

ZLAN9153

Fiber Optic Serial

Device Server

User Manual

Fiber to RS232/485/422 Converter

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1. Summary

ZLAN9153 fiber serial device server is an industrial serial port to fiber converting device developed by Shanghai ZLAN. The device can realize transparent transmission between one channel RS232/RS485/RS422 data and fiber.

The ZLAN9153 fiber use single-mode single-fiber SC interface, using one fiber to transmit can save fiber cost in long distance transmission. The power input can be plug or 2 line terminal, provide 9~24V wide range input voltage.

It has RS232/485/422 three-in-one serial port, RS232 is common interface DB9, RS485/422 is terminal type, easy to install.



Figure 1 ZLAN9153

Different with normal serial to fiber product (such as ZLAN9163), ZLAN9153 is not simply converting serial level signal to fiber signal, but first converting serial data to TCP/IP signal, then transmitting on fiber. The ZLAN9153 fiber signal can directly connect to fiber switch, directly participate in the transmission and exchange of network-layer data.

ZLAN9153 normally has 2 usages:

- 1) ZLAN9153 use in pairs, as the fiber interfaces of the 2 ZLAN9153 connect, it can realize RS485/RS232/RS422 signal extension through fiber, reaching a 20 km extension.
- 2) ZLAN9153 single use, directly connect to fiber switch or first connect a fiber to Ethernet device (ZLAN9100) then connect Ethernet switch. So ZLAN9153 can exchange data with any network device in the network. If communicating with computer, after installing virtual serial software ZLVircom in the computer, it can collect the ZLAN9153 serial data via virtual serial port.

The second usage is ZLAN9153 advantage, not only reduce the number of serial to fiber from 1 pair to 1 single, but also no need to use serial port and directly use network to do the data acquisition in the PC end. The PC end can also use virtual serial port software, and the existing host software no need to be modified to network communication when it can be directly realized. ZLAN9153 has really realized the function of fiber serial device server.

ZLAN9153 can be applied to:

- 1) Industrial remote data acquisition and control.
- 2) Connect the serial device to fiber switch network, the PC do the data acquisition and control application.

The typical application is as Figure 2. The existing serial device server connect with ZLAN9163, then connect ZLAN9153 with ZLAN9100 via fiber, ZLAN9100 connect to network via cable. Any data sent by serial device will be transparently transmitted to PC, and data sent to ZLAN9153 from PC also will be transparently transmitted to serial device.

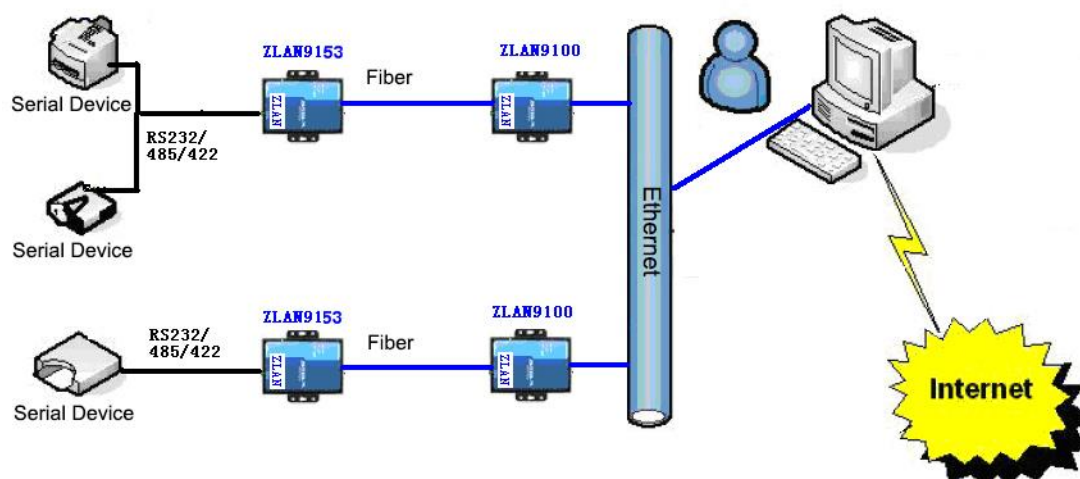


Figure 2 Connection Diagram

Note: ZLAN9153 has 2 sub-models: ZLAN9153-3 (A) and ZLAN9153-5 (B), if using in pairs, the 2 models must be different. As: A-end device connect with B-end device; B-end device connect with A-end device; the same sub-model cannot connect. When ZLAN9153 connect with fiber switch, please confirm the optical interface of optical switch is A or B, then choose the relevant model, if A please choose ZLAN9153-5 or else choose ZLAN9153-3.

