# **Protocol Converter ODOT-S1E1V2.0**

# **User Manual**

V2.00 2020.03.16

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### **ODOT Series ODOT-S1E1V2.0**



### **ODOT** Automation System Co., Ltd.

2022-03

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#### Version information

The following changes have been made to the document:

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### **1. Product Overview**

### **1.1 Product Functions**

The protocol converter is a converter developed by Sichuan Odot Automation System Co., LTD between RS232/485/422 and TCP/UDP. It can easily connect serial port devices to Ethernet and realize network upgrade of serial port devices. The protocol converter supports the function of "data transparent transmission", which can be set as a client or a server. This function can easily realize the data communication between PLC, server and other Ethernet devices and the underlying serial port devices.

### **1.2 Functional Characteristics**

- ◆ 9-36V wide voltage input, anti-reverse connection protection.DC-DC isolation power supply, 3000V isolation voltage.
- ◆ 2KV network port isolation protection, 10M/100Mbps rate adaptive, automatic MDI/MDIX reversal.
- Support TCP server pure transparent transmission, support 10 clients access.
- Support TCP client pure transparent transmission, support to connect 1 server.
- Support UDP pure transparent transmission.
- Support with and without protocol transparent transmission, protocol transparent transmission supports MODBUS RTU/ASCII.
- Support for WEB browser configuration parameters.
- ◆ It has three interfaces of RS485, RS422 and RS232.
- ◆ Serial port baud rate support 1200 ~ 115200bps
- Support DHCP, more convenient to use.
- Support one-key reset function to restore factory Settings.
- ◆ 35mm standard DIN-rail installation.
- ◆ EMC meets EN 55022:2010 & EN55024:2010 international standards.

### **1.3 Technical parameters**

The technical parameters of this product are shown in Table 3.1. Please use this

product within the parameters of this product to obtain better performance.

	ODOT-S1E1							
Environmental parameters								
Working temperature	-20~70°C							
Storage temperature	-55~125°C							
Operating humidity	5%~95% (No condensation)							
The power supply parar	neters							
Number of power	1							
ports								
Input voltage	9-36V (DC)							
Power consumption	700mW							
Ethernet parameters								
Working mode	TCP server, TCP client, UDP							
Number of Ethernet	1							
Network protocol	TCP, UDP, HTTP							
Number of TCP connections	TCP server pure transparent transmission, supports 10 clients accesses.							
	TCP client pure transparent transmission, support to connect 1 server.							
Serial port parameters								
Quantity of serial port	1							
Serial communication mode	RTU mode and ASCII mode are optional.							
Serial terminal resistance	120 $\Omega$ external resistance							
Supported Baud rate	2400-115200bps							
Supported validation mode	None, odd check, even check							
Number of slave stations supported	31(RS485)							

# 2. Hardware description

### 2.1 Product appearance



### **2.2 Indicator LED description**

The converter has 5 LED status indicators, of which symbol definition and status description are shown in "Table 2.1".

Symbol	Definition	State	Instruction
DWD	Damar I ED	ON	Power supply is connected
PWK	Power LED	OFF	Power supply is not connected
		Flash	The converter is running properly
SIA	Converter status LED	OFF	The converter is not running properly
NC	Not used	OFF	Not used
DAT	Serial port transceiver	Flash	The serial port is sending and receiving data
DAI	indicator	OFF	No data is being sent or received through the serial port
NC	Not used	OFF	Not used
NC	Not used	OFF	Not used

### 2.3 Terminal definition

The equipment connection adopts 10Pin 3.81mm distance unplugging terminal. The RS485 interface terminal is defined as follows.

serial numbe	Terminal	RS485	RS422	RS232
<b>r</b>	RX			RS232 receive
2	TX			RS232 transmission
3	SGND			RS232 grounding
4	TB-	RS485 B-	RS422 send negative	
5	TA+	RS485 A+	RS422 send positive	
6	R-		RS422 receive negative	
7	R+		RS422 receive positive	
8	SGND	RS485 grounding	RS422 grounding	
9	NC			
10	NC			
11	NC			
12	NC			
13	NC			
14	NC			
15	NC			
16	NC			

ODOT-S1E1 Terminal definition

### 2.4 Reset switch

RESET

The paper clip can be used to click the reset button, and all the indicators blink once to indicate a successful reset. Gateway reset successfully, the technical parameters of the gateway are as follows:

