

# **ZLAN6842/6802/6844**

## **8 Channels DI/DO/AI**

### **Remote IO Controller**

# **User Manual**

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# 1. Summary

ZLAN6842/ZLAN6802/ZLAN6844 are 8 channels remote IO controller launched by Shanghai ZLAN after ZLAN6042. The controlled channels from 4 channels of 6042 extending to 8 channels, including 8 channels Digital Input(DI), Digital Output(DO), Analog Quantity Input(AI). The DI support dry contact and wet contact with opto-isolator; DO is relay output with 5A 250VAC or 5A 30VDC control ability; the before 4 channels of AI input support 0~5V voltage quantity input, the after 4 channels support 4~20mA current input, the accuracy is 10 bits. ZLAN6842/ZLAN6802/ZLAN6844 respectively support 3 communication methods of Ethernet, RS485, Wifi.



Figure 1 ZLAN6802/6842

**ZLAN6842:** it's an IO controller using Ethernet to control, the usually using communication protocol is Modbus TCP protocol, in this case the module converting protocol choose Modbus TCP to RTU, DI/DO/AI are corresponding to different register. If want to control through Modbus RTU protocol, set module converting protocol to "No", by using TCP to send Modbus RTU protocol can do the control. The product can conveniently and reliably though

Ethernet to collect switch value, control relay, collect sensor.

**ZLAN6802:** It is an IO controller using RS485 bus to control. Compared with ZLAN6842, it only supports Modbus RTU protocol, but low cost, suitable for using RS485 bus to control relay, collect switch quantity and analog quantity. The default baud rate is 9600bps, can be custom set.



**Figure 2 ZLAN6844/6844N WIFI Remote IO Controller**

**ZLAN6844:** Compared with 6842, 6844 adds WiFi interface, it can save the wiring trouble. Meanwhile it has Ethernet interface. WiFi can be neither as AP nor as SAT style to connect router.

**ZLAN6844N:** Compared with 6844, it adds P2P function. It can use ZLAN P2P technology to realize relay control, switch quantity collection, analog quantity acquisition through ZLVircom or cellphone P2P software in anywhere.

**6802/6842/6844/6844N can be applied to:**

- building/e-guard system/security system;
- industry automation system;
- Intelligent home.

The typical application is showed in Figure 3. User connects IO devices to ZLAN6842 and connects ZLAN6842 to Ethernet. Then the PC software can control the IO devices through Modbus TCP protocol to realize query input device and control output device.

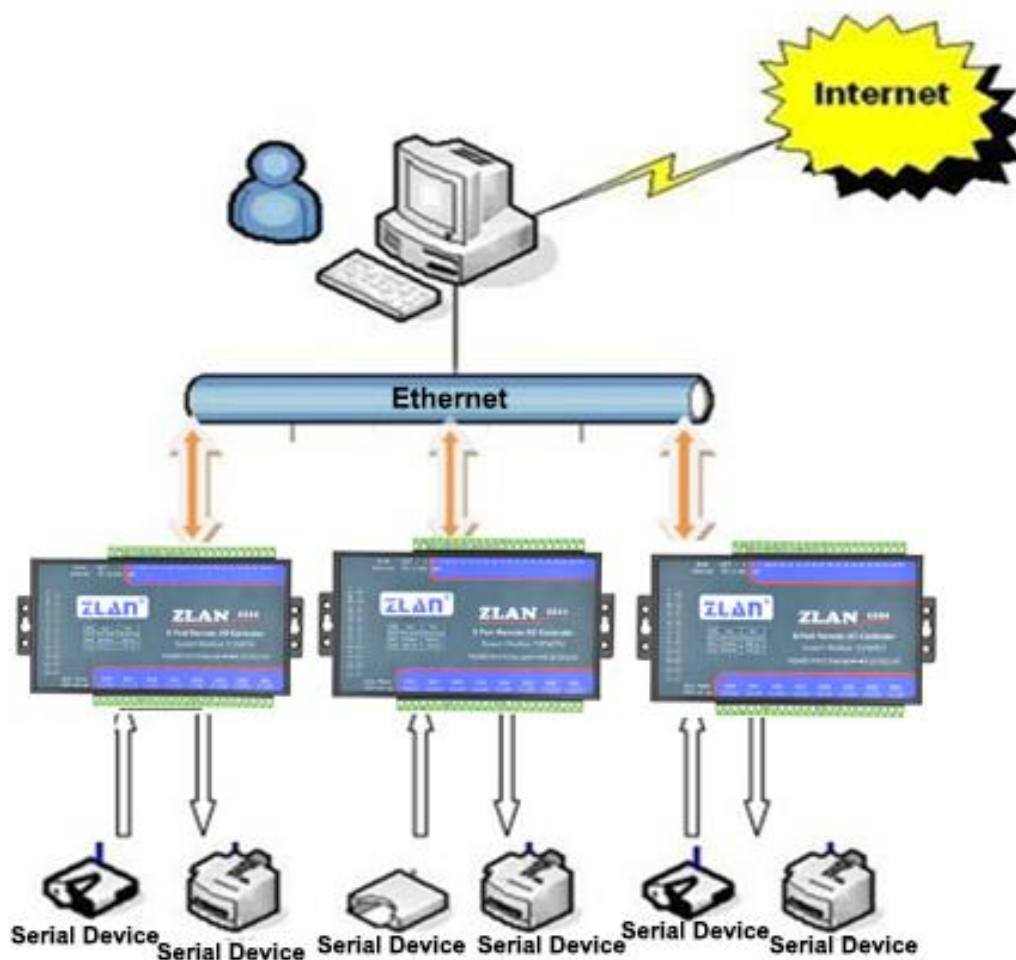


Figure 3 Connection Diagram

## 2. Feature

- 1) 8 channels digital quantity input:

Support passive switch value (dry contact) and active level (wet contact). The active level range as below:

VCC Voltage	Low Level Range	High Level Range
24V	0~17V	17~24V
9V	0~3V	3~9V

2) 8 channels digital quantity output:

The output type is relay output (5A@AC250V/DC30V).

3) 8 channels analog quantity input: in default the first 4 channels are 0~5V voltage input, the after 4 channels are 4~20mA. If need customized, can modify any channels to the below 4 types:

(1)Current signal input: 4~20mA

(2)Voltage signal input: 0~5V

(3)Voltage signal input: 0~10V

(4)Resistance impedance input: 0~10k or resistor-type temperature humidity sensor, etc.

