ZLAN8303/8303-5(N)

3G/4G Serial Device Server

User Manual

RS232/485 to 3G/4G Converter

Modbus RTU to 3G/4G Modbus TCP

RS232/485 P2P 3G/4G Serial Device Server

Document DI: ZL DUI 20141016.1.0

Version Information

The History of the revision to this document:

History

Date	Version	Document ID	Revising content
2014-10-16	Rev.1	ZL DUI 20141016.1.0	Release
2016-02-19	Rev.2	ZL DUI 20141016.2.0	Update

Copyright information

Content

1. Summary

ZLAN8303 is 3G/4G network solutions launched by Shanghai ZLAN after ZLAN8100. The serials contain 4 sub-models: 8303 (support Telecom 3G), 8343 (Support Modbus TCP Gateway), 8303-5 (Support Mobile and Unicom 3G/4G), 8303N (Support P2P). The function of Modbus TCP and P2P can add to models 8303 or 8303-5 such as ZLAN8343N-5.

Figure 1 ZLAN8303 Appearance

8303 has RS232/485 interface, can send the data collected by RS232/485 to the cloud server. Combined with ZLAN P2P technology, the users can collect data anytime and anywhere without building server, the collecting method can also be a virtual serial port. If be 8343N, can convert Modbus TCP protocol to Modbus RTU, the users use Modbus TCP to collect data of RTU devices on the computer. ZLAN8343N and ZLAN8343N-5 are the most functional serial server separately applied to P2P Modbus Gateway of Telecom and Mobile/Unicom, suitable for PLC monitoring and field data collection very well.

8303 also has the Ethernet port, can use it to communication in the places with Ethernet,

users can save the 3G/4G traffic. In addition 8303 can be used as 3G/4G router to achieve Ethernet port converting to 3G/4G.

Applications:

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

The following is the application of each sub-model respectively. Please refer to section 5 below for model selection.

1.1 Normal 3G/4G DTU

The normal 3G/4G DTU can be as TCP Server connected by other network devices, since the 8303 IP is not fixed when under 3G/4G mode, usually it isn't as TCP Server, but mostly as TCP Client to connect an fixed IP (or domain name) Server, and send its collecting data. The software on Server ask data through polling style. The RS485/232 of 8303 can connect with serial device and PLC needed collected, sending polling command to PLC, and upload the returned data to server. Shown as Figure 2.

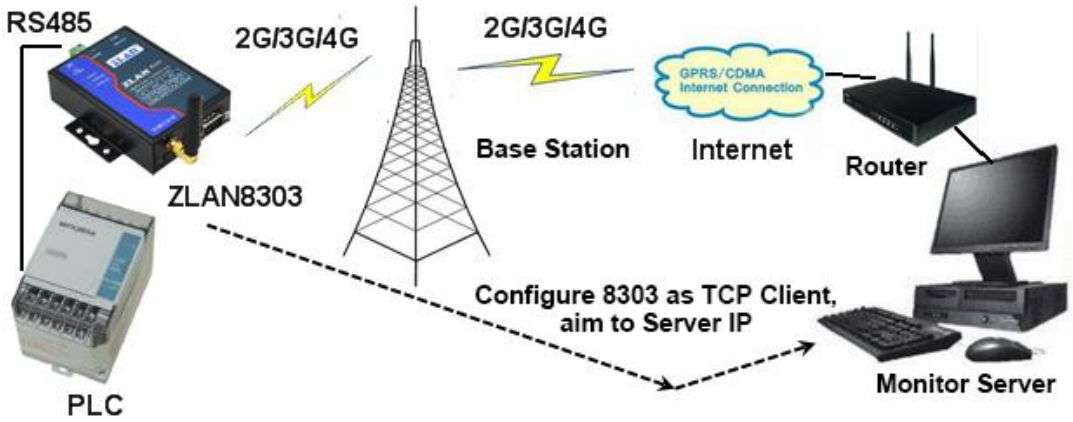


Figure 2 Normal 3G/4G DTU Mode

In this way the purpose of the 8303 IP must be set to the server IP, that is to say the

user must lease a server with a public network IP. However, for some application users may not have a public network server, because the user dial-up through the router, then the router must be set on the "port mapping" and "dynamic domain name" to send 8303 data to the server. "Port mapping" and "dynamic domain name" have the following problems:

