# ZLAN8305/8305L 2G/3G/4G Serial Device Server

# **User Manual**

# RS232/485 to 3G/4G Converter Modbus RTU to 3G/4G Modbus TCP RS232/485 to MQTT

CopyRight©2008 Shanghai ZLAN Information Technology Co., Ltd. All right

reserved



Document DI: ZL DUI 20180214.1.0

#### CopyRight©2008 Shanghai ZLAN Information Technology Co., Ltd. All right reserved

#### **Version Information**

The History of the revision to this document:

			History
Date	Version	Document ID	Revising content
2018-02-14	Rev.1	ZL DUI 20180214.1.0	Release
2019-04-29	Rev.2	ZL DUI 20180214.1.0	Update

#### **Copyright information**

Information in this document is subject to change without notice. It is against the law to copy the document on any medium except as specifically allowed in the license or nondisclosure agreement. The purchaser may make one copy of the document for backup purposes. No part of this manual may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or through information storage and retrieval systems, for any purpose other than for the purchaser's personal use, without the express written permission of Shanghai ZLAN information Technology Co., Ltd.

1.	Sun	nmary		5
	1.1	Norm	al 3G/4G DTU	7
2.	Fea	tures		7
3.	Тес	hnical Pa	arameters	7
4.	Har	dware In	struction	8
5.	Cor	nfiguratio	on	11
	5.1	Serial	Port Configuration	11
	5.2	Web o	configuration	14
	5.3	ZLViro	com Configuration	19
		5.3.1	LAN management	20
		5.3.2	Remote Manage and Upgrade	21
6.	Cor	nmunica	tion test	22
	6.1	Comn	nunication of Server and Device	22
	6.2	8305L	. test	24
		6.2.1	Transparent Transmission Test	25
		6.2.2	Modbus Protocol Conversion Test	25
		6.2.3	MQTT Protocol Test	26
7.	The	AT com	mand	27
	7.1	Login	and Configuration	27
		7.1.1	Enter Configuration Mode	27
		7.1.2	Landing	27
		7.1.3	Get Device Status	28
	7.2	Serial	Port Parameters	28
		7.2.1	Gets Serial Port Parameter	28
		7.2.2	Get Check Bit	28
		7.2.3	Fetch data bit	28
		7.2.4	Set serial port parameters	29
		7.2.5	Set check bit	29
		7.2.6	Set data bit	29
	7.3	Netwo	ork Parameters	29
		7.3.1	Get the destination IP or domain name	29
		7.3.2	Get destination port	29
		7.3.3	Get the device working mode	30
		7.3.4	Get DNS server IP	30
		7.3.5	Set the destination IP or domain name	30
		7.3.6	Set destination port	30
		7.3.7	Set operating mode	30
		7.3.8	Set up DNS server IP	31
	7.4	Regis	tration package and heartbeat package	31
		7.4.1	Query the registry content	31
		7.4.2	Enable to register packages	31
		7.4.3	Set the registry content	31
		7.4.4	Enable/disable registration packages	31
8.	Acc	essories	s to choose	32

## Content

9.	After-service	
----	---------------	--

# 1. Summary

ZLAN8305/ZLAN8305L is a new cost-effective 4G DTU/ 4G router launched by Shanghai ZLAN. The differences between the two sub-models are as follows:

- 1) ZLAN 8305: support RS232/485 to 4G, do not support Ethernet port. Support serial port configuration.
- 2) ZLAN 8305L: supports 4G and Ethernet ports, RS232/485 to 4G/ Ethernet, and Ethernet to 4G. It can be used as a 4G router. Support serial port configuration, Web configuration, ZLVircom LAN configuration. Support the MQTT.



FIG. 1 ZLAN8305

The 8305 use the latest 4G chipset, which ensures powerful functions and stability while achieving a lower price and a high cost performance. It supports 7-mode all-netcom system, support all cards of Telecom, Mobile, Unicom. 8305L supports the MQTT protocol and the Modbus TCP to RTU protocol. Industrial temperature range of -45 ~ 85 degrees is supported. Support for custom registry packages and heartbeat packages. Support remote upgrade on

server side.

In addition, 8305 can also be customized for various special needs, including when the network is not available, the local storage of dozens of megabytes of data, when the network in connection then upload the server.

The default 8305 is equipped with a 4G antenna sucker, also can be equipped with guide rail accessories. At the same time, the power supply terminal can provide two power supply modes of power socket and terminal type (the choice of delivery).

8305 is suitable for the following application fields:

- 1) Data collection in the field of industrial Internet and industrial automation.
- 2) Power data acquisition and monitoring.
- 3) Access control, security.
- 4) Collection and monitoring of hydrological, meteorological and environmental data.
- 5) Intelligent transportation, vehicle data collection.



#### Figure 2 Application Environment Diagram

## 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,

1) tion.

