UT-6502 Series
TCP/IP (100M fiber) to 2-port CANBUS protocol converter

User Manual

1. Overview

UT-6502 series is a high-performance CAN-bus communication converter integrating 2 CAN interfaces and 1 Ethernet (fiber optic) interface. The converter supports 10M/100M Ethernet network and 5Kbps~1Mbps communication rate CAN-bus interconnection, which further extends the application range of CAN-bus and network.UT-6502 converter provides Web configuration interface, users can flexibly set the operation parameters of UT-6502 converter. Industrial grade high standard design; isolation between communication interface and system, with certain anti-interference and anti-surge capability, widely used in industrial control and data communication system.

2. Product Technical Parameter

- Realizes bidirectional data transmission between CAN-bus and network
- Support CAN2.0 protocol
- Integrated 2-CAN-bus communication interface, supporting 5Kbps-1Mbps communication rate
- Integrated 1-channel 10M/100M Ethernet interface (100M fiber)
- Operating voltage: 12-36V DC
- Operating current: ≤ 200mA@12V
- Operating temperature: -40~85°C
- Storage temperature: -40~85°C
- Operating humidity: 5~95% (no condensing)
- Storage humidity: 5~95% (no condensing)
- Isolation voltage: 1000VDC
- Electrostatic protection: air 8kV, contact 6kV
- Surge protection: power port: 1.2/50us common mode 2kV, differential mode 1kV

  Ethernet port: 10/700us common-mode 2kV, differential-mode 1kV

3. Indicator light

PWR: red, power indicator; long light when power supply is normal.

RUN: green, system operation indicator; flashes when the system is running normally.

FDX: green, fiber optic communication indicator; flashes when there is data communication. (fiber optic interface is available)

T/R1: green, communication indicator; lights up when CAN1 sends and receives data, and goes out when transmitting and receiving is completed.

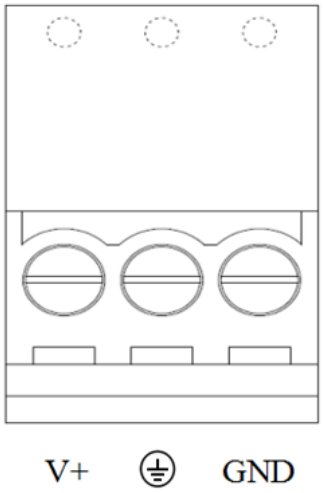
T/R2: green, communication indicator; when CAN2 transmit or receive data, the indicator is on and goes off when transmitting and receiving is completed.

4. Key Definition

Reset: button, press for 3 seconds to reboot the system, press for 5 seconds to restore the factory settings of the device

5. Pin Definition

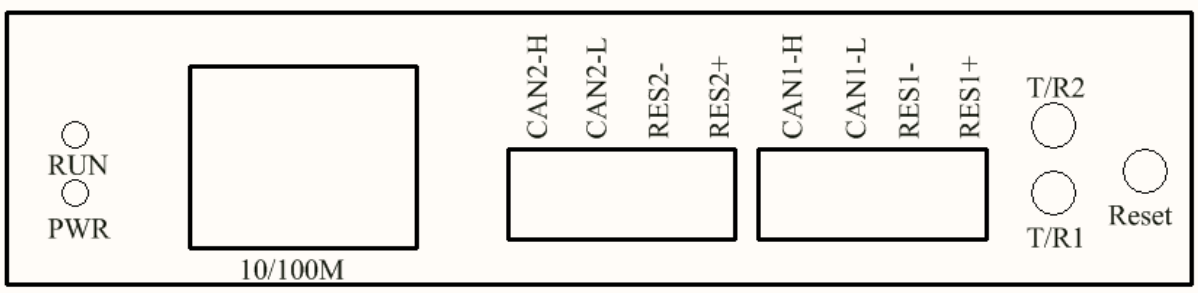
5.1 Power supply pin definition



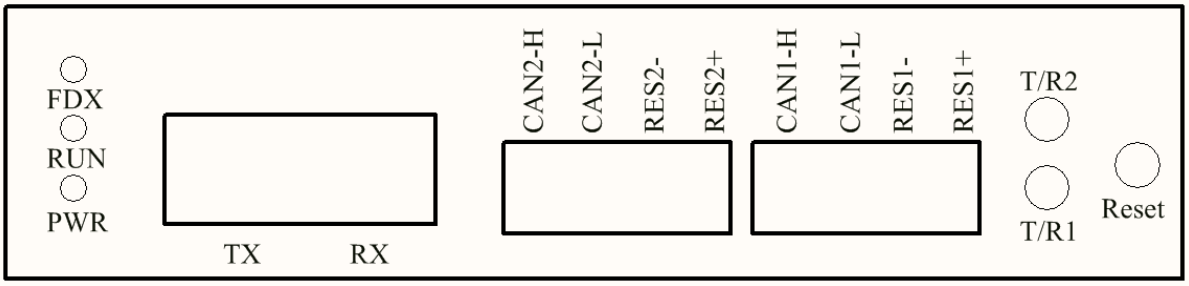
Definition	Description
V+	Power input positive
V-	Power input ground
⏚	PGND