Device Info				
Device name	S1E1			
Firmware version	V1.452			
Device ID				
<b>Network Configuration</b>				
Device IP	192.168.1.254			
Device Port	502			
Web access port	80			
Operating mode	TCP server (default), TCP client, UDP			
	mode, UDP multicast			
Subnet mask	255.255.255.0			
Gateway	192.168.1.1			
Destination IP/DNS	192.168.1.2			
Destination port	1024			
IP mode	Static (default), dynamic			
Serial Port Configuration	)n			
Baud rate	1200-115200, default; 115200			
Data bit	5, 6, 7, 8; default: 8			
Parity bit	None, odd check, even check;			
	default: None			
Stop bit	1,2; default:1			
Flow Control	None			
Advance Level				
None data restart	Disabled (default), Enabled			
None data restart time	5-1270ms, default:300			
Disconnection and	1-255 Second, default: 12			
reconnection time				
Multiple Host Settings				
Conversion Protocol	Modbus TCP to RTU(default), None			
Timeout time for	32-8000ms, default:192			
command response				
Multiple host setting	Enabled (default), Disabled			
RS485 Idle time	5-255ms,20			
interval				
Change the web login pa	assword			
New password				
Retype new password				

### **2.5 External terminal resistance**

According to the actual situation, a serial port side need external gateway 120  $\Omega$  terminal resistance.RS485 bus in the case of no trunk to support a maximum of 32 nodes, node and node between the "Daisy chain" connection mode, in the communication cable at both ends need to add terminal resistance, the resistance value is required to be approximately equal to the transmission cable characteristic impedance. In short distance transmission, no final resistance is required, that is, no final resistance is generally required below 300 meters. The final resistance is connected at the ends of the transmission cable.

Gateway in field application, if the RS485 bus distance, big field interference will need to add 120  $\Omega$  on both ends of the RS485 bus terminal resistance, in order to prevent the reflection of serial signal.

Note: 120  $\Omega$  resistance attached to the package, pay attention to check.



### 2.6 Installation dimension



# **3.** Typical application

S1E1 supports TCP server, TCP client, UDP pure transparent transmission mode. The transparent transmission mode supports transparent transmission with and without protocol. The S1E1 supports browser configuration and it directly forwarding data without storing.

### 3.1 Transparent transmission with protocol data

Example: ODOT-S1E1 was used for testing. On-site RS485 device (MODBUS RTU communication protocol is adopted for communication, serial port parameters: ID=1,19200 BPS, N81). Modbus Slave test software was used to simulate the field device.

### 3.1.1 TCP\_SERVER pattern

1. Open Google browser and enter 192.168.1.254 to login to the page configuration interface:

192.168.1.254/ip	html						
						退出	English
	设备信息 Dev	ice Info	Firmware Versi	on	Device ID		
Device Name	设备名称	S1E1	固件版本	V1. 452	设备ID	28-60-2C-D1-D1-02	
	网络设置 Ne	twork Configura	tion Device Port		Webpage acc	ess port	
	设备IP Device IP	192.168.1.254	设备端口	4196	网页访问端口	80	
Work Mode	工作模式	TCP 服务器 V	Subnet Mask 子网掩码	255.255.255.0	网关 Gateway	192.168.1.1	
Destination IP/DN	S目的IP/DNS	192.168.1.2	Destination Port 目的端口	4196	IP mode IP模式	静态 🗸 Static	
	串口设置 Se	erial Port Configu	uration				
Baud Rate	波特率	115200 - Data Bit	数据位	8 - Parity check	(校验位	无 v None	
Stop Bit	停止位	1 - Flow Contro	流控	无 v Non	e		
	高级设置 А	dvance Configu	ration None data re	start time	Disconnecti	on reconnection	time
None data restart	无数据重启	Disabled 禁用 🗸	无数据重启时间	300 5~1270 秒 Second	断线重连时间	12 1~255 秒	Second
	多主机设置	Multiple Host Co	onfiguration			le Host Config	
Conversion Protocol	转化协议	None 无 v	Long and re 指令应答超时时间	32~8000ms	S 主机设定	禁用▼ Disabled	
	RS485 空闲时间间 <sup>隔</sup> Noted: whe 注:当多主机设定被	0 5~255ms n multiple host ( 鼓禁用时,超时时间将始	config is disab 终为0。超时时间仅9	l <mark>led, the timeou</mark> t 只能设置为32的倍数。	t time will be	always 0, only m	ultiples of 32
	修改网页登录密	码 Change the	Webpage Log	in Password			
New Password	新密码		再次输入新密码		Enter the	new password ag	ain
			đ	是交修改 Subm	it		

Main nouns of configuration page Function description:

Baud rate:Serial port Baud rate, optional range 1200~115200bps, default 9600bps, please set this parameter to be consistent with the device connected to the serial port. Parity checking:No check, odd check, even check can be selected, default no check, please set this parameter to the serial port.