# 2. Features

- It supports 7 standard modes, including China Unicom 4G, 3G, 2G, Mobile 4G, 3G, 2G and China Telecom 4G, 3G and 2G networks.
- Support TCP Server, TCP Client, UDP mode. Support multiple TCP Client connections when as Server.
- The serial port supports 1200~460800 baud rate, 5~8 bits of data, no check, odd check and even check, 1~2 stop bits, no flow control, hard flow control and soft flow control.
- Support serial port to 4G, 8305L support serial port to Ethernet port and 4G router application, and support DHCP Server.
- Support serial port transparent transmission, 8305L support Modbus RTU to Modbus TCP, MQTT protocol.
- Support serial port AT command configuration, 8305L support WEB configuration, support ZLVirom software to view some parameters.
- 7) Support for custom registry packages, custom heartbeat packages.
- 8305L can update the firmware of the device through the WEB, and all models can update the firmware of the device through the ZLVircom software on the server side.

## 3. Technical Parameters

	7 modes are supported:			
Support Model	B1 / B3, B5 / B8 @ FDD LTE			
	B34 B38 / B39 B40 / B41 @ TDD LTE			
	B1 / B8 @ WCDMA			
	B34 / B39 @ td-scdma			
	BC0 @ CDMA2000 1 x/EVDO			
	B3 / B8 @ GSM			
	Including Unicom 4G, 3G, 2G, Mobile 4G, 3G, 2G and Telecom 4G, 3G, 2G			
	networks.			
	LTE-FDD: Max 150Mbps (download) /Max 50 Mbps (uplink)			
	LTE-TDD: Max130Mbps (download) /Max 30 Mbps (uplink)			
	WCDMA: 384Kbps (download) /Max384Kbps (uplink)			
Transmission Rate	TD-SCDMA: Max 4.2Mbps (download) /Max 2.2 Mbps (uplink)			
	EDGE: 296Kbps (download) /Max236.8Kbps (uplink)			
	GPRS: 107Kbps (download) /Max85.6Kbps (uplink)			
SIM Card	Voltage: 3V, 1.8V; Size: Big Card (Small card can buy card sets)			
Antenna Interface	Optional 50 $\Omega$ /SMA glue stick antenna or sucker antenna			
Serial Port Type	RS-232/RS-485			
Serial Port Parameter	Baud Rate: 1200~460800bps; Data bit: 5 $\sim$ 8; Stop bit: 1 $\sim$ 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 (150mA@12V when dial)			
Operating Temperature	-40~85℃			
Running temperature:	-40~90℃			
Storage temp:	0~95% Non - Condensing			
Size:	LxWxH=9.4cm×6.5cm×2.5cm			

# **4. Hardware Instruction**

The front view of ZLAN8305 is shown as FIG. 3.



Figure 3 ZLAN8305 Front View

The 8305 is made of anti-radiation metal shell, with two lugs on both sides, which can be fixed with screws; Also can be equipped with guide rail accessories.

#### Panel Light:

Indicator	Green	BLUE
Active	Network send data to serial port	Serial port send data to network
Link	The network wire of 8305L connect	Always bright: the TCP connection is established
4G	Power indicator	Flashing means the 4G is dialing, it starts dialing after power on 40s, usually can be dialed in 10s.





#### Figure 4 Interface Diagram 1

#### The front interface of ZLAN8305 is shown in figure 4:

- Power input: interface form Q2.1 socket, DC+9V ~ +24VDC, power needs over 3W. The default adapter is 12V. Can be customized to power terminal type input.
- 2) RS485 signal input. Be attention don't connect to power.
- 3) RJ45 interface, Ethernet access end. Only available for 8305L.

#### The back interface of ZLAN8305 is shown in figure 5:



#### Figure 5 Interface Diagram 2

- Antenna: 8305 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).
- 2) 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.

3) DB9: RS232 signal input.

# 5. Configuration

Devices can be configured through serial port and network. Since ZLAN8305 does not have Ethernet port, it usually only uses the serial port configuration, while ZLAN8305L has Ethernet port, so in addition to the serial port configuration, Web configuration and ZlVircom Windows tool network search configuration can be used.

## **5.1 Serial Port Configuration**

The serial port configuration is applicable to 8305 and 8305L. Since 8305 has no Ethernet port, it is mainly configured through the serial port.

Download ZL8100ConfigTool (http://www.zlmcu.com/download/ZL8100Conf.zip) version 2.4 above, the software can configure 8100 and 8305/8305L through serial port.

Connect USB to RS232 wire to 8305 serial port, power 8305 and open ZL8100ConfigTool (hereinafter referred to as the configuration tool).

