

1 Product Introduction

iMars WiFi200 communication converter has 1 RS485 and 1 WiFi communication port for the data transmission. This product is based on the embedded module with general serial port which meets the network standard, has built-in TCP/IP protocol stack for the transformation between the user serial port and WiFi port. The traditional serial device can transfer the data through Internet without any configuration modification, WiFi200 provides a complete and rapid solution of data transmission for serial devices.

Table 1-1 iMars WiFi200 has the following features:

Interface	Parameters function
RS485 interface	1. Automatic control of data flow, automatic identification and transmission direction of control data and no handshake signal is needed 2. Transmission speed 300~115200Baud 3. Up to 32 devices of RS485 4. the maximum transmission distance 1200m 5. Flow indicator 6. Half duplex mode
WiFi interface	1. Support data exchange between RS485 - WiFi interface 2. Meet the 802.11 b/g/n wireless standard 3. Wireless network AP/STA 4. Security mechanismWEP/WPA-PSK/WPA2-PSK/WAPI 5. Barrier-free transmission distance 100m
Others	1. TCP Server, TCP Client, UDP mode and UDP Server mode 2. Operation interface, target IP address and interface can be set in random 3. Disconnect automatically after the network disconnection, ensure the reliable TCP connection of the whole network 4. Support TCP/IP/UDP network protocol stack 5. IE configuration interface 6. Operation mode, Transparent data transmission or agreement transfer mode 7. Input power supply: 5VDC~12V/170mA~300mA and the power is provided by the inverter directly 8. Working temperature: -20~70°C 9. Working humidity:10%-90%RH (no condensation) 10. Storage temperature: -40-80°C 11. Storage humidity: 5%-90%RH (no condensation) 12. Other frequency: 20MHz, 40MHz and automatic

WiFi200 is AP mode in the factory. It can be connected with the 485 communication interface of inverters and visited by computer or mobile software.

2 Monitoring solutions

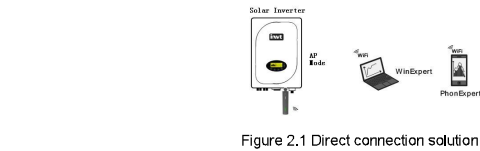
WiFi200 communication converter has 3 monitoring solutions to establish the solar power generation system for different requirements:

The first solution: direct connection. Short distance site control is available.

The second solution: router LAN. Remote LAN monitoring is available.

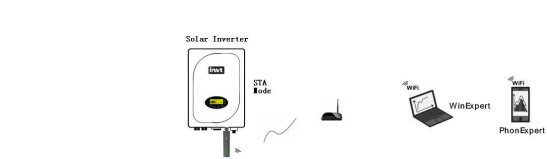
The third solution: router internet. Remote access internet control is available.

2.1 Direct connection



Direct connection solution is suitable for short distance monitoring. The wiring is as the figure above. Hardware and software devices such as iMars series solar inverters, WiFi200 communication converters, computers with the function of WiFi signal receiving, and WinExpert solar monitoring software are needed in the establishment of direct solar monitoring. WiFi200 operates in AP mode which is also the default mode of the module. The monitoring device can visit the inverter through wireless and wire modes. Refer to chapter 3 for the configuration of WiFi200 communication converter and computers.

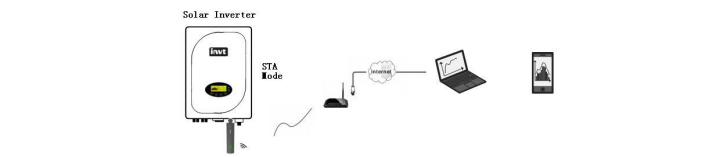
2.2 Router LAN



Router LAN is suitable for remote LAN monitoring. The wiring is as the figure above. Hardware and software devices such as iMars series solar inverters, WiFi200 communication converters, routers, devices with the function of WiFi signal receiving (such as computers and mobile phones) are needed in the establishment of router internet monitoring. WinExpert solar monitoring software or mobile phone APP are needed for the operation and data viewing.

Different configurations are needed in the wire or wireless connection between WiFi200 and routers, monitoring devices and routers. Refer to chapter 3 for detailed operation.

2.3 Router internet



Router internet is suitable for internet monitoring without distance limit. But the servers of INVT solar monitoring system are needed. The wiring is as the figure above. Hardware and software devices such as iMars series solar inverters, WiFi200 communication converters, devices with the function of WiFi signal receiving (such as

computers and mobile phone APP are needed for the operation and data viewing.

