ZLAN6002A remote IO controller

User Manual

Version information

The following modifications have been made to this document:

Modification record

Date	Version Number	Document Number	modified content
2012-10-21	Rev.1	ZL DUI 20121021.1.0	Release version
2013-8-4	Rev.2	ZL DUI 20121021.2.0	Add version V2
2018-5-13	Rev.4	ZL DUI 20121021.3.0	Modified version

Ownership information

CATALOGUE

1. Overview

The ZLAN6002A remote IO controller is an intelligent device based on RS485 for digital input and output as well as analog input, developed by Shanghai Zlan Information Technology Co., LTD. This remote IO controller can be conveniently connected to the 485 bus to achieve RS485 access. ZLAN6002A is an ideal choice for users to achieve remote control and data acquisition.

ZLAN6002A: This model is based on RS485 transmission and can simultaneously monitor 4 digital inputs, 2 analog inputs, and control 4 relay outputs. Remote IO control and data acquisition adopt the Modbus protocol.

Figure 1 ZLAN6002A collector

Can be applied to:

- Building/access control/security control system;
- Industrial automation system;
- Information appliances.

2. Functional Features

4 Digital input channels:

Passive switch quantity (dry node

The active level, that is, the wet node, has the following level range

VCC voltage	Low-level range	High-level range
24V	0～17V	17～24V
9V	0～3V	3～9V

2-channel analog input: Different input forms correspond to different sub-models.

Accuracy: 10 bits.(Confirm before leaving the factory)

Current signal input: such as 4~20mA.

Voltage signal input: such as 0~5V,0~10V.

Resistive impedance input: such as 0~10k or resistive temperature and humidity sensors, etc.

4 Digital output channels

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

3. Technical parameters

Shape	
Size	L x W x H =12.2cm×7.2cm×3.4cm
Serial port parameters (used for ZLAN6002A)	
RS485 interface, 1200-115200(default 9600bps), 8-bit data bits, NONE check, and 1-bit stop bit	
Software	

Upper-level agreement	MODBUS RTU
Underlying communication	RS485

Relay transmission speed (i.e., response time)
ZLAN6002A：<30ms

AI input form(Confirm the shipment before leaving the factory)
Current input: 4~20mA,0~20mA
Voltage input: 0-5V, 0-10V
Resistance input: 0-10K, resistance-type temperature and humidity sensors, etc

Power consumption
ZLAN6002A：<1.7W　<70mA@24V

Environmental requirements	
Operating temperature	-40~85℃
Storage temperature	-45~165℃
Humidity range	5 to 95% relative humidity

4. Hardware Description

The front view of the ZLAN6002A data collector is shown in Figure 3: The ZLAN6002A has its own card slot on the back and can be installed on a standard rail. It adopts an upper and lower wiring method, which is convenient for installation.
Panel light

1．ACT: Blue. When the ACT light is on, it indicates normal data transmission. When there is no data communication, the ACT light does not light up.

2．2. POWER: Red indicates that the ZLAN6002A has been powered on.

Figure 3 Panel light

The interface on one side of ZLAN6002A is shown in Figure 3

Terminal block	Function
1	Power supply ground
2	Power input, 24VDC
3	Contact 1 of Relay No. 4
4	Contact 2 of relay No. 4
5	Contact 1 of Relay No. 3
6	Contact 2 of Relay No. 3
7	Contact 1 of Relay No. 2
8	Contact 2 of relay No. 2
9	Contact 1 of relay No. 1
10	Contact 2 of Relay No. 1

The interface on the other side of ZLAN6002A is shown in Figure 3

Interface	Function

485	RS485A+，485B-
1	Analog Input 2
2	Simulated Input 1
3	The common ground for analog and digital inputs
4	Digital input 4
5	Digital input 3
6	Digital input 2
7	Digital input 1

Note:

1、 If it is ZLAN6002A 485, lines A and B correspond to 485+ and 485- respectively

2、 For different input forms of AI, there are the following sub-models, with the default being the sub-model of -V5. The accuracy is 10 bits.

