Serial Device Server D224

RS232/485/TTL To TCP/IP

KING PIGEON

User Manual

Ver 1.0

D224

Date Issued: 2019-07-08

www.IOT-Solution.com

Table of Contents

This handbook has been designed as a guide to the installation and operation of Serial Server D224.
Statements contained in the handbook are general guidelines only and in no way are designed to supersede the instructions contained with other products.
We recommend that the advice of a registered electrician be sought before any Installation work commences.
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【UPGRADE HISTORY】

DATE	FIRMWARE VERSION	HARDWARE VERSION	DESCRIPTION
2019.07.08	**V1.0**	**V1.0**	***First edition***

1. Brief introduction

The D224 Serial Device Server is a useful device to convert RS485/232/TTL data to TCP/IP network, it also can be used as converting Modbus RTU to Modbus TCP, and performs as a serial port converter to create the communication from RS485 to RS232 or TTL, moreover, it can be used as a repeater for two serial device communication directly, e.g.: PLC to PLC.

The D224 Serial Device Server provide a feature that can allow users to select master or slave operation mode for each serial port. It not only allows an Ethernet master to control serial slaves, but also allows serial masters to control Ethernet slaves. It accepts up to 5 connections to communicate at the same time, no matter the Serial Device Server be used as Server or Client.

The D224 Serial Device Server provides a simple and cost-effective way to bring the advantage of remote management and data accessibility to thousand of devices that can not connect to a network. It is the most popular industrial internet of things (IIOT) gateway.

The serial device server suitable for below applications:

Serial Devices to TCP/IP Communication and IoT Cloud Platform;

Serial Devices to Serial Devices communications, e.g.: PLC to PLC;

Equipment networking in the field of access control security;

Various types of configuration software and device communication interfaces;

Networking of transmitters such as water level, water pressure, flow rate and flow rate;

Data transmission in agriculture, water, coal mines, etc.;

Remote monitoring and program download of various PLCs;

Data collection and monitoring of various types of electric meters and meters;

Collection of parameters such as wind speed, wind, rainfall and temperature of the meteorological station;

Remote data acquisition and monitoring of solar power stations and smart charging piles;

Intelligent power grid data transmission;

Intelligent agricultural data collection and monitoring;

Intelligent breeding data collection and monitoring;

Intelligent traffic data collection and monitoring;

Intelligent industrial automation data transmission.

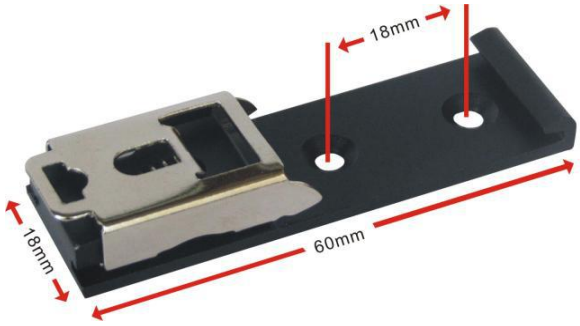
2.Safety Directions

Reasonable Use
Please install the product at suitable places as described in the product documentation.

Use Qualified Maintenance Service
Maintenance can be carried out only by qualified maintainer.

3. Standard Packing List

Serial device server D224 unit X1; AC/DC Adaptor X1; Network cable(0.5m) X1; RS232 cable X1.
Optional: 35mm Standard DIN rail fixed Bracket



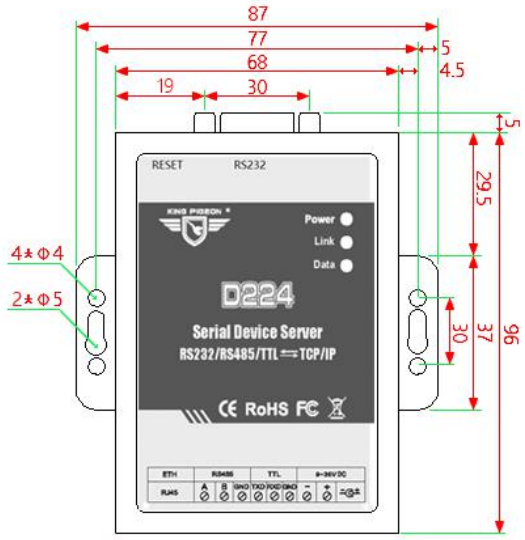
4. Mainly Features

- Wide working voltage, support 9-36V DC power supply, interface is DC Q2.1 jack and terminal block, and with anti-reverse protection design;
- Built-in industrial grade ARM® CortexTM core, high performance, stable and reliable;
- Support 1 channel RS-232, 1 channel RS-485 and 1 channel TTL;
- Serial port baud rate supports 4800bps-128000 bps,supports None, Odd, Even check mode;
- Supports 1 channel RJ45 Ethernet port, with link and data indicator, built-in isolation transformer, up to 2KV electromagnetic isolation;
- Support RESET button to recovery the parameters to factory defaults (long press for 3 seconds to recover), prevent parameter setting error;
- Metal shell, protection class IP30, suitable for industrial control applications;
- The configuration software supports WIN XP, WIN 7, WIN 8 and WIN 10, friendly interface;
- Support static IP address or DHCP to obtain IP address automatically, and query the devices in the network through UDP broadcast protocol;
- Support self-defined device name for easy user identification;
- Support server domain name DNS;
- Built-in TCP/IP protocol stack, support transparent transmission and Modbus RTU to Modbus TCP Protocol;
- Supports multiple working modes:TCP Server, TCP Client, UDP Server, and UDP Client;

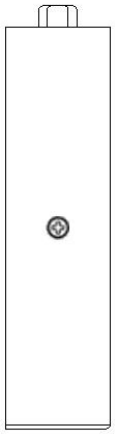
- Supports up to 5 TCP/UDP Clients and 5 TCP/UDP Servers connections simultaneously;
- Supports definition login message and heartbeat package function, can facilitate cloud platform for ID identification and data communication;
- Support automatically connect and reconnect the server after disconnection;
- Support serial port strategy function, data path is free to choose, for example: RS232 and RS485 bi-direction communication (RS232 ⇄ RS485), RS232 and server 1 bi-direction communication (RS232 ⇄ server 1);
- Can be used as a repeater for two serial device communications directly, e.g.: PLC to PLC;
- Support firmware upgrade through TTL, firmware update is more convenient;
- Small in size, 96mm*68mm*25mm, and supports wall mounting and DIN 35mm rail mounting.

5.Physical Layout and Installation Diagram

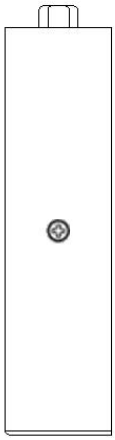
5.1 Control Unit physical layout



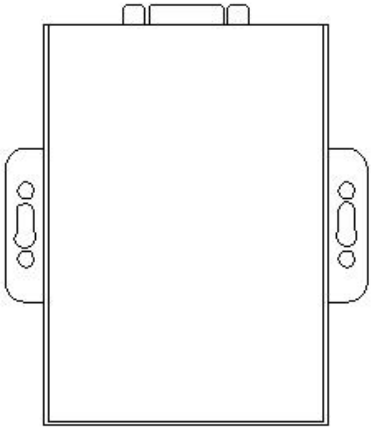
(Front view)



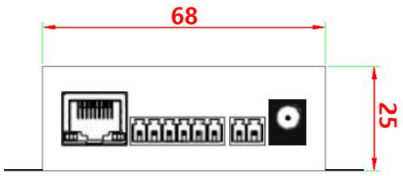
(Left side view)



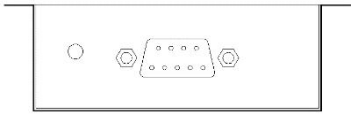
(Right side view)



(Back view)



Bottom view



Vertical view

5.2 Interface Instructions for installation

LED Status Description		
Power		Power Indicator: Power on the module will always on.
Link		On stands for TCP connection;otherwise, it is off.
Data		When transmitting data by Ethernet port, the LED will be on, otherwise, it is off.
Interface Instructions for installation		
RESET		Reset button. Recovery the parameters to factory default value.
RS232		RS232 port
ETH		RJ45,Ethernet port.
RS485	A	RS485 data A
	B	RS485 data B
	GND	RS485 data ground if required.
TTL	TXD	Transmit data port
	RXD	Receive data port
	GND	Data ground if required
9~36 VDC	-	DC9~36V negative input.
	+	DC9~36V positive input, 1A, for power the device.
		Power jack,for power the device.
	Can only need to choose one way to power the device	

6. Programming and Operation

The D224 Serial Device Server can be configured by host software,through the direct cable or crossover cable connect to the local area network, can also through the crossover cable connect to PC.

