TD1UDNET(-RJ45)

Serial port to Ethernet module application notes

Items	Content
Product features	Serial port/Ethernet conversion, multiple configuration methods, equipment entering the network
Notes abstract	Application description, configuration description, detailed function explanation

Version	Change Record
A/0	**First revision**
A/1	**Add new P/N TD1UDNET-RJ45, Change the original to TD1UDNET**

Contents

1 Overview

In order to allow customers to use this module quickly, this article mainly describes the operating process of serial port to the Ethernet module and some test verification functions.

Serial port to Ethernet module is a multi - function embedded Ethernet serial port data conversion module. It integrates the TCP/IP protocol stack. Users can easily complete the network function of the embedded device to save manpower and material resources and development time. Make products faster into the market and enhance competitiveness.

The module integrates 10/100M adaptive Ethernet interface, and the maximum Potter rate of serial communication is as high as 921.6kbps.

It has a variety of working modes such as TCP Server, TCP Client, UDP and Real COM, supports up to four connections, supports domain name access and other functions.

This series contains two products TD1UDNET and TD1UDNET -RJ45:

TD1UDNET Appearance   TD1UDNET-RJ45 Appearance
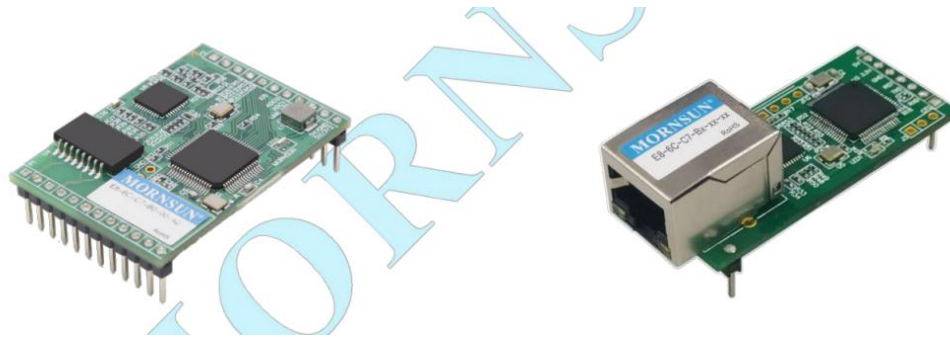
1.1 Functional characteristics

➢ 10/100M adaptive Ethernet interface;
➢ Supports AUTO MDI/MDIX and can be connected using crossover or parallel network cables;
➢ Potter rate can be set up at 1200bps ~ 921.6kbps;
➢ The working method can choose a variety of working modes such as TCP Server, TCP Client, UDP, and Real COM. Work ports, target IP addresses and ports can be set;
➢ Built -in web server, which is convenient for customers to configure web pages;
➢ After the network is disconnected, the connection is automatically disconnected to ensure that the entire network establishes a reliable TCP connection;
➢ Support DNS to meet the needs of communication through the domain name;
➢ Flexible serial data distribution settings to meet the user's various subcontracting needs;
➢ TCP supports multiple connections and supports connection verification password and sends specific data after connection. It can meet the requirements for up to 4 users to manage a device with an embedded module at the same time;

➢ UDP supports single-machine or multi-machine communication, enabling multiple users to manage a device with an embedded module at the same time;

➢ Support local and remote system firmware upgrades;

➢ Support the AT command configuration;

➢ Support remote configuration;

➢ TD1UDNET supports up to 6 IO and 2x 12bit ADC.

1.2 Product features

➢ Processor:

　　32-bit ARM Cortex-M4 microcontroller

➢ LAN：

　　Ethernet：10/100Mbps；

➢ Serial port：

　　TTL×1：TXD, RXD, GND

➢ Serial communication parameters：

　　Check： None, Even, Odd, Space, Mark

　　Data bit：8, 9

　　Stop bit：1, 1.5, 2

　　Flow Control：none

　　Potter：1200bps to 921.6Kbps

➢ Software resources：

　　Ethernet：ARP, ICMP, IGMP, UDP, TCP, HTTP, DHCP, DNS

　　Tool software: configuration software

　　Configuration method: web browser, Windows super terminal, telnet, serial port

➢ power supply：

　　Input voltage: 3.15V-3.45V DC or 4.5-30V DC. For details, please refer to the corresponding product datasheet.

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2 Hardware part description

2.1 Product Pin explanation

TD1UDNET Pin explanation:

引脚	功能	引脚	功能
1	ETX+	13	5VCC/3VCC
2	ETX−	14	5VCC/GND
3	ERX+	15	LINKLED
4	ERX−	16	ADC1
5	NC	17	ADC0
6	TXD	18	IO5
7	RXD	19	SPEEDLED
8	485EN	20	IO4
9	COMCFG	21	IO3
10	NRST	22	IO2
11	PGND	23	IO1
12	GND		

注:
尺寸单位: mm[inch]
端子截面公差: ±0.10[±0.004]
未标注公差: ±0.50[±0.020]
器件布局仅供参考,具体以实物为准
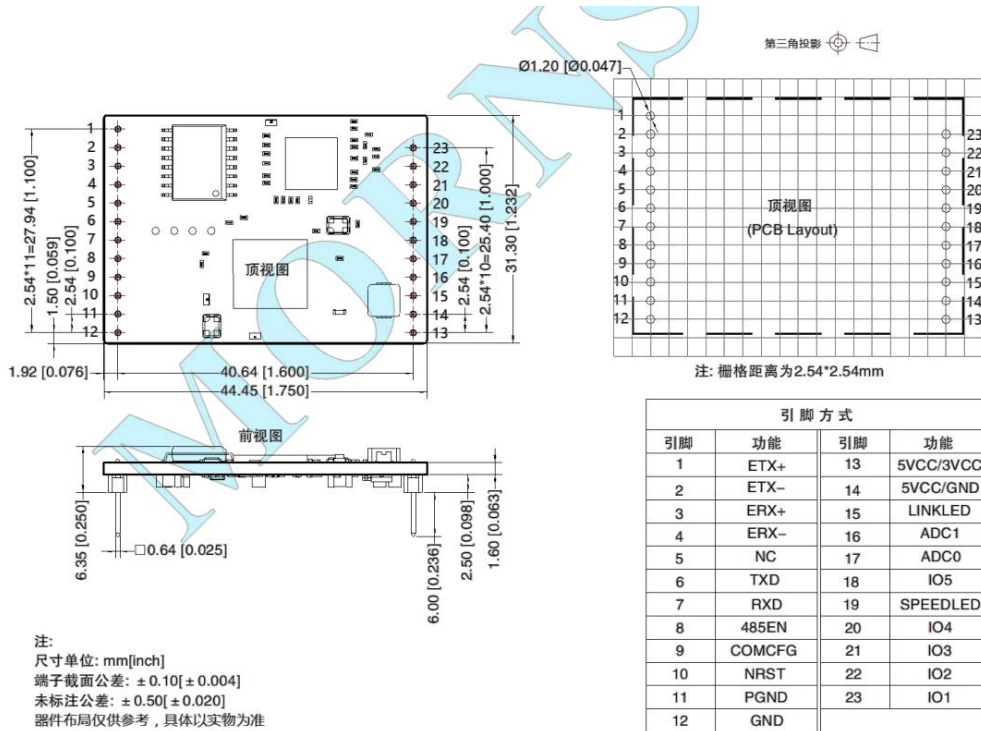
Pin 1, 2, 3, 4: Ethernet TX+, Ethernet TX-, Ethernet RX+, Ethernet RX- is the Ethernet differential signal Pin;

Pin 5: No functional Pins, not recommended to access any circuit network;

Pin 6: TXD is the module serial port signal output Pin, connecting the RXD Pin of the upgrade serial port;

Pin 7: RXD is the module serial signal input Pin, connecting the TXD Pin of the upgraded serial port;

Pin 8: 485_EN is 485 receiving control Pin, which can directly connect to the sending and receiving control terminal of the 485 transceivers.

Pin 9: COM_CFG is a serial port configuration control Pin. When the Pin is high level or suspended, it works in normal operating mode; In low level, the system works in serial port mode. In the normal working mode, the serial port forwards Ethernet data, and the serial port forwards Ethernet data. In the serial port configuration mode, the serial port sends configuration commands to set the working parameters of the module or obtain the working state parameters of the module. The Pin has a weak pull-up inside, and the user can add 100K pull-up resistance outside the Pin when using the

design to increase the anti-interference ability. If the configuration is inconsistent with the normal working mode, you can also lower the pull-up resistance, but it is recommended that the value be not lower than 10K.

Pin 10: nRST module reset Pin, the low level is valid, input a negative pulse greater than 100us into the Pin, the module reset (there is a power-on reset circuit inside the module, the Pin can be suspended)

Pin 11: PGND is the module earth Pin, users can connect this Pin to the own equipment earth;

Pin 12: GND is the power supply earth Pin;

Pin 13, 14: VCC (5VCC and 3VCC) are the power supply positive input Pin. The input voltage is 3.3V or 5V DC. The input range of other voltage is shown below;
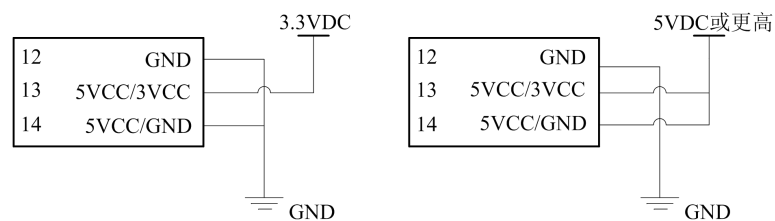
Category A: 3.15V ~ 3.45V connection method   Category B: 4.5V ~ 30V connection method

figure 2

This module supports a variety of power supply range. When the Category A connection method is used, Pin 13 is connected to 3.3V, and Pin 12 and 14 are connected to the GND; When the Category B connection method is used, Pin 13 and 14 are connected to high voltage, and Pin12 is connected to GND.

During the application process, the 5VCC/3VCC Pin cannot be suspended. It must be connected to the VCC when the Category A is connected, and the GND is connected when the Class B is connected, otherwise it will easily cause product damage.

Regardless of the Category A/B connection method, the system of 3.3V is required.