5.2 Label silkscreen

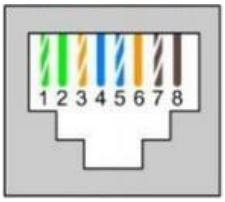
5.2.1 Ethernet interface



5.2.2 Fibre optic interface

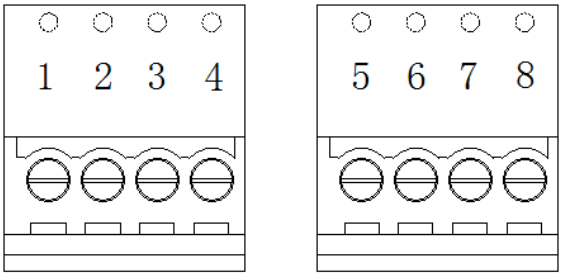


5.3 RJ45 network port definition



RJ45	Definition	Description
1	TX+	Transmitting signal positive
2	TX-	Transmitting signal negative
3	RX+	Receiving signal positive
6	RX-	Receiving signal negative
4，5，7，8	-	-

5.4 Terminal pin definition



3.81-4pin Phoenix terminal

PIN No.	PIN name	Description	PIN No.	PIN name	Description
1	CAN1-H	CAN1-H signal connection terminal	5	CAN2-H	CAN2-H signal connection terminal
2	CAN1-L	CAN1-L signal connection terminal	6	CAN2-L	CAN2-L signal connection terminal

3	RES1+	CAN1 matching resistor terminal 1	7	RES2+	CAN2 matching resistor terminal 1
4	RES1-	CAN1 matching resistor terminal 2	8	RES2-	CAN2 matching resistor terminal 2

* When the device is used as a CAN-bus terminal, CAN matching resistor terminal 1 and terminal 2 are shorted, equivalent to a 120R matching resistor connected to the signal line.

6. Factory parameter

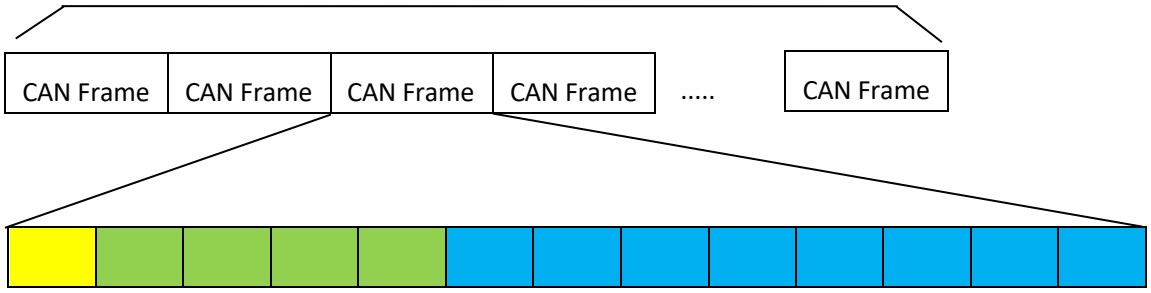
Default IP	192.168.1.125
Subnet Mask	255.255.255.0
Login Account	admin
Login Password	admin

7. Introduction to protocol function

7.1 CAN transmission formats are divided into CAN fixed format transmission and transparent transmission

7.1.1 Fixed format transmission: "Format conversion" is the simplest mode of use, where the data format is agreed to be 13 bytes, i.e. a fixed 13 bytes of serial frame data corresponding to a CAN message. 13 bytes contain the CAN message + ID + data. By correctly configuring the frame information (the first byte of data), standard, extended or even remote frames can be sent flexibly. By correctly parsing the 13 bytes of the serial frame the details of the standard, extended and even remote frames can be obtained.

Each frame is fixed at 13 bytes and must be filled with 0. A serial data frame that meets the 13 byte format in the same serial data frame corresponds to a CAN message, and serial data frames of less than 13 bytes are not converted. So make sure that the converted serial data frames are aligned to 13 bytes. During the conversion of serial frames to CAN messages, if the data format of a 13-byte segment of a 13-byte aligned serial data frame is not standard, the 13-byte segment will not be converted and the subsequent data will be converted. If you find that some CAN messages are missing after conversion, check that the 13-byte serial data format of the corresponding message does not conform to the standard format.



1 CAN frame contains 13 bytes

Frame information: 1 byte in length, used to identify some information about the CAN frame, such as type, length, etc.

Bit7							Bit0
FF	RTR	Reserved	Reserved	D3	D2	D1	D0

FF: Identification of standard and extended frames, 1 for extended frames, 0 for standard frames.

RTR: Identification of remote frames and data frames, 1 for remote frames and 0 for data frames.