Below are the steps to setup the parameters by PC Configuration, please follow it step by step.

Start to Configure:

Step1: Connect

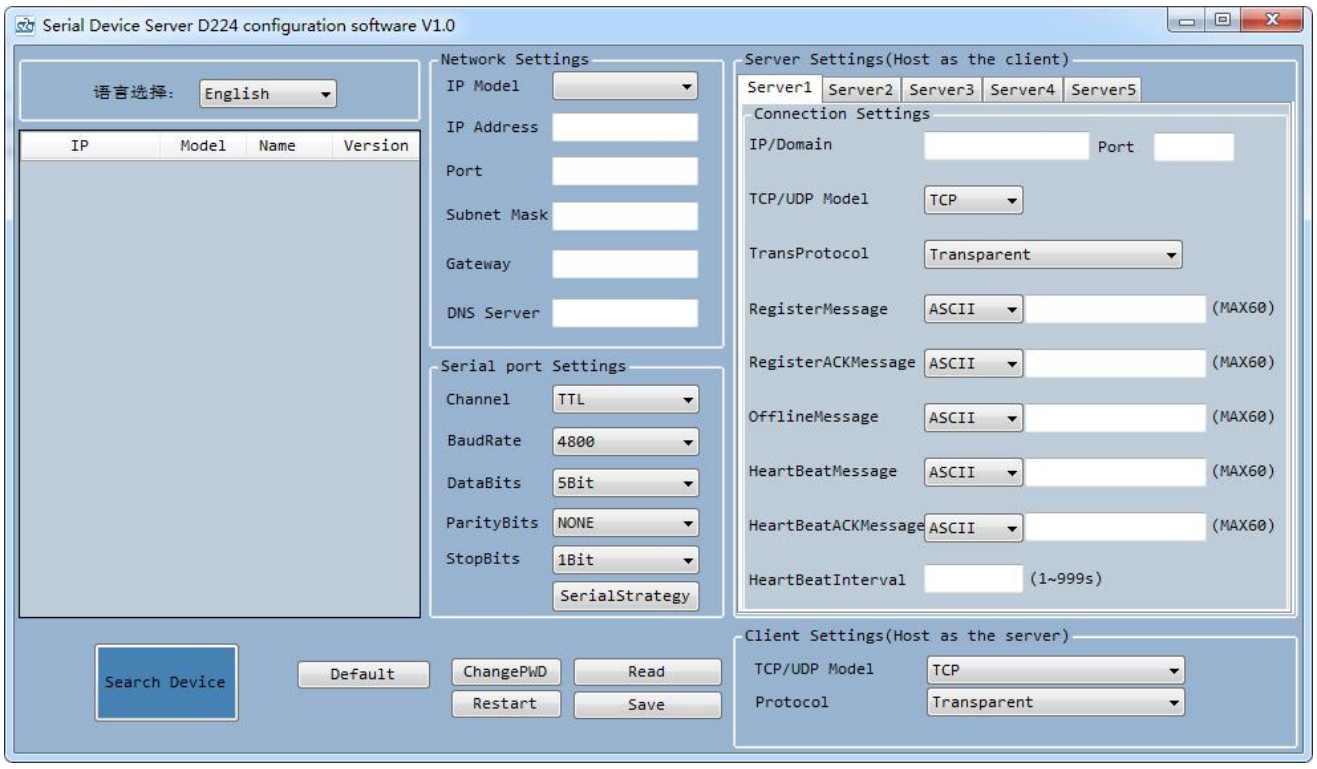
The Configurator in the CD or download from www.iot-solution.com, then installs it on the computer.

Step2: Connect External DC Power

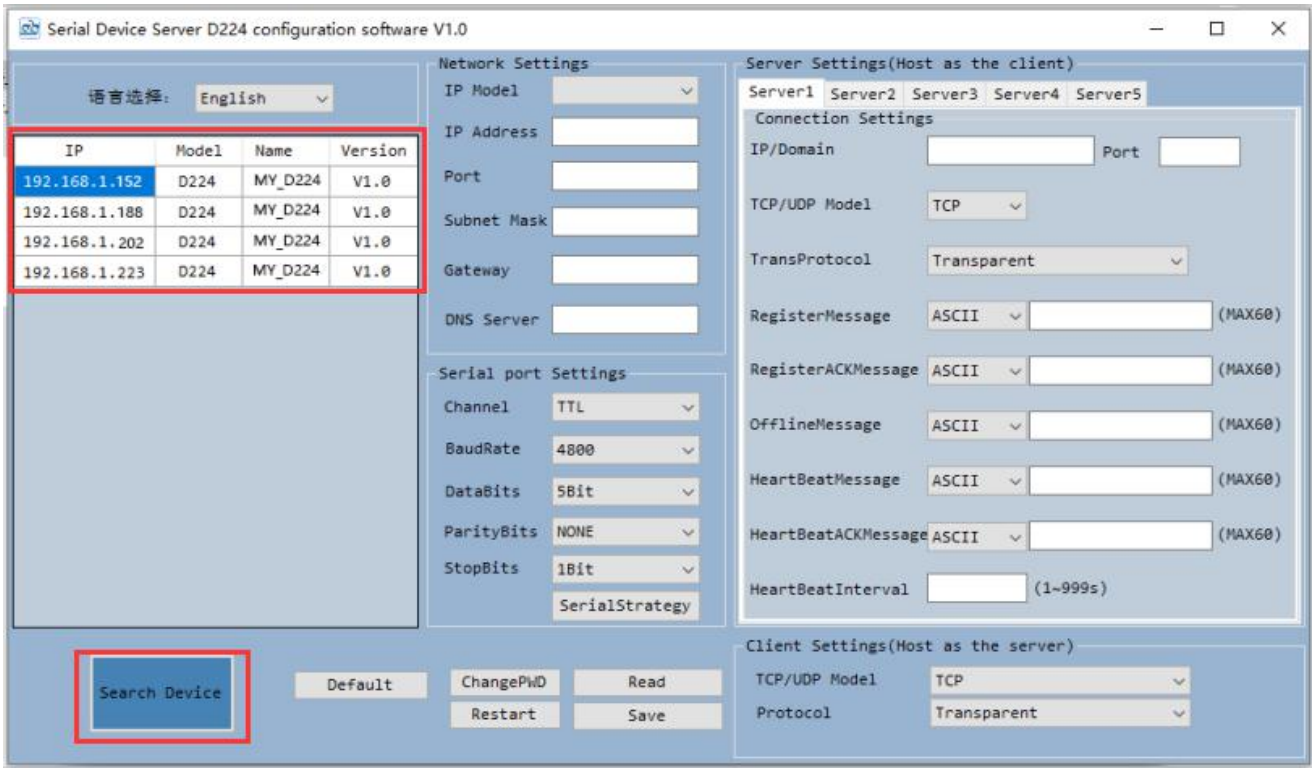
Connect the external DC Power 9~36V to DC in 9~36V Ports.

