

ZLAN8100

GPRS DTU Data Transmission Device

User Manual

RS232/485 To GPRS Solution

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1. Summary

ZLAN8100 is a new type GPRS remote wireless data transmission device launched by Shanghai ZLAN, it uses embedded design, with embedded TCP/IP protocol stack, meanwhile use powerful microprocessor chip, combined with built-in watchdog, it has stable and reliable performance.

The product use 2 band GSM/GPRS module, the working frequency band is EGSM 900MHZ and DCS 1800MHZ. It provides standard RS232/485 data interface, can conveniently connect with devices such as RTU, PLC, IPC, only needs one-time to finish initialization configuration. The user device can establish connections with data center through GPRS wireless network, to realize data full-transparent transmission. The appearance of ZLAN8100 is shown as FIG. 1.



Figure 1 ZLAN8100 GPRS DTU

Can be applied to:

- Industrial remote control/sensing/measurement
- Meteorological Data Acquisition
- Three-Proofing & Hydrology Monitor
- Finance, GPRS, etc.

Typical application connections are shown in FIG. 2. Connect the 232/485 devices on site to ZLAN8100, then connect to the Internet via GPRS network so that the remote data center can be connected to ZLAN8100 GPRS DTU.

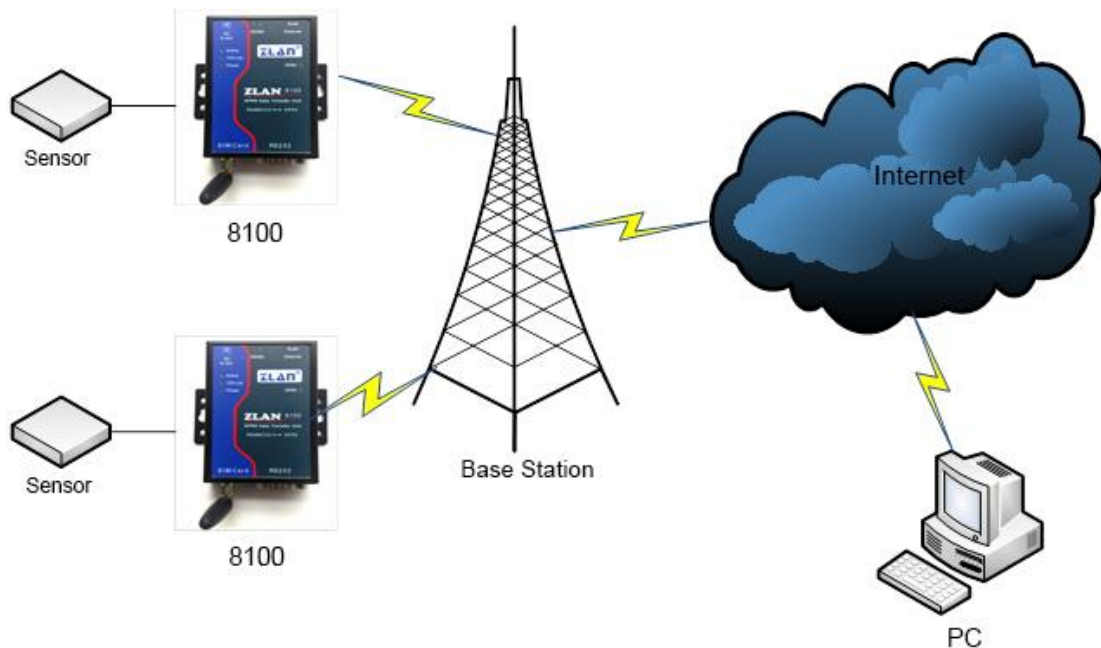


Figure 2 Connection Diagram

2. Feature

- 1) Support user data transparent transmission
- 2) Support connecting data center through fixed IP and dynamic domain name resolution methods
- 3) Support TCP/UDP/SMS three data link communication modes
- 4) Support two working mode: real-time online and data triggering online
- 5) Support TCP/UDP link online to send custom registration packet function
- 6) Support TCP/UDP link sending custom heartbeat packet function
- 7) Support TCP/UDP link offline sending custom deactivation packet function
- 8) Support query and configure device parameter via remote SMS command

