WMC252-1W-1T-300
User Manual

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Trademarks and patents

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Manufacturer

Interlogix
3211 Progress Drive, Lincolnton, NC 28092 USA

Authorized EU manufacturing representative:
UTC Climate Controls & Security B.V.,
Kelvinstraat 7, 6003 DH Weert, Netherlands

Intended use

Use this product only for the purpose it was designed for; refer to the data sheet and user documentation for details. For the latest product information, contact your local supplier or visit us online at www.interlogix.com.

Certification

ACMA compliance

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

European Union directives

2004/108/EC (EMC Directive): Hereby, UTC Building & Industrial Systems, Inc. declares that this device is in compliance with the essential requirements and other relevant provisions of Directive 2004/108/EC.

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 when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense. Any changes or modifications not expressly approved by UTC could void the user's authority to operate this equipment under the rules and regulations of the FCC.

FCC Caution:

To assure continued compliance, (for example, use only shielded interface cables when connecting to computer or peripheral devices) any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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

(2) This device must accept any interference received, including interference that may cause undesired operation.

Federal Communication Commission (FCC) Radiation Exposure Statement

This equipment complies with FCC radiation exposure set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20 cm (8 inches) during normal operation.

CAUTION: Changes or modifications not expressly approved by UTC for compliance could void the user’s authority to operate the equipment.

CE Mark Warning

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

Energy Saving Note of the Device

This power required device does not support Standby mode operation. For energy saving, please remove the DC-plug to disconnect the device from the power circuit. Without removing the DC-plug, the device still consumes power from the power circuit. In view of Saving the Energy, it is strongly suggested to remove the DC-plug for the device if this device is not intended to be active.

Canadian Compliance

This Class B digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations. Cet appareil numérique de la classe B respects toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Canada - Industry Canada (IC)

The wireless radio of this device complies with RSS 247 and RSS 102 of Industry Canada.

This Class B digital device complies with Canadian ICES-003 (NMB-003).

Cet appareil numérique de la classe B respects toutes les exigences du Règlement sur le matériel brouilleur du Canada.

This device complies with Industry Canada’s licence-exempt RSSs. Operation is subject to the following two conditions:

(1) This device may not cause interference; and

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

(1) l'appareil ne doit pas produire de brouillage, et

(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

WMC252-1W-1T-300 complies with IC requirements, IC: 20201-WMC252300.

This radio transmitter (IC: 20201-WMC252300) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

- Built-in 14dBi Dual-Polarization Antenna

Le présent émetteur radio (IC: 20201-WMC252300) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

- **Intégré 14dBi antenne double polarisation**

LE-LAN devices shall contain instructions related to the restrictions mentioned in the above sections, namely that:

1. the device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;
2. for devices with detachable antenna(s), the maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall be such that the equipment still complies with the e.i.r.p. limit;
3. for devices with detachable antenna(s), the maximum antenna gain permitted for devices in the band 5725-5850 MHz shall be such that the equipment still complies with the e.i.r.p. limits specified for point-to-point and non-point-to-point operation as appropriate; and
4. the worst-case tilt angle(s) necessary to remain compliant with the e.i.r.p. elevation mask requirement set forth in Section 6.2.2(3) of RSS-247 shall be clearly indicated.

The maximum conducted output power shall not exceed 250 mW or 11 + 10 $\log_{10}$B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 $\log_{10}$B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

2) Unwanted emission limits

i) For devices with both operating frequencies and channel bandwidths contained within the band 5250-5350 MHz, the device shall comply with the following:

a. All emissions outside the band 5250-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. if the equipment is intended for outdoor use; or
b. All emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. and any emissions within the band 5150-5250 MHz shall meet the power spectral density limits of Section 6.2.1 of RSS-247. The device shall be labelled “for indoor use only.”

ii) For devices with operating frequencies in the band 5250-5350 MHz but having a channel bandwidth that overlaps the band 5150-5250 MHz, the devices' unwanted emission shall not exceed -27 dBm/MHz e.i.r.p. outside the band 5150-5350 MHz and its power shall comply with the spectral power density for operation within the band 5150-5250 MHz. The device shall be labelled "for indoor use only."

3) Additional requirements

In addition to the above requirements, devices operating in the band 5250-5350 MHz with a maximum e.i.r.p. greater than 200 mW shall comply with the following e.i.r.p. at different elevations, where θ is the angle above the local horizontal plane (of the Earth) as shown below:

1. -13 dBW/MHz for 0° ≤ θ < 8°
2. -13 − 0.716 (θ-8) dBW/MHz for 8° ≤ θ < 40°
3. -35.9 − 1.22 (θ-40) dBW/MHz for 40° ≤ θ ≤ 45°
4. -42 dBW/MHz for θ > 45°

The measurement procedure defined in Annex A of RSS-247 shall be used to verify the compliance to the e.i.r.p. at different elevations.

Users should also be advised that high-power radars are allocated as primary users (i.e. priority users) of the bands 5250-5350 MHz and 5650-5850 MHz and that these radars could cause interference and/or damage to LE-LAN devices.

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CAUTION: TO ENSURE REGULATORY COMPLIANCE, USE ONLY THE PROVIDED POWER AND INTERFACE CABLES.

CAUTION: DO NOT OPEN THE UNIT. DO NOT PERFORM ANY SERVICING OTHER THAN THAT CONTAINED IN THE INSTALLATION AND TROUBLESHOOTING INSTRUCTIONS. REFER ALL SERVICING TO QUALIFIED SERVICE PERSONNEL.

R&TTE Compliance Statement

This equipment complies with all the requirements of DIRECTIVE 1999/5/CE OF THE EUROPEAN PARLIAMENT AND THE COUNCIL OF 9 March 1999 on radio equipment and telecommunication terminal Equipment and the mutual recognition of their conformity (R&TTE). The R&TTE Directive repeals and replaces in the directive 98/13/EEC (Telecommunications Terminal Equipment and Satellite Earth Station Equipment) as of April 8, 2000.

Safety

This equipment is designed with the utmost care for the safety of those who install and use it. However, special attention must be paid to the dangers of electric shock and static electricity when working with electrical equipment. All guidelines of this and of the computer manufacture must therefore be allowed at all times to ensure the safe use of the equipment.

Wireless LAN and your Health

The WMC252-1W-1T-300 like other radio devices, emits radio frequency electromagnetic energy, but operates within the guidelines found in radio frequency safety standards and recommendations.

Restrictions on Use of Wireless Devices

In some situations or environments, the use of wireless devices may be restricted by the proprietor of the building or responsible representatives of the organization. For example, these situations may include:

. Using wireless equipment in any environment where the risk of interference to other devices or services is perceived or identified as harmful.

If you are uncertain of the applicable policy for the use of wireless equipment in a specific organization or environment, you are encouraged to ask for authorization to use the device prior to turning on the equipment.

The manufacturer is not responsible for any radio or television interference caused by unauthorized modification of the devices included with this product, or the substitution or attachment of connecting cables and equipment other than specified by the manufacturer. Correction of interference caused by such unauthorized modification, substitution, or attachment is the responsibility of the user.

The manufacturer and its authorized resellers or distributors are not liable for any damage or violation of government regulations that may arise from failing to comply with these guideline documentation that comes with the product.

Postpone router installation until there is no risk of thunderstorm or lightning activity in the area.

Do not overload outlets or extension cords, as this can result in a risk of fire or electric shock. Overloaded AC outlets, extension cords, frayed power cords, damaged or cracked wire insulation, and broken plugs are dangerous. They may result in a shock or fire hazard.

Route power supply cords so that they are not likely to be walked on or pinched by items placed upon or against them. Pay particular attention to cords where they are attached to plugs and convenience receptacles, and examine the point where they exit from the product.

Place this equipment in a location that is close enough to an electrical outlet to accommodate the length of the power cord.

Place this equipment on a stable surface.

When using this device, basic safety precautions should always be followed to reduce the risk of fire, electric shock and injury to persons, including the following:

. Read all of the instructions {listed here and/or in the user manual} before you operate this equipment. Give particular attention to all safety precautions.
Retain the instructions for future reference.
. Comply with all warning and caution statements in the instructions. Observe all warning and caution symbols that are affixed to this equipment.
. Comply with all instructions that accompany this equipment.
. Avoid using this product during an electrical storm. There may be a risk of electric shock from lightning. For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet, and disconnect the cable system. This will prevent damage to the product due to lightning and power surges. We also recommend the use of ESP300 20Kv protection on the input at the switch or network.
. Operate this product only from the type of power source indicated on the product's marking label. If you are not sure of the type of power supplied to your home, consult your dealer or local power company.
. Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in safe operating condition.
It is recommended that the customer install an AC surge protector in the AC outlet to which this device is connected. This is to avoid damaging the equipment by local lightning strikes and other electrical surges.

Different types of cord sets may be used for connections to the main supply circuit. Use only a main line cord that complies with all applicable product safety requirements of the country of use. Installation of this product must be in accordance with national wiring codes.

Place unit to allow for easy access when disconnecting the power cord/adapter of the device from the AC wall outlet.

Wipe the unit with a clean, dry cloth. Never use cleaning fluid or similar chemicals. Do not spray cleaners directly on the unit or use forced air to remove dust.

This product was qualified under test conditions that included the use of the supplied cables between system components. To be in compliance with regulations, the user must use these cables and install them properly. Connect the unit to a grounding type AC wall outlet using the power adapter supplied with the unit.

Do not cover the device, or block the airflow to the device with any other objects. Keep the device away from excessive heat and humidity and keep the device free from vibration and dust.

Installation must at all times conform to local regulations

National Restrictions

This device is intended for home and office use in all EU countries (and other countries following the EU directive 1999/5/EC) without any limitation except for the countries mentioned below:

Country	Restriction	Reasons/remarks
Bulgaria	None	General authorization required for outdoor use and public service
France	Outdoor use; limited to 10 mW e.i.r.p. within the band 2454-2483.5 MHz	Military Radiolocation use. Reframing of the 2.4 GHz band has been ongoing in recent years to allow current relaxed regulation. Full implementation planned 2012
Italy	None	If used outside of own premises, general authorization is required
Luxembourg	None	General authorization required for network and service supply(not for spectrum)
Norway	Implemented	This subsection does not apply for the geographical area within a radius of 20 km from the centre of Ny-Ålesund
Russian Federation	None	Only for indoor applications

Note: Please don’t use the product outdoors in France.

WEEE regulation

To avoid the potential effects on the environment and human health as a result of the presence of hazardous substances in electrical and electronic equipment, end users of electrical and electronic equipment should understand the meaning of the crossed-out wheeled bin symbol. Do not dispose of WEEE as unsorted municipal waste and have to collect such WEEE separately.

Contact Information For contact information, see www.interlogix.com
or www.utcfssecurityproducts.eu.

CONTENTS

FIGURES

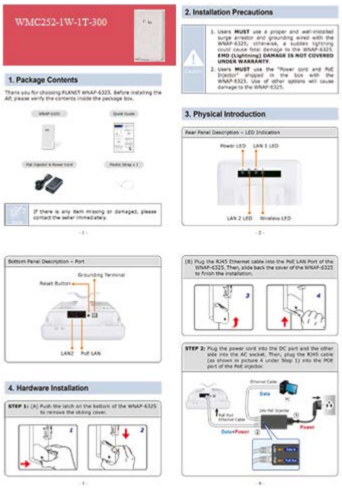
Chapter 1. Product Introduction

1.1 Package Contents

Thank you for choosing IFS **WMC252-1W-1T-300**. Before installing the AP, please verify the contents inside the package box.

WMC252-1W-1T-300

Quick Installation Guide



PoE Injector & Power Cord

Plastic Strap x 1

Note

If there is any item missing or damaged, please contact the seller immediately.

1.2 Product Description

IFS WMC252-300 Wireless Outdoor Access Point provides a higher transmission speed, higher power and better performance designed for outdoor wireless application.

Faster Speed and longer Distance

Adopting the IEEE 802.11n advanced 2T2R MIMO technology; the WMC252-300 provides high speed, reliable wireless network coverage, and incredible improvement in the wireless performance. As an IEEE 802.11a/n compliant wireless device, the WMC252-300 is able to give stable and efficient wireless performance for long distance application. Thus, it delivers a data rate of up to 300Mbps three times faster than the normal 802.11a wireless device. With its adjustable output power up to 500mW, it can extend the coverage of an outdoor area.

Multiple Operation and Wireless Modes

The WMC252-300 supports multiple wireless communication connectivity's (AP, Client CPE, WDS PtP, WDS PtMP and WISP), meeting user's application requirements. It also helps user to easily extend the existing wireless network.

Advanced Wireless Security

In aspect of security, besides 64/128- bit WEP encryption, the WMC252-300 is integrated with WPA / WPA2, WPA-PSK / WPA2-PSK and 802.1x authority to secure and protect your wireless LAN. The wireless MAC filtering and SSID broadcast help to consolidate the wireless network security and prevent unauthorized wireless connection.

Perfect Solution for Outdoor Environment

The WMC252-300 is perfectly suitable to be installed in outdoor environments. With its IP55 casing protection, the WMC252-300 can perform normally under rigorous weather conditions including heavy rain and wind. With the passive Power over Ethernet (PoE) design, the WMC252-300 can be easily installed in the areas where power outlets are not available. Thus, the WMC252-300 is ideal for outdoor wireless access applications between buildings on campuses, and in business and rural areas.

Easy Installation and Management

With user-friendly Web UI and step by step Setup Wizard, user can set up a wireless network without any difficulty.

1.3 Product Features

- **Industrial Compliant Wireless LAN & LAN**
  - Compliant with the IEEE 802.11n wireless technology (with data rate of up to 300Mbps)
  - Backward compatible with 802.11a standard
  - Equipped with 10/100Mbps RJ45 ports for LAN & WAN; auto MDI/ MDI-X supported
- **Fixed-network Broadband Router**
  - Supported connection types: Dynamic IP, Static IP, PPPoE
  - Supports Virtual Server, DMZ for various networking applications
  - Supports DHCP Server, UPnP, Dynamic DNS
- **RF Interface Characteristics**
  - Built-in 14dBi Dual-Polarization Antenna
  - High Output Power Up to 500mW with multiple adjustable transmit power control
- **Outdoor Environmental Characteristics**
  - IP55 enclosure
  - Passive Power over Ethernet design
  - Operating temperature: -20~70°C
- **Multiple Operation and Wireless Modes**
  - Multiple operation modes: Bridge, WISP
  - Multiple wireless modes: AP, Client CPE(WISP), WDS PtP, WDS PtMP
  - Supports multiple SSIDs to allow users to access different networks through a single AP
  - Supports WMM (Wi-Fi multimedia)
- **Secure Network Connection**
  - Supports software Wi-Fi Protected Setup (WPS)
  - Advanced security: 64/128-bit WEP, WPA/WPA2, WPA-PSK/WPA2-PSK(TKIP/AES) and 802.1x authentication
  - Supports IP / Protocol-based access control and MAC filtering
- **Easy Installation and Management**
  - Web-based UI and quick Setup Wizard for easy configuration
  - SNMP-based management interface
  - System status monitoring includes DHCP Client, System Log

1.4 Product Specifications

Product	**WMC252-1W-1T-300** 300Mbps 802.11a/n Wireless Outdoor CPE			
Hardware				
Standard Support	IEEE802.11a/n IEEE 802.3 IEEE 802.3u IEEE 802.3x			
Chipset	Atheros AR9344			
Memory	64 Mbytes DDR SDRAM 16 Mbytes Flash			
PoE	Passive PoE			
Interface	Wireless IEEE802.11a/n, 2T2R PoE LAN (LAN 1): 1 x 10/100BASE-TX, auto-MDI/MDIX, passive PoE LAN 2: 1 x 10/100BASE-TX, auto-MDI/MDIX, passive PoE out pass-through			
Antenna	Built-in 14dBi Dual-Polarization Antenna - Horizontal: 30 degrees - Vertical: 20 degrees			
Data Rate	IEEE 802.11a: 6, 9, 12, 18, 24, 36, 48, 54Mbps IEEE 802.11n (20MHz): up to 150Mbps IEEE 802.11n (40MHz): up to 300Mbp			
Media Access Control	CSMA/CA			
Modulation	Transmission/Emission type: OFDM Data modulation type: OFDM with BPSK, QPSK, 16-QAM, 64-QAM			
Frequency Band	5.180GHz ~ 5.825GHz			
Operating Channel	5.180GHz	CH36	5.580GHz	CH116
	5.200GHz	CH40	5.600GHz	CH120
	5.220GHz	CH44	5.620GHz	CH124
	5.240GHz	CH48	5.640GHz	CH128
	5.260GHz	CH52	5.660GHz	CH132
	5.280GHz	CH56	5.680GHz	CH136
	5.300GHz	CH60	5.700GHz	CH140
	5.320GHz	CH64	5.745GHz	CH149
	5.500GHz	CH100	5.765GHz	CH153
	5.520GHz	CH104	5.785GHz	CH157
	5.540GHz	CH108	5.805GHz	CH161
	5.560GHz	CH112	5.825GHz	CH165
	*The 24 channels are defined by the theory. The actual application will vary based on the regulation in different regions and countries.			

RF Output Power (dBm)	802.11a: up to 26 ± 1

	802.11n: up to 25 ± 1	
Receiver Sensitivity (dBm)	802.11a: -94dBm 802.11n: -93dBm	
Output Power Control	12~27dBm	
Power Consumption	12W	
Power Requirements	LAN	24VDC, 1A/ Passive PoE Pin 4,5 VDC+ Pin 7,8 VDC- Pin 3 Reset
Environment & Certification		
Operating Temperature	-20~70°c	
Operating Humidity	10~95% non-condensing	
IP Level	IP55	
Regulatory	CE, FCC, RoHS	
Software		
LAN	Built-in DHCP server supporting static IP address distribution	
	Support 802.1d STP (Spanning Tree)	
WAN	■ Static IP ■ Dynamic IP ■ PPPoE	
Operation Modes	■ Bridge ■ WISP	
Firewall	NAT firewall with SPI (Stateful Packet Inspection)	
	Built-in NAT server supporting Virtual Server, and DMZ	
	Built-in firewall with Port/ IP address/ MAC/ URL filtering	
Wireless Modes	■ AP ■ Client ■ WDS PTP ■ WDS PTMP ■ WISP	
Channel Width	20MHz / 40MHz	
Wireless Isolation	Enable it to isolate each connected wireless client so that they cannot access mutually.	
Encryption Type	64/128-bit WEP, WPA, WPA-PSK, WPA2, WPA2-PSK, 802.1X	
Wireless Security	Provides wireless LAN ACL (Access Control List) filtering	
	Wireless MAC address filtering	
	Enable/Disable SSID Broadcast	
Max. Wireless Clients	25	
Max. WDS Peers	8	
Max. Wired Clients	60	
WMM	Supports Wi-Fi multimedia	

QoS	Supports Quality of Service for bandwidth control
NTP	Network Time Management
Self Healing	Supports Schedule Reboot
Management	Web UI, DHCP Client, Configuration Backup & Restore, Dynamic DNS, SNMP
Diagnostic Tool	System Log, Ping Watchdog

Chapter 2. Hardware Installation

Please follow the instructions below to connect the WMC252-300 to the existing network devices and your computers.

2.1 Hardware Description

- **Dimensions**: 127 x 63 x 254 mm (W x D x H)

Appearance

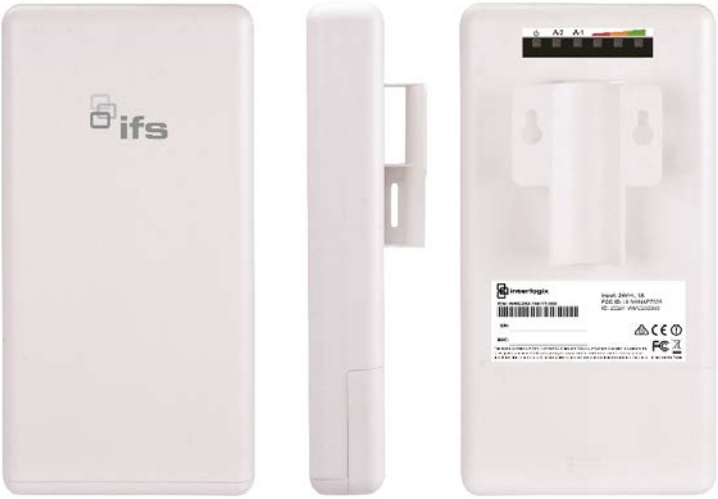


Figure 2-1 Three-way View

Rear Panel – LED

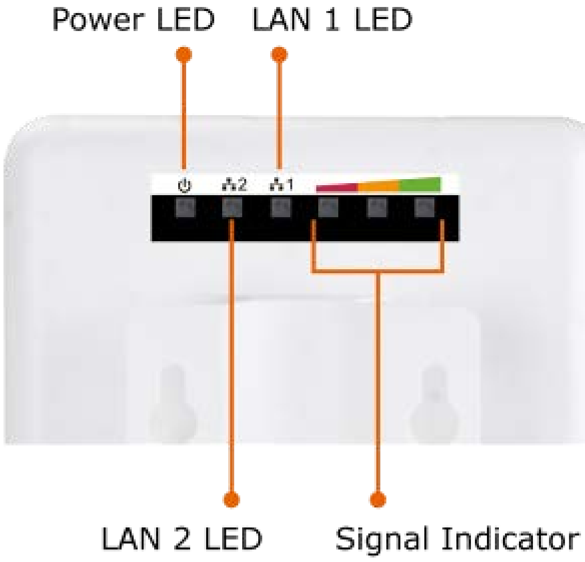


Figure 2-2 LED

LED Definition

LED	State	Meaning
Power	On	System On
	Off	System Off
Signal Indicator (Client Mode)	On	Indicates the wireless signal strength of remote AP
	Off	No remote wireless signal
LAN 1	On	Port linked.
	Off	No link.
LAN 2	On	Port linked.
	Off	No link.

Table 2-1 The LED indication

2.1.1 The Bottom Panel – Port

The Bottom panel provides the physical connectors connected to the power adapter and any other network device. **Figure 2-3** shows the bottom panel of the WMC252-300.

Bottom Panel

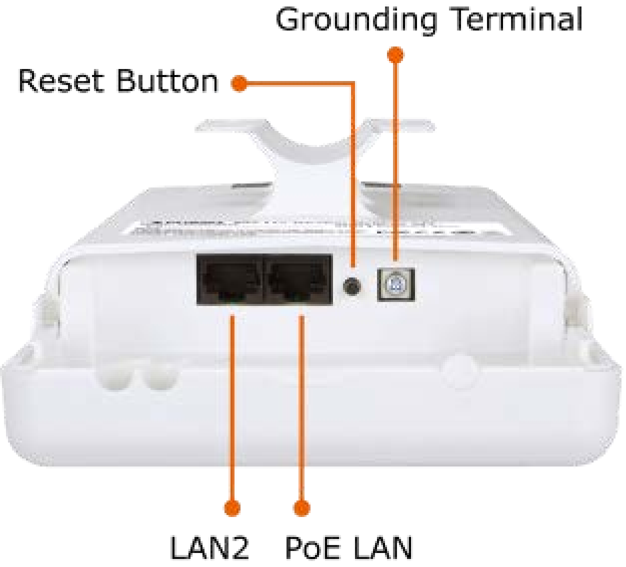


Figure 2-3 Bottom Panel

PoE Injector

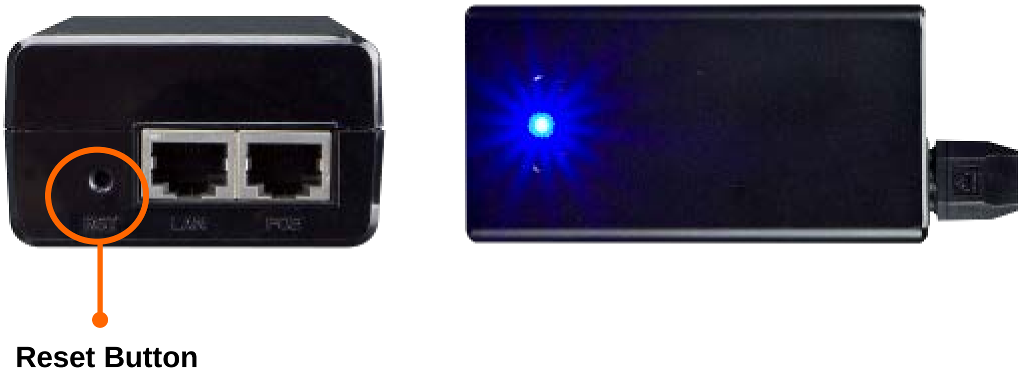


Figure 2-4 PoE Injector

H/W Interface Definition

Object	Description
PoE LAN **(Passive PoE)**	10/100Mbps RJ45 port , auto MDI/ MDI-X and passive PoE supported Connect LAN port to the PoE injector to power on the device. **Pin assignment:** **Pin 4, 5 (+)** **Pin 7, 8 (-)** **Pin 3 (Reset)**
LAN 2	10/100Mbps RJ45 port , auto MDI/ MDI-X Connect this port to the network equipment. ※ When the option “**Enable POE Pass Through**” on the System Management page is checked, the LAN2 can supply passive PoE power to the second WMC252-300 or WMC252-300 through LAN 2.

Reset	Press the **Reset** button on the device or on the PoE injector over 5 seconds to return to factory default setting. **※ If you have connected with the ESP300, please DO NOT press the reset button on the PoE injector to prevent the ESP300 from being damaged.**

Table 2-2 The PoE Injector Indication

Chapter 3. Connecting to the AP

3.1 Preparation before Installation

3.1.1 Professional Installation Required

Please seek assistance from a professional installer who is well trained in the RF installation and knowledgeable in the local regulations.