4) 8 channels switch value input state and 8 channels switch value output state both have independent indicator, can immediately know switch input/output state through indicator.

5) Provide demo software Remote IO controlled by RS485 or TCP/IP, can demonstrate IO control and AI data acquisition for devices.

6) Can provide complete RS485 control instructions and Modbus TCP commands, convenient for integrated development of engineer.

7) ZLAN6842/ZLAN6844 are freely equipped Windows virtual port & device management tool ZLVircom, support ZLVircom, can one-key search and modify parameters.

### 3. Technical parameter

Figure

Size:	L x W x H =9.2cm×19.7cm×2.5cm
<b>Serial Port Parameter (ZLAN6802)</b>	
RS485 Interface, 1200~115200 (default 9600bps), 8 bits data bit, None parity, 1 stop bit	
<b>Software</b>	
Upper protocol:	MODBUS TCP/ MODBUS RTU
Low-level Communication:	Ethernet, RS485, Wifi
<b>Relay Transmission Speed (Response Time)</b>	
ZLAN6842/ ZLAN6802 : <30ms	
<b>AI Input Type</b>	
Current signal input: 4~20mA	
Voltage signal input: 0~5V, 0~10V	
Resistance impedance input: 0~10k or resistor-type temperature humidity sensor, etc.	
<b>Power Consumption (Relay in Non pull-in State)</b>	
ZLAN6802: <12mA@24V	
ZLAN6842: <92mA @24V	
ZLAN6844/6844N: <220mA @24V	
<b>Environment</b>	
Running temperature:	-40~85℃
Storage temp:	-45~165℃
Humidity:	5~95%RH

## 4. Hardware description

The front view of Data Collector ZLAN6842/ZLAN6802/ZLAN6844 is shown as FIG 4.

Panel Light: from left to right, from up to down

- 1) ACT: communication activity indicator. Green means the device has received commands from RS485/Ethernet/WIFI, blue means the commands had been correctly identified and returned to the sender.



- 2) PWR: Power indicator.
- 3) Wifi Link: specially for ZLAN6844. The green blink means wifi in working, blue means wifi establishing.
- 4) Link: connection indicator. Green means the Ethernet connecting, blue means host has made TCP connection with the device, can go data communication.
- 5) DI1~DI8: green means DI1~DI8 input are low level or closed.
- 6) DO1~DO8: green means DO1~DO8 output are relay closed.

The upper side interfaces of ZLAN6842/ ZLAN6802/ ZLAN6844 shown as FIG 4 &5.

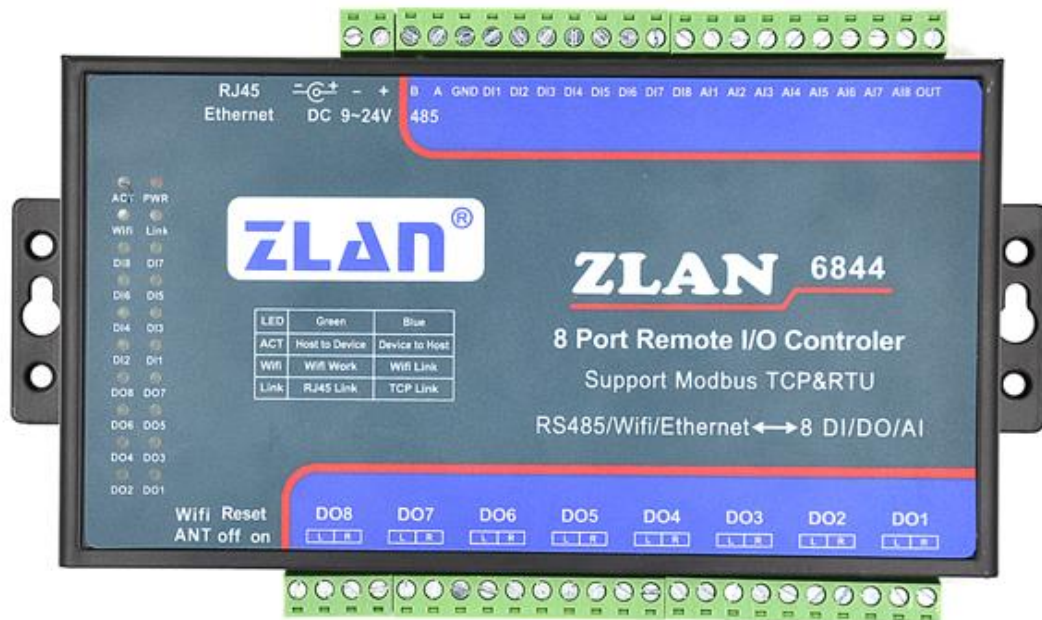


Figure 4 Panel Light

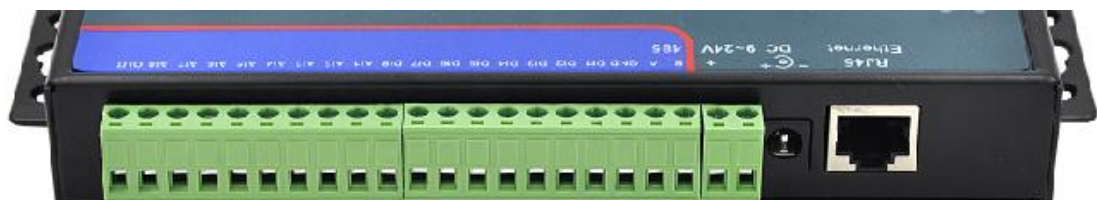


Figure 5 Upper side interfaces

Terminal	Function
RJ45	10M/100M Ethernet port, can do remote IO control via TCP/IP. (ZLAN6802 NO)
DC	DC pluggable power input, voltage 9~24V
Power terminal	Terminal power input, voltage 9~24V, optional with DC
RS485 B&A	A & B end of RS485 control port
GND	When dry contact input, bridging switch between the terminal and DI1~DI8, can collect the switch state.
DI1~DI8	8 channels switch value input
AI1~AI4	4 channels 0~5V voltage input
AI5~AI8	4channels 4~20mA current input
OUT	Test output point, can output 5V level, for test usage of AI1~AI8

The down side interfaces of ZLAN6842/ ZLAN6802/ ZLAN6844 shown as FIG 4&6.