- 9) Support up to 115200bps baud rate

3. Technical Parameter

| | |
|------------------------|--|
| Working Frequency Band | 900MHZ/1800MHZ , GPRS mulit-slot class 10/8,GPRS mobile station class B |
| Transmission Rate | Download highest: 85.6kbps |
| | Uplink highest: 42.8kbps |
| | Support PBCCH , Coding schemes CS 1,2,3,4,CSD to 14.4kbps,USSD,PPP-stack |
| SIM Card Voltage | 3V , 1.8V |
| Antenna Interface | 50Ω/SMA (Female) |
| Serial Port Type | RS-232/RS-485 |
| Baud Rate | 1200~115200bps |
| Input Voltage | DC9V~ 24V |
| Working Current | Instant Max 1400mA@9V |
| Operating Temperature | -40~85℃ |
| Running temperature: | -40~125℃ |
| Storage temp: | 0~95% Non - Condensing |
| Size: | 9.4cm×6.5cm×2.5cm |

4. Hardware Instruction

The front view of ZLAN8100 DTU is shown as FIG. 1.

Installation instructions:

- 1) Antenna installation, the device antenna interface adopts 50Ω/SMA (female), the external antenna must use the antenna suitable for GPRS work band, if use other antenna that not match, it may influence or even damage the DTU. It can be equipped with a short antenna or an extended antenna.
- 2) SIM card installation, this device use mobile GPRS network, need to purchase a SIM card from the mobile operator, when installing the SIM card there should ensure that device is not power on, this device use the drawer-type SIM cassette,

when open, need to push the yellow button inward, and then pull out card sets, after installed the SIM card, push the card sets in.

Penal light:

- 1) ACT: blue, the ACT light on indicates that data is being transmitted between GPRS network and serial port, when there is no data communication, the ACT light is not bright.
- 2) LINK: 64ms on/ 3000ms off, indicating that GPRS is normally registered, and other scintillation frequency indicates GPRS registration abnormality.
- 3) POWER: red indicates that ZLAN8100 has already been power on.
- 4) GPRS light: GPRS operating status indicator.



Figure 3 Interface

ZLAN8100 side-interface

The interface is shown as FIG. 3.

- 1) Power input, terminal-type, DC9~24V.
- 2) RS485 signal input.
- 3) RJ45 interface (for later expanding)

5. Work Station

- 1) The work mode of ZLAN8100 is mainly divided into normal working mode and user configuration mode. Before normal use of this DTU, users should configure

ZLAN8100 according to their own needs, and then the DTU can enter the normal mode of work.

2) Normal Working Mode

After the initialization phase, DTU will enter the work mode of data transmission. In this mode, the device's serial port will transparently receive and send the user's data. Please refer to user interface configuration for user data control parameters.

3) User Configuration Mode

When the system starts initialization, you can enter the configuration mode after receiving the specified command, and DTU can enter the user configuration mode. At this time, the serial port of the device has been transferred to the configuration status, can use ZLAN "ZLAN8100 Configuration Assistant" tool to configure. After the configuration is completed, with power on the device can be in use. For customers who need to develop their own configuration code, please refer to <ZLAN8100 Configuration Instructions>.

6. Optional Work Station Instruction

The GPRS DTU device of ZLAN technology supports the following two working modes, and users can set reasonable working mode in combination with actual communication requirements. In general, the system needs real-time query and timely reporting using real-time online working mode to ensure the validity of data. In the case that only there is data so need to report, it can use work mode of data to trigger the online.