3.1.2 Safety Precautions

1. To keep you safe and install the hardware properly, please read and follow these safety precautions.
2. If you are installing the WMC252-300 for the first time, for your safety as well as others', please seek assistance from a professional installer who has received safety training on the hazards involved.
3. Keep safety as well as performance in mind when selecting your installation site, especially where there are electric power and phone lines.
4. When installing the WMC252-300, please note the following things:
   - Do not use a metal ladder;
   - Do not work on a wet or windy day;
   - Wear shoes with rubber soles and heels, rubber gloves, long sleeved shirt or jacket.
5. When the system is operational, avoid standing directly in front of it. Strong RF fields are present when the transmitter is on.

3.2 Installation Precautions

- Users **MUST** use a proper and well-installed surge arrestor and grounding kit with the WMC252-300; otherwise, a random lightning could easily cause fatal damage to the WMC252-300. **(Lightning DAMAGE IS NOT COVERED UNDER WARRANTY).**

- Users **MUST** use the "Power cord and PoE Injector" shipped in the box with the WMC252-300. Use of other options will cause damage to the WMC252-300.

! OUTDOOR INSTALLATION WARNING

IMPORTANT SAFETY PRECAUTIONS:

LIVES MAY BE AT RISK! Carefully observe these instructions and any special instructions that are included with the equipment you are installing.

CONTACTING POWER LINES CAN BE LETHAL. Make sure no power lines are anywhere where possible contact can be made. Antennas, masts, towers, guy wires or cables may lean or fall and contact these lines. People may be injured or killed if they are touching or holding any part of equipment when it contacts electric lines. Make sure that equipment or personnel do not come in contact directly or indirectly with power lines.

The horizontal distance from a tower, mast or antenna to the nearest power line should be at least twice the total length of the mast/antenna combination. This will ensure that the mast will not contact power if it falls either during installation or later.

TO AVOID FALLING, USE SAFE PROCEDURES WHEN WORKING AT HEIGHTS ABOVE GROUND.

- Select equipment locations that will allow safe, simple equipment installation.
- Don’t work alone. A friend or co-worker can save your life if an accident happens.
- Use approved non-conducting lasers and other safety equipment. Make sure all equipment is in good repair.
- If a tower or mast begins falling, don’t attempt to catch it. Stand back and let it fall.
- If anything such as a wire or mast does come in contact with a power line, **DON’T TOUCH IT OR ATTEMPT TO MOVE IT**. Instead, save your life by calling the power company.
- Don’t attempt to erect antennas or towers on windy days.

MAKE SURE ALL TOWERS AND MASTS ARE SECURELY GROUNDED, AND ELECTRICAL CABLES CONNECTED TO ANTENNAS HAVE LIGHTNING ARRESTORS. This will help prevent fire damage or human injury in case of lightning, static build-up, or short circuit within equipment connected to the antenna.

- The base of the antenna mast or tower must be connected directly to the building protective ground or to one or more approved grounding rods, using 1 OAWG ground wire and corrosion-resistant connectors.
- Refer to the National Electrical Code for grounding details.

IF A PERSON COMES IN CONTACT WITH ELECTRICAL POWER, AND CANNOT MOVE:

- **DON’T TOUCH THAT PERSON, OR YOU MAY BE ELECTROCUTED.**
- Use a non-conductive dry board, stick or rope to push or drag them so they no longer are in contact with electrical power.

Once they are no longer contacting electrical power, administer CPR if you are certified, and make sure that emergency medical aid has been requested.

3.3 Installing the AP

Please install the AP according to the following steps. Don't forget to pull out the power plug and keep your hands dry.

Step 1. Push the latch in the bottom of the WMC252-300 to remove the sliding cover.

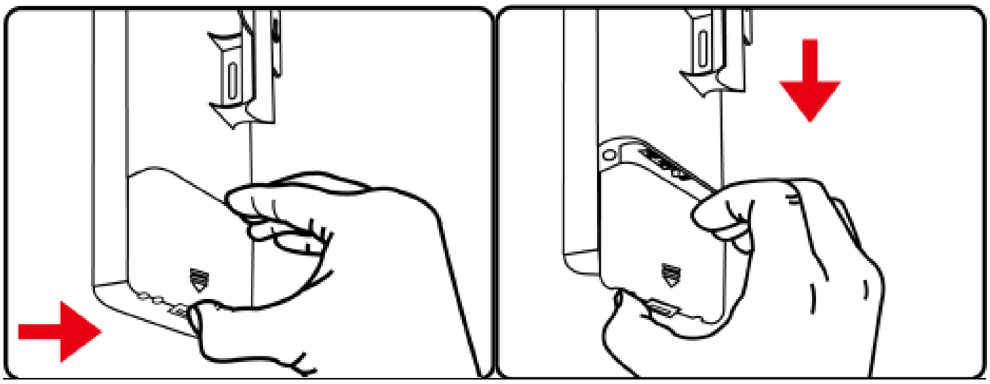


Figure 3-1 Connect the Antenna

Step 2. Plug the RJ45 Ethernet cable into the PoE LAN Port of the WMC252-300.

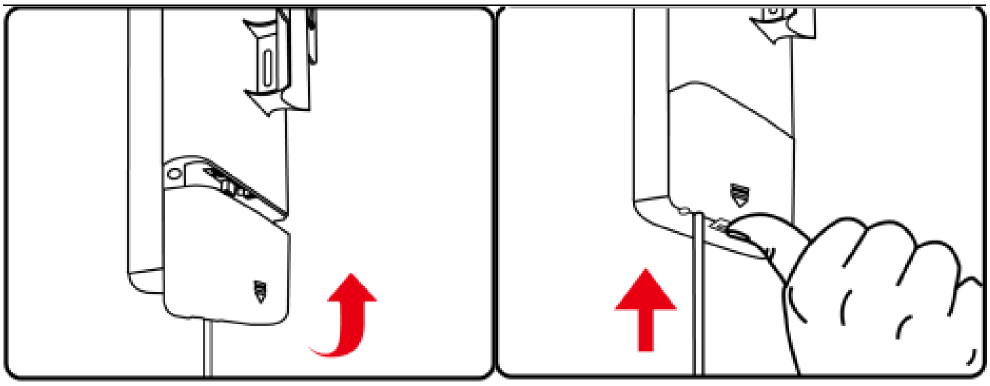


Figure 3-2 Connect the Ethernet cable

Step 3. Plug the power cord into the DC port and the other end into the AC socket. Then, plug the RJ45 cable (as shown in picture 4 under Step 1) into the POE port of the PoE injector.

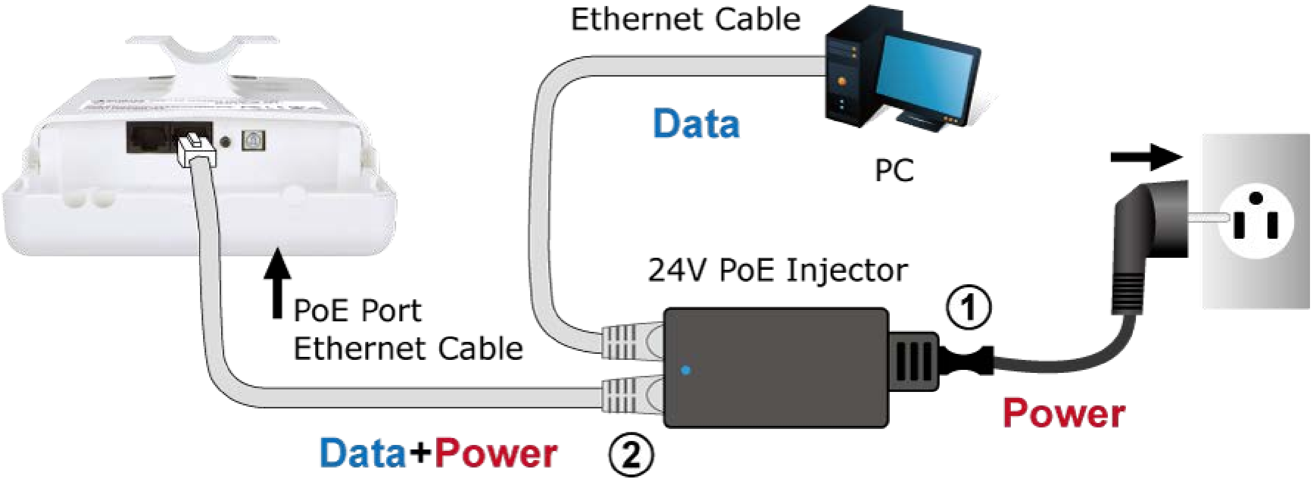


Figure 3-3 Connect the PoE injector

3.4 Standard Pole Mounting

Place the strap through the slots on the back of the WMC252-300 and then around the pole. Tighten the strap to secure the WMC252-300.

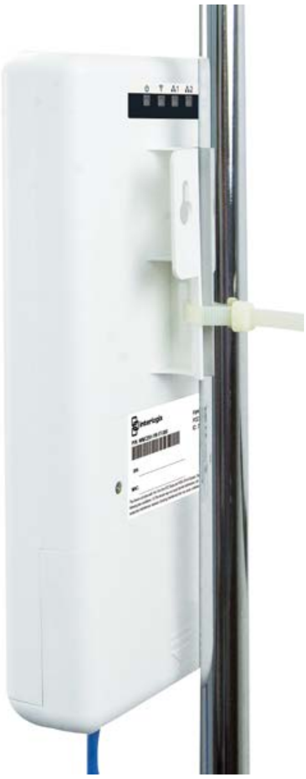


Figure 3-4 Pole Mounting

Chapter 4. Quick Installation Guide

This chapter will show you how to configure the basic functions of your AP within minutes.

Note

A computer with wired Ethernet connection to the Wireless AP is required for the first-time configuration.

4.1 Manual Network Setup - TCP/IP Configuration

The default IP address of the WMC252-300 is **192.168.0.100**. And the default Subnet Mask is 255.255.255.0. These values can be changed as you desire. In this guide, we use all the default values for description.

Connect the WMC252-300 with your PC via an Ethernet cable which is then plugged into a LAN port of the PoE injector with one end and into a LAN port of the PC with the other end. Then power on the WMC252-300 via PoE injector or PoE switch.

In the following sections, we'll introduce how to install and configure the TCP/IP correctly in **Windows 7**. And the procedures in other operating systems are similar. First, make sure your Ethernet adapter is working, and refer to the Ethernet adapter's manual if needed.

4.1.1 Configuring the IP Address Manually

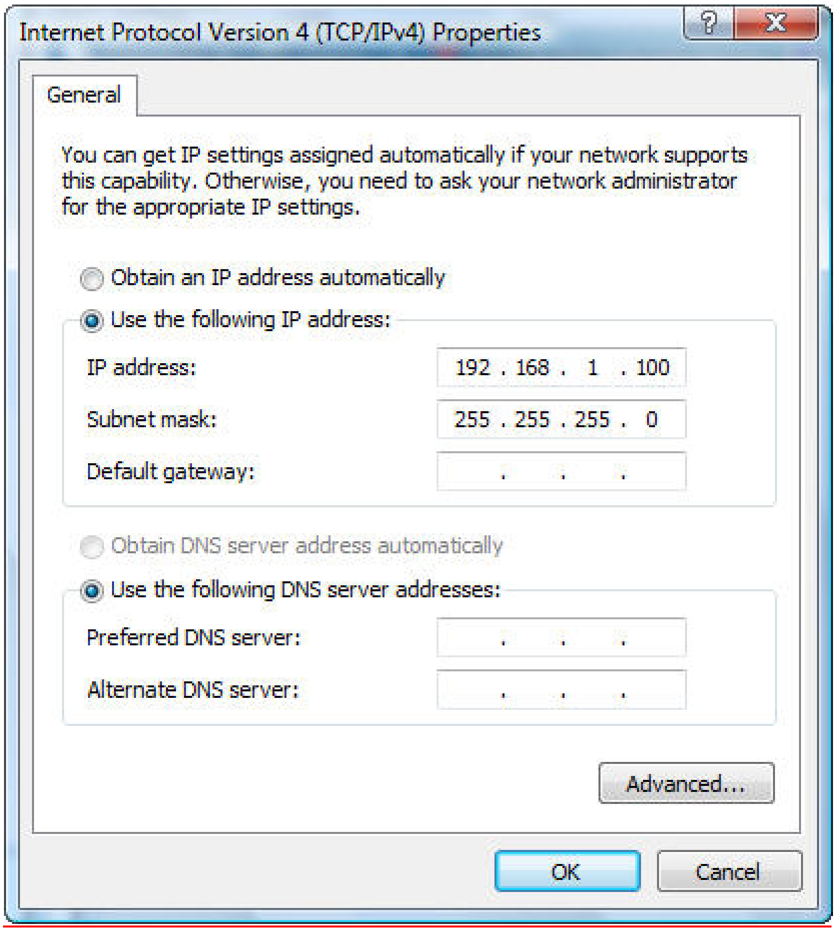
Summary:

- Set up the TCP/IP Protocol for your PC.
- Configure the network parameters. The IP address is 192.168.1.xxx ("xxx" is any number from 2 to 252), Subnet Mask is 255.255.255.0, and Gateway is 192.168.0.100 (The AP's default IP address)

1 Select **Use the following IP address** radio button.

2 If the AP's LAN IP address is 192.168.0.100, enter IP address 192.168.1.x (x is from 2 to 254), and **Subnet mask** 255.255.255.0.

3 Select **Use the following DNS server addresses** radio button. In the **Preferred DNS Server** field, you can enter the DNS server IP address which has been provided by your ISP.



Internet Protocol Version 4 (TCP/IPv4) Properties

General

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

○ Obtain an IP address automatically

● Use the following IP address:

IP address: 192 . 168 . 1 . 100

Subnet mask: 255 . 255 . 255 . 0

Default gateway: . . .

○ Obtain DNS server address automatically

● Use the following DNS server addresses:

Preferred DNS server: . . .

Alternate DNS server: . . .

Figure 4-1 TCP/IP Setting

Now click **OK** to save your settings.

Now, you can run the ping command in the **command prompt** to verify the network connection between your PC and the AP. The following example is in **Windows 7** OS. Please follow the steps below:

1. Click on **Start > Run**.

2. Type “**cmd**” in the Search box.

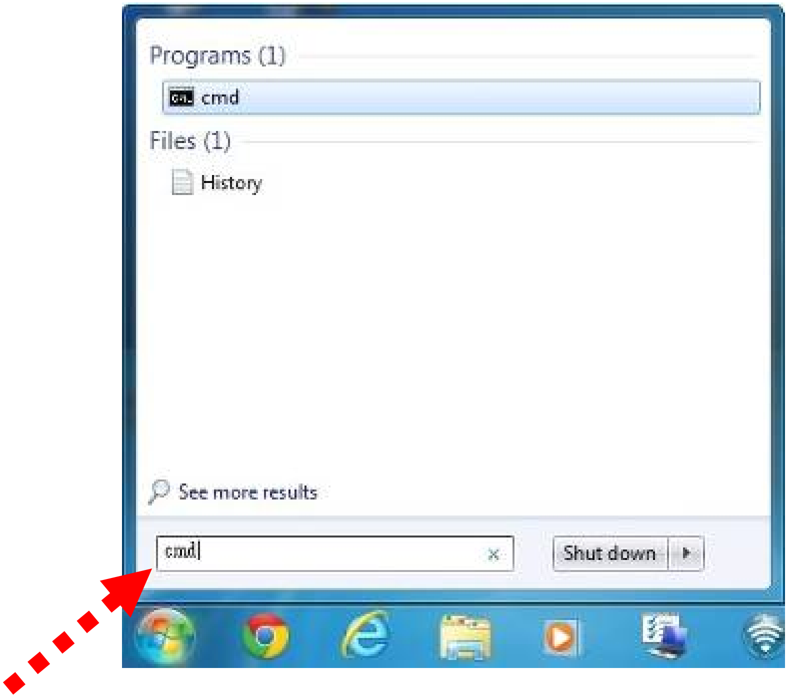
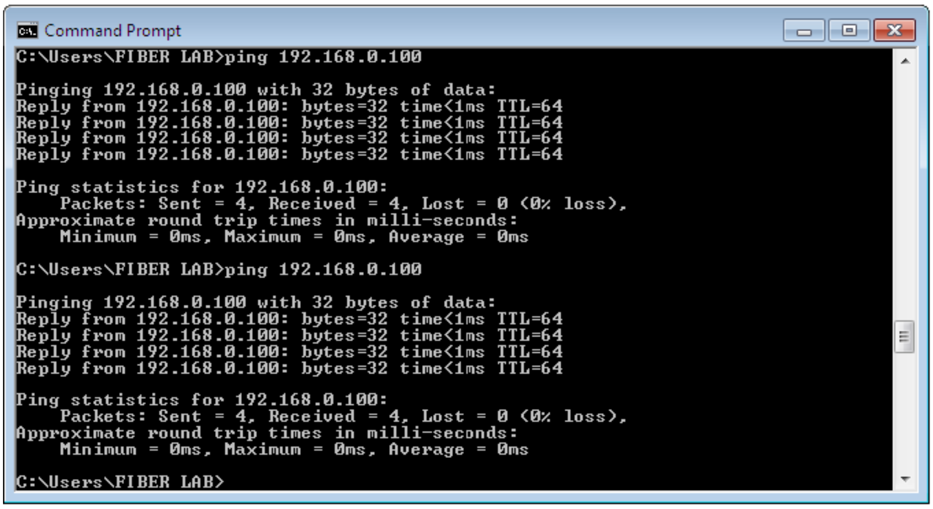


Figure 4-2 Windows Start Menu

3. Open a command prompt and type ***ping 192.168.0.100***, and then press **Enter**.

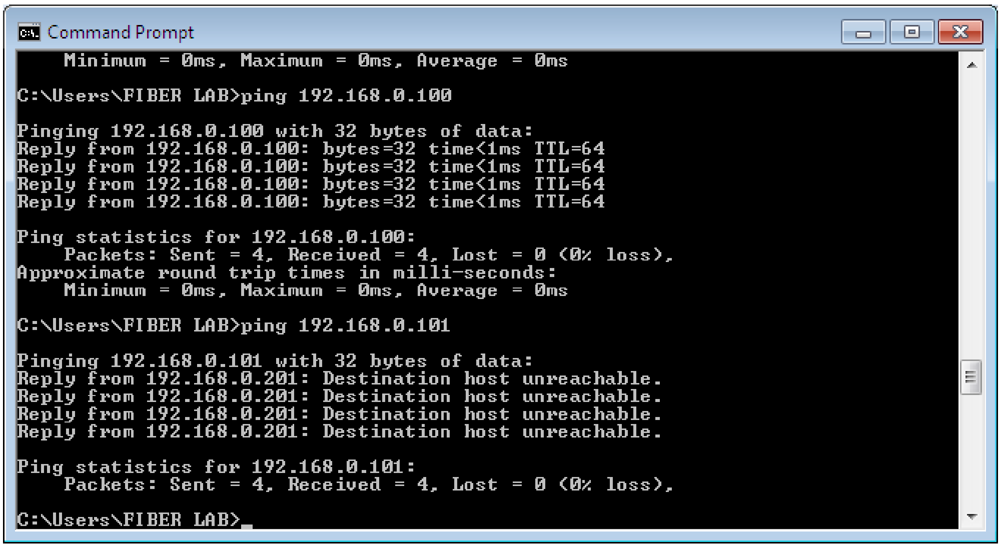
   If the result displayed is similar to **Figure 4-3**, it means the connection between your PC and the AP has been established well.



```
C:\Users\FIBER LAB>ping 192.168.0.100

Pinging 192.168.0.100 with 32 bytes of data:
Reply from 192.168.0.100: bytes=32 time<1ms TTL=64
Reply from 192.168.0.100: bytes=32 time<1ms TTL=64
Reply from 192.168.0.100: bytes=32 time<1ms TTL=64
Reply from 192.168.0.100: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.0.100:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\FIBER LAB>ping 192.168.0.100

Pinging 192.168.0.100 with 32 bytes of data:
Reply from 192.168.0.100: bytes=32 time<1ms TTL=64
Reply from 192.168.0.100: bytes=32 time<1ms TTL=64
Reply from 192.168.0.100: bytes=32 time<1ms TTL=64
Reply from 192.168.0.100: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.0.100:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\FIBER LAB>
```

Figure 4-3 Successful result of Ping command

If the result displayed is similar to **Figure 4-4**, it means the connection between your PC and the AP has failed.



```
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\FIBER LAB>ping 192.168.0.100

Pinging 192.168.0.100 with 32 bytes of data:
Reply from 192.168.0.100: bytes=32 time<1ms TTL=64
Reply from 192.168.0.100: bytes=32 time<1ms TTL=64
Reply from 192.168.0.100: bytes=32 time<1ms TTL=64
Reply from 192.168.0.100: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.0.100:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\FIBER LAB>ping 192.168.0.101

Pinging 192.168.0.101 with 32 bytes of data:
Reply from 192.168.0.201: Destination host unreachable.
Reply from 192.168.0.201: Destination host unreachable.
Reply from 192.168.0.201: Destination host unreachable.
Reply from 192.168.0.201: Destination host unreachable.

Ping statistics for 192.168.0.101:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

C:\Users\FIBER LAB>_
```

Figure 4-4 Failed result of Ping command

If the address is 0.0.0.0, check your adapter installation, security settings, and the settings on your AP. Some firewall software programs may block a DHCP request on newly installed adapters.

4.2 Starting Setup in the Web UI

It is easy to configure and manage the WMC252-300 with the web browser.

Step 1. To access the configuration page, open a web browser and enter the default IP address http://192.168.0.100 in the web address field of the browser.

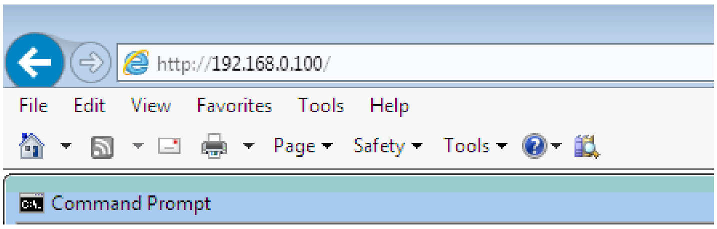
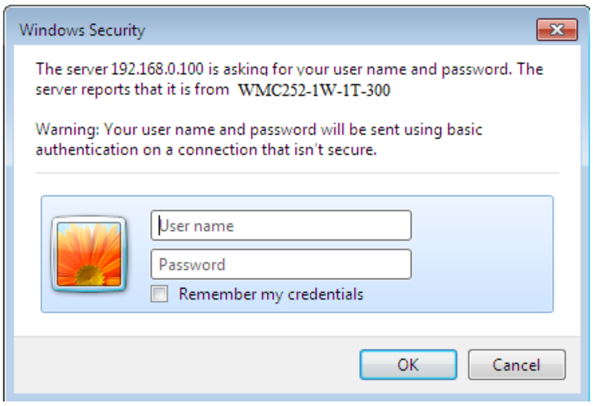


Figure 4-5 Login by default IP address

After a moment, a login window will appear. Enter **admin** for the User Name and Password, both in lower case letters. Then click the **OK** button or press the **Enter** key.



Windows Security

The server 192.168.0.100 is asking for your user name and password. The server reports that it is from WMC252-1W-1T-300

Warning: Your user name and password will be sent using basic authentication on a connection that isn't secure.

User name

Password

□ Remember my credentials

Figure 4-6 Login Window

Default IP Address: **192.168.0.100**

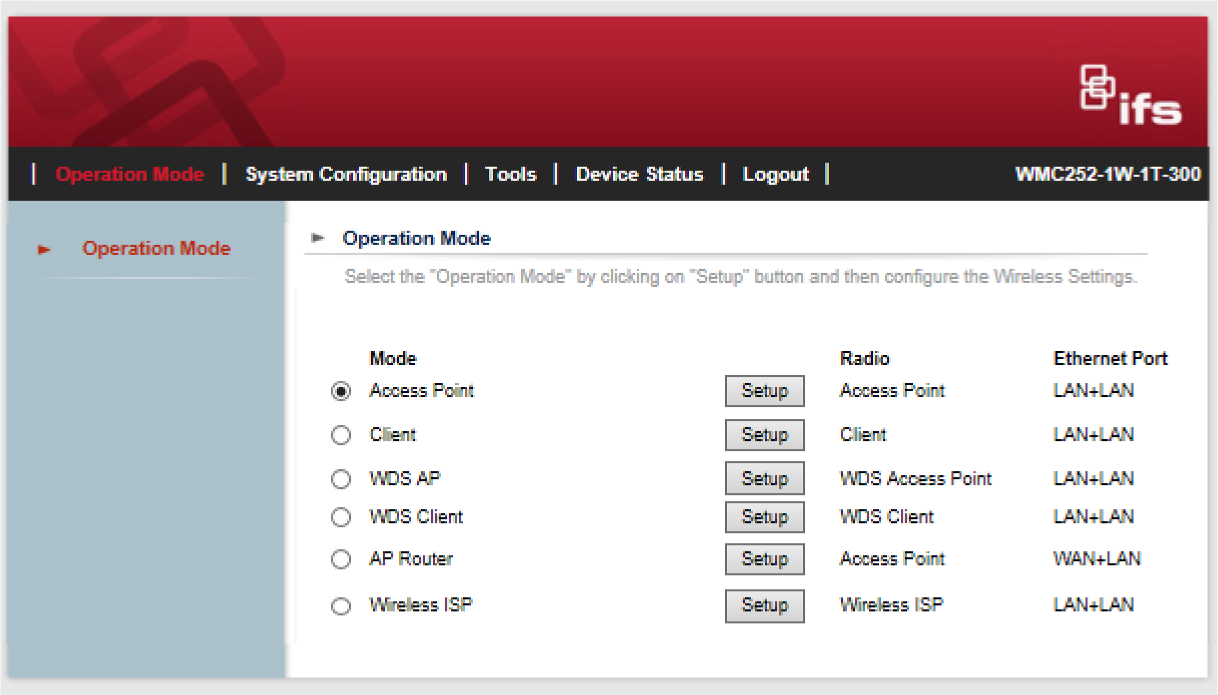
Default User Name: **admin**

Default Password: **admin**

Note

If the above screen does not pop up, it may mean that your web browser has been set to a proxy. Go to **Tools menu>Internet Options>Connections>LAN Settings** in the screen that appears, cancel the Using Proxy checkbox, and click OK to finish it.

