VDU2506规格书Datasheet

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设备清单/Product List

名称/Item	型号/Model Number	数量 /Number	备注/Remark
超宽带双向测距基站 UWB TWR ranging anchor	VDU2506	1 pcs	
5V2A 电源适配器 5V 2A DC Power Adapter	TBD	1pcs	选配 Optional

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1 产品介绍/Product Induction

VDU2506 是一款基于双向高精度测距的超宽带基站，在解析标签测距信息的同时也可以下发指令信息包，从而较易实现双向报警，电子围栏，防撞预警等功能。

VDU2506 is an UWB anchor based on TWR high precision ranging. It can receive tag broadcast package to calculate the distance and send command to tags at the same time, making it easy for bi-direction alert, electrical fence and distance keeping function, etc.

VDU2506 使用白色曲面外壳设计，可以与室内环境完美融合，独特防水结构在户外也同样性能不减。

VDU2506 can be perfectly integrated with the indoor environment with white curved shell design. Its unique waterproof structure fits outdoor environment as well.

图 1.1 VDU2506 外观　Figure 1.1 VDU2506 outlook

VDU2506 使用了 2 级 PA 和 1 级 LNA 来增强射频收发性能，让覆盖范围更广（符合煤安标准的前提下，使用 2 级 PA 的工卡或者基站互相测距时，最远距离可达 500m 以上）；测距精度更高，CEP95 条件下 0.3m 定位误差。

VDU2506 use 2 stage of Power Amplifers and single stage Low Noise Amplifer to enhance the transmit and receive performance. The coverage of VDU2506 can be more than 500 meters ranging with tags that using 2 stage PA or with another VDU2506. And the static precision is 0.3m in CEP95 condition.

VDU2506 支持多种供电方式，可以 POE 供电，降低施工难度；也可以 DC 5V 2A 电源供电，使用 WiFi 组网，减少布线成本；内部也有预留电池供电和充电接口，可以安装 2pin 2.54mm JST 连接器的锂电池供电，并能提供最大 800mA 的充电电流，方便断电时继续工作。

VDU2506 support multiple power supply ways. Power over Ethernet way can reduce construction difficulty; DC 5V 1A power supply and WiFi network can reduce the network wiring cost; Also, the internal PCBA reserves 2-pin-2.54mm-pitch-JST battery connection interface for Li-battery power supply. And it can charge the battery with up to 800mA current, which is convenient to continue working in case of power failure.

VDU2506 支持最大 64GByte 的符合 SD-XC (class 10)协议标准的 SD 卡（或者 TF 卡），进而可以实现断网时的长时间离线数据存储，方便查询历史轨迹。

VDU2506 supports up to 64GigaByte SD card(or TF card) conforming to the standard of SD-XC (Class 10) protocol, so that offline data storage(like history distance trajectory) can be restored for long time when the network is disconnected.

VDU2506 应用场景比较广泛，可以用于室内外测距和定位。而且 TWR 机制方便实现一维定位到二维定位的灵活切换，可以用于施工工地，煤场，矿井，隧道等场所对人员和车辆测距和定位用途。

The application of VDU2506 is wide, both in indoor and outdoor ranging and position. And the TWR way can shift easizily from one dimension ranging to two dimension positioning. It can be used in construction sites, coal yards, mines, tunnels and other places to range and locate personnel and vehicles.

VDU2506 的 PCBA 支持串口转 USB 功能，方便调试应用；也支持 TTL 转 485 串口功能，方便接到工控机调试；同时也带网口和 WiFi 上网功能，可以使用 TCP/IP 、UDP 协议测距数据透传到服务器上，方便组网调试 TWR 定位系统。VDU2506 的 PCBA 也可以直接安装到客户的主机中，支持客户的二次开发或定制化需求。我司可有偿提供 4.3 寸显示屏选件，和测距结果演示软件；同时可以提供通过叠板的方式增加测距模块，及其演示软件，此举可以提高测距稳定性或者用来判断标签的方向。

VDU2506 PCBA support UART to USB transfering for debug use. It support TTL to UART 485 transfering for industrial machines. It also support WiFi and Ethernet connection to TCP/IP or UDP server, making it easy to build a TWR positioning system. The PCBA can be directly installed to customer’s machine, and support secondary development. We can supply 4.3 inch display screen and its demo software(not free). And we also supply 2 ranging module by overlaying anothor PCBA on VDU2506 PCBA and its demo software. In this way the stablity can be enhanced or the tag’s direction can be determined.

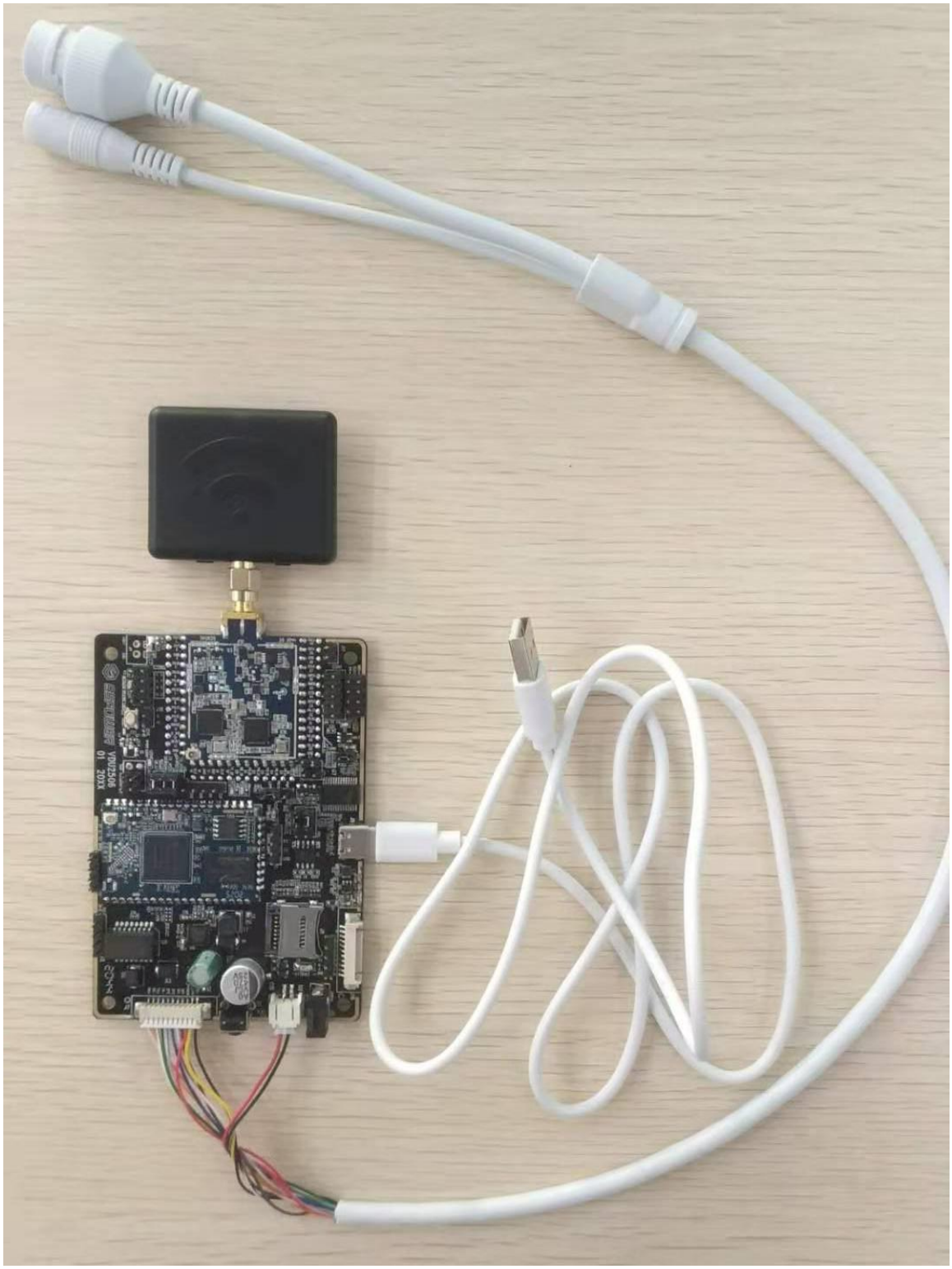


图 1.2　VDU2506 PCBA　Figure1.2　VDU2506 PCBA

2 基本参数

供电 Power Supply	
POE	POE 48V
直流电源 DC Power Adapter	输入电压 DC 5V 2A Input: DC 5V 2A
电池供电 Battery supply	锂离子可充电电池 电池电压 3.4~4.3V，充电电流 800mA Li+ rechargable Battery 3.4~4.3V，charge current 800mA
UWB	
支持协议 Supported protocol	IEEE802.15.4-2011 UWB
频率 Frequence	Default 3.9936GHz(with PA) support all channels ch1-5(Without PA)
发射功率 Tx POWER	Max 21dBm @CH2(Double PA)
接收灵敏度 Rx Sensitivity	-105dBm @110Kbps
数据传输速率 Data rate	Default 6.8Mbps，support 110Kbps，850kbps
数据存储 Data storage	支持网关断网存储数据 Support data storage without network
WiFi	
Wifi 协议/Protocol	IEEE 802.11n, IEEE 802.11g, IEEE 802.11b
传输速率 Data rate	IEEE 802.11 b Standard Mode: 1,2,5.5,11Mbps
	IEEE 802.11g Standard Mode: 6,9,12,18,24,36,48,54Mbps
	IEEE 802.11n : 72Mbps @ HT20 150Mbps @ HT40
接收灵敏度 Rx Sensitivity	HT40 MCS7 : -70dBm@10% PER(MCS7)
	HT20 MCS7 : -73dBm@10% PER(MCS7)
	54M: -77dBm@10% PER
	11M: -89dBm@ 8% PER
发射功率 Tx Power	IEEE 802.11n: 14dBm @HT40 MCS7 15dBm@HT20 MCS7