Pin 15 and 19: "SPEED_LED" and "LINK_LED" are used to indicate the current network status. When the network interface of the module sends and receives data, the "LINK_LED" Pin outputs a low level pulse (LED flashes). When the network interface of the module is connected to the 100M Ethernet cable and a carrier is detected, the "SPEED_LED" Pin outputs a low level (LED on), indicating that the module is connected to the 100M Ethernet network;

Pin 16, 17: ADC0 and ADC1 are analog signal input Pins, which can be used for simulation signal sampling. The maximum input voltage of the Pin is 3.3V;

Pin 18, 20, 21, 22, 23: IO1 ~ IO5 is an IO Pin controlled by the user, which can be configured to input and output mode.

TD1UDNET-RJ45 Pin explanation:

注:
尺寸单位: mm[inch]
端子截面公差: ± 0.10[± 0.004]
未标注公差: ± 0.50[± 0.020]
连接器: RJ45

引脚方式	
引脚	功能
1	PGND
2	RS485EN
3	Link
4	ISP
5	CFG
6	RXD
7	TXD
8	RST
9	GND
10	3V3
11	VDD
12	PGND
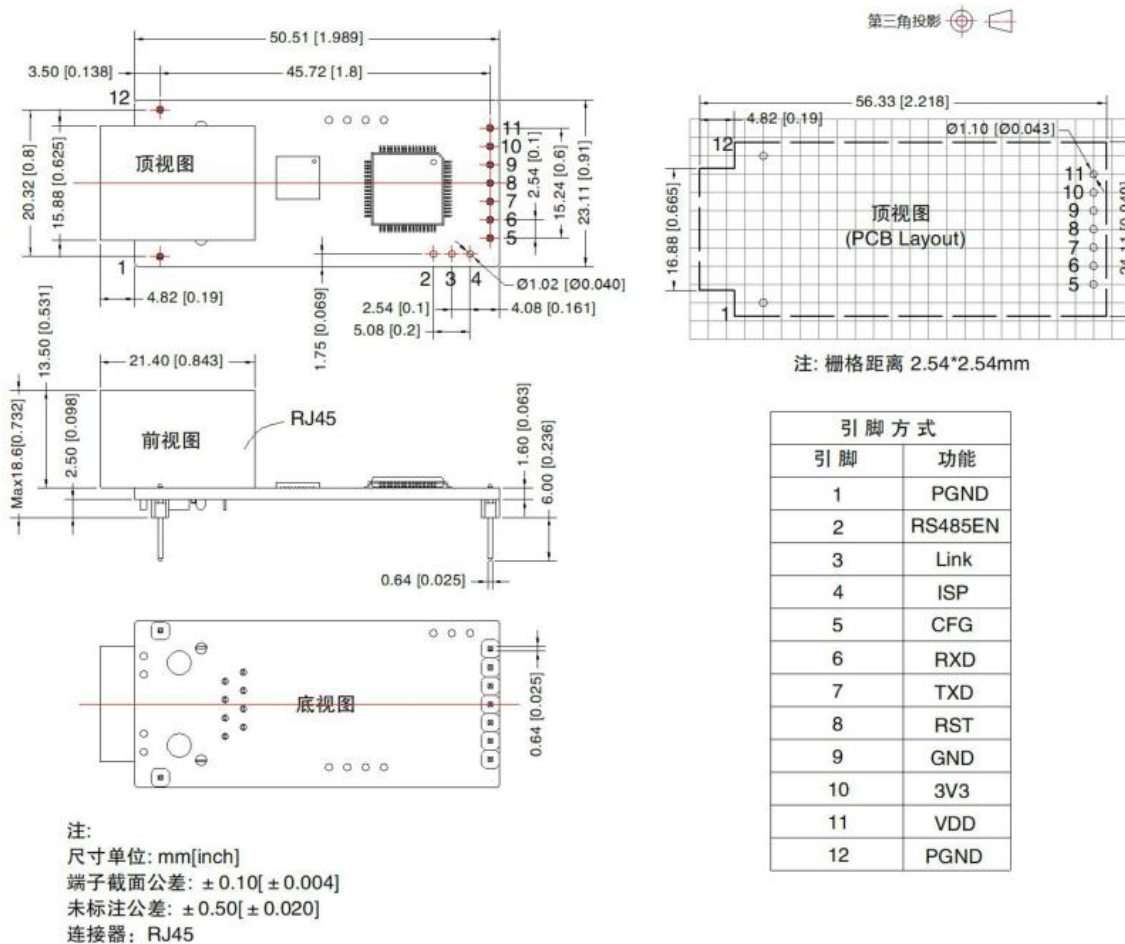
Pin 1,12: PGND is the module earth Pin. Users can connect this Pin to their own equipment earth;

Pin 2: 485_EN is the 485-transceiver control Pin, which can be directly connected to the 485 transceiver control terminal. This Pin does not lead out.

Pin 3: Link is the status indicator Pin for the module to establish communication connection. When the communication connection is established, the secondary Pin will output low level, and when no connection is established, it will output high level. When the module is in TCP mode, the Link Pin will automatically pull down after the communication connection is established. Otherwise, the Link Pin will be in high state. When the module is in UDP mode, the Link Pin will always be in low state.

Pin 4: ISP is the factory setting restore Pin, keep the low level for 3s to restore factory setting, this Pin does not lead out.

Pin 5: the serial port configuration control Pin. When the Pin is high level or suspended, it works in normal operating mode; In low level, the system works in serial port mode. In the normal working mode, the serial port forwards Ethernet data, and the serial port forwards Ethernet data. In the serial

port configuration mode, the serial port sends configuration commands to set the working parameters of the module or obtain the working state parameters of the module. The Pin has a weak pull-up inside, and the user can add 100K pull-up resistance outside the Pin when using the design to increase the anti-interference ability. If the configuration is inconsistent with the normal working mode, you can also lower the pull-up resistance, but it is recommended that the value be not lower than 10K.

Pin 6: RXD is the module serial signal input Pin, connecting the TXD Pin of the upgrade serial port;

Pin 7: TXD is the module serial signal output Pin, connecting the RXD Pin of the upgrade serial port;

Pin 8: nRST module reset Pin, the low level is valid, input a negative pulse greater than 100us into the Pin, the module reset (there is a power-on reset circuit inside the module, the Pin can be suspended)

Pin 9: GND is the power supply earth Pin;

Pin 10, 11: 3V3 module power supply Pin, power with 3.3V can work; The power supply Pin of the VDD high voltage module is 4.5~30V, which can make the module work. Meanwhile, the 3V3 Pin outputs 3.3V voltage.

2.2 Hardware connection instructions

Generally, the module can be used with the serial port device that needs to be connected to the network. The TXD and RXD of the module are connected to the serial port device, and the other end is connected to the switching device/router /PC device. In this way, the serial port device can be accessed by other network devices to realize the Internet access of the device.

With the internal driver transformer, the conventional RJ45 interface can be used to enter the network directly. TD1UDNET-RJ45 can directly access the network cable. Note that the internal network wiring structure of the RJ45 is:

Pin1	Pin2	Pin3	Pin6
Ethernet TX+	Ethernet TX-	Ethernet RX+	Ethernet RX-

The network cannot be a physics -level connection, and the network needs to be used to exchange equipment with other devices.

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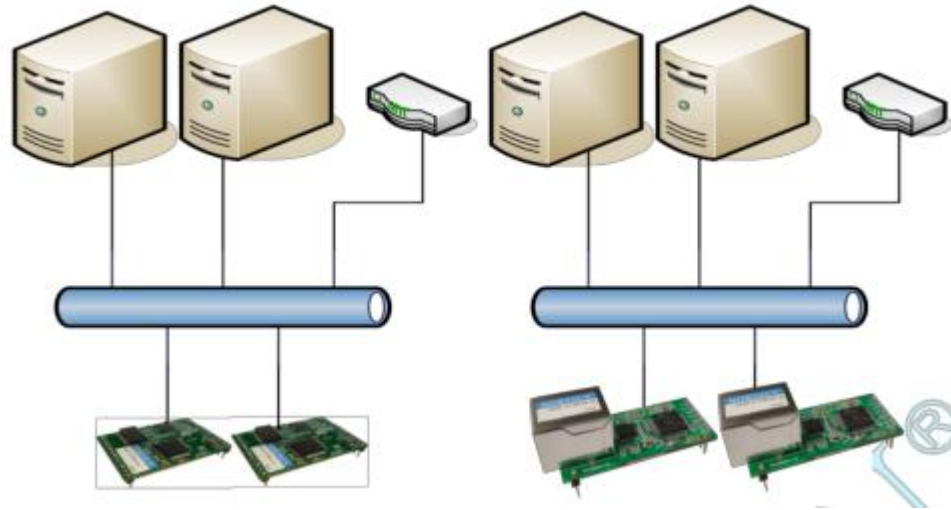
When using the module, you need to determine that other device IP and module IP in the network are in the same network segment. The module sets a default IP address (192.168.0.170) and netmask (255.255.255.0) when leaving the factory. All device IP addresses and network masks in the network must be the same.

本机IP

本机掩码

&

子网比较

&

其他IP

其他掩码

相同：可以通讯
不同：需要配置至同一子网

2.3 Computer test environment building instructions

Taking the Windows 8 system as an example, the user first opens the Ethernet settings in the settings, click the network and sharing center.

Then open the local network card, find the "Internet protocol version 4 (TCP/IPv4)" in the attribute, select "Specify IP Address" on the "IP address" page, and fill in the IP address 192.168.0.20, the subnet cover 255.255.255.0 Essence Click the "OK" on the page to restart the PC according to the prompt.
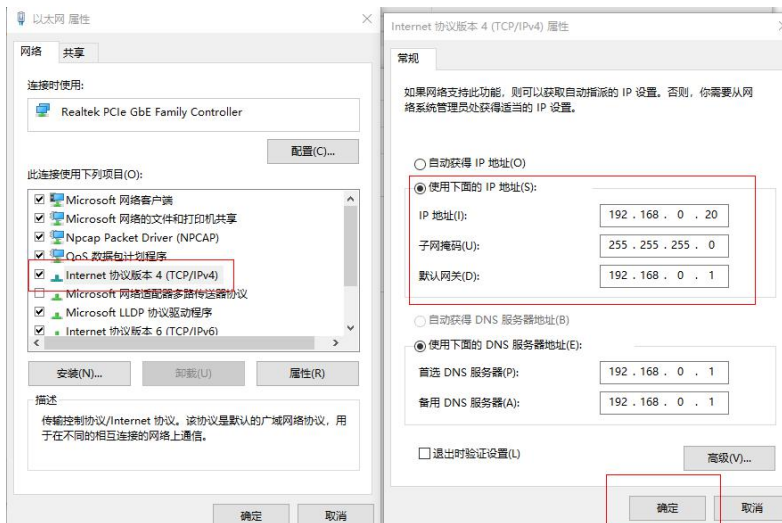
Now, you can communicate with the module, turn on the CMD command window, and try Ping the module to see if the communication is successful.