ZL8100ConfTool					
<ul> <li>串口参数</li> <li>串口: COM9 ▼</li> <li>波特率: 115200 ▼</li> <li>数据位: 8 ▼</li> <li>校验位: N ▼</li> <li>デ闭串口</li> <li>登录密码: 6666666</li> <li>登录 清空</li> <li>7CP/IP</li> <li>波特率: 115200 ▼</li> <li>目的IP或域名: 47.9 144.9</li> <li>目的端口: 1884</li> <li>协议: TCP ▼</li> <li>状态</li> <li>研究模式: Entered Config Mode</li> </ul>	信息 +STAT: +ID:869756045830582 +VER:ZLAN800500HW:HR11,SW:V1.0 +BAUD:115200 +PIPADD:47.9 144.9 +PPORT:1884 +PROTOCOL:TCP +HEARTIME:0 +HEARTIME:0 +HEARTIME:0 +HEARTDAT:heart +DATAB:8 +CHECKB:N +EN_ENROL:1 +ENROL:zlan				
章 (1) (1) State of the state					
· · · · · · · · · · · · · · · · · · ·					
场强:温度:℃电压:.V ID:8697	75604583058 硬件版本:HR11,软件版本:V1.0				

#### Figure 6 Configuration tool

Select the serial port number, COM9 here, and the baud rate is 115200. 115200 here is the factory default setting. If the user has set 8305 to other baud rates (such as 9600), then the actual device baud rate needs to be used here.

After power on, wait for 40 seconds, that is, after the dial-up light starts flashing, select and click "open" serial port. At this time, the configuration tool will try to communicate with the device, and if successful, the parameter information read will be displayed on the right side.

The default login password is 666666. Before clicking "login", the parameters are readonly and cannot be set or modified. That is: you can click the "get parameters" at the end, but the "set parameters" cannot be achieved. Now click the "login button" :

串口:       CON9       ▼         波特率:       115200       ▼         数据位:       ⑧       ▼         炭闭串口       ●       ●         登陆       ●       ●         登市       ▼       ●         登市       ●       ●         登市       ●       ●         登市       ●       ●         登示密码:       ●       ●         登示空码:       ●       ●         節が字       115200       ●         目的:rg.或42:       47.95.144.92       ●         目的:宗口:       1884       ●         协议:       TCP       ●         状态       TCP       ●         読者式:       Entered Config Mode.       ●         受陆状态:       已登陆       ●	ZL8100ConfTool		x
TCP/IP         波特率:       115200         目的Ir或域名:       47.95.144.92         目的端口:       1884         协议:       TCP         状态       TCP         献置模式:       Entered Config Mode.         登陆状态:       已登陆	<ul> <li>串口参数</li> <li>串口: COM9 ▼</li> <li>波特率: 115200 ▼</li> <li>数据位: 8 ▼</li> <li>校验位: N ▼</li> <li>关闭串口</li> <li>登</li> <li>登</li> <li>融合: 666666</li> <li>登</li> <li>菜</li> <li>済空</li> </ul>	信息. +LDGIN:OK	*
状态	TCP/IP         波特率:       115200         目的IP或域名:       47.95.144.92         目的端口:       1884         协议:       TCP		
	·状态		Ŧ
	获取参数 设置参数 高级参	数 取消	

#### Figure 7 Configuration tool 2

You can see that after logging in, the LOGIN status changes to "logged in", and the information of "+LOGIN OK" appears on the right side.

The TCP/IP field sets the main parameters, including baud rate, destination IP, destination port, and protocol. Protocol support TCP or UDP protocol. After modifying the corresponding parameters, click the "set parameters" button to set the new parameters inside the device. After setting the parameters, there is no obvious prompt message. After setting, the device needs to be powered again.

The "get parameters" button can get the parameters of the current device. The "get parameters" button can get the parameters by sending AT instruction, and the data listed on the right is the return data of AT instruction. For the AT directive, refer to the other

sections of this article. Since "get parameters" is automatically executed once "open" succeeds, it is generally not necessary to click the "get parameters" button.

Click on "advanced parameters"

高级参数	-	NAME OF TAXABLE PARTY.	×
	─工作参数 ──── 工作模式: DNS服务器IP:		 取消
	心跳间隔: 心跳内容:	 heart	
	串口数据位: 串口校验位:	8 <b>-</b> N <b>-</b>	
	登陆密码:		
	注册包:	1 💌	
	注册包内容:	zlan	

#### Figure 8 Configuration tool

The parameters commonly used here are:

- 1) Heartbeat interval: if the display is empty, it means there is no heartbeat packet, otherwise 30s, 45s and 60s can be set.
- 2) Heartbeat content: this is the heartbeat package content.
- 3) Registry: 1 means enabled, 0 means not enabled.
- 4) Registry content: the registry content sent after connecting to the server.

After selecting the parameters, click the "set" button to return to the main interface. At this time, there is no need to click the "set parameters" button on the main interface.

## 5.2 Web configuration

Only the ZLAN8305L version with L supports LAN port and Web configuration functions. The default IP of the 8305L device is 192.168.10.1. If you do not know the IP address of the device, you can search the device IP through ZLVircom software.