1) Some routers are standard telecom, cannot log in so cannot do some settings.
2) "Port mapping" for the average user may be too specialized, set up trouble.
3) "Dynamic domain name" free program may exist stability, real-time problems.

Of course, for the public network IP server users, ordinary ZLAN8303 is also very convenient to use. The following lists the differences between ZLAN8303 and ZLAN8303-5.

In this way, the Destination IP of 8303 must be set to the server's IP, which means that the user must rent a server with a public network IP. But for some applications the user may not have a public server, because the user access Internet through a router dial-up, at this time user must set “Port Mapping "and" Dynamic Domain Name "on the router so that can send 8303 data to the server. There are some problems with "port mapping" and " Dynamic Domain Name":

1) Some routers are Telecom standard matched, unable to log in so that some Settings cannot be done.
2) "Port Mapping" may be too specialized for regular users as setting up with trouble.
3) The free scheme of "Dynamic Domain Name" may have stability and real-time problems.

Of course, for users with public network IP servers, it is also convenient to use the normal ZLAN8303. The differences between ZLAN8303 and zlan8303-5 are listed below.

Model	**Support Mode**
ZLAN8303	CDMA2000, Telecom 3G network. If you use a Telecom 4G card, you can also communicate, but in 3G mode. 3G speed is enough for data monitoring. So you don't have to deal with 3G CARDS.

ZLAN8303-5	Support 5 operating modes, support Mobile, Unicom card, Telecom 4G card (but does not support telecom 3G/2G card).

1.2 Multi-host and Modbus Gateway

The model with this function is ZLAN8343 or zlan8343-5. These two models have the following two functions:

1) **Modbus Gateway can be configured.** As long as set the “Device/Advanced Parameter/Transformation Protocol” to "Modbus TCP to RTU", it is switched to Modbus Gateway mode. The upper computer can be queried with Modbus TCP, while PLC can use RTU instructions. The Modbus of 8343 is storage Modbus Gateway, and the polling is more real-time.

2) **Multiple hosts.** When set to Modbus Gateway, multiple host queries can be made, and 8303 will answer separately to realize multi-host query. In the non-Modbus Gateway mode, for the 8343 model, you just check the "multi-host" support in more advanced options it can also implement the multi-host queries.

ZLAN-multi-host technology is a technology developed for multi-host monitoring a device at the same time. In the ordinary serial device server or DTU, when there is A, B two monitoring computer, A and B can send data to the device, but data the device received from the serial port will be sent to the A and B at the same time. In other words, when A and the device communicate, B will receive unwanted data, which will interfere B's communication. Many software protocols will not be able to adapt to this situation and may not work.

The ZLAN multi-host technology can can achieve the communication scheduling between A and B computers. When A communicates with the device, the response data of the device is only sent to A; When B needs to communicate, you can quickly switch to B. ZLAN8343 will enable multiple computers to monitor the same device simultaneously.

1.3 P2P 3G/4G Serial Device Server

The model with this function is ZLAN8303N or ZLAN8303N-5. This model integrates

ZLAN's P2P technology, which can solve the inconvenience of "Port Mapping" and "Dynamic Domain Name" in general 3G/4G DTU.