Different configurations are needed in the wire or wireless connection between WiFi100 and routers, monitoring devices and routers. Refer to chapter 3 for detailed operation.

Different configurations are needed in the wire or wireless connection between WiFi200 and routers, monitoring devices and routers. Refer to chapter 3 for detailed operation.

3 Installation and commissioning

3.1. Computer network configuration

Take the computer configuration as the example. The user needs to ensure there is wireless network card in the computer and the card can access the IP address automatically. After power on, the factory default value is AP hotspot mode. Please connect the hotspot through the wireless network and then the computer can access the IP address automatically.

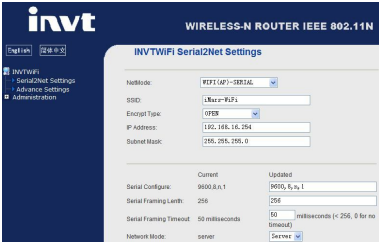
3.2. Parameters setting

3.2.1 Log in the Web

Open the web browser, input http://192.168.16.254 in the address bar. Input the user name: admin; Password: admin in the pop-up login window and then click "OK".



Enter into the main interface:



There are 3 areas in the main Web interface: 1 Network configuration; 2 Serial port configuration; 3 Configuration submitting

Network modes (NetMode):

- (1) Default – default operation mode
- (2) ETH-SERIAL – serial port to Ethernet
- (3) WIFI (CLIENT)-SERIAL – serial port to WIFI CLIENT
- (4) WIFI (AP)-SERIAL – serial port to WIFI AP

Different operation modes display different interface. The precious two modes can not be supported by WiFi200, so mode (3) and (4) is introduced in this manual.

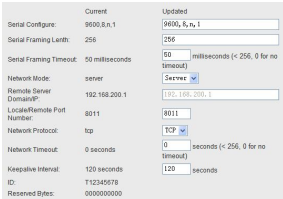
Serial port to WIFI CLIENT (STA mode):



Serial port to WIFI AP:



Serial port configuration:



Generally, above parameters does not need to be modified, and it can be adjusted during special requirements. Current: display the current configuration; Updated: display the current parameters to be modified. Serial Configure: serial port configuration. The format is as below: baud rate, parity check, data bits, stop bit, for example. "9600,8,n,1" Serial Framing Length: framing length of the serial port Serial Framing Timeout: framing time of the serial port Network Mode: network mode, select Client, Server or none Remote Server Domain/IP: The remote server domain name or IP address. For example, 192.168.200.1 Local/Remote Port Number: Local or remote port number. Different network mode designates different parameters. In the Client mode, it designates the remote port number and in Server mode, it designates the local port number.

Network Protocol: Network Protocol type, use tcp or udp protocol

Network Timeout: Network Timeout. In Server mode, there is no data during the timeout

Configuration submitting:

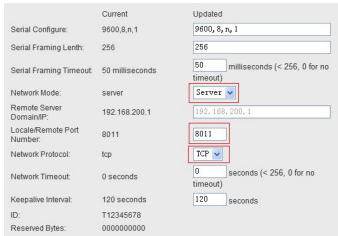


Click "Apply" to submit the current interface. If the network parameters are modified, it needs 25 seconds to submit. If only modifying the function of serial port, the submitting will be finished soon. Click "Cancel" to download the interface and the modified configuration will be lost.

3.2.2 Configuration of direct monitoring

Select AP hotspot mode as the operation mode. SSID is the hotspot name and can be modified by the user. The authenticated encryption is OPEN, WEP, WPA and so on. The user can set the security according to the needs.

Select TCP Server in the configuration of the serial port.



3.2.3 Configuration of router LAN monitoring

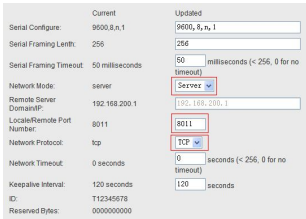
Select STA station spot mode as the operation mode. SSID is the hotspot name and the user needs to modify it as the router name.



The user can use the button "Scan" to scan the wireless hot spots information and then the router list can be found. The password and authentication encryption need to be set according to the attribute of the wireless router.



Select TCP Server in the configuration of the serial port.



3.2.4 Configuration of router server

Select STA station spot mode as the operation mode. SSID is the hotspot name and the user needs to modify it

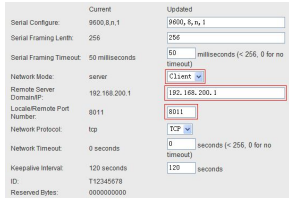
as the router name.



