User Manual

CANSwitch-AF2S2 User Manual

High-Performance Dual-CAN to Fiber Optic Switch

UM01010101 V1.03 Date: 2019/03/26 **Product User Manual**

Category	Contents
Keywords	Dual CAN, dual optical, hardware switch, converter, hub
Description	CANSwitch-AF2S2 is a high-performance dual-channel CAN-to-fiber switch based on ZLG Electronics' advanced CAN bus technologies and operating system technologies. It has two conversion modes: Hub and Converter.

Revision History

Version	Date	Description
V1.00	December 27, 2015	Created
V1.01	August 11, 2017	Changed the company name and sales network information
V1.02	March 14, 2019	Updated the document header and footer and "Sales and Service Network" content and added the "Disclaimer" content
V1.03	March 26, 2019	Updated product images

Contents

1. Functions

1.1 Overview

CANSwitch-AF2S2 is a high-performance industrial-grade optical fiber and CAN-bus data conversion device developed by Guangzhou ZLG Electronics Co., Ltd. It integrates two CAN-bus interfaces and two 100M fiber interfaces, and provides sophisticated and stable TCP/IP protocol stack and hard switch.It helps you easily interconnect CAN-bus network and optical fiber network, and further expand the scope of CAN-bus network. It can also be configured in hub mode for device cascading.

Compared with twisted pair and coaxial cable, the low transmission loss of optical fiber greatly increases the transmission distance. In addition, the optical cable also has the characteristics of not radiating energy, non-conducting, and non-inductive.Moreover, there is no influence of crosstalk and mutual interference of optical signals in the optical cable, it has excellent anti-EMI and EMC characteristics, and there is no safety problem caused by inductive coupling in the cable.

CANSwitch-AF2S2 is an industrial grade product and works in the temperature range of -40℃ to +85℃. It has two optical fiber interfaces, and the highest baud rate of 2-way CAN-bus interface communication is 1 Mbps. CANSwitch-AF2S2 has two modes: in the hub mode, it can realize cascading and automatic networking without configuration, as shown in Figure 1.1; in the converter mode, it has TCP Server, TCP Client, UDP, and other working modes. Each CAN port supports six IP segments to set a maximum of 200 TCP or UDP connections. By using the configuration software, you can flexibly set configuration parameters. Figure 1.2 shows a typical application.

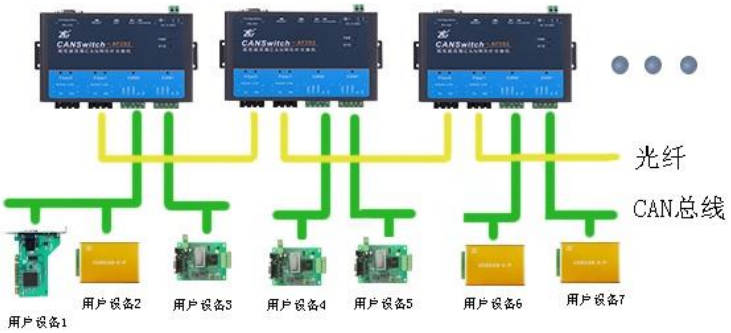


Figure 1.1 Typical application in Hub mode

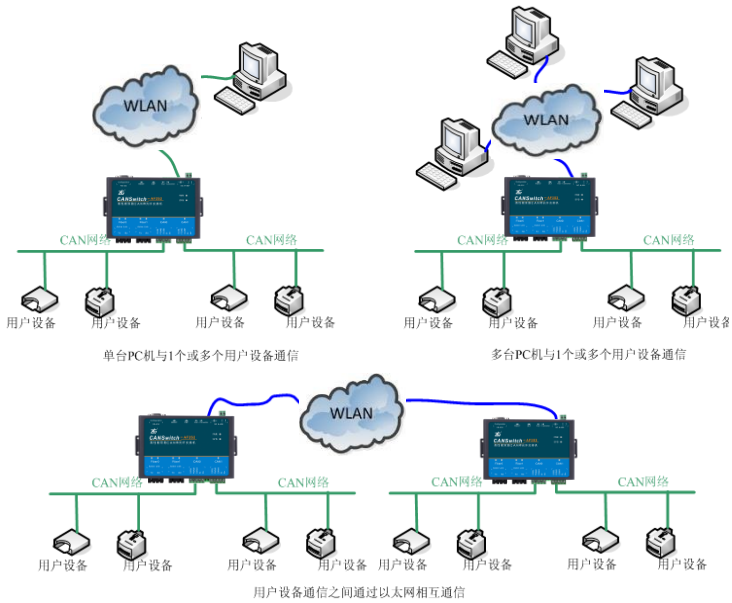


Figure 1.2 Typical application in Converter mode

1.1.1 Powerful Hardware

- Adopt TI Cortex-A8 800MHz high-performance processor;
- 100M fiber interface, hardware switch supported;
- Two CAN ports, 2.5 kV DC withstand voltage isolation;
- CAN port baud rate 5k-1,000kbps can be set arbitrarily;
- Embedded hardware watchdog;
- The rated power supply voltage range is 9-36 V DC ;
- The limit power supply voltage range is 7.5-40 V DC ;
- Operating temperature: -40°C to +85°C;
- Humidity: 5%-95% RH, no condensation;
- Rugged metal housing, SECC metal (1.1 mm);
- Specifically designed for industrial and military environments.

1.1.2 Perfect Functions

In Hub mode:

- Cascading is supported. A maximum of 32 levels can be cascaded;
- Each CAN port can be set to a different baud rate;
- Two-way transparent transmission of CAN data and optical fiber data (for the format, see Appendix A);
- Support the acceptance and filtering of CAN ports. You can select the ID range to be received, so as to filter unwanted CAN frames;
- Each CAN port can be configured into different working modes, which can be flexibly used in various fields;
- Each CAN port opens a diagnostic port, and the host computer can obtain the error status of the corresponding CAN port by connecting this port;
- You can use the Windows platform configuration software to configure operating parameters. The parameters can be imported and exported;

- Provide Windows configuration software function library for free, including easy-to-use API function library, which helps you write configuration software;
- Support local system firmware upgrade.

In Converter mode:

- Static or dynamic IP acquisition;
- Heartbeat and timeout disconnection;
- The working port is fixed, and the destination IP address and port can be set;
- After the network is disconnected, the connection resources are automatically restored, and the TCP connection is established reliably;
- TCP supports a maximum of 200 connections, which can satisfy six groups of users and manage one CAN port;
- In UDP mode, each CAN port supports six groups of target IP segments. Multiple users can manage a CAN device at the same time;
- Supported protocols include ETHERNET, ARP, IP, ICMP, UDP, DHCP, DNS, and TCP;
- Compatible with SOCKET working methods (TCP Server, TCP Client, UDP, etc.). The writing of the host computer communication software follows the standard SOCKET rules;
- Each CAN port can be set to a different baud rate;
- Two-way transparent transmission of CAN data and optical fiber data (for the format, see Appendix A);
- Flexible CAN port data framing settings meet various subcontracting needs;
- Support the acceptance and filtering of CAN ports. You can select the ID range to be received, so as to filter unwanted CAN frames;
- Each CAN port can be configured into different working modes, which can be flexibly used in various fields;
- Each CAN port opens a diagnostic port, and the host computer can obtain the error status of the corresponding CAN port by connecting this port;
- You can use the Windows platform configuration software to configure operating parameters. The parameters can be imported and exported;
- Provide Windows platform configuration software function library for free, including easy-to-use API function library, which helps users write their own configuration software;
- Support local system firmware upgrade.

1.2 Product Specifications

1.2.1 Fiber Interfaces

- Number of fiber ports: 2;
- Interface type: SC;
- Fiber type: single mode;
- Operating wavelength: 1,310 nm;
- Operating rate: 100 Mbps.

1.2.2 CAN Interfaces

- Number of CAN ports: 2;
- Interface type: 2EDG, 90°, terminal, 2.5 kV electromagnetic isolation;
- Signal cable: CAN0H, CAN0L, CAN1H, CAN1L;
- Shielded wire: FGND;
- Terminal resistance wiring: R-, R+;
- Baud rate: 5Kbps-1000Kbps.

1.2.3 Power Interfaces

- Round hole socket: positive inside and negative outside;
- Terminal: OPEN2.

1.2.4 Configuring the Interfaces

- RS232 interface;

1.2.5 Software Features

- Supported TCP/IP protocols: ETHERNET, ARP, IP, ICMP, UDP, TCP, DHCP, DNS.
- Tool software: ZNetCom configuration software (version 2.95 or later), CANtest test tool, TCP/UDP test tool.
- Configuration method: Windows configuration software ZNetCom.

1.2.6 EMC Characteristics

- Electrostatic Discharge Immunity (ESD)
  - ✧ Contact discharge: +8KV Class A
  - ✧ Air discharge: +15KV Class A
- Electrical fast transient (EFT) burst immunity
  - ✧ Power port: +2 kV Class A
  - ✧ Signal port: +1 kV Class A
- Surge (impact) immunity
  - ✧ Power port (DC terminal): +1 kV Class A
  - ✧ Power port (adapter): +2 kV Class A
  - ✧ Signal port: +1 kV Class A

1.2.7 Electrical Parameters

Unless otherwise specified, the parameters listed in Table 1.1 refer to the values at Tamb=25°C.

Table 1.1 Electrical parameters

Parameter Name	Symbol	Rating	Unit
Power voltage	VCC	+9~36V	V
Power consumption	PM	3350	mW
Operating ambient temperature	Tamb	-40℃~85℃	℃
Storage temperature	Tstg	-40℃~85℃	℃

1.3 Mechanical Dimensions

To install CANSwitch-AF2S2, see the appearance and mechanical dimensions (unit: mm) provided in Figure 1.3. The figure specifies the length, width, height, and part of the mechanical structure of the product.

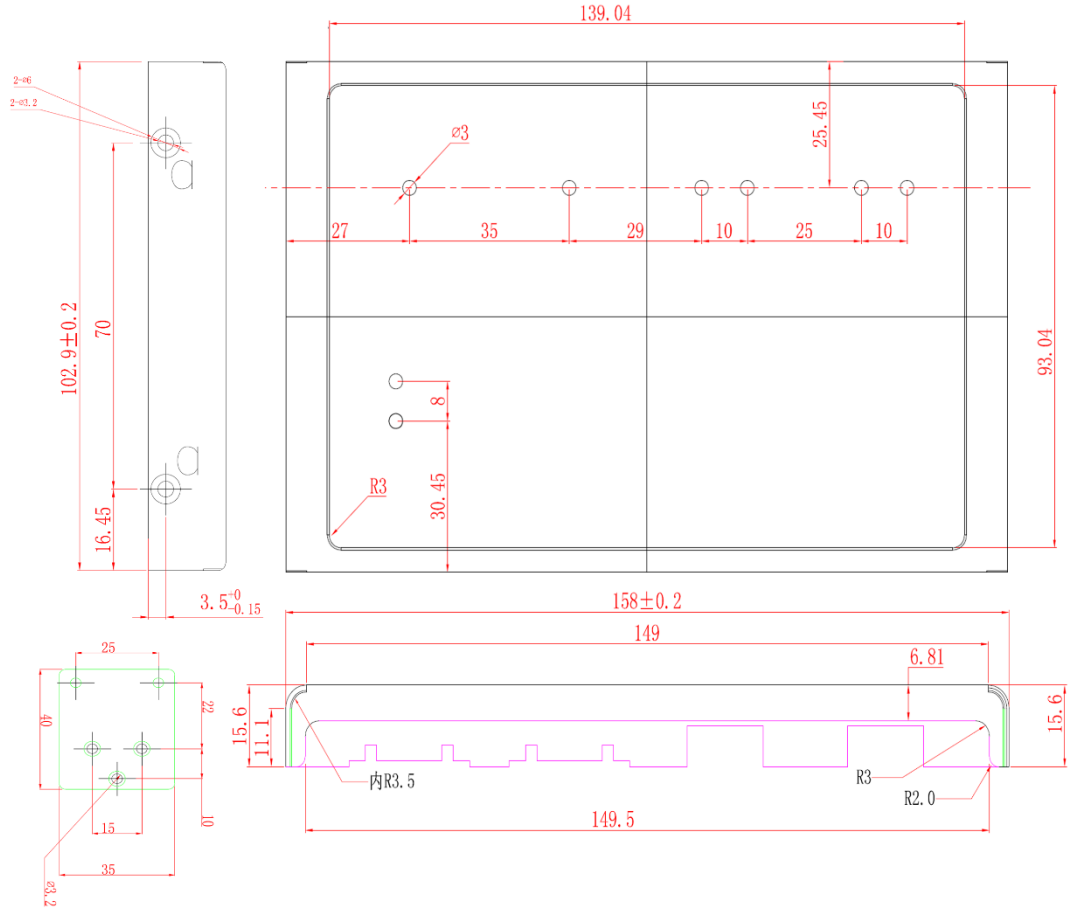


Figure 1.3 CANSwitch-AF2S2 installation mechanical dimensions

2. Hardware Interfaces

This chapter describes the hardware interfaces of CANSwitch-AF2S2.

2.1 Appearance Drawing

Figure 2.1 shows the front appearance of the product. Figure 2.2 and Figure 2.3 show the side appearance.

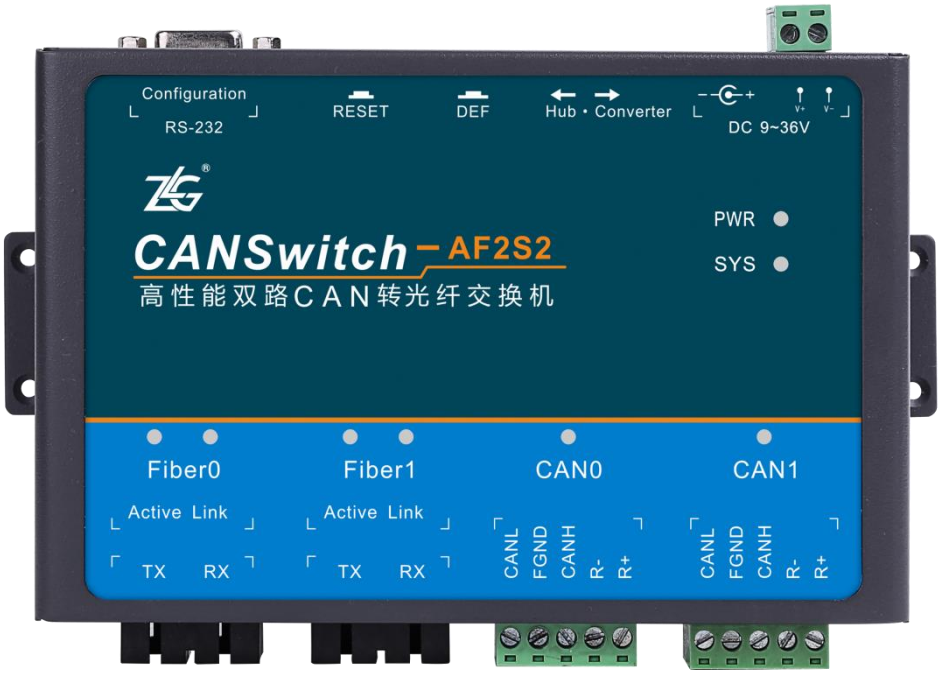


Figure 2.1 CANSwitch-AF2S2 front appearance

Figure 2.2 CANSwitch-AF2S2 side appearance 1

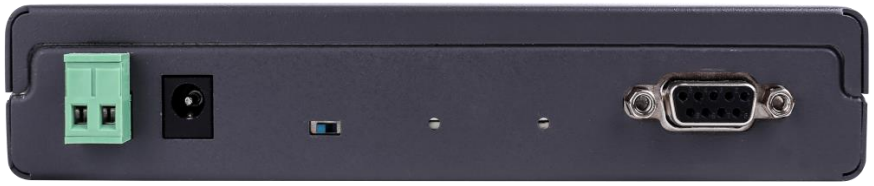


Figure 2.3 CANSwitch-AF2S2 side appearance 2

2.2 Power Interfaces

CANSwitch-AF2S2 uses a 9-36 V DC power supply that is easily available at the industrial site, and is equipped with two wiring ports. One is a round hole socket and the other is a terminal block. Both interfaces support positive and negative connections, with no need to confirm the positive and negative poles. Figure 2.4 shows its interface.

Figure 2.4 Power Interface

2.3 RS232 Configuration Interface

As shown in Figure 2.5, this interface is specially used to configure the CANSwitch-AF2S2 device.

Figure 2.5 Configuring ports

2.4 Reset Button, Default Restoration Button, and Function Switch

As shown in Figure 2.6, RESET is used to reset the device manually. Press it for 1 second to reset the device; DEF is used to restore factory settings. Press it for 5-10 seconds and then the system SYS is off (the SYS indicator is green). The device will automatically reset factory settings. The CANSwitch-AF2S2 device has two functions: Hub (hub) and Converter (converter). When the function switch is set to the corresponding function, press the RESET key once for the function to take effect.

Figure 2.6 Reset button, default restoration button and function switch

Tip: After default settings are restored, all current configurations will be lost. Operate with caution.

2.5 Fiber Interface

Figure 2.7 shows the appearance of the optical fiber (SC) interface of CANSwitch-AF2S2, with four indicators. The Link indicator is green, indicating whether the optical fiber network is physically connected. If it is connected to the optical fiber network, the Link indicator is always on; the Active indicator is yellow, indicating whether there is data transmission. If the optical fiber network has data transmission, the Active indicator flashes.

Figure 2.7 Optical fiber interface and indicators

2.6 CAN Port

The CANSwitch-AF2S2 device has two CAN ports. Figure 2.8 shows its appearance. It has two indicators: CAN0 and CAN1. When a device is connected, when there is data communication; Table 2.1 describes the pin definition.

Figure 2.8 CAN interface and indicators

Table 2.1 Definition of CANSwitch-AF2S2 CAN port pins

Signal	Introduction
CANL	CANL signal terminal of CAN
FGND	Terminals for connecting the CAN channel to the shielding layer
CANH	CANH signal terminal of CAN
R-	120-ohm termination resistor of CAN. Connecting the wire to R+ means enabling the internal termination resistor
R+	120-ohm termination resistor for CAN. Connecting the wire to R- means enabling the internal termination resistor

Tip: The terminal resistance can be configured if R- and R+ are short-circuited with wires.

2.7 LED Indicators

The CANSwitch-AF2S2 device has six indicators, PWR, SYS, Fiber0, Fiber1, CAN0, and CAN1, as shown in Figure 2.9.

Figure 2.9 Indicators

Table 2.2 describes the indicators.

Table 2.2 Description of LED indicators

LED	Description
PWR	The power indicator is always on after power on
SYS	System running indicator. When the device is not ready to start or fails, the red indicator is steady on; when it is running properly, the green indicator flashes
Fiber0/Fiber1 Active	LAN working indicator flashes when data is sent and received
Fiber0/Fiber1 Link	LAN working indicator is steady on when the optical fiber network is physically connected
CAN0/CAN1	Green indicator on or flashing: Data is sent or received on the CAN port Green indicator off: No data is sent or received on the CAN port Red indicator on: An error occurred on the CAN port Red indicator off: No error has occurred on the CAN port, or the error has been cleared

3. Quick Use in Hub Mode (Hub Mode)

Devices in hub mode can implement automatic networking, and devices can be cascaded in hub mode. This document uses three CANSwitch-AF2S2 devices for cascading. As long as the device is configured, the CAN bus will be forwarded to the corresponding CAN port as required. You can network independently without using switches and other equipment.

3.1 Device Configuration Method

Turn the switch to Hub and press the reset button. After the device beeps twice, it enters Hub mode. For details, see Section 2.4.

The CANSwitch-AF2S2 supports using the serial port to configure the device, as shown in Figure 3.1. The device can be configured as long as the dedicated RS232 configuration port is connected to the PC.

Figure 3.1 Dedicated configuration port

3.2 System Block Diagram

This document uses three devices for cascading and meets the following design requirements. The CAN signal sent by user equipment 1 and user equipment 2 can be received by user equipment 3, user equipment 6 and user equipment 7; the CAN signal sent by user equipment 3 can be received by user equipment 4 and user equipment 5; the CAN signals sent by user equipment 4 and user equipment 5 can be received by all the equipment; the CAN signal sent by user equipment 6 can be received by user equipment 1, the user equipment 2, the user equipment 3 and the user equipment 7; the CAN signal sent by user equipment 7 can be received by user equipment 1, user equipment 2, user equipment 3 and user equipment 6. Figure 3.2 shows the overall system block diagram.