Difference between ZLAN9163 and 9153:

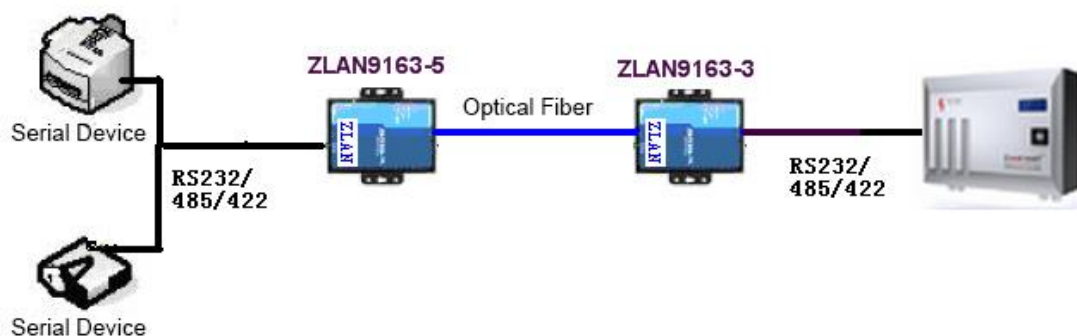


Figure 2 ZLAN9163 Usage Diagram

ZLAN9163 is normally used in optical fiber pairs-connection, can connect two RS485 devices together through fiber, no need to configure any parameters as port baud rate and 9163 IP and so on, can plug and play. In this case, ZLAN9163 can be regarded as a pure communication medium converter for RS485/232 to

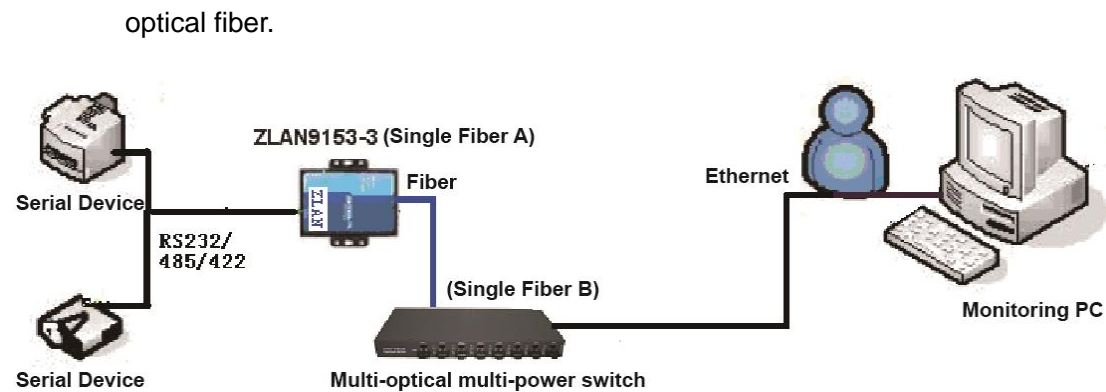


Figure 3 ZLAN9153 Usage Diagram

ZLAN9153 usually is single-used, it can connect with fiber switch, the host monitoring software can directly access ZLAN9153 IP address to get data. ZLAN9163 cannot realize this type. ZLAN9153 actually convert RS232/485 data to TCP format, it's a serial device server but transmitting on fiber.

If ZLAN9153 need use in pairs, must know the serial parameter of the device (baud rate, stop bit, data bit), and need to configure the 2 sets ZLAN9153 as mode of pairs connection (refer to "Pairs Connection" Part of < User Guide of Networking Products>), one as Client one as Server. The following situation we recommend to use ZLAN9153:

- 1) There is no single optical fiber left for 485 to fiber, or pair-connection of multiple 485 devices need to through a fiber. At this time, use ZLAN9153 pair-connection, and cooperate with optical switch.
- 2) Field network is the structure of optical switch, which requires cross-gateway and cross-routing.
- 3) The upper computer is a computer, and the computer wants to access the device through the network, not through the serial port card, USB to port, etc.

When connecting ZLAN9153 to the optical switch, pay attention to the A end connecting to ZLAN9153-5 (B end); B end connecting ZLAN9153-3 (A end).

2. Feature

- 1) The fiber interface use SC pluggable interface, easy for user installing.
- 2) Serial port provide RS232, RS485 and RS422 three type interface.
- 3) Support full duplex, high speed converting, and no packet lost.

ZLAN9153 is the first type of full duplex, continuous, and low cost serial server in industry. It support simultaneously converting between Ethernet & Serial with large bulk of data with no pause, and also no data is lost.