The user can use the button "Scan" to scan the wireless hot spots information and then the router list can be found. The password and authentication encryption need to be set according to the attribute of the wireless router.



Select TCP Server in the configuration of the serial port. Input the remote IP address according to the actual. For example, "192.168.200.1".



3.3. Commissioning

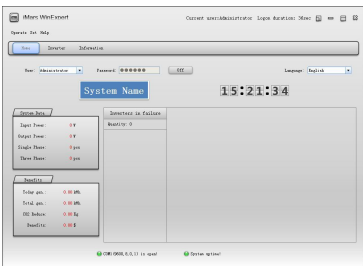
The software of iMars WinExpert can check the configuration of WiFi200 and this method can be used in the direct monitoring and router LAN monitoring.

Please download the monitoring software of iMars WinExpert and the operation instruction on www.invt-solar.com.

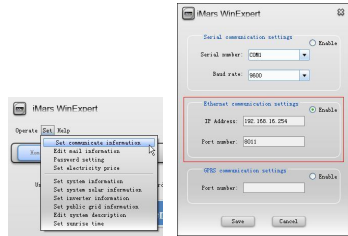
WinExpert software introduction: WinExpert software can support two kinds of communication mode of serial port and network. When WiFi100 monitors the inverter, it is necessary to select network monitoring.

Note: because of 485 communication and the influence of the WiFi100 communication converter, at the same time only one computer or mobile phone can transmit data with the inverter through WiFi100 converter; otherwise there will be data conflict to make WinExpert or PhonExpert monitoring software display the wrong data, and even lead to monitor software has burst automatically and shut down.

Install WinExpert software on the computer (Microsoft XP or Win7 operating system).



Click "Set" menu to click "Set communication information"



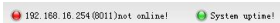
Enable the "Ethernet communication settings" in the pop-up dialog box, fill in the IP address and port number. The port number needs to be the same as that of the "Network setting"

3.3.1 Communication verification of WiFi200 and terminal devices

Complete the "Communication setting" of WinExpert solar monitoring software according to the above description. As shown in figure, if the "green light" on the below of the home page is on and display "Online", the communication between WiFi200 and monitoring devices is successful and it can go to the next step.

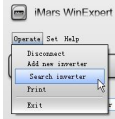


Otherwise, as shown in figure, if the "red light" on the below of the home page is on and display "Offline", the communication between WiFi200 and monitoring devices is not successful, please check WiFi200 network connections, network configuration and monitoring equipment again.

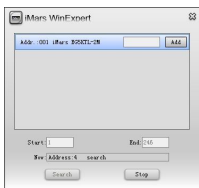


3.3.2 Communication verification of WiFi200 and inverters

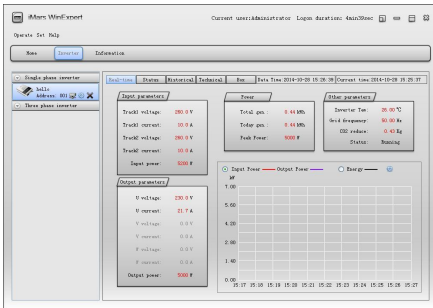
Ensure the successful communication between WiFi200 and monitoring devices, and then check the communication. As shown in the figure, select "Search inverter" in the operation menu of WinExpert software.



As shown in the figure, the inverter whose communication address in solar system is "001" inverter has been displayed in the search list, which means the "001" inverter has successfully establish communication with WiFi200. So on, when all the inverters in the solar system are displayed in the search list, the solar system has successfully established communication with WiFi200. Otherwise, please check the communication address and RS485 communication connection which are not listed and repeat the above operation.



And then, the real-time data of the inverter can be monitored by the software.



4 Contact us

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INVT Solar Website: www.invt-solar.com

1 产品简介

iMars WiFi200 通讯转换器具有 1 个 RS485 和 1 个 WiFi 通讯口，实现 RS485 和 WiFi 之间的数据传输。本产品是基于通用串行接口（UART）的符合网络标准的嵌入式模块，内置 TCP/IP 协议栈，能够实现用户串口和 WiFi 这 2 个接口之间的转换。通过 WiFi200，传统的串口设备在不需要更改任何配置的情况下，即可通过 Internet 网络传输自己的数据，为用户的串口设备通过网络传输数据提供完整快速的解决方案。