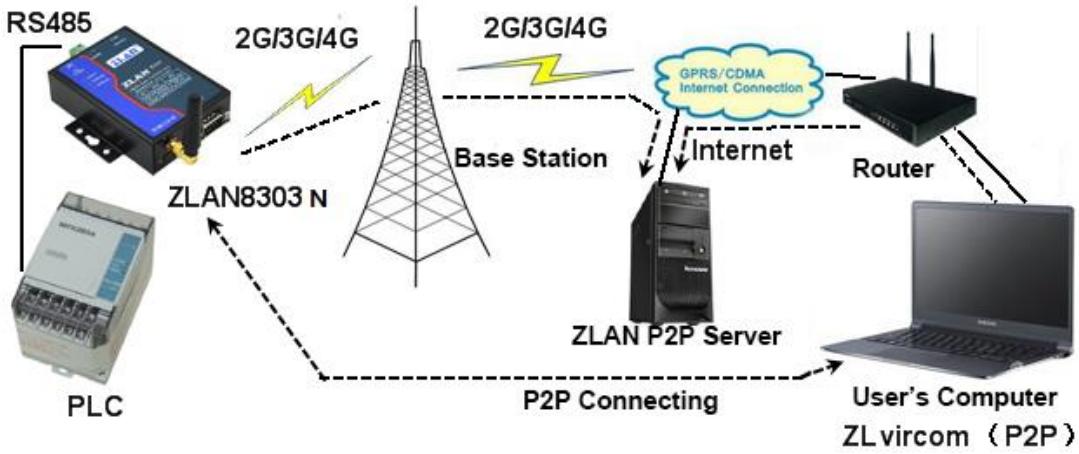


Figure 3 3G/4G DTU Mode of P2P

As shown in FIG. 3, compared with FIG. 2, (a) we increase the ZLAN P2P server, (b) the user computer replaces the monitoring server. Instead of using the server for monitoring, users can monitor their laptops whenever and wherever they are.

At the beginning of the communication, the P2P software on the user's computer---ZLVircom, communicated with the ZLAN P2P server. At the same time, 8303 can also communicate with ZLAN P2P server, which can establish direct communication between 8303 and ZLVircom (without the P2P server forwarding) after the negotiation is done. The software on the user's computer can communicate via a virtual serial port provided by ZLVircom or a TCP mock port.

When used, the user only needs to enter the serial number of 8303 that needs to be monitored in ZLVircom software to establish the P2P connection. The P2P approach allows users to get rid of the "Port Mapping", "Dynamic Domain Name" and the server of a public network IP, which can easily and conveniently do monitoring anytime and anywhere.

The combination of P2P technology and 3G/4G wireless technology has implemented an innovative monitoring method, which has the following characteristics:

1) Easy to use, users only need to add the serial number of 8303 so can go to

operate, no need any professional operation such as Port Mapping.

2) No additional cost, users no need to lease public server.
3) Support virtual serial port, no need to modify client PLC software, like local serial communication.
4) As no need to transfer through server, but direct P2P communication, shorten data communication time, improve the communication real-time, reduce the load of center server.
5) Support communication type of encryption and user name authentication to ensure the security of communication.

2. Features

1) The supporting 3G/4G network

   a) 8303/8343/8303N/8343N: support EVDO/CDMA2000, Telecom 3G network
   b) 8303-5/8343-5/8303N-5/8343N-5: support 5 modes, TD-LTE/ FDD-LTE/ WCDMA/ TD-SCDMA/ GSM, Unicom 4G/3G/2G, Mobile 4G/3G/2G and Telecom 4G network

2) Provide an Ethernet port, can be used as 3G router. Can be used as Ethernet DTU to save traffic when on the cable network, same as serial port server.
3) Support P2P connection, no need fixed IP and server, convenient to communicate and connect.
4) Support Modbus Gateway, as Modbus TCP converting to Modbus RTU.
5) Support multiple hosts monitoring, no interference between each other.
6) SIM card installation in drawer type without disassembly.
7) 8303 can be controlled in dormancy via serial port to operate in low power.