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```
C:\Users\Admin>ping 192.168.0.170

正在 Ping 192.168.0.170 具有 32 字节的数据:
来自 192.168.0.170 的回复: 字节=32 时间<1ms TTL=255
来自 192.168.0.170 的回复: 字节=32 时间<1ms TTL=255
来自 192.168.0.170 的回复: 字节=32 时间<1ms TTL=255
来自 192.168.0.170 的回复: 字节=32 时间<1ms TTL=255

192.168.0.170 的 Ping 统计信息:
    数据包: 已发送 = 4, 已接收 = 4, 丢失 = 0 (0% 丢失),
往返行程的估计时间(以毫秒为单位):
    最短 = 0ms, 最长 = 0ms, 平均 = 0ms
```

This shows that the module has successfully established communication with the PC.

3 Configuration function methods

3.1 The AT command configuration

The module supports the AT command configuration. The user can quickly realize the configuration of the module through the AT command, and it can also facilitate the manual input instruction configuration. For modules, users can use the AT command to configure the module through two channels, that is, based on serial port connection and network connection. The AT command supported by the module is a standard command format. It starts with "AT" and end with "\ r \ n".

Function	Input format	Output format
No parameter simple command	"AT+\<cmd>\r\n"	1. Same as ″Query parameter current value″ output 2. List command output ″command list \ r \ nok \ r \ n″ 3. EXIT, DEFAULT, Bootloader, Reset command without output prompts
Get this command help	"AT+\<cmd>=?\r\n"	\<cmd>+\<functional prompts> \ r \ n \ t+\<Parameter description>
Check parameter current value	"AT+\<cmd>?\r\n"	[\<cmd>] Value is:\<param>\r\nOK\r\n
Set current parameter value	"AT+\<cmd>=\<param>\r\n"	1. Successful output ″\ r \ n \ r \ nok \ r \ n″ 2. Failure output ″\ r \ n \ r \ n \<error prompt> \ r \ nerror \ r \ n″

3.2 Serial port AT command test

The serial AT command is to reach the module through the serial port. This method is applicable to the local configuration. Usually, the single -chip machine automatically configures the module. In the following, we use the "SSCOM serial debugging assistant" as the tool to simply explain how to use the serial AT command. First, open the serial debugging assistant software to the same settings such as Potter rate, data bit, stop bit and other information as the module currently set and open the serial port. Pull the level of the module COM_CFG Pin. If the data is received at this time, you can see the printing information of "Please Login!" On the serial debug assistant, indicating that the current device has entered the AT command mode.

When entering this mode, the COM_CFG Pin level, please confirm the connection to the low level. At the same time, the computers configure the correct serial port settings.
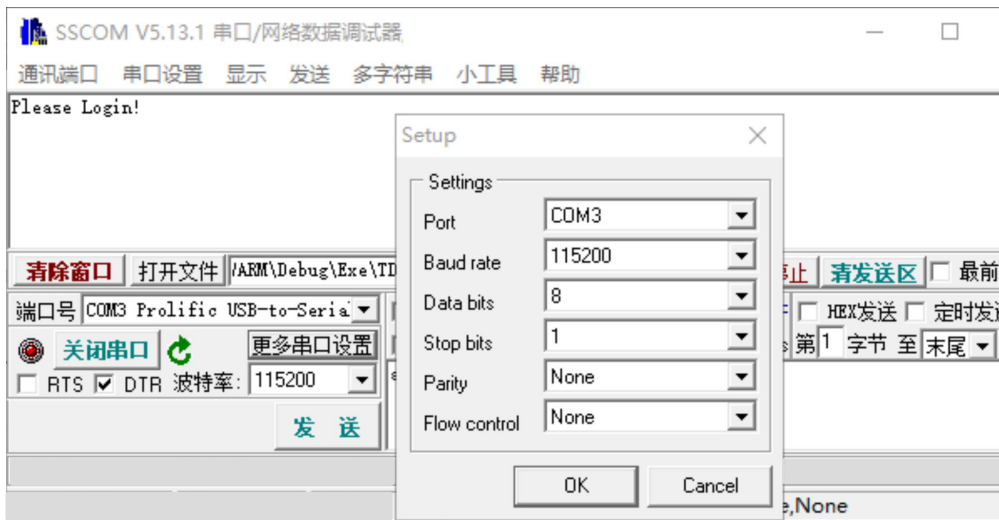
In the next login module, enter: "AT+Login = 88888", the module prompts the login successfully (take the latest password). We enter the parameter information that needs to be queried to query the information of the configuration parameter. The example is as follows:

3.3 Network AT command connection (CMD, Telnet mode test)

The network AT command is to reach the module through the network. This method is suitable for the remote device configuration. Generally, the usage is used to uniformly manage the remote device module to the administrator. Below we will use the Windows Telnet tool to briefly explain how to use the network AT command.

First, open the Windows command window and enter "Telnet 192.168.0.170 3003" in the command window, as shown in the figure.

Note: The module's default IP address is 192.168.0.170, and the default AT command port is 3003. If the user has modified the IP address and AT command port, please enter according to the actual parameter.

Press the "Enter" to start the Telnet tool and connect the target. At this time, the prompt information shown in the screen will be printed on the screen. After the user enters the password, you can check the parameter with the AT instructions.

According to the AT instruction list, you can check and set the corresponding parameters, such as check IP: "AT+IP?"

3.4 Web page configuration

The module supports the use of the web browser configuration. The usage is introduced as follows: open the browser, enter the module IP address in the address bar, and the login interface shown in the figure appears.

3.5 Visitor setting mode

Enter "GUEST" in [Username], enter the password in [Password] (the factory is set to "88888"), and click "Login". The visitor configuration interface shown in Figure 0.2 will appear in the IE.

3.6 Administrator configuration mode

Enter "Admin" in [Username], enter the password in [Password] (set to "88888"), and then click "Login". The browser will automatically enter the administrator configuration interface shown in Figure 0.3.

