



# Wisnetworks System Configuration Manual

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## Applicable Models

WIS-Q	Wireless CPE
WIS-L	Wireless Carrier Grade
WIS-S	Wireless Base Station
WIS-D	Wireless Dish Radio
WIS-G	Wireless Grid Radio
WIS-CM	Wireless Ceiling AP
WIS-WM	Wireless In-wall AP

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# Chapter 1

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## Hardware Configuration

- Connection Step
- Local Networking Setting

# 1. Hardware Connection

## 1.1 Connect with PoE Adapter

All Wisnetworks products are powered by PoE (Power over Ethernet). The connecting diagram showed below (here using a CPE WIS-Q2300 as example)

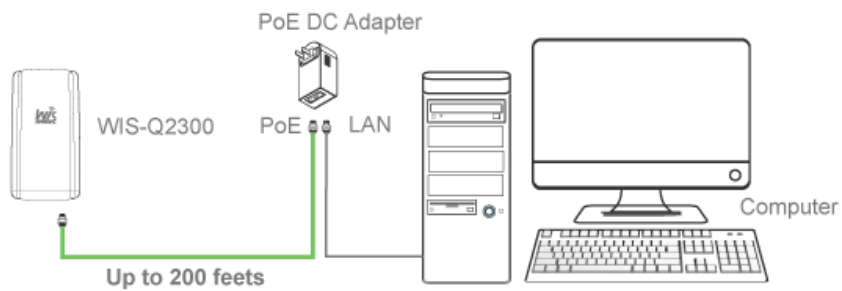


Figure 1-1 Diagram for hardware connection

The connection step is

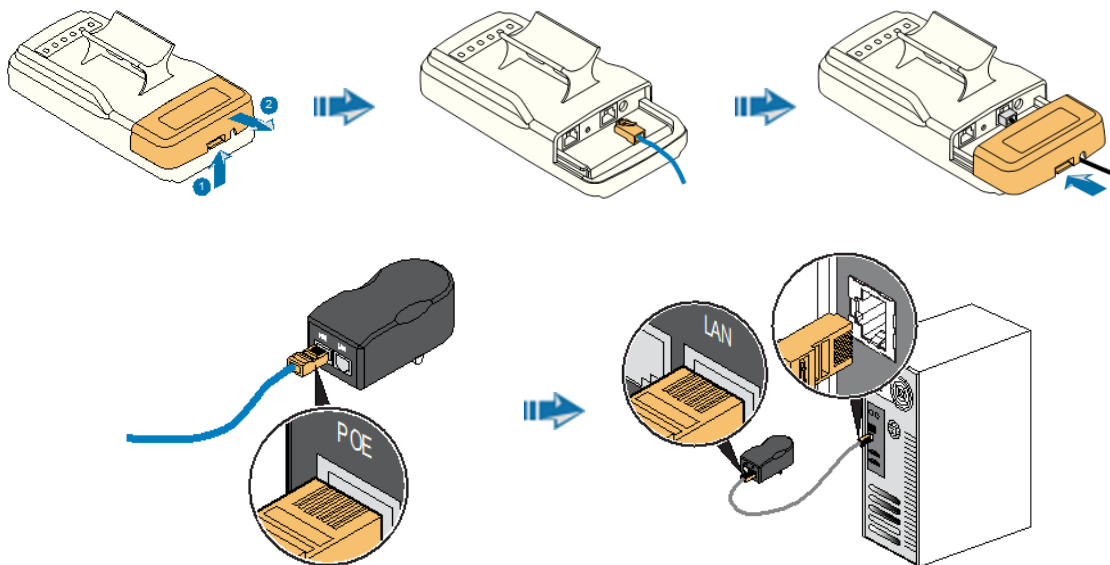


Figure 2-2 Power on the device

- Connect the device with an Ethernet cable.
- Connect the other end of the cable into **POE** port of power adapter.

- Using another Ethernet cable, connect one end of cable into LAN port of adapter, the other end into computer port.
- Plug the power adapter into an outlet to power up the device.

### NOTE

If you are using our 5GHz radios, most of them are using Gigabit LAN port. Thus you should connect them with a CAT-5E or CAT-6 cable to get the maximum performance.

## 1.2 Local Network Settings

- Set PC and set IP address as 192.168.1.x (x is 1-254 except 2, to make sure no conflict with other IP in the network.)
- Run Web browser, input <http://192.168.1.2> (default IP address) and enter.
- Figure 2, default username: **admin**, password: **admin** (You can change this password after entering the system) , and then click Login to the software system.



Figure 1-3 Login page



## Chapter 2

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# Software Configuration

- Status
- Radio Setting
- Network Setting
- Wireless Setting
- Service Setting
- System Setting
- Tools

## 2. Software Configuration

### 2.1 Main Page

#### Status





WIRELESS		NETWORK		SYSTEM	
<b>Radio</b>					
Wireless Mode :	Access point	Radio Mode :	11an		
Channel/Frequency :	157 / 5785	Tx Power :	19 dBm		
Channel Width :	20/40MHz Plus	Tx Busy :	0		
Country Code :	United States	Rx Busy :	0		
Max Rate :	300 Mbps	Total Busy :	0		
TDCA :	Disable				
<b>Wireless1</b>  [Up]					
SSID :	Wisnetworks	BSSID :	FC:AD:0F:01:50:68		
Security :	NONE	Assoc Number :	1		
<b>Wireless2</b>  [Down]					
<b>Wireless3</b>  [Down]					
<b>Wireless4</b>  [Down]					

Figure 2-1 Wireless Status(Access Point Mode)

#### Status



WIRELESS		NETWORK		SYSTEM	
<b>Radio</b>					
Wireless Mode :	Station	Radio Mode :	11an		
Channel/Frequency :	157 / 5785	Tx Power :	24 dBm		
Channel Width :	20/40MHz Plus	Tx Busy :	0		
Country Code :	China	Rx Busy :	0		
Max Rate :	300 Mbps	Total Busy :	0		
TDCA :	Disable				
<b>Station</b>  [Up]					
SSID :	Wisnetworks	BSSID :	FC:AD:0F:01:50:68		
Security :	NONE	Signal Strength :	-59 dBm 		

Figure 2-2 Wireless Status(Station Mode)

#### 2.1.1 Status-WIRELESS

Radio status window, mainly shows the radio work mode and related information of the unit.

- **Wireless mode:** working mode of the unit, supporting 4 kinds of working mode, AP Mode、Station Mode、 AP WDS Mode and Station WDS Mode.
- **Radio mode:** working mode of Radio, supporting 802.11a/an two kinds of working modes.

- **Channel/Frequency:** radio current working channel and working frequency.
- **Channel Width:** radio channel bandwidth , supporting 20MHz and 40MHz. Channel bandwidth has great influence to the wireless. Under no interference environment, average throughput of 40MHz channel bandwidth can reach more than twice of 20MHz channel bandwidth.
- **Country Code:** country code of current working Radio. Different country code has different channel and power for Radio supporting.
- **Tx Power:** current Radio transmission power. Transmission power influences directly signal strength of communication system, so we should guarantee transmission power big enough;
- **Max Rate:** max sending rate of Radio supporting. Different channel bandwidth could affect max sending rate. If AP and Station can reach to 40MHz channel bandwidth, max sending rate can reach to 300Mbps, and throughout rate can improve more than twice.
- **WiD TDMA:** the status of WiD TDMA with 'enable' or 'disable'.

