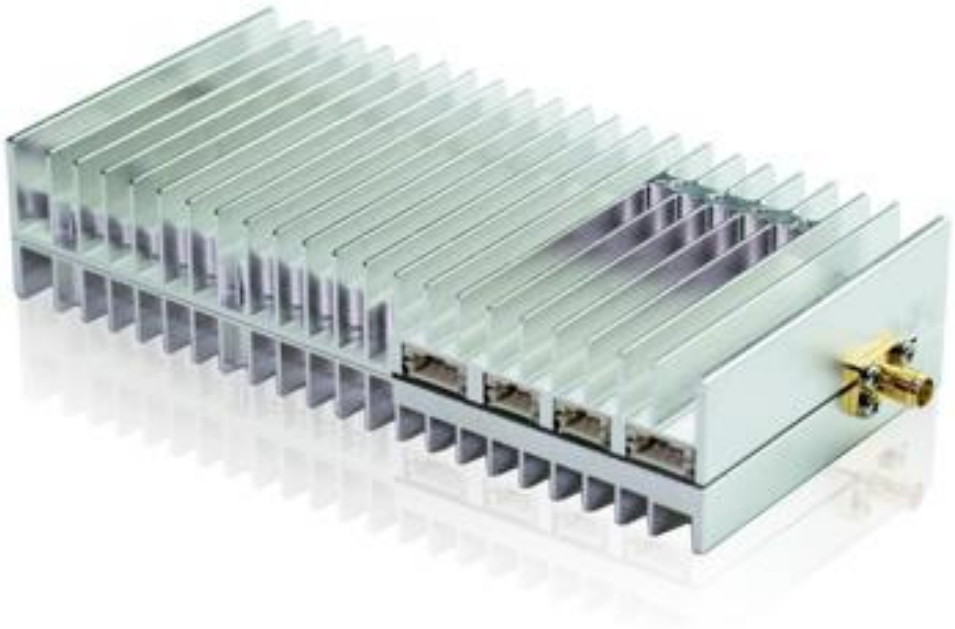
User Manual of FDM-615PTM

100km-150km 2*2 MIMO and PtMP Drone HD Video Downlink



Catalogue

The Central Node IP: 192.168.1.3

The Access Node 2 IP: 192.168.1.2

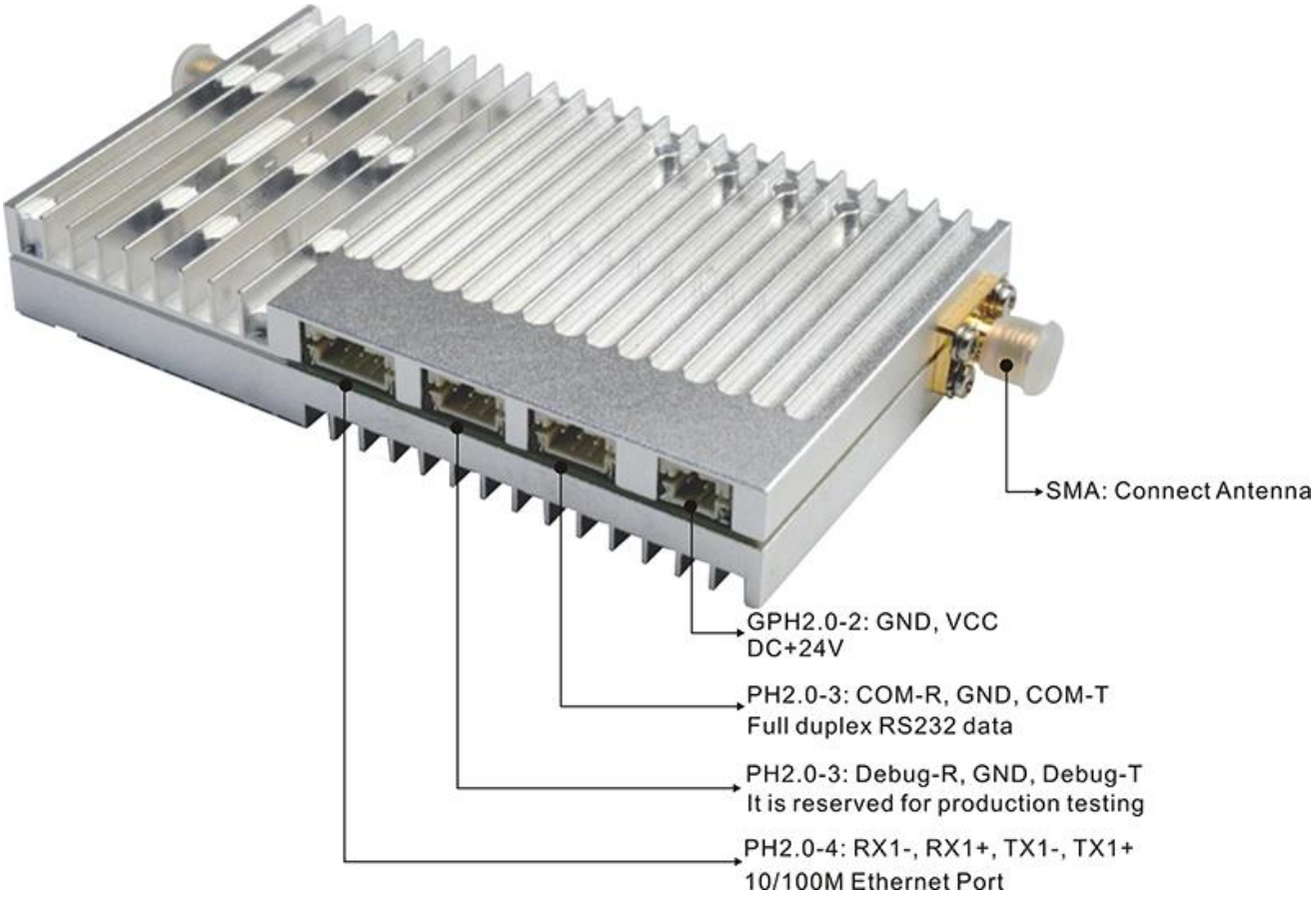
The Access Node 1 IP: 192.168.1.4

Install the access node on drone

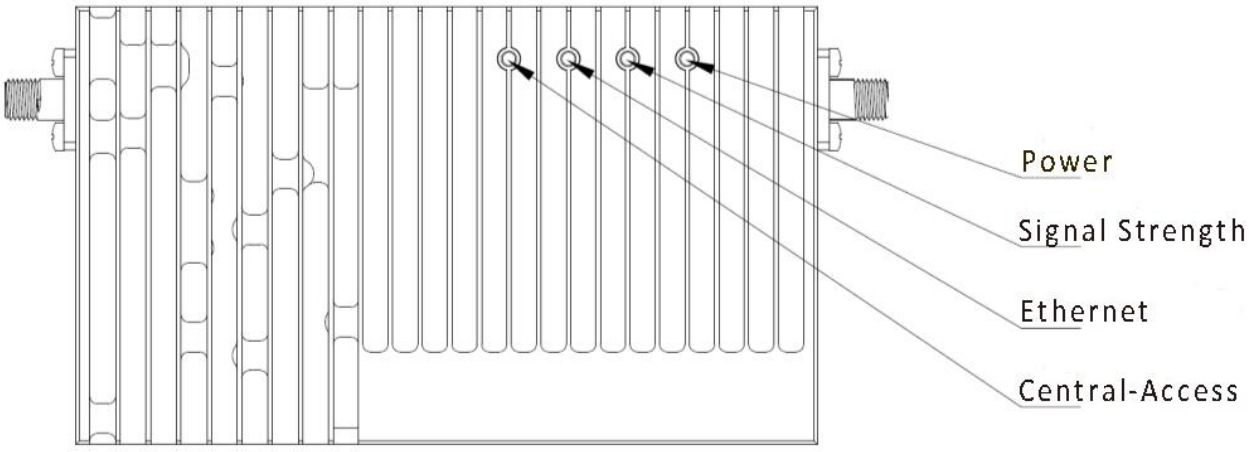
Install the central node on ground

1. Hardware

1.1. Interface



1.2. Indicator



Central-Access Indicator:
The indicator will be bright (central node).
The indicator will blink (Access node).
Ethernet Indicator
After power on, it will be fast blink for self-check. When it works normally, it will blink according to the data stream.
Signal Strength Indicator
The color of the indicator Green→Yellow→Red→Off
The change in color from green to red indicates that the signal strength goes from strong to weak. When the light is off, which means the connection is lost.
Power Indicator
The indicator will be bright after powering on it

1.3. Notice

- Please install the antennas firstly before powering on. Or the device will be burn out.
- For short-distance test, distance between two units should be more than 10meters before powering on. Otherwise, the equipment may be damaged.
- The power input should be at least +24V/1.5A. Or the distance will be affected.
- We suggest you to use IE browser (version 11) for Web login.

2. Software

2.1. WebUI Operation

- WebUI interface operation is mainly to manually select the corresponding parameters or input relevant parameters, configure the nodes, and return the configuration status displayed on the UI interface.
- The initial IP address is: http://192.168.1.XX
- The initial user name and password are
  User name: admin123
  Password: admin123
- Administrator login user name and password(password and user name changing is not supported)
  Administrator username: admin123
  Administrator password: admin123
- After registering and changing the password, it will automatically log in and jump to the index page.
- Registration function: directly enter the user name and password, the original account will be

overwritten.

