

USBCANFD-200U/100U

USBCANFD Series CANFD Interface Cards

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Product User Manual

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Abstract	USBCANFD-100U/200U Product Performance Description and User Guide

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1. Product Introduction

1.1 Product Overview

USBCANFD-200U (100U) is a high-performance CANFD interface card developed by Guangzhou ZLG Electronics. It meets the USB2.0 bus specification and integrates two CANFD interfaces (100U integrated one CANFD interface). The CAN channel integrates an independent electrical isolation protection circuit. The interface card connects the PC to the CAN(FD) network over the USB port to form a CAN(FD)-bus control node.

The USBCANFD-200U(100U) high-performance CANFD interface card is a powerful tool for CAN(FD)-bus product development and CAN(FD)-bus data analysis; the USBCANFD-200U(100U) interface card has its own electrical isolation module, which prevents the interface card from being damaged due to ground circulation and enhances the system reliability in harsh environments. The USBCANFD-200U(100U) high-performance CAN interface card supports operating systems such as Windows 7/Windows 10.

Note: USBCANFD-200U (100U) is collectively referred to as USBCANFD interface card below.

1.2 Product Appearance



Figure 1.1 Product appearance

1.3 Functions

- The USB interface meets the USB2.0 high-speed specification;
- Support CAN2.0A and B protocol and comply with ISO11898-1 specification;
- Integrate two CANFD interfaces (USBCANFD-100U integrates one channel);
- Compatible with high-speed CAN and CANFD;

- CANFD supports ISO standards and non-ISO standards;
- The CAN communication baud rate can be arbitrarily programmable between 4 Kbps and 1 Mbps;
- The CANFD baud rate can be arbitrarily programmable between 1 Mbps and 5 Mbps;
- Maximum data flow for single channel transmission: 3,000 frames per second (remote frame, single frame transmission);
- The highest data flow rate received by a single channel: 10,000 frames per second (remote frame);
- Each channel supports a maximum of 64 ID filters;
- Each channel supports a maximum of 100 scheduled messages;
- Built-in 120 ohm terminal resistance, which can be connected and disconnected by software control;
- Support USB bus power supply and external power supply;
- Support ZCANPRO test software (support Windows 7 and Windows 10);
- Provide the host computer secondary development interface function.

1.4 Product Specifications

1.4.1 Electrical Specifications

The USBCANFD interface card needs a certain electrical environment to work safely and stably. Table 1.1 lists the electrical parameters of the interface card. Exceeding the parameters listed in the table may cause the product to work unstable and fail, or even burn the module.

Table 1.1 Electrical specifications of USBCANFD interface card

Parameter		Test Conditions	Minimum	Typical Value	Maximum	Unit
Operating voltage	External input DC power supply	Two CAN transceivers	9	24	48	V
	USB powered	Two CAN transceivers	4.75	5	5.25	V
Operating current	External input DC power supply	VIN=24V	--	85	--	mA
	USB powered	VBUS=5V	--	110	--	mA
CAN interface	Bus pin withstand voltage	CANH, CAHL	-42	--	42	V
	Terminal resistance	Enable terminal resistance	--	120	--	Ω
	Isolation withstand voltage	Leakage current less than 1 mA	2500	--	--	VDC

1.4.2 Operating Temperature

The USBCANFD interface card meets the requirements of industrial grade products, and its applicable working temperature range is -40°C to $+85^{\circ}\text{C}$. Using the interface card in too low or too high ambient temperature will shorten its service life.

1.5 Mechanical Installation Dimensions

The external dimensions of the USBCANFD interface card are 115 mm x 80 mm x 35 mm, as shown in Figure

1.2.