Change the computer IP to the same network segment as the device, such as

192.168.10.2. If the network is directly connected, the IP can also be obtained dynamically (if not directly connected, the IP may not be assigned by 8305L). Enter the IP address of the device in the browser to enter the login interface. The default password is 666666.



#### Figure 9 Web login

Login to the main interface displays the current state of the device, working mode, IP address and other parameters. The device can operate in two modes:

- 4G router mode: at this time, both 4G and Ethernet are turned on, and the serial port can connect to the Internet through 4G or Ethernet. At the same time, Ethernet and 4G are interchangeable.
- 2) Wired mode (off 4G): no 4G function, only serial port to Ethernet function.

Different device information will be displayed according to different modes. The system status in 4G routing mode is shown in the figure below:

系统状态		设备配置	设备管理
设备信息			
当前工作模式:	4G路由模式		
运营商类型:	CHN-CT		
网络类型:	E-UTRAN		
网络状态:	注册到网络		
SIM卡状态:	SIM卡正常		
SIM卡ICCID:	89861117040216407564		
IMEI号 :	867732035176890		
信号强度:	100%		
基站定位:	3610:00C0310		
MAC地址:	5A:4C:01:02:03:04		
公网IP地址:	10.177.98.74		
LAN口IP地址:	192.168.10.1		
LAN口子网掩码:	255.255.255.0		
DNS地址:	222.66.251.8		

#### Figure 10 device information

#### Click device configuration:

系统状态		设备配置		设备管理
	工作模式	通讯设置	协议选择	
工作模式				
* 工作模式:	4G路由模式	v		
IP地址:	192.168.10.1			
子网掩码:	255.255.255.0			
DHCP Server开启:	是	Ŧ		
DHCP分配起始IP:	192.168.10.100			
DHCP分配终止IP:	192.168.10.200			
拨号失败重启次数:	5		如果设置为0则功能不启用	
APN :				
APN 账号:				
APN密码:				

#### Figure 11 work mode configuration

Working mode: select 4G router mode and wired mode.

串口奓釵				
波特率:	115200 •	类	文据位: 8	Ŧ
校验位:	无	停	事止位: 1	T
流控:	无			
通讯参数				
工作模式:	Client •			
本地端口:	0			
目的IP或域名:	47.95.144.92			
目的端口:	1884			
TCP保活时间:	60		小于65535秒	
高级参数				
注册包选择:	1 *			
注册包内容:	zlan			
心跳包时间:	0		15s为单位*输入的数值	
心跳包内容:	heart			
高级参数 注册包选择: 注册包内容: 心跳包时间: 心跳包内容:	1 v zlan 0 heart		15s为单位"输入的数值	

#### Click the communication Settings.

#### **Figure 12 Communication Settings**

Here you can configure serial port parameters, 8305 working on the client or server, destination IP and port. Set heartbeat package, registration package, etc.

Click protocol to select:

	工作模式	通讯设置	协议选择	
协议选择				
* 工作协议:	MQTT协议	Ŧ		
MQTT ID:	zlan			
用户名:	zlan			
密码:	zlan			
订阅主题:	zlan			
发布主题:	zlan			
		MQTT高级参数↓		

#### **Figure 13 Transformation Protocol**

Here you can select as follows:

- 1) No protocol: at this point, the serial port and TCP are transparent transport.
- Modbus protocol: at this time, the serial port is Modbus RTU protocol and the network is Modbus TCP protocol.
- 3) MQTT protocol: at this point the network is the MQTT protocol, and the serial port data is sent as the payload of the MQTT, where some mqtt-related parameters can be filled in. Click the "MQTT advanced parameters" button to select the configuration of advanced parameters.

		MQTT高级参数↓	
保活时间:	40		小于65535秒
清除标志:	1	Ŧ	
遗愿选择:	0	Ŧ	
遗愿主题:	zlan		
遗愿信息:	zlan		
遗愿消息质量:	0	T	
遗愿保持标志:	0	T	
订阅消息质量:	1	Ŧ	
发布消息质量:	0	Ŧ	
服务器保持发布消息:	0	Y	

#### Figure 14 advanced parameters of Modbus

Click device management:

<b>固件更新</b> 选择文件 未选择任何文件 固件更新	条统状态	设备配置	设备管理
选择文件 未选择任何文件 固件更新			
	╪ 未选择任何文件		固件更新
重启设备重启			重启
修改密码			
新密码:	新密码:		
再次输入新密码:	欠输入新密码:		
修改密码			修改密码

#### Figure 15 Device management

Here you can update firmware, restart the device, and change passwords.

## **5.3ZLVircom Configuration**

Through the ZLVircom tool, the local cross-network segment can search the device through the network and upgrade the firmware, and manage the device and upgrade the firmware through the cloud. In addition, ZLVircom can be used to create virtual serial ports, and if you do not need the virtual serial port function, you can download the installation-free version.