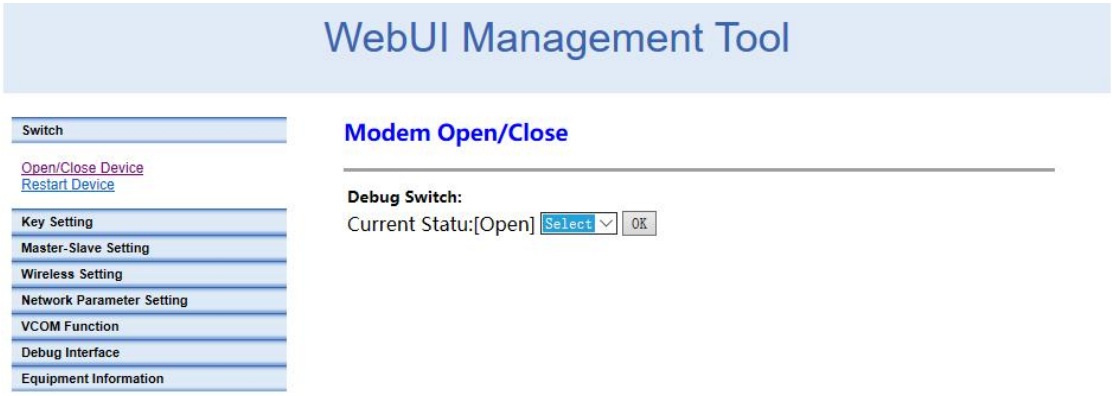
- After the factory settings are restored, the account and password are restored to their initial values.
- "Login", "Registration", "Modify Password" need to configure the IE browser, tools-options-Internet options-security settings-enable ActiveX controls and plug-ins.

Note: Administrator login does not require the above steps.

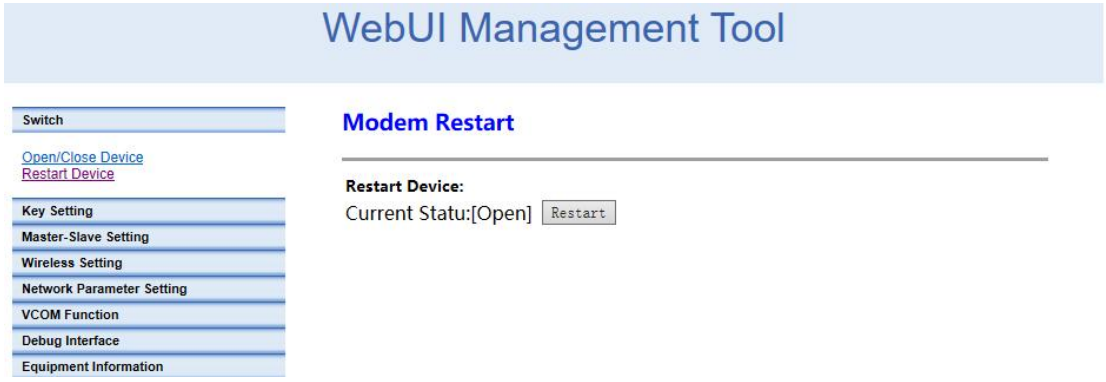
- Add the local and remote IP addresses of WebUI as trusted sites.
- The user name is 6-20 characters composed of letters and numbers, and the first character must be a letter.