The reserved: 0. 1 cannot be written.

D3~D0: Identifies the data length of the CAN frame.

Frame ID: 4 bytes long, standard frame valid bits are 11, extended frame valid bits are 29.

Low Byte			High Byte
12h	34h	56h	78h

As above for extended frame ID numbers

Representation of 0x12345678

Low Byte			High Byte
00h	00h	03h	FFh

As above for standard frame ID numbers

Representation of 0x3FF

Frame data: 8 bytes in length, valid length is determined by the value of D3 to D0 of the frame information.

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

As above for a representation of 8 bytes of valid data

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

As above for a representation of 6 bytes of valid data

7.1.2 Transparent transmission: "Transparent conversion" means that the converter simply converts the data of one bus format into the data format of the other bus, without attaching data or modifying it. This enables the exchange of data formats without changing the data content, so that the converter is as transparent to both buses.

7.1.3 Key point：

Fixed format transmission: when sending, the ID can be customized; when receiving, the data is the full byte sent by the other party

Transparent transmission: when sending, the ID is fixed; when receiving, the data is displayed in the other side's data bytes only

7.1.4 Example：

i.

When fixed format: e.g. extended frame (for simplicity, the standard frame of this module also goes in 13-byte mode, i.e.

ID<<0x000003FF)

0x

88	00	00	00	3A	11	22	33	44	55	66	77	88

At this point the ID is 0x0000003A.

ii.

In transparent format: e.g. extended frame

0x

88	00	00	00	3a	11	22	33	44	55	66	77	88

If the web configuration ID is 0x00000030 then the ID is 0x00000030.

7.2 CAN frame types are divided into data frames and remote frames.

7.2.1 Data frame type: send data to the other end; Remote frame type: send the other end ID to the other side.

7.3 CAN frame format is divided into extended frames and standard frame

7.3.1 Extended frame ID length: 29 bits; standard frame size: 11 bits; here both extended and standard frames are in 32-bit mode

7.3.2 Example:

iii. Extension frame

0x

88	00	00	00	3A	11	22	33	44	55	66	77	88

At this point ID=0x0000003A<0X1FFFFFFF,match

iv. Standard frame

0x

88	00	00	00	3A	11	22	33	44	55	66	77	88

At this point ID=0x0000003A<0X000003FF,match

7.4 Filter mode is divided into enable filter mode and disable filter mode

7.4.1 Enable filter mode: Here, a 32-bit filter mode is used with a filter code and a mask code as the filtering combination

7.4.2 Off filter mode: you can receive CAN packets with any ID

7.5 CAN frame packet time

7.5.1 The range of values: (4, 999) is appropriate. The smaller the value, the faster the packet is sealed and the faster the transmission speed.

7.6 The module communication modes are TCP and UDP, and the module operating modes are Client and Server

7.6.1 Differences between the two communication modes：

TCP: reliable, stable, orderly, etc., recommended for large amounts of data transmission

UDP: faster, can send broadcast, etc., recommended for small amount of data transmission

7.6.2 Key point: The Network Debugging Assistant is configured to communicate in its corresponding mode.

7.6.3 Example:

TCP Client mode ：

Module Port No.	5001
Remote Device Port No.	5005
Modular TCP/IP communication mode	TCP
Module TCP/IP operating mode	Client
Remote server IP address	192.168.1.176

At this time, the module is TCP Client, port number 5001, and the server is enabled at one end of the network port, configured with its IP 192.168.1.176 and port number 5005, and the local IP of the server should also be set to 192.168.1.176.

TCP Server mode ：

Module Port No.	5001
Remote Device Port No.	5005
Modular TCP/IP communication mode	TCP
Module TCP/IP operating mode	Server
Remote server IP address	N/A

At this point, the module is TCP Server, port number 5001, IP is the IP address of the device, and the client is enabled at one end of the network port, configured with its IP as the module IP and port number 5001

UDP Client mode:

(Note: Configure the network port udp server before this mode configuration)

Module Port No.	5001
Remote Device Port No.	5005

Modular TCP/IP communication mode	UDP
Module TCP/IP operating mode	Client
Remote server IP address	192.168.1.176

At this time, the module is UDP Client, port number 5005, one end of the network port to enable the UDP server, configure its IP to 192.168.1.176, port number 5005, and the server's local IP should also be set to 192.168.1.176.

After the configuration is complete, the module will send "udp client start receive" to the UDP server after the reboot has taken effect, indicating that it is starting to receive data.

UDP Server mode:

Module Port No.	5001
Remote Device Port No.	5005
Modular TCP/IP communication mode	UDP
Module TCP/IP operating mode	Server
Remote server IP address	N/A

At this point, the module is the UDP Server, port number 5001, IP is the IP address of the device, and the UDP client is enabled at one end of the network port, configured with its IP as the module IP and port number 5001

7.7 Connection timeout setting

7.1 When the data is 0, it means that the connection never times out. When the data is other, it means that the connection will be made within this time period, after which the connection cannot be made. It is recommended that the connection is set to 0.