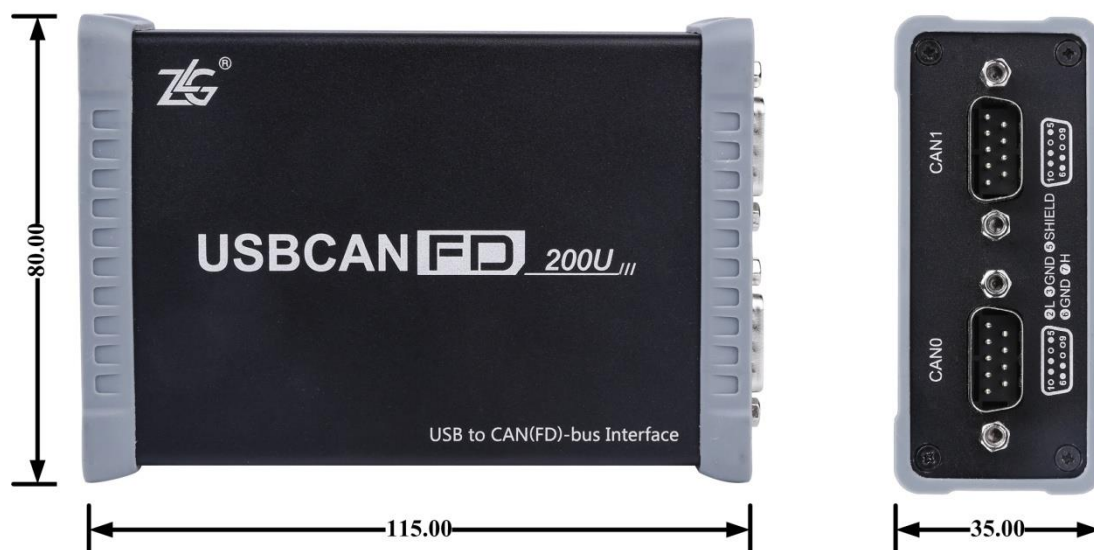


Figure 1.1 USBCANFD-200U dimensions

Note: The unit is mm

1.6 Typical Applications

- CAN(FD)-Bus network diagnosis and test
- Automotive electronics applications
- Electric power communication network
- Industrial control equipment
- High-speed, large data volume communication

2. Hardware Interfaces

2.1 Power Cable Connection

The USBCANFD interface card is designed with two power supply methods. One is to supply power through the USB port, and the other is to supply power through DC power supply. You can select one of the power supply methods. You can also connect DC power supply and USB cable at the same time. The external power supply mode is suitable for situations where the PC uses a USB bus hub, or is connected to multiple USB terminal devices, which prevents USB port from providing sufficient current to the USBCANFD interface card.

The USB cable is type B (square opening), with locking screws at both ends of the cable. One USB cable is provided before delivery. The DC socket is suitable for a round plug with an outer diameter of 5.5 mm, and there is no positive or negative requirement for the plug inside and outside. The DC power supply and its cables need to be provided by the customer, and the DC power supply meets +9 V to +48 V. Figure 2.1 shows the DC power interface and USB interface.



Figure 2.1 Left interface of USBCANFD-200U

2.2 CAN Communication Interface

A DB9 connector is used for the CAN communication interface of the USBCANFD interface card, and the signal definition of the interface pins meets the requirements of the CiA standard. Table 2.1 lists the pin signal definition of DB9, and Figure 2.2 shows the interface,

Table 2.1 DB9 pin signal definition

Pin	Signal	Description	Figure
1	--	Reserved	
2	CAN_L	CAN bus dominance is low	
3	CAN_GND	CAN reference ground	
4	--	Reserved	
5	CAN_SHLD	CAN shield ground	
6	CAN_GND	CAN reference ground	

Continued

Pin	Signal	Description	Figure
7	CAN_H	CAN bus is highly dominant	
8	--	Reserved	
9	--	Reserved	



Figure 2.2 CAN interface

2.3 Signal Indicators

The USBCANFD-200U interface card has one power indicator PWR and one two-color SYS indicator. Each two-color indicator corresponds to one CAN channel, indicating the operating status of the CAN channel. Figure 2.1 shows the location of the equipment indicator, and Table 2.2 lists the specific indicator function definition.