2.1.1. Home Page Debugging Switch

Modem switch setting: on/off

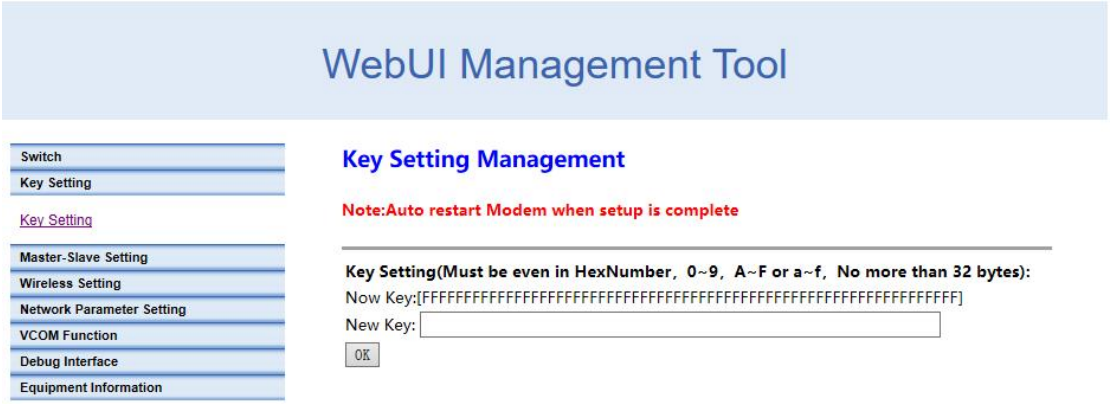


Modem Restart Setting



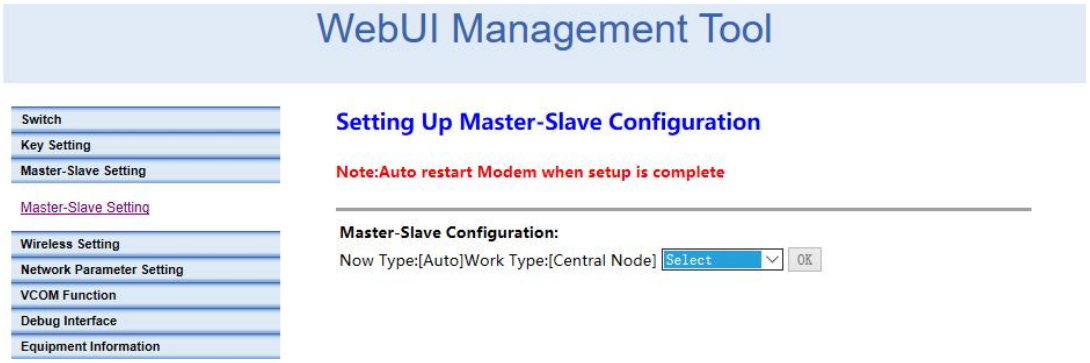
2.1.2.Key Setting

Before networking, each node need to enter into the key



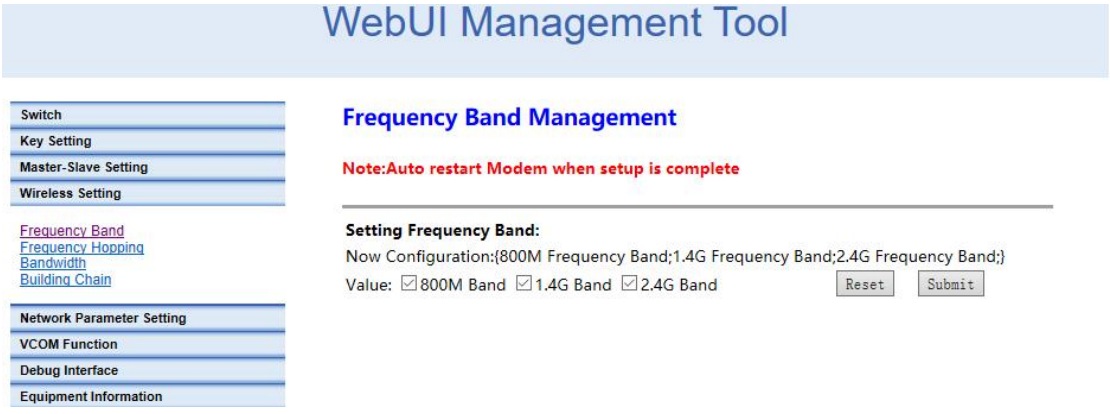
2.1.3.Master-slave Setting

In the same network, only one central node is allowed, and the others are all access nodes.



2.1.4. Wireless Setting

Set the frequency band



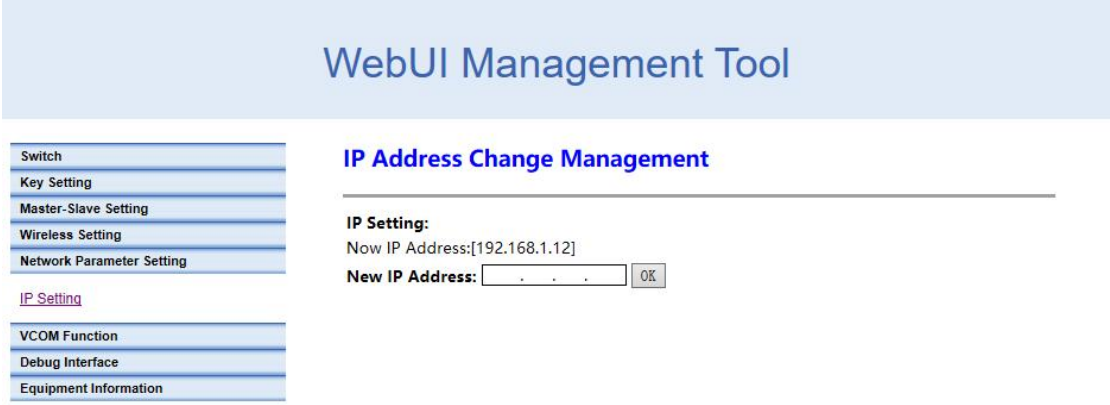
Frequency Hopping Management

Bandwidth

Building Chain Management: Input the frequency point and bandwidth.