- ZLAN6002A-V5: Voltage input, input is voltage, maximum 5V. The collected value when reporting the maximum value is 1024. So the actual voltage is AI/1024*5.

- Youdaoplaceholder5 ZLAN6002A-V10: indicates that the input is voltage, with a maximum of 10V. The collected value when reporting the maximum value is 1024. So the actual voltage is AI/1024*10.

- ZLAN6002A-I20: Current input, input is current, maximum 20mA. The reported value is the resistance value, and the formula for converting it to current is: AI/1024*25mA.

5. Software Instructions

ZLAN6002A uses the standard MODBUS RTU protocol, and its Modbus register table is as follows:

Address of the storage area	Passage	Instruction code	Description	Attribute
00001	0	01	DI value No. 1	Read-only

00002	1	01	No. 2 DI value	Read-only
00003	2	01	No. 3 DI value	Read-only
00004	3	01	No. 4 DI value	Read-only
00017	0	01/05	DO value No. 1	Reading and writing
00018	1	01/05	DO value No. 2	Reading and writing
00019	2	01/05	DO value No. 3	Reading and writing
00020	3	01/05	DO value No. 4	Reading and writing
30001	0	04	AI value No. 1	Read-only
30002	1	04	AI value No. 2	Read-only

ZLAN6002A uses the universal MODBUS protocol to exchange information with the software of the upper computer. Currently, it supports reading single-coil group instructions, forced single-coil instructions, and reading input register instructions.

1、 Read the single-coil group instruction 0x01

Byte count	1	1	1	1	1	1	1	1
Name	Equipment address	Instruction type	The starting address is high	The starting address is low	High length	Low length	CRC high	CRC low

For example: Send->   01 01 00 00 00 04 3d c9

   Return->   01 01 01 0f 11 8c

2、 Read the input register instruction 0x04

Byte count	1	1	1	1	1	1	1	1

Name	Equipment address	Instruction type	The starting address is high	The starting address is low	High length	Low length	CRC high	CRC low

For example: Send->   01 04 00 00 00 02 71 cb

Return->   01 04 04 00 01 00 02 2b 85

3、 Strong single-coil command 0x05

Byte count	1	1	1	1	1	1	1	1
Name	Equipment address	Instruction type	The starting address is high	The starting address is low	High length	Low length	CRC high	CRC low

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

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

6. Functional testing

1. Test the software's functions

Use the latest VIRCOM software and the IO controller to configure the test, as shown in the interface of Figure 4.

Figure 4 Test software

2. 6002A 485 Control

In the communication section of 6002A, open the corresponding serial port number. There is no need to select the baud rate (considering that customers may forget the baud rate of the device, we automatically detect the baud rate through the software). After opening the serial port, click "Search for Device". Here, you need to wait for the software to search for the device. If a device is found, a prompt "Device Found" will appear in the report box; otherwise, no device was found.

After searching for the device, a simple test can be conducted in the control area to verify that the hardware is working well.

3. Parameter Settings

The corresponding baud rate, device address, and active reporting of ai and di can be set.

7. DI uploads proactively

The 6002A is a standard MODBUS device, and it is used in the form of questions and answers. However, some customers want to receive feedback as soon as the DI input changes, that is, the function of active return. Here, the active reporting function of 6002A is utilized. The Settings are as shown in Figure 9 (for the setting method, refer to the content of Chapter 6). Set "Whether to report proactively" to 1 and enable the function. The reporting address can be set arbitrarily within the range of 0 to 255, and it will be filled into the address field in the feedback instruction. If the user wants to return to the original question-and-answer format, simply set "whether to report proactively" to 0.

Figure 9

8. Active reporting by AI

The active reporting function of AI enables the collected analog quantities to be automatically sent to the upper computer. This method does not require the upper computer to query Modbus instructions and is very useful for network analog quantity monitoring based on the Internet.

