# ZLAN5103 Serial Device Server User Manual

## RS232/485/422 To TCP/IP Converter

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# Contents

# 1.  Summary

ZLAN5103 can realize the data transparent transmit between RS232/485/422 and TCP/IP, easily make serial devices connected to Ethernet and Internet, achieving the network upgrading for serial devices. Support full duplex and uninterrupted communication of RS232/485/422 port; RS485/422 are embedded with lightning protection; RS485/422 and RS232 can be used at the same time without switch. Support DHCP, DNS. Support virtual serial port, the original serial PC software no need any modifying.

ZLAN5103 is a high performance serial device server developed by Shanghai ZLAN on the basis of ZLAN1003. It has the character of functional and cost-effective. Has the below character:

1)  Three-in-one serial port: RS232/RS485/RS422 three-in-one.
2)  Industrial power supply mode: it has terminal, power plug two power connection modes, convenient for using in industrial use. It can supply 9~24V wide range voltage.
3)  Using TCP/IP protocol stack with independent intellectual property, stable and reliable.
4)  Rich indicator, easy to debug. It has 100M-LINK light to indicate the cable connection, LINK light indicate TCP connections establishing, and serial port to TCP, TCP to serial port has single indicator lights, convenient to detect whether it is the master computer did not send data or the slave computer did not reply.

**Figure 1 ZLAN5103**

**Can be applied to:**

- Building /Entrance /Door /Security Control System

- Power /Electronic /Intelligent Instrument

- Bank /Medical Automation System

- Stock Exchange System

- Industrial Automation System

- Point-of-sale System (POS)

- Information Household Appliances

**Typical application is shown as Figure 2.** The original serial port connect with ZLAN5103, then connect ZLAN5103 to the network via cable. Any data sent from serial device will be transparently sent to PC appointed by ZLAN5103, and data sent by PC to ZLAN5103 via network also will be transparently sent to serial device.
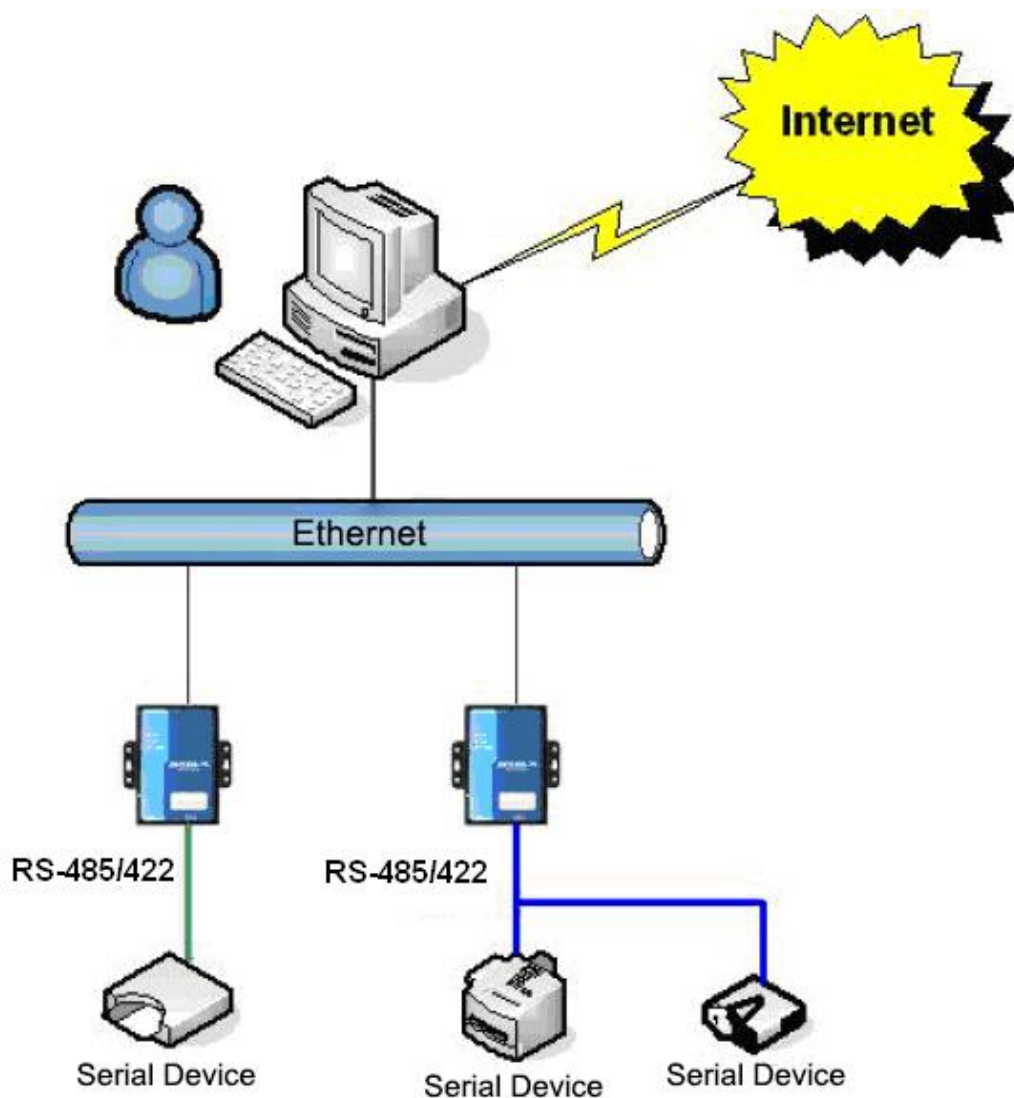
**Figure 2 Connection Diagram**

