Loopcomm

User Manual

LP-2396K

Outdoor 2.4GHz Wireless AP/CPE/Bridge

Table of Contents

1. Introduction

Thank you for purchasing Loopcomm product. At loopcomm we strive to provide you with the highest quality products through innovation and advanced technology. We pride ourselves on delivering products that outperform the competition and go beyond your expectations. If you have any questions please feel free to contact us. We'd love to hear from you and thank you for your support!

Email: support@loopcomm.com

Website: www.loopcomm.com

Notice

- This document is issued to guide users how to install and operate LP-2396K Outdoor Long Range 802.11b/g/n Wireless AP/CPE/Bridge. Please read the document carefully to avoid any damage which is caused by inappropriate use excluding from the warranty.

- Loopcomm Technology Inc. reserves the right to revise/update the content of LP-2396K user manual without advance notice.

1.1 Product Introduction

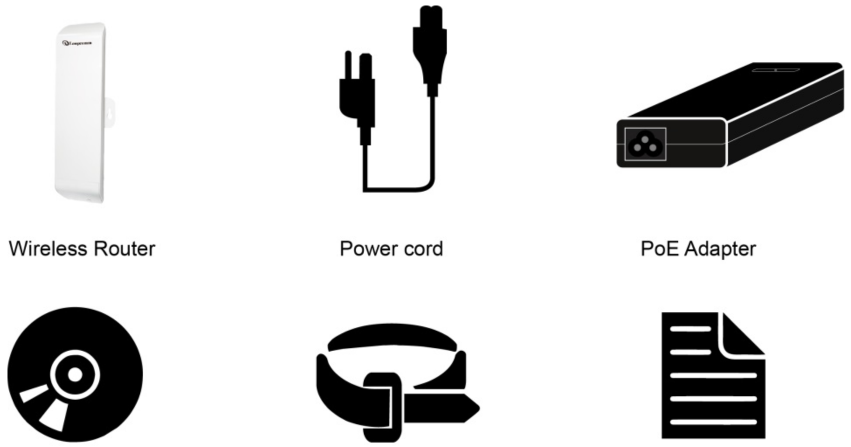
Loopcomm LP-2396K is an Outdoor Long Range 2.4GHz Wireless AP/CPE/Bridge that provides wide coverage of network connection in existing environment. It can operate up to 300Mbps data rate by supporting IEEE 802.11b/g/n standard and with full WEP, WPA/WPA2 data security, Wireless LAN Access Control List and TKIP/AES encryption, It keeps the data transmission safe in any network connection mode. Moreover, it supports different operation modes for any user's applications like point to point network and IP surveillance.

Product Outline

1.2 Package Content

The package content includes the following items, shown from left to right in the below figure.

- LP-2396K
- DC 24V/1A Power adapter
- Power cord
- User Manual CD
- Cable Tie
- Quick Installation Guide (QIG)



Wireless Router

Power cord

PoE Adapter

CD

Cable Tie

Quick Installation Guide

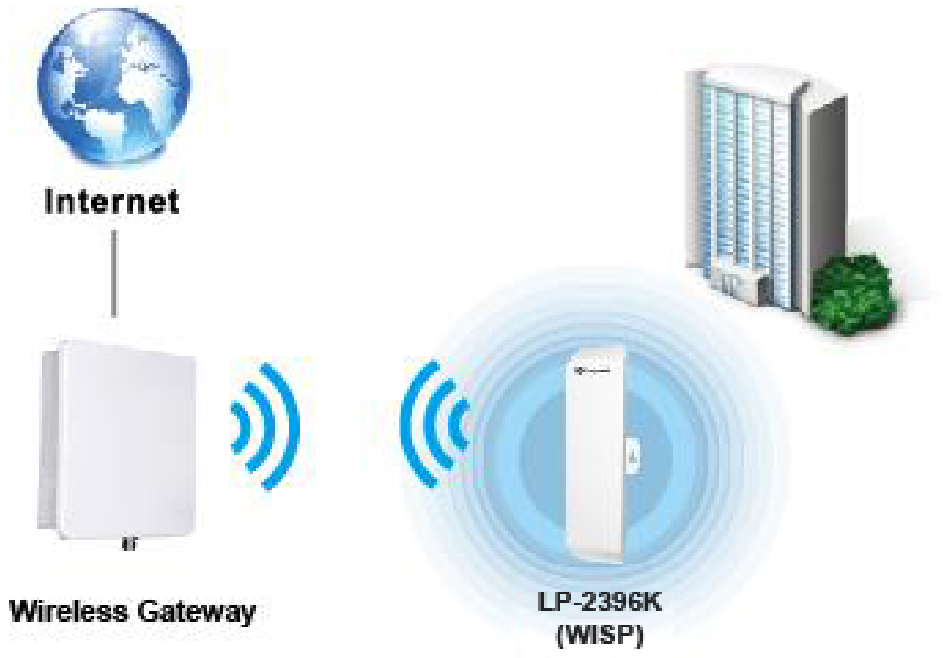
1.3 Product Features

- Wireless Standards : IEEE 802.11b/g/n
- Data transmission rate up to 300 Mbps at 40 MHz bandwidth
- Operation Mode: Access Point/Client/WDS Access Point/WDS Client/AP Router/Wireless ISP
- Reliable data security including WEP, WPA/WPA2, WPA-PSK/RADIUS, and WPA2-PSK/RADIUS with TKIP/AES encryption.
- Support SNMP V2 management, SSH, NTP, and Telnet.
- Support QoS bandwidth control
- MAC Access Control
- Built-in Web-based management and firmware upgrade
- PoE pass through available on Secondary Ethernet port (Configurable via Web UI)
- Remotely enable system reset by PoE Adapter.

1.4 Application

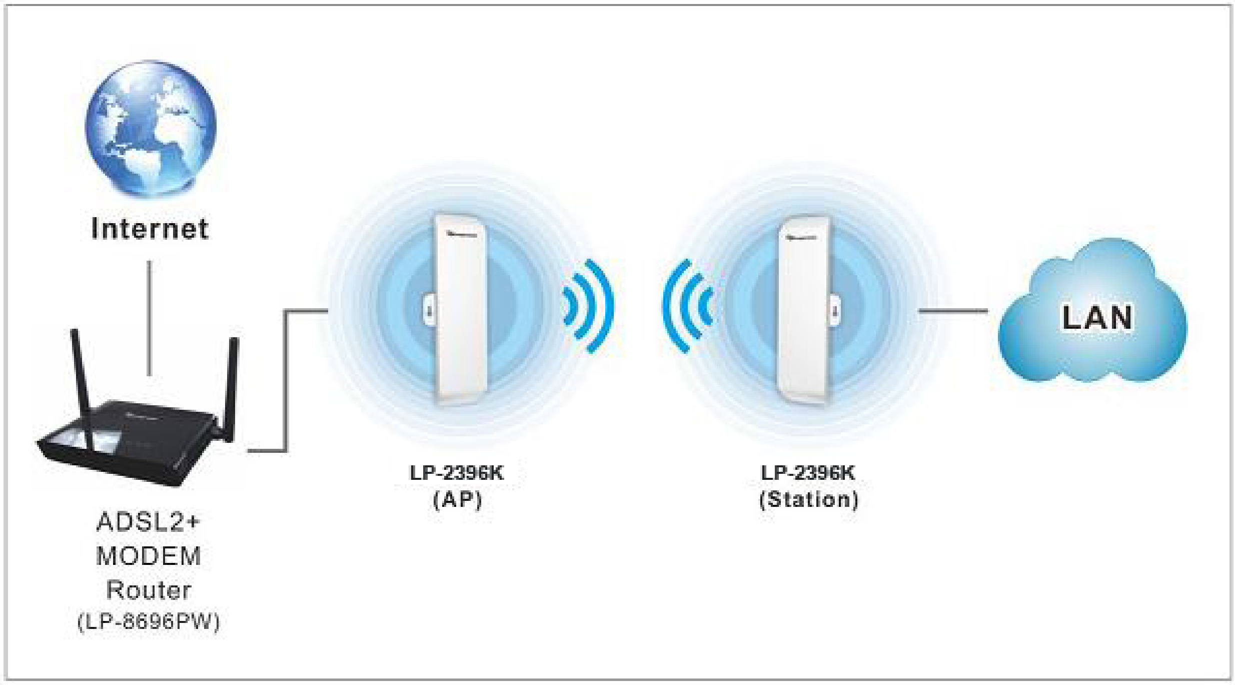
1.4.1 Wireless ISP (WISP) Mode

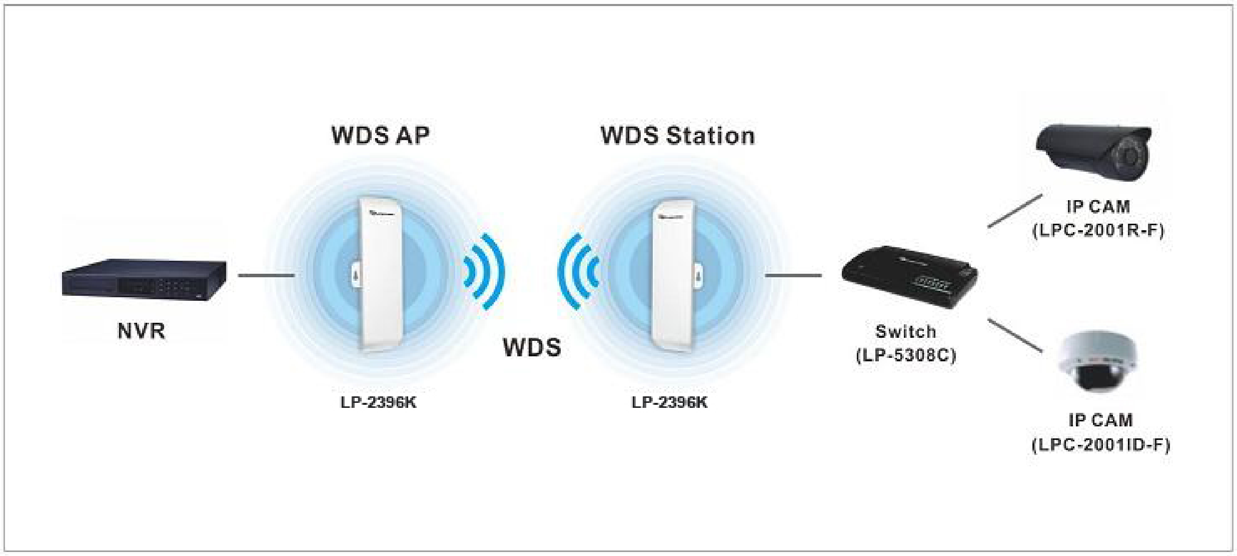
LP-2396K can operate as station (client) in WISP mode to remotely receive broadband signal from WISP outdoor AP (base station) of Internet Service Provider (ISP).



1.4.2 Bridge Mode

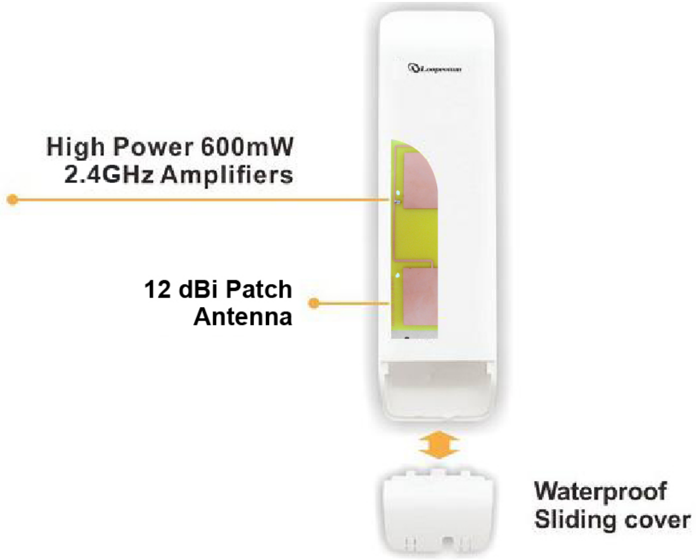
Since the antenna characteristics for LP-2396K is directional with high gain design, it can transmit RF signal for several miles. Based on this point, LP-2396K is greatly used to bridge at long distance transmission for point to point applications like IP surveillance, networking company.



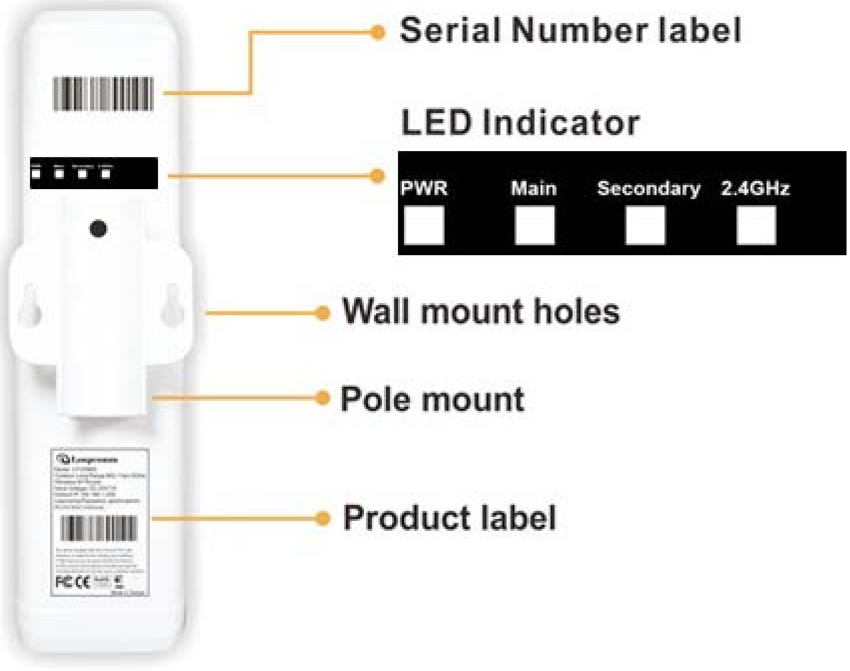


1.5 Product Outline Introduction

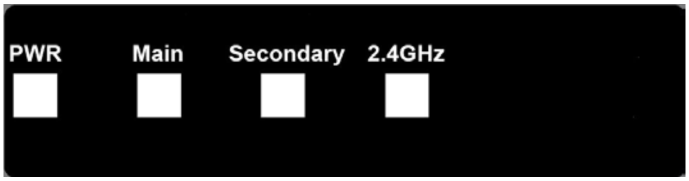
1.5.1 Front view



1.5.2 Back view

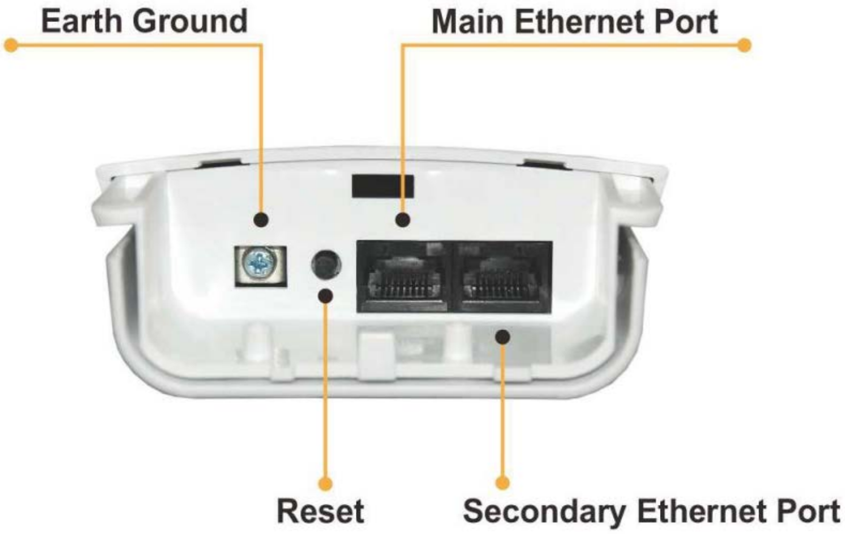


1.5.3 LED Indication



LED Indicator	Status	Description
⏻	ON	The LP-2396K is powered ON.
	OFF	The LP-2396K is powered OFF.
Main	ON	Port linked.
	OFF	No connection.
	Blink	Data is being transmitted or received on the Main Ethernet port.
Secondary	ON	Port linked.
	OFF	No connection.
	Blink	Data is being transmitted or received on the Secondary Ethernet port.
2.4GHz	Blink	Data is being transmitted or received using Wi-Fi.

1.5.4 I/O Interface



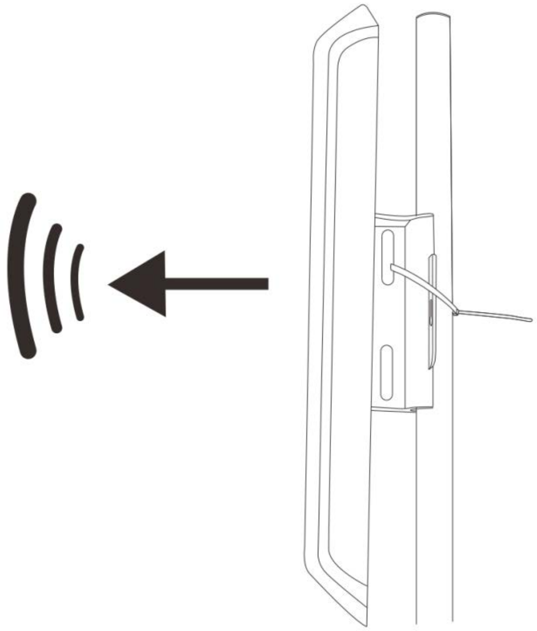
Item	Description
Main	It mainly used as Power over Ethernet (PoE) port, which allows the router powered up by PoE adapter when the connection is established by RJ-45 Cat.5 cable. It supports auto-sensing on 10/100M speed, half/ full duplex, and complies with IEEE 802.3/ 802.3u respectively.
Secondary	The Secondary Ethernet port allows users to connect to another device through RJ-45 Cat.5 cable. It supports auto-sensing on 10/100M speed, half/ full duplex, and complies with IEEE 802.3/ 802.3u respectively. (Note: In Operation mode the AP router's secondary port will be WAN Port by default).
Reset Button	Press continually the reset button at least 5 seconds to reset the configuration parameters to factory defaults
Earth Ground	It used to connect the metal line to ground in order to avoid the device from external electrical damage.

Note. LP-2396K built in PoE pass through function on Secondary Ethernet port. It means the Secondary Ethernet port is able to provide 24V power for a secondary device if this function enabled on Web Configuration (Please refer to the statement on Advanced Setting of Radio menu).

1.5.5 Mounting Options

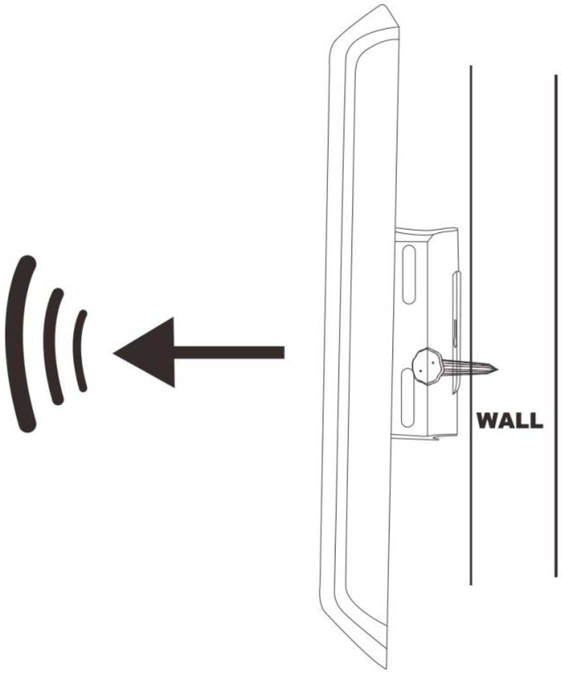
Pole Mount

Use cable tie and make it pass through the one of middle holes to fix and tie on the pole.



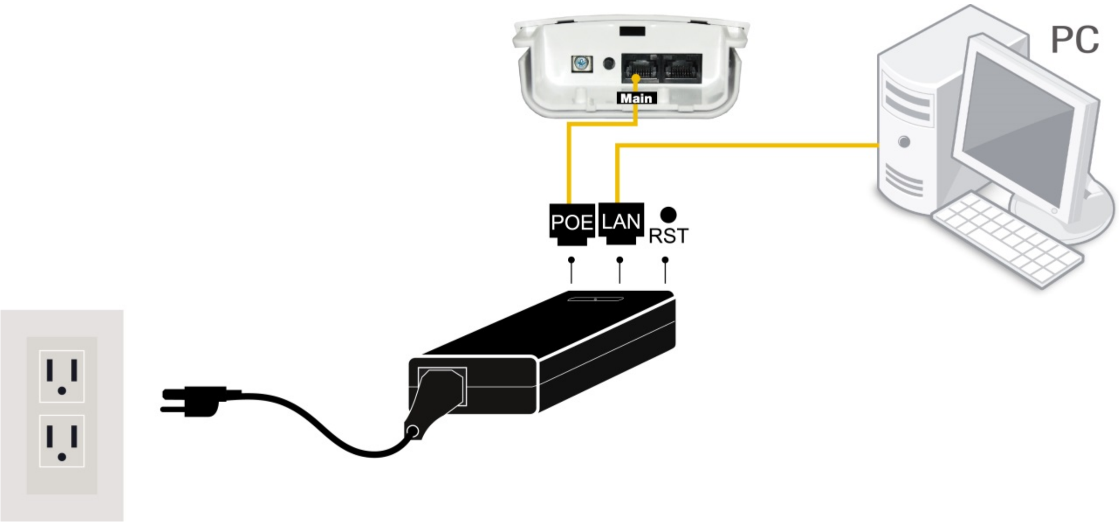
Wall Mount

Please fix the screws into the wall and hang LP-2396K on the corresponding screws.



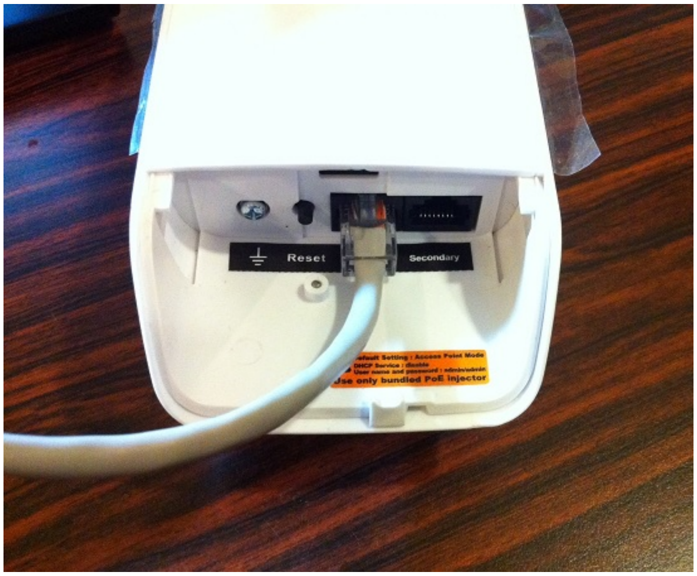
2. Hardware Installation

2.1 Connection overview



2.2 Installation Steps

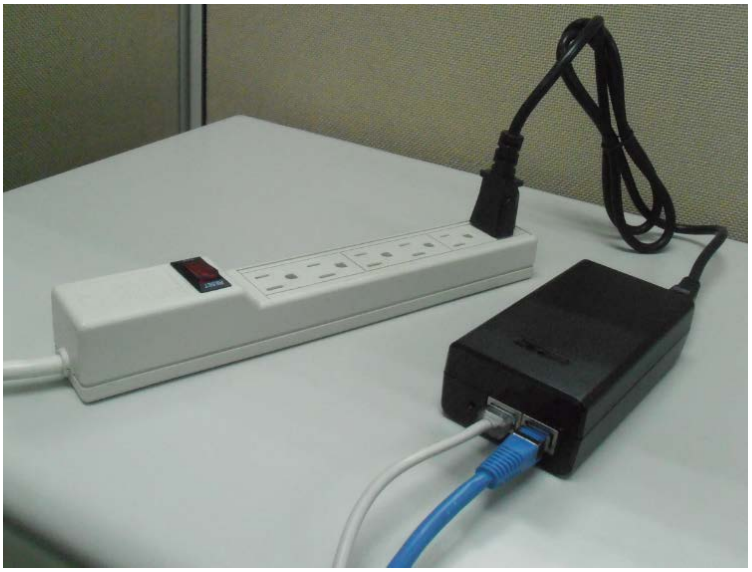
1. Take off the water-proof sliding cover.
2. Connect the **Main** Ethernet port of LP-2396K with a RJ-45 cable.


Reset
Secondary
efault Setting : Access Point Mode
DHCP Service : disable
User name and password : admin/admin
Use only bundled PoE injector

Note. LP-2396K built in PoE pass through function on Secondary Ethernet port. It means the Secondary Ethernet port is able to provide 24V power for a secondary device if this function enabled on Web Configuration (Please refer to the statement on Advanced Setting of Radio menu).

3. Make the water-proof sliding cover well installed.

4. Connect Power cord to power outlet.
5. Connect other end of Power cord to PoE Adapter of 24V/1A.
6. PoE port: Connect other end of Main Ethernet port to PoE Adapter.
7. LAN port: Connect Ethernet cable from PoE Adapter to your computer/laptop for Web configuration.
8. Reset button: It allows user to remotely reset the system of LP-2396K.



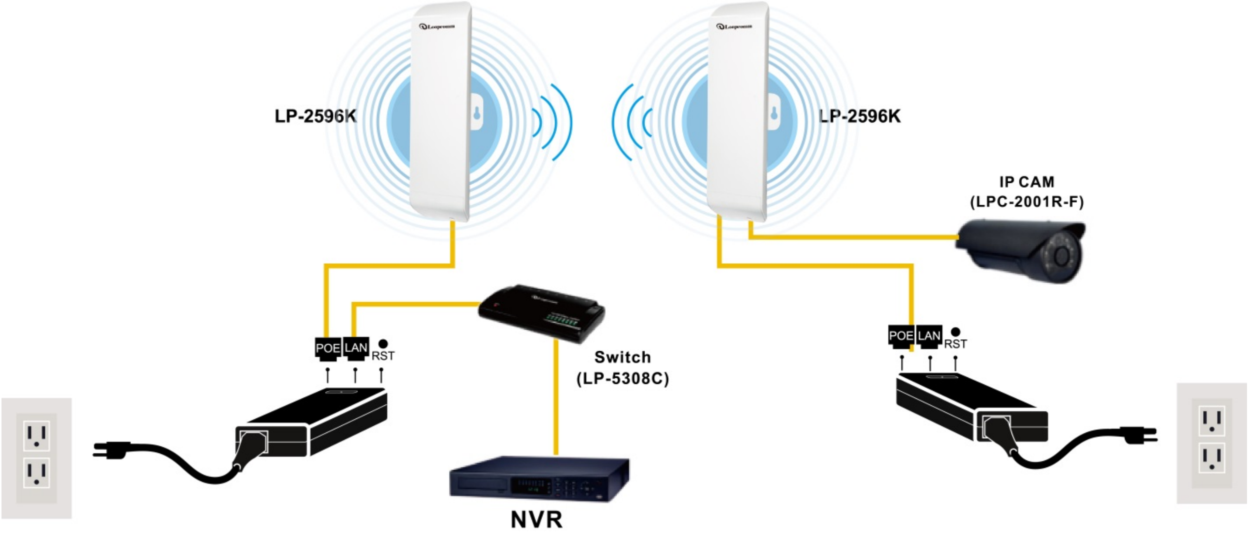
Note.

