



S01RS 通讯扩展模块使用说明书

一、产品型号列表和端子配线图

型 号	功率(24VDC)	外形尺寸
S01RS	0.4VA	30×95×82mm



二、指示灯说明

- 1、POW：电源指示灯。绿色，常亮 - 电源正常；不亮 - 电源异常。
- 2、LINK：多状态指示灯。三色（红色、黄色、绿色），如下表：

参考处理方式	模块总线状态	LINK 指示灯状态
正常	模块无通讯	不亮
	主机已识别模块且无通讯	绿色常亮
	串口或并口在通讯	绿色抖动：指示灯亮 30ms 灭 30ms
并行总线供电不足，需接外供电源	无并口或串口通讯	黄色闪烁：指示灯亮 0.5s 灭 0.5s
	有并口或串口通讯	黄色暗和抖动交替：指示灯灭 0.5s 抖动 0.5s
固件升级失败，重新升级模块固件	无并口或串口通讯	红色闪烁：指示灯亮 0.5s 灭 0.5s
	有并口或串口通讯	红色暗和抖动交替：指示灯灭 0.5s 抖动 0.5s
硬件故障，需返厂维修	无并口或串口通讯	红色常亮
	有并口或串口通讯	红色快速抖动：指示灯亮 30ms 灭 30ms

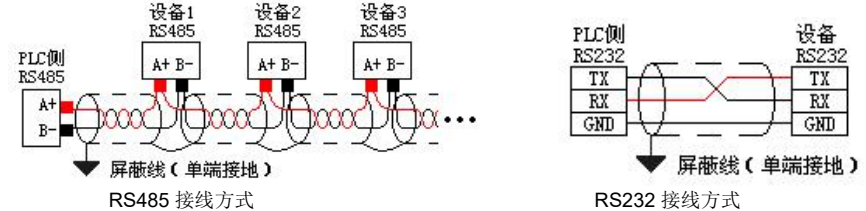
三、产品环境规格

项 目	环境规格
温度/湿度	工作温度：0~+55℃ 储存温度：-25~+70℃ 湿度：5~95%RH，无凝露
抗振动能力	10~57Hz 振幅 0.075mm，57Hz~150Hz 加速度 1G，X、Y、Z 三轴方向各 10 次
抗冲击能力	15G，持续 11ms，X、Y、Z 三轴方向各 6 次
抗干扰能力	DC EFT：±2500V，浪涌：±1000V
耐压能力	AC 端子对地线端子间 1500VAC，1 分钟 DC 端子对地线端子间 500VAC，1 分钟
绝缘阻抗	AC 端子对地线端子间 500VDC，5MΩ 以上（所有输入/输出点对地间 500VDC）
使用环境	防尘、防潮、防腐蚀、免受电击及外力冲击等环境

四、模块功能说明

通讯扩展模块是一款用于扩展串口通讯接口的模块。一个通讯模块可扩展 RS232 或 RS485 口，具体选择通讯方式由模块的接线决定，无需设置参数。一台主机最多可扩展 3 个通讯模块，即一个 PLC 系统可同时带 5 个通讯口与不同的设备进行通讯（主机自带 2 个分别为 RS232 与 RS485 的通讯接口）。用通讯模块扩展的通讯口与主机自带的通讯口功能完全相同。

五、RS485 和 RS232 接线图



六、模块连接方法

扩展模块与主机间或扩展模块间的连接是用总线方式实现的，每一个扩展模块在出厂时都自带有一根用于连接到上一个模块的扩展连接线。打开前一个模块的小翻盖，将要接入的模块的扩展连接线接头插入到前一个模块的扩展接口中，插

牢后将前一个扩展模块的小翻盖合上使其复位。

七、模块参数说明

通讯号的分配：通讯接口的端口号由 HaiwellHappy PLC 编程软件的《PLC 硬件配置》功能实现，其通讯端口号将由系统自动分配，与主机最近的为端口 3，依次为端口 4、端口 5，与程序一齐下载到 PLC 中。

扩展通讯接口模块的其它参数设定分为两种情况：

- A、扩展的通讯口作为主设备（Master）时，通讯接口的波特率、格式等参数由相应的通讯指令设定；
- B、扩展的通讯口作为从设备（Slave）时，通讯接口的波特率、格式等参数由相应的系统寄存器 SV 设定；

1、通讯协议定义：

通讯协议	S01RS
通讯波特率（bps）	0 -1200, 1 -2400, 3 -4800, 4 -9600, 5 -19200, 6 -38400, 7 -57600
通讯格式	0 -N,8,2 For RTU, 1 -E,8,1 For RTU 2 -O,8,1 For RTU, 3 -N,7,2 For ASCII 4 -E,7,1 For ASCII, 5 -O,7,1 For ASCII