Stop bits:1 t, 2 bit stop is optional, default is 1 bit stop. Set this parameter to match the device to which the serial port is connected.

2. Network Settings: IP address 192.168.1.254, device port: 502, working mode: TCP server.

Serial port Settings: Serial port parameters: 19200bps, N81. The Serial Port test tool Serial Port Utility is used to simulate Serial Port devices.

Multi-master setting: Select Modbus TCP to RTU mode as the conversion protocol. Click Submit when the Settings are completed.

102.460.4.254/	h to al						
192.168.1.254/1p	.ntml						
							退出 En
	设备信息						
	设备名称		S1E1	固件版本	V1. 452	设备ID	28-60-2C-D1-D1-02
	网络设置	let	work Configurat	ion			
Device IP	设备IP		192.168.1.254	设备端口	502	网页访问端口	80
Work mode	工作模式	T	TCP 服务器 ~	子网掩码	255.255.255.0	网关	192.168.1.1
Destination	目的IP/DNS		192.168.1.2	目的端口	4196	IP模式	静态 🗸
IP/DNS	串口设置	Se	rial Port Configu	iration			
Baud Rate	波特率		19200 🗸	<sub>数据位</sub> Data bit	8 <b>∨</b> Parity	Bit 校验位	无 🗸 None
Stop bit	停止位		1~	流控	无 🗸		
	高级设置						
	无数据重启		禁用▼	无数据重启时间	300 5~12 秒	270 断线重连时间	12 1~255 秒
	多主机设置	Ν	Iultiple Host Cor	nfiguration			
Conversion Protocol	转化协议	(	Modbus TCP转RTU 🗸	指令应答超时时间	0 32~8000ms	多主机设定	禁用 🗸
	RS485 空闲时 隔	9)D	0 5~255ms	Modbus TCP	to RTU		
	注: 当多主机谈	定被	妓禁用时, 超时时间将始	终为0。超时时间仅9	只能设置为32的倍数。		
	修改网页登	录密	码				
	新密码			再次输入新密码			
				ł	是交修改		

After the parameter settings are submitted, log in to the web page again to check whether the Settings take effect.

Note: If the config page could not be logged in or the config page is displayed abnormally, pls disable the wireless network card and log in again. If the login IP address is forgotten, it could press the reset key to restore the factory Settings and log in the converter through 192.168.1.254. And reconfigure the parameters before using. 4. After setting, open MODBUS POLL software to test whether the data is collected normally.

📲 Modbus Poll - [M	1bpoll1]	-		200 400	Modbus Slave - [N	Mbslave1]		- 🗆 ×
🛱 File Edit Conn Window Help	ection Setup Fur	nctions Display	View	<b>!!!</b>	File Edit Conne	ection Setup Di	splay View Wir	ndow Help 🗕 🗗 🗙
🗅 🖻 🖬 🎒 🗙	🗖   💆 🎃   자	05 06 15 16	17 22 23   T	D	🖻 🔒 🎒 🗎	트 희 💡 📢		
Tx = 616: Err = 7: ID	) = 1: F = 03: SR	= 1000ms		ID =	1: F = 03			
Alias	00000	Alias	^		Alias	00000	Alias	00020 ^
0	21.9624			0		21.9624		0
1				1				0
2	1739.16			2		1739.16		0
3				3				0
4	2			4		2		0
5				5				0
7	242			6		242		0
8	867			7				0
9				8		867		0
10	0	1		9				0
11	0			10		0		0
12	0			11		0		0
13	0		~	12		0		0 🗸
<			>	<				>
For Help, press F1.	[192.1	168.1.254]: 502	.:	For I	Help, press F1.	Port	3: 19200-8-N-1	

### 3.1.2 TCP\_CLIENT pattern

1. Open Google browser, and enter 192.168.1.254 to log in to the webpage

configuration interface.

Network Setting: IP address 192.168.1.254, Device port: 502, Wok mode: TCP client, set the Destination IP/DNS to the server IP address to be connected: 192.168.1.51 (IP address of the local NIC), and remote port number: 6001.

Serial port device parameters: 19200bps, N81.The Serial Port test tool Serial Port Utility is used to simulate Serial Port devices.

Multiple Host Config: Select Modbus TCP to RTU mode as the conversion protocol.

Click Submit when the Settings are completed.