**Station** status box shows the unit working as Station Mode.



Figure 2-3 Wireless Station Status

- **Up/Down:** UP means CPE has successfully connected with AP. Down means the link is not built.
- **SSID:** SSID name of AP that CPE is connecting.
- **BSSID:** BSSID address of AP that CPE is connecting.
- **Signal Strength:** signal strength of AP that CPE is connecting. Signal strength is negative, the smaller the absolute value of signal strength, the stronger it proves between CPE and AP. When it transmits in long distance, stronger signal can ensure higher thorough for wireless transmission.
- **Security:** security way of AP that CPE is connecting, CPE supporting None/WEP/WPA-TKIP/WPA-CCMP/WPA2-TKIP/WPA2-CCMP/WPA mix encryption and WPA2 mix encryption

connecting AP.

**Wireless1/2/3/4 status box** shows the unit working as AP Mode. Our radio supports at most 4 wireless services, representing Wireless1/2/3/4.





<b>Wireless1</b>  [Up]			
SSID :	Wisnetworks	BSSID :	FC:AD:0F:01:50:68
Security :	NONE	Assoc Number :	1
<b>Wireless2</b>  [Down]			
<b>Wireless3</b>  [Down]			
<b>Wireless4</b>  [Down]			

Figure 2-4 Wireless Access Point Status

- **Up/Down:** UP means interface of wireless service has started to work, and is providing wireless access services. And down means it has not
- **SSID:** SSID of wireless service.
- **BSSID:** BSSID of wireless service broadcast Beacon using.
- **Security:** security way of wireless service using, supporting None/WEP/WPA-TKIP/WPA-CCMP/WPA2-TKIP/WPA2-CCMP/WPA mix encryption and WPA2 mix encryption.
- **Assoc Number:** current online clients connected to this unit.

### 2.1.2 Status-NETWORK

<b>WIRELESS</b>		<b>NETWORK</b>		<b>SYSTEM</b>	
<b>Network Mode</b>					
Mode :	Bridge				
Management IP Address :	Static				
<b>LAN Setting</b>					
IP Address :	192.168.1.2				
Netmask :	255.255.255.0				
Gateway :					
Primary DNS IP :					
Secondary DNS IP :					

Figure 2-5 Network label

#### Network Role

- **Network Mode:** device supports 3 kinds of Network Modes, including Bridge Mode, SOHO Router Mode and WISP Mode.

A brief introduction to those modes:

1. **Bridge Mode:** bridge Mode is typical 2-layer network mode. The unit ETH port and wireless interface are working at layer-2 network mode, no independent IP address. For the whole unit only has one Bridge port IP address.
2. **SOHO Router Mode:** this mode is typical network mode of wireless router. The ETH port is worked as WAN interface, connecting another network by ETH port, such as Internet or enterprise network. This device connects with public network supporting three ways: static IP address, DHCP dynamic IP address and PPPoE.

### NOTE

Only when the unit works as **AP Mode** and **AP WDS Mode**, network mode can be set as **SOHO Router Mode**.

3. **WISP Mode:** this mode is opposite to SOHO Router. It uses wireless interface as WAN to connect public network and ETH port as 2-layer access port. For this mode we can think the unit as a wireless client router supporting PPPoE over air.

### NOTE

Only when the unit works as Station Mode or Station WDS Mode, network mode can be set as WISP Mode.

### Network Settings

- **Bridge IP Address:** IP address of Bridge interface.
- **Net mask:** net mask of bridge interface IP address.
- **Bridge Mac:** MAC address of bridge interface.
- **Gateway:** gateway IP Address of bridge interface.
- **Primary DNS IP:** primary DNS address of bridge interface.
- **Secondary DNS IP:** secondary DNS address of bridge interface.

### 2.1.3 Status-SYSTEM

WIRELESS	NETWORK	SYSTEM
Device Name : WIS-Q5300		
Serial Number : 5300000B14300130		
MAC : FC:AD:0F:01:50:68		
Flash : 16M		
Software Version : 1.0.0261.20140126_Beta		
Language : English		
Timezone : GMT		
Current Time : 2014/4/15/ 13:8:2		
Username : admin		

Figure 2-6 System table of status

- **Device Name:** device name or model name
- **Serial Number:** device serial NO.
- **Software Version:** current software version
- **Language:** current web language
- **Time zone:** current time zone
- **Current time:** current time
- **Username:** username when login

### 2.1.4 Monitor-Throughput

#### Monitor

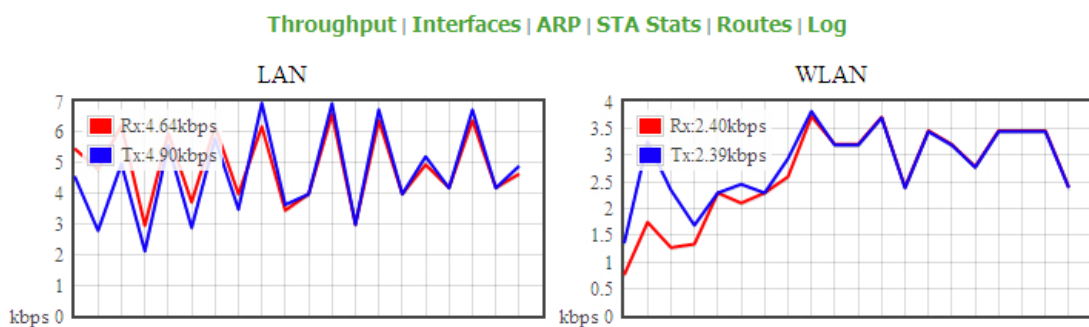


Figure 2-7 Monitor-Throughput

### 2.1.5 Monitor-Interfaces

Interfaces list counts send-receive info of all interfaces.

Monitor

[Throughput](#) | [Interfaces](#) | [ARP](#) | [AP Stats](#) | [Routes](#) | [Log](#)

Interface	MAC	Tx Bytes	Tx Packets	Tx Error	Rx Bytes	Rx Packets	Rx Error
eth0	FC:AD:0F:01:21:68	1.21M	6083	0	692.77K	5842	0
vbr1	FC:AD:0F:01:21:68	62.87M	50284	0	1.65M	27803	0
ath0	FC:AD:0F:01:21:68	62.86M	46663	0	2.03M	24027	0

Figure 2-8 Monitor-Interfaces

- **Interface:** listing all interfaces and interface name.
- **MAC Address:** listing MAC address of all interfaces.
- **Tx Bytes:** sending bytes number.
- **Tx Packet:** sending packet .
- **Tx Err:** sending error packet .
- **Rx Bytes:** receiving bytes .
- **Rx Packet:** receiving packet.
- **Rx Err:** receiving error packet.

### 2.1.6 Monitor-ARP List

ARP List counts ARP information of device learning, as Figure 2-9.

Monitor

[Throughput](#) | [Interfaces](#) | [ARP](#) | [AP Stats](#) | [Routes](#) | [Log](#)

IP	MAC	Interface
192.168.1.2	FC:AD:0F:01:50:68	vbr1
192.168.1.3	F8:0F:41:A0:D6:2B	vbr1

Figure 2-9 Monitor-ARP List

- **IP:** IP address of device learning.
- **MAC:** MAC address corresponding to IP address of device learning.
- **Interface:** interface to IP address of device learning.
- **Type:** interface hardware type of learning ARP.