Step3: Run the Configuration software (Compatible with Windows XP/Vista/7/8/10)

Tips: *In some computer, it required download net framework 4.0 while installation, then please click "Yes" to go to Microsoft website to download this service pack.*



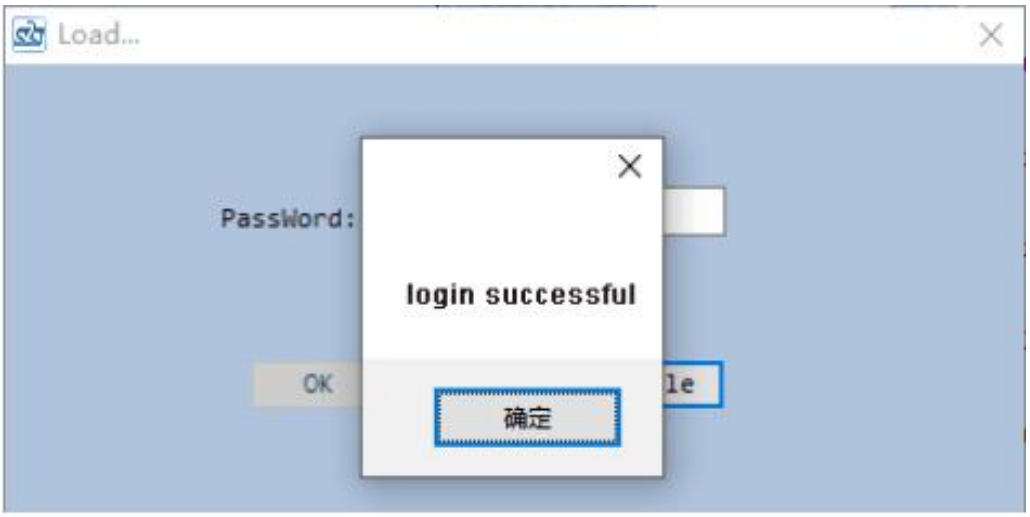
Click "Search Device",all devices in the LAN will appear on the left side.



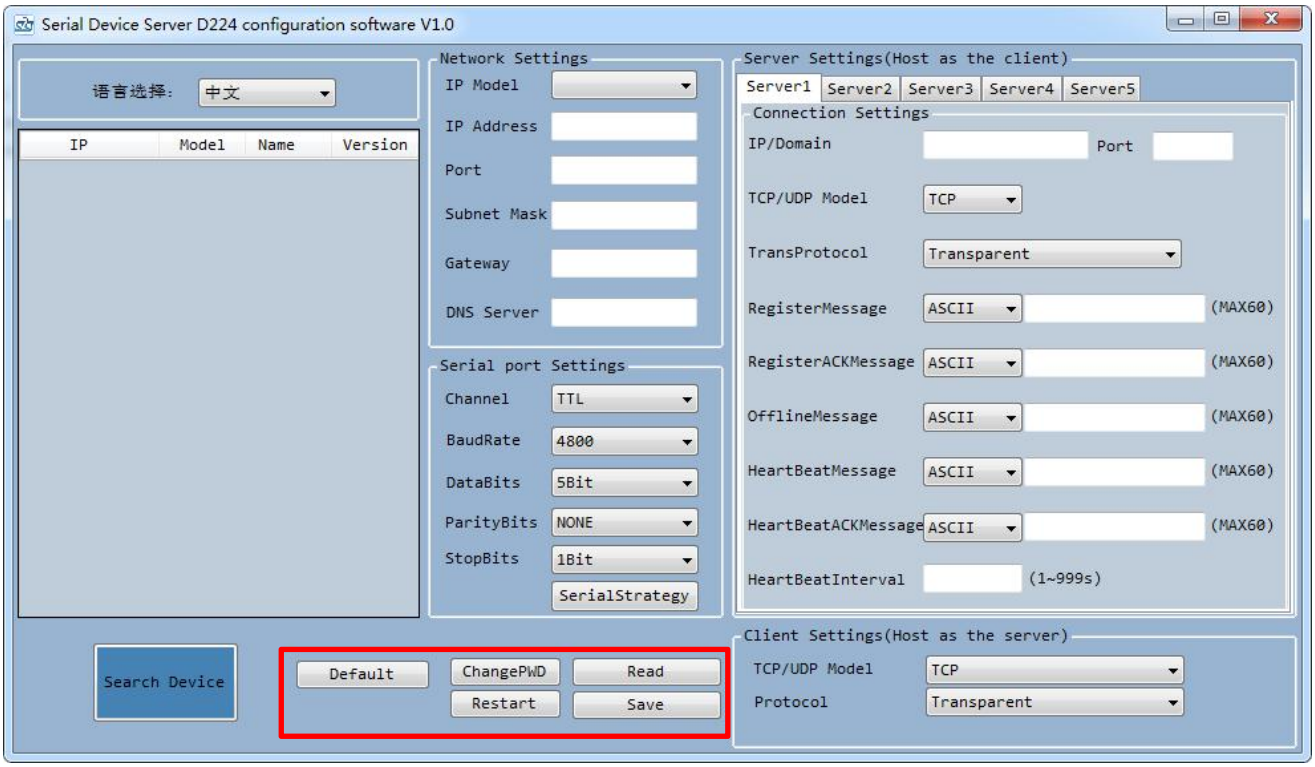
Search Device		
Button	Instruction	Default
IP	Device IP address in the LAN	--
Model	Device model	--
Name	Device name,can customize after connecting successfully	MY_D224
Version	Device firmware version	--

Dual-click device list,will appear below:

Enter password (default 1234),click “Confirm” prompts success,then will read device configuration parameter automatically.



Basic Settings



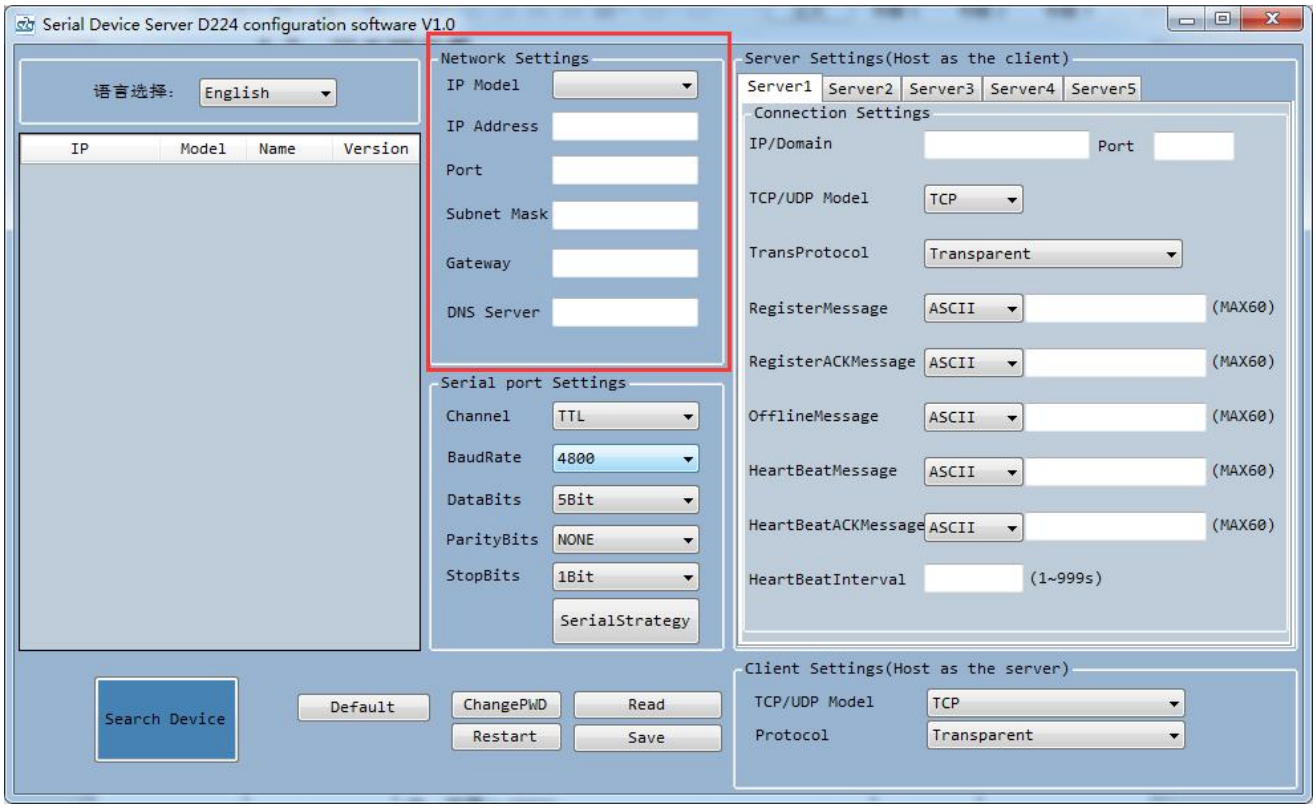
Basic Function	
Button	Description
Default	Restore to factory settings(need click save after default）
Change PWD	Modify device password
Read	Read all current configuration parameters of the device
Save	Save all configuration parameters to the device
Restart	Restart the device after saving

