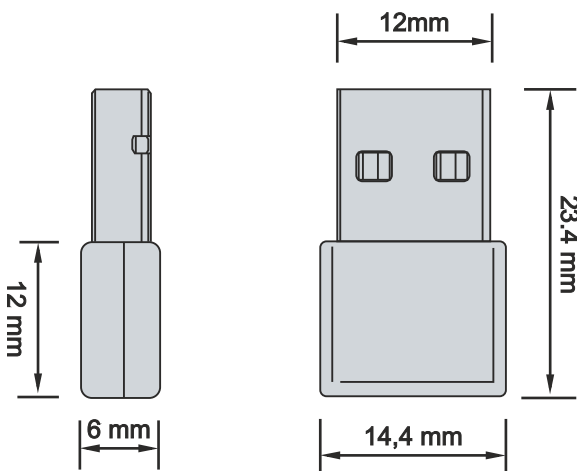


Fig. 4: CU8210-D001-0200 Dimensions.

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More Information:

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