### 2.1.7 Monitor-STA Stats

When the unit works as AP Mode, a list shows STA info of current clients as Figure 2-10

Monitor

[Throughput](#) | [Interfaces](#) | [ARP](#) | [STA Stats](#) | [Routes](#) | [Log](#)

MAC	SSID	Signal	Type	VLAN	IP Address	Connect Time	Action
FC:AD:0F:01:21:68	Wisnetworks	37	11an	1	192.168.1.1	00 - 00:15:23	kick

Figure 2-10 Monitor-STA Stats

**Station Details :**

MAC:	FC:AD:0F:01:50:80	Connection Time:	00 - 00:13:58
AID:	1	Bandwidth:	20/40MHz Plus
SSID:	AP1	PS Mode:	Active
Mode:	11an	Auth Mode:	OPEN
RSSI:	79	Encryption:	NONE
VLAN:	1	Listen Interval:	10
Tx/Rx Packets: 1919/8629			
Tx/Rx Bytes: 235.77K/1.68M			
Tx/Rx Rate: 300 Mbps/ 300 Mbps			

Tx/Rx Statistic:

Rates:	Tx:	Rx:
6	0	0
13	0	0
27	0	0
40	0	0
54	0	0
81	0	0
108	0	0
121	0	0
162	0	2
216	1	1
243	1	1
270	4	2
300	1912	8608

Figure 2-11 Station Details

- **BSSID:** BSSID of STA connecting wireless services.
- **Mode:** working mode of STA Radio.
- **AID:** connecting ID of STA.
- **Signal:** AP detected RSSI of STA.
- **Assoc Time:** time online of STA.
- **Tx/Rx Packets:** send-receive packets between AP and STA. Tx means sending packets from AP to STA, Rx means receiving packets from STA to AP.



- **Tx/Rx Bytes:** send-receive bytes between AP and STA. Tx means sending bytes from AP to STA, Rx means receiving bytes from STA to AP.
- **Tx/Rx Rate:** rate using by send-receive packets between AP and STA. Tx means sending rate from AP to STA, Rx means receiving rate from STA to AP, in fact it is sending rate of STA.

### 2.1.8 Monitor-AP Stats

When the unit works as Station Mode, the list shows info of CPE connecting AP, as Figure 2-12

**Monitor**

Throughput   Interfaces   ARP   <u>AP Stats</u>   Routes   Log			
SSID:	Wisnetworks	BSSID:	FC:AD:0F:01:50:68
Mode:	11an	Channel:	157
RSSI:	35	Assoc Time:	00 - 00:00:14
Tx/Rx Packets:	13/13	Tx/Rx Bytes:	1.24K/1.24K
Tx/Rx Rate:	300 Mbps/ 216 Mbps	Security:	NONE

Figure 2-12 Monitor-AP Stats

- **SSID:** SSID name of AP that CPE is connecting.
- **BSSID:** BSSID address of AP that CPE is connecting.
- **Mode:** radio work mode of AP that CPE is connecting.
- **Channel:** work channel of AP that CPE is connecting.
- **Signal:** CPE detected AP RSSI.
- **Assoc Time:** duration online after CPE is connecting AP.
- **Tx/Rx Packets:** send-receive packets between CPE and AP. Tx means sending packets from CPE to AP, Rx means receiving packets from AP to CPE.
- **Tx/Rx Bytes:** send-receive bytes between CPE and AP. Tx means sending bytes from CPE to AP, Rx means receiving bytes from AP to CPE .
- **Tx/Rx Rate:** rate using by send-receive packets between CPE and AP. Tx means sending rate from CPE to AP, Rx means receiving rate from AP to CPE, in fact it is sending rate of AP.

### 2.1.9 Monitor-Routes

Routes list shows current routing relationship of device, as Figure 2-13.

Monitor

Throughput   Interfaces   ARP   AP Stats   Routes   Log			
Destination	Netmask	Gateway	Interface
192.168.1.0	255.255.255.0	0.0.0.0	vbr1

Figure 2-13 Monitor-Routes

- **Destination:** destination address and mask;
- **Gateway:** next address against destination address, that is gateway address.
- **Flags:** network type of this routing info.
- **Interface:** interface of this routing info.

### 2.1.10 Monitor-PPPoE Information List

PPPoE information list shows connecting state of current PPOE, as Figure2-14.

Interfaces   ARP   AP Stats   Routes   PPPoE Information   DHCP Server			
Server Name:	hzl003	Connection Time:	00 - 01:54:12
Local IP Address:	8.1.1.10	TX Packets:	4
Remote IP Address:	8.1.1.1	RX Packets:	4
Primary DNS IP:	8.1.0.100	TX Bytes:	64
Secondary DNS IP:		RX Bytes:	52

Figure 2-14 Monitor-PPPOE

- **Server Name:** server name of PPPoE server.
- **Connection Time:** time online of PPPoE connection.
- **Local IP Address:** local IP address of PPPoE client.
- **Remote IP Address:** remote IP address of PPPoE server.
- **Primary DNS IP:** primary DNS address of PPPoE client.
- **Secondary DNS IP:** secondary DNS address of PPPoE client.
- **TX Packets:** CPE sending packets by PPP interface.
- **RX Packets:** CPE receiving packets by PPP interface.
- **TX Bytes:** CPE sending bytes by PPP interface.
- **RX Bytes:** CPE receiving bytes by PPP interface.

### 2.1.11 Monitor-DHCP Server

DHCP Server List shows status of assigning IP address when CPE is DHCP Server, as Figure 2-15.

Interfaces | ARP | AP Stats | Routes | PPPoE Information | DHCP Server

MAC Address	IP Address	Remaining Lease	Hostname
00:e0:4c:20:c3:75	192.168.1.203	00 - 00:19:40	H00031A

Figure 2-15 Monitor-DHCP Server

- **MAC Address:** MAC address of DHCP Client.
- **IP Address:** IP address of DHCP Client.
- **Remaining Lease:** remaining lease to this IP address of DHCP Server.
- **Hostname:** hostname of DHCP Client.

## 2.2 Radio Page

Radio Page is mainly used for setting WLAN RF parameter, as Figure 2-16.

### Basic Settings

Wireless Mode : Access Point

Country Code : United States

IEEE 802.11 Mode : 802.11an

Channel Width : Auto 20/40 MHz

Channel Shifting : Disable

Channel : auto

Tx Power : 19

Max TX Rate : MCS 15 - 130 [300]

Figure 2-16 Radio Page

### 2.2.1 Basic Wireless Settings

Wireless Mode : Access Point

Country Code : Station

IEEE 802.11 Mode : Station WDS

Channel Width : Access Point

Access Point WDS

Figure 2-17 Wireless Mode

- **Wireless Mode:** working mode of WLAN, the unit supporting AP Mode, Station Mode, AP WDS Mode and Station WDS Mode, the default is Station Mode. Because settings of those 4

modes have little impact to parameter setting of whole Radio,we will not introduce parameter setting of Radio for 4 modes.

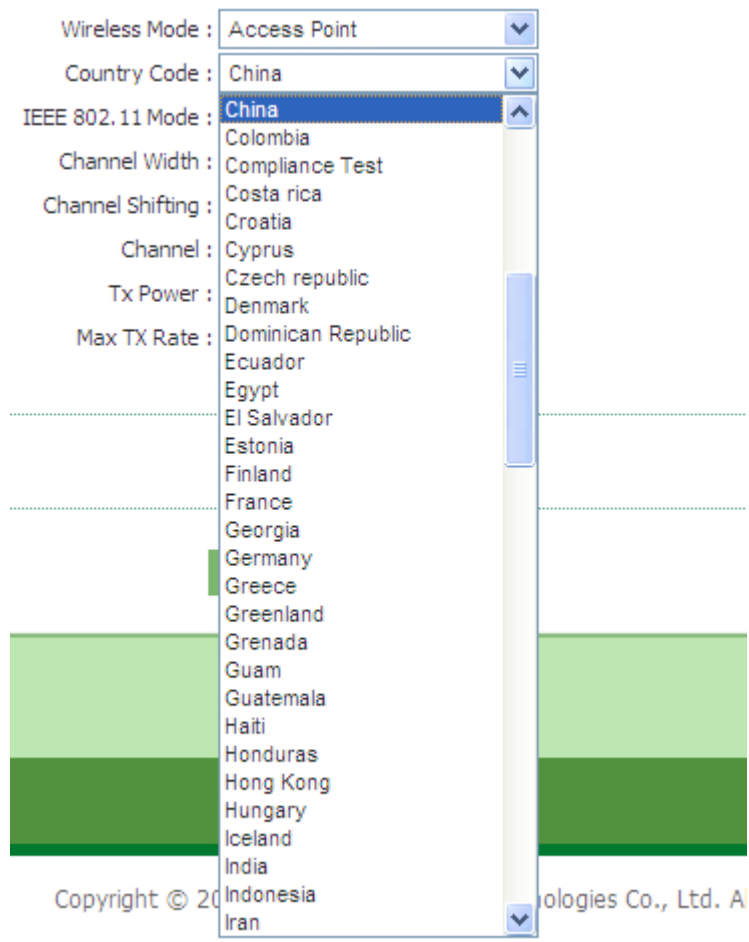


Figure 2-18 Country Code

- **Country code:** set country code of Radio, the default is United States.

