ZLSN2002 Embedded Device Networking Module

User Manual

Embedded Device Networking Solution

Version Information

The History of the revision to this document:

History

Date	Version	Document ID	Revising content
2011-11-01	Rev.1	ZL DUI 20111101.1.0	Release

Copyright information

Content

1. Summary

ZLSN2002 is an embedded module of serial port to Ethernet. It provides a fast, stable and economical method for embedded system and microcontroller access to TCP/IP network. Not only can ensure that your products are listed in market quickly, but also provide support for the stability of your products.
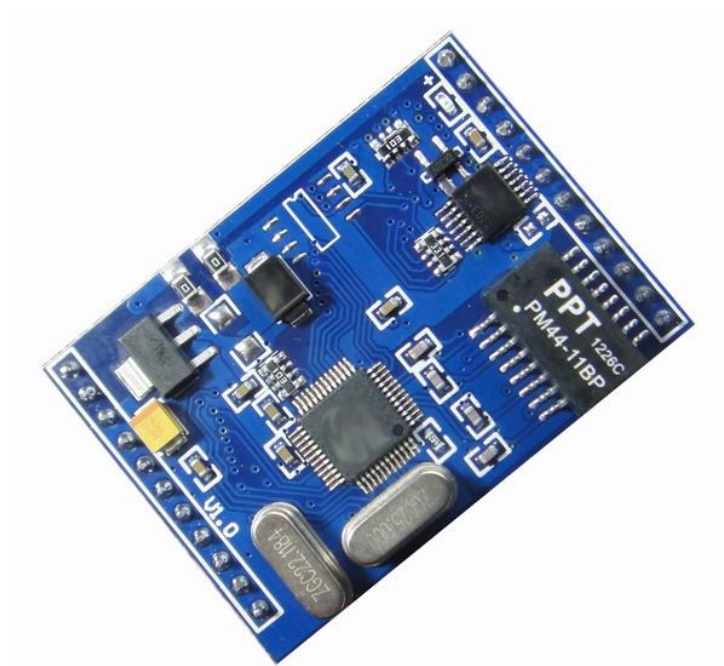

Figure 1 ZLSN2002

ZLSN2002 has 2 rows of single row needles, 11 needles and 12 needles, which are inserted through row pin to the user's circuit board. This includes two TTL-type serial wires for connecting the single chip. It provides four Ethernet cable connections that can connect Ethernet cable. Provide 5V power supply and GND to ZLSN2002 then it can realize the two-way forwarding of serial port and Ethernet port. In addition, the ZLSN2002-3.3 V model supports 3.3V power supply.

Compared with ZLSN2000, ZLSN2002 embedded networking module is already embedded network transformer internally, so users only need to connect network pins and RJ45 Ethernet port, serial port pin connecting to the serial port of user MCU.

Compared with ZLSN2001, ZLSN2002 has features of faster speed, and

zlsn2002-3.3V supports 3.3V. In addition, ZLSN2002 is higher in power consumption, ZLSN2002 is 100mA, while ZLSN2001 is about 30mA. ZLSN2002's pins are compatible with ZLSN2001.

ZLSN2002 provides Ethernet transparent transmission capabilities by default, as the serial data transparently converted to the application layer data of TCP protocol and vice versa. ZLSN2002 provides four working modes of TCP server, TCP client, UDP and UDP Multi-cast, which can be determined according to the user's upper computer software/equipment.

In terms of performance, ZLSN2002 can adapt to the temperature range of industrial grade and adapt to various complex voltage environment. The network can adapt to normal and fast operation in the high load network environment. Guarantee the zero packet loss of TCP transport data.

In terms of function, ZLSN2002 has a full range of features, which support 100 simultaneous TCP connections as the server, and support numerous features such as restart when no data.

ZLSN2002 is widely used in security monitoring, smart power grid, factory automation, energy environment detection, intelligent transportation and other fields. Let your system upgrade from serial port to Ethernet port immediately, let your device add network function immediately.

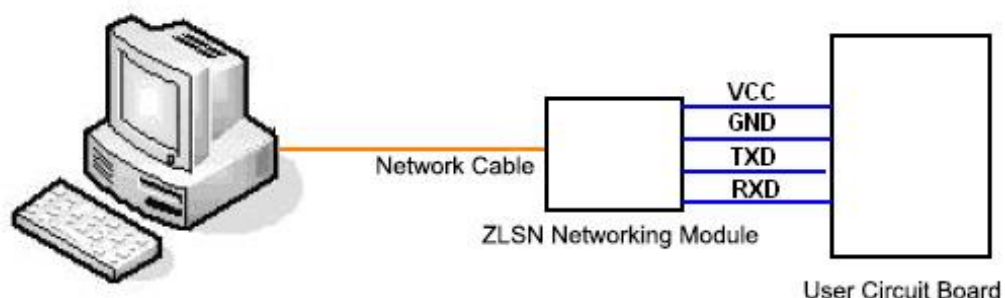The schematic diagram of ZLSN2002 is shown in figure 2.