Click the corresponding button, jump to different setting parameter interfaces. If the parameters are required, fill in the appropriate parameters, click to save, and then the prompts will pop up "configuration parameters have been updated, after restarting" (note that only parameter is modified at this time, but the function needs to wait for the restarting module before it will take effect).

4. Instructions for use of Ethernet and serial interpretation

According to the default configuration, the serial port is connected to the line, and the PC will open the serial port to debug assistant. According to the default serial port configuration parameters, set the baud rate "115200", the data bit "8", the stop bit "1", and the no check bit," None "without hardware control flow.
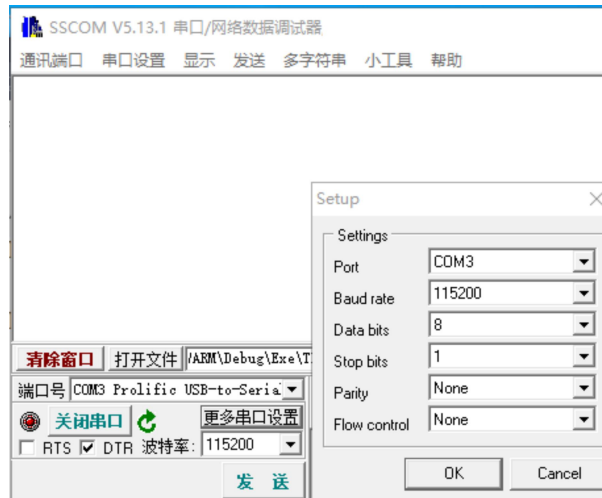
4.1 TCP Server Mode (module versus computer)

Open the network debugging assistant. Here is a TCP/UDP Socket debugging tool. The default working method of the module is the TCP server mode. According to the module's default IP: 192.168.0.170, work port: 5001, create TCP Client.

Then click the connection. After the connection is successful, you can see the local port number and other information. If the module sets the connection printing information (AT+C1_LINK_S = 3), you will see the answer "connected".
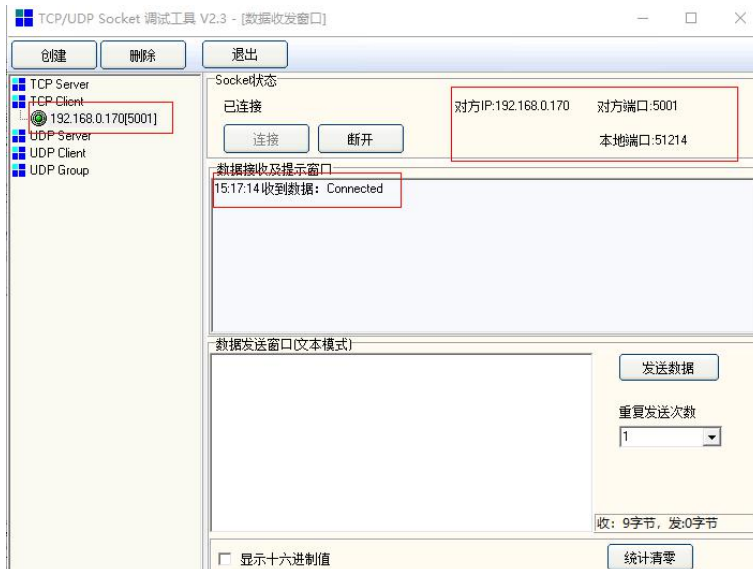
At this time, the network debugging assistant has established a TCP connection with the module to communicate. Enter "Guangzhou Mornsun Technology Co., Ltd." in the input box of The network debugging assistant and then click to send it.
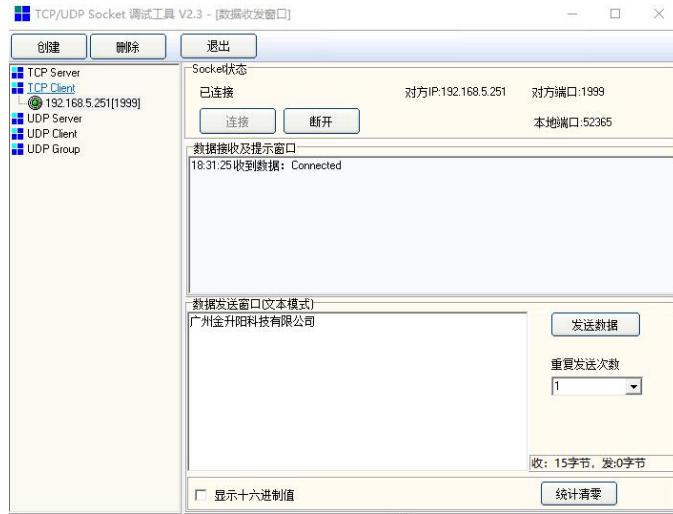
It can be seen in the serial port debug assistant that the module is transmitted through the serial port through the Ethernet data.
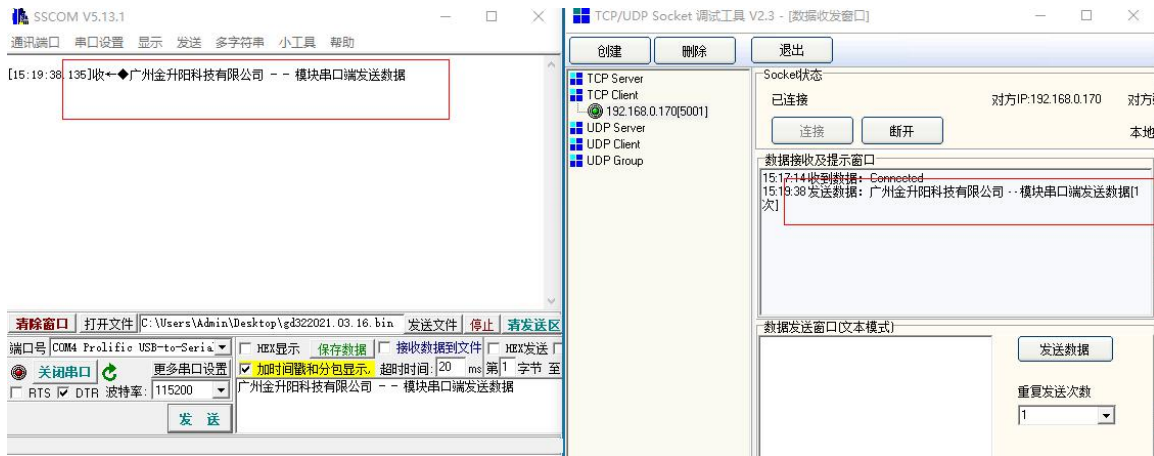
Similarly, enter the "Guangzhou Mornsun Technology Co., Ltd.-Ethernet Transfer serial port module" at the serial debug assistant input box. After clicking the sending, the network debug assistant also received the data sent by the serial port.
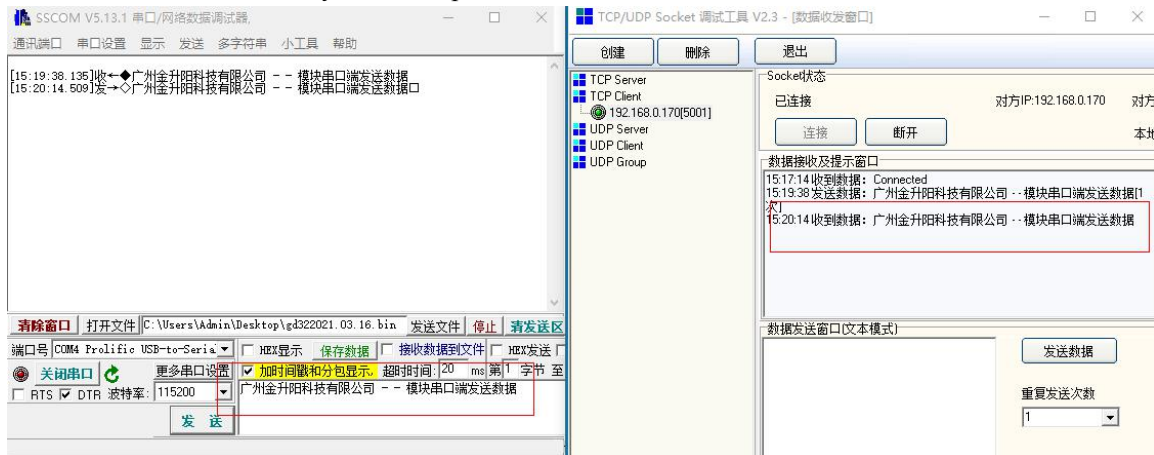
4.2 TCP Client Mode (module versus computer)

Open the network debugging assistant, and the module working method is configured with the TCP Client mode. According to the module's default IP: 192.168.0.170, working port: 5001. There are also 4 groups of module target IP and port number. First, the number of TCP connections is 4. Then create 4 TCP Server separately. The slogan of the module target is 8501, 8502, 8503, and 8504, respectively. The module target IP number is the computer's IP: 192.168.0.20.

Open the network debug assistant to establish a 4 -way TCP server:

Enter the "Guangzhou Mornsun Technology Co., Ltd.-Ethernet Transfer serial port module" and send it to the PC terminal. The PC's network debug assistant four-way TCP Server receives data.
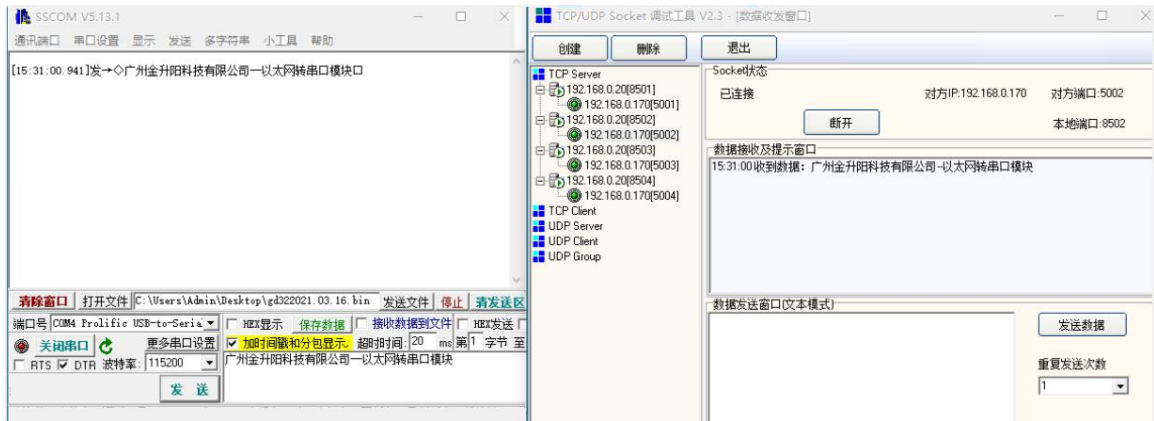
Similarly, enter the "Guangzhou Mornsun Technology Co., Ltd.-Ethernet Transfer serial port module experiment to send data" at the network debug assistant, send it to the serial port, and the serial port debug assistant receives data.
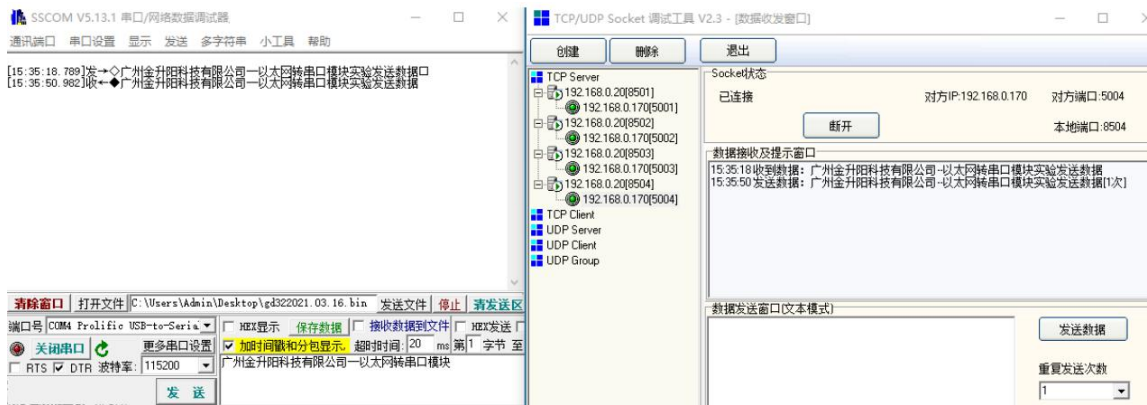
4.3 UDP Mode (Module versus PC)

Open the network debug assistant, and the module working method is configured to UDP mode. According to the module's default IP: 192.168.0.170, working port: 5001. There are also 4 groups of module target IP and port number. The module target IP and port number also have 4 groups. First, the number of TCP connections is 4. The slogan of the module target is 8501, 8502, 8503, and 8504, respectively. The module target IP number is the computer's IP: 192.168.0.20.
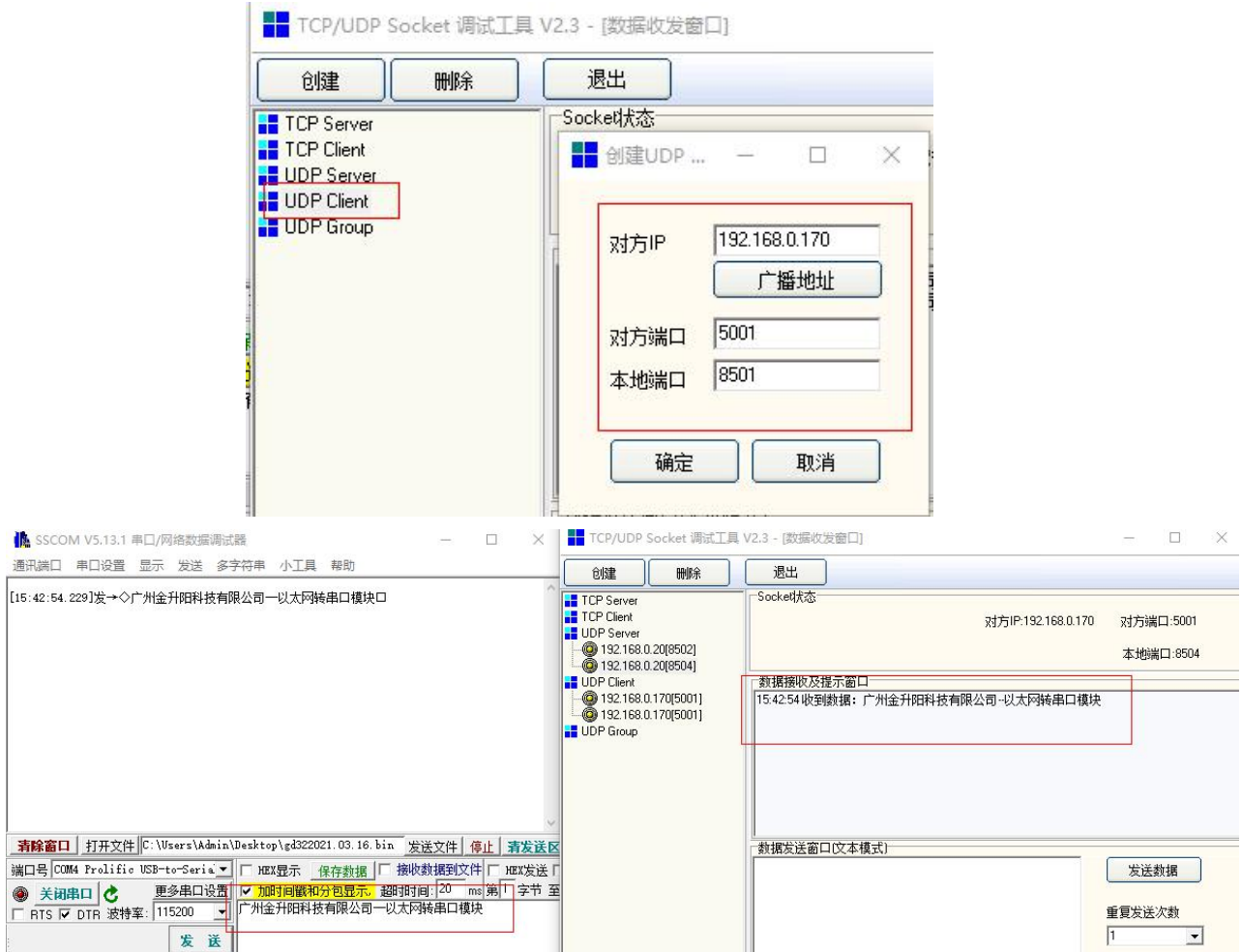
4.4 Hiticast mode (module to computer)

First set the module to UDP mode, then open the group to broadcast enable, click to save, and restart the module.

Then turn on the network debug assistant and set up the broadcast server:

Enter the "Guangzhou Mornsun Technology Co., Ltd.-Ethernet Transfer serial port module" and send it to the PC terminal.
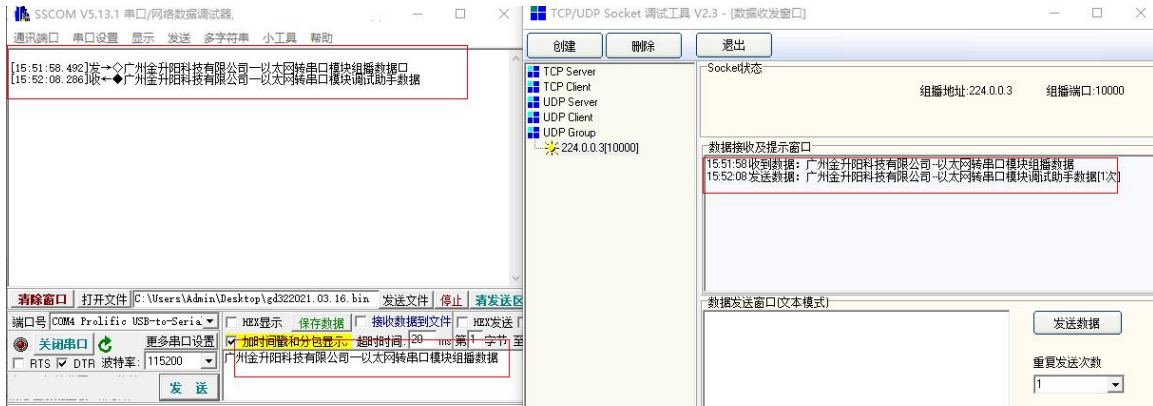
5 Other function application notes

5.1 IP whitelist description

First set the module to the TCP Server mode. Before the IP blacklist is not turned on, the network debug assistant can connect to the module, Ping the module, and send data.

Then set the IP of the PC host: 192.168.0.20 to the blacklist and open a whitelist to enable. (The opening method is set through the AT instructions, this section uses Telnet login to modify parameters as an example)