After entering the username and password, the **Operation Mode** page screen appears as in **Figure 4-8**



ifs
| Operation Mode | System Configuration | Tools | Device Status | Logout |
WMC252-1W-1T-300
► Operation Mode

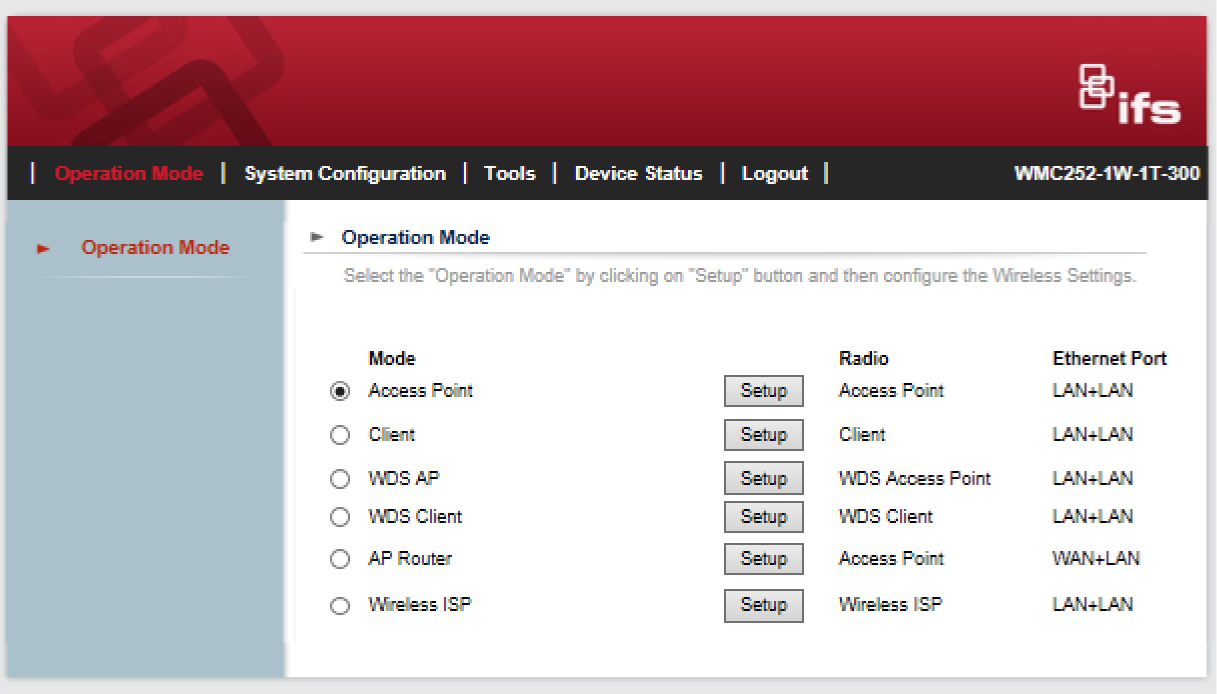
► Operation Mode

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 AP	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

Figure 4-7 WMC252-300 Web UI Screenshot

Step 2. You can choose an Operation Mode. Please refer to the instructions in the next chapter for configuring the other Operation Modes.


ifs
| Operation Mode | System Configuration | Tools | Device Status | Logout |
WMC252-1W-1T-300
► Operation Mode

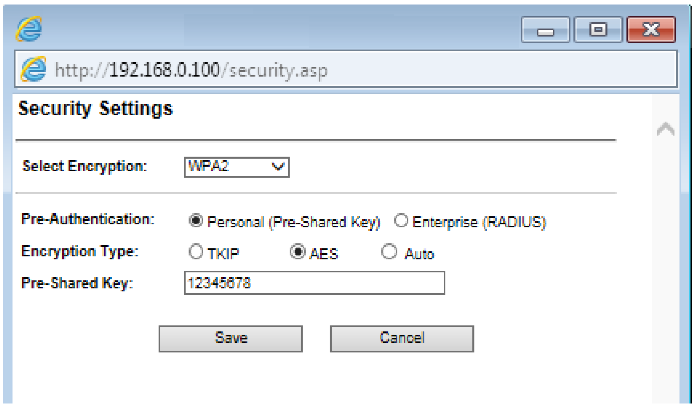
► Operation Mode

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 AP	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

Figure 4-8 Choose Operation Mode

Step 3. Please enter the SSID and configure your Encryption Settings, Pre-Shared Key, etc. Then click the **Save** button to make the configuration take effect immediately.



Security Settings

Select Encryption: WPA2

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

Encryption Type: ○ TKIP ● AES ○ Auto

Pre-Shared Key: 12345678

Figure 4-9 Configure Wireless Settings

Chapter 5. Configuring the AP

This chapter delivers a detailed presentation of AP's functionalities and features under 4 main menus (**Operation Mode**, **System Configuration**, **Tools** and **Device Status**) below, allowing you to manage the AP with ease.

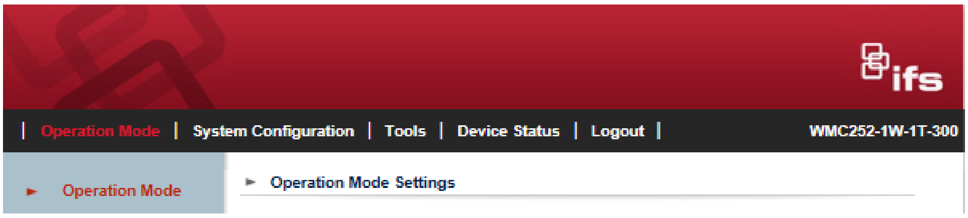
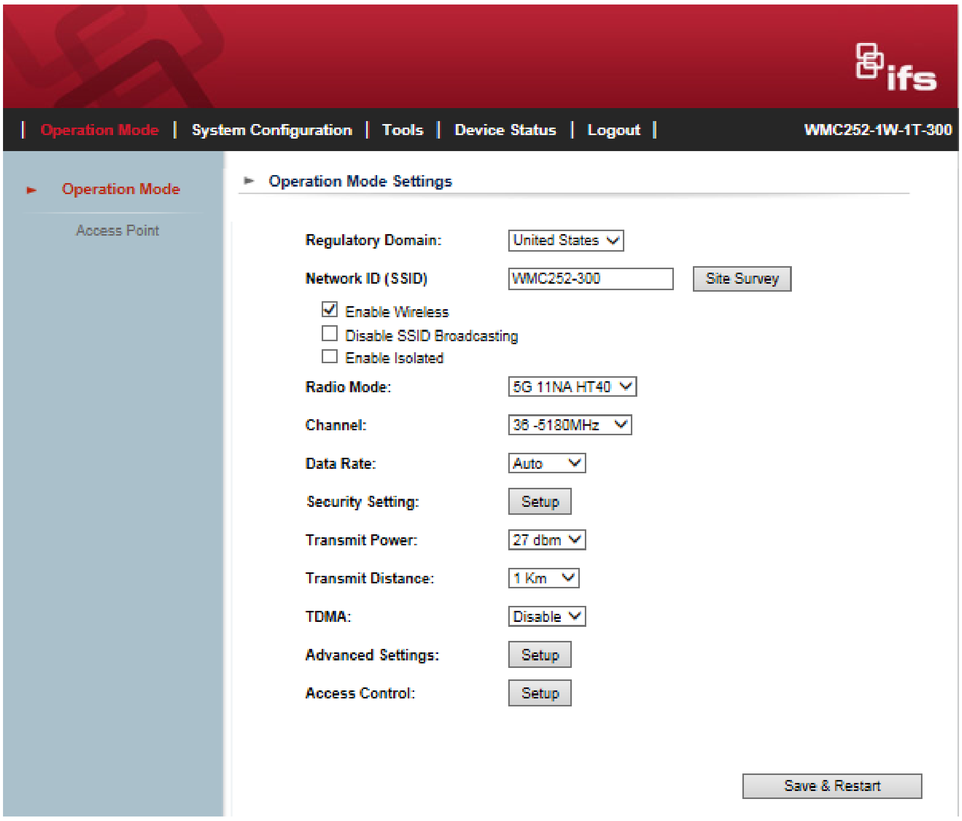

ifs
Operation Mode | System Configuration | Tools | Device Status | Logout |
WMC252-1W-1T-300
► Operation Mode
► Operation Mode Settings

Figure 5-1 Main Menu

5.1 Operation Mode

On this page, you can select different operation modes of the WMC252-300, including Access Point, Client, WDS AP, WDS Client, AP Router and Wireless ISP.


ifs
Operation Mode | System Configuration | Tools | Device Status | Logout |
WMC252-1W-1T-300
► Operation Mode
Access Point
► Operation Mode Settings

Regulatory Domain: United States

Network ID (SSID) WMC252-300 Site Survey

☑ Enable Wireless
☐ Disable SSID Broadcasting
☐ Enable Isolated

Radio Mode: 5G 11NA HT40

Channel: 36 -5180MHz

Data Rate: Auto

Security Setting: Setup

Transmit Power: 27 dbm

Transmit Distance: 1 Km

TDMA: Disable

Advanced Settings: Setup

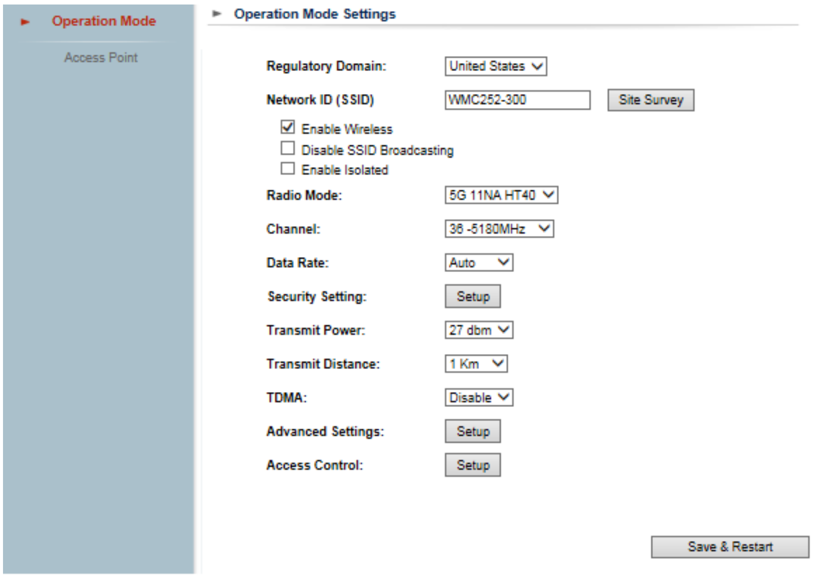
Access Control: Setup

Save & Restart

Figure 5-2 Operation Modes

5.1.1 Access Point

Click "**Operation Mode**" → "**Access Point**" and the following page will be displayed. This section allows you to configure the Access Point mode.



Regulatory Domain: United States

Network ID (SSID) WMC252-300

☑ Enable Wireless

□ Disable SSID Broadcasting

□ Enable Isolated

Radio Mode: 5G 11NA HT40

Channel: 36 -5180MHz

Data Rate: Auto

Security Setting: Setup

Transmit Power: 27 dbm

Transmit Distance: 1 Km

TDMA: Disable

Advanced Settings: Setup

Access Control: Setup

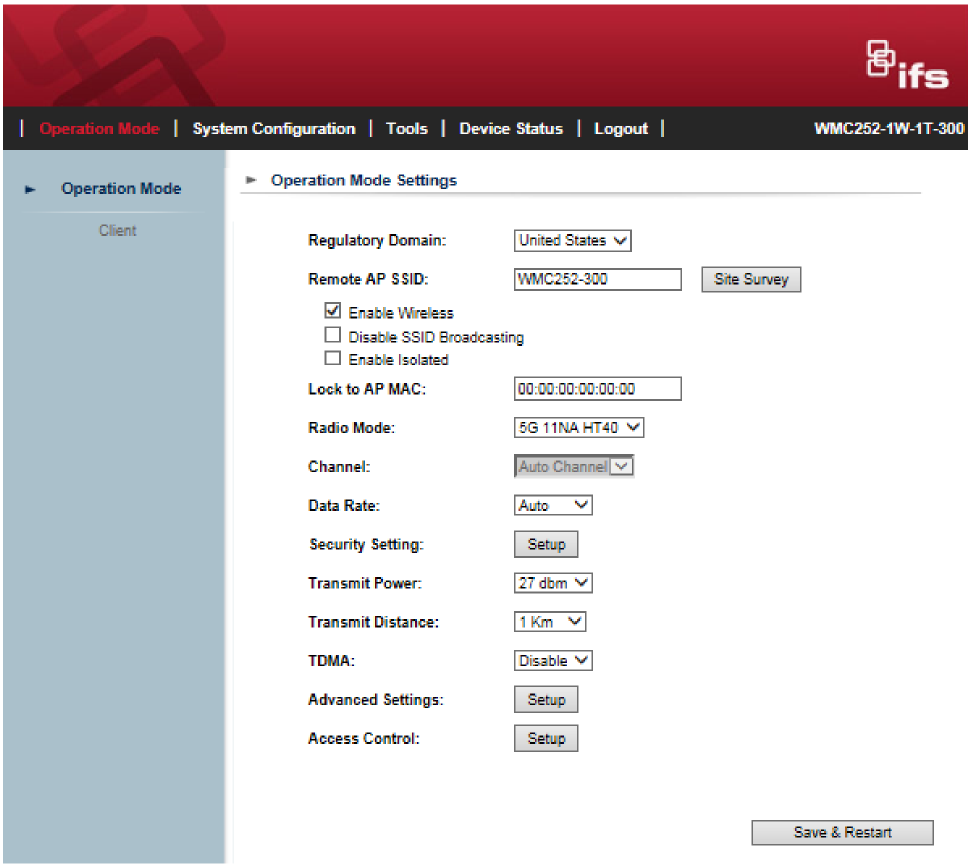
Figure 5-3 Basic Settings - AP

Object	Description
• **Regulatory Domain**	Select your domain from the list.
• **Network SSID**	It is the wireless network name. The default SSID is **WMC252-300.**
• **Site Survey**	Click "**Site Survey**" to check the signal of remote sites.
• **Enable Wireless**	Check it to enable Wireless function.
• **Disable SSID Broadcasting**	Check it to disable SSID broadcasting.
Enable Isolated	Check it to isolate each connected wireless client so that they cannot access each other.
Radio Mode	Select the channel width to "**Auto Select**", "**5G 11NA HT20**" or "**5G 11NA HT40**"
• **Channel**	Select the operating channel you would like to use. The channel range will be changed by selecting a different domain.
• **Data Rate**	Select MCS0~15 or Auto from the pull-down menu. The default is "**Auto**".
• **Security Setting**	Press "Setup" for more configurations. Please refer to 5.1.7 Security Setting for more information.
• **Transmit Power**	The range of transmit power is "**12~27 dbm**". In case of shortening the distance and the coverage of the wireless network, input a smaller value to reduce the radio transmission power.
• **Transmit Distance**	Select a specified distance of the two nodes.
• **TDMA**	Displays the System Time.

• **Advanced Settings**	Press "**Setup**" for more configurations. Please refer to 5.1.8 Advanced Settings for more information.
• **Access Control**	Press "**Setup**" for more configurations. Please refer to 5.1.9 Access Control for more information.

5.1.2 Client

Click "**Operation Mode**" → "**Client**" and the following page will be displayed. This section allows you to configure the Client mode.


ifs
| Operation Mode | System Configuration | Tools | Device Status | Logout |
WMC252-1W-1T-300
► Operation Mode
Client
► Operation Mode Settings

Regulatory Domain: United States

Remote AP SSID: WMC252-300 Site Survey

☑ Enable Wireless

☐ Disable SSID Broadcasting

☐ Enable Isolated

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

Radio Mode: 5G 11NA 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

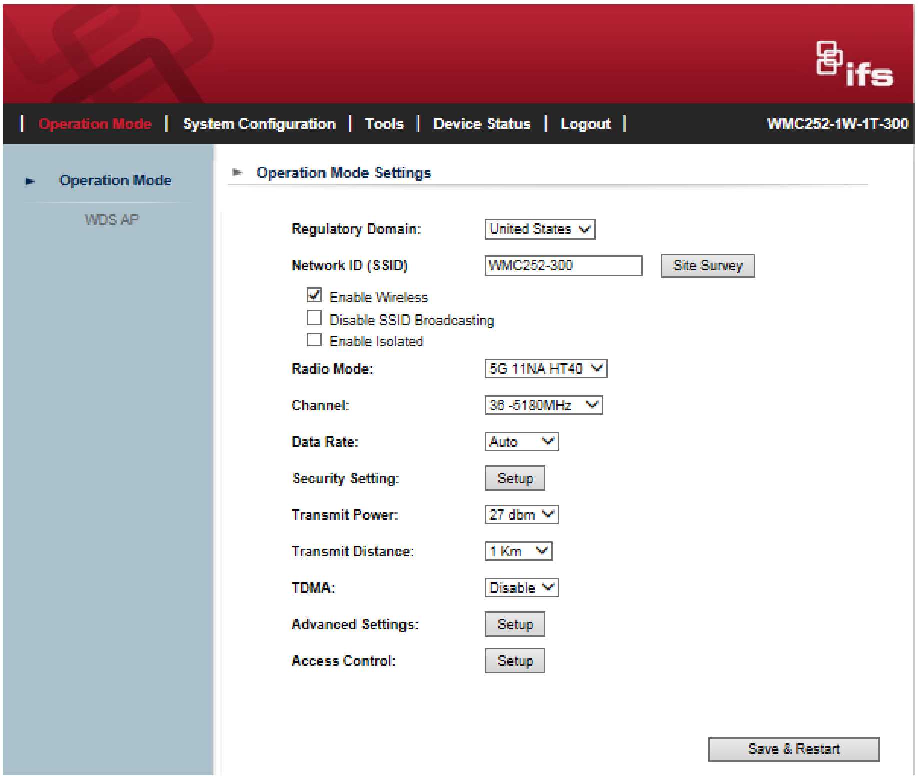
Figure 5-4 Basic Settings - Client

Object	Description
• **Regulatory Domain**	Select your domain from the list.
• **Network SSID**	It is the wireless network name. The default SSID is **WMC252-300.**
• **Site Survey**	Click "**Site Survey**" to find the remote sites to associate.
• **Enable Wireless**	Check it to enable Wireless function.
• **Disable SSID Broadcasting**	Check it to disable SSID broadcasting.
Enable Isolated	Check it to isolate each connected wireless clients so that they cannot access each other.

Lock to AP MAC	Enter the Mac address of the remote AP.
Radio Mode	Select the channel width to "**Auto Select**", "**5G 11NA HT20**" or "**5G 11NA HT40**"
• **Data Rate**	Select MCS0~15 or Auto from the pull-down menu. The default is "**Auto**".
• **Security Setting**	Press "**Setup**" for more configurations. Please refer to 5.1.7 Security Setting for more information.
• **Transmit Power**	The range of transmit power is "**12~27 dbm**". In case of shortening the distance and the coverage of the wireless network, input a smaller value to reduce the radio transmission power.
• **Transmit Distance**	Select a specified distance of the two nodes.
• **TDMA**	Displays the System Time.
• **Advanced Settings**	Press "**Setup**" for more configurations. Please refer to 5.1.8 Advanced Settings for more information.
• **Access Control**	Press "**Setup**" for more configurations. Please refer to 5.1.9 Access Control for more information.

5.1.3 WDS AP

Click "**Operation Mode**" → "**WDS AP**" and the following page will be displayed. This section allows you to configure the WDS AP mode. For each wireless parameter, please refer to section **5.1.1 AP** for more information.



| Operation Mode | System Configuration | Tools | Device Status | Logout |
WMC252-1W-1T-300
Operation Mode
WDS AP

► Operation Mode Settings

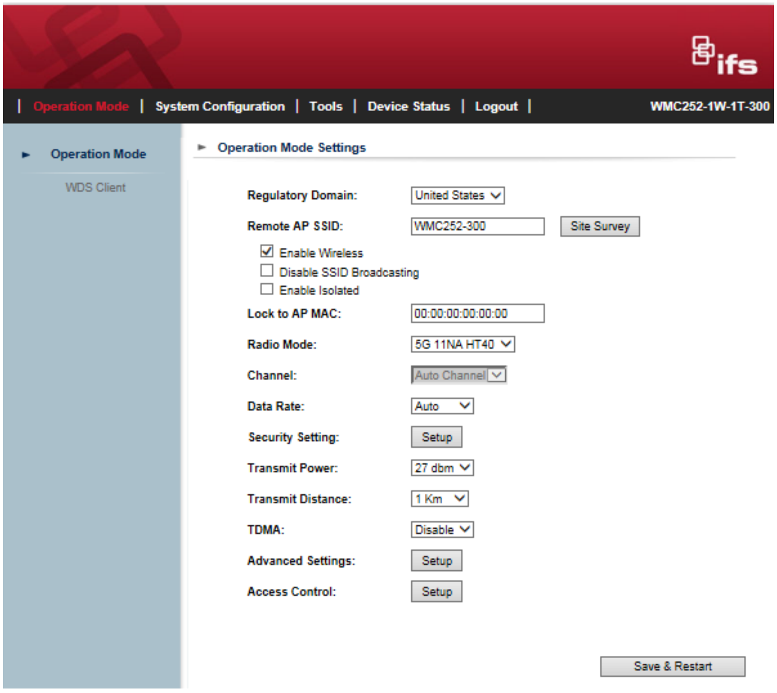
Regulatory Domain: United States
Network ID (SSID) WMC252-300 [Site Survey]
☑ Enable Wireless
☐ Disable SSID Broadcasting
☐ Enable Isolated
Radio Mode: 5G 11NA HT40
Channel: 36 -5180MHz
Data Rate: Auto
Security Setting: [Setup]
Transmit Power: 27 dbm
Transmit Distance: 1 Km
TDMA: Disable
Advanced Settings: [Setup]
Access Control: [Setup]

[Save & Restart]

Figure 5-5 Basic Settings – WDS AP

5.1.4 WDS Client

Click "**Operation Mode**" → "**WDS Client**" and the following page will be displayed. This section allows you to configure the WDS Client mode. For each wireless parameter, please refer to section **5.1.2 Client** for more information.



| Operation Mode | System Configuration | Tools | Device Status | Logout |
WMC252-1W-1T-300
Operation Mode
WDS Client

► Operation Mode Settings

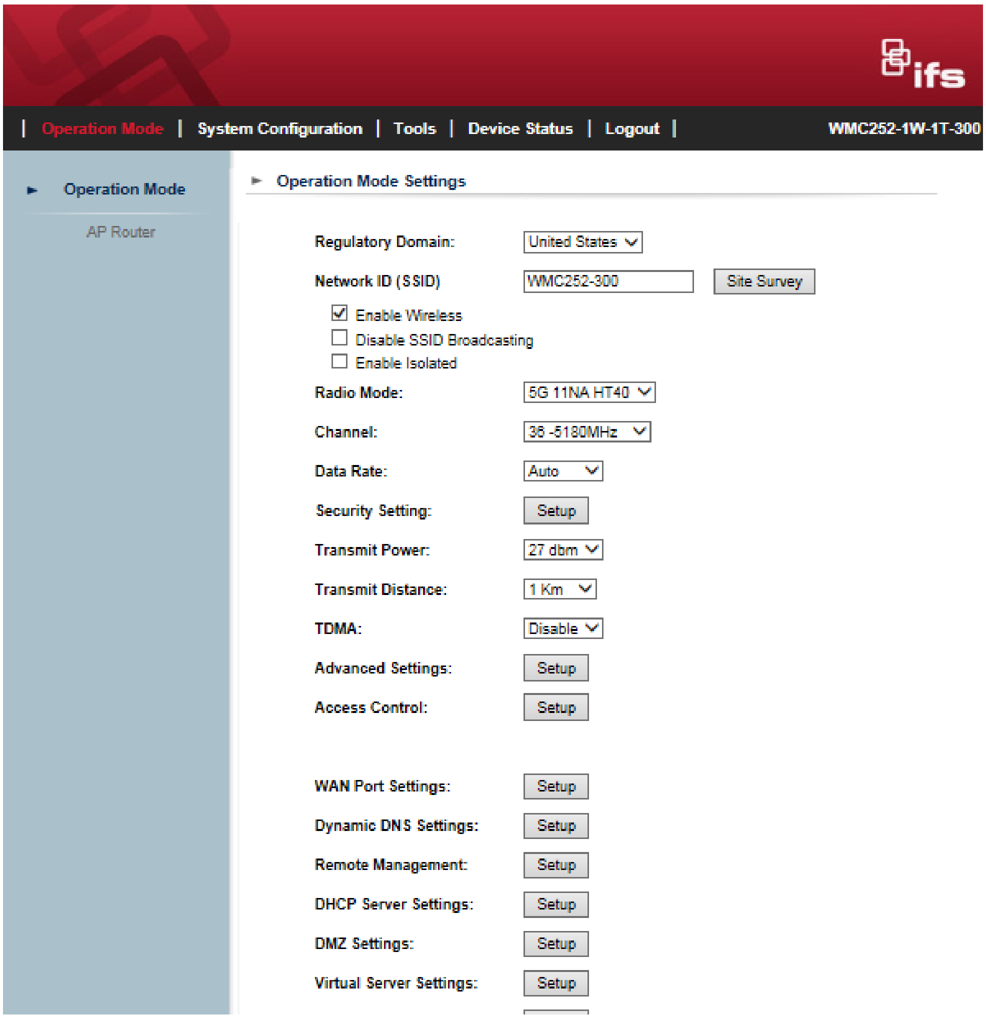
Regulatory Domain: United States
Remote AP SSID: WMC252-300 [Site Survey]
☑ Enable Wireless
☐ Disable SSID Broadcasting
☐ Enable Isolated
Lock to AP MAC: 00:00:00:00:00:00
Radio Mode: 5G 11NA HT40
Channel: Auto Channel
Data Rate: Auto
Security Setting: [Setup]
Transmit Power: 27 dbm
Transmit Distance: 1 Km
TDMA: Disable
Advanced Settings: [Setup]
Access Control: [Setup]