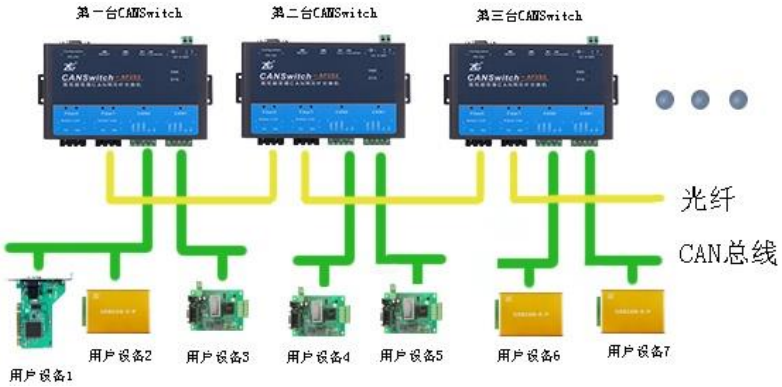


Figure 3.2 System block diagram in Hub mode

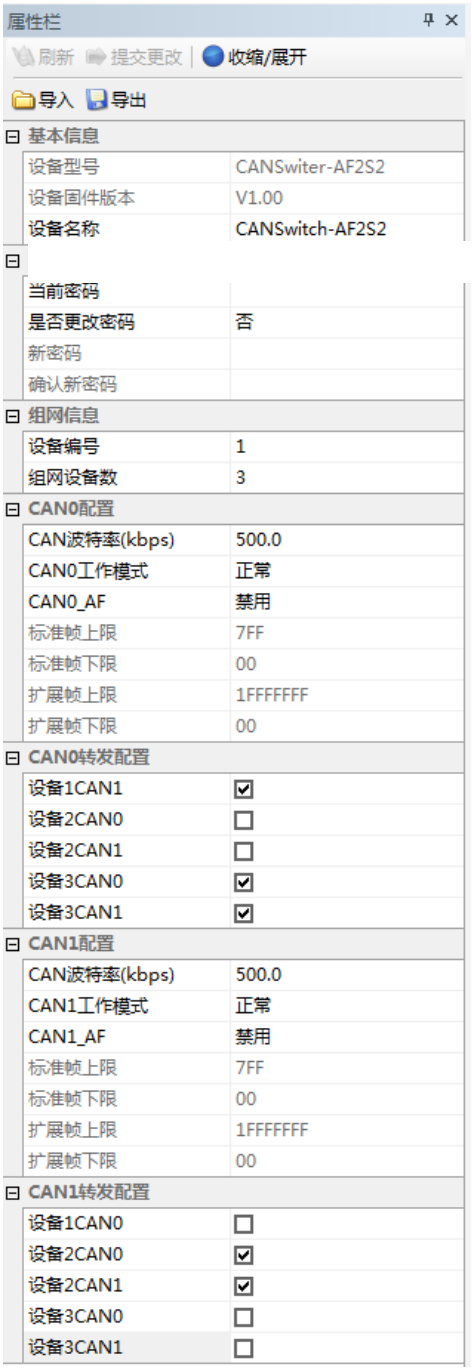
3.3 Configuring the Device

Search devices. The CANSwitch supports searching by serial port. When searching by serial port, the COM port should be selected correctly. See Figure 3.3.

Figure 3.3 Searching for devices

Note: For details about how to configure the device, see **错误!未找到引用源。**.

Configure the three CANSwitch devices, as shown in Figure 3.4, Figure 3.5, and Figure 3.6.



Be sure to submit the configuration modifications

The default password is 88888

A total of three devices are used for networking. Select 3 as the number of networking devices (a maximum of 32 devices are supported for cascading); this device is the first networking device, so select 1 as the device number

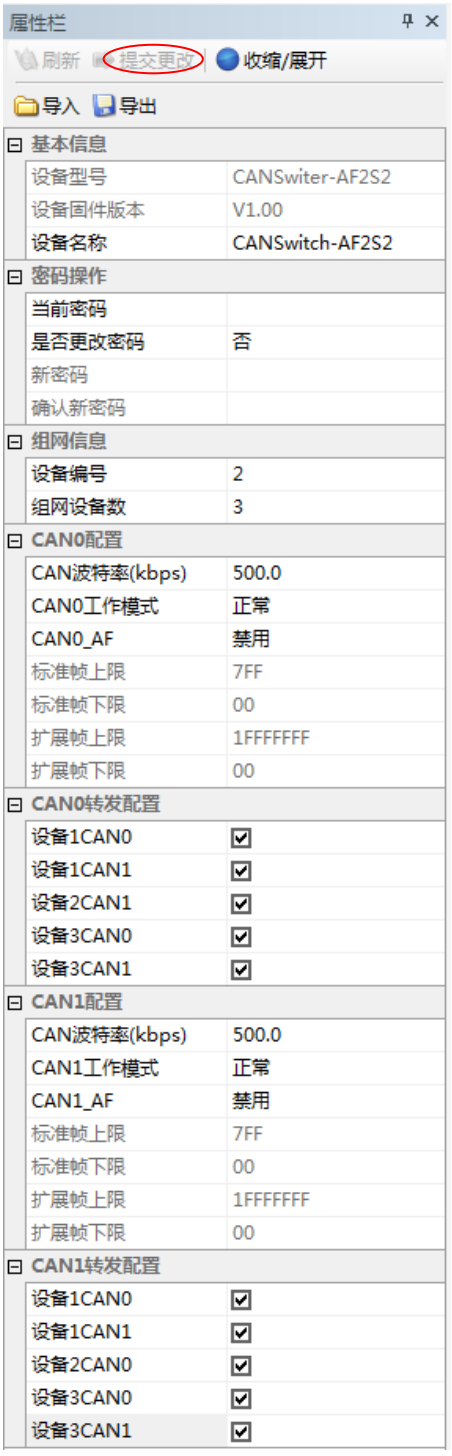
The baud rate should be 500K, which should be consistent with the CAN device connected to the CAN0 port.

The data of CAN0 port can only be forwarded to CAN1 port of device 1, CAN0 port of device 3 and CAN1 port of device 3

The baud rate should be 500K, which should be consistent with the CAN device connected to the CAN1 port.

The data of CAN1 port can only be forwarded to CAN0 port of device 2 and CAN1 port of device 2

Figure 3.4 Configuration of the first CANSwitch



Be sure to submit the configuration modifications

The default password is 88888

A total of three devices are used for networking. Select 3 as the number of networking devices (a maximum of 32 devices are supported for cascading); this device is the second networking device, so select 2 as the device number

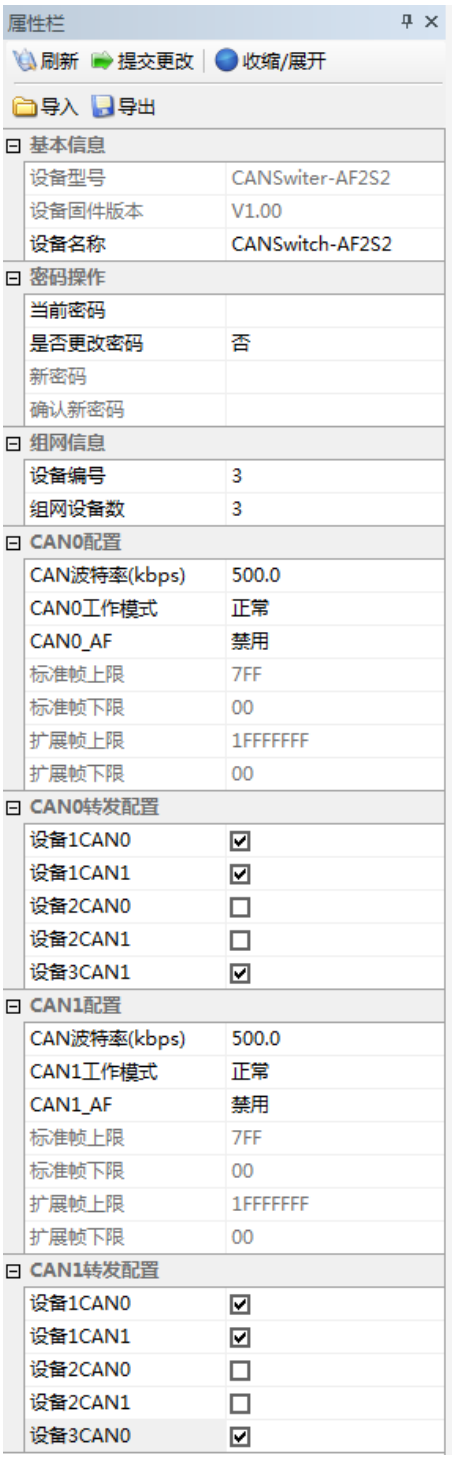
The baud rate should be 500K, which should be consistent with the CAN device connected to the CAN0 port.

The data of CAN0 port can only be forwarded to all CAN buses

The baud rate should be 500K, which should be consistent with the CAN device connected to the CAN1 port.

The data of CAN1 port can only be forwarded to all CAN buses

Figure 3.5 Configuration of the second CANSwitch



Be sure to submit the configuration modifications

The default password is 88888

A total of three devices are used for networking. Select 3 as the number of networking devices (a maximum of 32 devices are supported for cascading); this device is the third networking device, so select 3 as the device number

The baud rate should be 500K, which should be consistent with the CAN device connected to the CAN0 port.

The data of CAN0 port can only be forwarded to CAN0 port and CAN1 port of device 1; CAN1 port of device 3

The baud rate should be 500K, which should be consistent with the CAN device connected to the CAN1 port.

The data of CAN1 port can only be forwarded to CAN0 port and CAN1 port of device 1; CAN0 port of device 3

Figure 3.6 Configuration of the third CANSwitch

When the configuration is successful, it will beep twice. For details about how to use the ZNetCom software, refer to Section 5 ZNetCom software configuration.

3.4 CANTest Software Operation

We need a device equipped with a CAN port to demonstrate how the CANSwitch-AF2S2 device realizes bidirectional transparent conversion of CAN network data and optical fiber data. Here, select the USBCAN interface card, which is convenient

to use. Its related information is available at http://www.zlg.cn.

Note: For details about how to use the CANTest software, see *ZLG Electronics CAN Test Software and Interface Function User Manual*.

First, connect the CANSwitch-AF2S2 device to the PC by using an optical cable, and connect the CANSwitch-AF2S2 device to the USBCAN interface card by using a twisted pair cable (CANH is connected, and CANL is connected. Configure a 120-ohm terminal resistance). Then, connect the USBCAN interface card with the PC by using a USB cable. Finally, connect power to the USBCAN interface card and the CANSwitch-AF2S2 device. Run the CANtest software on the PC (as shown in Figure 3.7). The CANtest test software is available on http://www.zlg.cn/ (installation required).

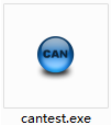


Figure 3.7 Software used to test communication

After starting CANtest, select a device type. Here we use USBCAN-EU as an example. First, we select USBCAN-EU, as shown in Figure 3.8. Then, select the "Open Device" menu in the "Device Operation" main menu to display the device's parameter setting interface. Pay attention to the baud rate. Click OK and start CAN, as shown in Figure 3.9.

Figure 3.8 Selecting a device type

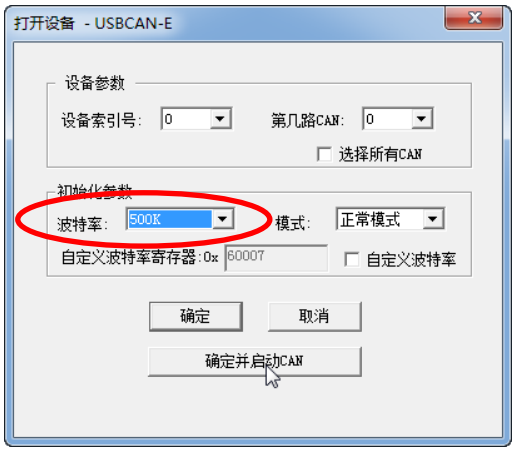


Figure 3.9 Setting device parameters

If the device is connected properly, there will be no prompt. If the connection is abnormal, an error message appears.

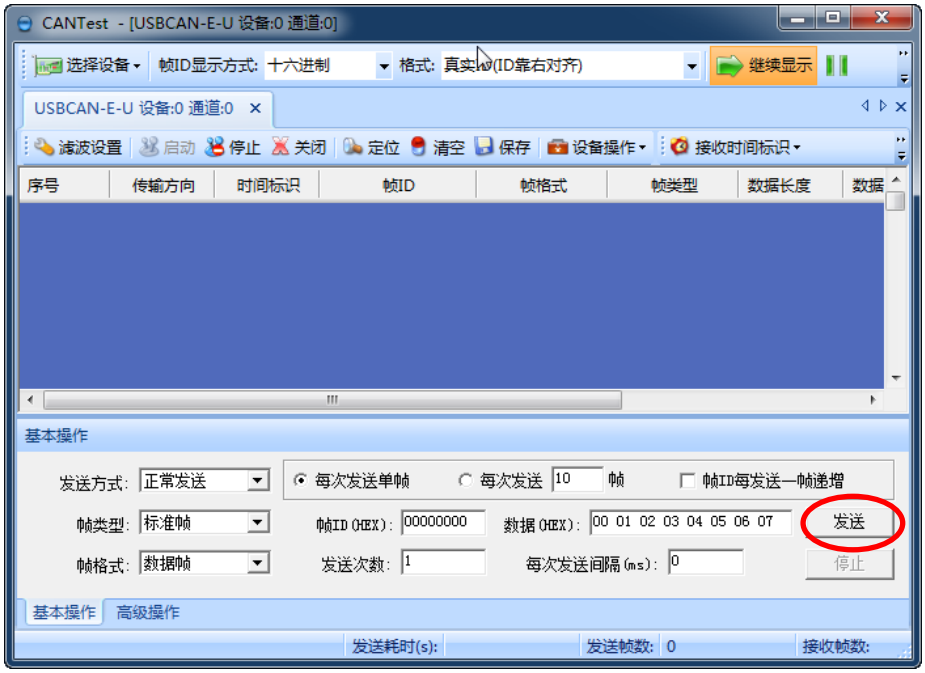


Figure 3.10 Starting USBCAN-E-U successfully

On the tab page of any CANtest software, click the "Send" button. You can then receive the data you just sent on the tab page of another CANtest software.

3.5 Test Result

Open all six CAN cards, as shown in Figure 3.11.

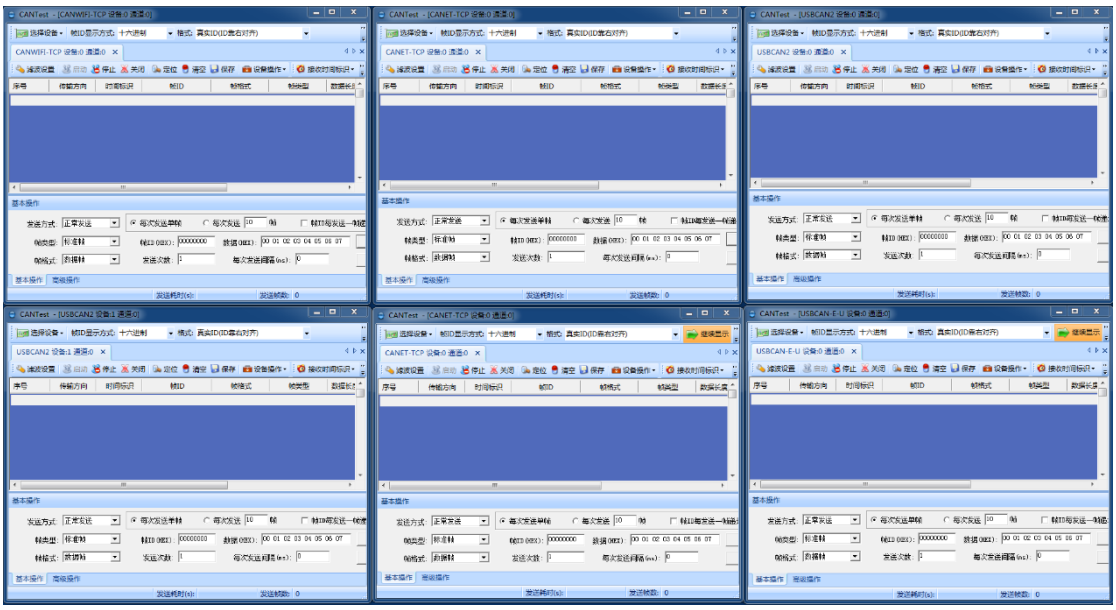


Figure 3.11 Starting the device

The first CAN bus sends data, the second, fifth, and sixth CAN buses receive data, and the third and fourth CAN buses do not receive data, which conforms to the configuration of the first CANSwitch-AF2S2. See Figure 3.12.

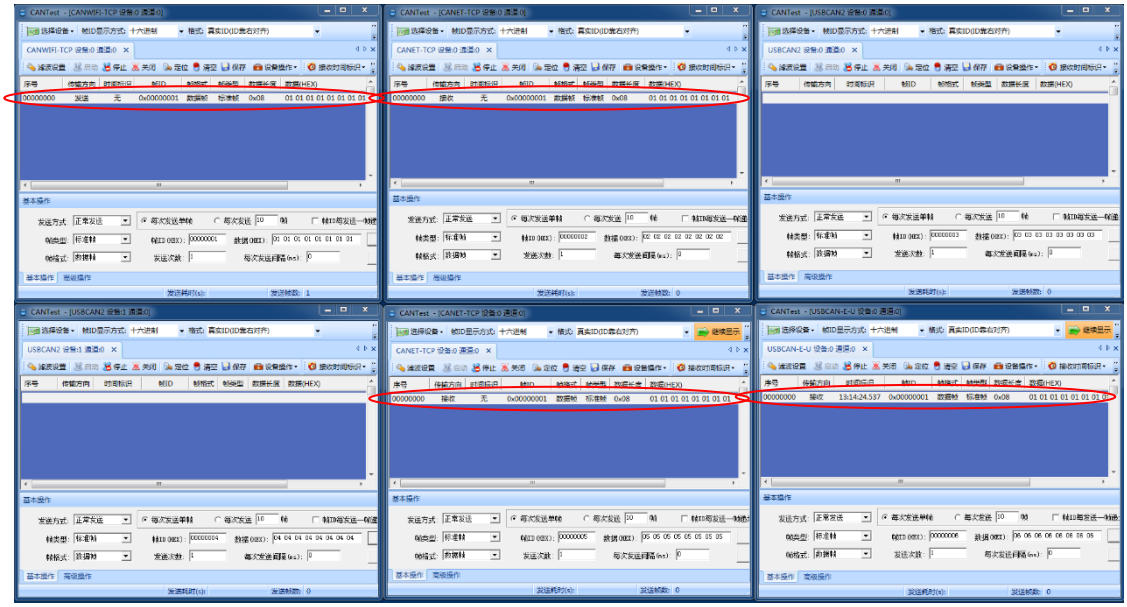


Figure 3.12 First CAN bus sending data

The second CAN bus sends data, the third and fourth CAN buses receive data, and the first, fifth, and sixth CAN buses do not receive data, which conforms with the configuration of the first CANSwitch-AF2S2. See Figure 3.13.

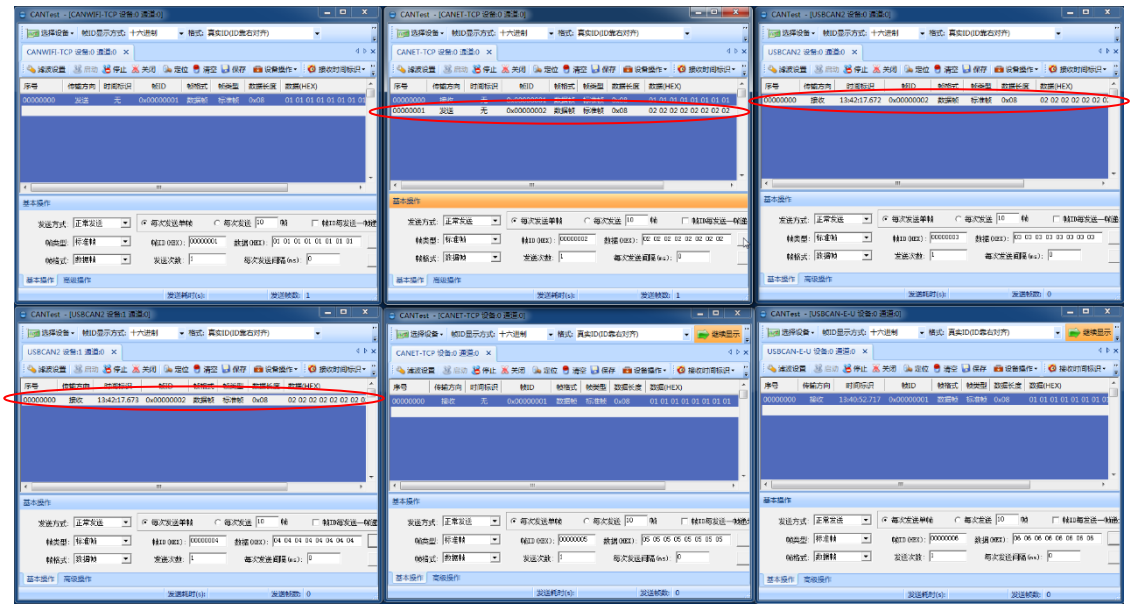


Figure 3.13 Second CAN bus sending data

The third and fourth CAN buses send data, and all other CAN buses can receive data, which conforms with the configuration of the second CANSwitch-AF2S2. See Figure 3.14.