	IEEE 802.11g: 15dBm
	IEEE 802.11b: 18dBm
无线安全 Wireless security	WPA/WPA2, WEP, TKIP, and AES
工作模式 Workig mode	Bridge、Gateway、AP Client
BLE	**Default off 30s after power on**
支持协议 Supported Protocol	BLE4.2 802.15.4
频率 Frequency	2400MHz-2483.5MHz
发射功率 Tx POWER	-20~+4dBm in 4dB step
接收灵敏度 Rx Sensitivity	-96dBm
定位性能 **Positioning performance**	
定位精度 Accuracy	<30cm （基站标签无遮挡）
推荐基站布局间隔 Anchor distance	<200m，使用大功率工卡时可以最大到 500m Default <200m, <500m if using tags with double PA
数据上传方式 Data uploading	100M Ethernet WiFi 2.4G
操作环境 Environment	
工作温度 Op. temperature	-20℃~70℃
存储温度 Storage temperature	-40℃~85℃
防水等级 **Waterproof**	IP67
结构尺寸 **Dimension**	178.0mmx94mmx58.0mm±2mm

3 产品尺寸 Product Dimension

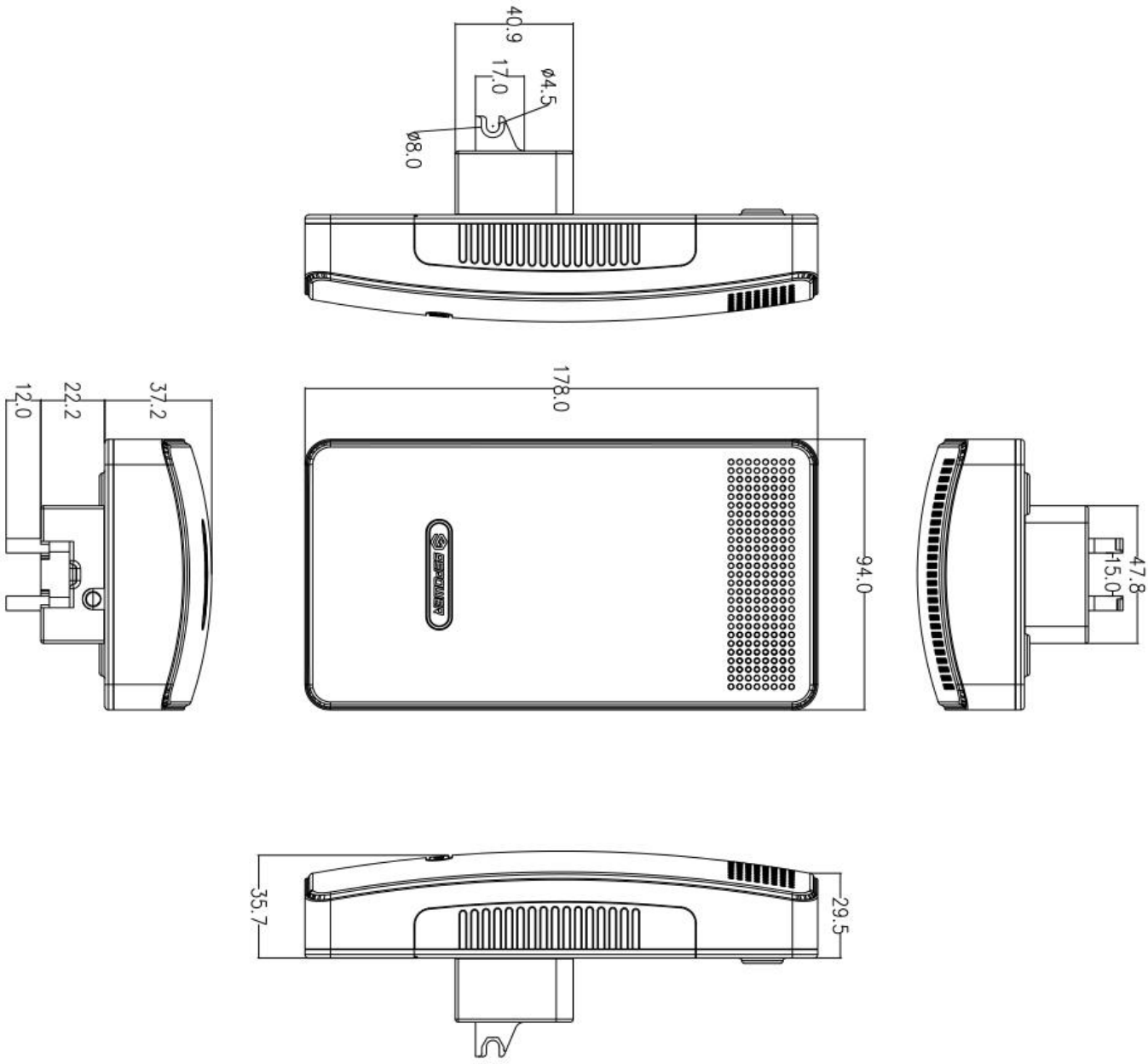


图 3.1 主体尺寸图（单位 mm）

Figure 3.1 Main Body Size (Unit mm)

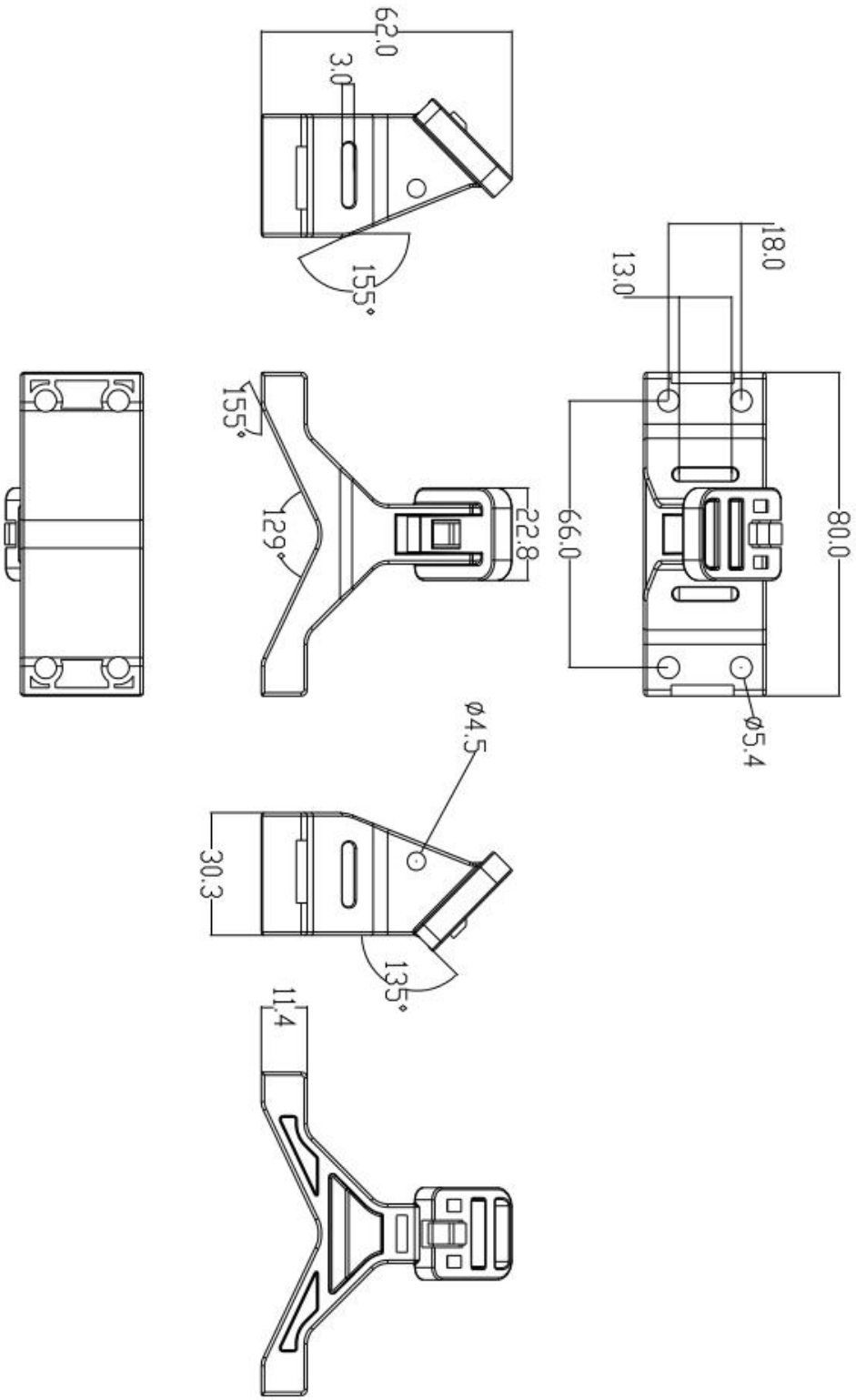


图 3.2 支架尺寸 Figure 3.2 Holder Size

4 安装 Installation

基站安装高度需要离地面 2.5m 以上。基站的间距取决于标签和基站的发射功率，单级 PA 最大增益时可以到 200 米，两级 PA 最大增益可以到 500 米。

Anchor needs to be installed more than 2.5m off the ground. And the anchor distance is relevant with tags' and anchors' broadcasting power. Single stage PA with max gain support max 200m distance. Double stage PA with max gain support max 500m distance.