Receiving and transmitting data protocol

i. Fixed format: 13 bytes

Example: 88 00 00 00 3a 11 22 33 44 55 66 77 88

88: Frame information bits. The first 8 indicates an extended frame, a 0 indicates a standard frame, the second 8 is the number of data bits and takes the value [1,8]

00 00 00 3a :Frame id bit. Frame id=0x0000003a, range [0, 0x1FFFFFFF] for extended frames, [0,0x3FF] for standard frames

11 22 33 44 55 66 77 88: frame data bits, the number of data bits is the same as the second bit of the frame information bits.

When transmitting in fixed mode.

Transmitter's command: 88 00 00 00 3a 11 22 33 44 55 66 77 88

Display on the receiving side: 88 00 00 00 3a 11 22 33 44 55 66 77 88

ii. Transparent method: 13-20 bytes

Example: 8a 00 00 00 3b 11 22 33 44 55 66 77 88 99 10

8a:Frame information bits. The first 8 indicates an extended frame, a 0 indicates a standard frame, the second a is the number of data bits and takes the value [1,f]

00 00 00 3b :Frame id bit. Frame id=0x0000003a, range [0, 0x1FFFFFFF] for extended frames, [0,0x3FF] for standard frames

11 22 33 44 55 66 77 88 99 10: frame data bit, the number of data bits is the same as the second bit of the frame information bit.

When transmitting in transparent mode.

Sender's command: 8a 00 00 00 00 3b 11 22 33 44 55 66 77 88 99 10

Display on the receiving end: 11 22 33 44 55 66 77 88 99 10

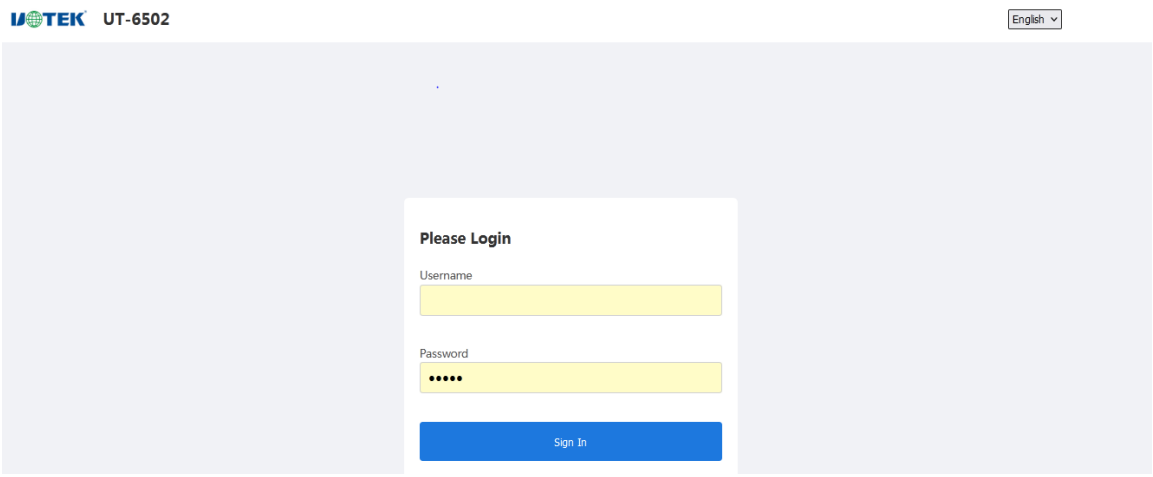
iii. Contrast:

When sending and receiving in fixed format: fast and stable, the id of the other party is displayed as a manually populated id of the other party, but the number of data bits transferred is slightly less.

Transparent sending and receiving: more data bits, but slower, the id of the other party is displayed as a fixed id of the module, configured by the web page

