Serial large color screen WIFI Tutorial _ V1.0

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1. Scope

This document is for the big prize was linked with all WIFI Serial screen products.

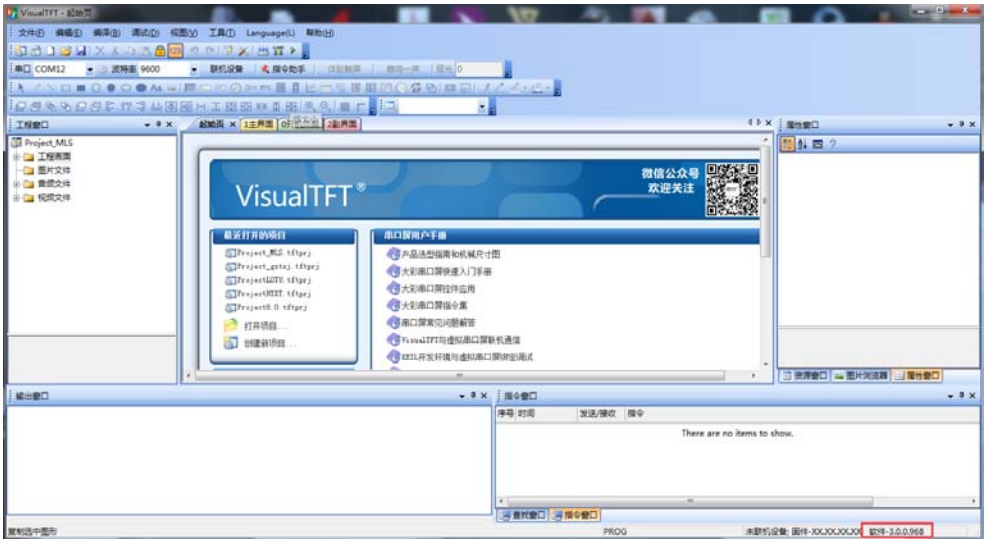
2. Development Environment version

1 . VisualTFT Software version: V3.0.0.944 And above versions. View version:

a) turn on VisualTFT Software start page is shown 2-1 Software version, the upper right corner will display the software version number;

Map 2-1 Software version

b) turn on VisualTFT You can view the map in the lower right corner of the software version of the software 2-2 Software version, the latest version can log http://www.gz-dc.com/ Download.



Map 2-2 Software version

2. Serial screen hardware version: V3.0.287.0 And above versions. View version:

a) Check the version number sticker on the back of the screen;

b) VisualTFT After the success of the online screen, the version number displayed in the lower right corner.

3. Serial screen was linked WIFI Features

Our company was linked serial screen introduces the concept of things, through the screen WIFI Upload module may be implemented to capture screen data serial cloud server; or serial port to receive information on the screen cloud server apparatus to achieve control operation corresponding to completion. At present, with WIFI Function was linked to the serial interface screen used the following three scenarios:

1. use HTTP Protocol for data exchange with the server and file downloads;

2. use FTP Remote protocol update Serial screen works and firmware;

3. Achieve mobile APP Exchange data with the serial screen.

3.1 WIFI Module Overview

Serial screen was linked WIFI The module is Taiwan's Realtek Realtek RTL8188EUS Chip, the chip features:

1. Low power consumption, high linear output power, 150M USB Wireless Interface Module card;

2. meets the IEEE802.11n Standard, compatible IEEE802.11g , IEEE802.11b Standards, providing USB2.0 interface;

3. Support for the latest 64/128 Place WEP Data encryption; Support WPA-PSK / WPA2-PSK, WPA / WPA2 Machine safety system;

WIFI Communication between the module and the server uses TCP / IP Agreement was also linked serial port supports the use of screen-based TCP / IP Communicating data communications protocol FTP protocol, HTTP protocol.

4. how to use HTTP Protocol for data exchange with the server and file downloads

There are examples of projects on the cloud server and the screen serial communication in our company provide reference materials in order to facilitate understanding of the parameter settings for the document mentioned, you can view the document while reading the project configuration assist in understanding the content of the document. Implement cloud servers and serial-screen WIFI Communications need to complete the following four steps:

1. Cloud server structures; (if existing cloud server may skip this step)
2. Serial Configuration screen network parameters;
3. Exchanging data with the server;
4. use HTTP Protocol to download files.

4.1 Build cloud server

Server, also known as the server is to provide computing services equipment. Configuration server includes a processor, hard drive, memory, a system bus, and general computer architecture is similar, but because of the need to provide highly reliable service, thus processing power, stability, reliability, security, scalability, the management of the higher requirements.

This step is more complicated to build a server, if the server does not recommend looking for professional development server development team to save time development projects. Example Project Server this chapter serial screen communicate with the server using a public cloud server.

