SILVERNET

SIL ECHO M5
User Manual

Version 1.0 (21/11/2017)

Radio frequency Interference Requirements

The operation of this device in the 5.15 GHz to 5.25 GHz frequency range is restricted to indoor use. FCC regulations require this product to be used indoors while operating at 5.15 GHz to 5.25 GHz to reduce the potential for harmful interference. However, the operation of this device in the 5.25 GHz to 5.35 GHz frequency range is allowed for both indoor and outdoor use. High power radars are allocated as primary users of the 5.25 GHz to 5.35 GHz and 5.65 GHz to 5.85 GHz bands. These radar stations can cause interference with and/or damage to this device.

FCC Warning

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. No guarantee exists that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception (determined by turning the equipment off and on), the user is encouraged to try to correct the interference by one or more of the following measures:

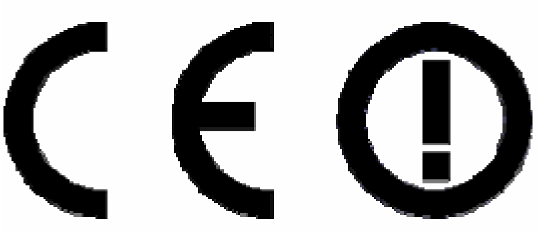
- Reorient or relocate the radio/TV receiving antenna.
- Increase the separation between the equipment and the radio/TV receiver.
- Connect the equipment into an outlet on a circuit different from that to which the radio/TV receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help. Modifications made to the product, unless expressly approved by SilverNet Limited, could void the user’s authority to operate the equipment.

RF Exposure Requirements

To ensure compliance with FCC RF exposure requirements, the antenna used for this device must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or radio transmitter. Installers and end-users must follow the installation instructions provided in this user guide.

CE Statement

The Pro Range 95 is intended to be used by suitably trained individuals or organisations that are familiar with the requirements of the R&TTE directive. In particular the client must ensure that appropriate antennas and transmit power levels are selected to ensure that all power limits are met. Hereby, SilverNet Limited declares that this device is in compliance with the essential requirements and other relevant provisions of the R&TTE Directive 1999/5/EC. However, the use of the following warning symbol



Means that this equipment is subject to restrictions of use in certain countries and selection of the correct country of operation (country code) will ensure that the device operates only on the frequencies permissible within that country. It is also the operator’s responsibility to ensure that appropriate licenses have been sought when operating on licensed frequencies, for example UK Band C, 5725-5850 MHz

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Contents

1. Installing the radio

1.1 Instructions before installing

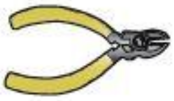
You will need **clear** Line-Of-Sight for the units to work correctly. Locate a suitable mounting location with a pole between 30 and 60mm. Do not install anywhere that is illegal and please ensure you obey the local regulatory rules.

You may need the following tools,

Screw Driver

Wire stripper

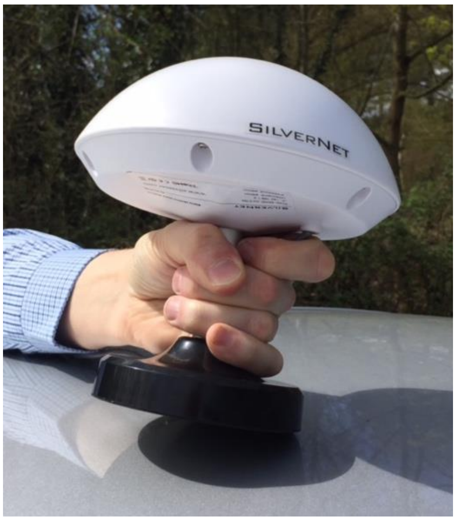
Cable clamp



Diagonal plier

1.2 Installation

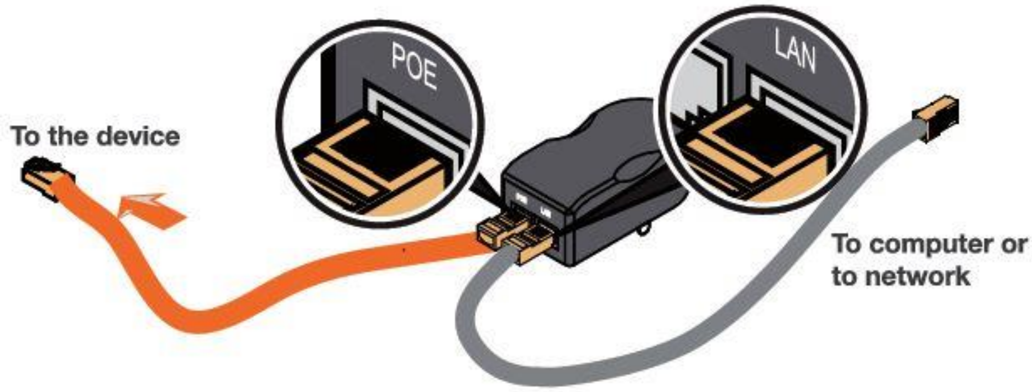
1. Attach center Pillar to the Dome and the other end of the pillar to the Magnabase
2. Place the Magnabase onto and metal face that is smooth, such as a Vehicle room
3. Route the network cable to the supplied PoE injector



⚠ **NOTE**

If you are using our 5GHz radios these should be connected with a Cat 5 or Cat 6 outdoor shielded grade Ethernet cable.

1.3 Powering up the Radio



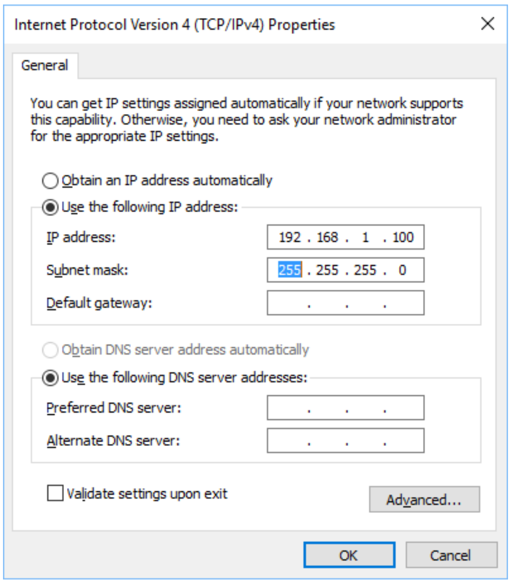
Connect the other end of the Ethernet cable to the PoE port of the provided PoE adapter. Then connect the LAN port of the PoE adapter to a PC or switch using a separate Ethernet cable. Finally, plug the PoE adapter into a standard electrical wall socket.

⚠ **NOTE**

If you use a PoE adapter which is not provided by SilverNet, we cannot provide warranty cover if the radio is damaged.

1.4 Accessing the radio

1. Configure the Ethernet adapter on your computer with a static IP address on the 192.168.1.x subnet (for example, IP address: *192.168.1.100* and subnet mask: *255.255.255.0*



Internet Protocol Version 4 (TCP/IPv4) Properties

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

○ Obtain an IP address automatically

● Use the following IP address:

IP address: 192 . 168 . 1 . 100

Subnet mask: 255 . 255 . 255 . 0

Default gateway: . . .

○ Obtain DNS server address automatically

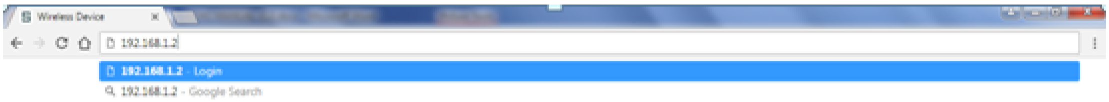
● Use the following DNS server addresses:

Preferred DNS server: . . .

Alternate DNS server: . . .

□ Validate settings upon exit

2. Launch your web browser and enter the default IP address of your device (192.168.1.1) in the address field.

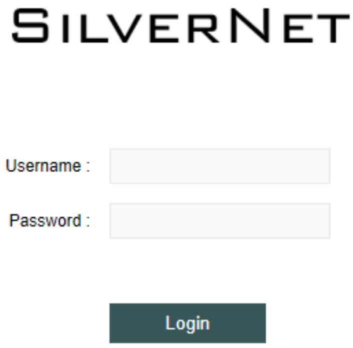


192.168.1.2

192.168.1.2 - Login

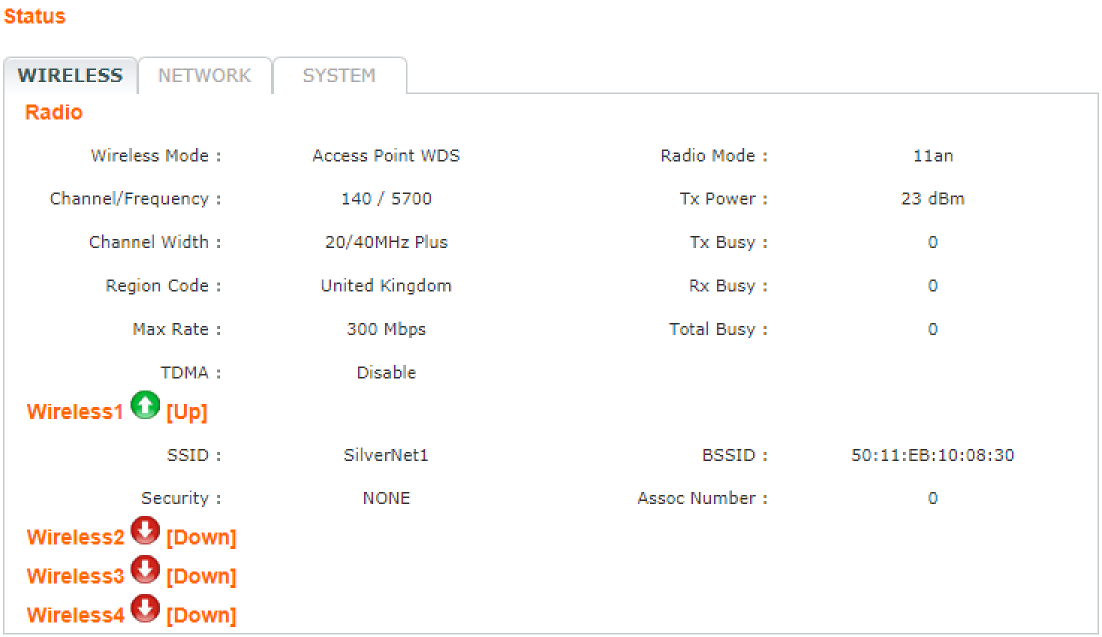
192.168.1.2 - Google Search

3. Enter **admin** in the *Username* field and **password** in the *Password* field, and click **Login**.



2. Software Configuration

2.1 Main Page



Status

WIRELESS | NETWORK | SYSTEM

Radio

Wireless Mode :	Access Point WDS	Radio Mode :	11an
Channel/Frequency :	140 / 5700	Tx Power :	23 dBm
Channel Width :	20/40MHz Plus	Tx Busy :	0
Region Code :	United Kingdom	Rx Busy :	0
Max Rate :	300 Mbps	Total Busy :	0
TDMA :	Disable		

Wireless1 ⬆ [Up]

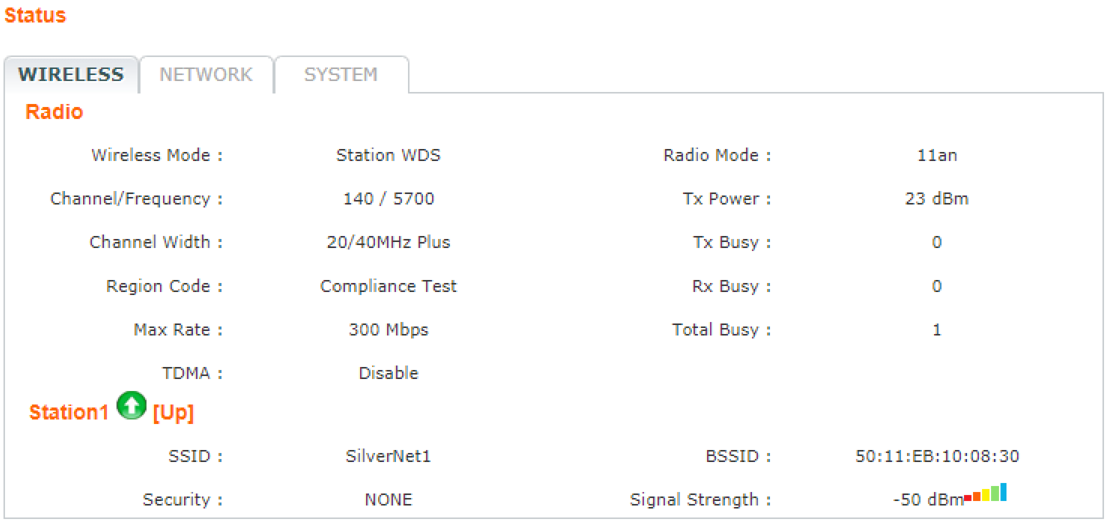
SSID :	SilverNet1	BSSID :	50:11:EB:10:08:30
Security :	NONE	Assoc Number :	0

Wireless2 ⬇ [Down]

Wireless3 ⬇ [Down]

Wireless4 ⬇ [Down]

Figure 2-1 Wireless Status (Access Point WDS Mode)



Status

WIRELESS | NETWORK | SYSTEM

Radio

Wireless Mode :	Station WDS	Radio Mode :	11an
Channel/Frequency :	140 / 5700	Tx Power :	23 dBm
Channel Width :	20/40MHz Plus	Tx Busy :	0
Region Code :	Compliance Test	Rx Busy :	0
Max Rate :	300 Mbps	Total Busy :	1
TDMA :	Disable		

Station1 ⬆ [Up]

SSID :	SilverNet1	BSSID :	50:11:EB:10:08:30
Security :	NONE	Signal Strength :	-50 dBm

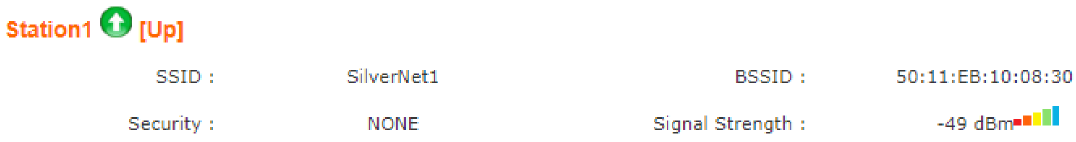
Figure 2-2 Wireless Status (Station Mode)

2.1.1 Status-WIRELESS

The Radio status window displays a summary of the link status information

- **Wireless mode**: The mode the unit is currently set to, there are 4 modes the unit can run in. AP Mode, Station Mode, AP WDS Mode and Station WDS Mode.
- **Radio mode:** The working mode of the radio, which supports 802.11a/an which are two separate wireless transmission standards.
- **Channel/Frequency:** The radio's current working channel and working frequency.
- **Channel Width:** Displays the spectral width of the radio channel. A 40 MHz channel in a minimal interference environment will give up to twice the bandwidth of a 20 MHz channel.
- **Country Code:** set the country to which the unit is operating this will affect the channels you can use and the power of the radio in order to comply with the countries regulations.
- **Tx Power:** The transmission power of the radio. The higher your transmission power the more signal strength you will receive on a link.
- **Max Rate:** The max transmission rate of the radio. Different channel bandwidth's have different max rates. A 40 MHz channel max rate is 300Mbps. The higher this rate on both ends of the link the better the transmission of the link.
- **TDMA:** The status of TDMA - 'enabled' or 'disabled'.