Table 2.2 Description of USBCANFD-200U (100U) interface card indicators

Indicator	STATUS	Indication status
PWR	Green	Power on equipment
	Off	The device is not powered on
SYS	Red	The driver is not installed properly, or the USB cable is not connected
	Green	The USB driver has been installed, and the USB cable has been connected
	Green flashing	The USB is communicating with the device
	Flash in red	USB and device communication error
CAN0, CAN1	Off	The CAN channel is not open
	Green	The CAN channel is open
	Green flashing	The CAN channel is transmitting messages
	Flash in red	CAN channel bus error

2.4 System Connections

When the USBCANFD interface card is connected to the CAN-bus bus, it is only necessary to connect

CAN_L to CAN_L and CAN_H to CAN_H signals. A linear topology is adopted for the CAN-bus network, and the two terminals of the bus need to be installed with 120 ohm terminal resistors; if the number of nodes is greater than 2, the intermediate nodes do not need to install 120 ohm terminal resistors. For branch connections, the length should not exceed 3 meters. Figure 2.3 shows the connection of CAN-bus bus.

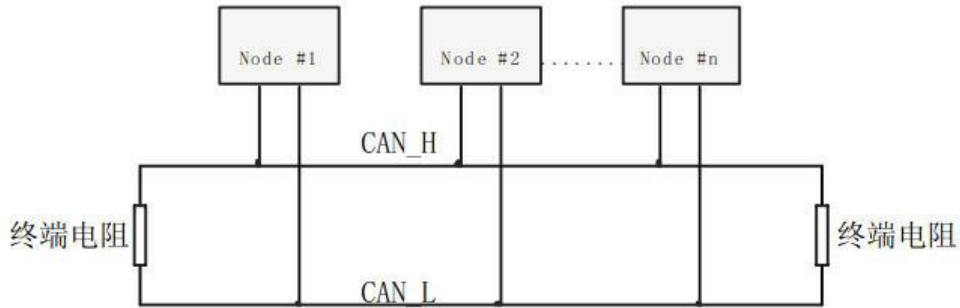


Figure 2.3 Linear topology of the CAN-bus network

In the CAN-bus network, shielded wires are often used for interconnection, so as to enhance the anti-interference ability. However, there are many types of shielded wires and field wiring is complicated. Therefore, the wiring diagrams of different types of cables in application are shown below, including the connection diagrams of double-core single-layer shielded wire, double-core double-layer shielded wire, and three-core single-layer shielded wire (The "equipment iron shell" in the pictures refers to the outer shell of the device, which is grounded by default). Regardless of the type of cable, reasonable changes must be made according to the complexity of the field wiring. Ensure the reliable grounding of the single point of the shielded wire or ground wire at any time, and carry out on-site wiring in strict accordance with the wiring specifications to minimize communication errors and abnormalities, and improve the communication quality and service life of the bus.