Download address: http://www.zlmcu.com/download.htm

Software	Description		
ZLVircom device management tool (non-	Non-installed version does not contain		
installed version)	virtual serial port function		
ZLVircom device management tool	Installation version, which contains		
(installation version)	zlvircom_x64.msi and zlvircom_x86.msi.		
	The 64-bit operating system installs x64,		
	and the 32-bit operating system installs the		
	x86 version.		

#### Table 1 ZLVircom version

When installing ZLVircom, follow the default prompt. After installation, zlvircom will be started every time the computer starts up, which is used to start up and create a virtual serial port.

## 5.3.1 LAN management

This usage is only for version 8305L, because 8305 does not have an Ethernet port. Assume that the computer on which ZLVircom is installed is on the same LAN as the 8305L port.

Click "device management" in the main interface of ZLVircom to enter the device management dialog box, and then click "automatic search".

设备管理													_	×
序	类型	设备名称	Ρ.	设备IP	本地	目的IP	模式	TCP连	虚拟串口	虚拟串口状	设备ID	TXD	RXD	
1	内网	httpd		192.168.1.254	0	192.168.1.184	TCP Client	未建立	未设置	未联通	E631C037	0	0	
2	内网	ZLAN800		192.168.10.1	0	192.168.1.57	TCP Client	已建立	未设置	未联通	01020304	0	0	目动搜索
	-													手动添加 串口搜索 P2P设备
														编辑设备 搜索列表 返回

#### Figure 16 LAN search

At this time, the configuration information of the device can be viewed. Currently, it is only supported to be read only and cannot be configured. Double-click to enter device editor, and then click "upgrade firmware".

反菌反直					
┌设备信息────	┌网络设置────		高级选项		
虚拟串ロ 不使用 💽	IP模式	静态	DNS服务器IP 8 . 8 . 4 . 4		
设备型号 Unknown	IP地址	192 .168 .10 .1	目的模式 动态 🗸		
设备名称 ZLAN8005A	端口	0	转化协议 无 🗨		
设备ID 5A4C01020304	工作模式	TCP 客户端     ▼	保活定时时间 60 (秒)		
固件版本 V1.500	子网掩码	255 . 255 . 255 . 0	断线重连时间 12 (秒)		
	网关	192 .168 .10 .1	网页访问端口 80		
□ 网页下载	目的IP或域名	47.95.144.92 本地IP	所在组播地址 230 . 90 . 76 . 1		
🗖 域名系统	目的端口	1884	□ 启用注册包: □ ASCII		
<b>一</b> REAL_COM协议			□ 启用无数据重启 每隔 300 (秒)		
🗖 Modbus TCP转RTU	波特率	115200 🔽	□ 启用定时发送参数每隔 5 (分钟)		
■ 串口修改参数	数据位	8 🗸	更多高级选项		
☑ 自动获取IP	校验位	无 🔽			
┏ 存储扩展EX功能	停止位	1 •	数据包长度 1024 (字节)		
□ 多TCP连接	流控	无	数据包间隔(越小越好) 3 (毫秒)		
系统默认参数 保存默认参数 加载默认参数 修改密码 升级固件 重启设备 修改设置 取消					

Figure 17 firmware update

Select the firmware that needs to be upgraded to upgrade:

卓岚网页/程序下载工具	-	×
<ul> <li>〇 网页目录下载 本地网页所在根目录:</li> <li>C:\Users\peter\Desktop\conf;</li> </ul>	s	<ul> <li>● 程序文件下载</li> <li>选择程序文件:</li> <li>□ \zlan_u</li> </ul>
执行网页压缩算法: 🔲		
特殊功能:	设计状态转换文件	
卓岚联网产品的IP地址或域名:	192. 168. 1. 163	下载端口(一般无需修改): 1092
模块类型/型号:	2003	•
网页Flash空间大小选择:	256 💌	KB
下载时,请先关闭打开的网页。		
停止		

Figure 18 firmware upgrade

## 5.3.2 Remote Manage and Upgrade

This method can be used for 8305L and 8305 models. Suppose the device is connected to the cloud on port 1884. Then run the ZLVircom tool on the server, click the menu "configuration", enter the "software configuration", and change the listening port to 1884

vircom 配置		×
<ul> <li>虚拟串口工作模式</li> <li>● 普通模式,模拟网络写入速率</li> <li>● 模拟串口写入速率</li> <li>● 模拟串口写入速率</li> <li>其它配置</li> <li>每隔 300 秒,检查配置文件更新。</li> <li>□ 打开串口时清空之前缓存数据。</li> <li>□ 每隔 5 秒刷新手动添加设备</li> </ul>	<ul> <li>送择需要自适应的串口参数</li> <li>☑ 波特率</li> <li>☑ 数据位</li> <li>☑ 校验位</li> <li>☑ 停止位</li> <li>☑ 流控</li> <li>□ 品虚拟串口数据监视</li> </ul>	程序启动时界面 ○ 最小化 ○ 显示界面 默认监听端口 1884
的连接状态。后用后符增加网络页担。 每隔 30 秒自动建立TCP连接。 □ 禁用广播方式设备搜索功能。 □ 每隔 5 秒自动刷新设备列表。 确定	<ul> <li>□ 开启监视(将增加内存开销)</li> <li>监视缓存: 3000 字节</li> <li>□ 十六进制监视模式</li> <li>□ 显示数据收发时间</li> </ul>	设备P2P心跳丢失 30 秒 后重置P2P连接。