Station status box shows the unit working in Station Mode.



Station1 [Up]

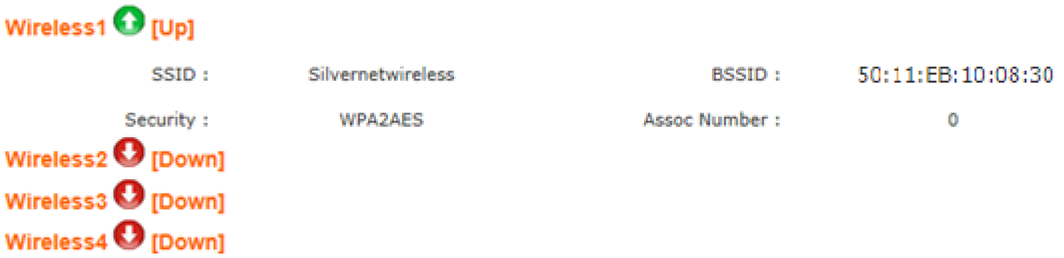
SSID : SilverNet1
BSSID : 50:11:EB:10:08:30
Security : NONE
Signal Strength : -49 dBm

Figure 2-3 Wireless Station Status

- **Up/Down:** UP means the Station has successfully connected with the AP. Down means there is no link.
- **SSID:** This is the name of the wireless network the AP is transmitting

- **BSSID:** BSSID is the Mac address of the remote device. Use this to lock stations to AP’s.
- **Signal Strength:** When there is a link between an AP and Station there will be a signal strength value. This is displayed as a negative so the smaller the value the better the signal strength.
- **Security:** This is the level of security on the device

Wireless 1 (2, 3 and 4 only appear in the AP). The device can support up to 4 wireless services 1 to 4.



Wireless1 ⬆ [Up]

SSID :	Silvernetwireless	BSSID :	50:11:EB:10:08:30
Security :	WPA2AES	Assoc Number :	0

Wireless2 ⬇ [Down]

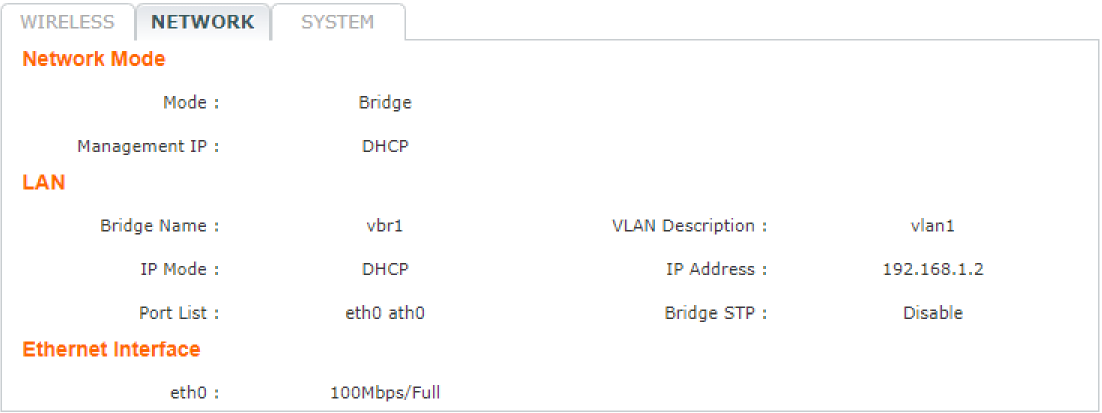
Wireless3 ⬇ [Down]

Wireless4 ⬇ [Down]

Figure 2-4 Wireless Access Point Status

- **Up/Down:** UP states the interface is enabled and providing wireless services. Down means it is disabled.
- **SSID:** This is the name of the wireless network the AP is transmitting
- **BSSID:** BSSID is the Mac address of the remote device. Use this to lock stations to AP’s.
- **Signal Strength:** When there is a link between an AP and Station there will be a signal strength value. This is displayed as a negative so the smaller the value the better the signal strength.
- **Security:** This is the level of security on the device
- **Assoc Number:** current amount of stations connected to the AP.

2.1.2 Status-NETWORK



Network Mode

Mode :	Bridge
Management IP :	DHCP

LAN

Bridge Name :	vbr1	VLAN Description :	vlan1
IP Mode :	DHCP	IP Address :	192.168.1.2
Port List :	eth0 ath0	Bridge STP :	Disable

Ethernet Interface

eth0 :	100Mbps/Full

Figure 2-5 Network

Network Mode

- **Mode:** The device supports 3 different network modes Bridge Mode, SOHO Router Mode and WISP Mode.

A brief introduction to those modes:

1. **Bridge Mode:** Bridge Mode is a 2-layer network mode. The unit ETH port and wireless interface are working at layer-2.
2. **SOHO Router Mode:** This mode is typically a network router mode. The ETH port works as a WAN interface by connecting it to another network via an ETH port such as the Internet or personal network.

⚠ **NOTE**

The network mode can only be set as **SOHO Router Mode** when the unit is in **AP Mode** or **AP WDS Mode**.

3. **WISP Mode:** This mode is opposite to the SOHO Router mode. It uses the wireless interface as a WAN to connect to a public network and the ETH port operates as a 2-layer access port.

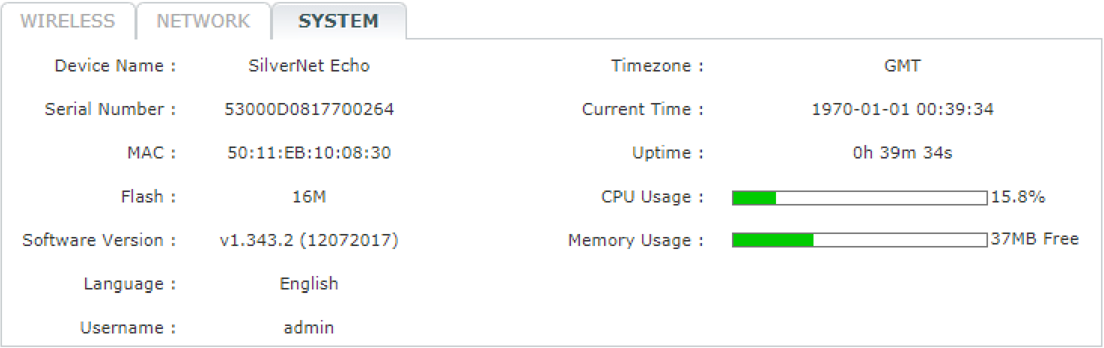
⚠ **NOTE**

The network mode can only be set as **WISP Mode** when the unit is in **Station Mode** or **Station WDS Mode**.

LAN

- **Bridge Name:** The name of the bridge interface
- **VLAN Description:** The name of the VLAN interface
- **IP Mode：** Will show as “static” or “DHCP” depending on the selected mode
- **IP address：** The IP address of the device
- **Port List：** The active ports on the device
- **Bridge STP：** Wil show as “Enabled” or “disabled”

2.1.3 Status-SYSTEM



Device Name :	SilverNet Echo	Timezone :	GMT
Serial Number :	53000D0817700264	Current Time :	1970-01-01 00:39:34
MAC :	50:11:EB:10:08:30	Uptime :	0h 39m 34s
Flash :	16M	CPU Usage :	15.8%
Software Version :	v1.343.2 (12072017)	Memory Usage :	37MB Free
Language :	English		
Username :	admin		

Figure 2-6 System label of status

- **Device Name:** Device name or model name
- **Serial Number:** Device serial NO.
- **MAC:** The MAC address of the device
- **Flash:** The flash memory of the device
- **Software Version:** Current software version
- **Language:** Current web language
- **Username:** Username when login
- **Time zone:** Current time zone
- **Current time:** Current time
- **Uptime:** How long the device has been on for
- **CPU Usage:** Shows the CPU usage as a percentage
- **Memory Usage:** Shows the memory usage

2.1.4 Monitor-Throughput

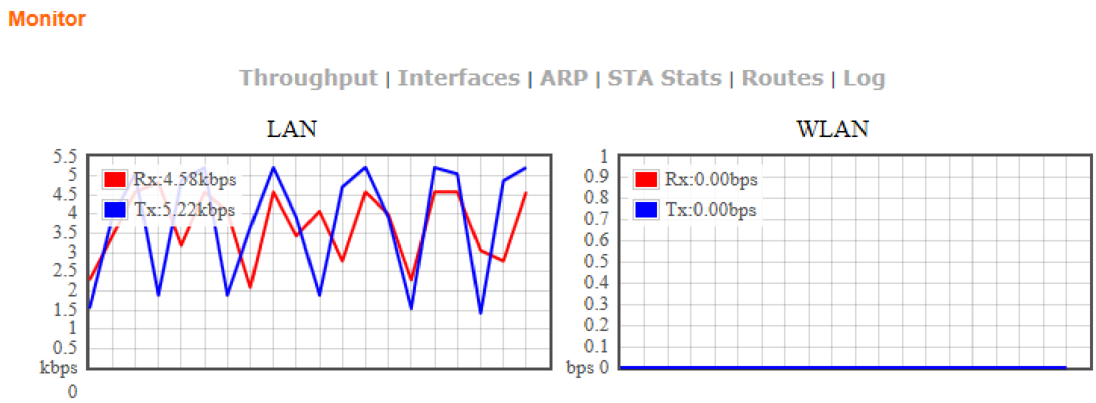
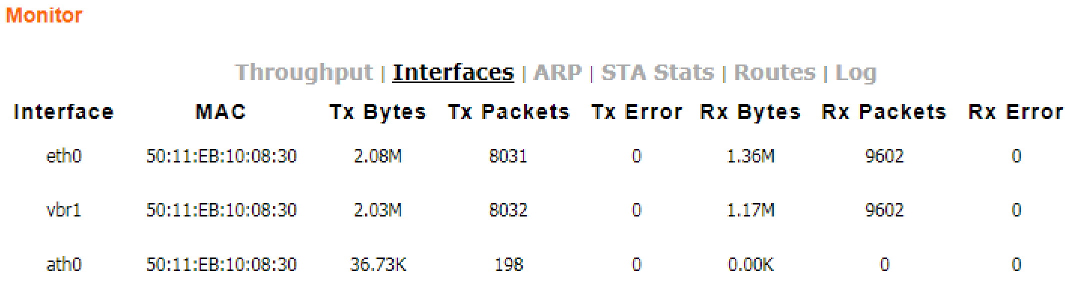


Figure 2-7 Monitor-Throughput

2.1.5 Monitor-Interfaces

Interfaces list counts the send-receive information of all interfaces.



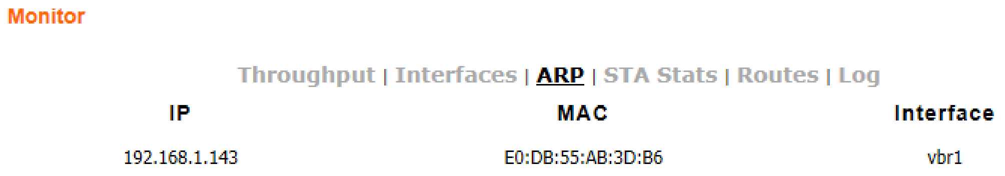
Interface	MAC	Tx Bytes	Tx Packets	Tx Error	Rx Bytes	Rx Packets	Rx Error
eth0	50:11:EB:10:08:30	2.08M	8031	0	1.36M	9602	0
vbr1	50:11:EB:10:08:30	2.03M	8032	0	1.17M	9602	0
ath0	50:11:EB:10:08:30	36.73K	198	0	0.00K	0	0

Figure 2-8 Monitor-Interfaces

- **Interface：** Listing all interfaces and interface names.
- **MAC Address：** Listing MAC address of all interfaces.
- **Tx Bytes：** Sending bytes number.
- **Tx Packet：** Sending packets.
- **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 the ARP information of device. As Figure 2-9.