6.1 Normal Working Mode

1) Real-time Online

DTU device maintain effective data link connection with data center, it can do real-time data communication between the two, the actual application can adopts connection-oriented TCP method, and combined with a heartbeat packets to maintain connection, also can use the non-connection-oriented UDP method provided by this device, plus the heartbeat packets to maintain connections, as a result of the UDP packet routing address jump degeneration is big, user can narrow the heartbeat interval, to keep the data center can prompt reply.

2) Data to Trigger Online

DTU device will automatically connect to the data center after the device is switched on, and then the DTU will automatically get offline if there is no data from the serial port or data center in a certain time. Until there is data from the serial port, it will be triggered online, and the data will be reported. After that, if the data is not available for a period of time, it will be automatically removed.

6.2 User Configuration Mode

In this mode, the basic working parameters of the device can be obtained, and the user can modify the work parameters according to the locale. The specific steps are as follows

1) Enter Configuration Mode

- i. Open the software first, as shown in FIG. 4 configuration tool.

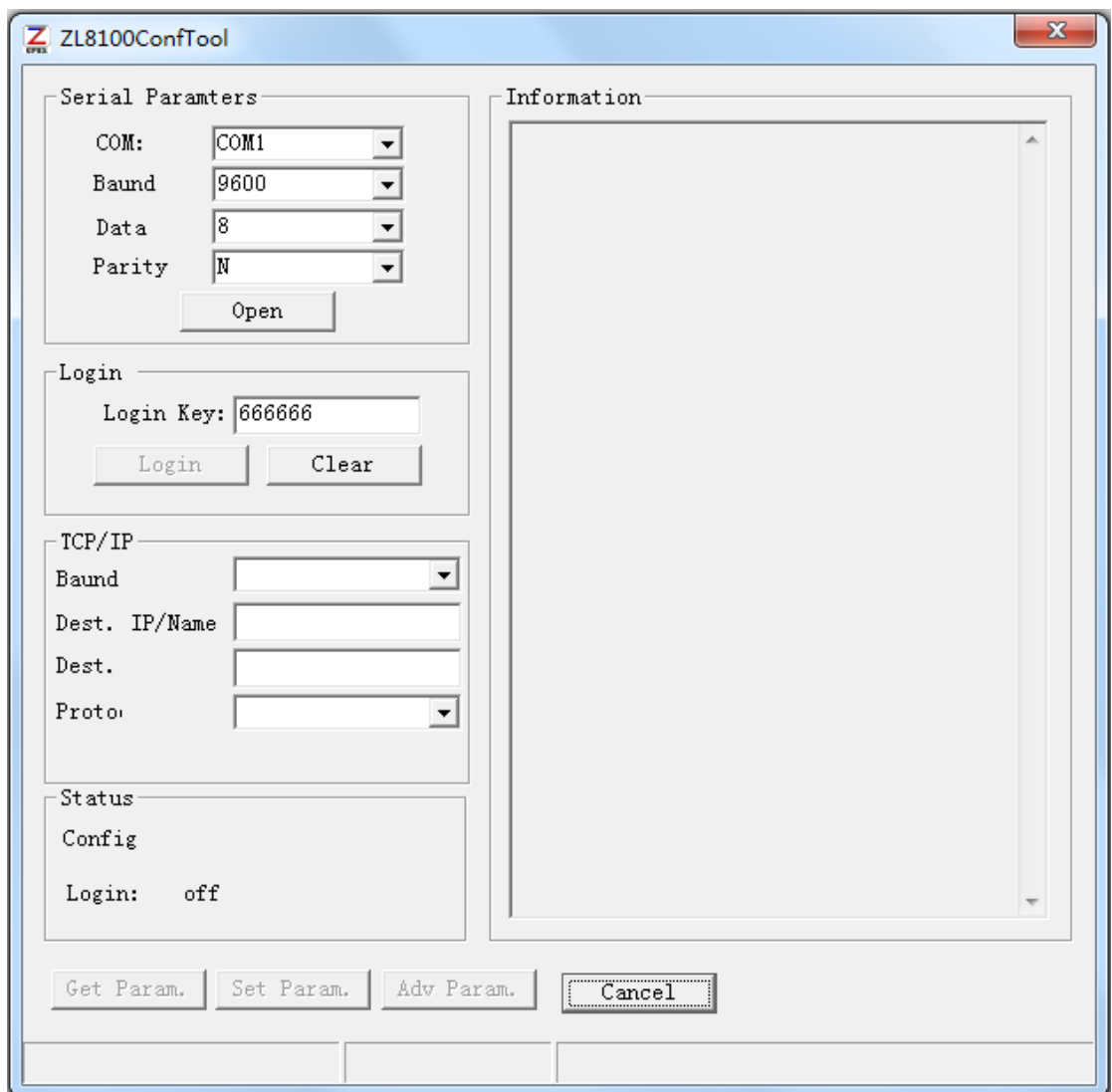


Figure 4 Configuration Tool

- ii. Select the serial number and other parameters unchanged.
- iii. Charge the device and wait for the Active light on.
- iv. When the Active light is on, please open the serial port in 2 seconds (click the "open" button of the software)
- v. Wait a while, the basic information of the device will be checked out.
- vi. This process lasts for up to 30 seconds, and the timeout cannot enter configuration mode.

The basic information of the device is shown in FIG. 5, and the more commonly used is the TCP/IP parameter, which is listed here in the main interface. The information box section is the data returned by the AT command.