1. There is no software driver or utility installation needed.
2. RJ-45 8P8C Ethernet cable is required.
3. It takes about 60 seconds to complete the boot up sequence after LP-2396K powered up.

2.3 IP Surveillance

Example – Scenario for IP surveillance

The following figure indicates the basic setup to implement IP surveillance with a pair of LP-2396K. The remote monitoring image can be delivered to local NVR via the high powered, long distance transmission by LP-2396K.



3. Software Configuration

3.1 System Requirements

- Microsoft Windows XP/Vista/7/8, Mac iOS, Linux
- A Web Browser supports HTTP such as Internet Explorer, Google Chrome, Safari, and Mozilla Firefox etc.

3.2 Easy Installation

Network Connection Setup:

The default IP of LP-2396K is ***192.168.1.200***. You have to make sure your computer is on the same network segment as LP-2396K before connecting to LP-2396K Configuration.

Example: In the Windows 7 operating system

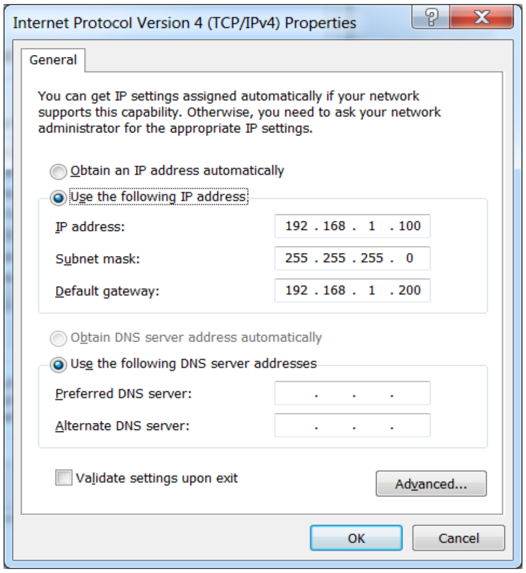
1. Press Start and enter **ncpa.cpl** in search bar. You will see network connection page.
2. Select your network interface card and Right click to set Properties.
3. Double click *Internet Protocol Version 4 (TCP/IPv4)*.
4. Select *Specify an IP address* and enter the IP address.

   IP Address: ***192.168.1.x (x can be any number between 1 to 254 except for 200)***

   Subnet Mask: ***255.255.255.0***

   Default Gateway: ***192.168.1.200***

5. Click OK to complete the IP setting.



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: 192 . 168 . 1 . 200

○ Obtain DNS server address automatically

● Use the following DNS server addresses

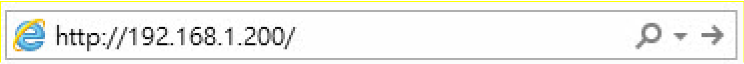
Preferred DNS server: . . .

Alternate DNS server: . . .

□ Validate settings upon exit

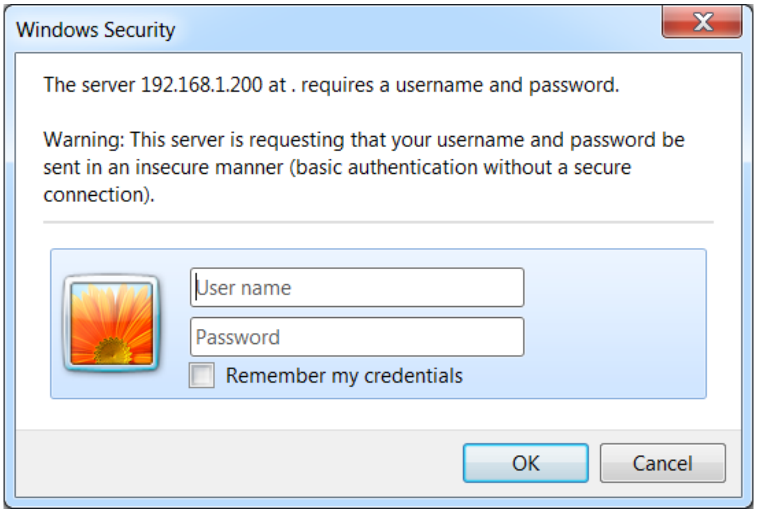
3.3 Get started with LP-2396K

1. Open Web browser and enter ***192.168.1.200*** in the URL field of Web browser.



http://192.168.1.200/

2. Enter “**admin**” as default user name, and “**admin**” as default password.



Windows Security

The server 192.168.1.200 at . requires a username and password.

Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).

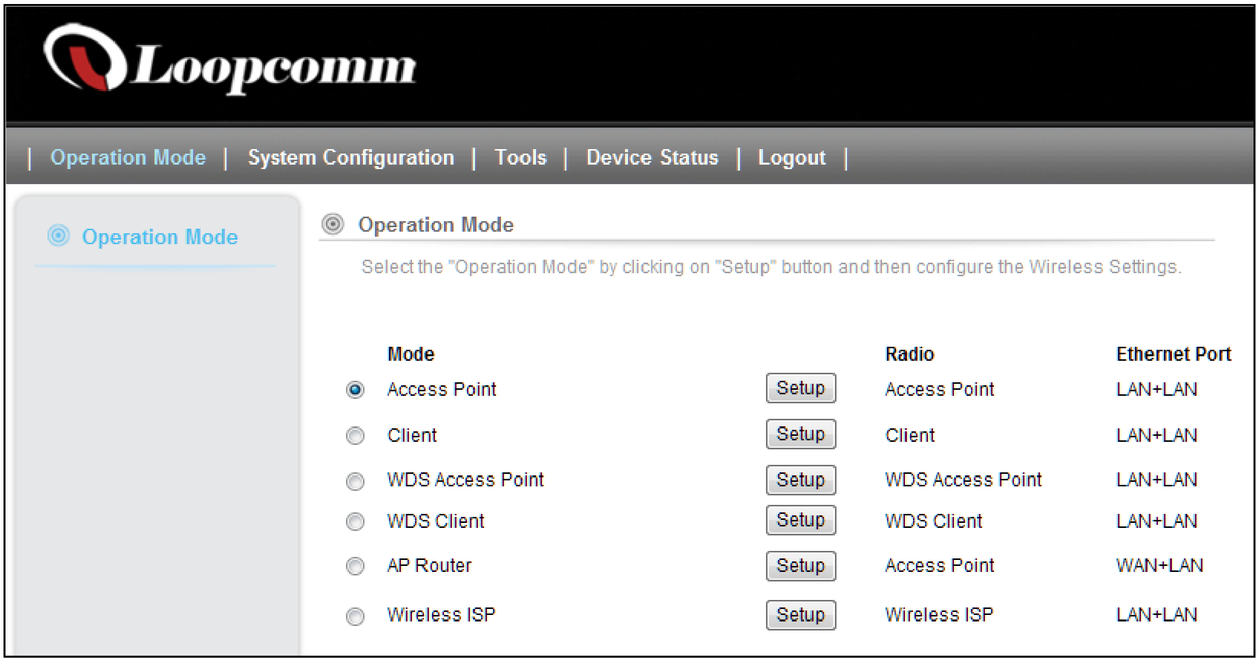
User name

Password

□ Remember my credentials

OK Cancel

After successful login , you can see the Loopcomm web page.



Loopcomm
| Operation Mode | System Configuration | Tools | Device Status | Logout |
Operation Mode

Operation Mode

Select the "Operation Mode" by clicking on "Setup" button and then configure the Wireless Settings.

	Mode		Radio	Ethernet Port
●	Access Point	Setup	Access Point	LAN+LAN
○	Client	Setup	Client	LAN+LAN
○	WDS Access Point	Setup	WDS Access Point	LAN+LAN
○	WDS Client	Setup	WDS Client	LAN+LAN
○	AP Router	Setup	Access Point	WAN+LAN
○	Wireless ISP	Setup	Wireless ISP	LAN+LAN

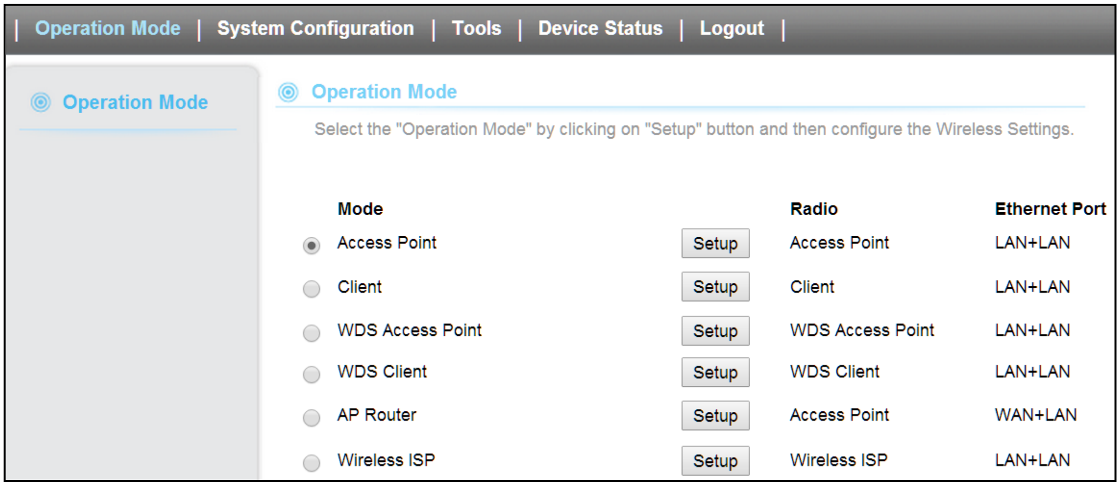
4. Software Features

4.1 Operation Mode

In Operation Mode you will find wireless and WAN settings. The LP-2396K wireless settings are dependent on the wireless operation mode you choose. To access wireless settings, click on the "Setup" button. In Operation Mode there are 6 types, they are

4.1.1 Access Point

It Connects to an internal network (LAN) and broadcasts a wireless network connection (WLAN). When operating in the Access Point mode, LP-2396K becomes the center hub of the wireless network. All wireless cards and clients connect and communicate through the device.


| Operation Mode | System Configuration | Tools | Device Status | Logout |
Operation Mode

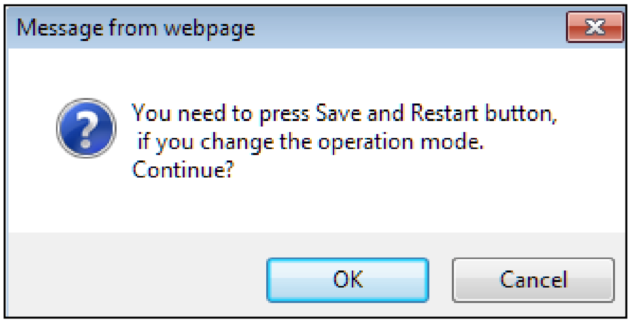
Operation Mode

Select the "Operation Mode" by clicking on "Setup" button and then configure the Wireless Settings.

	Mode		Radio	Ethernet Port
●	Access Point	Setup	Access Point	LAN+LAN
○	Client	Setup	Client	LAN+LAN
○	WDS Access Point	Setup	WDS Access Point	LAN+LAN
○	WDS Client	Setup	WDS Client	LAN+LAN
○	AP Router	Setup	Access Point	WAN+LAN
○	Wireless ISP	Setup	Wireless ISP	LAN+LAN

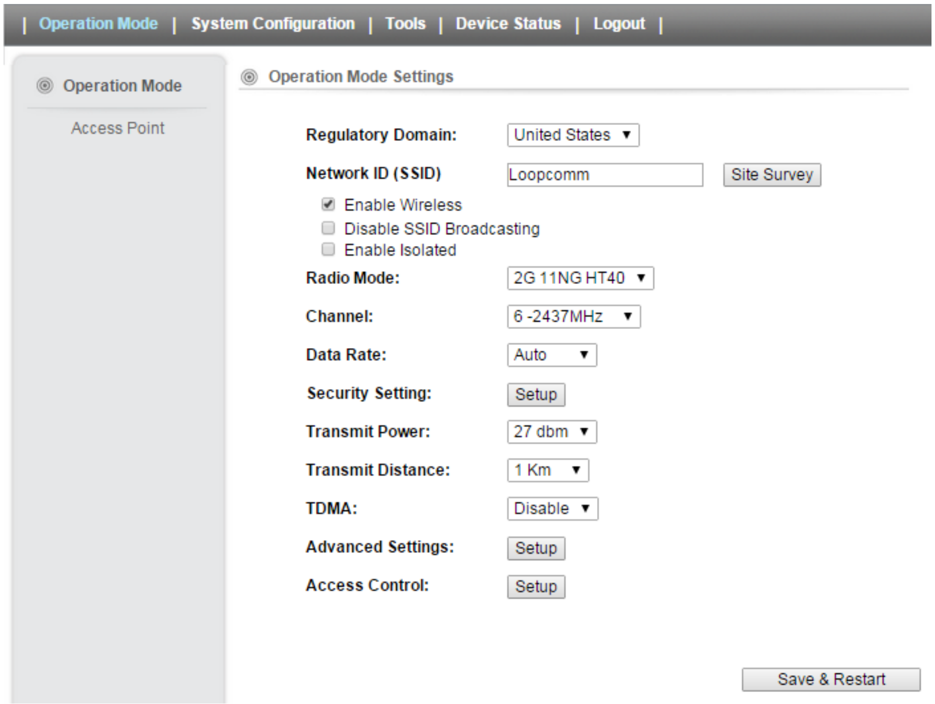
Note: Depending on the mode you choose, applicable settings will be enabled/ disabled automatically.

Press setup, then below Screen is displayed.


Message from webpage

You need to press Save and Restart button,
if you change the operation mode.
Continue?

Press OK to continue, then below page is displayed.



Regulatory Domain: United States ▼

Network ID (SSID) Loopcomm

☑ Enable Wireless

☐ Disable SSID Broadcasting

☐ Enable Isolated

Radio Mode: 2G 11NG HT40 ▼

Channel: 6 -2437MHz ▼

Data Rate: Auto ▼

Security Setting:

Transmit Power: 27 dbm ▼

Transmit Distance: 1 Km ▼

TDMA: Disable ▼

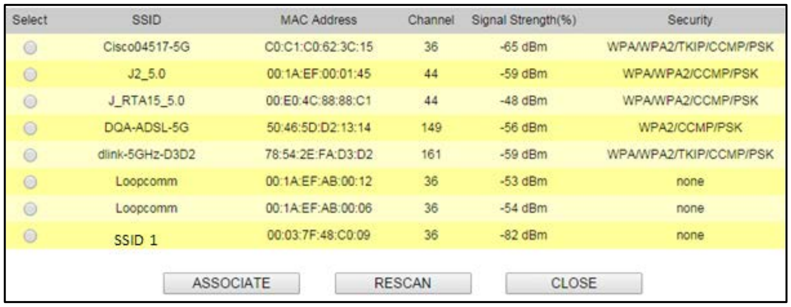
Advanced Settings:

Access Control:

Fields	Description
Regulatory Domain	Select the country from pull down menu.
Network SSID	It is the wireless network name. User can use the default SSID or change it. (Special characters cannot be used).
Enable Wireless Disable SSID Broadcasting Enable Isolated	Enable Wireless Option SSID will be hidden, only users who know the SSID can associate with this network. User cannot Ping.
Radio Mode	Select the Mode of 2G 11NG HT20 or 2G 11NG HT40 “Auto” option selects the mode by itself.
Channel	Select the wireless communication frequency/channel from pull-down menu.
Data Rate	Defines the data rate (in Mbps) at which the device should transmit wireless packets. You can fix a specific data rate between MCS 0 and MCS 7 (or MCS 15 for 2x2 chain devices).
Transmit Power	Defines the maximum average transmit output power (in dBm) of the device. The transmit power level maximum is limited according to country regulations.
Transmit Distance	Changing the distance value will change the ACK (Acknowledgement) timeout value accordingly, so it means the distance should be set as real distance between LP-2396K and other device for accurate transmission performance.
TDMA	Time Division Multiple Access. Enable/Disable the function to access.
Save and Restart	It saves the new settings and restarts.

Site Survey

You could configure AP Client parameters here.



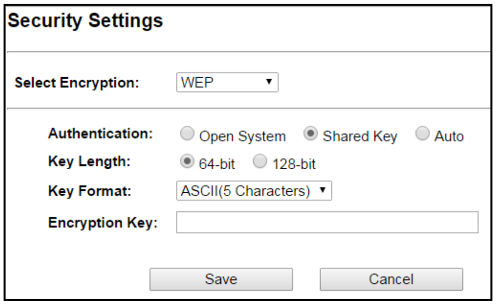
Select	SSID	MAC Address	Channel	Signal Strength(%)	Security
○	Cisco04517-5G	C0:C1:C0:62:3C:15	36	-65 dBm	WPA/WPA2/TKIP/CCMP/PSK
○	J2_5.0	00:1A:EF:00:01:45	44	-59 dBm	WPA/WPA2/CCMP/PSK
○	J_RTA15_5.0	00:E0:4C:88:88:C1	44	-48 dBm	WPA/WPA2/CCMP/PSK
○	DQA-ADSL-5G	50:46:5D:D2:13:14	149	-56 dBm	WPA2/CCMP/PSK
○	dlink-5GHz-D3D2	78:54:2E:FA:D3:D2	161	-59 dBm	WPA/WPA2/TKIP/CCMP/PSK
○	Loopcomm	00:1A:EF:AB:00:12	36	-53 dBm	none
○	Loopcomm	00:1A:EF:AB:00:06	36	-54 dBm	none
○	SSID 1	00:03:7F:48:C0:09	36	-82 dBm	none

Click **Rescan** to browse more networks then select the SSID and press associate then close the page.

Note: Enter the SSID Password, if necessary.

Security Settings

Security settings allow you to use encryption to secure your data.
There are 4 Encryption Modes in Security Settings. They are WEP, WPA, WPA2, and WPA-Mixed.
Functions are same for all Modes, below example is for WEP and WPA Encryption.



Security Settings

Select Encryption: WEP

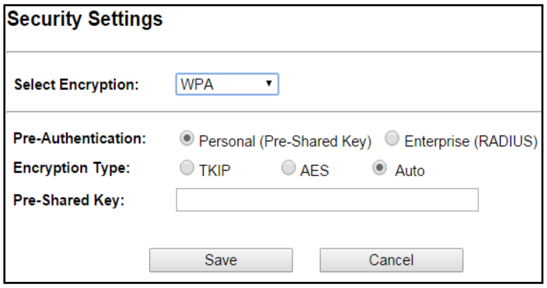
Authentication: ○ Open System ● Shared Key ○ Auto

Key Length: ● 64-bit ○ 128-bit

Key Format: ASCII(5 Characters)

Encryption Key:

Fields	Description
Select Encryption	Select the Encryption Mode from the pull down menu.
Authentication	**Open System:** Open system authentication provides identification for using the wireless adapter's MAC address. Open system authentication is used when no authentication is required. **Shared Key:** It verifies that an authentication-initiating station has knowledge of a shared secret. The 802.11 standard currently assumes that the shared secret is delivered to the participating wireless clients by means of a more secure channel that is independent of IEEE 802.11 **Auto:** Auto is the default authentication algorithm. It will change its authentication type automatically to fulfill client's requirement.
Key Length	Select the Key length
Key Format	When Key Length is selected as 64-bites then Input ASCII (5 Characters) or Hex (10 Characters) When Key Length is selected as 128-bits then Input ASCII (13 Characters) or Hex (128 Character)
Encryption Key	User can enter the characters based on selected Key Length & Key Format. The format can be passphrase or characters.



Security Settings

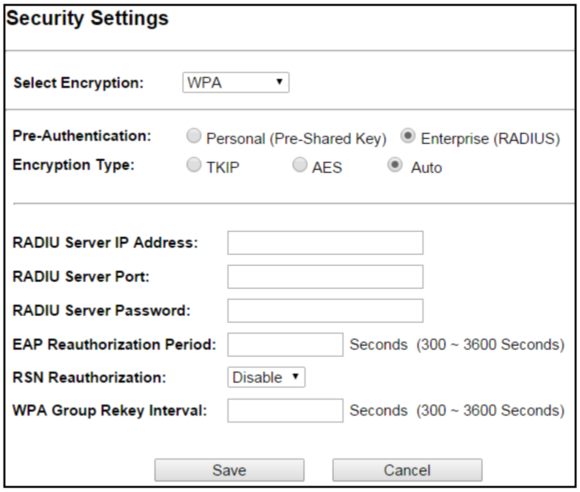
Select Encryption: WPA

Pre-Authentication: ● Personal (Pre-Shared Key) ○ Enterprise (RADIUS)

Encryption Type: ○ TKIP ○ AES ● Auto

Pre-Shared Key:

Fields	Description
Select Encryption	Select the Encryption Mode from the pull down menu.
Pre-Authentication	Select Pre-Authentication as Personal or Enterprise.
Encryption Type	**TKIP:** Temporal Key Integrity Protocol (TKIP) for data Encryption. TKIP utilizes a stronger encryption method and incorporates Message Integrity Code (MIC) to provide protection against hackers. **AES:** Advanced Encryption Standard (AES) for data encryption. AES utilizes a symmetric 128-bit block data encryption. **AUTO:** Auto is the default Encryption Type. It will change automatically to fulfill client's requirement.
Pre-shared Key	User can enter Maximum number of Key Length. The format can be passphrase or any characters.



Security Settings

Select Encryption: WPA ▾

Pre-Authentication: ○ Personal (Pre-Shared Key) ● Enterprise (RADIUS)

Encryption Type: ○ TKIP ○ AES ● Auto

RADIU Server IP Address:

RADIU Server Port:

RADIU Server Password:

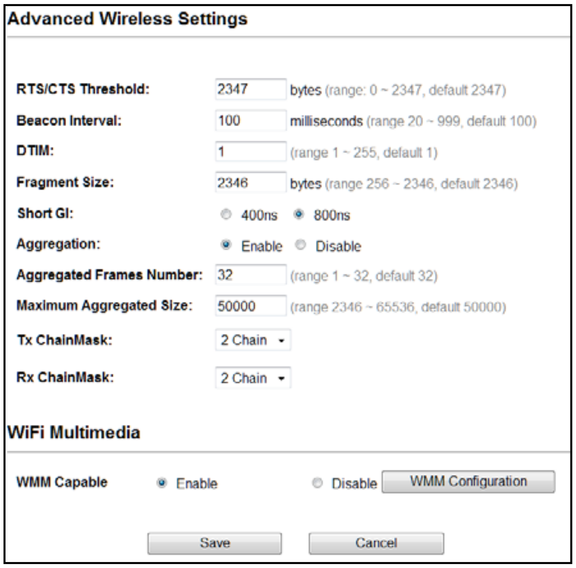
EAP Reauthorization Period: Seconds (300 ~ 3600 Seconds)

RSN Reauthorization: Disable ▾

WPA Group Rekey Interval: Seconds (300 ~ 3600 Seconds)

Fields	Description
RADIU Server IP Address	Enter the RADIU Server’s IP Address provided by your ISP.
RADIU Server Port	Enter the RADIUS Server’s port number provided by your ISP.
RADIU Server Password	Enter the RADIUS Server’s Password provided by your ISP.
EAP Reauthorization Period	EAP- Session timeout interval for 802.1x re-authorization setting. Session timeout interval unit is seconds
RSN Reauthorization	Enable/Disable the function to access.
WPA Group Rekey Interval	A group key is used for multicast/broadcast data, and the re-key interval is time period that the system will change the group key periodically. The shorter the interval is, the better the security.it varies from 300 to 3600 Seconds.
Save Cancel	Click Save to change the new settings. Click cancel to clear the entered settings.

Advanced Settings



Advanced Wireless Settings

RTS/CTS Threshold: 2347 bytes (range: 0 ~ 2347, default 2347)

Beacon Interval: 100 milliseconds (range 20 ~ 999, default 100)

DTIM: 1 (range 1 ~ 255, default 1)

Fragment Size: 2346 bytes (range 256 ~ 2346, default 2346)

Short GI: ○ 400ns ● 800ns

Aggregation: ● Enable ○ Disable

Aggregated Frames Number: 32 (range 1 ~ 32, default 32)

Maximum Aggregated Size: 50000 (range 2346 ~ 65536, default 50000)

Tx ChainMask: 2 Chain

Rx ChainMask: 2 Chain

WiFi Multimedia

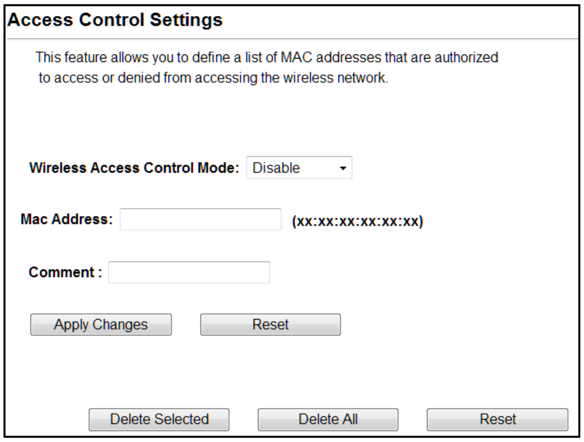
WMM Capable ● Enable ○ Disable

Fields	Description
RTS/CTS Threshold	Determines the packet size of a transmission and, through the use of an AP, helps control traffic flow. The range is 0-2347 bytes.
Beacon Interval	Beacons are the packets sending by Access point to synchronize the wireless network. The beacon interval is the time interval between beacons sending by this unit in AP or AP+WDS operation. The default and recommended beacon interval is 100 milliseconds.
DTIM	This is the Delivery Traffic Indication Map. It is used to alert the clients that multicast and broadcast packets buffered at the AP will be transmitted immediately after the transmission of this beacon frame. You can change the value from 1 to 255. The AP will check the buffered data according to this value. For example, selecting “1” means to check the buffered data at every beacon.
Fragment Size	A large data frame is fragmented into several fragments each of size equal to fragment threshold. By tuning the fragment threshold value, we can get varying fragment sizes.
Short GI (Guard Interval)	A GI is a period of time between symbol transmission that allows reflections (from multipath) from the previous data transmission to settle before transmitting a new symbol. The 802.11n draft specifies two guard intervals: 400ns (short) and 800ns (long). Support of the 400ns GI is optional for transmit and receive. The purpose of a guard interval is to introduce immunity to propagation delays, echoes, and reflections to which digital data is normally very sensitive.