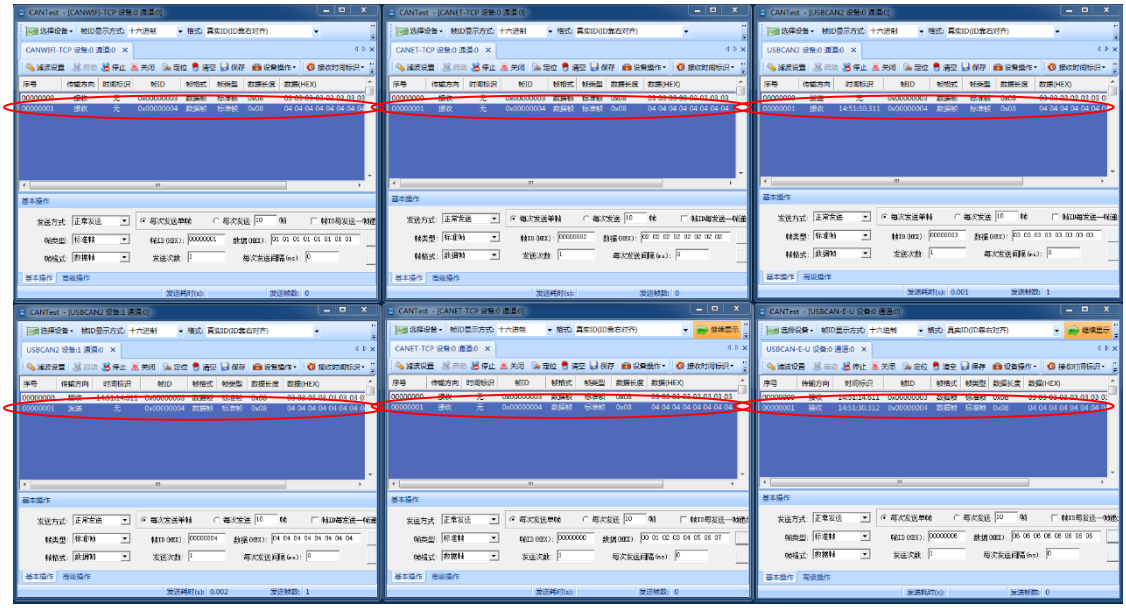


Figure 3.14 Third and fourth CAN buses sending data

The fifth and sixth CAN buses send data, respectively forwarding the first, second, and sixth CAN buses, and the first, second, and fifth CAN buses, which conforms with the configuration of the third CANSwitch-AF2S2. See Figure 3.15.

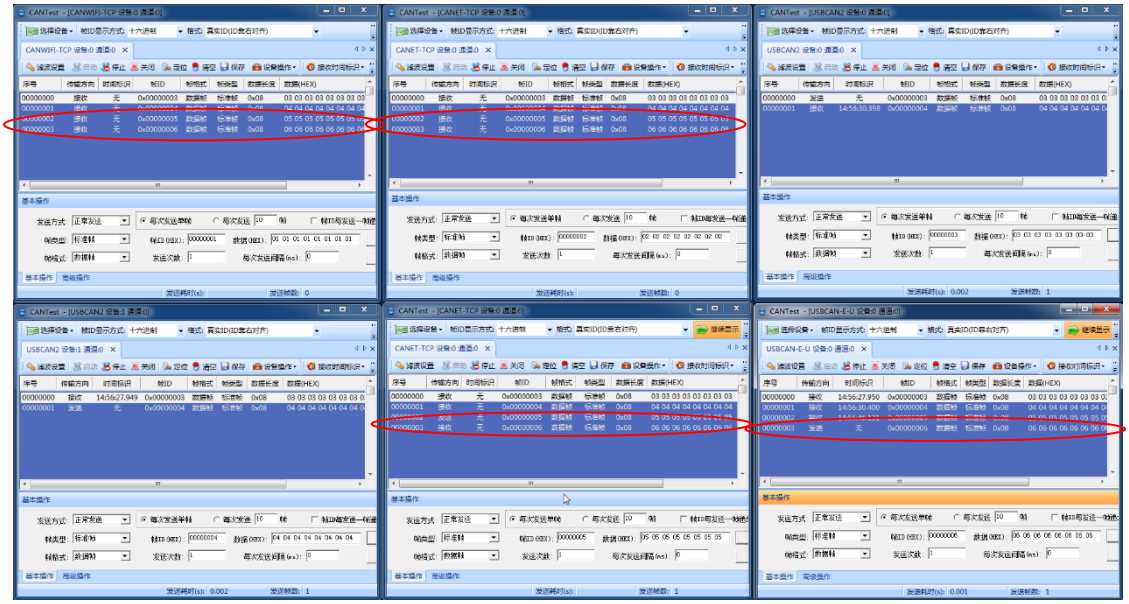


Figure 3.15 Fifth and sixth CAN buses sending data

4. Quick Use in Converter Mode (Converter Mode)

4.1 Device Configuration Method

Turn the switch to Converter, and press the reset button to enter Converter mode. The device will beep twice if the configuration is successful.

CANSwitch-AF2S2 supports using the serial port to configure the device, as shown in Figure 4.1. The device can be configured as long as the dedicated RS232 configuration port is connected to the PC.

Figure 4.1 Dedicated configuration port

4.2 IP Address Operation

4.2.1 Default Settings of the Device IP Address

The default IP address of the CANSwitch-AF2S2 high-performance dual-channel CAN-to-fiber switch device is 192.168.0.178.

4.2.2 Obtaining the Device IP Address

When you forget the IP address of the device or the device uses the DHCP protocol to obtain the IP address automatically, the current IP address of the device can be obtained by using the ZNetCom software. The CANSwitch-AF2S2 device supports two IP address acquisition methods: "static acquisition" and "dynamic acquisition". "Static acquisition" indicates that the device uses the "IP address", "subnet mask" and "gateway" specified by the user; "Dynamic acquisition" indicates that the device obtains the IP address, subnet mask, and gateway information from the DHCP server on the network over DHCP.

The ZNetCom software is the configuration software of CANSwitch-AF2S2 device running on Windows. No matter what the current IP address of the CANSwitch-AF2S2 device is, you can obtain the current IP address of the CANSwitch-AF2S2 device by using ZNetCom software and configure it. The procedure for obtaining CANSwitch-AF2S2 device IP address using ZnetCom software is as follows:

1. Connect the hardware. Connect the device to the 9-36 V DC power supply. It can be connected to the PC by optical fiber and serial port (RS232).
2. Install ZNetCom (version 2.95 or later). For the installation method of ZNetCom software, see 5.1 Installation and Configuration Software.
3. Double-click to run the ZNetCom software (if the system is later than Windows 7, right-click it and run as administrator). The interface shown in Figure 4.2

appears.

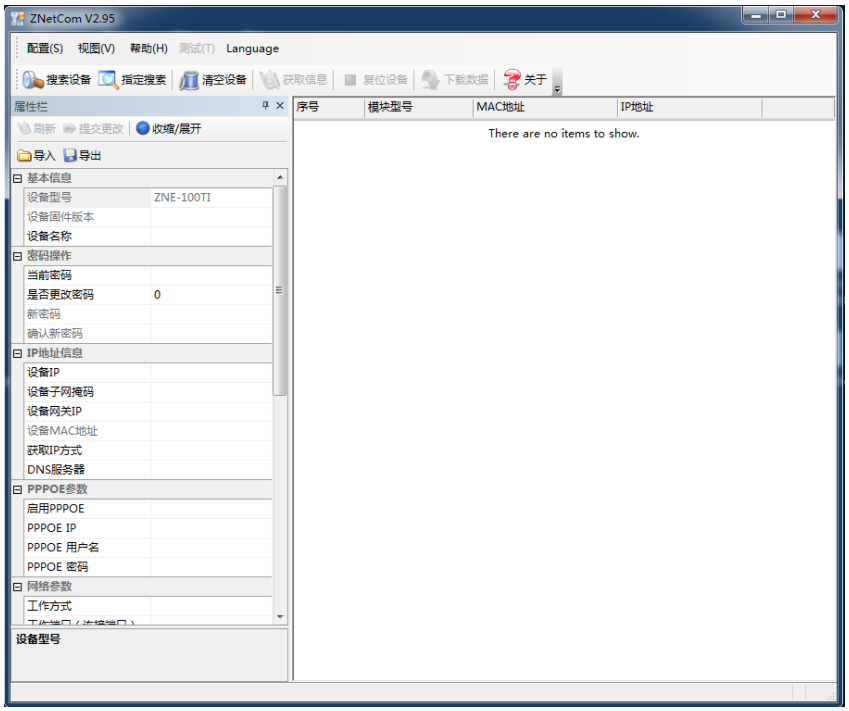


Figure 4.2 ZNetCom running interface

4. Turn off the firewall and antivirus software of the PC.

5. Click 

. The interface shown in Figure 4.3 appears, where you can obtain the IP address of the device.

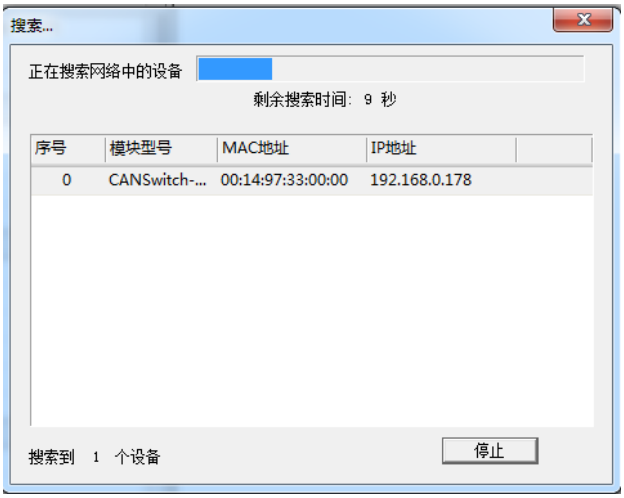


Figure 4.3 Searching for devices by using the ZNetCom software

4.2.3 PC and Device Network Segment Detection

Before using the PC to communicate with the CANSwitch-AF2S2 device, make sure that your PC and the CANSwitch-AF2S2 device are on the same network segment.

The CANE device is set with a default IP address (192.168.0.178) and network mask (255.255.255.0) when it leaves the factory. Check whether the device is on the same

network segment as the user's PC according to the process shown in Figure 4.4. If you are on the same network segment, you do not need to read the following content about the PC network settings. If different, the following PC network settings are very important for you.

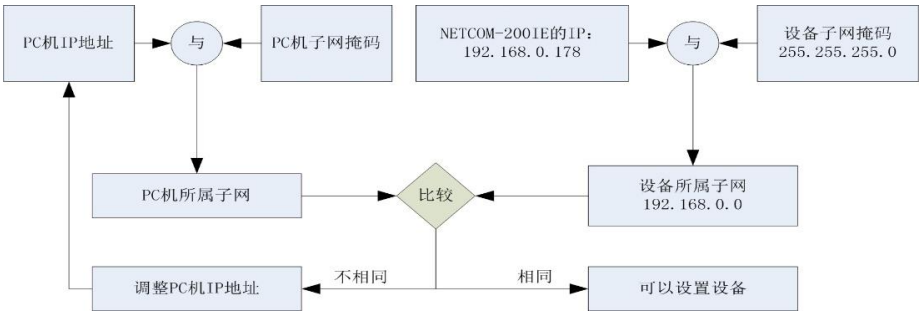


Figure 4.4 Checking whether the IP address of the CANSwitch-AF2S2 device and the PC are on the same network segment

The following describes how to set your PC and CANSwitch-AF2S2 device to the same network segment.

If you are using Windows 2000/XP/7/8/10, there are two methods. One is to add the local IP address, and the other is to change the local IP address.

4.2.4 Adding the IP Address of the Machine (Use Windows7 as an example)

It is assumed that the IP address of the user's PC is 192.168.7.91, and the IP address of the CANSwitch-AF2S2 device is the default IP address 192.168.0.178.

In the operating system, right-click the Start button → Control Panel → Network and Sharing Center → to modify the advanced sharing settings. The Network Connections window is displayed. Select the local area connection icon (Note: The connection is a CANSwitch-AF2S2 device network connection. If the user has multiple network cards, there may be multiple local area connections), right-click the local area connection . The window shown in Figure 4.5 appears.

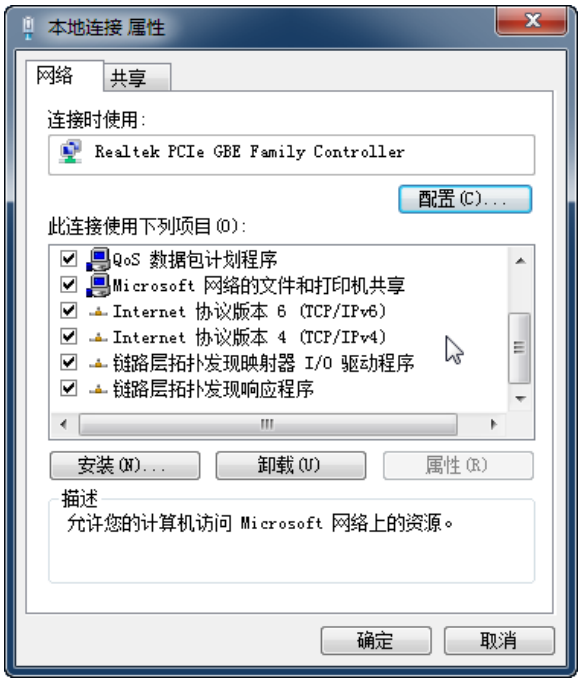


Figure 4.5 Local connection properties 1

Select "Internet Protocol Version 4 (TCP/Ipv4)" and click "Properties", as shown in Figure 4.6.

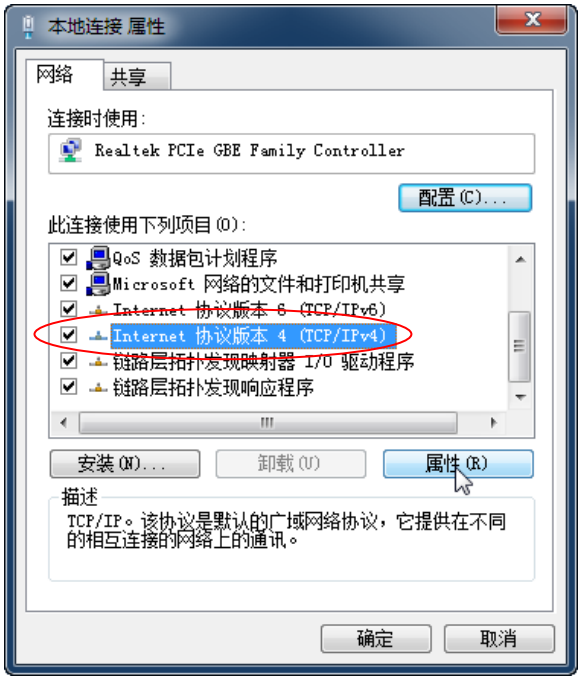


Figure 4.6 Local area connection properties 2

The "General" page displays the current IP address, subnet mask and default gateway and other information. Click "Advanced", as shown in Figure 4.7.

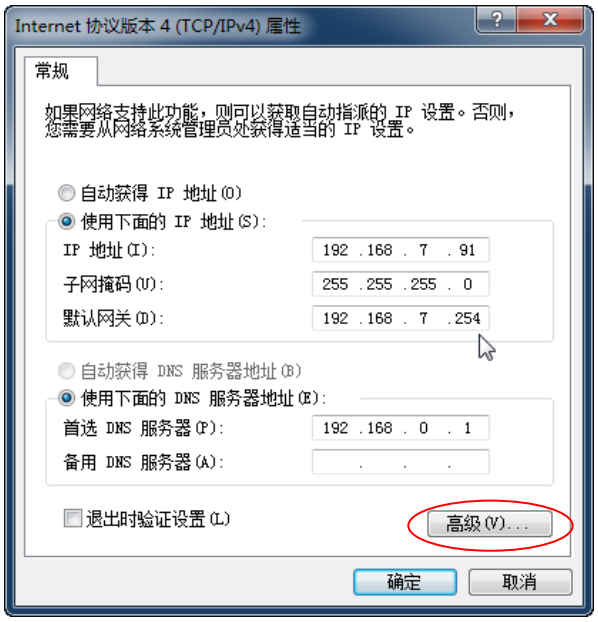


Figure 4.7 TCP/Ipv4 Properties

Click the "Add" button, as shown in Figure 4.8.

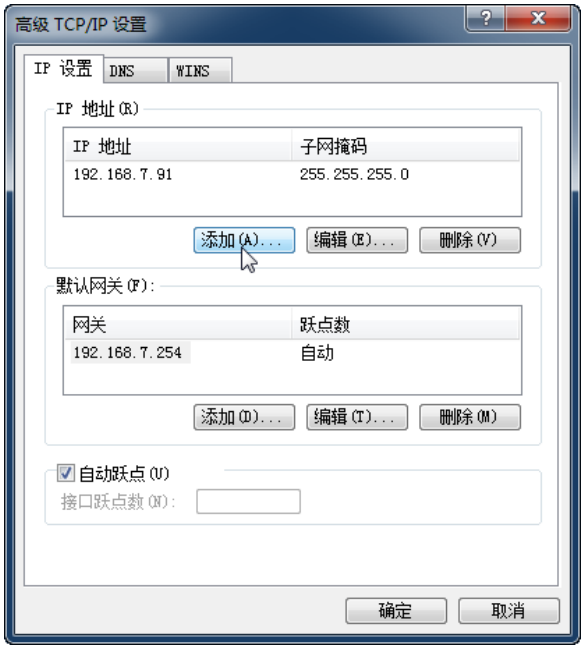


Figure 4.8 TCP/IP settings

Enter the IP address and subnet mask in this window. The IP address should be on the same network segment as CANSwitch-AF2S2, as shown in Figure 4.9.

Figure 4.9 Adding an IP address

Enter the content, and click the Add button. Press OK. Now you can communicate with the CANSwitch-AF2S2 device.

4.2.5 Modifying the Local IP Address

In the operating system, click the Start button Control Panel Network and sharing center to modify the advanced sharing settings, select the "Local Connection" corresponding to the network card connected to the CANSwitch-AF2S2 device, right-click and choose "Properties". In the displayed dialog box, select "Internet Protocol Version 4 (TCP/Ipv4)" and click "Properties". The page shown in Figure 4.10 is displayed. Select [Use the following IP address], and enter the IP address 192.168.0.22, the subnet mask 255.255.255.0, and the default gateway 192.168.0.1 (the DNS part can be left blank). Click "OK" on this page, and wait until the system is configured.

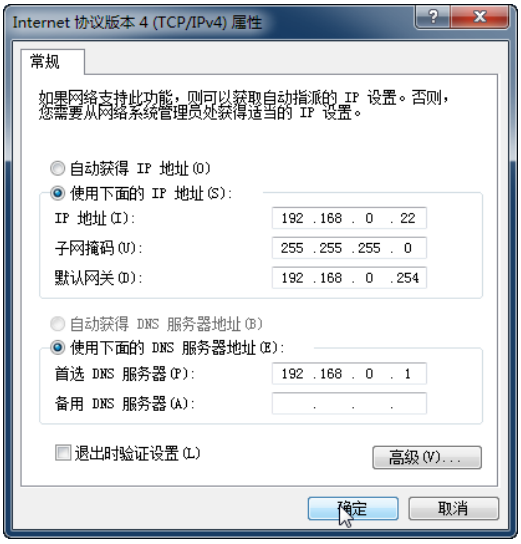


Figure 4.10 TCP/IP Properties window

Now you can communicate with the CANSwitch-AF2S2 device.

4.3 TCP Server Mode

4.3.1 System Block Diagram

In TCP Server mode, CANSwitch-AF2S2 will not actively connect with other devices. It always waits for the connection of the client (TCP Client), and can perform two-way data communication after establishing a TCP connection with the client. Figure 4.11 shows the communication establishment process.