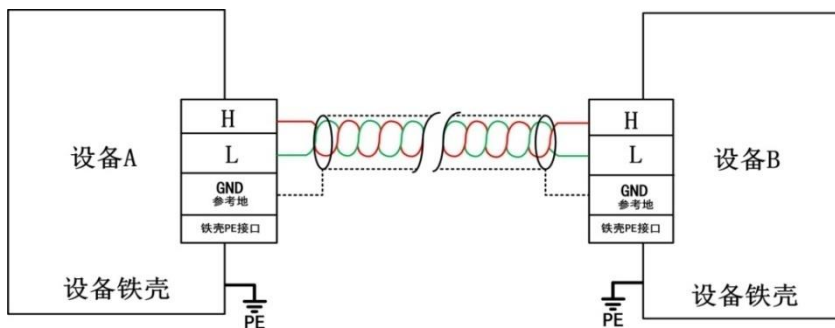


Figure 2.4 Double-core single-layer shielded cable connection

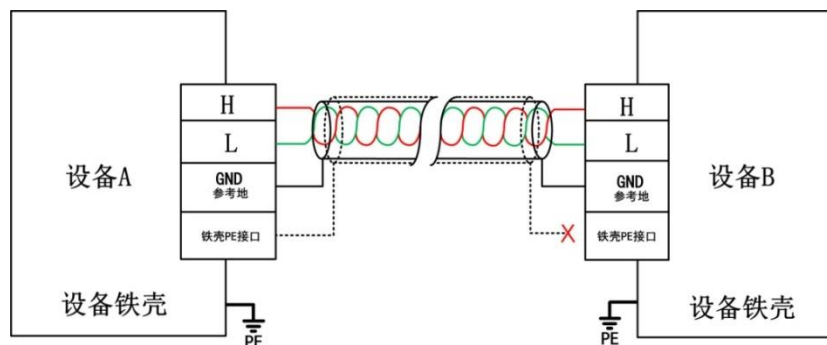


Figure 2.5 Double-core double-layer shielded cable connection

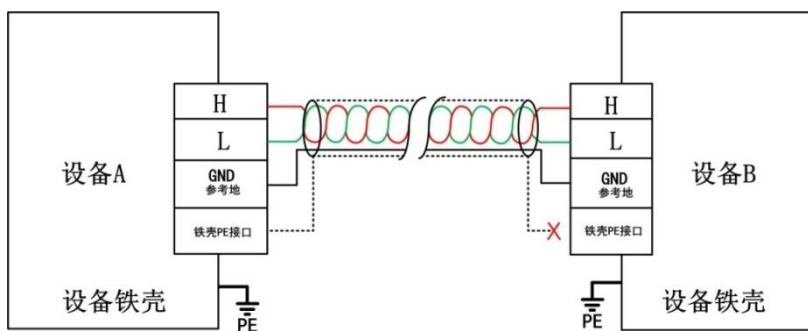


Figure 2.6 Three-core single-layer shielded cable connection

3. Driver Installation

This document uses a PC running Windows 7 as an example to describe how to install the USBCANFD-200U (100U) driver.

3.1 Installing the Driver under Windows

Connect the USBCANFD-200U (100U) interface card to the computer with a USB cable, and ensure that the device is powered properly.

Right-click [Computer] and choose [Properties] (as shown in Figure 3.1) to start the Device Manager. Before the driver is installed, the Device Manager is displayed, as shown in Figure 3.2. If the device manager does not display the message, check that the USB cable is connected correctly, the USB port of the computer is disabled, and the PWR indicator is on.



Figure 3.1 Starting the computer device manager

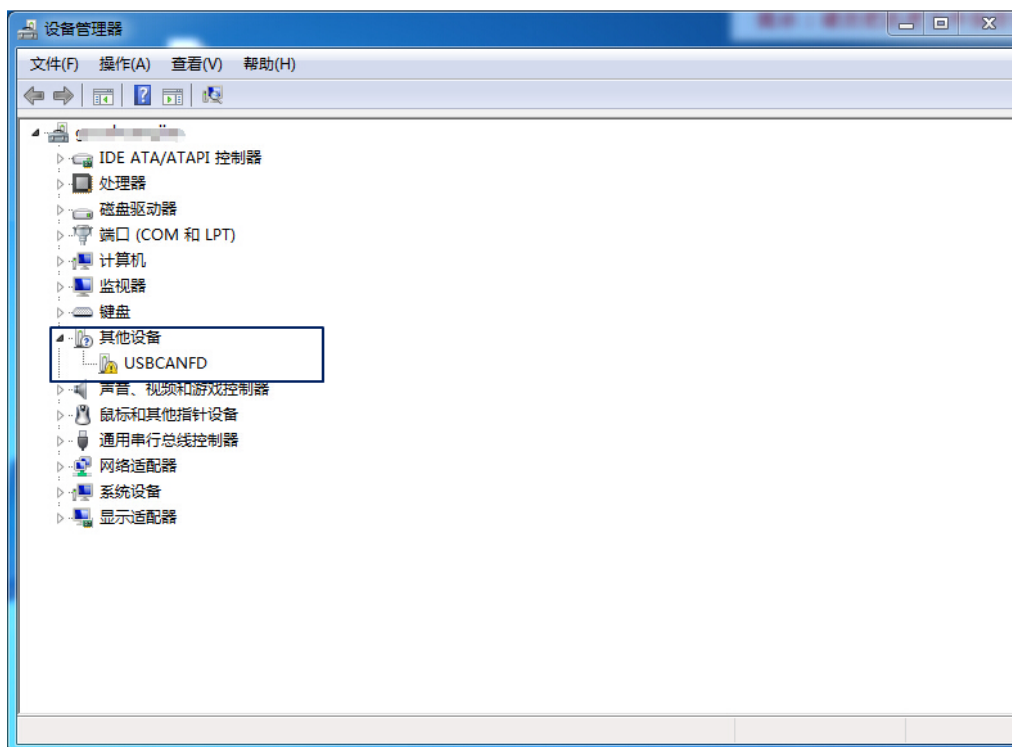


Figure 3.2 Starting the computer device manager

Right-click [USBCANFD] and choose [Update Driver Software]. The update driver software interface appears, as shown in Figure 3.3.