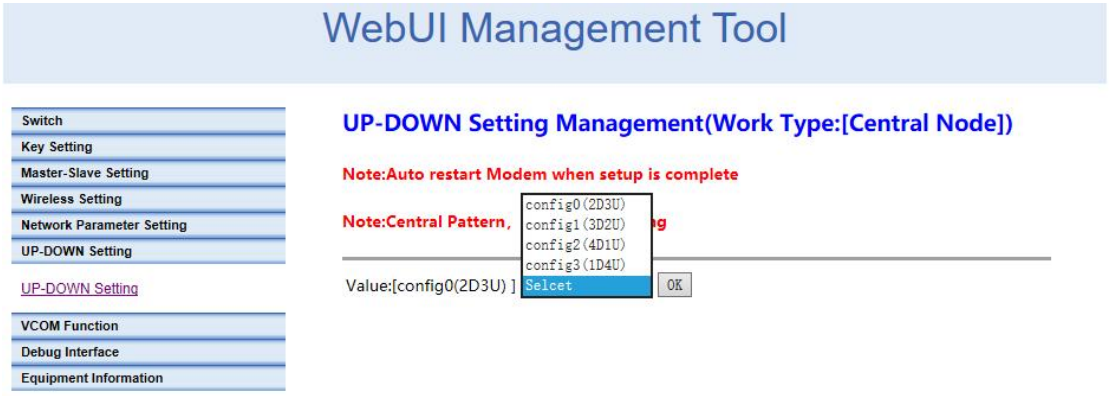
2.1.5.Network Parameter Setting

Set IP address of the node. The initial IP address is http://192.168.1.XX



2.1.6.Uplink and Downlink Setting

Four uplink and downlink modes:
config0(2D3U)
config1(3D2U)
config2(4D1U)
config3(1D4U)
D=DOWN, U=UP
Note: Only the central node can modify the uplink and downlink settings, and the device needs to be restarted to take effect after the setting is successful.

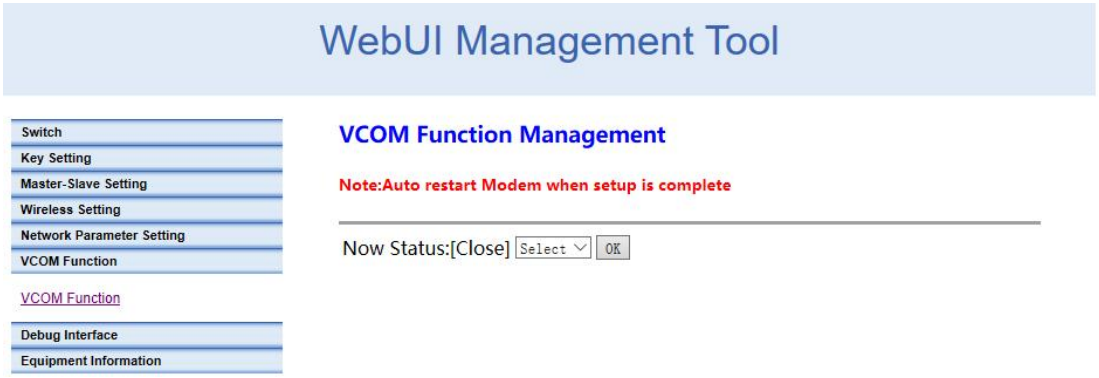


- There is no need to manually change the access node's configuration. Becasue the access node will automatically change its configuration according to the central node and obtain the new configuration after it access to the network.
- When the master node is configured with different bandwidths and different subframes,

the actual downlink bandwidth is as follows(The data is laboratory test data)