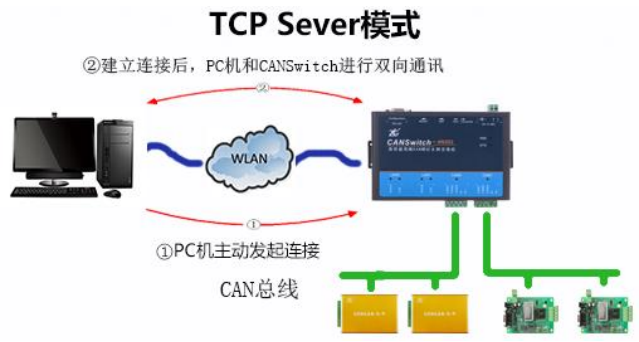


Figure 4.11 Communication in TCP Sever mode

Tip: In this mode, the client connects to the CANSwitch-AF2S2 device over the "working port (see Table 5.2)" corresponding to the CAN port.

4.3.2 Configuring the CANSwitch-AF2S2 Device

Figure 4.12 shows the configuration in TCP Server mode.

Be sure to submit the configuration modifications

The default password is 88888

The IP address configuration should be correct, and the PC and the device should be on the same network segment

Selecting TCP Server mode

The baud rate should be 1000K, which should be consistent with the CAN device connected to the CAN0 port.

Filtering is set, only the frame ID sent from the CAN port to the optical fiber is filtered, and the frame ID sent from the optical fiber to the CAN port is not filtered.

Figure 4.12 Configuration in TCP Sever mode

4.3.3 TCP&UDP Software Operation

Install the TCP&UDP test software, as shown in Figure 4.13.

Figure 4.13 TCP&UDP test software

Double-click to run the TCP&UDP software, and click to create a connection, as shown in Figure 4.14.

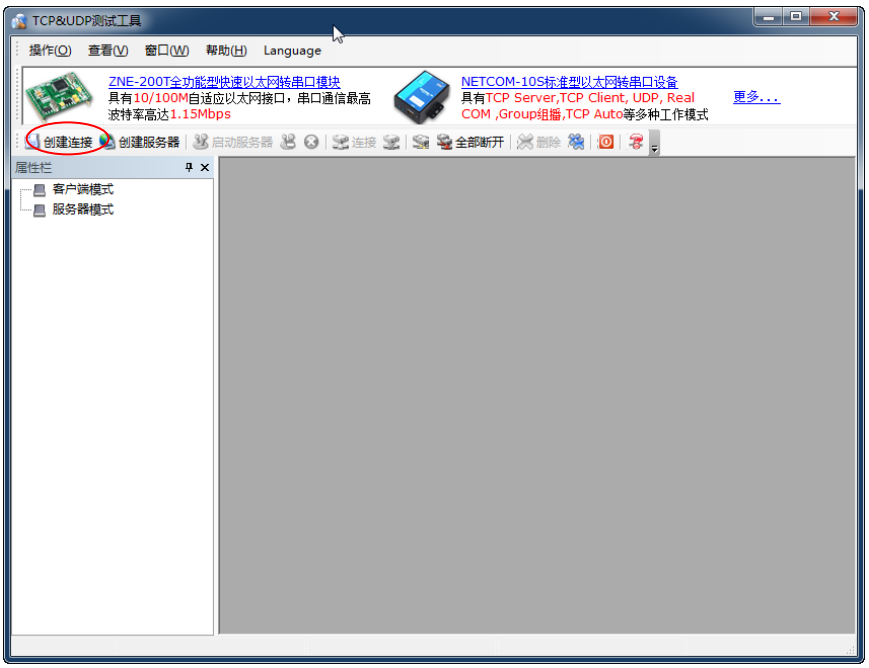


Figure 4.14 Open the TCP&UDP test tool

Select TCP mode in Type, enter the IP address and the working port number of CANSwitch-AF2S2, and click Create. See Figure 4.15.

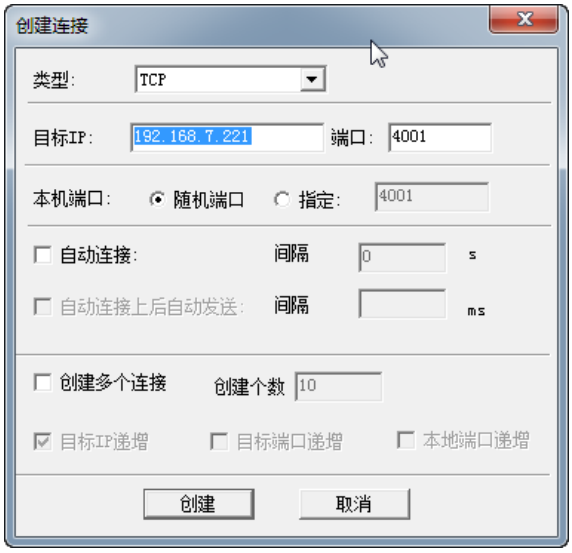


Figure 4.15 Creating a connection

Click Connect to connect the CANSwitch-AF2S2 device. See Figure 4.16.

Figure 4.16 Opening a connection

When the triangle below the client mode turns green, the connection is successful. See Figure 4.17.

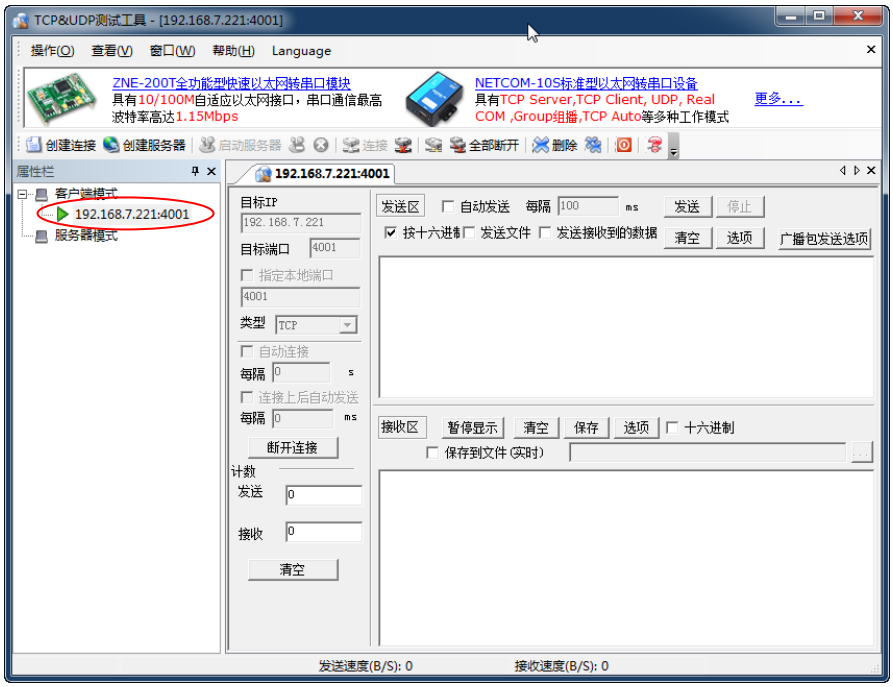


Figure 4.17 Connection created

4.3.4 CANTest Software Operation

Double-click the CANTest software icon to run the software, as shown in Figure 4.18.

Figure 4.18 CANTest software

Choose the correct device. Select USBCAN-E-U here, as shown in Figure 4.19.

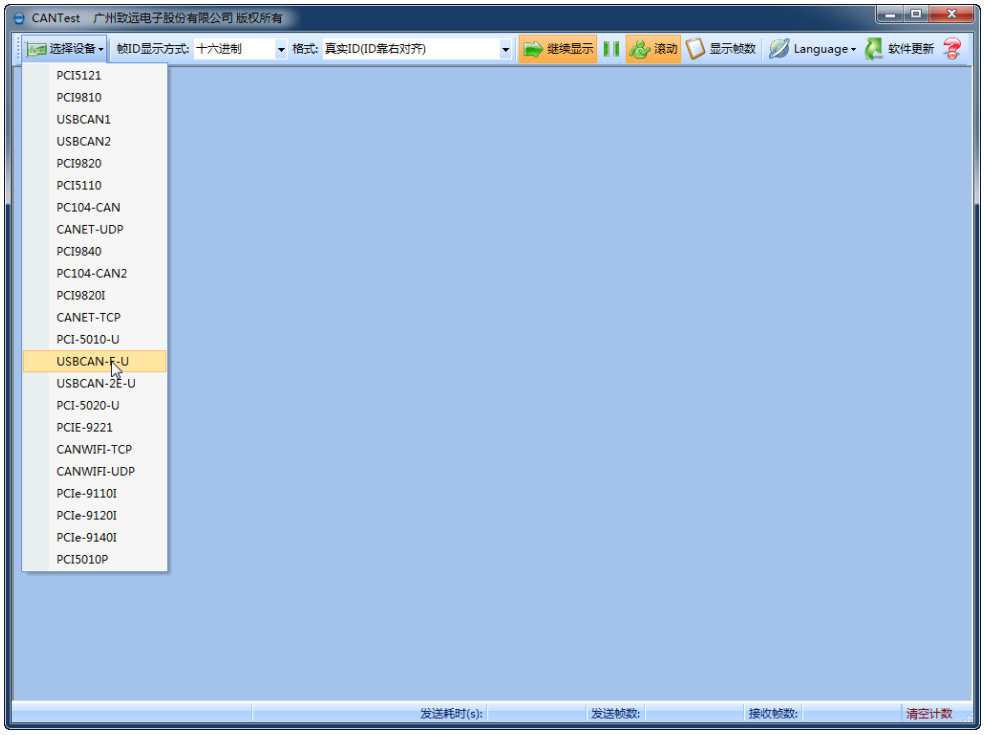


Figure 4.19 Selecting a device

Select the correct baud rate, click OK, and start the CAN, as shown in Figure 4.20.

Figure 4.20 Starting the device

After starting the device properly, the page appear, as shown in Figure 4.21.

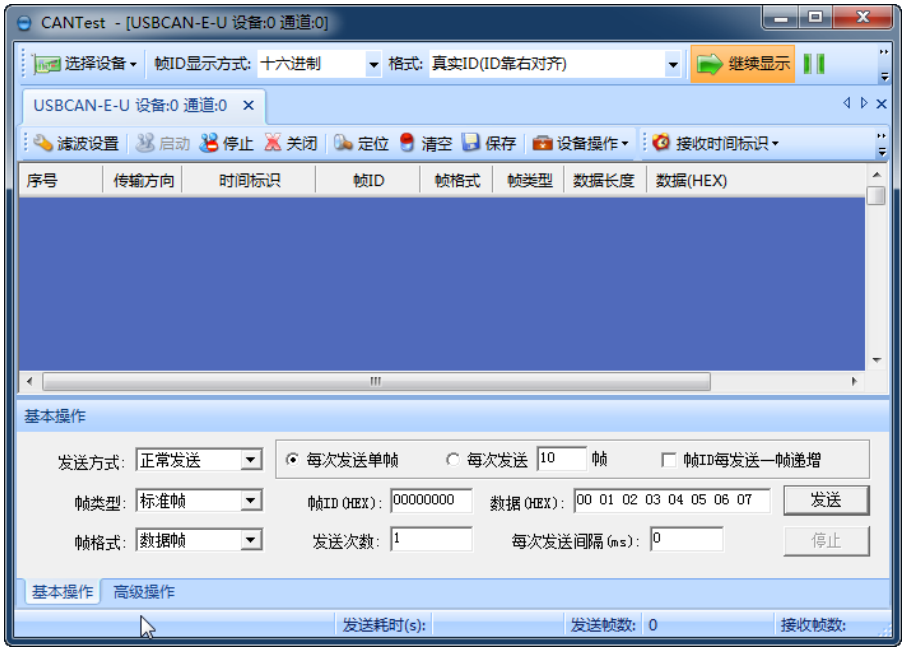


Figure 4.21 Starting the device

For details about how to use the CANTest software, see the *ZLG Electronics CAN Test Software and Interface Function User Manual*.

4.3.5 Test Result

Send a CAN frame whose ID is 00000000 and data is 0001020304050607 by using the CANTest software over USBCAN. Since we set frame ID filtering, this frame should not happen to the receiving device, as shown in Figure 4.22.

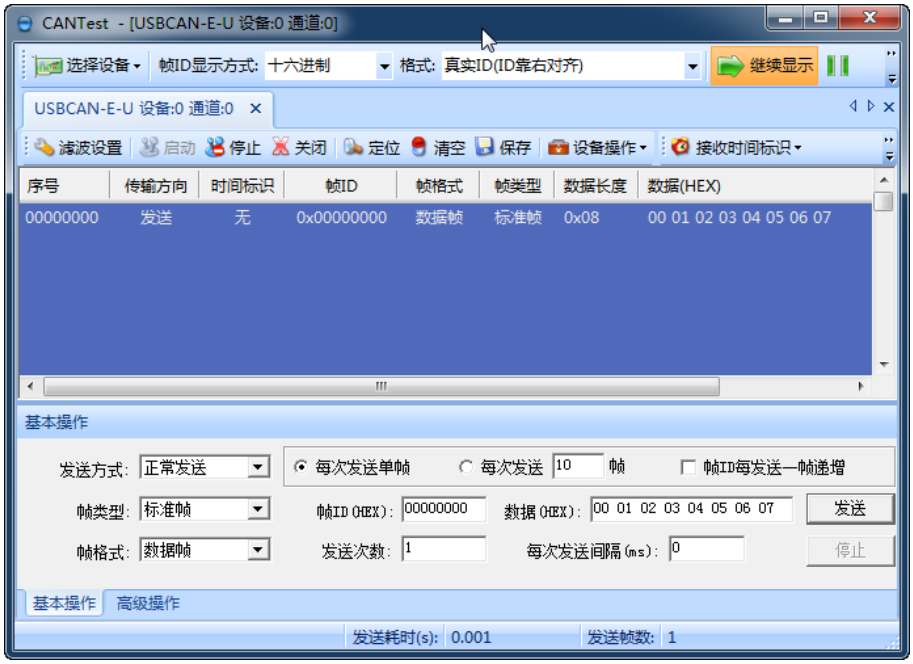


Figure 4.22 USBCAN sending data 1

Use the TCP&UDP test tool to receive data. Because the frame ID filter is set and ID00000000 is no longer in the receiving range, no data is received, as shown in Figure 4.23.

Figure 4.23 PC receiving data 1

The CAN frame with ID 00000009 and data 0001020304050607 is sent, and the ID is within the receiving range. The peer device can receive data correctly, as shown in Figure 4.24.

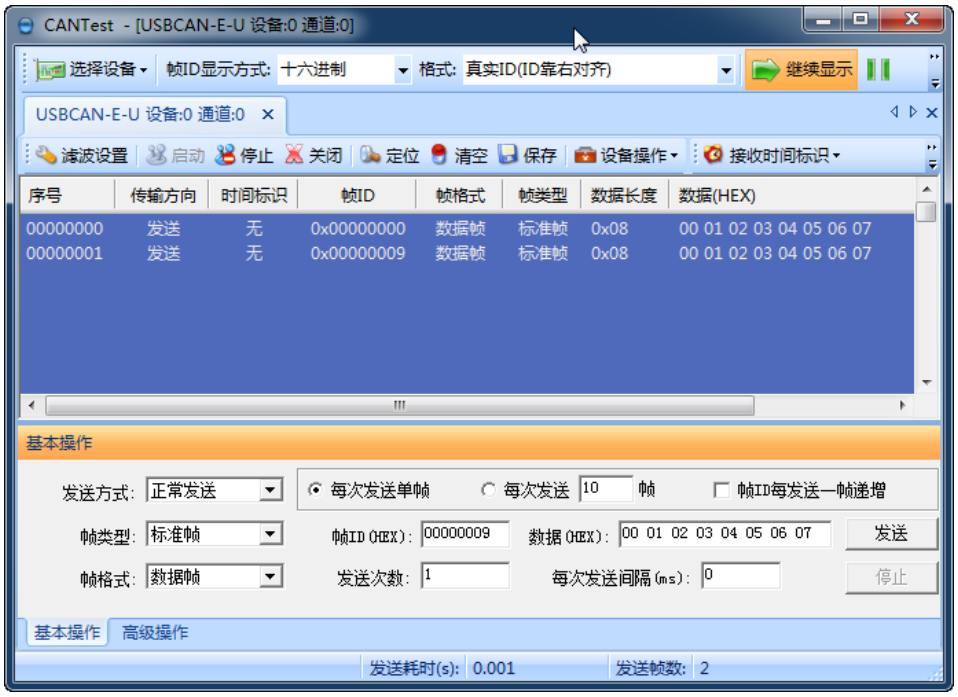


Figure 4.24 USBCAN sending data 2

The device has received the data, as shown in Figure 4.25. For the format of the received data, see Appendix A.

Figure 4.25 PC receiving data 2

Use the TCP&UDP test tool to send CAN frames, as shown in Figure 4.25. For the data format, see Appendix A.

Figure 4.26 PC sending data 1

Because the preset frame ID filter only filters the frame ID sent from the CAN port to the optical fiber, and the frame ID sent from the optical fiber to the CAN port is not filtered, both frames of data USBCAN can be received properly as shown in Figure 4.27.

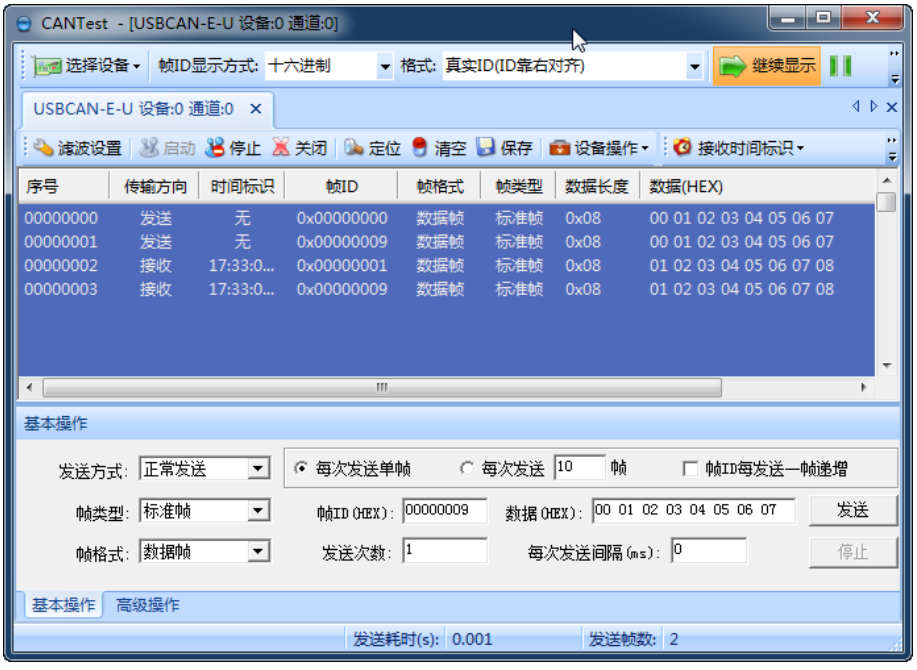


Figure 4.27 USBCAN receiving data 1

4.4 TCP Client Mode

4.4.1 System Block Diagram

In TCP Client mode, the CANSwitch-AF2S2 will actively connect to the preset TCP

server. If the connection fails, the client continuously tries to establish a connection with the TCP server based on the preset connection conditions. After establishing a TCP connection with the TCP server, two-way data communication can be carried out. Figure 4.28 shows the communication establishment process.

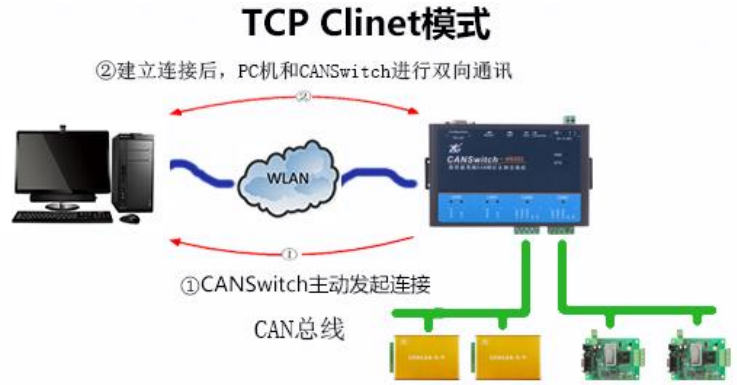


Figure 4.28 Communication in TCP Client mode

Tip: In this mode, the TCP server IP address is determined by "Destination IP (see Table 5.2)"; the TCP server port is determined by "Destination Port (see Table 5.2)". There are six groups of valid "Destination Port" and "Destination IP". The device will connect to the TCP server specified by the six groups of parameters in turn based on the preset number of connections until the connection is successful.