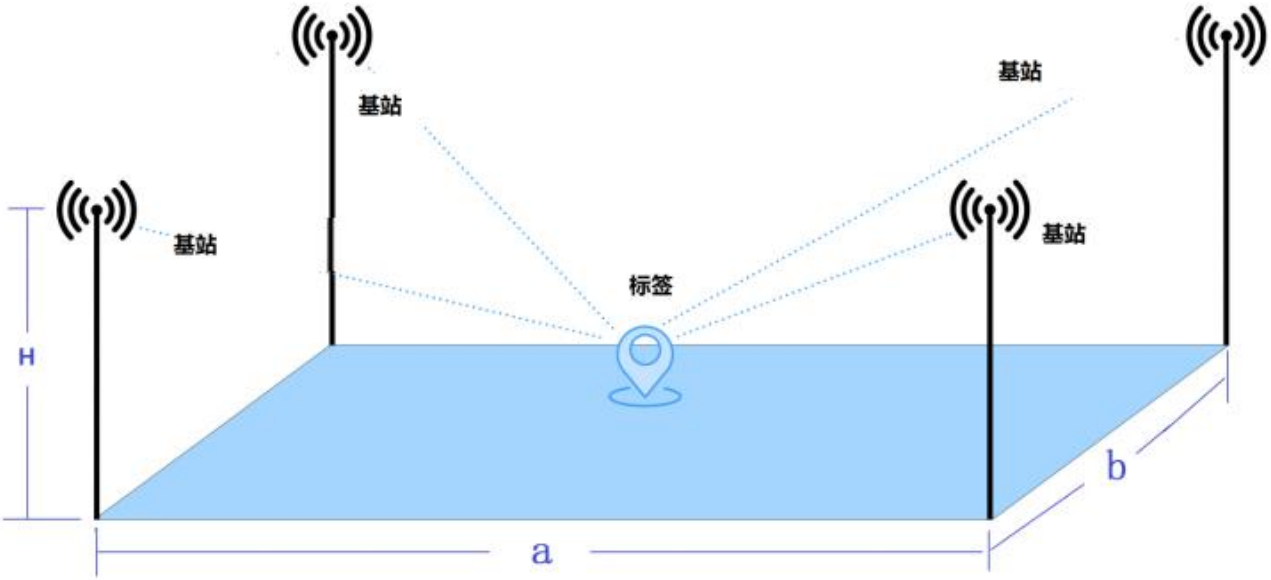


图 4.1 基站安装和标签最佳定位范围示意图

Figure 4.1 Anchor installation location and tag's best position area

基本要求 Basic Requirement： 1m<a<200m ,1m<b<200m ,3.5m> H>2.5

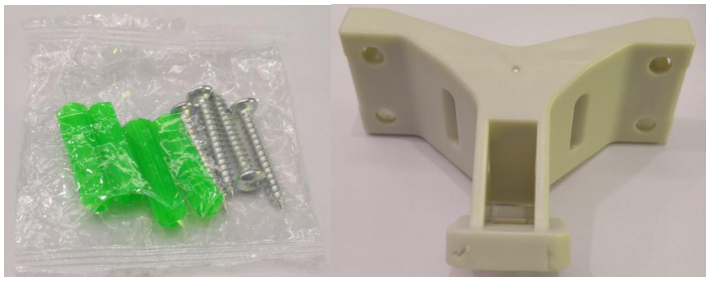
注意事项：基站安装位置应远离天花板和墙壁 15cm 以上

Note that the anchor should keep more than 15cm away from ceilings or walls

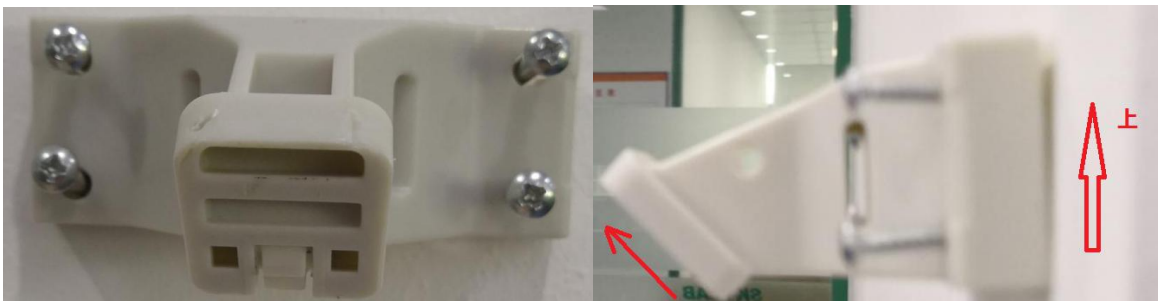
安装步骤 Install steps：

（1）用螺丝套料包，将支架固定在墙体上（实际可以根据墙壁材质灵活选择螺丝）

Using the expansion screws and fix the holder on the wall (You can change the screws depend on the wall material).



螺丝包 Screw pack　　安装支架 Holder



（2）对于圆柱安装，将铁抱箍穿过支架椭圆形槽，按照如图所示安装。（注：抱箍需要自备）

For cylinder install, please thread the hold hoop through the oval groove of the holder as shown in the figure.

（**注意**：抱箍长度由需要安装的柱子尺寸决定，抱箍厚度小于 3mm 宽度小于 13mm）

(Note:Hoop length depending on the cylinder diameter, and the thickness should be less than 3mm, width should be less than 13mm)

(3) 固定好支架后，基站主体由上向下，沿着卡槽卡住即可。

After fixing the holder, put the anchor stuck to the holder from top to bottom

（4）基站安装好后，插入 DC 5mm 电源接头或者 POE 网线，网口指示灯亮起，表示基站开始正常工作。

After installing the anchor, plug the DC 5mm power adapter or POE netcable. If the signal LED light as the right figure , the anchor start to work normally.

5. 配置参数/Configuration

5.1 网络拓扑/network topology

5.1.1 通过上级路由网段访问/Access through the superior routing network segment

VDU2506 在 gateway 模式下，唯一的网口为 WAN，PC 与 VDU2506 连接相同的上级路由，访问 VDU2506。

VDU2506 工作在 ap-client 模式下，PC 可以直接连接 VDU2506，访问 VDU2506。

下图是网络连接的拓扑图，VDU2506 的 wan 口连接路由器的 lan，个人 PC 也连接到路由器的 lan 口或者无线热点，此时在 PC 上使用浏览器可以访问 VDU2506 的管理界面；

In the Gateway mode of VDU2506, the only network port is WAN, PC and VDU2506 connect the same superior route, access VDU2506.

VDU2506 works in AP Client mode, where the PC accesses VDU2506 by net-cable connection directly .

The following figure is the topology of the network connection. The WAN port of VDU2506 is connected to the ROUTER's LAN port, and the PERSONAL PC is also connected to the router's LAN port or wireless hotspot. At this point, the management interface of VDU2506 can be accessed through the browser on the PC.

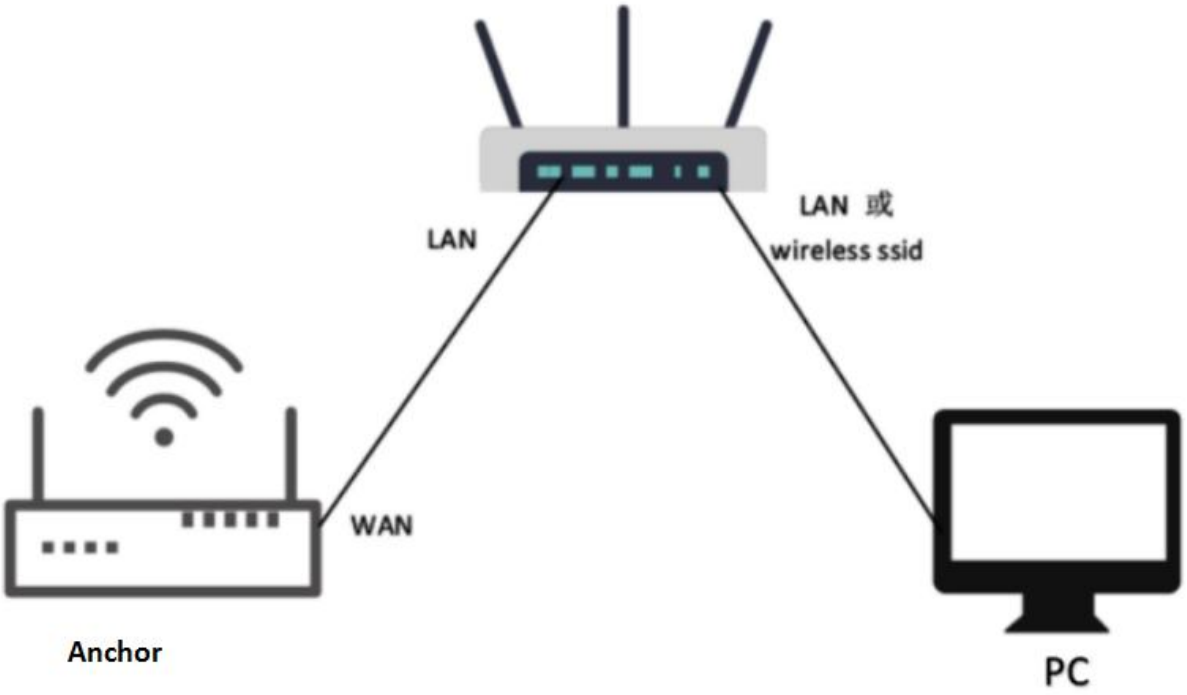
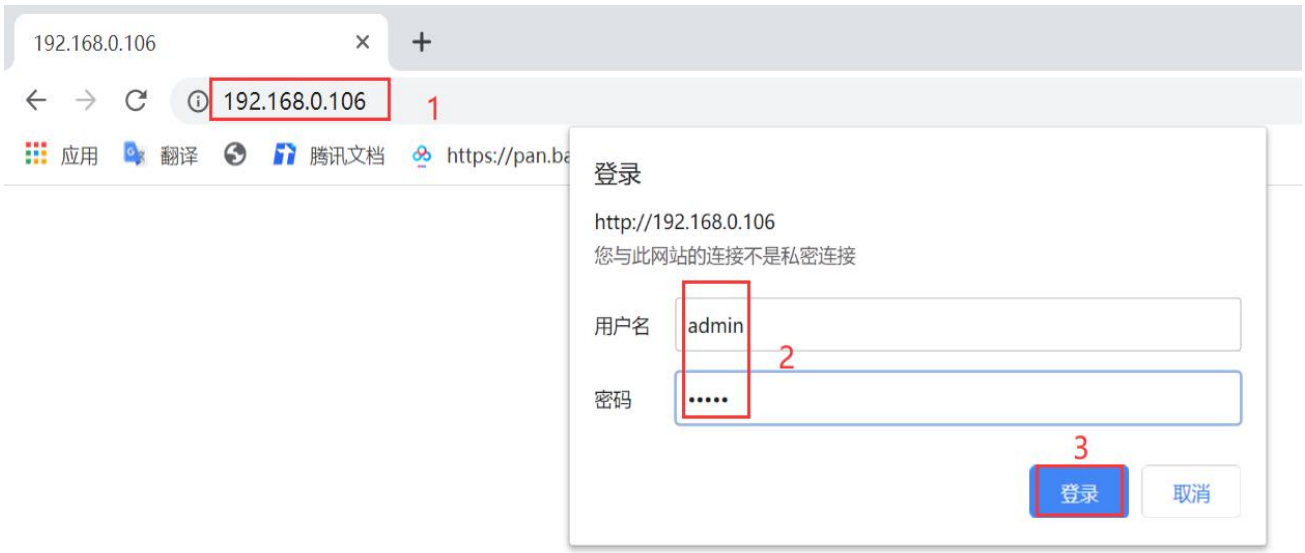