表 1-1 iMars WiFi200 具有以下特性：

接口	参数功能
RS485 接口	1) 数据流自动控制技术，自动判别和控制数据传输方向，不需要任何握手信号 2) 传输速率 300~115200Baud 3) 允许最大连接 32 个 RS485 接口设备 4) 最大传输距离 1200 米 5) 带流量指示灯 6) 半双工工作模式
WiFi 接口	1) 支持 RS485-WiFi 接口之间进行数据交换 2) 满足 802.11b/g/n 无线标准 3) 无线网络类型 AP/STA 模式 4) 安全机制 WEP/WPA-PSK/WPA2-PSK/WAPI 5) 无距离传输距离 100m
其它	1) 工作方式可选择 TCP Server、TCP Client、UDP 工作模式、UDP Server 工作模式 2) 工作端口，目标 IP 地址和端口均可任意设定 3) 网络断开后自动断开连接，保证整个网络可靠的建立 TCP 连接 4) 支持 TCP/IP/UDP 网络协议栈 5) 提供 IE 配置界面 6) 工作模式，数据透明传输或协议传输模式 7) 输入电源：5VDC~12V/170mA~300mA，由逆变器直接供电 8) 工作温度：-20~70℃ 9) 工作湿度：10%~90%RH（不凝结） 10) 存储温度：-40~80℃ 11) 存储湿度：5%~90%RH（不凝结） 12) 其它性能频段带宽可选：20MHz、40MHz、自动

WiFi200 在出厂状态下为 AP 模式，可直接插在逆变器的 485 通讯端口，用笔记本电脑或手机软件进行访问。

2 监控方案选择

WiFi200 通讯转换器提供以下三种光伏发电系统监控方案，以满足不同场合的监控要求：
第 1 种：直连方案。该方案可以实现短距离就地监控。
第 2 种：路由器局域网方案。该方案可以实现远距离局域网监控。
第 3 种：路由器互联网方案。该方案可以实现远距离访问互联网监控。

2.1 直连监控方案



图 2.1 直连监控方案

直连监控方案，适用于短距离监控。接线方式如图 2.1 所示，搭建直连光伏监控，需要 iMars 系列光伏逆变器，WiFi200 通讯转换器，和具备 WiFi 无线信号接收功能的计算机，WinExpert 光伏监控软件等软硬件设备。

该方式下 WiFi200 工作在 AP 模式，同时也是模块的缺省模式，这时监控设备可以通过无线方式对逆变器进行访问。WiFi200 通讯转换器及电脑的配置，具体操作参照第三章内容。

2.2 路由器局域网监控方案



图 2.2 路由器局域网监控方案

路由器局域网监控方案，适用于中距离局域网监控。接线方式如图 2.2 所示，搭建路由器局域网监控，需要 iMars 系列光伏逆变器，WiFi200 通讯转换器，无线路由器和具备 WiFi 无线信号接收功能的终端设备（如电脑、手机）等软硬件设备。用户可以使用 PC 监控软件 iMars WinExpert 或手机 APP 监控软件进行光伏逆变器的操作与数据查看。

关于 WiFi200 接入路由器的配置，具体操作参照第三章内容。

2.3 路由器互联网监控方案

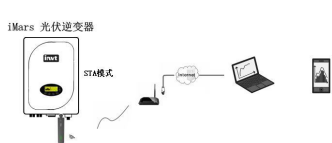


图 2.3 路由器互联网监控方案

路由器互联网监控方案，适用于互联网数据监测，不受距离限制，需要使用到英威腾光伏监控系统的服务器。接线方式如图 2.3 所示，搭建路由器互联网监控，需要 iMars 系列光伏逆变器，WiFi200 通讯转换器和具备 WiFi 无线信号接收功能的终端设备（如电脑、手机）等软硬件设备。用户使用 Web 浏览器或手机 APP 软件进行光伏逆变器的操作与数据查看。

关于 WiFi200 接入路由器的配置，具体操作参照第 3 章内容。

3 配置与调试

3.1. 电脑网络配置

以电脑配置为例，用户首先确认使用的电脑安装有无线网卡，并且网卡是处于自动获取 IP 地址的工作方式。WiFi200 上电后，出厂值是 AP 热点模式。请用用户使用电脑的无线网络来连接这个热点。此刻，电脑将自动获取到 IP 地址。