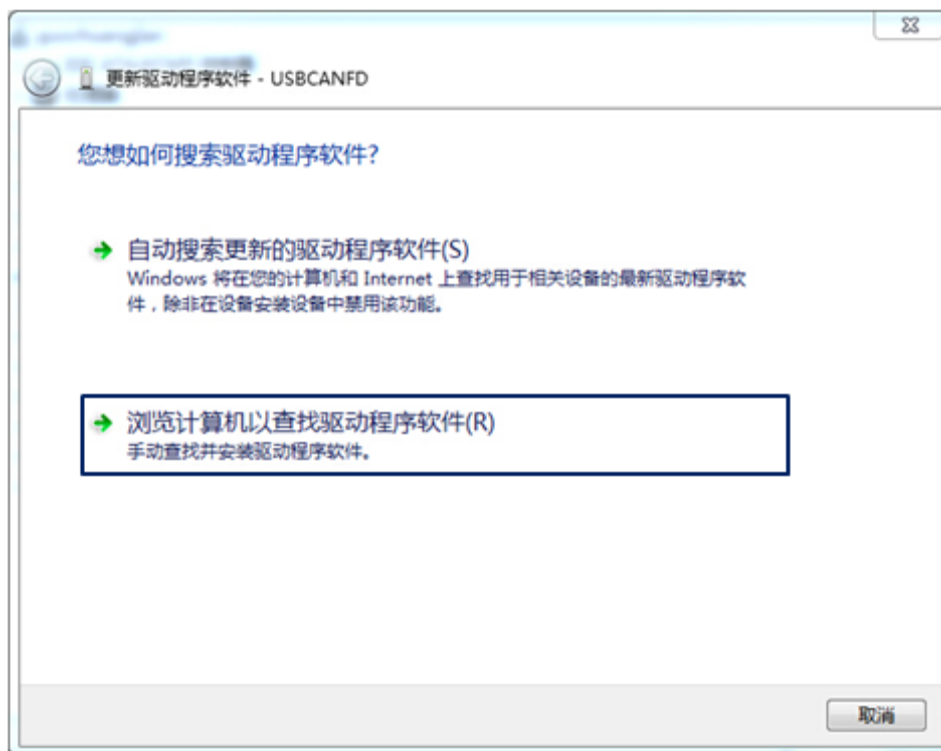


Figure 3.3 Browsing the computer to find the driver software

As shown in Figure 3.4, click [Browse], select the official USBCANFD driver folder, click [Next], and wait until the driver is installed.