4.4.2 Configuring the CANSwitch-AF2S2 Device

Figure 4.29 shows the configuration in TCP CLIENT mode.

Be sure to submit the configuration modifications

The default password is 88888

The IP address configuration should be correct, and the PC and the device should be on the same network segment

Select TCP Client method

The baud rate should be 1000K, which should be consistent with the CAN device connected to the CAN0 port.

Filtering is set, only the frame ID sent from the CAN port to the optical fiber is filtered, and the frame ID sent from the optical fiber to the CAN port is not filtered.

Enter the server-side destination port number, subnet mask, and IP address. If there is only one server, set the start address and end address to the same IP address.

Figure 4.29 Configuration in TCP Client mode

4.4.3 TCP&UDP Software Operation

Install the TCP&UDP test software, as shown in Figure 4.30.

Figure 4.30 TCP&UDP test software

Double-click the TCP&UDP software and click Create Server. If there are multiple network cards and you need to specify the server IP address, enter the server working port and click OK. See Figure 4.31.

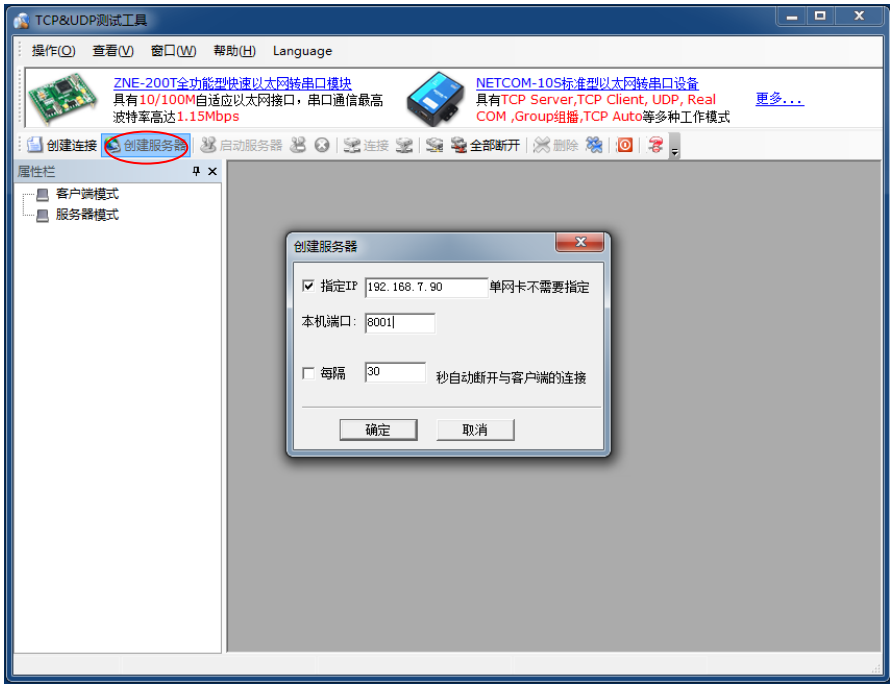


Figure 4.31 Creating a connection

Click Start Server to start the service. See Figure 4.32.

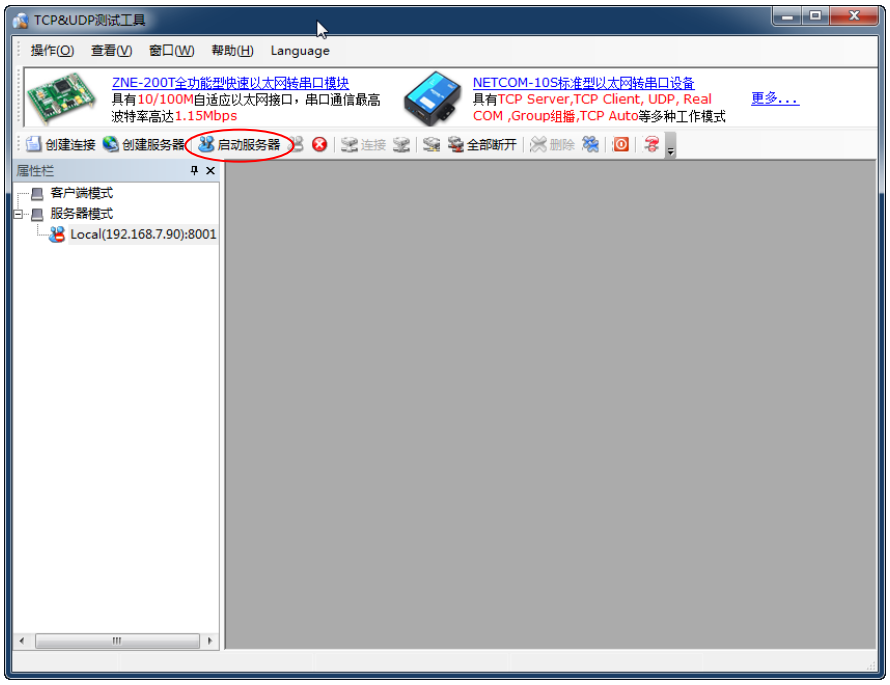


Figure 4.32 Opening a connection

When the triangle under the server mode turns green, the server is created successfully. See Figure 4.33.

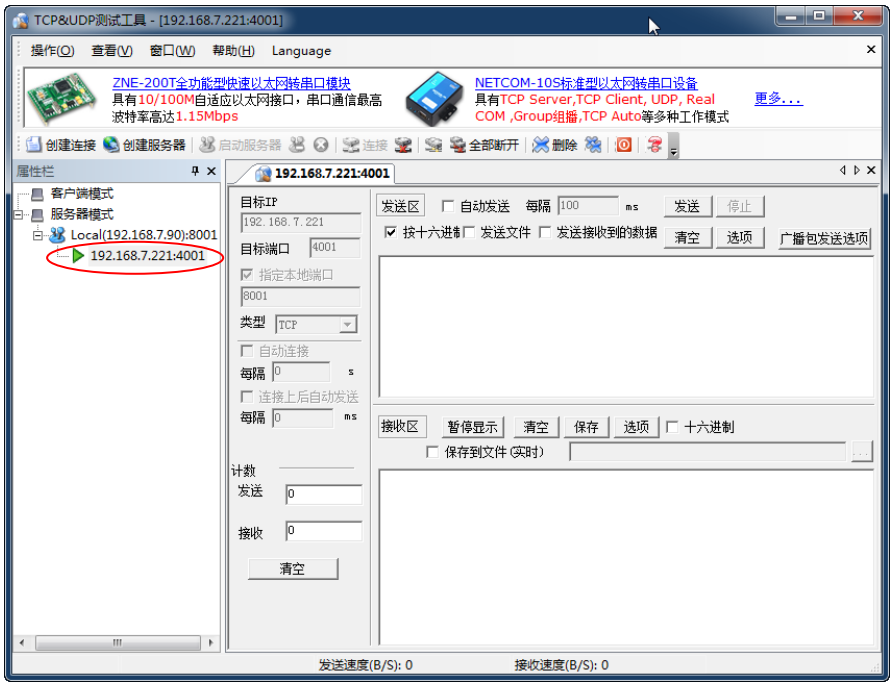


Figure 4.33 Connection created

4.4.4 CANTest Software Operation

Double-click the CANTest software icon to run the software, as shown in Figure 4.34.

Figure 4.34 CANTest software

Choose the correct device. Select USBCAN-E-U here, as shown in Figure 4.35.

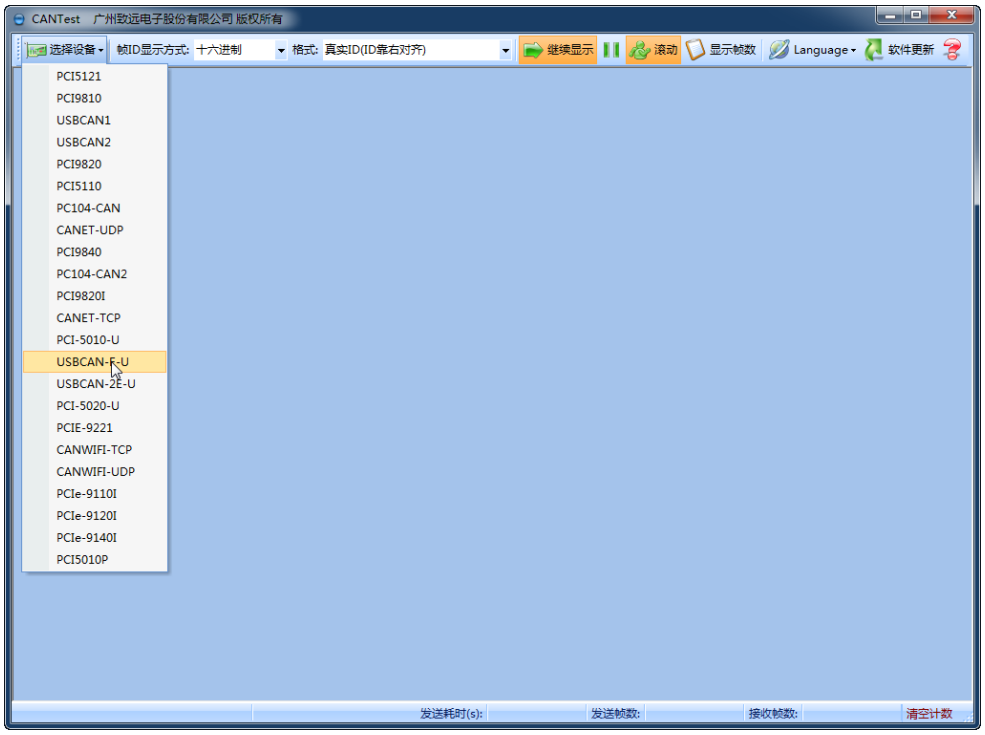


Figure 4.35 Selecting a device

Select a baud rate, click OK, and start the CAN, as shown in Figure 4.36.

Figure 4.36 Opening the device

After the device starts properly, a page appears, as shown in Figure 4.37.

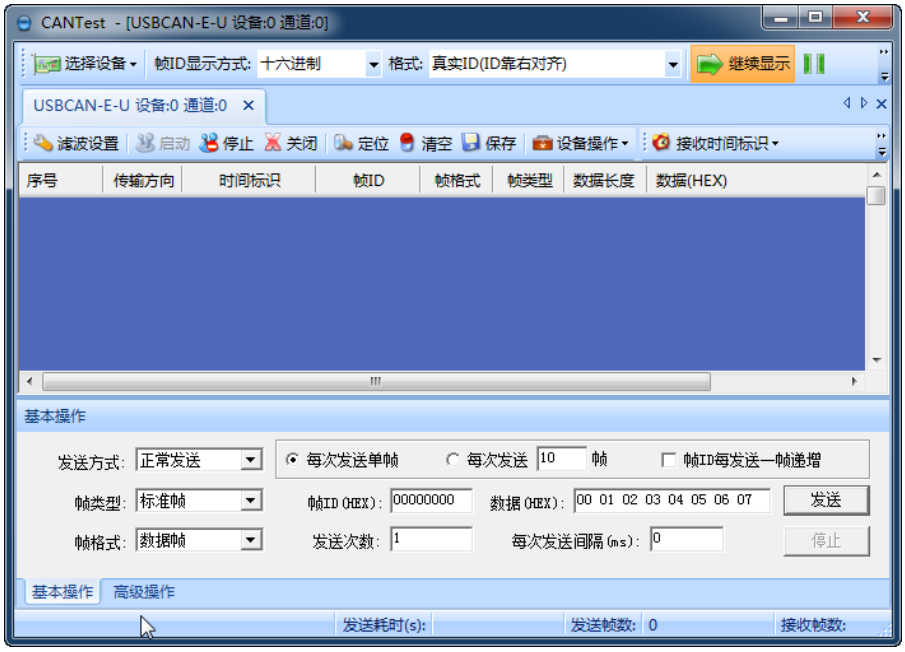


Figure 4.37 Device started

For details about how to use the CANTest software, see the *ZLG Electronics CAN Test Software and Interface Function User Manual*.

4.4.5 Test Result

Send a CAN frame whose ID is 00000000 and data is 0001020304050607 by using the CANTest software over USBCAN. Because we set frame ID filtering, this frame should not appear on the receiving device, as shown in Figure 4.38.

Figure 4.38 USBCAN sending data 1

Use the TCP&UDP test tool to receive data. Because the frame ID filter is set and

ID00000000 is no longer in the receiving range, no data is received, as shown in Figure 4.39.

Figure 4.39 PC receiving data 1

The CAN frame with ID 00000011 and data 0001020304050607 is sent, and the ID is within the receiving range. The peer device can receive data correctly, as shown in Figure 4.40.

Figure 4.40 USBCAN sending data 2

The device has received the data, as shown in Figure 4.41. For the format of the received data, see 错误!未找到引用源。.

Figure 4.41 PC receiving data 2

Use the TCP&UDP test tool to send CAN frames, as shown in Figure 4.42. For the data format, see Appendix A.

Figure 4.42 PC sending data 1

Because the preset frame ID filter only filters the frame ID sent from the CAN port to the optical fiber, and the frame ID sent from the optical fiber to the CAN port is not filtered,

both frames of data USBCAN can be received properly as shown in Figure 4.43.

Figure 4.43 USBCAN receiving data 1

4.5 UDP Mode

4.5.1 System Block Diagram

In UDP mode, the UDP protocol is used for data communication. UDP is a non-connection-based communication method. It cannot guarantee that the data packets sent to the target host will be received correctly. Therefore, in the scenarios with high reliability requirements, the upper-layer communication protocol must be used to ensure that the data is correct; however, because UDP is a simple communication method, it will not increase too much additional communication volume, and can provide a higher communication speed than the TCP method to ensure the real-time transmission of data packets. In fact, when the network environment is simple and the network communication load is not too large, the UDP working method is not error prone. The devices working in this mode are equal, and there is no server and client. Figure 4.44 shows the communication process.

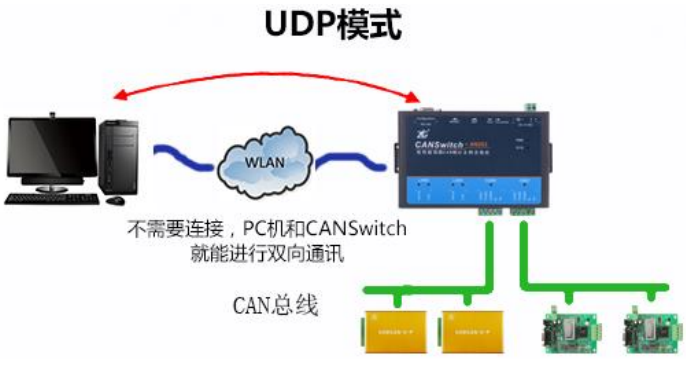


Figure 4.44 UDP mode communication

Tip: In this mode, the CANSwitch-AF2S2 uses "working port (see Table 5.2)" to receive UDP packets sent by user equipment; the data received by the CAN port of the CANSwitch-AF2S2 device will be sent to the "destination port (see Table 5.2)" of six groups of valid "destination IP (see Table 5.2)".

4.5.2 Configuring the CANSwitch-AF2S2 Device

Figure 4.45 shows the configuration in UDP mode.

Be sure to submit the configuration modifications

The default password is 88888

The IP address configuration should be correct, and the PC and the device should be on the same network segment

Select UDP method

The baud rate should be 1000K, which should be consistent with the CAN device connected to the CAN0 port.

Filtering is set, only the frame ID sent from the CAN port to the optical fiber is filtered, and the frame ID sent from the optical fiber to the CAN port is not filtered.

Figure 4.45 Configuration in UDP mode

4.5.3 TCP&UDP Software Operation

Install the TCP&UDP test software, as shown in Figure 4.46.

Figure 4.46 TCP&UDP test software

Double-click to run the TCP&UDP software, and click to create a connection, as shown in Figure 4.47.

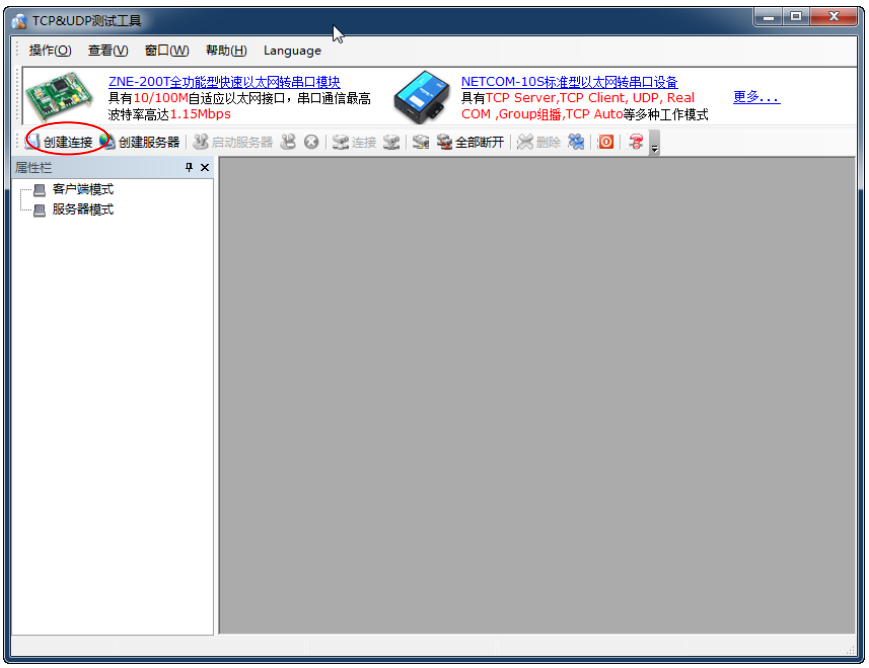


Figure 4.47 Opening the TCP&UDP test tool

Select UDP mode in Type, enter the IP address and the working port number of CANSwitch-AF2S2, and local port, and click Create. See Figure 4.48.

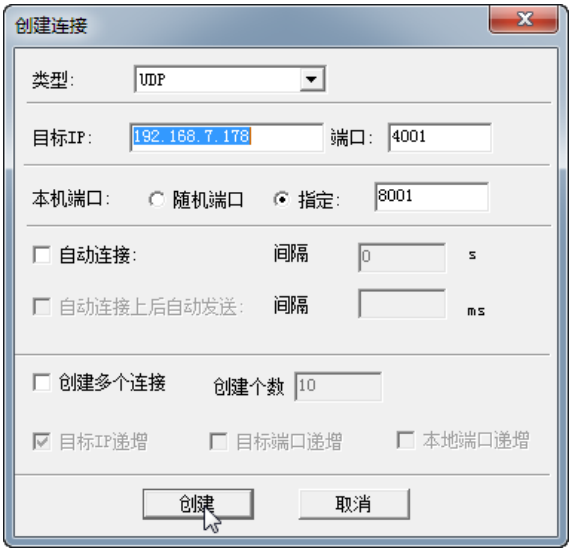


Figure 4.48 Creating a connection

Click Connect to connect the CANSwitch-AF2S2 device. See Figure 4.49.

Figure 4.49 Opening a connection

When the triangle below the client mode turns green, the connection is successful. See Figure 4.50.

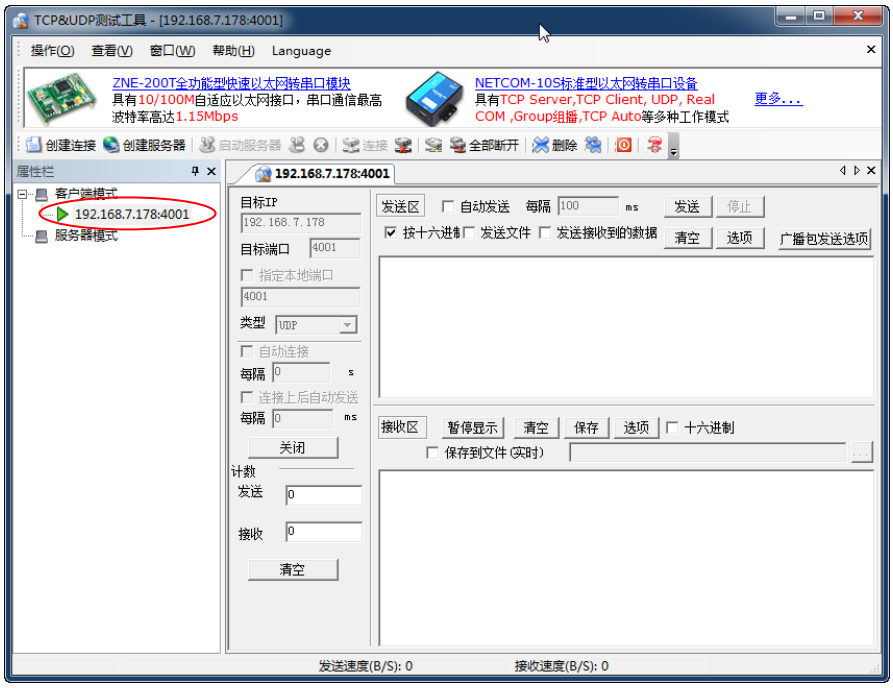


Figure 4.50 Connection created

4.5.4 CANTest Software Operation

Double-click the CANTest software icon to run the software, as shown in Figure 4.51.