The step of modifying configuration parameter:

1) Modify configuration parameter;
2) Click “Save ”until prompt “save success”,then click “Confirm”

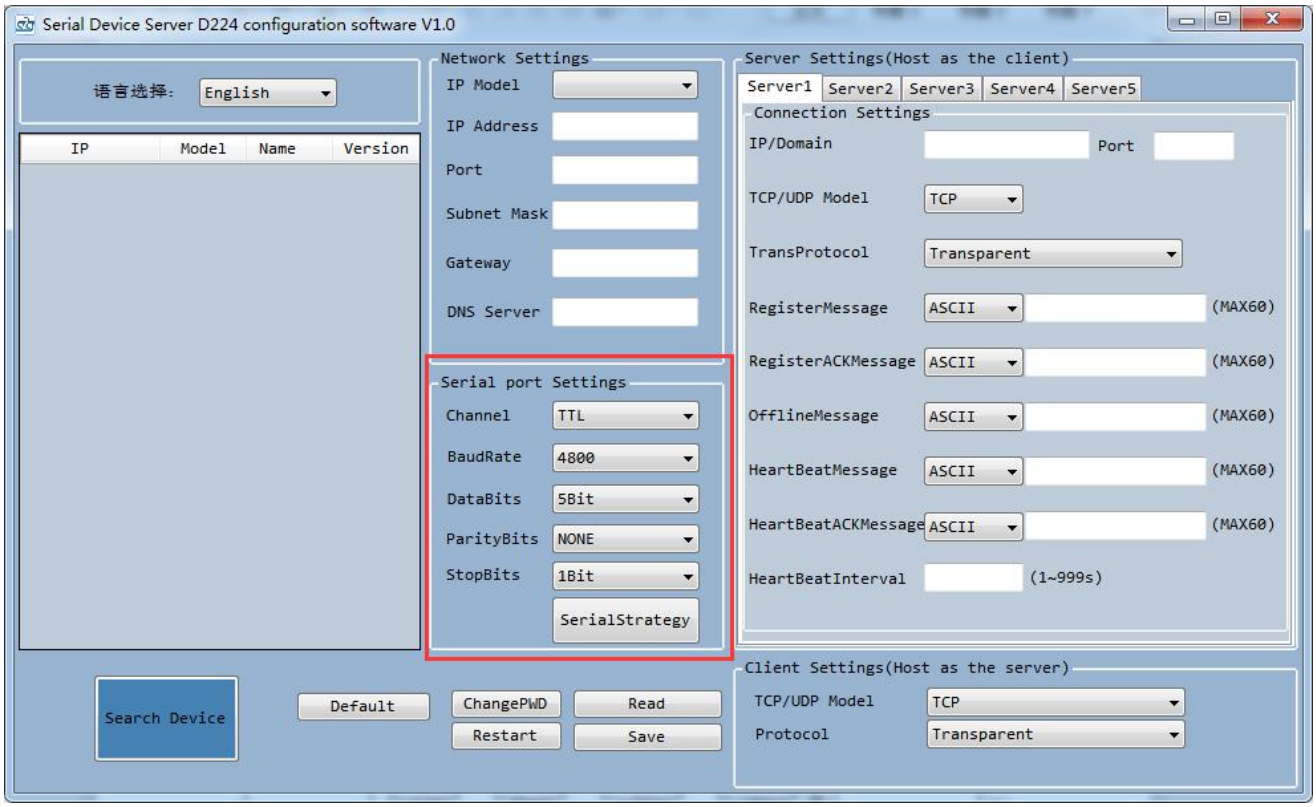
3) Click “Restart” or power off the device,then restart the device,then modify successfully.

Ethernet Settings



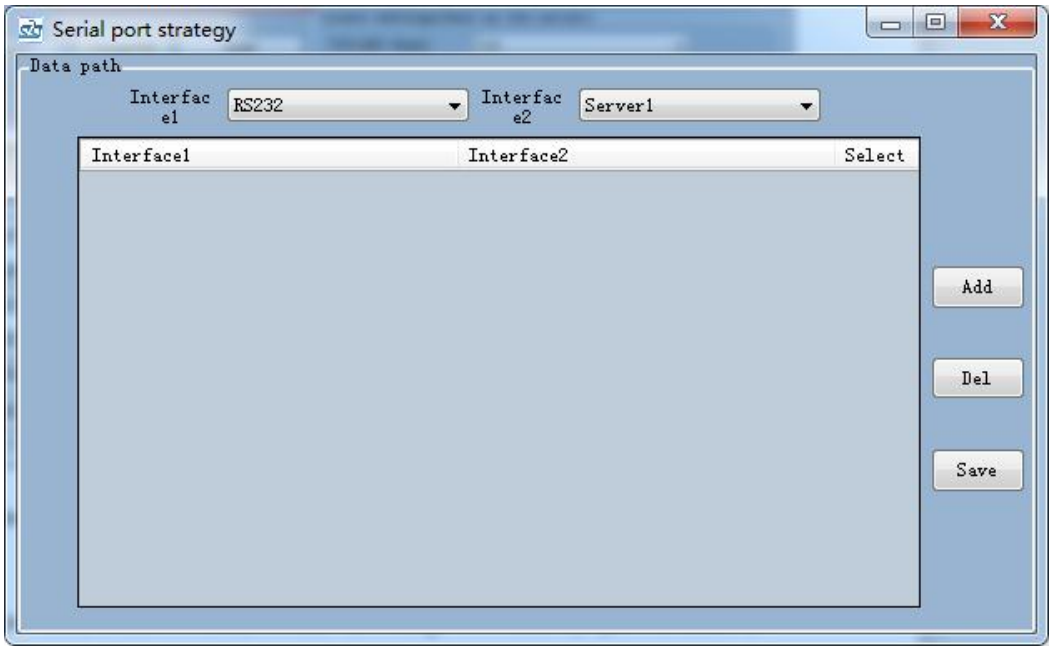
Network Setting		
Button	Description	Default
IP Model	The mode to get IP: ● Dynamic address：get IP automatically from DHCP server ● Static address：Manually configure a static IP	Dynamic address
IP Address	Set IP address	--
Port	The port when act as a TCP/UDP server,range 0-65536	502
Subnet Mask	The device subnet mask	--
Gateway	The device gateway address	--
DNS Server	The device DNS server address	--

Serial Port Settings



Serial Port Setting		
Button	Description	Default
Channel	Select and view the currently used serial channel,includes:TTL,RS232,RS485	RS485
Baud Rate	4800/9600/14400/5600/57600/19200/38400/115200/128000 optional	115200
Data Bits	5Bit/6Bit/7Bit/8 Bit optional	8 Bit
Parity Bits	NONE,EVEN,ODD optional	NONE
Stop Bits	1Bit,1.5 Bit,2Bit optional	1Bit