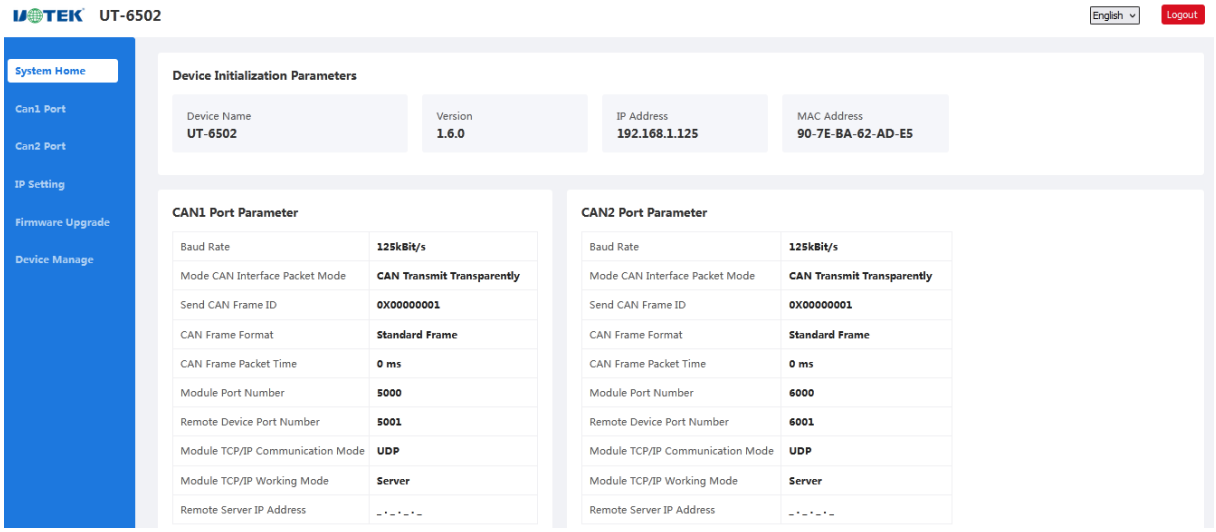
8. Web Operation Instructions

8.1 Login screen



The default username and password are admin

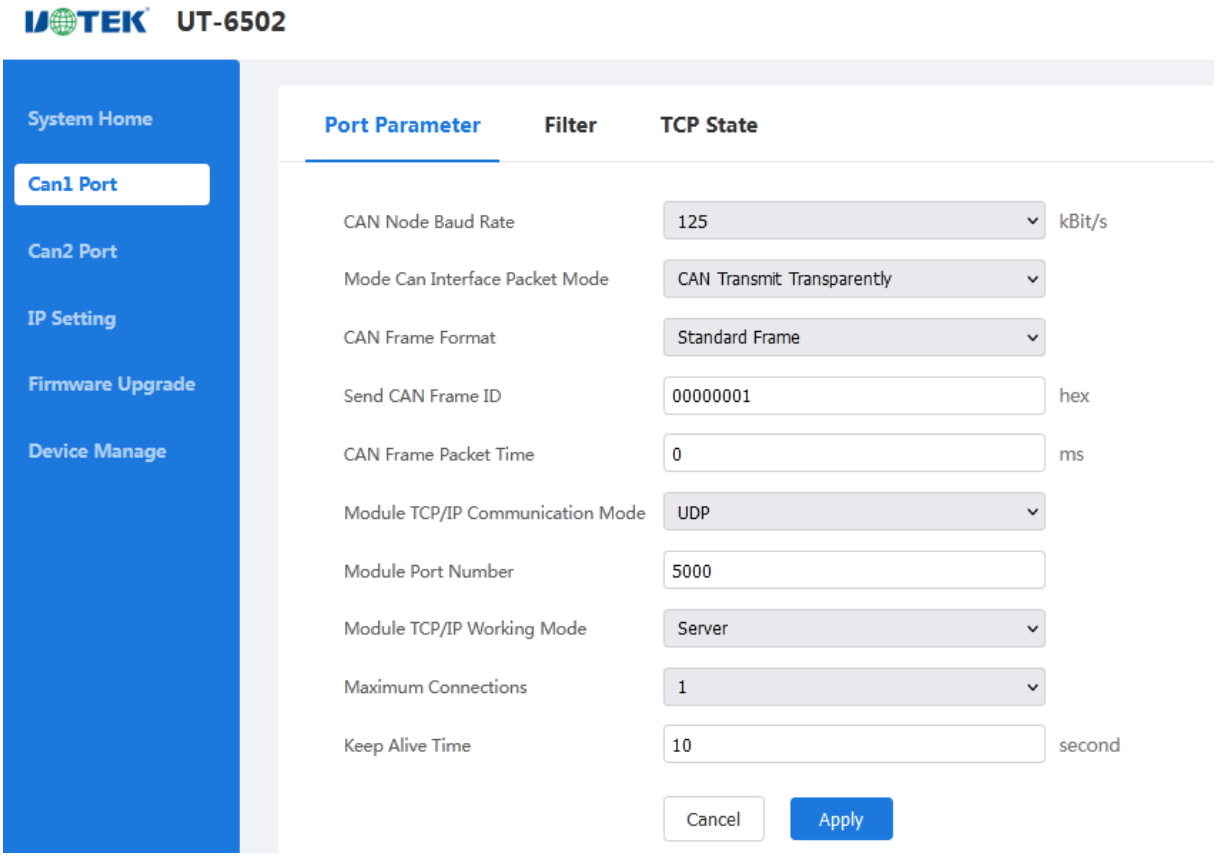
8.2 Main interface



Here you can view the current device parameters, including device name, version, network parameters and CAN port parameter