Aggregation	A part of the 802.11n standard that allows sending multiple frames per single access to the medium by combining frames together into one larger frame. It creates the larger frame by combining smaller frames with the same physical source, destination end points, and traffic class (QoS) into one large frame with a common MAC header
Aggregated Frames Number	Determines the number of frames combined in the new larger frame.
Maximum Aggregated Size	Determines the size (in bytes) of the larger frame.
Tx/Rx ChainMask	Displays the number of independent spatial data streams the device is transmitting (TX) and receiving (RX) simultaneously within one spectral channel of bandwidth. Multiple chains increase data transfer performance significantly.
WMM Capable	Wi-Fi Multimedia Enable the feature to access
WMM Configuration	Displays the WMM Parameters of station and Access Point
Save Cancel	Save the changed settings Cancel the selected settings

Access Control

This page allows administrator to have Access Control by entering MAC address of client stations. When this function is Enabled, MAC address can be added into access control list and only those clients whose wireless MAC address are in the access control list will be able to connect or disconnect the internet.



Access Control Settings

This feature allows you to define a list of MAC addresses that are authorized to access or denied from accessing the wireless network.

Wireless Access Control Mode: Disable

Mac Address: (xx:xx:xx:xx:xx:xx)

Comment :

Fields	Description
Wireless Access Control Mode	The Selections are: **Disable:** Disable the wireless ACL feature. **Allow Listed:** When this option is selected, no wireless clients except those whose MAC addresses are in the current access control list will be able to connect to internet. **Deny Listed:** When this option is selected, all wireless clients except those whose MAC addresses are in the current access control list will not be able to connect to internet.
Mac Address	Enter client MAC address and press “Apply Changes” button to add client MAC address into current access control list.
Comment	Make a comment for Wireless access control.

Function buttons for the Access Control List:

Apply Changes

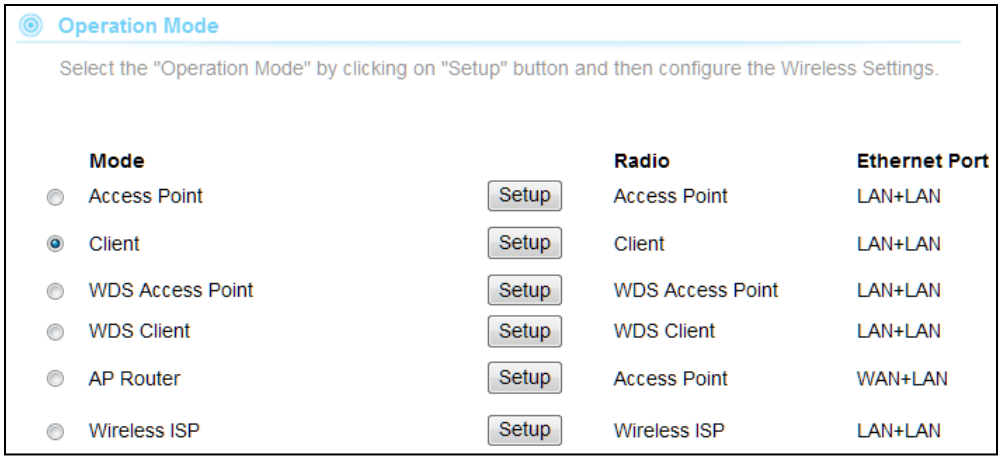
Click to add this entry into the Access Control List.

The Access Control List lists the client MAC addresses. Any wireless client with its MAC address listed in this access control list will be able to connect to the device. You can select the entries at the Select column and apply to the following function buttons.

Delete Selected: Delete the selected entries from the list.
Delete All: Flush the list.
Reset: Clear the settings.

4.1.2 Client

It acts as a wireless client, to connect a remote segment to an existing WLAN



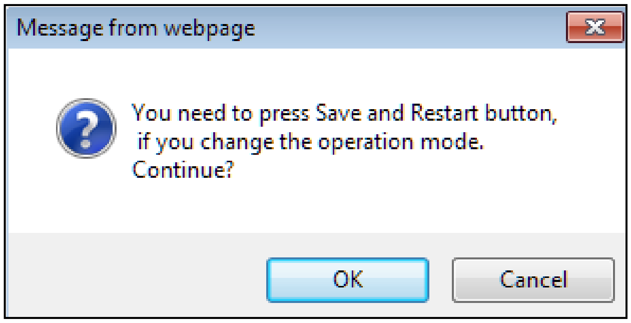
Operation Mode

Select the "Operation Mode" by clicking on "Setup" button and then configure the Wireless Settings.

	Mode		Radio	Ethernet Port
○	Access Point	Setup	Access Point	LAN+LAN
●	Client	Setup	Client	LAN+LAN
○	WDS Access Point	Setup	WDS Access Point	LAN+LAN
○	WDS Client	Setup	WDS Client	LAN+LAN
○	AP Router	Setup	Access Point	WAN+LAN
○	Wireless ISP	Setup	Wireless ISP	LAN+LAN

Note: Depending on the mode you choose, applicable settings will be enabled/disabled automatically.

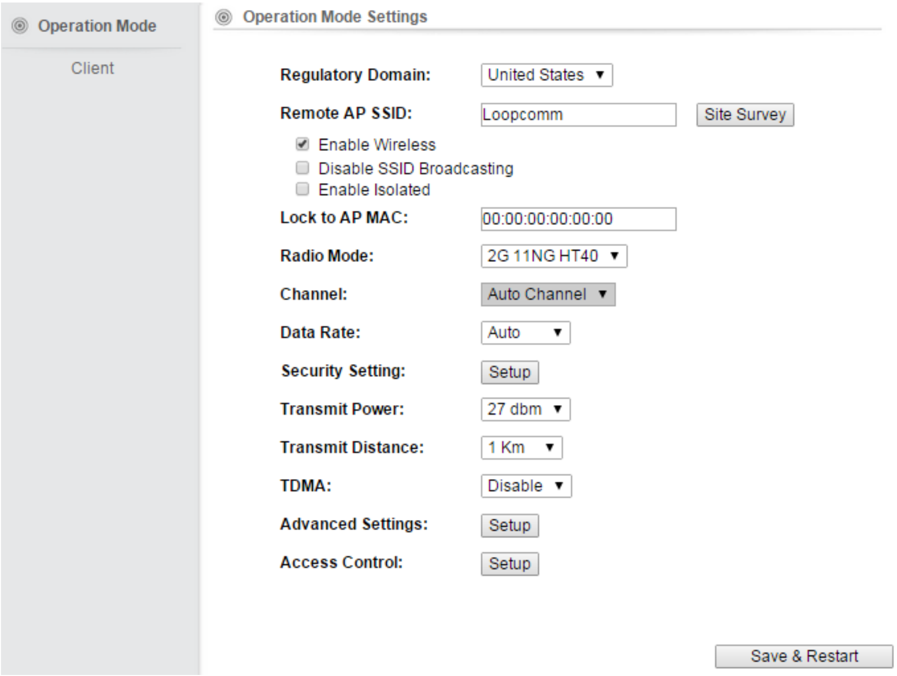
Press setup, then below Screen is displayed.



Message from webpage

You need to press Save and Restart button,
if you change the operation mode.
Continue?

Press OK to continue, then below page is displayed.



Operation Mode

Client

Operation Mode Settings

Regulatory Domain: United States ▼

Remote AP SSID: Loopcomm [Site Survey]

☑ Enable Wireless
☐ Disable SSID Broadcasting
☐ Enable Isolated

Lock to AP MAC: 00:00:00:00:00:00

Radio Mode: 2G 11NG HT40 ▼

Channel: Auto Channel ▼

Data Rate: Auto ▼

Security Setting: [Setup]

Transmit Power: 27 dbm ▼

Transmit Distance: 1 Km ▼

TDMA: Disable ▼

Advanced Settings: [Setup]

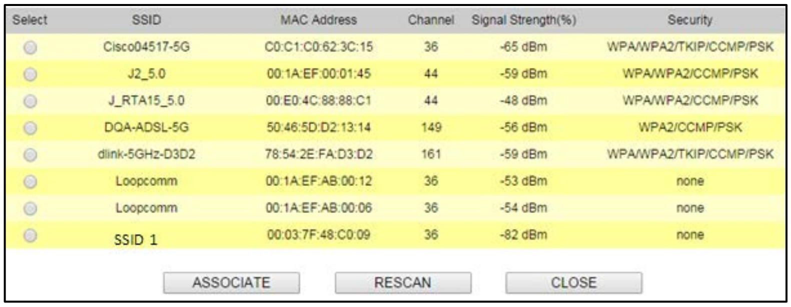
Access Control: [Setup]

[Save & Restart]

Fields	Description
Regulatory Domain	Select the country from pull down menu.
Remote AP SSID	Select Site Survey option then it will Scan & displays the SSID List, Choose one SSID from the list.
Enable Wireless Disable SSID Broadcasting Enable Isolated	Enable Wireless Option SSID will be hidden, only users who know the SSID can associate with this network. User cannot Ping.
Lock to AP Mac	Enter MAC address of the access point to which the client will be locked & connected.
Radio Mode	Select the Mode of 2G 11NG HT20 or 2G 11NG HT40 “Auto” option selects the mode by itself.
Channel	Select the wireless communication frequency/channel from pull-down menu.
Data Rate	Defines the data rate (in Mbps) at which the device should transmit wireless packets. You can fix a specific data rate between MCS 0 and MCS 7 (or MCS 15 for 2x2 chain devices).
Transmit Power	Defines the maximum average transmit output power (in dBm) of the device. The transmit power level maximum is limited according to country regulations.
Transmit Distance	Changing the distance value will change the ACK (Acknowledgement) timeout value accordingly, so it means the distance should be set as real distance between LP-2396K and other device for accurate transmission performance.
Save and Restart	It saves the new settings and restarts.

Site Survey

You could configure AP Client parameters here.



Select	SSID	MAC Address	Channel	Signal Strength(%)	Security
○	Cisco04517-5G	C0:C1:C0:62:3C:15	36	-65 dBm	WPA/WPA2/TKIP/CCMP/PSK
○	J2_5.0	00:1A:EF:00:01:45	44	-59 dBm	WPA/WPA2/CCMP/PSK
○	J_RTA15_5.0	00:E0:4C:88:88:C1	44	-48 dBm	WPA/WPA2/CCMP/PSK
○	DQA-ADSL-5G	50:46:5D:D2:13:14	149	-56 dBm	WPA2/CCMP/PSK
○	dlink-5GHz-D3D2	78:54:2E:FA:D3:D2	161	-59 dBm	WPA/WPA2/TKIP/CCMP/PSK
○	Loopcomm	00:1A:EF:AB:00:12	36	-53 dBm	none
○	Loopcomm	00:1A:EF:AB:00:06	36	-54 dBm	none
○	SSID 1	00:03:7F:48:C0:09	36	-82 dBm	none

Click **Rescan** to browse more networks then select the SSID and press associate then close the page.

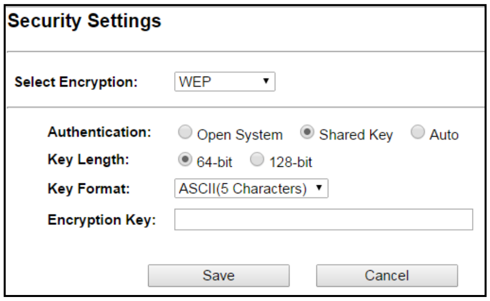
Note: Enter the SSID Password, if necessary.

Security Settings

Security settings allow you to use encryption to secure your data.

There are 4 Encryption Modes in Security Settings. They are WEP, WPA, WPA2, and WPA-Mixed.

Functions are same for all Modes, below example is for WEP and WPA Encryption.



Security Settings

Select Encryption: WEP ▾

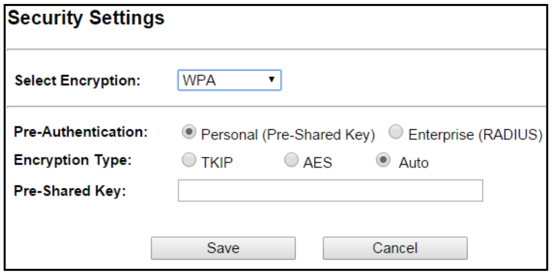
Authentication: ○ Open System ● Shared Key ○ Auto

Key Length: ● 64-bit ○ 128-bit

Key Format: ASCII(5 Characters) ▾

Encryption Key:

Fields	Description
Select Encryption	Select the Encryption Mode from the pull down menu.
Authentication	**Open System:** Open system authentication provides identification for using the wireless adapter's MAC address. Open system authentication is used when no authentication is required. **Shared Key:** It verifies that an authentication-initiating station has knowledge of a shared secret. The 802.11 standard currently assumes that the shared secret is delivered to the participating wireless clients by means of a more secure channel that is independent of IEEE 802.11 **Auto:** Auto is the default authentication algorithm. It will change its authentication type automatically to fulfill client's requirement.
Key Length	Select the Key length
Key Format	When Key Length is selected as 64-bites then Input ASCII (5 Characters) or Hex (10 Characters) When Key Length is selected as 128-bits then Input ASCII (13 Characters) or Hex (128 Character)
Encryption Key	User can enter the characters based on selected Key Length & Key Format. The format can be passphrase or characters.



Security Settings

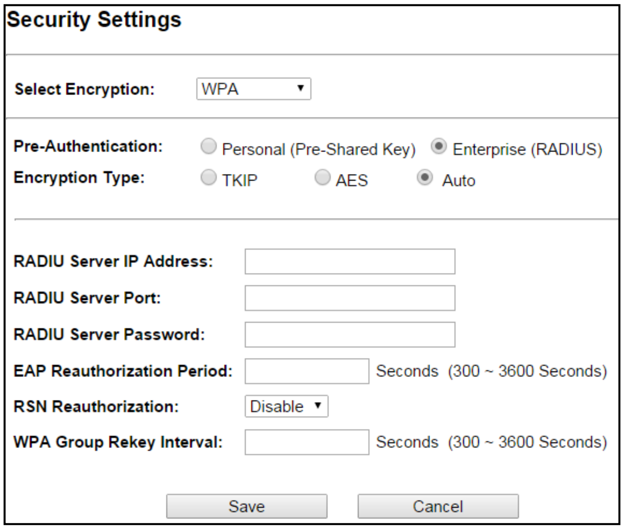
Select Encryption: WPA ▾

Pre-Authentication: ● Personal (Pre-Shared Key) ○ Enterprise (RADIUS)

Encryption Type: ○ TKIP ○ AES ● Auto

Pre-Shared Key:

Fields	Description
Select Encryption	Select the Encryption Mode from the pull down menu.
Pre-Authentication	Select Pre-Authentication as Personal or Enterprise.
Encryption Type	**TKIP:** Temporal Key Integrity Protocol (TKIP) for data Encryption. TKIP utilizes a stronger encryption method and incorporates Message Integrity Code (MIC) to provide protection against hackers. **AES:** Advanced Encryption Standard (AES) for data encryption. AES utilizes a symmetric 128-bit block data encryption. **AUTO:** Auto is the default Encryption Type. It will change automatically to fulfill client's requirement.
Pre-shared Key	User can enter Maximum number of Key Length. The format can be passphrase or any characters.



Security Settings

Select Encryption: WPA ▾

Pre-Authentication: ○ Personal (Pre-Shared Key) ● Enterprise (RADIUS)

Encryption Type: ○ TKIP ○ AES ● Auto

RADIU Server IP Address:

RADIU Server Port:

RADIU Server Password:

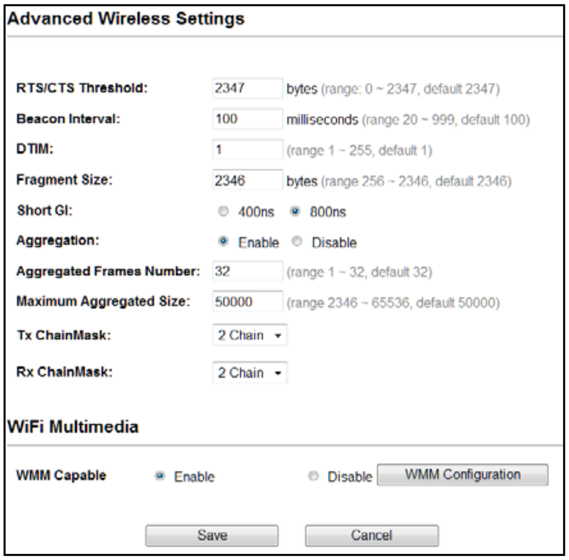
EAP Reauthorization Period: Seconds (300 ~ 3600 Seconds)

RSN Reauthorization: Disable ▾

WPA Group Rekey Interval: Seconds (300 ~ 3600 Seconds)

Fields	Description
RADIU Server IP Address	Enter the RADIU Server's IP Address provided by your ISP.
RADIU Server Port	Enter the RADIUS Server's port number provided by your ISP.
RADIU Server Password	Enter the RADIUS Server's Password provided by your ISP.
EAP Reauthorization Period	EAP- Session timeout interval for 802.1x re-authorization setting. Session timeout interval unit is seconds.
RSN Reauthorization	Enable/Disable the function to access.
WPA Group Rekey Interval	A group key is used for multicast/broadcast data, and the re-key interval is time period that the system will change the group key periodically. The shorter the interval is, the better the security.it varies from 300 to 3600 Seconds.
Save Cancel	Click Save to change the new settings. Click cancel to clear the entered settings.

Advanced Settings



Advanced Wireless Settings

RTS/CTS Threshold:	2347	bytes (range: 0 ~ 2347, default 2347)
Beacon Interval:	100	milliseconds (range 20 ~ 999, default 100)
DTIM:	1	(range 1 ~ 255, default 1)
Fragment Size:	2346	bytes (range 256 ~ 2346, default 2346)
Short GI:	○ 400ns ● 800ns	
Aggregation:	● Enable ○ Disable	
Aggregated Frames Number:	32	(range 1 ~ 32, default 32)
Maximum Aggregated Size:	50000	(range 2346 ~ 65536, default 50000)
Tx ChainMask:	2 Chain ▾	
Rx ChainMask:	2 Chain ▾	

WiFi Multimedia

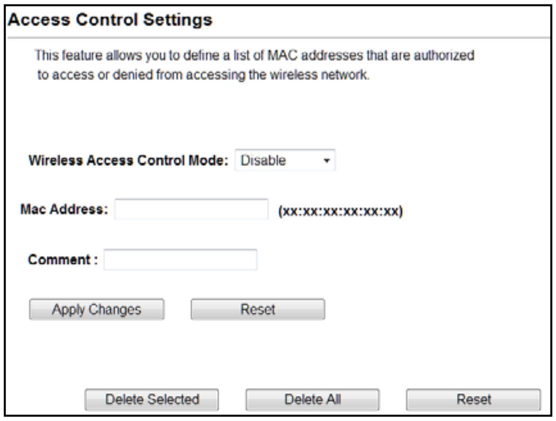
WMM Capable ● Enable ○ Disable

Fields	Description
RTS/CTS Threshold	Determines the packet size of a transmission and, through the use of an AP, helps control traffic flow. The range is 0-2347 bytes.
Beacon Interval	Beacons are the packets sending by Access point to synchronize the wireless network. The beacon interval is the time interval between beacons sending by this unit in AP or AP+WDS operation. The default and recommended beacon interval is 100 milliseconds.
DTIM (Delivery Traffic Indication Map)	This is the Delivery Traffic Indication Map. It is used to alert the clients that multicast and broadcast packets buffered at the AP will be transmitted immediately after the transmission of this beacon frame. You can change the value from 1 to 255. The AP will check the buffered data according to this value. For example, selecting “1” means to check the buffered data at every beacon.
Fragment Size	A large data frame is fragmented into several fragments each of size equal to fragment threshold. By tuning the fragment threshold value, we can get varying fragment sizes.
Short GI (Guard Interval)	A GI is a period of time between symbol transmission that allows reflections (from multipath) from the previous data transmission to settle before transmitting a new symbol. The 802.11n draft specifies two guard intervals: 400ns (short) and 800ns (long). Support of the 400ns GI is optional for transmit and receive. The purpose of a guard interval is to introduce immunity to propagation delays, echoes, and reflections to which digital data is normally very sensitive.
Aggregation	A part of the 802.11n standard that allows sending multiple frames per single access to the medium by combining frames together into one larger frame. It creates the larger frame by combining smaller frames with the same physical source, destination end points, and traffic class (QoS) into one large frame with a common MAC header
Aggregated Frames Number	Determines the number of frames combined in the new larger frame.

Maximum Aggregated Size	Determines the size (in bytes) of the larger frame.
Tx/Rx ChainMask	Displays the number of independent spatial data streams the device is transmitting (TX) and receiving (RX) simultaneously within one spectral channel of bandwidth. Multiple chains increase data transfer performance significantly.
WMM Capable	Enable the feature to access or Disable it.
WMM Configuration	Displays the WMM Parameters of station and Access Point
Save Cancel	Save the changed settings Cancel the selected settings

Access Control

This page allows administrator to have Access Control by entering MAC address of client stations. When this function is Enabled, MAC address can be added into access control list and only those clients whose wireless MAC address are in the access control list will be able to connect or disconnect the internet.



Access Control Settings

This feature allows you to define a list of MAC addresses that are authorized to access or denied from accessing the wireless network.

Wireless Access Control Mode: Disable

Mac Address: (xx:xx:xx:xx:xx:xx)

Comment :

Fields	Description
Wireless Access Control Mode	The Selections are: **Disable:** Disable the wireless ACL feature. **Allow Listed:** When this option is selected, no wireless clients except those whose MAC addresses are in the current access control list will be able to connect to internet. **Deny Listed:** When this option is selected, all wireless clients except those whose MAC addresses are in the current access control list will not be able to connect to internet.
Mac Address	Enter client MAC address and press “Apply Changes” button to add client MAC address into current access control list.
Comment	Make a comment for Wireless access control

Function buttons for the Access Control List:

Apply Changes

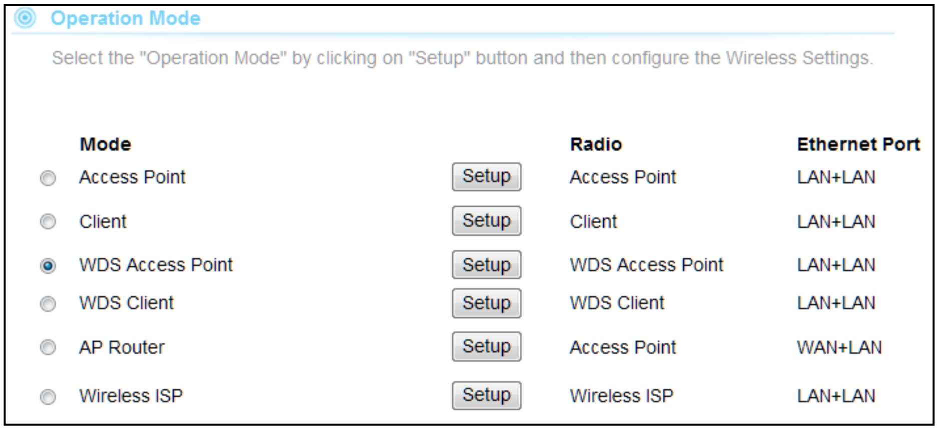
Click to add this entry into the Access Control List.

The Access Control List lists the client MAC addresses. Any wireless client with its MAC address listed in this access control list will be able to connect to the device. You can select the entries at the Select column and apply to the following function buttons.

Delete Selected: Delete the selected entries from the list.
Delete All: Flush the list.
Reset: Clear the settings.

4.1.3 WDS Access Point

It acts as the main base station for a Wireless Distribution System mesh network



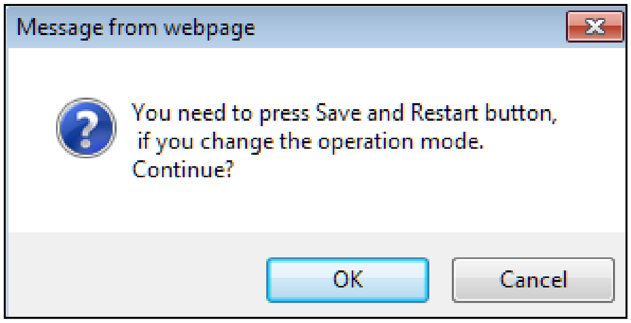
Operation Mode

Select the "Operation Mode" by clicking on "Setup" button and then configure the Wireless Settings.

	Mode		Radio	Ethernet Port
○	Access Point	Setup	Access Point	LAN+LAN
○	Client	Setup	Client	LAN+LAN
●	WDS Access Point	Setup	WDS Access Point	LAN+LAN
○	WDS Client	Setup	WDS Client	LAN+LAN
○	AP Router	Setup	Access Point	WAN+LAN
○	Wireless ISP	Setup	Wireless ISP	LAN+LAN

Note: Depending on the mode you choose, applicable settings will be enabled/ disabled automatically.

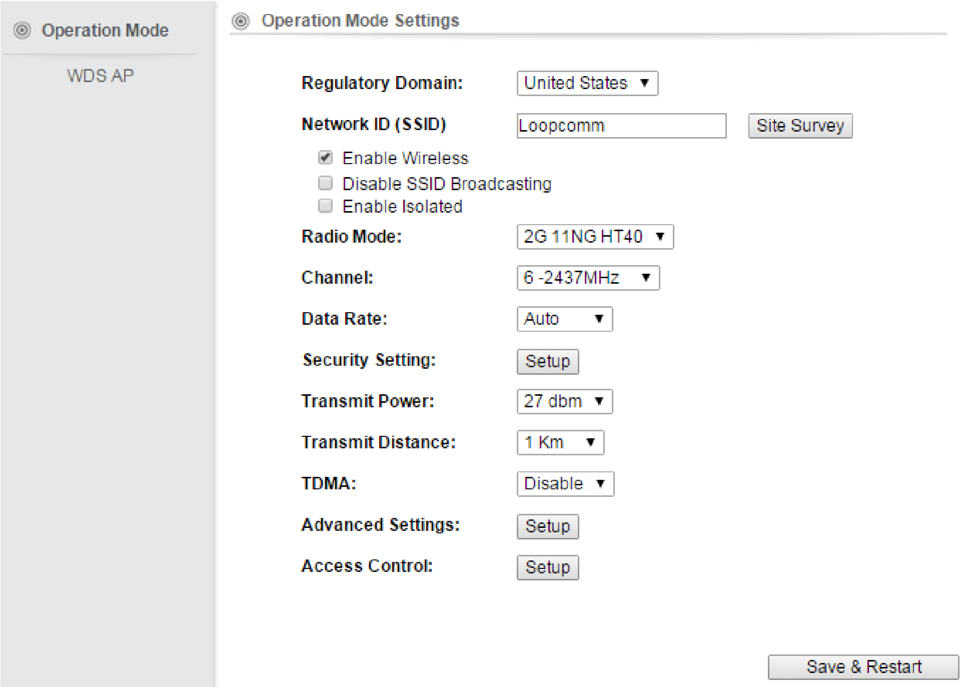
Press setup, then below Screen is displayed.



Message from webpage

You need to press Save and Restart button,
if you change the operation mode.
Continue?

Press OK to continue, then below page is displayed.