[Save & Restart]

Figure 5-6 Basic Settings – WDS Client

5.1.5 AP Router

Click “**Operation Mode**” → “**AP Router**” and the following page will be displayed. This section allows you to configure the AP Router mode.


ifs
| Operation Mode | System Configuration | Tools | Device Status | Logout |
WMC252-1W-1T-300
► Operation Mode
AP Router
► Operation Mode Settings
Site Survey
Setup

Regulatory Domain: United States

Network ID (SSID) WMC252-300

☑ Enable Wireless

☐ Disable SSID Broadcasting

☐ Enable Isolated

Radio Mode: 5G 11NA HT40

Channel: 36 -5180MHz

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

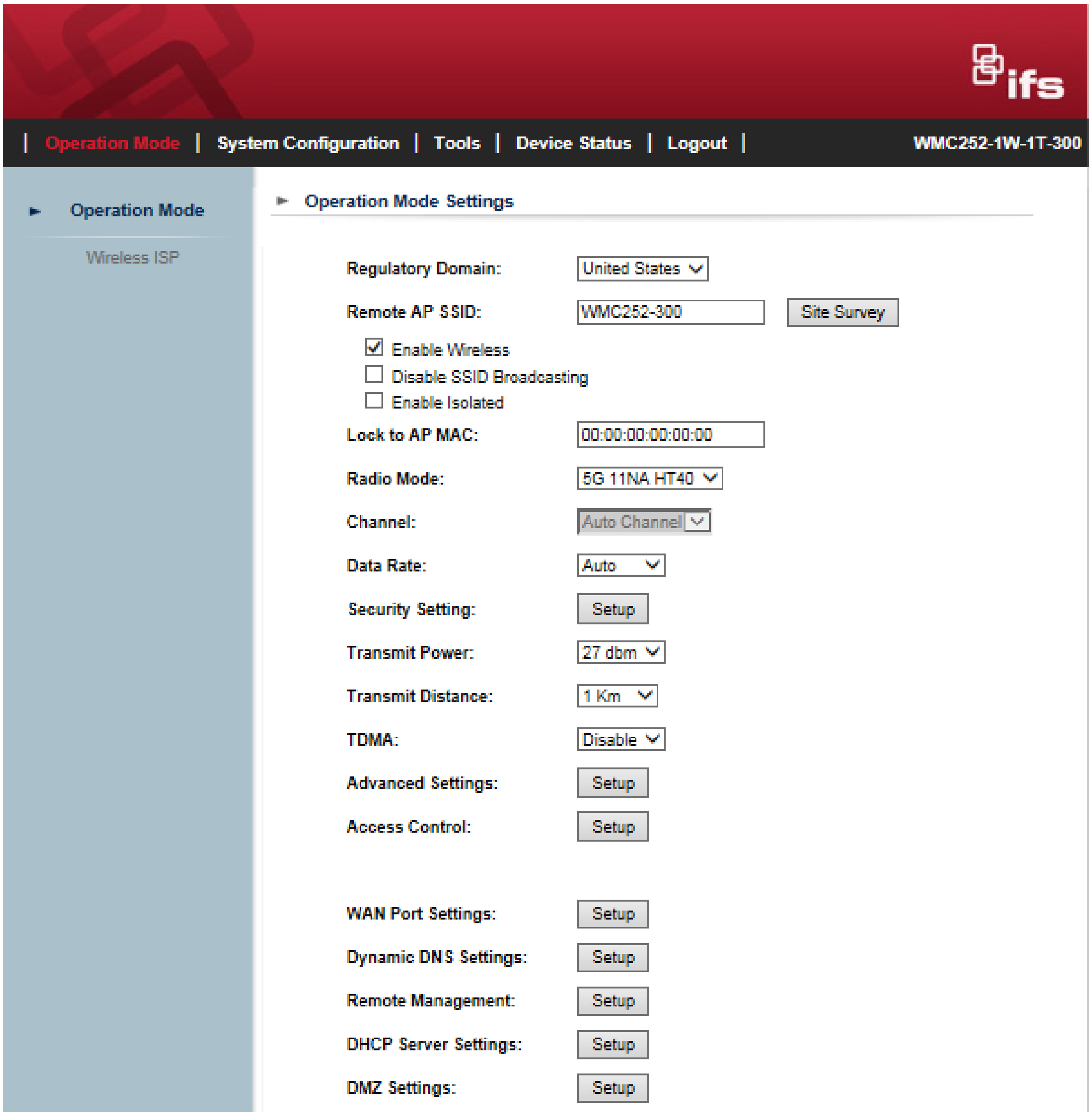
DMZ Settings: Setup

Virtual Server Settings: Setup

Figure 5-7 Basic Settings – AP Router

5.1.6 Wireless ISP

Click “**Operation Mode**” → “**Wireless ISP**” and the following page will be displayed. This section allows you to configure the Wireless ISP mode.


ifs
| Operation Mode | System Configuration | Tools | Device Status | Logout |
WMC252-1W-1T-300
► Operation Mode
Wireless ISP
► Operation Mode Settings

Regulatory Domain: United States

Remote AP SSID: WMC252-300 [Site Survey]

☑ Enable Wireless

□ Disable SSID Broadcasting

□ Enable Isolated

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

Radio Mode: 5G 11NA 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]

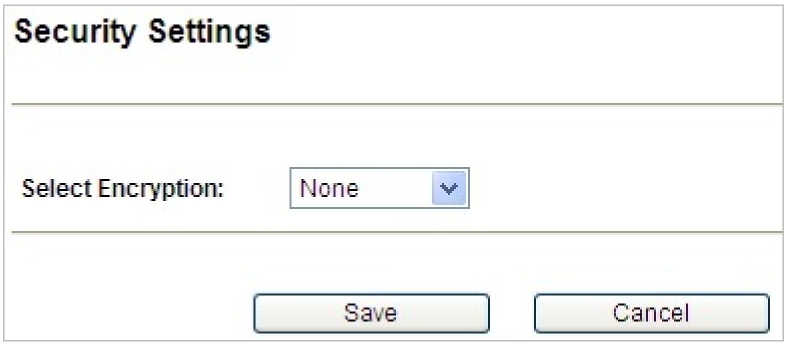
DHCP Server Settings: [Setup]

DMZ Settings: [Setup]

Figure 5-8 Basic Settings – WISP

5.1.7 Security Setting

Choose the operation mode you required, and then enter "**Security Setting**" by clicking the **Setup** button next to it and the following page will be displayed. This section allows you to configure the wireless security settings.



Security Settings

Select Encryption: None

Figure 5-9 Security Settings

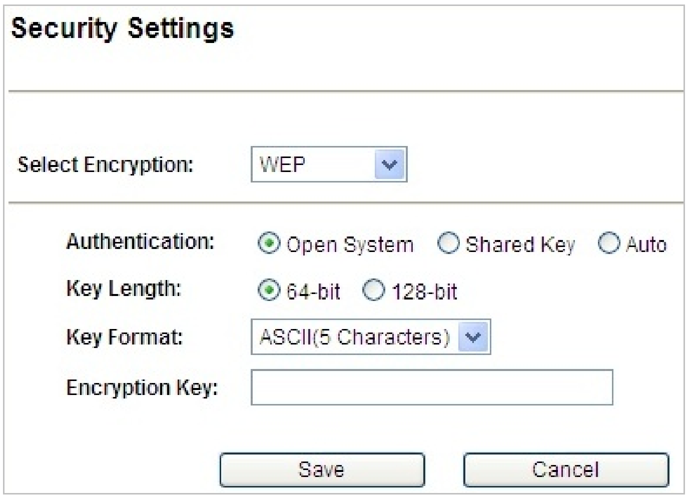
Object	Description
• **Select Encryption**	Select the encryption that you need. **None:** No security required **WEP:** Input 5, 13 (ASCII) or 10, 26 (HEX) character for WEP key. **WPA:** Enter ASCII characters between 8 and 63 character or 8 to 64 hexadecimal characters. **WPA2:** Enter ASCII characters between 8 and 63 character or 8 to 64 hexadecimal characters. **WPA-Mixed:** Enter ASCII characters between 8 and 63 character or 8 to 64 hexadecimal characters.

■ **None**

Authentication is disabled and no password/key is required to connect to the access point.

■ **WEP**

WEP (Wired Equivalent Privacy) is a basic encryption. For a higher level of security consider using the WPA encryption.



Security Settings

Select Encryption: WEP

Authentication: ● Open System ○ Shared Key ○ Auto

Key Length: ● 64-bit ○ 128-bit

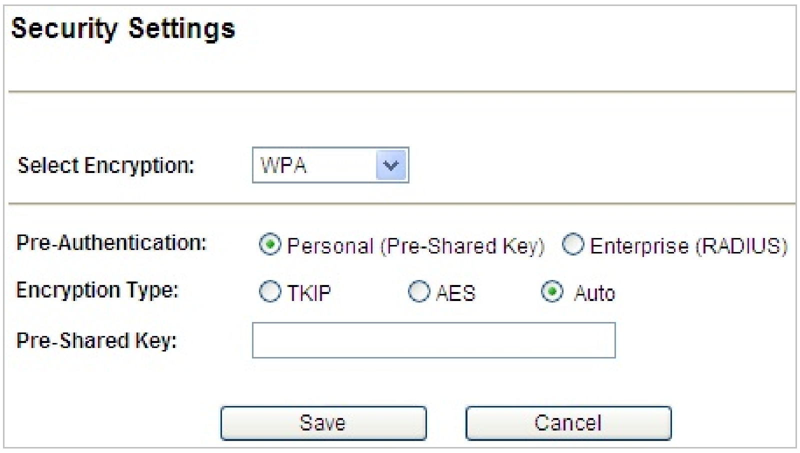
Key Format: ASCII(5 Characters)

Encryption Key:

Figure 5-10 Security Settings – WEP

Object	Description
• **Authentication**	You can select **Open System**, **Shared Key** or **Auto**.
• **Key Length**	Choose the WEP key length. You can choose **64-bit** or **128-bit**.
• **Key Format**	You can choose **ASCII** or **Hex**.
• **Encryption Key**	Enter the keys in the fields.

- **WPA**



Security Settings

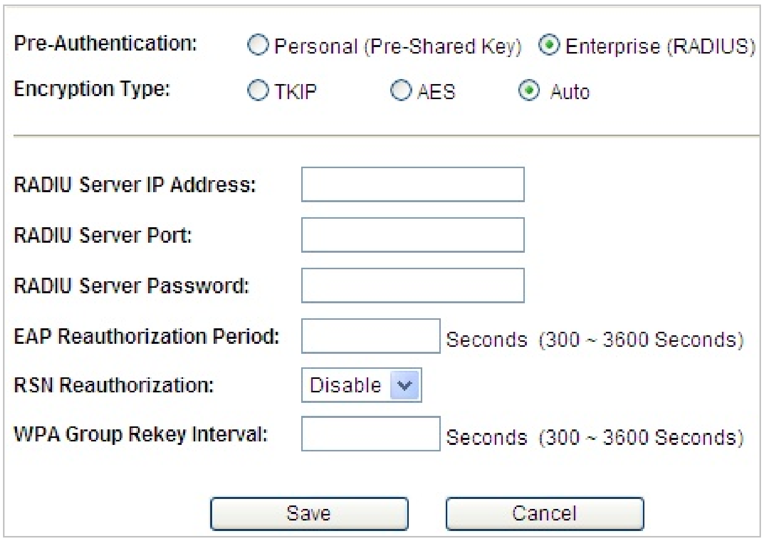
Select Encryption: WPA

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

Encryption Type: ○ TKIP ○ AES ● Auto

Pre-Shared Key:

Figure 5-11 Security Settings – WPA Personal



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

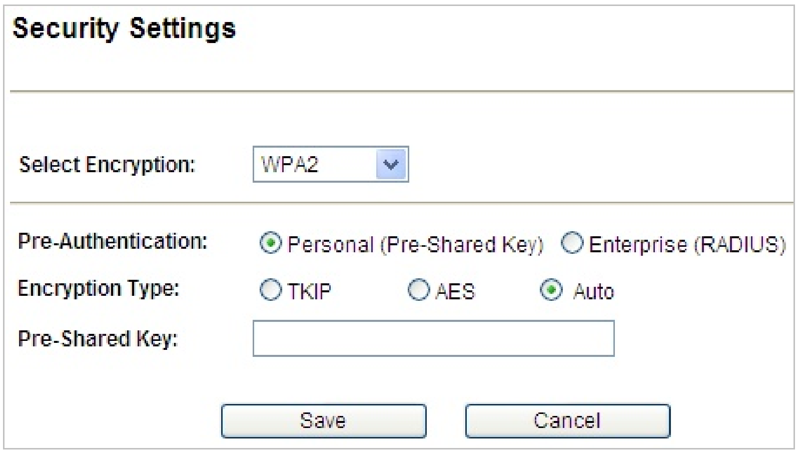
WPA Group Rekey Interval: Seconds (300 ~ 3600 Seconds)

Figure 5-12 Security Settings – WPA Enterprise

Object	Description
• **Pre-Authentication**	Select "**Personal (Pre-Shared Key)**" or "**Enterprise (RADIUS)**" encryption type.
• **Encryption Type**	Set the WPA to be **TKIP**, **AES** or **Auto**.
• **Pre-Shared Key**	Enter the keys in the fields.
• **RADIU Server IP Address**	Enter the RADIUS server host IP address.
• **RADIU Server Port**	Set the UDP port used in the authentication protocol of the RADIUS server. Value must be between 1 and 65535.
• **RADIU Server Password**	Enter a shared secret/password between 1 and 99 characters in length.
• **EAP Reauthorization Period**	Set duration of session timeout in seconds between 300 and 3600.
• **RSN Reauthorization**	Enable or disable RSN reauthorization.
• **WPA Group Re-key Interval**	Set duration of session timeout in seconds between 300 and 3600.

- **WPA2**

Please refer to WPA for more information.



Security Settings

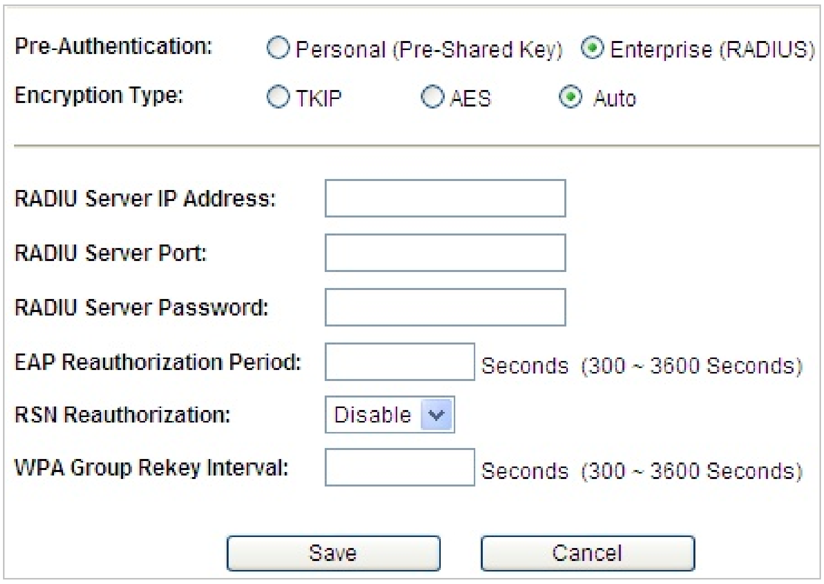
Select Encryption: WPA2

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

Encryption Type: ○ TKIP ○ AES ● Auto

Pre-Shared Key:

Figure 5-13 Security Settings – WPA2 Personal



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)

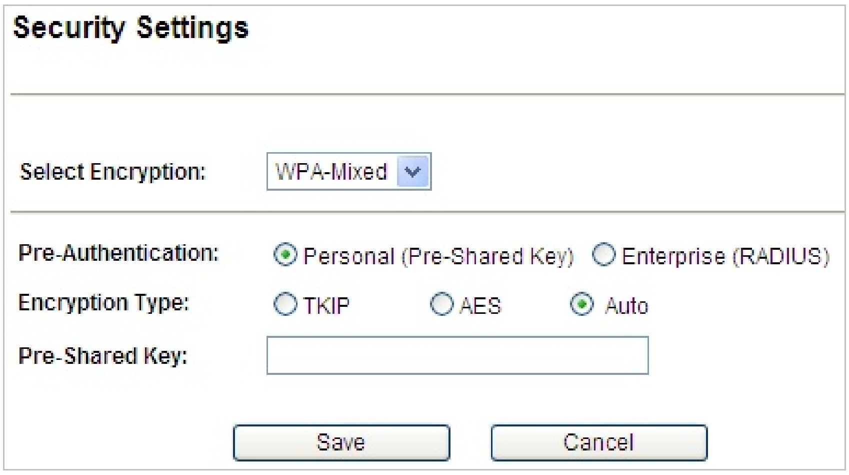
RSN Reauthorization: Disable

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

Figure 5-14 Security Settings – WPA2 Enterprise

■ WPA-Mixed

Please refer to WPA for more information.



Security Settings

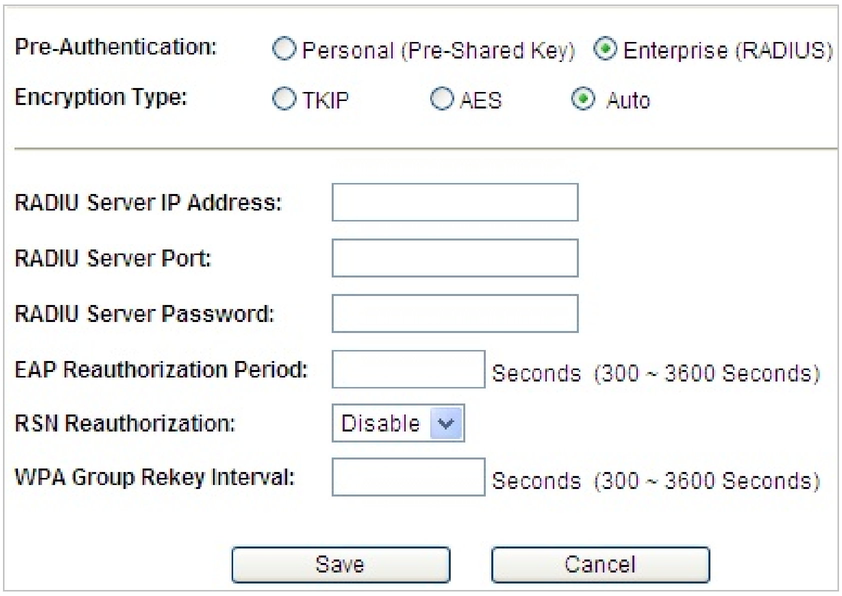
Select Encryption: WPA-Mixed

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

Encryption Type: ○ TKIP ○ AES ● Auto

Pre-Shared Key:

Figure 5-15 Security Settings – WPA-Mixed Personal



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)

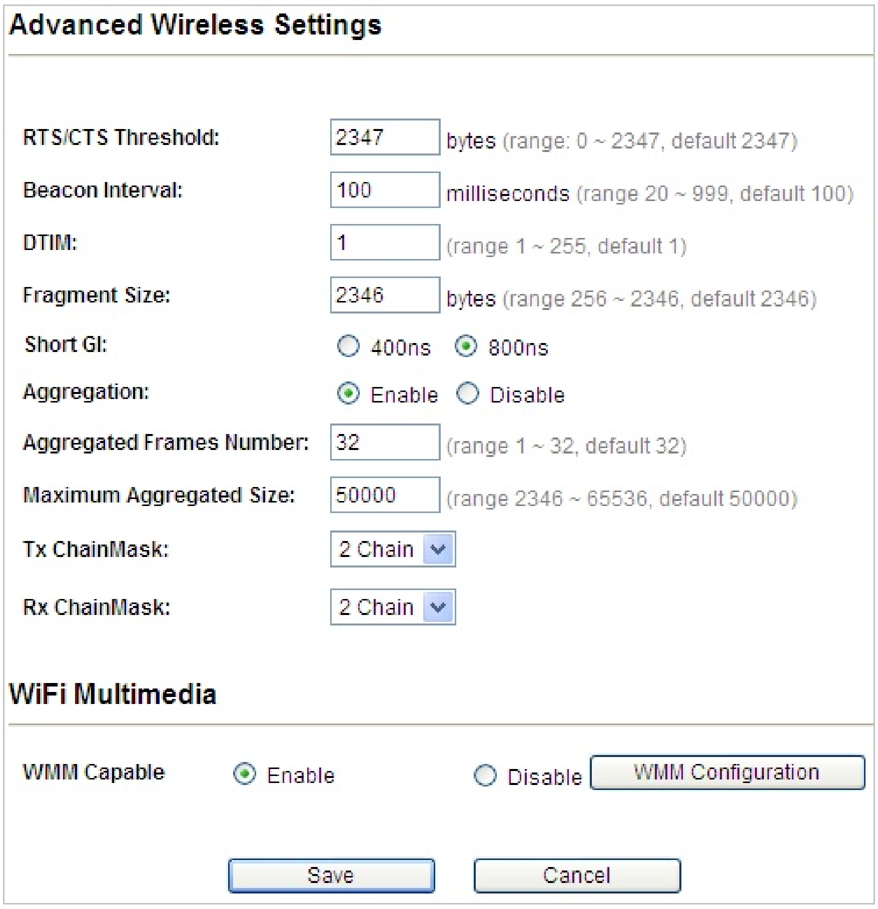
RSN Reauthorization: Disable

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

Figure 5-16 Security Settings – WPA-Mixed Enterprise

5.1.8 Advanced Settings

Choose the operation mode you require, and then enter “**Advanced Settings**” by clicking the **Setup** button next to it and the following page will be displayed. This section allows you to configure the wireless 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	

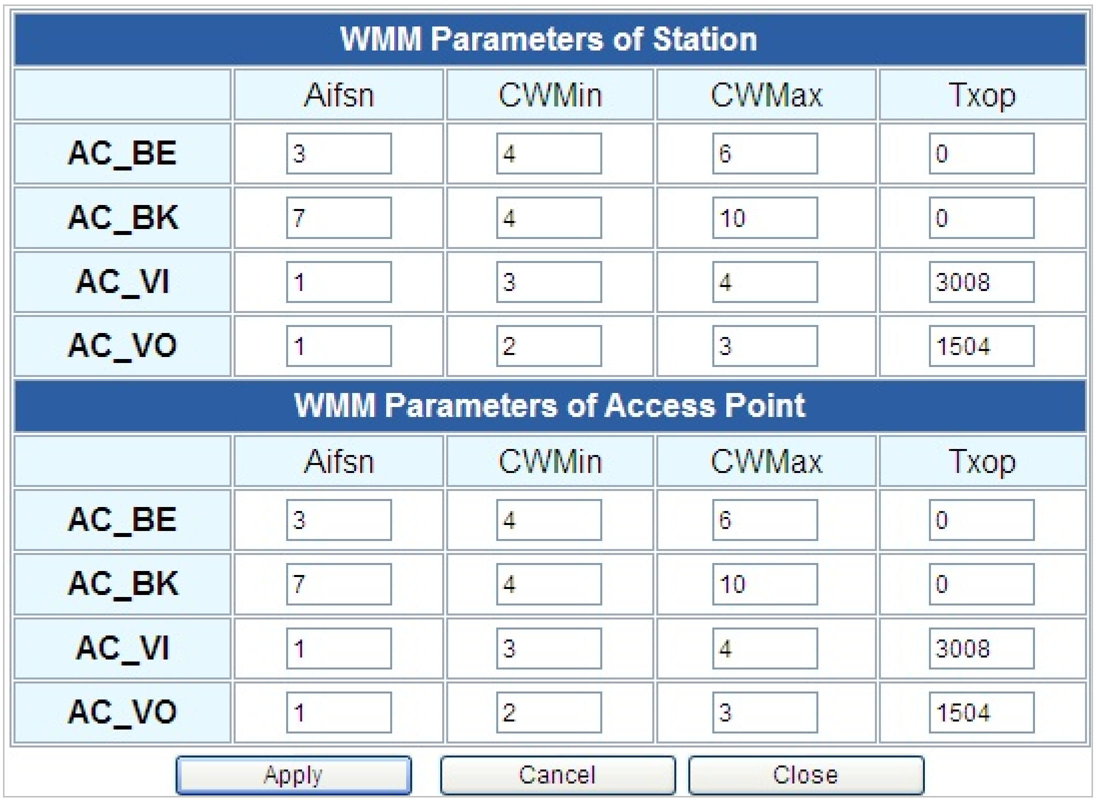
WiFi Multimedia

WMM Capable ● Enable ○ Disable

Figure 5-17 Advanced Settings

Object	Description
• **RTS/CTS Threshold**	When the length of a data packet exceeds this value, the router will send an RTS frame to the destination wireless node, and the latter will reply with a CTS frame, and thus they are ready to communicate. The default value is 2347.
• **Beacon Interval**	Set beacon interval, the value range is from 20 to 999. The default value is 100.
• **DTIM**	Set the DTIM (delivery traffic indication message) period value of the wireless radio. The default value is 1.
• **Fragment Size**	A data packet that exceeds this value in length will be divided into multiple packets. The number of packets influences wireless network performance. Avoid setting this value low. Default at 2346.

