User Manual

USBCANFD-100U-mini

USBCANFD Series CANFD Interface Card

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Category	Contents
Keywords	USB to CANFD card, USBCANFD-100U-mini
Abstract	USBCANFD-100U-mini Product Performance Description and User Guide

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Revision History

Version	Date	Description
V0.90	2018/04/15	Created
V1.00	2018/05/12	Released
V1.01	2018/07/20	Updated the ZCANPRO instructions in the Quick User Guide
V1.02	2019/03/14	Updated the document header and footer and "Sales and Service Network" content, and added the "Disclaimer" content

Contents

1. Product Introduction

1.1 Product Overview

USBCANFD-100U-mini is a portable, high-performance CANFD interface card developed by Guangzhou ZLG Electronics. It is compatible with the USB2.0 bus specification, integrates 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-100U-mini high-performance CANFD interface card is a powerful tool for CAN(FD)-bus product development and CAN(FD)-bus data analysis; the USBCANFD-100U-mini 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-100U-mini high-performance CAN interface card supports operating systems such as Windows 7/Windows 10.

1.2 Product Appearance

Figure 1.1 Product appearance

1.3 Functions

- The USB interface complies with the USB2.0 high-speed specification;
- Support CAN2.0A and B protocol and comply with ISO11898-1 specification;
- Integrates one CANFD interface;
- 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 timing sending messages. The timing accuracy can reach 500 us;
- Built-in 120 ohm terminal resistance, which can be connected and disconnected by software control;
- Support USB bus power supply;
- Support ZCANPRO software (support Windows 7 and Windows 10);
- Provide the host computer secondary development interface function.

1.4 Product Specifications

1.4.1 Electrical Specifications

USBCANFD-100U-mini needs a certain electrical environment to work safely and stably. Table 1.1 lists the electrical specifications of the interface card. Exceeding the specifications listed in the table may cause the product to work unstable and fail, or even burn the module.

Table 1.1 USBCANFD-100U-mini electrical specifications

Item		Test Conditions	Minimum	Typical value	Maximum	Unit
Operating voltage	USB powered	Two CAN transceivers	4.75	5	5.25	V
Operating current	USB powered	VBUS=5V	--	76mA	--	mA
CAN interface	Bus pin withstand voltage	CANH, CAHL	-42	--	42	V
	Terminal resistance	Enable terminal resistance	--	120	--	Ohm
	Isolation withstand voltage	Leakage current less than 1 mA	2500	--	--	VDC

1.4.2 Operating Temperature

USBCANFD-100U-mini meets the requirements of industrial grade products, and its applicable operating temperature range is –40°C to +85°C. Using the interface card in too low or too high ambient temperature will shorten its service life.

1.5 Mechanical Installation Dimensions

Figure 1.2 shows the external dimensions of USBCANFD-100U-mini.