图 5.1 通过上级路由网段访问/Access through the superior routing network segment

下面假设此时路由器分配给 VDU2506 的 IP 地址为 192.168.0.106，PC 分配的 IP 为 192.168.1.118，此时在 PC 上使用浏览器访问 192.168.0.106，可以进入 VDU2506 的 web 认证界面。如下图所示

It is assumed that the IP address assigned to VDU2506 by the router is 192.168.0.106, and the IP assigned to THE PC is 192.168.1.118. At this time, the browser can access 192.168.0.106 on the PC, and the Web authentication interface of VDU2506 can be entered.As shown in the figure below



VDU2506 的管理账号密码分别为 admin/admin。

The password of VDU2506 is admin/admin.

5.1.2 通过局域网连接/Connect via LAN

VDU2506 在 gateway 模式下，PC 通过 VDU2506 的 WIFI 热点访问 WIFI 模块。

VDU2506 在 ap-cli 模式下，PC 可通过 VDU2506 的 WIFI 热点和唯一的网口访问 WIFI 模块。

通过以上方式连接 VDU2506 后，VDU2506 会分配 ip 地址给 PC。用户可在 PC 上，通过访问网关 IP，登录到 VDU2506 的管理界面。默认的 IP 地址网段为 10.10.10.0/254，假设用户没有修改 VDU2506 的 IP 网段，那么，可在 PC 上通过浏览器 10.10.10.254，来到 VDU2506 的管理界面。

VDU2506 in Gateway mode, the PC accesses the WIFI module through the WIFI hotspot of VDU2506.

VDU2506 In AP-CLI mode, THE PC can access the WIFI module through the WIFI hotspot of VDU2506 and the unique network port.

After connecting to VDU2506 in the above way, VDU2506 will assign the IP address to the PC.Users can log in to the administration interface of VDU2506 on a PC by accessing the gateway IP.The default IP address network segment is 10.10.10.0/254. Assuming that the user has not modified the IP network segment of VDU2506, then the user can go to the management interface of VDU2506 through the browser on the PC at 10.10.10.254.

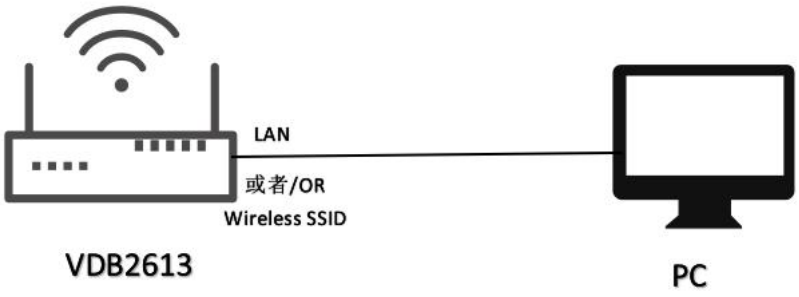
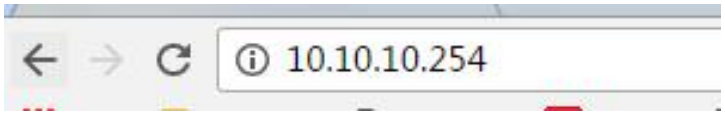


图 4.2 通过 VDU2506 局域网访问/Access via VDU2506 LAN

下图是 PC 上的访问截图：/The following is a screenshot of the access on PC:



5.2 广域网配置/Wan configuration

5.2.1 wan 口上网/Wan port access to the Internet

（1）系统工作默认为 gateway 模式；/The system works in gateway mode by default;

说明：点击 Save，可以保存配置，但不会立即生效，可以在系统配置完后，再一次性确定；

点击”确定”，会立即生效，网络会重启，需要等待网络恢复；

Note: Click Save, the configuration can be saved, but it will not take effect immediately. It can be determined once the system is configured.

Click "OK", it will take effect immediately, the network will restart, need to wait for the network recovery;

（2）广域网为动态地址分配；/Wan for dynamic address allocation;

（3）查看状态/Check the status

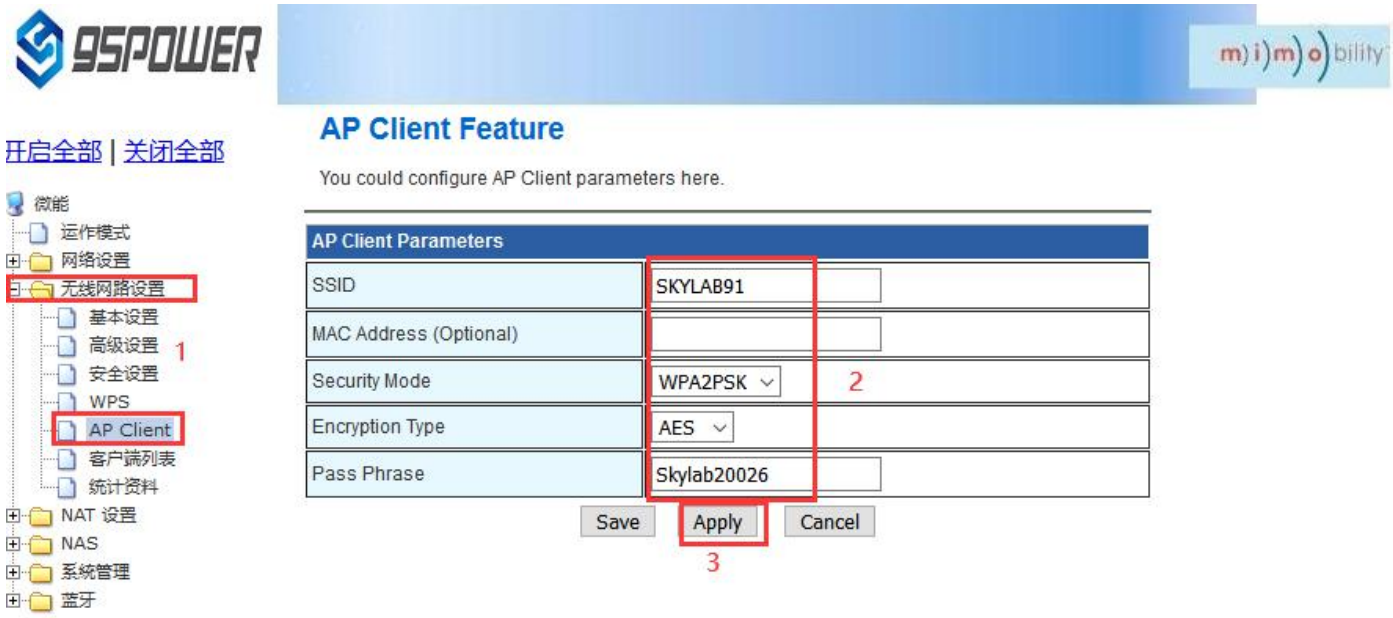
5.2.2 无线上网/wireless internet

（1）系统模式配置为 apclient 模式，按下图操作，点击”Save”后，需要刷新

The system mode is configured as APCLI mode. Follow the operation as shown in the figure below and click "Save" to refresh

（2）广域网配置为动态地址分配；/The WAN is configured for dynamic address assignment;

（3）配置上级 AP 信息；/Configure superior AP information;



5.3 局域网配置/LAN configuration

5.3.1 更改局域网 IP 地址/Change the LAN IP address

VDU2506 默认的局域网网段为 10.10.10.254/24，客户可以根据需求修改局域网 IP 地址，下面介绍其操作步骤：

The default LAN segment of VDU2506 is 10.10.10.254/24. Customers can modify the LAN IP address according to their needs. The following steps are described:

（1）按照下图步骤操作；/Follow the steps below;