Figure 4.51 CANTest software

Choose the correct device. Select USBCAN-E-U here, as shown in Figure 4.52.

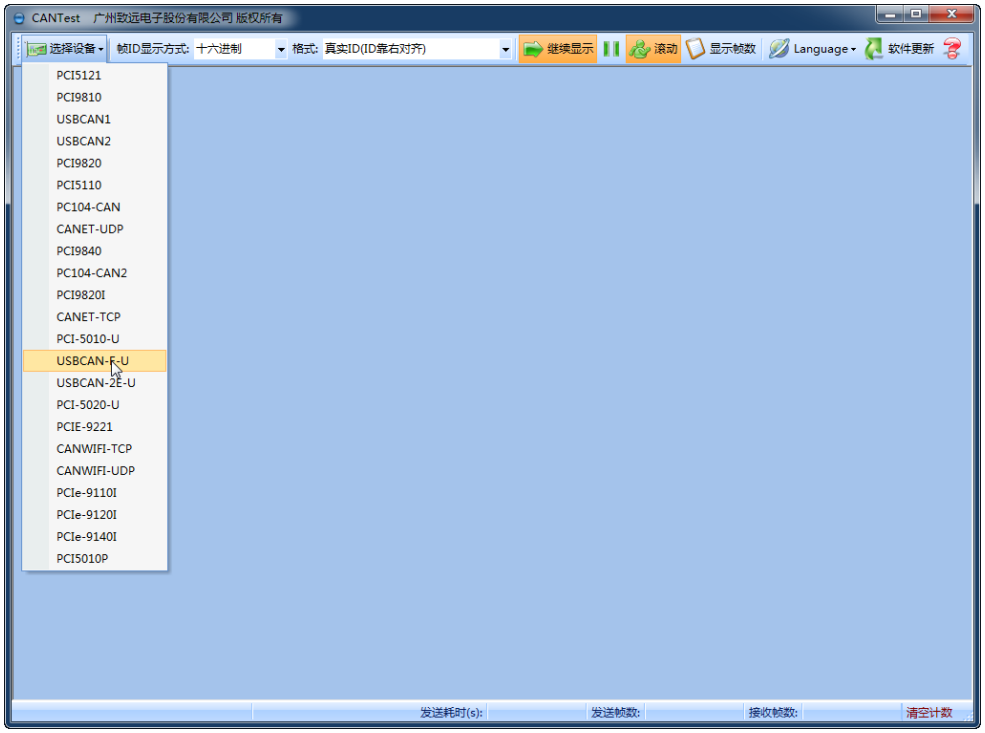


Figure 4.52 Selecting a device

Select the correct baud rate, click OK, and start the CAN, as shown in Figure 4.53.

Figure 4.53 Opening the device

After the device starts properly, a page appears, as shown in Figure 4.54.

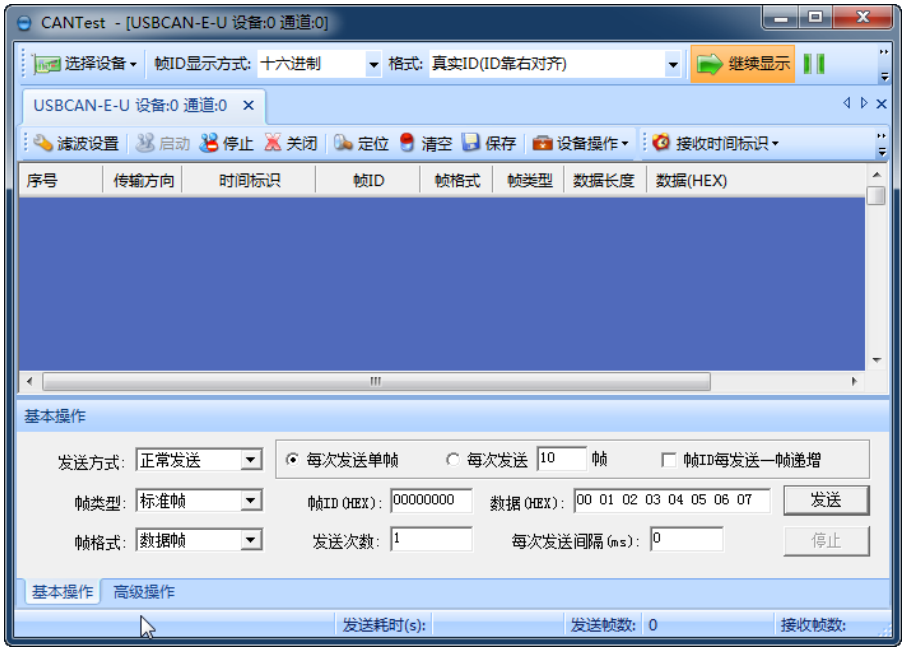


Figure 4.54 Device started

For details about how to use the CANTest software, see the *ZLG Electronics CAN Test Software and Interface Function User Manual*.

4.5.5 Test Result

Send a CAN frame whose ID is 00000000 and data is 0001020304050607 by using the CANTest software over USBCAN, as shown in Figure 4.55.

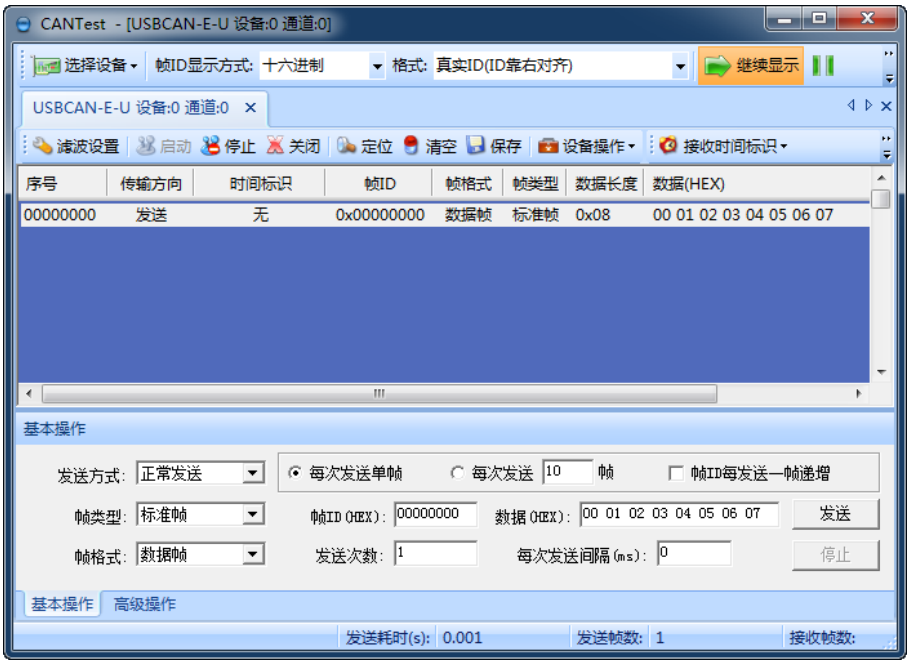


Figure 4.55 USBCAN sending data 1

Use the TCP&UDP test tool to receive data, as shown in Figure 4.56.

Figure 4.24 PC receiving data 1

Send the CAN frame whose ID is 00000022 and data is 0001020304050607. The peer device can receive the data correctly, as shown in Figure 4.57.

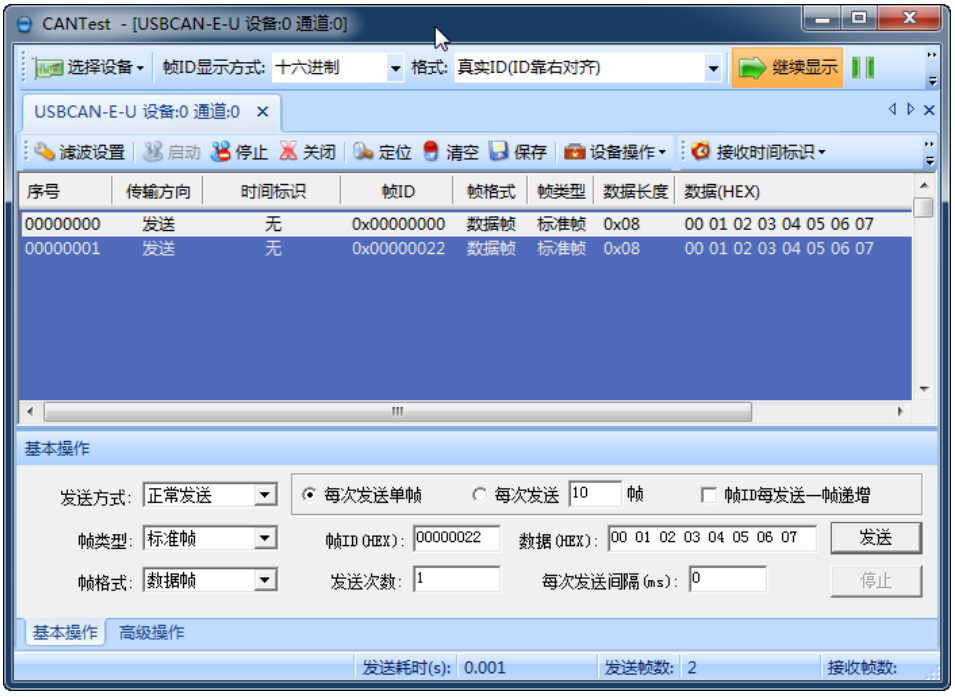


Figure 4.57 USBCAN sending data 2

The device has received the data, as shown in Figure 4.58. For the format of the received data, see Appendix A.

Figure 4.58 PC receiving data 2

Use the TCP&UDP test tool to send CAN frames, as shown in Figure 4.59. For the data format, see Appendix A.

Figure 4.59 PC sending data 1

Since there is no preset frame ID filtering, both frames of data USBCAN can be received properly, as shown in Figure 4.60.

Figure 4.60 USBCAN receiving data 1

5. ZNetCom Software Configuration

The ZNetCom software is dedicated configuration software for CANSwitch-AF2S2 device running on Windows. You can obtain the IP address of the CANSwitch-AF2S2 device, view and change the device configuration parameters, and upgrade the device firmware by using the ZNetCom software.

5.1 Installing the Configuration Software

Insert the CD-ROM into the CD-ROM drive and open the CD-ROM (you can download the latest ZnetCom software at http://www.zlg.cn). Double-click the ZNetComSetup.exe file, as shown in Figure 5.1 (if the system is Windows 7 or later, right-click and run as administrator) to start installation.

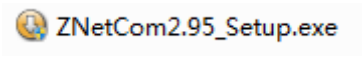


Figure 5.1 Installation file

The welcome window as shown in Figure 5.2 appears. Click [Next] to continue.

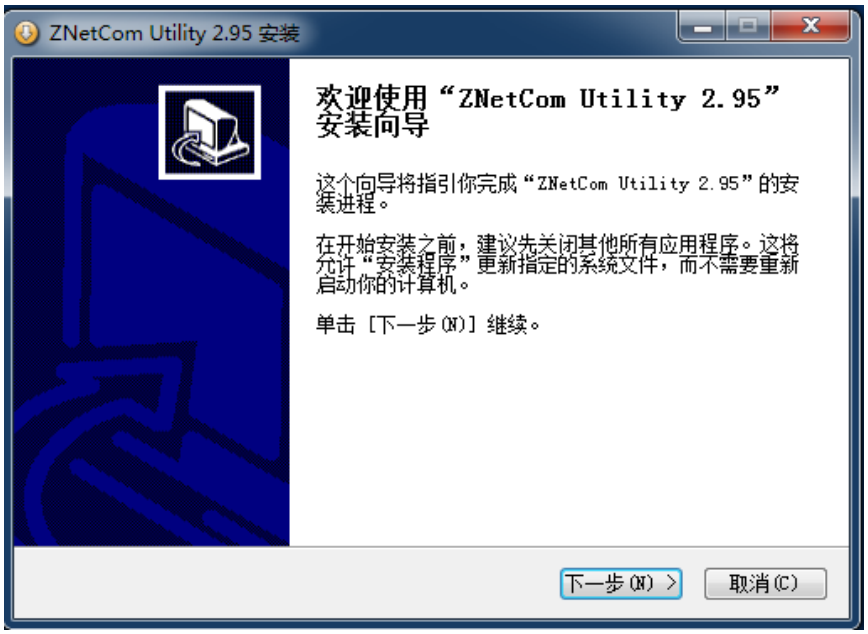


Figure 5.2 Welcome interface

The window shown in Figure 5.3 is displayed, asking for the installation path (the default path is C:\Program Files\ZNetCom Utility). To change the installation path, click the [Browse] button.

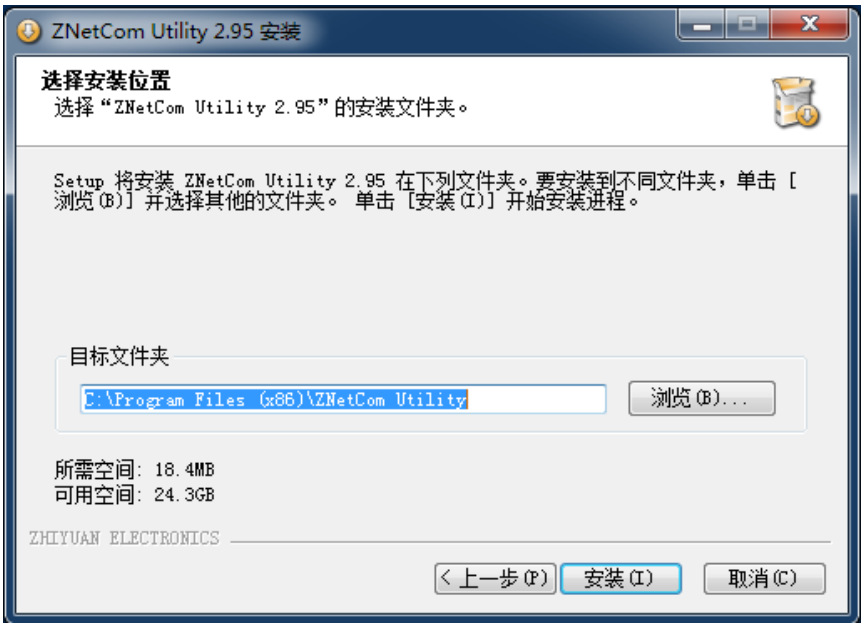


Figure 5.3 Selecting an installation path

Click [Install] to copy the files to the installation path. If the dialog box shown in Figure 5.4 appears, select Yes.

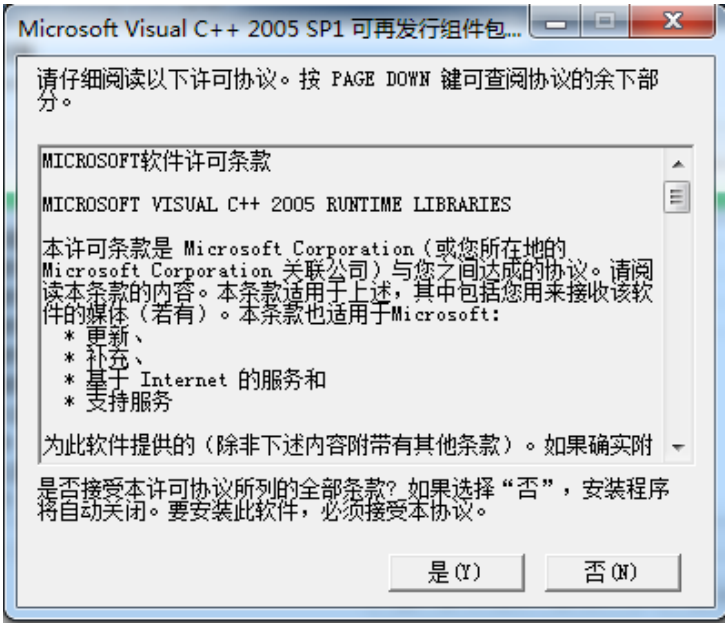


Figure 5.4 Installing the runtime library

After the installation is complete, the window for successful installation as shown in Figure 5.5 will appear. Click [Finish] to exit the installation software.

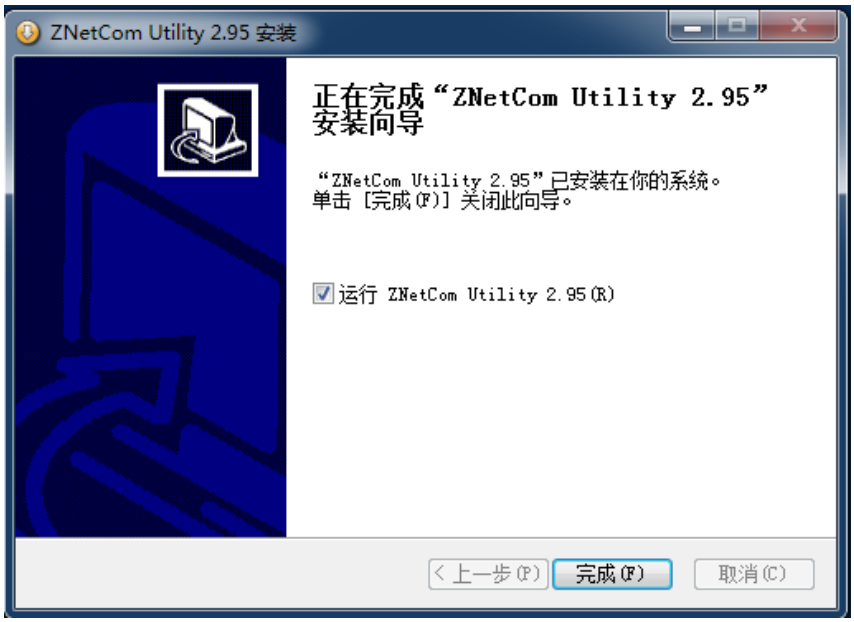


Figure 5.5 Installation completed

The configuration software is installed.

5.2 Obtaining Device Configurations

Before obtaining the configuration information, check whether the RS232 configuration serial port has been connected to the computer or the CANSwitch-AF2S2 device and the PC network card have been connected with a network cable (a fiber-to-Ethernet switch needs to be added)..

Run the ZNetCom software (if the system is later than Windows 7, right-click it and run as administrator). The interface shown in Figure 5.6 appears.

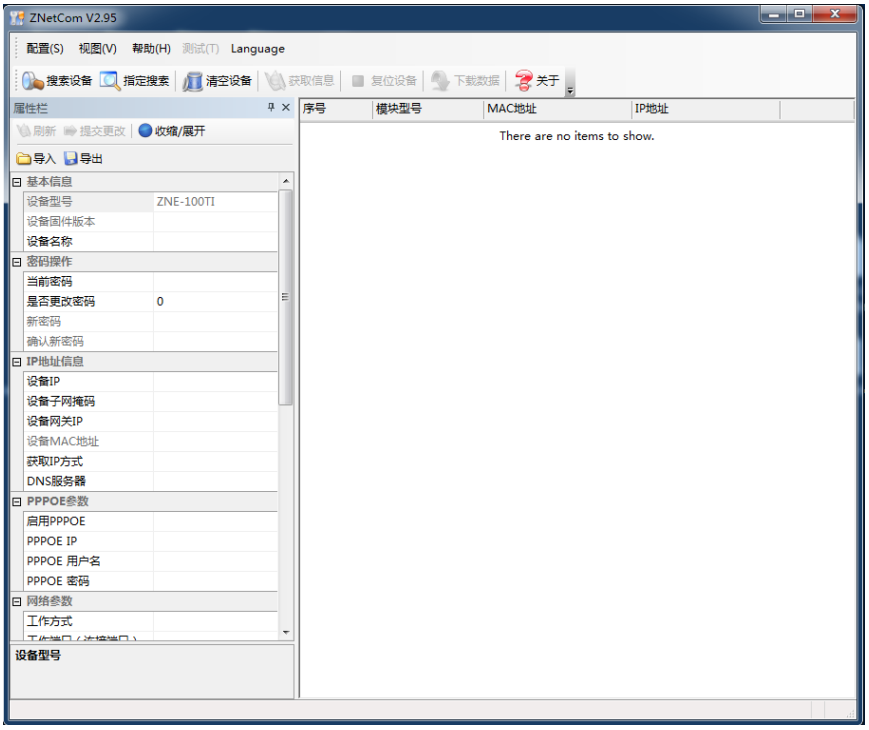


Figure 5.6 ZNetCom running interface

Click in the toolbar. A dialog box appears for communication link selection. The CANSwitch-AF2S2 allows you to configure the device over optical fiber or serial ports . Which method you choose depends on how you connect the device to the PC. If you use the LAN port to connect to the PC, choose optical fiber; if you use the RS232 configuration serial port to connect to the PC, choose the serial port. If you choose the serial port, you should select the correct port number. See Figure 5.7.