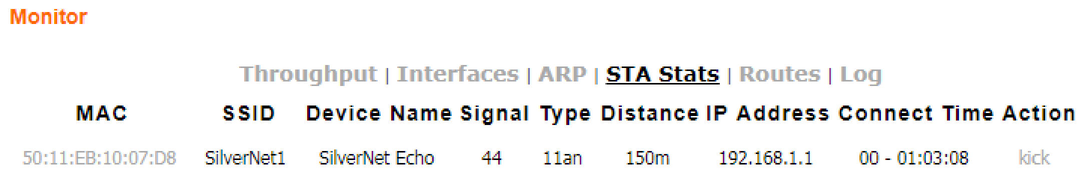
IP	MAC	Interface
192.168.1.143	E0:DB:55:AB:3D:B6	vbr1

Figure 2-9 Monitor-ARP List

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

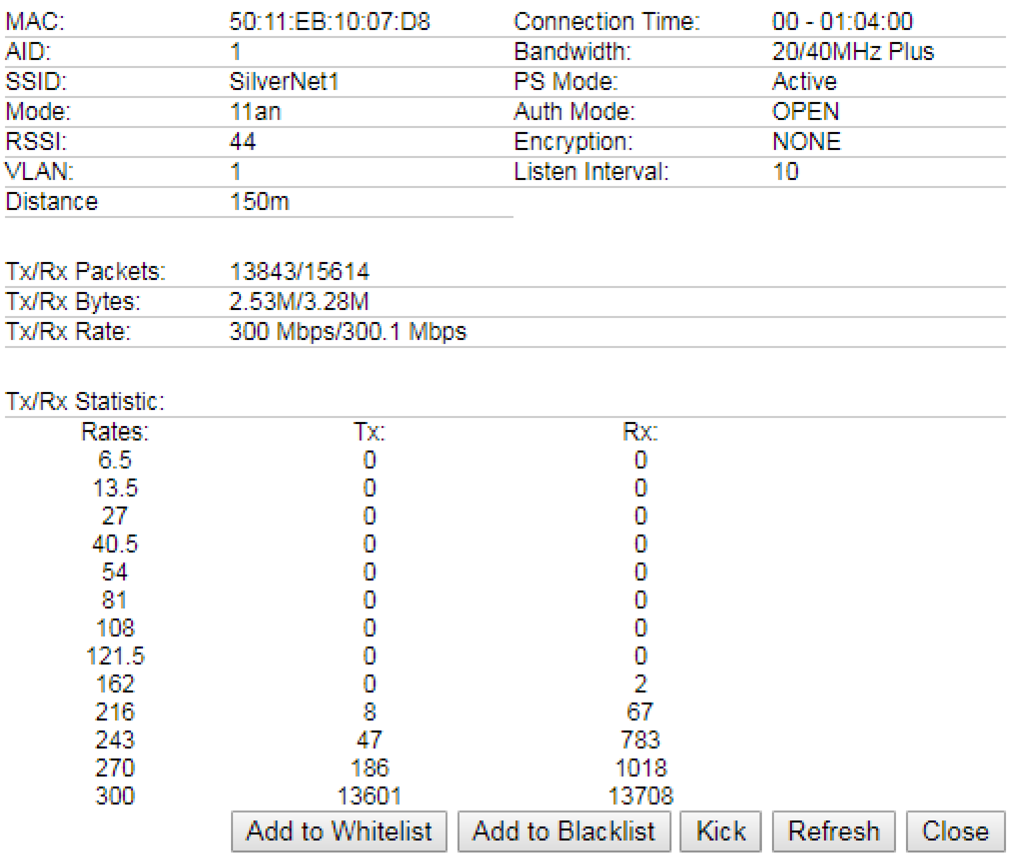
2.1.7 Monitor-STA Stats

When the unit is set to AP WDS Mode, the list shows STA info of current clients connected as Figure 2-10



MAC	SSID	Device Name	Signal	Type	Distance	IP Address	Connect Time	Action
50:11:EB:10:07:D8	SilverNet1	SilverNet Echo	44	11an	150m	192.168.1.1	00 - 01:03:08	kick

Figure 2-10 Monitor-STA Stats



MAC:	50:11:EB:10:07:D8	Connection Time:	00 - 01:04:00
AID:	1	Bandwidth:	20/40MHz Plus
SSID:	SilverNet1	PS Mode:	Active
Mode:	11an	Auth Mode:	OPEN
RSSI:	44	Encryption:	NONE
VLAN:	1	Listen Interval:	10
Distance	150m		

Tx/Rx Packets:	13843/15614
Tx/Rx Bytes:	2.53M/3.28M
Tx/Rx Rate:	300 Mbps/300.1 Mbps

Tx/Rx Statistic:

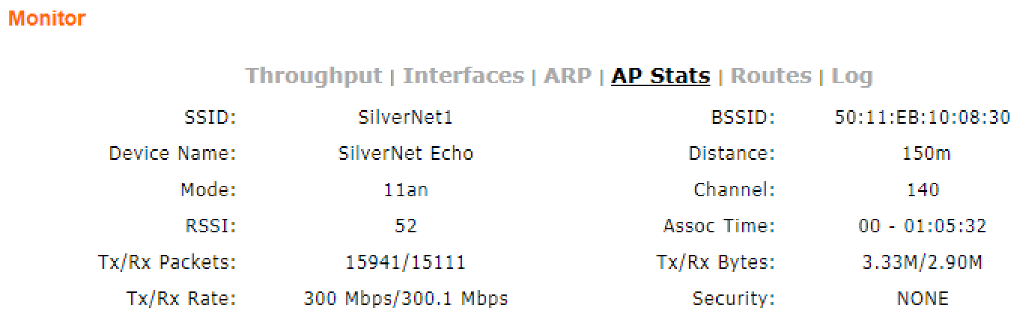
Rates:	Tx:	Rx:
6.5	0	0
13.5	0	0
27	0	0
40.5	0	0
54	0	0
81	0	0
108	0	0
121.5	0	0
162	0	2
216	8	67
243	47	783
270	186	1018
300	13601	13708

Figure 2-11 Station Details

- **BSSID：** BSSID of station.
- **Mode:** The mode of Station Radio.
- **AID:** connecting ID of Station.
- **Signal:** AP detected RSSI of the Station.
- **Assoc Time:** Uptime of STA.
- **Tx/Rx Packets:** send-receive packets between AP and Station. Tx means sending packets, Rx means receiving packets.
- **Tx/Rx Bytes:** send-receive bytes between AP and STA. Tx means sending bytes, Rx means receiving bytes.
- **Tx/Rx Rate:** The rate the packets are sent-received between AP and Station.

2.1.8 Monitor-AP Stats

When the unit is in Station Mode, the list shows information of the connected AP, as Figure 2-12



Monitor

Throughput | Interfaces | ARP | AP Stats | Routes | Log

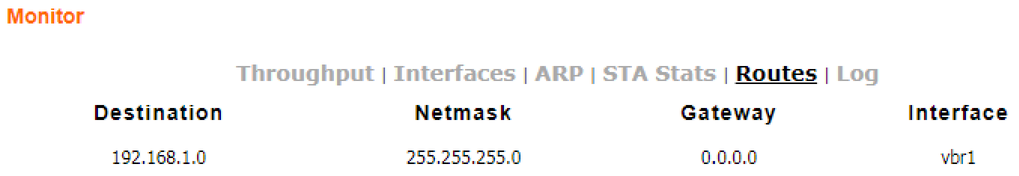
SSID:	SilverNet1	BSSID:	50:11:EB:10:08:30
Device Name:	SilverNet Echo	Distance:	150m
Mode:	11an	Channel:	140
RSSI:	52	Assoc Time:	00 - 01:05:32
Tx/Rx Packets:	15941/15111	Tx/Rx Bytes:	3.33M/2.90M
Tx/Rx Rate:	300 Mbps/300.1 Mbps	Security:	NONE

Figure 2-12 Monitor-AP Stats

- **SSID:** SSID name of the AP that the Station is connecting to.
- **BSSID:** BSSID address of the AP that the Station is connecting to.
- **Device Name:** The name of the device
- **Distance:** The estimated distance
- **Mode:** The Radio work mode of the AP that the Station is connecting to.
- **Channel:** The channel of the AP that the Station is connecting to.
- **Signal:** station detected AP RSSI.
- **RSSI:** The Receive signal strength
- **Assoc Time:** Up time after the station has connected to AP.
- **Tx/Rx Packets:** send-receive packets between AP and Station. Tx means sending packets, Rx means receiving packets.
- **Tx/Rx Bytes:** send-receive bytes between AP and STA. Tx means sending bytes, Rx means receiving bytes.
- **Tx/Rx Rate:** The rate the packets are sent-received between AP and Station.
- **Security:** The security mode the device is using

2.1.9 Monitor-Routes

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



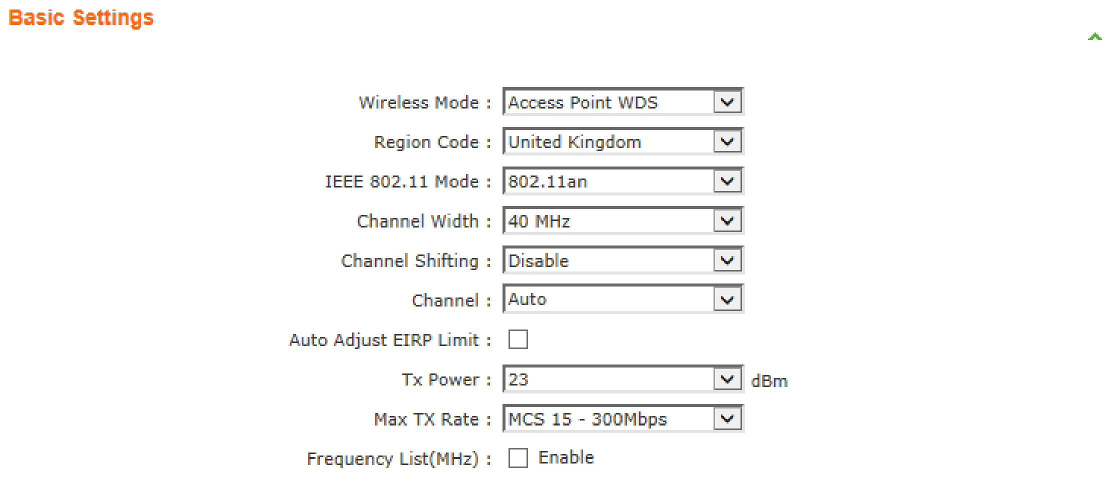
Destination	Netmask	Gateway	Interface
192.168.1.0	255.255.255.0	0.0.0.0	vbr1

Figure 2-13 Monitor-Routes

- **Destination:** Destination address
- **Netmask:** The subnet mask
- **Gateway:** The address of the router on the network if applicable.
- **Interface:** The interface relating to this routing info.

2.2 Radio Page

The Radio Page is mainly used for setting up the wireless LAN parameters



Basic Settings

Wireless Mode : Access Point WDS

Region Code : United Kingdom

IEEE 802.11 Mode : 802.11an

Channel Width : 40 MHz

Channel Shifting : Disable

Channel : Auto

Auto Adjust EIRP Limit : □

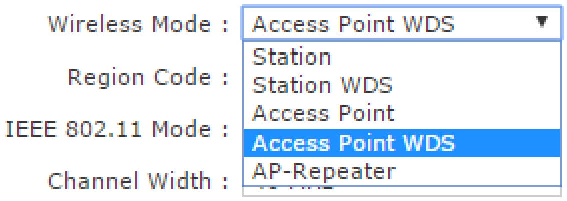
Tx Power : 23 dBm

Max TX Rate : MCS 15 - 300Mbps

Frequency List(MHz) : □ Enable

Figure 2-17 Radio Page

2.2.1 Basic Wireless Settings



Wireless Mode : Access Point WDS

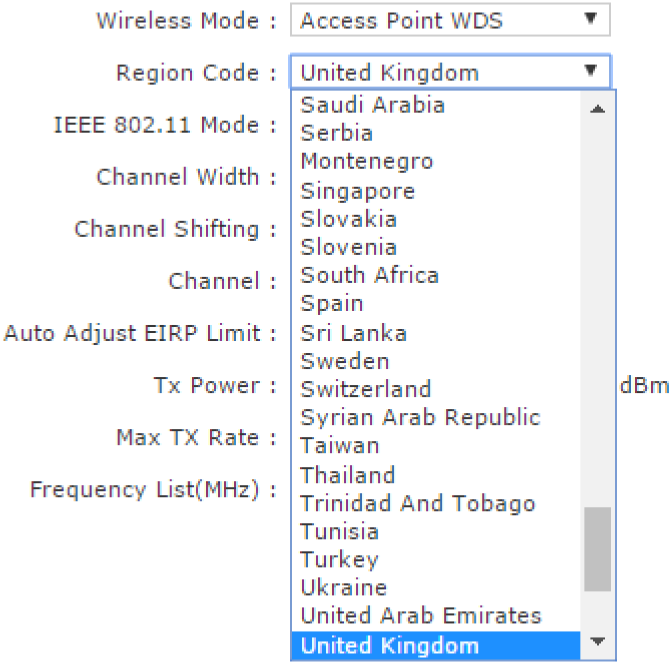
Region Code :

IEEE 802.11 Mode :

Channel Width :

Figure 2-18 Wireless Mode

- **Wireless Mode :** The mode of the WLAN. There are 4 modes the unit can run in. AP Mode, Station Mode, AP WDS Mode and Station WDS Mode. The default is AP WDS Mode.