Operation Mode

WDS AP

Operation Mode Settings

Regulatory Domain: United States ▾

Network ID (SSID) Loopcomm

☑ Enable Wireless

□ Disable SSID Broadcasting

□ Enable Isolated

Radio Mode: 2G 11NG HT40 ▾

Channel: 6 -2437MHz ▾

Data Rate: Auto ▾

Security Setting:

Transmit Power: 27 dbm ▾

Transmit Distance: 1 Km ▾

TDMA: Disable ▾

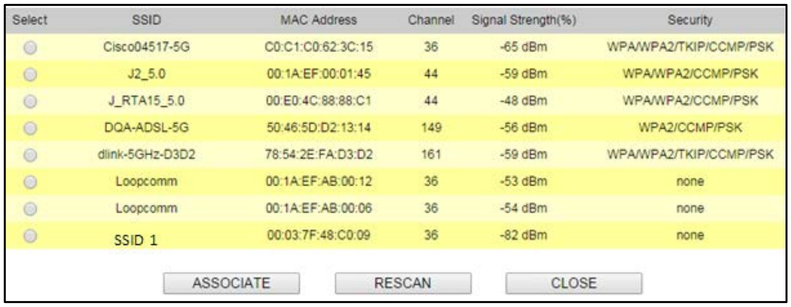
Advanced Settings:

Access Control:

Fields	Description
Regulatory Domain	Select the country from pull down menu.
Network SSID	It is the wireless network name. User can use the default SSID or change it. (Special characters cannot be used).
Enable Wireless Disable SSID Broadcasting Enable Isolated	Enable Wireless Option SSID will be hidden, only users who know the SSID can associate with this network. User cannot Ping.
Radio Mode	Select the Mode of 2G 11NG HT20 or 2G 11NG HT40 “Auto” option selects the mode by itself.
Channel	Select the wireless communication frequency/channel from pull-down menu.
Data Rate	Defines the data rate (in Mbps) at which the device should transmit wireless packets. You can fix a specific data rate between MCS 0 and MCS 7 (or MCS 15 for 2x2 chain devices).
Transmit Power	Defines the maximum average transmit output power (in dBm) of the device. The transmit power level maximum is limited according to country regulations.
Transmit Distance	Changing the distance value will change the ACK (Acknowledgement) timeout value accordingly, so it means the distance should be set as real distance between LP-2396K and other device for accurate transmission performance.
Save and Restart	It saves the new settings and restarts.

Site Survey

You could configure AP Client parameters here.



Select	SSID	MAC Address	Channel	Signal Strength(%)	Security
○	Cisco04517-5G	C0:C1:C0:62:3C:15	36	-65 dBm	WPA/WPA2/TKIP/CCMP/PSK
○	J2_5.0	00:1A:EF:00:01:45	44	-59 dBm	WPA/WPA2/CCMP/PSK
○	J_RTA15_5.0	00:E0:4C:88:88:C1	44	-48 dBm	WPA/WPA2/CCMP/PSK
○	DQA-ADSL-5G	50:46:5D:D2:13:14	149	-56 dBm	WPA2/CCMP/PSK
○	dlink-5GHz-D3D2	78:54:2E:FA:D3:D2	161	-59 dBm	WPA/WPA2/TKIP/CCMP/PSK
○	Loopcomm	00:1A:EF:AB:00:12	36	-53 dBm	none
○	Loopcomm	00:1A:EF:AB:00:06	36	-54 dBm	none
○	SSID 1	00:03:7F:48:C0:09	36	-82 dBm	none

Click **Rescan** to browse more networks then select the SSID and press associate then close the page.

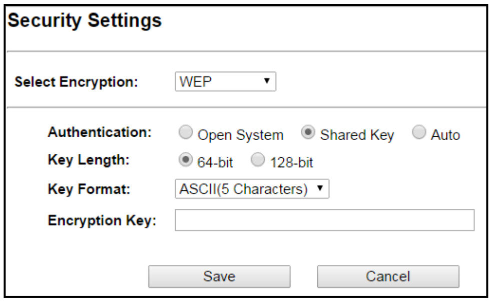
Note: Enter the SSID Password, if necessary.

Security Settings

Security settings allow you to use encryption to secure your data.

There are 4 Encryption Modes in Security Settings. They are WEP, WPA, WPA2, and WPA-Mixed.

Functions are same for all Modes, below example is for WEP and WPA Encryption.



Security Settings

Select Encryption: WEP

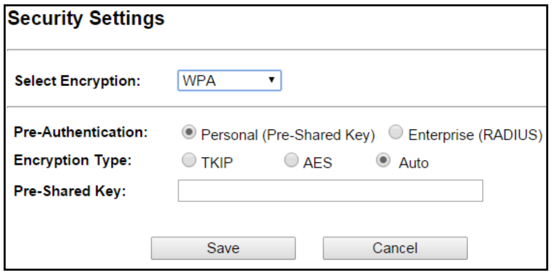
Authentication: ○ Open System ● Shared Key ○ Auto

Key Length: ● 64-bit ○ 128-bit

Key Format: ASCII(5 Characters)

Encryption Key:

Fields	Description
Select Encryption	Select the Encryption Mode from the pull down menu.
Authentication	**Open System:** Open system authentication provides identification for using the wireless adapter's MAC address. Open system authentication is used when no authentication is required. **Shared Key:** It verifies that an authentication-initiating station has knowledge of a shared secret. The 802.11 standard currently assumes that the shared secret is delivered to the participating wireless clients by means of a more secure channel that is independent of IEEE 802.11 **Auto:** Auto is the default authentication algorithm. It will change its authentication type automatically to fulfill client's requirement.
Key Length	Select the Key length
Key Format	When Key Length is selected as 64-bites then Input ASCII (5 Characters) or Hex (10 Characters) When Key Length is selected as 128-bits then Input ASCII (13 Characters) or Hex (128 Character)
Encryption Key	User can enter the characters based on selected Key Length & Key Format. The format can be passphrase or characters.



Security Settings

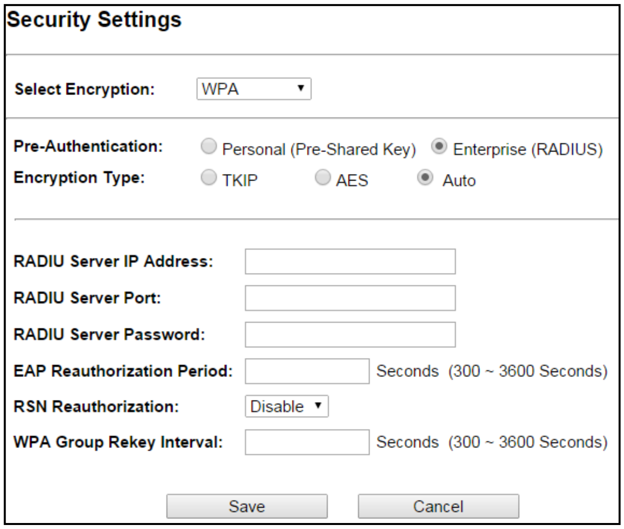
Select Encryption: WPA

Pre-Authentication: ● Personal (Pre-Shared Key) ○ Enterprise (RADIUS)

Encryption Type: ○ TKIP ○ AES ● Auto

Pre-Shared Key:

Fields	Description
Select Encryption	Select the Encryption Mode from the pull down menu.
Pre-Authentication	Select Pre-Authentication as Personal or Enterprise.
Encryption Type	**TKIP:** Temporal Key Integrity Protocol (TKIP) for data Encryption. TKIP utilizes a stronger encryption method and incorporates Message Integrity Code (MIC) to provide protection against hackers. **AES:** Advanced Encryption Standard (AES) for data encryption. AES utilizes a symmetric 128-bit block data encryption. **AUTO:** Auto is the default Encryption Type. It will change automatically to fulfill client's requirement.
Pre-shared Key	User can enter Maximum number of Key Length. The format can be passphrase or any characters.



Security Settings

Select Encryption: WPA ▾

Pre-Authentication: ○ Personal (Pre-Shared Key) ● Enterprise (RADIUS)

Encryption Type: ○ TKIP ○ AES ● Auto

RADIU Server IP Address:

RADIU Server Port:

RADIU Server Password:

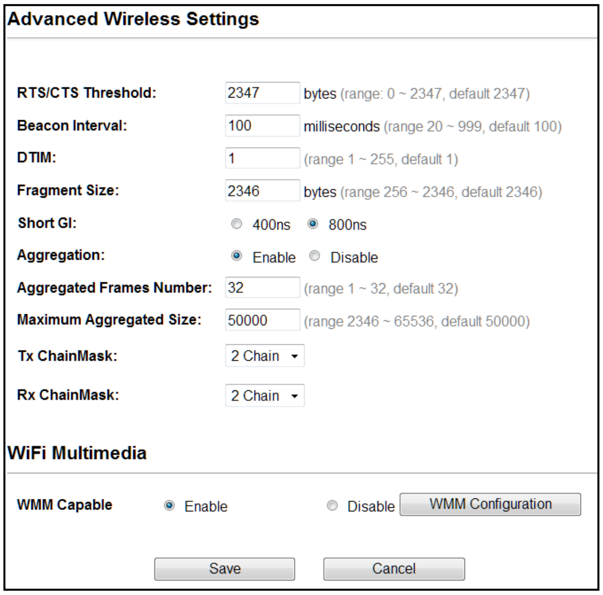
EAP Reauthorization Period: Seconds (300 ~ 3600 Seconds)

RSN Reauthorization: Disable ▾

WPA Group Rekey Interval: Seconds (300 ~ 3600 Seconds)

Fields	Description
RADIU Server IP Address	Enter the RADIU Server's IP Address provided by your ISP.
RADIU Server Port	Enter the RADIUS Server's port number provided by your ISP.
RADIU Server Password	Enter the RADIUS Server's Password provided by your ISP.
EAP Reauthorization Period	EAP- Session timeout interval for 802.1x re-authorization setting. Session timeout interval unit is seconds.
RSN Reauthorization	Enable/Disable the function to access.
WPA Group Rekey Interval	A group key is used for multicast/broadcast data, and the re-key interval is time period that the system will change the group key periodically. The shorter the interval is, better the security. It varies from 300 to 3600 Seconds.
Save Cancel	Click Save to change the new settings. Click cancel to clear the entered settings.

Advanced Settings



Advanced Wireless Settings

RTS/CTS Threshold: 2347 bytes (range: 0 ~ 2347, default 2347)

Beacon Interval: 100 milliseconds (range 20 ~ 999, default 100)

DTIM: 1 (range 1 ~ 255, default 1)

Fragment Size: 2346 bytes (range 256 ~ 2346, default 2346)

Short GI: ○ 400ns ● 800ns

Aggregation: ● Enable ○ Disable

Aggregated Frames Number: 32 (range 1 ~ 32, default 32)

Maximum Aggregated Size: 50000 (range 2346 ~ 65536, default 50000)

Tx ChainMask: 2 Chain

Rx ChainMask: 2 Chain

WiFi Multimedia

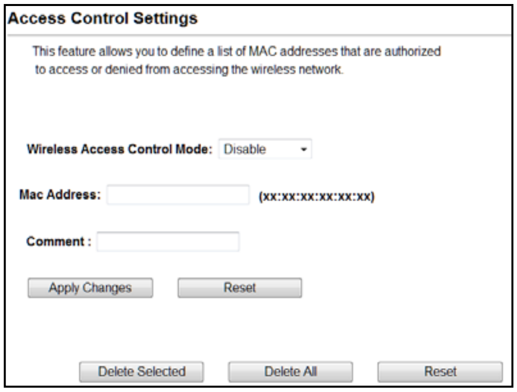
WMM Capable ● Enable ○ Disable

Fields	Description
RTS/CTS Threshold	Determines the packet size of a transmission and, through the use of an AP, helps control traffic flow. The range is 0-2347 bytes.
Beacon Interval	Beacons are the packets sending by Access point to synchronize the wireless network. The beacon interval is the time interval between beacons sending by this unit in AP or AP+WDS operation. The default and recommended beacon interval is 100 milliseconds.
DTIM (Delivery Traffic Indication Map)	This is the Delivery Traffic Indication Map. It is used to alert the clients that multicast and broadcast packets buffered at the AP will be transmitted immediately after the transmission of this beacon frame. You can change the value from 1 to 255. The AP will check the buffered data according to this value. For example, selecting "1" means to check the buffered data at every beacon.
Fragment Size	A large data frame is fragmented into several fragments each of size equal to fragment threshold. By tuning the fragment threshold value, we can get varying fragment sizes.
Short GI (Guard Interval)	A GI is a period of time between symbol transmission that allows reflections (from multipath) from the previous data transmission to settle before transmitting a new symbol. The 802.11n draft specifies two guard intervals: 400ns (short) and 800ns (long). Support of the 400ns GI is optional for transmit and receive. The purpose of a guard interval is to introduce immunity to propagation delays, echoes, and reflections to which digital data is normally very sensitive.
Aggregation	A part of the 802.11n standard that allows sending multiple frames per single access to the medium by combining frames together into one larger frame. It creates the larger frame by combining smaller frames with the same physical source, destination end points, and traffic class (QoS) into one large frame with a common MAC header

Aggregated Frames Number	Determines the number of frames combined in the new larger frame.
Maximum Aggregated Size	Determines the size (in bytes) of the larger frame.
Tx/Rx ChainMask	Displays the number of independent spatial data streams the device is transmitting (TX) and receiving (RX) simultaneously within one spectral channel of bandwidth. Multiple chains increase data transfer performance significantly.
WMM Capable	Enable the feature to access or Disable it.
WMM Configuration	Displays the WMM Parameters of station and Access Point.
Save Cancel	Save the changed settings Cancel the selected settings.

Access Control

This page allows administrator to have Access Control by entering MAC address of client stations. When this function is Enabled, MAC address can be added into access control list and only those clients whose wireless MAC address are in the access control list will be able to connect or disconnect the internet.



Access Control Settings

This feature allows you to define a list of MAC addresses that are authorized to access or denied from accessing the wireless network.

Wireless Access Control Mode: Disable

Mac Address: (xx:xx:xx:xx:xx:xx)

Comment :

Fields	Description
Wireless Access Control Mode	The Selections are: **Disable:** Disable the wireless ACL feature. **Allow Listed:** When this option is selected, no wireless clients except those whose MAC addresses are in the current access control list will be able to connect to internet. **Deny Listed:** When this option is selected, all wireless clients except those whose MAC addresses are in the current access control list will not be able to connect internet.
Mac Address	Enter client MAC address and press “Apply Changes” button to add client MAC address into current access control list.
Comment	Make a comment for Wireless access control

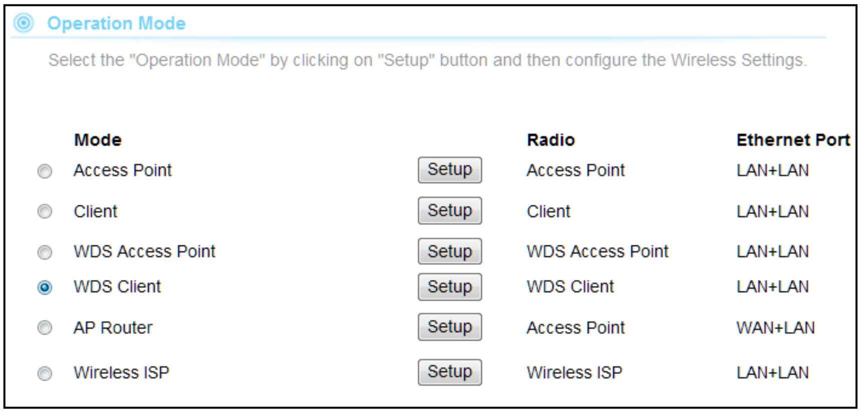
Function buttons for the Access Control List:

Apply Changes
Click to add this entry into the Access Control List.
The Access Control List lists the client MAC addresses. Any wireless client with its MAC address listed in this access control list will be able to connect to the device. You can select the entries at the Select column and apply to the following function buttons.

Delete Selected: Delete the selected entries from the list.
Delete All: Flush the list.
Reset: Clear the settings.

4.1.4 WDS Client

It acts as a remote base station in a Wireless Distribution System mesh network



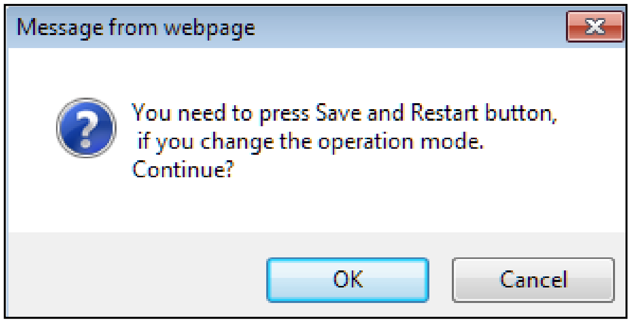
Operation Mode

Select the "Operation Mode" by clicking on "Setup" button and then configure the Wireless Settings.

	Mode		Radio	Ethernet Port
○	Access Point	Setup	Access Point	LAN+LAN
○	Client	Setup	Client	LAN+LAN
○	WDS Access Point	Setup	WDS Access Point	LAN+LAN
●	WDS Client	Setup	WDS Client	LAN+LAN
○	AP Router	Setup	Access Point	WAN+LAN
○	Wireless ISP	Setup	Wireless ISP	LAN+LAN

Note: Depending on the mode you choose, applicable settings will be enabled/ disabled automatically.

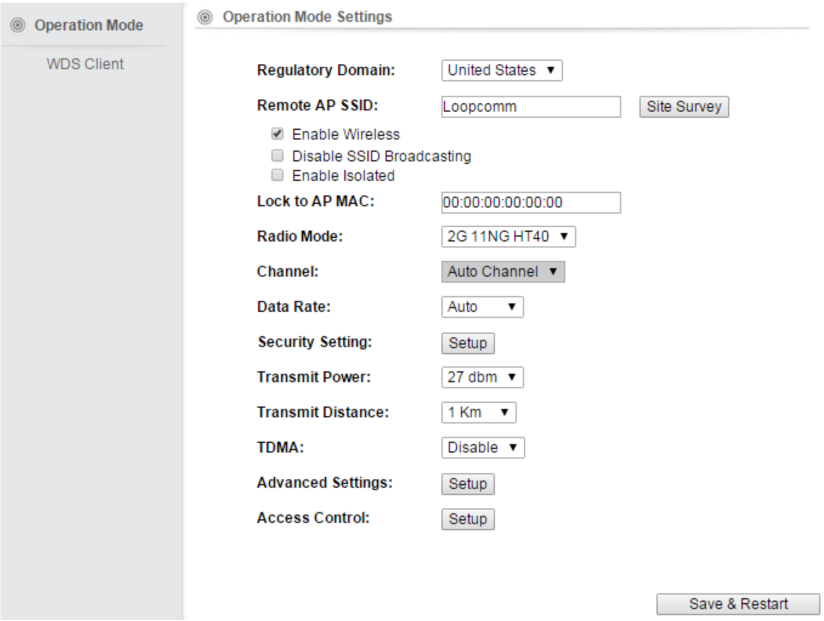
Press setup, then below Screen is displayed.



Message from webpage

You need to press Save and Restart button,
if you change the operation mode.
Continue?

Press OK to continue, then below page is displayed.



Operation Mode

WDS Client

Operation Mode Settings

Regulatory Domain: United States ▼

Remote AP SSID: Loopcomm [Site Survey]

☑ Enable Wireless

□ Disable SSID Broadcasting

□ Enable Isolated

Lock to AP MAC: 00:00:00:00:00:00

Radio Mode: 2G 11NG HT40 ▼

Channel: Auto Channel ▼

Data Rate: Auto ▼

Security Setting: [Setup]

Transmit Power: 27 dbm ▼

Transmit Distance: 1 Km ▼

TDMA: Disable ▼

Advanced Settings: [Setup]

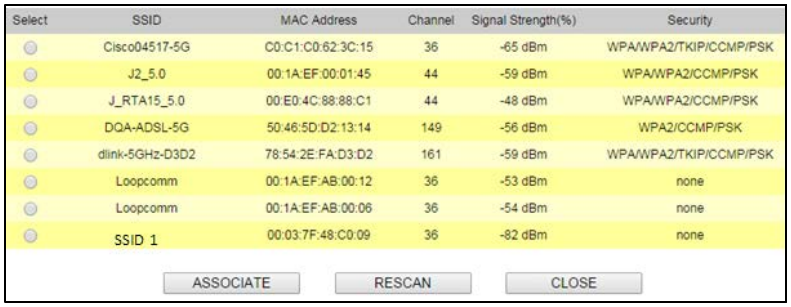
Access Control: [Setup]

[Save & Restart]

Fields	Description
Regulatory Domain	Select the country from pull down menu.
Remote AP SSID	Select Site Survey option then it will Scan & displays the SSID List, Choose one SSID from the list.
Enable Wireless Disable SSID Broadcasting Enable Isolated	Enable Wireless Option SSID will be hidden, only users who know the SSID can associate with this network. User cannot Ping.
Lock to AP Mac	Enter MAC address of the access point to which the client will be locked and connected.
Radio Mode	Select the Mode of 2G 11NG HT20 or 2G 11NG HT40 “Auto” option selects the mode by itself.
Channel	Select the wireless communication frequency/channel from pull-down menu.
Data Rate	Defines the data rate (in Mbps) at which the device should transmit wireless packets. You can fix a specific data rate between MCS 0 and MCS 7 (or MCS 15 for 2x2 chain devices).
Transmit Power	Defines the maximum average transmit output power (in dBm) of the device. The transmit power level maximum is limited according to country regulations.
Transmit Distance	Changing the distance value will change the ACK (Acknowledgement) timeout value accordingly, so it means the distance should be set as real distance between LP-2396K and other device for accurate transmission performance.
Save and Restart	It saves the new settings and restarts.

Site Survey

You could configure AP Client parameters here.



Select	SSID	MAC Address	Channel	Signal Strength(%)	Security
○	Cisco04517-5G	C0:C1:C0:62:3C:15	36	-65 dBm	WPA/WPA2/TKIP/CCMP/PSK
○	J2_5.0	00:1A:EF:00:01:45	44	-59 dBm	WPA/WPA2/CCMP/PSK
○	J_RTA15_5.0	00:E0:4C:88:88:C1	44	-48 dBm	WPA/WPA2/CCMP/PSK
○	DQA-ADSL-5G	50:46:5D:D2:13:14	149	-56 dBm	WPA2/CCMP/PSK
○	dlink-5GHz-D3D2	78:54:2E:FA:D3:D2	161	-59 dBm	WPA/WPA2/TKIP/CCMP/PSK
○	Loopcomm	00:1A:EF:AB:00:12	36	-53 dBm	none
○	Loopcomm	00:1A:EF:AB:00:06	36	-54 dBm	none
○	SSID 1	00:03:7F:48:C0:09	36	-82 dBm	none

Click **Rescan** to browse more networks then select the SSID and press associate then close the page.

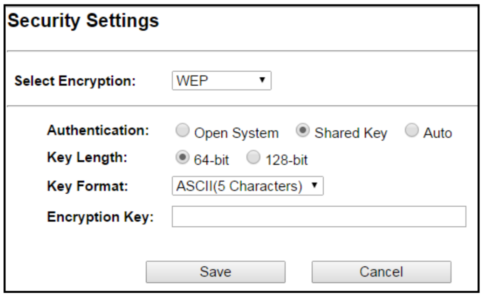
Note: Enter the SSID Password, if necessary.

Security Settings

Security settings allow you to use encryption to secure your data.

There are 4 Encryption Modes in Security Settings. They are WEP, WPA, WPA2, and WPA-Mixed.

Functions are same for all Modes, below example is for WEP and WPA Encryption.



Security Settings

Select Encryption: WEP

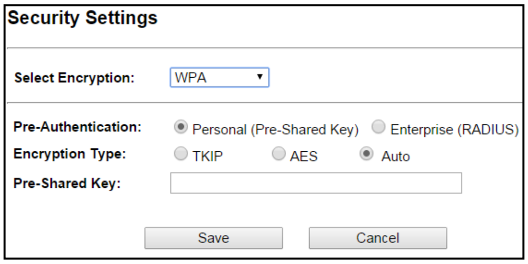
Authentication: ○ Open System ● Shared Key ○ Auto

Key Length: ● 64-bit ○ 128-bit

Key Format: ASCII(5 Characters)

Encryption Key:

Fields	Description
Select Encryption	Select the Encryption Mode from the pull down menu.
Authentication	**Open System:** Open system authentication provides identification for using the wireless adapter's MAC address. Open system authentication is used when no authentication is required. **Shared Key:** It verifies that an authentication-initiating station has knowledge of a shared secret. The 802.11 standard currently assumes that the shared secret is delivered to the participating wireless clients by means of a more secure channel that is independent of IEEE 802.11 **Auto:** Auto is the default authentication algorithm. It will change its authentication type automatically to fulfill client’s requirement.
Key Length	Select the Key length
Key Format	When Key Length is selected as 64-bites then Input ASCII (5 Characters) or Hex (10 Characters) When Key Length is selected as 128-bits then Input ASCII (13 Characters) or Hex (128 Character)
Encryption Key	User can enter the characters based on selected Key Length & Key Format. The format can be passphrase or characters.



Security Settings

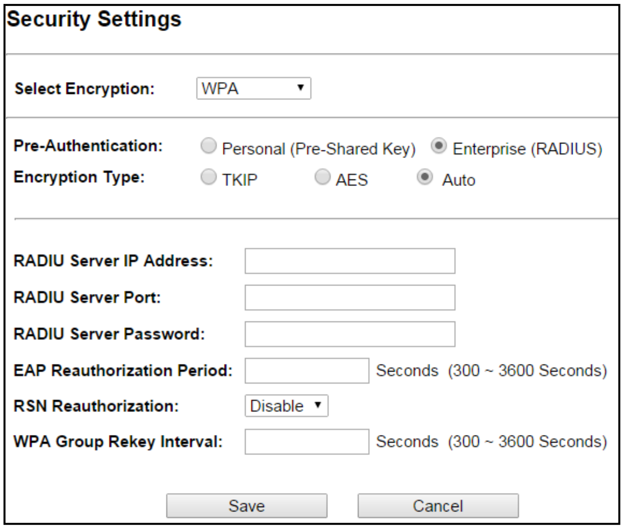
Select Encryption: WPA

Pre-Authentication: ● Personal (Pre-Shared Key) ○ Enterprise (RADIUS)

Encryption Type: ○ TKIP ○ AES ● Auto

Pre-Shared Key:

Fields	Description
Select Encryption	Select the Encryption Mode from the pull down menu.
Pre-Authentication	Select Pre-Authentication as Personal or Enterprise.
Encryption Type	**TKIP:** Temporal Key Integrity Protocol (TKIP) for data Encryption. TKIP utilizes a stronger encryption method and incorporates Message Integrity Code (MIC) to provide protection against hackers. **AES:** Advanced Encryption Standard (AES) for data encryption. AES utilizes a symmetric 128-bit block data encryption. **AUTO:** Auto is the default Encryption Type. It will change automatically to fulfill client’s requirement.
Pre-shared Key	User can enter Maximum number of Key Length. The format can be passphrase or any characters.