4.2 Serial Configuration screen network parameters

This step is to configure the serial port screen default network parameters, there are two methods:

1. Configure the serial port parameters screen network engineering;
2. Use script to configure network parameters.

4.2.1. Engineering configure the serial port parameters Screen Network

1. Double-click on map 4-1 Project name in the [Project] window in the right side of the window [Properties] belong to the project will be displayed Sex;

Map 4-1 Project Properties

2. Find the network settings in the properties window, as shown in 4-2 Shown;

Map 4-2 Project Properties

3. [Network Settings] parameter settings:

Network: This argument 4 Modes: Disabled, NIC mode, focus mode, and no network; here select the "card

Mode ", as 4-3 Shown;

a) Disable: Disable WIFI Features;

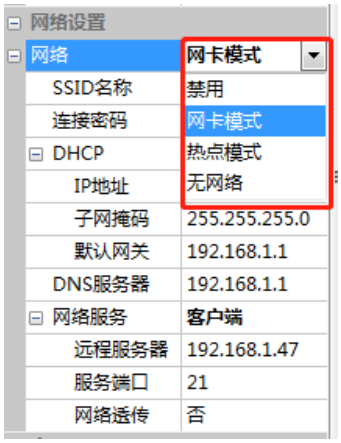
b) NIC mode: the screen can be connected to the serial port WIFI ,parameter SSID Name and password for the serial port on the electrical panel

After the automatic connection WIFI Device name and password;

c) Hot mode: self WiFi Network, waiting for the other devices connected to itself, such as the hot spot on the phone

Like, parameters SSID Name and password for the serial-screen broadcast hotspot name and password;

d) No network : No network function, if the screen has wifi Module will also be disabled.



Map 4-3 Network selection

SSID Name and Password: When you select "card mode", fill in the SSID Name and password for the serial port on the electrical panel After the automatic connection WIFI equipment SSID Name and password; when "hot model", fill in the SSID Screen name and password for the serial port as a hotspot name and password, as 4-4 Shown;

Map 4-4 WIFI account password

DHCP : Dynamic acquisition device IP Address; recommended to select "Enable", as 4-5 Shown;

a) Enable: Serial screen using dynamic IP Address, no need to fill IP Address, subnet mask, default gateway, DNS Server and other parameters directly distributed by the router address IP And other parameters;

b) Prohibition: serial port using static screen IP Need to fill IP Address, subnet mask, default gateway, DNS Server and other parameters.

DHCP After you select Enable, the following 4 Argument can not fill

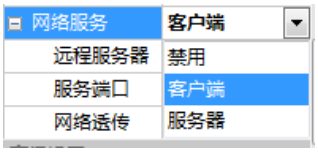
Map 4-5 DHCP

Network services: set the serial port for the client or the server screen, here select the "clients", such as Map 4-6 Shown;

a) Disable: Disable WIFI ;

b) Client: Serial screen as a client can connect to the specified server, you need to fill in a remote service Address (address specified connection server), the server port number (determined by the server), the network selection NO transparent transmission;

c) Server: Serial screen as the server waits for client connections, you need to fill in the server port number, network No transparent transmission network selection.



Map 4-6 Internet service

Remote server: When you select the "client", here need to fill out an access server address, if you choose "service Service is "not here to fill in as 4-7 Fig.

Server port: the server open to the passage connected to the client. Network transparent transmission: After selecting "Yes", the serial data sent from the server to the screen, the screen will be the same serial data send to MCU .