# 2.  Features

1)  Support full duplex, high speed converting, and no packet lost.

ZLAN5103 is the first type of full duplex, continuous, and low cost serial server in industry. It support simultaneously converting between Ethernet &Serial with large bulk of data with no pause, and also no data is lost.

2)  High cost performance.

ZLAN5103 is designed by concept of intensification, after ensure the stability. It highly takes the cost of networking upgrading in count

3)  Support TCP Server, TCP Client, UDP model, UDP multicast.

4)  Support baud rate 1200~115200bps, data size 5~9bits, parity of None, Odd, Even,

Mark, Space. Support CTS/RTS hardware flow control.

5) Embedded 485/422 lightning protection function, suitable for outdoor 485/422 communication.

6) Equipped freely with our Windows Virtual Serial & Device Management Tool ZLVirCom. It supports virtual serial and can one-key searching ZLAN5103 or modifying parameters.

7) Provide device management library (Windows DLL library). It's convenient for user to develop program with VC, VB, Delphi, C++ Builder. User need only use read or write function to communicate with ZLAN5103.

8) The innovative disconnecting detecting method, whether ZLAN5103 work in TCP Server mode or TCP Client mode it can automatically reestablishing connection after network broken, to ensure the data real-time accessibility.

9) With build-in Web server, its parameters can be modified by web browser.

10) Support DHCP, easy for IP management and solve IP confliction.

11) Support DNS. It fulfills the need of access data server through domain name.

12) Support 100 TCP connections communicate with network modules at the same time.

13) As a TCP client, can connect to 8 destination IP.

14) Flexible serial data framing setting. It fulfills all kinds of serial data frame requirement.

15) UDP mode support dynamic destination address mode. It helps for multi-user mange one serial server.

16) Real Com Driver mode support using the 9-th bit to facilitate communication with milt-device. (the 9-th bit being 0 means data frame and 1 means address frame).

17) Support searching serial servers and modifying parameters through Internet remotely

18) Support parameter modifying protection, preventing modifying by accident. Support running with default parameters.

19) Build-in 2 KV electrical plus protection in RJ45.

20) High protection of electromagnetic interference. With its high electromagnetic interference protection SECC external shell.

# 3.  Technical Parameters

| Figure | |
|---|---|
| Interface: | 485/422: Terminal; 232: DB9 |
| Power Supply: | 5.5mm, Inside positive outside negative, standard outlet |
| Size: | L x W x H =9.4cm×6.5cm×2.5cm |
| **Communicate Interface** | |
| Ethernet: | 10M/100M, 2KV electrical plus protection |
| Serial | RS232/485/422×1：RXD，TXD，GND， CTS，RTS |
| **Serial Parameters** | |
| Baud rate: | 1200~115200bps |
| Data size: | 5～9 |
| **Software** | |
| protocol: | ETHERNET、IP、TCP、UDP、HTTP、ARP、ICMP、DHCP、DNS |
| Setting method : | ZLVirCom, WEB browser, device management library |
| Net    communication method: | Socket, Virtual serial , device management library |
| **Work Mode** | |
| TCP server, TCP client, UDP, Real Com Driver | |
| **Power Requirement** | |
| 9～24V DC，145mA@9V | |
| **Environment** | |
| Running temperature: | -40~85℃ |
| Storage temp: | -45~165℃ |
| Humidity: | 5~95%RH |