Security Settings

Select Encryption: WPA ▾

Pre-Authentication: ○ Personal (Pre-Shared Key) ● Enterprise (RADIUS)

Encryption Type: ○ TKIP ○ AES ● Auto

RADIU Server IP Address:

RADIU Server Port:

RADIU Server Password:

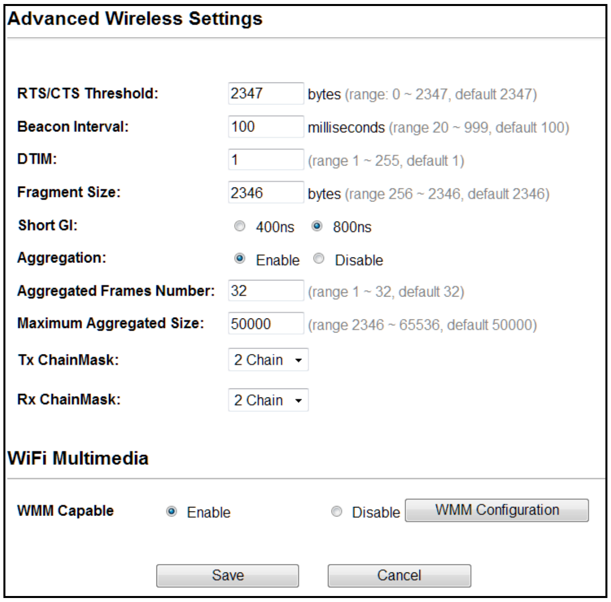
EAP Reauthorization Period: Seconds (300 ~ 3600 Seconds)

RSN Reauthorization: Disable ▾

WPA Group Rekey Interval: Seconds (300 ~ 3600 Seconds)

Fields	Description
RADIU Server IP Address	Enter the RADIU Server's IP Address provided by your ISP.
RADIU Server Port	Enter the RADIUS Server's port number provided by your ISP.
RADIU Server Password	Enter the RADIUS Server's Password provided by your ISP.
EAP Reauthorization Period	EAP- Session timeout interval for 802.1x re-authorization setting. Session timeout interval unit is seconds
RSN Reauthorization	Enable/Disable the function to access.
WPA Group Rekey Interval	A group key is used for multicast/broadcast data, and the re-key interval is time period that the system will change the group key periodically. The shorter the interval is, better the security. It varies from 300 to 3600 Seconds.
Save Cancel	Click Save to change the new settings. Click cancel to clear the entered settings.

Advanced Settings



Advanced Wireless Settings

RTS/CTS Threshold: 2347 bytes (range: 0 ~ 2347, default 2347)

Beacon Interval: 100 milliseconds (range 20 ~ 999, default 100)

DTIM: 1 (range 1 ~ 255, default 1)

Fragment Size: 2346 bytes (range 256 ~ 2346, default 2346)

Short GI: ○ 400ns ● 800ns

Aggregation: ● Enable ○ Disable

Aggregated Frames Number: 32 (range 1 ~ 32, default 32)

Maximum Aggregated Size: 50000 (range 2346 ~ 65536, default 50000)

Tx ChainMask: 2 Chain

Rx ChainMask: 2 Chain

WiFi Multimedia

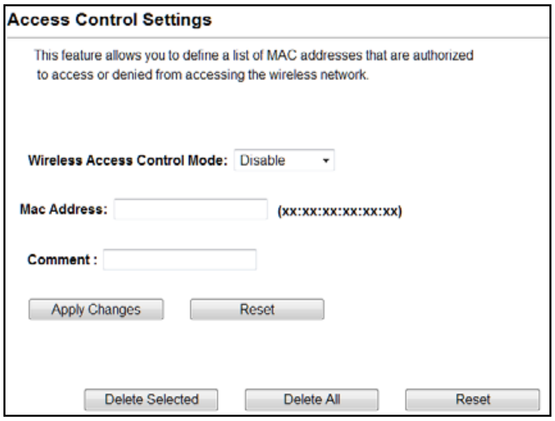
WMM Capable ● Enable ○ Disable

Fields	Description
RTS/CTS Threshold	Determines the packet size of a transmission and, through the use of an AP, helps control traffic flow. The range is 0-2347 bytes.
Beacon Interval	Beacons are the packets sending by Access point to synchronize the wireless network. The beacon interval is the time interval between beacons sending by this unit in AP or AP+WDS operation. The default and recommended beacon interval is 100 milliseconds.
DTIM (Delivery Traffic Indication Map)	This is the Delivery Traffic Indication Map. It is used to alert the clients that multicast and broadcast packets buffered at the AP will be transmitted immediately after the transmission of this beacon frame. You can change the value from 1 to 255. The AP will check the buffered data according to this value. For example, selecting "1" means to check the buffered data at every beacon.
Fragment Size	A large data frame is fragmented into several fragments each of size equal to fragment threshold. By tuning the fragment threshold value, we can get varying fragment sizes.
Short GI (Guard Interval)	A GI is a period of time between symbol transmission that allows reflections (from multipath) from the previous data transmission to settle before transmitting a new symbol. The 802.11n draft specifies two guard intervals: 400ns (short) and 800ns (long). Support of the 400ns GI is optional for transmit and receive. The purpose of a guard interval is to introduce immunity to propagation delays, echoes, and reflections to which digital data is normally very sensitive.

Aggregation	A part of the 802.11n standard that allows sending multiple frames per single access to the medium by combining frames together into one larger frame. It creates the larger frame by combining smaller frames with the same physical source, destination end points, and traffic class (QoS) into one large frame with a common MAC header
Aggregated Frames Number	Determines the number of frames combined in the new larger frame.
Maximum Aggregated Size	Determines the size (in bytes) of the larger frame.
Tx/Rx ChainMask	Displays the number of independent spatial data streams the device is transmitting (TX) and receiving (RX) simultaneously within one spectral channel of bandwidth. Multiple chains increase data transfer performance significantly
WMM Capable	Enable the feature to access or Disable it.
WMM Configuration	Displays the WMM Parameters of station and Access Point
Save Cancel	Save the changed settings Cancel the selected settings

Access Control

This page allows administrator to have Access Control by entering MAC address of client stations. When this function is Enabled, MAC address can be added into access control list and only those clients whose wireless MAC address are in the access control list will be able to connect or disconnect the internet.



Access Control Settings

This feature allows you to define a list of MAC addresses that are authorized to access or denied from accessing the wireless network.

Wireless Access Control Mode: Disable

Mac Address: (xx:xx:xx:xx:xx:xx)

Comment :

Fields	Description
Wireless Access Control Mode	The Selections are: **Disable:** Disable the wireless ACL feature. **Allow Listed:** When this option is selected, no wireless clients except those whose MAC addresses are in the current access control list will be able to connect to internet. **Deny Listed:** When this option is selected, all wireless clients except those whose MAC addresses are in the current access control list will not be able to connect to internet.
Mac Address	Enter client MAC address and press “Apply Changes” button to add client MAC address into current access control list.
Comment	Make a comment for Wireless access control

Function buttons for the Access Control List:

Apply Changes

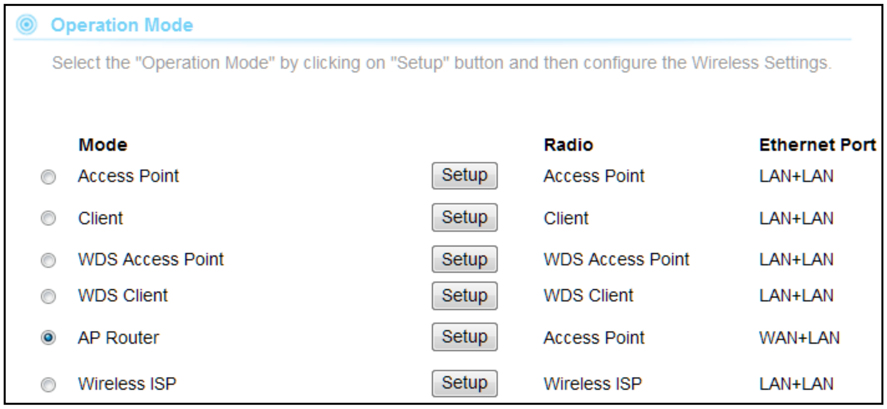
Click to add this entry into the Access Control List.

The Access Control List lists the client MAC addresses. Any wireless client with its MAC address listed in this access control list will be able to connect to the device. You can select the entries at the Select column and apply to the following function buttons.

Delete Selected: Delete the selected entries from the list.
Delete All: Flush the list.
Reset: Clear the settings.

4.1.5 AP Router

It connects an external network (WAN) with an internal network (LAN/WLAN), to allow cross-communication



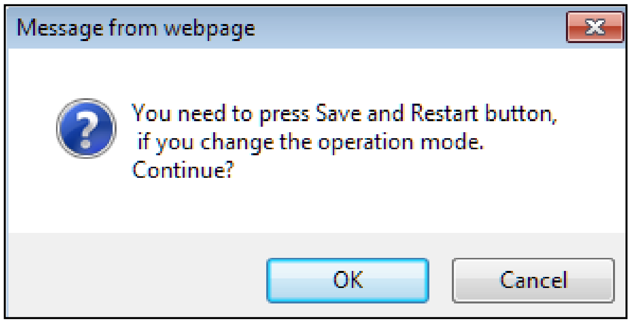
Operation Mode

Select the "Operation Mode" by clicking on "Setup" button and then configure the Wireless Settings.

	Mode		Radio	Ethernet Port
○	Access Point	Setup	Access Point	LAN+LAN
○	Client	Setup	Client	LAN+LAN
○	WDS Access Point	Setup	WDS Access Point	LAN+LAN
○	WDS Client	Setup	WDS Client	LAN+LAN
●	AP Router	Setup	Access Point	WAN+LAN
○	Wireless ISP	Setup	Wireless ISP	LAN+LAN

Note: Depending on the mode you choose, applicable settings will be enabled/ disabled automatically.

Press setup, then below Screen is displayed.

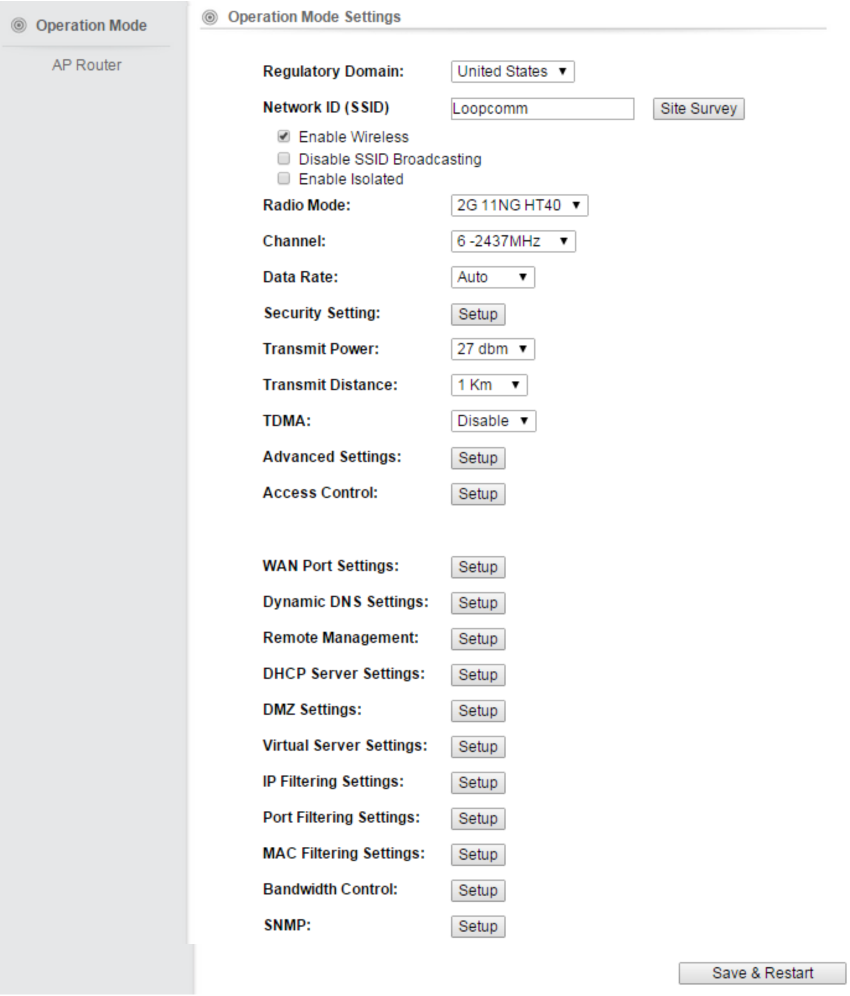


Message from webpage

You need to press Save and Restart button,
if you change the operation mode.
Continue?

Press OK to continue, then below page is displayed.

Note: In AP router secondary port will be WAN Port by default.



Operation Mode Settings

Regulatory Domain: United States

Network ID (SSID) Loopcomm

☑ Enable Wireless
☐ Disable SSID Broadcasting
☐ Enable Isolated

Radio Mode: 2G 11NG HT40

Channel: 6 -2437MHz

Data Rate: Auto

Security Setting: Setup

Transmit Power: 27 dbm

Transmit Distance: 1 Km

TDMA: Disable

Advanced Settings: Setup

Access Control: Setup

WAN Port Settings: Setup

Dynamic DNS Settings: Setup

Remote Management: Setup

DHCP Server Settings: Setup

DMZ Settings: Setup

Virtual Server Settings: Setup

IP Filtering Settings: Setup

Port Filtering Settings: Setup

MAC Filtering Settings: Setup

Bandwidth Control: Setup

SNMP: Setup

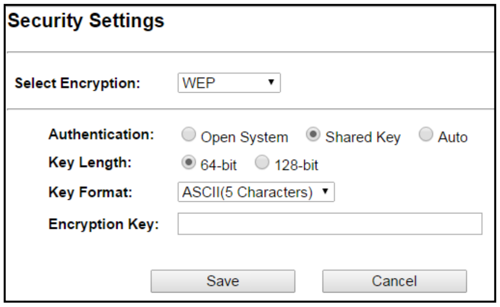
Fields	Description
Regulatory Domain	Select the country from pull down menu.
Network SSID	It is the wireless network name. User can use the default SSID or change it. (Special characters cannot be used).
Enable Wireless Disable SSID Broadcasting Enable Isolated	Enable Wireless Option SSID will be hidden, only users who know the SSID can associate with this network. User cannot Ping.
Radio Mode	Select the Mode of 2G 11NG HT20 or 2G 11NG HT40 “Auto” option selects the mode by itself.
Channel	Select the wireless communication frequency/channel from pull-down menu.
Data Rate	Defines the data rate (in Mbps) at which the device should transmit wireless packets. You can fix a specific data rate between MCS 0 and MCS 7 (or MCS 15 for 2x2 chain devices).
Transmit Power	Defines the maximum average transmit output power (in dBm) of the device. The transmit power level maximum is limited according to country regulations.

Transmit Distance	Changing the distance value will change the ACK (Acknowledgement) timeout value accordingly, so it means the distance should be set as real distance between LP-2396K and other device for accurate transmission performance.
Save and Restart	It saves the new settings and restarts.

Security Settings

Security settings allow you to use encryption to secure your data.

There are 4 Encryption Modes in Security Settings. They are WEP, WPA, WPA2, and WPA-Mixed. Functions are same for all Modes, below example is for WEP and WPA Encryption.



Security Settings

Select Encryption: WEP

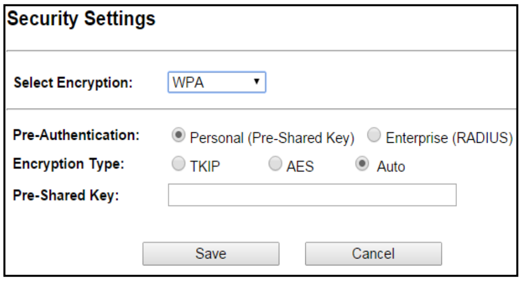
Authentication: ○ Open System ● Shared Key ○ Auto

Key Length: ● 64-bit ○ 128-bit

Key Format: ASCII(5 Characters)

Encryption Key:

Fields	Description
Select Encryption	Select the Encryption Mode from the pull down menu.
Authentication	**Open System:** Open system authentication provides identification for using the wireless adapter's MAC address. Open system authentication is used when no authentication is required. **Shared Key:** It verifies that an authentication-initiating station has knowledge of a shared secret. The 802.11 standard currently assumes that the shared secret is delivered to the participating wireless clients by means of a more secure channel that is independent of IEEE 802.11 **Auto:** Auto is the default authentication algorithm. It will change its authentication type automatically to fulfill client’s requirement.
Key Length	Select the Key length
Key Format	When Key Length is selected as 64-bites then Input ASCII (5 Characters) or Hex (10 Characters) When Key Length is selected as 128-bits then Input ASCII (13 Characters) or Hex (128 Character)
Encryption Key	User can enter the characters based on selected Key Length & Key Format. The format can be passphrase or characters.



Security Settings

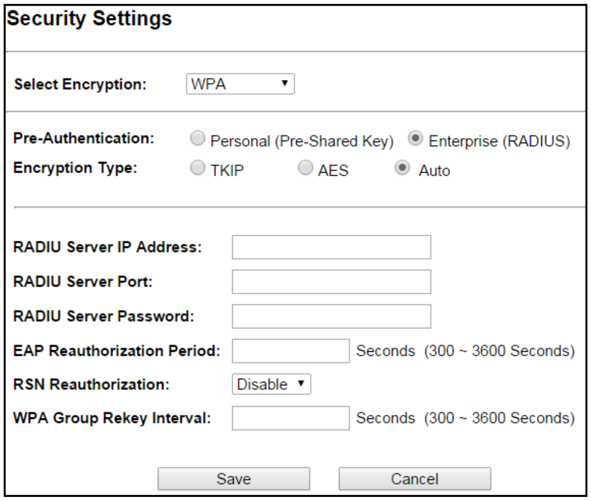
Select Encryption: WPA

Pre-Authentication: ● Personal (Pre-Shared Key) ○ Enterprise (RADIUS)

Encryption Type: ○ TKIP ○ AES ● Auto

Pre-Shared Key:

Fields	Description
Select Encryption	Select the Encryption Mode from the pull down menu.
Pre-Authentication	Select Pre-Authentication as Personal or Enterprise.
Encryption Type	**TKIP:** Temporal Key Integrity Protocol (TKIP) for data Encryption. TKIP utilizes a stronger encryption method and incorporates Message Integrity Code (MIC) to provide protection against hackers. **AES:** Advanced Encryption Standard (AES) for data encryption. AES utilizes a symmetric 128-bit block data encryption. **AUTO:** Auto is the default Encryption Type. It will change automatically to fulfill client's requirement.
Pre-shared Key	User can enter Maximum number of Key Length. The format can be passphrase or any characters.



Security Settings

Select Encryption: WPA ▾

Pre-Authentication: ○ Personal (Pre-Shared Key) ● Enterprise (RADIUS)

Encryption Type: ○ TKIP ○ AES ● Auto

RADIU Server IP Address:

RADIU Server Port:

RADIU Server Password:

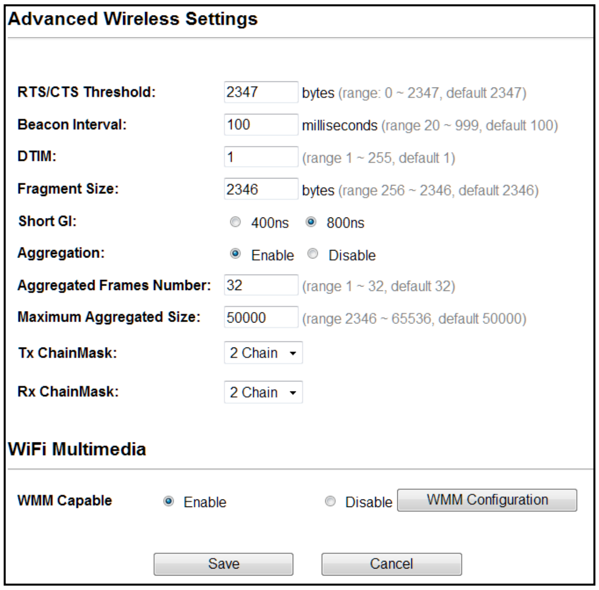
EAP Reauthorization Period: Seconds (300 ~ 3600 Seconds)

RSN Reauthorization: Disable ▾

WPA Group Rekey Interval: Seconds (300 ~ 3600 Seconds)

Fields	Description
RADIU Server IP Address	Enter the RADIU Server's IP Address provided by your ISP.
RADIU Server Port	Enter the RADIUS Server's port number provided by your ISP.
RADIU Server Password	Enter the RADIUS Server's Password provided by your ISP.
EAP Reauthorization Period	EAP- Session timeout interval for 802.1x re-authorization setting. Session timeout interval unit is seconds
RSN Reauthorization	Enable/Disable the function to access.
WPA Group Rekey Interval	A group key is used for multicast/broadcast data, and the re-key interval is time period that the system will change the group key periodically. The shorter the interval is better the security. It varies from 300 to 3600 Seconds.
Save Cancel	Click Save to change the new settings. Click cancel to clear the entered settings.

Advanced Settings



Advanced Wireless Settings

RTS/CTS Threshold:	2347	bytes (range: 0 ~ 2347, default 2347)
Beacon Interval:	100	milliseconds (range 20 ~ 999, default 100)
DTIM:	1	(range 1 ~ 255, default 1)
Fragment Size:	2346	bytes (range 256 ~ 2346, default 2346)
Short GI:	○ 400ns ● 800ns	
Aggregation:	● Enable ○ Disable	
Aggregated Frames Number:	32	(range 1 ~ 32, default 32)
Maximum Aggregated Size:	50000	(range 2346 ~ 65536, default 50000)
Tx ChainMask:	2 Chain	
Rx ChainMask:	2 Chain	

WiFi Multimedia

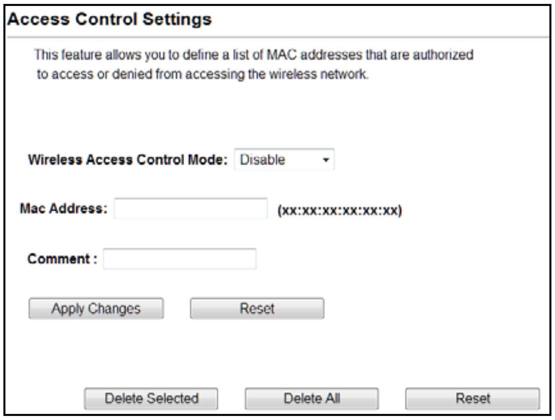
WMM Capable ● Enable ○ Disable

Fields	Description
RTS/CTS Threshold	Determines the packet size of a transmission and, through the use of an AP, helps control traffic flow. The range is 0-2347 bytes.
Beacon Interval	Beacons are the packets sending by Access point to synchronize the wireless network. The beacon interval is the time interval between beacons sending by this unit in AP or AP+WDS operation. The default and recommended beacon interval is 100 milliseconds.
DTIM (Delivery Traffic Indication Map)	This is the Delivery Traffic Indication Map. It is used to alert the clients that multicast and broadcast packets buffered at the AP will be transmitted immediately after the transmission of this beacon frame. You can change the value from 1 to 255. The AP will check the buffered data according to this value. For example, selecting "1" means to check the buffered data at every beacon.
Fragment Size	A large data frame is fragmented into several fragments each of size equal to fragment threshold. By tuning the fragment threshold value, we can get varying fragment sizes.
Short GI (Guard Interval)	A GI is a period of time between symbol transmission that allows reflections (from multipath) from the previous data transmission to settle before transmitting a new symbol. The 802.11n draft specifies two guard intervals: 400ns (short) and 800ns (long). Support of the 400ns GI is optional for transmit and receive. The purpose of a guard interval is to introduce immunity to propagation delays, echoes, and reflections to which digital data is normally very sensitive.

Aggregation	A part of the 802.11n standard that allows sending multiple frames per single access to the medium by combining frames together into one larger frame. It creates the larger frame by combining smaller frames with the same physical source, destination end points, and traffic class (QoS) into one large frame with a common MAC header
Aggregated Frames Number	Determines the number of frames combined in the new larger frame.
Maximum Aggregated Size	Determines the size (in bytes) of the larger frame.
Tx/Rx ChainMask	Displays the number of independent spatial data streams the device is transmitting (TX) and receiving (RX) simultaneously within one spectral channel of bandwidth. Multiple chains increase data transfer performance significantly
WMM Capable	Enable the feature to access or Disable it.
WMM Configuration	Displays the WMM Parameters of station and Access Point
Save Cancel	Save the changed settings Cancel the selected settings.

Access Control

This page allows administrator to have Access Control by entering MAC address of client stations. When this function is Enabled, MAC address can be added into access control list and only those clients whose wireless MAC address are in the access control list will be able to connect or disconnect the internet.



Access Control Settings

This feature allows you to define a list of MAC addresses that are authorized to access or denied from accessing the wireless network.

Wireless Access Control Mode: Disable

Mac Address: (xx:xx:xx:xx:xx:xx)

Comment :

Fields	Description
Wireless Access Control Mode	The Selections are: **Disable:** Disable the wireless ACL feature. **Allow Listed:** When this option is selected, no wireless clients except those whose MAC addresses are in the current access control list will be able to connect to internet. **Deny Listed:** When this option is selected, all wireless clients except those whose MAC addresses are in the current access control list will not be able to connect to internet.
Mac Address	Enter client MAC address and press “Apply Changes” button to add client MAC address into current access control list.
Comment	Make a comment for Wireless access control

Function buttons for the Access Control List:

Apply Changes

Click to add this entry into the Access Control List.

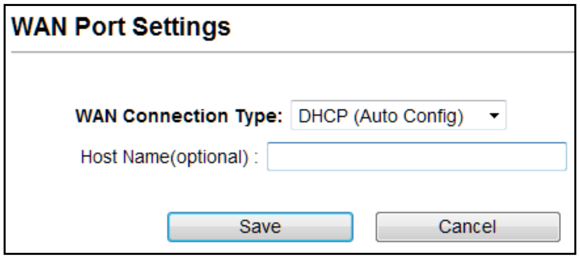
The Access Control List lists the client MAC addresses. Any wireless client with its MAC address listed in this access control list will be able to connect to the device. You can select the entries at the Select column and apply to the following function buttons.

Delete Selected: Delete the selected entries from the list.
Delete All: Flush the list.
Reset: Clear the settings.

WAN Port Settings

There are three options DHCP, Static Mode, PPPoE for Internet connection on WAN port.

- **DHCP (Auto Config)**



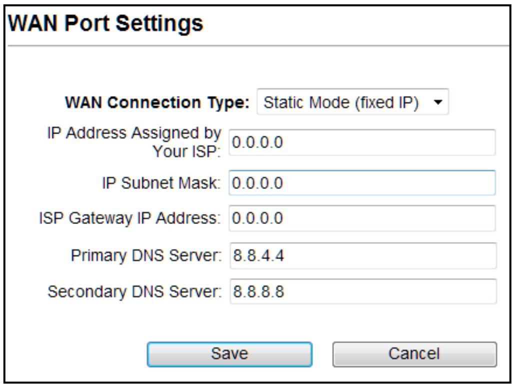
WAN Port Settings

WAN Connection Type: DHCP (Auto Config)

Host Name(optional) :

Fields	Description
WAN Connection Type	Select DHCP from pull down menu
Host Name	Enter the Host Name of DHCP server. The default value is empty.
Save Cancel	Click Save to change the new settings. Click cancel to clear the entered settings.