网络服务	客户端
远程服务器	192.168.1.47
服务端口	21
网络透传	否

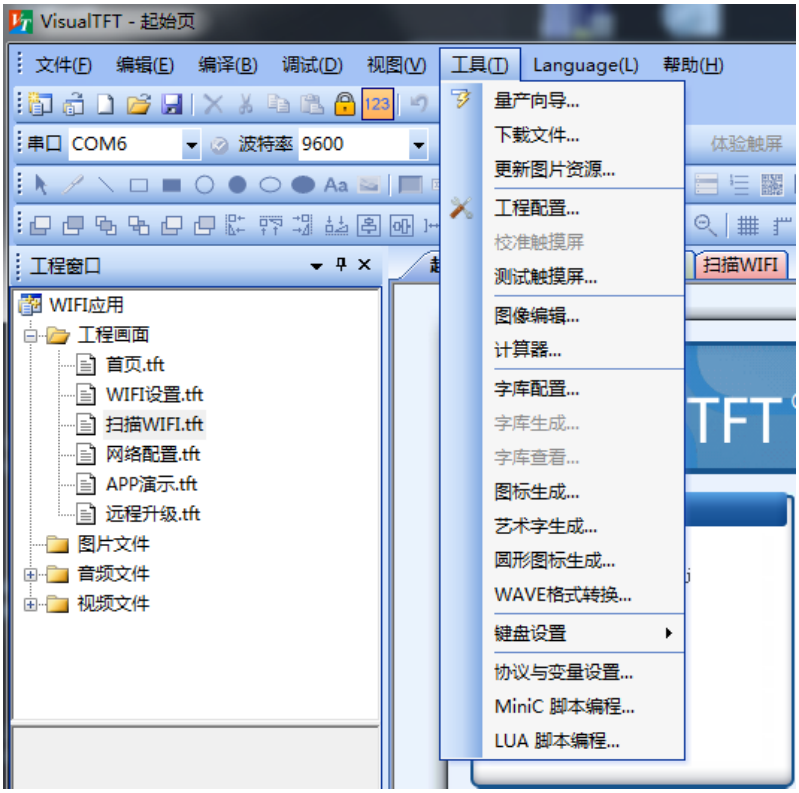
Map 4-7 Internet service

As used in the project only HTTP Agreement and FTP Server communication protocol, just make sure connections WIFI The device can be connected to the network, other parameters may be ignored.

4.2.2 Configure the network parameters using scripts

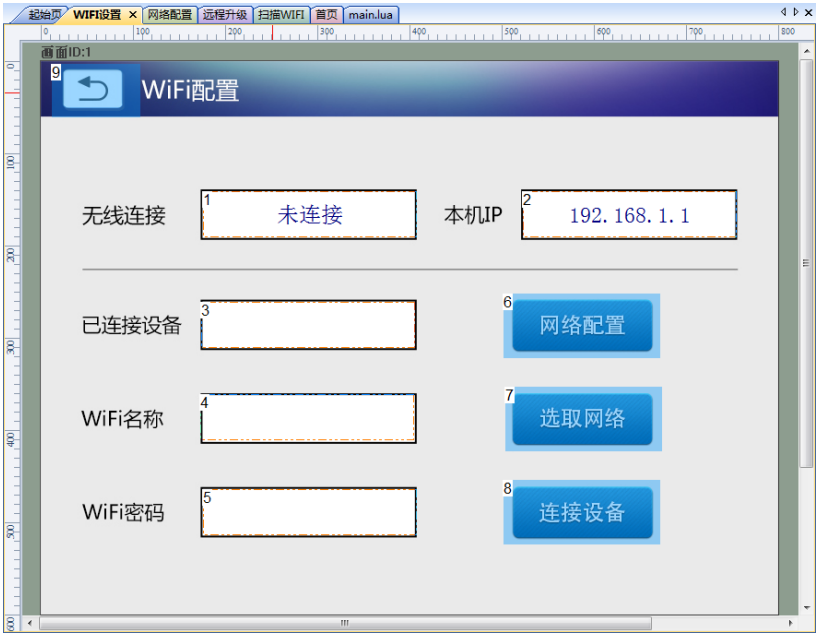
In Software Visual TFT [Tools] menu bar to open LUA Adding scripting program to modify the default network parameters, as 4-8 Shown; hereinafter LUA Procedures used API Interface Function Reference "was linked LUA script API "Documents, where only part of API Parameter as a function of the simple description:

```
--Set the control to display content (string), text control, two-dimensional code control, etc. - screen : Screen ID ; control ; Controls ID ; text :
--The string to be displayed
set_text (screen, control, text)

--Gets the contents of a string (string), text control, two-dimensional code control, etc. - screen : Screen ID ; control : Controls ID
get_text (screen, control)

--Scanning for wireless hotspot, returns the number of hotspots ap_count = scan_ap ()
scan_ap ()

--Access to information designated hotspots ssid, security, quality = get_ap_info (index)          index : Hot index; ssid : Hot name;
security : Encryption; quality :Signal quality
get_ap_info (index)

--dhcp- Enable DHCP , 0 Disable 1 Enabled, disabled back - parameter is valid ipaddr- Static state IP ; netmask- Mask;
gateway- Subnet Mask; dns- Domain name server
    set_network_cfg (dhcp, ipaddr, netmask, gateway, dns)

--Return five parameters described above dhcp, ipaddr, netmask, gateway, dns
    get_network_cfg ()

    --Save the network settings, and then reconnect to the network
    save_network_cfg ()
```



Map 4-8 turn on LUA program

Suggested that in the example project Division I WIFI Settings, Scan WIFI And network configuration of these three pictures directly transplanted to use as a fixed template, modify only the picture style does not change the numbering sequence control, if the picture ID Change, we need to LUA Script corresponding picture ID change. Example Project WIFI Setting screen in FIG. 4-9 Shown;