**Figure 6 Down side interfaces**

Interface	Function
Wifi ANT	Wifi antenna port of ZLAN6844
Reset	To "On" for over 3 seconds, can reset IP address to default 192.168.1.254
DO8~DO1	R and L represent the 2 contacts of relay, here for 8 channels relay output

## 5. Software description

ZLAN6842/ ZLAN6802/ ZLAN6844 use standard Modbus TCP and Modbus RTU protocol, the Modbus register are as below:

**Table 1 DI register**

Register Area address	Channel	Order code	Description	Attribute
1	0	1	No. 1 DI Value	ready only
2	1	1	No. 2 DI Value	ready only
3	2	1	No. 3 DI Value	ready only
4	3	1	No. 4 DI Value	ready only
5	4	1	No. 5 DI Value	ready only
6	5	1	No. 6 DI Value	ready only
7	6	1	No. 7 DI Value	ready only
8	7	1	No. 8 DI Value	ready only

**Table 2 DO register**

Register Area address	Channel	Order code	Description	Attribute
00017	0	01/05	No. 1 DO Value	read-write
00018	1	01/05	No. 2 DO Value	read-write
00019	2	01/05	No. 3 DO Value	read-write
00020	3	01/05	No. 4 DO Value	read-write
00021	4	01/05	No. 5 DO Value	read-write
00022	5	01/05	No. 6 DO Value	read-write

00023	6	01/05	No. 7 DO Value	read-write
00024	7	01/05	No. 8 DO Value	read-write

**Figure 3 AI register**

Register Area address	Channel	Order code	Description	Attribute
30001	0	04	No. 1 AI Value	只读
30002	1	04	No. 2 AI Value	只读
30003	2	04	No. 3 AI Value	只读
30004	3	04	No. 4 AI Value	只读
30005	4	04	No. 5 AI Value	只读
30006	5	04	No. 6 AI Value	只读
30007	6	04	No. 7 AI Value	只读
30008	7	04	No. 8 AI Value	只读

ZLAN6842/ ZLAN6802/ ZLAN6844 use MODBUS general protocol to transmit data with host software, currently support: read single coil group instruction, force setting single coil instruction, read input register instruction.

### 1) Read single coil group instruction 0x01

Byte	1	1	1	1	1	1	1	1
Name	Device Addr.	Instruction type	start addr. High	start addr. Low	length High	length Low	CRC high	CRC low

For example: sending-> 01 01 00 00 00 08 3d cc

Return-> 01 01 01 80 50 28

## 2) Read input register instruction 0x01

Byte	1	1	1	1	1	1	1	1
Name	Device Addr.	Instruction type	start addr. High	start addr. Low	length High	length Low	CRC high	CRC low

For example: sending-> 01 04 00 00 00 08 f1 cc

Return-> 01 04 10 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 03 b4 55 ab

## 3) Force setting single coil instruction 0x05

Byte	1	1	1	1	1	1	1	1
Name	Device Addr.	Instruction type	start addr. High	start addr. Low	length High	length Low	CRC high	CRC low

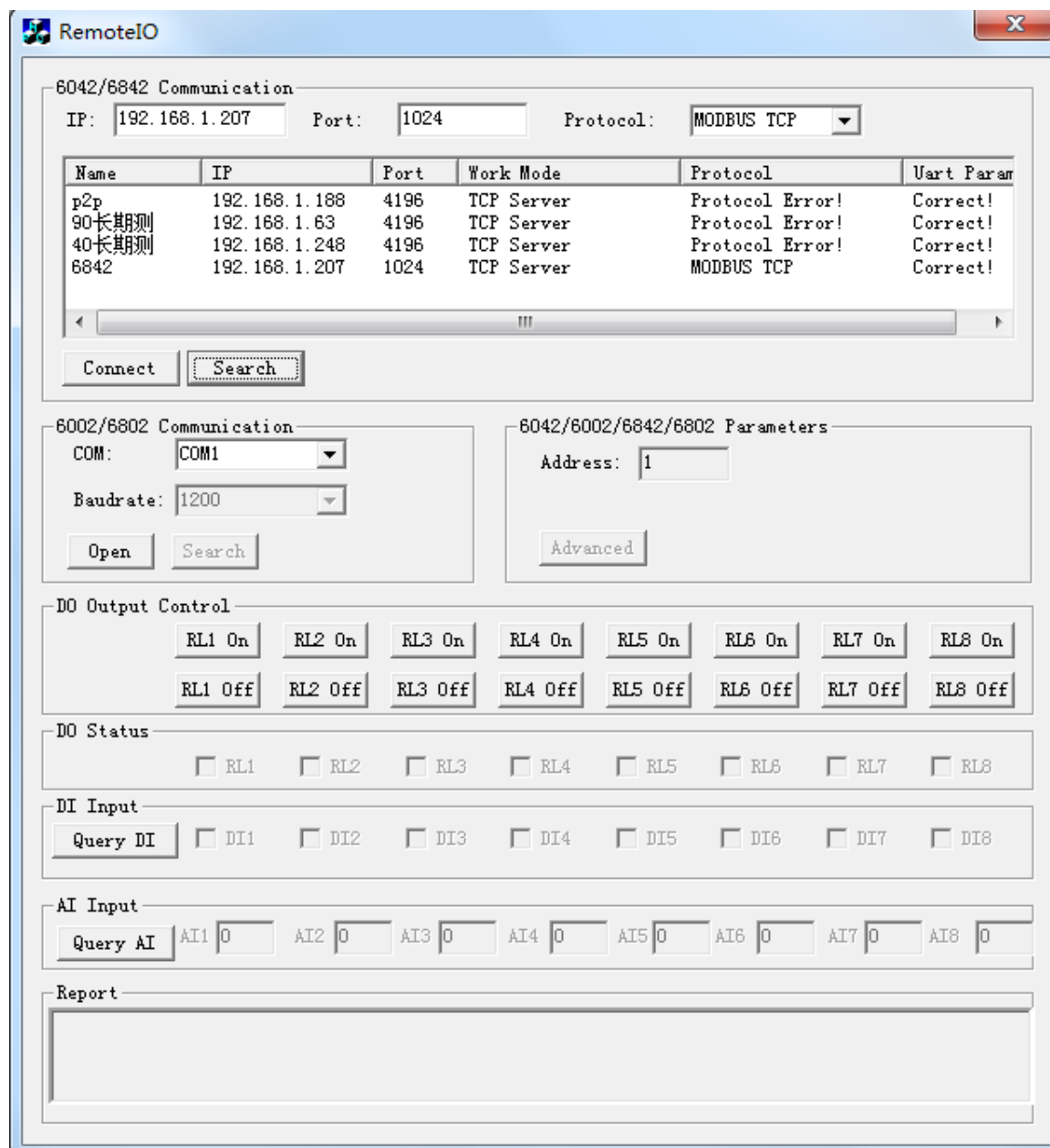
For example: sending-> 01 05 00 10 ff 00 8d ff