- **Static Mode (fixed IP)**



WAN Port Settings

WAN Connection Type: Static Mode (fixed IP)

IP Address Assigned by Your ISP: 0.0.0.0

IP Subnet Mask: 0.0.0.0

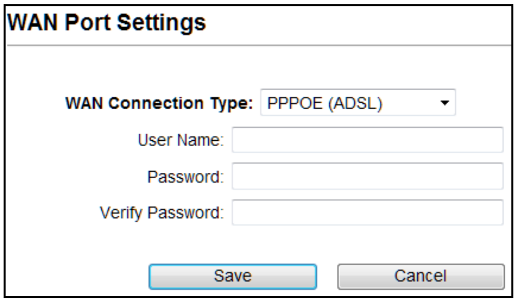
ISP Gateway IP Address: 0.0.0.0

Primary DNS Server: 8.8.4.4

Secondary DNS Server: 8.8.8.8

Fields	Description
WAN Connection Type	Select Static Mode from pull down menu.
IP Address	Enter the IP address.
IP Subnet Mask	Enter the subnet mask for WAN interface.
Gateway IP address	Enter the default gateway for WAN interface outgoing data packets.
Primary DNS Server	Enter the IP address of Domain Name Server 1.
Secondary DNS Server	Enter the IP address of Domain Name Server 2.
Save Cancel	Click Save to change the new settings. Click cancel to clear the entered settings.

- **PPPoE (ADSL)**



WAN Port Settings

WAN Connection Type: PPPOE (ADSL)

User Name:

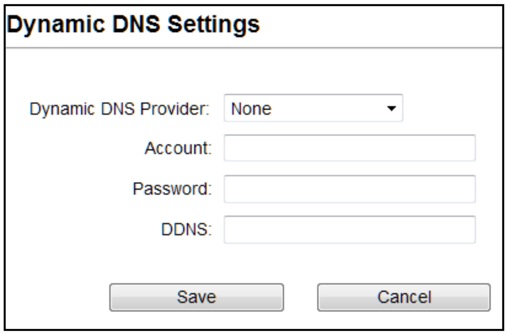
Password:

Verify Password:

Fields	Description
WAN connection Type	Select PPPoE from pull down menu
User Name	If you select the PPPoE support on WAN interface, Enter the user name to login the PPPoE server Provided by ISP
Password	If you select the PPPoE support on WAN interface, Enter the password to login the PPPoE server Provided by ISP
Verify Password	Enter the same password again for verification.
Save: Cancel	Click Save to change the new settings. Click cancel to clear the entered settings.

Dynamic DNS Settings

The Dynamic DNS features allow you to register your device with a DNS server and access your device each time using the same host name



Dynamic DNS Settings

Dynamic DNS Provider: None

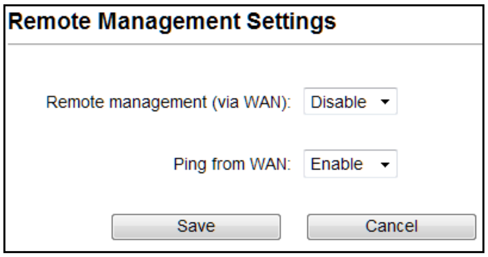
Account:

Password:

DDNS:

Fields	Description
Dynamic DNS Provider	Click the drop down menu to pick up the right DDNS provider you registered.
Account	Enter the account of DDNS you registered.
Password	Password assigned by the DDNS service provider.
DDNS	Enter the domain name that you registered.
Save Cancel	Click Save to change the new settings. Click cancel to clear the entered settings.

Remote Management

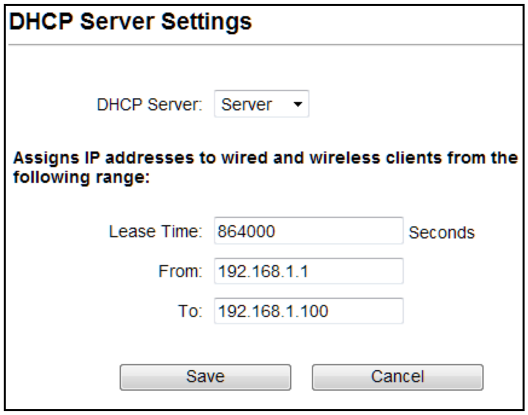

Remote Management Settings

Remote management (via WAN): Disable

Ping from WAN: Enable

Fields	Description
Remote Management	Select Enable or Disable for remote management function.
Ping from WAN	Select Disable or Enable for Ping permit from WAN.
Save Cancel	Click Save to change the new settings. Click cancel to clear the entered settings.

DHCP Server Settings


DHCP Server Settings

DHCP Server: Server

Assigns IP addresses to wired and wireless clients from the following range:

Lease Time: 864000 Seconds

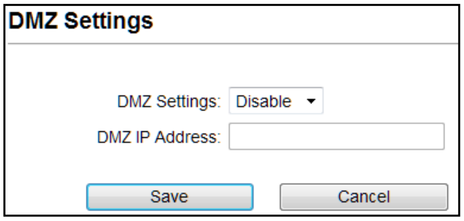
From: 192.168.1.1

To: 192.168.1.100

Fields	Description
DHCP Server	Select Server to access the feature.
Lease Time	The Lease Time is the amount of time that a network user is allowed to maintain a network connection to the device using the current dynamic IP address. At the end of the Lease Time, the lease is either renewed or a new IP is issued by the DHCP server. The amount of time is in units of seconds. The default value is 864000 seconds (1 day). The value –1 stands for the infinite lease.
From	Enter Start Address of the DHCP Client address range.
To	Enter End Address of the DHCP Client address range.
Save Cancel	Click Save to change the new settings. Click cancel to clear the entered settings.

DMZ Settings

You may setup a De-Militarized (DMZ) to separate internal network and internet.



DMZ Settings

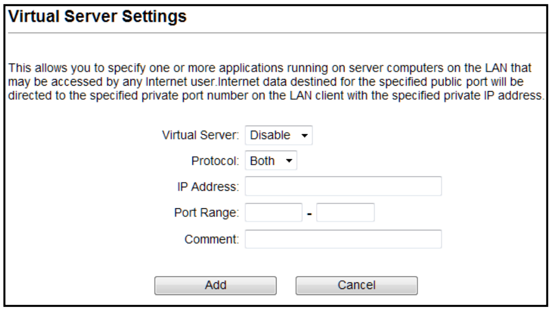
DMZ Settings: Disable

DMZ IP Address:

Fields	Description
DMZ Settings	Enable or Disable the DMZ function.
DMZ IP Address	To support DMZ in your firewall design, Enter IP address of DMZ host that can be access from the WAN interface.
Save Cancel	Click Save to change the new settings. Click cancel to clear the entered settings.

Virtual Server Settings

Virtual server feature allows users to make servers on your LAN accessible to internet users. Normally, Internet users would not be able to access a server on your LAN because of native NAT protection.The "virtual server" feature solves these problems and allows internet users to connect to your servers



Virtual Server Settings

This allows you to specify one or more applications running on server computers on the LAN that may be accessed by any Internet user.Internet data destined for the specified public port will be directed to the specified private port number on the LAN client with the specified private IP address.

Virtual Server: Disable

Protocol: Both

IP Address:

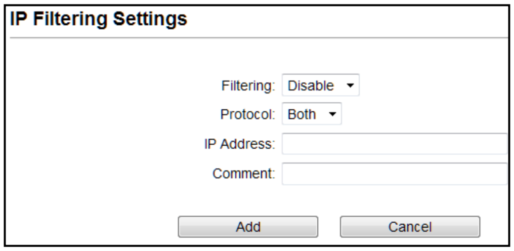
Port Range: -

Comment:

Fields	Description
Virtual Server	Select Enable or Disable the Virtual Server function.
Protocol	There are 3 options, TCP&UDP, TCP or UDP.
IP Address	Enter the IP address to which the data packets can be forwarded from WAN. The IP address should be hosted in LAN behind the NAT firewall.
Port Range	Enter the port range to which data packets can be forwarded.
Comment	Make a comment for the Virtual Server policy.
Add Cancel	Click Add to change the new settings. Click cancel to clear the entered settings.

IP Filtering Settings

The IP filtering feature allows you to deny specific IP address which cannot connect to internet.



IP Filtering Settings

Filtering: Disable

Protocol: Both

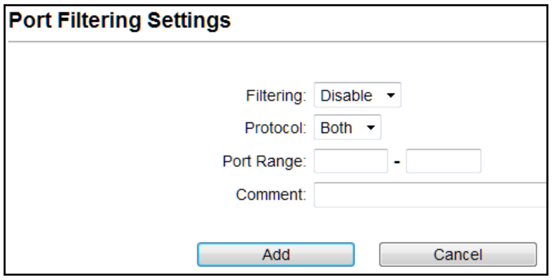
IP Address:

Comment:

Fields	Description
Filtering	Enable/Disable the function to IP Filter
Protocol	Specify protocol, TCP&UDP, TCP or UDP.
IP Address	Enter the specific IP Address to be denied.
Comment	Make a comment for the IP Filtering policy.
Add Cancel	Click Add to change the new settings. Click cancel to clear the entered settings.

Port Filtering Settings

The Port filtering feature allows you to deny specific Ports which cannot connect to internet.



Port Filtering Settings

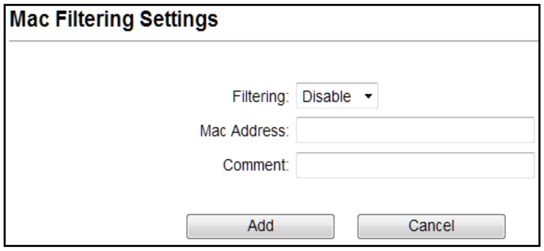
Filtering: Disable

Protocol: Both

Fields	Description
Filtering	Enable/Disable the function to Port Filter
Protocol	Specify the protocol TCP&UDP, TCP or UDP.
Port Range	Enter the specific Port range to be denied.
Comment	Make a comment for the Port Filtering policy.
Add Cancel	Click Add to change the new settings. Click cancel to clear the entered settings.

MAC Filtering Settings

The MAC filtering feature allows you to deny MAC address which cannot connect to internet.



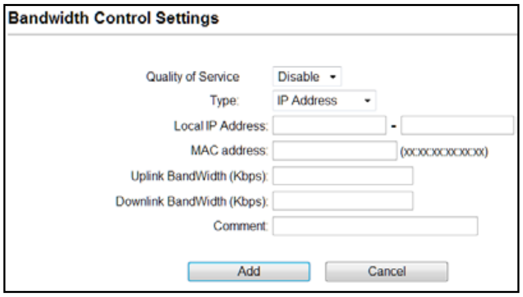
Mac Filtering Settings

Filtering: Disable

Fields	Description
Filtering	Select Enable/Disable the Mac Filtering function.
Mac Address	Enter the specific MAC address to be denied.
Comment	Make a comment for the filtering policy.
Add Cancel	Click Add to change the new settings. Click cancel to clear the entered settings.

Bandwidth Control

Bandwidth controls the transmission speed of IP address and MAC address. Router can use bandwidth control to limit the Internet connection speed of IP address or MAC address.

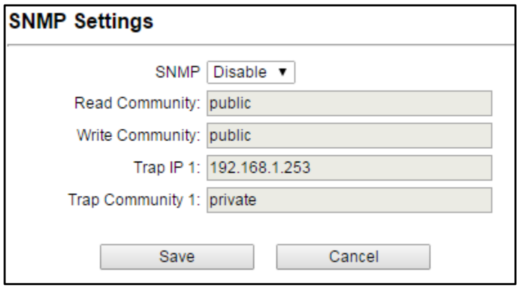


Bandwidth Control Settings

Quality of Service: Disable
Type: IP Address
Local IP Address: -
MAC address: (xx:xx:xx:xx:xx:xx)
Uplink BandWidth (Kbps):
Downlink BandWidth (Kbps):
Comment:

Fields	Description
Quality of Service	Enable/Disable the function
Type	The two type options are IP Address and Mac address
Local IP Address	If you select IP Address, then Enter the IP Address of the device/PC connected to the router.
MAC Address	If you select MAC Address, then Enter the MAC Address of the device/PC connected to the router.
Uplink Bandwidth (Kbps)	Enter the limit for uplink bandwidth
Downlink Bandwidth (Kbps)	Enter the limit for downlink bandwidth
Comment	Make a comment for Bandwidth Control
Add Cancel	Click Add to change the new settings. Click cancel to clear the entered settings.

SNMP Settings



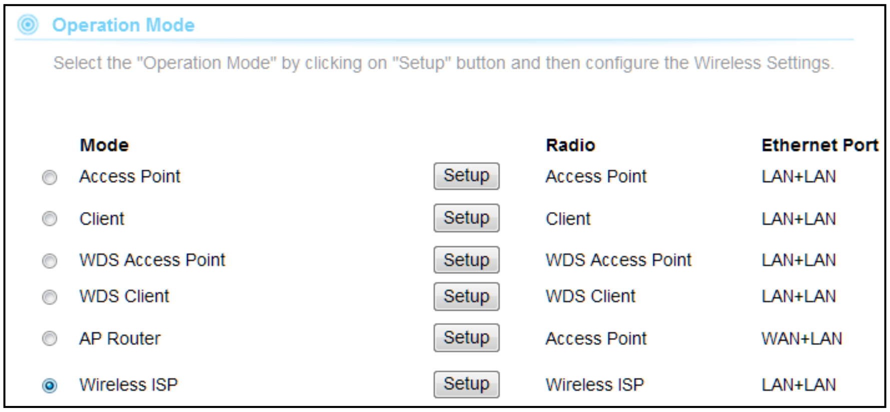
SNMP Settings

SNMP: Disable
Read Community: public
Write Community: public
Trap IP 1: 192.168.1.253
Trap Community 1: private

Fields	Description
SNMP	Enable/Disable the feature to access.
Save Cancel	Click Save to change the new settings. Click cancel to clear the entered settings.

4.1.6 Wireless ISP

A Wireless Internet Service Provider (WISP) is an internet Service Provider with a network based on wireless networking.



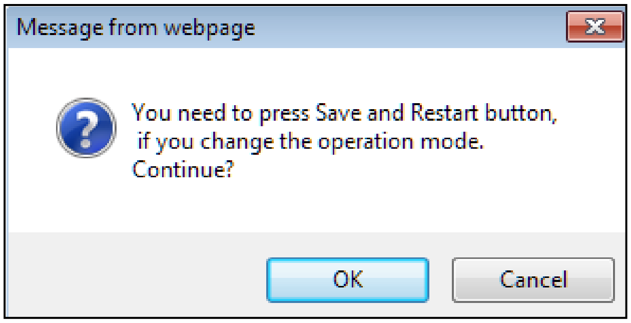
Operation Mode

Select the "Operation Mode" by clicking on "Setup" button and then configure the Wireless Settings.

	Mode		Radio	Ethernet Port
○	Access Point	Setup	Access Point	LAN+LAN
○	Client	Setup	Client	LAN+LAN
○	WDS Access Point	Setup	WDS Access Point	LAN+LAN
○	WDS Client	Setup	WDS Client	LAN+LAN
○	AP Router	Setup	Access Point	WAN+LAN
●	Wireless ISP	Setup	Wireless ISP	LAN+LAN

Note: Depending on the mode you choose, applicable settings will be enabled/ disabled automatically.

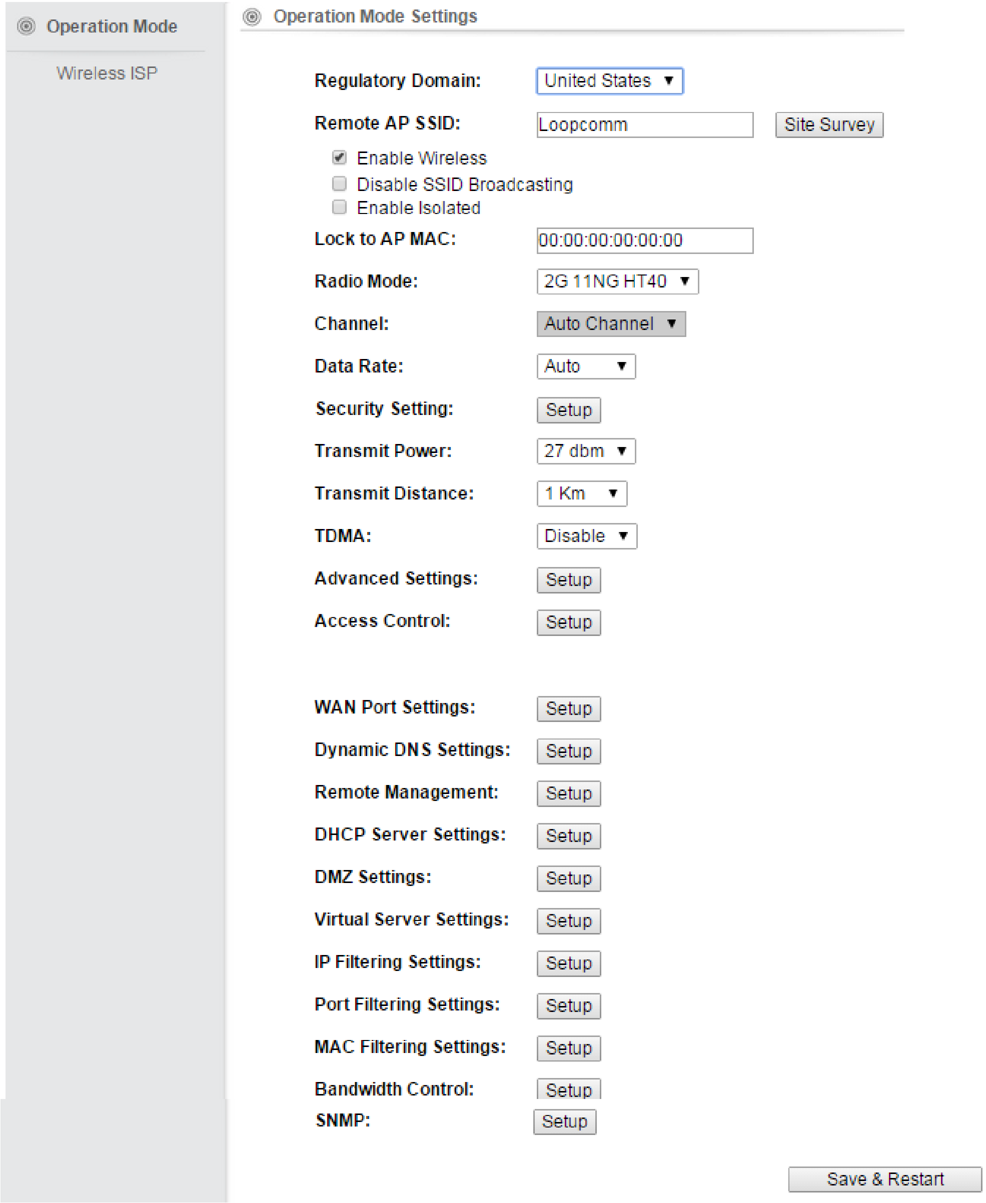
Press setup, then below Screen is displayed.



Message from webpage

You need to press Save and Restart button,
if you change the operation mode.
Continue?

Press OK to continue, then below page is displayed.



Operation Mode

Wireless ISP

Operation Mode Settings

Regulatory Domain:	United States ▼
Remote AP SSID:	Loopcomm Site Survey
☑ Enable Wireless	
☐ Disable SSID Broadcasting	
☐ Enable Isolated	
Lock to AP MAC:	00:00:00:00:00:00
Radio Mode:	2G 11NG HT40 ▼
Channel:	Auto Channel ▼
Data Rate:	Auto ▼
Security Setting:	Setup
Transmit Power:	27 dbm ▼
Transmit Distance:	1 Km ▼
TDMA:	Disable ▼
Advanced Settings:	Setup
Access Control:	Setup
WAN Port Settings:	Setup
Dynamic DNS Settings:	Setup
Remote Management:	Setup
DHCP Server Settings:	Setup
DMZ Settings:	Setup
Virtual Server Settings:	Setup
IP Filtering Settings:	Setup
Port Filtering Settings:	Setup
MAC Filtering Settings:	Setup
Bandwidth Control:	Setup
SNMP:	Setup

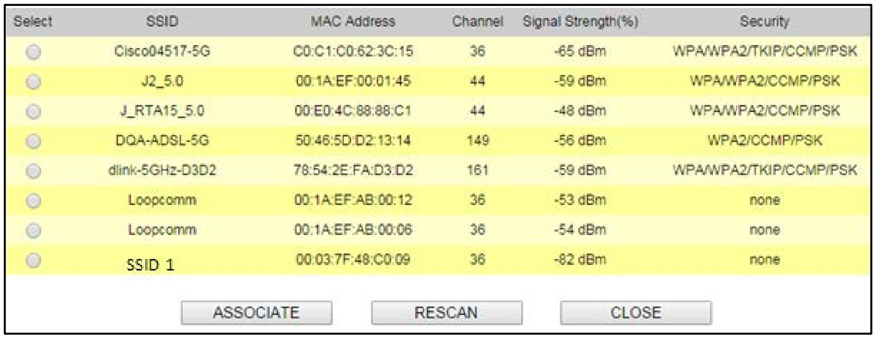
Save & Restart

Fields	Description
Regulatory Domain	Select the country from pull down menu.
Remote AP SSID	Select Site Survey option then it will Scan & displays the SSID List, Choose one SSID from the list.
Enable Wireless Disable SSID Broadcasting Enable Isolated	Enable Wireless Option SSID will be hidden, only users who know the SSID can associate with this network. User cannot Ping.
Radio Mode	Select the Mode of 2G 11NG HT20 or 2G 11NG HT40 “Auto” option selects the mode by itself.
Channel	Select the wireless communication frequency/channel from pull-down menu.

Data Rate	Defines the data rate (in Mbps) at which the device should transmit wireless packets. You can fix a specific data rate between MCS 0 and MCS 7 (or MCS 15 for 2x2 chain devices).
Transmit Power	Defines the maximum average transmit output power (in dBm) of the device. The transmit power level maximum is limited according to country regulations.
Transmit Distance	Changing the distance value will change the ACK (Acknowledgement) timeout value accordingly, so it means the distance should be set as real distance between LP-2396K and other device for accurate transmission performance.
Save and Restart	It saves the new settings and restarts.

Site Survey

You could configure AP Client parameters here.



Select	SSID	MAC Address	Channel	Signal Strength(%)	Security
○	Cisco04517-5G	C0:C1:C0:62:3C:15	36	-65 dBm	WPA/WPA2/TKIP/CCMP/PSK
○	J2_5.0	00:1A:EF:00:01:45	44	-59 dBm	WPA/WPA2/CCMP/PSK
○	J_RTA15_5.0	00:E0:4C:88:88:C1	44	-48 dBm	WPA/WPA2/CCMP/PSK
○	DQA-ADSL-5G	50:46:5D:D2:13:14	149	-56 dBm	WPA2/CCMP/PSK
○	dlink-5GHz-D3D2	78:54:2E:FA:D3:D2	161	-59 dBm	WPA/WPA2/TKIP/CCMP/PSK
○	Loopcomm	00:1A:EF:AB:00:12	36	-53 dBm	none
○	Loopcomm	00:1A:EF:AB:00:06	36	-54 dBm	none
○	SSID 1	00:03:7F:48:C0:09	36	-82 dBm	none

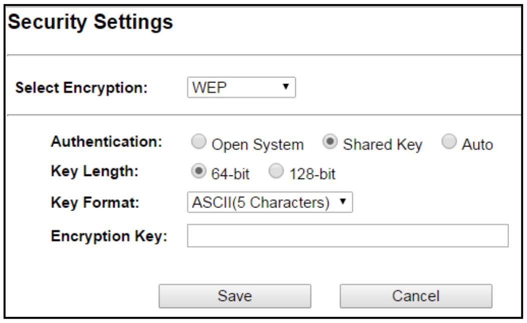
Click **Rescan** to browse more networks then select the SSID and press associate then close the page.

Note: Enter the SSID Password, if necessary.

Security Settings

Security settings allow you to use encryption to secure your data.

There are 4 Encryption Modes in Security Settings. They are WEP, WPA, WPA2, and WPA-Mixed. Functions are same for all Modes, below example is for WEP and WPA Encryption.



Security Settings

Select Encryption: WEP

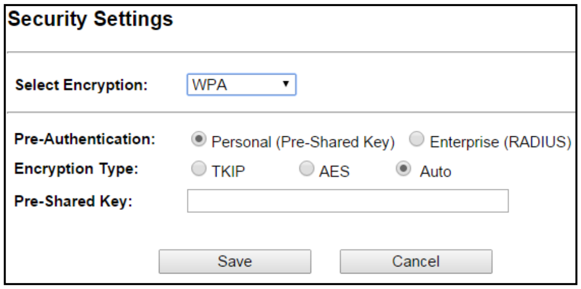
Authentication: ○ Open System ● Shared Key ○ Auto

Key Length: ● 64-bit ○ 128-bit

Key Format: ASCII(5 Characters)

Encryption Key:

Fields	Description
Select Encryption	Select the Encryption Mode from the pull down menu.
Authentication	**Open System:** Open system authentication provides identification for using the wireless adapter's MAC address. Open system authentication is used when no authentication is required. **Shared Key:** It verifies that an authentication-initiating station has knowledge of a shared secret. The 802.11 standard currently assumes that the shared secret is delivered to the participating wireless clients by means of a more secure channel that is independent of IEEE 802.11 **Auto:** Auto is the default authentication algorithm. It will change its authentication type automatically to fulfill client’s requirement.
Key Length	Select the Key length
Key Format	When Key Length is selected as 64-bites then Input ASCII (5 Characters) or Hex (10 Characters) When Key Length is selected as 128-bits then Input ASCII (13 Characters) or Hex (128 Character)
Encryption Key	User can enter the characters based on selected Key Length & Key Format. The format can be passphrase or characters.



Security Settings

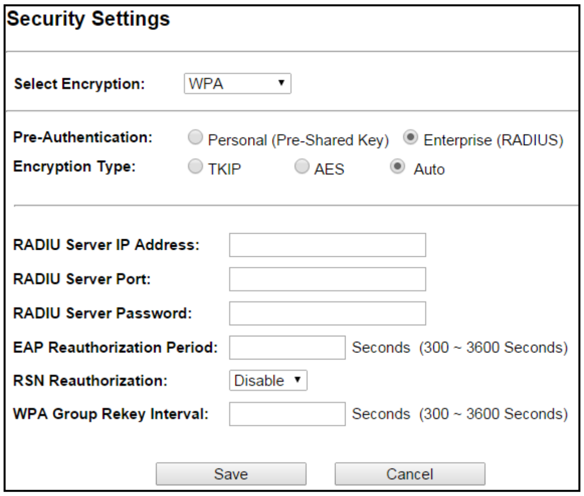
Select Encryption: WPA

Pre-Authentication: ● Personal (Pre-Shared Key) ○ Enterprise (RADIUS)

Encryption Type: ○ TKIP ○ AES ● Auto

Pre-Shared Key:

Fields	Description
Select Encryption	Select the Encryption Mode from the pull down menu.
Pre-Authentication	Select Pre-Authentication as Personal or Enterprise.
Encryption Type	**TKIP:** Temporal Key Integrity Protocol (TKIP) for data Encryption. TKIP utilizes a stronger encryption method and incorporates Message Integrity Code (MIC) to provide protection against hackers. **AES:** Advanced Encryption Standard (AES) for data encryption. AES utilizes a symmetric 128-bit block data encryption. **AUTO:** Auto is the default Encryption Type. It will change automatically to fulfill client’s requirement.
Pre-shared Key	User can enter Maximum number of Key Length. The format can be passphrase or any characters.