2、通讯错误代码：

错误码	说 明	错误码	说 明
0	正常	5	内含非 ASCII 字符
1	功能码 错误	6	从机忙接收资料超时
2	资料地址错误	7	无结束字符
3	资料值错误	8	写数据信息太长或太短
4	通讯帧太短或太长，最小 4 字节，最大 128 字节	9	校验码错误

八、使用注意事项

- 1、RS485 总线的最长通讯距离可达 1000 米，RS232 采用 150pF/m 的通信电缆时，最大通信距离为 15 米。
 - 2、RS485 总线可以带 128 台设备进行通讯。通讯距离越长、波特率越高、线径越细、线材质量越差、转换器品质越差、转换器电能供应不足(无源转换器)、防雷保护越强，这些都会降低真实负载数量。
 - 3、RS485 的 A+ 和 B- 数据线一定要互为双绞线。
 - 4、RS485 总线一定要用手牵手式的总线结构，坚决避免星型连接和分叉连接。
 - 5、为避免强电对其干扰，通讯线应避免和强电线路走在一起，离干扰源大于 10 厘米并而垂直走线。
 - 6、在确保设备接线正确，且施工合乎规范。遇到通讯不稳定问题可采用下面几种调试方法：
 - ①共地法:使用电源线或屏蔽线将所有 485 设备的 GND 地连接起来，可以避免设备之间存在影响通讯的电势差。
 - ②终端电阻法:在最后一台 485 设备的 A+ 和 B- 上并接 120 欧姆的终端电阻来改善通讯质量。
 - ③中间分段断开法:通过从中间断开来检查是否设备负载过多、通讯距离过长、某台设备对整个通讯线路的影响等。
 - ④单独拉线法:单独简易拉一组通讯线到设备，这样可以用来排除是否是布线引起了通讯故障。
 - ⑤更换转换器法:随身携带几个转换器，这样可以排除是否是转换器质量问题影响了通讯质量。
- 注：**一般情况下不需要增加终端电阻，只有在 485 通信距离超过 300 米的情况下，要在 485 通讯的开始端和结束端增加终端电阻。尤其是 485 总线上设备数量较少时。当设备数量较多时（如超过 22 台）。一般不需增加终端电阻，因为终端电阻会降低 485 总线的负载能力。

感谢您选用 Haiwell PLC，若您对我们的产品或服务有问题或不足之处，敬请告诉我们！

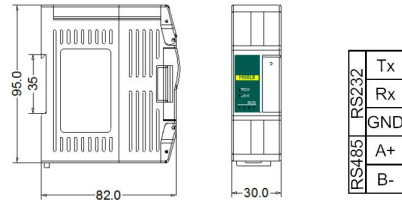
网址：<http://www.haiwell.com> <http://www.haiwell.cn>

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User's Manual of Communication Extension Module S01RS

1.Product list and terminal wiring diagram

Type	24VDC power supply	Dimension
S01RS	0.4VA	30×95×82mm



2. Indicator Description

①POW:power indicator .green,constant light -Power normal;Not light - Power error.

②LINK:many state indicator .three colors(Red. Yellow. Green),as follow:

Consult manage	Module bus state	LINK the state of the indicator
Normal	Module no communication	Not light
	MPU identification the module but have not communication	Green constant light
	Serial or parallel communicating	Green flicker:indicator light 30ms not light 30ms
parallel power supply not enough,must connect to external power supply	Without serial or parallel communicate	Yellow flicker:indicator light 0.5s not light0.5s
	With serial or parallel communicate	Yellow dark and shake alternately:indicator not light 0.5s shark 0.5s
Upgrade the fireware fail,reupgrade the fireware of the module	Without serial or parallel communicate	Red flicker:indicator light 0.5s not light 0.5s
	With serial or parallel communicate	Red dark and shake alternately:indicator not dark 0.5s shark 0.5s
Maintain	Without serial or parallel communicate	Red constant light
	With serial or parallel communicate	Red shark quickly:indicator light 30ms not light 30ms

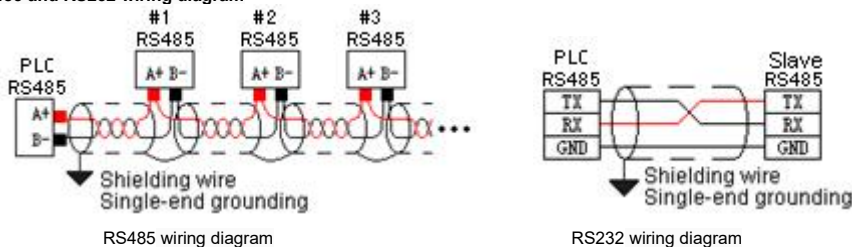
4. Environmental specifications for Product