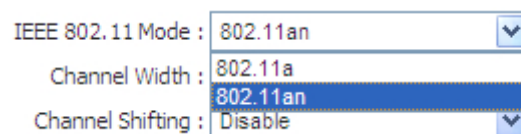


Figure 2-19 IEEE 802.11 Mode

- **IEEE 802.11 Mode:** set working mode of Radio, the default is 802.11n.

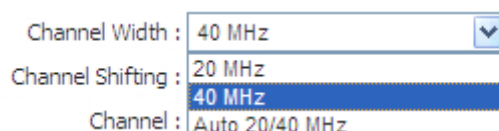


Figure 2-20 Channel Width

- **Channel Width:** set occupied bandwidth of channel, the default is 20/40MHz Mode.

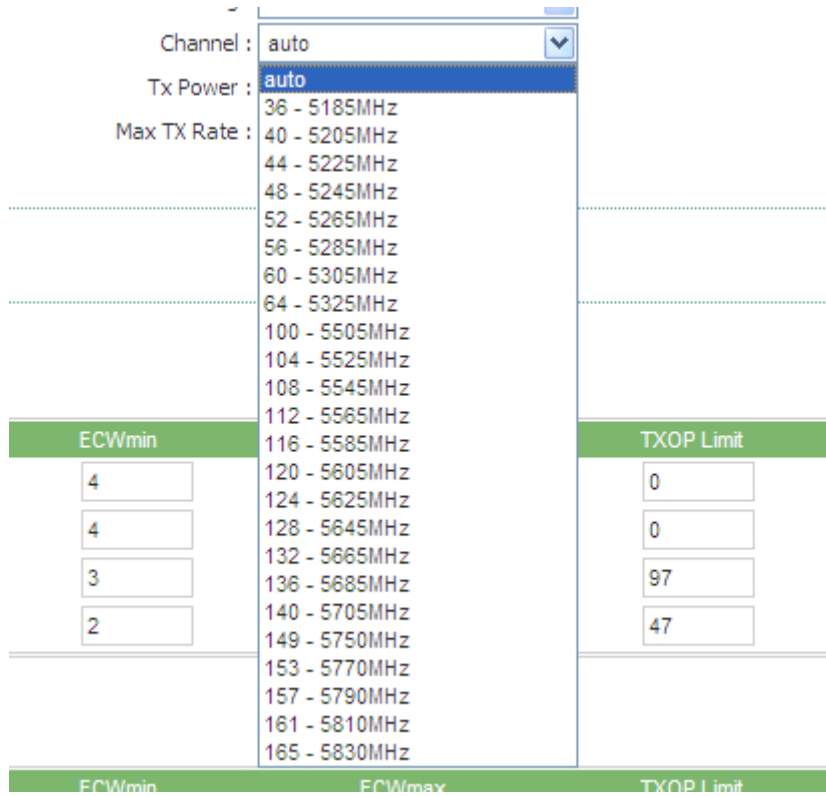


Figure 2-21 Channel

- **Channel:** set working channel of Radio, the default is auto channel.

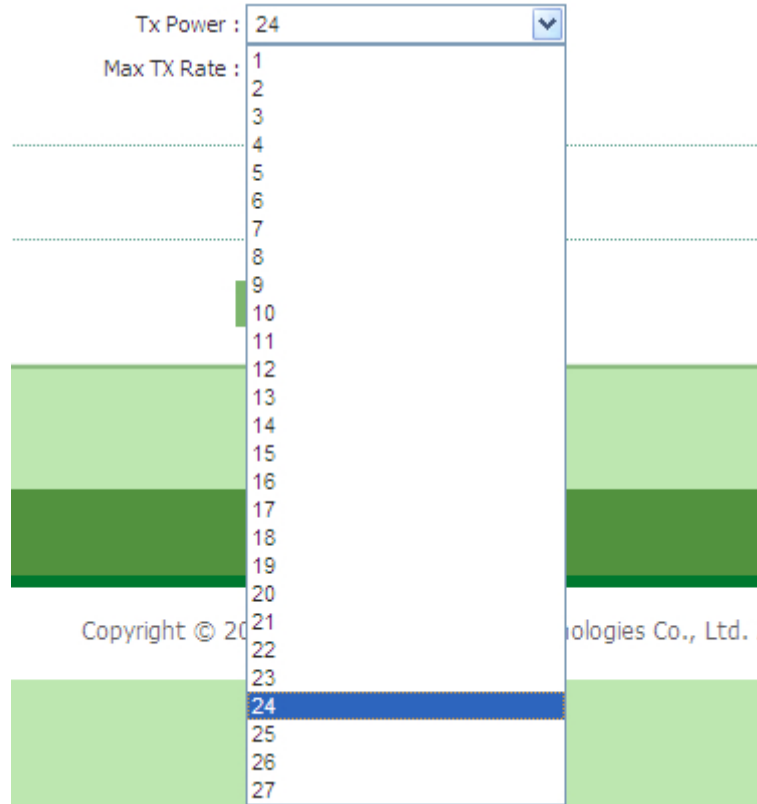


Figure 2-22 Tx Power

- **Tx Power:** set transmission power of Radio, the default is 24dBm.

**⚠ WARNING**

**Tx power has different limit for each country. When changing the tx power the user or operator should follow the regulatory rules.**

Transmission power can influence signal strength of wireless communication. when it transmits in long distance, please properly increase transmit power to ensure stronger signal. And when testing indoor, pls properly decrease transmission power in order to prevent signal saturation for higher signal strength.

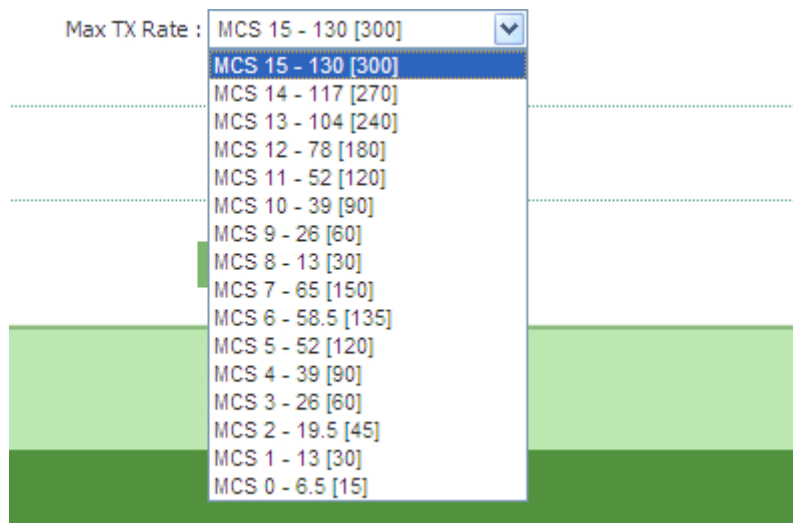


Figure 2-23 Max TX Rate

- **Max TX Rate:** set packets sending rate of Radio. 2.4GHz/5GHz radio is 2X2 device, so max support is MCS=15 and default setting.