192.168.1.254/ip	html							
						退出 Eng		
	设备信息							
	设备名称	S1E1	固件版本	V1. 452	设备ID	28-60-2C-D1-D1-02		
	网络设置 net	work config	device port					
device IP	设备IP	192.168.1.254	设备端口	502	网页访问端口	80		
work mode	工作模式	TCP 客户端 V	CP client 子网掩码	255.255.255.0	网关	192.168.1.1		
destination	目的IP/DNS	192.168.1.51	目的端口	6001	IP模式	静态~		
IP/DNS	串口设置		destination p	ort no.				
	波特率	19200 🗸	数据位	8 🗸	校验位	无 🗸		
	停止位	1~	流控	无 🖌				
	高级设置							
	无数据重启	禁用 🗸	无数据重启时间	300 5~1270 秒	断线重连时间	12 1~255 秒		
	多主机设置 m	ultiple host conf	9 Modbus T	CP to RTU				
onversion otocol	转化协议	Modbus TCP转RTU ~	旨令应答超时时间	0 32~8000ms	多主机设定	茶用▼		
protocol	RS485 空闲时间间 隔	0 5~255ms						
	注: 当多主机设定被禁用时,超时时间将始终为0。超时时间仅只能设置为32的倍数。							
	修改网页登录密	密码						
	新密码		再次输入新密码					
			ł	是交修改	submit the	modification		

2. Open the TCP Debugging Assistant test tool, select TCP Server, set the remote host

IP address to 192.168.1.254, local port no: 6001, and click Start monitoring.

CP调试助手(V1.9) TC	P Debugging Assi	stant test tool		_	
文件(F) 工具(T) 编码方式	、关于(A)				
通讯模式 通讯模式 で TCP Server で TCP Server で UDP 设置 远程主机 remote ho 192.168.1_254 远程端口 503 ▼ 本地端口 6001 ▼ 停止监听	<del>de</del> st local port no. stop monitoring	数据	接收区	▶ 十六进制	<u>利显示</u> ^
清空接收区					~
「 实时 手动发送 」       万 安送 手动发送 」       清空发送区 」       退出 」	「 自动发送(ms) 500		发送区	▶ 十六进制	<u>11发送</u> ^
远程客户192.168.1.254: 503	收到:272585	发送:142916	计数器清零	2022/3/2	3 //.

Open Modbus Slave (simulate serial port device), click Connection or press the F3 shortcut key, set the correct serial port number and communication parameters in the pop-up window, and click OK.

🕌 M 🛒 Fil	lodbus Slave - [Mbslave1] le Edit Connection Setup Display View W	_ /indow	□ Help	× - 5
D E 1 D = 1 No cor 0 C 1 1 2 3 4 5 6 7 8 9 9	Image: Second Setup         Connection         Alias       00000         Connection         Serial Setings         USB Serial Port         USB Serial Port         Serial Setings         USB Serial Port         Serial Setings         USB Serial Port         Serial Setings         USB Serial Port         USB Serial Port         Connection         Serial Setings         USB Serial Port         DSB CTS         Boata bits         Flow Control         DSR         TCP/IP Server         IP Address         IPAddress         Ort         Soza         Any Address	X DK ancel		
For He	Ignore Unit ID     IPv6     ID, press F1,     Port 3: 19200-8-N-1			

After the Settings, MODBUS master message is sent in the TCP debugging Assistant sending window, and Automatic Sending is selected to collect MODBUS Slave data.

6 TCP调试助手(V1.9)		- 0	×	🗱 Modbus Slave - [Mbslave1] — 🗆 🗙
文件(F) 工具(T) 编码方	式 关于(A)			File Edit Connection Setup Display View Window
iiiiii 通讯模式 C TCP Client C TCP Server	<u> </u>	7 十六进制显示 00 00 (29) 00 00 (29) 00 00 (29) 00 00 (29) 00 00 (29)	^	Help
设置 远程主机 192.168.1.254	00 59 00 00 00 00 17 01 03 14 11 11 22 22 66 67 88 99 33 33 44 41 12 34 23 45 00 00 00 55 90 00 00 17 01 03 14 11 11 22 22 66 67 88 99 33 33 44 44 12 34 23 45 00 00 00 59 00 00 00 17 01 03 14 11 11 22 22 66 67 88 99 33 33 44 44 12 34 23 45 00 00	00 00 (29) 00 00 (29) 00 00 (29)		Alias         00000           0         0x1111           1         0x222
远程端口 503 ▼ 本地端口 6001 ▼				2 0x6667 3 0x8899 4 0x3333
	□□ 白砂岩洋(ma)500 - 秋塘岩洋(□□ □	一十六进制长送	~	5 0x4444 6 0x1234 7 0x2345
□ 案时 发送 手动发送 清空发送区	00 59 00 00 00 06 01 03 00 00 00 0A		^	8 0x0000 9 0x0000
退出	33 收到:274731 发送:143804 计数器清零 3	2022/3/23	/	For Help, press F1. Port 7: 19200-8-N-1

### 3.1.3 UDP\_CONNECT pattern:

UDP is an unlinked protocol that does not establish a connection between the source

and the terminal before transferring data. When it wants to transfer data, it simply grabs the data from the application and throws it onto the network as quickly as possible. At the sending end, the speed at which UDP delivers data is limited only by the speed at which the application generates data, the capacity of the computer, and the transmission bandwidth. At the receiving end, UDP puts each message segment into a queue, and the application reads one message segment at a time from the queue. 1. Open Google browser, and enter 192.168.1.254 to log in to the webpage configuration interface.