Return-> 01 05 00 10 ff 00 8d ff

# 6. Function test

## 1) Test software function

RemotelO software is a software tool for testing and configuring 6802, as FIG 7.

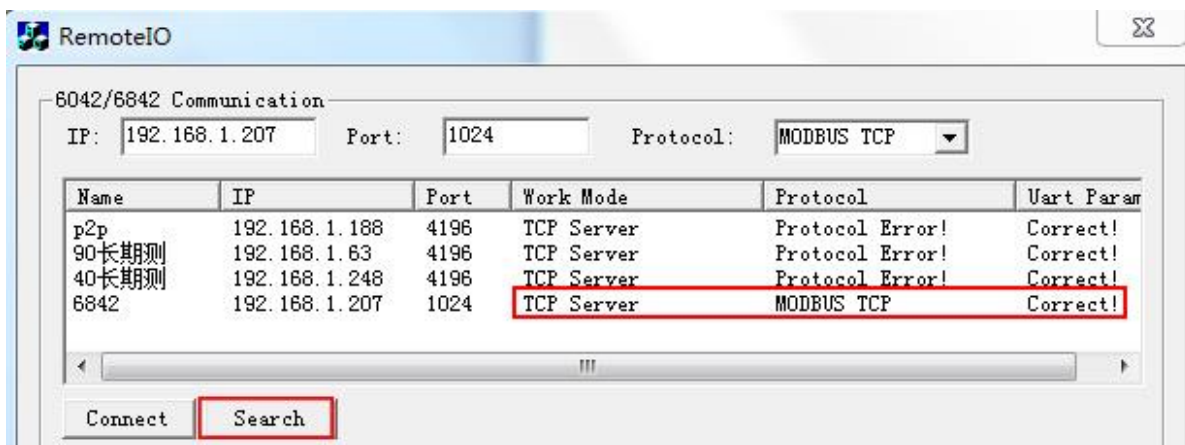


**Figure 7 Test Software**

Software has 5 parts, the first part is communication set of 6842 remote IO controller, the second is communication set of 6802 remote IO controller, the third part is 6842/6802 control part, the fourth part is parameter set, the fifth part is report area.

## 2) Ethernet control 6842

First connect 6842 to LAN via cable, then click “search” button so can search the 6842 devices in LAN, as FIG 8.



**Figure 8 search**

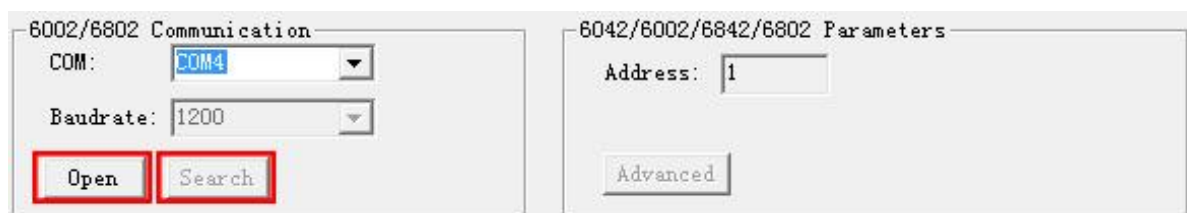
You can see some devices in the showing list, the “6842” is 6842, after is IP, Port., Work Mode, Protocol, Uart Parameter. The work mode must be Server Mode, Protocol (Modbus RTU or Modbus TCP) should be same as the one on top right corner., if not same need use ZLVircom to configure. Serial parameter is 115200、8、N、1. All the above are correct so that can do communication.

The IP and Port will be automatically filled after choosing the 6842 device. Click the “connect“ button will do TCP connection.

The “TCP Client Connected to” information on report area means TCP successfully made. Then the software will automatically detect device address and make “advanced” usable. Next you can test 6842 through buttons in control area.

**3) 6802 RS485 control**

Connect RS485 wire to 485 port of 6802, open related port No. on RemoteIO, no need to choose baud rate, then click “search”, then wait till “already searched the device” on report area means there has device. Can do simple test in control area.

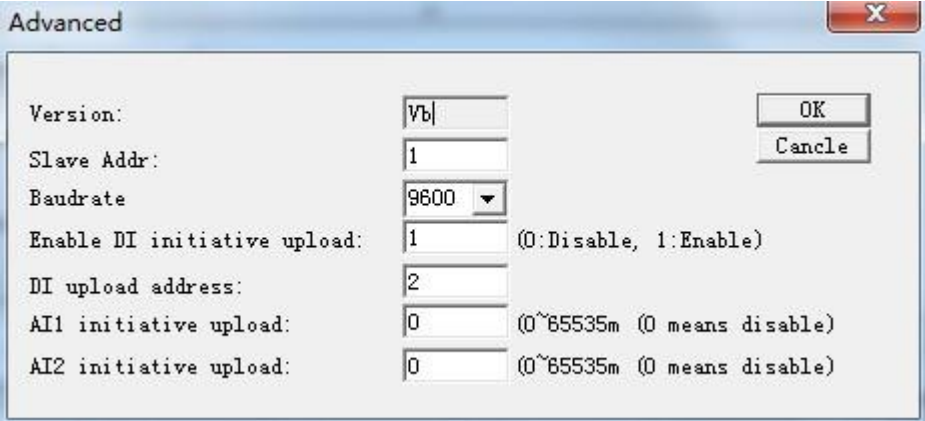


**Figure 9 No searched device**

#### 4) Advanced parameter

6802 and 6842 share a dialog box, do not use both models at the same time.