## 2.2.2 Advanced Wireless Settings

### Advanced Settings

RTS Threshold :	<input type="text" value="2347"/>	<input type="checkbox"/> Enable
Distance :	<input type="text" value="3"/>	KM
Aggr Enable :	<input checked="" type="checkbox"/> Enable	
Aggr Limit Enable :	<input checked="" type="checkbox"/> Enable	
	<input type="text" value="64"/>	Frames
	<input type="text" value="60000"/>	Bytes
ShortGI :	<input checked="" type="checkbox"/>	
Broadcast Probe Response :	<input checked="" type="checkbox"/>	
Wireless Client Isolation :	<input checked="" type="checkbox"/>	
Beacon Interval :	<input type="text" value="100"/>	ms
Max Association Number :	<input type="text" value="128"/>	
WiD TDMA :	<input checked="" type="checkbox"/>	
Channel Utilization :	<input type="text" value="80"/>	%
Compatible :	<input checked="" type="checkbox"/>	
Force :	<input checked="" type="checkbox"/>	

Figure 2-24 RTS Threshold

- **RTS Threshold:** set RTS/CTS threshold, the default is off state.

### **⚠ WARNING**

**RTS/CTS is mainly to prevent hidden node disturbing. But if RTS/CTS threshold is setting too much smaller, it may obviously reduce throughput rate of wireless communication.**

- **Fragmentation Threshold:** set fragmentation threshold, the default is off state.
- **Distance:** set transmission distance between AP and STA, so that system can choose proper ACK \_timeout, the default is 3Km. When it is transmitting in long distance, proper adjusting distance can improve throughput.
- **Aggr Enable:** set “enable” and “to enable” sending function of A-MPDU, the default is enable state.
- **Aggr limit Enable:** set sending limit function of A-MPDU, the default is enable state, the max aggr packet of the default is 64 units, the max aggr length is 60000 bytes. As long as one conditon meets, it will trigger aggr limit.

## 2.2.3 WMM Settings

### WMM Settings

Enable

AP EDCA Parameter :

AC Type	AIFSN	ECWmin	ECWmax	TXOP Limit	No ACK
AC_BK	<input type="text" value="7"/>	<input type="text" value="4"/>	<input type="text" value="10"/>	<input type="text" value="0"/>	<input type="checkbox"/>
AC_BE	<input type="text" value="3"/>	<input type="text" value="4"/>	<input type="text" value="6"/>	<input type="text" value="0"/>	<input type="checkbox"/>
AC_VI	<input type="text" value="1"/>	<input type="text" value="3"/>	<input type="text" value="4"/>	<input type="text" value="97"/>	<input type="checkbox"/>
AC_VO	<input type="text" value="1"/>	<input type="text" value="2"/>	<input type="text" value="3"/>	<input type="text" value="47"/>	<input type="checkbox"/>

STA EDCA Parameter :

AC Type	AIFSN	ECWmin	ECWmax	TXOP Limit
AC_BK	<input type="text" value="7"/>	<input type="text" value="4"/>	<input type="text" value="10"/>	<input type="text" value="0"/>
AC_BE	<input type="text" value="3"/>	<input type="text" value="4"/>	<input type="text" value="6"/>	<input type="text" value="0"/>
AC_VI	<input type="text" value="2"/>	<input type="text" value="3"/>	<input type="text" value="4"/>	<input type="text" value="94"/>
AC_VO	<input type="text" value="2"/>	<input type="text" value="2"/>	<input type="text" value="3"/>	<input type="text" value="47"/>

Figure 2-25 WMM Settings

## 2.3 WIRELESS Page

Wireless Page is used for setting wireless service of AP Mode or relevant parameters for Station Mode connecting AP .

### 2.3.1 AP/AP WDS Mode

When the unit is set as AP/AP WDS Mode, Wireless Page is shown as Figure 3-12.

#### 1. Wireless Settings

- **Wireless1/2/3/4:** device can be set with 4 wireless service at most, separately 4 labels to distinguish.
- **Wireless Availability:** working “Enable” or “Disable” wireless service, the default is “Enable” status for Wireless1, and ‘Disabled’ for others.
- **Hide SSID:** working “Enable” and “Disable” hiding SSID function. The function would make the base station hidden from searching by other clients. The default is “Disable” status.
- **SSID:** text box for entering the name of the wireless service.



Wireless Settings

Wireless Security

Apply

Figure 2-26 Wireless Page

## 2. Wireless Security

- **Security:** set security type, the default is 'None'. If choosing WEP security type, as shown

Figure 2-27.

Wireless Security

Figure 2-27 WEP Security Type

- **Authentication Type:** set authentication method, the default is open.
- **WEP Key Length:** set WEP key length, the default is 64 bit.
- **Key Type:** set key type, the default is ASCII type.
- **WEP Key:** enter WEP key.
- **Key Index:** choose key index, the default is 1.

If choosing WPA/WPA2 security type, as shown Figure 2-28.

Wireless Security

Figure 2-28 WPA security type

Wireless Security

Security : WPA  
 WPA Authentication : EAP  
 Auth Server IP/Port : 1812  
 Auth Server Secret : Show  
 Accounting Server :   
 Acct Server IP/Port : 1813  
 Acct Server Secret : Show

Apply

Figure 2-29 WPA2 security type

- **WPA Authentication:** set WPA/WPA2 authentication method, current only supporting PSK .
- **WPA Preshard Key:** set PSK key of WPA/WPA2, supporting ASCII and Hex.

2.3.2 Station/Station WDS Mode

When the unit is set as Station/Station WDS Mode, Wireless Page is shown as Figure 2-30.

Wireless Settings

SSID : Wisnetworks Scan  
 Lock to AP MAC : FC:AD:0F:01:21:68  
 VLAN : 1

Figure 2-30 Wireless Setting Page

1. Wireless Settings

- **SSID:** when the unit is set as Station Mode, enter here SSID of linked AP. If just enter SSID not AP MAC address, it will choose the strongest signal among the same SSID to connect to.
- **Lock to AP MAC:** lock MAC address needing to link AP. After SSID and AP MAC both enter, it will connect to the AP which meet two condition, not only same SSID.
- **Scan:** scan button is used for scanning SSID with available channels, as Figure 2-31.

Scan List

Note: Site Survey can only scan the channel/frequency supported by current country code.

Scan

MAC Address	SSID	Auth_mode	Encryption	Signal / Noise, dBm	Frequency, GHz	Channel
1. FC:AD:0F:01:50:68	Wisnetworks			-70 / -95	5.785	157

Scan

Figure 2-31 Scan List

- **MAC Address:** BSSID address of wireless service.
- **SSID:** BSSID name of wireless service, also called ESSID.
- **Auth\_mode:** authentication method of the wireless service.
- **Encryption:** encryption types of the wireless service .
- **Signal/Noise:** signal strength and noise floor of wireless service.
- **Frequency:** working frequency of the wireless service.
- **Channel:** working channel of the wireless service.
- **Lock to AP:** if click this button, the unit would lock the BSSID of this wireless service.

## 2. Wireless Security

The unit would automatically choose the right encryption type, and you need to input the encryption key in this textbox.

## 2.4 NETWORK

NETWORK Page is used for setting relevant parameters of network mode. The unit supports **Bridge Mode**, **SOHO Router Mode** and **WISP Mode**.

**SOHO Router Mode** and **WISP Mode** is the same for settings page, here is introduction about **Bridge Mode** and **WISP Mode**.

### 2.4.1 Bridge Mode

Setting of Bridge Mode is shown as Figure 2-32.