Network config: IP address 192.168.1.254, device port: 502, work mode: UDP, set the destination IP/DNS to the server IP address to be connected: 192.168.1.51 (IP address of the local NIC), and remote port number 6000. And it could use TCP debugging assistant to simulate test for TCP side.

Serial port config: serial port parameters: 19200bps, N81.The Serial Port test tool Serial Port Utility is used to simulate Serial Port devices.

Multiple Host Config: Select Modbus TCP to RTU mode as the conversion protocol. Click Submit when the Settings are completed.

						退出
	设备信息					
	设备名称	S1E1	固件版本	V1. 452	设备ID	28-60-2C-D1-D1-02
	网络设置 ne	twork config	device por	t		
device IP	设备IP	192.168.1.254	设备端口	502	网页访问端口	80
work mode	工作模式	UDP 模式 V	子网掩码	255.255.255.0	网关	192.168.1.1
destination	目的IP/DNS	192.168.1.51	目的端口	6000	IP模式	静态~
IP/DNS	串口设置	di	ata bit		parity chee	ck
baud rate	波特率	19200 🗸	数据位	8 🗸	校验位	无 v none
stop bit	停止位	1 -	流控	无 🗸		
	高级设置					75
nultiple host	无数据重启	禁用 🗸	无数据重启时间	300 5~1270 秒	断线重连时间	12 1~255 秒
onfig	多主机设置	Modbus TCP to F	RTU			
conversion	转化协议	Modbus TCP转RTU ~	指令应答超时时间	0 32~8000ms	多主机设定	禁用 🗸
protocol	RS485 空闲时间间隔	0 5~255ms				
	注: 当多主机设定被	故禁用时, 超时时间将始终	终为0。超时时间仅见	只能设置为32的倍数。		
	修改网页登录密	码				
	新家码	·	再次输入新密码			

| 192.168.1.254/ip.html

TCP debugging assistant simulates UDP client, Modbus Slave simulates serial port device, and it connects to S1E1 serial port through computer serial port USB to 485 converter.

Open TCP Debugging Assistant, select UDP, and set the remote host IP address: 192.168.1.254, remote port: 502, and local port: 6000. Click to enable UDP.



Open Modbus Slave (simulate serial port device), click Connection or press the F3 shortcut key, set the correct serial port number and communication parameters in the pop-up window, and click OK.

00C	File Edit Connection Setup Display View Window Help -
D	🚔 🖬 🎒 📃 🚊 💡 😢
D =	1: F = 03
No (	connection
	Alias 00000
0	Connection Setup X
1	Connection -
2	
3	Cancel
4	Serial Settings
-	USB Serial Port (CC M3)
2	Mode
6	RTU O ASCII
7	8 Data bits V
8	
9	1 [me] BTS disable delau
	1 Stop Bit V
	IP Address Port
	192.168.1.50 🗸 502
	Any Address IPv4
	Ignore Unit ID O IPv6

After the Settings, MODBUS master message is sent in the TCP debugging Assistant sending window, and Automatic Sending is selected to collect MODBUS Slave data.

The The Article Connection Color Division View	
文件D 工具(D) 编码方式 天丁(A)	Window
	- 8 ×
世球機     町 0314 23 44 55 55 66 78 89 99 100 000 000 000 000 000 72 E0 [25]     「     TCP Client     ① 10314 23 44 55 55 66 78 89 99 100 000 000 000 000 000 000 000 72 E0 [25]     □     □ 1: F = 03     □ 1: F = 03	
CODP     C1 03 14 23 44 55 55 66 67 88 99 0 00 00 00 00 00 00 00 00 00 00 00 72 E0 (25)     Alias     O0000     Alias	
CML 01 03 14 23 44 55 55 66 67 88 99 0 00 00 00 00 00 00 00 00 00 72 E0 (25) 0 0 0x2344     Ox2344	
192.168.1.254 1 0x5555	
」 近程端口 502 ▼ 2 0x6667	
本地端口 6000 - 3 0x8899	
4 0x0000	
5 0x0000	
<u>6</u> 0x0000	
【 □ 目动发送(ms) 1000 _ 数据发送区 ▼ 十六进制发送 7 0x0000	
□ 「 <u>发授</u> 手动发送 00 58 00 00 00 05 01 03 00 00 04 へ 8 0 x0000	
9 0x0000	

### 3.2 None protocol data transmission

### 3.2.1 TCP\_SERVER pattern

1. Open Google browser, and enter 192.168.1.254 to log in to the webpage

configuration interface.