Click the “advanced”, shown as FIG. 10.



The screenshot shows a dialog box titled "Advanced" with a close button (X) in the top right corner. The dialog contains several configuration fields:

Version:	<input type="text" value="Vb"/>	<input type="button" value="OK"/>
Slave Addr:	<input type="text" value="1"/>	<input type="button" value="Cancel"/>
Baudrate	<input type="text" value="9600"/>	
Enable DI initiative upload:	<input type="text" value="1"/>	(0:Disable, 1:Enable)
DI upload address:	<input type="text" value="2"/>	
AI1 initiative upload:	<input type="text" value="0"/>	(0~65535m (0 means disable)
AI2 initiative upload:	<input type="text" value="0"/>	(0~65535m (0 means disable)

**Figure 10 Advanced Parameter**

Firmware version: the version of the inside 6802 firmware.

Device address: 6802 device slave-station address (Modbus addr.).

Baud rate: 6842 working baud rate.

Report address: please refer to next section.

Modify the corresponding parameters, click the "Settings" button to complete the changes. Need to restart the device to make it effective. Note that if you do not need advanced parameters, do not configure.

## 7. DI Active Reporting

6842 is standard Modbus device, use question and answer form. Some users want active return function, here we introduce the active reporting function of 6842.

As FIG 11, set “Enable DI initiative upload” to 1, the function open. The reporting address can be set at 0~255, it will be filled to the address field in the feedback instruction. If want original



type, set to 0.

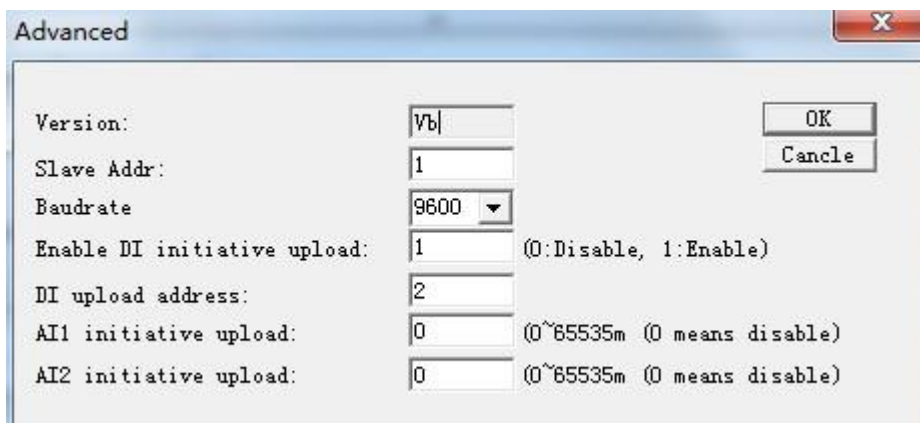


Figure 11

## 8. AI Active Reporting

The AI active reporting function is to make the collected analog value automatically send to host, no need the host to do Modbus instruction query.

It can set reporting time of A1 and A2. Time interval can be selected 2~65535ms. If set to 0 means not open this function. The “Advanced” as FIG 12, the RemoteIO software version must above 2014.12.22, the firmware version must be above V5.

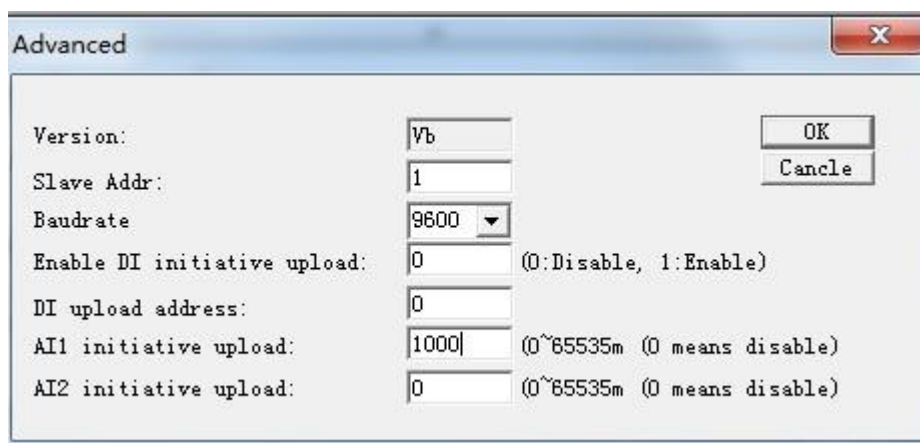


Figure 12

Here set reporting time of AI1 & AI2. The resolution of reporting time is 200ms. (1~200ms, 200ms report once; 201~400ms, 400ms report once; and so on)

The data format are same for reporting and returned of Modbus query.

**1) If only A1 or A2 be set, the reporting instruction:**

- a. No conversion protocol instruction: aa 04 02 xx yy c1 c2
- b. Conversion protocol is Modbus TCP to RTU instruction: s1 s2 00 00 00 05 aa 04 02  
xx yy

aa means device addr., xx yy is reporting AI value, the hexadecimal means voltage value, c1 c2 IS CRS check. S1 s2 is ordinal number of Modbus TCP, generally not handle.

The A1 and A2 upload instructions are the same, so the user should know if it is A1 or A2, because only one in A1 and A2 is allowed to upload. Note that when only A2 is selected, the number of active reporting is shown in the box of the collection of A1 in the RemotelO program.