Security Settings

Select Encryption: WPA ▾

Pre-Authentication: ○ Personal (Pre-Shared Key) ● Enterprise (RADIUS)

Encryption Type: ○ TKIP ○ AES ● Auto

RADIU Server IP Address:

RADIU Server Port:

RADIU Server Password:

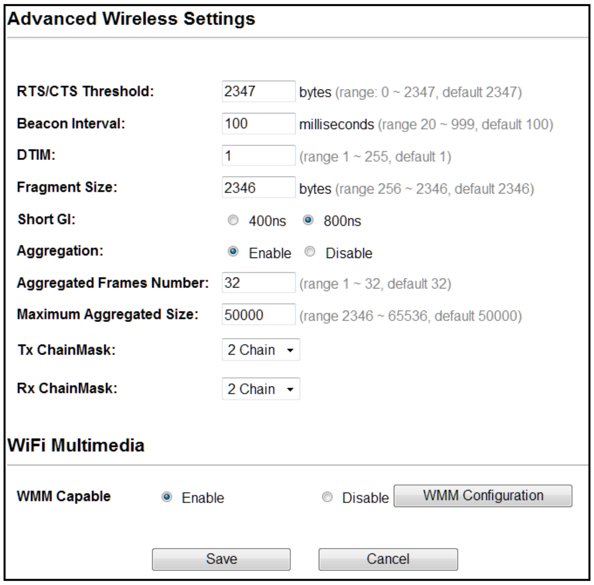
EAP Reauthorization Period: Seconds (300 ~ 3600 Seconds)

RSN Reauthorization: Disable ▾

WPA Group Rekey Interval: Seconds (300 ~ 3600 Seconds)

Fields	Description
RADIU Server IP Address	Enter the RADIU Server's IP Address provided by your ISP.
RADIU Server Port	Enter the RADIUS Server's port number provided by your ISP.
RADIU Server Password	Enter the RADIUS Server's Password provided by your ISP.
EAP Reauthorization Period	EAP- Session timeout interval for 802.1x re-authorization setting. Session timeout interval unit is seconds
RSN Reauthorization	Enable/Disable the function to access.
WPA Group Rekey Interval	A group key is used for multicast/broadcast data, and the re-key interval is time period that the system will change the group key periodically. The shorter the interval is better the security.it varies from 300 to 3600 Seconds.
Save Cancel	Click Save to change the new settings. Click cancel to clear the entered settings.

Advanced Settings



Advanced Wireless Settings

RTS/CTS Threshold:	2347 bytes (range: 0 ~ 2347, default 2347)
Beacon Interval:	100 milliseconds (range 20 ~ 999, default 100)
DTIM:	1 (range 1 ~ 255, default 1)
Fragment Size:	2346 bytes (range 256 ~ 2346, default 2346)
Short GI:	○ 400ns ● 800ns
Aggregation:	● Enable ○ Disable
Aggregated Frames Number:	32 (range 1 ~ 32, default 32)
Maximum Aggregated Size:	50000 (range 2346 ~ 65536, default 50000)
Tx ChainMask:	2 Chain
Rx ChainMask:	2 Chain

WiFi Multimedia

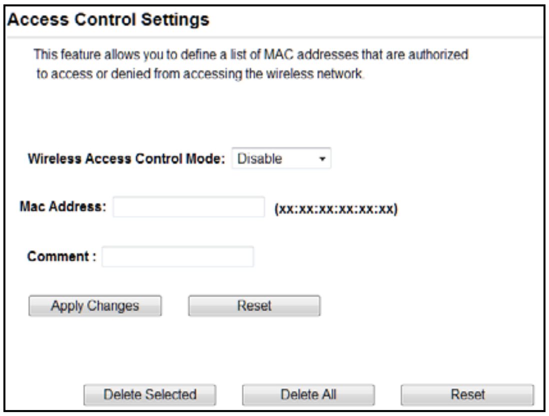
WMM Capable ● Enable ○ Disable

Fields	Description
RTS/CTS Threshold	Determines the packet size of a transmission and, through the use of an AP, helps control traffic flow. The range is 0-2347 bytes.
Beacon Interval	Beacons are the packets sending by Access point to synchronize the wireless network. The beacon interval is the time interval between beacons sending by this unit in AP or AP+WDS operation. The default and recommended beacon interval is 100 milliseconds.
DTIM (Delivery Traffic Indication Map)	This is the Delivery Traffic Indication Map. It is used to alert the clients that multicast and broadcast packets buffered at the AP will be transmitted immediately after the transmission of this beacon frame. You can change the value from 1 to 255. The AP will check the buffered data according to this value. For example, selecting "1" means to check the buffered data at every beacon.
Fragment Size	A large data frame is fragmented into several fragments each of size equal to fragment threshold. By tuning the fragment threshold value, we can get varying fragment sizes.
Short GI (Guard Interval)	A GI is a period of time between symbol transmission that allows reflections (from multipath) from the previous data transmission to settle before transmitting a new symbol. The 802.11n draft specifies two guard intervals: 400ns (short) and 800ns (long). Support of the 400ns GI is optional for transmit and receive. The purpose of a guard interval is to introduce immunity to propagation delays, echoes, and reflections to which digital data is normally very sensitive.
Aggregation	A part of the 802.11n standard that allows sending multiple frames per single access to the medium by combining frames together into one larger frame. It creates the larger frame by combining smaller frames with the same physical source, destination end points, and traffic class (QoS) into one large frame with a common MAC header

Aggregated Frames Number	Determines the number of frames combined in the new larger frame.
Maximum Aggregated Size	Determines the size (in bytes) of the larger frame.
Tx/Rx ChainMask	Displays the number of independent spatial data streams the device is transmitting (TX) and receiving (RX) simultaneously within one spectral channel of bandwidth. Multiple chains increase data transfer performance significantly.
WMM Capable	Enable the feature to access or Disable it.
WMM Configuration	Displays the WMM Parameters of station and Access Point
Save Cancel	Save the changed settings Cancel the selected settings

Access Control

This page allows administrator to have Access Control by entering MAC address of client stations. When this function is Enabled, MAC address can be added into access control list and only those clients whose wireless MAC address are in the access control list will be able to connect or disconnect the internet.



Access Control Settings

This feature allows you to define a list of MAC addresses that are authorized to access or denied from accessing the wireless network

Wireless Access Control Mode: Disable

Mac Address: (xx:xx:xx:xx:xx:xx)

Comment :

Fields	Description
Wireless Access Control Mode	The Selections are: **Disable:** Disable the wireless ACL feature. **Allow Listed:** When this option is selected, no wireless clients except those whose MAC addresses are in the current access control list will be able to connect to internet. **Deny Listed:** When this option is selected, all wireless clients except those whose MAC addresses are in the current access control list will not be able to connect to internet.
Mac Address	Enter client MAC address and press “Apply Changes” button to add client MAC address into current access control list.
Comment	Make a comment for Wireless access control

Function buttons for the Access Control List:

Apply Changes

Click to add this entry into the Access Control List.

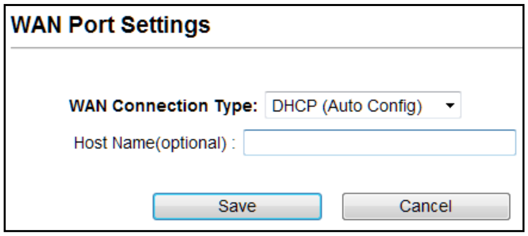
The Access Control List lists the client MAC addresses. Any wireless client with its MAC address listed in this access control list will be able to connect to the device. You can select the entries at the Select column and apply to the following function buttons.

Delete Selected: Delete the selected entries from the list.
Delete All: Flush the list.
Reset: Clear the settings.

WAN Port Settings

There are three options DHCP, Static Mode, PPPOE for Internet connection on WAN port.

- **DHCP (Auto Config)**

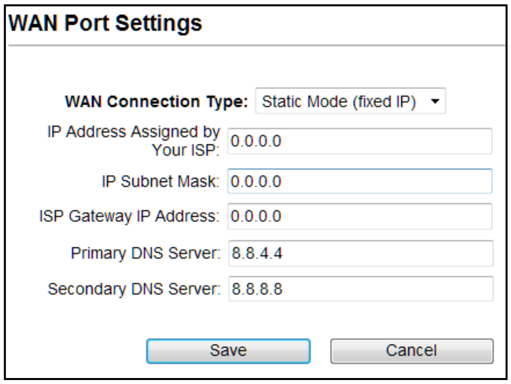

WAN Port Settings

WAN Connection Type: DHCP (Auto Config)

Host Name(optional) :

Fields	Description
WAN Connection Type	Select DHCP from pull down menu
Host Name	Enter the Host Name of DHCP server. The default value is empty.
Save Cancel	Click Save to change the new settings. Click cancel to clear the entered settings.

- **Static Mode (fixed IP)**


WAN Port Settings

WAN Connection Type: Static Mode (fixed IP)

IP Address Assigned by Your ISP: 0.0.0.0

IP Subnet Mask: 0.0.0.0

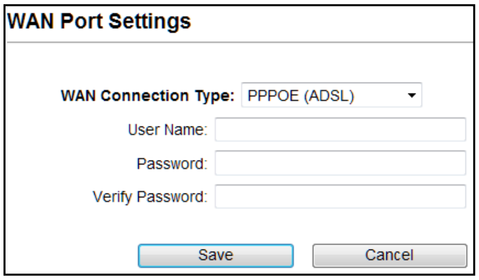
ISP Gateway IP Address: 0.0.0.0

Primary DNS Server: 8.8.4.4

Secondary DNS Server: 8.8.8.8

Fields	Description
WAN Connection Type	Select Static Mode from pull down menu
IP Address	Enter the IP address.
IP Subnet Mask	Enter the subnet mask for WAN interface.
Gateway IP address	Enter the default gateway for WAN interface outgoing data packets.
Primary DNS Server	Enter the IP address of Domain Name Server 1.
Secondary DNS Server	Enter the IP address of Domain Name Server 2.
Save Cancel	Click Save to change the new settings. Click cancel to clear the entered settings.

- **PPPoE (ADSL)**

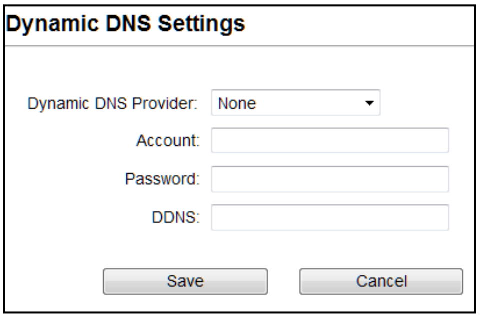


WAN Connection Type: PPPOE (ADSL)

Fields	Description
WAN connection Type	Select PPPoE from pull down menu
User Name	If you select the PPPoE support on WAN interface, Enter the user name to login the PPPoE server provided by ISP.
Password	If you select the PPPoE support on WAN interface, Enter the password to login the PPPoE server provided by ISP.
Verify Password	Enter the same password again for verification.
Save Cancel	Click Save to change the new settings. Click cancel to clear the entered settings.

Dynamic DNS Settings

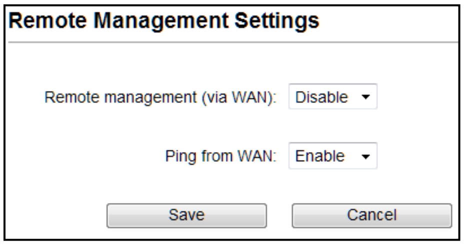
The Dynamic DNS features allow you to register your device with a DNS server and access your device each time using the same host name



Dynamic DNS Provider: None

Fields	Description
Dynamic DNS Provider	Click the drop down menu to pick up the right DDNS provider you registered.
Account	Enter the account of DDNS you registered.
Password	Password assigned by the DDNS service provider.
DDNS	Enter the domain name that you registered.
Save Cancel	Click Save to change the new settings. Click cancel to clear the entered settings.

Remote Management

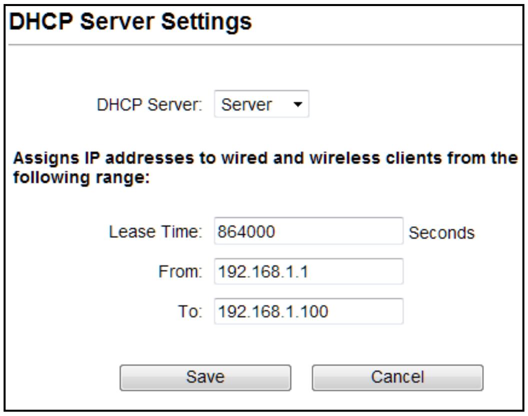

Remote Management Settings

Remote management (via WAN): Disable

Ping from WAN: Enable

Fields	Description
Remote Management	Select Enable or Disable for remote management function.
Ping from WAN	Select Disable or Enable for Ping permit from WAN.
Save Cancel	Click Save to change the new settings. Click cancel to clear the entered settings.

DHCP Server Settings


DHCP Server Settings

DHCP Server: Server

Assigns IP addresses to wired and wireless clients from the following range:

Lease Time: 864000 Seconds

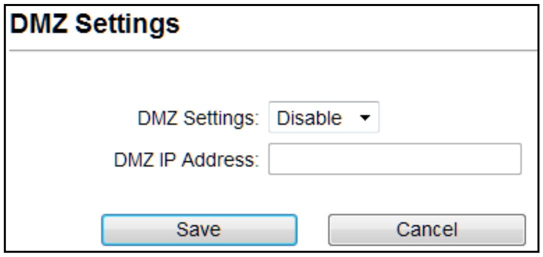
From: 192.168.1.1

To: 192.168.1.100

Fields	Description
DHCP Server	Select Server to access the feature
Lease Time	The Lease Time is the amount of time that a network user is allowed to maintain a network connection to the device using the current dynamic IP address. At the end of the Lease Time, the lease is either renewed or a new IP is issued by the DHCP server. The amount of time is in units of seconds. The default value is 864000 seconds (1 day). The value –1 stands for the infinite lease.
From	Enter Start address of the DHCP Client address range.
To	Enter End address of the DHCP Client address range.
Save Cancel	Click Save to change the new settings. Click cancel to clear the entered settings.

DMZ Settings

You may setup a De-Militarized (DMZ) to separate internal network and internet.



DMZ Settings

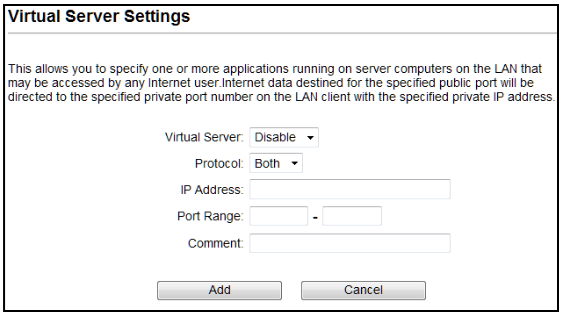
DMZ Settings: Disable

DMZ IP Address:

Fields	Description
DMZ Settings	Enable or Disable the DMZ function.
DMZ IP Address	To support DMZ in your firewall design, Enter IP address of DMZ host that can be access from the WAN interface.
Save Cancel	Click Save to change the new settings. Click cancel to clear the entered settings.

Virtual Server Settings

Virtual server feature allows users to make servers on your LAN accessible to internet users. Normally, Internet users would not be able to access a server on your LAN because of native NAT protection.The “virtual server” feature solves these problems and allows internet users to connect to your servers



Virtual Server Settings

This allows you to specify one or more applications running on server computers on the LAN that may be accessed by any Internet user.Internet data destined for the specified public port will be directed to the specified private port number on the LAN client with the specified private IP address.

Virtual Server: Disable

Protocol: Both

IP Address:

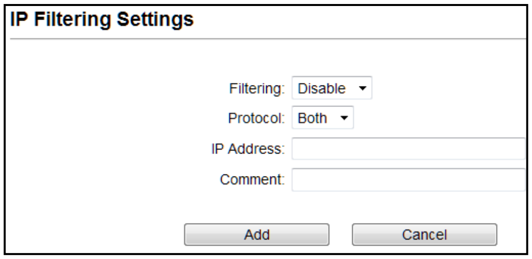
Port Range: -

Comment:

Fields	Description
Virtual Server	Select Enable or Disable the Virtual Server function.
Protocol	There are 3 options, TCP&UDP, TCP or UDP.
IP Address	Enter the IP Address to which the data packets can be forwarded from WAN. This IP address should be hosted in LAN behind the NAT Firewall.
Port Range	Enter the port range to which data packets can be forwarded.
Comment	Make a comment for the Virtual Server policy.
Add Cancel	Click Add to change the new settings. Click cancel to clear the entered settings.

IP Filtering Settings

The IP filtering feature allows you to deny specific IP address which cannot connect to internet.



IP Filtering Settings

Filtering: Disable

Protocol: Both

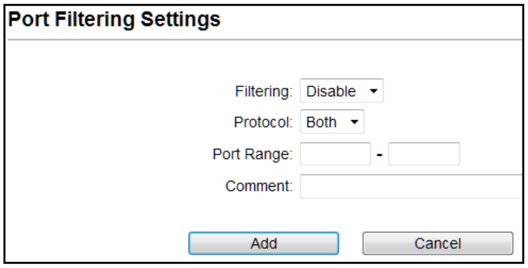
IP Address:

Comment:

Fields	Description
Filtering	Enable/Disable the function to IP Filter
Protocol	Specify protocol, TCP&UDP, TCP or UDP.
IP Address	Enter the specific IP Address to be denied.
Comment	Make a comment for the IP Filtering policy.
Add Cancel	Click Add to change the new settings. Click cancel to clear the entered settings.

Port Filtering Settings

The Port filtering feature allows you to deny specific Ports which cannot connect to internet.



Port Filtering Settings

Filtering: Disable

Protocol: Both

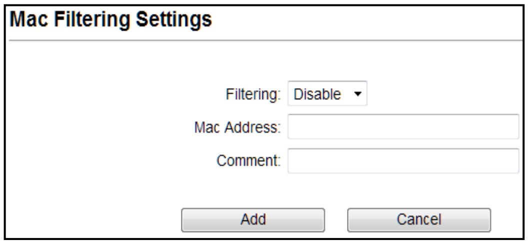
Port Range: -

Comment:

Fields	Description
Filtering	Enable/Disable the function to Port Filter
Protocol	Specify the protocol TCP&UDP, TCP or UDP.
Port Range	Enter the specific Port range to be denied.
Comment	Make a comment for the Port Filtering policy.
Add Cancel	Click Add to change the new settings. Click cancel to clear the entered settings.

MAC Filtering Settings

The MAC filtering feature allows you to deny MAC address which cannot connect to internet



Mac Filtering Settings

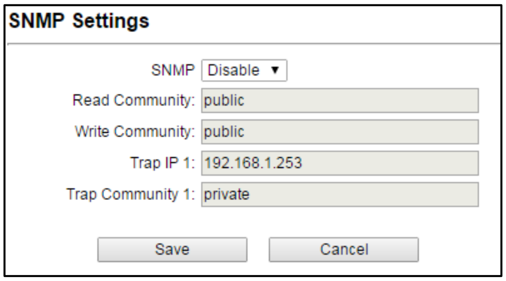
Filtering: Disable

Mac Address:

Comment:

Fields	Description
Filtering	Select Enable or Disable the Mac Filtering function.
Mac Address	Enter the specific MAC address to be denied.
Comment	Make a comment for the filtering policy.
Add Cancel	Click Add to change the new settings. Click cancel to clear the entered settings.

SNMP Settings



SNMP Settings

SNMP Disable

Read Community: public

Write Community: public

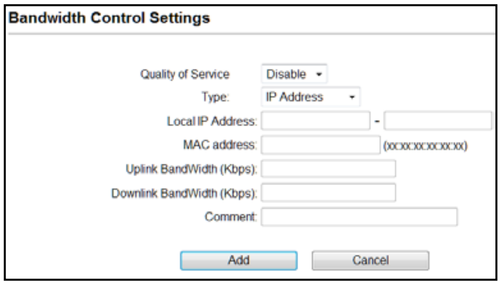
Trap IP 1: 192.168.1.253

Trap Community 1: private

Fields	Description
SNMP	Enable/Disable the feature to access.
Save Cancel	Click Save to change the new settings. Click cancel to clear the entered settings.

Bandwidth Control

Bandwidth controls the transmission speed of IP address and MAC address. Router can use bandwidth control to limit the Internet connection speed of IP address or MAC address.



Bandwidth Control Settings

Quality of Service: Disable

Type: IP Address

Local IP Address: -

MAC address: (xx:xx:xx:xx:xx:xx)

Uplink BandWidth (Kbps):

Downlink BandWidth (Kbps):

Comment:

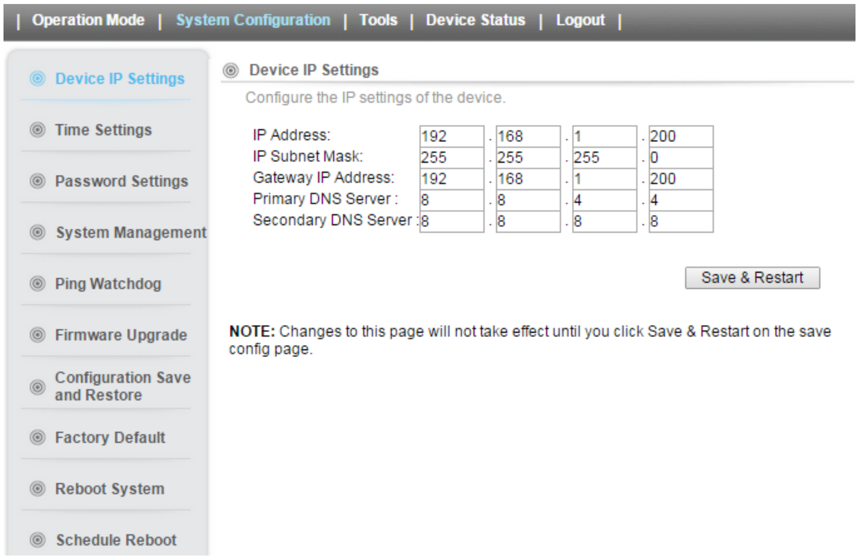
Fields	Description
Quality of Service	Enable/Disable the function
Type	The two type options are IP Address and Mac address
Local IP Address	If you select IP Address, then Enter the IP Address of the device/PC connected to the router.
MAC Address	If you select MAC Address, then Enter the MAC Address of the device/PC connected to the router.
Uplink Bandwidth (Kbps)	Enter the limit for uplink bandwidth
Downlink Bandwidth (Kbps)	Enter the limit for downlink bandwidth
Comment	Make a comment for Bandwidth Control
Add Cancel	Click Add to change the new settings. Click cancel to clear the entered settings.

4.2 System Configuration

Select the System Configuration menu from the top of your screen to access IP. The system configuration includes Device IP Settings, Time Settings, Password Settings, System Management, Ping Watchdog, Firmware Upgrade, Configuration Save and Restore, Factory Default, Reboot System.

4.2.1 Device IP Settings

All settings besides Wireless and WAN functions are in this category.



Device IP Settings

Configure the IP settings of the device.

IP Address:	192	168	1	200
IP Subnet Mask:	255	255	255	0
Gateway IP Address:	192	168	1	200
Primary DNS Server :	8	8	4	4
Secondary DNS Server :	8	8	8	8

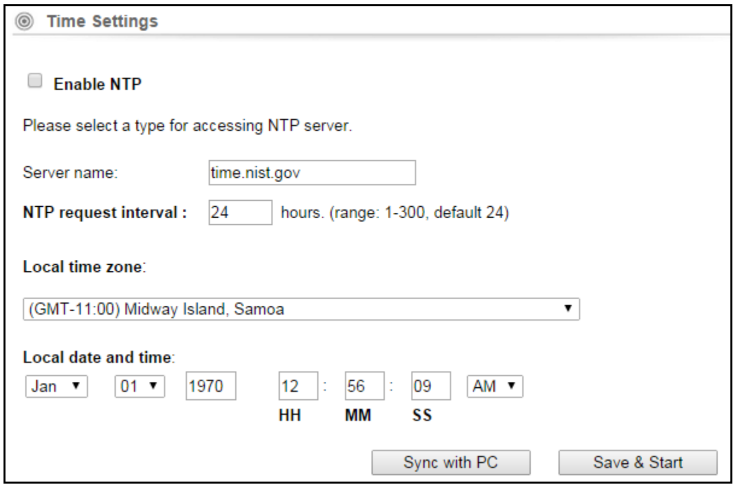
NOTE: Changes to this page will not take effect until you click Save & Restart on the save config page.

Fields	Description
IP Address	Enter the IP Address for the Device.
IP Subnet Mask	Enter the Subnet Mask as 255.255.0.0
Gateway IP Address	Enter the Gateway IP Address for the Device.
DNS Server Primary DNS Server Secondary DNS Server	The Domain Name System (DNS) is a server on the Internet that translates logical names such as “www.yahoo.com” to IP addresses like 66.218.71.80. In order to do this, a query is made by the requesting device to a DNS server to provide the necessary information. If your system administrator requires you to manually enter the DNS Server addresses, you should enter them here. Enter the Primary DNS Server Enter the Secondary DNS Server
Save & Restart	It saves the settings and restarts.

4.2.2 Time Settings

System Configuration ->Time Settings

It synchronizes the date & time of PC to device. Enable NTP (Network time protocol) for clock synchronization to device. If NTP is not enabled then user must enter the date and time manually.



Time Settings

□ Enable NTP

Please select a type for accessing NTP server.

Server name: time.nist.gov

NTP request interval : 24 hours. (range: 1-300, default 24)

Local time zone:

(GMT-11:00) Midway Island, Samoa

Local date and time:

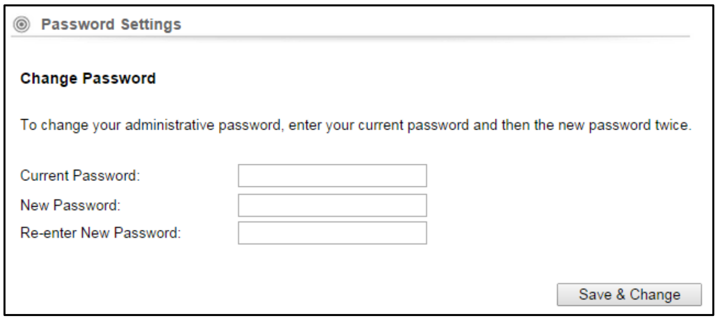
Jan 01 1970 12 : 56 : 09 AM

HH MM SS

Fields	Description
Enable NTP	Enable NTP so that time & date will be updated correctly even after reboot.
Server Name	Enter the NTP server Name
NTP request interval	NTP updating time interval. By default its 24.
Local Time Zone	Select the Time zone of your country from pull-down menu.
Local date and time	Enter the month, date, year, hours, Minutes and seconds, AM/PM Manually to set date and time.
Sync with PC	It Synchronizes the new settings of date and time to your computer.
Save & Start	It Saves the settings and starts.

4.2.3 Password Settings

This settings helps to change password to restrict from unauthorized access.
To change password, please go to “System Configuration” -> “Password Settings” menu.



Password Settings

Change Password

To change your administrative password, enter your current password and then the new password twice.

