IOT Relay User Manual

V1.9.8.1

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1 Product Overview

1.1 Overview

Support Ethernet, WiFi, RS485, CAN
10/100Mbps ethernet, Auto-MDIX,DHCP ip,Static IP
WiFi 802.11 b/g/n, MAX 150Mbps
Digital input, can be Local Button control(SelfLock/Jogging/Delay)
Support RELAY On/OFF/Jogging/Delay.
Support HTTP GET CGI, UDP, TCP Server, TCP Client
Support Modbus-RTU/ASCII/TCP/UDP/WIFI
Support Modbus-RTU Over TCP/UDP/WIFI
Support Modbus-ASCII Over TCP/UDP/WIFI
Support WEB control
Support MQTT, CoAP
Support NTP, IP Watchdog, Task timer
Support Domoticz, Home Assistant, openHAB

Home Automation System Support:

Name	How to
Domoticz	Appendix II How to use Domoticz https://github.com/dtlzp/Domoticz-Dingtian-Relay-Plugin Software version <=V2.16.xx, please use V1.1 for github software version >=V2.17.xx, please use V1.2 for github
Home Assistant	Appendix VI How to Home Assistant
openHAB	Appendix VII How to openHAB

Notice:
1 Close your firewall
2 All command and script run as root/administrator

SDK download link:
http://www.dingtian-tech.com/sdk/relay_sdk.zip

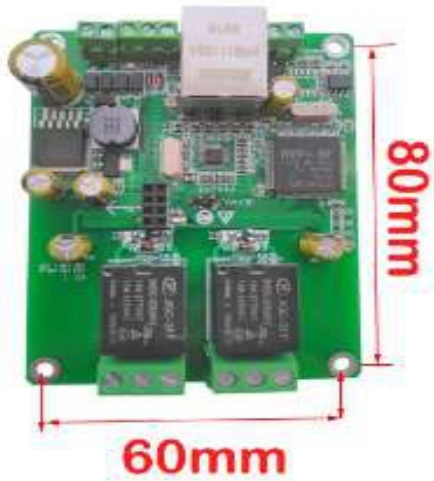
1.2 Technical Parameters

Function	Interface	RJ45/ RS485/CAN/WIFI
	Baudrate	100M/115200bps/125kbps/150Mbps
	Protocol	TCP server/client, UDP HTTP GET CGI, Modbus-RTU/ASCII/TCP/UDP/WIFI Modbus-RTU Over TCP/UDP/WIFI Modbus-ASCII Over TCP/UDP/WIFI MQTT CoAP
	Home Automation System	Domoticz Home Assistant openHAB
	Others	NTP IP Watchdog Task timer
Output	Relay Power	AC 250V/10A,DC 30V/10A
	Contacts	Normally Close(NC) Normally Open(NO)
	Delay	1~65535 seconds
	Momentary	Pull in 0.5 seconds, automatically release
Temperature and Humidity	Storage temperature	-40°C to +70°C
	Operating temperature	-20°C to +70°C
	Relative humidity (during operation)	25°C @ ≤95%, no condensation
Power	Power Specifications	12/24VDC(recommend) 12/24VAC
	Current	2 channel: 0.15A/12V(recommend 1A/12V) 4 channel: 0.25A/12V(recommend 1A/12V) 8 channel: 0.5A/12V(recommend 2A/12V)
	Power consumption	2 channel: 2W 4 channel: 3W 8 channel: 5W

2 Image and Size

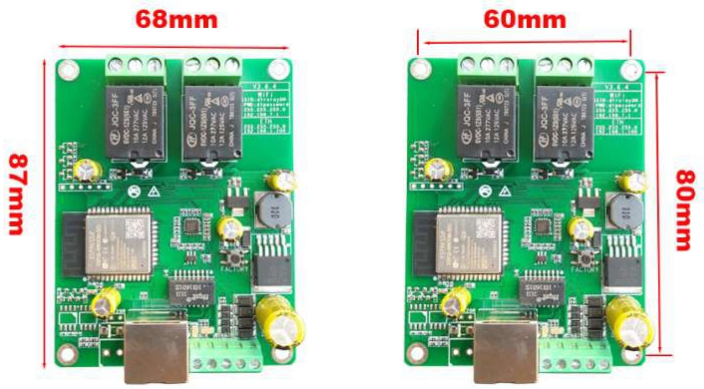
2.1 Hardware version <3.x.x

Hole size: 3.5mm



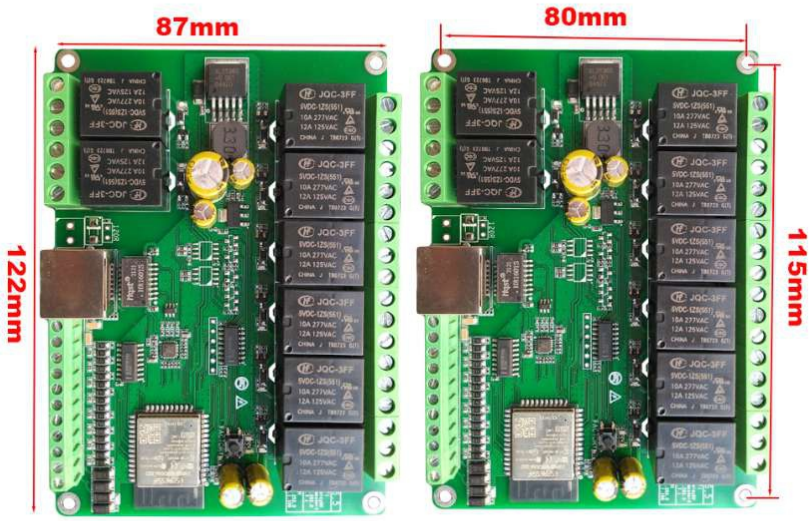
2.2 Hardware version >=V3.x.x

Hole size: 3.5mm



2CH relay board
Size of relay: 87*68mm
Distance of hole: 80*60mm

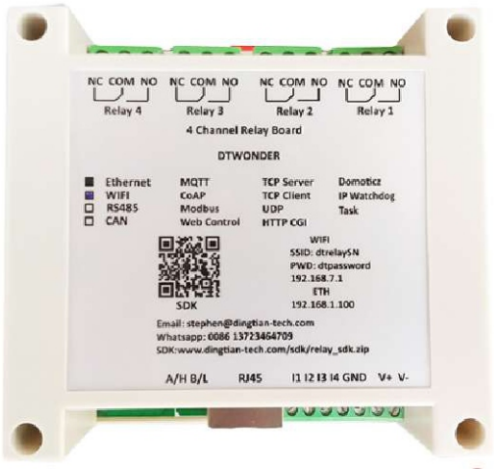
4CH relay board
Size of relay: 91.6*86.4mm
Distance of hole: 85.3*80mm



8CH relay board
Size of relay: 122*87mm
Distance of hole: 115*80mm

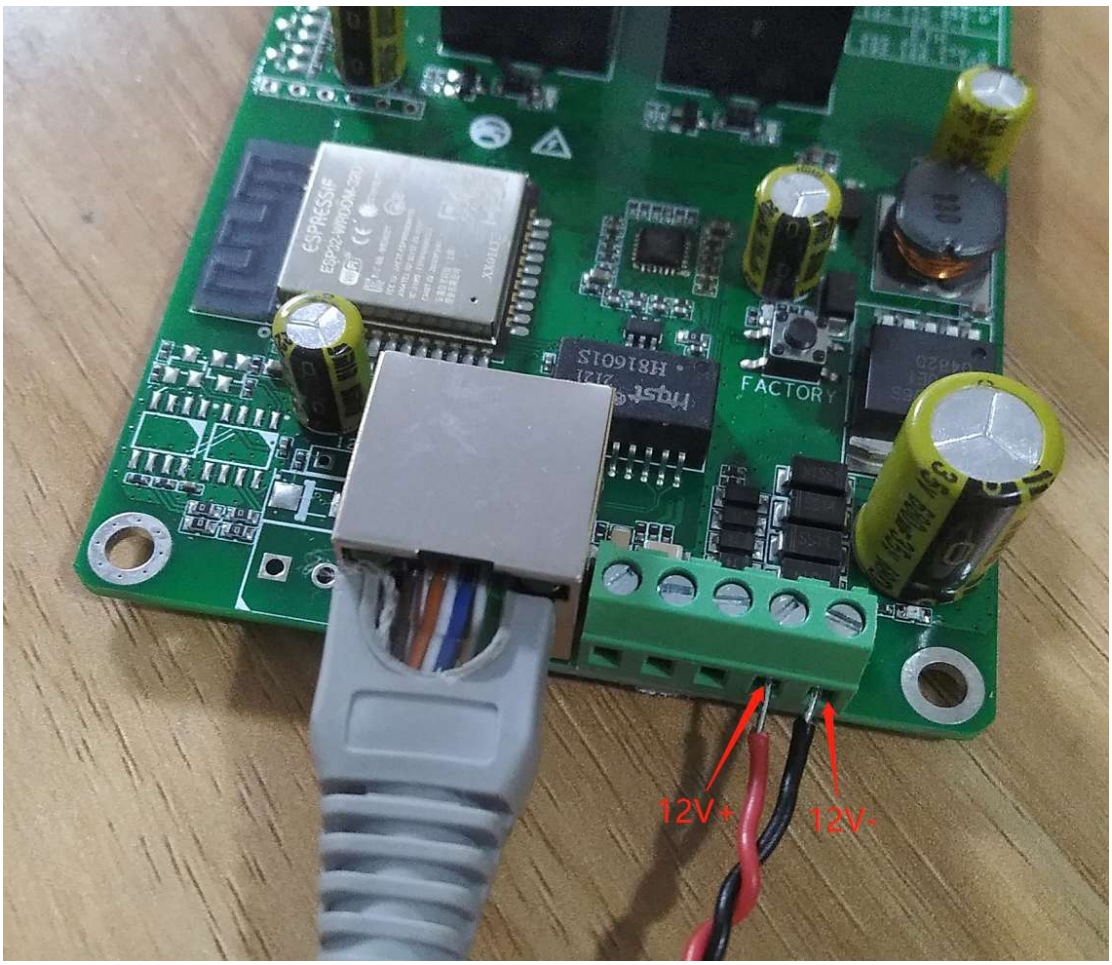
2.3 Case

The 2CH,4CH,8CH Case is ABS material, Standard DIN35 rail installation

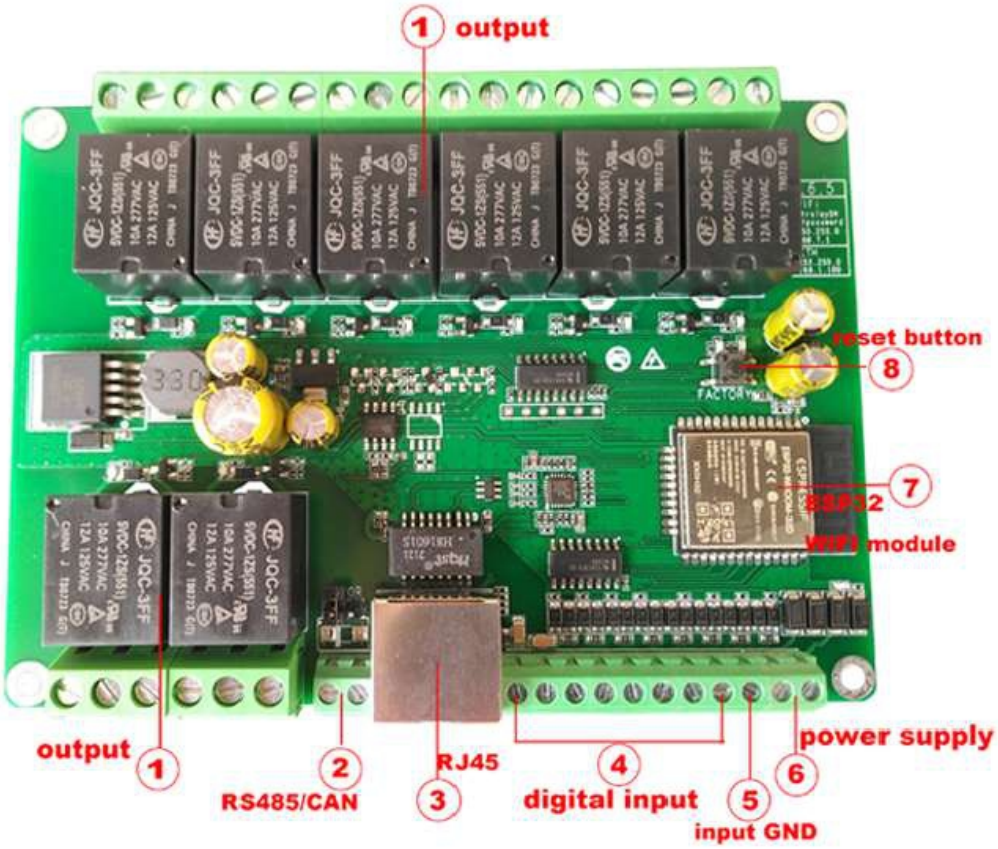


3 Interface Description

3.1 Power Supply

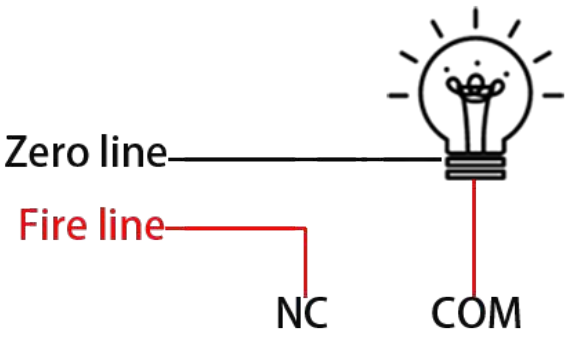


3.2 Funcation

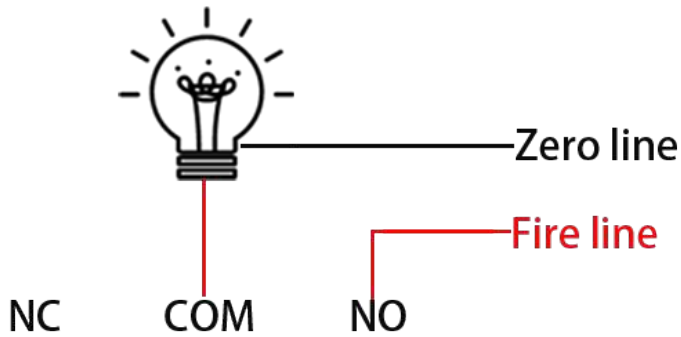


3.3 Relay Contact

Connect Example:



Normal Close Example



Normal Open Example

3.4 Reset To Factory

3.4.1 Hardware Version <V3.x.x

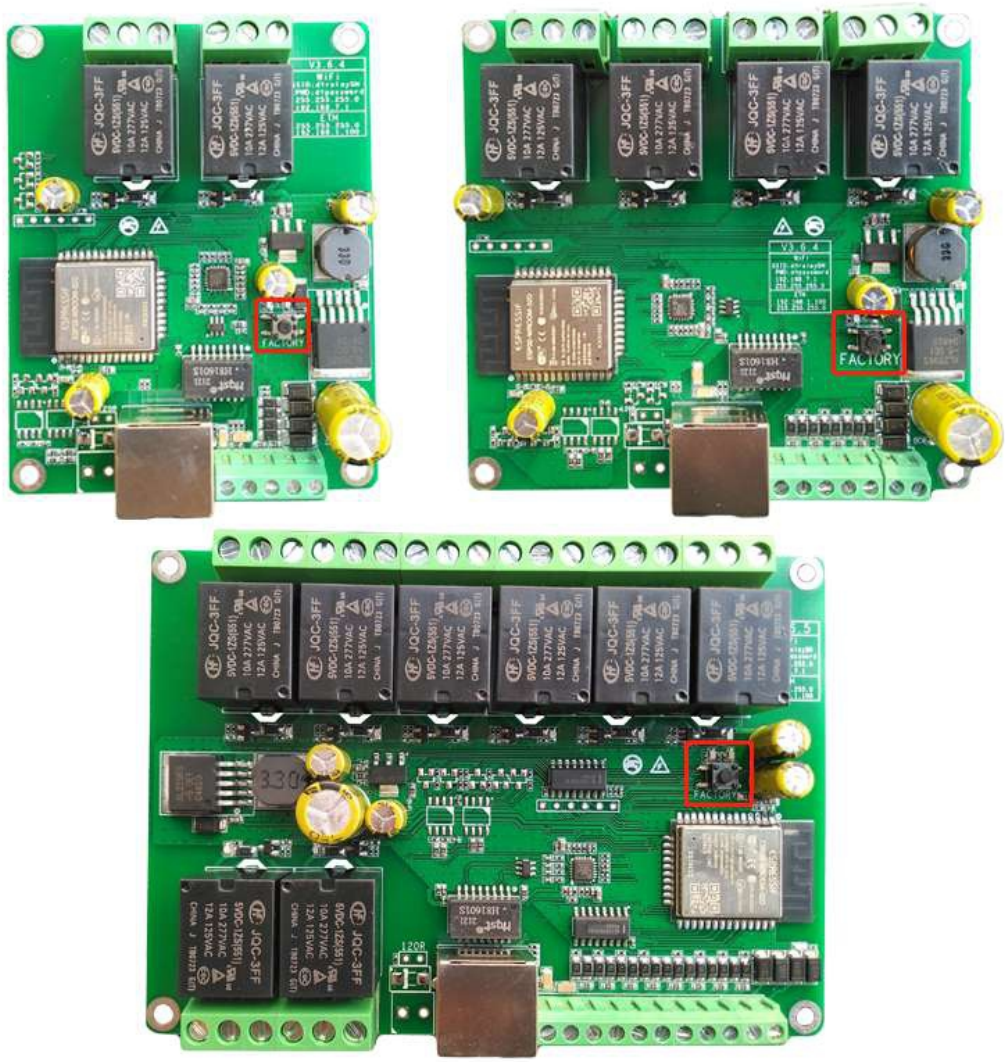
1. Short-circuit the 2 pin headers under the Default assembly with a jumper cap

2 Power off the relay board

3 Power on the relay board

4 Pull out the Default jumper cap

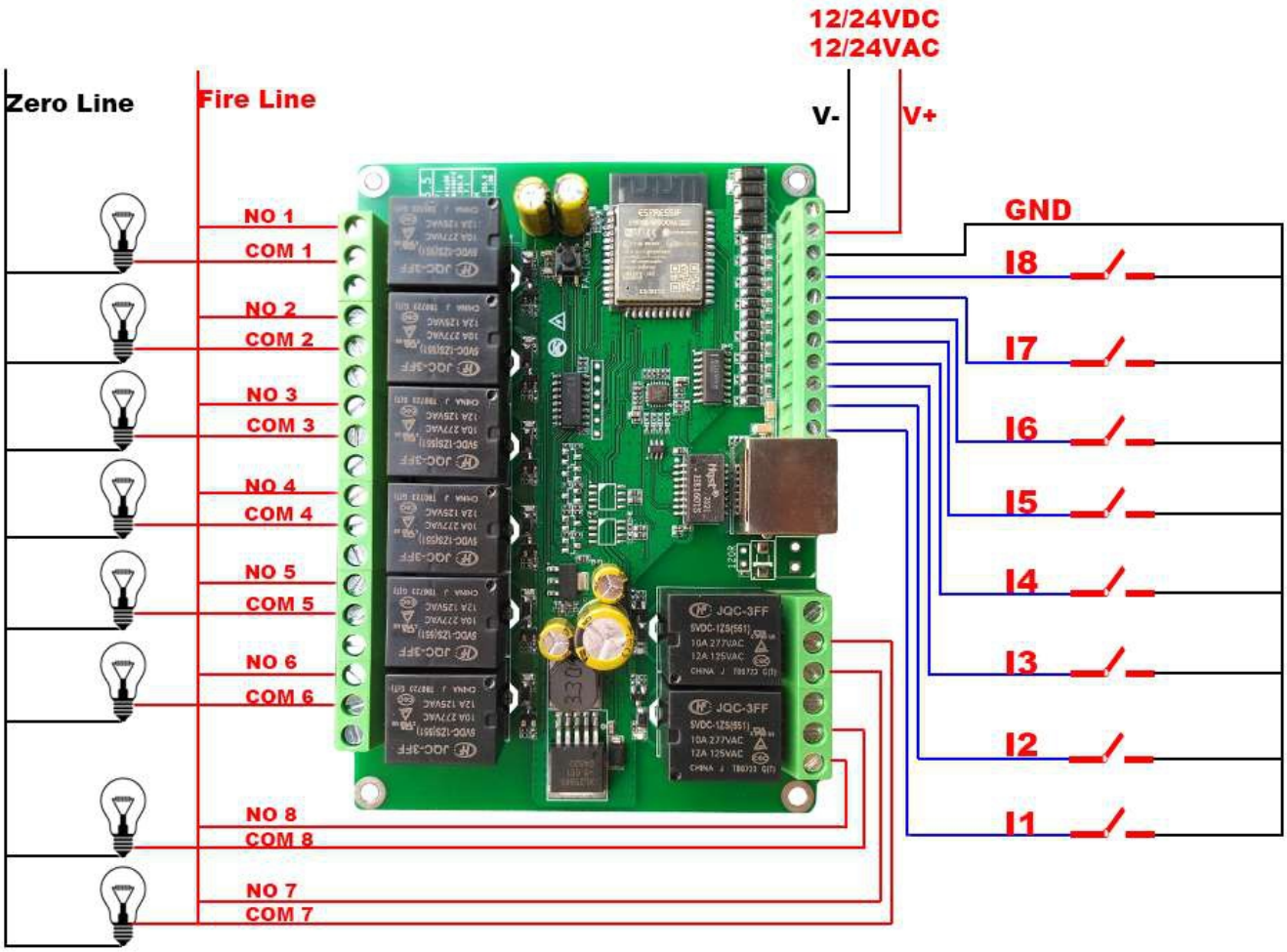
3.4.2 Hardware Version >=V3.x.x



1 power on relay board,wait 10 second
2 press “FACTORY” button(left light will ON)
3 wait 5 second(right light will ON)
4 release “FACTORY” button
5 relay board will reset all parameter to factory.

3.5 Input Output and Power wiring diagram

	LOW	HIGH
Hardware Version < V1.8	0V	3.3V
Hardware Version >= V1.8	0V	3.3V~24V

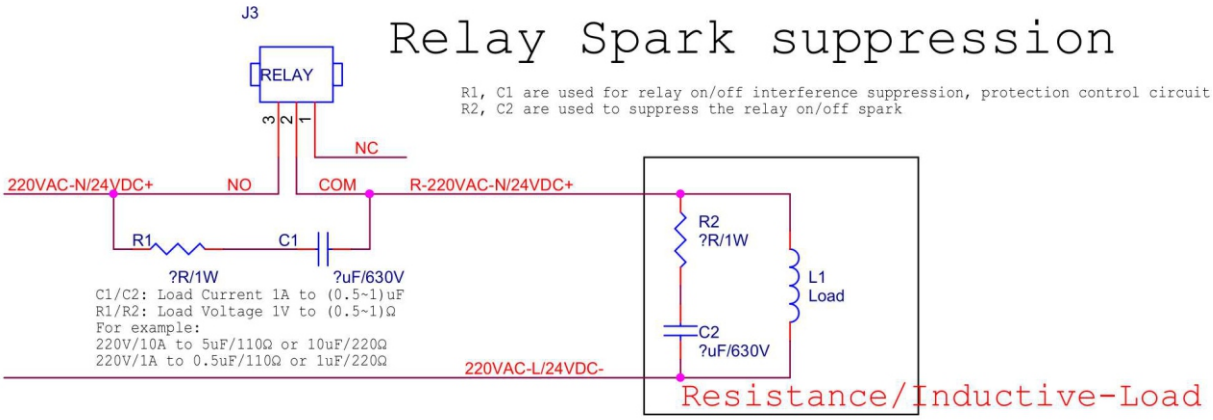


3.6 Add Spark killer and contractor

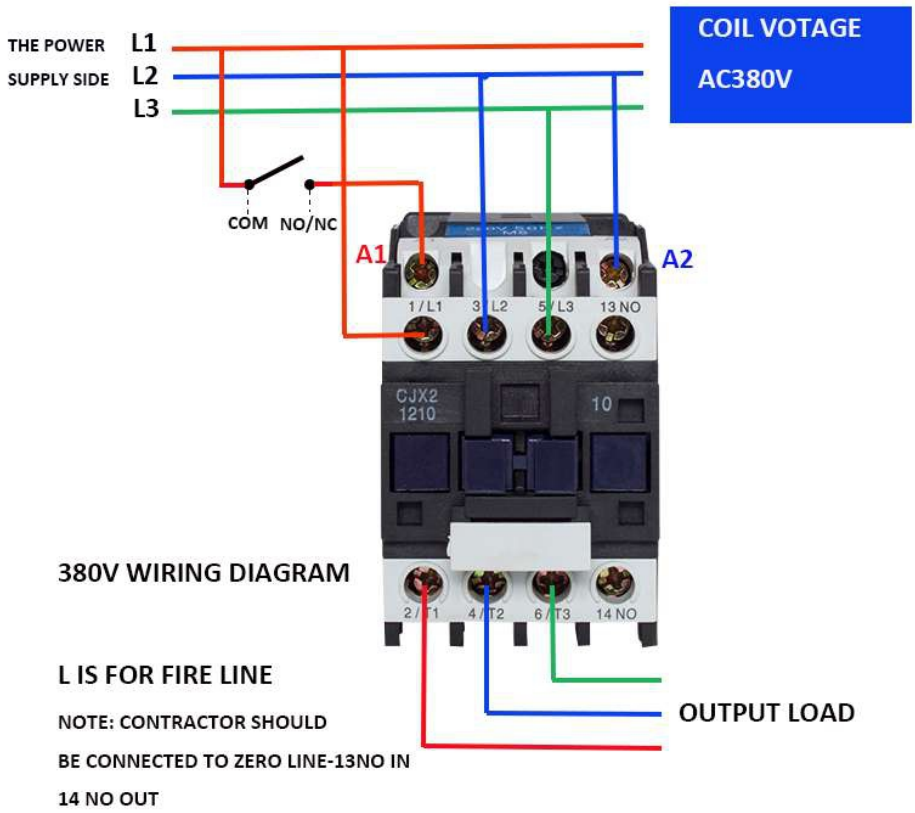
R1,C1 are used for relay on/off interference suppression, protection control circuit

R2,C2 are used to suppress the Load spark and noise when relay ON/OFF

Most of time the Load comes with the best R2+C2,so we don't need care R2 and C2



Our max current is 10A, if the current of your device is too big, suggest add a contractor



4 Ethernet Web Page

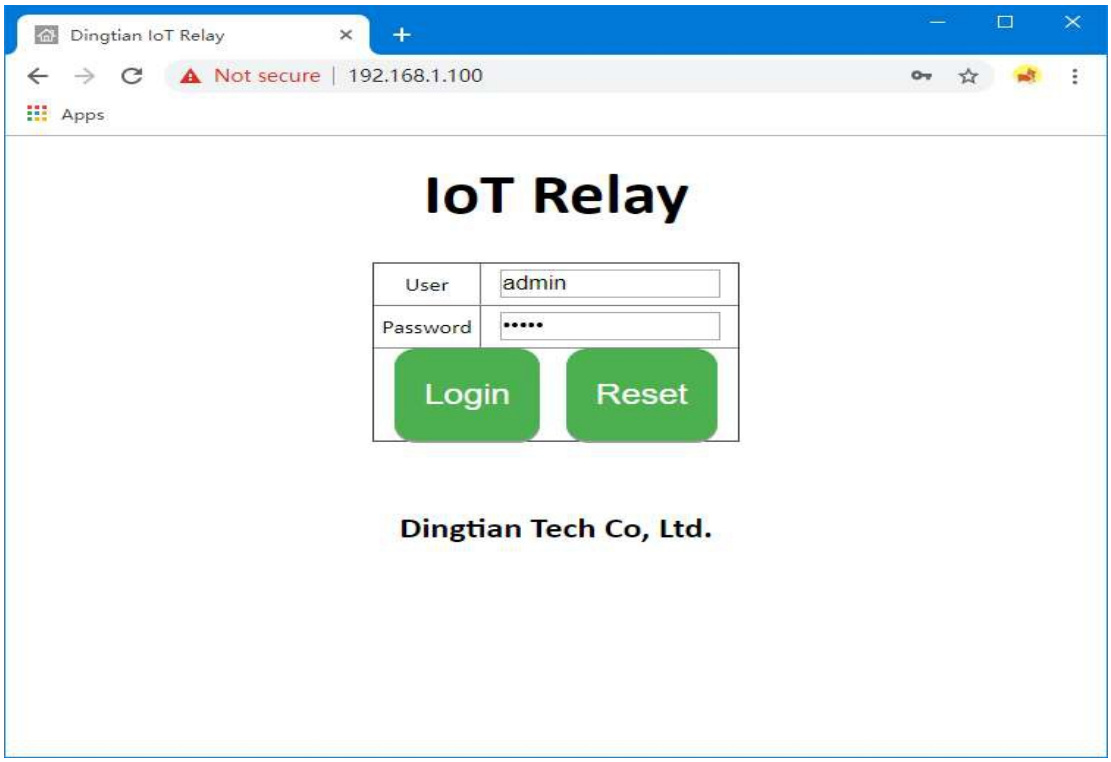
IE is not support, please use firefox and c hrome

4.1 Login

Default IP: 192.168.1.100

user: admin

password: admin



4.2 Setting Network

Set network information, NTP Server on Relay setting page

after click “Save” button, device well reboot

Parameter:

Software Version: Relay board firmware version

Model:

2CH is Dingtian IOT RELAY-2

4CH is Dingtian IOT RELAY-4

8CH is Dingtian IOT RELAY-8

Serial Number: Relay board Serial Number

Date Time: current date and time(Need internet because of NTP)

NTP Server: NTP server get time from, suggest use pool.ntp.org

DHCP: Ethernet IP DHCP or Static

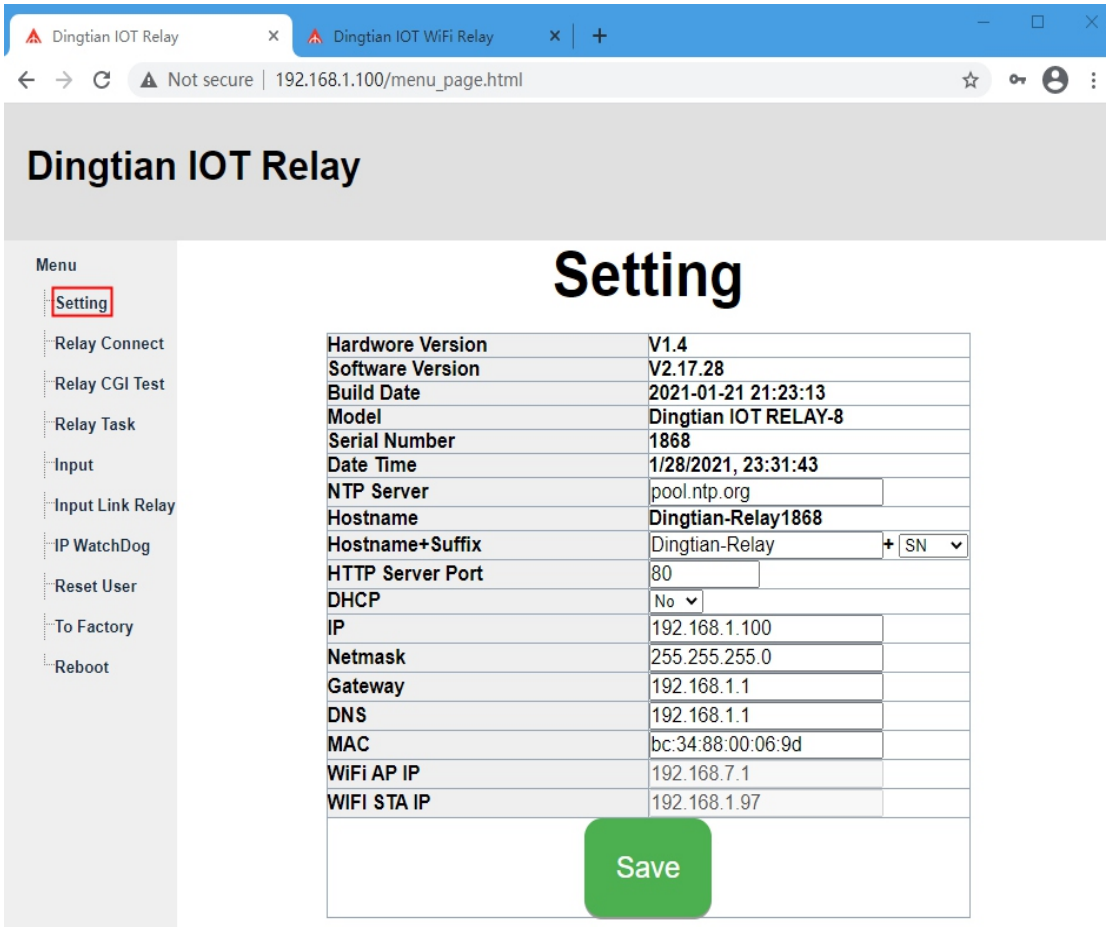
IP: Ethernet current IP Address

Netmask: Ethernet current Netmask

Gateway: Ethernet current Gateway

DNS: Ethernet current DNS Server

MAC: Ethernet current MAC address



4.3 Relay Connect

Set control interface parameter of relay board on the Relay connect page and test relay

After click “Save” button, device will reboot

Protocol refers to programming manual_en.pdf

Channel Parameter:

RS485: RS485 protocol, addr, baudrate, databits, stopbits, parity config

Protocol:

Dingtian String

Dingtian Binary

Modbus-RTU

Modbus-ASCII

Baudrate:

1200bps,2400bps,4800bps,9600bps,19200bps,38400bps,57600bps,115200bps

CAN: CAN protocol, ID, Speed config

Protocol:

Dingtian String

Dingtian Binary
Modbus-RTU(0x03,0x06),only support Read/Write single register once time
Speed:
5Kbps,10Kbps,20Kbps,25Kbps,50Kbps,100Kbps,125Kbps,200Kbps,250Kbps,500Kbps,800Kbps,888Kbps,1Mbps
ETH-UDP1: Ethernet UDP1 protocol, Remote Server Address,Remote Server Port,Local Port config
Protocol:
Dingtian String
Dingtian Binary
Modbus-RTU Over UDP
Modbus-ASCII Over UDP
Modbus-UDP
CoAP(need change port to 5683)
Input Mutual Control
ETH-UDP2: Ethernet UDP2 protocol, Remote Server Address,Remote Server Port,Local Port config
Protocol:
Dingtian String
Dingtian Binary
Modbus-RTU Over UDP(use RS485 addr)
Modbus-ASCII Over UDP(use RS485 addr)
Modbus-UDP
CoAP(we suggest enable CoAP at ETH/WiFi-UDP2)
Input Mutual Control
ETH-TCP Server: Ethernet TCP Server protocol, Local Port config
Protocol:
Dingtian String
Dingtian Binary
Modbus-RTU Over TCP(use RS485 addr)
Modbus-ASCII Over TCP(use RS485 addr)
Modbus-TCP
ETH-TCP Client: Ethernet TCP Client protocol, Remote Server Address,Remote Server Port config
Protocol:
Dingtian String
Dingtian Binary
Modbus-RTU Over TCP(use RS485 addr)
Modbus-ASCII Over TCP(use RS485 addr)
Modbus-TCP
ETH-MQTT: Ethernet MQTT protocol, Broker Address, Broker Port, Broker Username, Broker Password config
Protocol:
MQTT(without tls)

Other Parameter:
Relay Password: use for checking control is valid, only correct password control relay board

Keep Alive Second: send relay status to server with every "Keep Alive Second", only protocol Dingtian String and Dingtian binary have Keep Alive Second

Jogging Time: Jogging time, default is 500ms,1=100ms

what is Jogging: ON then delay 500ms OFF,or OFF then delay 500ms ON,

Power Failure Recovery Relay: relay status will restore after re-power

Input Control Relay: Input link relay output

Button Type Parameter:

Selflock: Connect Selflock Button,

press button relay ON,release button relay OFF

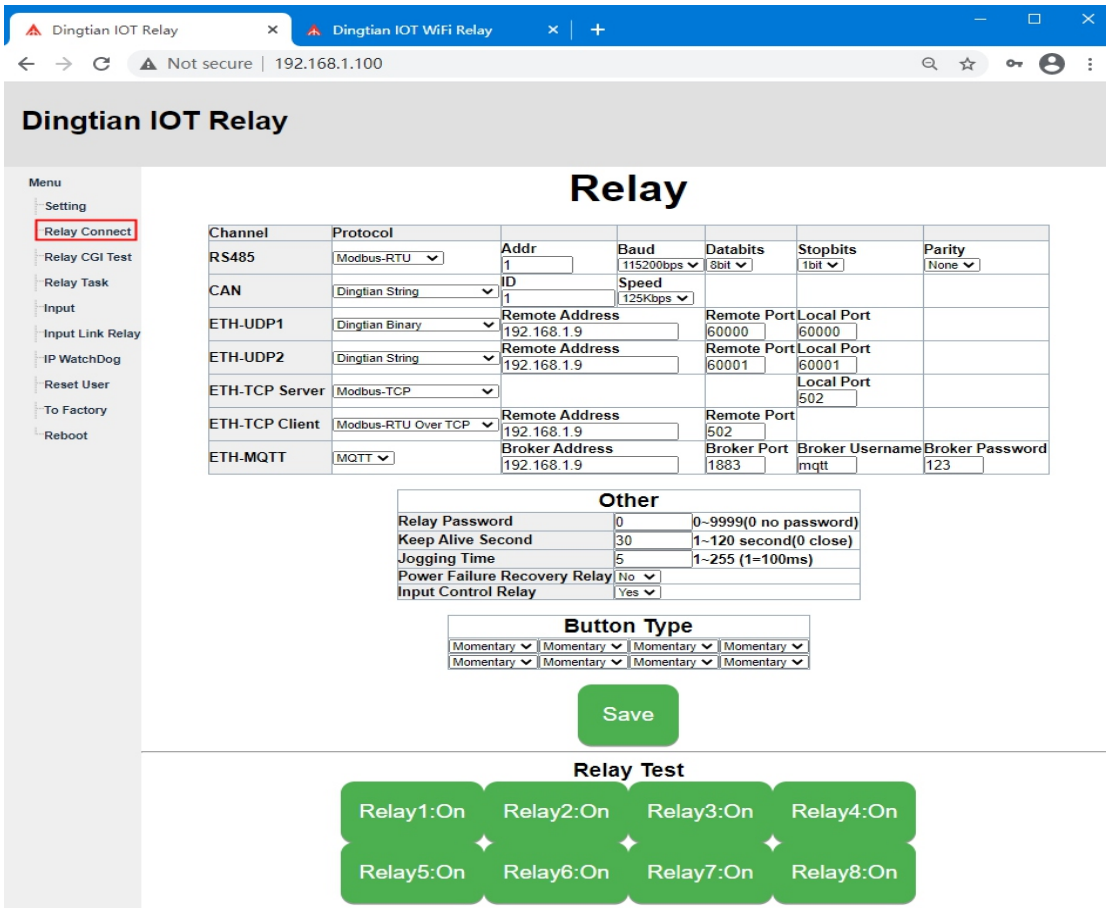
Jogging: Connect Momentary Button,

press and release button relay Jogging(ON and delay 500ms OFF)

Momentary: Connect Momentary Button,

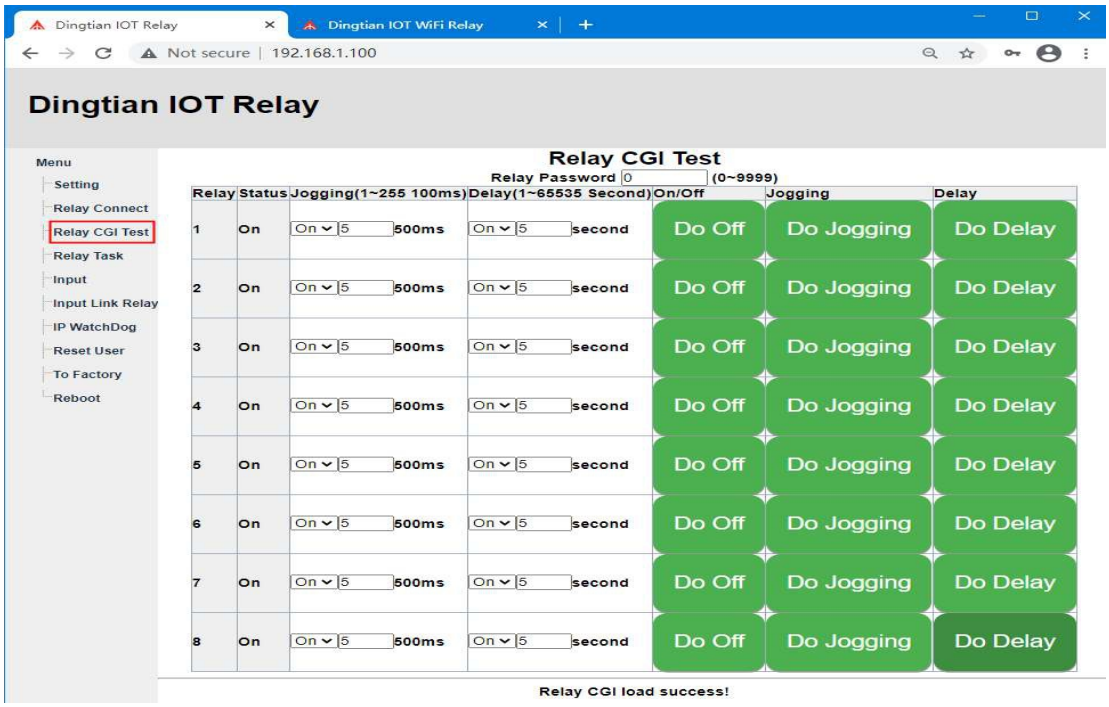
press and release button relay ON,press and release button relay OFF

How to Connect button please move to 3.5



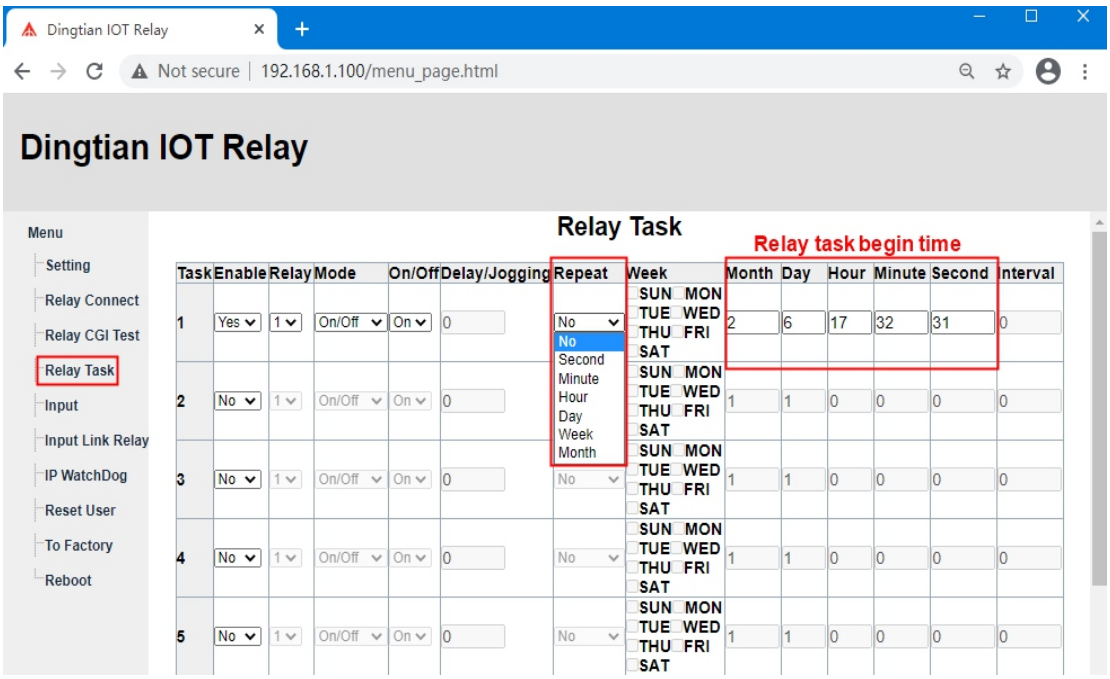
4.4 Relay CG I Test

relay CGI test

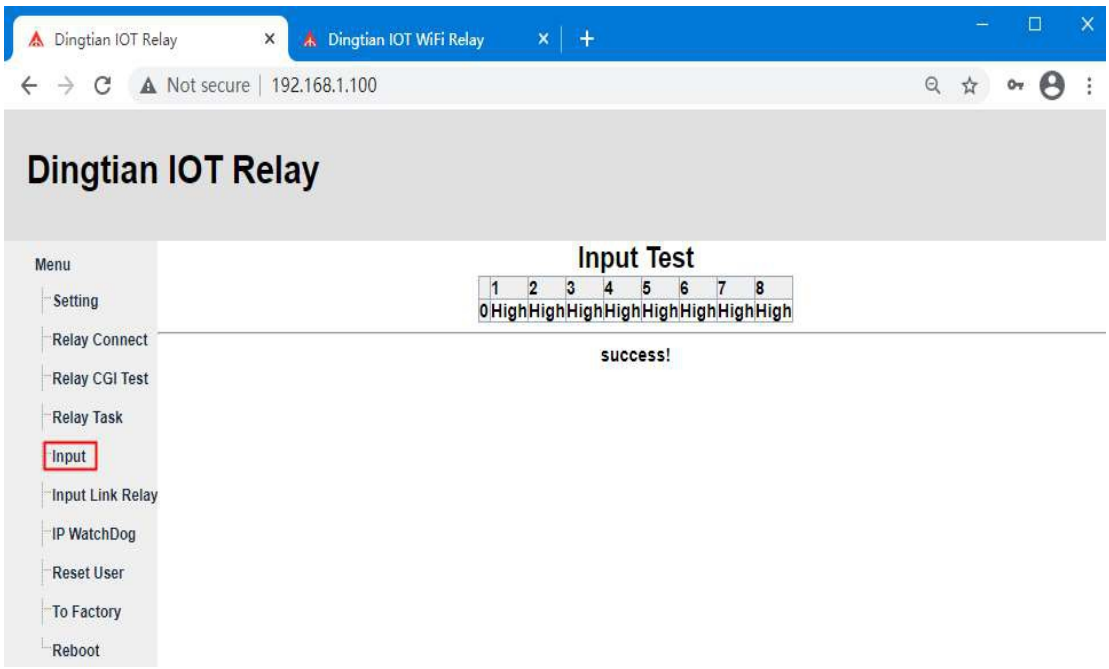


4.5 Relay Task

Choose “Repeat”, you c an ask repeat by sec ond/minute/hour/day/week/month

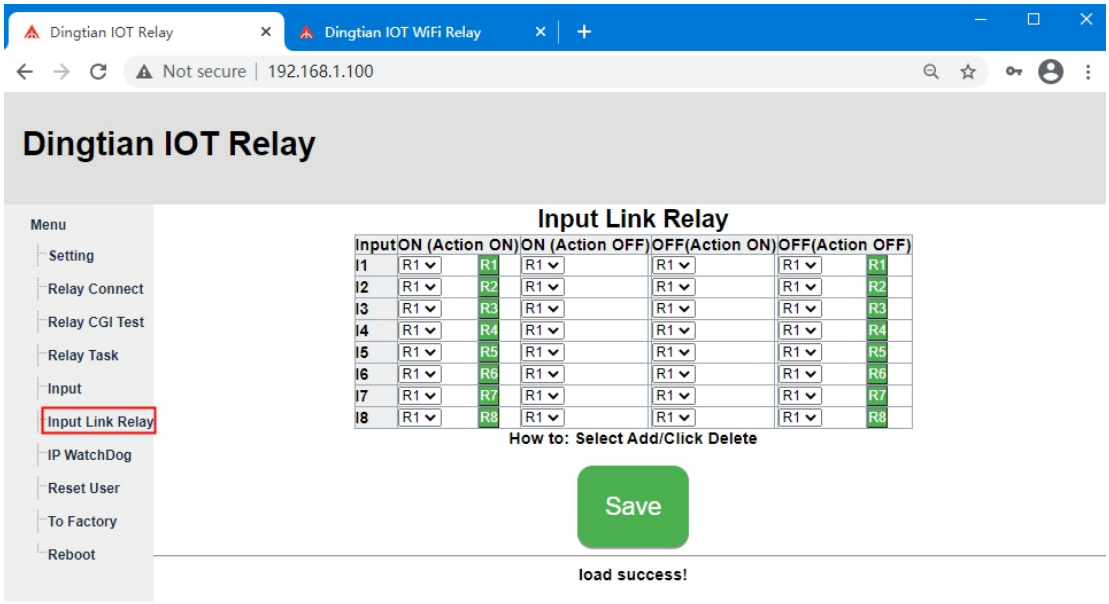


4.6 Input


Dingtian IOT Relay
Dingtian IOT WiFi Relay
Not secure | 192.168.1.100
Dingtian IOT Relay
Menu
Setting
Relay Connect
Relay CGI Test
Relay Task
Input
Input Link Relay
IP WatchDog
Reset User
To Factory
Reboot
Input Test
1 2 3 4 5 6 7 8
0 High High High High High High High High
success!

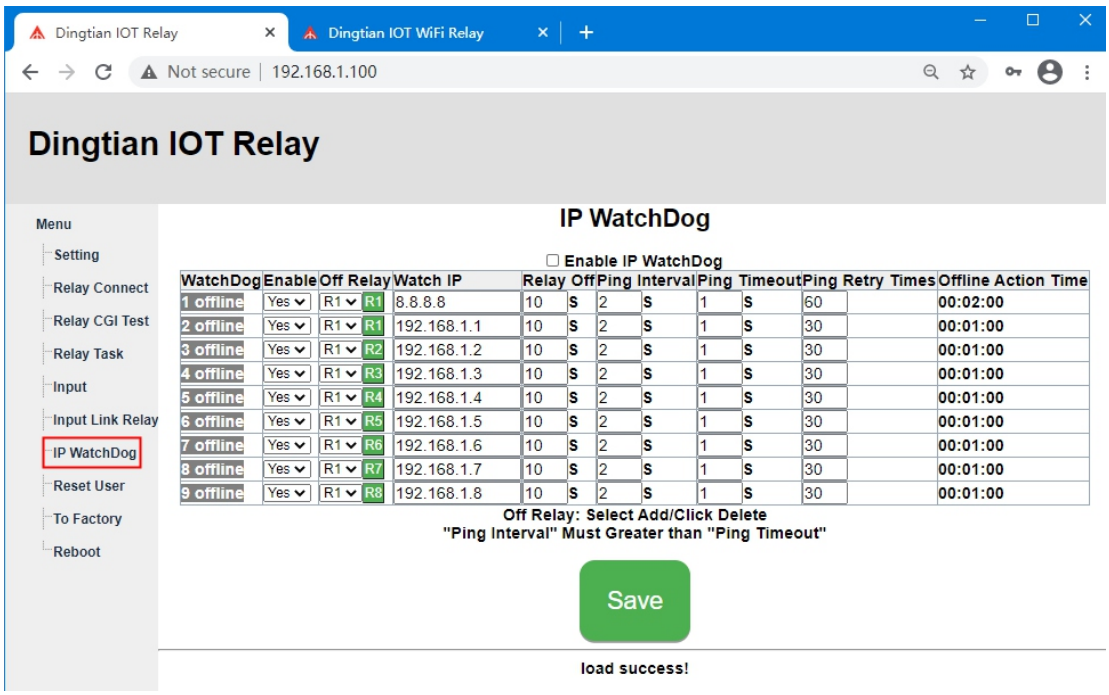
4.7 Input Link Relay

Select R1~R8, means you add the relay to link with Input, Click the green button R1~R8 means delete relay

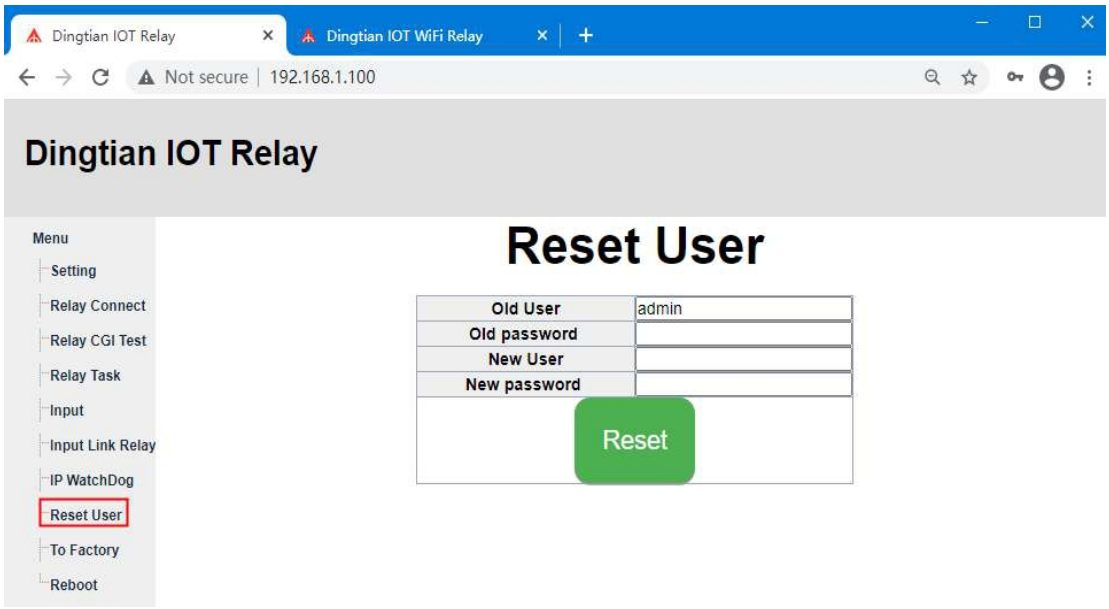


4.8 IP WatchDog

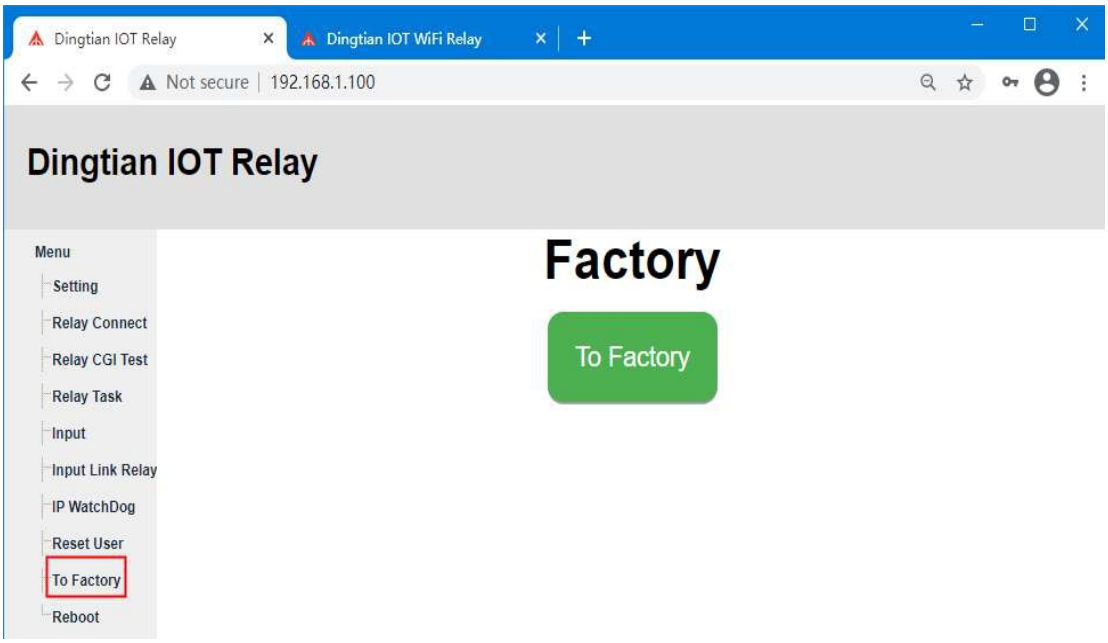
When Enable IP WatchDog function, all relay ON, when the “Watch IP” offline, relay OFF, after seconds, the relay ON automatically,“Ping Interval” must be bigger than “Ping Timeout”



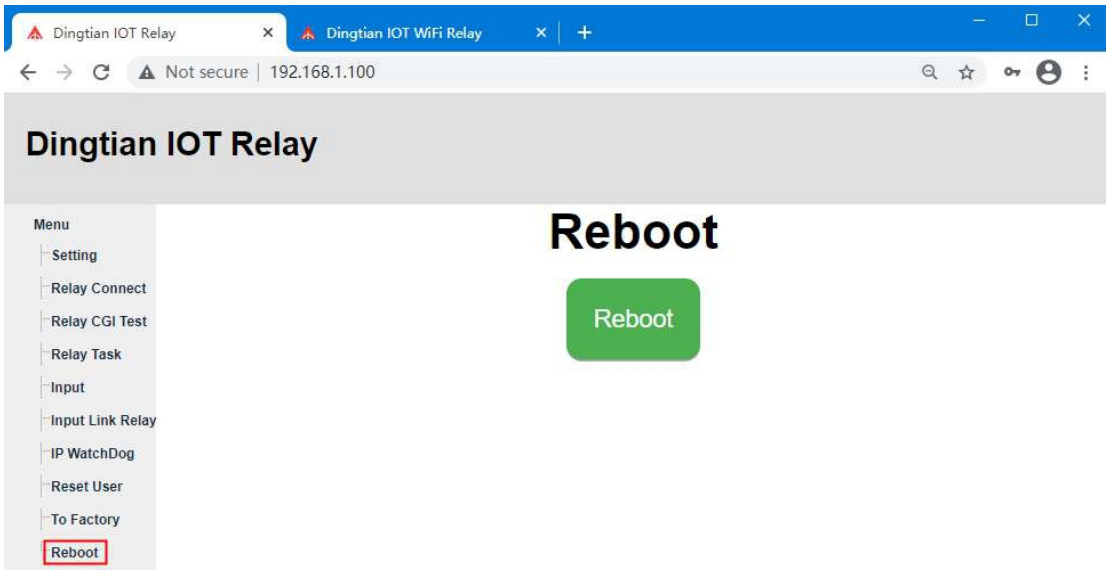
4.9 Reset User



4.10 To Factory



4.11 Reboot


Dingtian IOT Relay
Dingtian IOT WiFi Relay
Not secure | 192.168.1.100
Dingtian IOT Relay
Menu
Setting
Relay Connect
Relay CGI Test
Relay Task
Input
Input Link Relay
IP WatchDog
Reset User
To Factory
Reboot
Reboot
Reboot

5 WIFI web Page

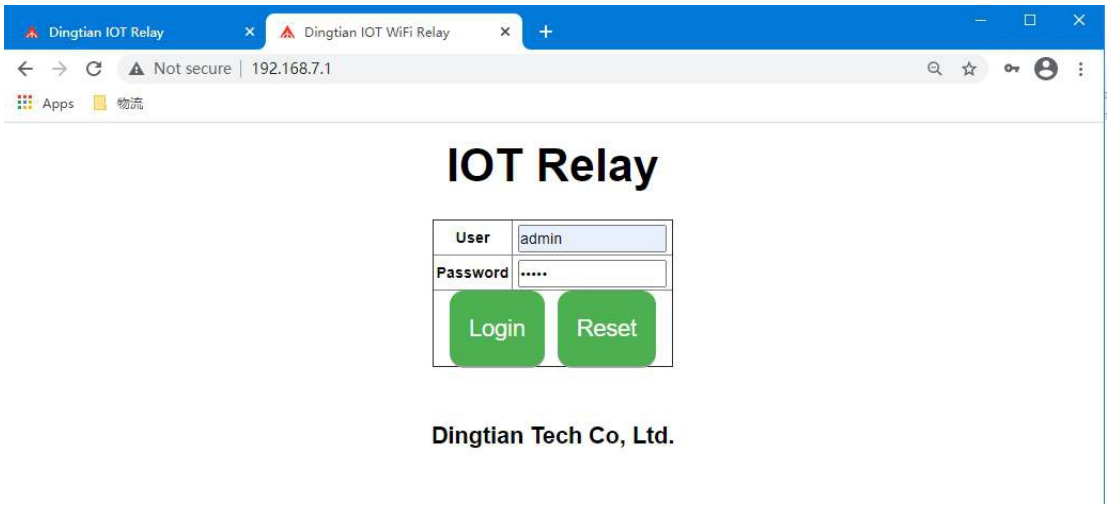
IE is not support, please use firefox and chrome

5.1 Login

Default IP: 192.168.7.1

user:admin

password:admin



5.2 Setting WIFI

Set WIFI information, NTP Server and STA WIFI SSID and password on WIFI Relay setting page

After click “Save” button, device will reboot

Parameter:

Software Version: Relay board firmware version

Model:

2CH is Dingtian IOT WRELAY-2

4CH is Dingtian IOT WRELAY-4

8CH is Dingtian IOT WRELAY-8

Serial Number: Relay board Serial Number

Date Time: current date and time(Need internet because of NTP)

NTP Server: NTP server get time from, suggest use pool.ntp.org

STA WiFi SSID: Your Router WiFi Name,Relay board will access to your router

STA WiFi Password: Your Router WiFi Password, Relay board will access to your router

STA IP: Relay board get IP from your Router

Netmask: WIFI Netmask

Gateway: WIFI Gateway

DNS: WIFI DNS Server

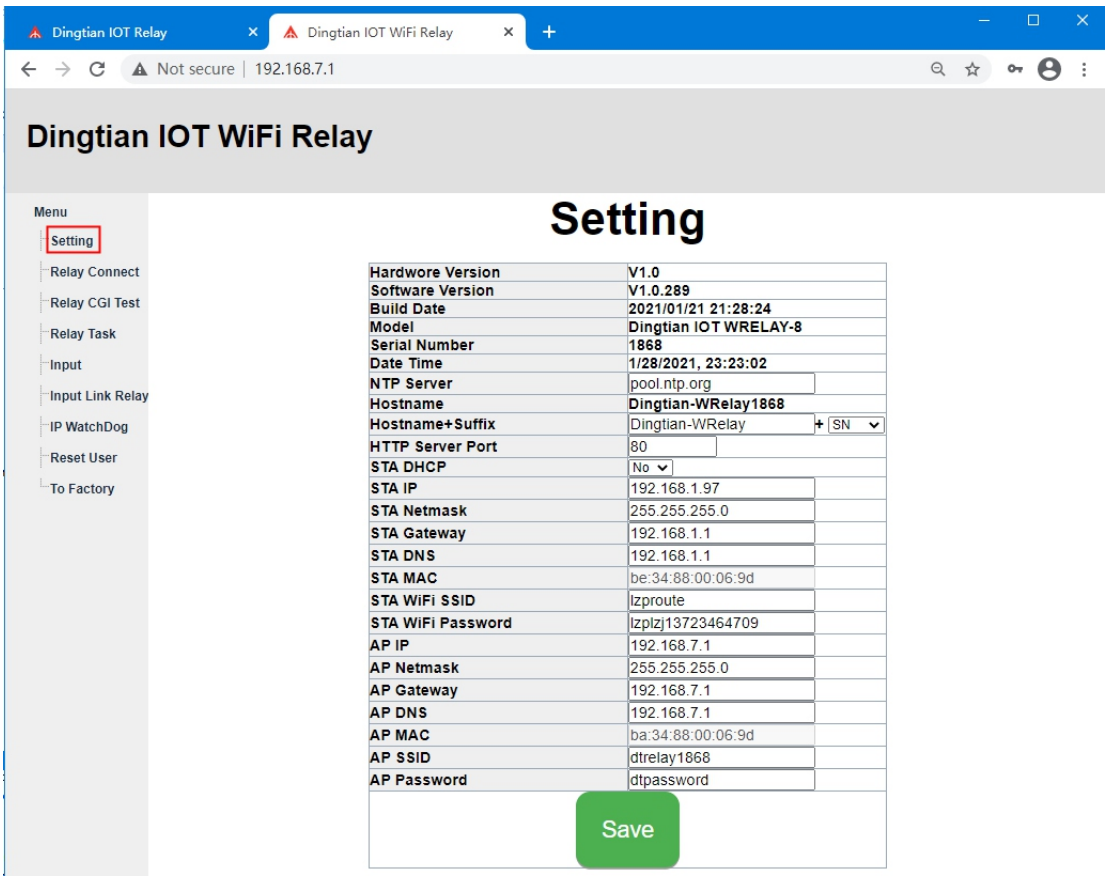
MAC: WIFI MAC address

AP IP: WIFI default address

AP SSID: WIFI default name, as a router, we need to connect the WIFI with your computer firstly and access the wifi web

AP Password: WIFI default Password

we can use STA IP or AP IP to control relay board via WIFI, only accept to use one browser(Firefox or Chrome) to access.



5.3 Setting Relay Connect

WIFI-UDP1: WIFI UDP1 protocol, Remote Server Address,Remote Server Port,Local Port config

Protocol:

Dingtian String

Dingtian Binary

Modbus-RTU Over UDP(use RS485 addr)

Modbus-ASCII Over UDP(use RS485 addr)

Modbus-UDP

CoAP(need change port to 5683)

Input Mutual Control

WIFI-UDP2: WIFI UDP2 protocol, Remote Server Address,Remote Server Port,Local Port config

Protocol:

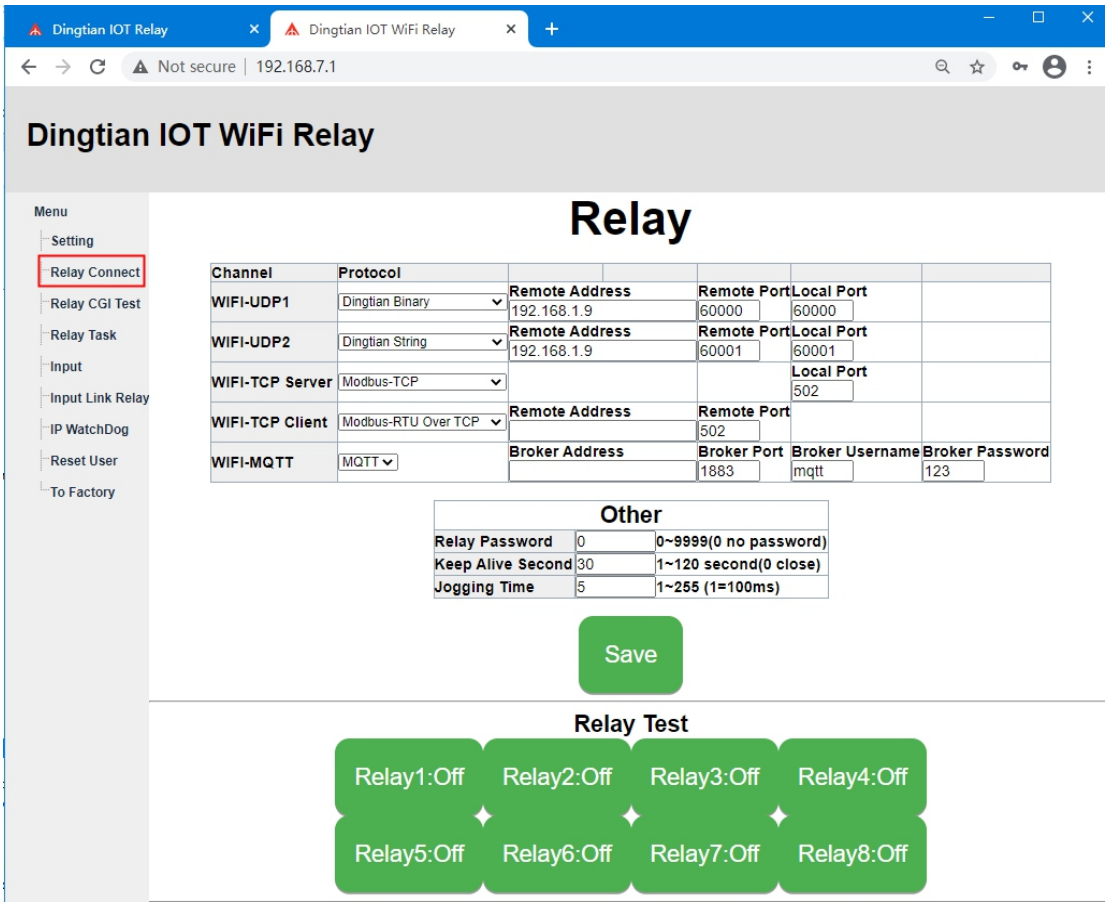
Dingtian String

Dingtian Binary

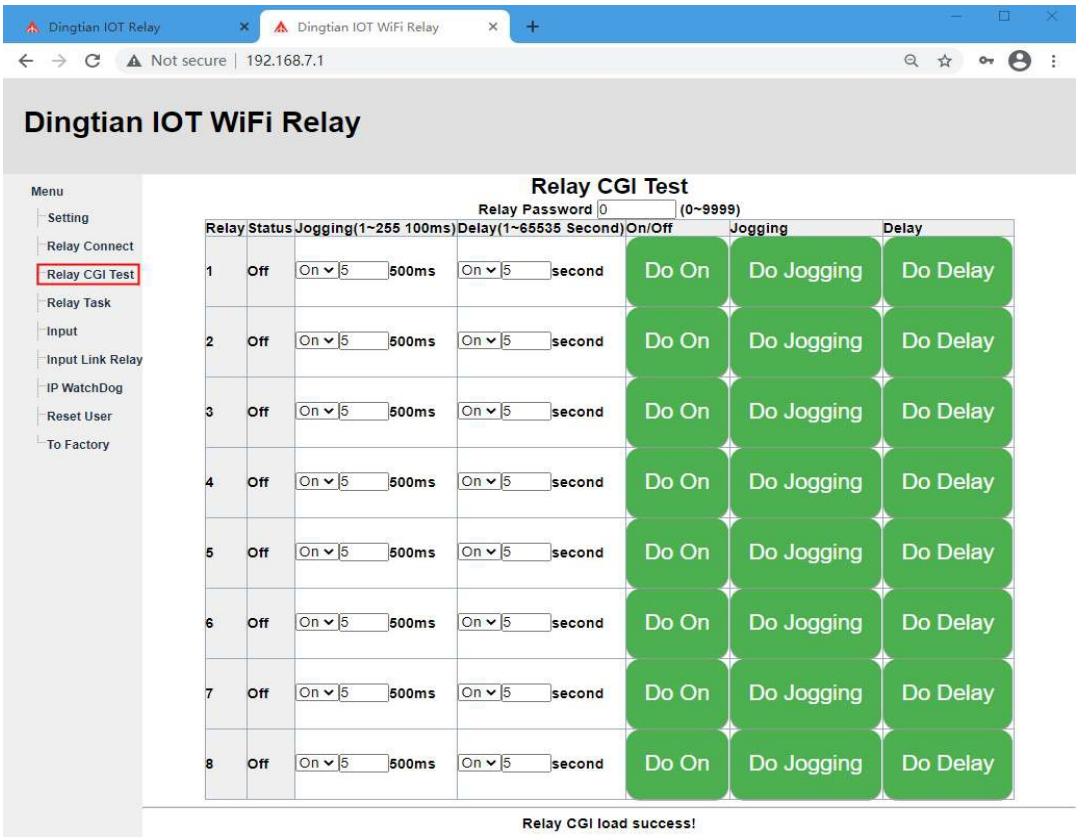
Modbus-RTU Over UDP(use RS485 addr)

Modbus-ASCII Over UDP(use RS485 addr)
Modbus-UDP
CoAP(we suggest enable CoAP at ETH/WiFi-UDP2)
Input Mutual Control
WIFI-TCP Server: WIFI TCP Server protocol, Local Port config
Protocol:
Dingtian String
Dingtian Binary
Modbus-RTU Over TCP(use RS485 addr)
Modbus-ASCII Over TCP(use RS485 addr)
Modbus-TCP
WIFI-TCP Client: WIFI TCP Client protocol, Remote Server Address,Remote Server Port config
Protocol:
Dingtian String
Dingtian Binary
Modbus-RTU Over TCP(use RS485 addr)
Modbus-ASCII Over TCP(use RS485 addr)
Modbus-TCP
WIFI-MQTT: WIFI MQTT protocol, Broker Address, Broker Port, Broker Username, Broker Password config
Protocol:
MQTT(without tls)
Other Parameter:
Relay Password: use for checking control is valid, only correct password control relay board
Keep Alive Second: send relay status to server with every "Keep Alive Second", only protocol Dingtian String and Dingtian binary have Keep Alive Second