• **Short GI**	Guard intervals are used to ensure that distinct transmissions do not interfere with one another. Only effect under Mixed Mode.
• **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 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.
• **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 (WMM) is a Wi-Fi Alliance interoperability certification based on the IEEE 802.11e standard, which provides Quality of Service (QoS) features to IEE 802.11 networks. WMM prioritizes traffic according to four categories: background, best effort, video and voice.



WMM Parameters of Station

	Aifsn	CWMin	CWMax	Txop
AC_BE	3	4	6	0
AC_BK	7	4	10	0
AC_VI	1	3	4	3008
AC_VO	1	2	3	1504

WMM Parameters of Access Point

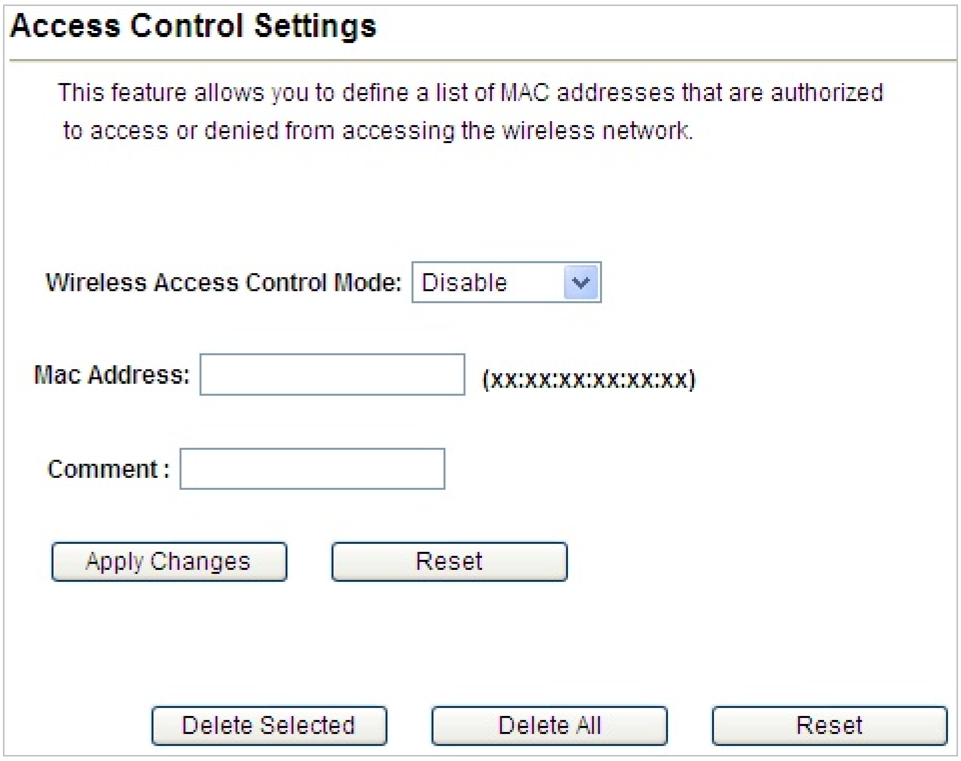
	Aifsn	CWMin	CWMax	Txop
AC_BE	3	4	6	0
AC_BK	7	4	10	0
AC_VI	1	3	4	3008
AC_VO	1	2	3	1504

Figure 5-18 WMM Configuration

WMM Capable	
BE	Traditional IP data, medium throughput and delay.
BK	High throughput, non time sensitive bulk data e.g. FTP
VI	Time sensitive video data with minimum time delay.
VO	Time sensitive data such as VoIP and streaming media with minimum time delay.
AIFS, Interlogixn	Arbitration Inter-Frame Space (milliseconds): Specifies additional time between when a channel goes idle and the AP/client sends data frames. Traffic with a lower AIFS, INTERLOGIXN value has a higher priority.
CWMin	Maximum Contention Window (milliseconds): This value is the upper limit to random backoff value doubling (see above).
CWMax	Arbitration Inter-Frame Space (milliseconds): Specifies additional time between when a channel goes idle and the AP/client sends data frames. Traffic with a lower AIFS, INTERLOGIXN value has a higher priority.
Txop	Transmission Opportunity (milliseconds): The maximum interval of time an AP/client can transmit. This makes channel access more efficiently prioritized. A value of 0 means only one frame per transmission. A greater value effects higher priority.

5.1.9 Access Control

Choose the operation mode you require, and then enter “**Access Control**” by clicking the **Setup** button next to it and the following page will be displayed. This section allows you to configure the wireless access control settings.



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 :

Figure 5-19 Access Control

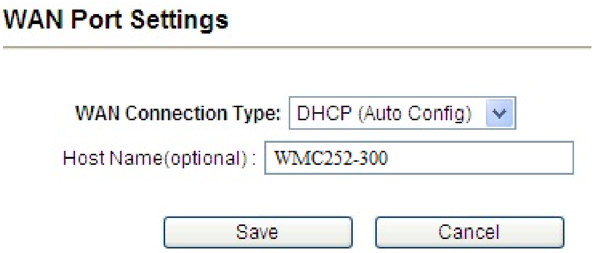
Object	Description
Wireless Access Control Mode	You can choose “**Disable**”, “**Allow Listed**” or “**Deny Listed**”.
Mac Address	The MAC address to be filtered.
Comment	Enter a comment of this setting.

5.1.10 WAN Port Settings

Click “**Operation Mode**” → “**AP Router**” or “**Wireless ISP**” and then enter the “**WAN Port Settings**” by clicking the **Setup** button next to it. This section allows you to configure the internet connection settings.

- **DHCP (Auto Config)**

Choose “**DHCP**” and the router will automatically obtain IP addresses, subnet masks and gateway addresses from your ISP.



WAN Port Settings

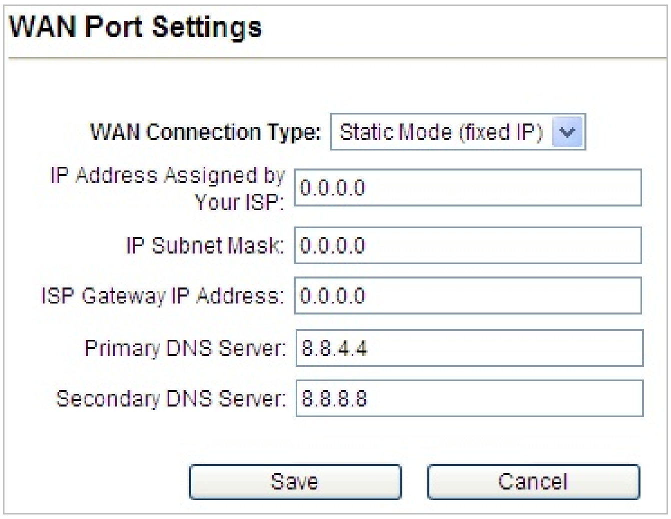
WAN Connection Type: DHCP (Auto Config)

Host Name(optional) : WMC252-300

Figure 5-20 WAN Port Settings – DHCP

- **Static Mode (Fixed IP)**

If your ISP offers you static IP Internet connection type, select “**Static Mode**" and then enter IP address, subnet mask, primary DNS and secondary DNS information provided by your ISP in the corresponding fields.



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

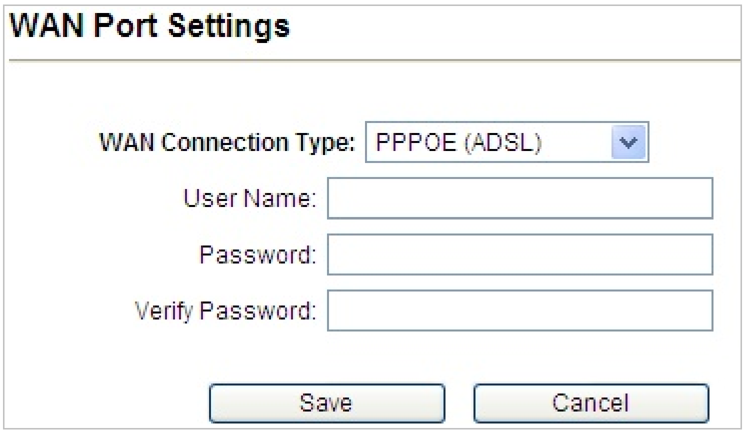
Figure 5-21 WAN Port Settings – Static IP

Object	Description
• **IP Address Assigned by Your ISP**	Enter the WAN IP address provided by your ISP. Enquire your ISP if you are not clear.
• **IP Subnet Mask**	Enter WAN Subnet Mask provided by your ISP.
• **ISP Gateway IP Address**	Enter the WAN Gateway address provided by your ISP.

• **Primary DNS Server**	Enter the necessary DNS address provided by your ISP. Default is 8.8.4.4.
• **Secondary DNS Server**	Enter the other DNS address if your ISP provides you with 2 such addresses. Default is 8.8.8.8.

■ PPPOE (ADSL)

Select **PPPOE** if your ISP is using a PPPoE connection and provide you with PPPoE user name and password info.



WAN Port Settings

WAN Connection Type: PPPOE (ADSL)

User Name:

Password:

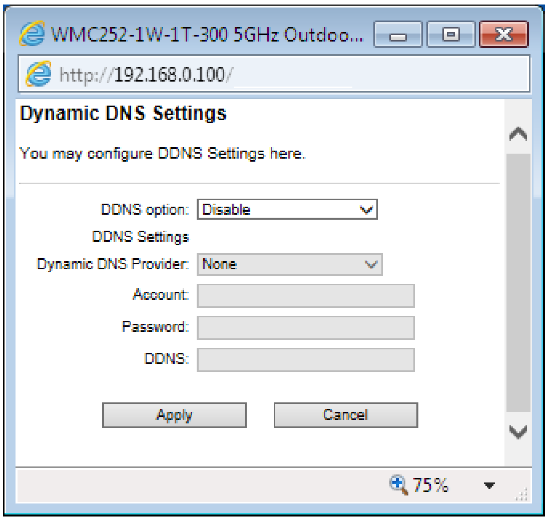
Verify Password:

Figure 5-22 WAN Port Settings – PPPOE

Object	Description
• **User Name**	Enter the User Name provided by your ISP.
• **Password**	Enter the password provided by your ISP.
• **Verify Password**	Enter the password again to verify if it is correct.

5.1.11 Dynamic DNS Settings

Click “**Operation Mode**” → “**AP Router**” or “**Wireless ISP**” and then enter the “**Dynamic DNS Settings**” by clicking the **Setup** button next to it. This section allows you to configure the DDNS settings.



Dynamic DNS Settings

You may configure DDNS Settings here.

DDNS option: Disable

DDNS Settings

Dynamic DNS Provider: None

Account:

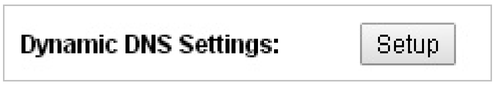
Password:

DDNS:

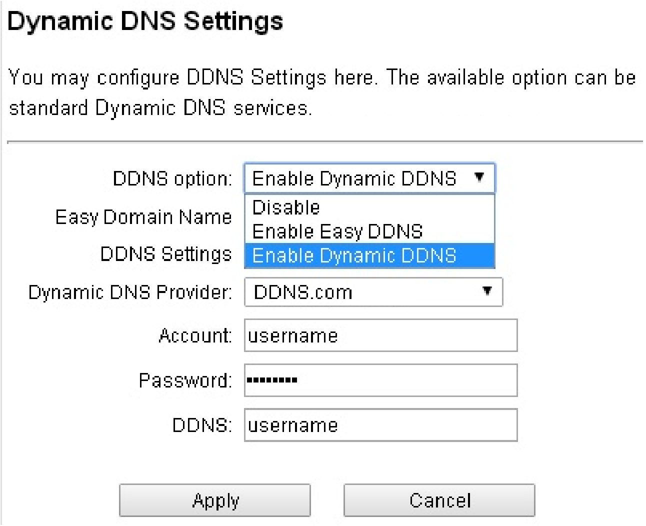
Figure 5-23 Dynamic DNS Settings

Object	Description
- **DDNS option**	**Disable:** Disable DDNS function **Enable Easy DDNS:** Enable “www.yourddns.com” DDNS **Enable Dynamic DDNS:** You are allowed to modify the DDNS settings.
- **Dynamic DNS Provider**	Select a server provider or disable the existing server.
- **Account**	Enter the DDNS user name of the DDNS account.
- **Password**	Enter the DDNS password of the DDNS account.
- **DDNS**	Enter the host name or domain name provided by DDNS provider.

Click “**Operation Mode**” → “**AP Router**” or “**Wireless ISP**”, select **Dynamic DNS Settings** and press “**Setup**”.



Step 1. Select “**Enable Dynamic DDNS**” from the list.



Dynamic DNS Settings

You may configure DDNS Settings here. The available option can be standard Dynamic DNS services.

DDNS option: Enable Dynamic DDNS

Easy Domain Name

DDNS Settings

Dynamic DNS Provider: DDNS.com

Account: username

Password: ••••••••

DDNS: username

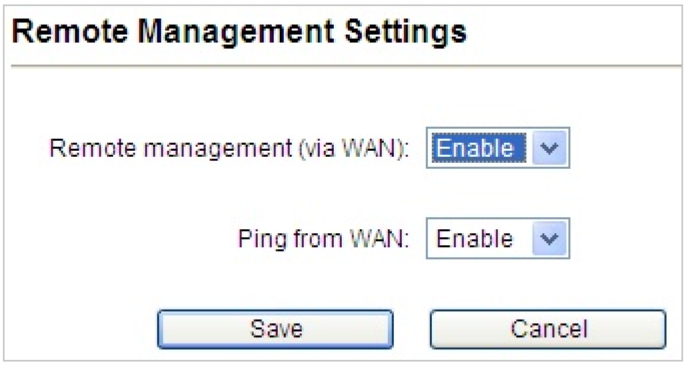
Step 2. Configure the DDNS account that has been registered in a DDNS website.

Account: Enter your DDNS host (format: xxxddns.com, xxx is the registered domain name)

Password: Enter the password of your account.

DDNS: Enter your DDNS host again.

Step 3. Go to “**Remote Management**” to enable remote access from WAN port.

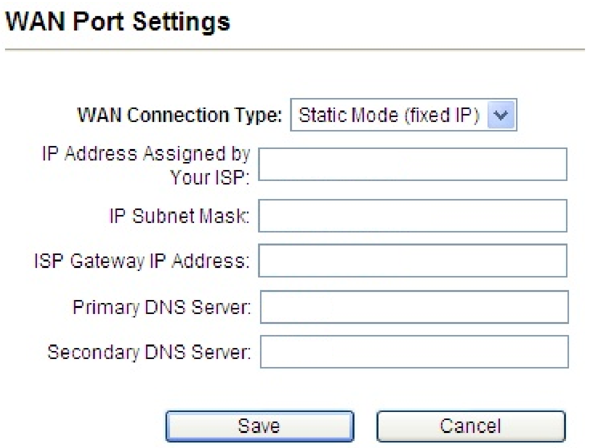


Remote Management Settings

Remote management (via WAN): Enable

Ping from WAN: Enable

Step 4. Go to “**WAN Port Settings**” to configure WAN connection to Static Mode (fixed IP).



WAN Port Settings

WAN Connection Type: Static Mode (fixed IP)

IP Address Assigned by Your ISP:

IP Subnet Mask:

ISP Gateway IP Address:

Primary DNS Server:

Secondary DNS Server:

Step 5. Save the setting and connect your WAN port of the Wireless AP to the internet via Ethernet cable. In a remote computer, enter the DDNS host name as the figure shown below. Then, you should be able to login the WMC252-300 remotely.

Example of Easy DDNS Settings:

Note

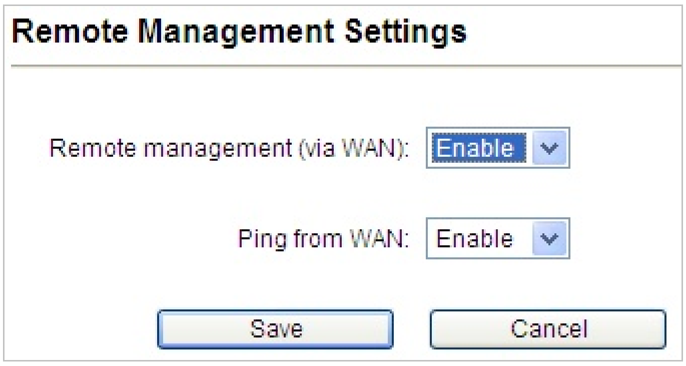
This service is not required to register any DDNS account.

Please refer to the procedure listed as follows to configure using a DDNS service.

Step 1. Select "**Enable Easy DDNS**" to use the DDNS service.

Easy Domain Name: Display the specified domain name for this device. (Format: xxxxxx.ddns.com, xxxxxx is the last six-digit of the WAN Port MAC address)

Step 2. Go to "**Remote Management**" to enable remote access from WAN port.

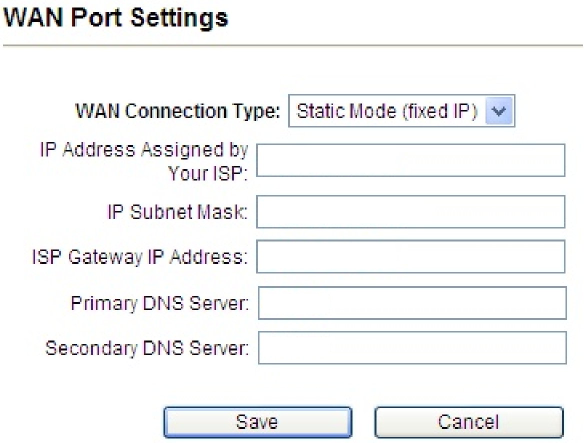


Remote Management Settings

Remote management (via WAN): Enable

Ping from WAN: Enable

Step 3. Go to "**WAN Port Settings**" to configure WAN connection to Static Mode (fixed IP).



WAN Port Settings

WAN Connection Type: Static Mode (fixed IP)

IP Address Assigned by Your ISP:

IP Subnet Mask:

ISP Gateway IP Address:

Primary DNS Server:

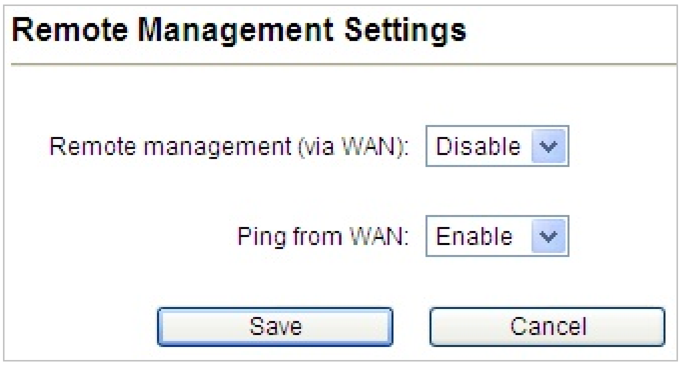
Secondary DNS Server:

Step 6. Save the setting and connect your WAN port of the Wireless AP to the internet via Ethernet cable. In a remote computer, enter the Easy Domain Name displayed in **Step 1**. Then, you should be able to login the

WMC252-300 remotely.

5.1.12 Remote Management

Click "**Operation Mode**" → "**AP Router**" or "**Wireless ISP**" and then enter the "**Remote Management**" by clicking the **Setup** button next to it. This section allows you to enable or disable the remote management through the WAN port.


Remote Management Settings

Remote management (via WAN): Disable

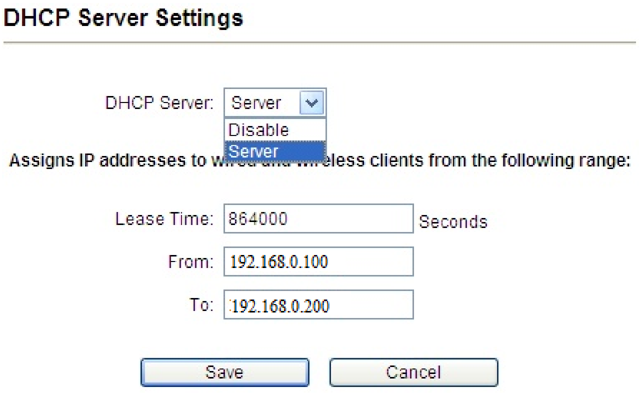
Ping from WAN: Enable

Figure 5-24 Remote Management

Object	Description
• **Remote management (via WAN)**	Enable or Disable this function.
• **Ping from WAN**	Enable or Disable this function.

5.1.13 DHCP Server Settings

Click "**Operation Mode**" → "**AP Router**" or "**Wireless ISP**" and then enter the "**DHCP Server Settings**" by clicking the **Setup** button next to it. This section allows you to configure the DHCP server.


DHCP Server Settings

DHCP Server: Server

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

Lease Time: 864000 Seconds

From: 192.168.0.100

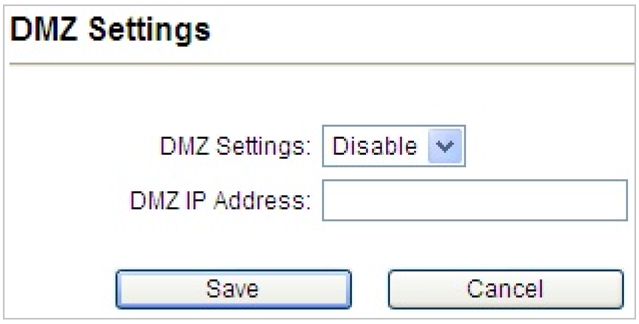
To: 192.168.0.200

Figure 5-25 DHCP Server Settings

Object	Description
• **DHCP Server**	Select as DHCP server or disable the function.
• **Lease Time**	Select the time for using one assigned IP from the dropdown list. After the lease time, the AP automatically assigns new IP addresses to all connected computers.
• **From**	The start IP address of all the available successive IPs.
• **To**	The end IP address of all the available successive IPs.

5.1.14 DMZ Settings

Click "**Operation Mode**" → "**AP Router**" or "**Wireless ISP**" and then enter the "**DMZ Settings**" by clicking the **Setup** button next to it. This section allows you to configure the DMZ server.


DMZ Settings

DMZ Settings: Disable

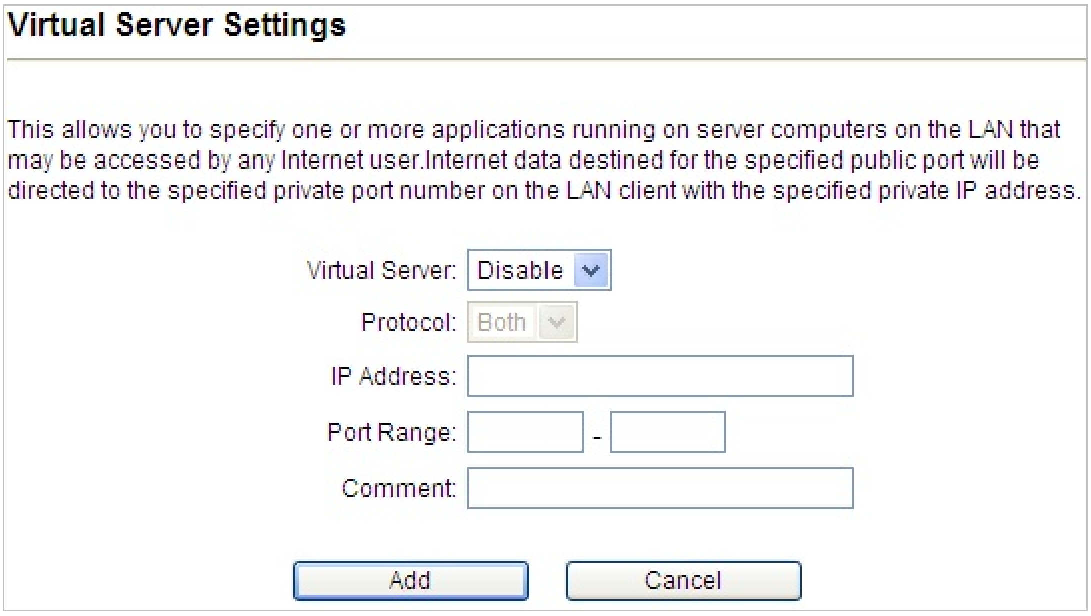
DMZ IP Address:

Figure 5-26 DMZ Settings

Object	Description
• **DMZ Setting**	Disable or Enable DMZ function.
• **DMZ IP Address**	Enter the DMZ IP address.