```
at+ipf_en=1

Value is : 1 启用IP过滤功能
at+ipf1=192.168.0.22-255.255.255.255
                                Value is : 192.168.0.22-255.255.255.255
```

After the restarting module, only the host access to the IP of 192.168.0.22 was allowed, while the original host IP192.168.0.20 could not access the module.

```
C:\WINDOWS\system32\cmd.exe

Microsoft Windows [版本 10.0.18363.1379]
(c) 2019 Microsoft Corporation。保留所有权利。

C:\Users\Admin>ping 192.168.0.170

正在 Ping 192.168.0.170 具有 32 字节的数据:
请求超时。
请求超时。
请求超时。
请求超时。

192.168.0.170 的 Ping 统计信息:
    数据包: 已发送 = 4, 已接收 = 0, 丢失 = 4 (100% 丢失),
```

5.2 DHCP dynamic IP acquisition

Putting the module into the router, the router turns on the DHCP function, and the module also turns on the DHCP function. Then the module is called:

```
at+ip_mode=0

Value is : 0 动态获取（DHCP）
```

Enter the AT instructions of the serial port to check IP information:

```
[11:08:00.935]发→◇at+ip?
□
[11:08:00.938]收←◆Value is : 192.168.8.104

[11:09:09.879]发→◇at+gateway?
□
[11:09:09.881]收←◆Value is : 192.168.8.1
```

清除窗口 | 打开文件 C:\Users\Admin\Desktop\gd322021.03.16.bin | 发送文件 | 停止
端口号 COM3 Prolific USB-to-Serial ▼ | □ HEX显示 | 保存数据 | □ 接收数据到文件 | □
● 关闭串口 ↻ | 更多串口设置 | ☑ 加时间戳和分包显示, 超时时间:20 ms 第1
□ RTS ☑ DTR 波特率:115200 ▼ | at+gateway?

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You can see that the module obtains a new IP information, indicating that the dynamic obtaining IP information is successful.

5.3 DNS domain name resolution

The router that can access the module can access the Internet, and then the module is dynamic to obtain IP (that is, AT settings to open DHCP), and write the destination IP address in the module parameter list into the domain name (such as "AT+C1_CLI_IP1 = www.honor.com" ""), And then after clicking, after the module completes the domain name analysis, the IP information obtained by the analysis domain name will be filled in the destination address. At this time, check the value of the C1_CLI_IP1. IP.

5.4 Virtual serial port

First set the working mode of the module to a virtual serial port mode:

Then open the virtual serial software, set the COM slogan you need to use, fill in the module's IP and port slogan, and then click "Start".
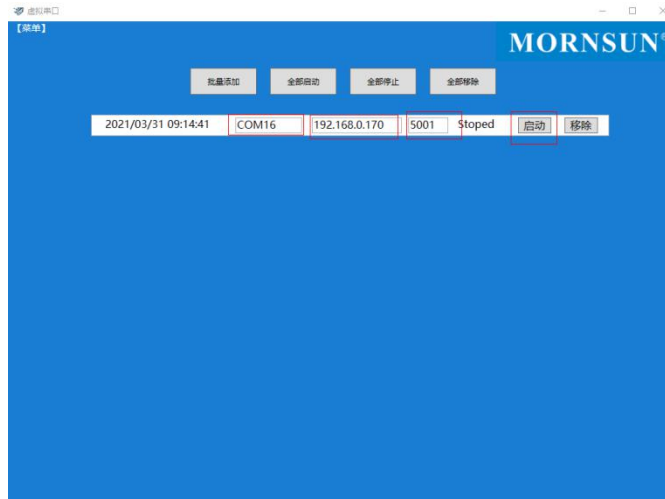
After the creation is successful, click to start to display "Running"

Open the serial port to the assistant, you can see the created virtual serial port "COM16 Eltima Virtual Serial Port". Another serial port that is actually created is not used for COM 116.
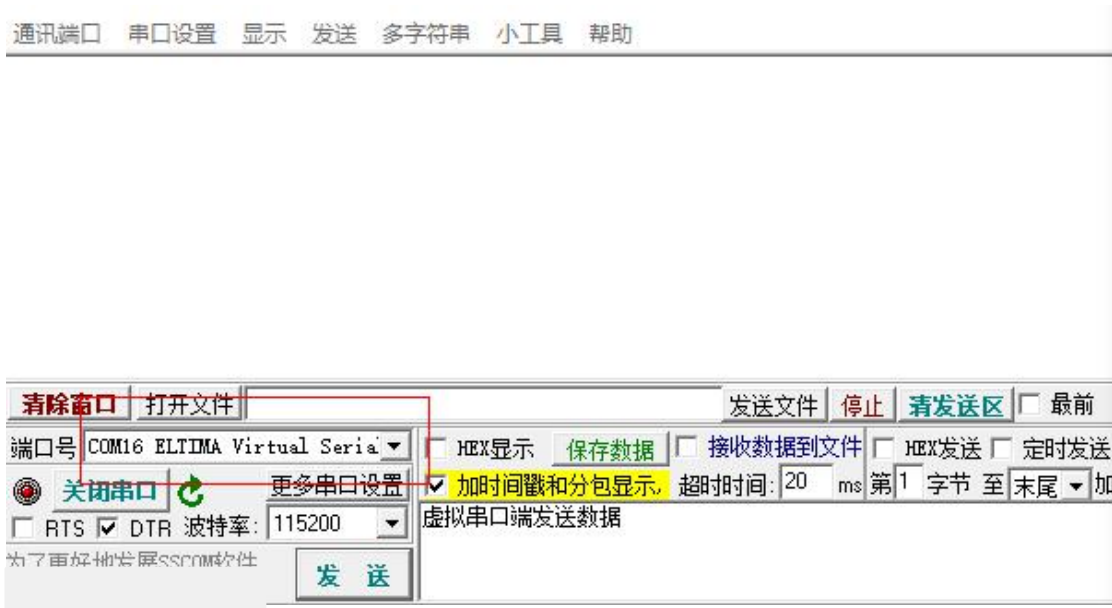
Open the COM16 serial port, and the serial port COM9 of the module (choose according to the actual computer COM), then the module serial port and virtual serial port can send and receive data:
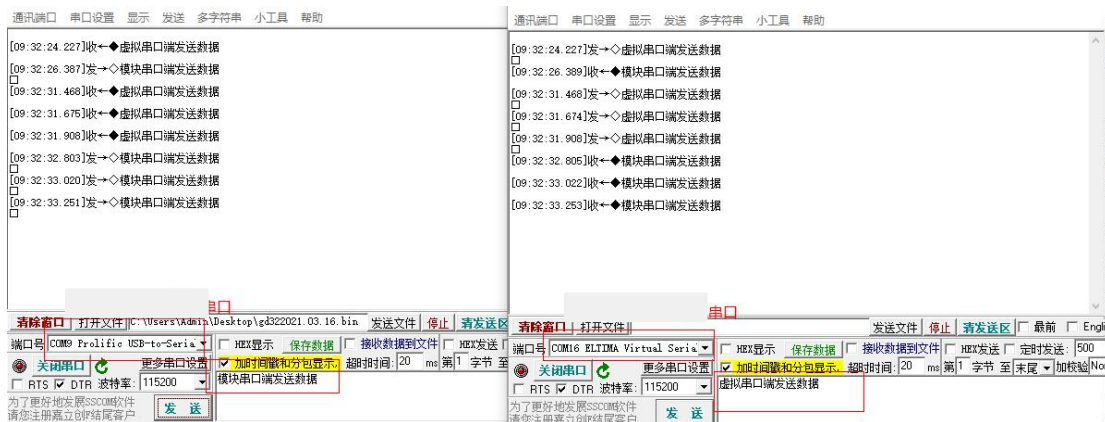
Explain the successful creation of the virtual serial port to complete the communication.

5.5 Upper computer computer software configuration and firmware upgrade

Note: Before the firmware upgrade, the module acquisition IP method should be set to static acquisition method, and the module shuts down the IP list filtering.

5.6 Local firmware upgrade:

Open the configuration software on the PC ，The interface as shown in the figure appears.
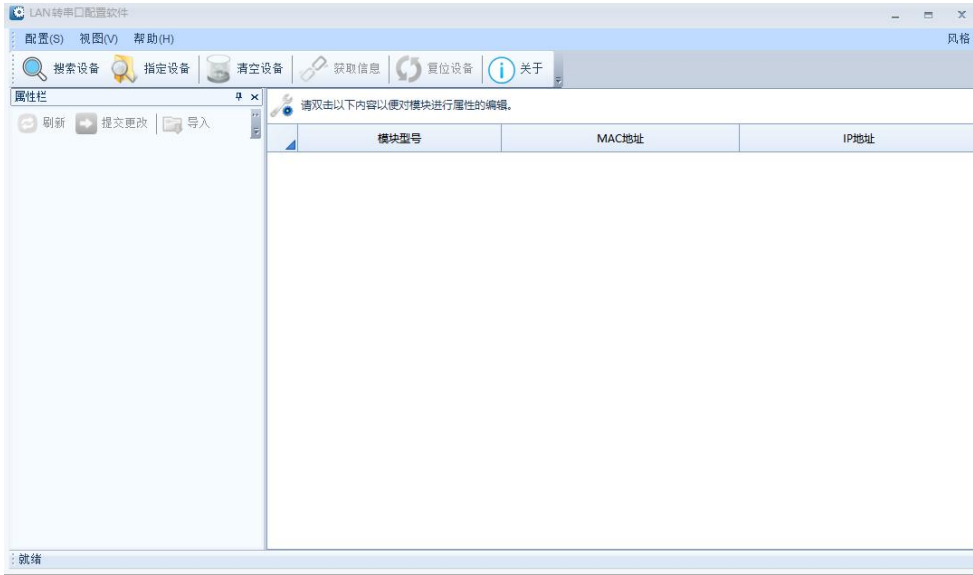
Click in the toolbar Button, Configuration software starts to search for modules connected to the PC, as shown in the figure. After the search is completed, the search device will appear in the software list of the software, as shown in the figure. Double -click the device items in the device list; or select the device item, click the button in the toolbar Or in the property bar You can get device information. Double click the list to view the module information:

At this time, the product and information will be displayed on the left side. When the product configuration needs to be modified, you can enter the current password after modifying the product configuration and click the change to wait for the restart. The equipment configuration is updated.
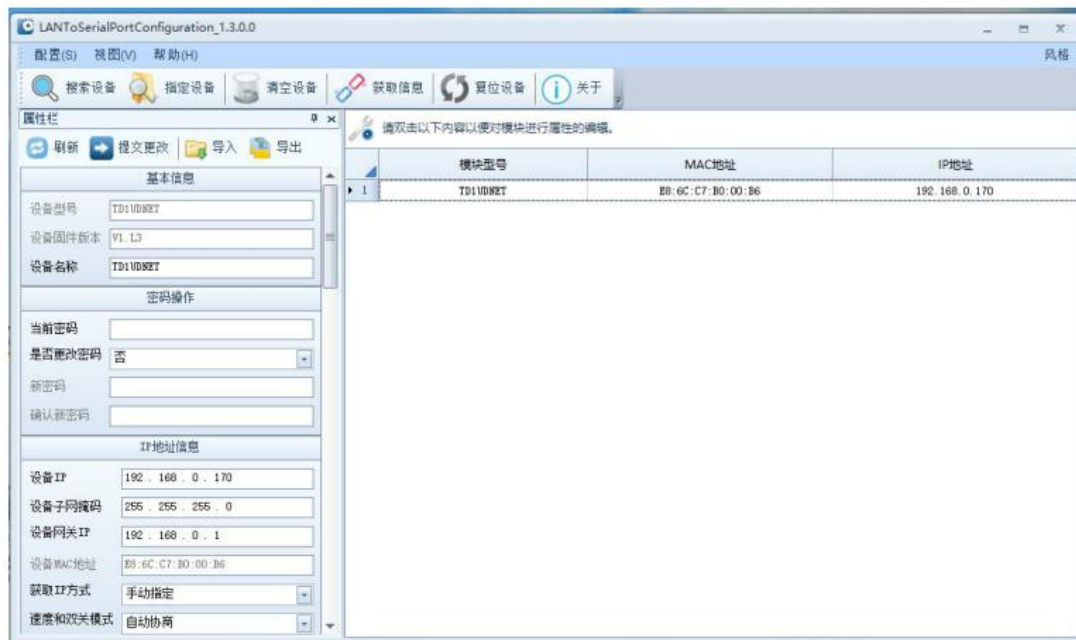
Back to the firmware upgrade, click the menu at this time, select "Upgrade firmware" in the drop -down menu, the upgrade firmware window as shown in the figure appears, then click "Browse", select the firmware to be upgraded, double -click to open, and start upgrading.
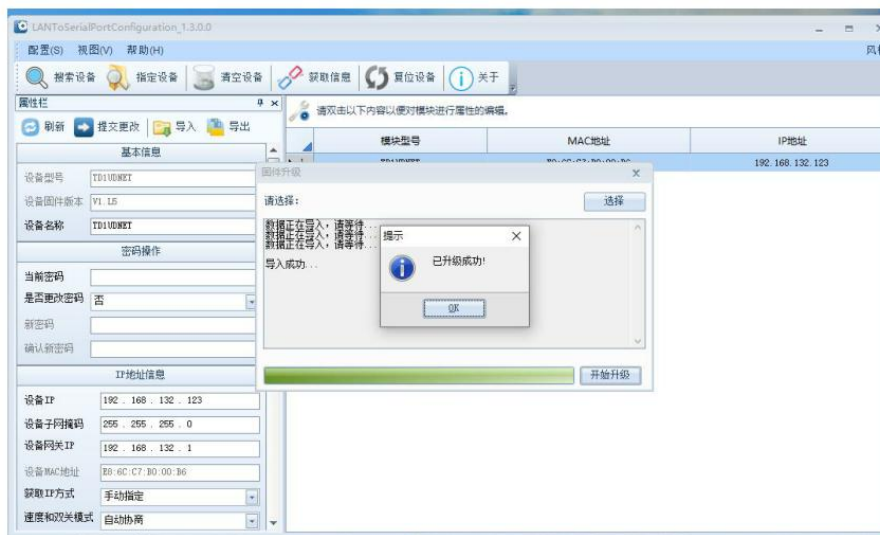
After sending the firmware, if it is successful, the update firmware will be successfully prompted. At this time, the product software has been upgraded.

6. Detailed list of the AT commands

The AT command is a standard command format, starting with "AT", ending with "\ r \ n", the entire command part is not distinguished from a lower case. Here, some use instructions are made based on the module's AT instruction list.

6.1 AT command detailed list

Features	Order	Attributes	The maximum ginseng (byte)	Parameter Description	Defaults	TD1UD NET	TD1UDNET -RJ45
Equipment type	TYPE	RO	12		"TD1UDNET(-RJ45)"	◆	◆
Device name	NAME	RW	15	Any character (up to 15 bytes, take one Chinese characters as two bytes)	"TD1UDNET(-RJ45)"	◆	◆
Firmware version	GMR	RO	-	GMR-firmware version	"V1.01"	◆	◆
Device password	PASS	RW	15	Any string (up to 15 long Bytes), non -Chinese, use A ~ Z, A ~ Z, 0 ~ 9, the longest: 15 bytes	"88888"	◆	◆
Device IP	IP	RW	15	IP address	"192.168.0.170"	◆	◆
Device mask	MARK	RW	15	Sub -web mask	"255.255.255.0"	◆	◆
Device gateway	GATEWAY	RW	15	Gateway address	"192.168.0.1"	◆	◆
Device DNS	DNS	RW	15	DNS address	"192.168.0.1"	◆	◆
Mac	MAC	RO	-	Device MAC address, cannot be modified	"E8-67-C7-Bx-xx-xx"	◆	◆
IP acquisition method	IP_MODE	RW	1	0-Dynamic acquisition (DHCP); 1-Static acquisition	"1"	◆	◆
Web port	WEB_PORT	RW	5	Web configuration port number	"80"	◆	◆
Command port	CMD_PORT	RW	5	Network configuration port number	"3003"	◆	◆

IP filtering enable	IPF_EN	RW	1	0-Disable IP filtering function; 1-Enable IP filtering function	0	◆	◆
IP filter white list 1-8	IPF1-IPF8	RW	33	IP -MASK (such as: 192.168.0.17. - 255.255.255.255), filter For details, please refer to 6.2.13	0.0.0.0-255.255.255.0	◆	◆
Connect to send information	CNCT_SEND	RW	15	Any string (up to 15 long byte)	"Connected"	◆	◆
Broadcast IP	MULT_IP	RW	15	Circuit IP address	"224.0.0.3"	◆	◆
Broadcast port	MULT_PORT	RW	5	Broadcast port	"10000"	◆	◆
Broadcasting enable	MULTCAST_EN	RW	1	0-Disable; 1- Enable	"0"	◆	◆
Operating mode	C1_OP	RW	1	0-tcp_server, 1-TCP_Client, 2-real_com, 3-udp 4-Disable this serial port	"0"	◆	◆
Working port	C1_PORT	RW	5	1~65534	"4001"	◆	◆
Serial port baud rate	C1_BAUD	RW	7	1200~921600	"115200"	◆	◆
Serial data bit	C1_DATAB	RW	1	8、9	"8"	◆	◆
Serial stop bit	C1_STOPB	RW	1	1~2	"1"	◆	◆
Serial verify bit	C1_PARITY	RW	1	0-No verification, 1-Strange Study, 2-Puppetition, 3-Forced to 1, 4-Forced to 0	"0"	◆	◆