Map 4-9 WIFI Setting Screen

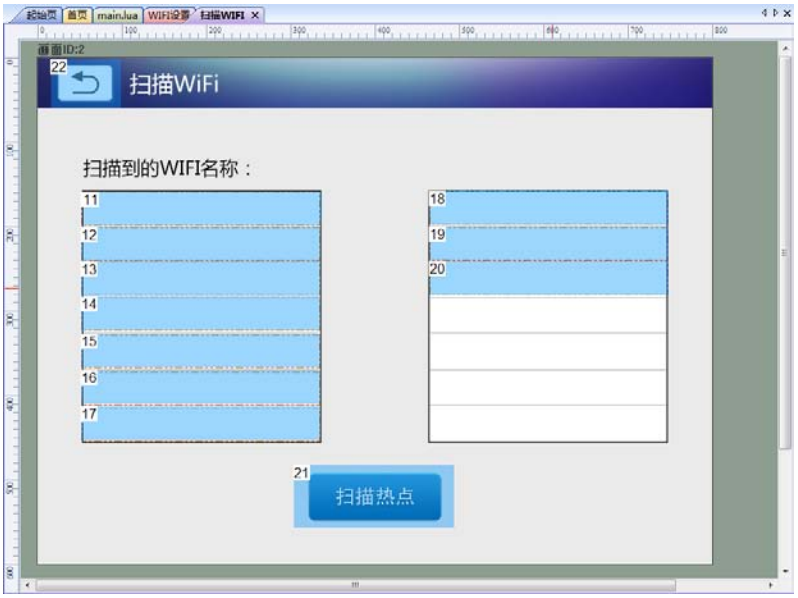
Control Number 4 , 5 Pop-up text box control is set to keyboard input, you can manually enter WIFI The account password, click on the "connected device" call LUA of API function get_text () Obtain WIFI Name and WIFI Password corresponding text

This box content and then call LUA Script set_wifi_cfg () Function modify the default connection WIFI Equipment, engineering LUA

Script:

```
--This function is called by pressing the button, and the screen ID And Controls ID And a control parameter value passed into the function
function on_control_notify (screen, control, value)
    .....
    if screen == 1 and control == 8          and value == 1          --Press the button to connect the device
      then
        ssid = get_text (1,4)                                        --Gets the text box contents
        psw = get_text (1,5) set_wifi_cfg
        (1,0, ssid, psw)                                             --connection WIFI , 1 NIC mode, 0 Automatic Identification Encryption
        save_network_cfg ();                                         --Save Settings
        set_text (1,1, ' connecting...')
      end
  ..... end
```

Click the "Select Network", switch to the scan WIFI Screen in FIG. 4-10 As shown; click "Scan WIFI "After calling LUA Script API function scan_ap () with get_ap_info () Scans available WIFI Equipment, and scan out WIFI Name appears in the list, the script is as follows:



Map 4-10 scanning WIFI

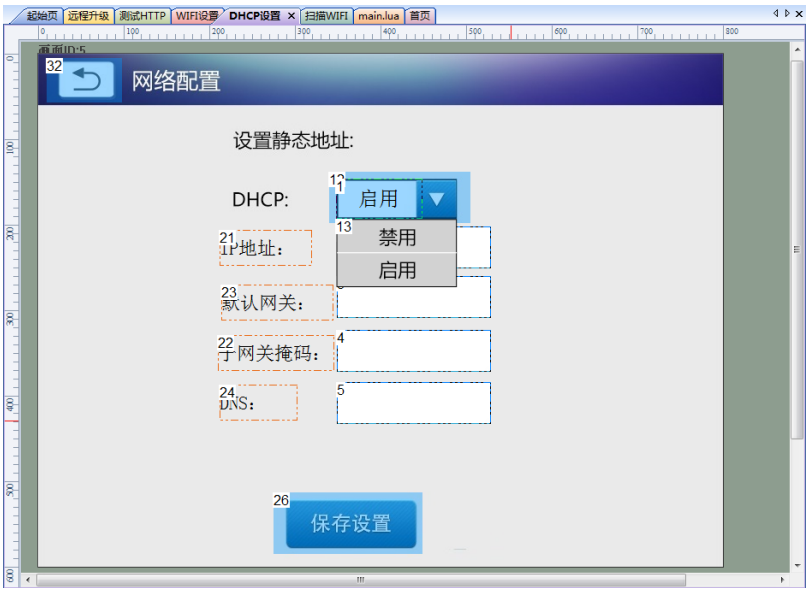
```
--scanning wifi Display
function scan_ap_fill_list ()
    ap_cnt = scan_ap ()                                              --Scan available hotspots
    for i = 1, ap_cnt do
        ssid, security, quality = get_ap_info (i-1)                  --getting information
        set_text (2, i, ssid)                                        --Appears in the list id
    end
    for i = ap_cnt, 10 do
        set_text (2, i, "")                                          --Empty behind
```

```
        end
end
--Control Control
function on_control_notify (screen, control, value)
        --Click Scan hotspot
        if screen == 1 and control == 7 or
            screen == 21 then 2 and control ==

            scan_ap_fill_list () end
    ..... end
```

All scanned WIFI After the device name, device name After selecting one, return to WIFI When you configure the screen will automatically fill selected WIFI Name of the device, enter WIFI Click Password "Connecting device" access to the WIFI Device. LUA Procedures are as follows:

```
--Select Hot
function on_control_notify (screen, control, value)
        .....
        if screen == 2 and control> = 11 and control <= 20 and value == 1 then

            ssid = get_text (2, (control-10))                    --Text control from 1 ~ 10
            set_text (1,4, ssid)                                 --Display selected SSID name
        end
    ..... end
```