Wireless Mode : Access Point WDS

Region Code : United Kingdom

IEEE 802.11 Mode :

Channel Width :

Channel Shifting :

Channel :

Auto Adjust EIRP Limit :

Tx Power : dBm

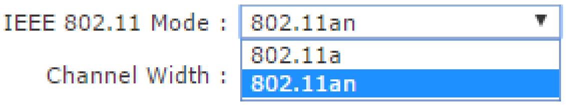
Max TX Rate :

Frequency List(MHz) :

Saudi Arabia
Serbia
Montenegro
Singapore
Slovakia
Slovenia
South Africa
Spain
Sri Lanka
Sweden
Switzerland
Syrian Arab Republic
Taiwan
Thailand
Trinidad And Tobago
Tunisia
Turkey
Ukraine
United Arab Emirates
United Kingdom

Figure 2-19 Country Code

- **Region code：** The default set region code is United Kingdom.



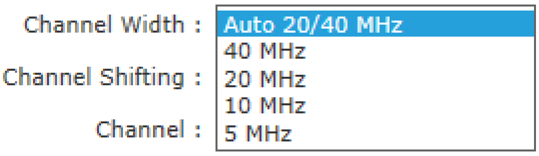
IEEE 802.11 Mode : 802.11an

Channel Width :

802.11a
802.11an

Figure 2-20 IEEE 802.11 Mode

- **IEEE 802.11 Mode:** The default mode is 802.11an.



Channel Width :

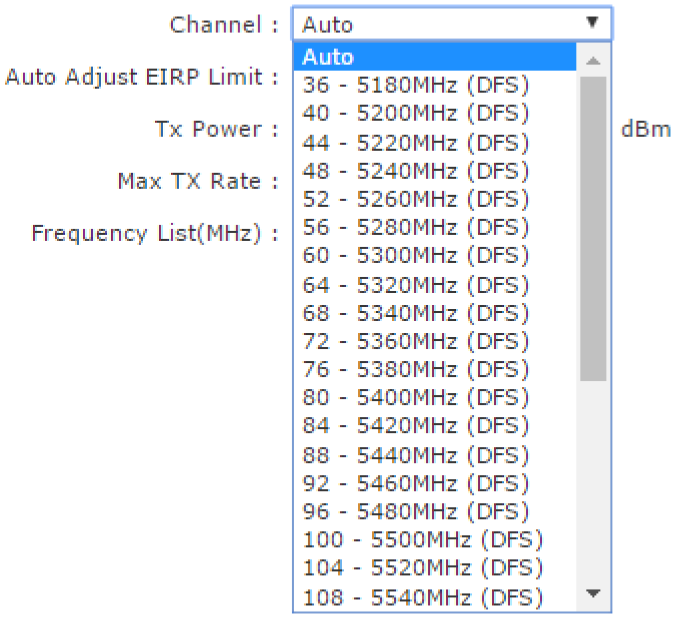
Channel Shifting :

Channel :

Auto 20/40 MHz
40 MHz
20 MHz
10 MHz
5 MHz

Figure 2-21 Channel Width

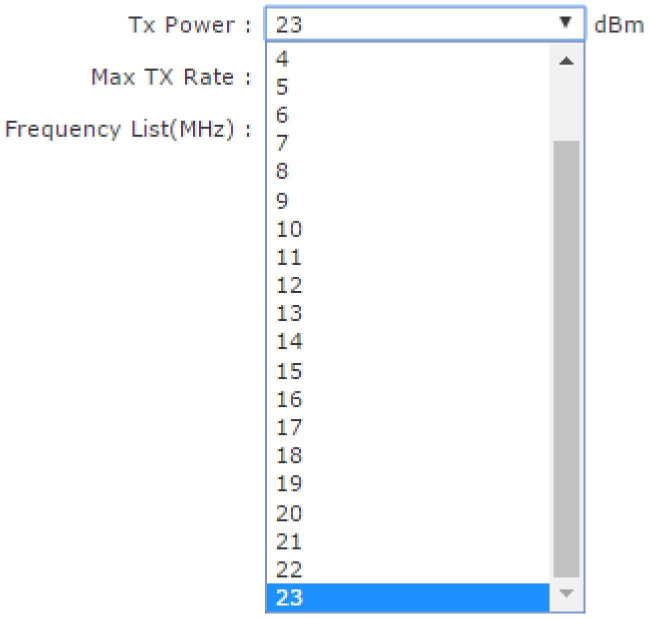
- **Channel Width：** The default mode is 20/40MHz.



Channel : Auto

Figure 2-22 Channel

- **Channel:** This is set to auto channel by default.



Tx Power : 23 dBm

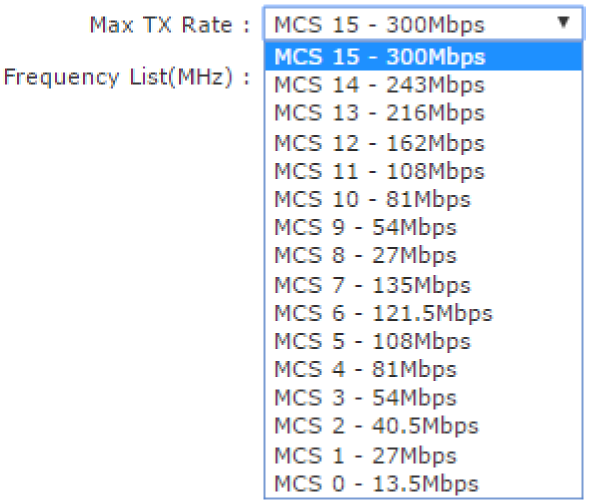
Figure 2-23 Tx Power

- **Tx Power：** The default is 24dBm.

⚠ WARNING

Tx power has a different limit for each country. When changing the Tx power the user should follow the regulatory rules.

Transmission power can influence signal strength of the wireless communication. When it transmit distance is long, please increase transmit power intermittently to ensure stronger signal. signal strength.



Max TX Rate : MCS 15 - 300Mbps ▼

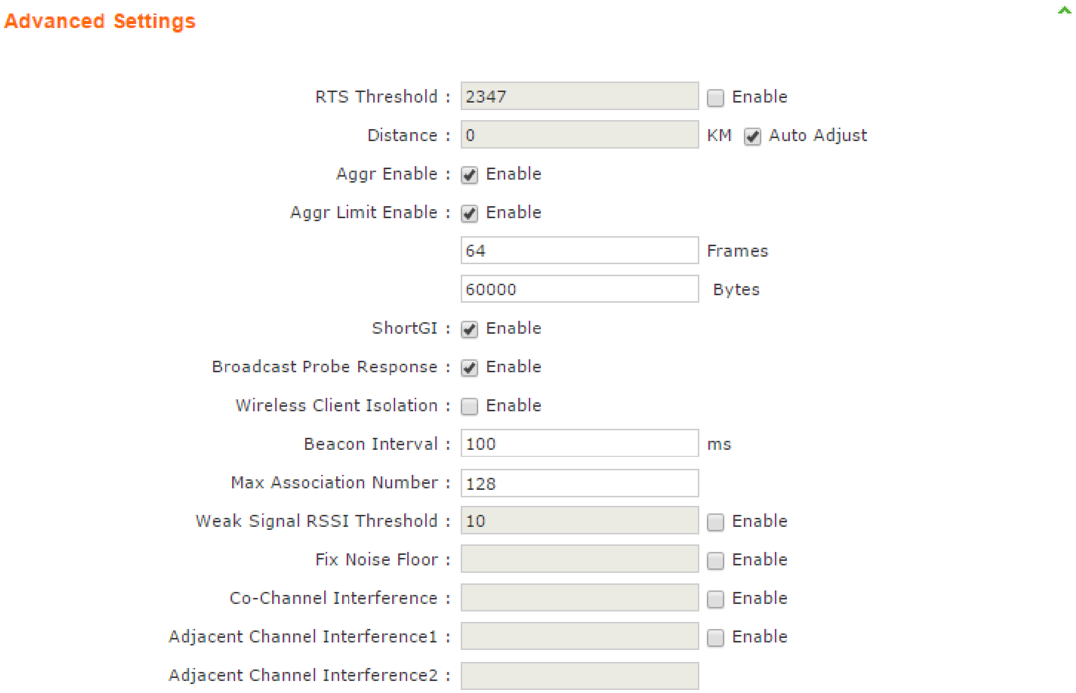
Frequency List(MHz) :

MCS 15 - 300Mbps
MCS 14 - 243Mbps
MCS 13 - 216Mbps
MCS 12 - 162Mbps
MCS 11 - 108Mbps
MCS 10 - 81Mbps
MCS 9 - 54Mbps
MCS 8 - 27Mbps
MCS 7 - 135Mbps
MCS 6 - 121.5Mbps
MCS 5 - 108Mbps
MCS 4 - 81Mbps
MCS 3 - 54Mbps
MCS 2 - 40.5Mbps
MCS 1 - 27Mbps
MCS 0 - 13.5Mbps

Figure 2-24 Max TX Rate

- **Max TX Rate：** 2.4GHz/5GHz radio are 2X2 devices, the max support is MCS=15 which is also the default setting.

2.2.2 Advanced Wireless Settings



Advanced Settings

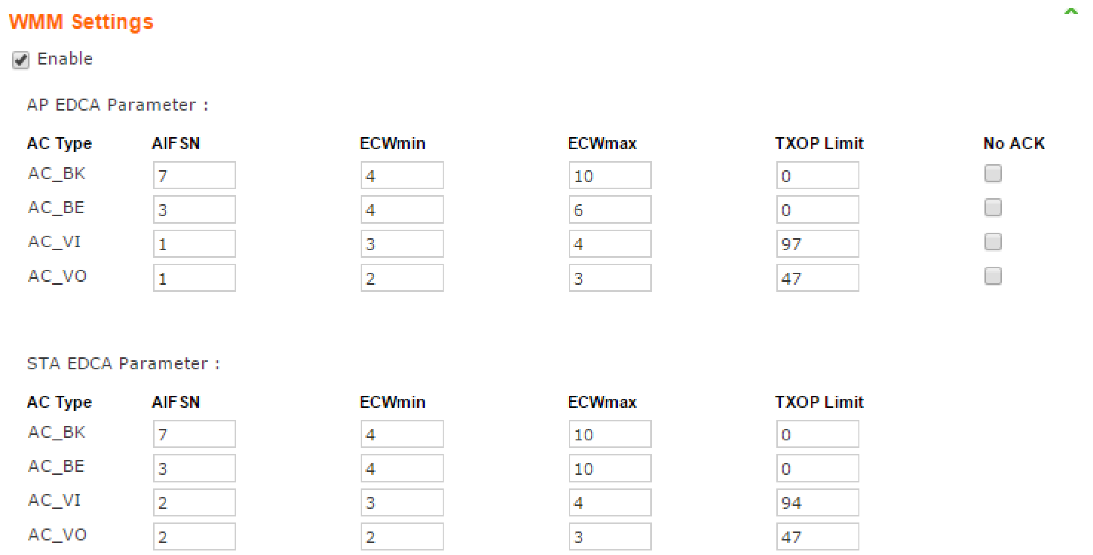
RTS Threshold : 2347 □ Enable
Distance : 0 KM ☑ Auto Adjust
Aggr Enable : ☑ Enable
Aggr Limit Enable : ☑ Enable
64 Frames
60000 Bytes
ShortGI : ☑ Enable
Broadcast Probe Response : ☑ Enable
Wireless Client Isolation : □ Enable
Beacon Interval : 100 ms
Max Association Number : 128
Weak Signal RSSI Threshold : 10 □ Enable
Fix Noise Floor : □ Enable
Co-Channel Interference : □ Enable
Adjacent Channel Interference1 : □ Enable
Adjacent Channel Interference2 :

Figure 2-25 RTS Threshold

- **RTS Threshold:** The default setting for the RTS threshold is 2347. However this is not enabled by default.
- **Fragmentation Threshold：** This is not set by default

- **Distance:** ACK _timeout is enabled by default you can set distance between AP and STA allowing the link to be more stable when it is transmitting in long distance, proper adjustment can improve throughput.
- **Aggr Enable：** Enable to start function of A-MPDU this is set to enable by default.
- **Aggr limit Enable:** used o set the sending limit function of A-MPDU, this is set to enable by default. The max Aggr packet is 64 units. The max Aggr length is 60000 bytes.

2.2.3 WMM Settings



WMM Settings

☑ Enable

AP EDCA Parameter :

AC Type	AIFSN	ECWmin	ECWmax	TXOP Limit	No ACK
AC_BK	7	4	10	0	☐
AC_BE	3	4	6	0	☐
AC_VI	1	3	4	97	☐
AC_VO	1	2	3	47	☐

STA EDCA Parameter :

AC Type	AIFSN	ECWmin	ECWmax	TXOP Limit
AC_BK	7	4	10	0
AC_BE	3	4	10	0
AC_VI	2	3	4	94
AC_VO	2	2	3	47

Figure 2-26 WMM Settings

WMM Settings is used to set AP EDCA parameter and ST EDCA parameter.

- **AC Type:** Access control, the Enhance Distributed Channel Access (EDCA) has 4 AC types. Each AC type has a specific set of parameters that they follow.
- **AIFSN：** Arbitration Inter-Frame Space Number. This allows for AC types to be given higher or lower priority.
- **ECWmin/max：** CW means content window. This can be set according to the traffic expected in each AC. Wider window is set for higher traffic.
- **TXOP Limit：** TXOP means Tx opportunity. This is a bounded time window in which a unit can send as many frames as possible.
- **No ACK:** No ACK frames do not have to be acknowledged used to avoid retransmission.