Serial subcontracting length	C1_SER_LEN	RW	4	0- Turn off this function; 1 ~ 1460 (unit byte)	"500"	◆	◆
Serial port segmentation interval	C1_SER_T	RW	2	0- Turn off this function; 1 ~ 50 (unit MS)	"5"	◆	◆
TCP timeout disconnection	C1_IT	RW	5	0- Turn off this function; 1 ~ 65535 (unit 10ms)	"0"	◆	◆

TCP heartbeat time	C1_TCPAT	RW	5	0- Turn off this function; 1 ~ 60000 (unit s)	"0"	◆	◆
TCP hardware disconnected	C1_TCP_CLS	RW	1	0-The hardware is disconnected and kept open, 1-hardware disconnect is disconnected	"0"	◆	◆
Number of connections	C1_LINK_NUM	RW	1	1~4	"1"	◆	◆
Types of TCP connection information	C1_LINK_S	RW	1	0- not sending information, 1-Send the device name, 2-Send device IP; 3-Send string	"0"	◆	◆
Target 1 address	C1_CLI_IP1	RW	19	Target IP or domain name (maximum 63 bytes)	"192.168.0.1"	◆	◆
Port 1	C1_CLI_PP1	RW	5	1~65534	"6001"	◆	◆
Target 2 address	C1_CLI_IP2	RW	19	Target IP or domain name (maximum 63 bytes)	"192.168.0.1"	◆	◆
Port 2	C1_CLI_PP2	RW	5	1~65534	"6002"	◆	◆
Target 3 address	C1_CLI_IP3	RW	19	Target IP or domain name (maximum 63 bytes)	"192.168.0.1"	◆	◆
Port 3	C1_CLI_PP3	RW	5	1~65534	"6003"	◆	◆
Target 4 address	C1_CLI_IP4	RW	19	Target IP or domain name (maximum 63 bytes)	"192.168.0.1"	◆	◆
Port 4	C1_CLI_PP4	RW	5	1~65534	"6004"	◆	◆
TCP connection password	C1_LINK_P	RW	1	0-TCP connection does not need a password, 1-TCP connection requires password	"0"	◆	◆
Send the number of bytes in the serial port	C1_SEND_NUM	RO	5	Send bytes (maximum record 4294967296 bytes after clearing zero)	"0"	◆	◆
Number of bytes receiving by the serial port	C1_RCV_NUM	RO	19	Receive bytes (maximum record 4294967296 bytes after clearing zero)	"0"	◆	◆
Command list	LIST	RO	-	-	-	◆	◆
Login device	LOGIN	RO	-	Device password	-	◆	◆
reset	DEFAULT	WO	*	Any character	-	◆	◆

Reset	RESET	WO	*	Any character	-	◆	◆
Enter BOOT upgrade	BOOTLOADER	RO	*	Any character	-	◆	◆
Number of bytes of network sending	NETSEND	RO	-		"0"	◆	◆
Network sending successful byte number	NETSENDOK	RO	-		"0"	◆	◆
Network receiving byte number	NETRCV	RO	-		"0"	◆	◆
The number of bytes successfully received by the network	NETRCVOK	RO	-		"0"	◆	◆
Running time	RUNTIME	RO	-		"0"	◆	◆
IO mode storaged value	IOSTASETTOE	RW	4	0000 ~ ffff (hex), see Table 0.4 for detail	"0000"	◆	◆
IO level storaged value	IOOUTTOE	RW	2	00 ~ ff (hex), see Table 0.3 Sixteen inlet Value for details, scope: 0x00 ~ 0x3f	"00"	◆	◆
IO mode current value	IOSTASET	RW	4	0000~FFFF(hex)	-	◆	◆
IO level current value	IORDORWR	RW	2	00~FF(hex)	-	◆	◆

Function	Order	Attribute	Maximum (Bytes)	Parameter declaration	Windows default
The ADC 0 signal value	IOADC0	RO	-	--Outputs the value of ADC 0, - -hexadecimal value, range from 0000 to 3300	"0000"
The ADC 1 signal value	IOADC1	RO	-	- -The output is the value of ADC 1, - -the hexadecimal value, range 0000~3300	"0000"
Exit the AT command	EXIT	WO		Any character	-

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
-	-	IO6	IO5	IO4	IO3	IO2	IO1

IO Pin	Bit	00	01	10	11
IO1	[1:0]	Disable	In	Out	-
IO2	[3:2]	Disable	In	Out	-
IO3	[5:4]	Disable	In	Out	-
IO4	[7:6]	Disable	In	Out	-
IO5	[9:8]	Disable	In	Out	-
IO6	[11:10]	Disable	In	Out	485 EN Pin
ADC0	[13:12]	Disable	-	-	ADC0
ADC1	[15:14]	Disable	-	-	ADC1

Tip: "*" indicates any length; "-" means no item and ◆ with this function.

6.2 TA command function detailed instructions

6.2.1 device type

Read-only, type of device "TD1UDNET (-RJ 45)".

6.2.2 device name

Read and write type, the current device name, can be customized to identify the target device when there are more devices.

6.2.3 Firmware version

Read-only, record the current software firmware version information.

6.2.4 Device password

Read and write type, used for the host machine configuration, AT command login, WEB administrator login and other operations required.

6.2.5 equipment IP

Read-write type, the current IP address of the device.

* * Note: If the device IP address is set to class D and E (the first field of IP address is greater than 223), the upper computer will not be able to search for the device.

6.2.6 Equipment mask

Read-write type, the current gateway address of the device.

6.2.7 equipment DNS

Read-write type, DNS server address.

6.2.8 equipment MAC

Read-only type, the physical address of the device network card.

6.2.9 IP Access to the way

Read and write type, used to select the device IP acquisition mode, can be configured for dynamic acquisition (DHCP) or static designation.

* * Note: The dynamically acquisition feature is used only after the DHCP server exists on the network. If the function is enabled without the DHCP server on the network and the IP is not obtained, the IP parameter will be automatically set to the default IP.

6.2.10 WEB port

Read-write type, WEB configuration page access port number.

6.2.11 Command port

Read-write type for the network AT command to configure the port number required for the connection.

6.2.12 IP Filter enabling

  Read-write type, used to turn the IP filter function on or off.

6.2.13 IP Filter the whitelist from 1 to 8

Read and write type, when the IP filter function is on, used to set the IP (IP whitelist);

Filtering rule: receiving the reported IP & set mask = set IP, this message is allowed to pass. If IP filtering is: 192.168.0.0 255.255.255.0, then the device with IP 192.168.0.xxx can communicate with the device.

6.2.14 Hoast IP

Read and write type. When the multicast condition is established, for the target address IP of the multicast delivery, see 6.2.16.

When Working Mode is in UDP mode, if the multicast enable is 1 and the multicast address meets the multicast address range, it takes effect together with the multicast port, and the target IP and port fail.

6.2.15 The multicast port

Read and write type. When the multicast condition is established, for the target address port number sent by the multicast, see 6.2.16.

6.2.16 Conducting can

Read-write type is effective when "Working mode" is in UDP mode. If "multicast enable" is 1 and the multicast IP meets the multicast address range, then the multicast condition is valid, and the target IP and port are invalid. Otherwise, use the target IP and port to send unicast data, and the multicast condition is invalid.

6.2.17 work pattern

Read-write type, used to select the current module network working mode, including TCP-server, TCP-client, virtual serial port (real_com), UDP, etc.

6.2.18 Work port

Read-write type, the port number currently used by the module.

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www.mornsun.cn   www.mornsun-power.com

6.2.19 Serial port port rate

Read and write type, serial port port rate effective range of 1200~921600.

6.2.20 String data bits

Read and write type, serial port data bits, support 8 bit and 9 bit data bits.