Click on WIFI "Network Configuration" switch on the screen to the configuration of the network configuration, FIG. 4-11 Shown; this screen can modify the default configuration of the project DHCP But recommended DHCP Select "Enable"; project to modify the program default network parameters are as follows:



Map 4-11 Modify network parameters

```
function on_screen_change (screen)                                  --We will call this function when switching the screen
    if screen == 3                                                  --Enters the screen of the display default network parameters
    then
        local dhcp, ipaddr, netmask, gateway, dns = get_network_cfg ()   --Serial screen parameters to obtain a network address
        ......
        set_text (3,1, ahcp_n) set_text
        (3,2, ipaddr) set_text (3,3,
        netmask) set_text (3,4,
        gateway) set_text (3,5, dns)
        ......

end
```

Click on "Save Settings" button to save the network parameters, procedures are as follows:

```
function on_control_notify (screen, control, value)                 --Operation control trigger callback function
    if screen == 3 and control == 26 and value == 1                 --Press the Save button
    then
        for i = 1, 9 do
            network_cfg [i] = get_text (3, i)                       --Obtain 1 To 9 Text content control
            ......
        end ......

        --Set the network address parameter
        set_network_cfg (network_cfg [1], network_cfg [2], network_cfg [4], network_cfg [3], network_cfg [5]) save_network_cfg ()
                                                                    --Save the modified information
    end
end
```

4.3 Serial screen to interact with the server data

An example is the use of engineering HTTP Protocol for data exchange with the public server, works used HTTP Agreement

API Function as follows:

```
http_request (taskid,        uri      ,method, content_type, postdata)   send HTTP Requests to the server
taskid : Request task number, any set
uri :                Resource Path
method : method, 0GET , 1POST
The following parameters POST The method requires only
content_type : Types such as application / json, xml, text Wait
postdata : POST data
on_http_response (taskid, response)          HTTP response
taskid : Response task number, and http_request match
response : Response Data
```

Project server to communicate with the screen configuration shown in Figure 4-12 As shown; click on "Send HTTP-GET "Button calls API function http_request () After the server request information, receives the information returned by the server in response to the serial call screen will on_http_response () Processing information returned by the server, and the server information processing server returns the requested information engineering procedures are as follows:

Map 4-12 Get the server information

```
--Request transmission button is pressed
function on_control_notify (screen, control, value)
        if screen == 3 and control == 20 and value == 1 then
         --Obtain public entrance IP address
         http_request (1000, 'http: //ip.taobao.com/service/getIpInfo.php ip = myip?', 0) set_text (3,21, 'wait
    http response ...') end end



--Callback system http response,
function on_http_response (taskid, resp)
    set_text (3,21, resp)                          -- Response information is displayed on the text control
    local jsdata = cjson.decode (resp)             --Parse the returned json package
    local region = jsdata [ 'data'] [ 'region'] local city =
    jsdata [ 'data'] [ 'city'] set_text (3,22, region .. '/' ..
    city)
    --return- 1 When, in response to the user data is sent through the serial port MCU
    return -1
end
```

4.4 An updated pictures or a video from the cloud

Was linked using serial screen provides HTTP Agreement API Function call HTTP Protocol to download files API Remote update function can be a picture, a video or download a firmware package to the serial screen. HTTP Agreement API

Function Parameters:

```
http_download (taskid, uri, savepath)                  use HTTP Download files
taskid : Request task number, any set
uri : Resource Path
savepath : Storage location, you need to specify the file name Such as downloading named pic1.jpg File storage b Should fill the lower zone b: /pic1.jpg
on_http_download (taskid, status)                      Download the response
```

taskid : Response task number, and http_download match

status : Download Status: 0 download failed, 1 Download success but failure to store, 2 Download and store success

Implementation process of downloading files can remotely update the reference sample project, the screen shown in remote update 4-13 As shown; click on the "picture update 1 "Button calls LUA Script http_download () Function after the download is complete serial screen calls on_http_download () Feedback download information, sample project LUA Procedures are as follows:

Map 4-13 Remote Update

```
function on_control_notify (screen, control, value) if screen == 4
  and control == 1                                    -- use HTTP Protocol to download files from the server
                then
                        http_download (1, 'http: //www.gz-dc.com/download/tuku/pic1.jpg',u_dir .. "pic1.jpg") set_value (4,4,0) end
                ..... end



function on_http_download (taskid, status)
        if taskid == 1 then
                if status == 0 then
                        set_value (4,4,1)
                elseif status == 1 then
                        set_value (4,4,2)
                elseif status == 2 then
                        set_value (4,4,3) end
        end ..... end
```