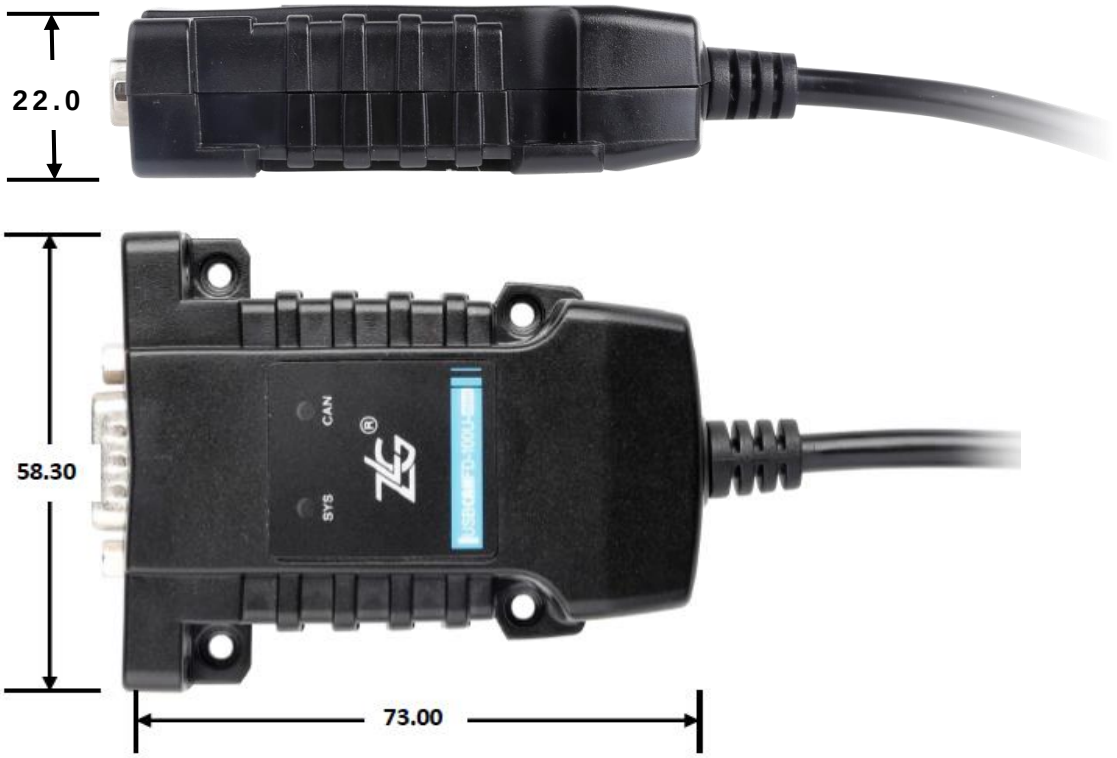


Figure 1.2 USBCANFD-100U-mini dimensions

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 USB Interface

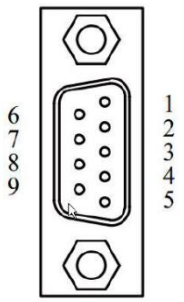
USBCANFD-100U-mini adopts USB power supply mode (no external power interface). The USB cable is directly connected to the board before delivery, as shown in Figure 2.1.

Figure 2.1 USBCANFD-100U-mini

2.2 CAN Communication Interface

The USBCANFD-100U-mini CAN communication interface uses a DB9 connector. 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

USBCANFD-100U-mini has a two-color SYS indicator and a two-color CAN channel indicator that indicate the operating status of the CAN channel. Figure 2.1 shows the indicator locations, and Table 2.2 describes the indicators.

Table 2.2 Description of USBCANFD-100U-mini interface card indicators

Indicator	Status	Indication status
SYS	Red	The USB driver is not installed properly
	Green	The USB driver is installed
	Green flashing	The USB is communicating with the device
	Flash in red	USB and device communication error
CAN	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 USBCANFD-100U-mini is connected to the CAN-bus, you only need to connect CAN_L to CAN_L and CAN_H to CAN_H signal. The CAN-bus network adopts a linear topology, 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.

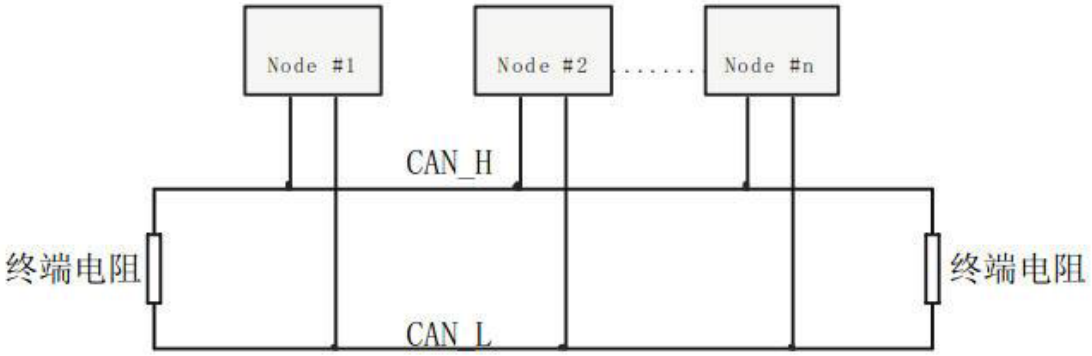


Figure 2.3 Linear topology of the CAN-bus network

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.