# 4.  Instructions

## 1.1 Hardware

The front view of ZLAN5103 serial device server is shown as FIG 4: ZLAN5103 use black anti-radiation SECC board, it's equipped with two "ears" for easy installation.
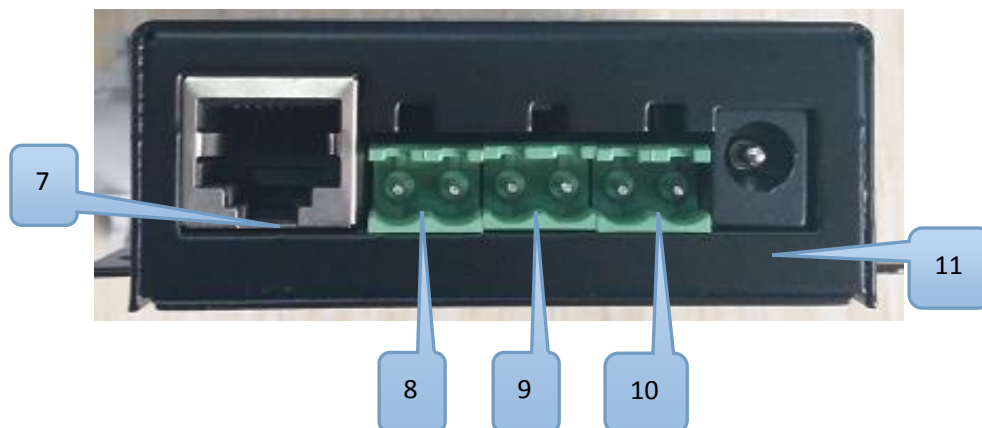


**Figure 3**



**Figure 4**

**Figure 5**

| Item | Name | Instruction |
|------|------|-------------|
| 1 | **DEF Switch** | When DEF is push to 1, serial server will start with default parameter (default IP is 192.168.0.254) |
| 2 | **MODE Switch** | Keep for following extensions |
| 3 | **RS232 port** | DB9 |
| 4 | **Active Indicator** | Indicates if there is data transform between serial and Ethernet. When Ethernet port sending data to serial port the indicator is green, when serial port sending data to Ethernet port it's blue. |
| 5 | **Link Indicator** | Indicates if Ethernet line is plug in. When cable on the indicator is green, when TCP connection establishing or UDP mode the green light and blue light are both on. |
| 6 | **Power Indicator** | Power on |
| 7 | **RJ45** | Ethernet Port |
| 8 | **RS422 Terminal** | Combined with RS485 port to RS422 port |

| 9 | **RS485 Terminal** | RS485 port |
|---|---|---|
| 10 | **DC Plug** | Power interface; OD 5.5mm, ID 2.1mm |
| 11 | **DC Terminal** | Power interface; 5.08mm terminal |

The RS232 line sequence shows as the following table:

| Item | Name | Instruction |
|---|---|---|
| 2 | **RXD** | receiving pin of the serial device server |
| 3 | **TXD** | sending pin of the serial device server |
| 5 | **GND** | Ground wire |
| 7 | **RTS** | After the flow control in using, the serial device server will accept the data of the serial device when the pin is 0. |
| 8 | **CTS** | After the flow control in using, the serial device server will send the data to the serial device when the pin is 0. |

## 1.2 485 Character

ZLAN5103 meet the RS485 standard, each ZLAN5103 can be with 32 terminal 485 devices. The maximum communication distance is 1200 meter, the resistance of 485 terminal is 120 ohms, usually must use terminal resistance when wiring over 300m. Pay attention to the wiring, 485+ and 485- must be a twisted-pair, in order to reduce signal interference.