Here, the reporting times for the two analog quantities A1 and A2 can be set. The time interval can be selected from 0 to 65535, with the unit being ms. If 0 is set, it indicates that active reporting is not enabled.

AI1 Auto-report: 0 (0~65535ms (0 is disable)

Figure 10

Please note that the resolution of the reported time is 200ms. That is, from 1 to 200ms, it is reported once every 200ms, while from 201 to 400ms, it is reported once every 400ms, and so on.

9. Two devices are used in parallel

Considering that the customer needs to control the DO output through the DI input, but the DI input device and the DO output device are relatively far apart, we can achieve remote control of the DO output through two 6002as. DI input can only control the corresponding DO. For example, DI1 corresponds to DO1, DI2 corresponds to DO2, and so on.
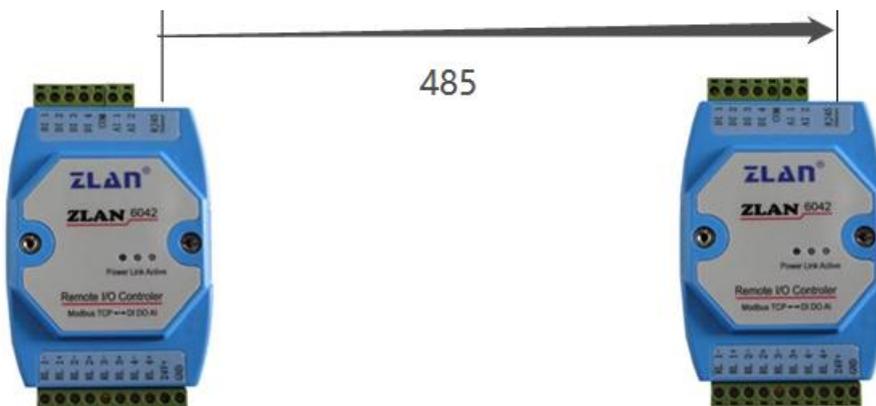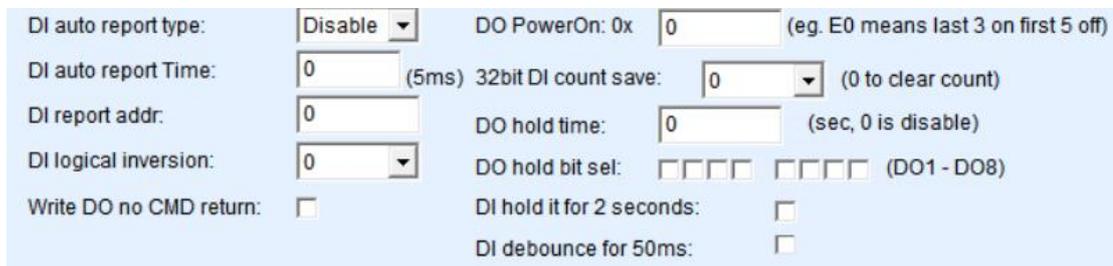

Figure 11 Connection control of 6002A

As shown in Figure 11, the connection control of 6002A, two 6002As are

connected together via 485.

First, the two 6002As need to be set up, as shown in the DevA configuration in Figure 12. Here, the reporting address and whether to report are required. Based on the functional test content of the previous chapter, search for and connect the device DevA, enter "Advanced Parameters", set the device address to 1, fill in 1 in "Whether to report" to indicate that this function is enabled, and the "report address" is the address of the remote 6002A device that needs to be controlled, which is set to 2 here. The DevA setup is complete.

Figure 12 DevA configuration

Then search for and connect to device DevB, enter the advanced parameters, set the device address to 2, whether to report to 1, and the reporting address to 1 (DevA). According to this setting, after the DI of DevA changes, a control DO instruction will be sent to DevB. Similarly, a change in DevB's DI will also send a control instruction to DevA.

10. After-sales service and technical support

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