- 4) Support TCP Server, TCP Client, UDP mode, and if communicating with ZLVirCom, it automatically change to Real Com Driver Mode.
- 5) Support band rate 1200~115200bps, data size 5~9bits, parity of None, Odd, Even, Mark, Space. Support CTS/RTS hardware flow control.
- 6) Embedded 485/422 lightning protection function, suitable for outdoor 485/422 communication.
- 7) Equipped freely with our Windows Virtual Serial & Device Management Tool ZLVirCom. It supports virtual serial and searching device or modifying parameters with ZLVircom.
- 8) Provide device management library (Window DLL library). It will help user to develop program with VC, VB, Delphi, C++ Builder. User need only use read() or write() function to communicate with ZLAN9153.
- 9) The innovative disconnecting detecting method. Whether it running in TCP Server mode or TCP Client mode can automatically establish connection after network broken, to ensure the data real-time reaching.
- 10) Suitable for Modbus network upgrading, support directly converting Modbus TCP to Modbus RTU.
- 11) With build-in Web server, its parameters can be modified by web browser.

- 12) Support DHCP, easy for IP management and solve IP confliction.
- 13) Support DNS. It fulfills the need of access data server through domain name.
- 14) Support up to 100 TCP connections communicate with network module meanwhile.
- 15) Flexible serial data framing setting. It fulfills all kinds of serial data frame requirement.
- 16) UDP mode support dynamic destination address mode. It helps for multi-user manage one serial server.
- 17) Real Com Driver mode support using the 9-th bit to facilitate communication with milt-device. (the 9-th bit being 0 means data frame and 1 means address frame).
- 18) Support searching serial servers and modifying parameters through Internet remotely
- 19) Support parameter modifying protection, preventing modifying by accident.
Support running with default parameters.
- 20) High protection of electromagnetic interference, with its high electromagnetic interference protection SECC external shell.

3. Technical parameter

Figure	
Interface:	422: Terminal; 485: Terminal; 232: DB9; 9163: Optical SC pluggable interface
Power Supply:	5.5mm, Inside positive outside negative, standard outlet
Size:	L x W x H =9.4cm×6.5cm×2.5cm
Communicate Interface	
Ethernet:	Not in use, for extension,
Optical Fiber (9163):	Single-mode Single-fiber, double transferring
Serial:	RS232/485/422×1: RXD, TXD, GND, CTS, RTS

Serial Parameters			
Baud rate:	1200~115200bps	Parity bits:	None, Odd, Even, Mark, Space
Data bits:	5~9	Flow Control:	XON/XOFF, RTS/CTS, NONE
Optical Fiber Parameters			
Sub-Model:	Emission (TX) Wavelength		Receiving (RX) Wavelength
ZLAN9153-3（A-end）	1310nm		1550nm
ZLAN9153-5（B-end）	1550nm		1310nm
Optical Fiber Transmission Distance:	20Km	Optical Communication Interface:	SC
Work Mode			
TCP server, TCP client, UDP, Real Com Driver			
Power			
Power:	9~24V DC, 357mA@9V（9163）		
Environment			
Running temperature:	-40~85℃		
Storage temp:	-45~165℃		
Humidity:	5~95%RH		

4. Hardware instruction

The front view of ZLAN5143 serial device server is shown as FIG 4: ZLAN5143 use black anti-radiation SECC board, it's equipped with two "ears" for easy installation. If you want to install to the guide rail, you can choose the guide installation accessories.