## 1.3 Module Configuration

ZLAN5103 can be searched and configured through the network tool ZLVircom. Also you can do the configuration after login in the Web by entering the IP address of the module in the browser. Because of the convenient of configuration via network tools, here is the example of ZLVircom configuration. Click "device
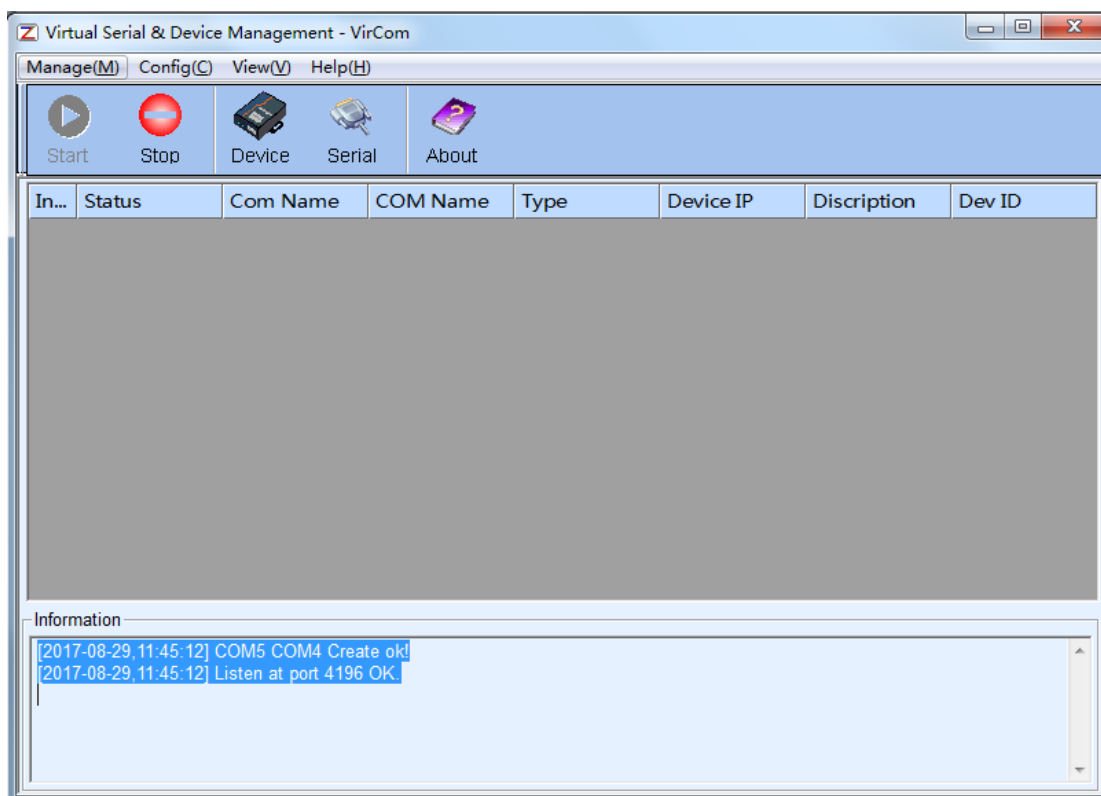
manage" and you'll see a list of devices.



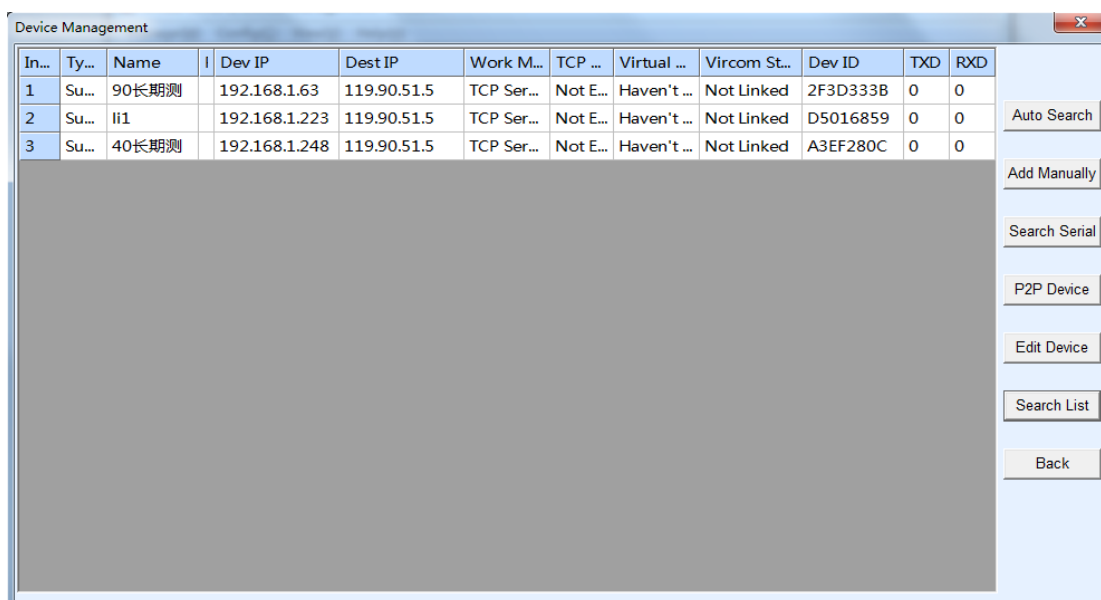**Figure 3 ZLVircom Main Interface**



**Figure 4 Device List**

You can see all the current online devices from the device list. Click "Edit Device"
to configure the parameters. The main configuration parameters are device IP,
baud rate, etc. For specific details, please refer to the <User Guide of Networking

Products>.