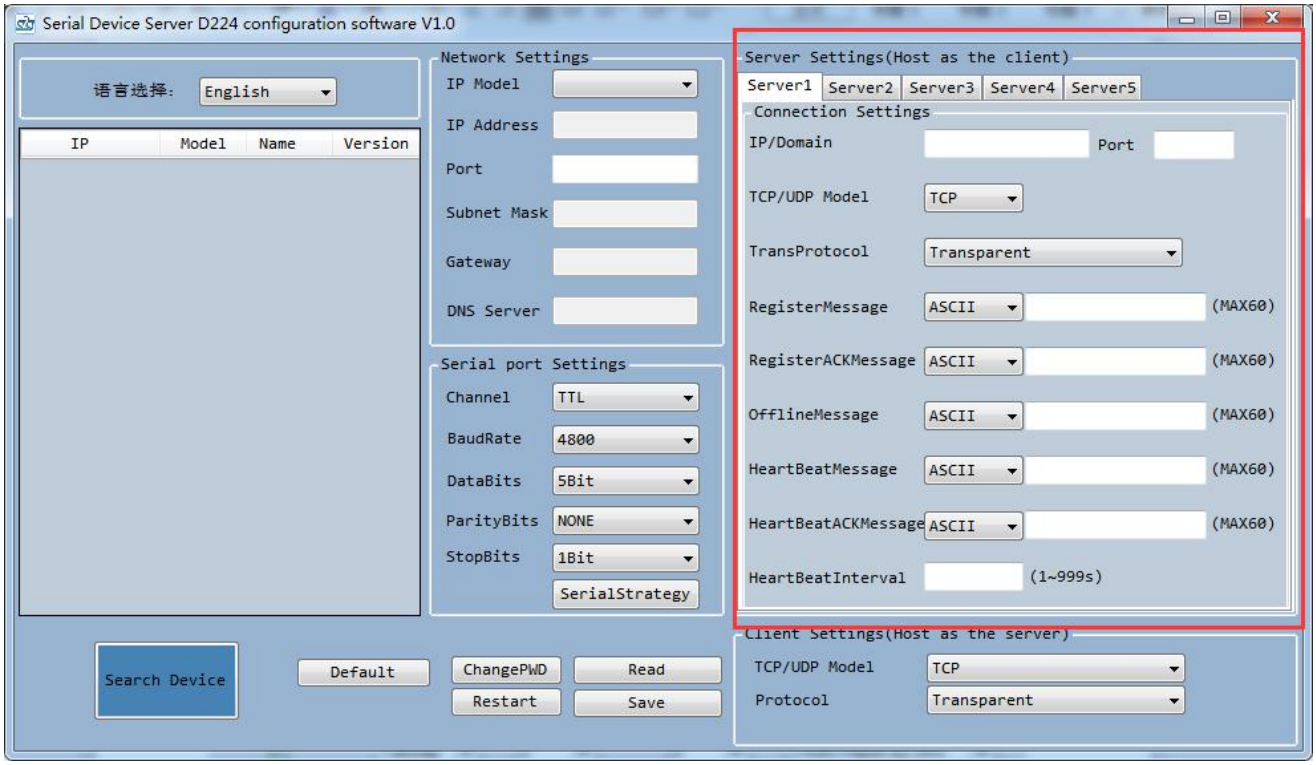
Click “Serial Strategy”as below,it is for configuring data transmission path,default supports 3 paths.



Serial port strategy setting		
Button	Description	Default
Interface 1	TTL,RS232,RS485 optional	--
Interface 2	Server 1,Server 2,Server 3,Server 4,Server 5,Client,TTL,RS232,RS485 optional	--
Add	Add data path	--
Delete	Delete data path	--
Save	Save configuration parameter	--

Server Settings

This part is for connecting the device to internet platform.D224 supports 5 different target servers at the same time,every server supports rich automatic handshake login message, self defined heartbeat message, data transparent transmission, and Modbus RTU to Modbus TCP,device can be quickly compatible with multiple third-party cloud platform systems.

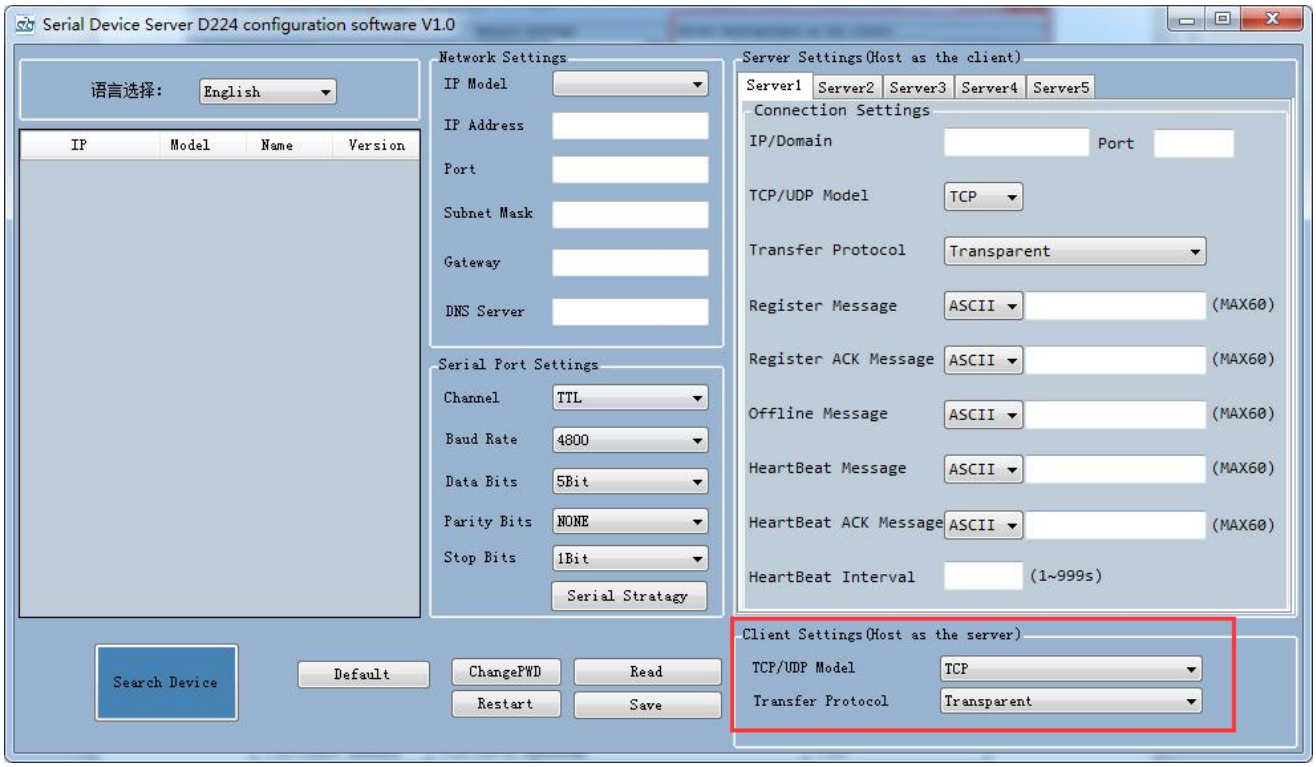


Server Settings		
Button	Description	Default
Server(1-5)	Supports 5 different target servers at the same time	Server 1
IP/Domain	Target server IP/domain address Default is King Pigeon 3.0 cloud platform domain	Modbusrtu.kprtu.com
Pore	Target server port	4000
TCP/UDP Model	TCP,UPD optional	TCP
Transfer Protocol	Transparent,Modbus RTU ⇄ Modbus TCP optional	Transparent
Register Message	Registration data sent to the target server	Empty

Register ACK Message	The response data returned by the target server after receiving the registration message	Empty
Offline Message	After the target server sends the content to the device, the device will go offline.	Empty
Heartbeat Message	Heartbeat data sent to the target server	Empty
Heartbeat ACK Message	The response data returned by the target server after receiving the heartbeat data	Empty
Heartbeat Interval	The interval time of sending heartbeat data,range 1-999(second)	10

Client Settings

Supports up to 5 TCP/UDP Clients and 5 TCP/UDP Servers connections simultaneously.



Client Settings		
Button	Description	Default
TCP/UDP Model	TCP,UPD,TCP/UPD optional	TCP
Transfer Protocol	Transparent,Modbus RTU ⇄ Modbus TCP optional	Transparent

7.Reset

There have 2 ways to reset:

1) By configuration software:

Click “Default”---”Save”---”Restart”.The device will be reset successfully.