6.2.21 Serial stop bit

Read and write type, serial stop bit, support 1 or 2 bits (1.5 bits).

6.2.22 Serial check bit

Read and write type, used for serial port data check, support no check, odd check, even check.

6.2.23 Length of serial port subcontracting

Read and write type is used in combination with "serial subcontracting interval". This function is enabled when "serial subcontracting length" and "serial subcontracting interval" are not 0 and is closed when both are 0. Other combinations should not be set, which may cause unpredictable effects.

Subcontracting rules: When the serial port data is continuous, the length of the serial port receiving data reaches the set value in the "serial port subcontract length", and the data will be packaged into one package. If the discontinuous gap time is greater than the set value in "Serial Subcontract Interval", the gap is the dividing point, with all the previous data as a packet, and the data behind the gap will continue to be received as the next packet.

6.2.24 Serial port subcontracting interval

Read and write type, with the "serial port subcontract length".

6.2.25 TCP disconnect timeout

Read and write type, used for serial port or network port without data transmission for a long time, the TCP connection (including TCP _ Server and TCP _ Client) is automatically disconnected. When the parameter value is set to 0, this function is turned off.

6.2.26 The TCP heartbeat time

Read / write type for TCP-Server to automatically detect client connection. When this parameter is set to 0, this function is turned off, and when not 0, the module will send the heartbeat detection packet according to this event interval.

6.2.27 TCP hardware disconnected

Read-write type, used to select whether to immediately disconnect TCP connection or constantly open TCP connection for a short time when the network line fails.

6.2.28 Number of connections

Read-write type, used to set the current maximum number of network connections.

6.2.29 The TCP connection password is enabled

Read / write, which is only valid in TCP-Server mode. When this feature is enabled, the first packet of data for the client connection must be the settings in Device Password, otherwise it will be disconnected.

6.2.30 The TCP connection information type

Read-write type is used to set whether the module automatically sends, and the prompt information type sent when TCP connects for the first time. The prompt information type includes device name, device IP address and string information set in "Connect Send Information". The device name and the "connection sending message" are sent in a string form, and the device IP will be sent in a decimal form.

6.2.31 Target 1 address

Read-write type to set TCP-Client and UDP target addresses. If the target IP is written to a domain name, the module needs to connect to the DNS server to resolve the domain name to the corresponding IP. After the resolution, the target IP can check the target IP parameter to see the resolved IP.

6.2.32 Target 1 port

Read-write type to set the TCP-Client and UDP target ports.

6.2.33 Target 2 address

Read-write type to set TCP-Client and UDP target addresses. If the target IP is written to a domain name, the module needs to connect to the DNS server to resolve the domain name to the corresponding IP. After the resolution, the target IP can check the target IP parameter to see the resolved IP.

6.2.34 Target 2 port

Read-write type to set the TCP-Client and UDP target ports.

6.2.35 Target 3 address

Read-write type to set TCP-Client and UDP target addresses. If the target IP is written to a domain name, the module needs to connect to the DNS server to resolve the domain name to the corresponding IP. After the resolution, the target IP can check the target IP parameter to see the resolved IP.

6.2.36 Target 3 port

Read-write type to set the TCP-Client and UDP target ports.

6.2.37 Target 4 address

Read-write type to set TCP-Client and UDP target addresses. If the target IP is written to a domain name, the module needs to connect to the DNS server to resolve the domain name to the corresponding IP. After the resolution, the target IP can check the target IP parameter to see the resolved IP.

6.2.38 Target 4 ports

Read-write type, used to set TCP-Client and UDP target ports.

6.2.39 The number of bytes sent by the serial port

Only read the number of bytes sent in the serial port.

6.2.40 Number of bytes receiving by the serial port

Only read the number of bytes received in the serial port.

6.2.41 Connection Status

Reading and writing, for viewing the TCP connection situation and information corresponding to the current serial port. Through the "CLOSE+<NUM>" command, a certain connection can be disconnected. For example, "1" TCP connection.

6.2.42 Login device

Type only to log in to the AT command.

6.2.43 reset

Only write types to restore the factory settings. When executed, it is necessary to write any data.

6.2.44 Reset

Only write types for resetting the entire module.

6.2.45 Enter BOOT upgrade

Only write types for upgrading the module. Please confirm that you are ready to upgrade before executing.

6.2.46 Number of bytes of network sending

Read only, used to count the number of bytes sent by the network.

6.2.47 Network sending successful byte number

Read only, used to count the number of bytes successfully sent by the statistical network.

6.2.48 Network receiving byte number

Only read types for statistical network receiving byte number.

6.2.49 The number of bytes successfully received by the network

Read only, for statistical network successful receiving bytes.

6.2.50 performance period

Read only, for reading module power on time, unit S.

6.2.51 IO Mode storage value

The read -write type is used to store the initial IO mode. The execution of the command does not modify the current IO working mode. It only takes effect after the next power on is served.

6.2.52 IO Level storage value

The read -write type is used to store the initial IO level status. The execution of the command will not modify the current IO working level, and it will take effect only after the next power on is served.

6.2.53 IO Mode current value

Reading and writing only changes the current IO working mode, and it takes effect immediately after modification.

6.2.54 IO Level current value

Reading and writing type only changes the current IO level status, and it takes effect immediately after modification.

6.2.55 ADC0 signal value

Only read the type, only after the corresponding IO is set to ADC mode, otherwise the data read is meaningless. The read value range is 0000-3300, and the corresponding input voltage is 0V ~ 3.3V, and decimal.

6.2.56 ADC1 signal value