## 1.4 Simple TCP Connection Test

Now we need to test the transparent communication function of the networking products. The transparent communication is what data the computer sends to a networking product, the serial port of the networking product outputs what data. Instead, what data is received that the serial port of the networking products will send to the computer on the network.
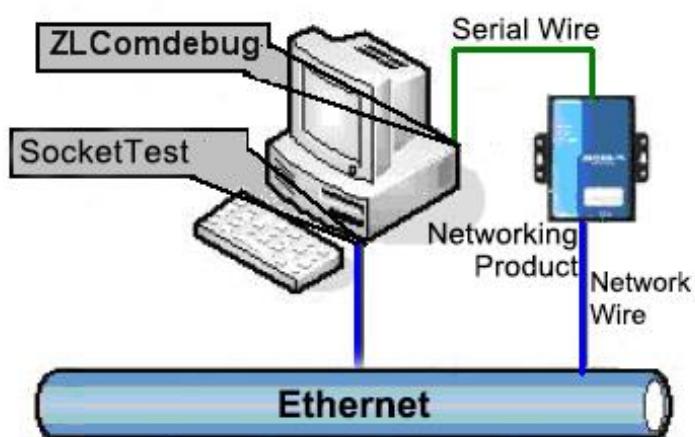


**Figure 5 Transparent Transmission Diagram**

If the COM port of PC is connected with the serial port of networking product, then open the ZLComDebug serial port debugging assistant, the ZLComDebug can communicate with the serial port of networking product. Open TCP&UDP debugging assistant SocketTest, and as TCP client, connect to the 4196 port under the IP (currently 192.168.1.200) of the networking product, and the TCP link can be established with networking products.

Since then, the data sent by SocketTest can be received by ZLComDebug, and the data sent by ZLComDebug can also be received by SocketTest.
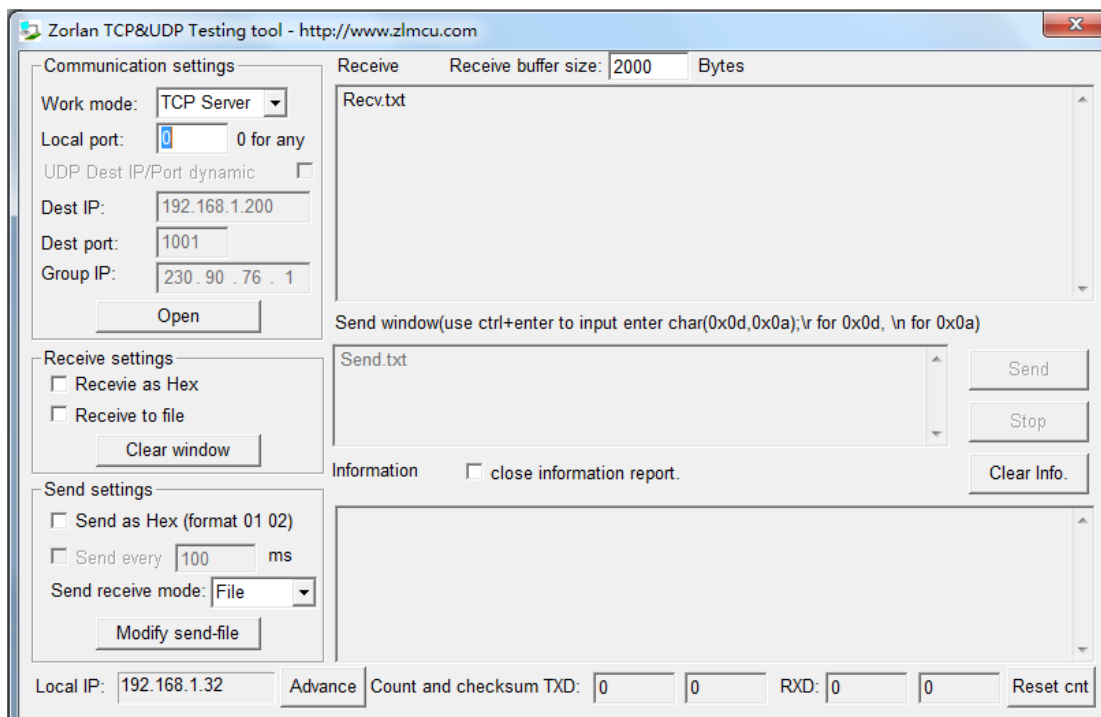
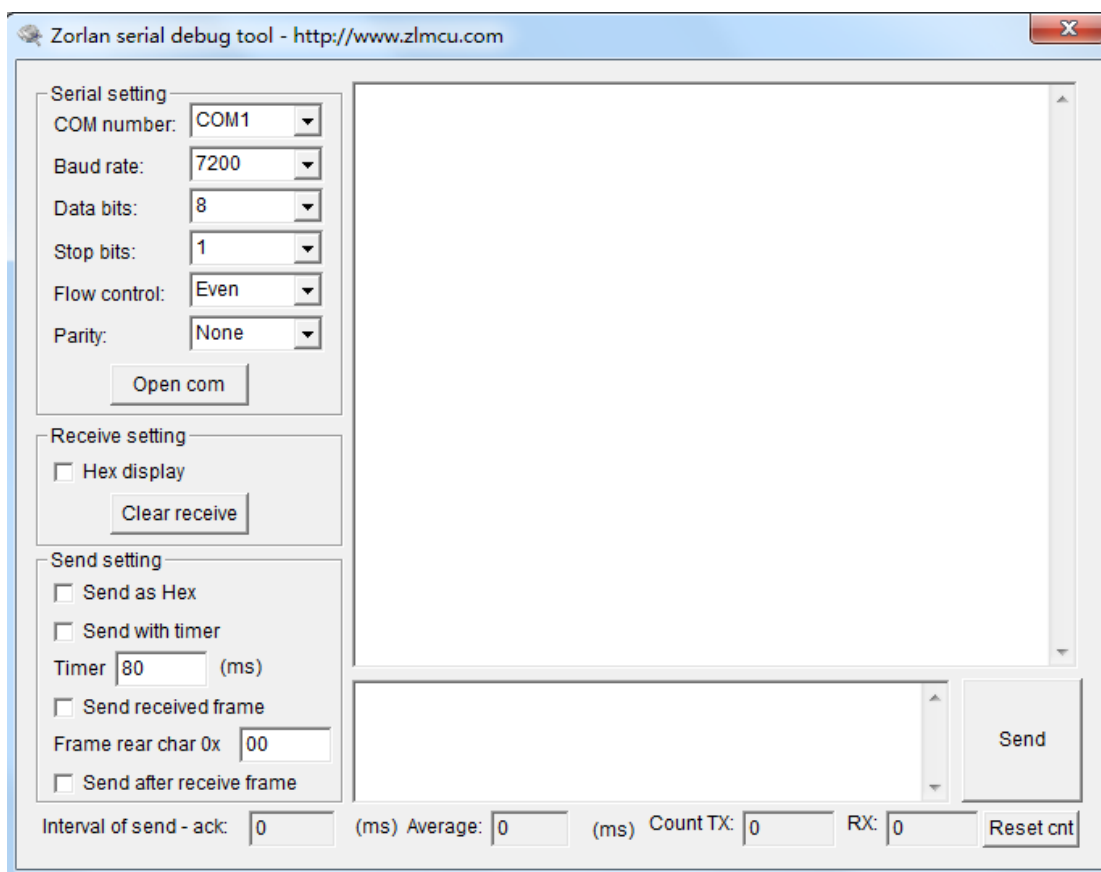**Figure 6 SocketTest Send-receive Interface**