Network config: IP address 192.168.1.254, device port: 502, work mode: TCP server.

Serial port config: serial port parameters: 19200bps, N81.The Serial Port test tool

Serial Port Utility is used to simulate Serial Port devices.

Multiple Host Config: Select the conversion protocol as none.

Click Submit when the Settings are completed.

192.168.1.254/ip.	html						
						退出	Er
	设备信息						
	设备名称	S1E1	固件版本	V1. 452	设备ID	28-60-2C-D1-D1-02	
	网络设置 netv	work config d	evice port				
device IP	设备IP	192.168.1.254	设备端口	502	网页访问端口	80	
work mode	工作模式	TCP 服务器 ~	子网掩码	255.255.255.0	网关	192.168.1.1	
	目的IP/DNS	192.168.1.51	目的端口	6001	IP模式	静态 🗸	
	串口设置 se	rial port config					
baud rate	波特率	19200 V data bit	数据位	<sup>8</sup> → parity check	校验位	无 🗸	
stop bit	停止位	1~	流控	无~			
	高级设置						
	无数据重启	禁用 🗸	无数据重启时间	300 5~1270 秒	断线重连时间	12 1~255 秒	>
	多主机设置	multiple host cor	nfig				
onversion	转化协议	none 无	指令应答超时时间	0 32~8000ms	多主机设定	禁用▼	
1010001	RS485 空闲时间间隔	0 5~255ms					
	注: 当多主机设定被禁用时, 超时时间将始终为0。超时时间仅只能设置为32的倍数。						
	修改网页登录器	容码					
	新密码		再次输入新密码				
			Ť	是交修改			

Open the TCP debug assistant, simulate the TCP Client, and access the converter

192.168.1.254 port 502.

Open the Serial Port Utility to simulate the underlying Serial Port device.

The following figure shows the screenshot of normal communication of data:



### **3.2.2 TCP\_CLIENT pattern**

1. Open Google browser, and enter 192.168.1.254 to log in to the webpage configuration interface.

Network Setting: IP address 192.168.1.254, Device port: 502, Wok mode: TCP client,

set the Destination IP/DNS to the server IP address to be connected: 192.168.1.51 (IP

address of the local NIC), and remote port number: 6004.

Serial port device parameters: 19200bps, N81.The Serial Port test tool Serial Port

Utility is used to simulate Serial Port devices.

Multiple Host Config: Select the conversion protocol as None.

Click Submit when the Settings are completed.

192.168.1.254/ip.html							
						退出 English	
	设备信息						
	设备名称	S1E1	固件版本	V1. 452	设备ID	28-60-2C-D1-D1-02	
	网络设置	network config	device port				
device IP	设备IP	192.168.1.254	设备端口	502	网页访问端口	80	
work mode	工作模式	TCP 客户端 V	' client <sup>子网掩码</sup> destin	255.255.255.0	网关	192.168.1.1	
destination	目的IP/DNS	192.168.1.51	目的端口	6004	IP模式	静态 🗸	
IP/DNS	串口设置。	serial port config					
baud rate	波特率	19200 🗸 data bit	数据位	<sup>8</sup> → parity check	(校验位	无 <mark>&gt; none</mark>	
stop bit	停止位	1~	流控	无 🗸			
	高级设置						
	无数据重启	禁用▼	无数据重启时间	300 5~1270 秒	断线重连时间	12 1~255 秒	
	多主机设置	multiple host con	fig				
conversion protocol	转化协议	无 none v	指令应答超时时间	0 32~8000ms	多主机设定	禁用▼	
	RS485 空闲时间 隔	间间 0 5~255ms					
	注:当多主机设定被禁用时,超时时间将始终为0。超时时间仅只能设置为32的倍数。						
	修改网页登录	录密码					
	新密码		再次输入新密码				
			B	是交修改S	ubmit		

Open the TCP debugging assistant, and it simulates THE TCP Server (local IP address 192.168.1.51, port number 6004), and wait for the protocol converter to be actively connected.

Open the Serial Port Utility to simulate the underlying Serial Port device. The following figure shows the screenshot of normal communication of data:



### 3.2.3 UDP\_CONNECT pattern

1. Open Google browser, and enter 192.168.1.254 to log in to the webpage

configuration interface.