**Network Role**

Network Mode :

Auto IP Aliasing :

**VLAN**

ID	Describe	STP	Untagged Port	Tagged Port	Edit	Delete
1	vlan1	Disable	eth0 wlan1			

**VLAN Interface**

ID	Interface	Mode	IP	Mask	Gateway	DHCP	MTU	Edit
1	vlan1	Static	192.168.1.2	255.255.255.0		Disable	1500	

**Static Routes**

Enabled	Target Network IP	Netmask	Gateway IP	Comment	Action
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="button" value="Add"/>

**Traffic Shaping**

Enable

Figure 2-32 Bridge Mode

### 1. Network Role

- **Network Mode:** set current network mode.

#### Edit VLAN

VLAN ID:	<input type="text" value="1"/>		
VLAN Description :	<input type="text" value="vlan1"/>		
STP:	<input checked="" type="checkbox"/>		
Port :	Untagged Port	Tagged Port	No Member
eth0:	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
wlan1:	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 2-33 Edit VLAN

## Edit VLAN Interface

IP :	<input checked="" type="radio"/> Static <input type="radio"/> DHCP <input type="radio"/> None		
IP Address :	<input type="text" value="192.168.1.1"/>	Primary DNS :	<input type="text"/>
Netmask :	<input type="text" value="255.255.255.0"/>	Secondary DNS :	<input type="text"/>
Gateway IP :	<input type="text"/>		
MTU:	<input type="text" value="1500"/>		
DHCP Server:	<input checked="" type="checkbox"/>		
IP Start :	<input type="text"/>		
IP End :	<input type="text"/>		
Netmask :	<input type="text"/>		
Lease Time :	<input type="text"/>		

Figure 2-34 Edit VLAN Interface

## 2. Management Network Settings

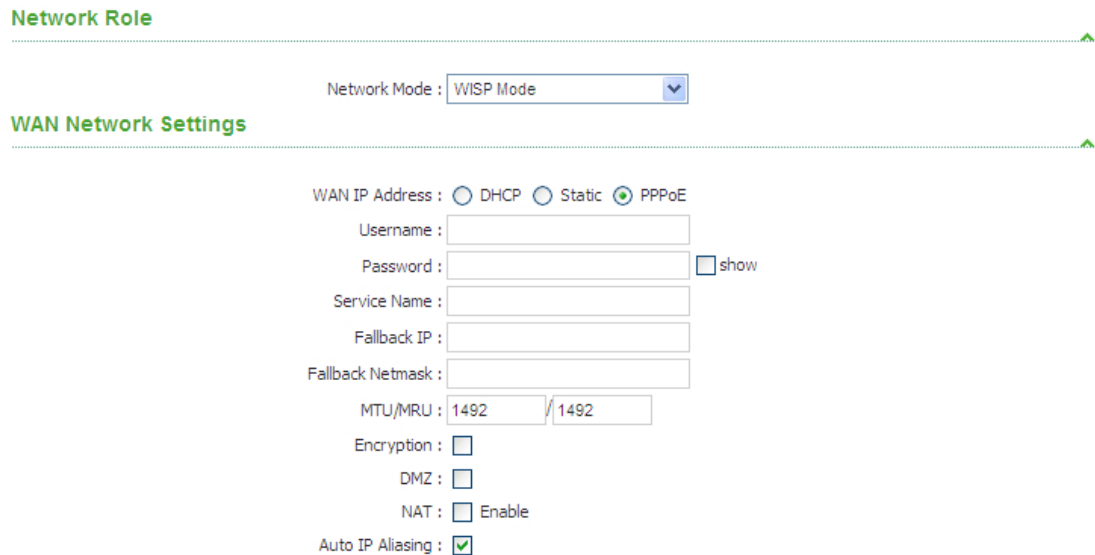
- **Bridge IP Address:** bridge IP address obtaining way, separately static set and DHCP access.
- **IP Address:** set static IP address.
- **Netmask:** set netmask of static IP address.
- **Gateway IP:** set static gateway address.
- **Primary DNS IP:** set static main DNS address.
- **Secondary DNS IP:** set static backup DNS address.
- **MTU:** set MTU, the default is 1500 bytes.

## 3. LAN Network Settings

- **DHCP Server:** working “enable” or “to enable” DHCP Server function, the default is “to enable” state.
- **Range Start:** set range start IP address of DHCP Server address pool.
- **Range End:** set range end IP address of DHCP Server address pool.
- **Netmask:** set netmask of DHCP Server address field.
- **Lease Time:** set lease time DHCP Server assigned address.
- **DNS Proxy:** working “enable” or “to enable” DNS proxy function.

## 2.4.2 WISP/SOHO Router Mode

Setting of WISP/SOHO Router Mode is shown as Figure 2-35.



**Network Role**

Network Mode : WISP Mode

**WAN Network Settings**

WAN IP Address :  DHCP  Static  PPPoE

Username :

Password :   show

Service Name :

Fallback IP :

Fallback Netmask :

MTU/MRU : 1492 / 1492

Encryption :

DMZ :

NAT :  Enable

Auto IP Aliasing :

Figure 2-35 Setting Page

### 1. Network Role

- **Network Mode** : set current network mode.

### 2. WAN Network Settings

- **WAN IP Address**: WAN IP address obtaining way, separately static set, DHCP access and PPPoE negotiation. Because static set and DHCP access are the same with setting of Bridge Mode, there is directly introduction PPPoE.
- **Username**: set PPPoE connection username .
- **Password**: set PPPoE connection password.
- **Service Name**: set PPPoE connection service name.
- **Fallback IP**: set fallback IP address after PPPoE negotiation failed.
- **Fallback Netmask**: set fallback netmask of IP address after PPPoE negotiation failed.
- **MTU/MRU**: set MTU and MRU PPPoE negotiation.
- **Encryption**: set MPPE Agreement when “enable” or “to enable” PPPoE negotiation is using (Microsoft Point-to-Point Encryption Agreement) .
- **NAT**: set NAT service of “enable” or “disabled” with the checkbox.
- **NAT Protocol**: for some NAT service of special agreement, it needs to enable alone, CPE supporting NAT service of SIP、RSTP、FTP and PPTP.

### 3. LAN Network Settings

#### LAN Network Settings

IP Address :

Netmask :

MTU :

DHCP Server :  Disabled  Enabled

Range Start :

Range End :

Netmask :

Lease Time :  seconds

DNS Proxy :  Enable

Primary DNS IP :

Secondary DNS IP :

Figure 2-36 Setting Page

- **IP address:** set IP address of management devices.
- **Netmask:** set netmask of IP address.
- **DHCP Server:** work “enable” or “to enable” DHCP Server function, the default is “to enable”state.
- **Range Start:** set range start IP address of DHCP Server address pool.
- **Range End:** set range end IP address of DHCP Server address pool.
- **Netmask:** set netmask of DHCP Server address field.
- **Lease Time:** set lease time DHCP Server assigned address.
- **DNS Proxy:** working “enable” or “to enable” DNS proxy function.

#### Static Routes

Enabled	Target Network IP	Netmask	Gateway IP	Comment	Action
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="button" value="Add"/>

Figure 2-37 Static Routes

#### Port Forwarding

Enabled	Private IP	Private Port	Type	Source IP/mask	Public IP/mask	Public Port	Comment	Action
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	UDP	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="button" value="Add"/>

Figure 2-38 Port Forwarding

**Traffic Shaping**

Enable

Interface	Ingress			Egress			Action
	Enable	Rate, kbit/s	Burst, kBytes	Enable	Rate, kbit/s	Burst, kBytes	
eth0	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="button" value="Add"/>

Figure 2-39 Traffic Shaping

## 2.5 SERVICES

Services Page is used for setting safe access, access management and so on, as Figure 2-40.