8.3 CAN1 port parameter configuration

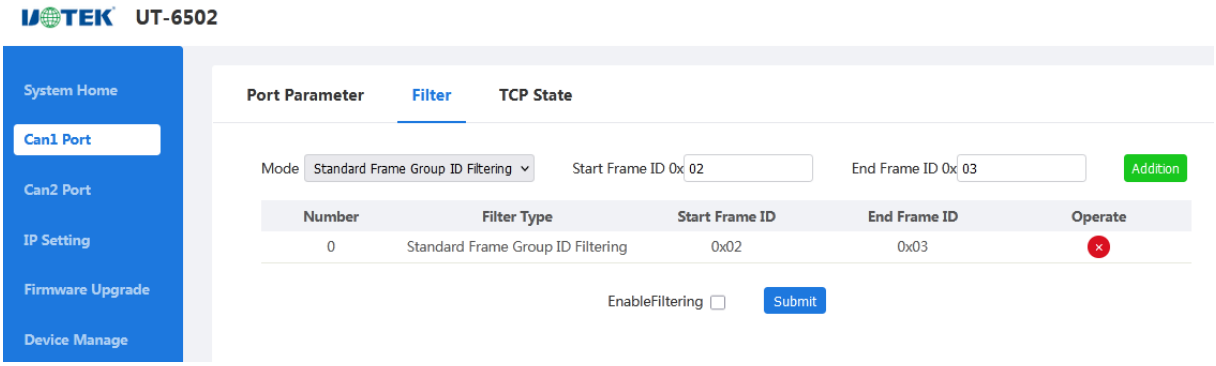
8.3.1 Port parameter setting



Configuration item	Description
CAN node baud rate	CAN communication rate, selectable between 5k-1000kbps
Module CAN interface packet mode	CAN transmission method, which can be set to transparent transmission or fixed format transmission
CAN frame format	CAN frame format, can be set to standard and extended frame
Transmit CAN frame ID	Set the frame ID
CAN frame packet time	CAN packet transmission interval
Modular TCP/IP communication mode	Device communication modes, divided into TCP and UDP
Module port No.	Module port number of the device as a server
Module TCP/IP operating mode	Set the module operating mode, Server and Client
Remote server IP address	IP address of the remote server to which the device needs to connect as a client
Remote device port No.	The remote server port number to which the device needs to connect as a

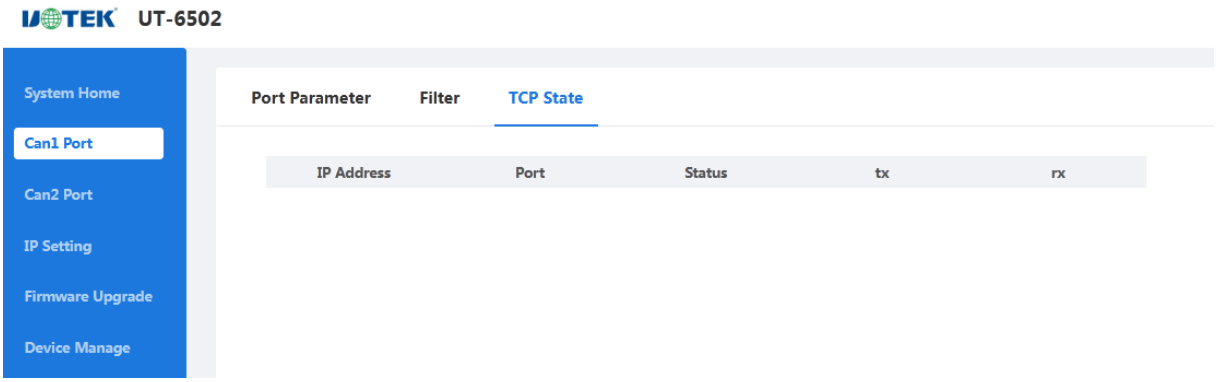
	client
Max. connections number	Max. number of client connections that can be supported
Shelf life	TCP guaranteed live time

8.3.2 Filter setting



Configuration item	Description
Mode	The frame format of the filter needs to be set, divided into standard frame ID filter and extended frame ID filter
Start frame ID	The start frame ID of the filter needs to be set
End frame ID	The end frame ID of the filter needs to be set
Note： ●When only standard frame ID filtering is set, it only takes effect for standard frames; no filtering effect will be generated for extended frames without setting. ● The generated filter ID ranges between the start frame and end frame (including the set start frame and end frame IDs), and can be set by multiple groups simultaneously to take effect.	