5.1.15 Virtual Server Settings

Click "**Operation Mode**" → "**AP Router**" or "**Wireless ISP**" and then enter the "**Virtual Server Settings**" by clicking the **Setup** button next to it. This section allows you to configure the virtual server.



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: -

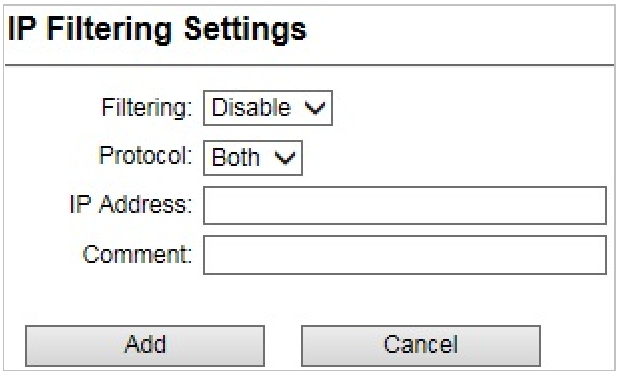
Comment:

Figure 5-27 Virtual Server Settings

Object	Description
• **Virtual Server**	Enable or disable Virtual Server.
• **Protocol**	You can choose TCP, UDP or Both.
• **IP Address**	Enter the LAN IP.
• **Port Range**	Set the range of public port.
• **Comment**	Set a name for the rule.

5.1.16 IP Filtering Settings

Click "**Operation Mode**" → "**AP Router**" or "**Wireless ISP**" and then enter the "**IP Filtering Settings**" by clicking the **Setup** button next to it. This section allows you to configure the IP filtering settings.



IP Filtering Settings

Filtering: Disable

Protocol: Both

IP Address:

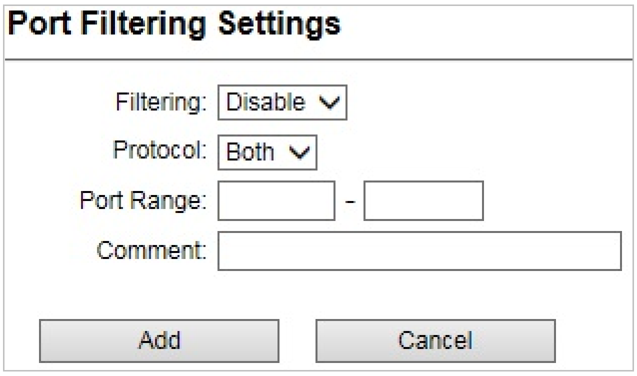
Comment:

Figure 5-28 IP Filtering Settings

Object	Description
• **Filtering**	Enable or disable IP Filtering.
• **Protocol**	You can choose TCP, UDP or Both.
• **IP Address**	Enter the IP address to be filtered.
• **Comment**	Set a name for the rule.

5.1.17 Port Filtering Settings

Click "**Operation Mode**" → "**AP Router**" or "**Wireless ISP**" and then enter the "**Port Filtering Settings**" by clicking the **Setup** button next to it. This section allows you to configure the port filtering settings.



Port Filtering Settings

Filtering: Disable

Protocol: Both

Port Range: -

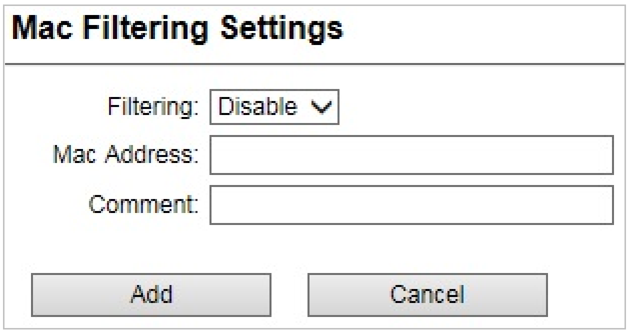
Comment:

Figure 5-29 Port Filtering Settings

Object	Description
• **Filtering**	Enable or disable IP Filtering.
• **Protocol**	You can choose TCP, UDP or Both.
• **Port Range**	Enter the range of Port to be filtered.
• **Comment**	Set a name for the rule.

5.1.18 MAC Filtering Settings

Click “**Operation Mode**” → “**AP Router**” or “**Wireless ISP**” and then enter the “**Mac Filtering Settings**” by clicking the **Setup** button next to it. This section allows you to configure the MAC filtering settings.



Mac Filtering Settings

Filtering: Disable

Mac Address:

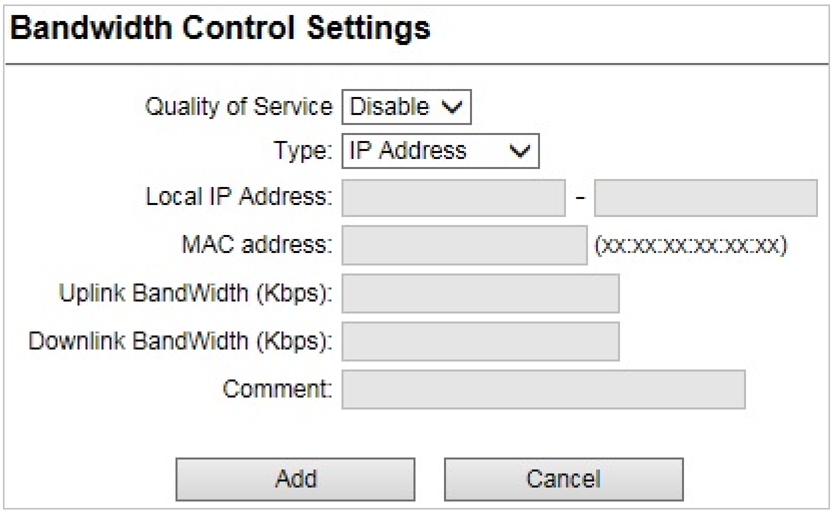
Comment:

Figure 5-30 Mac Filtering Settings

Object	Description
• **Filtering**	Enable or disable Mac Filtering.
• **Mac Address**	Enter the Mac address to be filtered.
• **Comment**	Set a name for the rule.

5.1.19 Bandwidth Control

Click “**Operation Mode**” → “**AP Router**” or “**Wireless ISP**” and then enter the “**Bandwidth Control**” by clicking the **Setup** button next to it. This section allows you to configure the bandwidth control.



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):

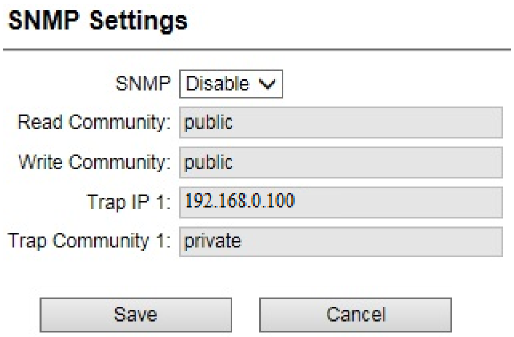
Comment:

Figure 5-31 Bandwidth Control Settings

Object	Description
• **Quality of Service**	Enable or disable the QoS service.
• **Type**	Select QoS type **IP Address** or **Mac Address**.
• **Local IP Address**	The IP address segment which uses this QoS rule.
• **MAC Address**	The Mac address which uses this QoS rule.
• **Uplink BandWidth (Kbps)**	Set the maximum uplink bandwidth allowed by the listed QoS rules.
• **Downlink BandWidth (Kbps)**	Set the maximum downlink bandwidth allowed by the listed QoS rules.
• **Comment**	Set a name for the rule.

5.1.20 SNMP

Click “**Operation Mode**” → “**AP Router**” or “**Wireless ISP**” and then enter the “**SNMP**” by clicking the **Setup** button next to it. This section allows you to configure the SNMP.


SNMP Settings

SNMP: Disable

Read Community: public

Write Community: public

Trap IP 1: 192.168.0.100

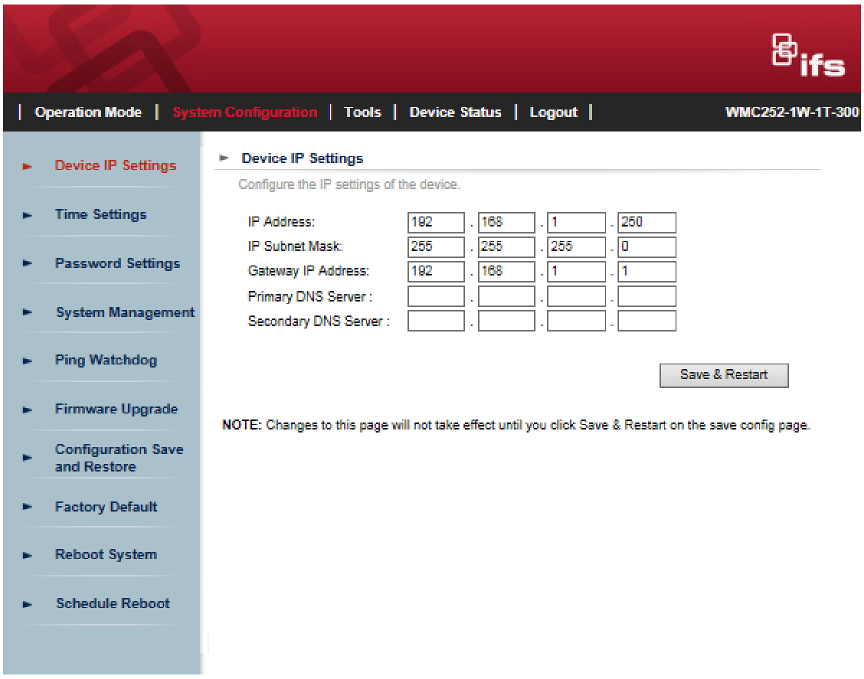
Trap Community 1: private

Figure 5-32 SNMP Settings

Object	Description
• **SNMP**	Enable or disable the SNMP service.
• **Read Community**	Enter a Read Community name for verification with the SNMP manager for SNMP Read requests.
• **Write Community**	Enter a Write Community name for verification with the SNMP manager for SNMP Write requests.
• **Trap IP 1**	Enter the Trap IP address.
• **Trap Community**	Enter an SNMP Trap Community name for verification with the SNMP manager for SNMP Trap requests.

5.2 System Configuration

On this page, you can configure the system of the WMC252-300, including IP settings, Time settings, Password settings, System management, Ping Watchdog, Firmware upgrade, Configuration save and restore, Factory default, Reboot and Schedule reboot.



Device IP Settings

Configure the IP settings of the device.

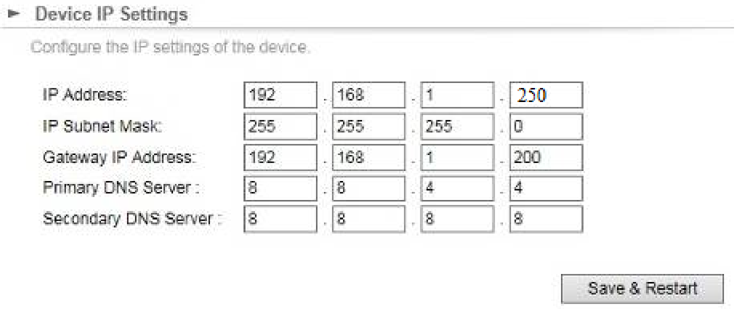
IP Address:	192	168	1	250
IP Subnet Mask:	255	255	255	0
Gateway IP Address:	192	168	1	1
Primary DNS Server :				
Secondary DNS Server :				

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

Figure 5-33 System Configuration default page

5.2.1 Default IP Settings

Click "**System Configuration**" → "**Device IP Settings**" and the following page will be displayed.



Device IP Settings

Configure the IP settings of the device.

IP Address:	192	168	1	250
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

Figure 5-34 Default IP Settings

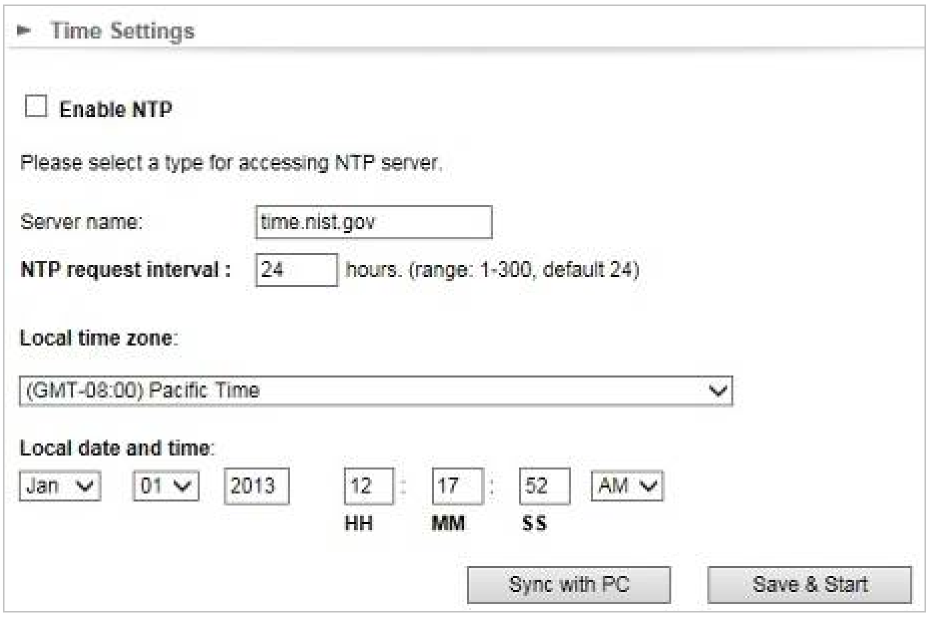
The page includes the following fields:

Object	Description
- **IP Address**	WMC252-300's LAN IP. The default is **192.168.0.100**. You can change it according to your needs.
- **IP Subnet Mask**	WMC252-300's LAN subnet mask.

• **Gateway IP Address**	The Gateway IP address of WMC252-300.
• **Primary DNS Server**	Enter the DNS server. The default is 8.8.4.4.
• **Secondary DNS Server**	Enter the DNS server. The default is 8.8.8.8.

5.2.2 Time Settings

Click “**System Configuration**” → “**Time Settings**” and the following page will be displayed.



► 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-08:00) Pacific Time

Local date and time:

Jan 01 2013 12 : 17 : 52 AM

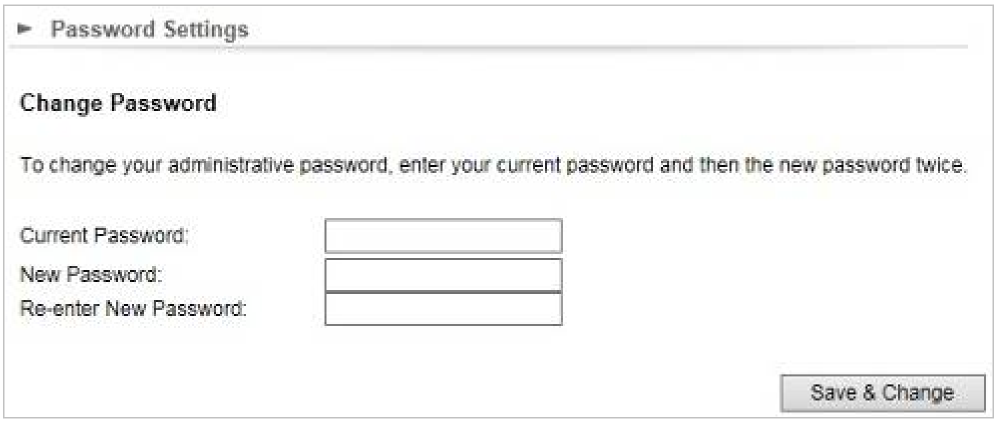
HH MM SS

Figure 5-35 Time Settings

Object	Description
• **Enable NTP**	Enable it to support NTP (Network Time Protocol) for automatic time and date setup.
• **Server Name**	Enter the host name or IP address of the time server if you wish.
• **NTP Request Interval**	Specify a frequency (in hours) for the access point to update/synchronize with the NTP server.
• **Local Time Zone**	Select the time zone of your country/region. If your country/region is not listed, please select another country/region whose time zone is the same as yours.
• **Local Date and Time**	Set the access point’s date and time manually.

5.2.3 Password Settings

Click “**System Configuration**” → “**Password Settings**” and the following page will be displayed.



► Password Settings

Change Password

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

Current Password:

New Password:

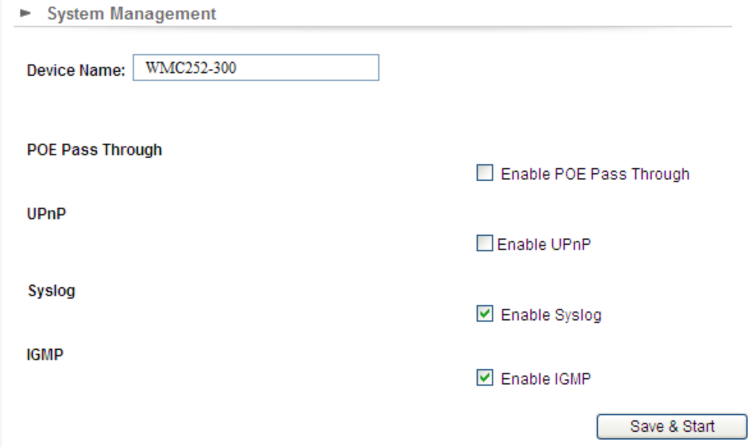
Re-enter New Password:

Figure 5-36 Password Settings

Object	Description
- **Current Password**	Set the access point’s administrator password. This is used to log in to the browser based on the configuration interface.
- **New Password**	Enter a new password.
- **Re-enter New Password**	Enter the new password again.

5.2.4 System Management

Click “**System Configuration**” → “**System Management**” and the following page will be displayed.



► System Management

Device Name: WMC252-300

POE Pass Through ☐ Enable POE Pass Through

UPnP ☐ Enable UPnP

Syslog ☑ Enable Syslog

IGMP ☑ Enable IGMP

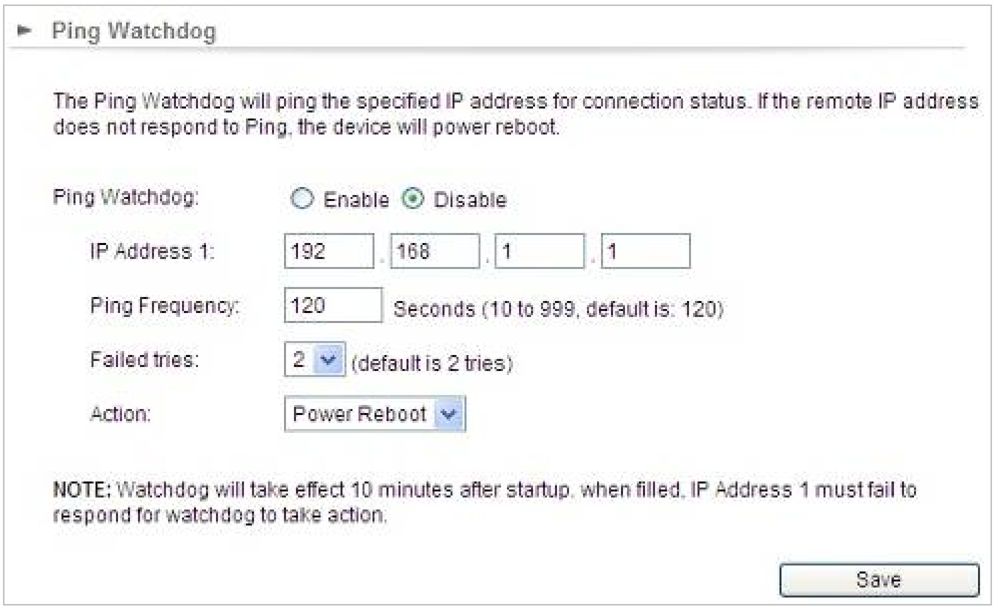
Figure 5-37 System Management

Object	Description
- **Device Name**	Enter a name for this access point. Default is **WMC252-300**.
- **POE Passthrough**	Enable the POE Passthrough function. ※ When the option “**Enable POE Passthrough**” in the System

	Management page is checked, the LAN2 can supply passive PoE power to the second WMC252-300.
• **UPnP**	Check to enable the UPnP function. The UPnP feature allows the devices, such as Internet computers, to access the local host resources or devices as needed. UPnP devices can be automatically discovered by the UPnP service application on the LAN. **This option is only available in AP Router mode.**
• **Syslog**	Check to enable Syslog function.
• **IGMP**	Check to enable the IGMP Proxy function. **This option is only available in AP Router mode.**

5.2.5 Ping Watchdog

Click "**System Configuration**" → "**Ping Watchdog**" and the following page will be displayed.



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

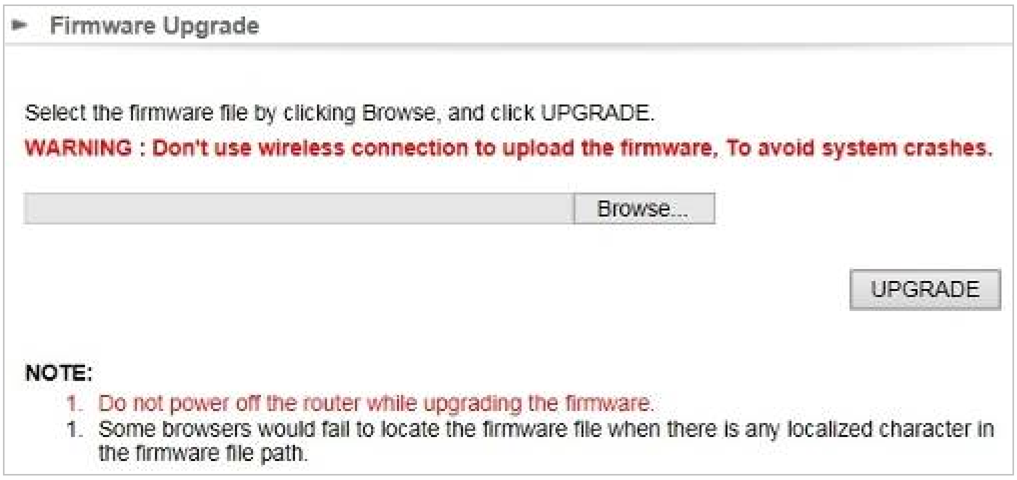
NOTE: Watchdog will take effect 10 minutes after startup, when filled, IP Address 1 must fail to respond for watchdog to take action.

Figure 5-38 Ping Watchdog

Object	Description
• **Ping Watchdog**	**Enable** or **Disable** this function.
• **IP Address 1**	Enter the IP address which pings every time interval
• **Ping Frequency**	Set times from 10 to 999.
• **Failed tries**	Select failed tries from 1 to 5.
• **Action**	System will reboot when failing to ping the IP.

5.2.6 Firmware Upgrade

Click “**System Configuration**” → “**Firmware Upgrade**” and the following page will be displayed.



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:

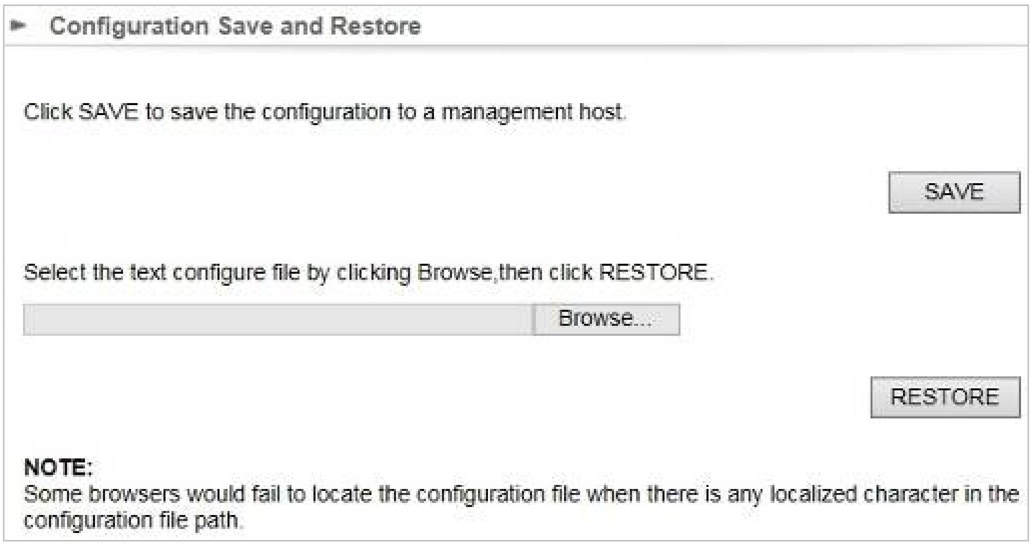
1. Do not power off the router while upgrading the firmware.
1. Some browsers would fail to locate the firmware file when there is any localized character in the firmware file path.

Figure 5-39 Firmware Upgrade

Object	Description
• **Browse**	Click **Browse** to select the firmware file and click **Upgrade** to upgrade the firmware.

5.2.7 Configuration Save and Restore

Click “**System Configuration**” → “**Configuration Save and Restore**” and the following page will be displayed.



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.

NOTE:
Some browsers would fail to locate the configuration file when there is any localized character in the configuration file path.