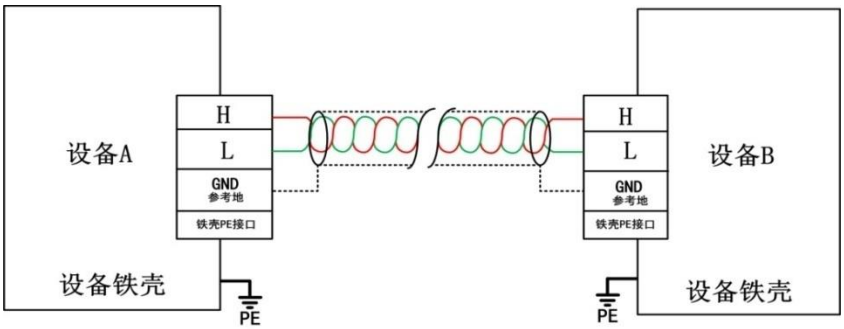


Figure 2.4 Double-core single-layer shielded cable connection

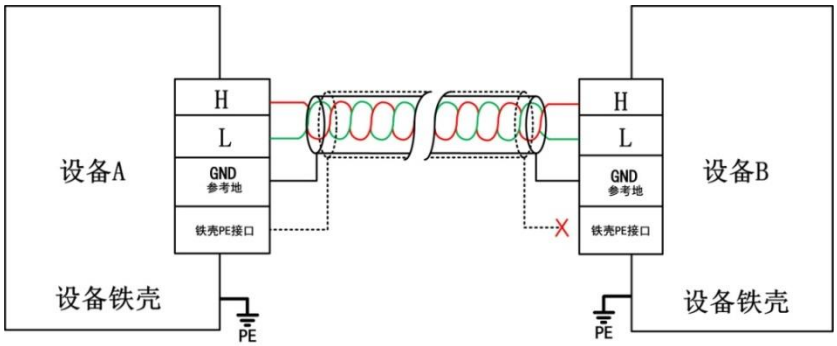


Figure 2.5 Double-core double-layer shielded cable connection

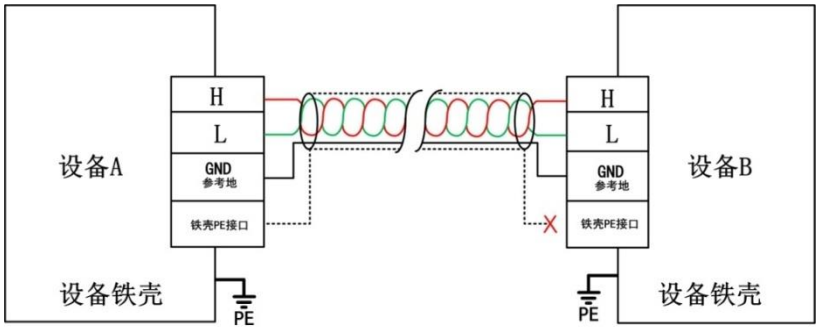


Figure 2.6 Three-core single-layer shielded cable connection

3. Driver Installation

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

3.1 Installing the Driver Under Windows

Connect the USBCANFD-100U-mini interface card to the computer with a USB cable to ensure that the device is powered properly.

Right-click [Computer] and choose [Properties] (as shown in Figure 3.1) to open the Device Manager. Before the driver is installed, the device manager is displayed, as shown in Figure 3.2. At this time, if the device manager does not display the message, check whether the USB cable is connected correctly, whether the USB port of the computer is disabled, and whether the device indicator SYS is on (red indicator at this time).