Jogging Time: Jogging time, default is 500ms,1=100ms
what is Jogging: ON then delay 500ms OFF,or OFF then delay 500ms ON

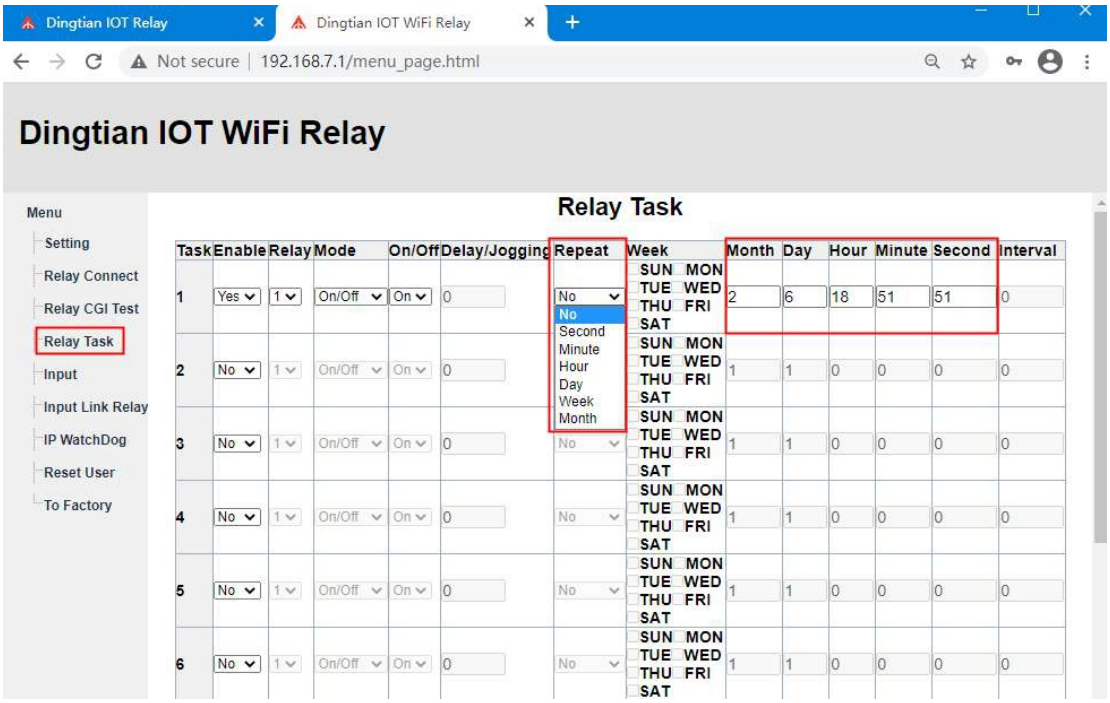

Dingtian IOT Relay
Dingtian IOT WiFi Relay
Not secure | 192.168.7.1
Dingtian IOT WiFi Relay
Menu
Setting
Relay Connect
Relay CGI Test
Relay Task
Input
Input Link Relay
IP WatchDog
Reset User
To Factory
Relay
Channel
Protocol
WIFI-UDP1
Dingtian Binary
Remote Address
192.168.1.9
Remote Port
60000
Local Port
60000
WIFI-UDP2
Dingtian String
Remote Address
192.168.1.9
Remote Port
60001
Local Port
60001
WIFI-TCP Server
Modbus-TCP
Local Port
502
WIFI-TCP Client
Modbus-RTU Over TCP
Remote Address
Remote Port
502
WIFI-MQTT
MQTT
Broker Address
Broker Port
1883
Broker Username
mqtt
Broker Password
123
Other
Relay Password
0
0~9999(0 no password)
Keep Alive Second
30
1~120 second(0 close)
Jogging Time
5
1~255 (1=100ms)
Save
Relay Test
Relay1:Off
Relay2:Off
Relay3:Off
Relay4:Off
Relay5:Off
Relay6:Off
Relay7:Off
Relay8:Off

5.4 Relay CG I Test

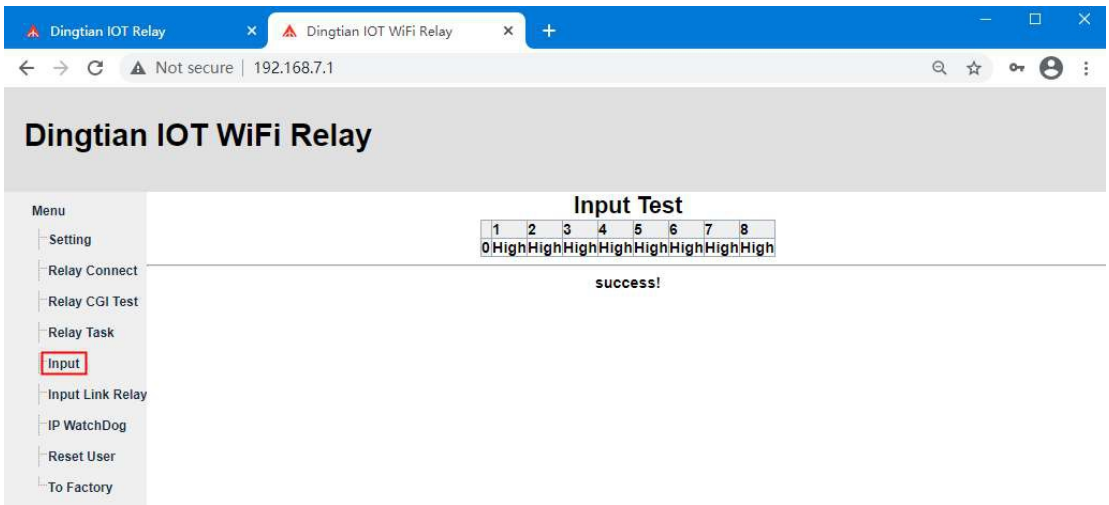


5.5 Relay Task

Choose “Repeat”, you can ask repeat by second/minute/hour/day/week/month

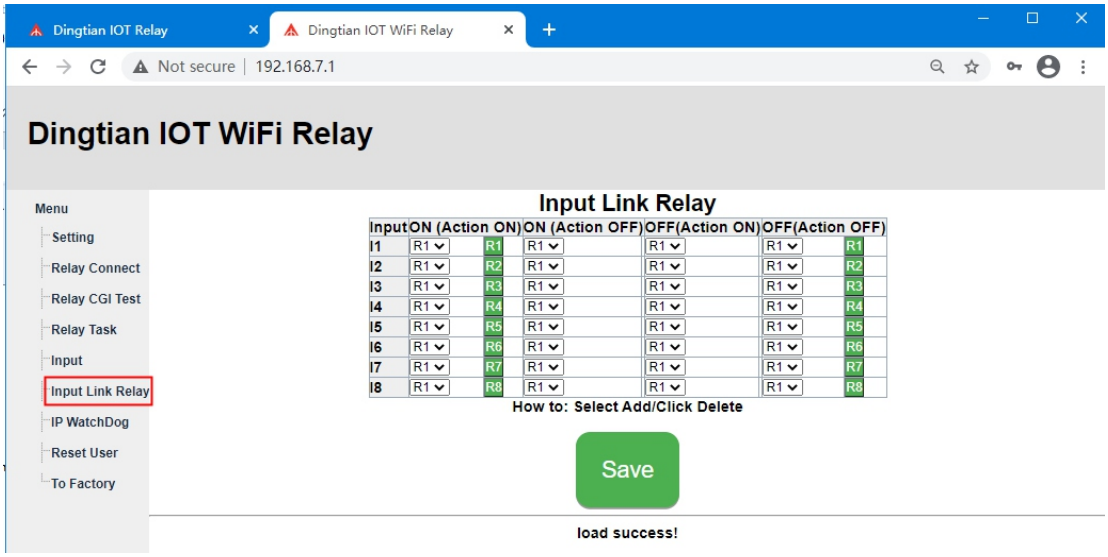


5.6 Input



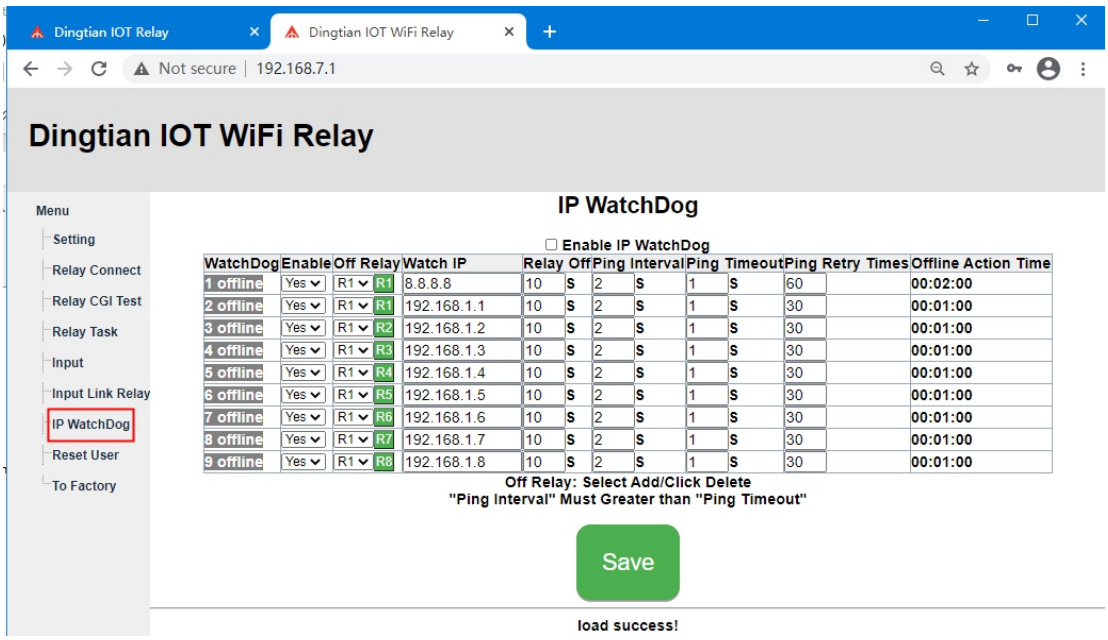
5.7 Input Link Relay

Select R1~R8, means you add the relay to link with Input, Click the green button R1~R8 means delete relay

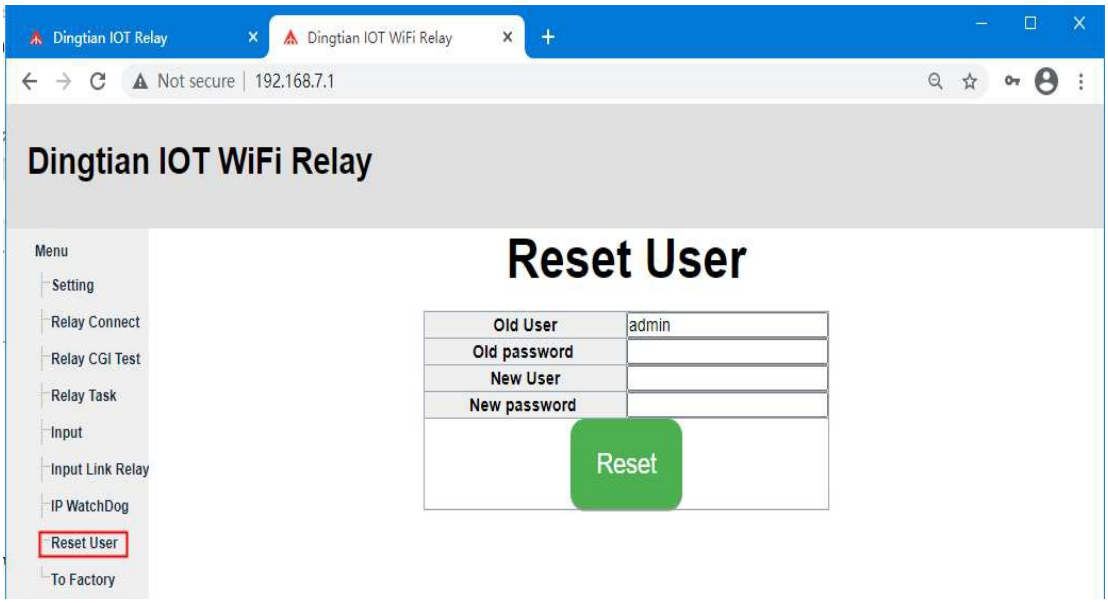


5.8 IP WatchDog

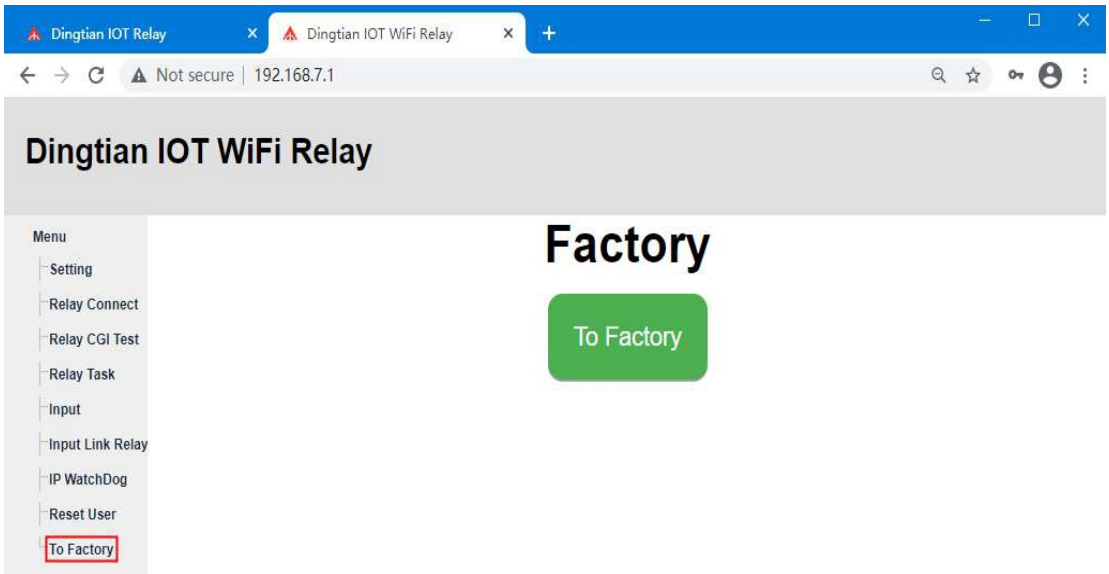
When Enable IP WatchDog function, all relay ON, when the “Watch IP” offline, relay OFF, after seconds, the relay ON automatically,“Ping Interval” must be bigger than “Ping Timeout”



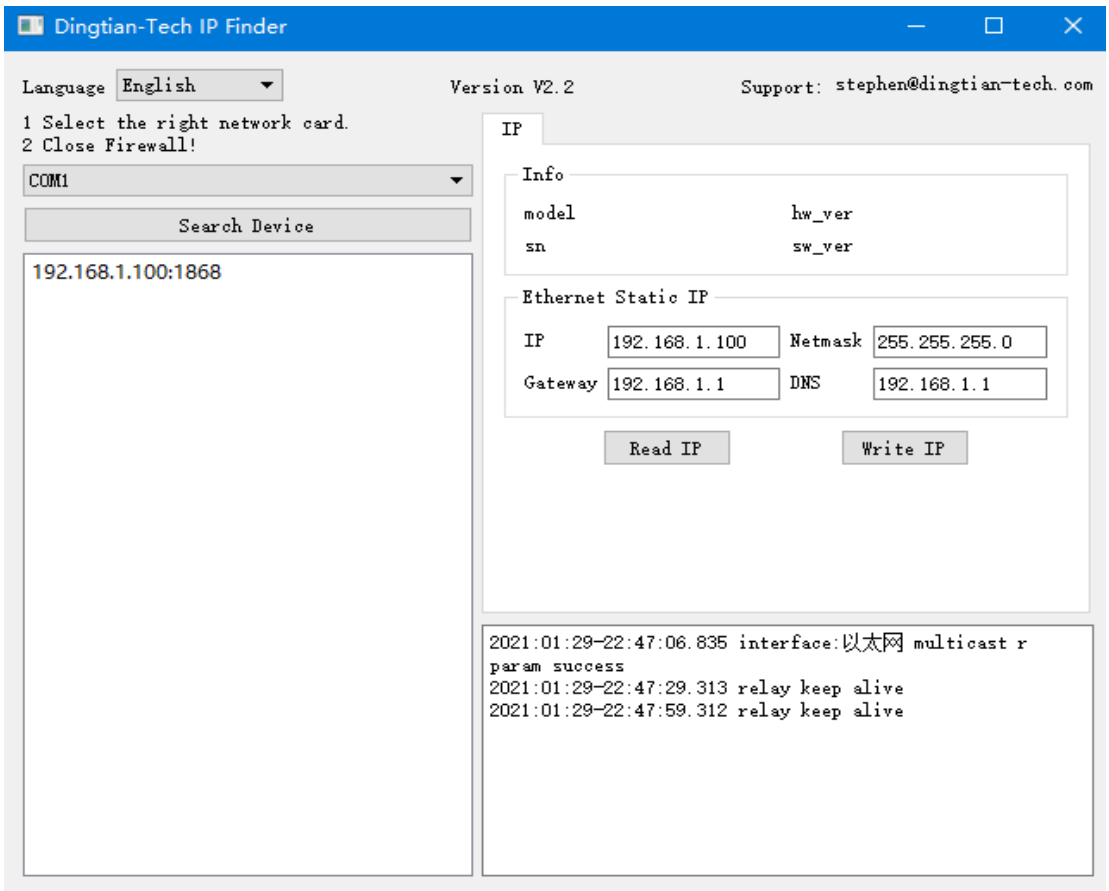
5.9 Reset User



5.10 To Factory



6 IP Finder



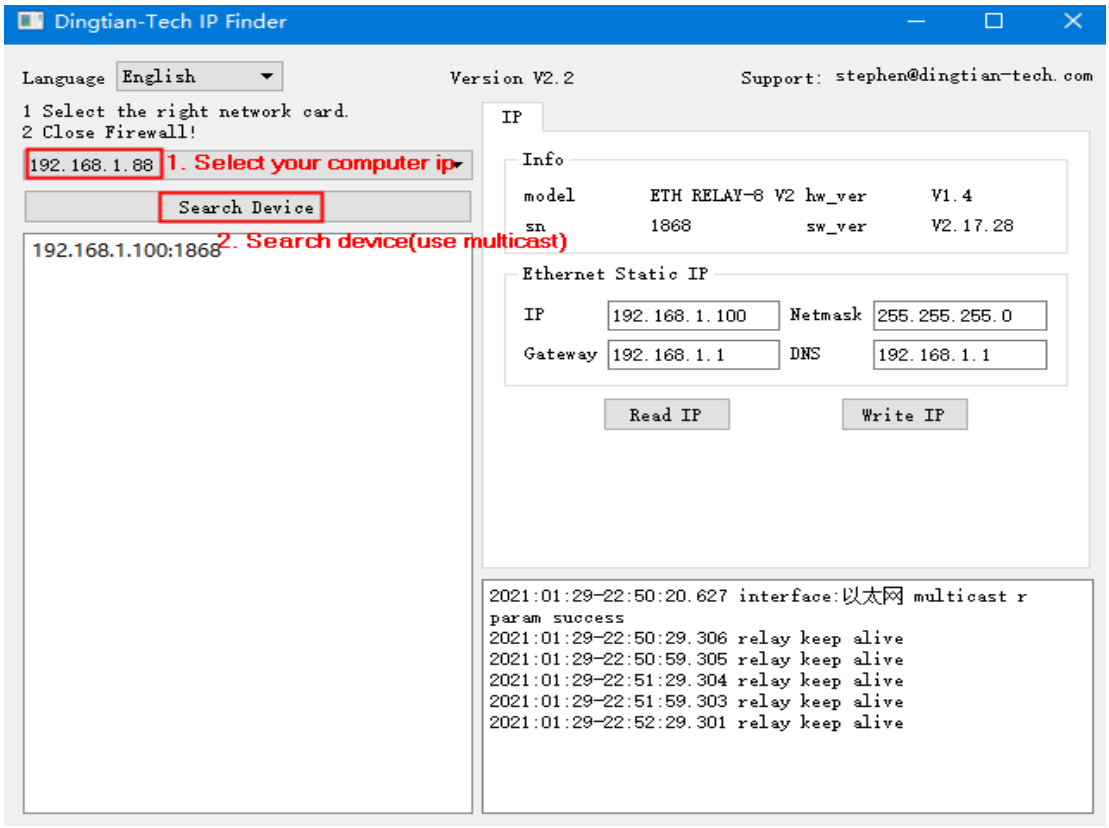
Notice:

please close all firewall,security software(windows defender/firewall alse must close)

otherwise nothing will be find

6.1 Search Device

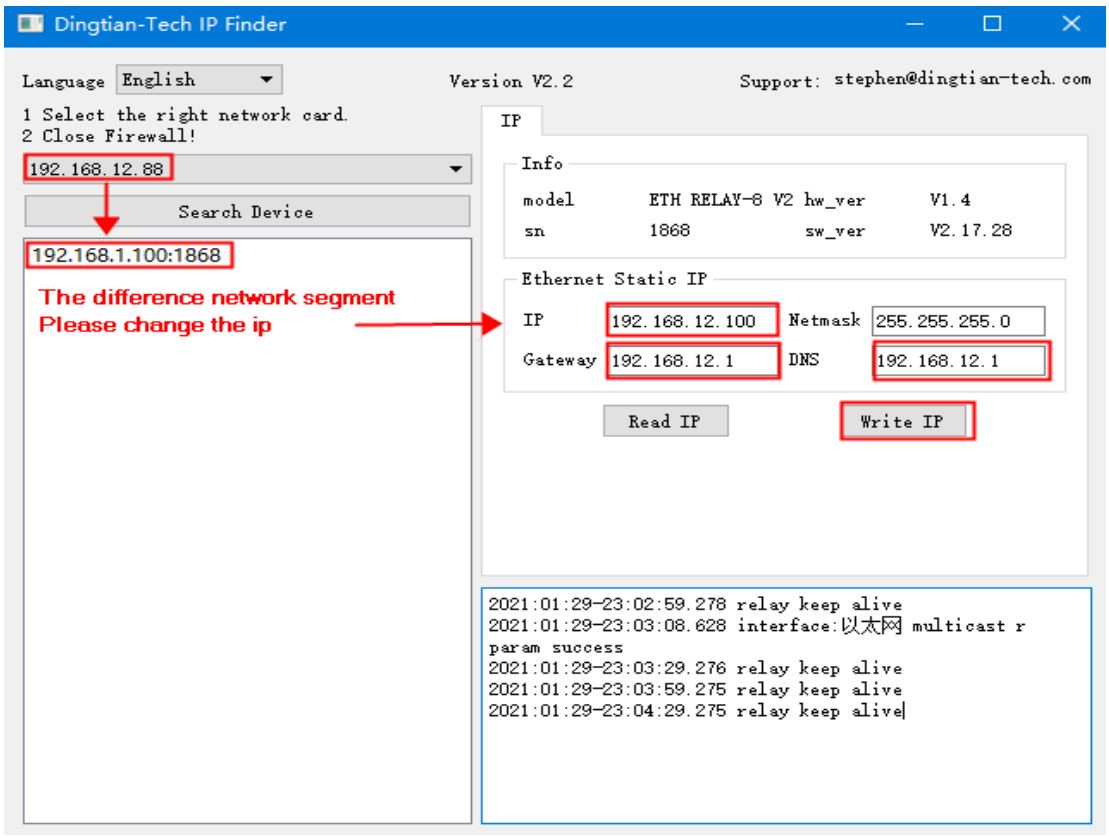
Note: When you use IP Finder to check your relay board ip, please keep your computer just connect with one relay board and the communication of relay board just has one(only Ethernet or WIFI)



Then we can find computer ip is 192.168.1.88, relay board ip is 192.168.1.100

If your computer ip is not the same network segment as relay board, you can change the IP in Ethernet Static IP

6.2 Change Static IP



Change Static IP and Click"Write IP", then your relay board ip is 192.168.12.100

Appendix I How to Test Command

step 1: download SDK

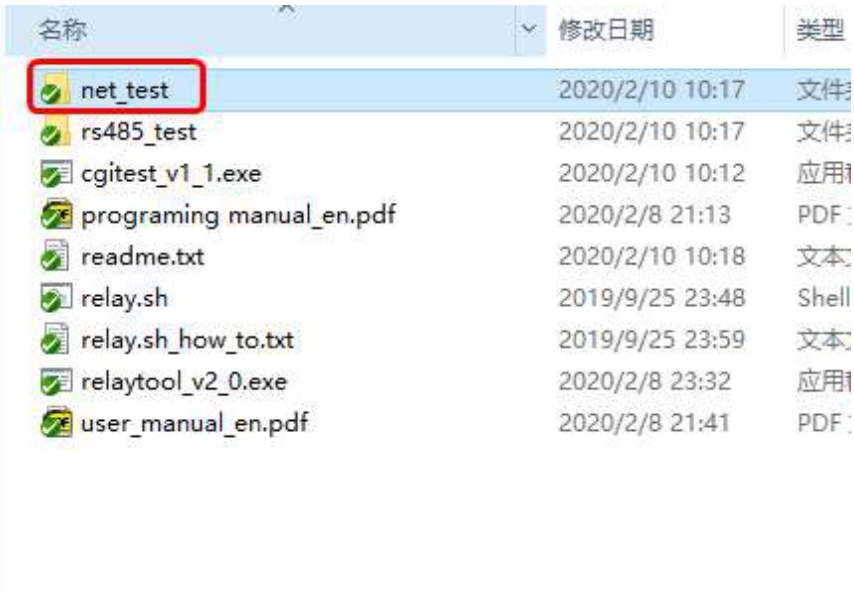
we can find network tool in SDK

http://www.dingtian-tech.com/sdk/relay_sdk.zip

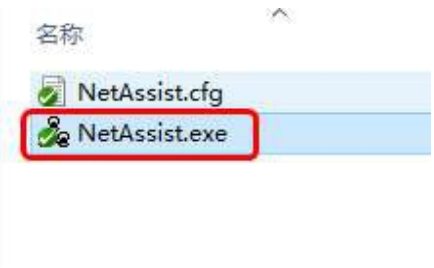
unzip relay_sdk.zip

network tool name is net_test

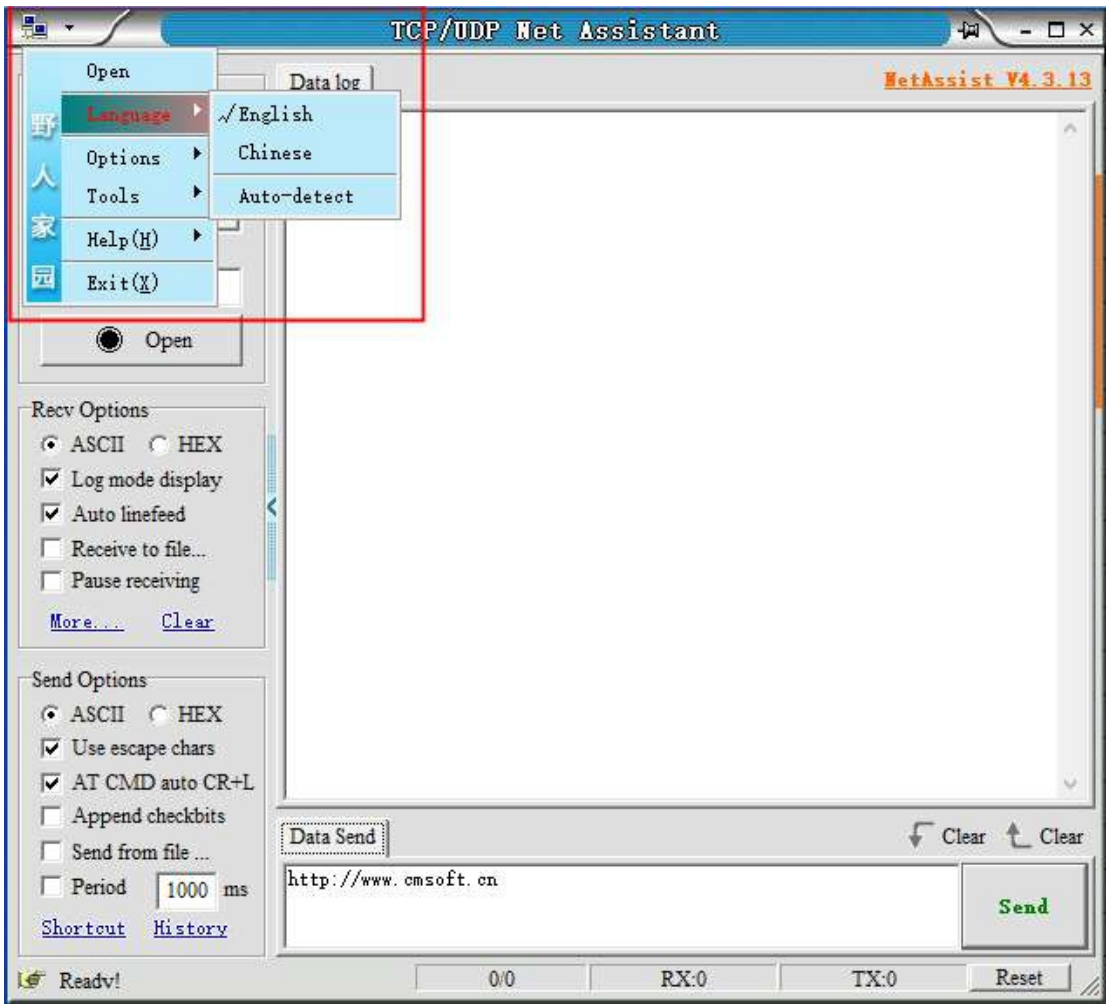
rs485 tool name is rs485_test



Access directory “net_test”



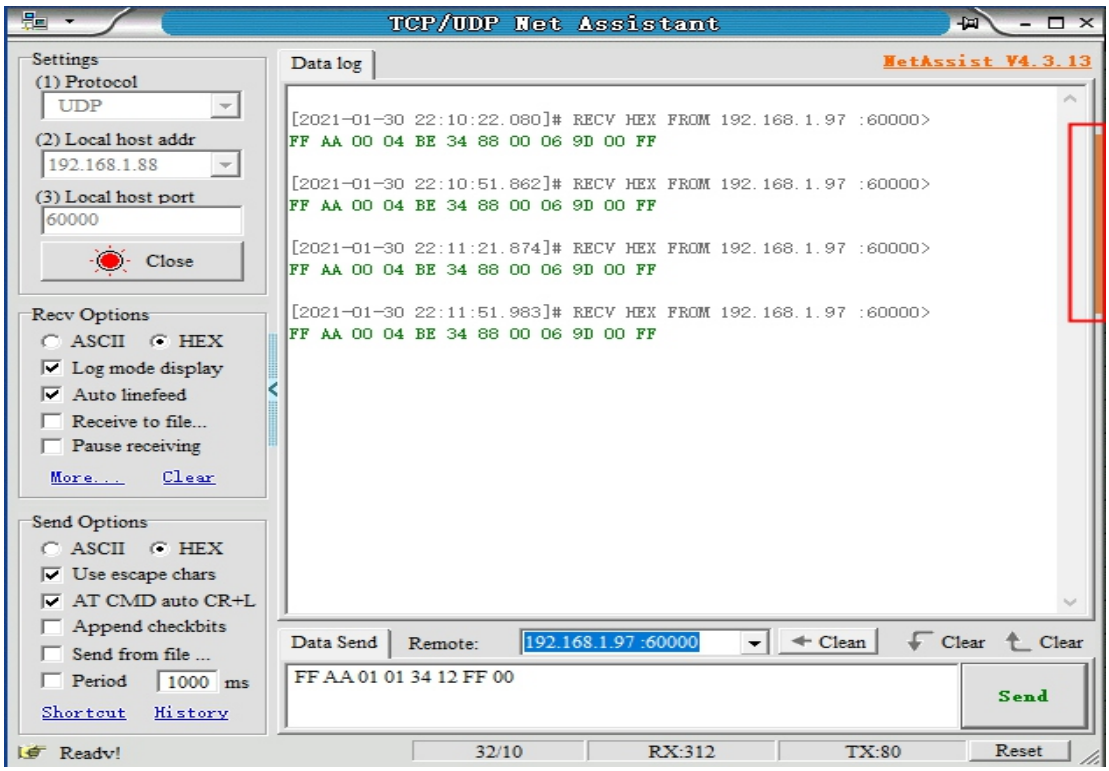
step 2: Change NetAssist language

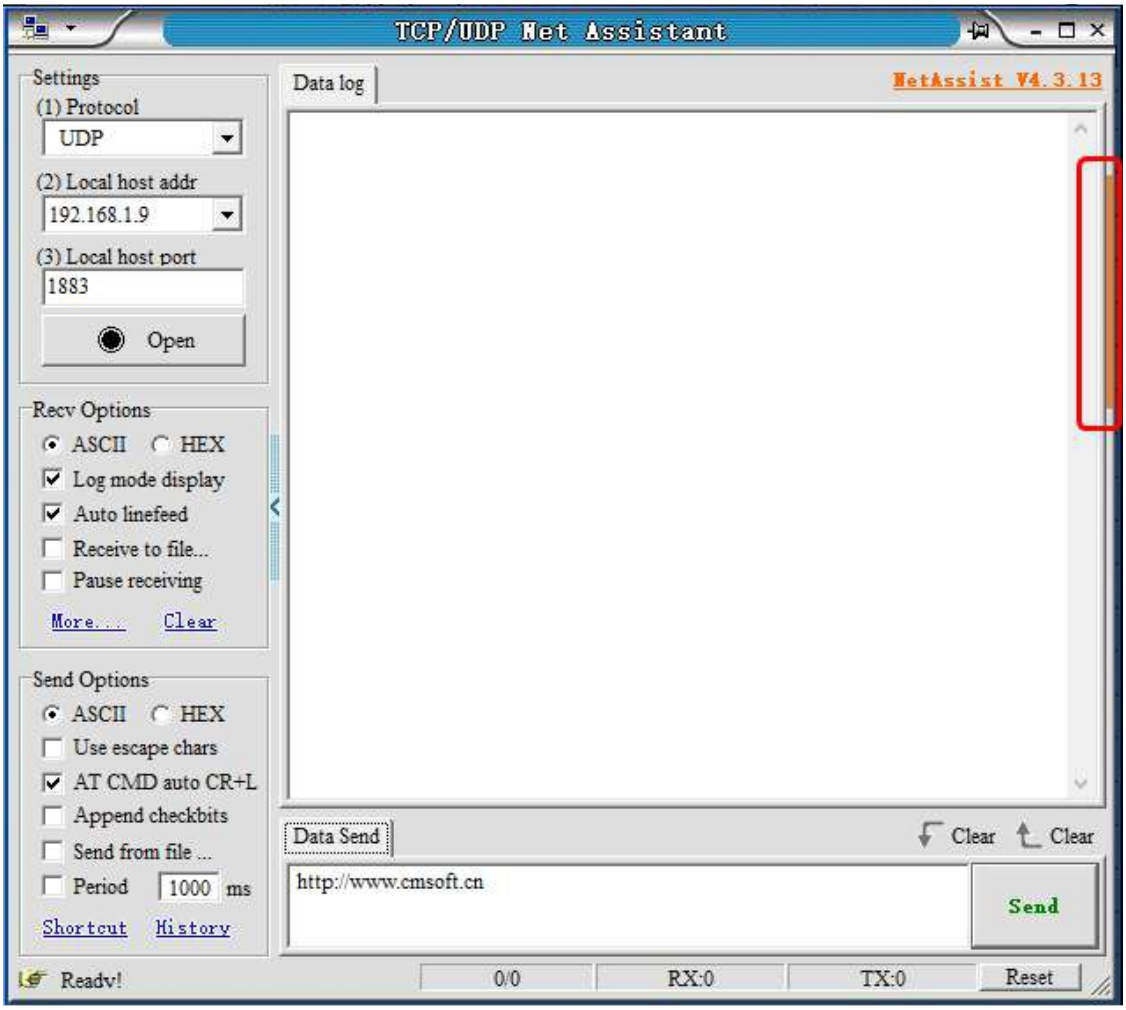


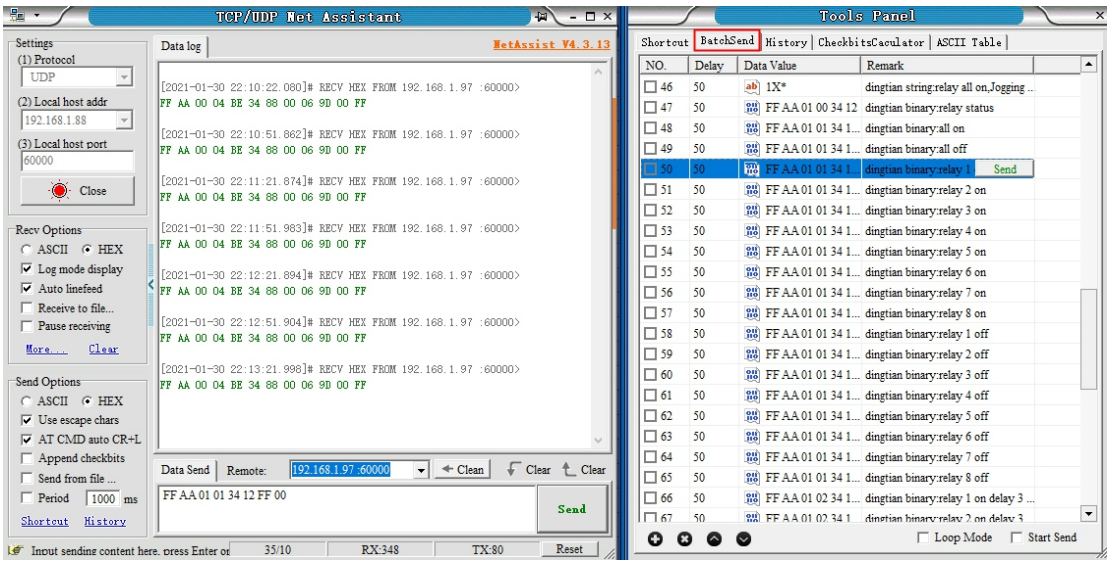
step 3: Control relay via NetAssist network tool by wifi module