**Web Server**

Server Port :

Session Timeout :  minutes

**Telnet Server**

Enable Telnet Server :

Server Port :

**NTP Client**

NTP Client :

NTP Server :

**System Log**

System Log :

Remote Log :

Remote Log IP Address :

Remote Log Port :

**Wireless Client Rate Limit**

**Security Basic**

**Security Service**

**Virus Protection**

**Website Control**

**Black&White List**

Figure 2-40 Services

### 2.5.1 Web Server

**Web Server**

Server Port :

Session Timeout :  minutes

Figure 2-41 Web Server

- **Server Port:** set server port of web service, the default is 80.



- **Session Timeout:** set web session timeout, the default is 15 minutes.

## 2.5.2 Telnet Server

**Telnet Server**

---

Enable Telnet Server :

Server Port :

Figure 2-42 Telnet Server

- **Enable Telnet Server:** working “enable” or “to enable” Telnet server, the default is “to enable”state.
- **Server Port:** set server port of telnet server, the default is 23.

**NTP Client**

---

NTP Client :

NTP Server :

Figure 2-43 NTP Client

**System Log**

---

System Log :

Remote Log :

Remote Log IP Address :

Remote Log Port :

Figure 2-44 System Log

**Wireless Client Rate Limit**

---

Disabled  All Clients  Classified Clients

**All Clients :**

CIR(Outbound) :       CIR(Inbound) :

CIR: Committed Information Rate(kbps)

Figure 2-45 Client Rate Limit-All Clients

**Wireless Client Rate Limit**

---

Disabled  All Clients  Classified Clients

**11n Clients :**

CIR(Outbound) :       CIR(Inbound) :

**11a/11g Clients :**

CIR(Outbound) :       CIR(Inbound) :

**11b Clients :**

CIR(Outbound) :       CIR(Inbound) :

CIR: Committed Information Rate(kbps)

Figure 2-46 Client Rate Limit-Classified Clients

### 2.5.3 Security Basic

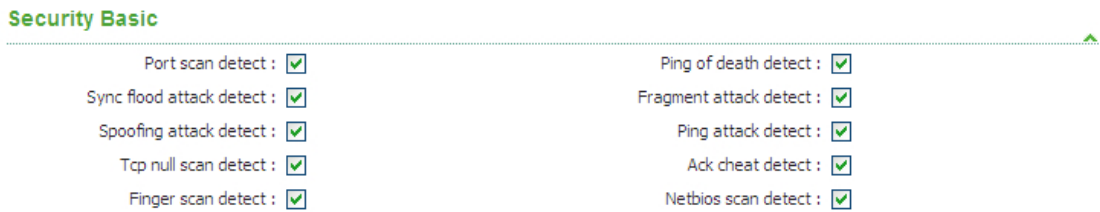


Figure 2-47 Security Basic

Security Basic is used for defending common outer net attack, including intrusion 、 damage, and obtaining or changing sensitive data. Page is set as Figure 2-47.

- **port scan detect:** port scan, if enable, refuse outer net to scan equipment.
- **ping of death detect:** ping flood attack, if enable, still allow ping request, but restrict frequent ping request.
- **sync flood attack detect:** sync flood attack, if enable, restrict frequency of sending sync.
- **fragment attack detect:** fragment attack, if enable, restrict fragment package of outer net.
- **spoofing attack detect:** spoofing attack, if enable, prevent outer net linking by using inner net IP.
- **ping attack detect:** ping request, if enable, abandon ping request of outer net sending.
- **tcp null scan detect:** tcp null scan, if enable, abandon null scan of tcp sending.
- **ACK cheat detect:** ack request, if enable, abandon false ack package of tcp sending.
- **finger scan detect:** finger scan, if enable, abandon relevant requests of finger service.
- **netbios scan detect:** netbios scab, if enable, abandon relevant requests of netbios service.

### 2.5.4 Security Service

Security Service is mainly used for forbidding or allowing access of some web service, as Figure 2-48.

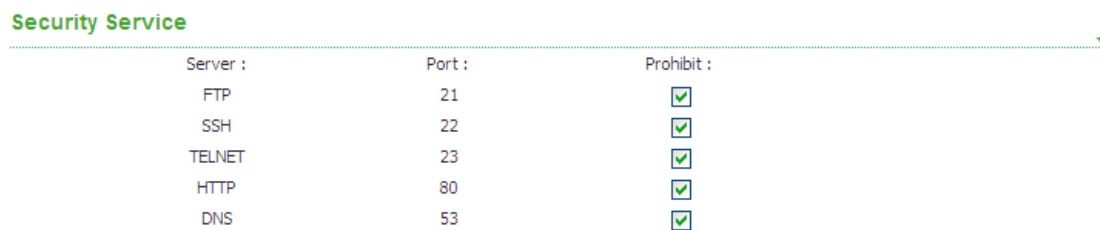


Figure 2-48 Security Service

- **ftp:** port 21, if enable, forbid ftp service.

- **ssh:** Port 22, if enable, forbid ssh service.
- **telnet:** port 23, if enable, forbid telnet service.
- **http:** port 80, if enable, forbid http service.
- **dns:** port 53, if enable, forbid dns service.

**⚠ WARNING**

If enable corresponding service by http, it will forbid http service, and user cannot visit through browser.

### 2.5.5 Virus Protection



Figure 2-49 Virus Protection

Virus protection can prevent common network virus attack, as shown Figure 2-46.

- **worm\_virus:** worm virus, if enable, prevent worm virus attack.
- **shake\_virus:** shake virus, if enable, prevent shake virus attack.
- **shock\_virus:** shock virus, if enable, prevent shock virus attack.
- **hackers\_horse:** hackers horse, if enable, prevent hackers horse attack .
- **netbus\_horse:** netbus horse, if enable, prevent netbus horse attack.
- **netspere\_horse:** netspere horse, if enable, prevent netspere horse attack.

### 2.5.6 Website Control

Website Control can set web blacklist. If web address is in the list, user cannot visit them. Now 20 website can be set, if do not control website, all website can be visit, as shown Figure 2-50.

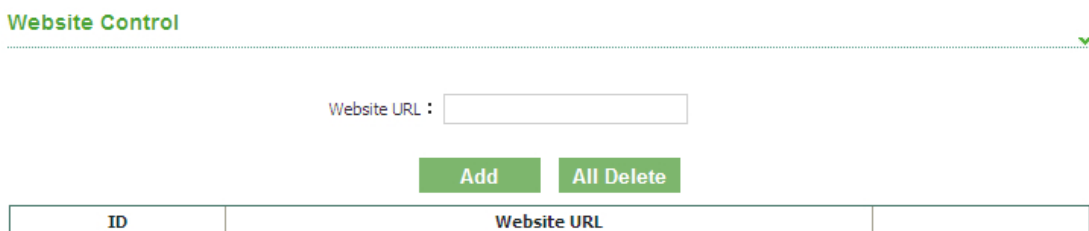


Figure 2-50 Website Control

## 2.5.7 MAC Control

MAC Control means to restrict Internet access by computer MAC address, and manage access and visit of users by supporting blacklist or white list. Don't open MAC control in the case of the default, that is to say, all computers can visit Internet without limit, as Figure 2-51.

**Black&White List**

Mode:

MAC 1 :	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	MAC 2 :	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
MAC 3 :	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	MAC 4 :	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
MAC 5 :	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	MAC 6 :	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
MAC 7 :	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	MAC 8 :	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
MAC 9 :	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	MAC 10 :	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Figure 2-51 MAC Control

### NOTE

MAC Control is available to all ports. Pls be careful to setup.

## 2.6 SYSTEM

System Page is mainly used for setting relevant device management, as Figure 2-49.

**Device**

Device Description :

Language :

Timezone :

Enable Startup Date :

Startup Date :

**Ping Watchdog**

Ping Watchdog :

IP Address :

Web URL :

Startup Delay :  seconds

Ping Interval :  seconds

Failed Tries To Reboot :

**System Accounts**

**Location**

**Configuration Management**

**Firmware Upgrade**

Figure 2-52 System Page

## 2.6.1 Device

### Device

Device Description : WaveFlex

Language : English

Timezone : (GMT) Western Europe Time

Enable Startup Date :

Startup Date : 2013-03-01

Figure 2-53 Device

- **Device Description:** set device description.
- **Enable Startup Date:** set enable startup date, the default is enable state.
- **Startup Date:** set device startup date.