Figure 3 Starting the computer device manager

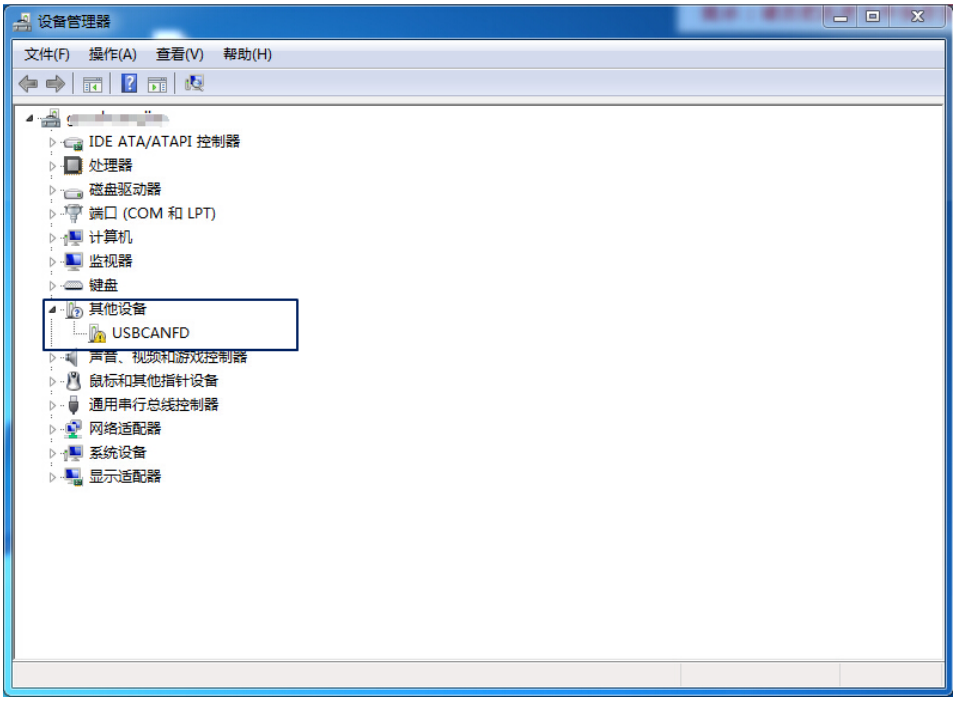


Figure 3.2 Starting the computer device manager

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

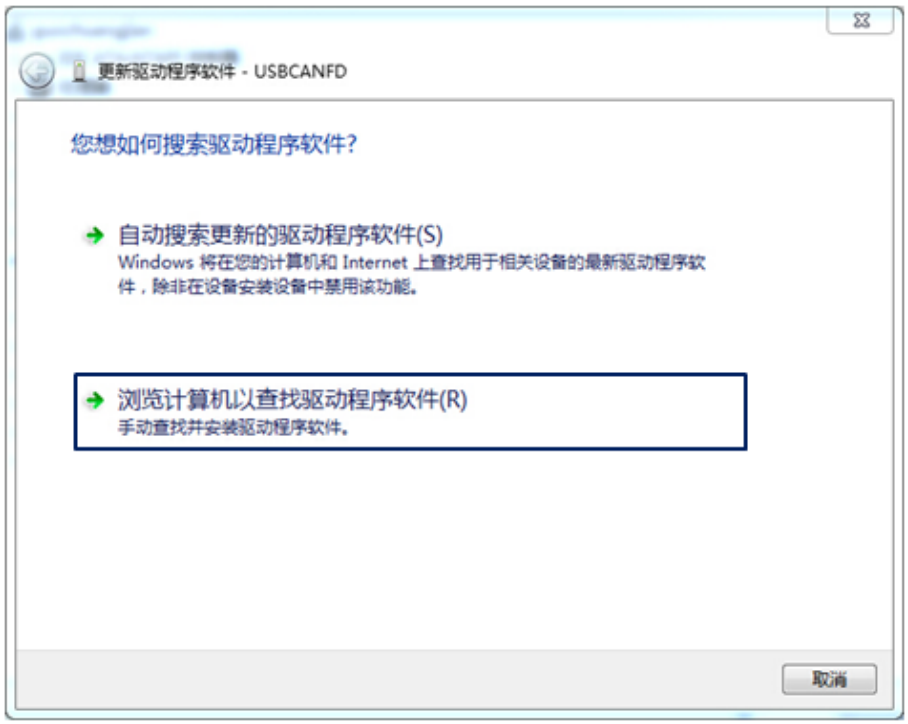


Figure 3.3 Browsing the computer to find the driver software

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

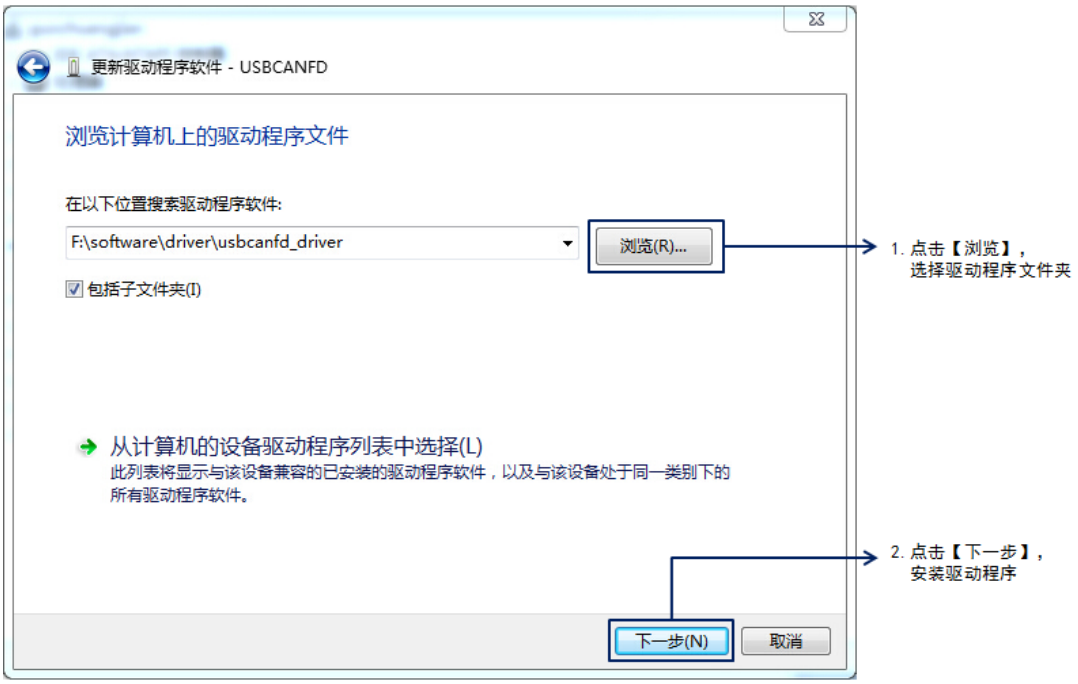


Figure 3.4 Finding the driver and install it

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.

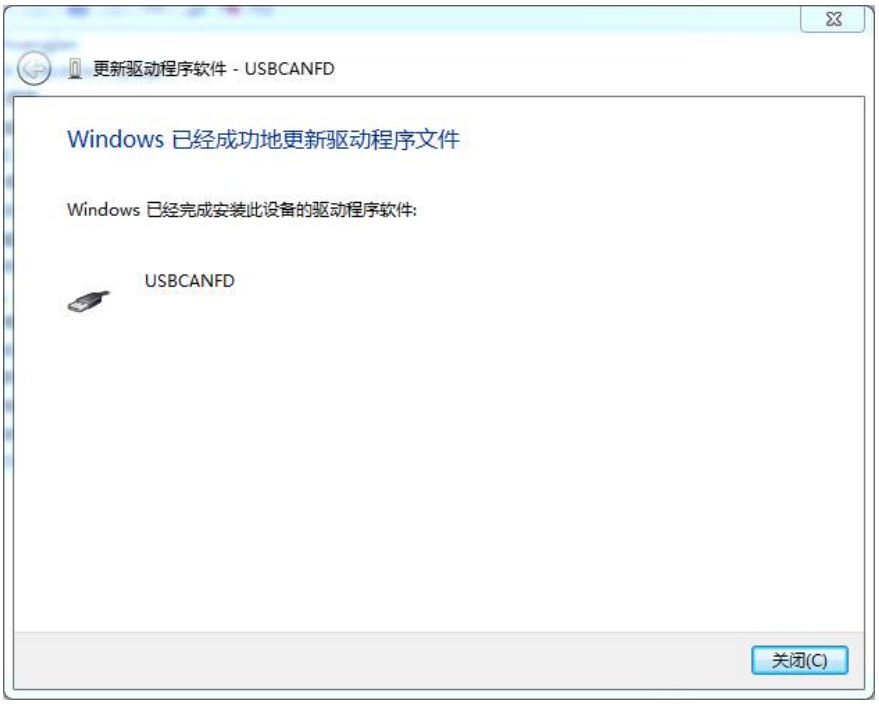
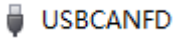


Figure 3.5 Finding the driver and install it

After the driver is installed, 

is displayed in the device manager, indicating that the driver is installed correctly. The device SYS indicator turns from red to green. In this case, the CANFD card has been connected to the PC, and the host computer software can be used to 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 USBCANFD-100U-mini are semiconductor components. Although it has a long service life, it may also age fast under incorrect 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 to a year. Under unfavorable environmental conditions, more frequent inspections should be carried out.

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	USB port power +5V 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
		Check the noise source near the equipment	No significant noise signal source	Isolate the device from the noise source or protect the device
3	Installation and Wiring	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-100U-mini Packing List V1.00

No.	Name	Quantity	Unit	Remarks
1	USB to CANFD interface card	1	Piece	
2	After-sales Service Guide	1	Pcs	
3	Certificate of Conformity	1	Piece	
4	DB9 to OPEN4 adapter	1	Piece	
5				

6. ZCANPRO Software User 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 you to carry out 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 4.1). For detailed instructions for the ZCANPRO software, see [User Manual].

Figure 4.1 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.

Remarks: It is recommended to use shielded twisted pair cables as the USBCANFD interface card series transmission cables. If these cables are not used in harsh environments, communication may be unstable.

Dreams come true with professionalism and dedication.

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