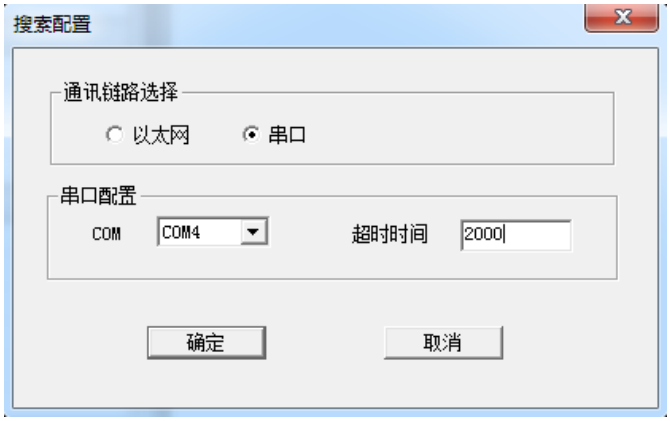


Figure 5.7 Searching configuration

Click OK. The ZNetCom configuration software starts to search for the CANSwitch-AF2S2 device connected to the PC, as shown in Figure 5.8. In the search window, we can see the searched device, and the corresponding MAC address and IP address. The search window closes automatically after 10 seconds. You can also click the [Stop] button to close it.

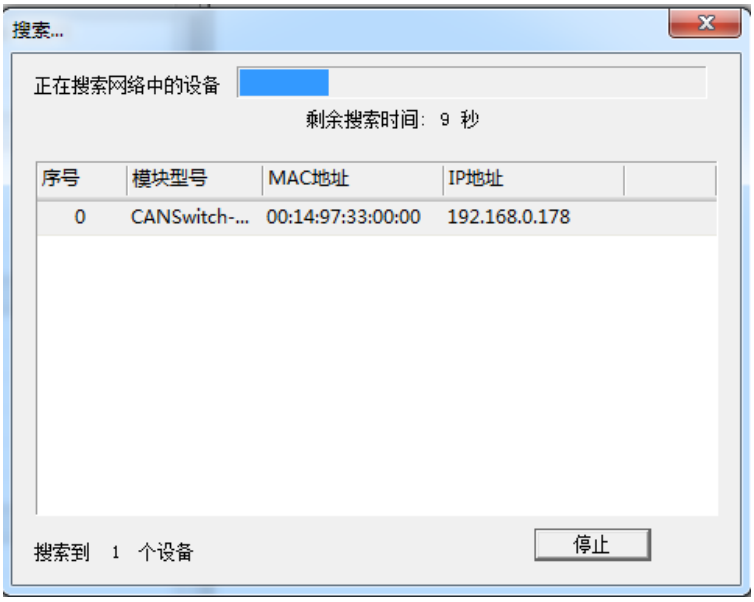


Figure 5.8 Searching for devices by using the ZNetCom software

After the search is completed, the searched devices appear in the device list of the ZNetCom software, as shown in Figure 5.9.

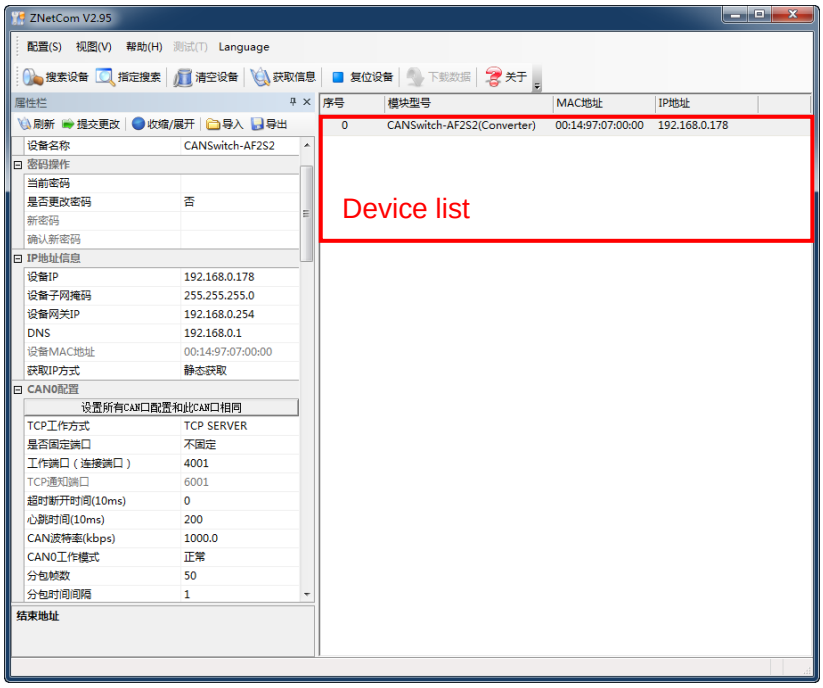


Figure 5.9 Obtaining CANSwitch-AF2S2 device configuration properties

Double-click the device item in the device list; or after selecting the device item, click in the toolbar or in the property bar. The "Get Device Information" dialog box appears, as shown in Figure 5.10.

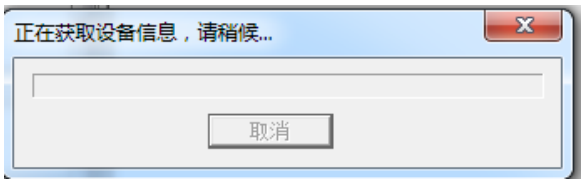


Figure 5.10 Obtaining configuration data

When the "Get Device Information" dialog box disappears, you can view the CANSwitch-AF2S2 device configurations as shown in Figure 5.11 and Figure 5.12 in the property column.

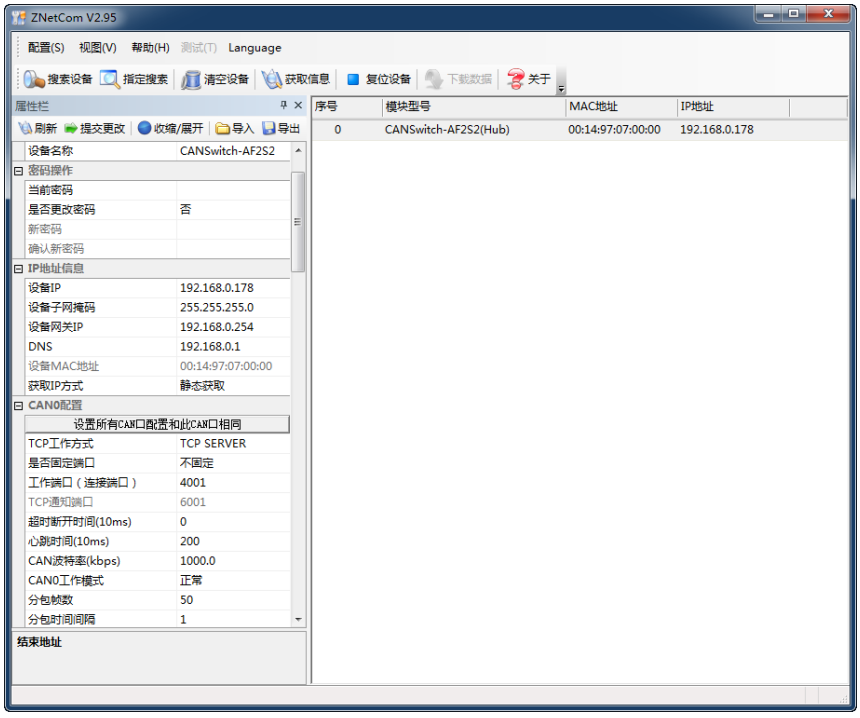


Figure 5.11 CANSwitch-AF2S2 device configuration hub (Hub) mode

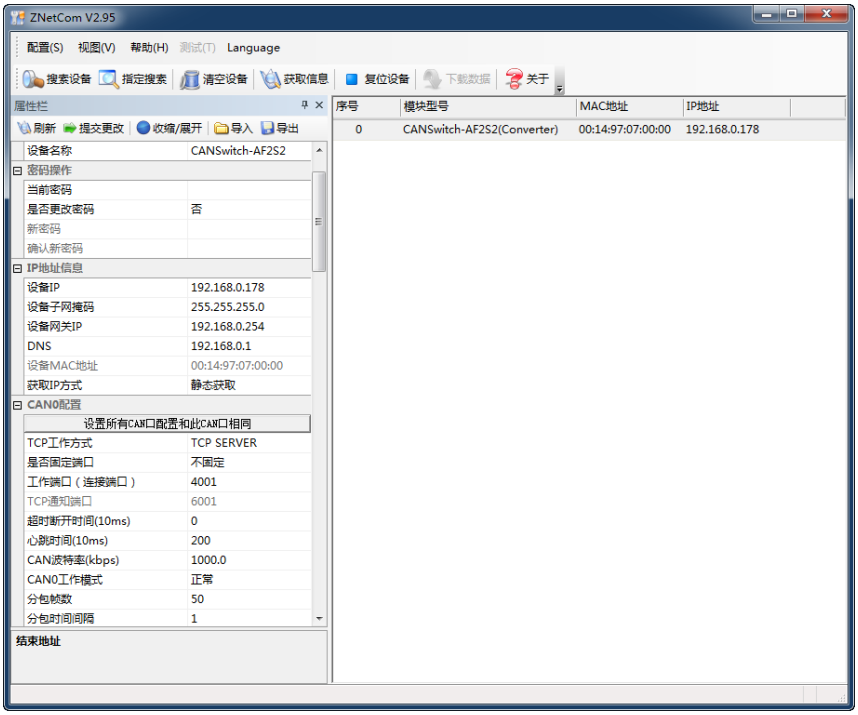


Figure 5.12 CANSwitch-AF2S2 device configuration information converter (Converter) mode

5.3 Modifying Device Configurations

When you modify the CANSwitch-AF2S2 device configurations by using the ZNetCom software, the device configuration password (the default value is "88888") is required. After you modify the device configurations in the property column, enter the device configuration password in the current password, click to complete the device configuration modification. See Figure 5.13.

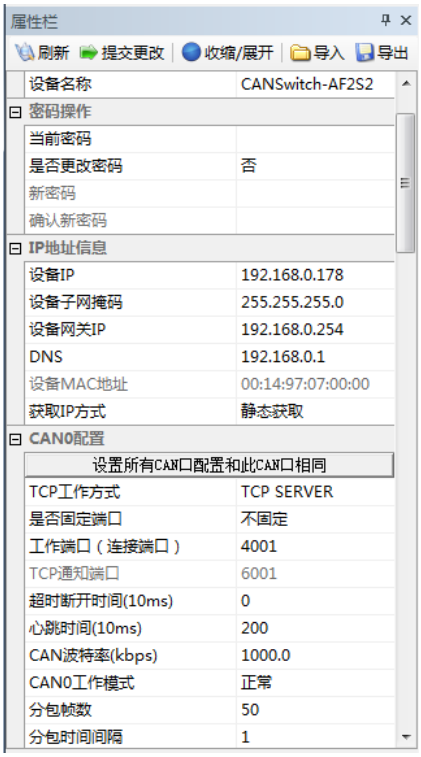


Figure 5.13 Modifying CANSwitch-AF2S2 device configuration properties

5.4 Configuration Parameter Description

5.4.1 Configuration in Hub Mode (Hub Mode)

Table 5.1 describes the default settings of the CANSwitch-AF2S2 device in hub mode.

Table 5.1 Description of "Property column" items in hub mode

Category	Name	Default	Description
Basic information	Device model	CANSwitch-AF2S2	This item cannot be changed.
	Device firmware version	It is related to the device delivery time.	Display the latest firmware version number of the device.
	Equipment name	CANSwitch-AF2S2	The value can be changed and contains a maximum of 15 characters, consisting of a to z, A to Z, 0 to 9. Modifying this value is very useful for users to identify multiple CANSwitch-AF2S2 devices on the same network.
Password operation	Current password	“88888”	Before changing other items, you must enter the correct password. The password contains a maximum of 10 characters, including a to z, A to Z, 0 to 9.
	Whether to change the password	No	You can set "New Password" and "Confirm Password" only if you select "Yes".
	New password	None	If "Whether to change the password" is "No", the password cannot be changed. Used to enter a new password. The password contains a maximum of 10 characters. For the character range, see the description in the "Current Password" column.
	Confirm the new password	None	If "Whether to change the password" is "No", the password cannot be changed. Used to confirm the new password. It must be the same as "New Password".
Network information	Device No.	1	The range is 1-32. In the cascade, it is used to select the position of the device in the cascade and associate it with the CAN forwarding configuration. For example, device 2 in device 2CAN0 refers to the device number filled here.

	Number of networking devices	2	The range is 2-32. It is used to select how many devices are required to be cascaded.
CAN0 configuration	CAN baud rate (kbps)	1000.0	You can also enter any baud rate. The minimum resolution is 0.1 kbps.
	CAN working mode	Normal	Normal: The CAN port can respond to the received CAN frame properly; Listen only: The CAN port works in listening mode and does not respond; Self-test: The CAN port works in self-transmitting and self-receiving mode. This is used to check whether if it can properly and whether it is damaged.
	CAN_AF	Disabled	CAN interface acceptance filter enabling After enabling, enter the upper and lower limits of the standard frame ID and the upper and lower limits of the extended frame ID to be received in the following four items.
	Upper limit of the standard frame	7FF（HEX）	After CAN_AF is enabled, the upper and lower limits of the receiving standard frame ID set by the user together determine the range of the standard frame ID to be received.
	Lower limit of the standard frame	00（HEX）	

Continued

Category	Name	Default	Description
CAN0 configuration	Upper limit of the extended frame	1FFFFFFF（HEX）	After CAN_AF is enabled, the upper and lower limit values of the received extended frame ID set by the user together determine the range of the extended frame ID to be received.
	Lower limit of the extended frame	00（HEX）	
CAN0 forwarding configuration	Device 1CAN1	Deselected	If it is selected, the data of CAN0 port will be forwarded to the corresponding CAN bus. It is deselected by default. A maximum of 63 CAN buses can be forwarded.
	Device 2CAN0	Deselected	
	Device 2CAN1	Deselected	
	Device 3-32CAN0	Deselected	
	Device 3-32CAN1	Deselected	

Except for the working port, destination port and destination IP address, the default parameter values of CAN1 are exactly the same; the meaning of each parameter is the same as that of each parameter of CAN0.

5.4.2 Configuration in Converter Mode (Converter Mode)

Table 5.2 describes the device configuration in converter mode.

Table 5.2 Description of "Properties column" items in Converter mode

Category	Name	Default	Description
Basic information	Device model	CANSwitch-AF2S2	This item cannot be changed.
	Device firmware version	It is related to the device delivery time.	Display the latest firmware version number of the device.
	Equipment name	CANSwitch-AF2S2	The value can be changed and contains a maximum of 15 characters, consisting of a to z, A to Z, 0 to 9. Modifying this value is very useful for users to identify multiple CANSwitch-AF2S2 devices on the same network.
Password operation	Current password	“88888”	Before changing other items, you must enter the correct password. The password contains a maximum of 10 characters, including a to z, A to Z, 0 to 9.
	Whether to change the password	No	You can set "New Password" and "Confirm Password" only if you select "Yes".

	New password	None	If "Whether to change the password" is "No", the password cannot be changed. Used to enter a new password. The password contains a maximum of 10 characters. For the character range, see the description in the "Current Password" column.
	Confirm the new password	None	If "Whether to change the password" is "No", the password cannot be changed. Used to confirm the new password. It must be the same as "New Password".
IP address information operation	Device IP address	192.168.0.178	X.X.X.0 or X.X.X.255 cannot be filled. An IP address is an address on a network assigned by a network device (such as a PC and CANSwitch-AF2S2). It is unique on the same network.
	Device subnet mask	255.255.255.0	The subnet mask is very important to the network. Within the same network, the IP address and subnet mask are the same value. So set the "IP address" and "Subnet mask" correctly. Two input methods are used: dotted method (such as 255.255.255.0); number notation (range 0-32; for example, 255.255.255.0 indicates 24)

Continued

Category	Name	Default	Description
IP address information operation	Device Gateway IP address	192.168.0.254	Enter the IP address of the gateway within the network or the IP address of the router.
	DNS	192.168.0.1	Domain name access server. The current version is invalid.
	Device MAC address	The value is different for each module	This item cannot be changed.
	How to get an IP address	Static acquisition (Static)	You can also select "Dynamic acquisition". Static acquisition means that you directly enters the "IP address", "Subnet mask", and "Gateway". Dynamic acquisition means that the CANSwitch-AF2S2 module uses the DHCP protocol to obtain the IP address, subnet mask and gateway information allocated by the DHCP server on the network. Note: The function of dynamic acquisition can only be used when there is a DHCP server on the network. Usually, the router can also serve as a DHCP server.
CAN configuration	Set all CAN configurations to be the same as this CAN port	-	This setting button is used for quick configuration. For example, when the CAN0 configuration is completed, click this button above CAN0. CAN1 is copied according to the same configuration (except the port), which saves the configuration time.

	How TCP works	TCP Sever	Refers to the communication mode used. 1. The default is TCP Sever. You can also choose working modes such as TCP Client and UDP. When TCP is used, a connection is established before data can be transferred. TCP Sever mode is to wait for client connection; 2. TCP Client is the CANSwitch-AF2S2 device actively connecting to the destination IP and port. Among the two CANSwitch-AF2S2s, one is set as TCP Sever, and the other is set as TCP Client to connect to each other to send and receive data; 3. The UDP protocol itself does not require a connection. Therefore, when the UDP protocol is used for transmission, the data is sent and received only to the destination IP address and port. When the device works in UDP mode, by setting the destination IP address, the device can communicate with multiple network devices with different IP addresses at the same time.
	Whether the port is fixed	Not fixed	When the working mode is TCP Client, the working port corresponding to CANSwitch-AF2S2 is allowed to increase or not when reconnection is allowed, so as to avoid the limitation of the connected device Windows system. It is not fixed by default. For example, the port initiated by the first connection is 37650, and the port initiated by the second connection is 37651... If you choose Fixed, any connected port will be its working port, for example, port 4001 for CAN0
	Working port	4001/4002	The working port of CAN communication can be modified. CAN0 uses port 4001 by default; CAN1 uses port 4002 by default. Because some are occupied by other network protocols, it is recommended not to be less than 1,000. The working port transmits CAN frames in the format of 13 bytes/frame. See Appendix A for the specific format.

Continued

Category	Name	Default	Description
CAN configuration	TCP notification port	6001/6002	Refers to the CAN status information port, which cannot be modified. CAN0 uses port 6001; CAN1 uses port 6002. Cannot be modified arbitrarily, because some are occupied by other network protocols. The notification port is used to feed back the status of the CAN port. Once connected, a warning is generated when an error occurs on the corresponding CAN interface. For details, see Appendix B.
	Timeout disconnect time (10 ms)	0	The values that can be filled are 0 and 100-65525. This item is meaningful only when the TCP protocol is used for communication. Time (in 10 ms) that the CAN or optical fiber interface delays from receiving the last data after the TCP connection is established. If no data is received before the timeout period expires, the TCP connection is disconnected. "0" indicates it will not be disconnected all the time.
	Heartbeat time (10 ms)	200	The values that can be filled are 0 and 100-65525. This item is meaningful only when the TCP protocol is used for communication. When the TCP connection is established, a "heartbeat packet" (non-application data will not be forwarded to the working port) will be sent every time interval filled in this item. The CANSwitch-AF2S2 will disconnect the connection if the other party does not respond to three consecutive heartbeat packets. If you fill in "0", the "heartbeat packet" will not be sent.
	CAN baud rate (kbps)	1000.0	You can also enter any baud rate. The precision is 0.1 kbps.
	CAN working mode	Normal	Normal: The CAN port can respond to the received CAN frame properly; Listen only: The CAN port works in listening mode and does not respond; Self-test: The CAN port works in self-transmitting and self-receiving mode. This is used to check whether if it can properly and whether it is damaged.