**Figure 7 ComDebug Send-receive Interface**

From FIG. 6 and FIG. 7, transparent communication between serial port and network port is carried out. If the serial port is connected to a user's serial port device, it can communicate with device serial port through the network TCP

connection for data collection and control.

## 1.5 Simple Virtual Serial Port Test

Input the IP of ZLAN5102-3 in the web browser and open the login web. Input the password of 123456 and login. Then you open a configuration web and you can change IP, baud rate and so on.

In FIG. 5 SocketTest is through TCP&UDP to communicate with device, in order to let the user's developed serial port software can be used but no need to be modified for TCP communications, need to add a converting step of COM port to TCP between the user program and TCP. ZLVircom can do this.
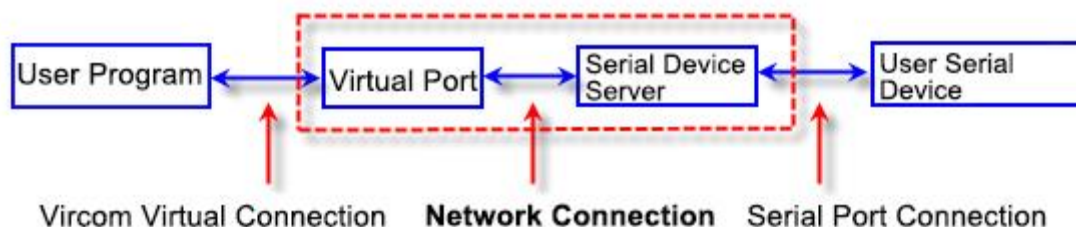