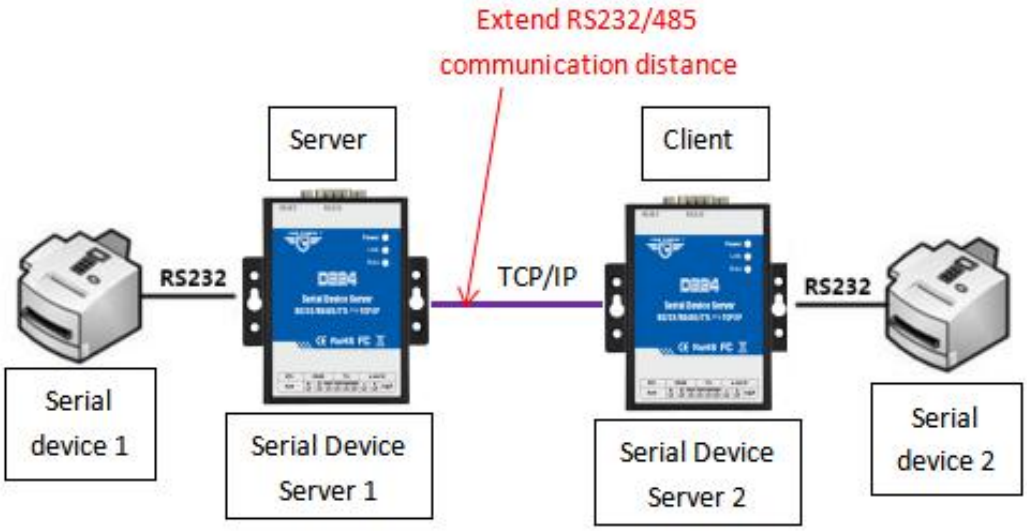
2) By Reset button:

When device is on,long press the RESET button for more than 3 seconds until the 3 LEDs are fully illuminated and

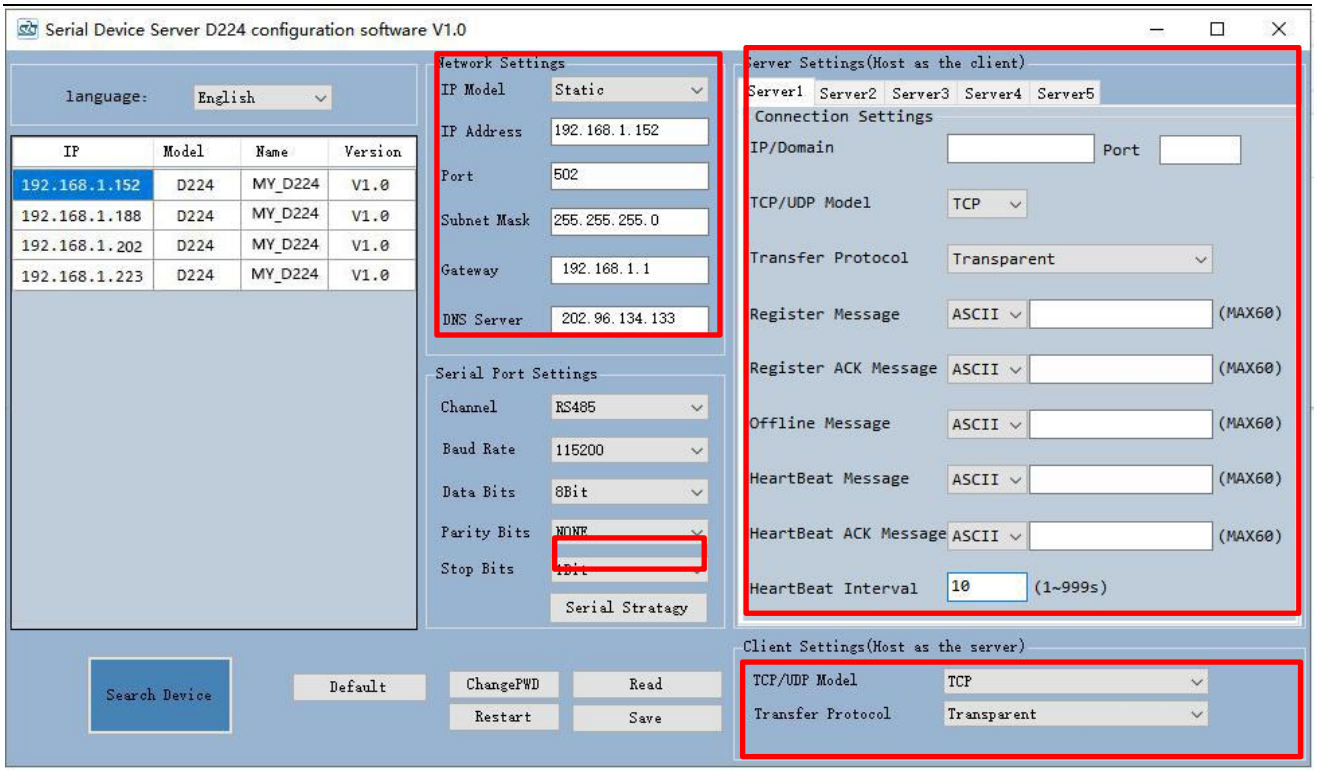
then released,the device will be reset successfully.

8.Application

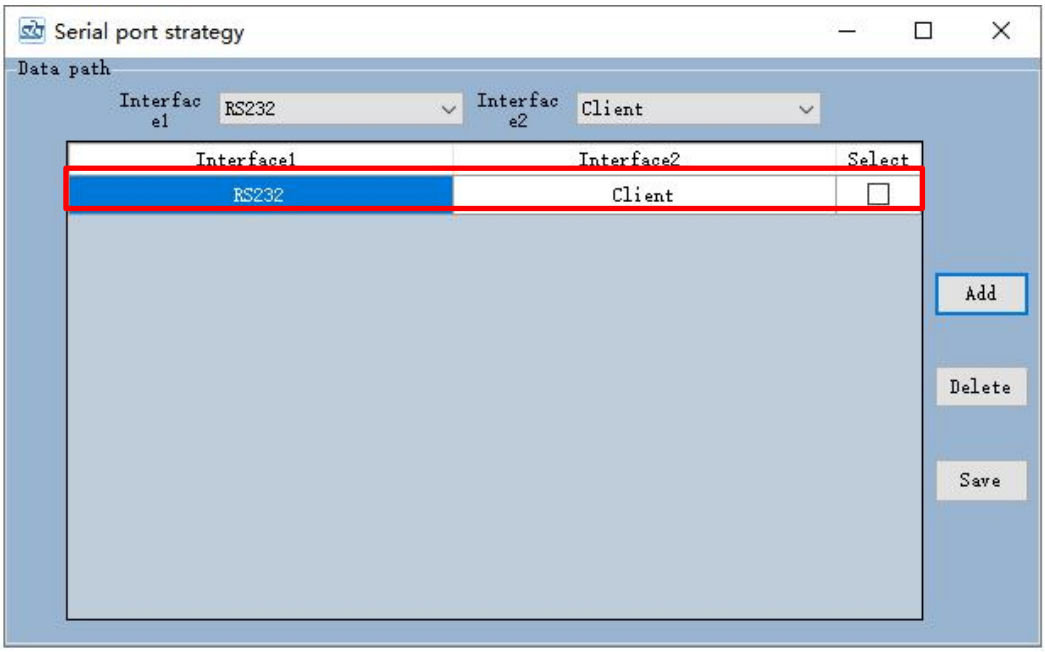
8.1 Extend the serial device communication distance