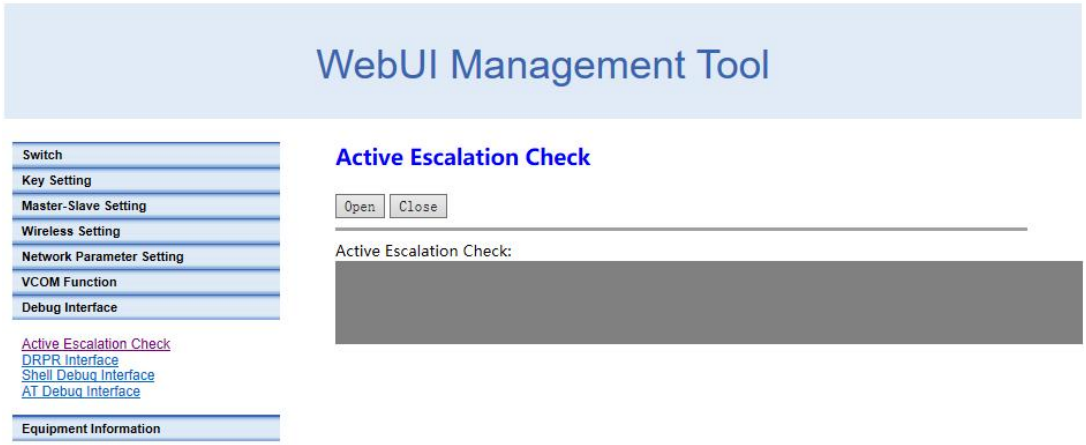
Bandwith(MHz)	D/U	Data Rate(Mbps)			
		0	1	2	3
1.4	UL	1.675586	1.092773	0.546386	2.294824
	DL	0.752198	1.385009	2.053467	0.236768
3	UL	4.775196	3.114257	1.557129	6.539941
	DL	2.70205	4.487988	6.385547	1.45332
5	UL	8.571094	5.589844	2.794922	11.73867
	DL	4.85376	7.94751	11.23462	2.608594
10	UL	17.80254	11.61035	5.805176	24.38174
	DL	10.83633	17.02852	23.60772	5.418164
20	UL	27.47871	17.9209	8.96045	37.63389
	DL	16.72617	26.28398	36.43916	8.363086

2.1.7.VCOM

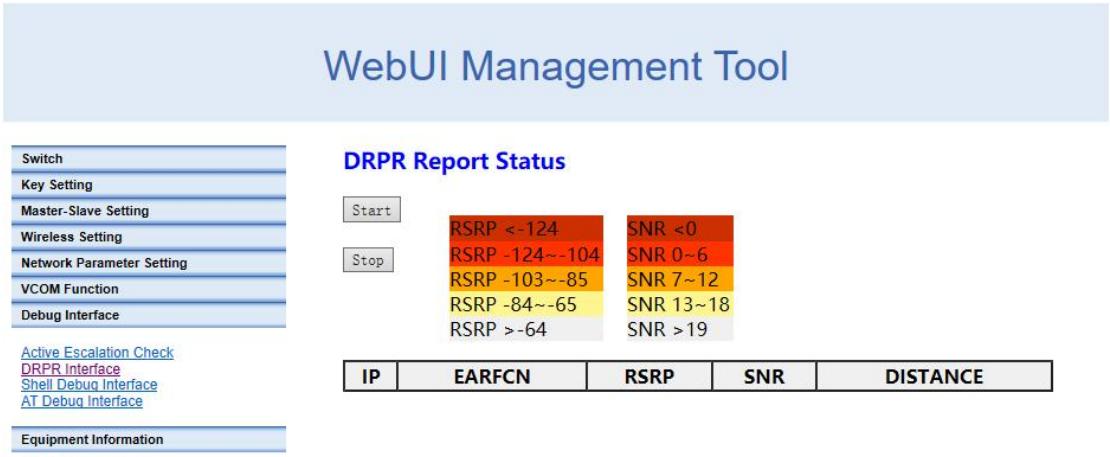


2.1.8.Debug Interface

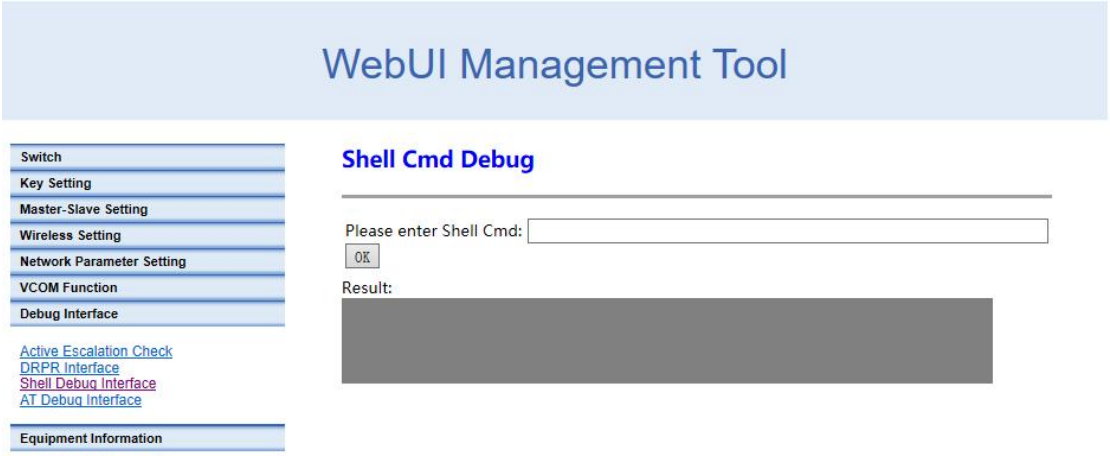
Actively report information such as IP address, signal strength, RSRP, etc.