## 2.6.2 Ping Watchdog

### Ping Watchdog

Ping Watchdog :

IP Address :

Web URL :

Startup Delay :  seconds

Ping Interval :  seconds

Failed Tries To Reboot :

Figure 2-54 Ping Watchdog

- **Time zone:** set device time zone.

## 2.6.3 System Accounts

### System Accounts

Username :

Current Password :

New Password :

Verify New Password :

Figure 2-55 System Accounts

- **Username:** set admin username.
- **Current Password:** amending username and new password after entering current password.
- **New Password:** set new password.
- **Verify New Password:** verify new password.

## 2.6.4 Configuration Management

### Location

Latitude :

Longitude :

Figure 2-56 Location Page

### Configuration Management

Restore Factory Defaults :  Reboot :

Export Configuration :

Import Configuration :

Figure 2-57 Configuration Management

### Restore Factory-default settings

Note:Restore factory-default settings will reset the settings to factory-default after reboot the device.

Figure 2-58 Restore Factory-default settings

### Import the configuration file

Note:Restore configuration will delete the current settings and reboot the device.

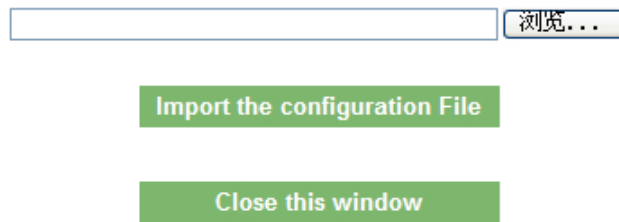


Figure 2-59 Import the configuration file

### Device Reboot

Note:Any configuration changes that have not been saved will lost after the system reboots.

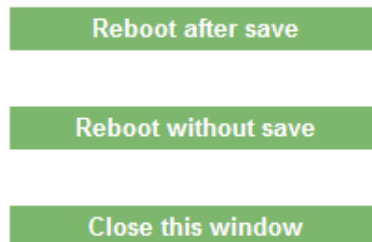


Figure 2-60 Device Reboot

- **Restore Factory defaults:** restore factory default.
- **Export Configuration :** export latest configuration.
- **Import Configuration:** import configuration into device.
- **Reboot:** reboot device.

## 2.6.5 Firmware upgrade

### Firmware Upgrade



Figure 2-61 Firmware Upgrade

Firmware upgrade is used for upgrading software of the device.

## 2.7 Tools

### 2.7.1 Ping

The ping test is usually used for measuring the network latency performance.

**Network Ping**

Destination IP :

Packet Count :  Packet Size :

Host	Time	TTL
192.168.1.136	9.6 ms	64
192.168.1.136	3.3 ms	64
192.168.1.136	2.4 ms	64
192.168.1.136	1.4 ms	64
192.168.1.136	29.4 ms	64

Receive/Transmit : 5 / 5 Loss Ratio : 0%

Min : 1.4 ms	Avg : 9.22 ms	Max : 29.4 ms
--------------	---------------	---------------

Figure 2-62 Network Ping

- **Destination IP :** the target IP address
- **Packet Count:** number of the ping times
- **Packet Size:** define the ping/ICMP packet size, the larger size of the packet the higher latency for the ping



## 2.7.2 Traceroute

**Network Traceroute**

Destination Host :   Resolve IP Address

#	Host	IP	Responses
1	192.168.1.136	192.168.1.136	1.32ms - 2.34ms - 2.21ms

Figure 2-63 Network Traceroute

- **Destination host :** the target IP address/domain for tracing
- **Resolve IP Address:** allow to enter IP address

## 2.7.3 Site survey

### Scan List

Note: Site Survey can only scan the channel/frequency supported by current country code.

MAC Address	SSID	Auth_mode	Encryption	Signal / Noise, dBm	Frequency, GHz	Channel
1. FC:AD:0F:01:50:68	Wisnetworks			-70 / -95	5.785	157

Figure 2-64 Scan List

- **MAC Address:** BSSID address of wireless service.
- **SSID:** BSSID name of wireless service, also called ESSID.
- **Auth\_mode:** authentication method of the wireless service.
- **Encryption:** encryption types of the wireless service .
- **Signal/Noise:** signal strength and noise floor of wireless service.
- **Frequency:** working frequency of the wireless service.
- **Channel:** working channel of the wireless service.

## 2.7.4 Speed Test

**Network Speed Test**

Destination IP :	<input type="text" value="192.168.1.1"/>	<b>Test Results</b> <table><tr><td>RX:</td><td>37.7 MByte</td></tr><tr><td>TX:</td><td>38.4 MByte</td></tr><tr><td>Total:</td><td>76.1 MByte</td></tr></table>	RX:	37.7 MByte	TX:	38.4 MByte	Total:	76.1 MByte
RX:	37.7 MByte							
TX:	38.4 MByte							
Total:	76.1 MByte							
Web Port :	<input type="text" value="80"/>							
Username :	<input type="text" value="admin"/>							
Password :	<input type="password" value="•••••"/>							
Type :	<input type="text" value="duplex"/>							

Figure 2-65 Network Speed Test

- **Destination IP :** the target IP address, in most condition is the IP of the opposite radio
- **Web Port:** default is 80
- **Username:** default is admin
- **Password:** default is admin
- **Type:** transmit/receive/duplex speed performance of wireless
- **Test Result:** after pressing the apply button for a few seconds, the test result would come out

### **⚠ NOTE**

If you require specific throughput, you should use a test tool like iperf or chariot. The speed test tool can only provide a rough result.

# Appendix A

Acronym	Explanation
<b>802.11</b>	A family of specifications related to wireless networking, including: 802.11a, 802.11b, and 802.11g.
<b>AP</b>	Access Point. The hub of a wireless network. Wireless clients connect to the access point, and traffic between two clients must travel through the access point. Access points are often abbreviated to AP
<b>BSSID</b>	Broadcast Service Set Identifier
<b>CPE</b>	Customer Premises Equipment
<b>DHCP</b>	Dynamic Host Configuration Protocol. A protocol which enables a server to automatically assign an IP address to clients so that the clients do not have to configure the IP addresses manually.
<b>EAP</b>	Extensible Authentication Protocol. A standard form of generic messaging used in 802.1X.
<b>ESSID</b>	Egoed Service Set Identifier
<b>Station</b>	Client mode compared to Access Point
<b>SSID</b>	Service Set Identifier, a set of characters that give a unique name to a WLAN.
<b>TKIP</b>	Temporal Key Integrity Protocol
<b>VLAN</b>	Virtual Local Access Network
<b>WDS</b>	Wireless Distribution System
<b>WEP</b>	Wired Equivalent Privacy. An encryption system created to prevent eavesdropping on wireless network traffic.
<b>WiD</b>	Wireless Individual Division technology
<b>TDMA</b>	Time division multiple access
<b>WPA</b>	Wi-Fi Protected Access. A modern encryption system created to prevent eavesdropping on wireless network traffic. It is considered more secure than WEP.
<b>WPA-EAP</b>	WPA-Extensible Authentication Protocol
<b>WPA-PSK</b>	WPA-Pre-Shared Key

# Declaration of Conformity

Hereby, WISNETWORKS Technologies Co., Ltd. , declares that this Wisnetworks device, is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

**Wisnetworks Technologies CO., LTD.**

No.77, FuTe West 3 Road, China (Shanghai) Pilot Free Trade Zone

## CE Mark Warning



This is a class B product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.