Figure 5 Optical fiber interface and RS232



Figure 6 Front View

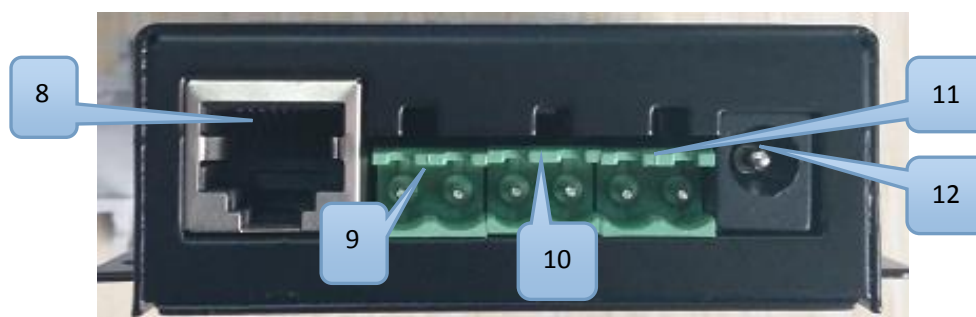


Figure 7 Power and RS485/RS422

Table: Interface No. and Description

Item	Name	Instruction
1	SC fiber optical interface	fiber optical interface
2	RS232 port	RS232 port DB9
3	RS232 port	DB9
4	Fiber Link Indicator	Optical fiber interface link/status indicator; The light indicates that there is optical fiber access; light off indicates that no optical fiber access.
5	Power Indicator	Power on
6	TCP Link Indicator	TCP connection establish indicator. When 9153 as TCP Server there has other computer establish the TCP connection with it; when 9153 as TCP Client, it connects with the destination computer; when 9153 as UDP mode.
7	Active Indicator	Communication indicator, the light is on when there has data communication
8	RJ45	Ethernet Port
9	RS422 Terminal	Combined with RS485 port to RS422 port
10	RS485 Terminal	RS485 port
11	DC Plug	Power interface; OD 5.5mm, ID 2.1mm
12	DC Terminal	Power interface; 5.08mm terminal

The serial port use standard DB9 male head, the line sequence shows as the following table:

Item	Name	Instruction
2	RXD	receiving pin of the serial device server
3	TXD	sending pin of the serial device server
5	GND	Ground wire
7	RTS	After the flow control in using, the serial device server will accept the data of the serial device when the pin is 0.
8	CTS	After the flow control in using, the serial device server will send the data to the serial device when the pin is 0.

5. Usage

5.1 ZLAN9153 single use method:

For a single use, ZLAN9153 communicates with a PC of a network, and there should have a fibre-optic to Ethernet product between PC and ZLAN9153. Please install ZLVircom on the PC. ZLVircom search ZLAN9153 through the Ethernet port and do configuration, main configure the serial port baud rate, IP address, port, working mode, etc. of 9153, the specific methods of configuration are similar with common serial device server, please refer to: <User Guide of Networking Products>.

5.2 ZLAN9153 for pair-connection:

When used in pairs, the first thing to notice is that must be the interconnection between ZLAN9153-5 and ZLAN9153-3. In addition, need to configure the serial port baud rate and TCP pair-connection. If the user has the photoelectric conversion device, just connects ZLAN9153 to the Ethernet port of the computer, it can be conveniently configured via ZLVircom through the Ethernet port search. If the user does not have a photoelectric conversion device, the version advanced

ZLVircom4.13 provides a method for serial search and configuration. The specific methods are as follows:

1) Search Device

- a) User has a photoelectric converter, just connect 9153 to the computer network, click the "Device Manage", ZLVircom automatically find device, click on the "Edit Device" to configure the baud rate and working mode of the device.
- b) User doesn't have photoelectric converter, connect RS232 port of 9153 to computer serial port or USB to RS232 port. As shown in figure 8, click "Search Serial", select the serial number in the pop-up dialog box, no need to select baud rate, and click ok. ZLVircom searches for 9153 through a serial port, the device will be listed in the list after being searched out, the type is "Serial". Then click "Edit Device" to enter the configuration of the device parameters.