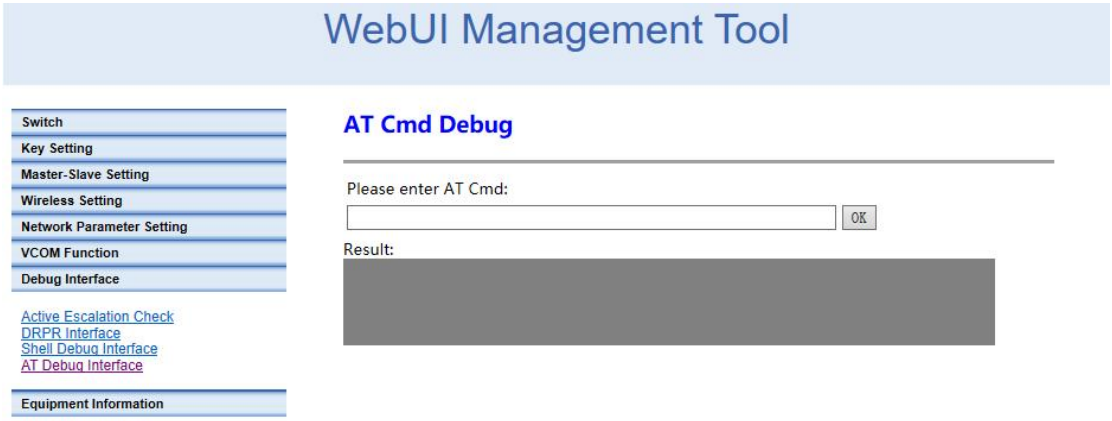
DRPR Report



Shell debugging interface, which can execute the shell commands.



AT debug interface



2.1.9.Device Information

Show the version information of the device

3.AT Commands Supported by WebUI

3.1.Command Set Supported by AT Debug Interface

WebUI supports the following AP side AT commands

"AT+CFUN"
"AT^LCMFUN"
"AT^DTSET"
"AT^NETIFCFG"
"AT^DGMR"
"AT^DFGMR"
"AT^RCVR"
"AT^DAMR"
"AT^POWERCTL"

"AT^CAMERATL"
"AT^RMTCTL"
"AT^ELFUN"
"AT^ELCH"
"AT^ELCFGUL"
"AT^RECOVSET"
"AT^APLFUN"
"AT^VCOMFUN"
"AT^DHCPSET"
"AT^DHDRSET"

3.2.Explanation of AT Command in WebUI

Explanation of AT Command in WebUI

Menu	Commands	X Value		Remark	Prompt
Debug Switch	at+cfun=	0 or 1	Single Selection		Success or Failure
Key Setting	at+cfun=0 at^dapi="X" at+cfun=1 Rule: For commands that can only be issued in the shutdown state, the combined command mode must be used	"must be even number"	Must be hexadecimal, i.e. 0~9, A~F or A~F, and must not exceed 64 characters, i.e. 32 bytes. It has to be even. Add auxiliary instructions and set limits	It can only be set after soft shutdown	Success or Failure
Master-Slave Setting	at+cfun=0 at^ddtc=X at+cfun=1 Rule: for the instruction which can only be sent in the shutdown state, the combined instruction mode must be adopted	1 or 2 or 0 can only be displayed (1 is the main, 2 is the slave)	The single setting can only be 1/2, but it can display 0 (X can also be 0 to indicate that the boot is of automatic type).	It can only be set after soft shutdown	Success or Failure
Frequency band setting	at^daocndi=X at+cfun=0 at+cfun=1 Prompt needs to be issued after a soft restart	01 or 04 or 08	multiple choice	It can take effect only after soft switch	Success or Failure

IP address Setting	at^netifcfg=2,"X.X.X.X"	Comply with IP address regulations	X is a space to manually enter any number		Success or Failure
Bandwidth settings	at^drps=,X,	0 or 1 or 2 or 3 or 5	Single Selection	Local settings	Success or Failure
Bandwidth settings	at^drpc=,X,	0 or 1 or 2 or 3 or 5	Single Selection	Chain group settings	Success or Failure
Power setting	at^drpc=,,"X"	-40 to +40	Manually input values in the range	Chain group settings	Success or Failure
Frequency setting	at^drpc=X,,	Frequency point (bandwidth value range, 24015~24814, 8060~8259, 14279~14478)	Manually input the frequency point number	Chain group settings	Success or Failure
Query version	AT^DGMR?		Query the whole system version number		Displays the whole system version number
	AT^DCMR=17		Query the physical layer version number		Displays the physical layer version number
	AT^DCMR=18		Query the high-level version number		Displays the high-level version number

VCOM	at^vcomfun=X	0 or 1	Single Selection 1: vcom open 0: vcom close		Success or failure prompt to power off and restart to take effect
Frequency hopping setting (master end setting)	AT^DFHC=X at+cfun=0 a+cfun=1 Prompt needs to be issued after a soft restart	0 or 1 （0: close ，1: on）	Single Selection		Success or Failure

4.Case

4.1.Configuration

- Power on the FDM-615PTM and connect it with PC.