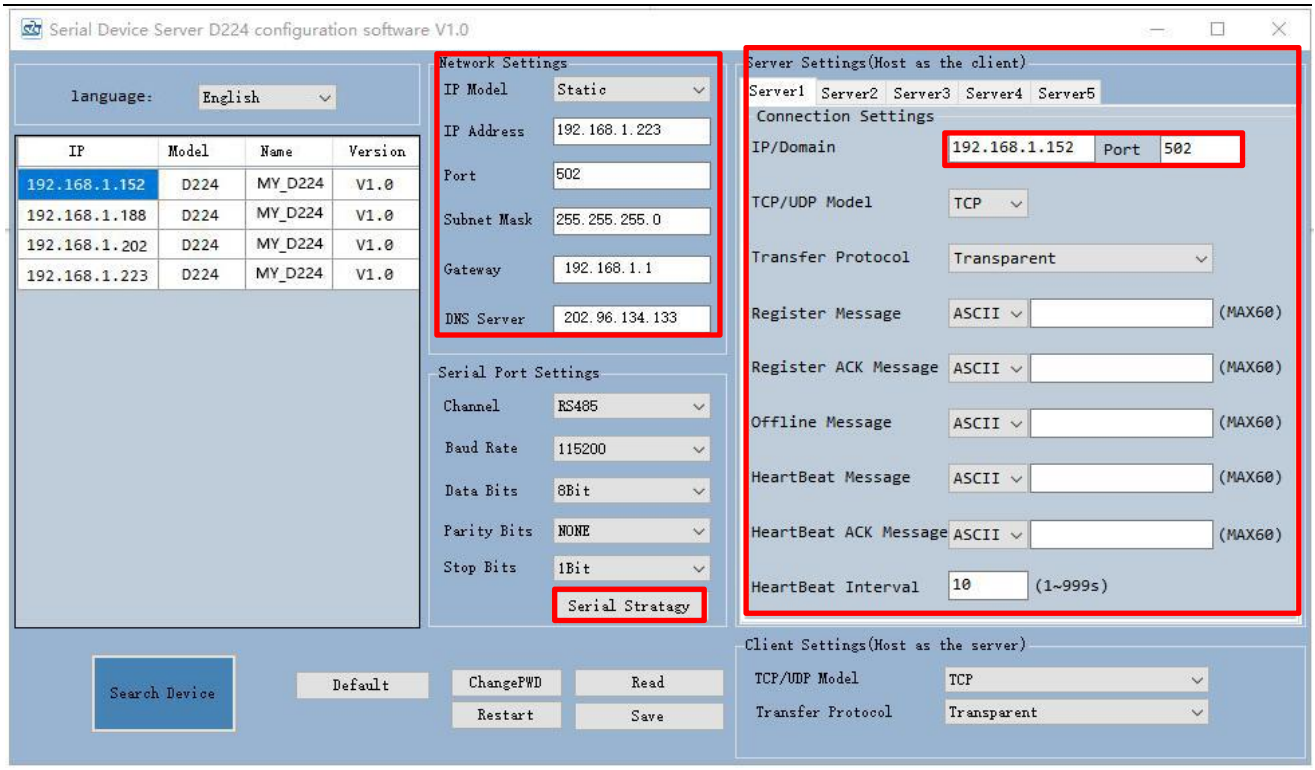
Connect 2 serial devices with 2 D224 ,can realize data communication.
(2 D224 must be connected by crossover cable)
One D224 works as TCP Server,another D224 works as TCP Client.
D224 as server the IP needs to be set to static,and the IP address should be in the same network segment with another D224,as below:



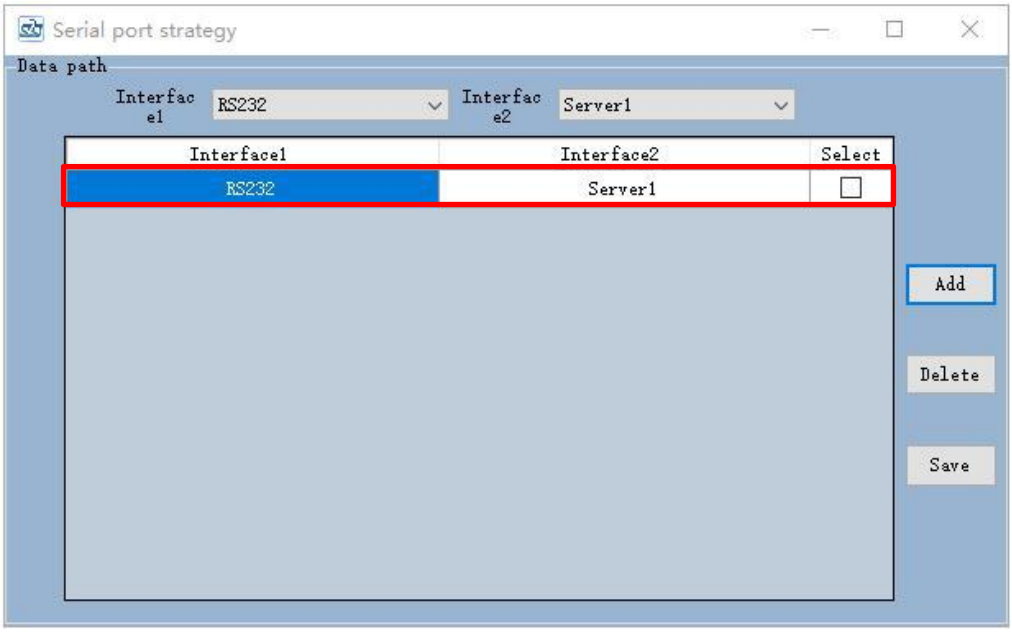
Serial strategy add a path"RS232-Client"



Client parameter settings are as follows:



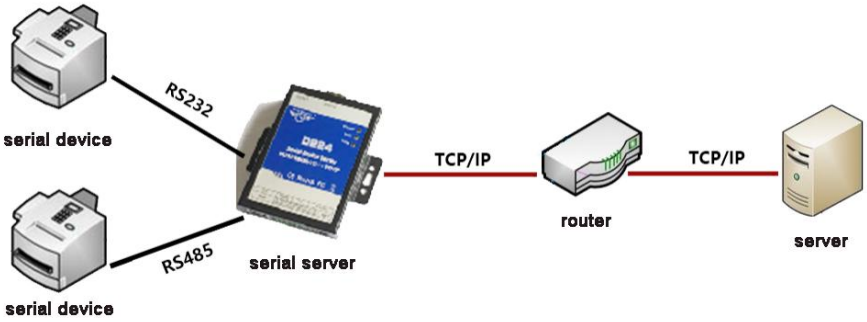
Serial strategy add a path"RS232-Server 1"(Default added)



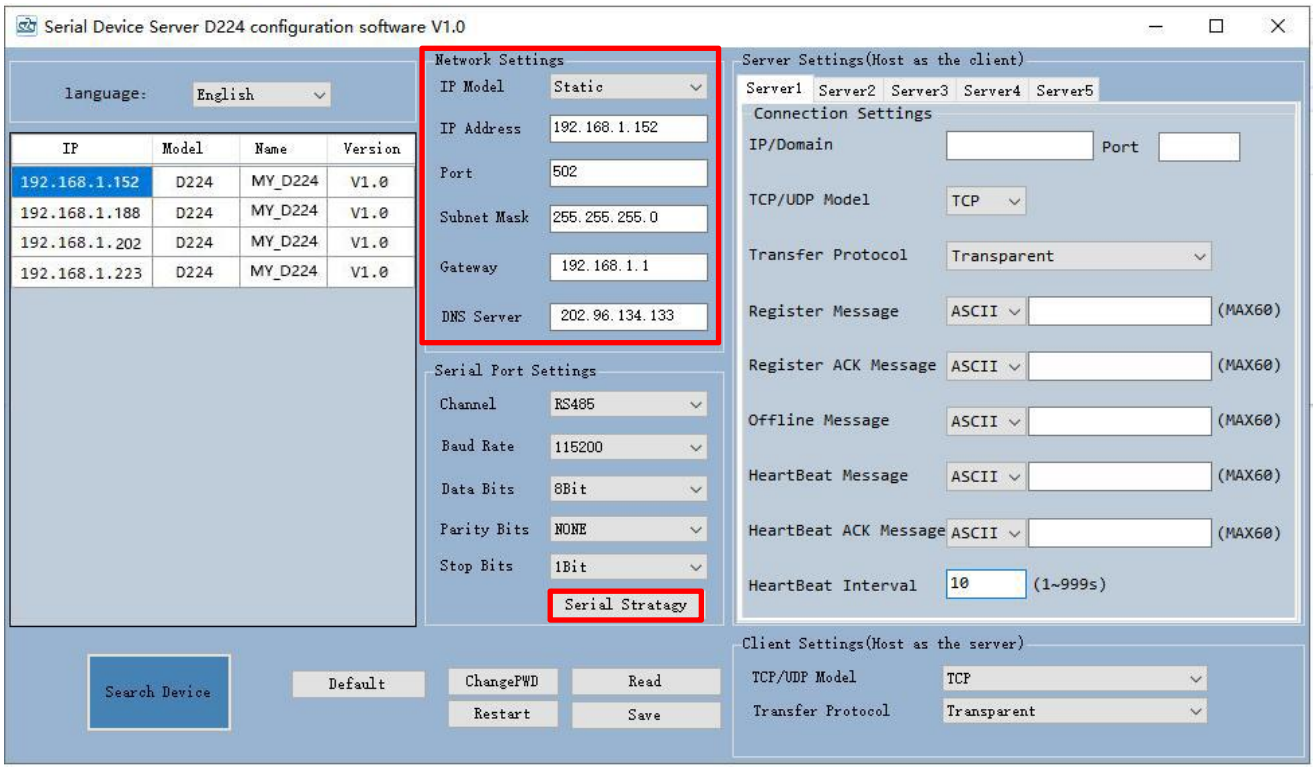
8.2 Multi-device connect to cloud platform

D224 supports RS232, RS485 and TTL type devices to connect the cloud platform at the same time.