3.2. 参数设置

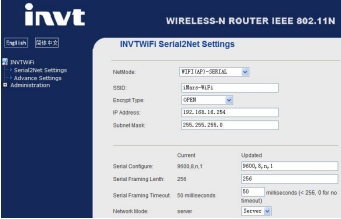
3.2.1 登陆 Web

打开 Web 浏览器，在地址栏中键入 http://192.168.16.254 在弹出的登录窗口里，输入用户名：admin，密码：admin。

然后单击“确定”。



登陆后进入网站的主界面：



Web 主界面分为 3 大区：1 网络配置区；2 串口功能配置区；3 配置提交区。

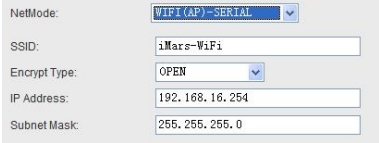
网络模式选择（NetMode）：

- (1) Default - 默认工作模式
- (2) ETH-SERIAL - 串口转以太网
- (3) WIFI(CLIENT)-SERIAL - 串口转 WIFI CLIENT
- (4) WIFI(AP)-SERIAL - 串口转 WIFI AP

选择不同的工作模式，Web 显示的页面将不相同。前面两种模式，WiFi200 不支持，所以本说明书仅介绍后面两种，实际工作也只会用到这两种模式，模式配置界面如下：
串口转 WIFI CLIENT(STA 模式)：

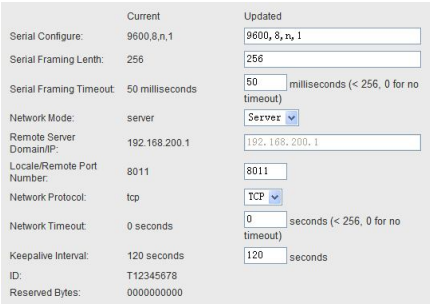


串口转 WIFI AP：



串口功能配置区：

- 3 -



通常以上参数都不需要修改，设备就可以正常使用，当用户有特殊要求时可以稍微调整。

Current 列显示当前配置，Updated 列显示当前修改的参数。
Serial Configure：串口配置，格式如下：波特率,数据位,校验位,停止位。例：“9600,8,n,1”。
Serial Framing Leneth：串口帧长度。
Serial Framing Timeout：串口帧超时时间。
Network Mode：网络模式。选择 Client、Server 或者 none。
Remote Server DomainIP：远端服务器域名或者 ip 地址。例：192.168.200.1。

Locale/Remote Port Number：本地或远端端口号。不同的网络模式下指定的参数不一样。Client 下指定远端端口号，Server 下指定本地端口号。

Network Protocol：网络协议类型。使用 tcp 或 udp 协议。
Network Timeout：网络超时时间。Server 网络模式下，当在超时时间内没有任何数据传输，该连接将被断开。0 指定永不断开。
配置提交区：



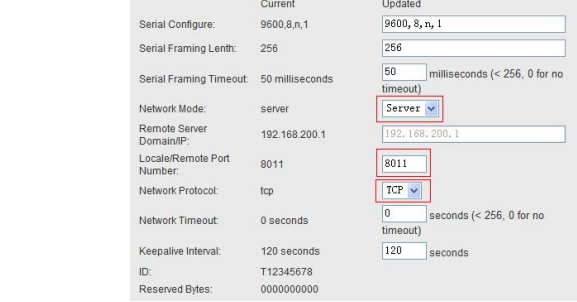
点击 Apply 将当前页面的配置提交。如果网络部分参数已更改，提交过程可能需要约 25 秒。如果只修改串口功能配置，提交过程会很快完成。点击 Cancel 将重载页面，已修改的配置将会丢失。

3.2.2 直接监控方式配置

直接监控方式，WiFi200 工作模式必须是 AP 热点模式。SSID 是 WiFi200 模块本身的热点名称，用户可以随意更改。认证加密类型分为 OPEN、WEP、WPA 等等，用户可以根据自身需求设置安全性。

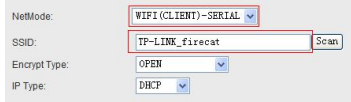


串口功能配置区，请选择 TCP Server 的方式。



3.2.3 路由局域网监控方式配置

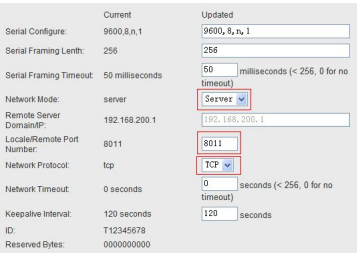
直接监控方式，WiFi200 工作模式必须是 STA 站点模式。SSID 是无线路由器热点的名称，用户必须更改为路由器的名称。