#### Figure 19 Modify the listener port

Pop-up dialog prompts:

监听端口冲突!
默认端口已经被其它程序占用,请退出占用该端口的程序, 并点击"确定"或修改端口号,并点击"确定"。点击"取 消"将取消TCP服务。
修改端口号: 1884

#### Figure 20 Modify listener port 2

Be sure to select the cancel button in this step. After 1-2 minutes, you can see the connected device when you enter device management. You can perform device management and firmware upgrade as described in the "LAN management" section.

# 6. Communication test

## 6.1 Communication of Server and Device

This test is suitable for 8305 and 8305L.

Assuming the following networking structure as shown in the figure below, 8305 is configured to connect to port 4196 of server 116.226.72.135. Use the method in the "serial port configuration" section. After the configuration is completed, the power will be re-powered, and it will take 40-50 seconds to connect to the server.



#### FIG. 21 Networking Structure Diagram

We run TCP tool SocketDlgTest on the server (http://www.zlmcu.com/document/tcp\_debug\_tools.html).

🤰 卓岚TCP&UDP调试工	具-ZLAN专业的串口联网方案提供商-http://www.zlmcu.com
通信设置	<u> 接收缓冲大小: 10000</u> 字节
工作模式: TCP服务器 ▼ d	lev send
本地端口: 4196 0表示任意	
WDP目的IP/端口随对方变化 ☑	
目的IP: 192.168.1.200	
目的端口: 4196	
所在组播组: <sup>230.90.76.1</sup>	
关闭 ☑ 自动重连	×
	定送信息(ctrl+Enter输入回车(OxOd,OxOa); \r输入OxOd,\n输入OxOa) 发送
□ 十六进制援收 □ 洗择接收文件/信止接收	erver send
清除窗口	- 伊止
	3告 I 关闭报告
□ 十六进制发送(格式01 02)	0:13:52.628 :TCP socket 114.87.22.200:19968 Send OK!
□ 每隔 1000 毫秒发送 1	0:13:52.627 :TCP socket 101.84.48.75:55848 Send OK!
□ 收到任何数据后启动发送	0:13:49.979 :TCP row from socket 114.87.158.58:39357
	0:12:32.275 :The NO. 16 TCP socket 114.87.158.58:39357 is accepted!
118成友法乂仟名	×
本地IP: 10.80.85.60 高级设	置 计数和校验和 TXD: 17 992 RXD: 8 641 重新计数

#### Figure 22 Server-side tools

Select the local port of 4196 as shown in the figure (note that if you run the ZLVircom tool, you need a different port), and then click the "open" button. When 8305 connects to the server, it will display information of "The NO... Is accepted!".

Now connect serial port of 8305 to the usb to serial port 232 wire, and open a serial port debug tool (http://www.zlmcu.com/document/com\_debug\_tools.html), and open the correct com port. The diagram below:

😪 卓岚串口调试工具-http	://www.zlmcu.com		a a had	×
通信设置 串口号 COM4 ▼ 波特率(支持手动输入) 115200 ▼	server send			*
数据位 8 ▼ 停止位 1 ▼ 校验位 None ▼ 流控制 None ▼				
关闭串口				
接收区设置 □ Hex显示 接收窗口字节 1000				
<ul> <li>□ 自动发送</li> <li>毎隔 1 (ms)</li> <li>□ 发送收到的抽</li> </ul>	发送信息(ctrl+Ente: dev send	ະ输入回车 (0x0d, 0x0a) ;	; \r输入OxOd,\n输入	(0x0a)
<ul> <li>帧尾字符0x 0b</li> <li>□ 收到帧尾后发送</li> <li>□ 加载自动发送指令</li> </ul>				手动发送
发送一应答时间差 2752	, .25( (ms)均值 <mark>2752.</mark> ;	251 (ms) 计数TX:	8 RX: 17	

Figure 23 Serial Port Debugging tool on device side

Now if you send data through the serial port, you will receive the corresponding data "dev send" on the server side, and if you send data "server send" through the server side, you will receive the same data through the serial port tool. This demonstrates the two-way communication between serial port to 4G network.

## 6.28305L test

The following test is suitable for model 8305L.

## 6.2.1 Transparent Transmission Test

Connect the computer serial cable to the device. On the WEB set the device to wired mode, TCP server mode, local port 4196. Select convert protocol to no protocol.