2.3 WIRELESS Page

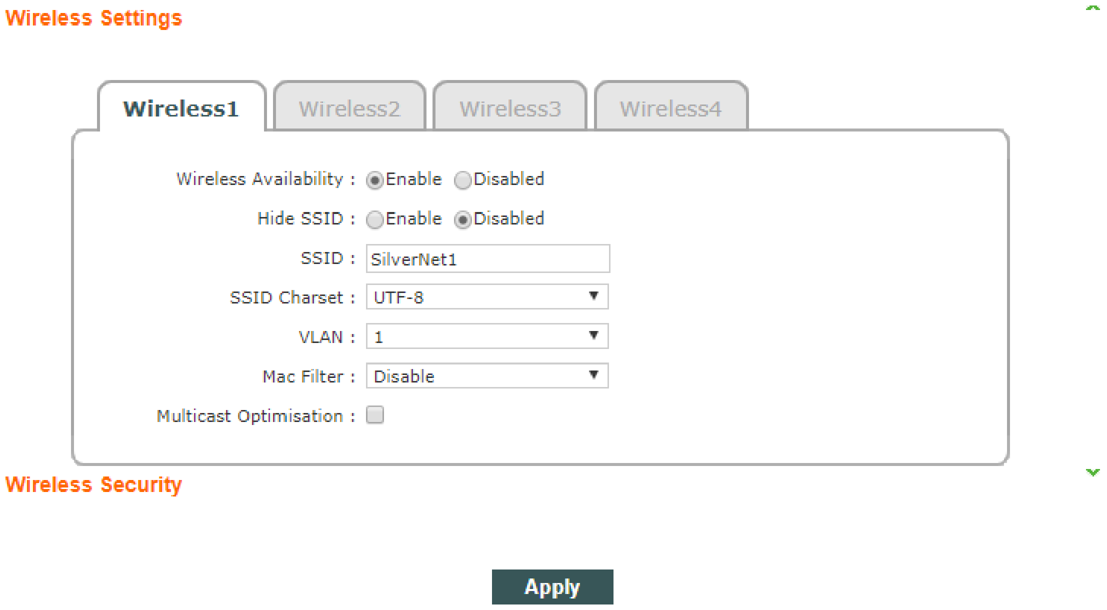
The wireless Page is used to set up the WLAN of the AP or the relevant parameters for the Station allowing the station to connect to the AP

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 :** The unit can be ser with 4 wireless services, name correctly so they can be distinguished from one another.
- **Wireless Availability :** Weather the wireless service is enabled or disabled by default the status of Wireless1 is enabled, and Disabled for all others.
- **Hide SSID :** This can be disabled or enabled. This function allows the link to be hidden from all other wireless equipment. By default this is disabled.
- **SSID:** In this textbox is where you would type the SSID.

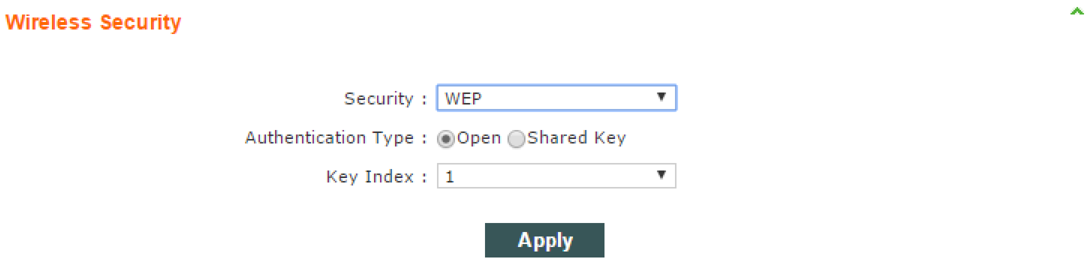


Wireless Availability : ● Enable ○ Disabled
Hide SSID : ○ Enable ● Disabled
SSID : SilverNet1
SSID Charset : UTF-8
VLAN : 1
Mac Filter : Disable
Multicast Optimisation : □

Figure 2-27 Wireless Page

2. Wireless Security

- **Security:** This is where the security settings of the link can be changed the default setting is WPA2 PSK. WEP security type, as shown Figure 2-27.



Wireless Security

Security : WEP ▼

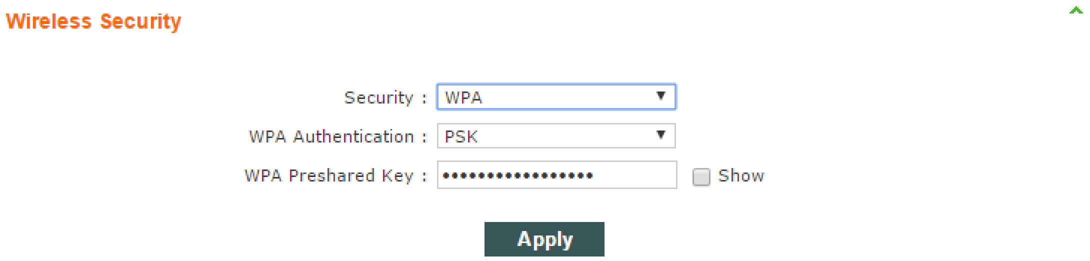
Authentication Type : ● Open ○ Shared Key

Key Index : 1 ▼

Figure 2-28 WEP Security Type

- **Authentication Type：** Set authentication method, the default is set to 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.

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



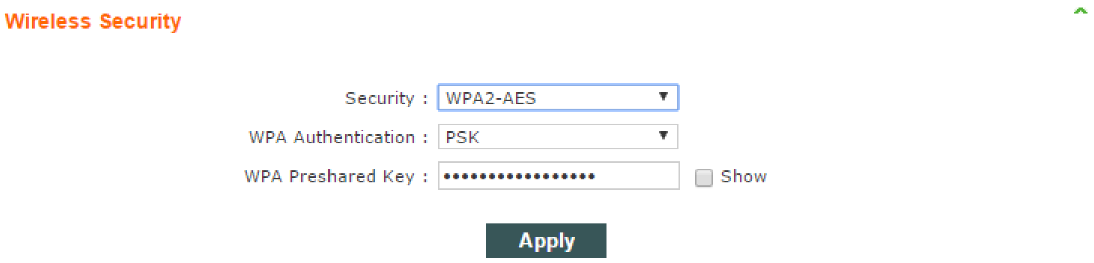
Wireless Security

Security : WPA ▼

WPA Authentication : PSK ▼

WPA Preshared Key : ••••••••••••••••• □ Show

Figure 2-29 WPA security type



Wireless Security

Security : WPA2-AES ▼

WPA Authentication : PSK ▼

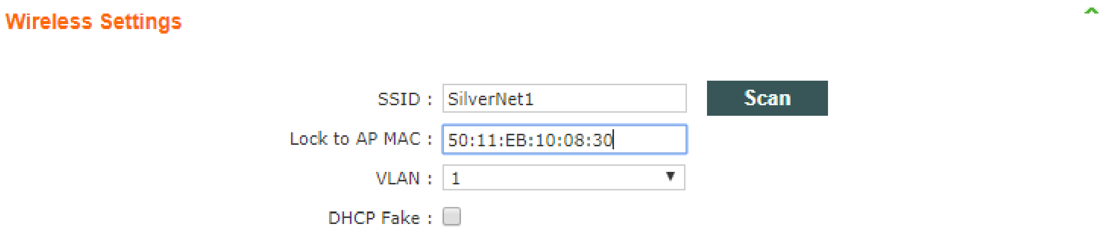
WPA Preshared Key : ••••••••••••••••• □ Show

Figure 2-30 WPA2 security type

- **WPA Authentication:** Set WPA/WPA2 authentication method
- **WPA Preshard Key：** Set PSK key of WPA/WPA2.

2.3.2 Station/Station WDS Mode

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



Wireless Settings

SSID : SilverNet1

Lock to AP MAC : 50:11:EB:10:08:30

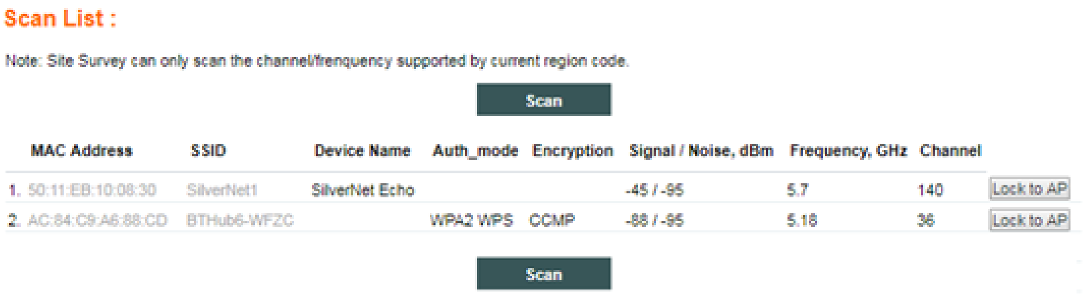
VLAN : 1

DHCP Fake : □

Figure 2-31 Wireless Setting Page

1. Wireless Settings

- **SSID:** Enter the same SSID as you have in the AP. IF you just enter the SSID and do not lock to AP MAC the station will connect to the strongest signal of the same SSID.
- **Lock to AP MAC:** Here you will enter the Mac of the partner radio making the radios have to meet two conditions before they connect.
- **Scan:** The scan button is used to scan for SSID's and available channels， as Figure 2-31.



Scan List :

Note: Site Survey can only scan the channel/frenquency supported by current region code.

	MAC Address	SSID	Device Name	Auth_mode	Encryption	Signal / Noise, dBm	Frequency, GHz	Channel	
1.	50:11:EB:10:08:30	SilverNet1	SilverNet Echo			-45 / -95	5.7	140	Lock to AP
2.	AC:84:C9:A6:88:CD	BTHub6-WFZC		WPA2 WPS	CCMP	-88 / -95	5.18	36	Lock to AP

Figure 2-32 Scan List

- **MAC Address:** The BSSID address of the wireless service.
- **SSID:** The BSSID name of the wireless service, also called ESSID.
- **Auth_mode:** Authentication method of the wireless service.
- **Encryption:** The encryption type of the wireless service.
- **Signal/Noise:** Ssignal strength of the wireless service.
- **Frequency：** The frequency of the wireless service.
- **Channel:** The channel of the wireless service.
- **Lock to AP:** If this button is pressed the unit would lock to the BSSID of this wireless service.

2. Wireless Security

The unit would automatically choose the right encryption type you would need to manually go and input the pre shared key to establish connection.

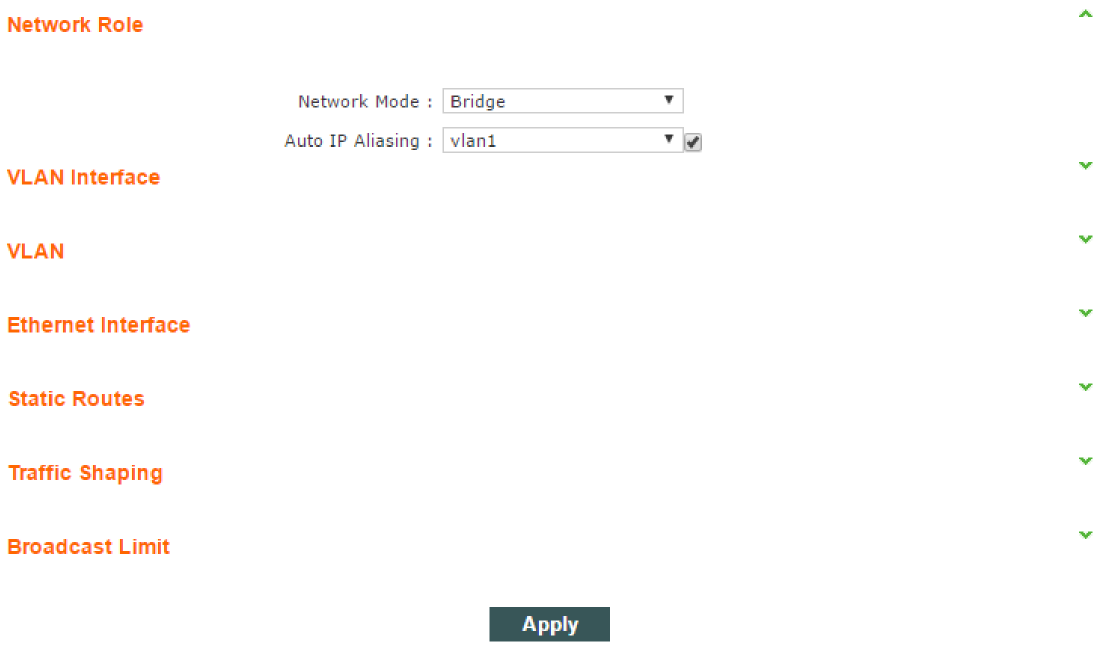
2.4 NETWORK

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

SOHO Router Mode and **WISP Mode** have the same 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 : Bridge

Auto IP Aliasing : vlan1 ☑

Figure 2-33 Bridge Mode

1. Network Role

- **Network Mode:** set current network mode.
- **Auto IP Aliasing:** When this is enable the unit will be recoverable by the IP address set up in whichever Vlan interface the user inputs into the drop down menu

2. VLAN

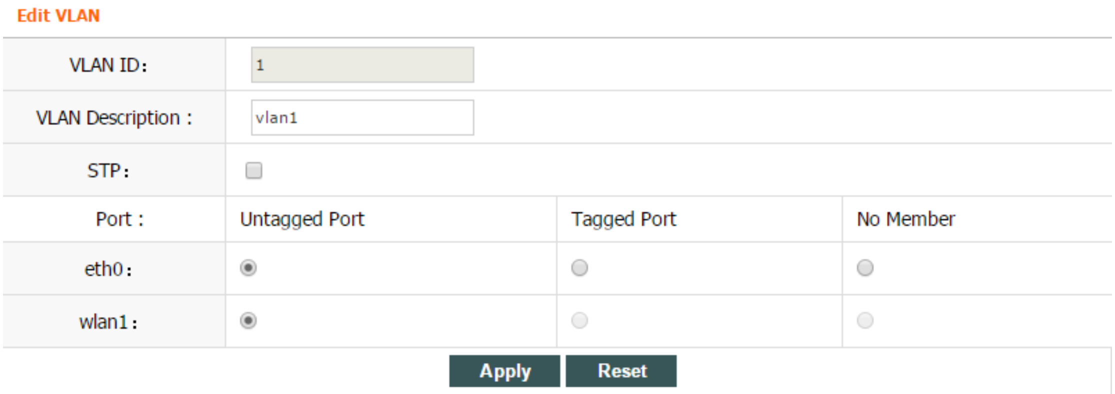
- **ID:** The added VLAN ID.