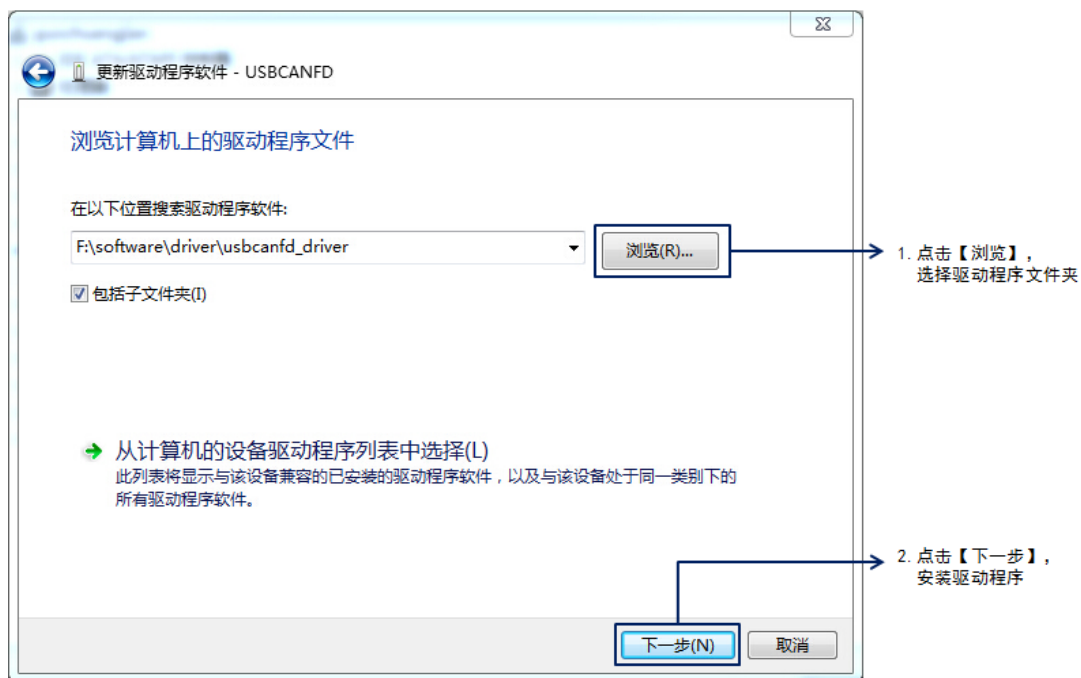


Figure 3.4 Finding the driver and install it

After the installation is complete, the message "The driver file has been successfully updated" appears. Click the [Close] button to complete the installation, as shown in Figure 3.5.

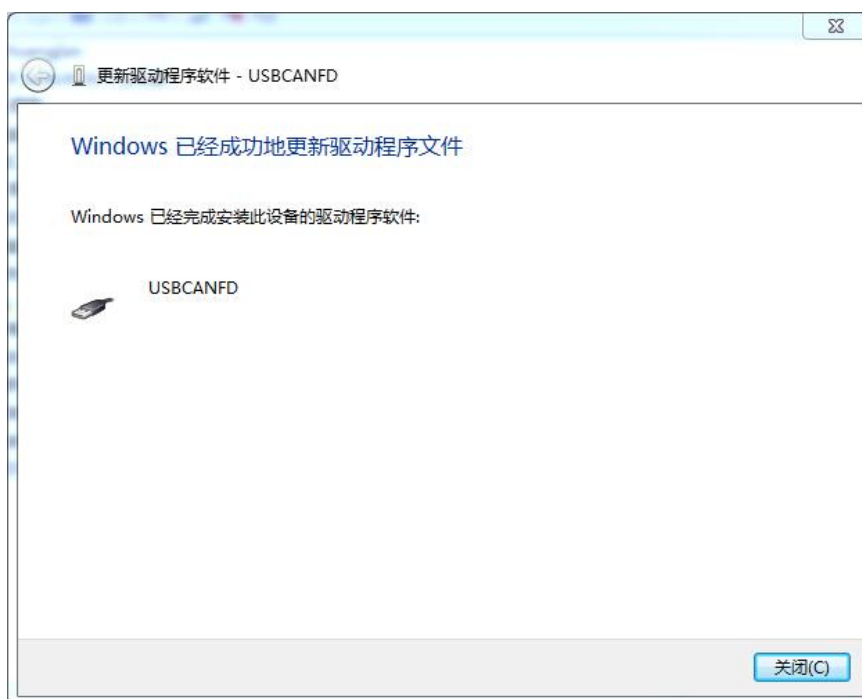



Figure 3.5 Finding the driver and install it

After the driver is installed,  **USBCANFD** is displayed in the device manager, indicating that the driver is installed correctly. The device SYS indicator turns from red to green. At this time, the CANFD card has been connected to the PC, and the host computer software can send and receive CAN (FD) messages. It is recommended to use the ZCANPRO software provided by ZLG Electronics as the host computer software. Users can also develop their own host computer software by using the provided secondary development function library.

4. Inspection and Maintenance

The main electrical components of the USBCANFD interface card are semiconductor components. Although it has a long life, it may also age quickly under inappropriate conditions. Periodic inspections should be carried out to ensure that the required conditions are maintained. It is recommended to check at least once every 6 months a year. Under unfavorable environmental conditions, inspections should be carried out more frequently.

If you encounter a problem during the maintenance, see Table 4.1 to identify the fault cause. If the fault persists, contact Guangzhou ZLG Electronics Co., Ltd.