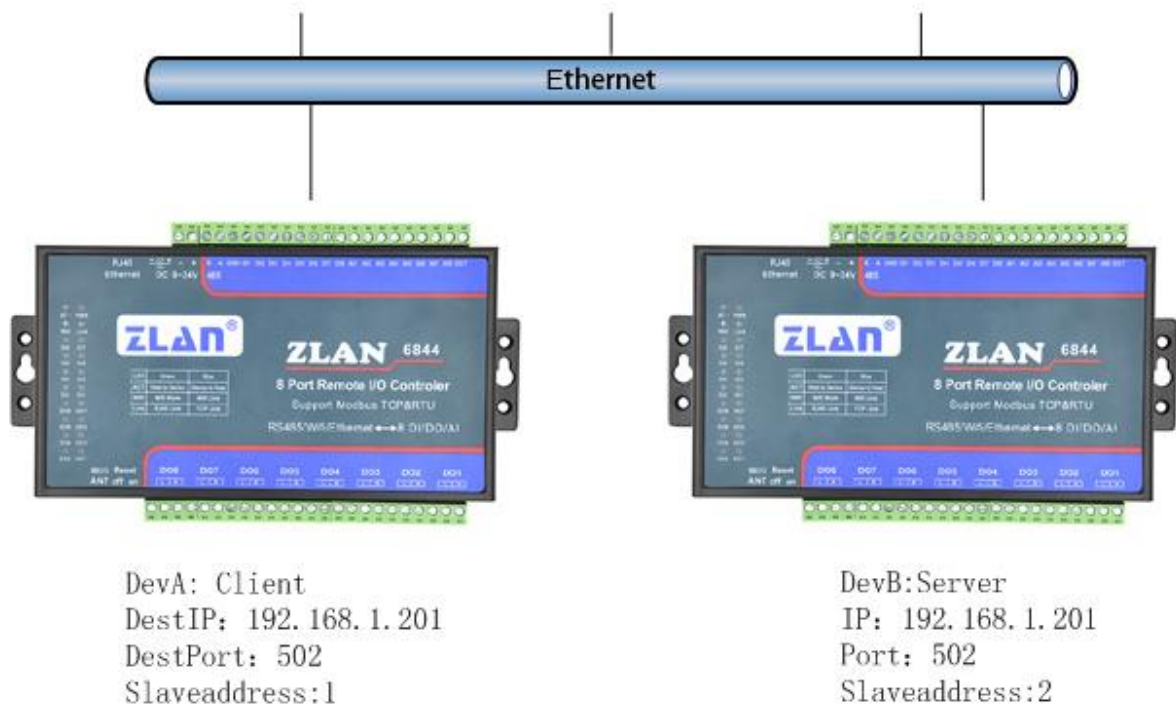
**2) If A1 and A2 both be set, the reporting instruction:**

- a. No conversion protocol instruction: aa 04 04 x1 y1 x2 y2 c1 c2
- b. Conversion protocol is Modbus TCP to RTU instruction: s1 s2 00 00 00 07 aa 04 04  
x1 y1 x2 y2

Here x1 y1 represents the acquisition of A1, x2 y2 represents the acquisition of A2. A1 and A2 are set at the same time, the reporting period is mainly the small period, and the quantity of A1 and A2 is reported simultaneously in the packet.

## 9. Two used in pairs

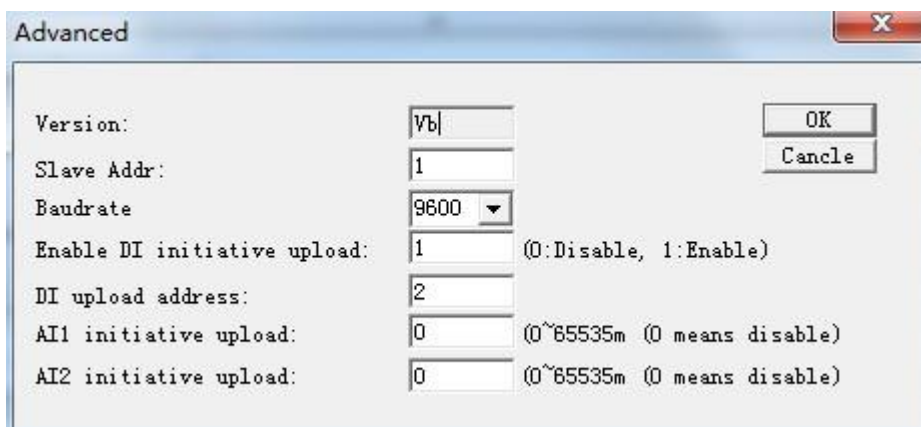
Considering the user needs to control the DO output through DI input, however, DI input devices and the DO output devices are far apart, so we can connect two 6842 through the Ethernet network, to realize DI remote control the DO output. DI inputs only control the corresponding DO. For example, DI1 of device 1 control DO1 1 of device 2, DI2 of device 1 control DO2 of device 2, and so on.



**Figure 13 6842 pairs-connection control**

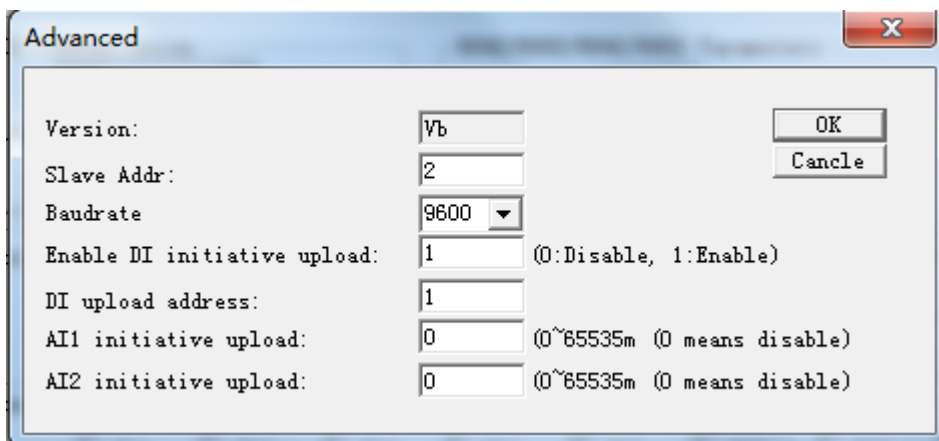
As shown in figure 13 6842, two 6842 are connected by Ethernet.

First set the two 6842, as shown in figure 14 DevA, here need reporting addr., whether to submit. According to the functional test content in the previous chapter, search and connect device DevA, enter the "advanced", device address is set to 1, " Enable DI initiative upload " fill in the 1 means open this feature, "DI upload address" is the need to control the remote device address of 6842, it set to 2. DevA setup.



**Figure 14 DevA configuration**

Then, search and connect the device DevB, enter the advanced parameter, set the device address to 2, whether to submit is set to 1, and the report address is 1 (DevA). Following this setting, when DevA's DI changes, a control DO instruction is sent to DevB. Similarly, the DI change of DevB also sends a control instruction to DevA.



**Figure 15 DevB configuration**

Configure the DevA and DevB parameters to establish the TCP connection. DevB works in server mode, sets work IP and port, DevA as client mode, sets up DevA's destination IP and port as DevB's IP and port. For specific Settings, please refer to the <guide to the use of ZLAN networking products>.