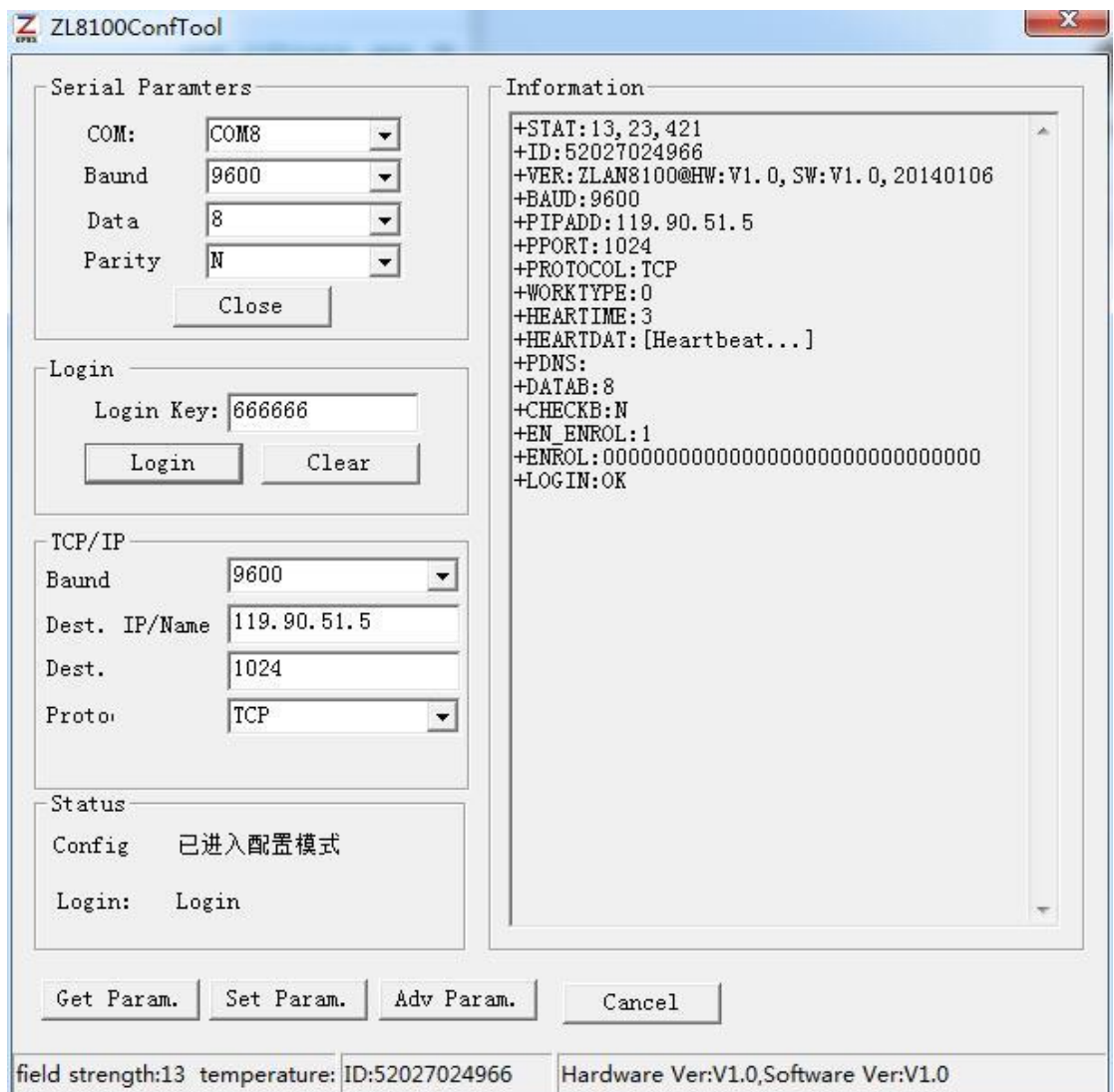


Figure 5 Device Information

2) Obtain Device Parameters

When the device enters the configuration mode, we can get his work parameters and click the "get parameter" button. The software will automatically perform this

function after the search is completed, so no extra access is needed.

3) Landing Device

If you want to set the parameters, you must log in, and the default password is 666666. If you just get the parameters, you don't need to log in. Click the LOGIN button to LOGIN the device, and in the information box section, you will see "+ LOGIN: OK", means the LOGIN is successful, the LOGIN status will change, otherwise LOGIN failed, please confirm whether the password is correct or not.

4) Setting Parameters

Modify the parameters you need to change (if the parameters need to be valid) and click "Set Param.". After setting the parameters, there is no obvious prompt information. If the information of the parameter box is consistent with the set information, the modification is successful, and the information box will also have relevant information.