Read only, as "ADC0 signal value".

6.2.57 Exit the AT command

Only write the type, exit the AT command login status. If it is the network AT command, the connection of the configuration will be disconnected at the same time.

7 Use considerations and application examples

7.1 IP level current value.

In the virtual serial port mode, the maximum data of a frame is 255 bytes.

7.2 Data sending and loss

The module is in the TCP server mode. If the serial port or the network has a large data amount of data needs to be sent, the Potter rate of the module can be set larger.

7.3 DNS

When the DNS domain name is parsing, the DHCP is turned on, and the IP acquisition method is changed to a dynamic acquisition IP, so that the DNS server automatically is the address of the router to successfully analyze the domain name. The module connects the router that can access the Internet. After turning on the DHCP, the DNS default server that starts to set up is covered by the DNS server assigned by DHCP. Try to automatically obtain the DNS server address through DHCP, do not set manually. If you need to manually set the DNS server, set the correct DNS server address, otherwise the correct IP cannot be parsed. If the module needs to set the target IP domain name, the DHCP is required to dynamically obtain the IP, and the router that can be connected to the Internet. At this time, when the domain name is set through the AT instruction, the module will resolve the domain name and fill in the target IP-C1_CLI_IP.

If the analysis domain name fails (maybe due to other reasons such as the router cannot access the Internet), this AT input target IP domain name cannot be parsed, and the module will check whether the domain name completes the analysis every time when power on. If the analysis is not completed, the domain name will be resolved.

If the destination address is the domain name, the module needs to be connected to the router that can access the Internet to resolve the domain name, and then the data can be sent to the corresponding domain name address.

7.4 TCP disconnect timeout

After setting the TCP time interrupt function, in the TCP Server mode, if there is no data in the serial port or mesh timeout, it will automatically disconnect the corresponding client connection. If the data needs to be sent, the server will not take the initiative to connect to the client.

In the TCP Client mode, if there is no data in the serial port or mesh timeout, it will automatically disconnect the corresponding client connection. After disconnecting with the server for a period, the client will automatically re -initiate a connection request to the server. Check the timeout from then on.

7.5 Multicast communication

When broadcasting, you need to set it to UDP mode and turn on the group broadcast enable.

7.6 IO port settings (TD1UDNET only)

Here, the COM_CFG Pin is pulled down by the serial port instruction, and then the "AT+Login = 88888" login device is sent.

The current value of the IO mode and the current value of the IO level will take effect immediately after modification.

The IO mode storage value and IO mode storage value will take effect only after the power/reset will be on the next time, and the current value of the IO mode will be synchronized with the IO mode storage value.

In the Disable mode, the IO is weak internally. At this time, modifying or reading the IO level value is invalid.

IO is set to the output mode, and the internal weakness is pulled; in the input mode of IO, the input mode is weak.

Set all the IO port mode to the output mode: Modify the current mode value "AT+iOSTASET = 0AAA" (the corresponding IO is written "AT+IOnRWR?" Essence Then set all the IO port output high level: modify the current level of "at+ordorwr = 3F". After setting, all IO port outputs high levels. According to Table 0.3 and Table 0.4, the corresponding IO port mode and level value can be set.

For example: write "AT+iOSTASET = 005A", at this time IO1 and IO2 are output mode, IO3 and IO4 are input mode, IO5 and IO6 are Disable mode. Then read the "AT+IORDORWR?" The returned data is "33", and the binary is 0011 0011, so that we only look at the level of IO3 and IO4 of the input mode is low. At this time, Io3 is connected to IO3 3.3V, and reads "AT+IORDORWR?" The data returned is "37", which is replaced with 0011 0111. In this way, we see that the level of the IO3 of the input mode is high level. The value of other non -input mode IO ports is invalid and can be ignored.

In the same way, in the non -input mode, modifying the corresponding IO level value is also invalid. For example: write "AT+iOSTASET = 005A", at this time IO1 and IO2 are output mode, IO3 and IO4 are input mode, IO5 and IO6 are Disable mode. Then write "AT+IORDORWR = 3F", set iO3 and IO4 to high levels. At this time, Io3 and IO4 are measured with a multimeter. The level is low level. At this time, it does not take effect.

You can set the IO port to the input mode. In the input mode, read the level of the IO oral electricity. Set all IO ports to the input mode to send "AT+iOSTASET = 0555" (in the input mode, write "AT+IORDORWR = 3F" any setting of IO oral electricity is invalid), and then send "AT+IORDORWRWR ? "Read all the hexadecimal values returned by all IO ports. According to Table 0.3, you can see the current value of the corresponding IO port.

Set the IO port storage mode and the storage level value. After modification, you need to wait for the next power on to get effective before taking effect. Set the storage mode of all IO ports to the output mode to send "AT+iOSTASETTOE = 0AAA", and then set all IO's storage electricity value to high level "AT+IOOUTTOE = 3F".

7.7 ADC value read (TD1UDNET only)

The ADC switch enables to send "AT+IOOUTTOE = FXXX" (x is any value). Then module ADC0 and ADC1 Pins are connected to the sampling circuit Pins. After re-power on, send "AT+IOADC0?" You can view the value of the sampled ADC0 channel.

7.8 other

> Do not support hot plug;

> Leave the Pins in the air if not in use;

> The product is an ESD sensitive device. If necessary, please take anti -static measures. You can refer to the "TD1UDNET Datasheet";

> The product power supply voltage should not exceed the allowable range in the corresponding mode of connection. The unused power Pins cannot be suspended to avoid damaging the product. The IO input of the module is 3.3V TTL level, please use the matching level controller.

> If you need to learn more about the electrical parameters of the TD1UDNET (-rj45) product, please refer to the "TD1UDNET Datasheet" and "TD1UDNET-RJ45 Datasheet ".

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8 Disclaimer

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