Figure 2 Schematic Diagram of ZLSN2002 Usage

2. Features

(1) The system characteristics

Stable and reliable, support full duplex, high speed, long time data forwarding, not losing packets. ZLSN2002 is the first full-duplex, uninterrupted, low-cost embedded networking module in the industry. Support users to send large quantities of data without interruption at the same time, when sending no need to stop also without losing data.

(2) The software features

1) Working mode: support TCP Server, TCP Client, UDP mode, UDP multicast. Support includes: UDP broadcast, device pair communication, Realcom mode. UDP mode supports simultaneous communication with multiple visitors.

2) The baud rate supports 1200~460800bps, and can be customized to special baud rate. The data bits support 5~9 bits, and the check bits can be None, Odd, Even, Mark, and Space, supporting flow control CTS/RTS, DSR/DTR, XON/XOFF, 1~2 stop bits.

   Support for fast switching the 9th bit, which is suitable for use in a multi-machine communication when the 9th bit as address.

3) Support virtual serial port, equipped with Windows virtual serial port & device management tool ZLVircom.

   a) When using virtual serial port, support the serial parameters self-adaption of on-the-fly technology.

   b) Virtual serial driver supports Windows 7/8/10 and 64-bit operating systems.

   c) The virtual serial port is stable and reliable, but the whole duplex can continuously send not 1 byte.

d) In virtual serial mode, it supports broken network reconnect function.

4) Module parameter modification mode is flexible and varied.

  a) Equipped with Windows tool ZLVircom, a one-click search for LAN devices, manually adding devices on the Internet.

  b) Web browser mode. The built-in Web server can modify module parameters through the browser.

  c) All parameters can be set by ZLSN2002 serial port, and the command format is similar to the AT command, which can be directly controlled and read the operation status.

5) Support DHCP, DNS and no data restart functions.

6) Support read and write for 7 IO pins.

(3) Hardware characteristics

1) Economic prices. Bulk customer can give special offer.

2) Super small size: 31.75 x 44.45 mm.

3) Low power consumption, maximum current is less than 100mA.

4) Super pressure resistance: can resist the power connecting reversely or high pressure.

5) Wide temperature range: support live work under - 40~85 ℃.

(4) Supporting software and technical support

1) Complete supporting software. Equipped with Windows device management tool ZLVircom, one-key search networking module and modify parameters. Equipped with UDP/TCP debugging tool SocketDlgTest. Equipped with serial debugging tool ZLComDebug. ZLSN2030EX web download tool ZLFsCreate.

2) Provide example programs for the upper machine development, includes: VC, VB, Delphi, C ++ Builder, Java, C# routines. It can also provide a DLL library

that can communicate directly with networked modules via the Ethernet port.

(5) Special function module

1) Page module ZLSN2032EX. The user can design the web page and download it to the inside of the module. Support the ZLAN web page control technology, such as the web button can directly control the relay, the web page can display temperature and other user data.

2) Multi-destination IP module ZLSN2092MDIP. Support to connect 8 destination IP and do communication at the same time.

3) Modbus TCP converting to Modbus RTU module ZLSN2042. Connect Modbus RTU device and Modbus TCP software/device.

3.   Technical Parameter

Figure			
Interface:	23 pins in double rows		
Size:	31.75 × 44.45mm		
Communicate Interface			
Ethernet:	10M/100M self-adaptive,1KV surge protection		
Serial	TTL×1: RXD, TXD, GND. Interface level 3.3V		
Serial Parameters			
Baud rate:	1200~460800bps	Parity bits:	None, Odd, Even, Mark, Space
Data bits:	5～9	Flow Control:	RTS/CTS, DSR/DTR, XON/XOFF, NONE
Software			
protocol:	ETHERNET, IP, TCP, UDP, HTTP, ARP, ICMP, DHCP, DNS		
Setting method :	ZLVirCom, WEB browser, serial port		
Net communication method:	Socket, Virtual serial		
Work Mode			

TCP server, TCP client, UDP, UDP Multicast	
Power Requirement	
Power supply:	5V DC (ZLSN2002-3.3V support 3.3V) <100mA
Environment	
Running temp.:	-40~85℃
Storage temp.:	-45~165℃
Humidity:	5~95%RH