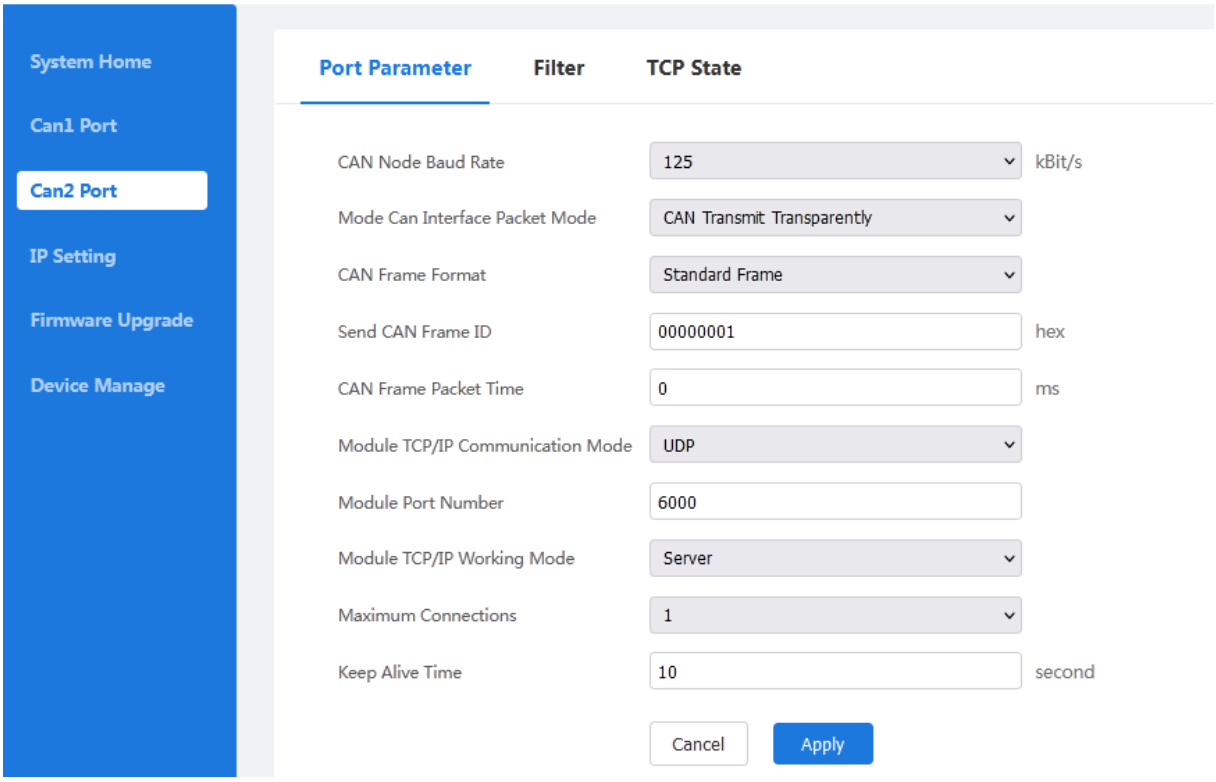
8.3.3 TCP Status



Configuration item	Description
IP address	IP address of the device connection in TCP state
Post	TCP state of the port to which the device is connected
Status	Display connection status
Tx, Rx	Current CAN port transmit and receive data count

8.4 CAN2 port parameters configuration

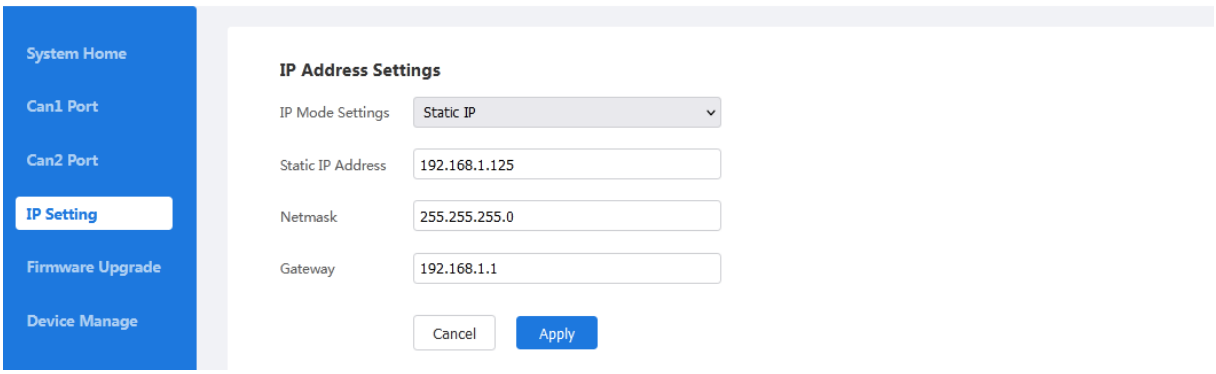
UTEK UT-6502



CAN2 port setting method is the same as CAN1 port, see CAN1 port setting instructions for details.