	Packet frames	50	The value ranges from 1 to 50. When the CAN port continuously receives data (the interval is less than the sub-packet time interval), and the number of received CAN frames reaches the "number of sub-packet frames", the received data is encapsulated into an optical fiber packet and sent to the network port. Packet Frames refers to the maximum number of frames in a packet.If the number of packet frames is not reached during the receiving process, and the frame interval exceeds the packet time interval, the received data is also encapsulated into an optical fiber packet and sent. If the number of packetized frames is set to 1, it means no packetization. Each CAN frame is sent as a separate optical fiber packet, and the real-time performance is the best at this time, but the network load is the highest;If the number of sub-packet frames is set to 50, the channel traffic is the largest and the network load is the smallest.
	Packet time interval (ms)	1	The value ranges from 1 to 254. When the CAN port does not receive a new data frame within the time defined by the "packet time interval" (unit: ms), and the number of packet frames has not been reached, all data frames that have been received and have not been sent will be encapsulated into an optical fiber packet and sent to the network port.

Continued

Category	Name	Default	Description
CAN configuration	Clear CANBuffer	Cleared on TCP connection	This option is only valid in TCP working mode. It determines whether to clear the data in the CAN port Buffer after the connection is established. If it is not empty, the data in the Buffer will be sent after the connection is established. If it is cleared when TCP connection is selected, the saved CAN buffer will be cleared when the TCP connection is established.
	CAN_AF	Disabled	CAN interface acceptance filter enabling After enabling, enter the upper and lower limits of the standard frame ID and the upper and lower limits of the extended frame ID to be received in the following four items. Only the frame ID sent from the CAN port to the optical fiber is filtered, and the frame ID sent from the optical fiber to the CAN port is not filtered.
	Upper limit of the standard frame	7FF（HEX）	After CAN_AF is enabled, the upper and lower limits of the receiving standard frame ID set by the user together determine the range of the standard frame ID to be received.
	Lower limit of the standard frame	00（HEX）	
	Upper limit of the extended frame	1FFFFFFF（HEX）	After CAN_AF is enabled, the upper and lower limit values of the received extended frame ID set by the user together determine the range of the extended frame ID to be received.
	Lower limit of the extended frame	00（HEX）	

	CAN send buffer number (10 frames)	65535	CAN interface transmit buffer size. The default value is 65535x10 frames. You can set the buffer size to adjust the balance between the real-time performance of the CAN port and the large-capacity buffer. Because the speed of the optical fiber is much higher than the transmission speed of CAN, the CAN needs to buffer transmission if the amount of data received by the optical fiber is too large. This ensures that no frames are dropped, but such a large buffer may lead to poor real-time performance. That is, the data currently sent by the optical fiber needs to wait for a certain period of time to be sent out from the CAN interface. In this case, either the client controls the transmission speed of the optical fiber to match the transmission speed of the CAN port; or the buffer is changed to a smaller size and the frame is dropped appropriately to ensure real-time performance.
	CAN transmit buffer policy	Discard new data when buffer is full	Policy when the CAN interface transmit buffer is full: discard new data when the buffer is full and discard old data when the buffer is full
	Number of TCP connections (number of UDP destination IP segments)	1	When the CANSwitch-AF2S2 works in TCP Sever, each CAN port can have a maximum of 200 TCP connections by default without configuration; When working in TCP Client mode, this item is used to define the number of connection IP segments allowed to be established during communication with the corresponding CAN port. The maximum value is 6. When working in UDP mode, this item is used to define the number of IP segments where the network device communicating with the corresponding CAN port is located. The maximum value is 6.

Continued

Category	Name	Default	Description
CAN configuration	Destination port 1	8001/8002	Available values are 1 to 65535. Only valid in TCP Client and UDP working modes. Used to define the port of the network device that communicates with the CANSwitch-AF2S2 device. Only the network data sent through this port can be received by the CANSwitch-AF2S2 device, and the data frame received by the CAN port of the CANSwitch-AF2S2 device will also be sent to this port through the optical fiber. The default CAN0 destination port 1 is 8001, and the default CAN1 destination port 1 is 8002.
	Subnet mask 1	255.255.255.0	The subnet mask determines whether the host number of the network and whether the host number is legal, such as the network segment 192.168.1.x. If the subnet mask is 255.255.255.0, the IP 192.168.1.255 is a broadcast address and cannot be used to represent a host.But if the subnet mask is 255.255.0.0, 192.168.1.255 is an illegitimate device address
	Start address 1	192.168.0.55	Only valid in TCP Client and UDP working modes. It is used to define the destination IP address; that is, the port IP address of the network device that communicates with the CANSwitch-AF2S2 device (it can also be the starting IP address in the IP address segment).
	End address 1	192.168.0.55	Only valid in TCP Client and UDP working modes. Used to define the end IP address in the IP address segment. If there is only one destination address, the end address can be the same as the start address. Note: If the IP address segment is filled in the end address, multiple network devices will communicate with CANSwitch-AF2S2 at the same time. The first three bytes of the IP address segment must conform to the subnet mask 1 limit, and the fourth byte of the ending address must be greater than or equal to the fourth byte of the starting IP address.

	Destination ports 2-6	0	The value ranges from 1 to 65535. The function is the same as the destination port 1. To enable it, set the number of TCP connections.
	Subnet masks 2-6	0.0.0.0	Used for shielding. To enable it, set the number of TCP connections
	Start addresses 2-6	0.0.0.0	The function is the same as the starting address 1. To enable it, set the number of TCP connections
	End addresses 2-6	0.0.0.0	The function is the same as the starting address 1. To enable it, set the number of TCP connections

Except for the working port, destination port and destination IP address, the default parameter values of CAN1 are exactly the same; the meaning of each parameter is the same as that of each parameter of CAN0.

5.5 Saving Restored Settings

To help you modify the configurations of the CANSwitch-AF2S2 device in batches, the ZNetCom software allows you to import/export configurations. The Import/Export function button is located on the property column, as shown in Figure 5.14.

Figure 5.14 Device configurations import/export

5.5.1 Saving Settings

Click 导出. In the "Save As" dialog box (as shown in Figure 5.15), select the save path, enter the file name, and click [Save]. Device configurations will be saved in XML format.

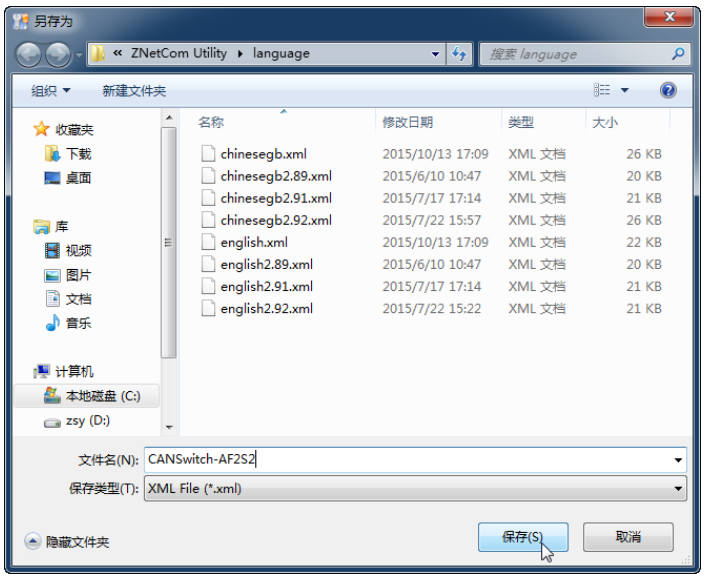


Figure 5.15 Saving device configurations

5.5.2 Restoring Settings

Click 导入. In the "Open" dialog box (as shown in Figure 5.16), select the saved device configuration file, and click the [Open] button. The ZNetCom software imports the settings saved in the file.

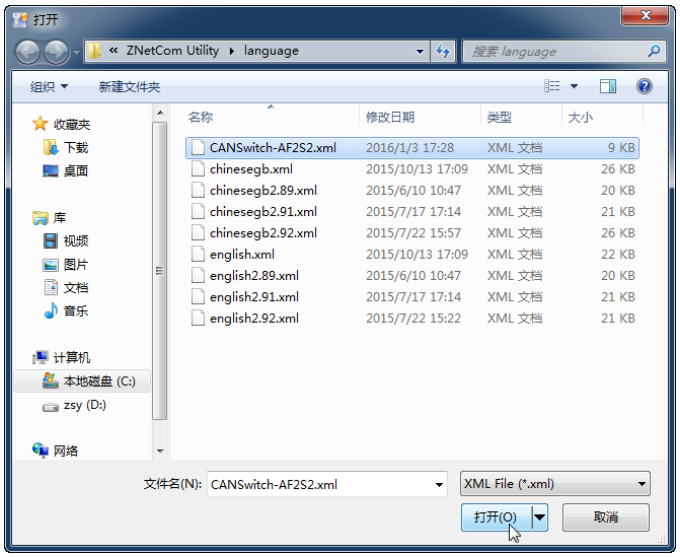


Figure 5.16 Opening device configuration information

5.6 Upgrading the Firmware

CANSwitch-AF2S2 series devices support local firmware upgrade. When you upgrade the CANSwitch-AF2S2 device by using the ZNetCom software, the PC and the CANSwitch-AF2S2 device must be on the same network segment (refer to 4.2 PC and device network segment detection). The firmware upgrade procedure is as follows:

1. In the device list column of ZNetCom software, select the device to be upgraded in the list item, and right-click the mouse. The menu items appear, as shown in Figure 5.17.

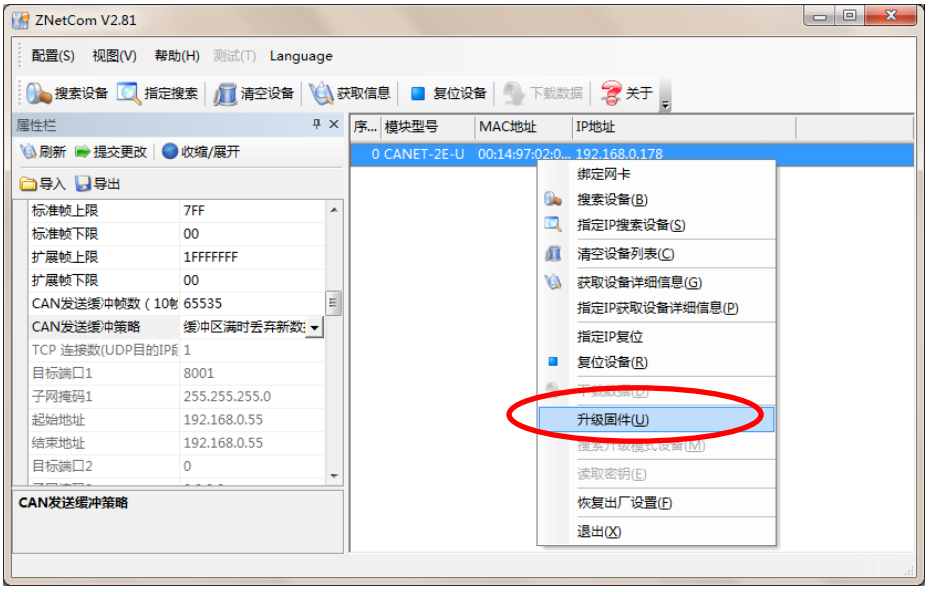


Figure 5.17 Firmware upgrade menu

2. Click [Upgrade Firmware]. On the firmware upgrade interface shown in Figure 5.18, enter the password (the default password is 88888), select the upgrade file, and click "Open".

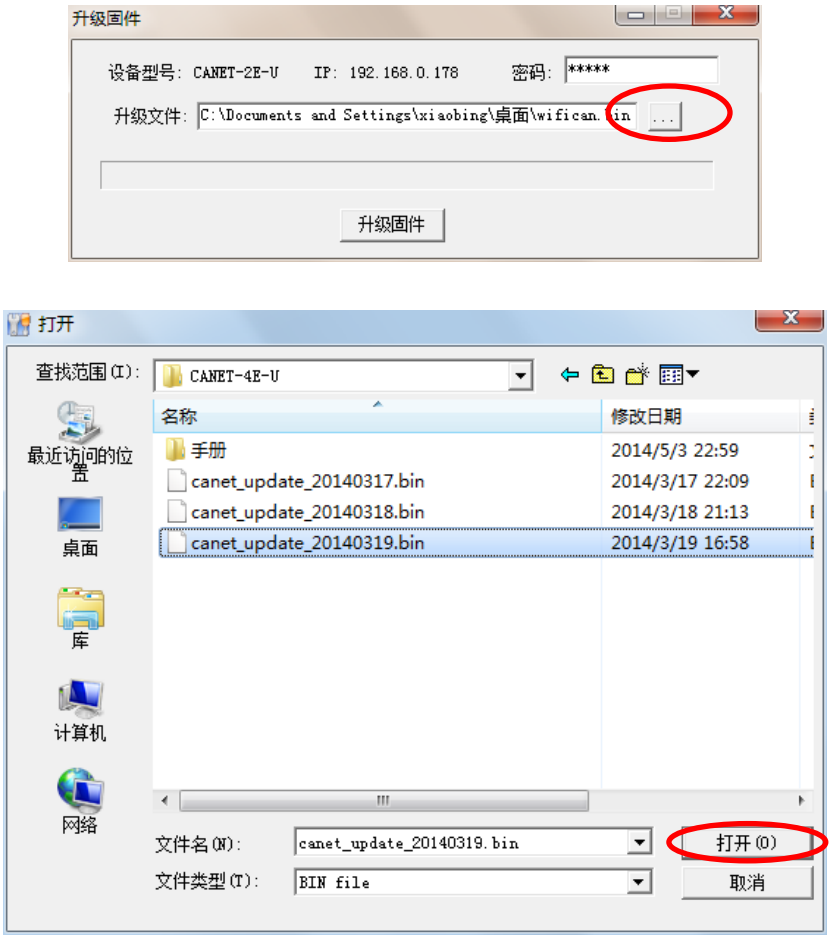


Figure 5.18 Firmware upgrade

3. Click . The device starts firmware upgrade, as shown in Figure 5.19.

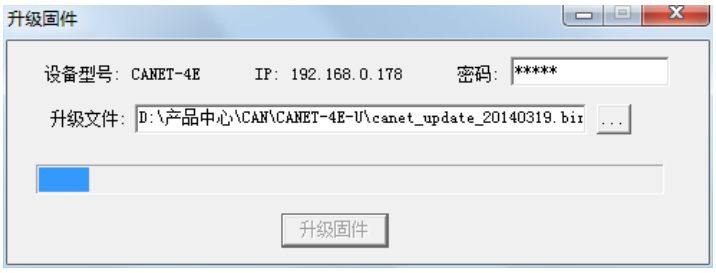


Figure 5.19 Firmware upgrade in progress

4. After about 1 minute, the firmware can be upgraded, as shown in Figure 5.20. Wait about 30 seconds until the system is initialized and starts.

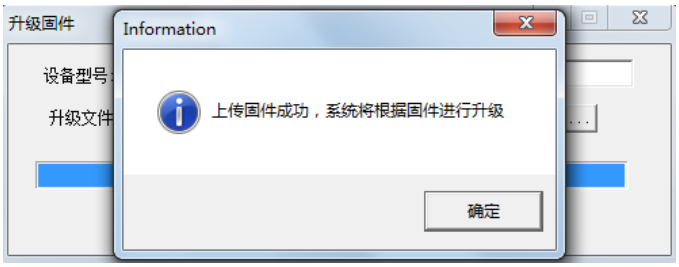


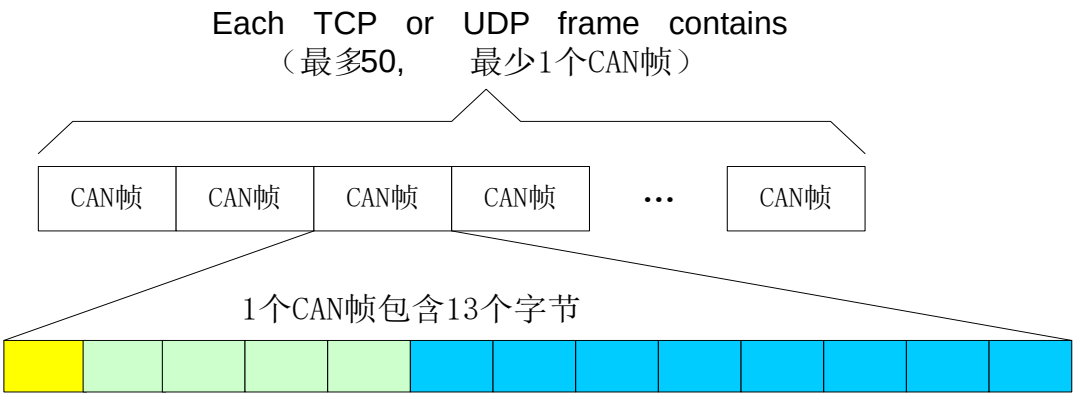
Figure 5.20 Firmware upgraded

If the upgrade fails due to an accident (such as power failure and network cable disconnection), power on the device, and perform search and upgrade again.

6. 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 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!

附录A Optical fiber working port data conversion format



帧信息：长度1个字节，用于标识该CAN帧的一些信息，如类型、长度等

Bit7							Bit0
FF	RTR	保留	保留	D3	D2	D1	D0

FF：标准帧和扩展帧的标识，1为扩展帧，0为标准帧。
RTR：远程帧和数据帧的标识，1为远程帧，0为数据帧。
保留值为0，不可写入1。
D3～D0 ：标识该CAN帧的数据长度。

帧ID：长度4个字节，标准帧有效位是11位，扩展帧有效位是29位。

高字节			低字节
12h	34h	56h	78h

如上为扩展帧ID号
0x12345678的表示方式

高字节			低字节
00h	00h	03h	FFh

如上为标帧ID号
0x3FF的表示方式

帧数据：长度8个字节，有效长度由帧信息的D3～D0的值决定。

DATA1							DATA8
11h	22h	33h	44h	55h	66h	77h	88h

如上为8个字节有效数据
的表示方式

DATA1							DATA8
11h	22h	33h	44h	55h	66h	00h	00h

如上为6个字节有效数据
的表示方式

以下例子是一个扩展数据帧，ID为0x12345678，包含8个字节数据（11h, 22h, 33h, 44h, 55h, 66h, 77h, 88h）的帧的表示方式

88h	12h	34h	56h	78h	11h	22h	33h	44h	55h	66h	77h	88h

以下例子是一个标准数据帧，ID为0x3ff，包含6个字节数据（11h, 22h, 33h, 44h, 55h, 66h）的帧的表示方式

06h	00h	00h	03h	FFh	11h	22h	33h	44h	55h	66h	00h	00h

When you send UDP frames on the PC, the number of CAN frames contained in each UDP frame cannot be greater than 50 frames! It is recommended that the sending speed of UDP frames should not exceed 400 packets per second. There is another condition. If the user has 400 packets of UDP frames per second, and each UDP frame contains 50 CAN frames, you can calculate that it is equivalent to 20,000 CAN frames per second. Even with a baud rate of 1,000 kbps, the CAN cannot send it so fast. Therefore, it is recommended that you should not send more than 400 UDP frames per second, and should not convert more than 4000 frames per second into CAN frames.

附录B Data conversion format of TCP notification port in CAN port state

某路CAN对应的TCP通知端口被连接后，如果此路CAN发生错误，
通知端口将向主机定时发出状态警告，TCP包数据段格式如下：

固定格式。包头AAh 00h,包尾55h

CMD 状态码

Time1 Time2 Time3 Time4 错误计数(32bit)，高字节在前，即Time1为高字节

CMD value	Status description (all are CANSwitch-AF2S2 devices)	Time error count value	Notification period (seconds)
00h	Fiber send buffer about to overflow	0	2s
01h	Fiber send buffer overflowed	0	0.5s
02h	Fiber receive buffer about to overflow	0	2s
03h	Fiber receive buffer overflowed	0	0.5s
04h	The CAN controller sends an error alarm (send error counter > 96)	Number of occurrences	2s
05h	The CAN controller receives an error alarm (receive error counter > 96)	Number of occurrences	2s
06h	CAN controller transmit error passive (transmit error counter > 127)	Number of occurrences	2s
07h	CAN controller receive error passive (receive error counter > 127)	Number of occurrences	2s
08h	CAN controller receive overflow error (overload)	Number of occurrences	2s
09h	CAN controller bus off (bus off)	Number of occurrences	2s
0Ah	CAN controller arbitration loss (bus congestion)	Number of	2s

		occurrences	
0Bh	CAN controller bus error (as long as there is an error)	Number of occurrences	2s
0Ch	Other errors	Number of occurrences	2s

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