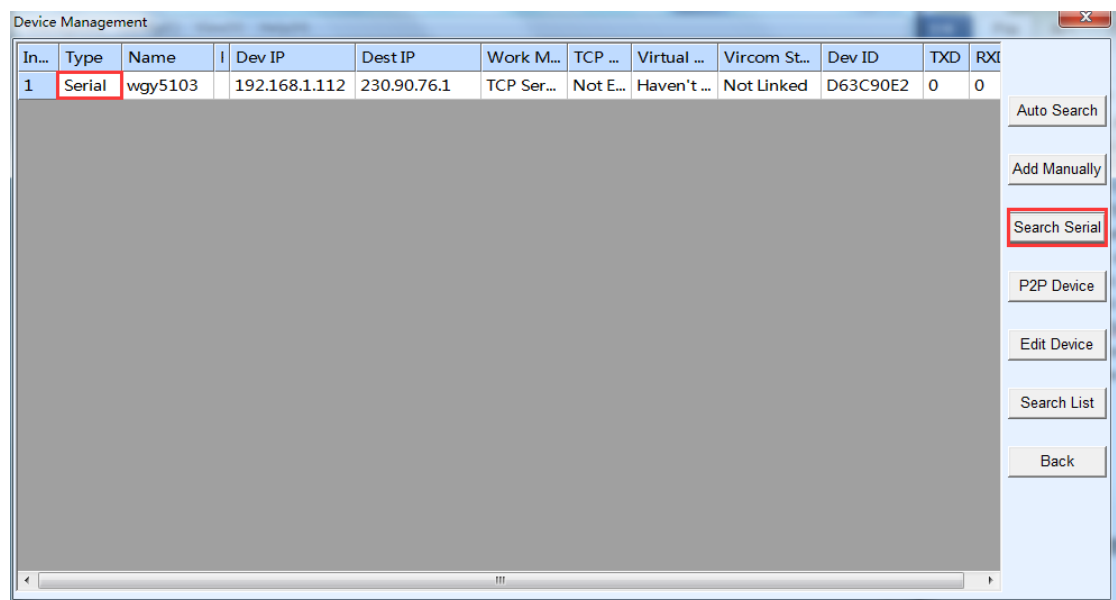


Figure 8 Serial Port Search Device

2) Serial Parameter Setting

Please configure the parameters of 9153 according to the baud rate, data bits

and check bits of the device connected with the serial port.

3) TCP pair-connection configuration

The configuration is to make two 9153 establish TCP connections. As shown in figure 9, the picture on the left shows the configuration of 9153-3, and the picture on the right shows the configuration of 9153-5.

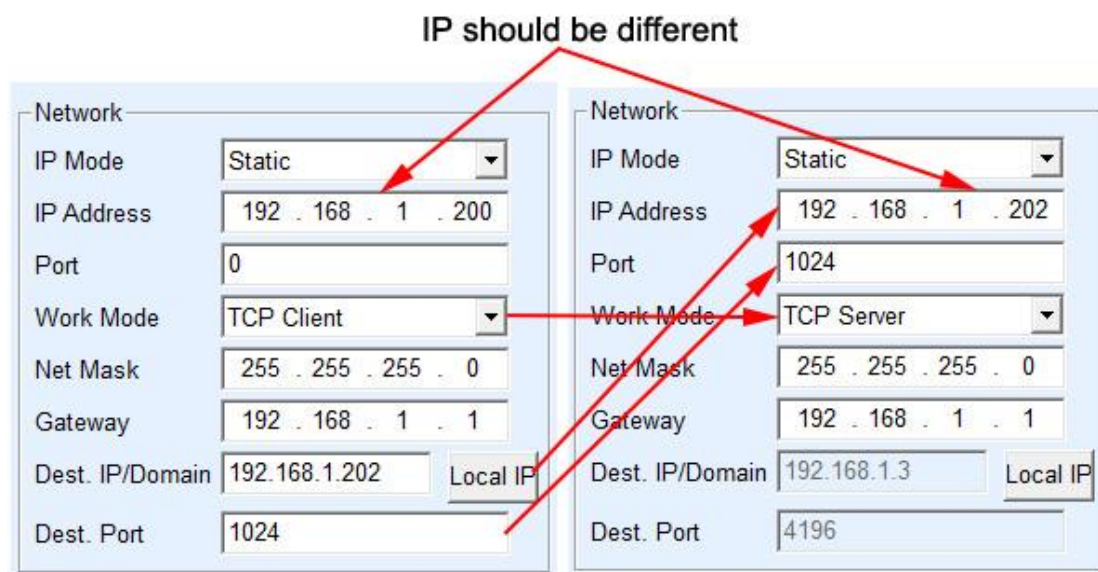


Figure 9 IP configuration of device pair-connection

- 4) As shown in figure 10, if you need to speed up the corresponding speed of the round-trip data packet, change the packet interval to 0, so that the speed of the serial port can be speeded up. After setting, click "Modify Settings". However, after this modification, the function of the serial port configuration parameter will be disabled, so it is suggested that the user can be configured with the Ethernet port to follow this setting method.

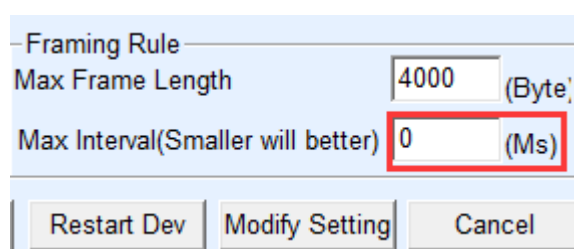


Figure 10 Reduces Packet Interval

- 5) After the above configuration is completed, the optical ports of 9153-3 and

9153-5 are connected to each other, and the TCP Link lights of 9153-3 and 9153-5 are also highlighted, indicating that the above network configuration is correct. When there is serial data communication, the ACT light of the two devices will be on at the same time, indicating that the data is transmitted between the two.

6. 485 Character

ZLAN5143 meet the RS485 standard, each ZLAN9153 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.

7. Model Choice

Model	Instruction
ZLAN9153-3	A-end device
ZLAN9153-5	B-end device
Fiber jumper	SC interface, 1m. Non-standard equipped, if need please purchase separately.
Power adapter	9V1A, 220V input, standard equipped.

8. After-service

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