Network config: IP address 192.168.1.254, device port: 502, work mode: UDP mode, set the Destination IP/DNS to the server IP address to be connected: 192.168.1.51 (IP address of the local NIC), and remote port number: 6005.

Serial port config: serial port parameters: 19200bps, N81.The Serial Port test tool

Serial Port Utility is used to simulate Serial Port devices.

Multiple Host Config: Select the conversion protocol as none.

Click Submit when the Settings are completed.

192.168.1.254/ip	html						
						退出 En	
	设备信息						
	设备名称	S1E1	固件版本	V1. 452	设备ID	28-60-2C-D1-D1-02	
	网络设置 net	work config		-			
device IP	设备IP	192.168.1.254	设备端口	502	网页访问端口	80	
work mode	工作模式	UDP 模式 🖌	子网掩码	255.255.255.0	网关	192.168.1.1	
destination	目的IP/DNS	192.168.1.51	目的端口	6005 destinati	on port IP模式	静态~	
IP/DNS	串口设置 ser	ial port config					
baud rate	波特率	19200 V data bit	数据位	8 - parity check	c校验位	无 v none	
stop bit	停止位	1~	流控	无 🗸			
	高级设置						
	无数据重启	禁用▼	无数据重启时间	300 5~1270 秒	断线重连时间	12 1~255秒	
	多主机设置	multiple host cor	nfig		4 		
conversion	转化协议	无 none 🗸	指令应答超时时间	0 32~8000ms	多主机设定	禁用▼	
protocol	RS485 空闲时间间隔	0 5~255ms					
	注: 当多主机设定被禁用时,超时时间将始终为0。超时时间仅只能设置为32的倍数。						
	修改网页登录部	密码					
	新密码		再次输入新密码				

Open the TCP debugging assistant to simulate the UDP connection protocol converter. Open the Serial Port Utility to simulate the underlying Serial Port device. The following figure shows the screenshot of normal communication of data:

VI.9) TCP调试助手(V1.9)	- 🗆 🗙	■ 友善串口调试助手 - □	$\times$
文件(E) 工具(I) 编码方式关于(A)		文件(F) 编辑(E) 视图(V) 工具(T) 帮助(H)	
→ 通讯模式 99 97 89 78 33 33 ℃	▶ 十六进制显示		
C TCP Client (89 97 89 78 33 33 (6) C TCP Server (89 97 89 78 33 33 (6) C TCP Server (89 97 89 78 33 33 (6)		串口设置 串 ロ USB Ser(COM7) ▼	
(89 97 89 78 33 33 (6) 89 97 89 78 33 33 (6) 99 97 89 78 33 33 (6)		波特傘 19200     マ     11 11 11 11 11 11 11 11 11 11     11 11	
1254至王初。 192.168.1.254 89.97.89.78.33.33 (6) 89.97.89.78.33.33 (6)		RANG 12 0     III 11 11 11 11 11 11 11 11 11 11 11	
法程端口 502 - 99 37 89 78 33 33 (6) 本排除口 6005 - 88 97 89 78 33 33 (6)		停止位 1 · · · · · · · · · · · · · · · · · ·	
◆ 关闭UDP		接收设置	
二濟学榜收区		○faSCII ⑥ Hex □ 自动换行	
	▶ 十六进制发送		
「 <u>发</u> 提 手动发送 111111111111111111111111111111111111	^		送
清空发送区		ASCII I Hex	
	~	▲ 東東友区 1000 ▼ 和S 899789783333	•
UDP通信 192.168.1.254: 502 收到:284489 发送:152777	计数器清零 022/3/2 /	COM7 OPENED, 19200, 8, NONE, 1, OFF Rx: 132 Bytes Tx: 72 Bytes	

## 4. Supplement

### Brief introduction of serial port network topology

### 1. RS232

RS232 is one of serial communication interfaces controlled by industry. It is widely used to connect computer serial interface with peripherals. RS232 using a signal and a signal transmission form, return lines were in the land of the three wire connection mode, can realize full-duplex communications, the transmission signals for single ended, the total transmission of easy to generate common-mode interference, so the noise resistance is weak, the transmission distance is limited, RS232 interface standards stipulated in the code element distortion maximum transmission distance is less than 4% under the condition of standard values of 50 feet (15 meters) (more than 15 m long distance communication, need to adopt modem), the maximum transmission distance is also associated with communication baud rate, in the process of practical application, if the transmission distance is far, Please reduce the baud rate. In order to reduce the electromagnetic interference from the outside during the signal transmission, please use the shielded cable as the communication cable.