**Figure 8 Virtual Port Usage**

Click on the "Serial Manage" of the main interface of ZLVircom, then click "Add", and select COM5, where COM5 is the COM port that didn't exist on the computer.
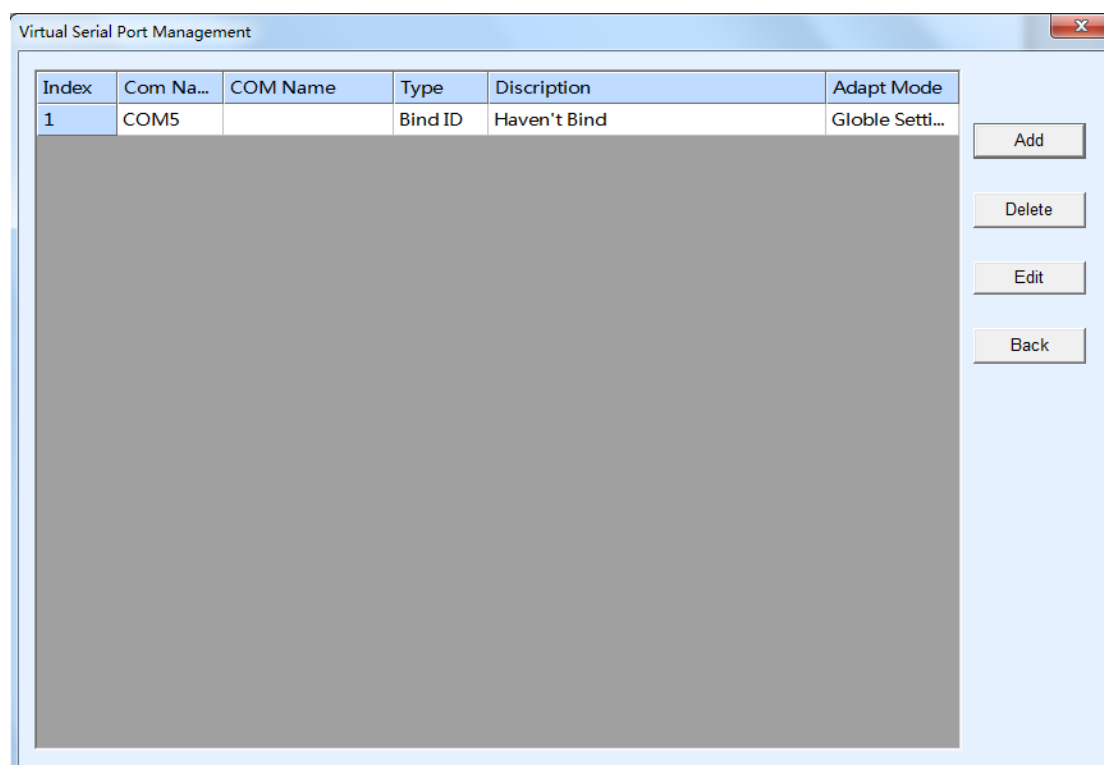
**Figure 9 Add Virtual Serial Port**

Then enter the "device manage", and double-click the device that you need to bind

to the COM5. As shown in FIG. 4, select COM5 from the "virtual serial port" list in

the upper left corner. Then click "modify Settings". And return to the main interface