5. how to use FTP Protocol for remote engineering and firmware update Serial screen

Things screen supports the use of serial type FTP Protocol engineering and firmware updates online. by FTP The server DCIOT.PKG After the file is downloaded to the screen serial, serial screen will automatically extract the updated content compression bag. Specific steps are as follows:

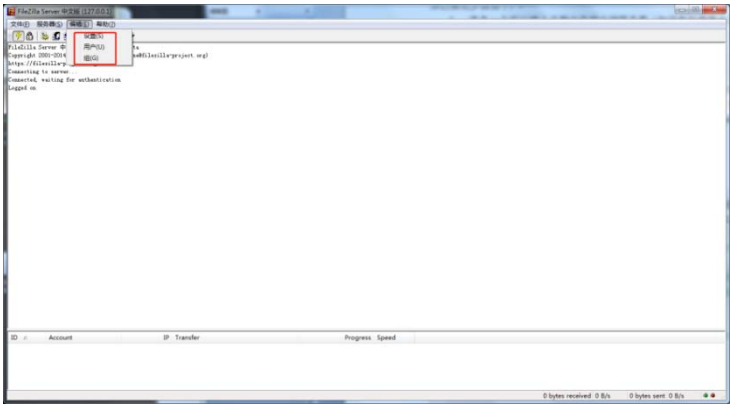
1. will DCIOT.PKG Files in FTP Server (if no server is required to build their own);

2. transfer API Interface functions from FTP Server download PKG file.

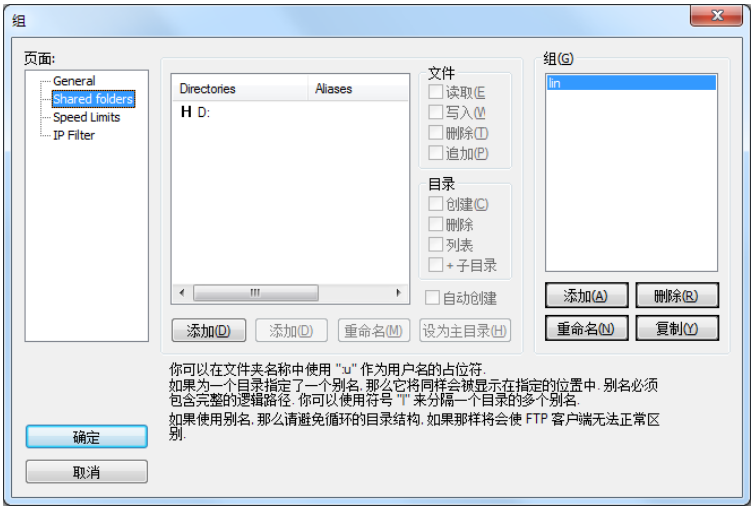
5.1 Build server

If the server is not required for this step. This example used FTP Server is to use free and open source software FileZillaFTP Structures, as 5-1 Shown; After installing the software, and then run FileZilla ServerInterface.exe get on FTP Users and permissions configuration, as shown in 5-2

Fig.



Map 5-1 Set to build FTP Local Server



Map 5-2 Set Server Directory

Once configured, in WINDOWS Enter Explorer ftp: // The machine IP Address, if you can connect FTP Server, it means the configuration is successful.

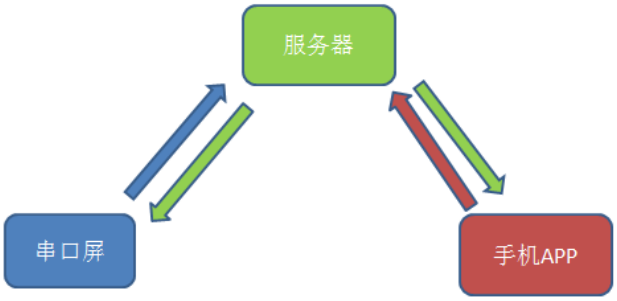
5.2 Remote Update

transfer LUA script API start_upgrade () Download Function PKG package, API Function Description:

```
-- start_upgrade Function can only download DCIOT file
start_upgrade ( 'ftp://192.168.0.2/DCIOT.PKG')                    --Anonymous login without a password service
-- start_upgrade ( 'FTP: // username: password@192.168.1.47 /ftp/DCIOT.PKG') - Require a logon password server
```

6. How to implement phone APP Exchanging data with the serial screen

Cellular phone APP Communication between the screen and the need for serial data transfer passes through the cloud server, can be understood as the serial screen first upload the collected data to the cloud server, cloud server and then synchronize the data to your phone APP In; or mobile phone APP The first operation command is sent to the cloud server, then the corresponding operating device to the serial transmission by the server screen. Diagram in FIG. 6-1 Shown;



Map 6-1 relation chart

Specific steps are as follows:

1. Build servers and mobile phones APP ;

2. Serial configuration screen network parameters; (cf. 4.2 Chapters)

3. Serial data exchange with the server screen; (cf. 4.3 Chapters)

4. Server and mobile phone APP Data exchange. (If the company is no such experiences, we recommend consulting a professional development group team)

Build servers and mobile phones APP They are more complex project, if the company does not have server APP Developers recommend looking for professional development team, this can speed up the development progress, or the use of third-party server and mobile platforms APP Provide in our routine that uses wit and resourcefulness cloud server cloud APP Engineering data demonstrate that interacts with the serial screen.