- **Describe:** The description of a VLAN.
- **Untagged Port:** Untagged ports of this VLAN.
- **Tagged Port:** Tagged ports of this VLAN.
- **Edit:** Edit corresponding VLAN
- **Delete:** Delete corresponding VLAN.

3. VLAN Interface

- **ID**: VLAN ID.
- **Interface:** corresponding VLAN interface of VLAN ID.
- **Mode:** Access of the IP of the corresponding VLAN interface.
- **IP/ Mask:** IP address and netmask of corresponding VLAN interface.
- **Gateway:** Gateway of corresponding VLAN interface.
- **DHCP:** Open DHCP server function of corresponding VLAN interface.
- **MTU:** MTU of corresponding VLAN interface.
- **Edit:** Edit corresponding VLAN interface.

,

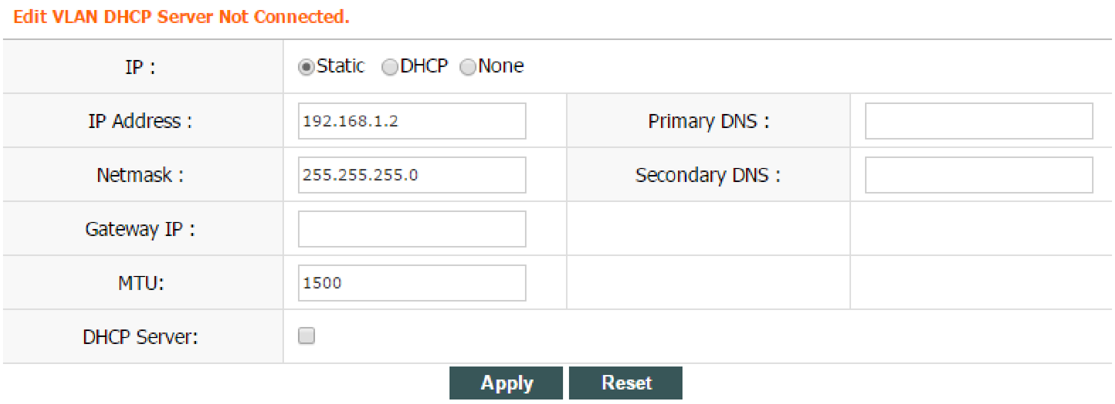


Edit VLAN

VLAN ID:	1		
VLAN Description :	vlan1		
STP:	□		
Port :	Untagged Port	Tagged Port	No Member
eth0:	●	○	○
wlan1:	●	○	○

Figure 2-34 Edit VLAN

- **VLAN Description:** edit the description of the VLAN
- **Port:** When set to untagged all traffic can flow through the port tagged and untagged. When set to tagged only traffic with the corresponding Vlan ID can pass through the port.



Edit VLAN DHCP Server Not Connected.

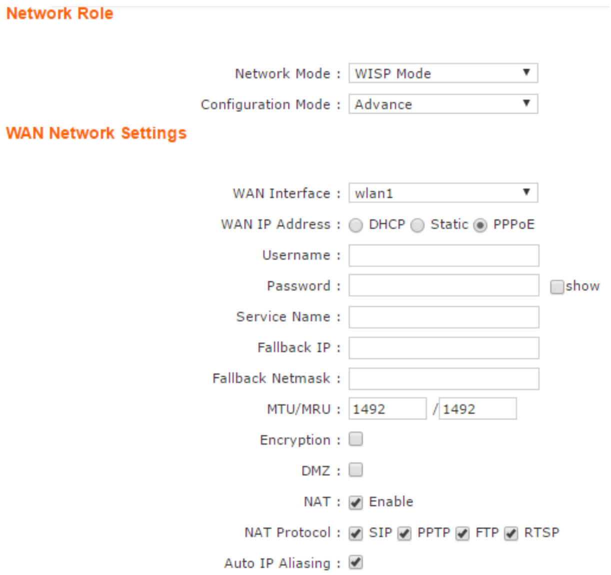
IP :	● Static ○ DHCP ○ None		
IP Address :	192.168.1.2	Primary DNS :	
Netmask :	255.255.255.0	Secondary DNS :	
Gateway IP :			
MTU:	1500		
DHCP Server:	□		

Figure 2-35 Edit VLAN Interface

- **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.
- **IP Start:** Set start IP address of DHCP server
- **IP End:** Set end IP address of DHCP server
- **Netmask:** Set netmask of DHCP server
- **Lease Time:** Set lease time of DHCP server

2.4.2 WISP/SOHO Router Mode

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



Network Role

Network Mode : WISP Mode ▾

Configuration Mode : Advance ▾

WAN Network Settings

WAN Interface : wlan1 ▾

WAN IP Address : ○ DHCP ○ Static ● PPPoE

Username :

Password : □ show

Service Name :

Fallback IP :

Fallback Netmask :

MTU/MRU : 1492 / 1492

Encryption : □

DMZ : □

NAT : ☑ Enable

NAT Protocol : ☑ SIP ☑ PPTP ☑ FTP ☑ RTSP

Auto IP Aliasing : ☑

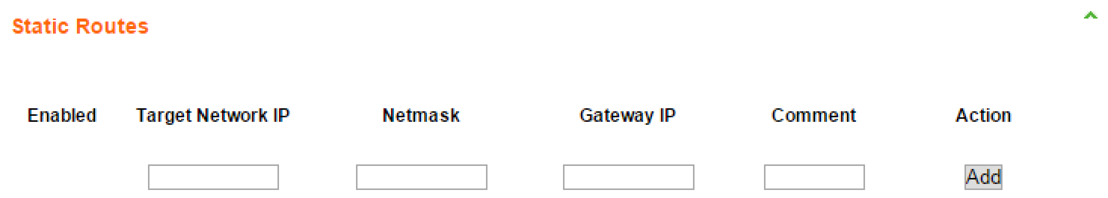
Figure 2-36 Setting Page

1. Network Role

- **Network Mode:** Used to set network mode.

2. WAN Network Settings

- **WAN IP Address:** The WAN IP address can be obtained in three different ways, Static, DHCP and PPPoE negotiation. WISP Mode uses PPPoE to obtain wan IP address
- **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 is enabled when PPPoE negotiation is using Microsoft Point-to-Point Encryption Agreement.
- **NAT:** Set NAT service to “enabled” or “disabled” with the checkbox.
- **DMZ**: Set DMZ service of “enabled” or “disabled” with the checkbox
- **NAT Protocol:** Device supports the following NAT services of SIP, RSTP, FTP and PPTP.



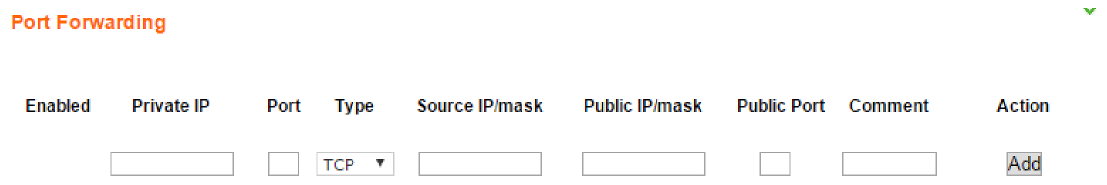
Static Routes

Enabled	Target Network IP	Netmask	Gateway IP	Comment	Action
					Add

Figure 2-38 Static Routes

Static Routes is one kind of special routes, manually configured by the administrator.

- **Enable:** Set the static routes service to enable or disabled.
- **Target Network IP:** Set the target network IP address.
- **Netmask:** set the netmask.
- **Gateway IP:** Set the gateway IP.
- **Comment:** Comment can be added for corresponding static routes.
- **Action:** Add, delete, and edit static routes.



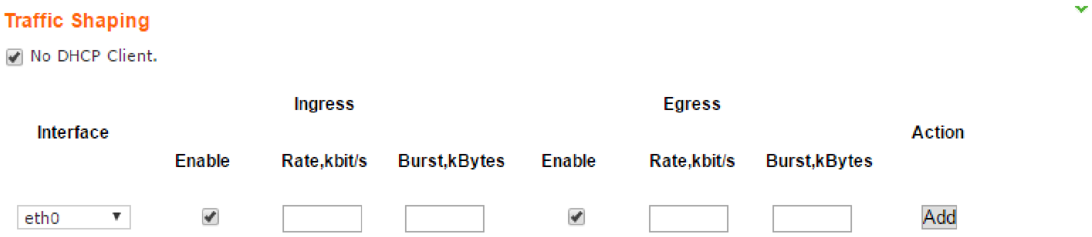
Port Forwarding

Enabled	Private IP	Port	Type	Source IP/mask	Public IP/mask	Public Port	Comment	Action
			TCP ▼					Add

Figure 2-39 Port Forwarding

Port Forwarding comes into effect when network mode is SOHO Router/WISP.

- **Enable:** Set the port forwarding to enable or disabled.
- **Private IP:** Set the forwarded intranet host IP address.
- **Private Port:** Set the forwarded intranet host protocol a port number.
- **Type:** Set the forwarded intranet host protocol to either TCP or UDP.
- **Source IP/Mask:** Set the visiting host source IP and mask.
- **Public IP/Mask:** Set the forwarded extranet host IP and mask.
- **Public Port:** Set the extranet port for intranet host forwarding.
- **Comment:** Add a comment for corresponding forwarding.
- **Action:** Add, delete, and edit corresponding forwarding.



Traffic Shaping

☑ No DHCP Client.

Interface	Ingress			Egress			Action
	Enable	Rate,kbit/s	Burst,kBytes	Enable	Rate,kbit/s	Burst,kBytes	
eth0 ▾	☑			☑			Add

Figure 2-40 Traffic Shaping

Traffic Shaping is used to limit ingress and egress bandwidth on the Ethernet port and the wireless interface.

- **Enable:** set traffic shaping service to enable or disabled for the corresponding interface.
- **Ingress:** ingress traffic is traffic on the ingressing interface.
- **Egress:** egress traffic is traffic on the forwarding interface.
- **Rate,kbit/s:** Set limited max rate.
- **Burst,kBytes:** Set burst byte length.
- **Action:** Add, delete, and edit corresponding rules.

2.5 SERVICES

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

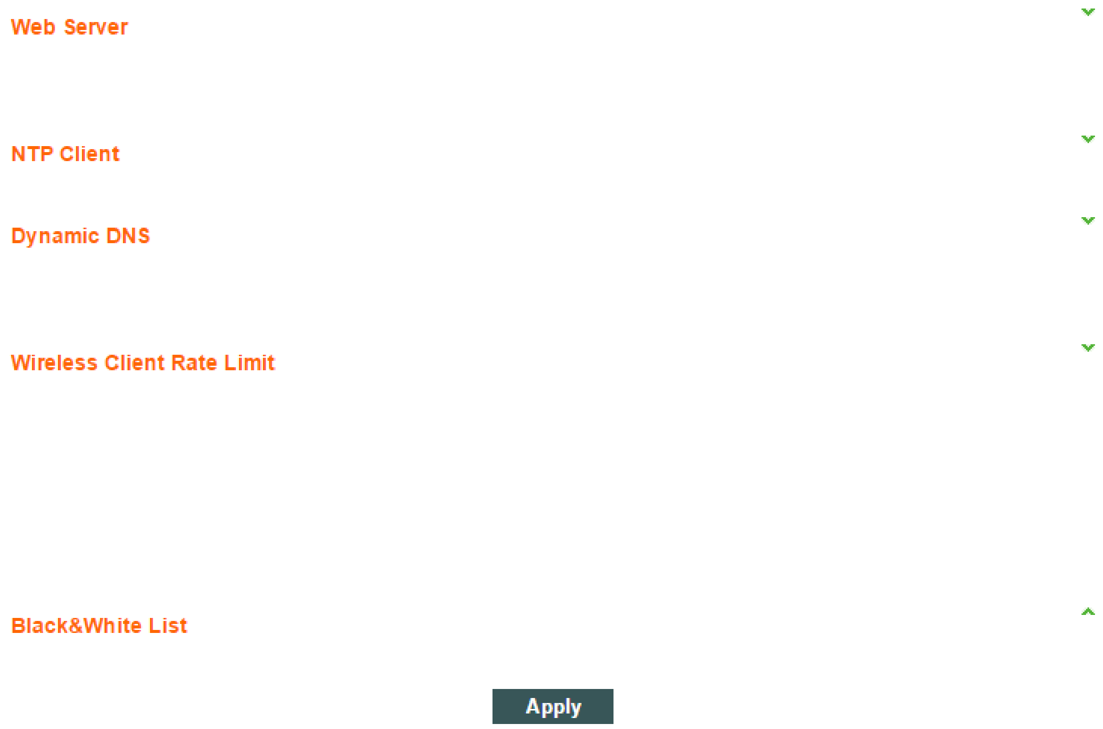
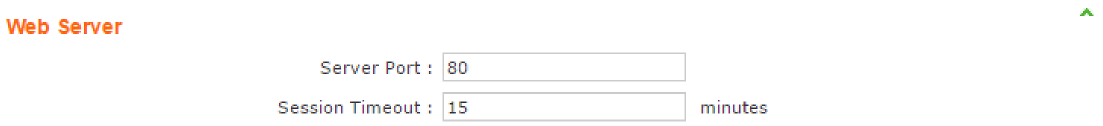


Figure 2-41 Services

2.5.1 Web Server

Web Server is used to set server port and session timeout of web server.