4. Interface Definition
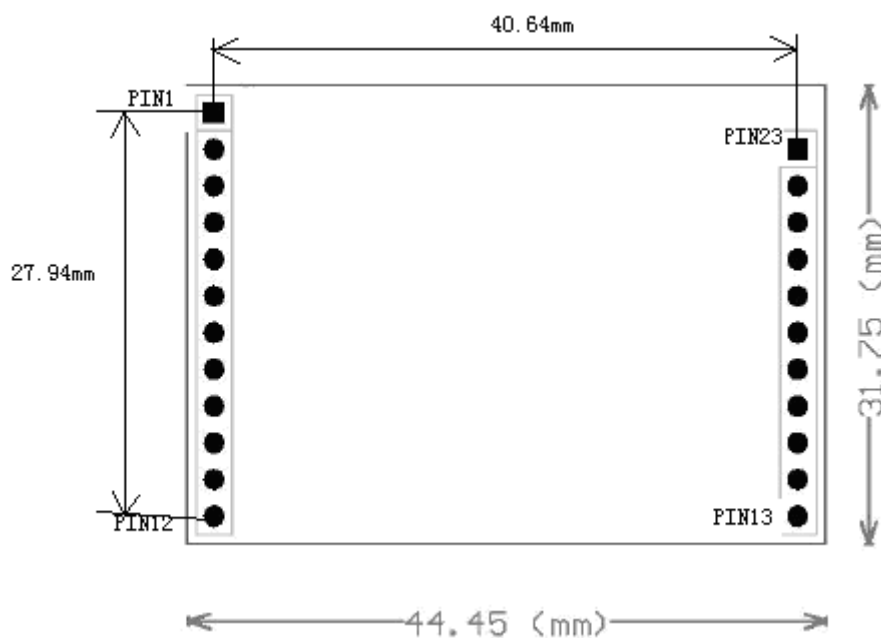
The front of the module is shown in FIG. 3:

Figure 3 ZLSN2002 Front View

The pin definition is shown in the following table:

Table 1 Pin Definition of ZLSN2002

Pin	Signal	Direction	Pin	Signal	Direction
1	ETHER_TX+	OUT			
2	ETHER_TX-	OUT	23	RTS	OUT
3	ETHER_RX+	IN	22	CTS	IN

4	ETHER_RX-	IN	21	DEF	IN
5	CG	OUT	20	MODE	OUT
6	TXD	OUT	19	100M_LINK	OUT
7	RXD	IN	18	RESERVE	IN/OUT
8	485_TXD_EN	OUT	17	NC	/
9	SPR	IN	16	LINK	OUT
10	nRST	IN	15	ACT	OUT
11	GND	IN	14	VCC(+5V)	IN
12	GND	IN	13	VCC(+5V)	IN

The pin functions are described as follows:

(1) TXD, RXD: TTL level, serial port input and output pins can be directly connected with MCU serial port. Note that RXD is connected to user MCU TXD, TXD connect user MCU RXD.

(2) CTS, RTS: TTL level, serial port flow control pins.

    a) When the flow control of ZLSN2002 is NONE and XON/XOFF, the two pins do not work, normally RTS= 0.

    b) After the flow control is set to CTS/RTS or DTR/DSR, normally RTS=0, RTS=1 indicates that ZLSN2002 cannot receive data, and the user MCU should stop sending data to ZLSN2002. The reasons that ZLSN2002 could not receive data include: module initialization, TCP connection not established, ZLSN2002 serial port reception buffer full; ZLSN2002 only outputs data from serial port when User MCU CTS is set to 0.

    c) RTS can be used as an indication of ZLSN2002 initialization. When the flow control is NONE or XON/XOFF, the RTS=1 indicates that ZLSN2002 is in initialization, RTS=0 indicates that ZLSN2002 is initialized. Therefore, RTS=1 can be used to detect whether ZLSN2002 is restarted through the network.

(3) TPIN +, TPIN -, TPOUT -, TPOUT+: network input and output pins.

(4) MODE, SPR: for the ZLSN2030EX web page download module, these two pins are used to control the storage extension chip. Not used in other models.

(5) DEF: for 0, and hold for more than 1 second, the module will restart, with default IP of 192.168.1.254, static IP mode, gateway 255.255.255.0, gateway 192.168.1.1. This helps users to reset to default IP when they forget IP.

(6) ACT: at 0, indicates that the ZLSN2002 serial port has data send-receving. Connecting the negative pole of led light by 1K resistance.

(7) LINK: at 0, it indicates that the module has established the TCP connection (or in UDP mode) with the network server, and the network connection is normal, so the module can send and receive data normally. If the cable is unplugged at this point, the LINK will become 1. Connecting the negative pole of led light by 1K resistance.

(8) 485_TXD_EN: 485 sending control side, normally 0, be 1 when the module sends data to the serial port. Can directly connect the MAX485 chip's TXD_EN pin.

(9) 100M_LINK: if the line is connected, output low level, or else output high level. Connecting the negative pole of led light by 1K resistance.

(10) NRST: inputting low level to this pin it will do reset of the module, suspend when not in use. The input reset level is less than 0.8v and the duration is greater than 10us.

(11) CG: for the products of ZLSN2002-G, the CG pins connect to the shell to enhance the ability of resisting electromagnetic interference.

(12) RESERVE: reserved for extended use, please do not use, just hanging.

(13) NC: unconnected

Note: the pins users do not use please hang them.

5.　Model Choose

Model	Instruction
ZLSN2002	5V voltage supply by default
ZLSN2002-3.3	3.3V voltage supply
ZLSN2002-G	5V products with more electrostatic protection on Ethernet port, please connect CG pins to the shell GND of the product to achieve better results.

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