3. Technical Parameters

Support Model	8303/8343/8303N/8343N：SYS EVDO/CDMA2000, Telecom 3G/2G network

	8303-5/8343-5/8303N-5/8343N-5： Support 5 modes, TD-LTE/ FDD-LTE/ WCDMA/ TD-SCDMA/ GSM, Unicom 4G/3G/2G, Mobile 4G/3G/2G and Telecom 4G network
Transmission Rate	3G network speed: uplink 5.76Mbps download 7.2Mbps
	4G network speed: uplink 2Mbps download 68Mbps
SIM Card	Voltage: 3V, 1.8V; Size: Big Card（Small card can buy card sets）
Antenna Interface	Optional 50Ω/SMA glue stick antenna or sucker antenna
Serial Port Type	RS-232/RS-485
Serial Port Parameter	Baud Rate: 1200~115200bps; Data bit: 5～9; Stop bit：1～2; Flow Control: Hardware, Software; Check bit: None, Odd, Even, Mark, Space
Power Supply	Q2.1 outlet, can be customized to power terminal input
Input Voltage	DC9V~24V
Working Current	< 200mA@9V
Operating Temperature	-40~85℃
Running temperature:	-40~90℃
Storage temp:	0~95% Non - Condensing
Size:	L×W×H=9.4cm×6.5cm×2.5cm

4. Function

4.1 Hardware Instruction

The front view of ZLAN8303/N is shown as FIG. 4.

Figure 4 ZLAN8303 Front View

Panel Light:

Indicator	Green	BLUE
Active	There is data passing serial port	There is data input from serial port
Link	The network function module has been initialized	Always bright: the TCP connection is established Blinking: P2P initialization completed
SYS	Always bright: system in startup Flashing: the system startup finished	Rapidly flashing: 3G in connection Always bright: 3G connection success

Figure 5 Interface Diagram 1

1) The front interface of ZLAN8303 is shown in figure 5:

   a) Power input: interface form Q2.1 socket, DC+9V ~ +24VDC, power needs over 12W. The default adapter is 9V. Can be customized to power terminal type input.

   b) RS485 signal input.

   c) RJ45 interface, Ethernet access end. 3G connection no need to connect RJ45. If the RJ45 has light on some model, the indicator light flashes indicates that the network port data is active.

2) The back interface of ZLAN8303 is shown in figure 6:

Figure 6 Interface Diagram 2

   a) Antenna: 8303 antenna interface using 50Ω/SMA(female), if external antenna must use the antenna suitable for 3G/4G working band. ZLAN can provide a gel antenna and a suction antenna that can be sucked onto a metal shell (by default 2M).

   b) SIM card installation: ensure that the device isn't power on when installing the

SIM card. Use the pen and screwdriver to push out the SIM card slot, and the SIM metal surface pushes down into the card slot.

c) DB9: RS232 signal input, support flow control. Among them, the 9th pin is dormant control, and the high level gives 8303 dormant state.

4.2 Power Saving Mode

3G devices sometimes don't work long hours and have alarm data opened, which can save traffic and save batteries. Thus the resting function is designed for 8303/8303-5, as long as the RS232 pin9 connect to high level 5V, it can cut off almost all the power of the device. Without connecting pin9, or set to 0, the system is power re-supply.

4.3 Device Configuration and Usage

Please install ZLVircom software on your computer, then connect the Ethernet port of the computer to ZLAN8303 Ethernet port. The device can be searched by ZLVircom after normal operation with power on, and the serial parameters and IP parameters of the device can be configured after being searched out. Specific configuration method please refer to file <User Guide of Networking Products>.

If configured as 3G access network (not the Ethernet port access), please use ZLVircom to configure the device's gateway to 192.168.10.1, the IP to 192.168.10.200, DNS domain name server to 192.168.10.1, and IP can also be obtained dynamically. If 8303N needs to enable P2P, then go to "More Advanced Settings", check "Enable P2P", and then click ok and modify Settings.

4.4 Used as 3G/4G Router

For more configuration of routers, refer to the instructions of ZLAN8300 3G/4G router.

4.5 P2P usage

Please refer to the file for the use of P2P products.