5) Advanced Parameters

Advanced parameters are generally configured by default. Specific instructions refer to parameters explanation.

Advanced Parameters

Work Parameters

Work Mode: 实时在线

DNS Server IP:

Heart Beat Interval: 60s

Heart Beat Content: [Heartbeat...]

Serial Data Bits: 8

Serial Parity: N

Login Key:

Regist Packet: 0

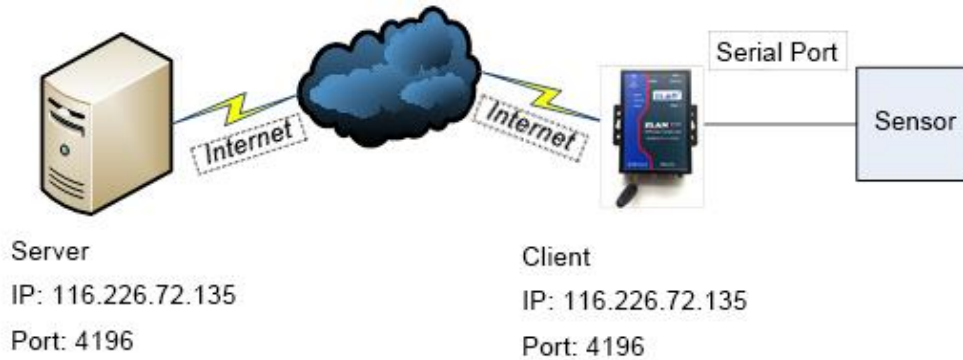
Regist Packet Content: 000000000000000000

Set

Cancel

Figure 6 Advanced Parameters

7. Usage

**Figure 7 Network Structure**

The basic usage method is given here, mainly the parameter configuration of 8100DTU. First is the Server settings, it needs to have a public network IP address. The software on the server opens 4196 (any) listening port and waits for the client's connection request. If the server is an Intranet connected to a router, a port mapping is required to establish a connection. Here we assume that the user server has a public network IP address.