Open SocketTest network debugging software and Comdebug serial debugging software. Set SocketTest to the client mode, the destination IP is set to the device IP, and the destination port is the local port 4196 of the device. Click to open the connection device. Set the Comdebug software's serial port parameters to be consistent with the device's serial port parameters. Comdebug and SocketTest software can carry two-way communication through the device.

	— 🤏 卓岚串口调试工具-http://www.zlmcu.com X
シ 卓成TCP&UDP调试_L具-ZLAN专业的单口联网方案提供的-http://www.zlmcu.com - U )	通信设置
·通信设立 · · · · · · · · · · · · · · · · · · ·	_ 串口号 COM5 ▼ 1234686990
11月候式: 10月客戸端 ▲ 0987654321	波特室(支持手动输入)
本地端山:  º 0表示任意	115200 -
WDF目的IF/端口随对方变化 🔽	数据位 8 🔽
目的IP: 192.168.1.163	停止位 1 👤
日的港口: 4196	校验位 None ▼
	· 流控制 None ▼
所任祖藩组: 200.30 .10 .1	关闭串口
关闭 IV 自动重连	接收区设置
	□ Hex显示
发送	接收窗口字节 1000
□ 选择接收文件/停止接收 信止	清除窗口
清除窗口	
发送区设置报告 [] 关闭报告	▲ Hex发送(如01 02)
□ 十六进制发送(格式01 02) 15:26:31.712 :TCP row from socket TCPClient	□ 自动发送
□ 毎隔 50 変形发送 15:26:08.89 :TCP rov from socket TCPClient	毎隔 10 (ms) 友送信息 (ctrl+Enter输入回车(0x0d,0x0a); \r输入0x0d, \n输入0x0a)
□ 收到任何数据后启动发送 15:26:05.188 :TCP socket TCPClient Send 0K!	□ 发送收到的帧
发送接收方式: 信息模式 ▼ 15:25:43.66 :TCP rov from socket TCPClient	· 翰尾字符0x Od 手动发送
修改发送文件名	「 收到帕尾后发送
本地IP: 192.168.10.50 高级设置 IXD字节: 53 RXD字节: 98 接收数据次数: 0 重新计	□ 加戦自动发送指令 、
	发送一应答时间差 1964089 (ns)均值 390607.1 (ns) 计数TX: 90 RX: 54 重新计数

#### Figure 24 Transparent Transport Test

## 6.2.2 Modbus Protocol Conversion Test

The configuration parameters are basically the same as the no protocol pass-through test. All that is required is to change the conversion protocol to MODBUS. MODBUS RTU protocol can be converted into MODBUS TCP protocol of the network, and MODBUS TCP protocol of the network can be converted into MODBUS RTU protocol of the serial port.

自 お に た の ち の ち の た に の の の の の の の の の	👒 卓岚串口调试工具-http://www.zlmcu.com 🛛 👋
通信设置     指收信息     接收信息     接收信息     接收信息     第中       工作模式:     TCF客户端     0     00     00     00     00     00     00       本坊街湖口:     0     0     0     05     00     01     03     00     00     00     0       비印目的17:     192:163.1163     目日時減口:     192:163.1163     目日時減口:     14166       所在組織組:     230:90.76.1     三            美田<	通信法     005 · · ·       銀台菜(支持手助输入)     115500 · ·       「115500 · ·     ·       泉田俊 (支持手助输入)     ·       「11550 · ·     ·       水田俊 (支 · ·     ·       水田俊 (J · ·     ·       小田俊 (J · ·     ·       小田俊 (J · ·     ·       小田 (J · · ·
接收区设置         送送信息(etrl*Enter编入回车(0x04.0x04)*\r编入0x04.\r编入0x04.\r编入0x04.         发送信息(etrl*Enter编入回车(0x04.0x04)*\r编入0x04.\r编入0x04.\r编入0x04.         发送           び         十六批時換收         000000000000000000000000000000000000	「 F Ine最示 撤收窗口字节[1000 承折窗口」 发送[C9畳 「 F Ine发送 (0001 02)   自动发送
本地IP:         1992.168.10.50         高级设置         TXII字节:         100         IXII字节:         114         接收數据次数:         0         重新计器           在WEB 上将转换协议选择为 MODBUS 协议转换         在WEB 上将转换协议选择为 MODBUS 协议转换         114	4239908(局友选 □ 加數自动发送指令 ) 发送一应部时间差 30501.01 (ms)均值 300637.5 (ms) 计数TX: 98 8X: 63 重新计数

Figure 25 Modbus protocol conversion test

#### 6.2.3 MQTT Protocol Test

This test is to connect BAIDU cloud to do a test. Create a new theme on BAIDU cloud called zlansub, which allows publishing and subscription. The device is configured as a client mode to connect the IP of BAIDU cloud and port 1883, and the conversion protocol is selected as MQTT protocol.