6.1 Serial screen with wit cloud server, cloud wit APP communication

Serial screen with wit cloud server, cloud wit APP Implement remote data exchange step is carried out as follows:

1. Setting parameters wit cloud server device;

2. Wit cloud APP Configuration;

3. Serial Configuration screen works;

4. LUA Scripting send and receive data.

6.1.1. Witty sense of the term cloud parameters defined

Here wit cloud configuration of some parameters of the more important parameters of a simple explanation to facilitate the understanding of the document reading process parameters:

Productkey : The access device is an important parameter cloud wit, the basic meaning of this parameter is: a device identification code. For example, a company air conditioners, heaters, air conditioners and water heaters are different models of devices, access the company equipment wit cloud, at least two Productkey parameter.

Product Secret : Product key, generated Productkey When a cloud will generate a corresponding Product Secret This parameter is critical parameters confidential and can not be disclosed to third parties.

DID : Device number, the primary device when access to wit a cloud, cloud automatically in accordance wit ProductKey And equipment Wi-Fi Module MAC A registered address for this device did , With a user operation and subsequent binding .

AppID : Application code, when the developer needs is a smart product development applications (including iOS , Android , Web Application, etc.), the background will automatically generate a AppID And to be associated with this device. This time need to fill in application development AppID .

App Secret : Application key, generated in the cloud AppID When generated will correspond to a App Secret The parameter APP end SDK Registered phone users get SMS verification code will be used when.

Data points: witty cloud data point is a set of communications protocols used functions and parameters describe items of equipment.

6.1.2. Setting device parameters wit cloud server

Set wit cloud server device parameters, complete the following in tact cloud official website 3 step:

1. Sign up for a developer account;

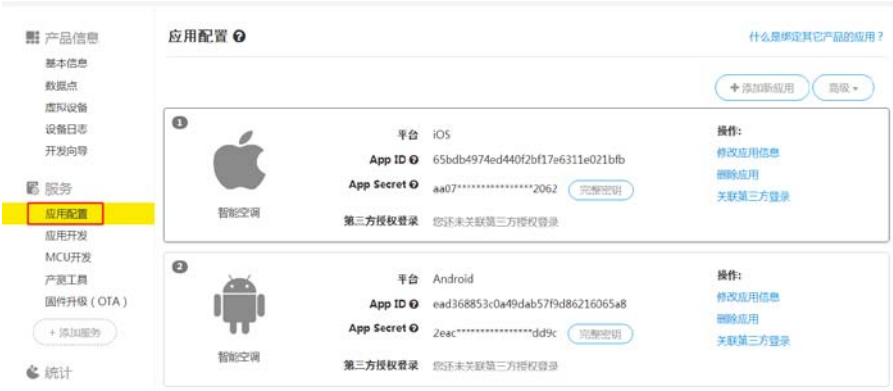
2. Creating a development project;

3. Point setting data items of equipment, as shown in 6-2 Fig. Click this link " independent MCU Program access cloud wit "Wit can enter the cloud server engineering parameters set in the introduction.

Map 6-2 Add Device data points

6.1.3 Wit cloud APP Configuration

Data point to define the device after click application configuration, and add Andrews IOS Application configuration, FIG. 6-3 Shown; if desired cloud wit APP Secondary development based on the source code, such as changing to a more aesthetically pleasing interface, added more features and so on, click application development, wit cloud will automatically generate the corresponding product according to your definition of data points App Source code, then download the generated field development. (See instructions wit cloud official website " App Development and preparation guide "Documents)



Map 6-3 Add Application

6.1.4 Serial Configuration screen works

The serial port configuration screen picture with wit cloud APP The control screen similar to the configuration shown in Figure engineering 6-4 Shown, wit cloud APP UI As shown in the picture 6-5 Shown;

Map 6-4 Project Configuration

Map 6-5 APP Control screen

6.1.5 LUA Scripting send and receive data

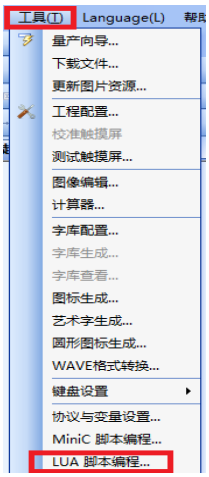
After completion of the above steps, downloading wit cloud generating apparatus according to the parameter "cloud independently wit MCU Program access