Server Port : 80

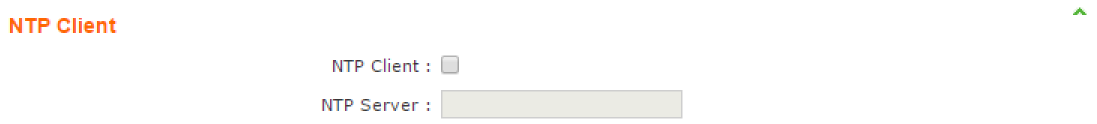
Session Timeout : 15 minutes

Figure 2-42 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 NTP Client

NTP means Network Time Protocol. NTP can set the time as the same on all units.



NTP Client

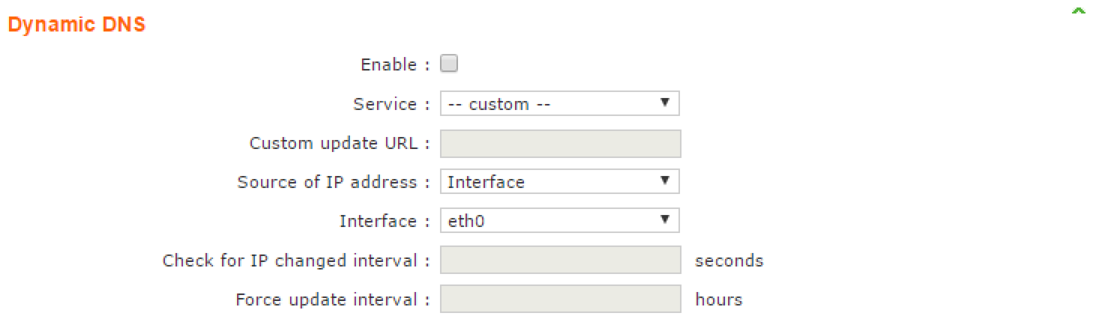
NTP Client : ☐

NTP Server :

Figure 2-44 NTP Client

- **NTP Client:** Set NTP Client service as enable or disabled, the default is set to disabled.
- **NTP Server:** Set IP address or domain name of NTP Server.

2.5.3 Dynamic DNS



Dynamic DNS

Enable : ☐

Service : -- custom --

Custom update URL :

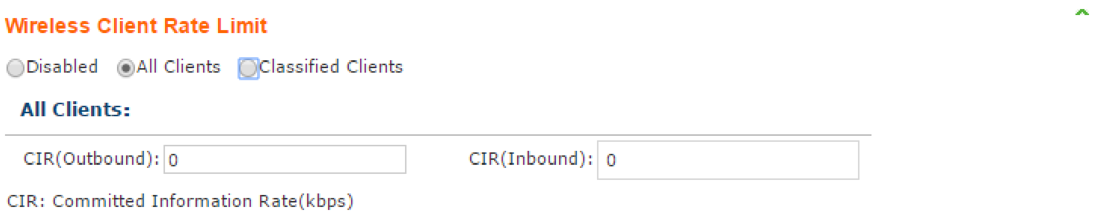
Source of IP address : Interface

Interface : eth0

Check for IP changed interval : seconds

Force update interval : hours

2.5.4 Wireless Client Rate Limit



Wireless Client Rate Limit

○Disabled ●All Clients ○Classified Clients

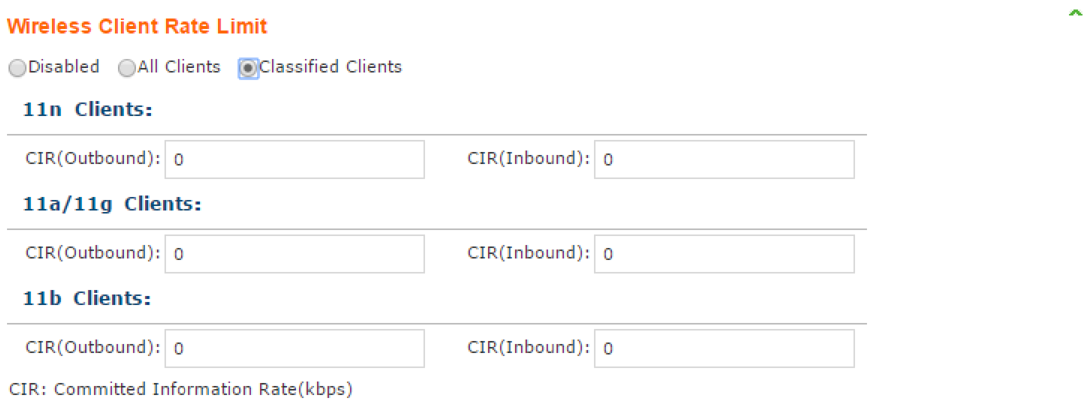
All Clients:

CIR(Outbound): 0 CIR(Inbound): 0

CIR: Committed Information Rate(kbps)

Figure 2-46 Client Rate Limit-All Clients

- **CIR:** CIR means Committed Information Rate in other words bandwidth rate limit, kbps is the unit of measure.
- **Outbound:** Set the outbound rate limit value this is the limited rate of Transmitting.
- **Inbound:** Set the inbound speed limit value this is the limited rate of the receiving RF.



Wireless Client Rate Limit

○ Disabled ○ All Clients ● Classified Clients

11n Clients:

CIR(Outbound): 0 CIR(Inbound): 0

11a/11g Clients:

CIR(Outbound): 0 CIR(Inbound): 0

11b Clients:

CIR(Outbound): 0 CIR(Inbound): 0

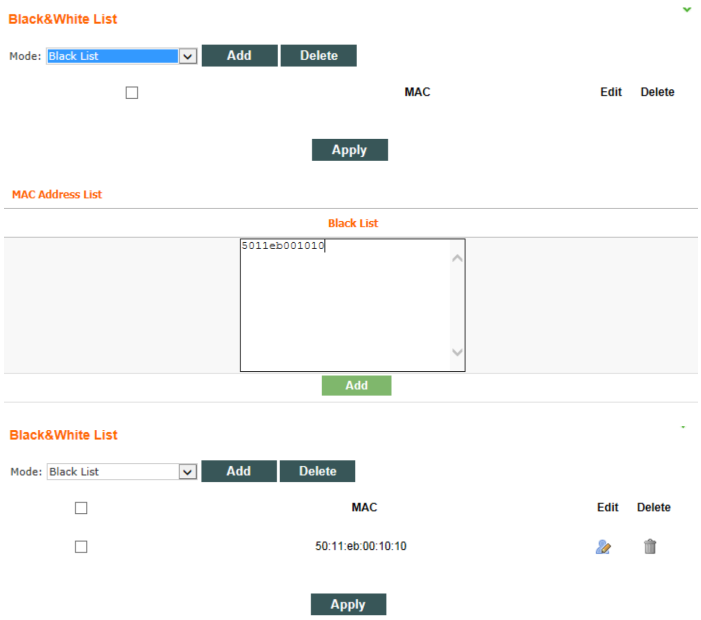
CIR: Committed Information Rate(kbps)

Figure 2-47 Client Rate Limit-Classified Clients

- **11n Clients:** Set the inbound and outbound rate limit of 802.11n clients.
- **11a/11g Clients:** Set the inbound and outbound rate limit of 802.11a/802.11g clients.
- **11b Clients:** Set the inbound and outbound rate limit of 802.11b clients.

2.5.5 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: Black List

□	MAC	Edit	Delete

MAC Address List

Black List

5011eb001010

Black&White List

Mode: Black List

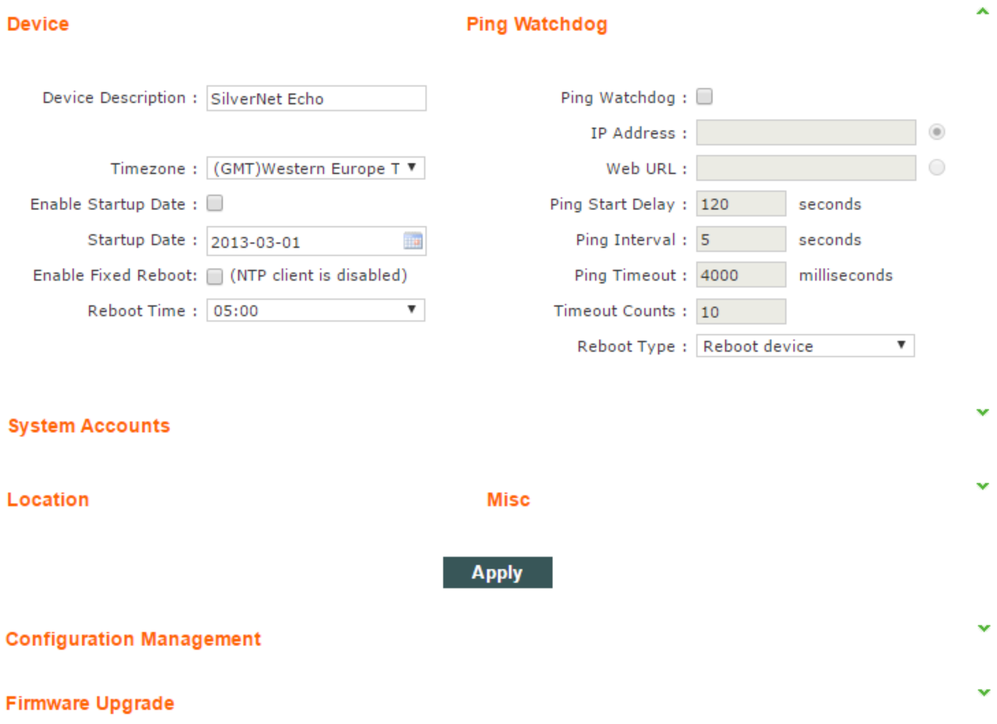
□	MAC	Edit	Delete
□	50:11:eb:00:10:10		

Figure 2-52 MAC Control

- **Mode:** This can be set to either Blacklist or Whitelist, this will deny or allow specific MAC addresses.
- **Mac Address** List: Input MAC address, Add.

2.6 SYSTEM

System Page is mainly used for settings relating to device management, as Figure 2-49.



Device

Device Description : SilverNet Echo

Timezone : (GMT)Western Europe T ▼

Enable Startup Date : □

Startup Date : 2013-03-01

Enable Fixed Reboot: □ (NTP client is disabled)

Reboot Time : 05:00 ▼

Ping Watchdog

Ping Watchdog : □

IP Address : ●

Web URL : ○

Ping Start Delay : 120 seconds

Ping Interval : 5 seconds

Ping Timeout : 4000 milliseconds

Timeout Counts : 10

Reboot Type : Reboot device ▼

System Accounts

Location

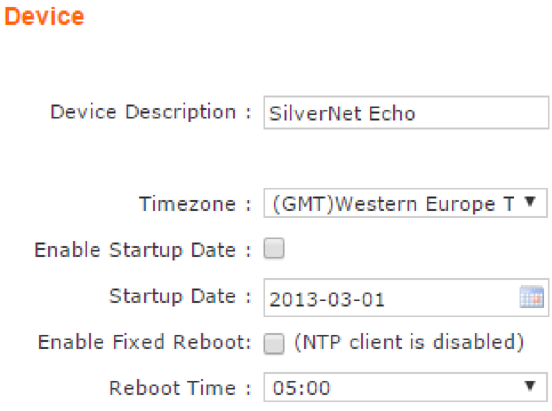
Misc

Configuration Management

Firmware Upgrade

Figure 2-53 System Page

2.6.1 Device



Device

Device Description : SilverNet Echo

Timezone : (GMT)Western Europe T ▼

Enable Startup Date : □

Startup Date : 2013-03-01

Enable Fixed Reboot: □ (NTP client is disabled)

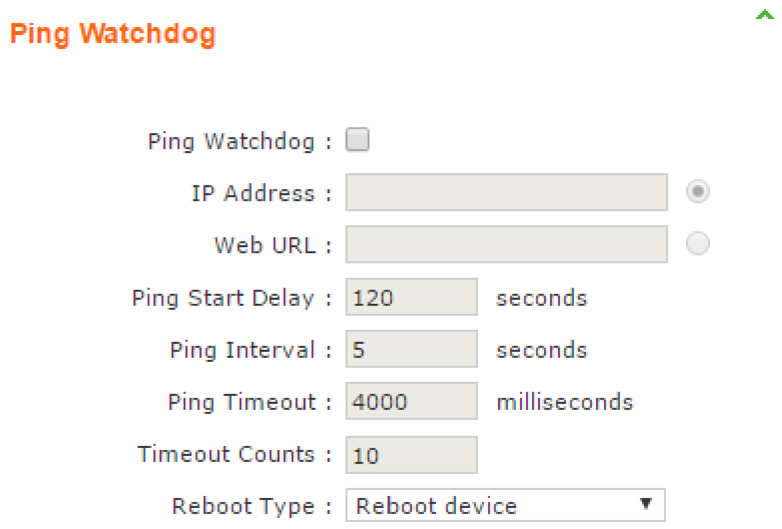
Reboot Time : 05:00 ▼

Figure 2-54 Device

- **Device Description:** Set the device description.
- **Enable Startup Date:** Set to enable startup date, the default is disabled.