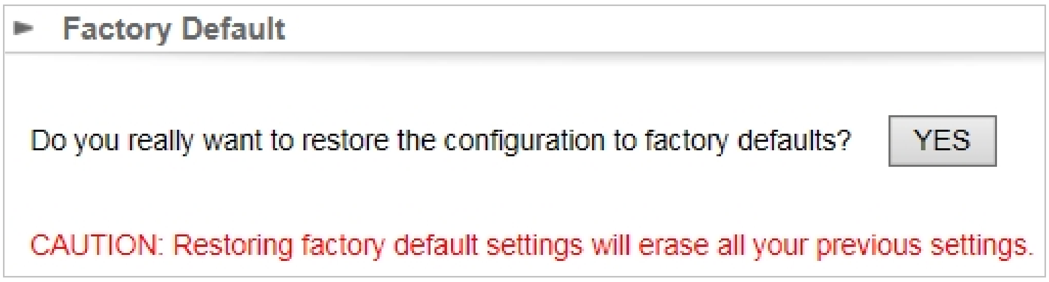
Figure 5-40 Configuration Save and Restore

Object	Description
• **SAVE**	Click **SAVE** to save the configuration to a management host.
• **Browse**	Click **Browse** to select the configuration file and click **Restore** to restore the configuration file.

5.2.8 Factory Default

Click “**System Configuration**” → “**Factory Default**” and the following page will be displayed.

Press **YES** to restore to factory default.



► Factory Default

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

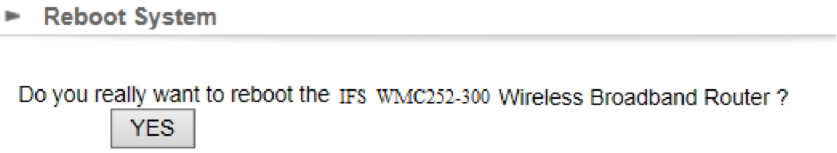
CAUTION: Restoring factory default settings will erase all your previous settings.

Figure 5-41 Factory Default

5.2.9 Reboot System

Click “**System Configuration**” → “**Reboot System**” and the following page will be displayed.

Press **YES** to reboot the system.



► Reboot System

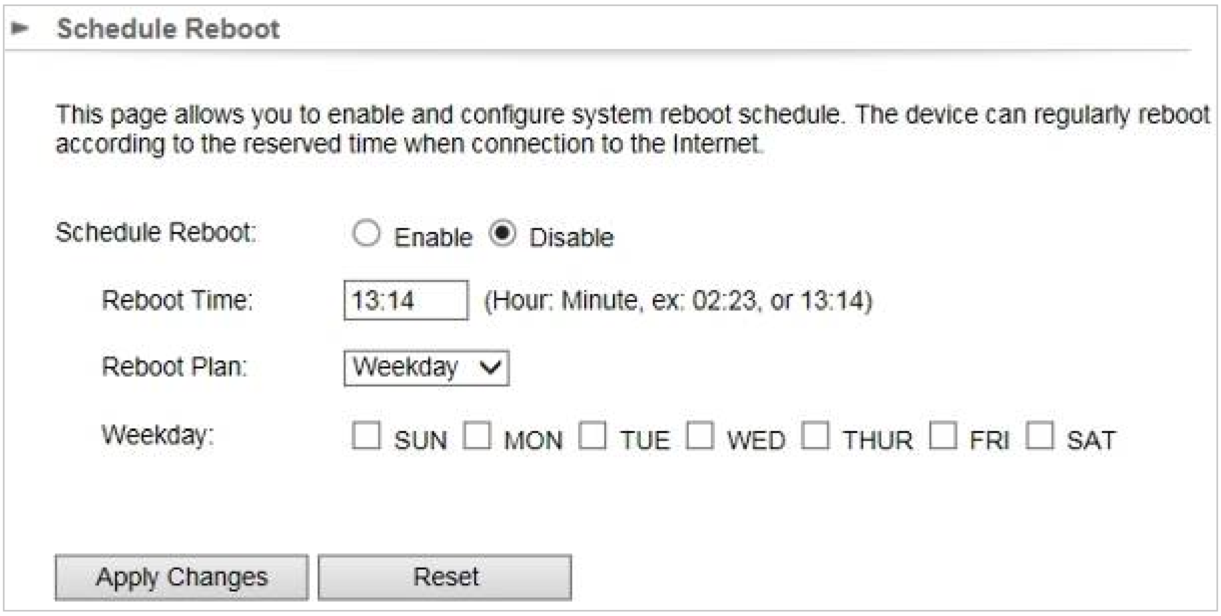
Do you really want to reboot the IFS WMC252-300 Wireless Broadband Router ?
YES

Figure 5-42 Reboot System

5.2.10 Schedule Reboot

Click “**System Configuration**” → “**Schedule Reboot**” and the following page will be displayed.

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



► 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

Figure 5-43 Schedule Reboot

Object	Description
• **Schedule Reboot**	**Enable** or **Disable** this function.
• **Reboot Time**	Enter the time that you want to reboot this device.
• **Reboot Plane**	Select **Weekday** to reboot in the day you choose or **Every day**.
• **Weekday**	Select the day that you want to reboot.

Note

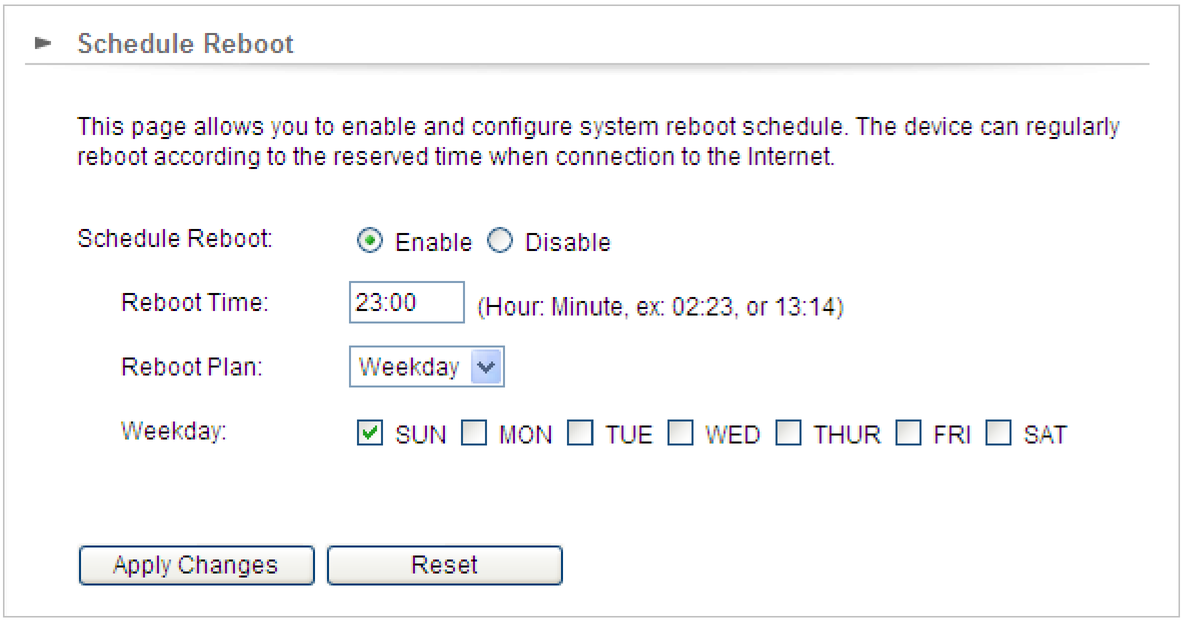
1. This setting will only take effect when the Internet connection is accessible and the GMT time is configured correctly.
2. You must select at least one day when choosing “**Weekday**” as your reboot plan.
3. When choosing “**Every day**” as your reboot plan, the “**Weekday**” will be grayed out (disabled), which means **Every day** will auto reboot at the time that you schedule.

■ Example of how to configure **Schedule Reboot**. Please take the following steps:

Before configuring schedule reboots, please ensure the Internet connection is accessible and the GMT time is configured correctly according to **NTP Settings** page.

Step 1. Enable the “Schedule Reboot”.

Step 2. Enter the Reboot Time (24-hour format) to enable this function to take effect. For example, if you want this function to work at 23:00 every Sunday, choose "Weekday" in the Reboot Plan field.



► 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: 23:00 (Hour: Minute, ex: 02:23, or 13:14)

Reboot Plan: Weekday

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

Figure 5-44 Schedule Reboot - Example

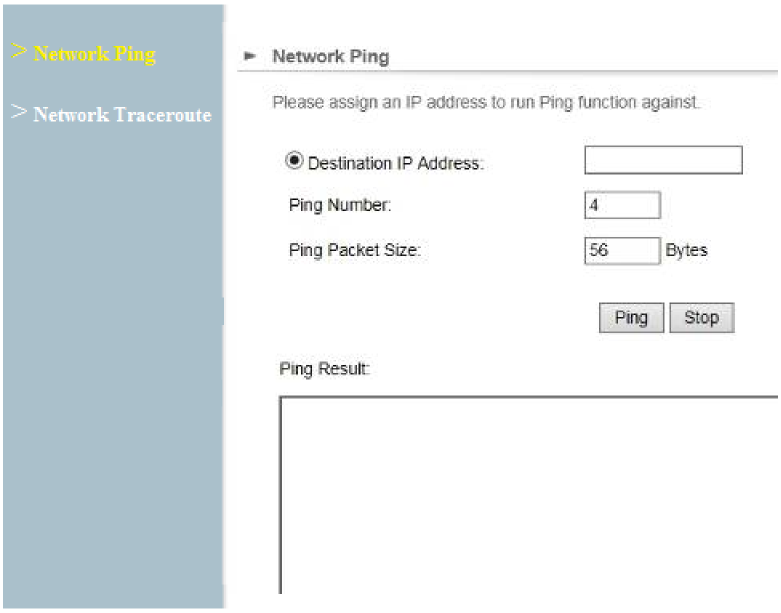
Step 3. Click the “Apply Changes” button to take this function effect.

5.3 Tools

5.3.1 Network Ping

Click “**Tools**” → “**Network Ping**” and the following page will be displayed.

Ping is a network tool used to test whether a particular host is reachable across an IP network.
Enter the IP, Ping Count, and click “**Ping**” to diagnostic your internet connection.



► Network Ping

Please assign an IP address to run Ping function against.

● Destination IP Address:

Ping Number: 4

Ping Packet Size: 56 Bytes

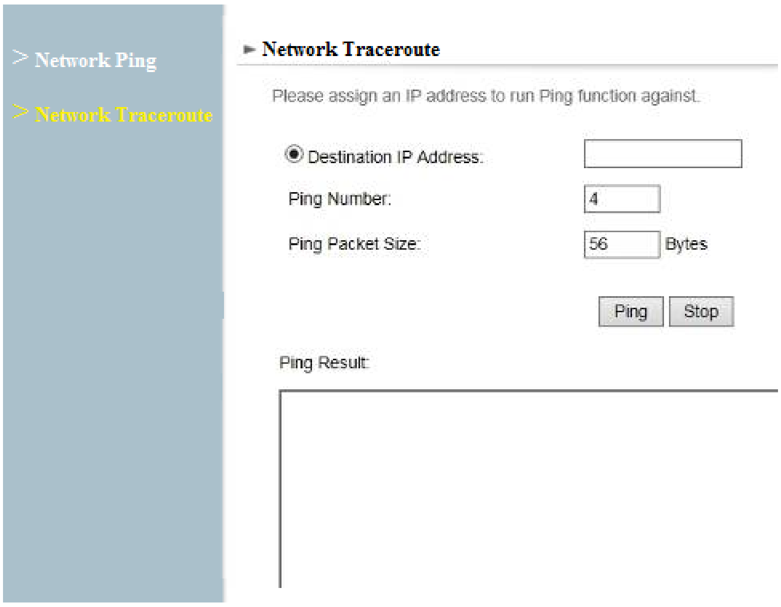
Ping Result:

Figure 5-45 Network Ping

5.3.2 Network Traceroute

Click “**Tools**” → “**Network Traceroute**” and the following page will be displayed.

Traceroute is a computer network diagnostic tool for displaying the route (path) and measuring transit delays of packets across an Internet Protocol (IP) network. It can help identify connection problems.
Enter the IP and click “**Traceroute**” to diagnostic your internet connection.



► Network Traceroute

Please assign an IP address to run Ping function against.

● Destination IP Address:

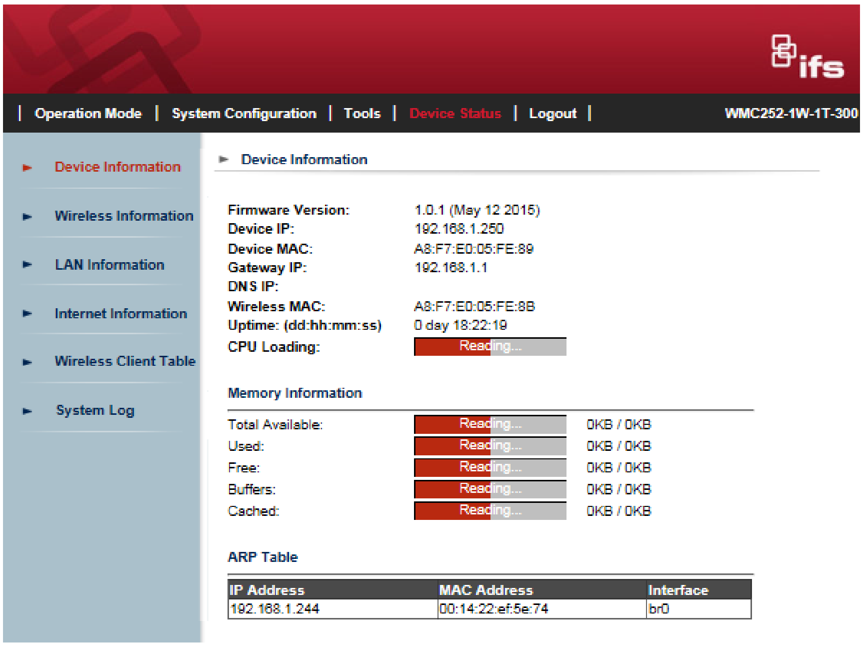
Ping Number: 4

Ping Packet Size: 56 Bytes

Ping Result:

Figure 5-46 Network Traceroute

5.4 Device Status



Device Information

Firmware Version: 1.0.1 (May 12 2015)
Device IP: 192.168.1.250
Device MAC: A8:F7:E0:05:FE:89
Gateway IP: 192.168.1.1
DNS IP:
Wireless MAC: A8:F7:E0:05:FE:8B
Uptime: (dd:hh:mm:ss) 0 day 18:22:19
CPU Loading: Reading...

Memory Information

Total Available:	Reading...	0KB / 0KB
Used:	Reading...	0KB / 0KB
Free:	Reading...	0KB / 0KB
Buffers:	Reading...	0KB / 0KB
Cached:	Reading...	0KB / 0KB

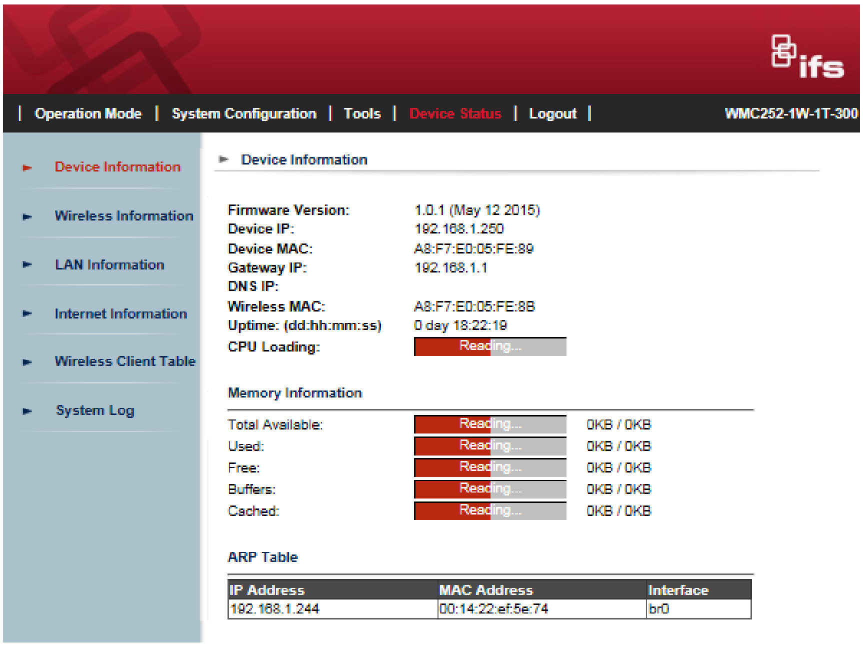
ARP Table

IP Address	MAC Address	Interface
192.168.1.244	00:14:22:ef:5e:74	br0

Figure 5-47 Device Status

5.4.1 Device Information

Click “**Device Status**” → “**Device Information**” and the following page will be displayed.



Device Information

Firmware Version: 1.0.1 (May 12 2015)
Device IP: 192.168.1.250
Device MAC: A8:F7:E0:05:FE:89
Gateway IP: 192.168.1.1
DNS IP:
Wireless MAC: A8:F7:E0:05:FE:8B
Uptime: (dd:hh:mm:ss) 0 day 18:22:19
CPU Loading: Reading...

Memory Information

Total Available:	Reading...	0KB / 0KB
Used:	Reading...	0KB / 0KB
Free:	Reading...	0KB / 0KB
Buffers:	Reading...	0KB / 0KB
Cached:	Reading...	0KB / 0KB

ARP Table

IP Address	MAC Address	Interface
192.168.1.244	00:14:22:ef:5e:74	br0

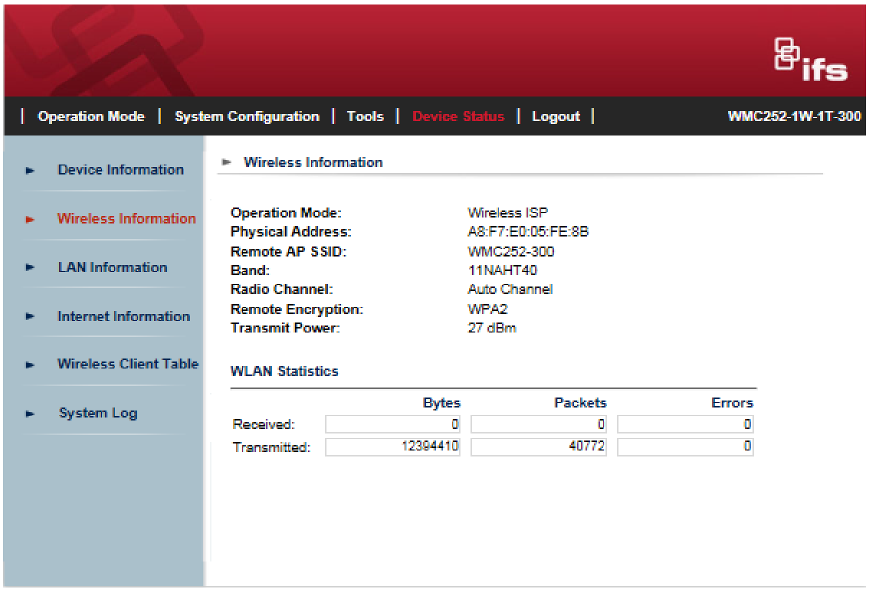
Figure 5-48 Device Information

The page includes the following fields:

Object	Description
• **Firmware Version**	Displays current F/W version.
• **Device IP**	Displays IP of AP.
• **Device MAC**	Displays AP's LAN MAC address.
• **Gateway IP**	Displays Gateway IP of AP.
• **DNS IP**	Displays DNS IP of AP.
• **Wireless MAC**	Displays AP's Wireless MAC address.
• **Uptime**	Displays the uptime of AP.
• **CPU Loading**	Displays the CPU loading of AP.

5.4.2 Wireless Information

Click "**Device Status**" → "**Wireless Information**" and the following page will be displayed.



Operation Mode: Wireless ISP
Physical Address: A8:F7:E0:05:FE:8B
Remote AP SSID: WMC252-300
Band: 11NAHT40
Radio Channel: Auto Channel
Remote Encryption: WPA2
Transmit Power: 27 dBm

WLAN Statistics

	Bytes	Packets	Errors
Received:	0	0	0
Transmitted:	12394410	40772	0

Figure 5-49 Wireless Information

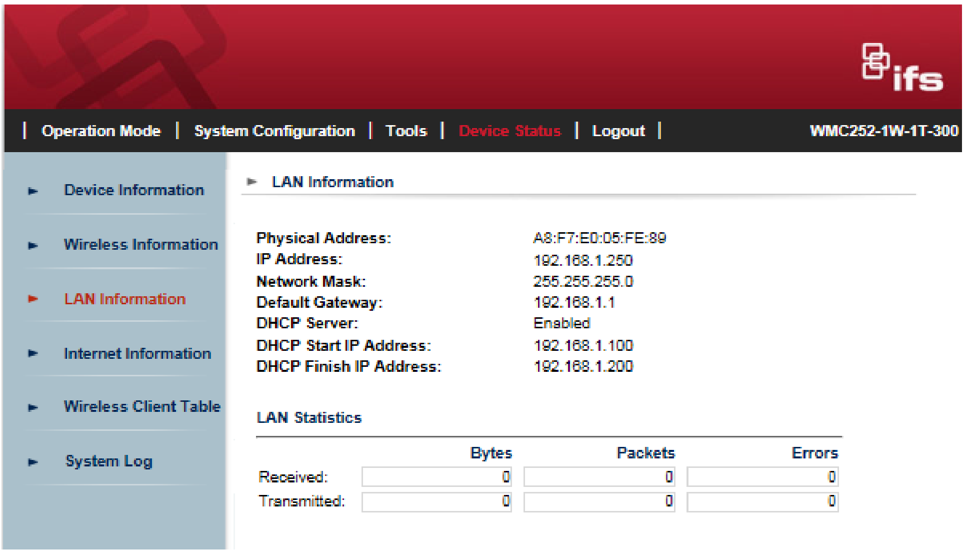
The page includes the following fields:

Object	Description
• **Operation Mode**	Displays current Operation Mode.
• **Physical address**	Displays AP's Wireless MAC address.
• **SSID**	It is the wireless network name. The default SSID is **WMC252-300**.

• **Band**	Displays operating channel width which is **Auto Select**, **5G 11NA HT20** or **5G 11NA HT40**.
• **Radio Channel**	Displays the channel you would like to use. The channel range will be changed by selecting a different domain.
• **Wireless Encryption**	Displays the encryption type that you would like to use.
• **Transmit Power**	Display the TX power that you would like to use.

5.4.3 LAN Information

Click “**Device Status**” → “**LAN Information**” and the following page will be displayed.



```
Physical Address:          A8:F7:E0:05:FE:89
IP Address:                192.168.1.250
Network Mask:              255.255.255.0
Default Gateway:           192.168.1.1
DHCP Server:               Enabled
DHCP Start IP Address:     192.168.1.100
DHCP Finish IP Address:    192.168.1.200
```

LAN Statistics

	Bytes	Packets	Errors
Received:	0	0	0
Transmitted:	0	0	0

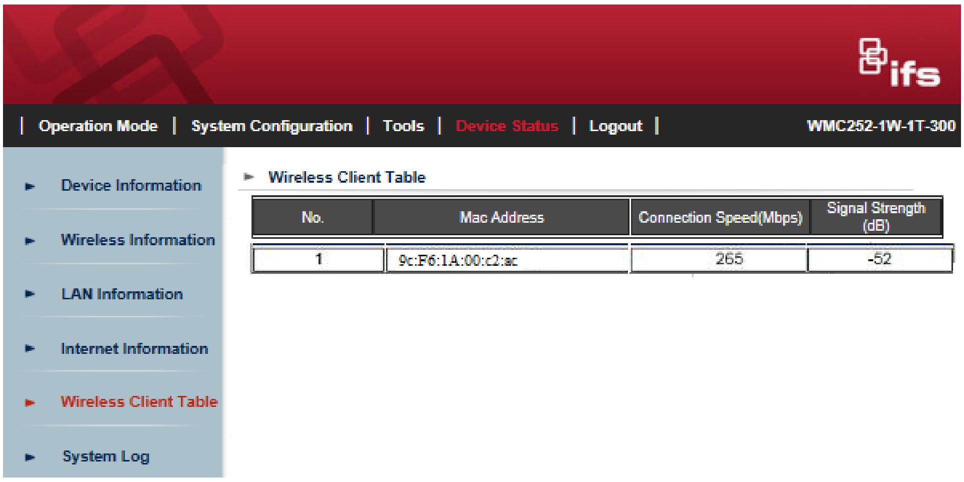
Figure 5-50 LAN Information

The page includes the following fields:

Object	Description
• **Physical Address**	Displays AP’s LAN MAC address.
• **IP Address**	Displays IP of AP.
• **Network Mask**	Displays Network Mask of AP.
• **Default Gateway**	Displays Gateway IP of AP.
• **DHCP Server**	**Enable** or **Disable** DHCP server.
• **DHCP Start IP Address**	Enter the starting IP address for the DHCP server’s IP assignment.
• **DHCP Finish IP Address**	Enter the ending IP address for the DHCP server’s IP assignment.

5.4.4 Wireless Client Table

Click “**Device Status**” → “**Wireless Client Table**” and the following page will be displayed.