开启全部 | 关闭全部
微能
运作模式
网络设置
广域网络
局域网
DHCP 客户端列表
VPN Passthrough
高级路由配置
IPv6
无线网路设置
NAT 设置
NAS
系统管理
蓝牙
1
2
局域网设置
您可以启用/停止以及设置所有的网络功能。
局域网设置
网络名称 Mediatek
IP 地址 172.16.10.254
子网络遮罩 255.255.255.0
局域网 2 启用 停用
局域网 2 IP 地址
局域网 2 子网络遮罩
MAC 地址 (null)
DHCP 类型 服务器
起始 IP 地址 172.16.10.100
结束 IP 地址 172.16.10.200
子网络遮罩 255.255.255.0
惯用 DNS 服务器 168.95.1.1
其他 DNS 服务器 8.8.8.8
预设信关 172.16.10.254
3
在此处设置需要设置的IP
4
在此空白处点击，下方的
DHCP参数会自动同步

开启全部 | 关闭全部
DHCP 类型 服务器
起始 IP 地址 172.16.10.100
结束 IP 地址 172.16.10.200
子网络遮罩 255.255.255.0
惯用 DNS 服务器 168.95.1.1
其他 DNS 服务器 8.8.8.8
预设信关 172.16.10.254
释放时间 86400
静态指定 MAC: IP:
静态指定 MAC: IP:
静态指定 MAC: IP:
802.1d Spanning Tree 停用
LLTD 停用
IGMP Proxy 停用
UPNP 停用
Router Advertisement 停用
5
Save
确定
取消

（2）修改完 IP 地址后，网络会重启，如果使用 WIFI 热点连接，可能出现断网情况，再次连接到热点，使用新设置的 IP 地址访问模块。

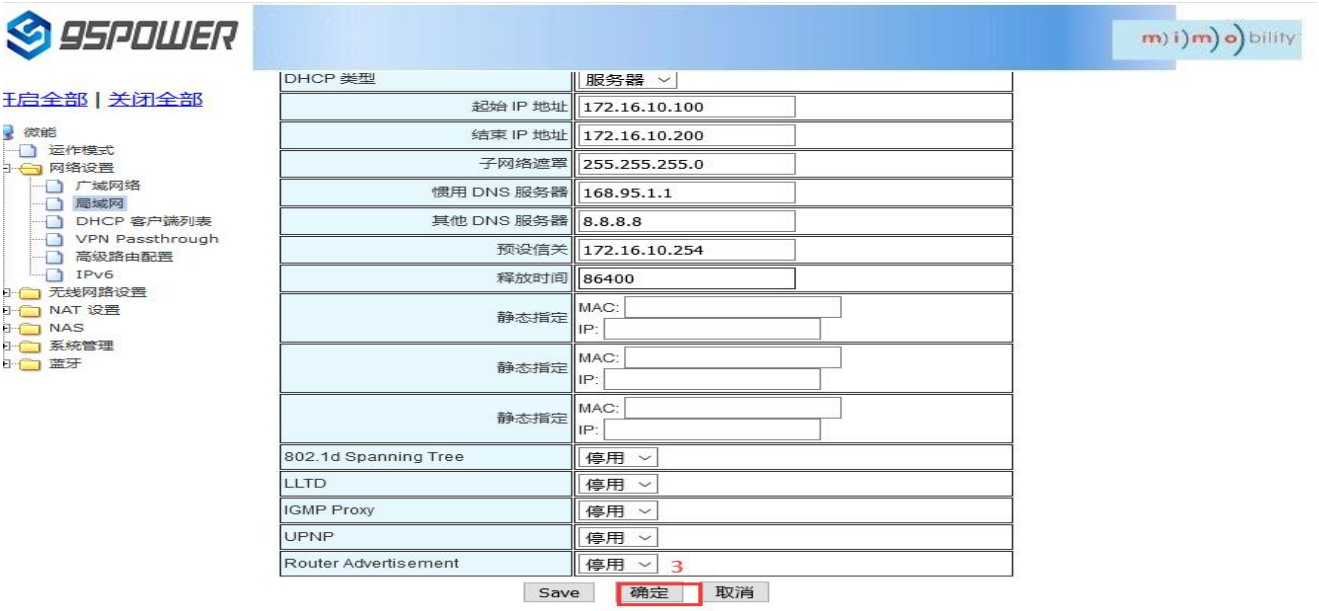
After the IP address is modified, the network will restart. If the WIFI hotspot is used to connect, the network may be disconnected. Connect to the hotspot again and use the newly set IP address to access the module.

5.3.2 增设局域网网段/Add LAN segment

VDU2506 可以增设局域网网段 lan2，默认没有开启 lan2。

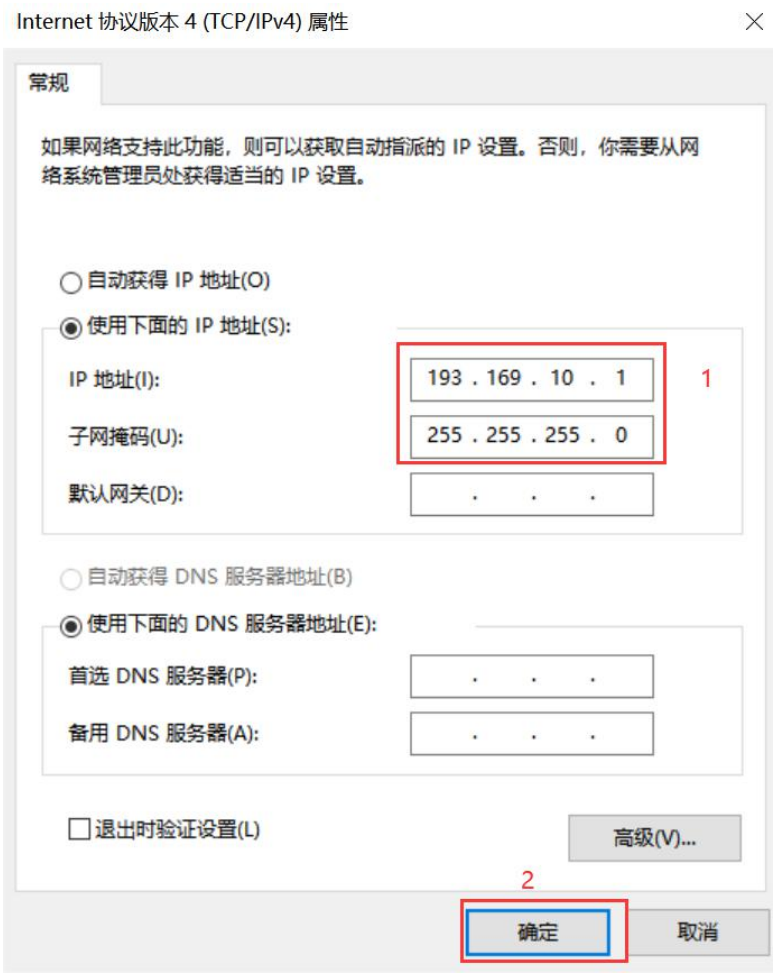
Lan2 can be added to LAN segment in VDU2506. Lan2 is not enabled by default.

（1）按下图步骤设置 lan2。/Follow the steps below to set up LAN2



（3）lan2 设置完成后，用户可以使用设置静态 IP 为该网段，与设置通信，通过 lan2 的 IP 访问网关。

After lan2 is set up, the user can set the static IP for the network segment and communicate with the set through lan2's IP access gateway.



5.3.3 配置 DHCP 参数/**configuration DHCP**

VDU2506 支持用户修改 DHCP 的各个参数，包括起始 IP、结束 IP、IP 地址租赁时间等参数，也支持用户关闭 DHCP 功能，使用静态 IP 连接。

VDU2506 supports users to modify various DHCP parameters, including starting IP, ending IP, IP address lease time and other parameters, and also supports users to turn off DHCP function and use static IP connection.

（1）下面是关闭 DHCP 服务的步骤；/The following steps are to close the DHCP service

下面是设置 DHCP 服务器参数的步骤：/Here are the steps to set the DHCP server parameters:

（1）按图示步骤设置/Set according to the steps shown in the diagram

5.3.4 绑定 IP 地址/Bind IP address

在调试过程中，在 PC 上模拟服务器端进行测试时，可绑定 PC 的 IP 地址，使服务器在测试中 IP 地址固定。

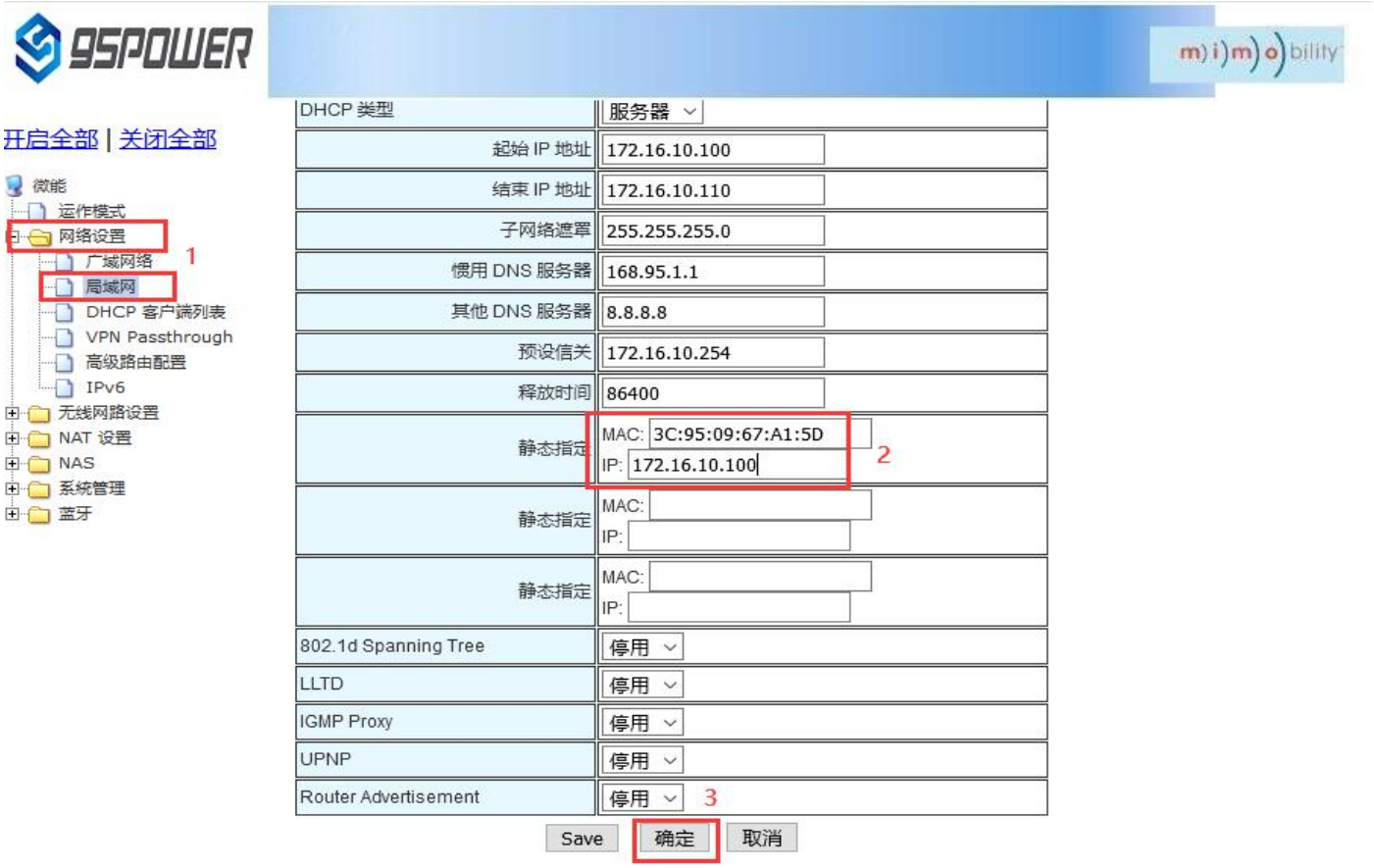
In the debugging process, when the server side is simulated on PC for testing, the IP address of THE PC can be bound so that the IP address of the server can be fixed during the test.

（1）可以先查看 VDU2506 的 DHCP 列表，复制对应 PC 的 MAC。下图是查看 DHCP 列表的步骤：

You can first check the DHCP list of VDU2506 and copy the MAC corresponding to PC.The following is the steps to view the DHCP list:

（2）通过下图方式绑定 PC 的 IP 地址，绑定后对应 PC 连接到 VDU2506，获取的 IP 就是绑定的 IP 地址。

Bind THE IP address of PC through the following method. After binding, the PC is connected to VDU2506, and the IP obtained is the binding IP address.



5.4 无线参数配置/Wireless parameter configuration

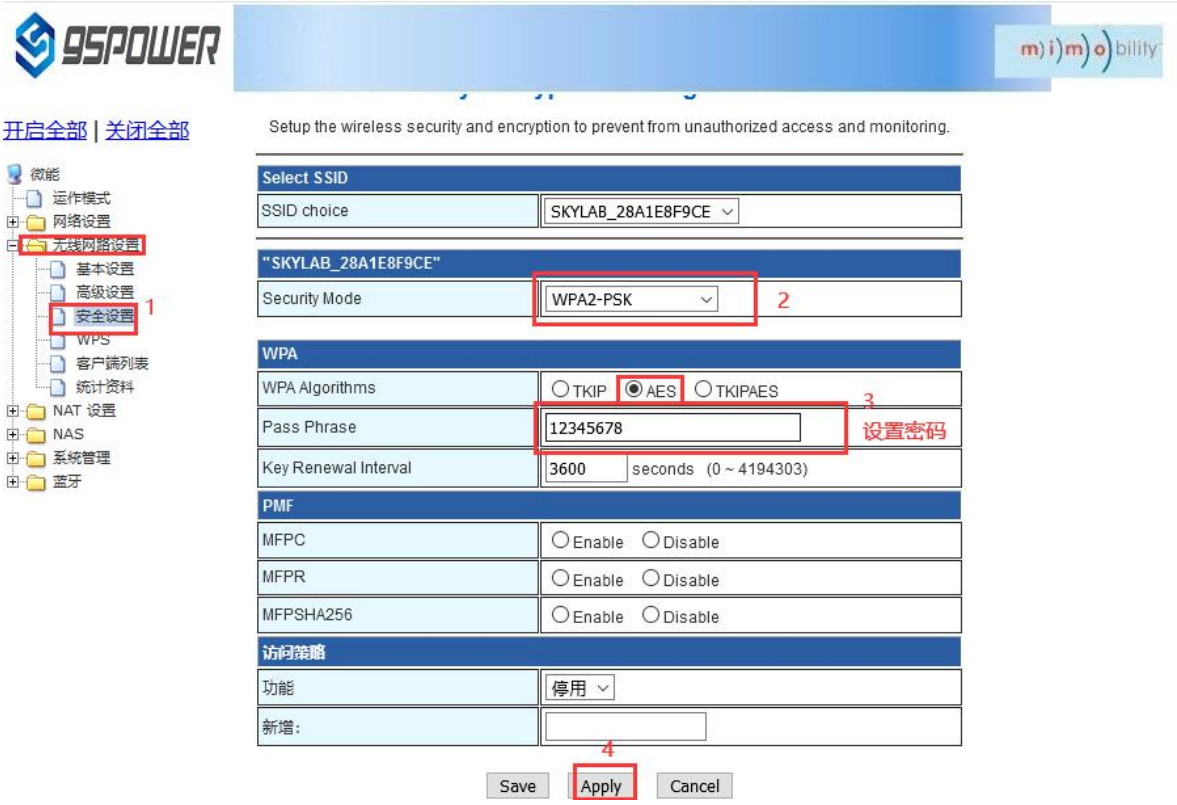
5.4.1 修改 WIFI 热点名、设置固定信道/

Modify WIFI hotspot name and set fixed channel

5.4.2 设置热点加密/不加密/Set hotspot encryption/unencryption

下面是设置开放热点的步骤图：/Here is the step-by-step diagram for setting up an open hot spot:

下面是介绍设置密码连接的配置图：/Here is the configuration diagram for setting up a password connection:



6、 服务器信息配置/Server information configuration

用户可以通过 web 界面配置服务器地址和端口信息，配置的服务器地址和端口需要 VDU2506 可以访问到。此外，VDU2506 默认的上网方式为 UDP 协议，在 web 界面可以自定义通信协议，可以选择的协议有 TCP/UDP/MQTT。配置方式如下：

The user can configure the server address and port information through the Web interface, which requires VDU2506 to be accessible.In addition, the default Internet access mode of VDU2506 is UDP protocol. In the Web interface, you can customize the communication protocol, and the optional protocol is TCP/UDP/MQTT.The configuration method is as follows:

6.1 配置为 TCP 协议通信/Configure for TCP protocol communication

配置为 TCP 协议通信方式，配置截图如下：

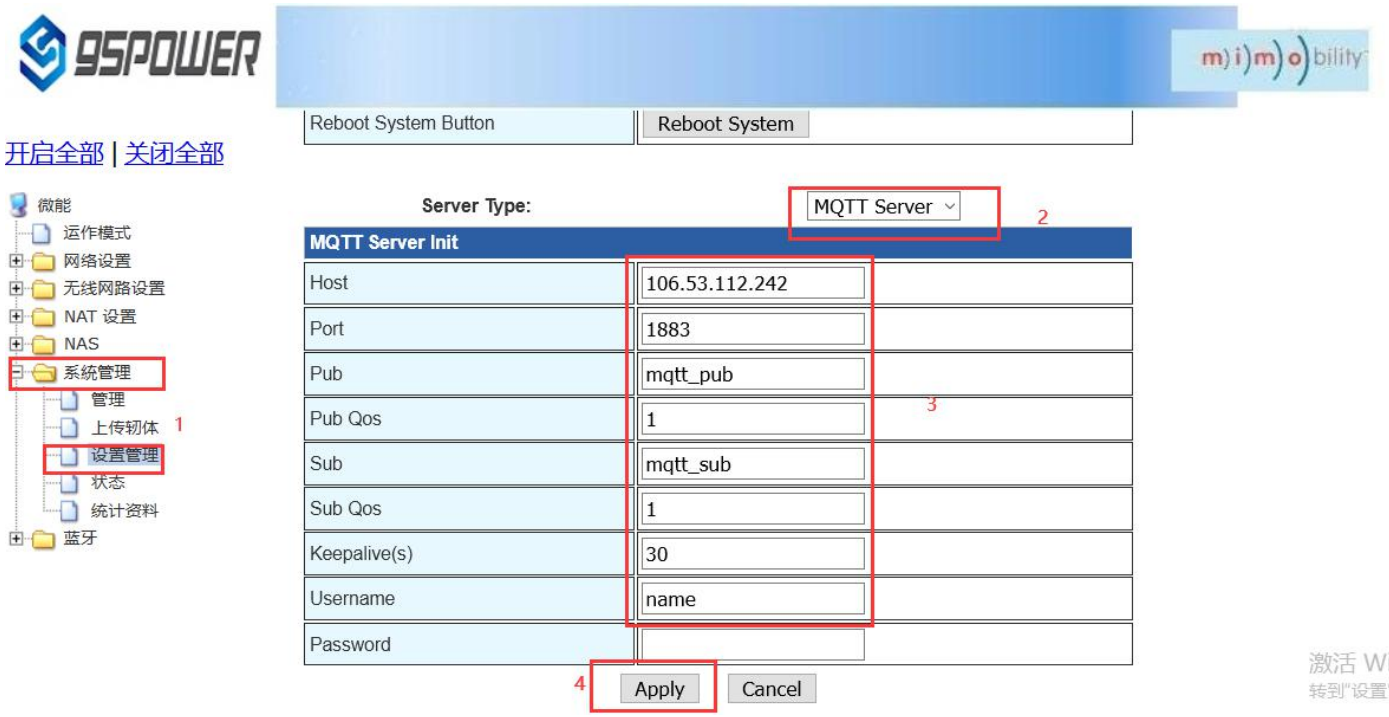
The configuration is the communication mode of TCP protocol. The configuration screenshot is as follows