Next is the 8100 DTU Settings, as shown in FIG. 8 sets the destination address, using the configuration tool to fill the "Dest. IP/Name" with Server IP, and fill the "Dest." with port, put the device on power after parameters setting. It is important to note that these parameters need to set up in advance because the 8100 currently supports only the serial port configuration.

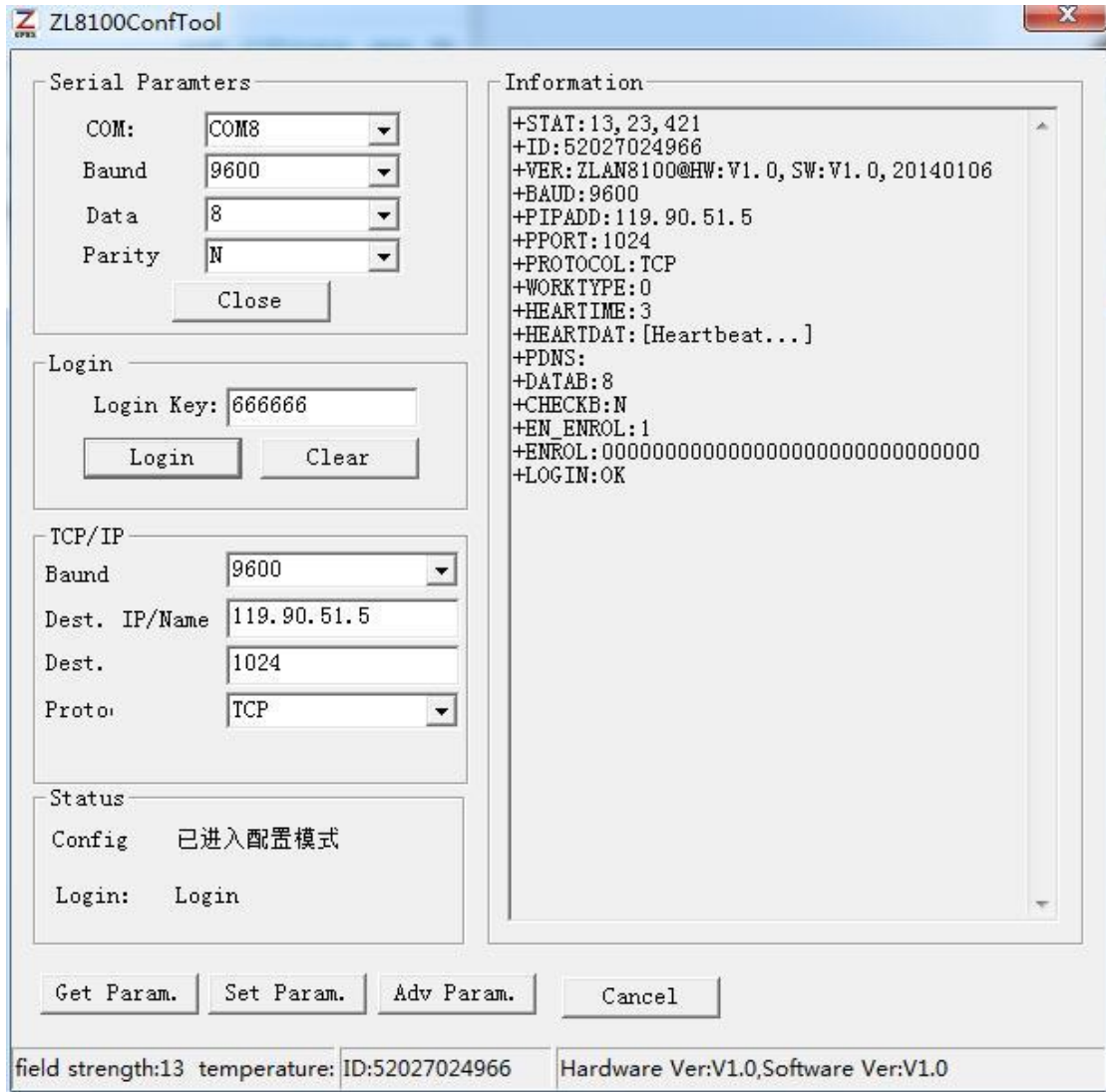


Figure 8 Setting Destination Address

Wait a moment, 8100 will connect to the server.

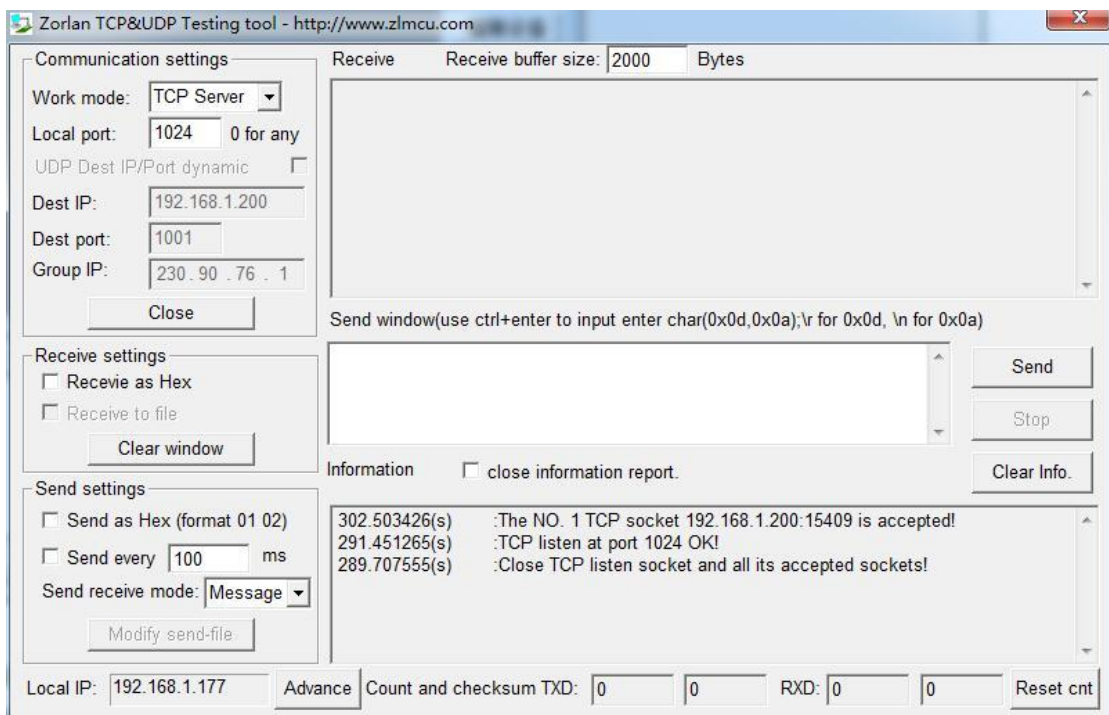


Figure 9 Server Accepting Connection

As shown in FIG. 9 the Server accepting the connection, you can see there has the Client connecting in on the report box. After that, the server software and the ZLAN8100 serial port can do data communication.