open NetAssist.exe

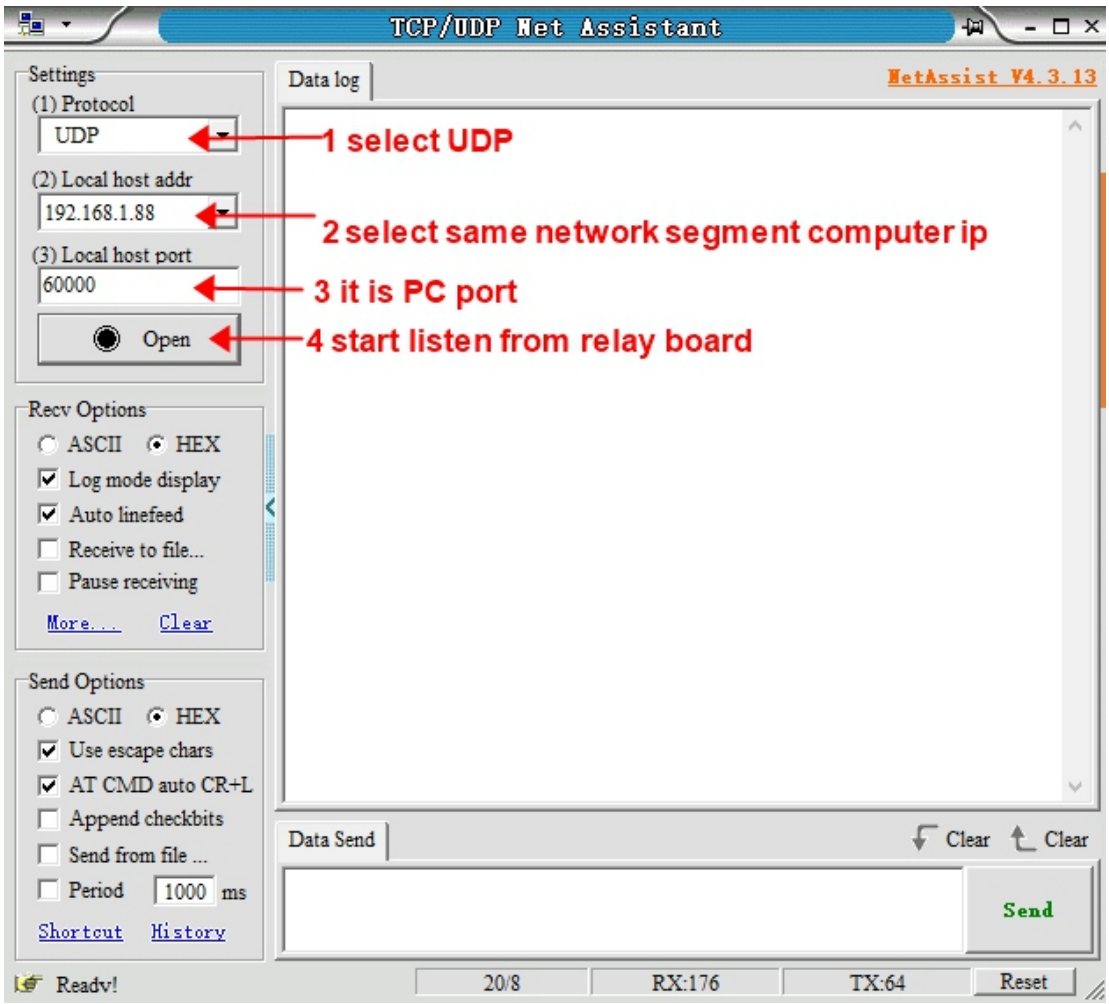
Shown in red box, open expansion panel



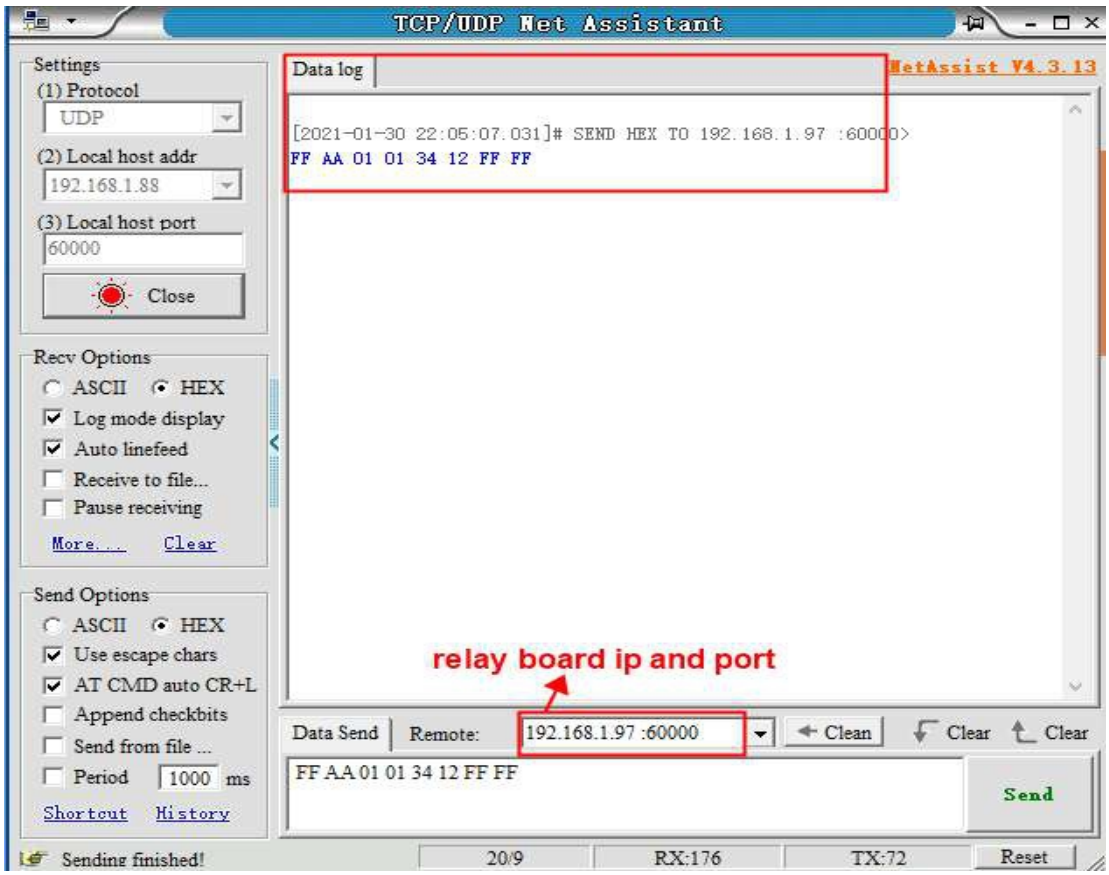

TCP/UDP Net Assistant
Settings
(1) Protocol
UDP
(2) Local host addr
192.168.1.9
(3) Local host port
1883
Open
Recv Options
ASCII HEX
Log mode display
Auto linefeed
Receive to file...
Pause receiving
More... Clear
Send Options
ASCII HEX
Use escape chars
AT CMD auto CR+L
Append checkbits
Send from file ...
Period 1000 ms
Shortcut History
Data log
NetAssist V4.3.13
Data Send
Clear Clear
http://www.cmsoft.cn
Send
Readv!
0/0
RX:0
TX:0
Reset


TCP/UDP Net Assistant
Tools Panel
Shortcut
BatchSend
History
CheckbitsCaculator
ASCII Table
NO.
Delay
Data Value
Remark
Loop Mode
Start Send

step 4: open UDP listen.



now relay board send relay status to pc via wifi module

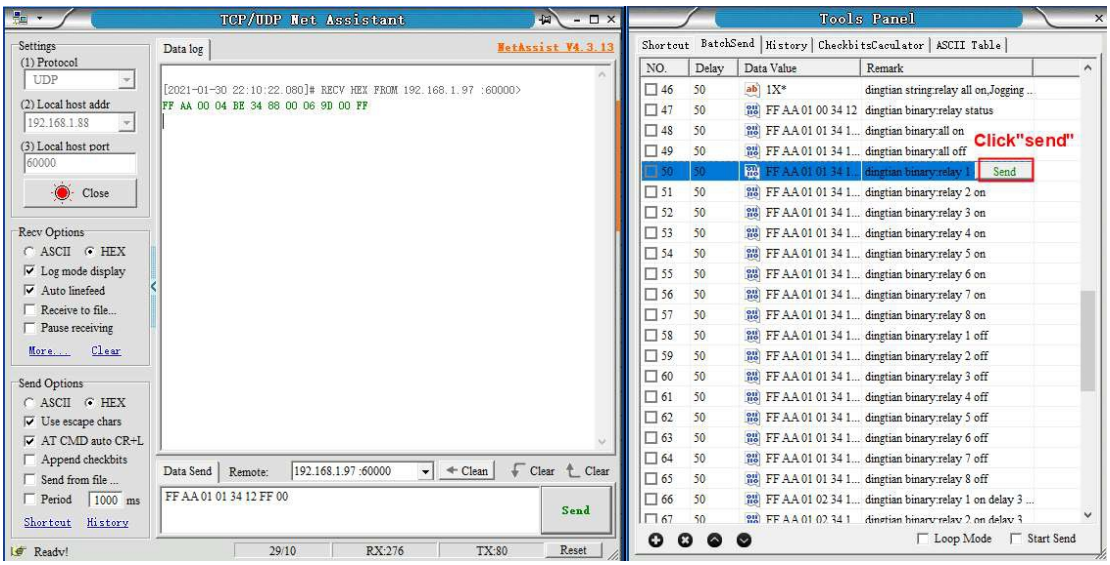


step 5: control relay via wifi module

NetAssist tool saved preset command

we only need send to relay board via netAssist

like below set relay 1 on



Appendix II How to use Domoticz

Notice:

1 Close your firewall

2 All command and script run as root/administrator

3 please step by step

Please install domotiz first

https://releases.domoticz.com/releases/release/domoticz_windows_x86.zip

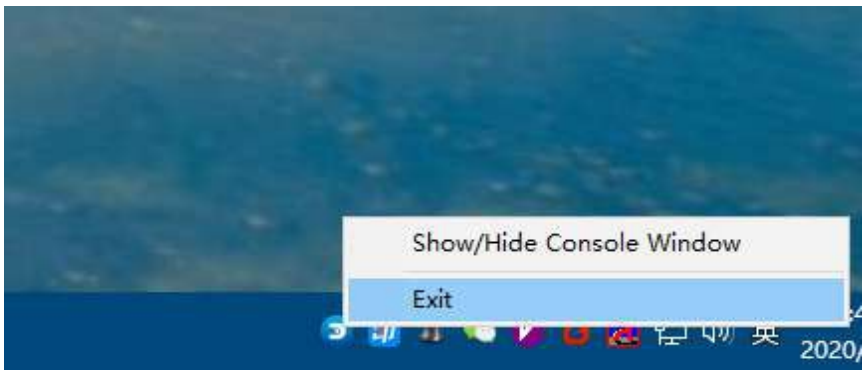
step 1: install Dingtian plugin to Domoticz

Dingtian plugin find in SDK or github

http://www.dingtian-tech.com/sdk/relay_sdk.zip

https://github.com/dtlzp/Domoticz-Dingtian-Relay-Plugin

1 Stop Domoticz



2 Copy Domoticz_plugins\dingtian to Domoticz plugin dir

to Domoticz install dir

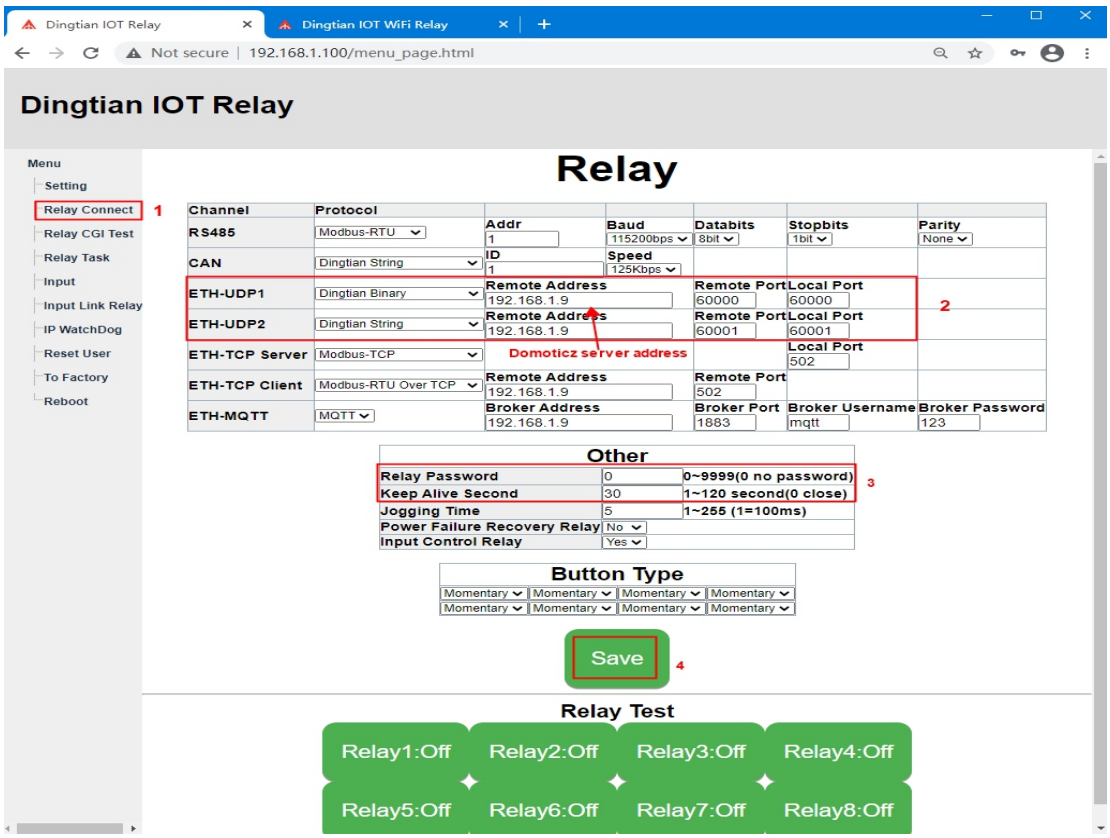
now Dingtian Relay plugin install to Domoticz successfully.

step 2: config Dingtian Relay board

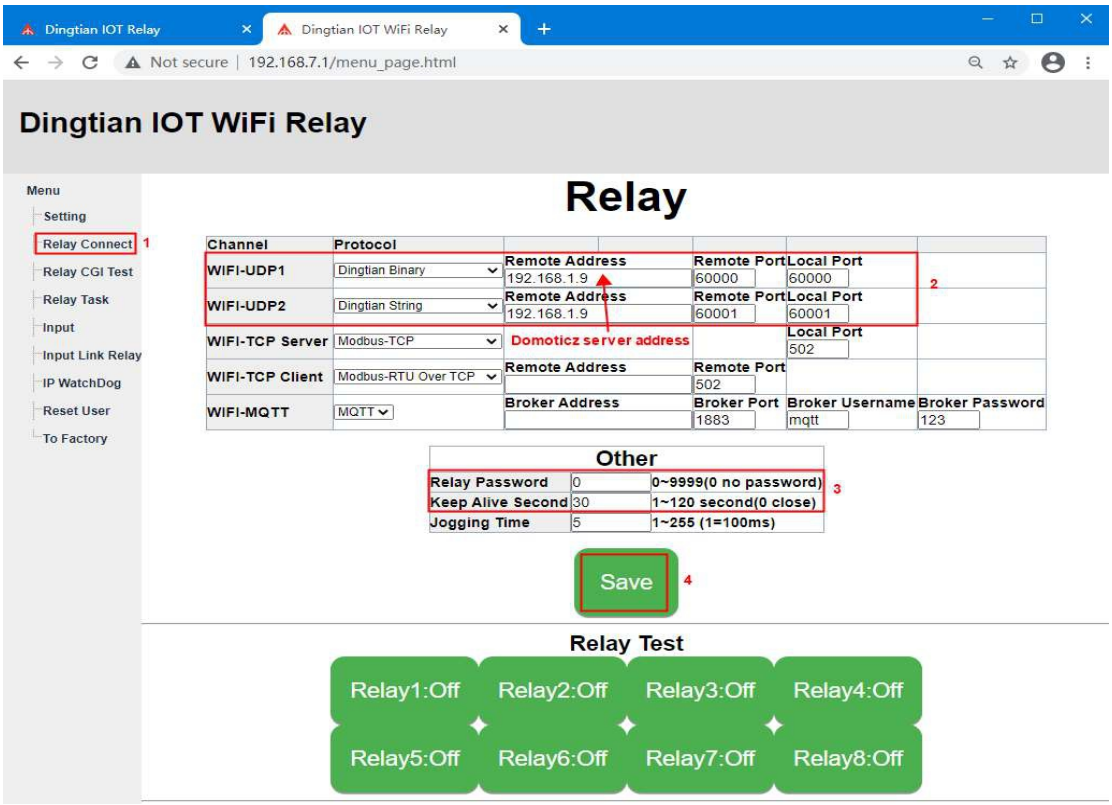
1 config relay board UDP Server,Remote Port,Local Port,Keep Alive Secondand Relay Password (firmware version <= 2.16.xx)

2 config relay board UDP Server, Remote Port,Local Port and Relay Password (firmware version is 2.17.xx)

Domoticz Ethernet



Domoticz WIFI



Dingtian Relay board web page **Relay Connect**

set UDP Server, Remote Port,Local Port,Relay Password and Keep Alive Second(donot need to set for firmware 2.17.xx)

Notice: UDP Server set to Domoticz Server IP Save config

step 3: Add Dingtian Relay to Domoticz

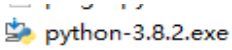
1 Install Python 3.8.2

download link:

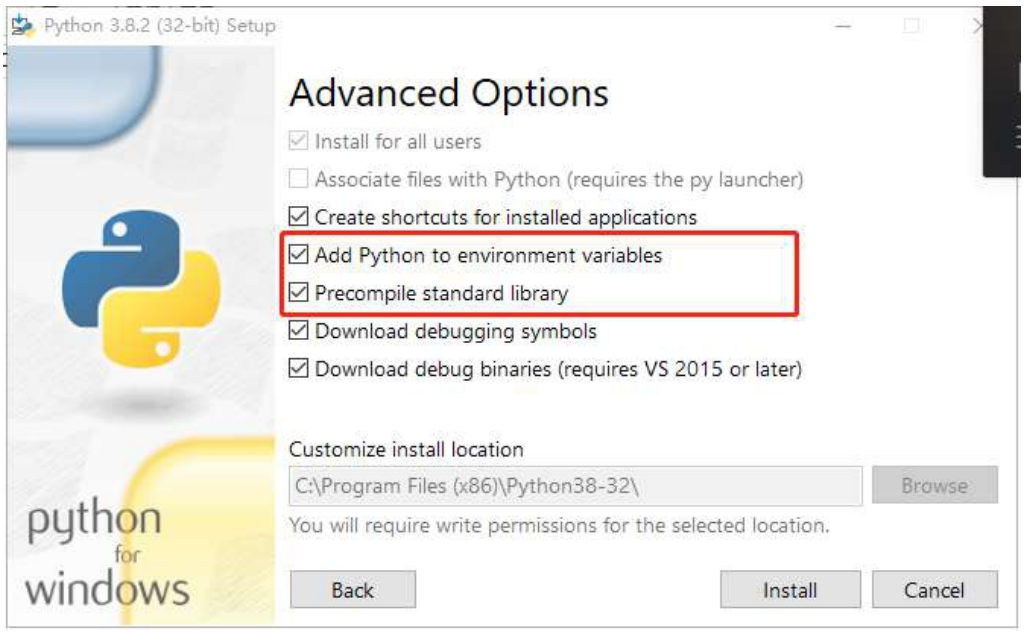
https://www.python.org/ftp/python/3.8.2/python-3.8.2.exe

Notic e: Domotic z only support 32bit Python

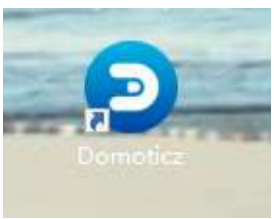
after download,install it



Add Python to environment

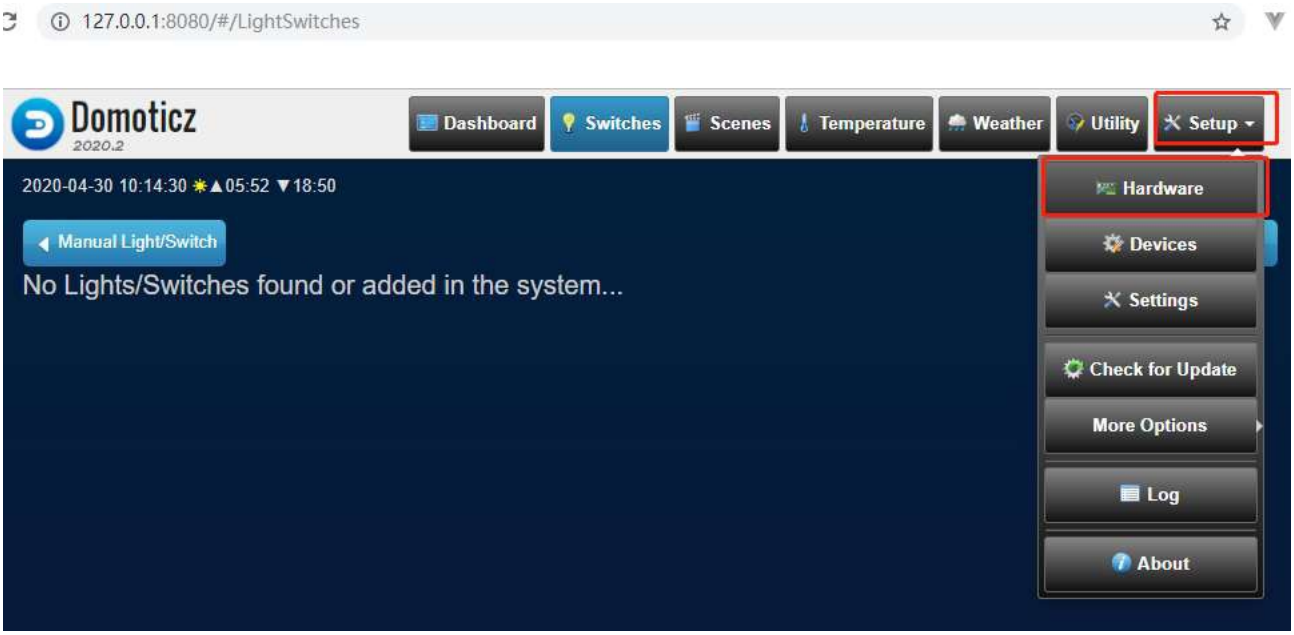


2 Run to Domoticz

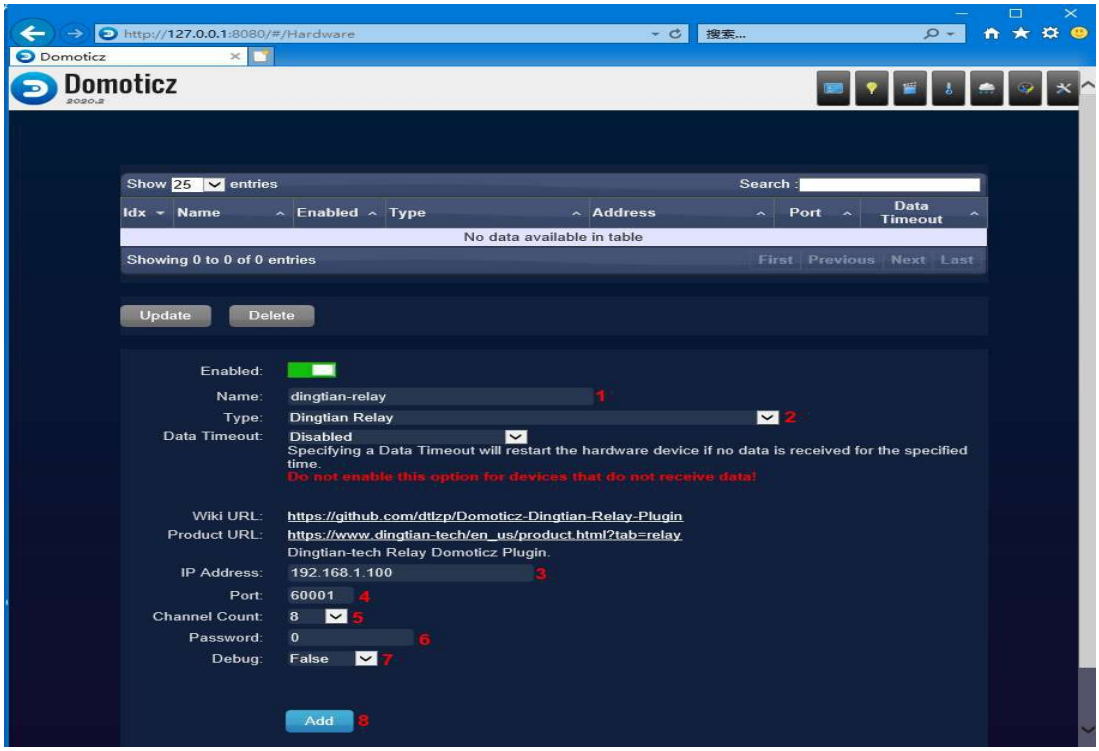


3 Add Dingtian Relay to Domoticz

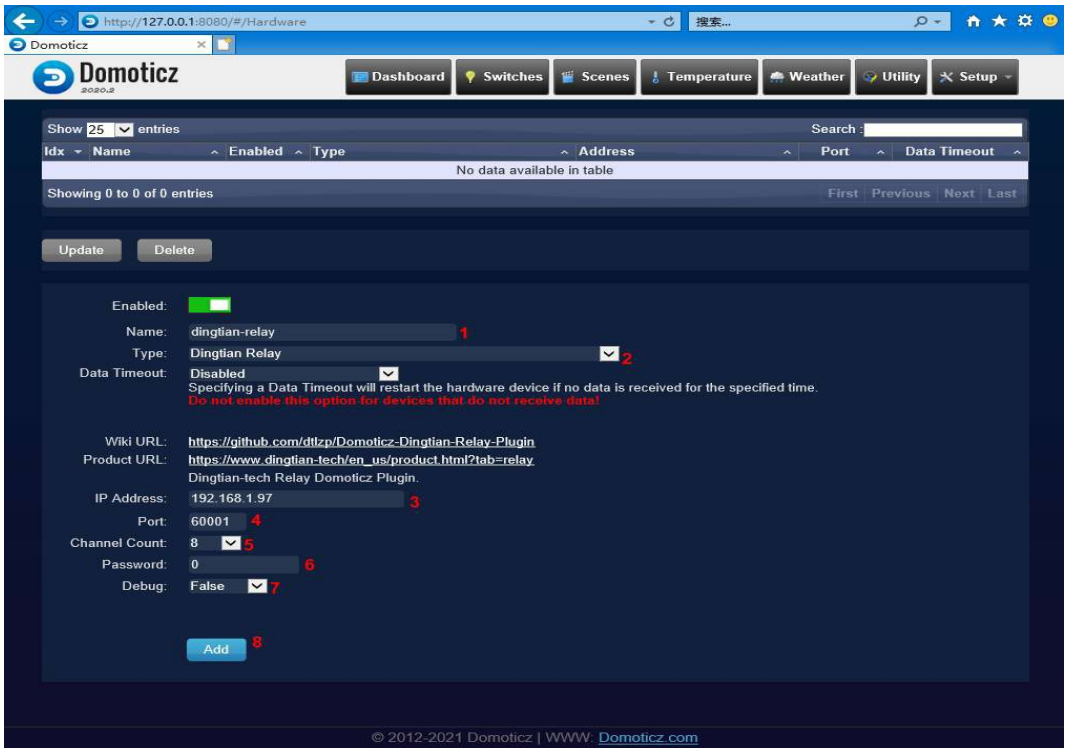
1 Find Hardware Menu



2 Input Dingtian Relay config(Ethernet)



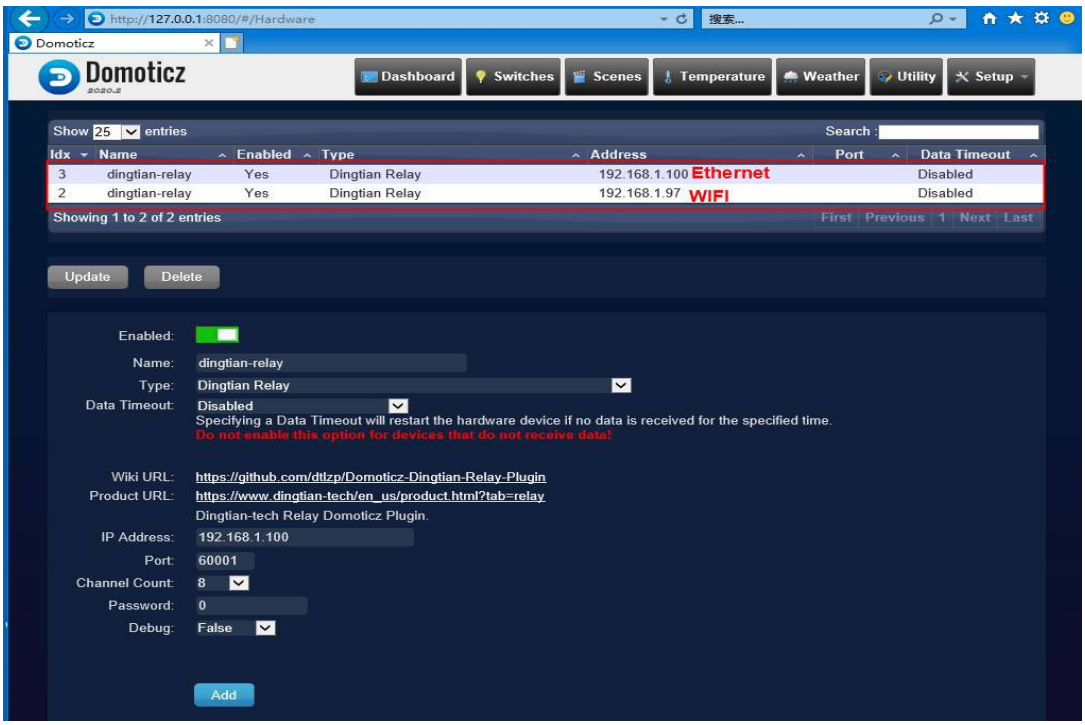
3.Input Dingtian Relay config(WIFI)



Type,IP Address,Port,Channel Count,Password must correct,
Password is 1 config relay board UDP Server,Remote Port,Local Port,Keep Alive Second and Relay Password

now check parameters is ok,
click "**Add**" to save

Now your can find Hardware and Relay



4 Multiple Relay board Add to Domoticz

Domoticz Need 2 UDP port for each Relay board

default is:60000 and 60001

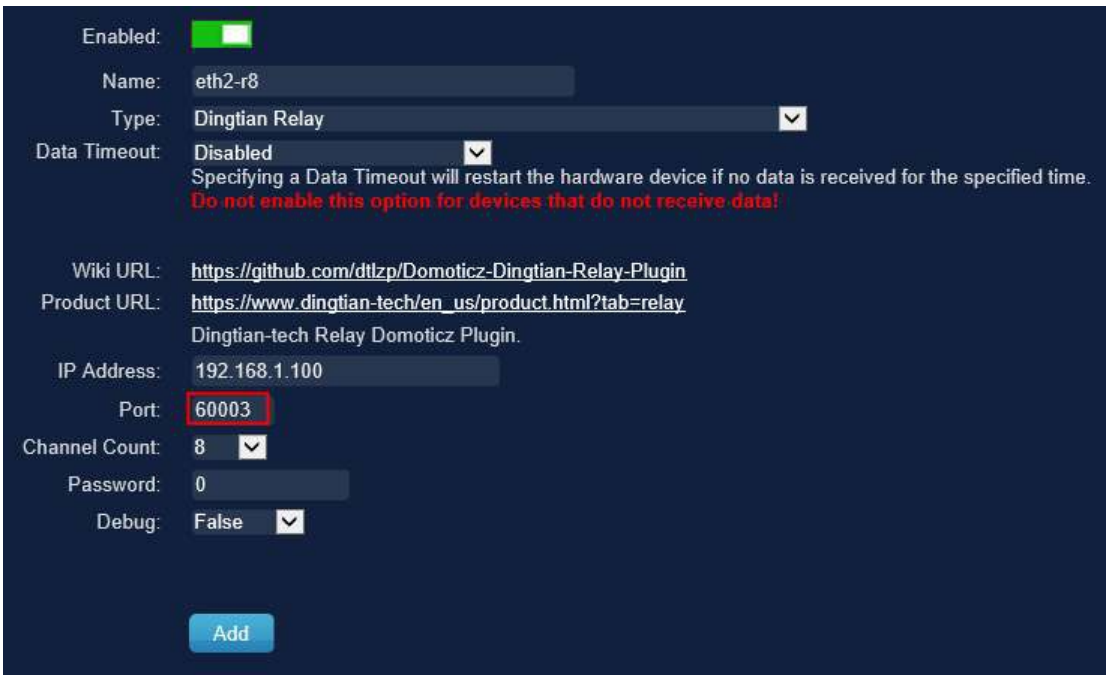
you can add mutiple with difference UDP port like:

60002 and 60003

60004 and 60005

60006 and 60007

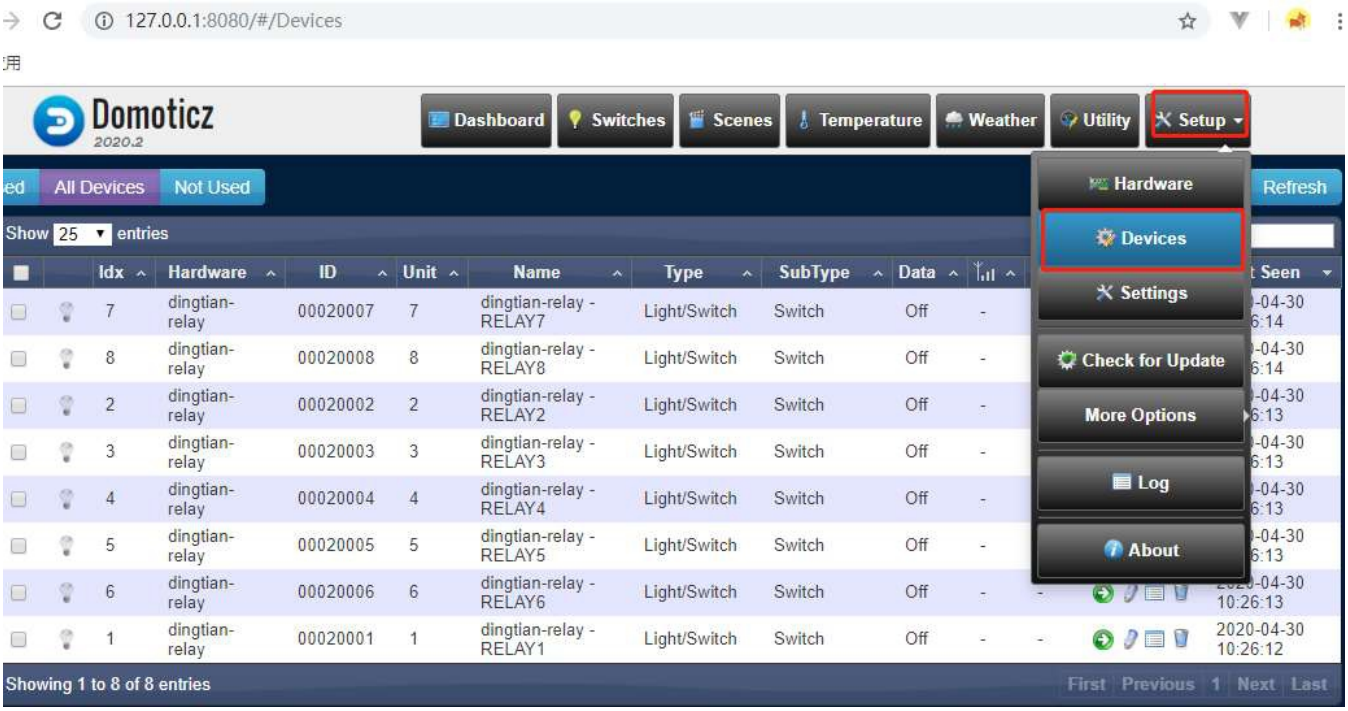
below is example 60002 and 60003



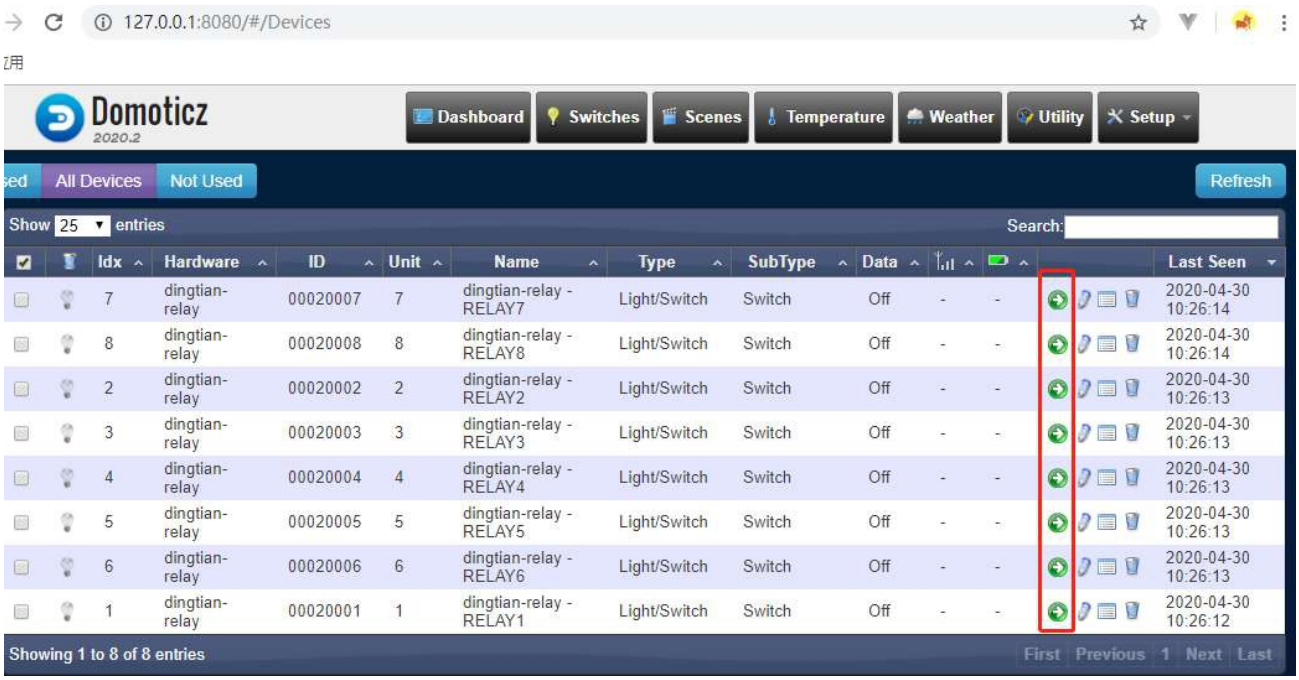
Relay

Channel	Protocol					
RS485	Modbus-RTU	Addr 1	Baud 115200bps	Databits 8bit	Stopbits 1bit	Parity None
CAN	Dingtian String	ID 1	Speed 125Kbps			
ETH-UDP1	Dingtian Binary	Remote Address 192.168.1.88		Remote Port 60002	Local Port 60002	
ETH-UDP2	Dingtian String	Remote Address 192.168.1.88		Remote Port 60003	Local Port 60003	
ETH-TCP Server	Modbus-TCP				Local Port 502	
ETH-TCP Client	Modbus-RTU Over TCP	Remote Address 192.168.1.9		Remote Port 502		
ETH-MQTT	MQTT	Broker Address 192.168.1.88		Broker Port 1883	Broker Username mqtt	Broker Password 123

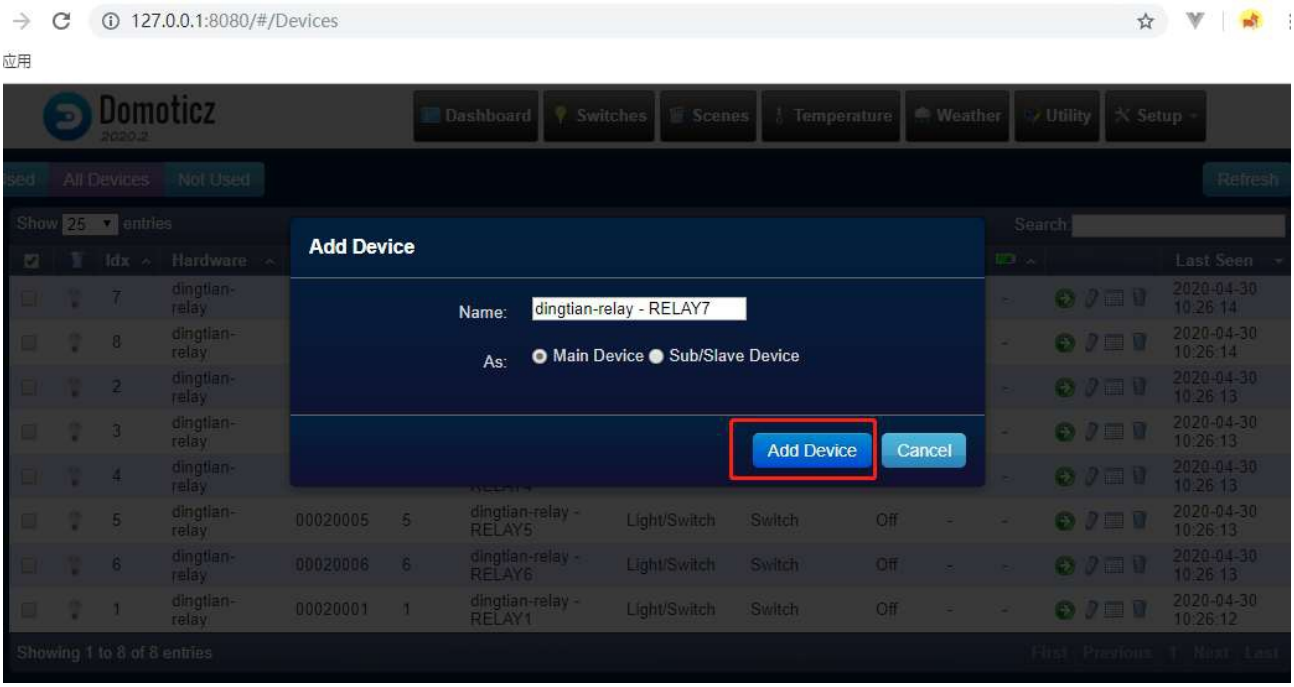
5 Add Relay to Switches Page



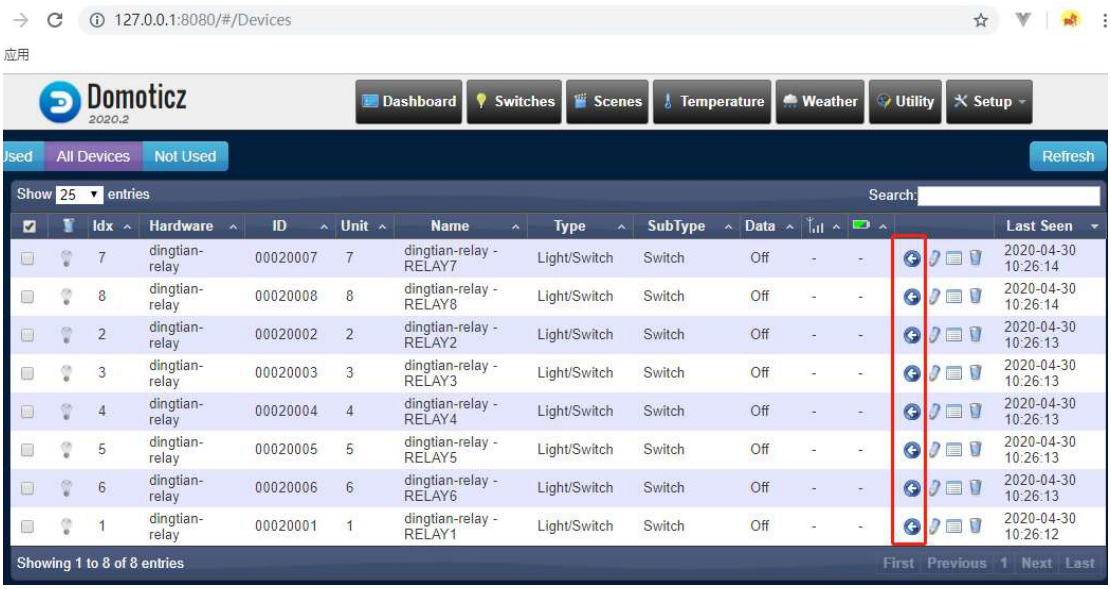
Click Add Device to use Relay



Click Add Device to confirm

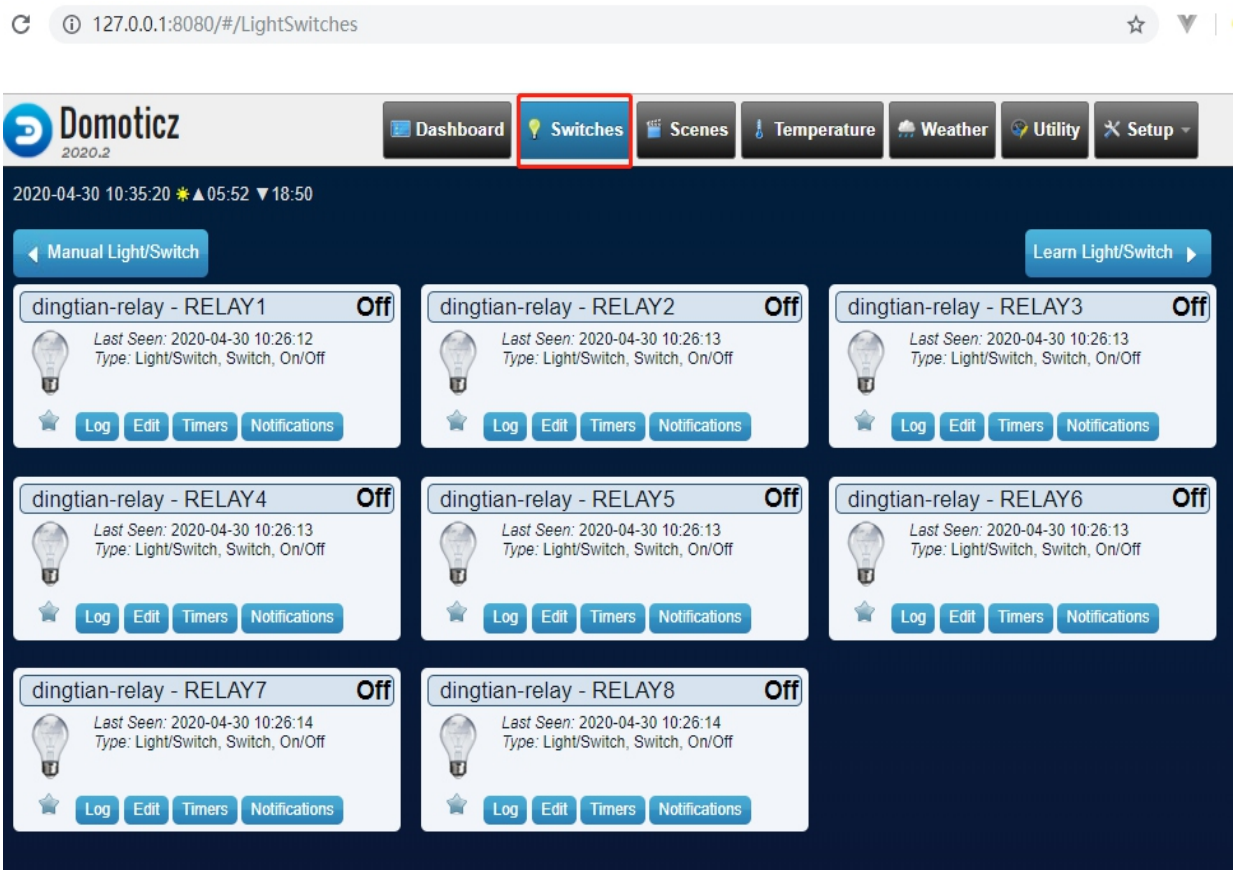


result

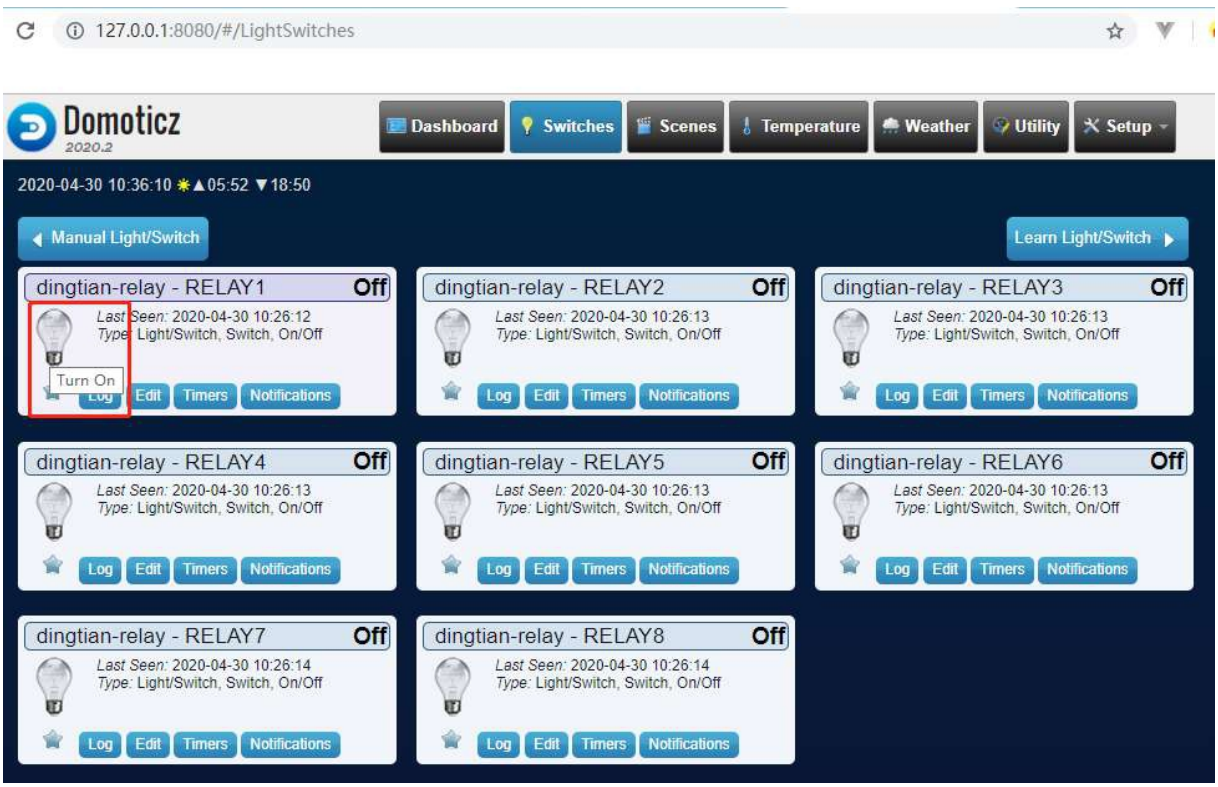


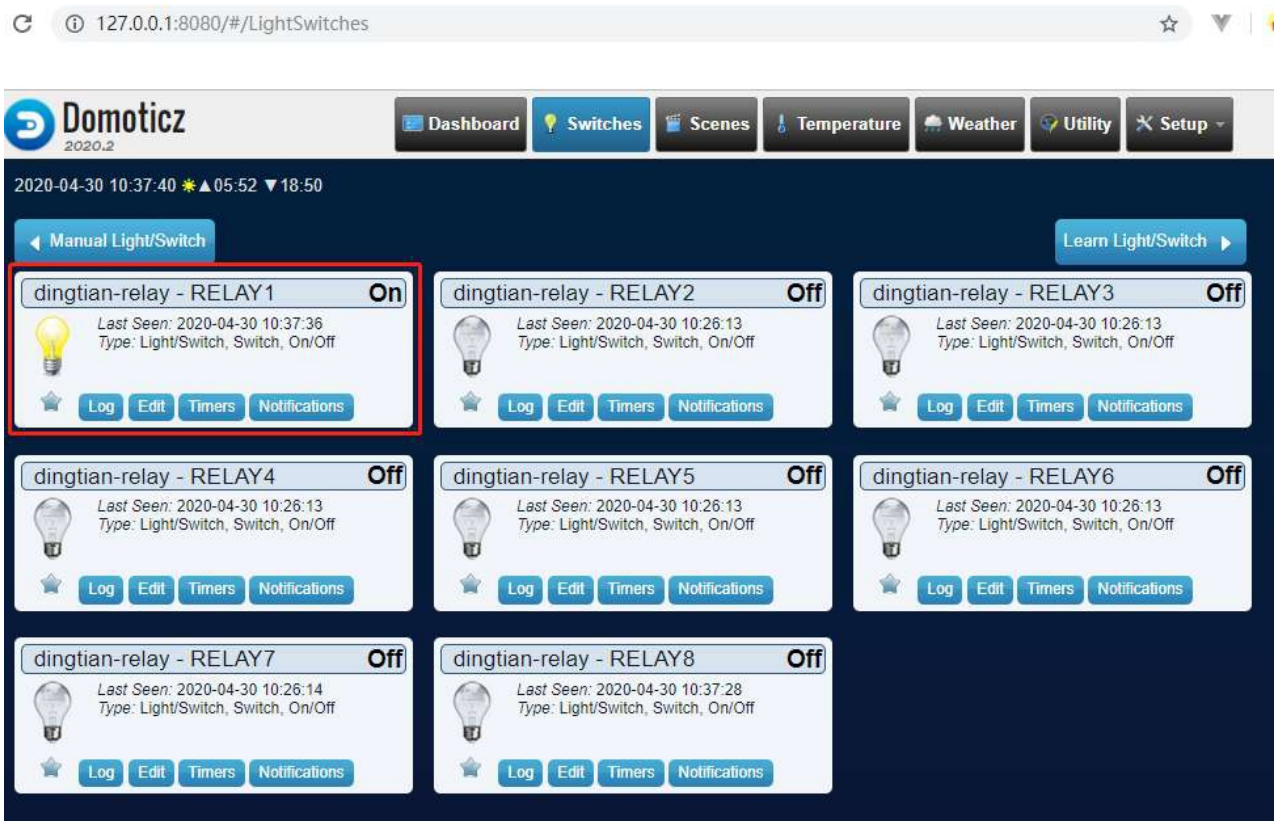
4 Control Dingtian Relay with Domoticz

Switch “Switches” page



Click light icon to control relay

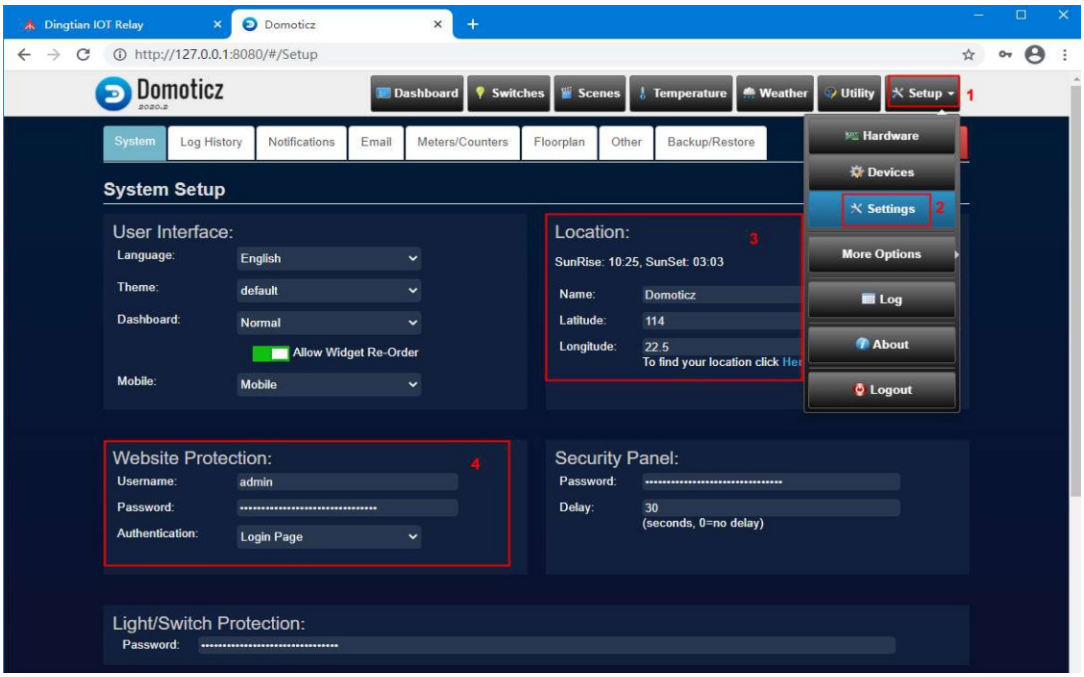



127.0.0.1:8080/#/LightSwitches
Domoticz
2020.2
Dashboard
Switches
Scenes
Temperature
Weather
Utility
Setup
2020-04-30 10:37:40 ☀▲05:52 ▼18:50
Manual Light/Switch
Learn Light/Switch
dingtian-relay - RELAY1 On
Last Seen: 2020-04-30 10:37:36
Type: Light/Switch, Switch, On/Off
Log Edit Timers Notifications
dingtian-relay - RELAY2 Off
Last Seen: 2020-04-30 10:26:13
Type: Light/Switch, Switch, On/Off
Log Edit Timers Notifications
dingtian-relay - RELAY3 Off
Last Seen: 2020-04-30 10:26:13
Type: Light/Switch, Switch, On/Off
Log Edit Timers Notifications
dingtian-relay - RELAY4 Off
Last Seen: 2020-04-30 10:26:13
Type: Light/Switch, Switch, On/Off
Log Edit Timers Notifications
dingtian-relay - RELAY5 Off
Last Seen: 2020-04-30 10:26:13
Type: Light/Switch, Switch, On/Off
Log Edit Timers Notifications
dingtian-relay - RELAY6 Off
Last Seen: 2020-04-30 10:26:13
Type: Light/Switch, Switch, On/Off
Log Edit Timers Notifications
dingtian-relay - RELAY7 Off
Last Seen: 2020-04-30 10:26:14
Type: Light/Switch, Switch, On/Off
Log Edit Timers Notifications
dingtian-relay - RELAY8 Off
Last Seen: 2020-04-30 10:37:28
Type: Light/Switch, Switch, On/Off
Log Edit Timers Notifications

step 4: Domoticz mobile application

Please follow up step 1/2/3 firstly to confirm PC Domoticz connect

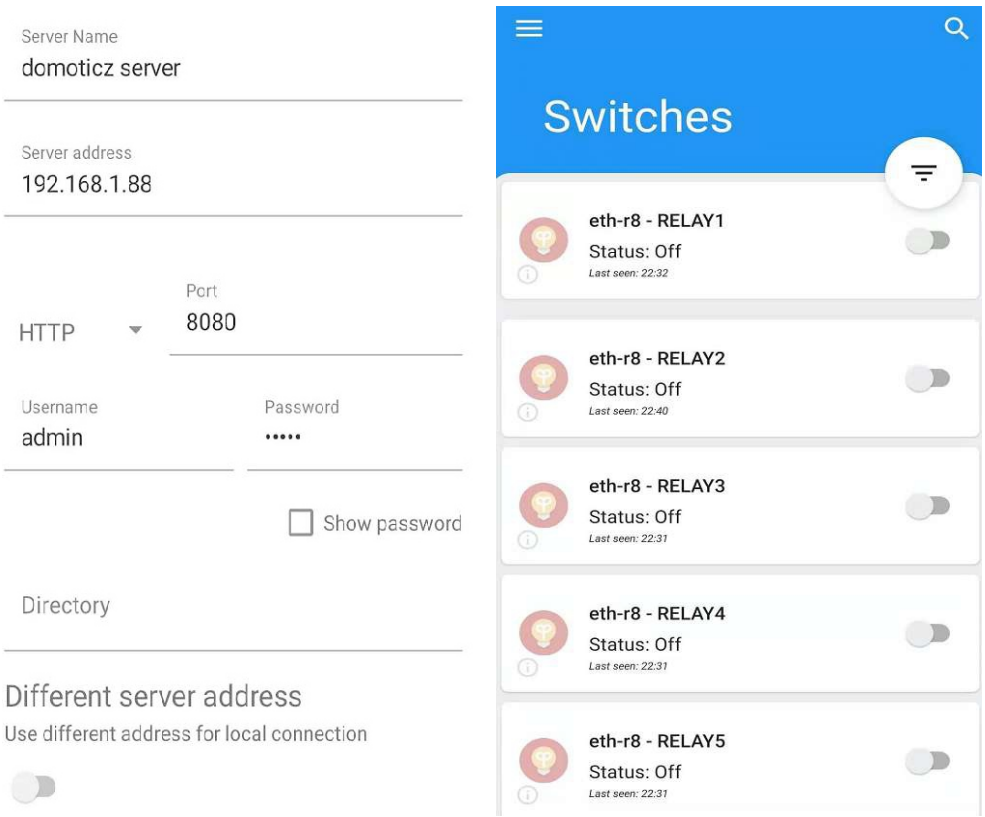
1 Set the Location, User name and password on PC Domoticz



2 Install Domoticz

Android google play “Domoticz Home Automation Lite”, which is free of charge and cannot refresh automatically. So please refresh by manual after do it

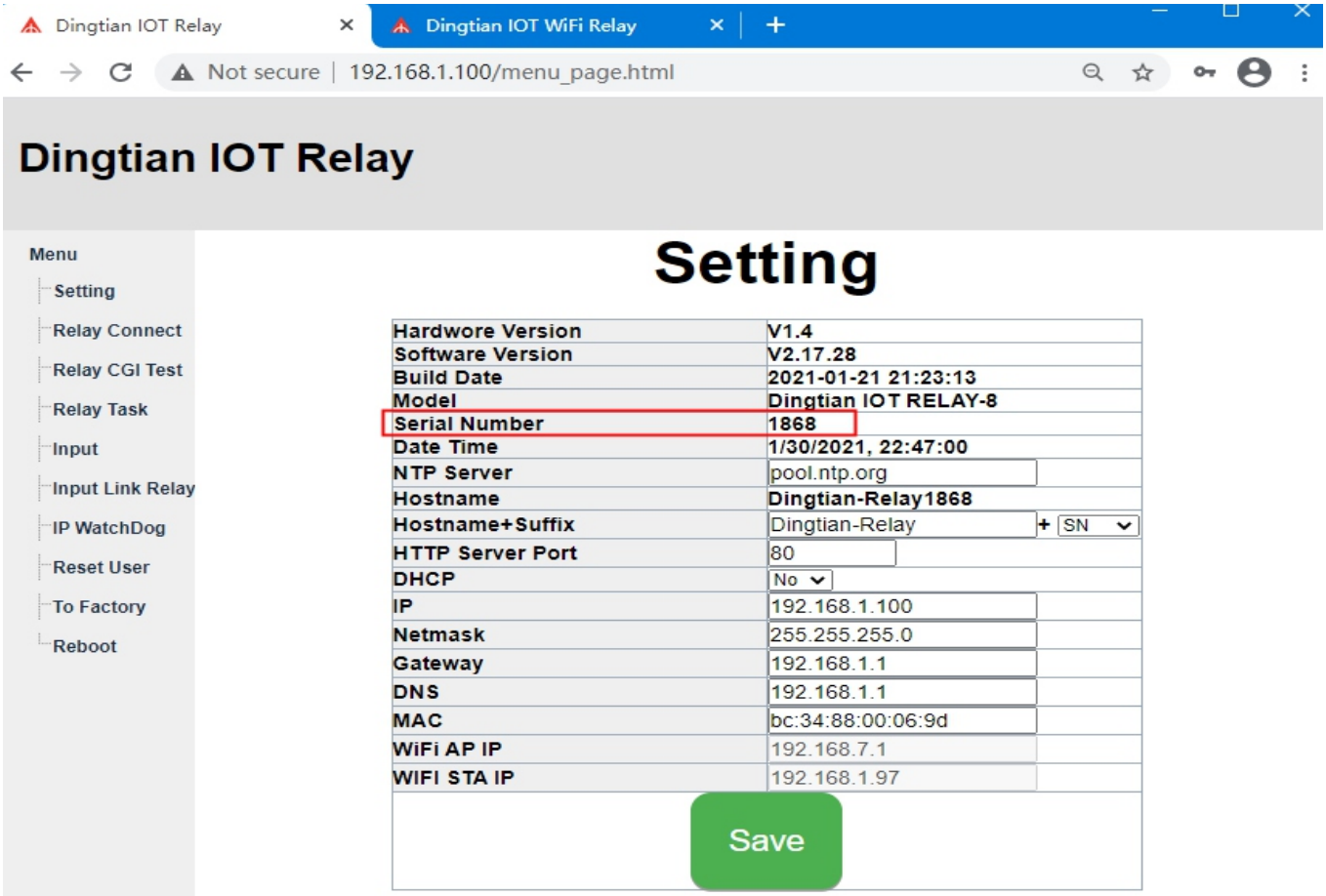
3 Set Domoticz Server parameter



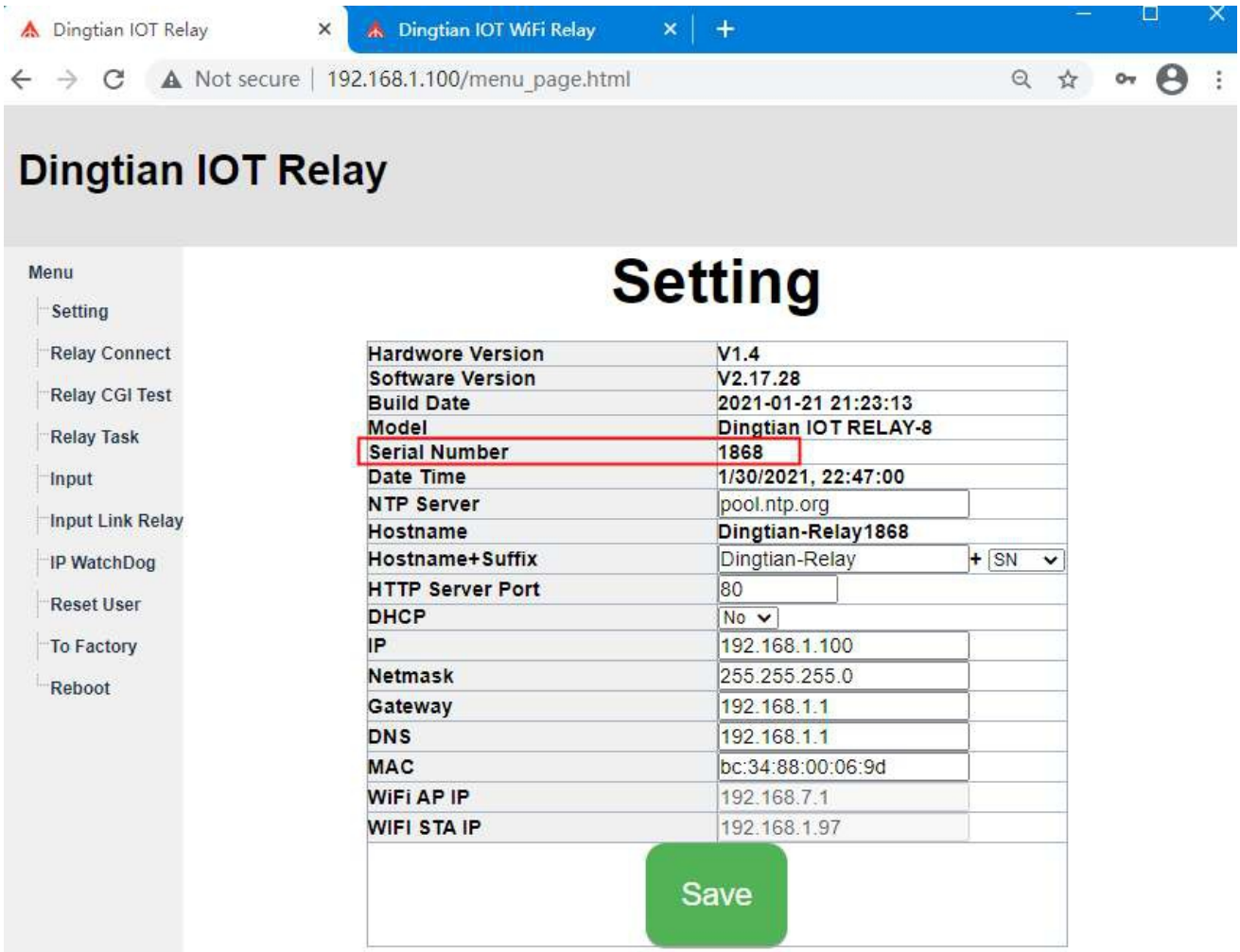
Domoticz mobile connect successfully, then you can control the switch by mobile phone

Appendix III How to MQTT

MQTT Ethernet



MQTT WIFI


Dingtian IOT Relay
Dingtian IOT WiFi Relay
Not secure | 192.168.1.100/menu_page.html
Dingtian IOT Relay
Menu
Setting
Relay Connect
Relay CGI Test
Relay Task
Input
Input Link Relay
IP WatchDog
Reset User
To Factory
Reboot
Setting
Hardwore Version V1.4
Software Version V2.17.28
Build Date 2021-01-21 21:23:13
Model Dingtian IOT RELAY-8
Serial Number 1868
Date Time 1/30/2021, 22:47:00
NTP Server pool.ntp.org
Hostname Dingtian-Relay1868
Hostname+Suffix Dingtian-Relay + SN
HTTP Server Port 80
DHCP No
IP 192.168.1.100
Netmask 255.255.255.0
Gateway 192.168.1.1
DNS 192.168.1.1
MAC bc:34:88:00:06:9d
WiFi AP IP 192.168.7.1
WIFI STA IP 192.168.1.97
Save