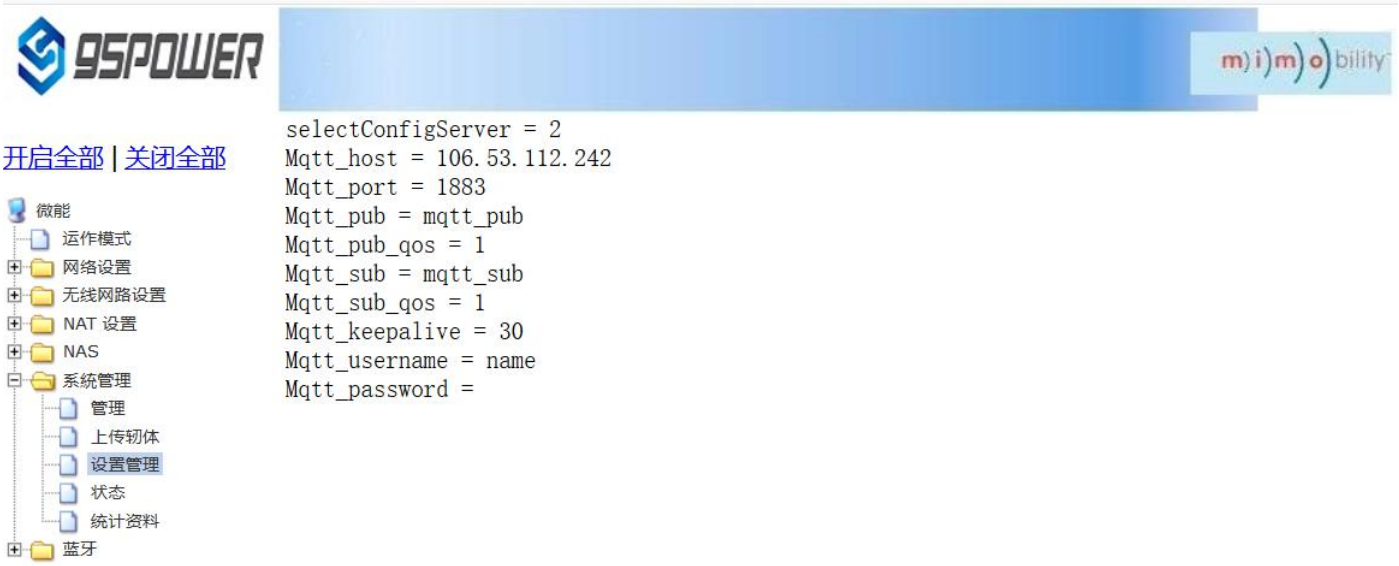
6.2 配置为 UDP 协议通信/It is configured for UDP protocol communication

配置为 UDP 协议方式通信，配置截图如下所示：

The configuration is UDP protocol communication. The configuration screenshot is as follows:

6.3 配置为 MQTT 协议通信/Configure for MQTT protocol communication





7、系统管理配置 / System management configuration

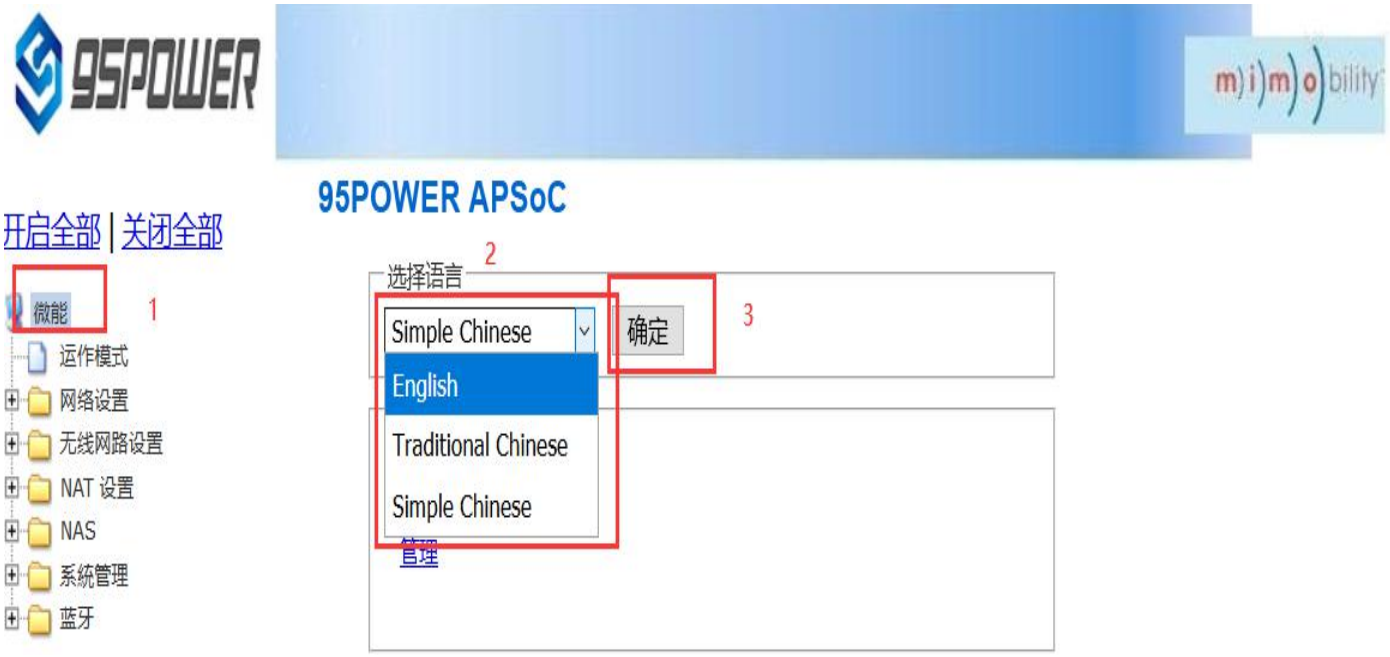
7.1 设置 WEB 界面显示 / Set up the WEB interface display

VDB2613 的网页支持简体中文、繁体中文、英文的显示，默认为简体中文显示。客户根据需要可以切换显示的语言，操作步骤如下：

VDB2613 web pages support simplified Chinese, traditional Chinese, English display, default for simplified Chinese display.Customers can switch the displayed language according to their needs. The operation steps are as follows:

（1）选择需要切换的语言，下面以切换到英文为例，图中 2 时，选择 English。

Select the language to be switched. Take Switching to English as an example. In figure 2, select English.



（2）查看切换效果 / Check the switching effect

7.2 恢复出厂设置 / factory data reset；restore factory setting

网关固件升级后，默认保留原来的设置，如果需要恢复出厂设置，请按下面图示的步骤操作。

If you need to restore factory Settings, please follow the steps shown below.

7.3 重启系统 / Restart the system

下面是重启系统的操作步骤 / Here are the steps to restart the system

7.4 升级系统 / upgrade system

通过 Web 界面可以升级 WIFI 固件，升级步骤如下:

WIFI firmware can be upgraded through the Web interface. The upgrade steps are as follows:

（1）下图中点击 2 后，在本地选择你所需要升级的固件，确定后，出现 3 的提示，点击确定开始升级。

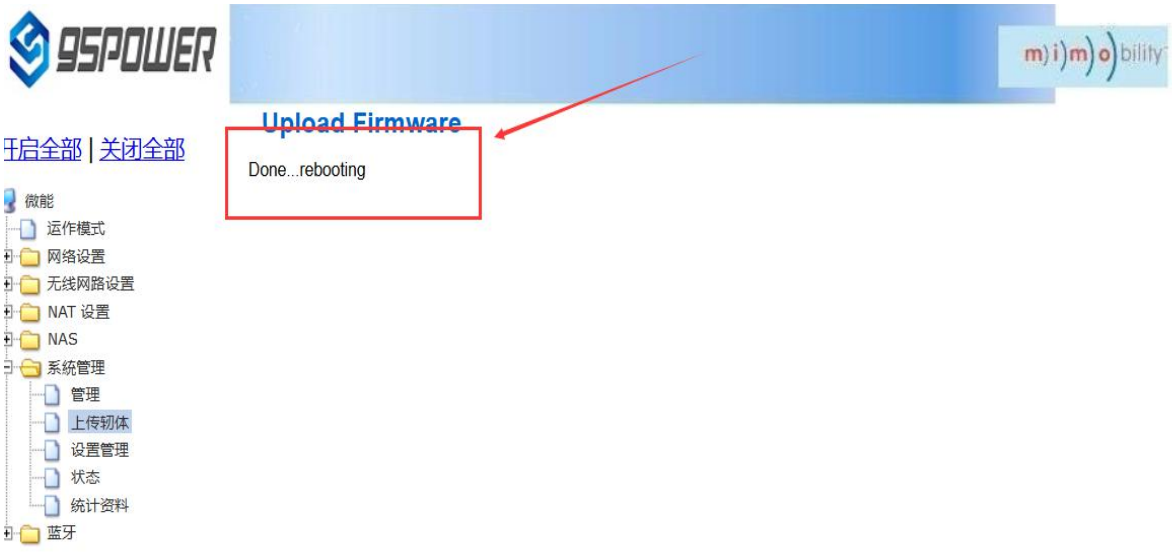
After clicking 2 in the figure below, select the firmware you need to upgrade locally. When you confirm, a prompt of 3 appears and click OK to start the upgrade.