of ZLVircom. You can see that the COM5 has been connected to a device with IP

192.168.1.200. You can use COM5 instead of SocketTest to communicate.
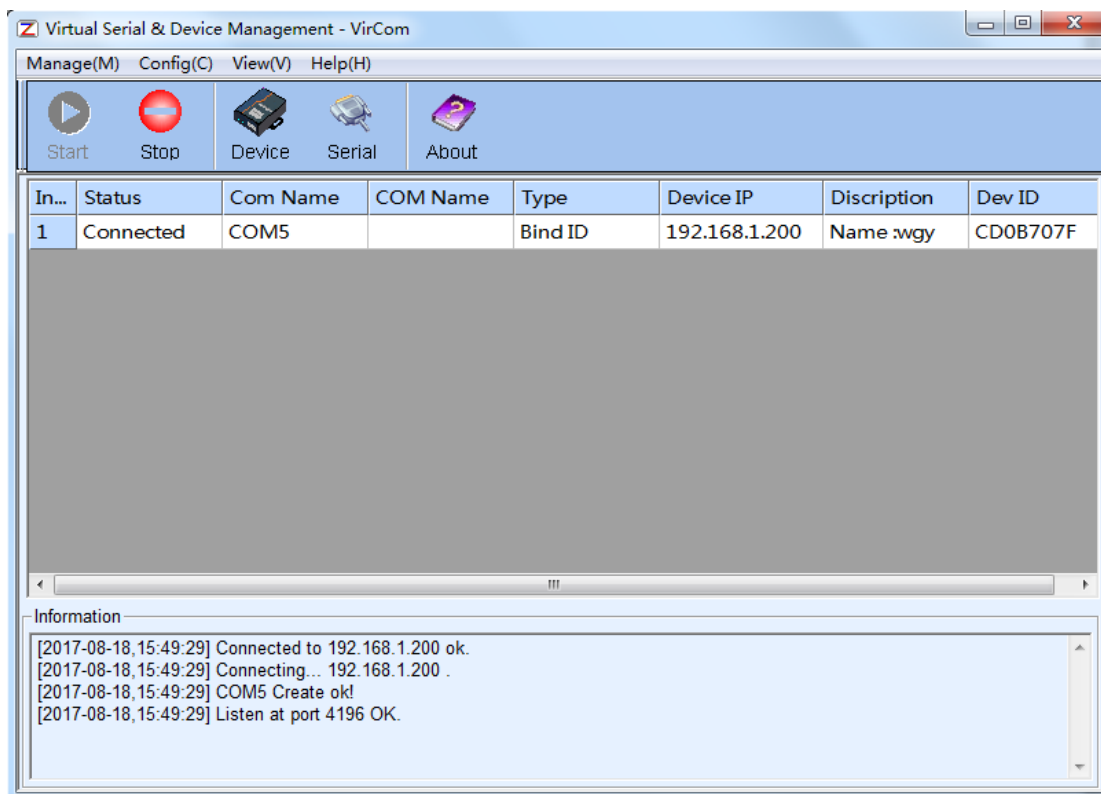


**Figure 10 Virtual Serial Port has been connected**

Now close the before SocketTest and open a new ZLComdebug as the user's

serial port program, now open COM5. At this point, COM5 (virtual serial port) and

COM4 (hardware serial port) can send-receive data through networking products.

If the serial port of the connected product is not connected to the COM port of PC,

but a serial port device, then the COM5 can be opened to communicate with the
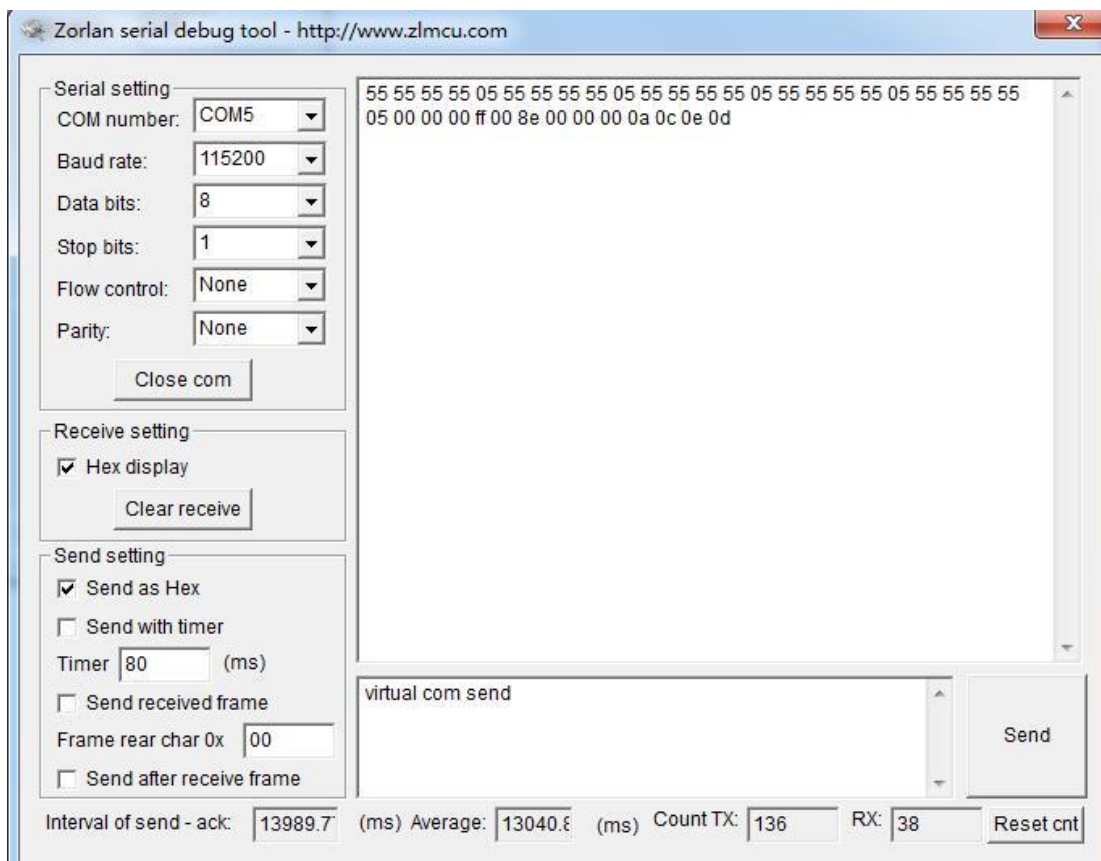
device. And it's just use the network way now.

**Figure 11 Communication via Virtual Serial Port**

# 5.  After-service

Shanghai ZLAN Information Technology Co., Ltd.

Address: 12 floor D building No. 80 CaoBao road Xuhui District Shanghai City China

Phone: 021-64325189

Fax: 021-64325200

Web: http://www.zlmcu.com

Email: support@zlmcu.com