## 10. Usage

### 1) ZLAN6842

Take the software of modbus poll as an example to introduce the use of 6842.

There are two ways to communicate with 6842, namely virtual serial port and Modbus TCP. In the case of Modbus TCP, the host software is used as the main station of Modbus TCP to query the corresponding Modbus register address of 6842, and the conversion protocol parameter of 6842 is configured as "Modbus TCP to RTU". Using the virtual serial port, the host software uses the Modbus RTU protocol to open the virtual serial port created by ZLVircom and communicates directly with 6842 via virtual serial port. Use ZLVirCom software to configure ZLAN6842 please refer to the <online product

usage guide>.

Open the modbus poll software as shown in figure 16:

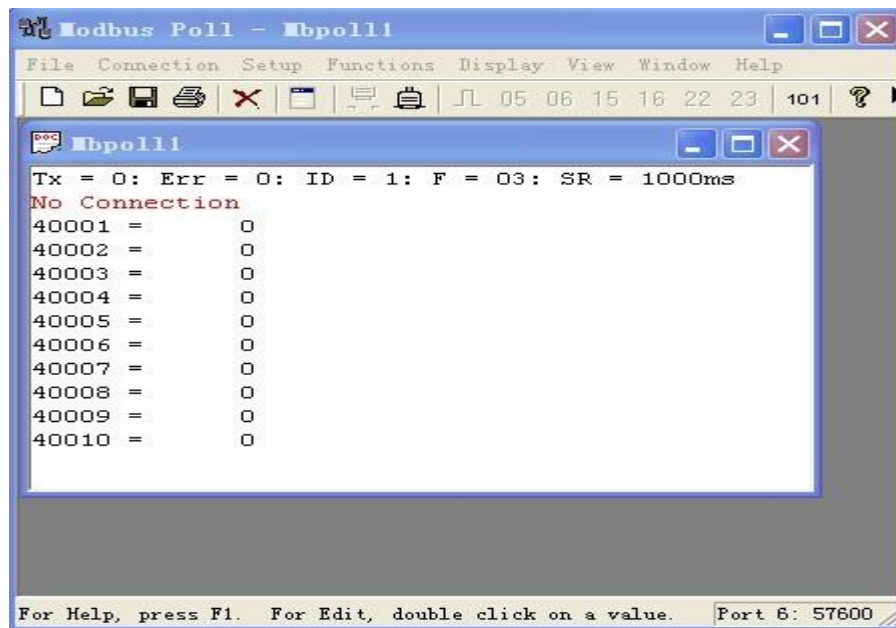


Figure 16

Then click SETUP to configure a POLL1 to query DI as shown in figure 17:

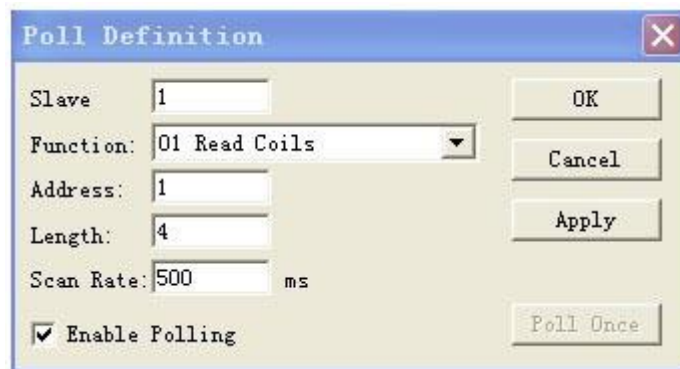


Figure 17

Then create another POLL2 and configure it to query and control DO as shown in figure 18:

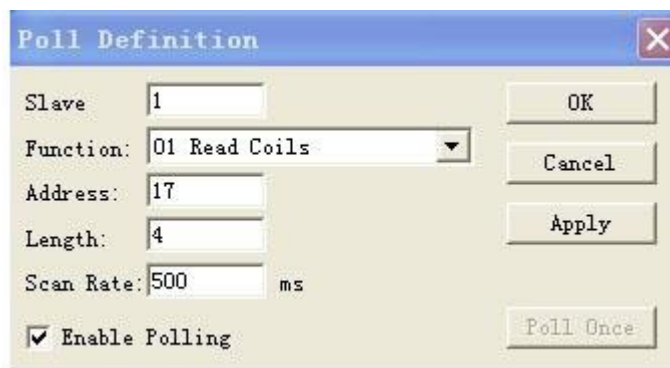


Figure 18

Then create another POLL3 and configure it to query and control AI as shown in figure 19:

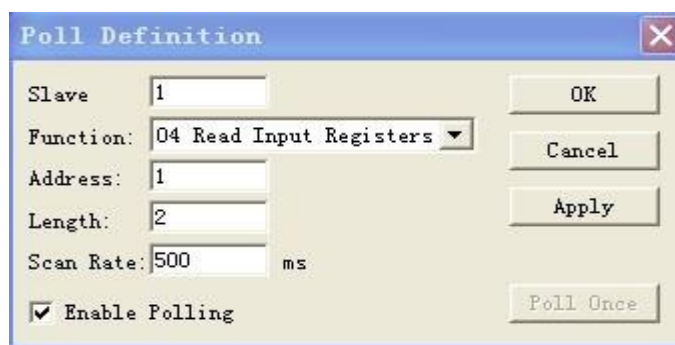


Figure 19

When the above operations are completed, you will see the following figure 20:

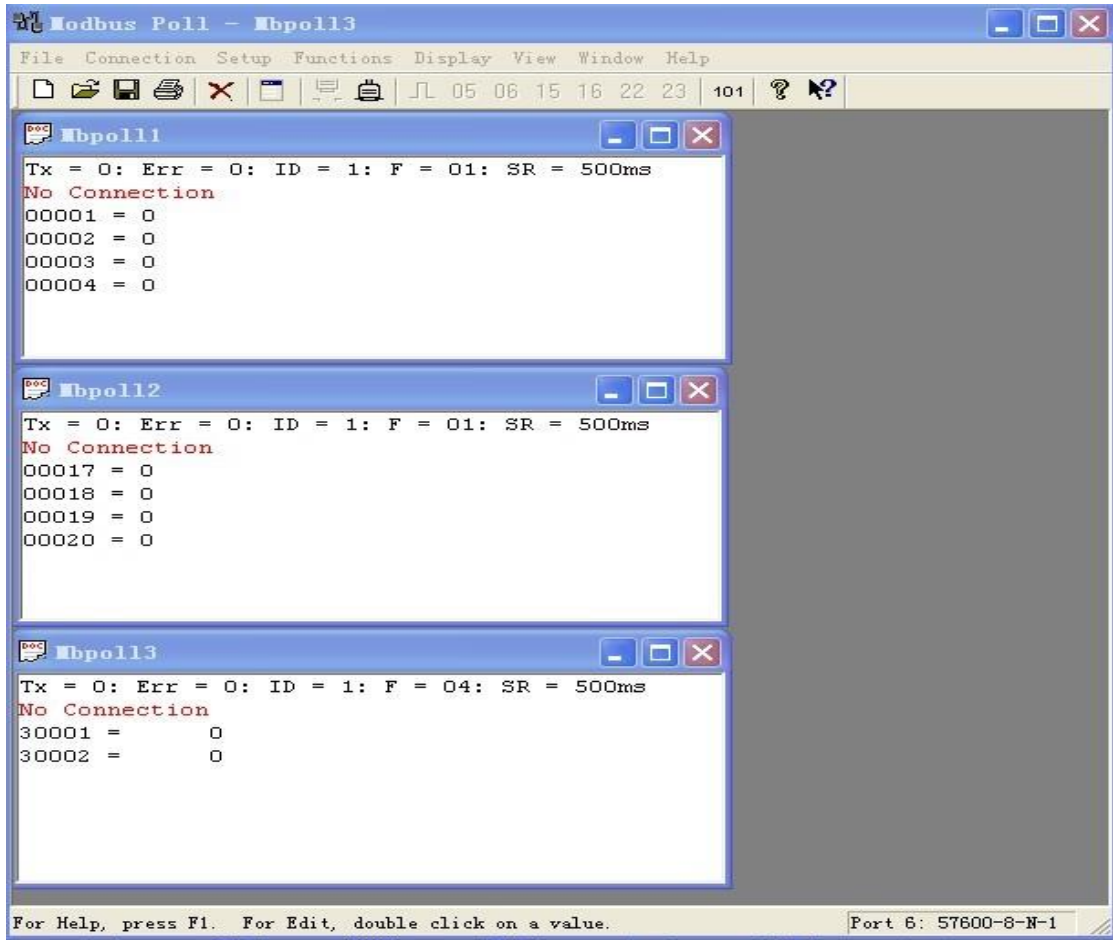


Figure 20

Next, the virtual serial port is shown in figure 21. According to the following configuration, press the OK button to establish the communication with ZLAN6842.

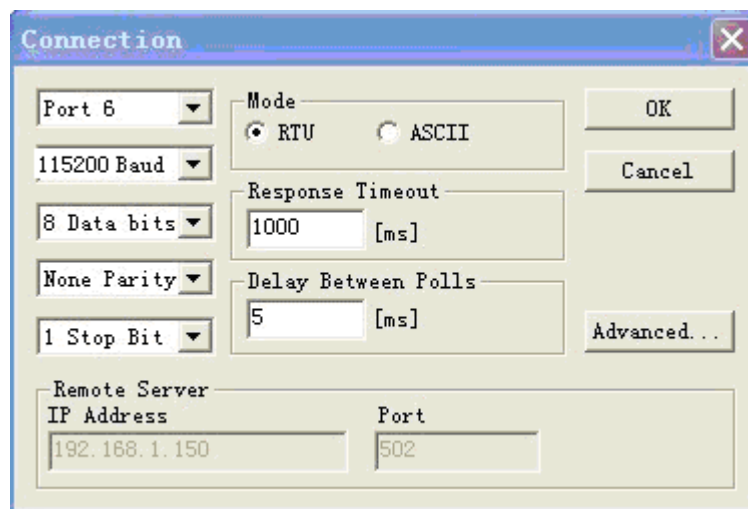
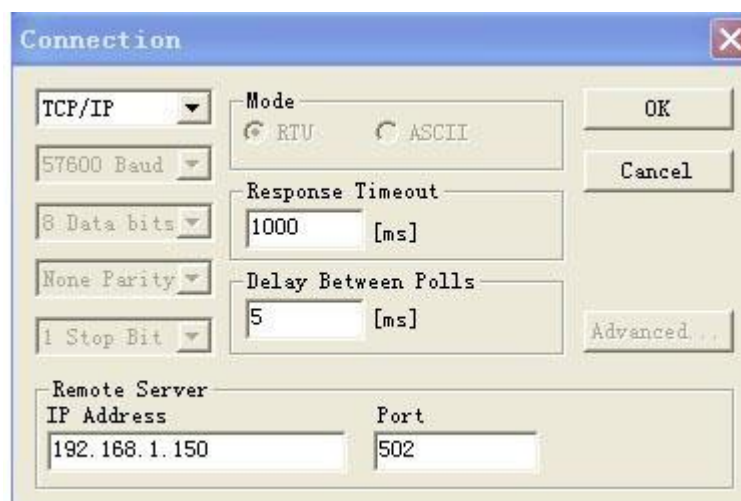


Figure 21

The following is the MODBUS TCP as shown in figure 22, according to the following configuration, press OK button to communicate with ZLAN6842.



**Figure 22**

## 2) ZLAN6802

ZLAN6802 485 access can also refer to the above ZLAN6842 way of virtual serial port using method, but here the virtual serial port to the actual serial port, and between the PC serial port and ZLAN6802 485 plus a RS232 to RS485 switch.

## 3) ZLAN6844

The difference between ZLAN6844 and 6842 is a Wifi feature. For the configuration of Wifi, refer to ZLAN product manual <ZLAN7104>.

## 4) ZLAN6844N

Combining 6844 with P2P technology can greatly improve the convenience of remote IO control, especially through Internet control switches. The P2P technology enables users to control the Modbus TCP devices within the LAN without having to build a server. For the introduction of P2P, please refer to: ZLAN P2P IoT solution introduction.

([http://www.zlmcu.com/document/tech\\_p2p.html](http://www.zlmcu.com/document/tech_p2p.html))

# 11. After-service



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