- **Startup Date:** Set the device startup date.
- **Time zone:** Set the device time zone.

2.6.2 Ping Watchdog



Ping Watchdog

Ping Watchdog : ☐

IP Address : ●

Web URL : ○

Ping Start Delay : 120 seconds

Ping Interval : 5 seconds

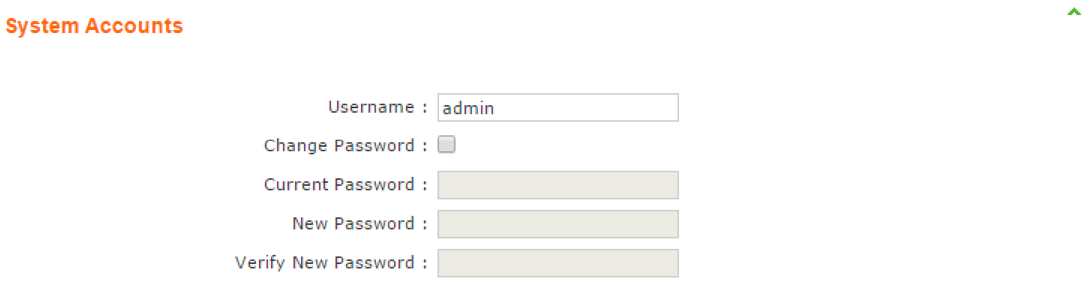
Ping Timeout : 4000 milliseconds

Timeout Counts : 10

Reboot Type : Reboot device ▼

Figure 2-55 Ping Watchdog

2.6.3 System Accounts



System Accounts

Username : admin

Change Password : ☐

Current Password :

New Password :

Verify New Password :

Figure 2-56 System Accounts

- **Username:** Set the admin username.
- **Current Password:** Input current password.
- **New Password:** Set a new password.
- **Verify New Password:** Verify the new password.

2.6.4 Configuration Management

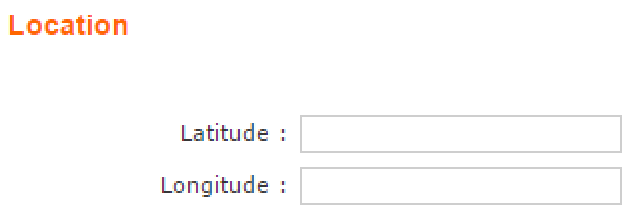


Figure 2-57 Location Page

- **Latitude:** Set device latitude.
- **Longitude:** Set device longitude.

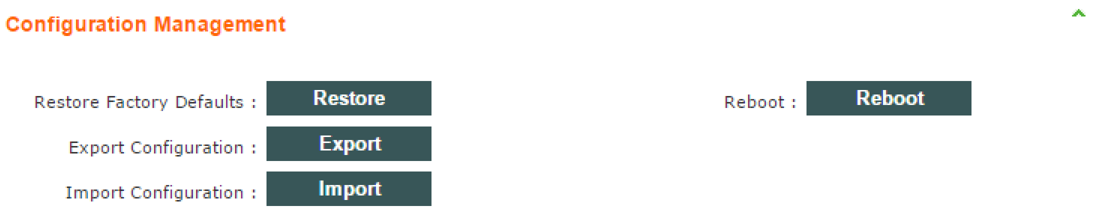
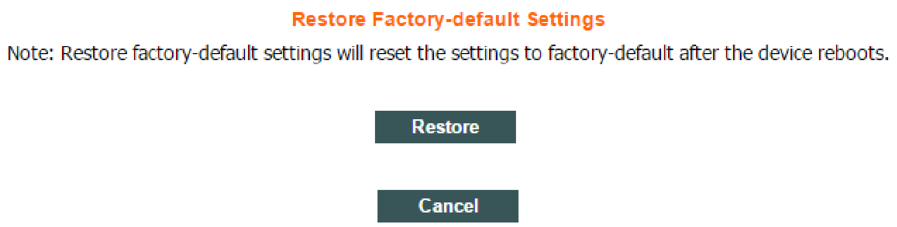
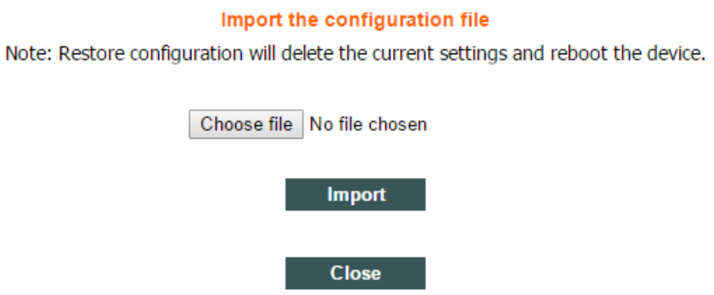


Figure 2-58 Configuration Management


Restore Factory-default Settings

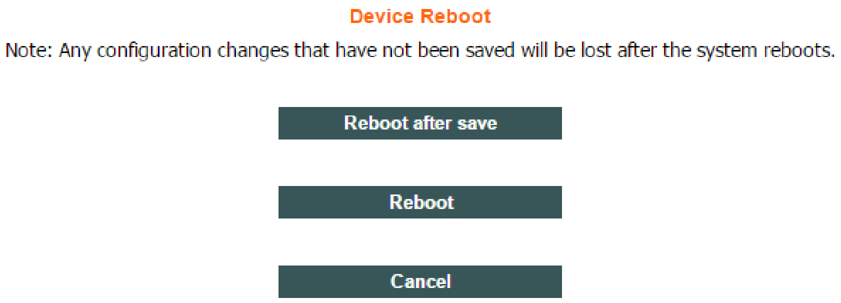
Note: Restore factory-default settings will reset the settings to factory-default after the device reboots.

Figure 2-59 Restore Factory-default settings


Import the configuration file

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

Figure 2-60 Import the configuration file



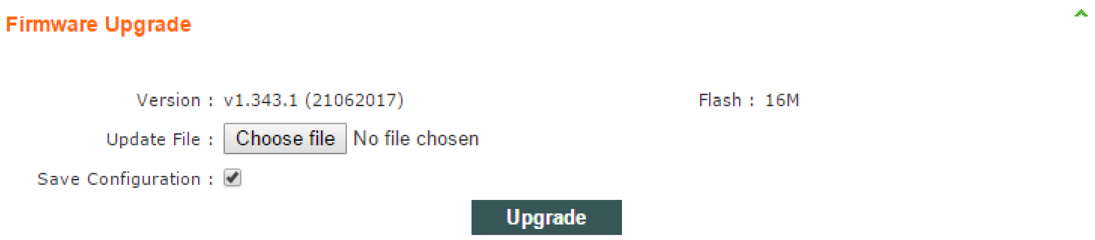
Device Reboot

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

Figure 2-61 Device Reboot

- **Restore Factory defaults:** Restore to factory default.
- **Export Configuration:** Export current configuration.
- **Import Configuration:** Import configuration into device.
- **Reboot:** Reboot device.

2.6.5 Firmware upgrade



Firmware Upgrade

Version : v1.343.1 (21062017) Flash : 16M

Update File : Choose file No file chosen

Save Configuration : ☑

Figure 2-62 Firmware Upgrade

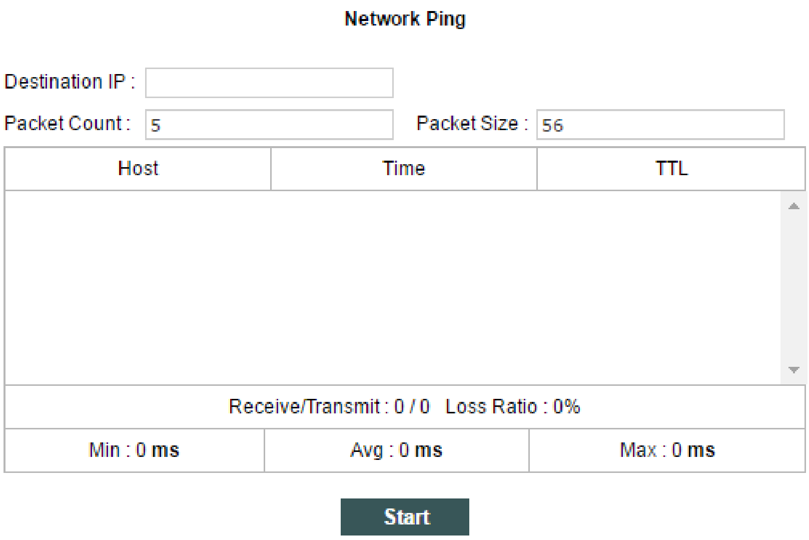
Firmware upgrade is used for upgrading software of the device.

- **Version:** displays the current version of firmware.
- **Update File:** Choose update file.

2.7 Tools

2.7.1 Ping

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



Network Ping

Destination IP :

Packet Count : 5

Packet Size : 56

Host	Time	TTL

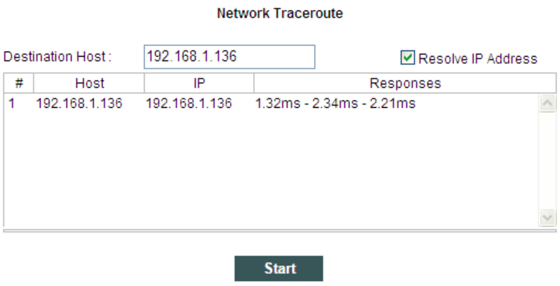
Receive/Transmit : 0 / 0   Loss Ratio : 0%

Min : 0 ms	Avg : 0 ms	Max : 0 ms

Figure 2-63 Network Ping

- **Destination IP:** The target IP address.
- **Packet Count:** Number of the pings.
- **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 : 192.168.1.136

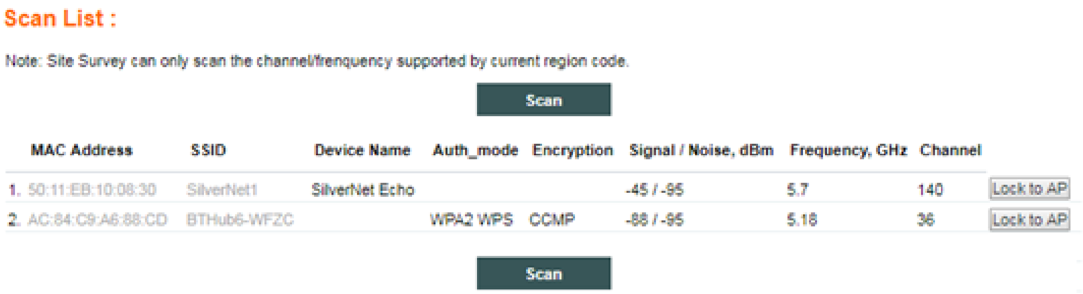
☑ Resolve IP Address

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

Figure 2-64 Network Traceroute

- **Destination host:** The target IP address/domain for tracing.
- **Resolve IP Address:** Allows IP address to be entered

2.7.3 Site survey



Scan List :

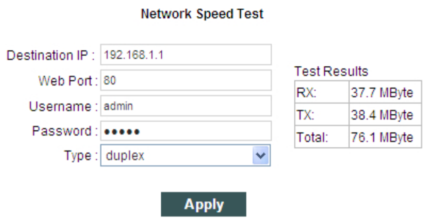
Note: Site Survey can only scan the channel/frenquency supported by current region code.

	MAC Address	SSID	Device Name	Auth_mode	Encryption	Signal / Noise, dBm	Frequency, GHz	Channel	
1.	50:11:EB:10:08:30	SilverNet1	SilverNet Echo			-45 / -95	5.7	140	Lock to AP
2.	AC:84:C9:A6:88:CD	BTHub6-WFZC		WPA2 WPS	CCMP	-88 / -95	5.18	36	Lock to AP

Figure 2-65 Scan List

- **MAC Address:** BSSID address of the wireless service.
- **SSID:** BSSID name of wireless service, also called ESSID.
- **Auth_mode:** Authentication method of the wireless service.
- **Encryption:** Encryption type of the wireless service.
- **Signal/Noise:** Signal strength and noise of wireless service.
- **Frequency：** The frequency of the wireless service.
- **Channel:** The channel of the wireless service.

2.7.4 Speed Test



Network Speed Test

Destination IP : 192.168.1.1
Web Port : 80
Username : admin
Password : •••••
Type : duplex

Test Results

RX:	37.7 MByte
TX:	38.4 MByte
Total:	76.1 MByte

Figure 2-66 Network Speed Test

- **Destination IP ：** The target IP address is often 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:** The end of test results.

Contact Us

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Online Resources

If you need any further assistance go to our website download centre:

www.silvernet.com/downloadcentre/

View our troubleshooting guide:

http://www.silvernet.com/support/frequently-asked-questions/

Use our online ticket support:

www.silvernet.com/support/

Email us at support@silvernet.com

www.silvernet.com

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.