Relay board Ethernet MQTT Client Id
dingtian-relay+SN
Relay board WiFi MQTT Client Id
dingtian-wrelay+SN

example:
below relay board “Serial Number” is 1868
so ETH MQTT client id is:dingtian-relay1868
so WiFI MQTT client id is:dingtian-wrelay1868
Relay board MQTT Topic and Publish format:
below V2.15.869
/dingtian/relay/in/control
/dingtian/relay/out/relayX
above V2.15.869
/dingtian/relaySN/in/control
/dingtian/relaySN/out/relayX
above V2.17.xx
ETH
/dingtian/relaySN/in/control
/dingtian/relaySN/in/rX
/dingtian/relaySN/out/rX
/dingtian/relaySN/out/iX
/dingtian/relaySN/out/relayX
/dingtian/relaySN/out/inputX
/dingtian/relaySN/out/ip
/dingtian/relaySN/out/sn
/dingtian/relaySN/out/mac
/dingtian/relaySN/out/input_cnt
/dingtian/relaySN/out/relay_cnt

WiFi
/dingtian/wrelaySN/in/control
/dingtian/wrelaySN/in/rX
/dingtian/wrelaySN/out/rX
/dingtian/wrelaySN/out/iX
/dingtian/wrelaySN/out/relayX
/dingtian/wrelaySN/out/inputX
/dingtian/wrelaySN/out/ip
/dingtian/wrelaySN/out/sn
/dingtian/wrelaySN/out/mac
/dingtian/wrelaySN/out/input_cnt
/dingtian/wrelaySN/out/relay_cnt

example:
below V2.15.869
/dingtian/relay/in/control
/dingtian/relay/out/relay1
/dingtian/relay/out/relay2
/dingtian/relay/out/relay3
/dingtian/relay/out/relay4
/dingtian/relay/out/relay5
/dingtian/relay/out/relay6
/dingtian/relay/out/relay7
/dingtian/relay/out/relay8

above V2.15.869
/dingtian/relay1868/in/control
/dingtian/relay1868/out/relay1
/dingtian/relay1868/out/relay2
/dingtian/relay1868/out/relay3
/dingtian/relay1868/out/relay4
/dingtian/relay1868/out/relay5
/dingtian/relay1868/out/relay6
/dingtian/relay1868/out/relay7
/dingtian/relay1868/out/relay8

above V2.17.xx
ETH
/dingtian/relay1868/in/control
/dingtian/relay1868/in/r1~8
/dingtian/relay1868/out/r1~8
/dingtian/relay1868/out/i1~8
/dingtian/relay1868/out/relay1~8
/dingtian/relay1868/out/input1~8
/dingtian/relay1868/out/ip
/dingtian/relay1868/out/sn
/dingtian/relay1868/out/mac
/dingtian/relay1868/out/input_cnt
/dingtian/relay1868/out/relay_cnt

WIFI
/dingtian/wrelay1868/in/control
/dingtian/wrelay1868/in/r1~8
/dingtian/wrelay1868/out/r1~8
/dingtian/wrelay1868/out/i1~8
/dingtian/wrelay1868/out/relay1~8
/dingtian/wrelay1868/out/input1~8

/dingtian/wrelay1868/out/ip
/dingtian/wrelay1868/out/sn
/dingtian/wrelay1868/out/mac
/dingtian/wrelay1868/out/input_cnt
/dingtian/wrelay1868/out/relay_cnt

Relay board MQTT Topic to subscribe:
/dingtian/relay/in/control
or
/dingtian/relay1868/in/control

type:ON/OFF,DELAY,JOGGING
idx:1~8
status:ON,OFF
time: (ON/OFF)0,(DELAY)1~65535second,(JOGGING)1~255*100ms
pass:0~9999

example:
{"type":"ON/OFF",'idx':'1',"status":"ON","time":"0","pass":"0"}
{"type":"DELAY",'idx':'2',"status":"ON","time":"5","pass":"0"}
{"type":"JOGGING",'idx':'3',"status":"ON","time":"5","pass":"0"}
{"type":"ON/OFF",'idx':'4',"status":"OFF","time":"0","pass":"0"}

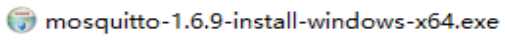
Relay board MQTT Topic to publish:
/dingtian/relay/out/relay1
/dingtian/relay/out/relay2
/dingtian/relay/out/relay3
/dingtian/relay/out/relay4
/dingtian/relay/out/relay5
/dingtian/relay/out/relay6
/dingtian/relay/out/relay7
/dingtian/relay/out/relay8
or
/dingtian/relay1868/out/relay1
/dingtian/relay1868/out/relay2
/dingtian/relay1868/out/relay3
/dingtian/relay1868/out/relay4
/dingtian/relay1868/out/relay5
/dingtian/relay1868/out/relay6
/dingtian/relay1868/out/relay7
/dingtian/relay1868/out/relay8
or
/dingtian/relay1868/out/r1~8
/dingtian/relay1868/out/i1~8

/dingtian/relay1868/out/relay1~8
/dingtian/relay1868/out/input1~8
/dingtian/relay1868/out/ip
/dingtian/relay1868/out/sn
/dingtian/relay1868/out/mac
/dingtian/relay1868/out/input_cnt
/dingtian/relay1868/out/relay_cnt

idx:1~8
status:ON,OFF

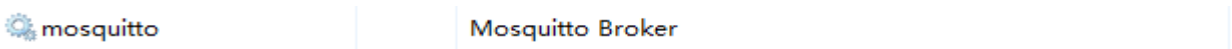
example:
{"idx":"1","status":"OFF"}

step 1: Install and config Broker

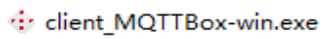


1 config "mosquitto.conf"
bind_address 0.0.0.0
port 1883

2 start windows Service "mosquitto"

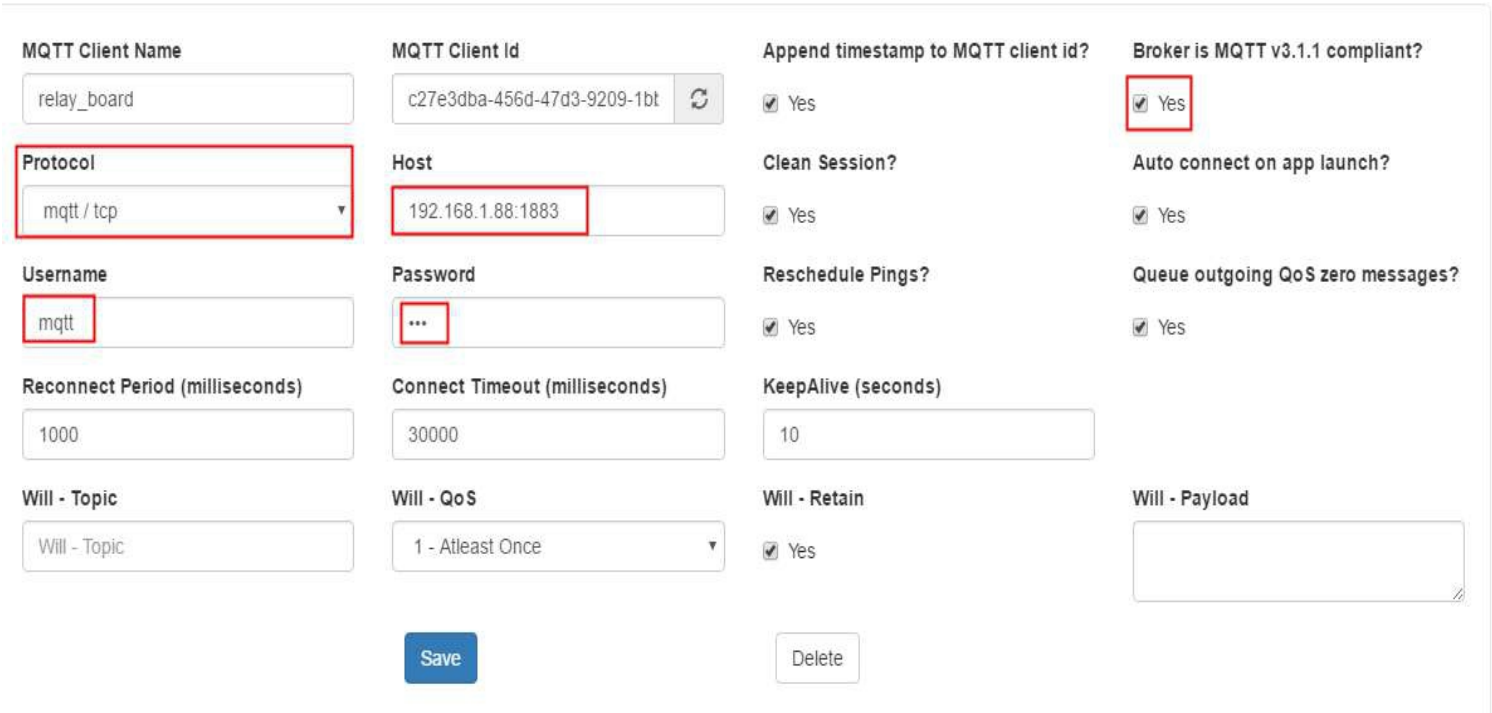


step 2: Install MQTT PC client

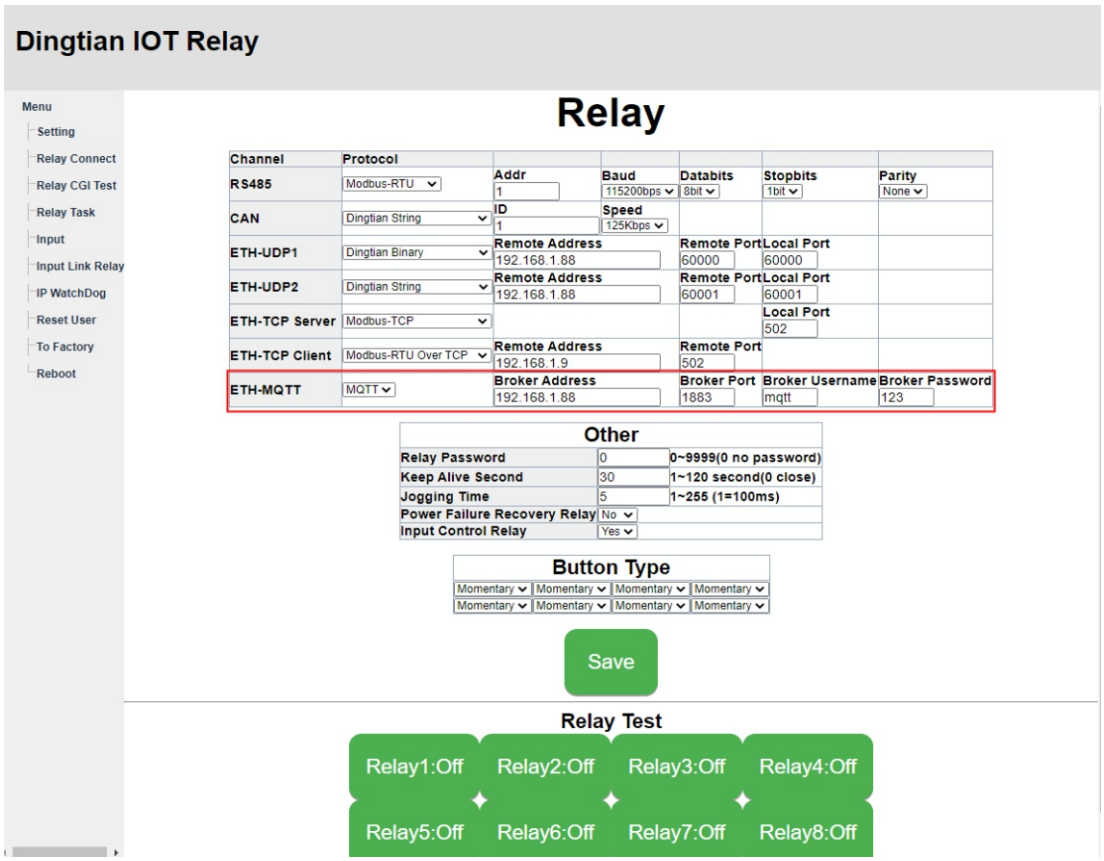


step 3: MQTTBox Add Client

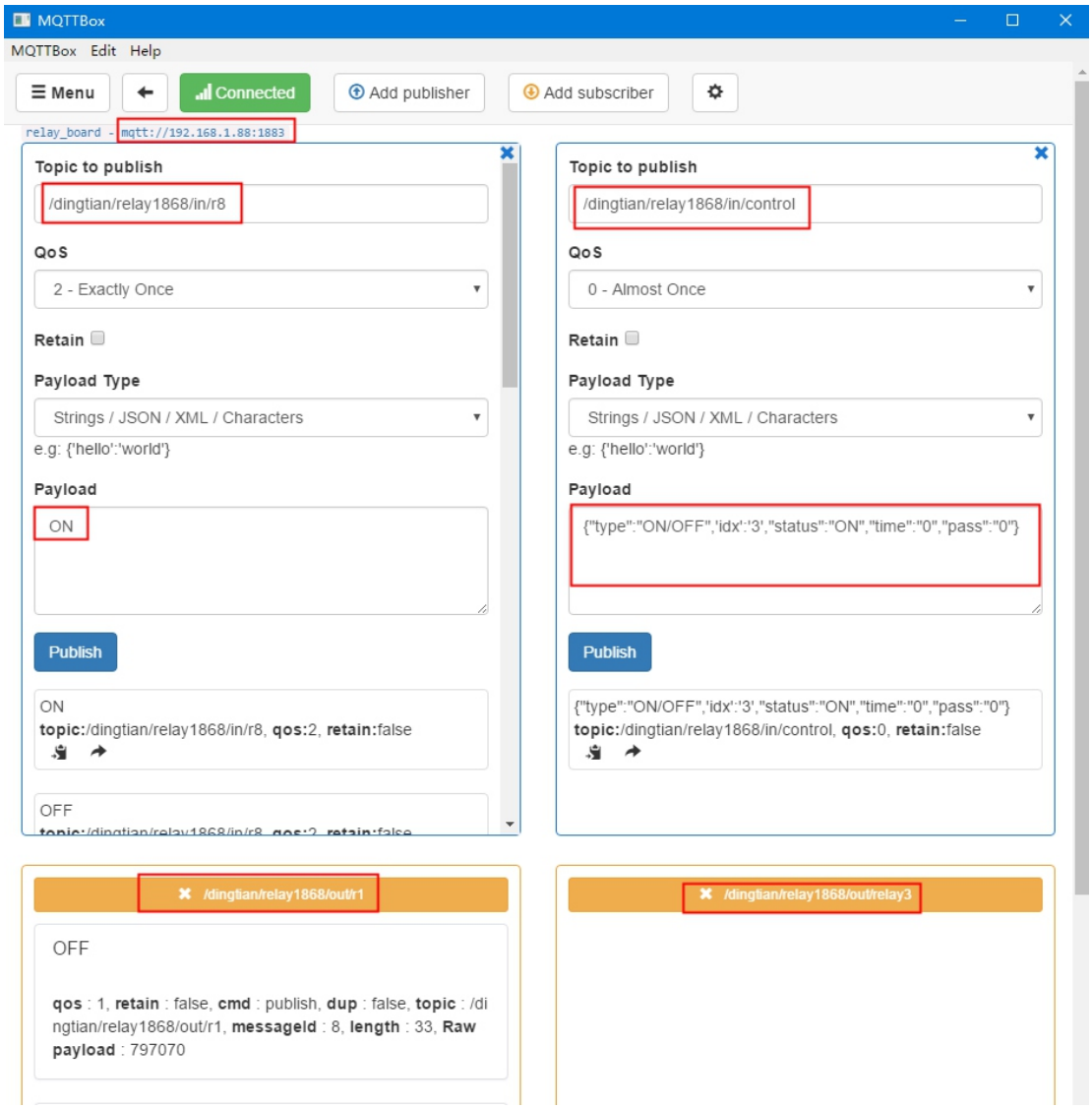
Protocol:mqtt/tcp
Host:192.168.1.88:1883(Broker server ip and port)
Username:mqtt
Password:123
Broker MQTT V3.1.1 compliant



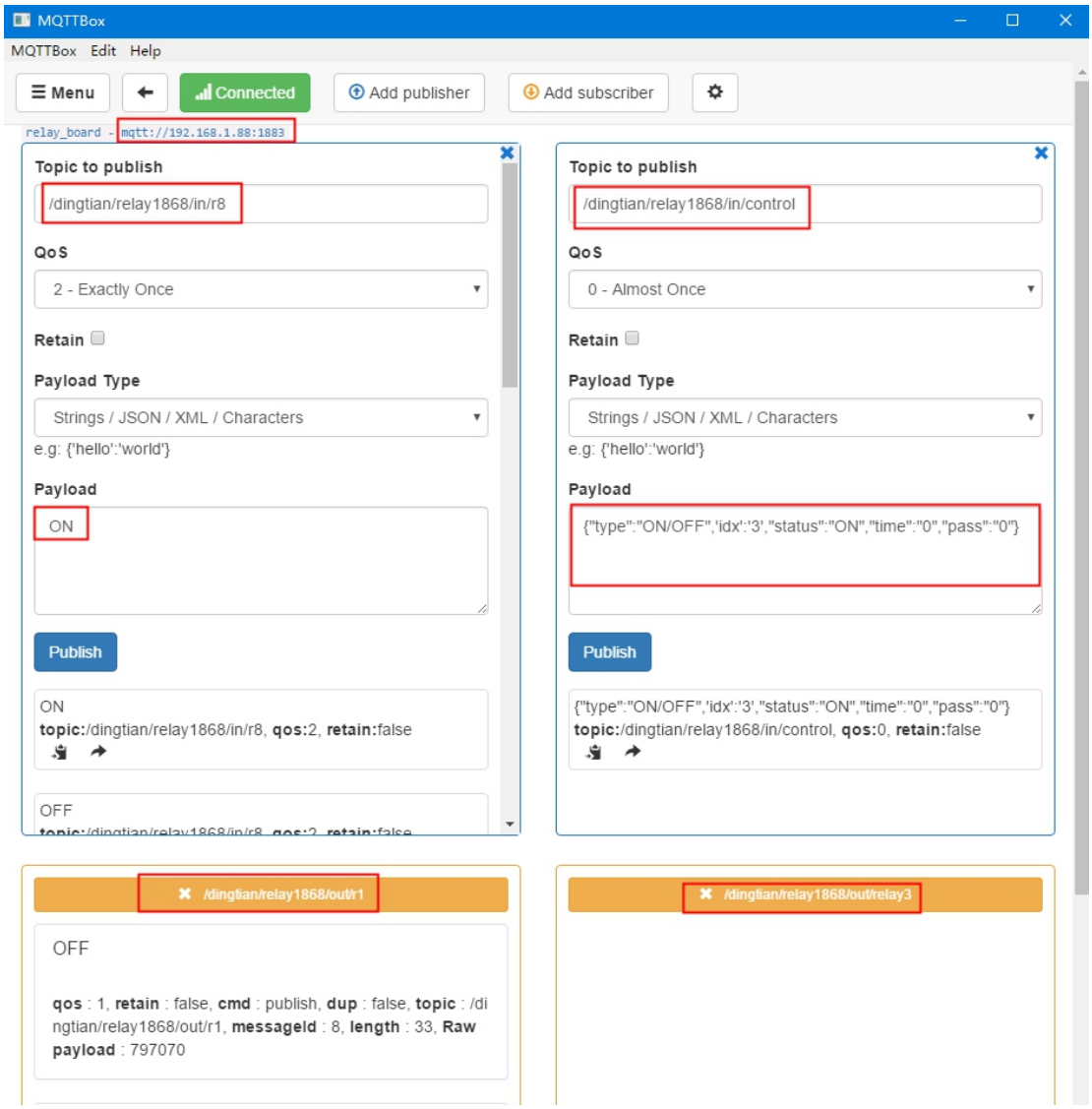
Config Relay board Web page MQTT parameter



step 4: MQTTBox Publish topic to relay board and subcribe topic



step 4: MQTTBox Publish topic to relay board and subcribe topic



Appendix IV How to CoAP

you need linux system

step 1: compile libcoap

git clone --recurse-submodules https://github.com/obgm/libcoap
./autogen.sh
./configure --disable-manpages --enable-examples --enable-tests
make

step 2: CoAP Get relay status

Relay Status(1:ON, 0:OFF)
./coap-client -m get coap://192.168.1.100/dingtian/r1
./coap-client -m get coap://192.168.1.100/dingtian/r2
./coap-client -m get coap://192.168.1.100/dingtian/r3
./coap-client -m get coap://192.168.1.100/dingtian/r4
./coap-client -m get coap://192.168.1.100/dingtian/r5
./coap-client -m get coap://192.168.1.100/dingtian/r6
./coap-client -m get coap://192.168.1.100/dingtian/r7
./coap-client -m get coap://192.168.1.100/dingtian/r8

Input Status(1:High, 0:Low)
./coap-client -m get coap://192.168.1.100/dingtian/i1
./coap-client -m get coap://192.168.1.100/dingtian/i2
./coap-client -m get coap://192.168.1.100/dingtian/i3
./coap-client -m get coap://192.168.1.100/dingtian/i4
./coap-client -m get coap://192.168.1.100/dingtian/i5
./coap-client -m get coap://192.168.1.100/dingtian/i6
./coap-client -m get coap://192.168.1.100/dingtian/i7
./coap-client -m get coap://192.168.1.100/dingtian/i8

step 3: CoAP Control relay(simple)

./coap-client -e "1" -m put coap://192.168.1.100/dingtian/r1 # relay1 ON
./coap-client -e "0" -m put coap://192.168.1.100/dingtian/r1 # relay1 OFF
./coap-client -e "1" -m put coap://192.168.1.100/dingtian/r2 # relay2 ON
./coap-client -e "0" -m put coap://192.168.1.100/dingtian/r2 # relay2 OFF
./coap-client -e "1" -m put coap://192.168.1.100/dingtian/r3 # relay3 ON
./coap-client -e "0" -m put coap://192.168.1.100/dingtian/r3 # relay3 OFF
./coap-client -e "1" -m put coap://192.168.1.100/dingtian/r4 # relay4 ON
./coap-client -e "0" -m put coap://192.168.1.100/dingtian/r4 # relay4 OFF
./coap-client -e "1" -m put coap://192.168.1.100/dingtian/r5 # relay5 ON
./coap-client -e "0" -m put coap://192.168.1.100/dingtian/r5 # relay5 OFF
./coap-client -e "1" -m put coap://192.168.1.100/dingtian/r6 # relay6 ON
./coap-client -e "0" -m put coap://192.168.1.100/dingtian/r6 # relay6 OFF

```
./coap-client -e "1" -m put coap://192.168.1.100/dingtian/r7        # relay7 ON
./coap-client -e "0" -m put coap://192.168.1.100/dingtian/r7        # relay7 OFF
./coap-client -e "1" -m put coap://192.168.1.100/dingtian/r8        # relay8 ON
./coap-client -e "0" -m put coap://192.168.1.100/dingtian/r8        # relay8 OFF
```

step 4: CoAP Control relay

format:
status:type:time:password
status:0,1
type:ON/OFF,DELAY,JOGGING
time:(ON/OFF)0,(DELAY)1~65535second,(JOGGING)1~255*100ms
password:0~9999

example:
1:ON/OFF:0:4660
status:1
type:ON/OFF
time:0
password:4660

ON/OFF example:

```
./coap-client -e "1:ON/OFF:0:4660" -m put coap://192.168.1.100/dingtian/r1
./coap-client -e "1:ON/OFF:0:4660" -m put coap://192.168.1.100/dingtian/r2
./coap-client -e "1:ON/OFF:0:4660" -m put coap://192.168.1.100/dingtian/r3
./coap-client -e "1:ON/OFF:0:4660" -m put coap://192.168.1.100/dingtian/r4
./coap-client -e "1:ON/OFF:0:4660" -m put coap://192.168.1.100/dingtian/r5
./coap-client -e "1:ON/OFF:0:4660" -m put coap://192.168.1.100/dingtian/r6
./coap-client -e "1:ON/OFF:0:4660" -m put coap://192.168.1.100/dingtian/r7
./coap-client -e "1:ON/OFF:0:4660" -m put coap://192.168.1.100/dingtian/r8
./coap-client -e "0:ON/OFF:0:4660" -m put coap://192.168.1.100/dingtian/r1
./coap-client -e "0:ON/OFF:0:4660" -m put coap://192.168.1.100/dingtian/r2
./coap-client -e "0:ON/OFF:0:4660" -m put coap://192.168.1.100/dingtian/r3
./coap-client -e "0:ON/OFF:0:4660" -m put coap://192.168.1.100/dingtian/r4
./coap-client -e "0:ON/OFF:0:4660" -m put coap://192.168.1.100/dingtian/r5
./coap-client -e "0:ON/OFF:0:4660" -m put coap://192.168.1.100/dingtian/r6
./coap-client -e "0:ON/OFF:0:4660" -m put coap://192.168.1.100/dingtian/r7
./coap-client -e "0:ON/OFF:0:4660" -m put coap://192.168.1.100/dingtian/r8
```

DELAY example:

```
./coap-client -e "1:DELAY:5:4660" -m put coap://192.168.1.100/dingtian/r1
./coap-client -e "1:DELAY:5:4660" -m put coap://192.168.1.100/dingtian/r2
./coap-client -e "1:DELAY:5:4660" -m put coap://192.168.1.100/dingtian/r3
./coap-client -e "1:DELAY:5:4660" -m put coap://192.168.1.100/dingtian/r4
./coap-client -e "1:DELAY:5:4660" -m put coap://192.168.1.100/dingtian/r5
```

./coap-client -e "1:DELAY:5:4660" -m put coap://192.168.1.100/dingtian/r6
./coap-client -e "1:DELAY:5:4660" -m put coap://192.168.1.100/dingtian/r7
./coap-client -e "1:DELAY:5:4660" -m put coap://192.168.1.100/dingtian/r8
./coap-client -e "0:DELAY:5:4660" -m put coap://192.168.1.100/dingtian/r1
./coap-client -e "0:DELAY:5:4660" -m put coap://192.168.1.100/dingtian/r2
./coap-client -e "0:DELAY:5:4660" -m put coap://192.168.1.100/dingtian/r3
./coap-client -e "0:DELAY:5:4660" -m put coap://192.168.1.100/dingtian/r4
./coap-client -e "0:DELAY:5:4660" -m put coap://192.168.1.100/dingtian/r5
./coap-client -e "0:DELAY:5:4660" -m put coap://192.168.1.100/dingtian/r6
./coap-client -e "0:DELAY:5:4660" -m put coap://192.168.1.100/dingtian/r7
./coap-client -e "0:DELAY:5:4660" -m put coap://192.168.1.100/dingtian/r8

JOGGING example:
./coap-client -e "1:JOGGING:5:4660" -m put coap://192.168.1.100/dingtian/r1
./coap-client -e "1:JOGGING:5:4660" -m put coap://192.168.1.100/dingtian/r2
./coap-client -e "1:JOGGING:5:4660" -m put coap://192.168.1.100/dingtian/r3
./coap-client -e "1:JOGGING:5:4660" -m put coap://192.168.1.100/dingtian/r4
./coap-client -e "1:JOGGING:5:4660" -m put coap://192.168.1.100/dingtian/r5
./coap-client -e "1:JOGGING:5:4660" -m put coap://192.168.1.100/dingtian/r6
./coap-client -e "1:JOGGING:5:4660" -m put coap://192.168.1.100/dingtian/r7
./coap-client -e "1:JOGGING:5:4660" -m put coap://192.168.1.100/dingtian/r8
./coap-client -e "0:JOGGING:5:4660" -m put coap://192.168.1.100/dingtian/r1
./coap-client -e "0:JOGGING:5:4660" -m put coap://192.168.1.100/dingtian/r2
./coap-client -e "0:JOGGING:5:4660" -m put coap://192.168.1.100/dingtian/r3
./coap-client -e "0:JOGGING:5:4660" -m put coap://192.168.1.100/dingtian/r4
./coap-client -e "0:JOGGING:5:4660" -m put coap://192.168.1.100/dingtian/r5
./coap-client -e "0:JOGGING:5:4660" -m put coap://192.168.1.100/dingtian/r6
./coap-client -e "0:JOGGING:5:4660" -m put coap://192.168.1.100/dingtian/r7
./coap-client -e "0:JOGGING:5:4660" -m put coap://192.168.1.100/dingtian/r8

Appendix V How to “input mutual control”

Example param:

DevA IP: 192.168.1.100

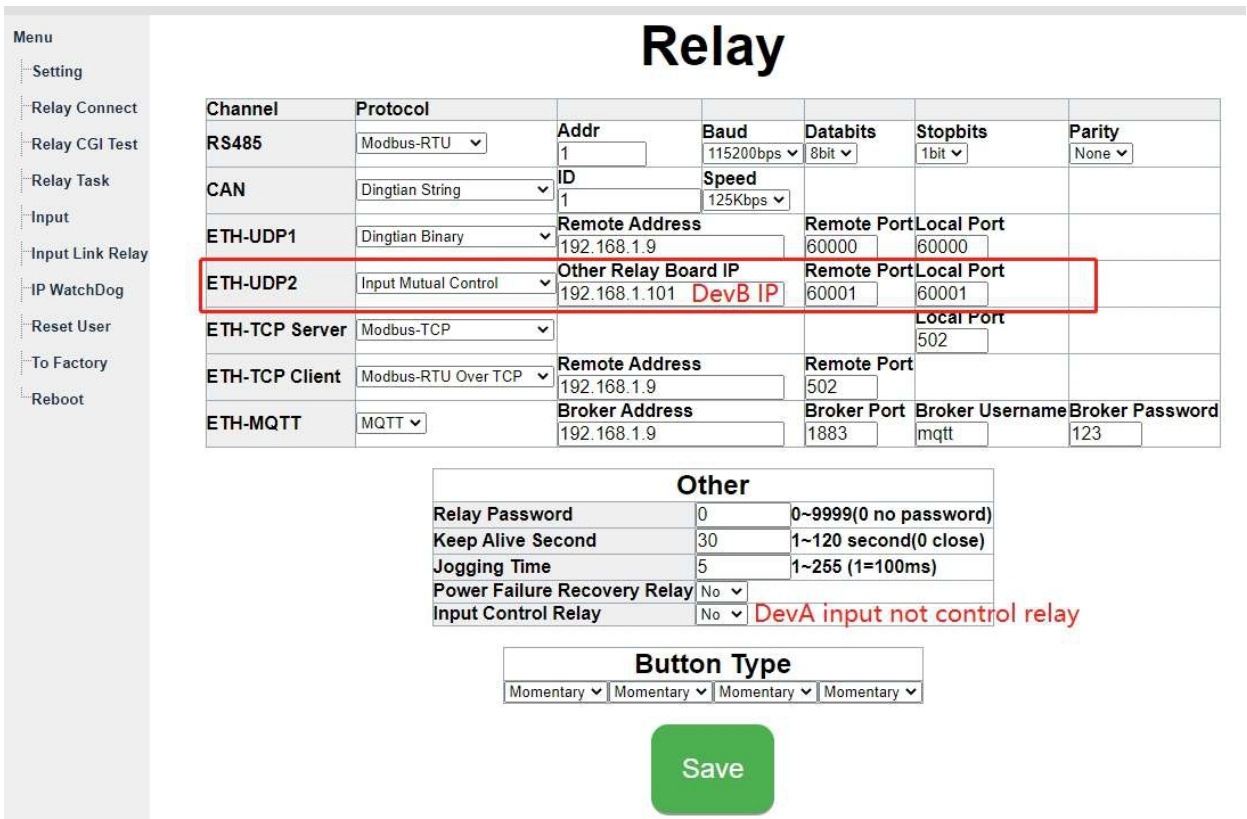
DevB IP: 192.168.1.101

web config “Input Control Relay”

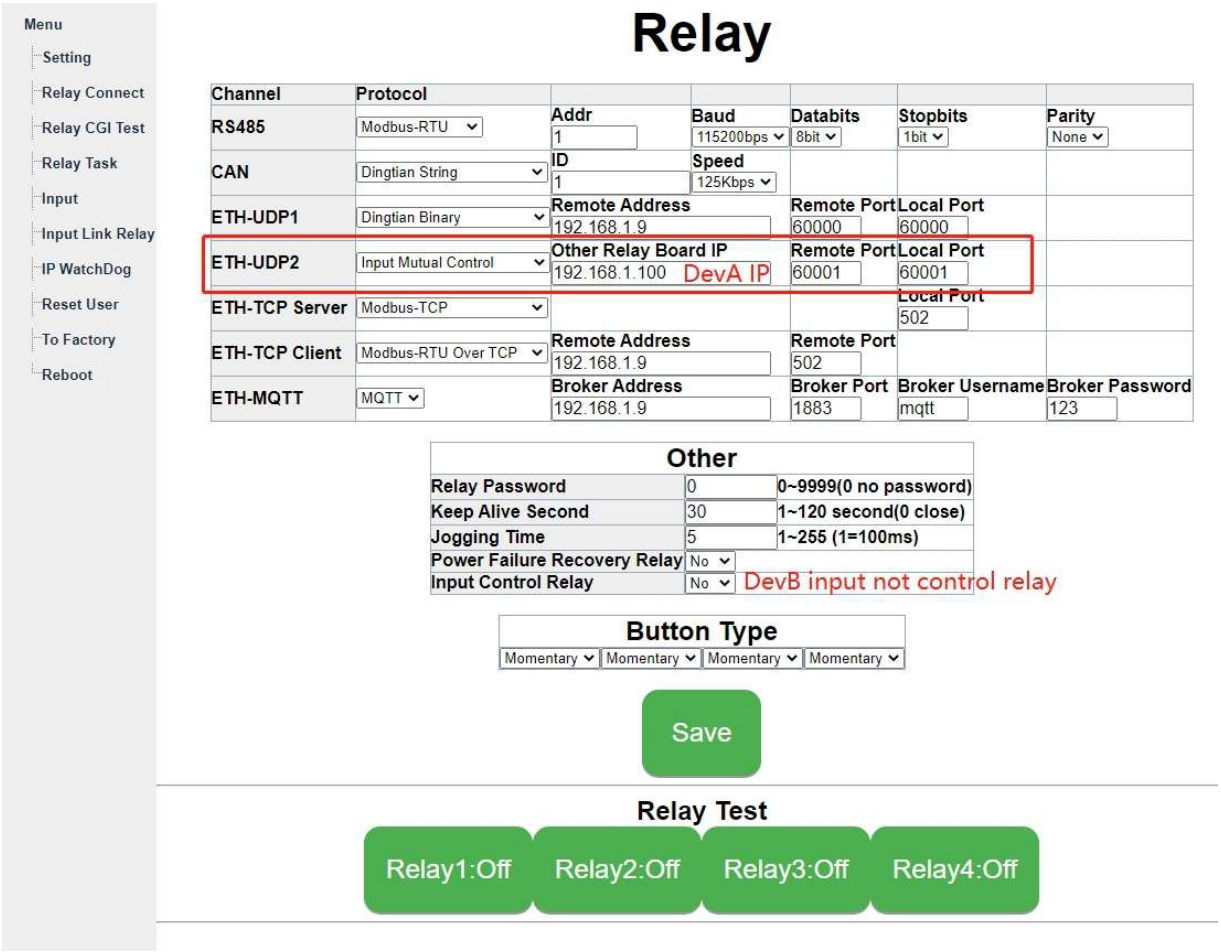
“No”:input only control remote output

“Yes”:input control local output and remote output

DevA web config:



DevB web config:



Appendix VI How to Home Assistant

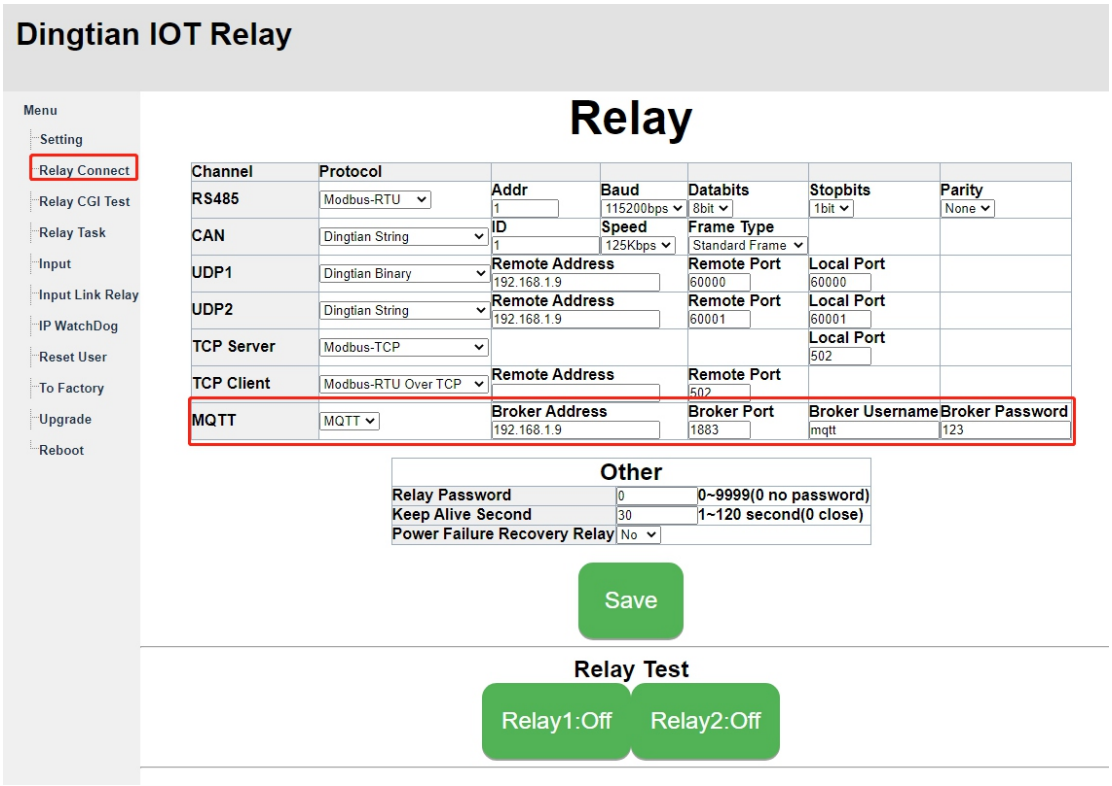
Notice:

1 Close your firewall

2 All command and script run as root/administrator

3 please step by step

Step 1 config Relay board



The “192.168.1.9” is MQTT broker IP

Step 2 Install MQTT Broker

Link step 1: Install and config Broker for details how to install MQTT Broker

Step 3 Install Home Assistant

1 install python

Python download link:
https://www.python.org/ftp/python/3.10.0/python-3.10.0.exe

2 install Home Assistant

Windows install command:
python -m pip install --upgrade homeassistant tzdata met

3 Add relay board Switch and input to Home Assistant

Home assistant default config yaml path:
C:\Users\Administrator\AppData\Roaming\.homeassistant\configuration.yaml

example is 2 channel relay board, SN is 100
when you use it please replace with you relay board SN

SDK path:
MQTT\home_assistant_example.yaml

add below lines to configuration.yaml

```
########################## start ##########################
switch:
  - platform: mqtt
    unique_id: dingtian100-r1
    name: "Dingtian Ethernet Switch1"
    state_topic: "/dingtian/relay100/out/r1"
    command_topic: "/dingtian/relay100/in/r1"
    availability:
      - topic: "/dingtian/relay100/out/lwt_availability"
        payload_available: "online"
        payload_not_available: "offline"
    payload_on: "ON"
    payload_off: "OFF"
    state_on: "ON"
    state_off: "OFF"
    optimistic: false
```

```
  qos: 0
  retain: false

- platform: mqtt
  unique_id: dingtian100-r2
  name: "Dingtian Ethernet Switch2"
  state_topic: "/dingtian/relay100/out/r2"
  command_topic: "/dingtian/relay100/in/r2"
  availability:
    - topic: "/dingtian/relay100/out/lwt_availability"
      payload_available: "online"
      payload_not_available: "offline"
  payload_on: "ON"
  payload_off: "OFF"
  state_on: "ON"
  state_off: "OFF"
  optimistic: false
  qos: 0
  retain: false

binary_sensor:
- platform: mqtt
  unique_id: dingtian100-i1
  name: "Dingtian Ethernet Input1"
  state_topic: "/dingtian/relay100/out/i1"
  availability:
    - topic: "/dingtian/relay100/out/lwt_availability"
      payload_available: "online"
      payload_not_available: "offline"
  payload_on: "ON"
  payload_off: "OFF"
  qos: 0

- platform: mqtt
  unique_id: dingtian100-i2
  name: "Dingtian Ethernet Input2"
  state_topic: "/dingtian/relay100/out/i2"
  availability:
    - topic: "/dingtian/relay100/out/lwt_availability"
      payload_available: "online"
      payload_not_available: "offline"
  payload_on: "ON"
  payload_off: "OFF"
  qos: 0
```

########################## end ##########################

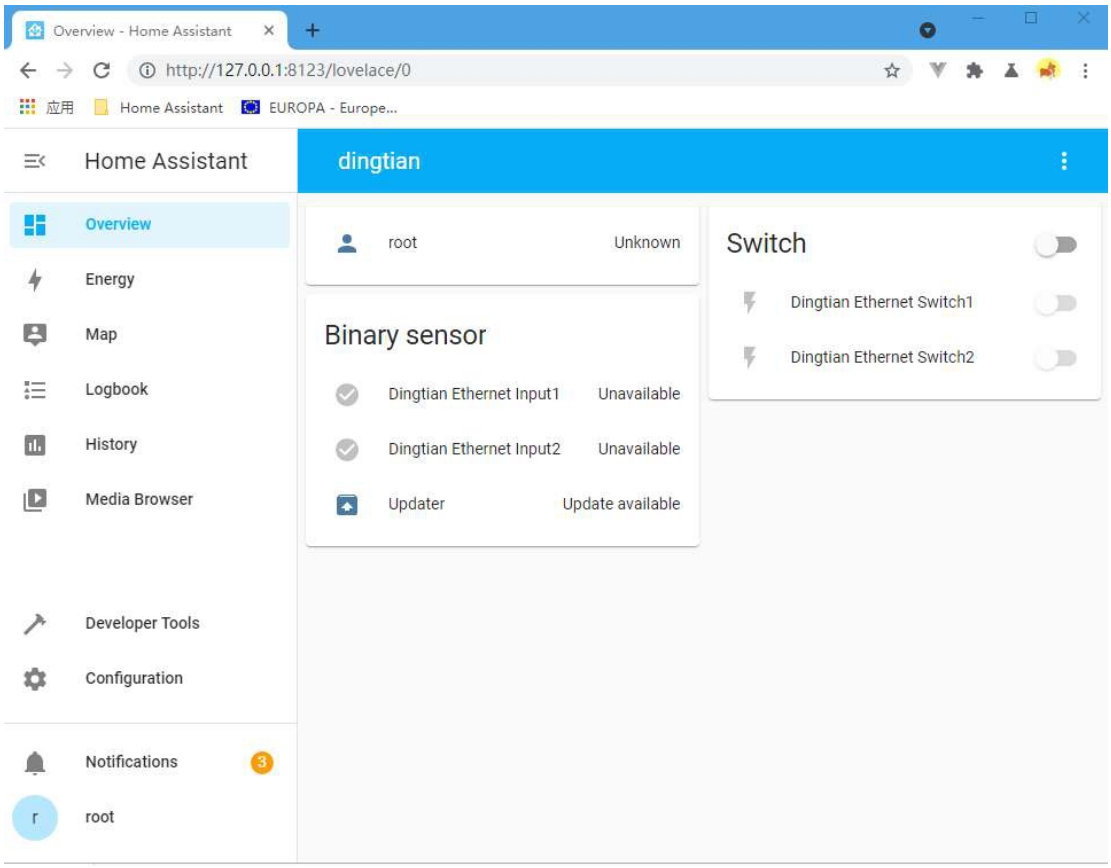
4 Home Assistant config MQTT Broker

Windows open Home Assistant c ommand:

hass –open-ui

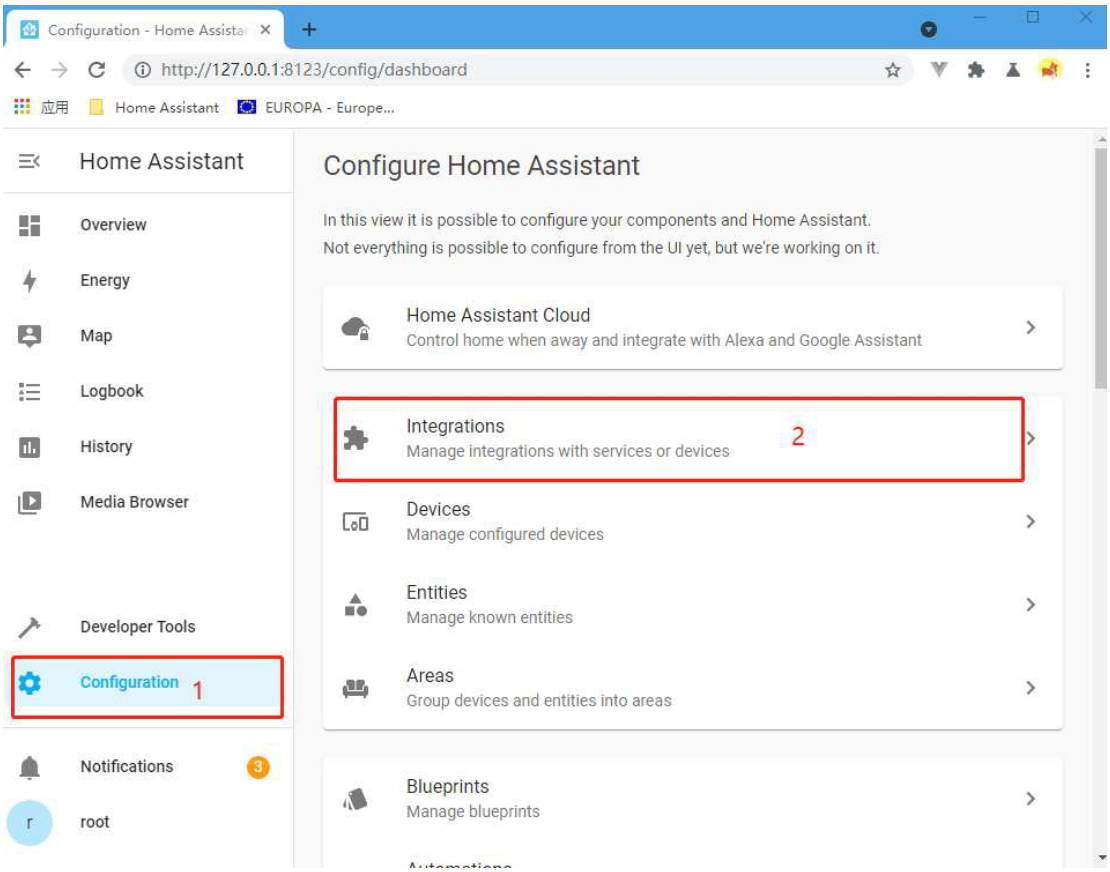
Home Assistant web link:

http://127.0.0.1:8123/

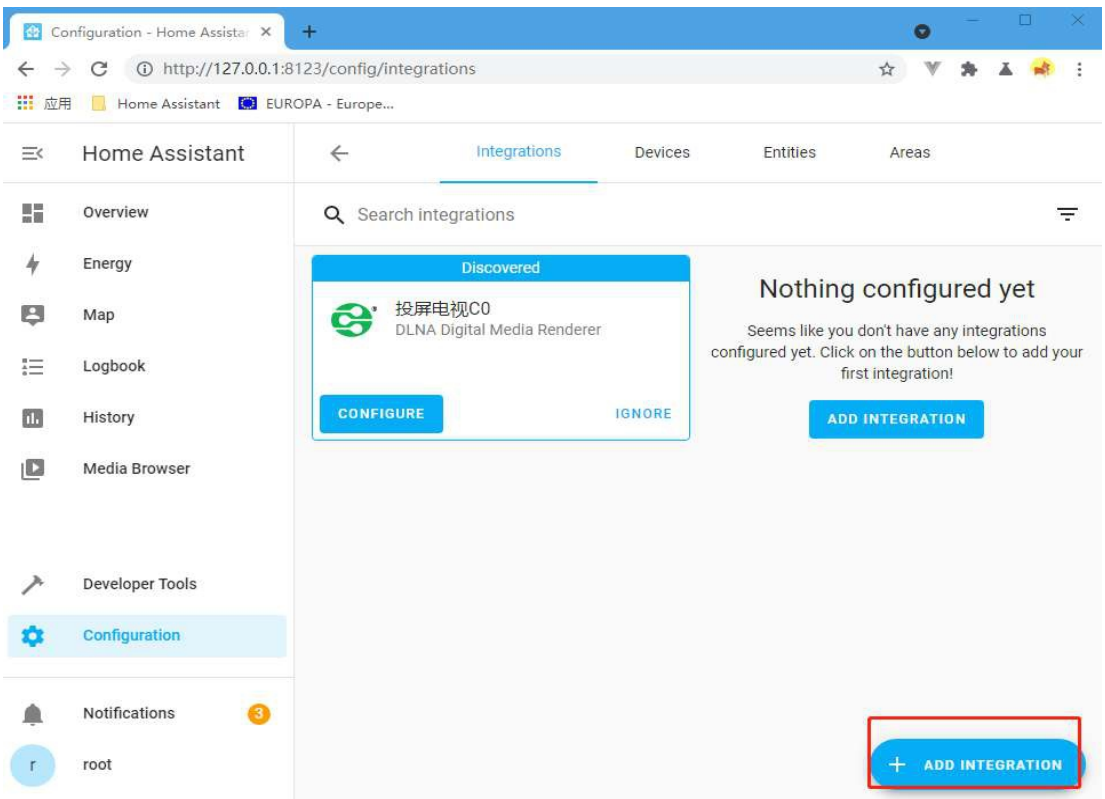


config MQTT Broker

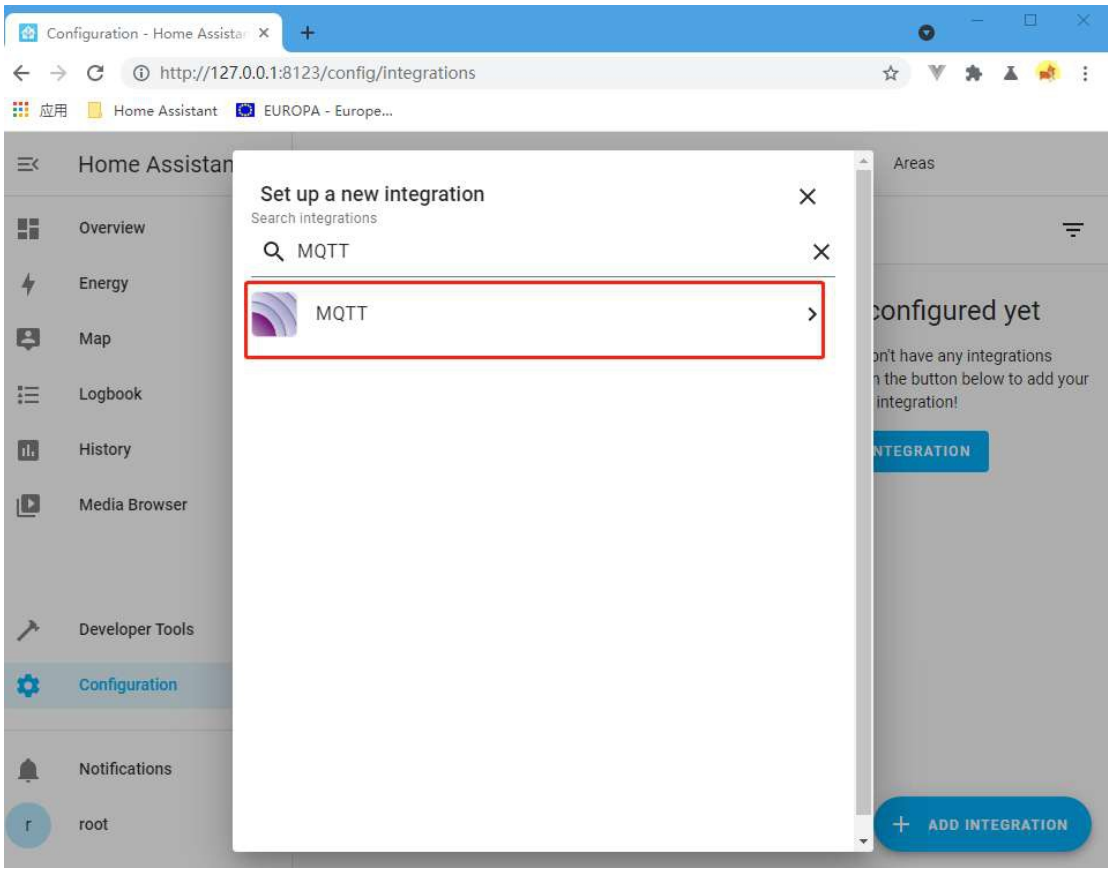
step 1



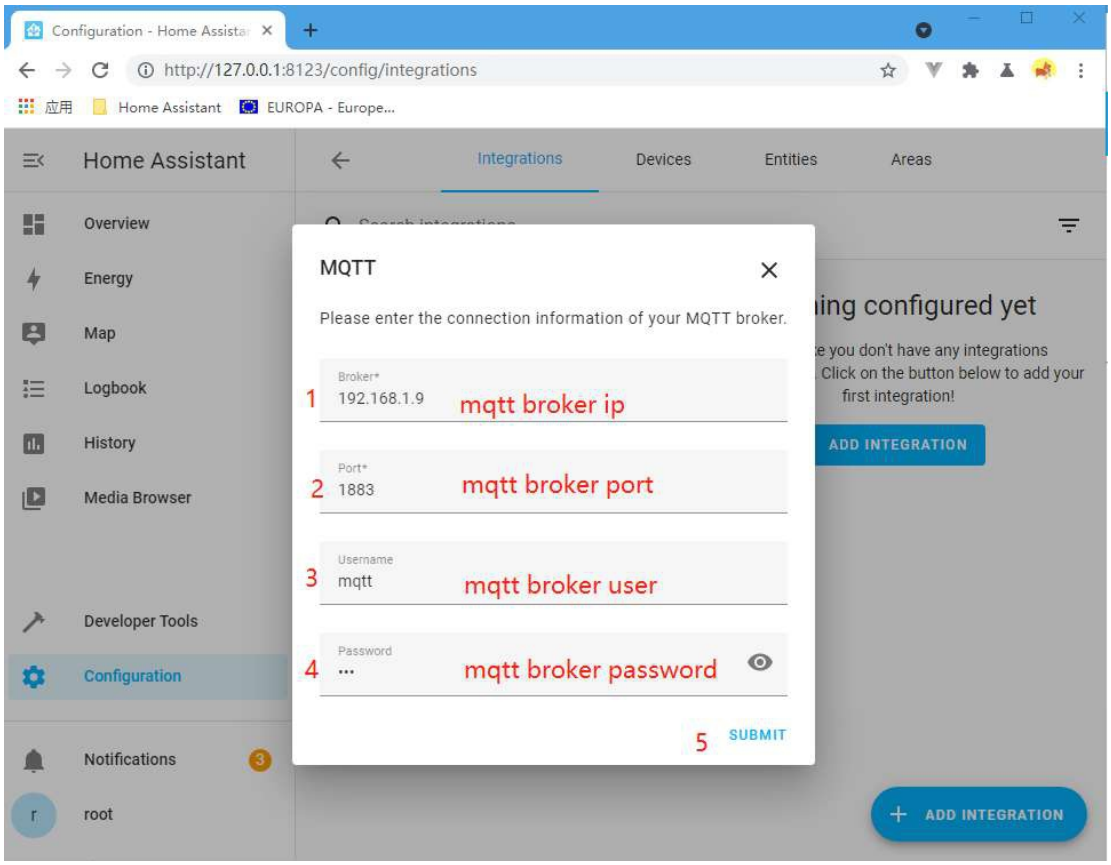
step 2



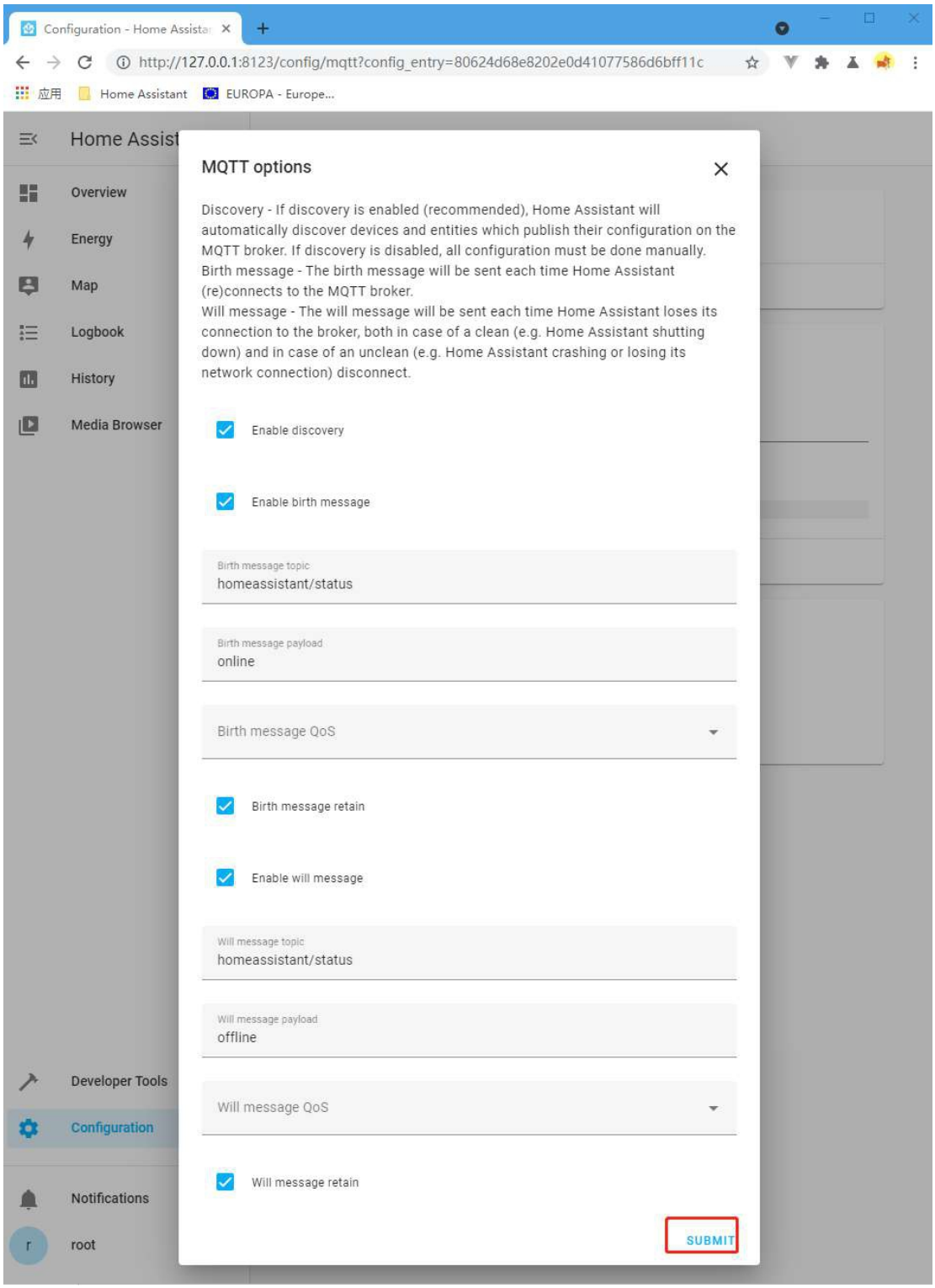
step 3


Configuration - Home Assistant
http://127.0.0.1:8123/config/integrations
Home Assistant
Overview
Energy
Map
Logbook
History
Media Browser
Developer Tools
Configuration
Notifications
root
Areas
Set up a new integration
Search integrations
MQTT
MQTT
configured yet
ADD INTEGRATION

step 4


Configuration - Home Assistant
http://127.0.0.1:8123/config/integrations
Home Assistant
Overview
Energy
Map
Logbook
History
Media Browser
Developer Tools
Configuration
Notifications
root
Integrations
Devices
Entities
Areas
MQTT
Please enter the connection information of your MQTT broker.
Broker*
1 192.168.1.9
mqtt broker ip
Port*
2 1883
mqtt broker port
Username
3 mqtt
mqtt broker user
Password
4 ...
mqtt broker password
5 SUBMIT
ADD INTEGRATION

step 5



step 6

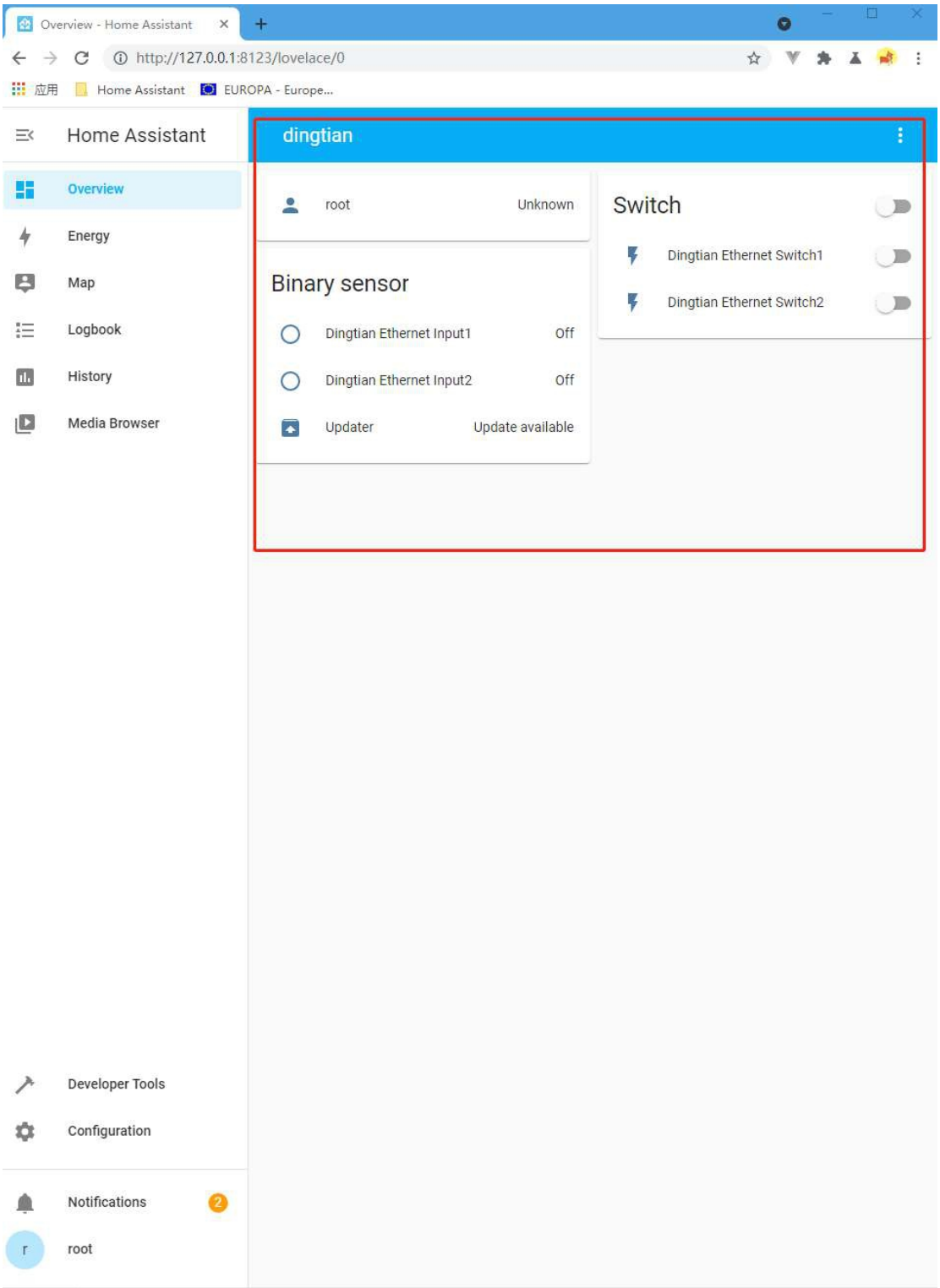
restart Home Assistant

Ctrl+C hot key to Stop Home Assistant

hass –open-ui to start Home Assistant

step 6

new Home Assistant can control relay and get input status



Appendix VII How to openHAB

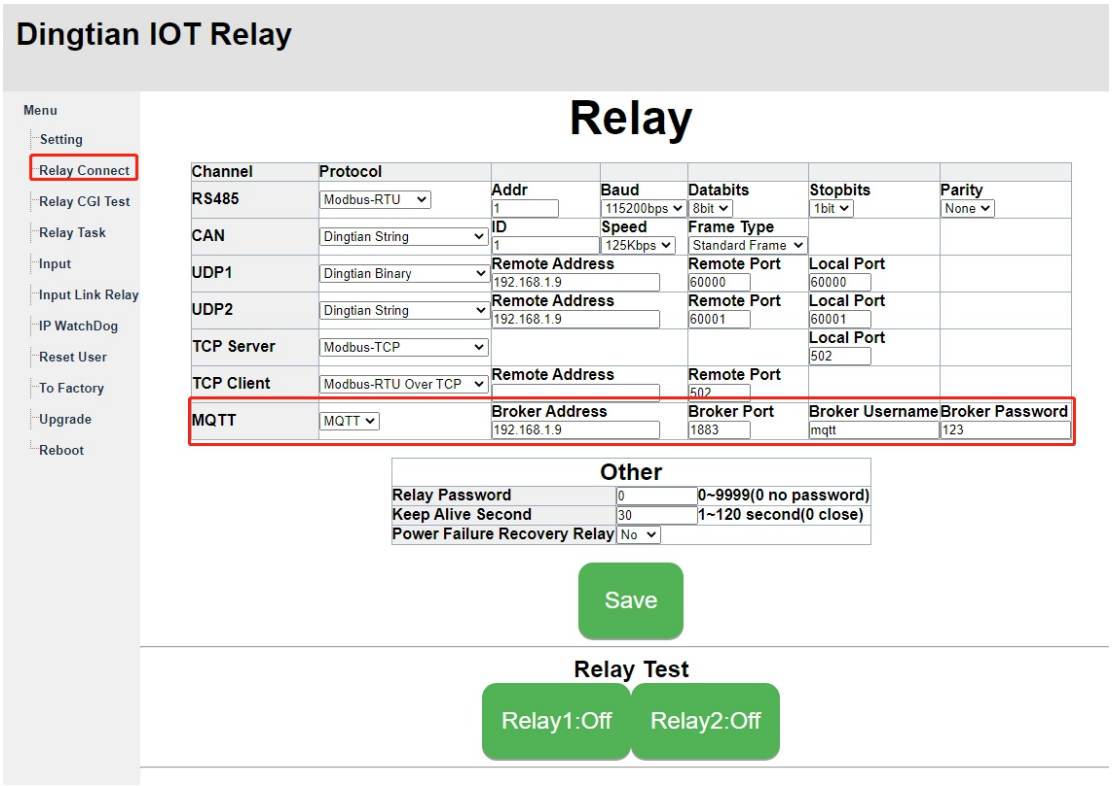
Notice:

1 Close your firewall

2 All command and script run as root/administrator

3 please step by step

Step 1 config Relay board



The “192.168.1.9” is MQTT broker IP

Step 2 Install MQTT Broker

Link step 1: Install and config Broker for details how to install MQTT Broker

Step 3 install JDK and openHAB

1 Download

JDK download link:
https://cdn.azul.com/zulu/bin/zulu11.54.25-ca-jdk11.0.14.1-win_x64.msi

OpenHAB download link:
https://openhab.jfrog.io/artifactory/libs-release-local/org/openhab/distro/openhab/3.2.0/openhab-3.2.0.zip

OpenHAB add-on download link:
https://openhab.jfrog.io/artifactory/libs-release-local/org/openhab/distro/openhab-addons/3.2.0/openhab-addons-3.2.0.kar

2 install

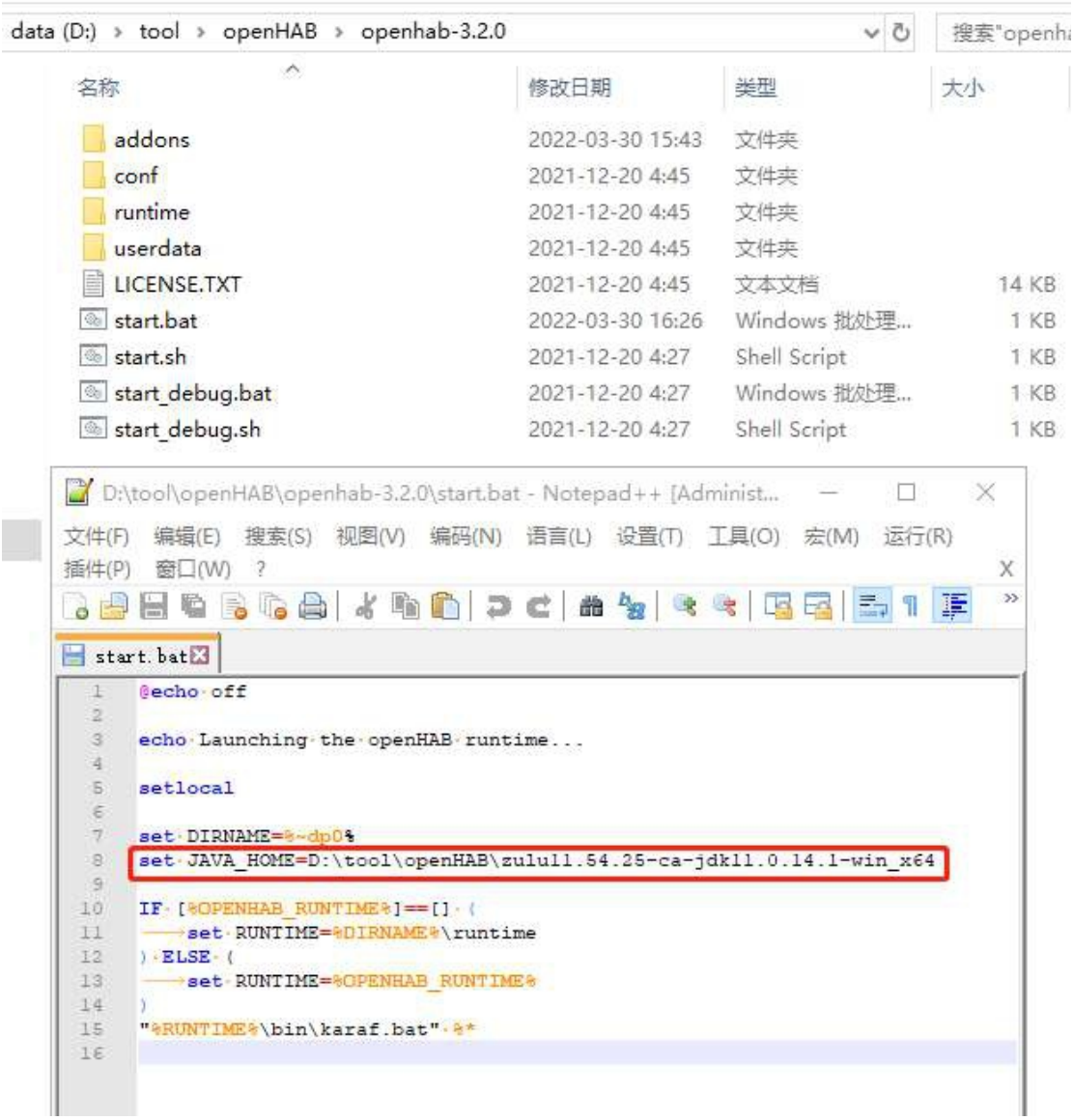
unpack zip directory tree as below image(Example install directory is “D:\tool\openHAB”):

Notice:

The openHAB install directory must **contain no spaces**

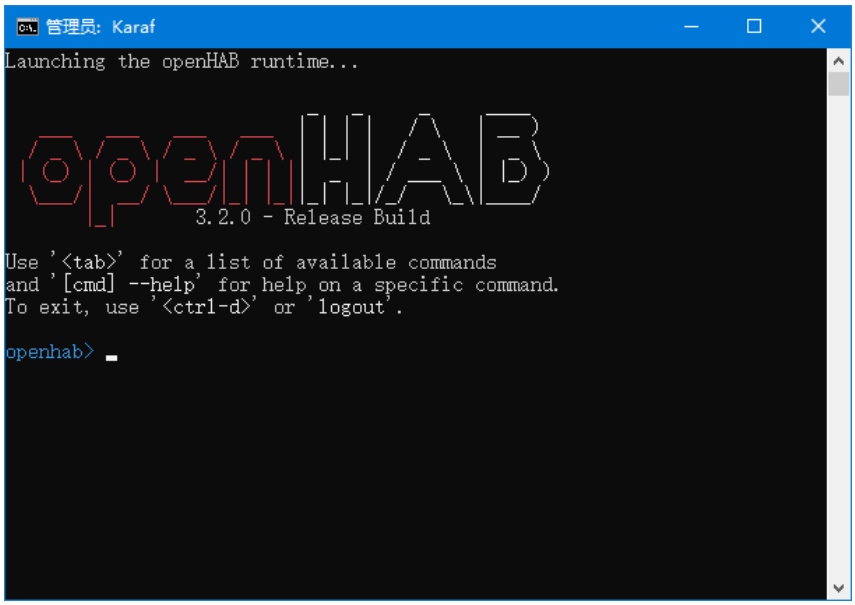
3 Add jdk directory to “start.bat”

Add “set JAVA_HOME=D:\tool\openHAB\zulu11.54.25-ca-jdk11.0.14.1-win_x64”
to file start.bat as below



4 First time init openHAB

1 double click “start.bat”



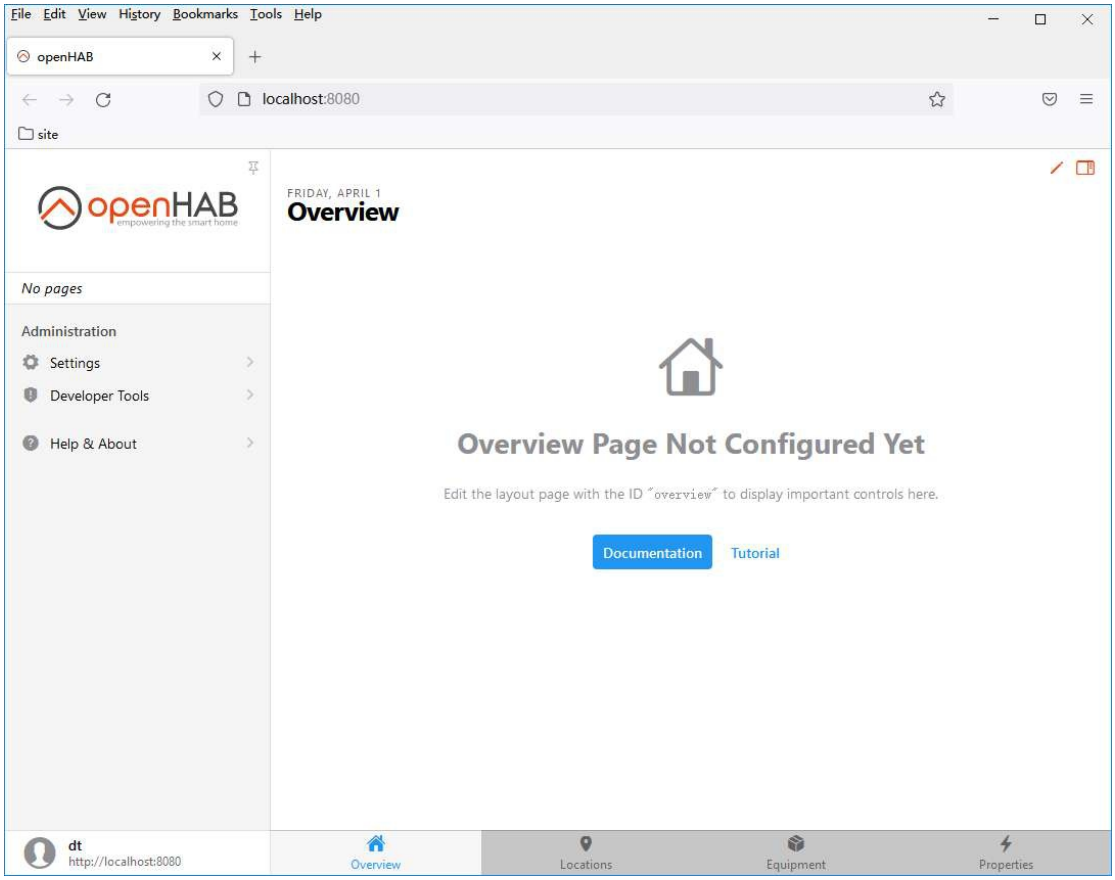
2 First time init openHAB

use Firefox open URL “http://localhost:8080”(my computer chromium can’t open openHAB web page)

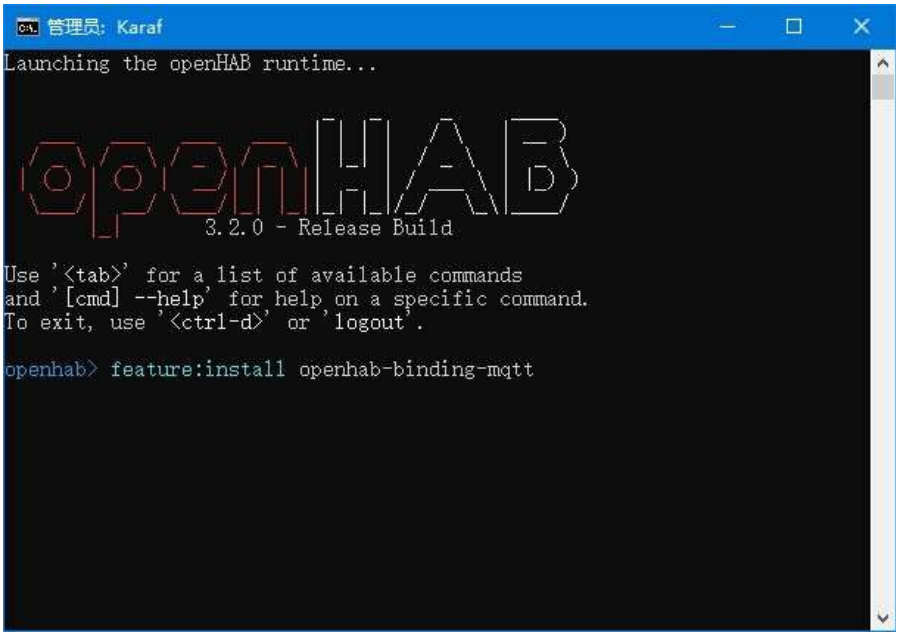
after first time config,you can get main web page like below

Notice:

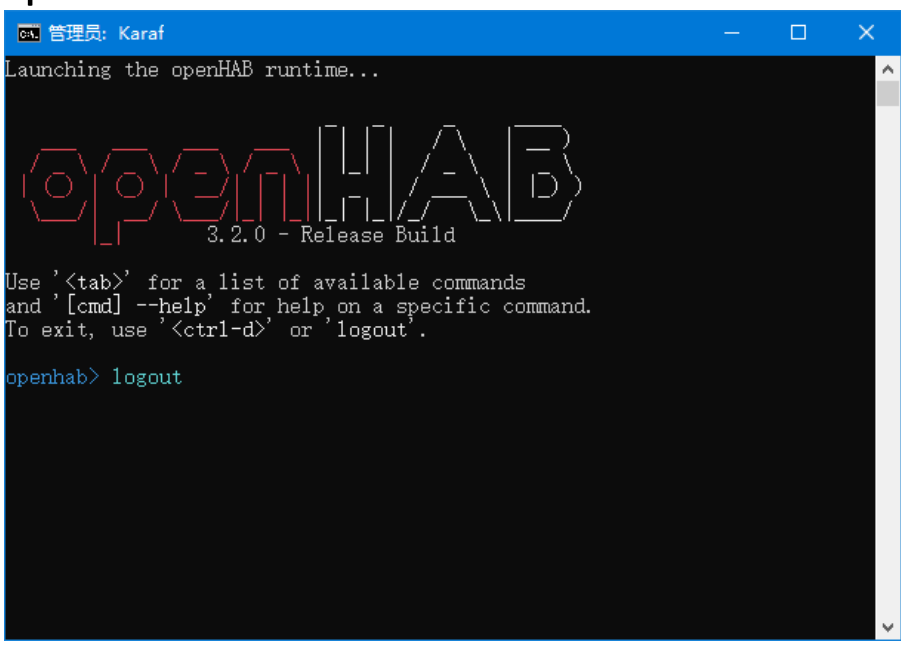
please save username and password



3 install MQTT-binding



4 Stop openHAB



Step 4 Add Dingtian Relay board to openHAB

2ch_config for 2 channel relay board

4ch_config for 4 channel relay board

8ch_config for 8 channel relay board

1 Change json MQTT broker host, username,password

change file “org.openhab.core.thing.Thing.json”

org.openhab.core.thing.Thing.json | org.openhab.core.thing.link.ItemChannelLink.json | org.openhab.core.items.Item.json

```
{
  "mqtt:broker:dingtianbroker": {
    "class": "org.openhab.core.thing.internal.BridgeImpl",
    "value": {
      "label": "MQTT Broker",
      "channels": [],
      "configuration": {
        "properties": {
          "certificatepin": false,
          "clientid": "b1e677c2-577c-4678-86f6-5e0a060827b6",
          "enableDiscovery": false,
          "host": "192.168.1.9",
          "keepAlive": 60,
          "lwtQos": 1,
          "lwtRetain": true,
          "password": "123",
          "port": 1883,
          "publickeypin": false,
          "qos": 1,
          "reconnectTime": 60000,
          "secure": false,
          "username": "mqtt"
        }
      },
      "properties": {},
      "uid": {
        "segments": [
          "mqtt",
          "broker",
          "dingtianbroker"
        ],
        "uid": "mqtt:broker:dingtianbroker"
      },
      "thingTypeUID": {
        "segments": [
          "mqtt",
          "broker"
        ],
        "uid": "mqtt:broker"
      }
    }
  },
```

change to you broker IP

change to you broker password

change to you broker username

2 Change json SN(example SN 7920) to you relay board SN

Change file:

“org.openhab.core.thing.Thing.json”

“org.openhab.core.thing.link.ItemChannelLink.json”

“org.openhab.core.items.Item.json”

Step 4 Add Dingtian Relay board to openHAB

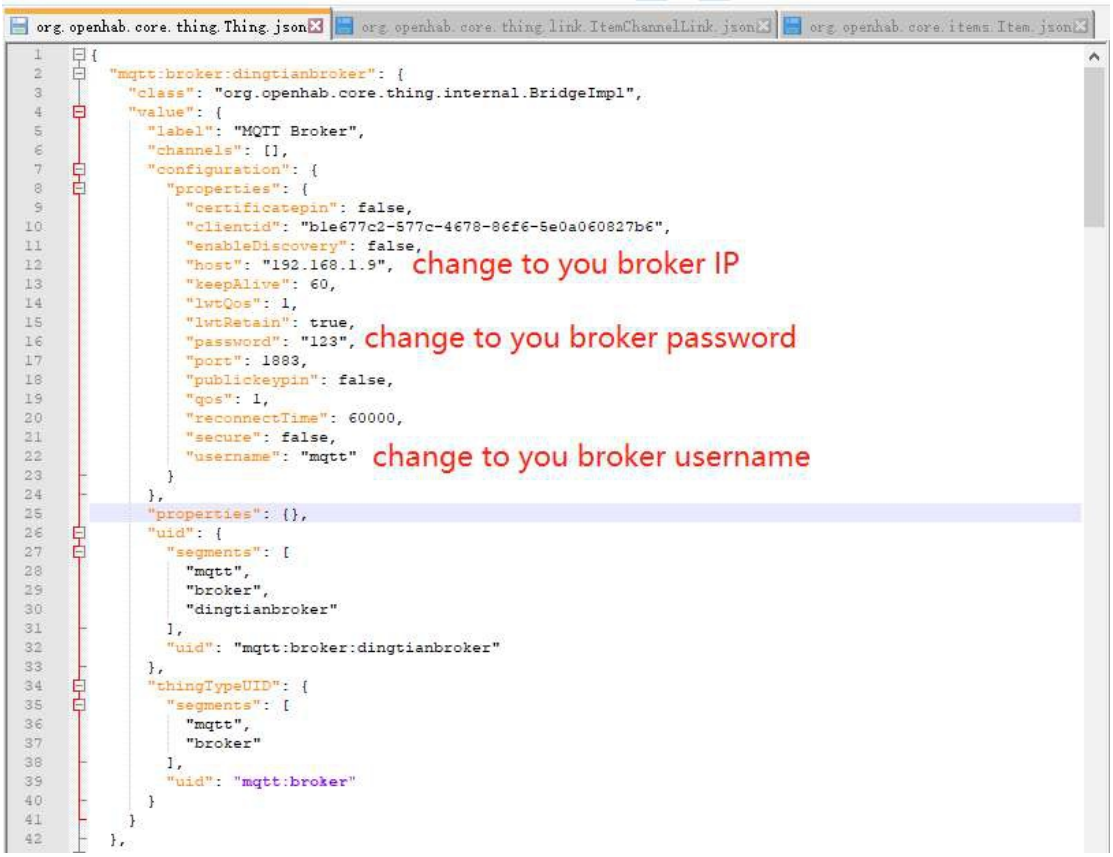
2ch_config for 2 channel relay board

4ch_config for 4 channel relay board

8ch_config for 8 channel relay board

1 Change json MQTT broker host, username,password

change file “org.openhab.core.thing.Thing.json”



2 Change json SN(example SN 7920) to you relay board SN

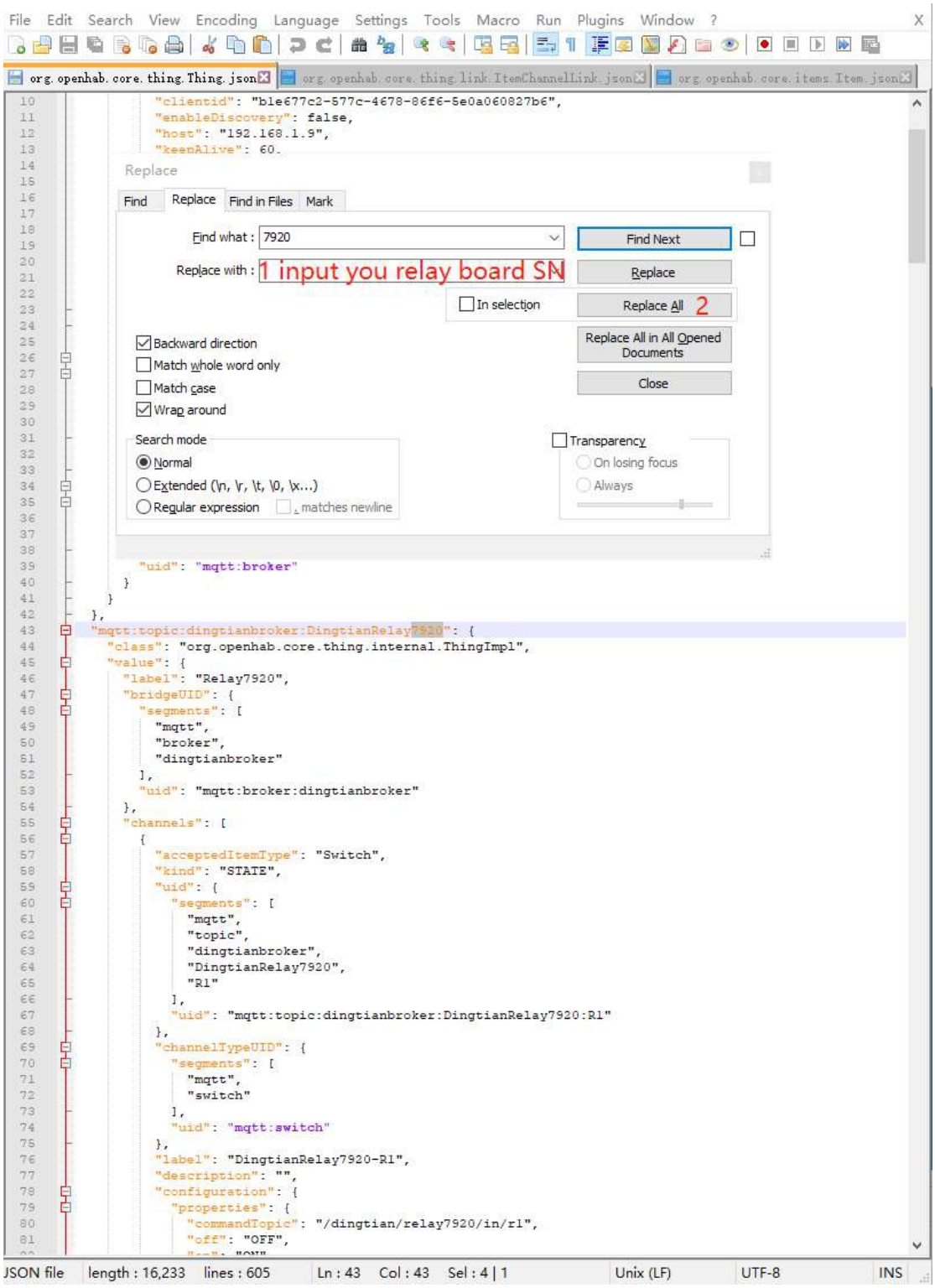
Change file:

“org.openhab.core.thing.Thing.json”

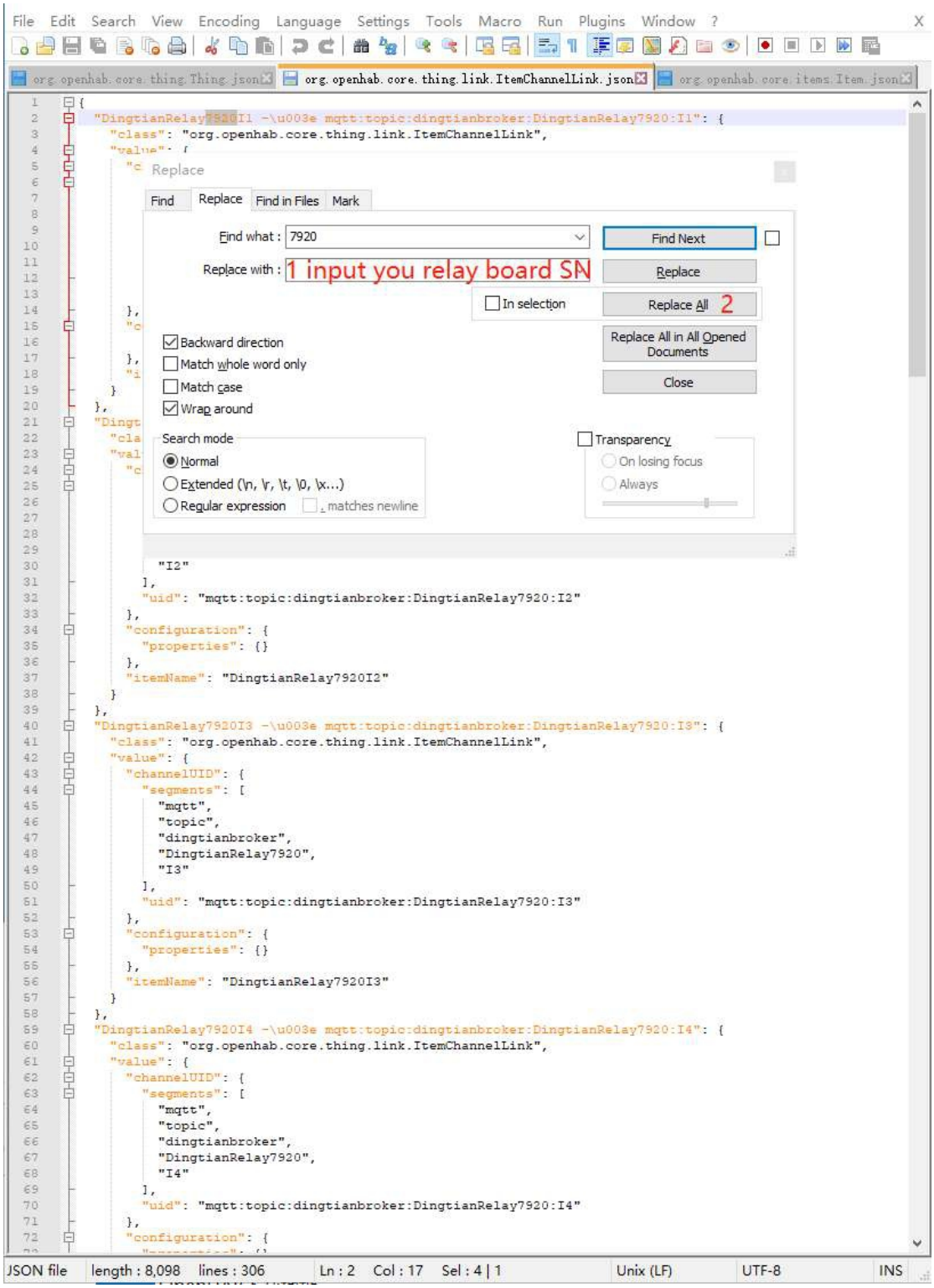
“org.openhab.core.thing.link.ItemChannelLink.json”

“org.openhab.core.items.Item.json”

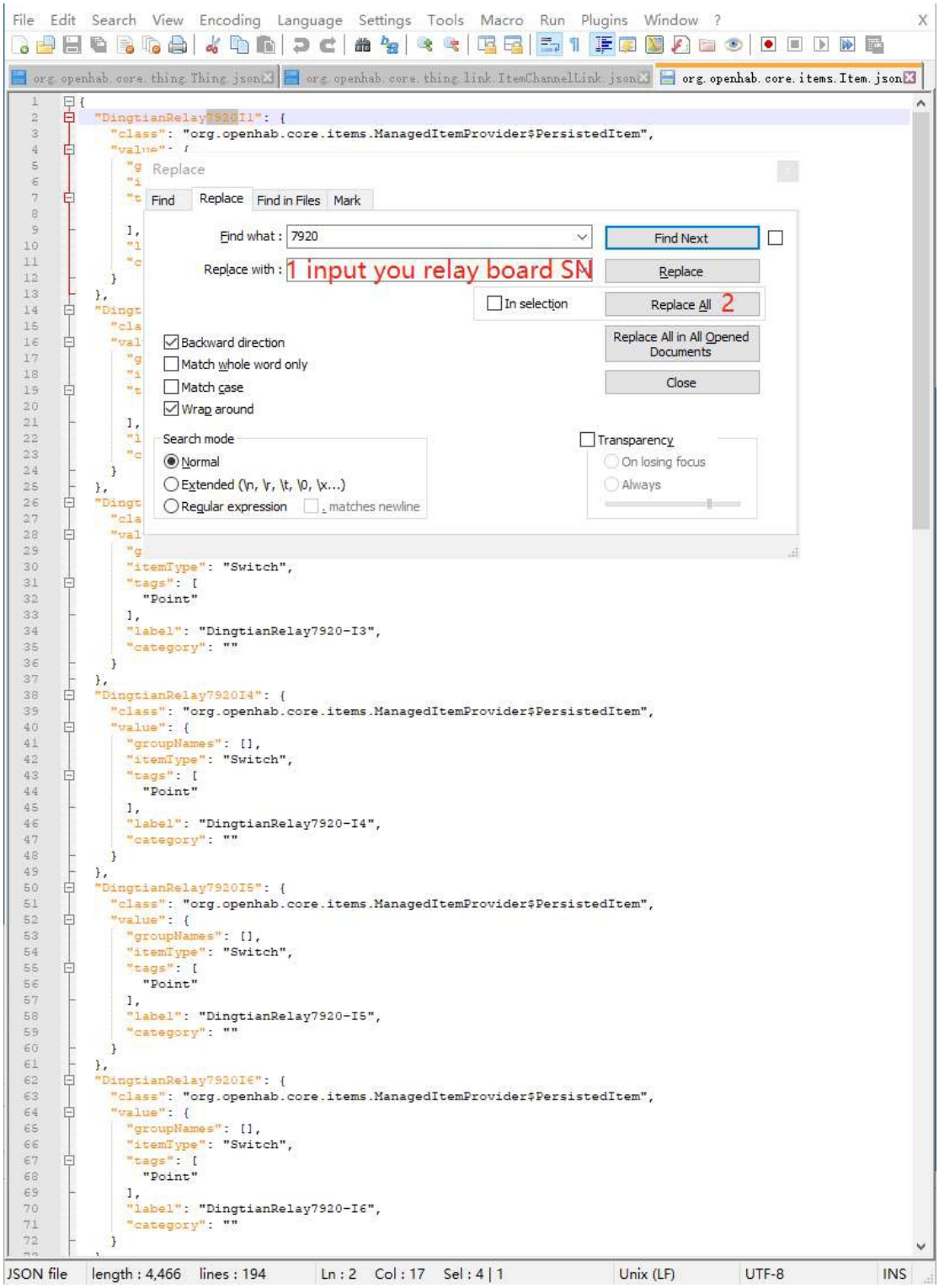
org.openhab.core.thing.Thing.json



org.openhab.core.thing.link.ItemChannelLink.json



org.openhab.core.items.Item.json

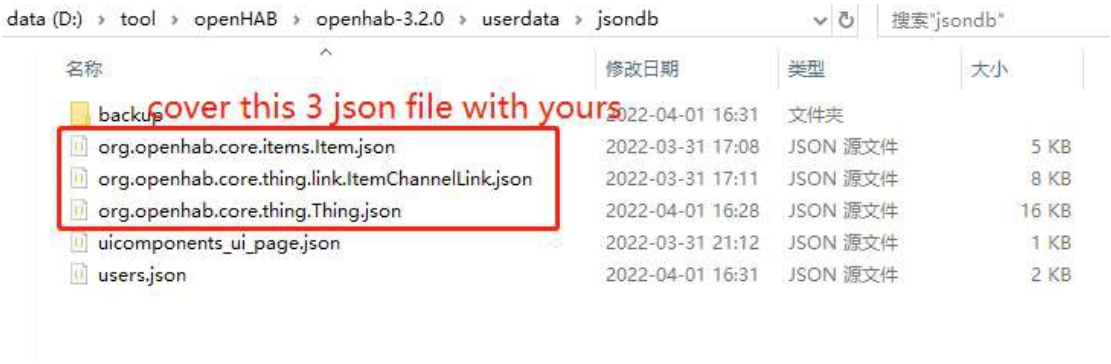


3 Cover openHAB json

OpenHAB json path: “D:\tool\openHAB\openhab-3.2.0\userdata\jsondb”

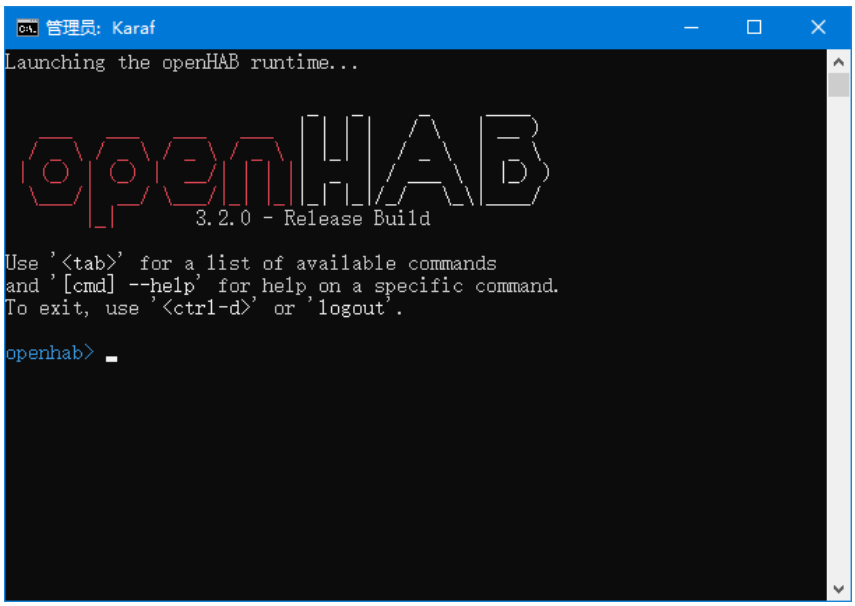
Notic e:

example openHAB install path “D:\tool\openHAB\openhab-3.2.0”



4 Control relay board with openHAB

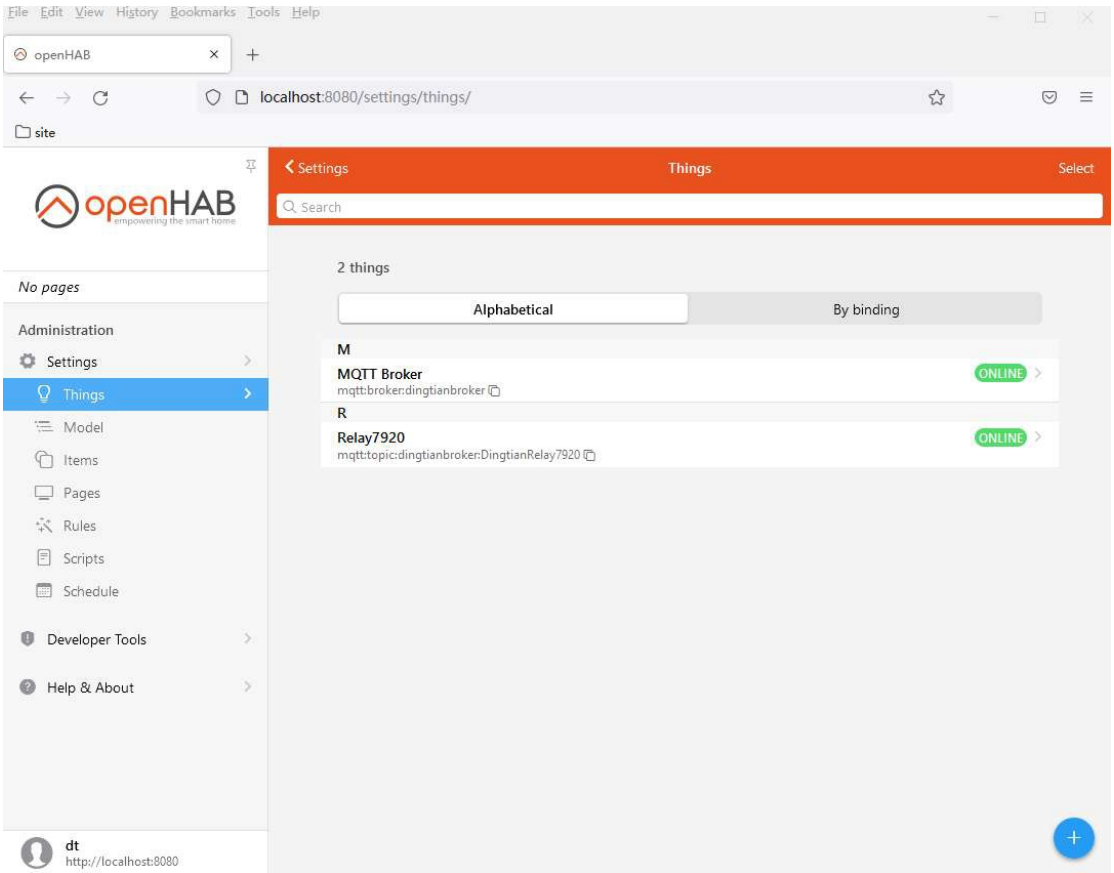
1 double click “start.bat”



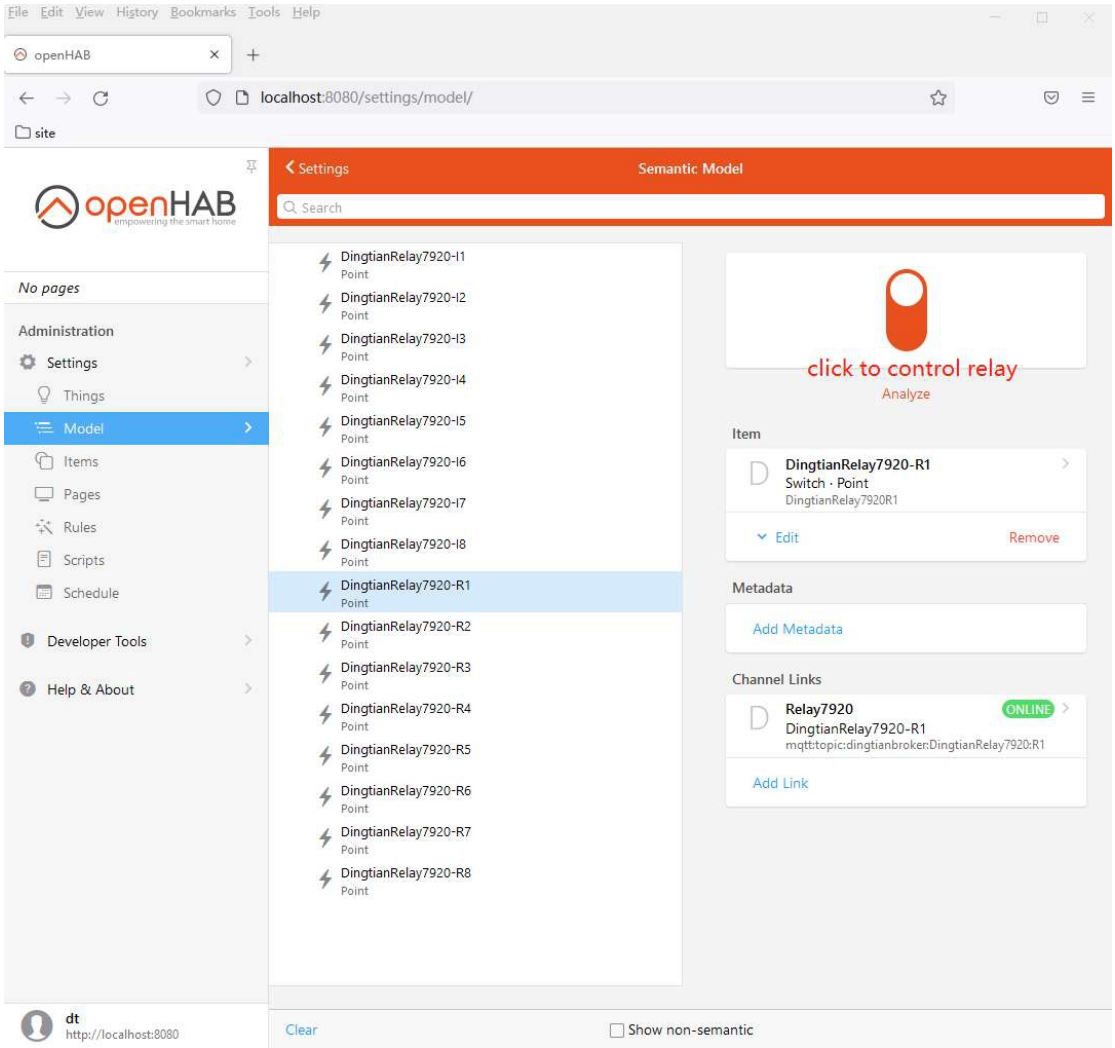
Wait 1 minute for openHAB startup

2 Open openHAB web page

It shows MQTT broker and Relay board 7920 is online



control relay


File Edit View History Bookmarks Tools Help
openHAB
localhost:8080/settings/model/
site
openHAB
empowering the smart home
No pages
Administration
Settings
Things
Model
Items
Pages
Rules
Scripts
Schedule
Developer Tools
Help & About
dt
http://localhost:8080
Settings
Semantic Model
Search
DingtianRelay7920-I1
Point
DingtianRelay7920-I2
Point
DingtianRelay7920-I3
Point
DingtianRelay7920-I4
Point
DingtianRelay7920-I5
Point
DingtianRelay7920-I6
Point
DingtianRelay7920-I7
Point
DingtianRelay7920-I8
Point
DingtianRelay7920-R1
Point
DingtianRelay7920-R2
Point
DingtianRelay7920-R3
Point
DingtianRelay7920-R4
Point
DingtianRelay7920-R5
Point
DingtianRelay7920-R6
Point
DingtianRelay7920-R7
Point
DingtianRelay7920-R8
Point
click to control relay
Analyze
Item
DingtianRelay7920-R1
Switch · Point
DingtianRelay7920R1
Edit
Remove
Metadata
Add Metadata
Channel Links
Relay7920
ONLINE
DingtianRelay7920-R1
mqtt:topic:dingtianbroker:DingtianRelay7920:R1
Add Link
Clear
Show non-semantic