Item	Environment Specification
Temperature/Humidity	Operating temperature:0~+55℃ Storage temperature:-25~+70℃ Humidity: 5~95%RH, No condensation
Vibration Resistance	10~57 HZ, amplitude=0.075mm, 57HZ~150HZ acceleration=1G, 10 times each for X-axis, Y-axis and Z-axis
Impact Resistance	15G, duration=11ms, 6 times each for X-axis, Y-axis and Z-axis
Interference Immunity	DC EFT:±2500V Surge:±1000V
Over Voltage Resistance	1500VAC/1min between AC terminal and PE terminal, 500VAC/1min between DC terminal and PE terminal
Insulation Impedance	≧5MΩbetween AC terminal and all input/output points to PE terminal @500VDC
Operating environment	Avoid dust, moisture, corrosion, electric shock and external shocks

4.Module function specification

Extending communication module is a used to extend the serial communication interface module. A communication module can be extended RS232 or RS485, Specific choose communication way is determined by module connection, do not need to set parameters. A host can be extended 3 communication module most, That is, a PLC system can take five communication and different devices with which it communicates(Host comes with 2 communication interface, RS232 and RS485).The function of Communications port that is extended with communication module and the host's own is exactly the same.

5.RS485 and RS232 wiring diagram



6.Module connection methods

The connection between extension module and the host or extension module is achieved through the method of bus, Each extension module in the factory are bringing an connecting line that was used to connect the previous module. Opening the small module cover of previous module,and,insert the Cable connector of module which Access to in into the Extension interface of the previous module, Close the flip of the previous module to reset after Plug stability.

7.Module parameters specification

Communication signal distribution: Communication interface port implementation by the 《The PLC hardware configuration》 function of HaiwellHappy PLC programming software, The communication port number will be assigned by the system automatically, With the host recently for port 3, followed by ports 4, 5, downloaded to the PLC With the program.

Other parameters setting of expand the communication interface module is divided into two cases:

- Port of the extension communication as the main equipment (Master), the parameters such as baud rate, format of communication interface are set According to the corresponding communication instruction;
- Port of the extension communication as the response equipment (Slave), the parameters such as baud rate, format of communication interface are set According to the Registers the SV system;

1.Communication protocol definition:

Communication protocol	S01RS
Communication baud rate (bps)	0 -1200, 1 -2400, 3 -4800, 4 -9600, 5 -19200, 6 -38400, 7 -57600
Communication format	0 -N,8,2 For RTU, 1 -E,8,1 For RTU 2 -O,8,1 For RTU, 3 -N,7,2 For ASCII 4 -E,7,1 For ASCII, 5 -O,7,1 For ASCII

2.Communication error code:

Error code	Declare	Error code	Declare
0	Normal	5	Include not ASCII characters
1	Function Code Error	6	Slave PLC receive message overtime
2	Data Address Error	7	No end character
3	Data Value Error	8	Write data information is too long or too short
4	Communication message too short or too long	9	Check Code Error

8.PRECAUTIONS FOR USE

1.Maximum communication distance of RS485 bus is up to 1000 meters, RS232 using 150 pf/m communication cable, The maximum communication distance is up to 15 meters.

2.RS485 bus can communicate with 128 devices. Communication distance is longer, the baud rate higher, the wire thinner, the worse quality of wire rod, the worse converter, converter supply power short (passive converter), he stronger the lightning protection, these will reduce the real load quantity.

3.RS485 + and B - cable must be twisted pair.

4.RS485 bus must use the bus structure of type of hand in hand, star connection and branching connections.

5.To avoid high voltage interference, Communication line should be avoided and the high voltage lines together, From the interference source is more than 10 cm and the vertical line.

6.Ensuring equipment wiring is correct, and the construction of textbook. Communication instability problems can adopt the following debugging methods:

①A total of law: Use the power cord or shielded wire all 485 devices connect to GND, Can avoid the equipment affect communication between electric potential difference.

②Terminal resistance method: Parallel connection 120 ohm resistor In A + B -of In the last 485 devices to improve communication quality.

③Middle section disconnect method: check whether equipment load too much, communication distance is too long, impact on the entire communications lines a device by Disconnect between

④Separate thread method: Pull a set of communication line to the equipment Separate and Simple, Whether it can be used to eliminate wiring caused the communication failure.

⑤Replace the converter: Carry a few converters, So we can rule out whether converter quality problem affects the communication quality.

Note: Generally do not need to increase the terminal resistance, Only in the case of a 485 communication distance of more than 300 meters, Increase the terminal resistance In the beginning and end terminal of the 485 communication and end terminal, Especially the 485 bus equipment quantity is small. When the equipment is large (e.g., more than 22). Generally do not need to increase the terminal resistance, because the terminal resistance can reduce the load capacity of 485 bus