8. Parameter Instruction

8.1 General Parameters

1) Serial Port Parameters of Configuration Mode

9600, 8, N, 1. Considering that the user will modify the baud rate parameter, we will configure the parameter of baud rate fix bit, when entering the normal working mode, the serial port will be set according to the saved parameters.

2) Login Password

The password is used in when login in the device to modify parameters.

3) Baud Rate

Baud rate for device normal communication.

4) Destination IP or Domain Name

The IP address of the server

5) Destination Port

Server software port

6) Protocols

Network communication transport protocol, TCP/UDP.

8.2 Advanced Parameters

7) Work Parameters

The data triggers the online mode, and the connection is established when there is data, when there is no data for a certain time it will automatically get offline.

Real-time online mode, long connect, will not automatically disconnect.

8) DNS.

Domain name resolution Server address, by default.

9) Heartbeat Interval

The interval time of the heartbeat packet is divided into 30S, 45S, and 60S.

10) Heartbeat Content

Heartbeat packet content, every heartbeat interval time, send this data to the Server.

11) Data Bit and Stop Bit

The data bit and stop bit in the normal communication of serial port.

8.3 Equipment AT instruction

1) Enter Configuration Mode

Command: REQUEST CFG MODE

Function: enter Configuration Mode, send this instruction during device startup, and enter configuration mode after the device is started.

Return: CFG MODE\r.

2) Login

Command: ZL + LOGIN = 666666\r\n

Function: log in, modify the device parameters to be successful when must be logged in.

Return: + LOGIN: OK\r\n (success) or + LOGIN: NG\r\n (failure)

3) Acquisition Device Status

Command: ZL + STAT?The\r\n

Function: check the signal strength, temperature and voltage of the device

Return: + STAT: strength, temperature, voltage\r\n

4) Get Serial Parameters

Command: ZL+BAUD?\r\n

Function: get the baud rate

Return: +BAUD:n\r\n, n means specific BAUD rate

Command: ZL+CHECKB?\r\n

Function: gets the parity bit

Returns: +CHECKB:N/O/E\r\n

N: None Parity

O: Odd Parity

E: Even parity

Command: ZL+DATAB?\r\n

Function: gets the data bit

Returns: +DATAB:5/6/7/8\r\n

5) Set Serial Parameters

Command: ZL+BAUD=n\r\n

Function: set baud rate, n represents the value to be set

Returns: +BAUD:n\r\n

Command: ZL+CHECKB= N/O/E\r\n

Function: set parity bit

Returns: +CHECKB:N/O/E\r\n

N: None Parity

O: Odd Parity

E: Even parity

Command: ZL+DATAB=5/6/7/8\r\n

Function: sets the data bit

Returns: +DATAB:5/6/7/8\r\n

6) Get Network Parameters

Command: ZL+PIPADD?\r\n

Role: gets the destination IP or domain name

Returns: +PIPADD=ip\r\n

Command: ZL+PPORT?\r\n

Role: gets the destination port

Returns: +PPORT=n\r\n

Command: ZL+PROTOCOL?\r\n

Role: get the device working mode

Returns: +PROTOCOL=TCP/UDP\r\n

Command: ZL+PDNS?\r\n

Role: gets the DNS server IP address

Returns: +PDNS=ip\r\n

7) Setting Network Parameters

Command: ZL+PIPADD=ip\r\n

Role: sets the destination IP or domain name

Returns: +PIPADD=ip\r\n

Command: ZL+PPORT=n\r\n

Role: set destination port

Returns: +PPORT=n\r\n

Directive: ZL+PROTOCOL=TCP/UDP \r\n

Role: set work mode

Returns: +PROTOCOL=TCP/UDP\r\n

Command: ZL+PDNS=ip\r\n

Role: sets the DNS server IP address

Returns: +PDNS=ip\r\n

8) Device Working Mode

Command: ZL+WORKTYPE?\r\n

Role: get the device working mode

Returns: +WORKTYPE=0/1

9. After-Service

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