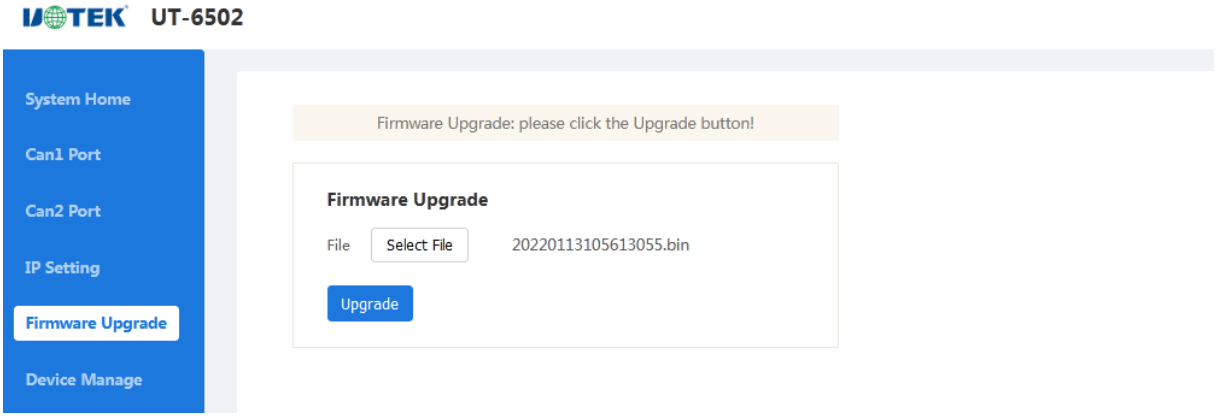
8.5 IP Configuration

UTEK UT-6502



Configuration item	Description
IP mode setting	Set IP mode, static IP or dynamic IP DHCP get
Static IP address	Set the static IP address of the device
Subnet mask	Device subnet mask
Gateway	Device gateway address

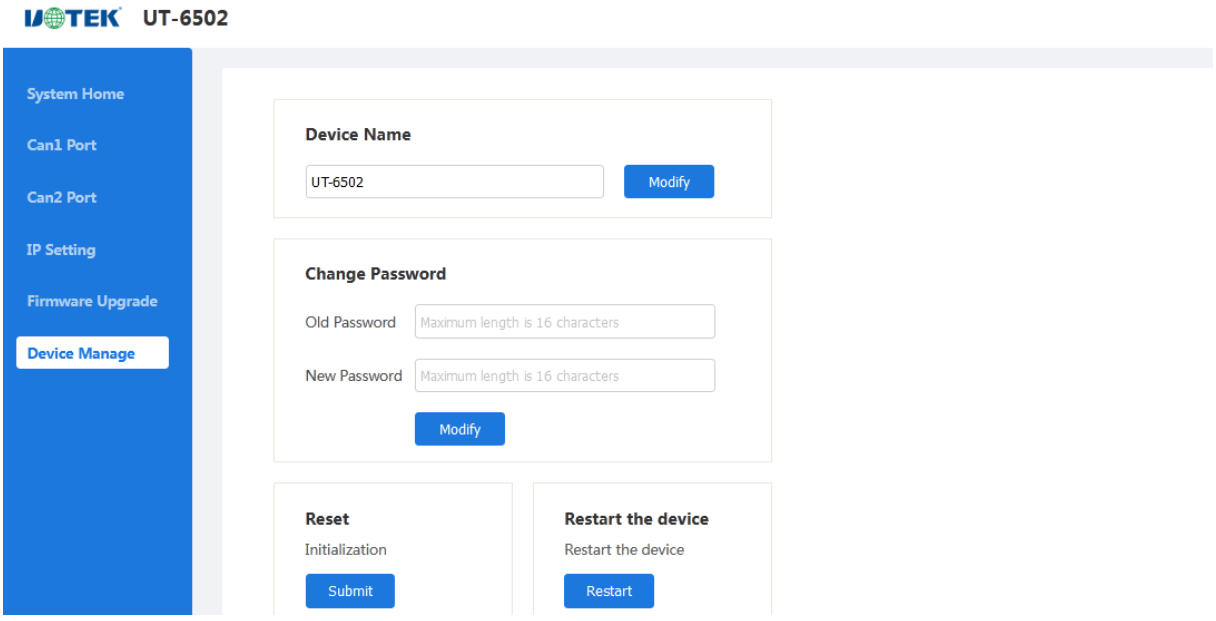
8.6 Firmware Upgrade



Here, you can upgrade the firmware of your device.

When you need to upgrade your device, please use the official upgrade package to upgrade; click Select File > Import File > Click Upgrade.

8.7 Equipment Management



Configuration item	Description
Equipment name	Set the name of the device, also known as the device model
Old password	If you need to change the login password of the device, you must first enter the current password
New password	Set a new login password
Reset	Restore the factory parameters of the device
Reboot Configuration	Restart button

9. Ordering

Model	10/100M Ethernet	100M Fiber optic	CAN Interface
UT-6502	1	-	2
UT-6502SM-SC	-	1 SC Interface (single mode)	2
UT-6502SM-FC	-	1 FC Interface (single mode)	2
UT-6502SM-ST	-	1 ST Interface (single mode)	2
UT-6502MM-SC	-	1 SC Interface (multi-mode)	2
UT-6502MM-FC	-	1 FC Interface (multi-mode)	2
UT-6502MM-ST	-	1 ST Interface (multi-mode)	2