The following figure shows the D224 connecting two serial devices to the cloud platform at the same time:

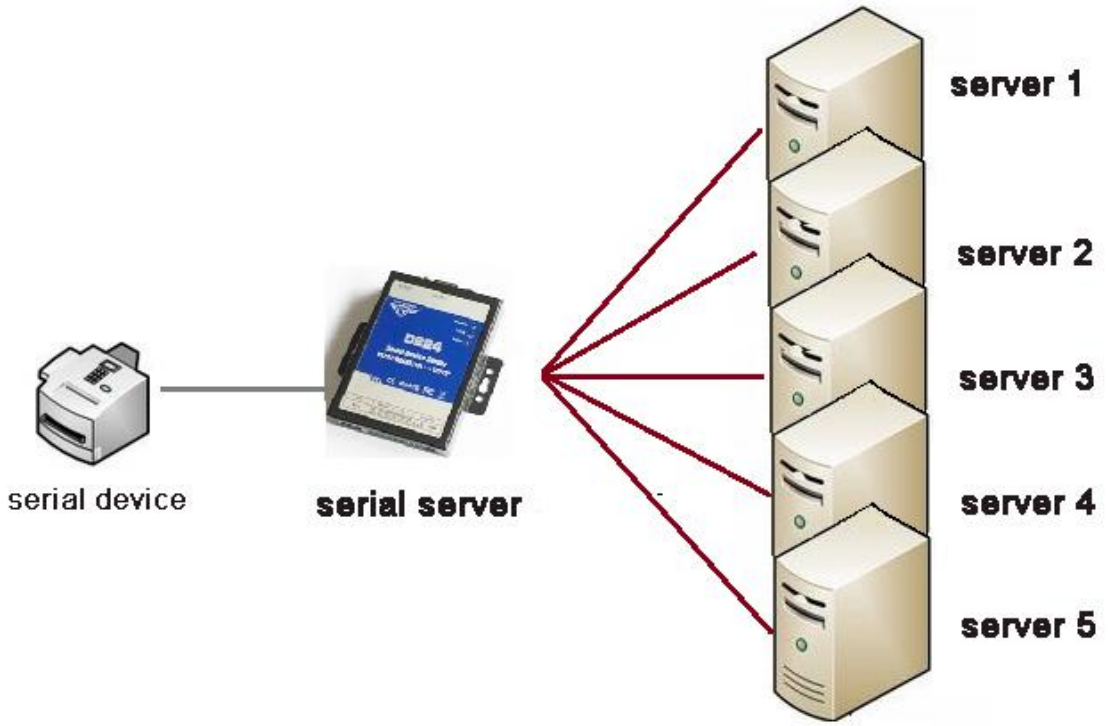


The RS232/RS485 serial setting parameters need the same with RS232/RS485 device,serial strategy adds a data path of "RS232-Server 1" and "RS485-Server 1" (Default added); In the server 1 settings enter the corresponding information for the IP/domain name and port (Default KingPigeon KPIIOT cloud platform).Setting as follows:



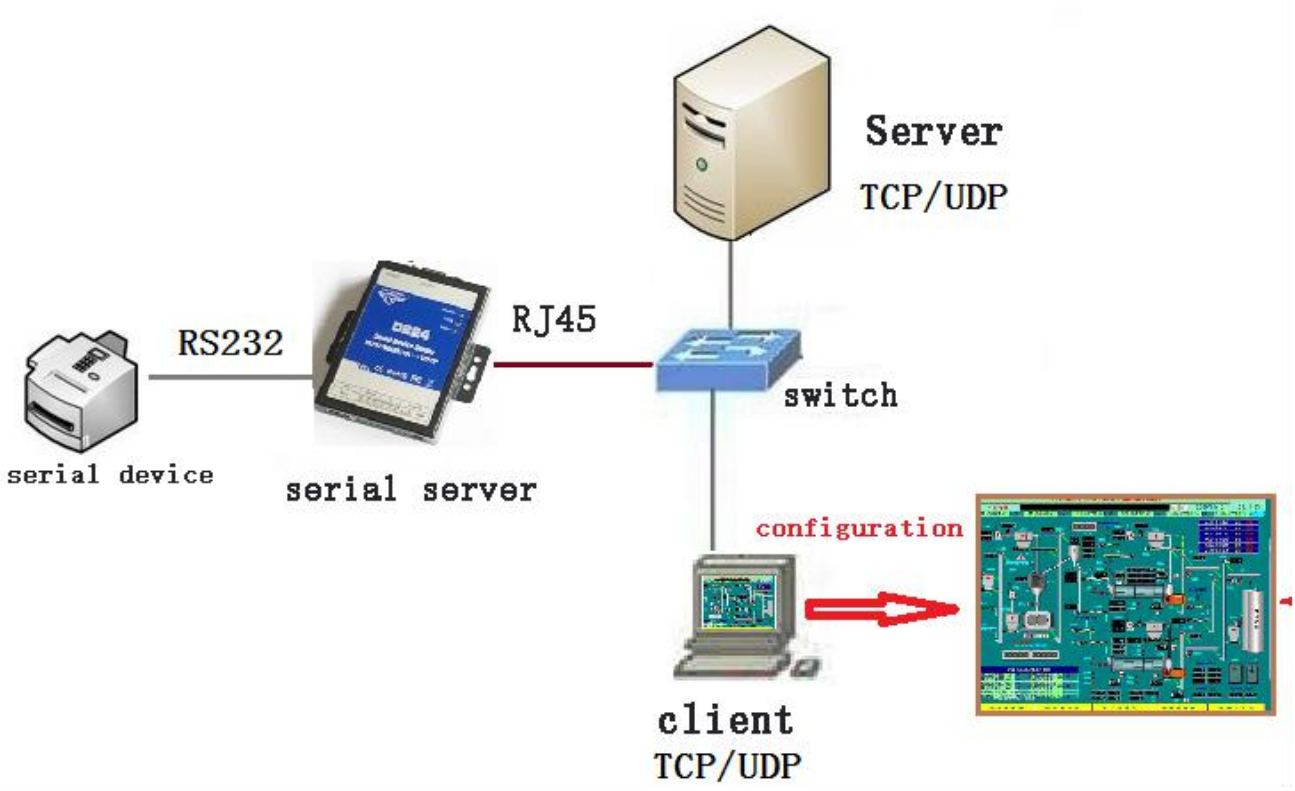
8.3 Connect multiple servers Simultaneously

As a TCP client, D224 can connect 5 servers at the same time.If the serial device (RTU device) used as master and server 1-5 (Modbus TCP device) as the slave,at the same time, there are multiple network port slave devices (up to 5). then the serial device can easily initiate Modbus commands to 5 servers. The server 1-5 judges whether or not to answer based on its own slave ID.



8.4 Local configuration and connect to the cloud platform

The D224 used as server and supports client functions,For RS232 devices (Modbus slaves), local configuration can be implemented, allowing the computer in the LAN (Modbus master) to initiate commands and simultaneously receive commands from the cloud platform (Modbus master).



9.Upgrade Firmware

The Modem supports upgrade firmware via USB port directly. If we upgraded the firmware functions of the data loggers, we will inform you to upgrade the firmware if you required. If there any new requirements of the present functions caused it should update the firmware, the user can upgrade them directly by USB port. If you required upgrade, please contact us to modify the firmware according to you requirements, and we will provide the upgraded firmware to you to upgrade them.

10.Warranty

1) This system is warranted to be free of defects in material and workmanship for one year.
2) This warranty does not extend to any defect, malfunction or failure caused by abuse or misuse by the Operating Instructions.

The End!
Any questions please help to contact us feel free.
Http://www.IOT-Solution.com