Current Password:

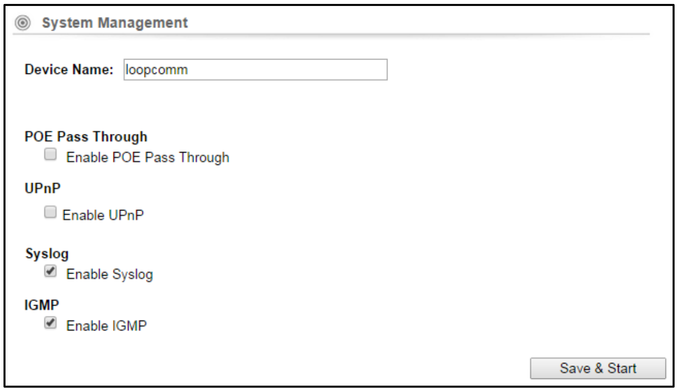
New Password:

Re-enter New Password:

Fields	Description
Current Password	Enter the password of the device.
New Password	Enter your new password to which you want to change.
Re-enter New Password	For confirmation, enter the new password again.
Save & Change	It saves and changes to New Password.

4.2.4 System Management

System Configuration -> System Management
In this page, administrator can change the management parameters and disable/enable management interface.



System Management

Device Name: loopcomm

POE Pass Through
□ Enable POE Pass Through

UPnP
□ Enable UPnP

Syslog
☑ Enable Syslog

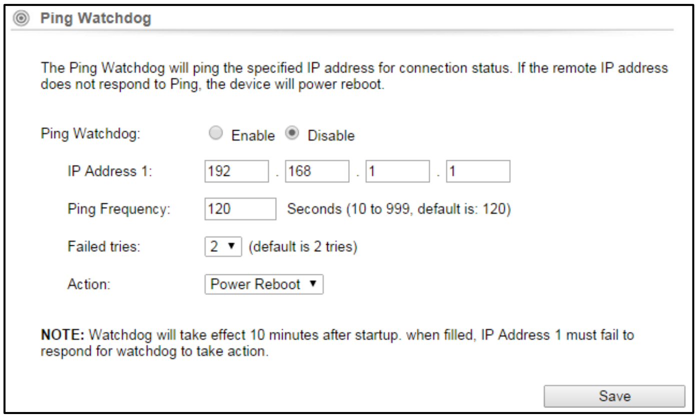
IGMP
☑ Enable IGMP

Fields	Description
Device Name	Enter the Device Name
POE Pass Through	It allows Secondary Ethernet port to provide 24V power for a secondary device when it’s enabled.
UPnP	Administrator can enable or disable the UPnP function
Syslog	This option enables the registration routine of system log (syslog) messages.
IGMP	Internet Group Management Protocol. Enable/disable the IGMP function for the multiple bridged ports.
Save & Start	It saves the settings and starts.

4.2.5 Ping Watchdog

System Configuration -> Ping Watchdog

This menu allows to configure system to reboot on kernel panic, when an IP address does not respond, or in case the system has locked up. Software watchdog timer is used to provide the last option, so in very rare cases (caused by hardware malfunction) it can lock up by itself. There is a hardware watchdog device available in all Router BOARD PowerPC which can reboot the system in any case.



Ping Watchdog

The Ping Watchdog will ping the specified IP address for connection status. If the remote IP address does not respond to Ping, the device will power reboot.

Ping Watchdog: ○ Enable ● Disable

IP Address 1: 192 . 168 . 1 . 1

Ping Frequency: 120 Seconds (10 to 999, default is: 120)

Failed tries: 2 ▾ (default is 2 tries)

Action: Power Reboot ▾

NOTE: Watchdog will take effect 10 minutes after startup. when filled, IP Address 1 must fail to respond for watchdog to take action.

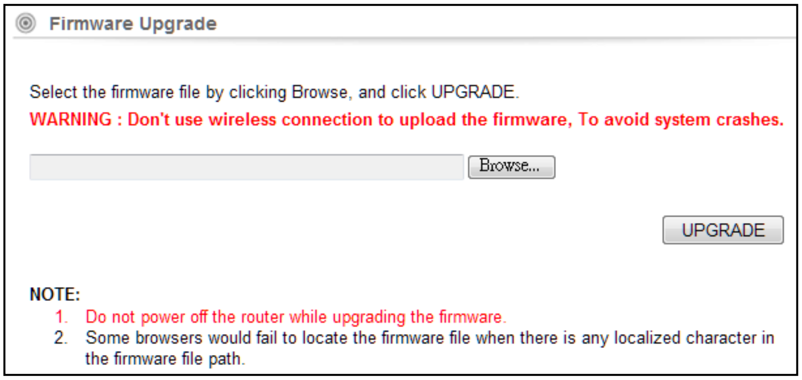
Fields	Description
Ping Watchdog	Enable/Disable the function to access
IP Address 1	Enter the IP address to be pinged.
Ping Frequency	Set the number of seconds to be Pinged.
Failed Tries	Enter the number of permitted times for the ping to be failed before power reboot. For example "2" means the CPE will reconnect if the PING doesn't respond for 120Seconds.
Action	If the remote IP address does not respond to Ping the device will power reboot.
Save	It saves the changed settings.

When you set the Ping Frequency to every "120" seconds and Fail Tries to "2". It means the User will ping every 120 seconds, after the second failure, it will reconnect.

4.2.6 Firmware Upgrade

System Configuration -> Firmware Upgrade

Upgrade the device firmware to obtain new functionality. It takes about 1minute to upload new version. Click the Browse button to select the path and filename for the firmware, and then click the UPGRADE button to upgrade firmware.



Firmware Upgrade

Select the firmware file by clicking Browse, and click UPGRADE.

WARNING : Don't use wireless connection to upload the firmware, To avoid system crashes.

NOTE:

1. Do not power off the router while upgrading the firmware.
2. Some browsers would fail to locate the firmware file when there is any localized character in the firmware file path.

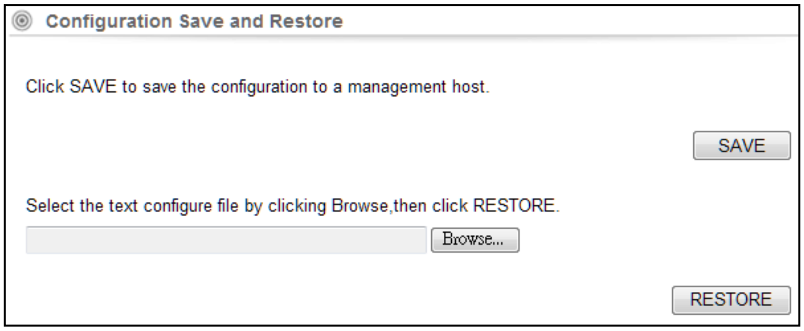
Note: Please do not off the power or remove the Ethernet cable connected to LP-2396K when firmware upgrade is in process. Otherwise, it will probably cause system crash.

Caution! A corrupted file will hang up the System

4.2.7 Save and Restore

System Configuration -> Configuration Save and Restore

You can save system configuration settings to a file, and later download it back to the LP-2396K by following the steps.



Configuration Save and Restore

Click SAVE to save the configuration to a management host.

Select the text configure file by clicking Browse,then click RESTORE.

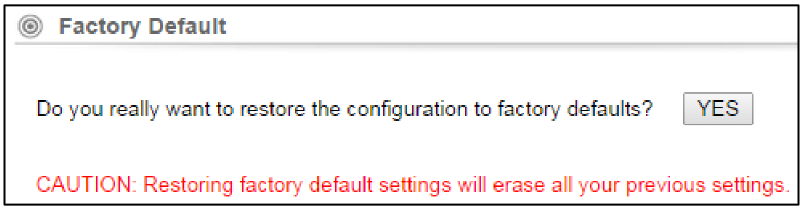
Save: Press Save button to save the current configuration settings of the device to the Management Host or click the *Browse* button to locate the configuration file,

Restore: click the RESTORE button to restore the system configuration from the specified file.

4.2.8 Factory Default

System Configuration -> Factory Default

This Feature is used to reset the current configuration setting to the factory default configuration settings.



Factory Default

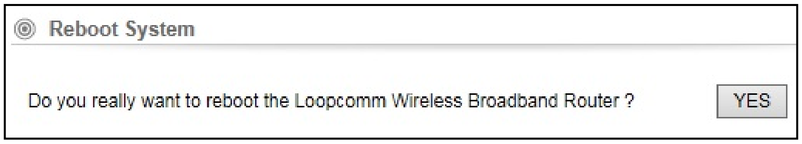
Do you really want to restore the configuration to factory defaults?

CAUTION: Restoring factory default settings will erase all your previous settings.

Click YES to go ahead and restore the configuration to the factory default.

4.2.9 Reboot

Whenever you use the Web configuration to change system settings, the changes are initially placed in temporary storage. These changes will be lost if the device is reset or turn off.

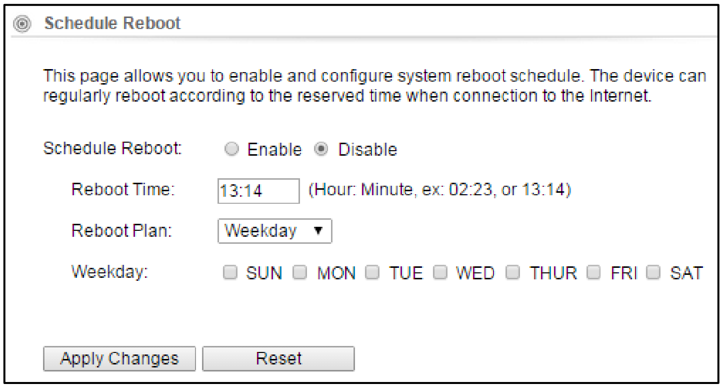


Reboot System

Do you really want to reboot the Loopcomm Wireless Broadband Router ?

IMPORTANT! Do not turn off or press the Reset button while this procedure is in progress.

4.2.10 Schedule Reboot



Schedule Reboot

This page allows you to enable and configure system reboot schedule. The device can regularly reboot according to the reserved time when connection to the Internet.

Schedule Reboot: ○ Enable ● Disable

Reboot Time: 13:14 (Hour: Minute, ex: 02:23, or 13:14)

Reboot Plan: Weekday ▼

Weekday: □ SUN □ MON □ TUE □ WED □ THUR □ FRI □ SAT

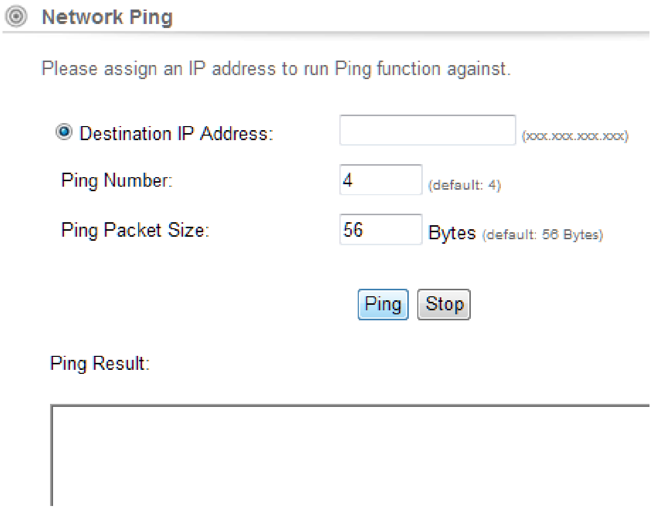
Fields	Description
Schedule Reboot	Enable/Disable the feature to access
Reboot Time	Enter the Time to reboot
Reboot Plan	Select the option weekday or every day to reboot
Weekday	Select the number of days to reboot
Apply changes Reset	Click it to save the changed settings Click it to erase the saved settings.

4.3 Tools

There are two features in Tools they are Network Ping & Network Traceroute

4.3.1 Network Ping

Network Ping is used to provide a basic connectivity test between the requesting host and a destination host. This is done by using the Internet Control Message Protocol (ICMP) which has the ability to send an echo packet to a destination host and a mechanism to listen for a response from this host. Simply stated, if the requesting host receives a response from the destination host, this host is reachable. Network Ping is commonly used to provide a basic picture of where a specific networking problem may exist. For example, if an Internet connection is down at an office, the ping utility can be used to figure out whether the problem exists within the office or within the network of the Internet provider.



Network Ping

Please assign an IP address to run Ping function against.

● Destination IP Address: (xxx.xxx.xxx.xxx)

Ping Number: 4 (default: 4)

Ping Packet Size: 56 Bytes (default: 56 Bytes)

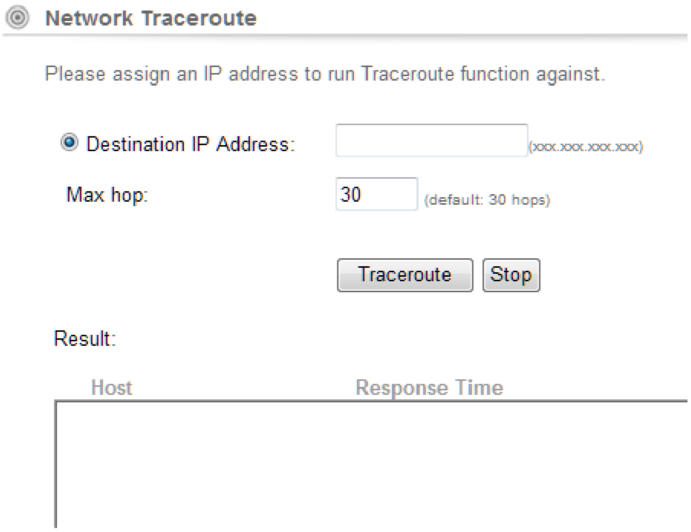
Ping Result:

Fields	Description
Destination IP Address	Enter the IP address to be Pinged.
Ping Number	Number of times to be pinged.
Ping Pack Size	Ping Data packet size.
Ping Result	It displays the result

Ping: Click it to start to ping.
Stop: Stop the ping.

4.3.2 Network Traceroute

Once the Network Ping has been used to determine basic connectivity, the Network traceroute can used to determine more specific information about the path to the destination host including the route the packet takes and the response time of these intermediate hosts. If you execute the Traceroute command on a source device, it sends IP packets toward the destination with Time To Live (TTL) values that increment up to the maximum specified hop count. This is 30 by default on most systems.



Network Traceroute

Please assign an IP address to run Traceroute function against.

● Destination IP Address: (xxx.xxx.xxx.xxx)

Max hop: 30 (default: 30 hops)

Result:

Host	Response Time

Fields	Description
Destination IP Address	Enter the IP address to which you like to know the trace route.
Max Hop	Maximum number of routes.
Result	It displays the result

Traceroute: Click it to trace the route.
Stop: Stop the Traceroute.

4.4 Device Status

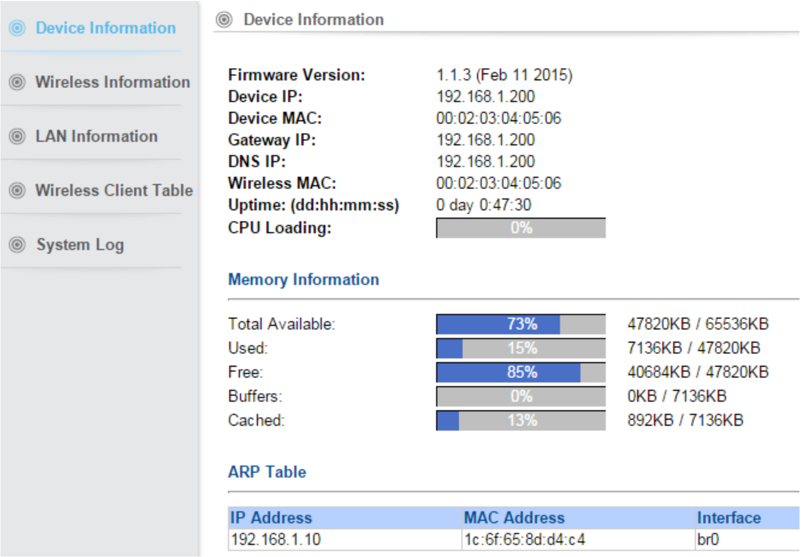
Click on the “Device Status” on the top menu bar,

It is used to monitor the status of the device. It provides information on device status, wireless information, LAN Information, wireless client table and system log.

4.4.1 Device Information

Device Status → Device Information

It presents the status of LP-2396K Firmware devices, memory utilization and ARP Table.



Device Information

Firmware Version:	1.1.3 (Feb 11 2015)
Device IP:	192.168.1.200
Device MAC:	00:02:03:04:05:06
Gateway IP:	192.168.1.200
DNS IP:	192.168.1.200
Wireless MAC:	00:02:03:04:05:06
Uptime: (dd:hh:mm:ss)	0 day 0:47:30
CPU Loading:	0%

Memory Information

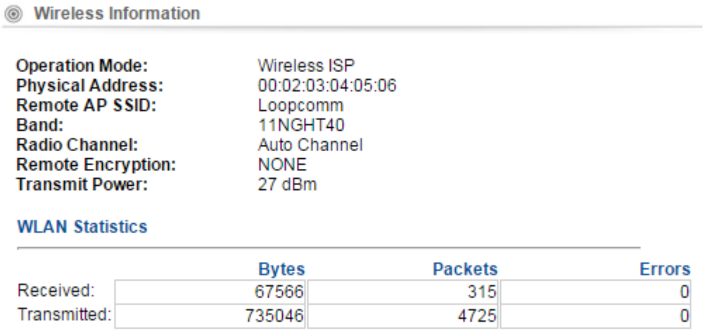
Total Available:	73%	47820KB / 65536KB
Used:	15%	7136KB / 47820KB
Free:	85%	40684KB / 47820KB
Buffers:	0%	0KB / 7136KB
Cached:	13%	892KB / 7136KB

ARP Table

IP Address	MAC Address	Interface
192.168.1.10	1c:6f:65:8d:d4:c4	br0

4.4.2 Wireless Information

This page shows the wireless information of LP-2396K device, such as current operation mode, wireless traffic, error packets, device SSID, Band, channel, and encryption used, Transmit Power.



Wireless Information

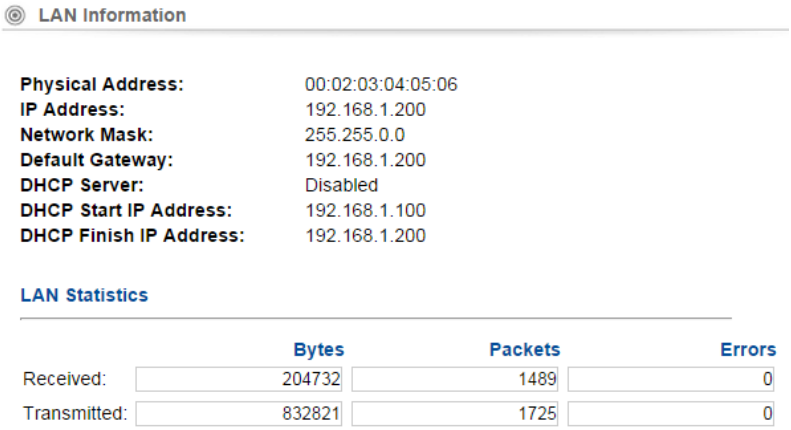
Operation Mode:	Wireless ISP
Physical Address:	00:02:03:04:05:06
Remote AP SSID:	Loopcomm
Band:	11NGHT40
Radio Channel:	Auto Channel
Remote Encryption:	NONE
Transmit Power:	27 dBm

WLAN Statistics

	Bytes	Packets	Errors
Received:	67566	315	0
Transmitted:	735046	4725	0

4.4.3 LAN Information

This page shows the LAN information of LP-2396K device, such as Physical Address, IP Address, Network Mask, Default Gateway and DHCP details.



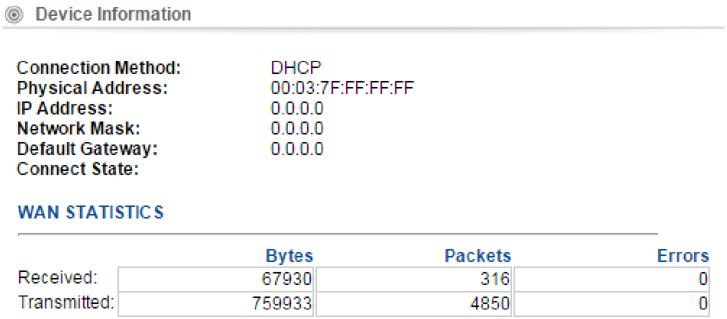
LAN Information

Physical Address:	00:02:03:04:05:06
IP Address:	192.168.1.200
Network Mask:	255.255.0.0
Default Gateway:	192.168.1.200
DHCP Server:	Disabled
DHCP Start IP Address:	192.168.1.100
DHCP Finish IP Address:	192.168.1.200

LAN Statistics

	Bytes	Packets	Errors
Received:	204732	1489	0
Transmitted:	832821	1725	0

4.4.4 Internet Information



Device Information

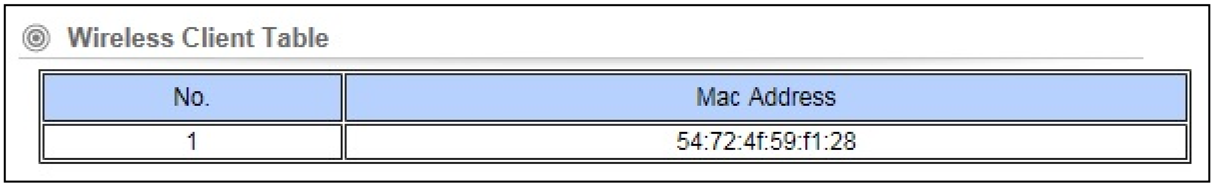
Connection Method: DHCP
Physical Address: 00:03:7F:FF:FF:FF
IP Address: 0.0.0.0
Network Mask: 0.0.0.0
Default Gateway: 0.0.0.0
Connect State:

WAN STATISTICS

	Bytes	Packets	Errors
Received:	67930	316	0
Transmitted:	759933	4850	0

4.4.5 Wireless Client Table

This feature displays the currently connected MAC address of Wi-Fi clients

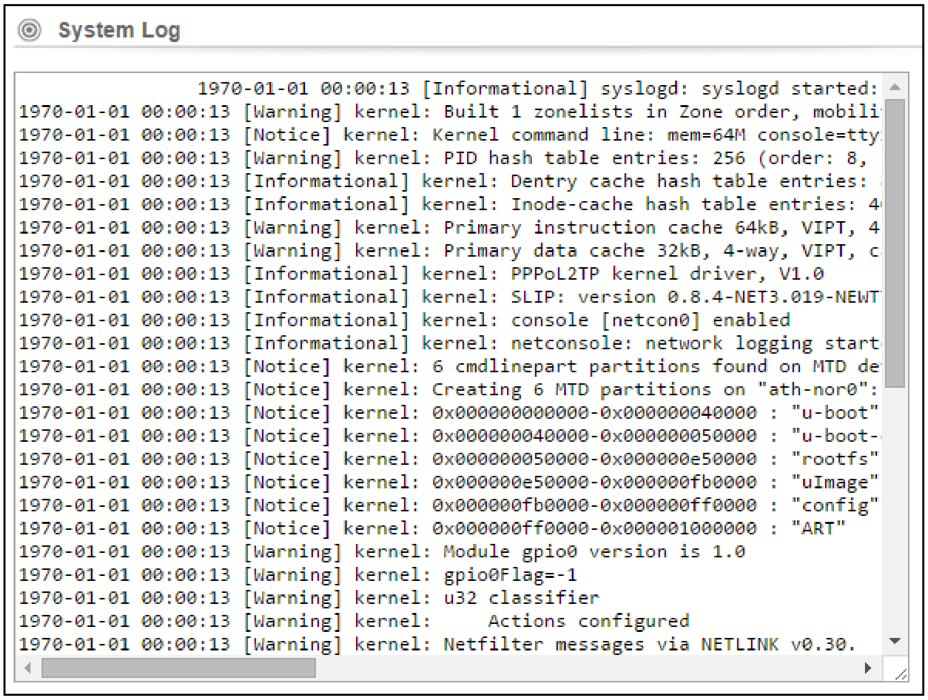


Wireless Client Table

No.	Mac Address
1	54:72:4f:59:f1:28

4.4.6 System LOG

This page is used to view system logs. The System Log displays the system activities, login, and system error report.



```
               1970-01-01 00:00:13 [Informational] syslogd: syslogd started:
1970-01-01 00:00:13 [Warning] kernel: Built 1 zonelists in Zone order, mobili
1970-01-01 00:00:13 [Notice] kernel: Kernel command line: mem=64M console=tty
1970-01-01 00:00:13 [Warning] kernel: PID hash table entries: 256 (order: 8,
1970-01-01 00:00:13 [Informational] kernel: Dentry cache hash table entries:
1970-01-01 00:00:13 [Informational] kernel: Inode-cache hash table entries: 4
1970-01-01 00:00:13 [Warning] kernel: Primary instruction cache 64kB, VIPT, 4
1970-01-01 00:00:13 [Warning] kernel: Primary data cache 32kB, 4-way, VIPT, c
1970-01-01 00:00:13 [Informational] kernel: PPPoL2TP kernel driver, V1.0
1970-01-01 00:00:13 [Informational] kernel: SLIP: version 0.8.4-NET3.019-NEWT
1970-01-01 00:00:13 [Informational] kernel: console [netcon0] enabled
1970-01-01 00:00:13 [Informational] kernel: netconsole: network logging start
1970-01-01 00:00:13 [Notice] kernel: 6 cmdlinepart partitions found on MTD de
1970-01-01 00:00:13 [Notice] kernel: Creating 6 MTD partitions on "ath-nor0":
1970-01-01 00:00:13 [Notice] kernel: 0x000000000000-0x000000040000 : "u-boot"
1970-01-01 00:00:13 [Notice] kernel: 0x000000040000-0x000000050000 : "u-boot-
1970-01-01 00:00:13 [Notice] kernel: 0x000000050000-0x000000e50000 : "rootfs"
1970-01-01 00:00:13 [Notice] kernel: 0x000000e50000-0x000000fb0000 : "uImage"
1970-01-01 00:00:13 [Notice] kernel: 0x000000fb0000-0x000000ff0000 : "config"
1970-01-01 00:00:13 [Notice] kernel: 0x000000ff0000-0x000001000000 : "ART"
1970-01-01 00:00:13 [Warning] kernel: Module gpio0 version is 1.0
1970-01-01 00:00:13 [Warning] kernel: gpio0Flag=-1
1970-01-01 00:00:13 [Warning] kernel: u32 classifier
1970-01-01 00:00:13 [Warning] kernel:     Actions configured
1970-01-01 00:00:13 [Warning] kernel: Netfilter messages via NETLINK v0.30.
```

4.5 LOGOUT

Please make sure to Logout after you finish all settings.

5.Compliance

Federal Communication Commission Interference Statement

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. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be 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 receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

RF Radiation Exposure and Hazard Statement:

To ensure compliance with FCC RF exposure requirements, this device must be installed in a location such that the antenna of the device will be greater than 0.25m away from all persons. Using higher gain antennas and types of antennas not covered under the FCC certification of this product is not allowed. Installers of the radio and end users of the product must adhere to the installation instructions provided in this manual. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Non-modification Statement:

Use only the integral antenna supplied by the manufacturer when operating this device. Unauthorized antennas, modifications, or attachments could damage the TI Navigator access point and violate FCC regulations. Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.