4.6 485 Character

ZLAN8303 meet the RS485 standard, each ZLAN8303 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.

5. Appendix

5.1 Power On Process

Here is a list of the changes of the 8303 power on process indicator light to help users analyze the steps of the device to help troubleshoot problems.

Table 1 8303-5 Power-on Process (Configured as DHCP Mode)

Time(s)	Status	SYS	LINK
0～1	Power on reset	BLUE	OFF
1～18	System in startup	GREEN	OFF
18～42	The system is started and the network is initialized	GREEN flash, frequency is 1 second	OFF
42～60	The 4G module initialization begins	GREEN flash, frequency is 1 second	GREEN for 1 second, then off
60～82	4G first dial-up connection	BLUE flash, frequency is 0.2 seconds/time	
82～126	4G ready for a second dialing	GREEN flash, frequency is 1 second	OFF
126 ～ 150	4G the second dialing	BLUE flash, frequency is 0.2 seconds/time	OFF
150～	4G in connection	BLUE (with faint GREEN flash)	The BLUE blinks after P2P connection.

Table 2 8303 Power-on Process

Time(s)	Status	SYS	LINK
0～1	Power on reset	BLUE	OFF

1～12	System in startup	GREEN	OFF
12～29	The system is started and the network is initialized	GREEN flash, frequency is 1 second	OFF
29～31	The network initialization is completed, 3G module initialization begins	GREEN flash, frequency is 1 second	GREEN
31～52	3G is Connecting	BLUE flash, frequency is 0.2 seconds/time	GREEN
52～73	3G connecting success	BLUE (with faint GREEN flash)	GREEN
73～87	P2P initialization is completed (this step only P2P products set to P2P mode)	BLUE	BLUE flash, frequency is 1 second

If you use the ZLAN8303-5, the user's card is a 3G card, then need to dial twice, the first time using the 4G mode dial-up if failed it will use 3G dial-up, this time dialing time will be slower. But using 2G Mobile card will be one time dialing success in ZLAN8303-5.

Table 3 Ethernet Connection (SIM card not installed) Power-on Process

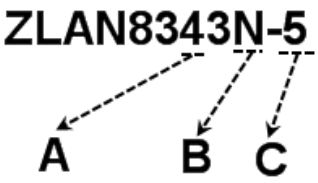
Time(s)	**Status**	**SYS**	**LINK**
0～1	Power on reset	BLUE	OFF
1～3	System in startup	GREEN	OFF
3～6	The network initialization is completed	GREEN	GREEN
6～15	P2P initialization is completed (this step only P2P products set to P2P mode)	GREEN	BLUE flash, frequency is 1 second
15～29	System initialization is complete, normal operation.	GREEN flash, frequency is 1 second	GREEN(BLUE flash if P2P Mode)
	3G dialing. Although there is no	BLUE flash,	GREEN

	SIM card installed, 3G dialing is done every time, dial for 2 minutes, and then idle for 1 minute. Repeatedly, in dial-up periods Ethernet data communication is not affected.	frequency is 0.2 seconds/time	

5.2 Model Selection

The following list of selection steps for the 8303 series are provided for users' reference::

1) Select the model:



A Field	4: support for multi-host and Modbus Gateway functions; 0: multi-host and Modbus Gateways are not supported.
B Field	N: support for P2P function; Empty: no P2P function.
C Field	-5: support the 3G/4G model of Unicom and Mobile card; Empty: support Telecom 3G model.

2) Antenna selection:

Can choose glue stick antenna or suction dish antenna, the suction dish antenna is 2M by default, can be customized 3M antenna.

3) Power input:

The default is the plug type Q2.1 socket, which can be customized for wiring terminal type power input.

6. After-service

Shanghai ZLAN Information Technology Co., Ltd.

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

Phone: 021-64325189

Fax: 021-64325200

Web: http://www.zlmcu.com

Email: support@zlmcu.com