Enter the ID, username, and password of the MQTT. Since the theme of publish and subscribe on BAIDU cloud is zlansub, the theme of publish and subscribe configured by the device is also zlanusb. The advanced parameters of MQTT are not configured in this test, but are actually configured as required.

		工作模式	通讯设置	协议选择	
协议选择					
* 工	作协议:	MQTT协议	~		
N	AQTT ID:	zlany			
	用户名:	,			
	密码:				
ì	订阅主题:	zlanjsub			
2	发布主题:	zlanşub			
			MQTT高级参数↓		

Figure 26 MQTT Settings

The data is sent from the serial port of the device and published to the BAIDU cloud MQTT server through the theme of zlansub. At the same time, because the device has subscribed to the theme of zlansub, the MQTT server sends the information to the device after receiving the information published by the device, which forms a spontaneous self-collection test of the serial port. At the same time, we also subscribe to the theme of zlansub on BAIDU cloud, so we can also receive the data of zlansub theme on BAIDU cloud.





# 7. The AT command

## 7.1 Login and Configuration

## 7.1.1 Enter Configuration Mode

Instruction: REQUEST CFG MODE

**Function:** enter the configuration mode, send this instruction in the device startup stage, and enter the configuration mode after the device is started.

Return: CFG MODE\r.

## 7.1.2 Landing

Instructions: ZL+LOGIN=666666\r\n

Function: login, modify the device parameters need to be in the login state to succeed.

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

## 7.1.3 Get Device Status

Instructions: ZL+STAT?\r\n

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

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

## 7.2 Serial Port Parameters

## 7.2.1 Gets Serial Port Parameter

Instructions: ZL+BAUD?\r\n

Function: get baud rate

Return: +BAUD:n\r\n, n represents the specific BAUD rate

## 7.2.2 Get Check Bit

Instructions: ZL+CHECKB?\r\n

Function: get the check bit

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

N: no check

O: parity

E: odd parity

## 7.2.3 Fetch data bit

Instructions: ZL+DATAB?\r\n

Function: get data bits

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

## 7.2.4 Set serial port parameters

**Instructions:** ZL+BAUD=n\r\n

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

Returns: +BAUD:n\r\n

## 7.2.5 Set check bit

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

Function: set check bit

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

N: no check

O: parity

E: odd parity

## 7.2.6 Set data bit

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

Function: set data bit

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

## 7.3 Network Parameters

## 7.3.1 Get the destination IP or domain name

Instructions: ZL+PIPADD?\r\n

Function: gets the destination IP or domain name

Returns: +PIPADD=ip\r\n

## 7.3.2 Get destination port

Instructions: ZL+PPORT?\r\n

Function: gets the destination port

Returns: +PPORT=n\r\n

## 7.3.3 Get the device working mode

Instructions: ZL+PROTOCOL?\r\n

Function: gets the device's working mode

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

## 7.3.4 Get DNS server IP

Instructions: ZL+PDNS?\r\n

Function: gets the DNS server IP address

Returns: +PDNS=ip\r\n

## 7.3.5 Set the destination IP or domain name

Instructions: ZL+PIPADD=ip\r\n

Function: sets the destination IP or domain name

Returns: +PIPADD=ip\r\n

## 7.3.6 Set destination port

Instructions: ZL+PPORT=n\r\n

Function: sets the destination port

Returns: +PPORT=n\r\n

## 7.3.7 Set operating mode

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

Function: sets the working mode

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

## 7.3.8 Set up DNS server IP

Instructions: ZL+PDNS=ip\r\n

Function: set DNS server IP address

Returns: +PDNS=ip\r\n

## 7.4 Registration package and heartbeat package

## 7.4.1 Query the registry content

Instructions: ZL+ENROL?\r\n

Query registry contents (default registry hexadecimal)

Returns: +ENROL:1234567890\r\n

## 7.4.2 Enable to register packages

Instructions: ZL+EN\_ENROL?\r\n

Query to enable registry (1 enable 0 disable)

Returns: +EN\_ENROL:1\r\n

## 7.4.3 Set the registry content

Instructions: ZL+ENROL=123456\r\n

Set the register package content (default register package hexadecimal) to the actual register package 0X12 0X34 0X56

Returns: +ENROL:123456\r\n

## 7.4.4 Enable/disable registration packages

Instructions: ZL+EN\_ENROL=1\r\n

Enable/disable registration packages

Returns: +EN\_ENROL:1\r\n

# 8. Accessories to choose

#### Model selection:

Model	Function	Instruction
ZLAN8305	4G to serial port	Without Ethernet port
ZLAN8305L	4G to serial port, Ethernet to serial	Including Ethernet network port
	port, 4G router	

#### Antenna selection:

Glue stick antenna or sucker antenna can be selected. The default of sucker antenna is 2M,

and 3M antenna can be customized.

#### Power input:

The default is a plug Q2.1 socket, which can be customized as terminal power input.

Guide rail mounting accessories are available.

# 9. 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