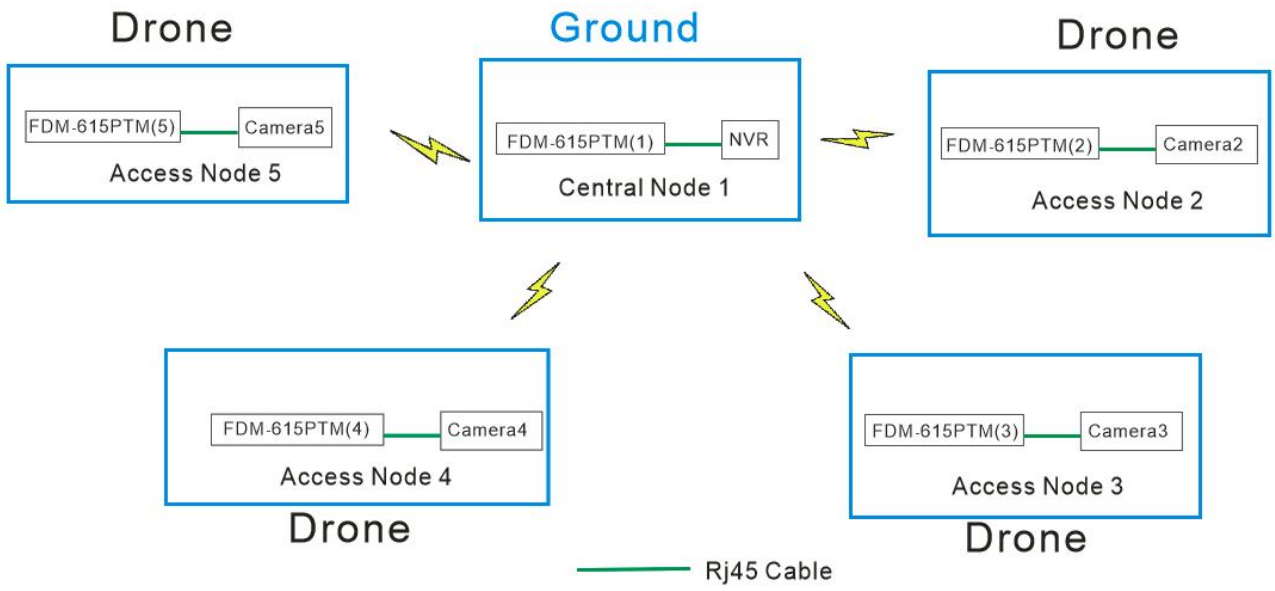
Default IP Address:
Center node:192.168.1.3/24
Access node:192.168.1.2/24
Access node:192.168.1.4/24

- Set the computer IP wtih same network segment address. Such as 192.168.1.99/255.255.255.0
- Visit device default IP via IE browser(version 11) and input the user name and password. Then you can configure the device per your requirement.

4.2.Monitor the video from the PC

- Set the PC IP address with 192.168.1.99
- IP Camera's IP address:192.168.1.21
- Visit http://192.168.1.21 and input the IP camera user name and password.

4.3. Visit the IP Camera via NVR



Access Node 2----CAMERA2
IP Address: 170.218.2.21
Subnet Mask: 255.0.0.0
Gateway: 170.18.15.6(NVR IP Address)

Access Node 3----CAMERA3

IP Address: 170.218.2.22

Subnet Mask: 255.0.0.0

Gateway: 170.18.15.6(NVR IP Address)

Access Node 4----CAMERA4

IP Address: 170.218.2.23

Subnet Mask: 255.0.0.0

Gateway: 170.18.15.6(NVR IP Address)

Access Node5----CAMERA5

IP Address: 170.218.2.24

Subnet Mask: 255.0.0.0

Gateway: 170.18.15.6(NVR IP Address)

NVR

IP Address: 170.18.15.6

Subnet Mask: 255.0.0.0

Gateway: 170.18.15.1

Note: Since NVR can automatically send ARP packets, so it can be set with different subnet network with FDM-615PTM.

Notice: FDM-615PTM defaults 2-layer routing and forwarding. If there is no IP conflicts, you can use the default gateway and IP.

If you want to change the gateway and IP, please update the IP on WebUI, and then restart it.