Communication protocol document "Serial screen according to the agreement with the wit cloud communications, as 6-6 Shown;

Map 6-6 Protocol

Wit cloud tutorial " MCU Development "This step of the source code has been transplanted into the serial screen, just add our offer in engineering LUA script API Function configures the serial ports associated wit cloud screen, and the screen and addition processing serial wit cloud cloud communication protocol according to wit APP The upper and lower data transfer scripts that interact to open the [Tools] in the sample project

LUA Programming, as 6-7 Shown; wit Serial screen and cloud APP The use of interactive LUA Procedures are as follows:



Map 6-7 LUA program

1. Wit cloud configuration parameters: call API Function gagent_get_info (), The procedure is as follows:

```
--Generally only need to change the product key
function gagent_get_info ()
    product_key = '1cc8b199a4c14a5f957e033'                    --Product Key
    protocol_ver = '00000001' p0_ver
                    = '00000002'
    hard_ver          = '00000003'
    soft_ver          = '00000004'
    return product_key, protocol_ver, p0_ver, hard_ver, soft_ver end
```

2. transfer API function gagent_get_bind_url () Get wit cloud dimensional code binding link and screen with two serial ports

Control-dimensional code is displayed, as shown in 6-8 Shown;

Map 6-8 Display two-dimensional code

LUA Script as follows:

```
--Set two-dimensional code to bind wit cloud URL
if screen == 20
then
        bind_url = gagent_get_bind_url ()                    --Acquiring two-dimensional code
        set_text (20,17, bind_url)                           --Set two-dimensional code
end
```

3. WIFI Once connected to the switching APP Presentation screen, using a mobile phone wit cloud APP Scan the QR code to bind the serial screen, in APP Control screen after pressing the first button, APP After receiving the screen data to the serial port, the serial port through the lower screen data sent from the server calls the function button is pressed update_cloud_ui () Set up APP Example of the screen corresponding to the button is pressed, the upper and lower handles data transmission as follows:

```
......
--Cloud Server Control " APP Examples of "controls
function update_cloud_ui ()
        local status = dev_status [0] * 256 + dev_status [1]          --Acquisition value
        switch = (status & 0x0001) switch_plasma = (status
         & 0x0002) led_air_quality = (status & 0x0004)
         child_security_lock = (status & 0x0008)
         wind_velocity = (status & 0x0030) >> 4
         air_sensitivity = (status & 0x01C0) >> 6

         --Control Control
         set_value (20,1, switch)                            --Settings button switch
         set_value (20,2, switch_plasma)                     --Plasma switch disposed
         set_value (20,3, led_air_quality)                   --Air Quality Settings button
         set_value (20,4, child_security_lock)               --Settings button child lock switch
         set_value (20,10, wind_velocity) .....

         temprature = dev_status [4] * 255 + dev_status [5]   --Settings button
         temprature = temprature / 10.0
         set_value (20,6, temprature) .....

         countdown_off_min = dev_status [6] * 256 + dev_status [7]
```

```
        set_value (20,16, countdown_off_min) end .....



--Serial screen control cloud " app Examples of "controls
function on_conctrol_notify_cloud (screen, control, value)
        local notify = 0 local
        status_mask = 0 local
        status_value = 0
        --Set switch position
        -- When the value of the button changes to 1 , The corresponding position 1 ; 0 When set 0 ; Retention value of the other bits
        if control> = 1 and control <= 4 then

            status_mask = 1 << (control-1) if
            value> 0 then

                status_value = status_mask end
         ..... if notify> 0 then




            gagent_send_status (4)                                                    --send
        end
end
-- MCU Control cloud, upload data
function gagent_wifi_ctrl_mcu (packet)
       .....
end
```

The above procedure is taken in part a function of the source program, the program needs detailed reference source file, API Parameter Description Function and function description refer to the "object linking LUA script API "Technical documentation.

6.2 Operation example process

Download the project to the real screen, run screen connected to the serial port WIFI , Click " APP Presentation ", enter the interface, as 6-9 Shown;

Map 6-9 APP Presentation screen

Mobile Download "wit cloud" APP And then open APP Sign up wit a cloud account; click APP Upper left corner of the "My Devices" Scan APP Two-dimensional code to bind the serial presentation screen screen, as 6-10 Shown;

Map 6-10 Scanning equipment

After binding is successful, enter APP Control interface, as shown in 6-11 Shown;

Map 6-11 APP Control Interface

Press APP Screen "switch", after receiving the screen serial data sent by the server APP Exemplary screen "switch" is pressed, as shown in 6-12 And 6-13 Fig.

Map 6-12 operating APP

Map 6-13 Serial screen images simultaneously

6.3 You can quickly understand the link below cloud wit

http://docs.gizwits.com/zh-cn/quickstart/README.html	Getting Started tutorial wit cloud.
http://docs.gizwits.com/zh-cn/overview/overview.html	Overview wit cloud platform.

7. Disclaimer

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