（2）升级过程会出现下图所示提示，提示没有消失前，不要断电，此时断电可能导致模块升级变砖。

During the upgrade process, a prompt as shown in the figure below will appear. Do not power off until the prompt disappears. At this point, power off may cause the module to be upgraded to brick

（3）升级成功后，会有重启系统的提示，如下图所示。

After the successful upgrade, there will be a prompt to restart the system, as shown in the figure below.



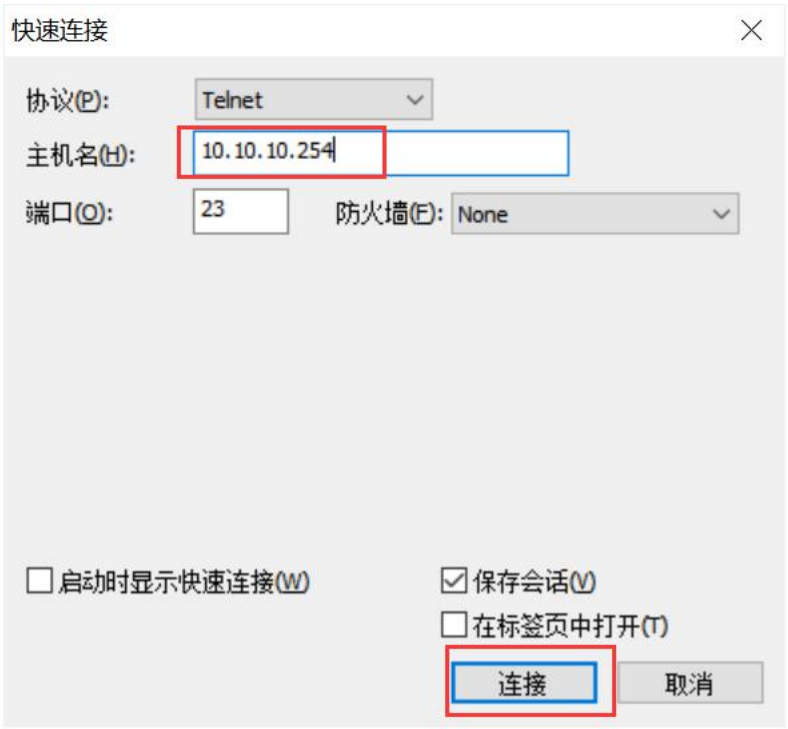
7.5 telnet 测试管理 / Telnet test management

下面介绍使用 SecureCRT 工具配置 Telnet 的过程。

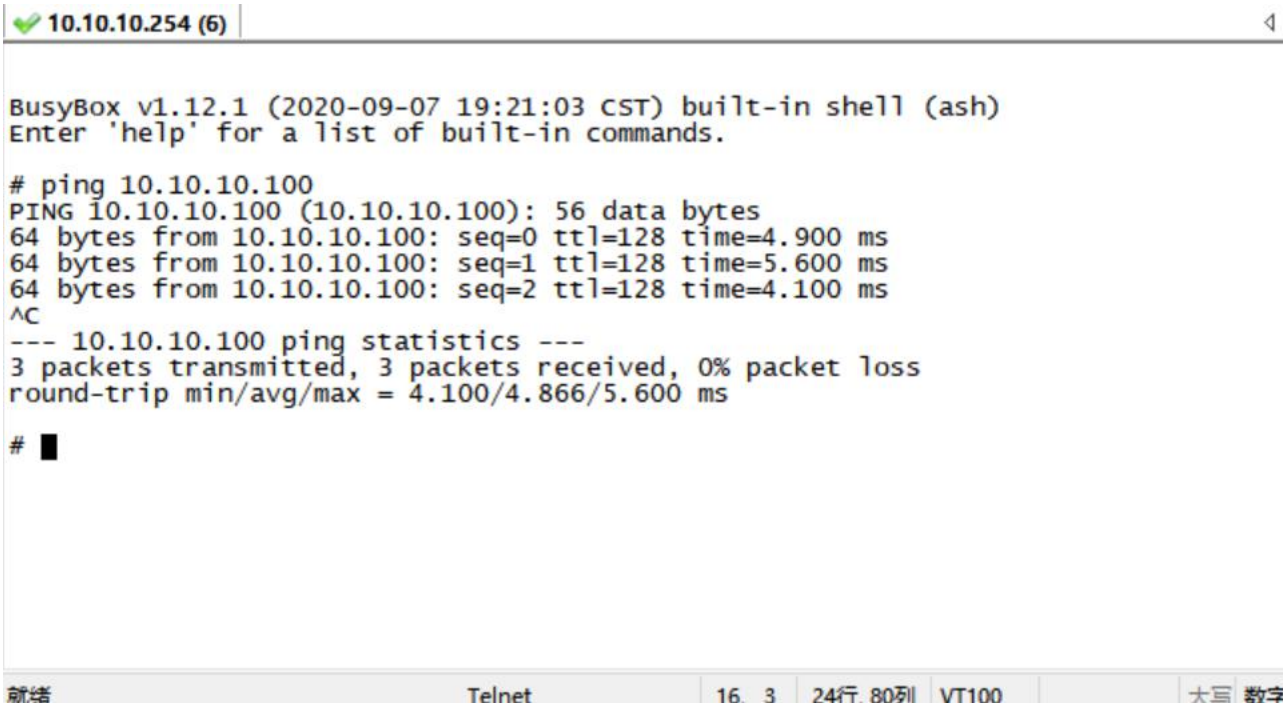
The following describes the process of configuring Telnet using the SecureCRT tool.

（1）选择 telnet 协议，主机名为 10.10.10.254，端口默认 23 即可；

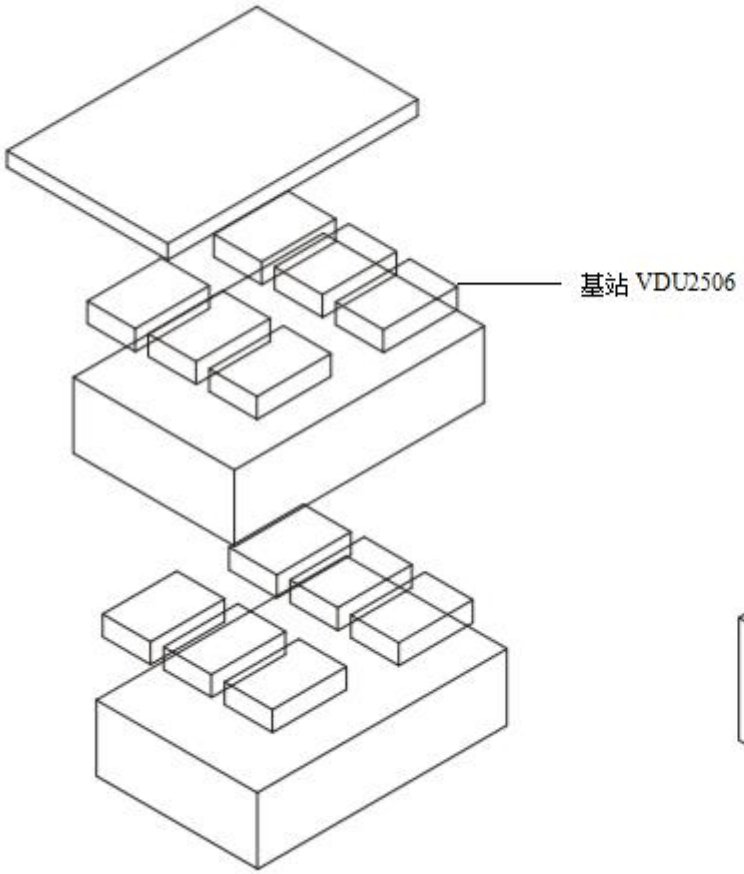
Select Telnet protocol, host name 10.10.10.254, port default 23;

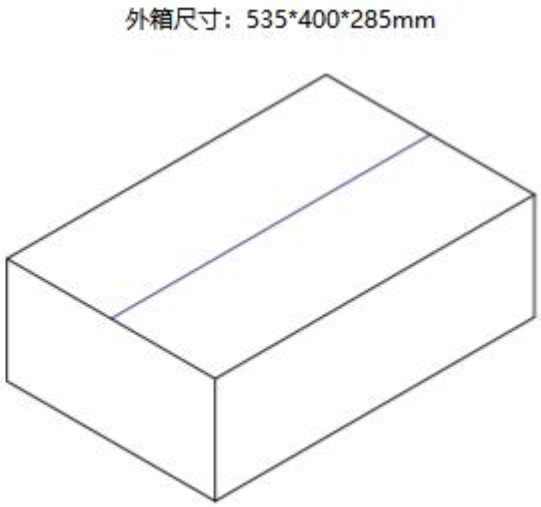


（2）进入到管理终端后，使用命令检测。 / After entering the administrative terminal, use the command detection



8 包装





配件	数量	备注
直流电源	12 个/箱（每台基站/1 个）	客户选用 POE 供电则不需要
安装螺丝	12 包（每台基站/1 包）	必备
塑料支架	12 个（每台基站/1 个）	必备

9 历史版本/Reversion History

版本号/Version	更新内容/Remark	制作人/Maker	日期
V1.01	初始发布/Initial Release	Rowen	2020/11/23
V1.02	更新软件操作指导/Update software configuration guide	Sherman	2020.12.10

10 联系方式

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