RS232 interface standard specifies that TXD and RXD:

RS232 USES negative logic to transmit signals and takes the signal of  $-(3\sim15)V$  as logic "1".Take the signal of  $+(3\sim15)V$  as logical "0";Voltages between -3 and +3V are meaningless, as are voltages lower than -15V or higher than +15V.

RS232 Interface Classification:

DB9 header interface



The top left corner is 1, the bottom right corner is 9

9-pin RS232 serial port (DB9)				
Pin	Name	Function		
1	CD	Carrier detect		
2	RXD	Receive data		
3	TXD	Send data		
4	DTR	Data terminal ready		
5	GND	Signal ground		
6	DSR	Data ready		
7	RTS	Request to send		
8	CTS	Clear to send		
9	RI	Ring alert		

As the RS232 interface has the above electrical characteristics, it can only realize point-to-point communication.

RS232 communication wiring diagram is shown in the figure below:



#### 2. RS422

The full name of RS422 interface standard is "Electrical Characteristics of Balanced Voltage Digital Interface Circuit", which defines the characteristics of the interface circuit. RS422 adopts four-wire plus ground wire (T+, T-, R+, R-, GND), full-duplex, differential transmission, multi-point communication data transmission protocol. It USES a balanced transmission line that is unidirectional/non-reversible,

with or without an enabling end. Because the receiver USES a high input impedance and the sending driver is stronger than RS232, it is allowed to connect multiple receiving nodes on the same transmission line, up to 10 nodes. That is, one Master device (Master), the rest are slave devices (Salve), and the slave devices cannot communicate with each other, so RS-422 supports point-to-many two-way communication.

The RS-422 has a maximum transmission range of 4,000 feet and a maximum transmission rate of 10Mb/s. The length of the balanced twisted pair is inversely proportional to the transmission rate, and the maximum transmission distance can be reached only if the rate is below 100KB /s. The highest rate of transmission can be obtained only over very short distances. Generally, the maximum transmission rate obtained on 100 meters long twisted pair is only 1Mb/s.

The RS-422 requires a terminal resistance that is approximately equal to the characteristic impedance of the transmission cable. In short distance transmission, no final resistance is required, that is, no final resistance is generally required below 300 meters. The final resistance is connected to the farthest end of the transmission cable.

In a master multi-slave network connection, all the sending terminals of the slave connect to the receiving terminals of the master station by daisy-chain. All the receiving ends of the slave stations are connected by daisy-chain to the sending end which is finally connected to the master station.

RS422	2 (9 Pin)	Function	Remark
3	R-	Receive negative	Must connect
2	T-	Send negative	Must connect
7	R+	Receiving positive	Must connect
8	T+	Send positive	Must connect

The RS422 pin definition:



The upper left corner is 1, the lower right corner is 9.



The RS422 communication wiring diagram is shown in the figure:

#### 3. RS485

Since the RS-485 is developed from the RS-422, many electrical provisions of the RS-485 are similar to those of the RS-422.If they all adopt the balanced transmission mode, they all need to connect the final resistance on the transmission line, etc. The RS-485 can adopt two - wire and four - wire mode, and the two - wire system can realize real multi - point two - way communication.

RS485 is a standard for defining the electrical characteristics of drivers and receivers in a balanced digital multipoint system, using a combination of balanced drivers and differential receivers for enhanced common-mode dry resistance, i.e., good noise interference resistance. Because the semi-duplex network composed of RS485 interface generally adopts the wiring mode of two-wire system and adopts differential signal to transmit data, the voltage difference between the two lines is -(2-6)V to represent logic "0", and the voltage difference between the two lines is +(2-6)V to represent logic "1".

RS485 signal transmission distance is related to communication baud rate, the higher the baud rate, the shorter the transmission distance, under the condition of the baud rate is not higher than 100 KBPS, theory of the maximum communication distance is about 1200 meters, in the process of practical application, Due to electromagnetic interference and other factors, often cannot meet the maximum communication distance, if in a long-distance communication, please reduce the baud rate, to reduce the signal during transmission by external electromagnetic interference, please use twisted-pair shielded cable as a communication cable.

RS485 bus in the case of no trunk to support a maximum of 32 nodes, node and node between the "Daisy chain" connection mode, in the communication cable at both ends need to add terminal resistance, the resistance value is required to be approximately equal to the transmission cable characteristic impedance. In short distance transmission, no final resistance is required, that is, no final resistance is generally required below 300 meters. The final resistance is connected at the ends of the transmission cable.

-			
Pin	Name	Function	Remark
1	Data-/B-/485-	Send	Must
		positive	connect
2	Data+/A+/485+	Receiving	Must
		positive	connect
5	GND	Ground	
		wire	

RS485 9 pin definition:

The RS485 communication wiring diagram is shown in the figure:



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