Table 4.1 Inspection and maintenance

No.	Item	Inspection	Standard	Action
1	Power supply	Check for voltage fluctuations at the power supply side	The external power supply is within the allowable voltage fluctuation range: +9 V to +48 V DC or USB port power +5 V DC	Use a voltmeter to check the power supply at the power input. Take necessary measures to keep the voltage fluctuation within the range
2	Surrounding environment	Check the ambient temperature (including the internal temperature of the enclosed environment)	-40°C ~ +85°C	Use a thermometer to check the temperature and ensure that the ambient temperature is kept within the allowable range
		Check the ambient humidity (including the internal humidity of the enclosed environment)	The relative humidity must be between 10% and 90% when there is no air conditioner	Use a hygrometer to check the humidity and ensure that the ambient humidity is kept within the allowable range
		Check for dust, powder, salt, metal chips	No accumulation	Clean and protect the equipment
		Check that water, oil or chemical spray should not touch the equipment	No spray touches the device	To clean and protect the equipment
		Check for corrosive or flammable gases in the equipment area	No corrosive or flammable gas	Check by smelling or using a sensor
		Check vibration and shock levels	Vibration and shock are within the specified range	If necessary, install gaskets or other shock absorbers
3	Installation and Wiring	Check the noise source near the equipment	No significant noise signal source	Isolate the device from the noise source or protect the device
		Check that each unit is securely connected and has been safely locked with the next unit	No looseness	Press the connectors together completely and lock them with the slider

5. Packing List

Table 5.1 USBCANFD-200U Packing List V1.00

No.	Name	Quantity	Unit	Remarks
1	USB to CANFD interface card	1	Piece	
2	USB cables	1	Piece	With lock
6	After-sales Service Guide	1	Pcs	
7	Certificate of Conformity	1	Piece	
8				
9				

6. Quick Guide


6.1 Introduction to ZCANPRO Software

ZCANPRO is the supporting software for CAN/CANFD series products produced by Guangzhou ZLG Electronics Co., Ltd., which can perform operations such as raw data transmission and reception, data playback, and high-level protocol analysis. The software is easy to operate and powerful, and it is a good helper for CAN bus testing, monitoring, diagnosis, and development.

ZCANPRO software can be downloaded from the ZLG Electronics official website <http://www.zlg.cn>.

6.2 Using USBCANFD on ZCANPRO

After the device driver and ZCANPRO are installed, you can use USBCANFD on the ZCANPRO software.

For details about how to use USBCANFD on ZCANPRO, click  in the upper right corner of the software main interface and select [Quick User Guide] in the drop-down box (as shown in Figure 6.1). For detailed instructions for the ZCANPRO software, see [User Manual].

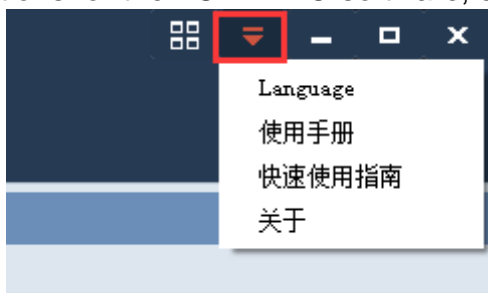


Figure 6.1 Opening the Quick User Guide

7. Disclaimer

Based on the principle of providing better service for users, Guangzhou ZLG Electronics Co., Ltd. ("ZLG Electronics") will try to present detailed and accurate product information to users in this manual. However, due to the effectiveness of this manual within a particular period of time, ZLG Electronics does not guarantee the applicability of this document at any time. ZLG Electronics shall reserve the right to update this manual without prior notice. To get the latest version, please visit the official website of ZLG Electronics regularly or contact ZLG Electronics. Thank you!

Right to modify the document

Guangzhou ZLG Electronics Co., Ltd. shall reserve the right to modify related documents of USBCANFD interface card series products at any time without prior declaration.

ESD protection

The USBCANFD interface card series products have electrostatic protection capabilities to ensure the stable operation of the products. When using USBCANFD interface card series products, first discharge the static electricity on the body. For example, wear a reliable grounding static ring, or touch a water pipe connected to the earth.



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