用户可以使用按钮“Scan”来扫描周围的无线热点信息，可以发现路由器列表。认证加密类型和密码需要根据无线路由器自身的属性来设置。

Ch	SSID	BSSID	Security	Signal(%)	WMode	ExtCh	NT
1	int-erp	68:86:a7:b0:ae:11	WPA2PSK/AES	29	11b/g/n	NONE	In
1	int-produce	68:86:a7:b0:ae:17	NONE	29	11b/g/n	NONE	In
6	TP-LINK_firecat	c0:61:18:40:b9:74	NONE	100	11b/g/n	BELOW	In

串口功能配置区，请选择 TCP Server 的方式。



2.4 路由器互联网监控方式配置

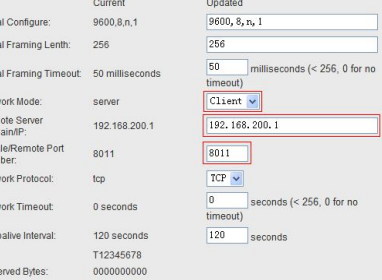
直接监控方式，WiFi200 工作模式必须是 STA 站点模式。SSID 是无线路由器热点的名称，用户必须更改为路由器的名称。



用户可以使用按钮“Scan”来扫描周围的无线热点信息，可以发现路由器列表。认证加密类型和密码需要根据无线路由器自身的属性来设置。

Ch	SSID	BSSID	Security	Signal(%)	WMode	ExtCh	NT
1	int-erp	68:86:a7:b0:ae:11	WPA2PSK/AES	29	11b/g/n	NONE	In
1	int-produce	68:86:a7:b0:ae:17	NONE	29	11b/g/n	NONE	In
6	TP-LINK_firecat	c0:61:18:40:b9:74	NONE	100	11b/g/n	BELOW	In

串口功能配置区，请选择 TCP Client 的方式。远端 IP 地址，根据实际情况输入，例如“192.168.200.1”。



3.3 调试验证

利用光伏 PC 版本的监控软件 iMars WinExpert，可以验证 WiFi200 是否配置成功。该方法适用于当光伏系统采用直接监控方式和采用路由器局域网监控方式时。

光伏监控软件 iMars WinExpert 及其使用说明书可以从英威腾光伏网站 www.invt-solar.com 直接下载获得。WinExpert 软件简介：WinExpert 软件本身可以支持串口和网络两种接口方式进行通讯。当通过 WiFi200 对逆变器进行监控时，只能选择使用网络监控方式。

注意：受 RS485 通讯方式和 WiFi200 通讯转换器本身的影响，在同一时刻只能允许一台计算机或者手机通过 WiFi200 通讯转换器与逆变器进行数据传输；否则会出现数据冲突，使 WinExpert 或者 PhoneExpert 监控软件显示错误的数，甚至导致监控软件崩溃自动关闭。

请用户自行在计算机（WinXP 或 Win7）上安装并运行 iMars WinExpert 软件。



软件主界

点“设置”菜单，选取“通信设置”菜单项。

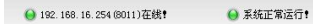


通信设置

在弹出的对话框中点击“以太网通信设置”，填写 IP 地址和端口号。此处填写的“端口号”必须与 WiFi200 通讯转换器“网络设置”中的端口号保持一致。

3.3.1 验证 WiFi200 与终端设备通讯

按照以上描述，完成对 WinExpert 光伏监控软件“通信设置”。如图，软件的主页下方亮起“绿灯”，同时显示“在线！”说明 WiFi200 与监控设备通讯成功，可以进行下一步操作：



否则，如图，软件的主页下方亮起“红灯”，同时显示“离线！”，说明 WiFi200 与监控设备通讯失败，请重新检查 WiFi200 与监控设备的网络连接和网络配置。



3.3.2 验证 WiFi200 与光伏逆变器通讯

确定 WiFi200 与监控设备通讯成功之后，再验证 WiFi200 与逆变器通讯。如图，在 WinExpert 软件的“操作”菜单中选择“搜索逆变器”。



如图所示，该光伏系统中通讯地址为“001”的逆变器已经显示在查找列表上，说明“001”逆变器已经成功与 WiFi200 建立通讯。依次类推，当光伏系统中所有逆变器都显示在查找列表上，说明这个光伏系统成功与 WiFi200 建立通讯；否则，请对未显示在查找列表上逆变器通讯地址及 RS485 通讯连接进行检查，并重复以上操作。



成功之后，WinExpert 软件便可以监控光伏逆变器的实时数据。



4 联系方式

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