No.	Mac Address	Connection Speed(Mbps)	Signal Strength (dB)
1	9c:F6:1A:00:c2:ac	265	-52

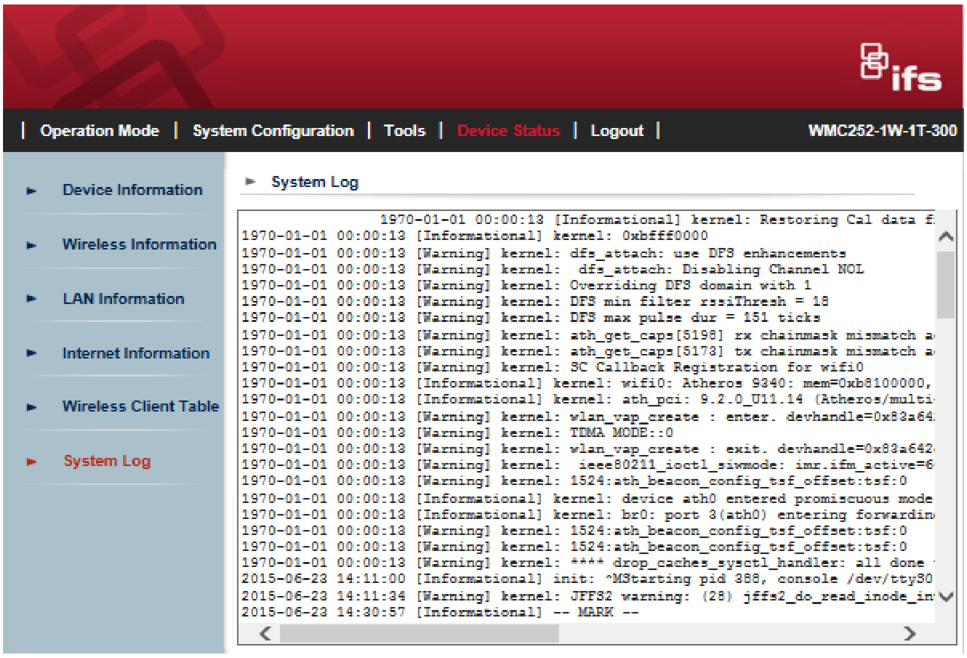
Figure 5-51 Wireless Client Table

The page includes the following fields:

Object	Description
• **No.**	Displays the number of connecting device.
• **Mac Address**	Displays Mac address of AP.
• **Connection Speed**	Displays connection speed of device.
• **Signal Strength**	Display signal strength of device. The signal strength between “**-30 and -70**” can set up a reliable connection.

5.4.5 System Log

Choose menu “**Device Status** → “**System Log**” to view the logs of the Wireless AP.

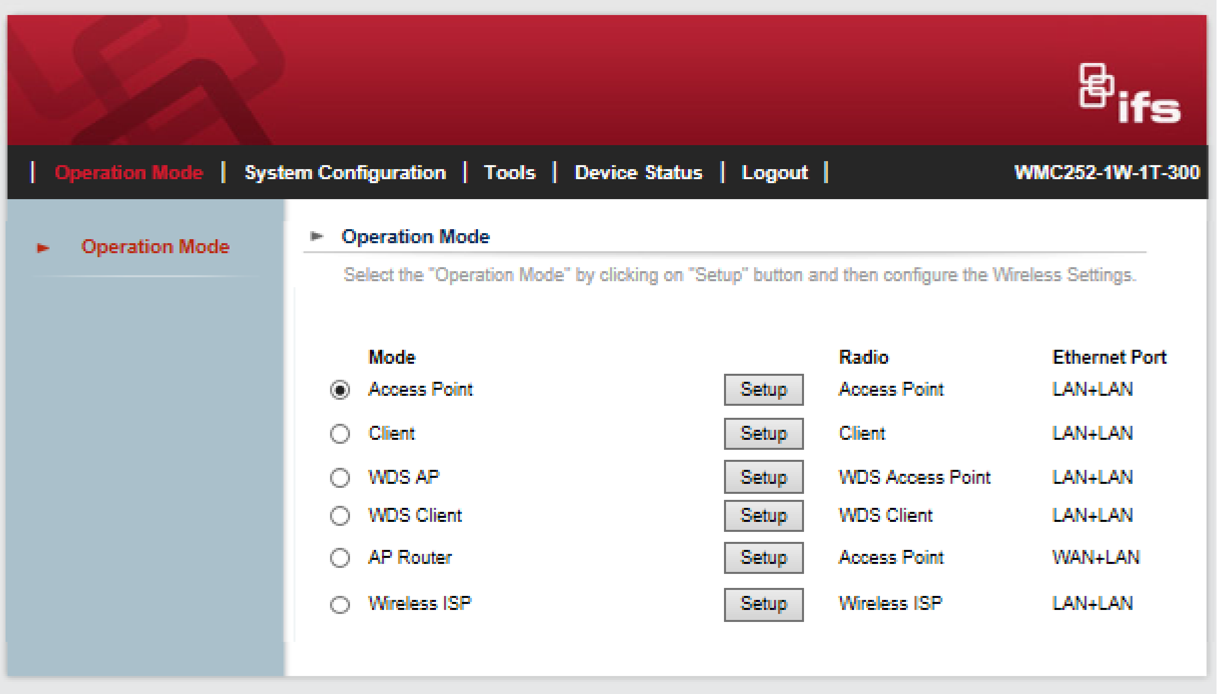


```
                1970-01-01 00:00:13 [Informational] kernel: Restoring Cal data f
1970-01-01 00:00:13 [Informational] kernel: 0xbfff0000
1970-01-01 00:00:13 [Warning] kernel: dfs_attach: use DFS enhancements
1970-01-01 00:00:13 [Warning] kernel:  dfs_attach: Disabling Channel NOL
1970-01-01 00:00:13 [Warning] kernel: Overriding DFS domain with 1
1970-01-01 00:00:13 [Warning] kernel: DFS min filter rssiThresh = 18
1970-01-01 00:00:13 [Warning] kernel: DFS max pulse dur = 151 ticks
1970-01-01 00:00:13 [Warning] kernel: ath_get_caps[5198] rx chainmask mismatch a
1970-01-01 00:00:13 [Warning] kernel: ath_get_caps[5173] tx chainmask mismatch a
1970-01-01 00:00:13 [Warning] kernel: SC Callback Registration for wifi0
1970-01-01 00:00:13 [Informational] kernel: wifi0: Atheros 9340: mem=0xb8100000,
1970-01-01 00:00:13 [Informational] kernel: ath_pci: 9.2.0_U11.14 (Atheros/multi
1970-01-01 00:00:13 [Warning] kernel: wlan_vap_create : enter. devhandle=0x83a64
1970-01-01 00:00:13 [Warning] kernel: TDMA MODE::0
1970-01-01 00:00:13 [Warning] kernel: wlan_vap_create : exit. devhandle=0x83a642
1970-01-01 00:00:13 [Warning] kernel:  ieee80211_ioctl_siwmode: imr.ifm_active=6
1970-01-01 00:00:13 [Warning] kernel: 1524:ath_beacon_config_tsf_offset:tsf:0
1970-01-01 00:00:13 [Informational] kernel: device ath0 entered promiscuous mode
1970-01-01 00:00:13 [Informational] kernel: br0: port 3(ath0) entering forwardin
1970-01-01 00:00:13 [Warning] kernel: 1524:ath_beacon_config_tsf_offset:tsf:0
1970-01-01 00:00:13 [Warning] kernel: 1524:ath_beacon_config_tsf_offset:tsf:0
1970-01-01 00:00:13 [Warning] kernel: **** drop_caches_sysctl_handler: all done
2015-06-23 14:11:00 [Informational] init: ^MStarting pid 388, console /dev/ttyS0
2015-06-23 14:11:34 [Warning] kernel: JFFS2 warning: (28) jffs2_do_read_inode_in
2015-06-23 14:30:57 [Informational] -- MARK --
```

Figure 5-52 System Log

5.5 Logout

Select “**Logout**” to logout the system.

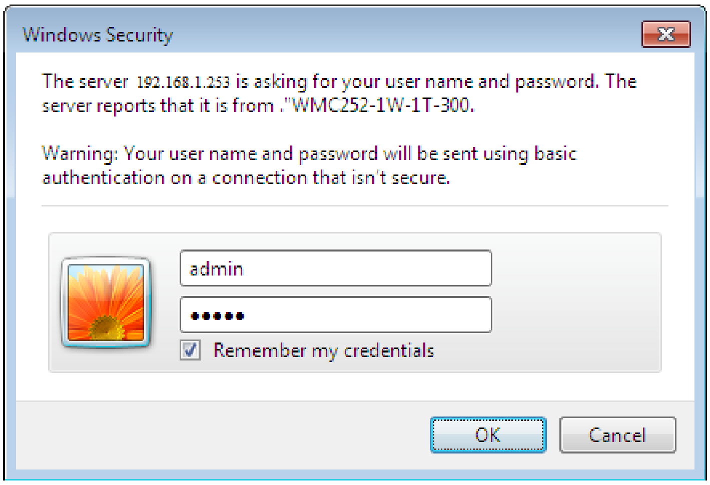

| Operation Mode | System Configuration | Tools | Device Status | Logout |
WMC252-1W-1T-300
ifs
► Operation Mode

► 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 AP	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

Figure 5-53 Logout



The server 192.168.1.253 is asking for your user name and password. The server reports that it is from ."WMC252-1W-1T-300.

Warning: Your user name and password will be sent using basic authentication on a connection that isn't secure.

admin

•••••

☑ Remember my credentials

Figure 5-54 Re-login

Appendix A: Troubleshooting

If you found the AP is working improperly or stop responding to you, please read this troubleshooting first before contacting the IFS Tech Support for help. Some problems can be solved by yourself within very short time.

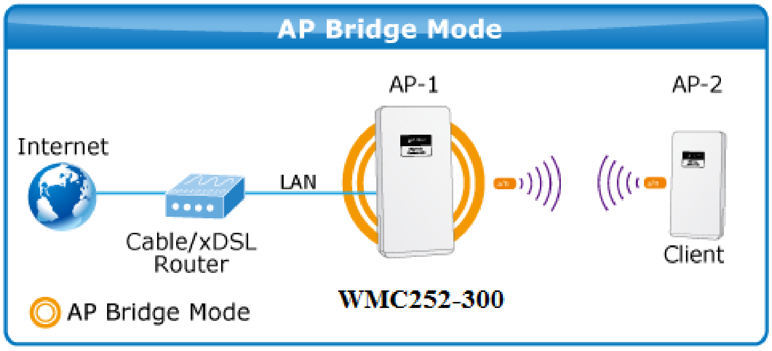
Scenario	Solution
The AP is not responding to me when I want to access it by web browser.	a. Please check the connection of the power cord and the Ethernet cable of this AP. All cords and cables should be correctly and firmly inserted to the AP. b. If all LEDs on this AP are off, please check the status of power adapter, and make sure it is correctly powered. c. You must use the same IP address section that AP uses. d. Are you using MAC or IP address filter? Try to connect the AP by another computer and see if it works; if not, please reset the AP to the factory default settings (Press the 'reset' button for over 10 seconds). e. If you did a firmware upgrade and this happens, contact the IFS Tech Support for help. f. If all the solutions above don't work, contact the IFS Tech Support for help.
I can't get connected to the Internet.	a. Check the Internet connection status from the router that is connected with the AP. b. Please be patient. Sometimes, Internet is just that slow. c. If you have connected a computer to Internet directly before, try to do that again, and check if you can get connected to Internet with your computer directly attached to the device provided by your Internet service provider. d. Check PPPoE / L2TP / PPTP user ID and password in your router again. e. Call your Internet service provider and check if there's something wrong with their service. f. If you just can't connect to one or more website, but you can still use other internet services, please check URL/Keyword filter. g. Try to reset the AP and try again later. h. Reset the device provided by your Internet service provider. i. Try to use IP address instead of hostname. If you can use IP address to communicate with a remote server, but can't use hostname, please check DNS setting.
I can't locate my AP by my wireless device.	a. 'Broadcast ESSID' set to off? b. The antenna is properly secured. c. Are you too far from your AP? Try to get closer.

	d. Please remember that you have to input ESSID on your wireless client manually, if ESSID broadcast is disabled.
File downloading is very slow or breaks frequently.	a. Are you using QoS function? Try to disable it and try again. b. Internet is slow sometimes; try to be patient. c. Try to reset the AP and see if it's better after that. d. Try to know what computers do on your local network. If someone's transferring big files, other people will think Internet is really slow. e. If this never happens before, call you Internet service provider to know if there is something wrong with their network.
I can't log into the web management interface; The password is wrong.	a. Make sure you're connecting to the correct IP address of the AP. b. Password is case-sensitive. Make sure the 'Caps Lock' light is not illuminated. c. If you really forget the password, do a hardware reset.
The AP becomes hot	a. This is not a malfunction, if you can keep your hand on the AP's case. b. If you smell something wrong or see the smoke coming out from AP or A/C power adapter, please disconnect the AP and A/C power adapter from utility power (make sure it's safe before you're doing this!), and call your dealer for help.

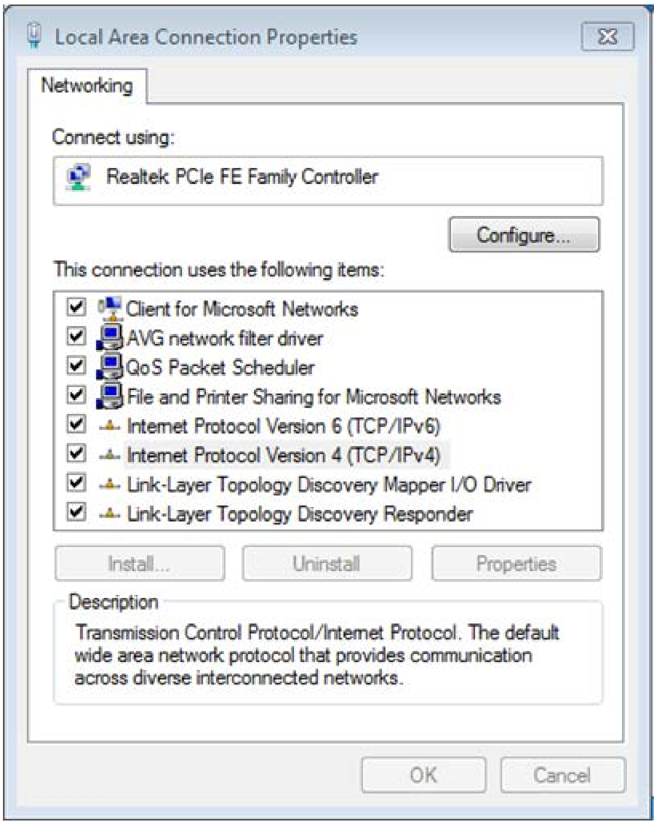
Appendix B: FAQ

Q1: How to set up the AP Client Connection

Topology:



Step 1. Use static IP in the PCs that are connected with AP-1(Site-1) and AP-2(Site-2). In this case, Site-1 is “**192.168.0.100**”, and Site-2 is “**192.168.1.200**”.



Local Area Connection Properties

Networking

Connect using:

Realtek PCIe FE Family Controller

Configure...

This connection uses the following items:

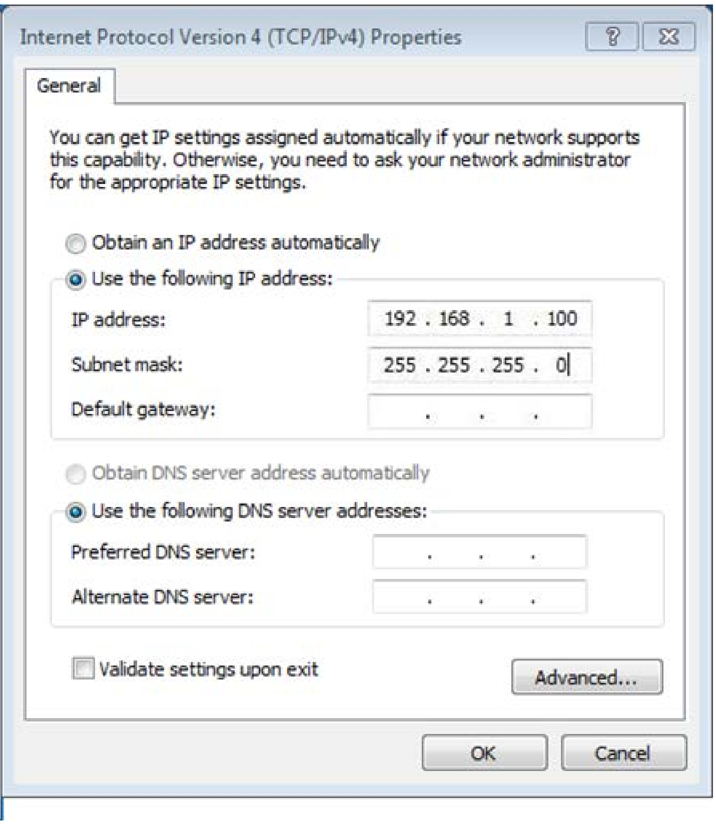
- ☑ Client for Microsoft Networks
- ☑ AVG network filter driver
- ☑ QoS Packet Scheduler
- ☑ File and Printer Sharing for Microsoft Networks
- ☑ Internet Protocol Version 6 (TCP/IPv6)
- ☑ Internet Protocol Version 4 (TCP/IPv4)
- ☑ Link-Layer Topology Discovery Mapper I/O Driver
- ☑ Link-Layer Topology Discovery Responder

Install... Uninstall Properties

Description

Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

OK Cancel



Internet Protocol Version 4 (TCP/IPv4) Properties

General

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

○ Obtain an IP address automatically

● Use the following IP address:

IP address:	192 . 168 . 1 . 100
Subnet mask:	255 . 255 . 255 . 0
Default gateway:	. . .

○ Obtain DNS server address automatically

● Use the following DNS server addresses:

Preferred DNS server:	. . .
Alternate DNS server:	. . .

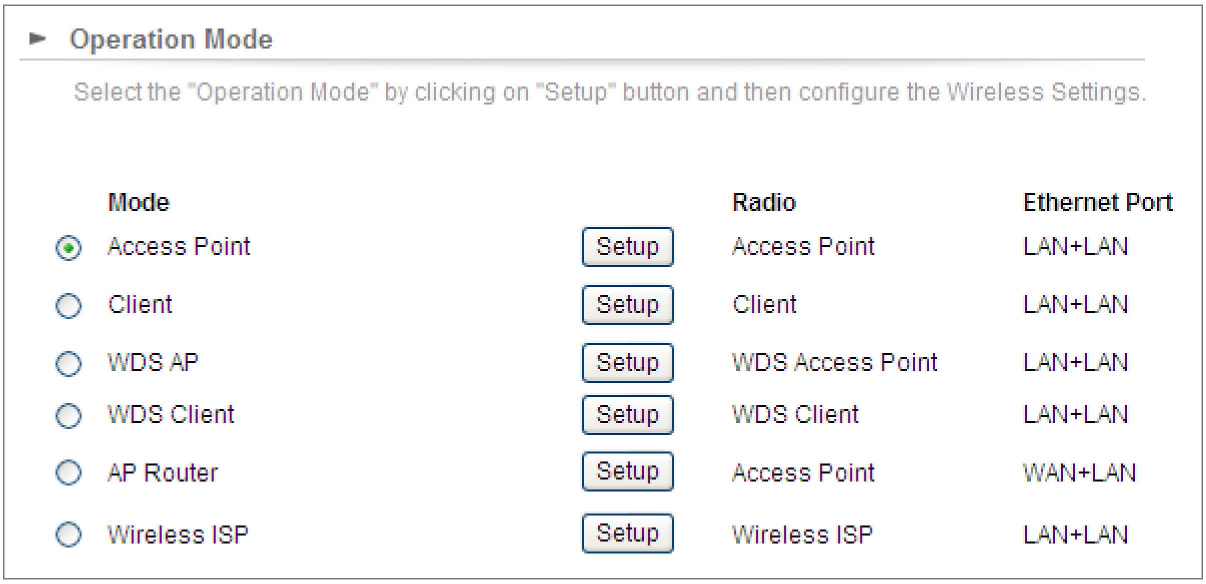
□ Validate settings upon exit

Advanced...

OK Cancel

Step 2. In AP-1, go to "**Operation Mode**" to configure it to **Access Point** Mode.

※ **You can also configure it in "AP Router" mode if you want to connect the WAN port of the AP to the internet directly.**



► 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 AP	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

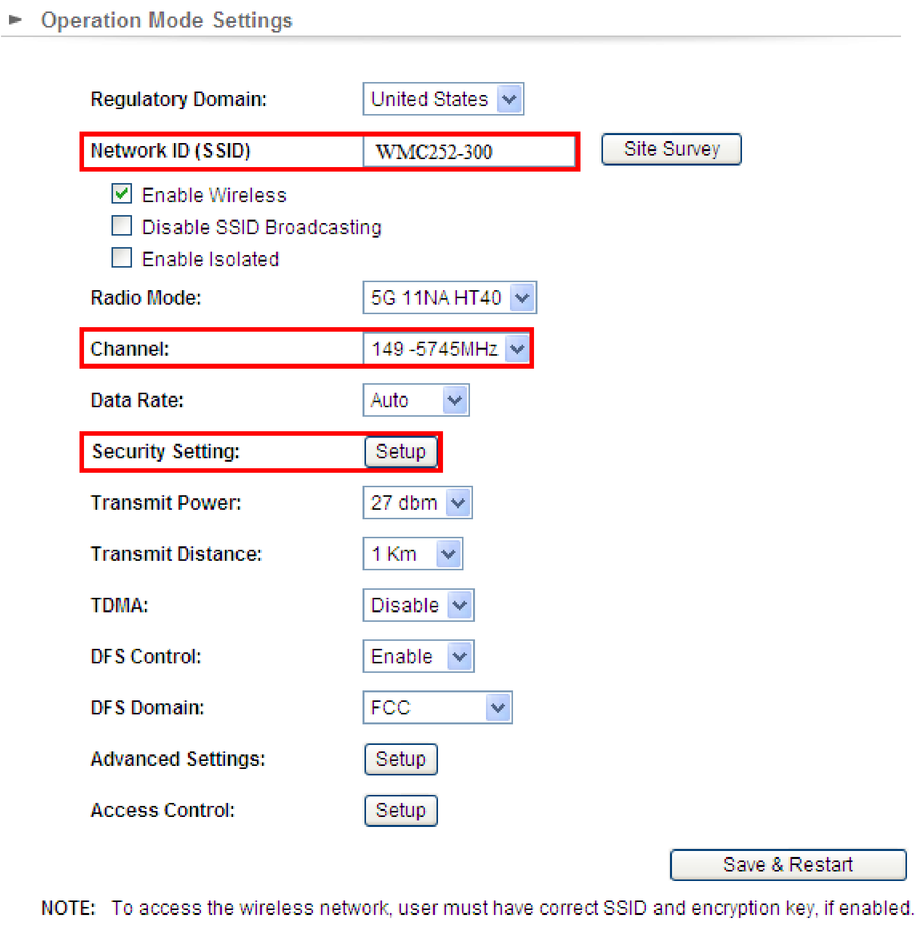
STEP 3. Click "**Setup**" to configure the following parameters and then click **Save & Restart** to save the settings.

1) **Network ID (SSID)**: set to a unique value

2) **Channel**: set to a fixed one

3) **Security Setting**: strongly suggested to configure it.

In this case, we configure it to WPA2-PSK, AES



► Operation Mode Settings

Regulatory Domain: United States

Network ID (SSID) WMC252-300 [Site Survey]

☑ Enable Wireless

□ Disable SSID Broadcasting

□ Enable Isolated

Radio Mode: 5G 11NA HT40

Channel: 149 -5745MHz

Data Rate: Auto

Security Setting: [Setup]

Transmit Power: 27 dbm

Transmit Distance: 1 Km

TDMA: Disable

DFS Control: Enable

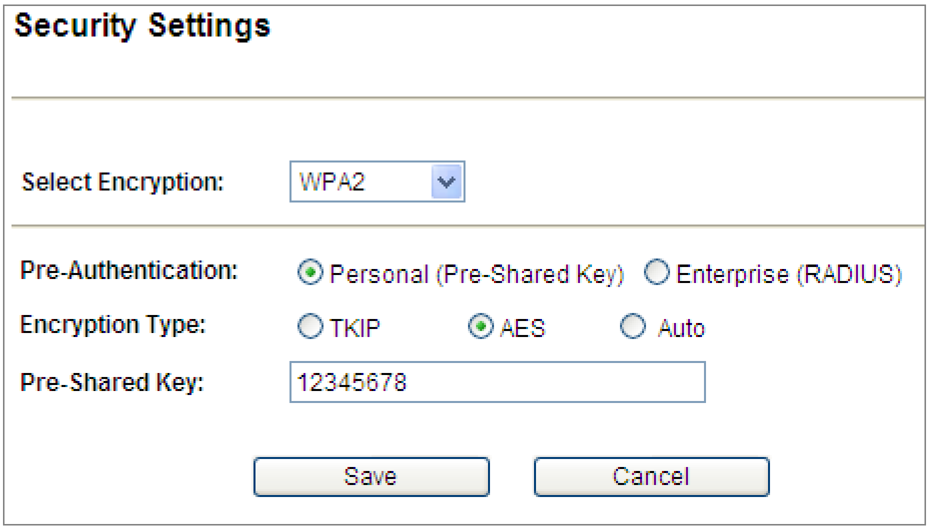
DFS Domain: FCC

Advanced Settings: [Setup]

Access Control: [Setup]

[Save & Restart]

NOTE: To access the wireless network, user must have correct SSID and encryption key, if enabled.



Security Settings

Select Encryption: WPA2

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

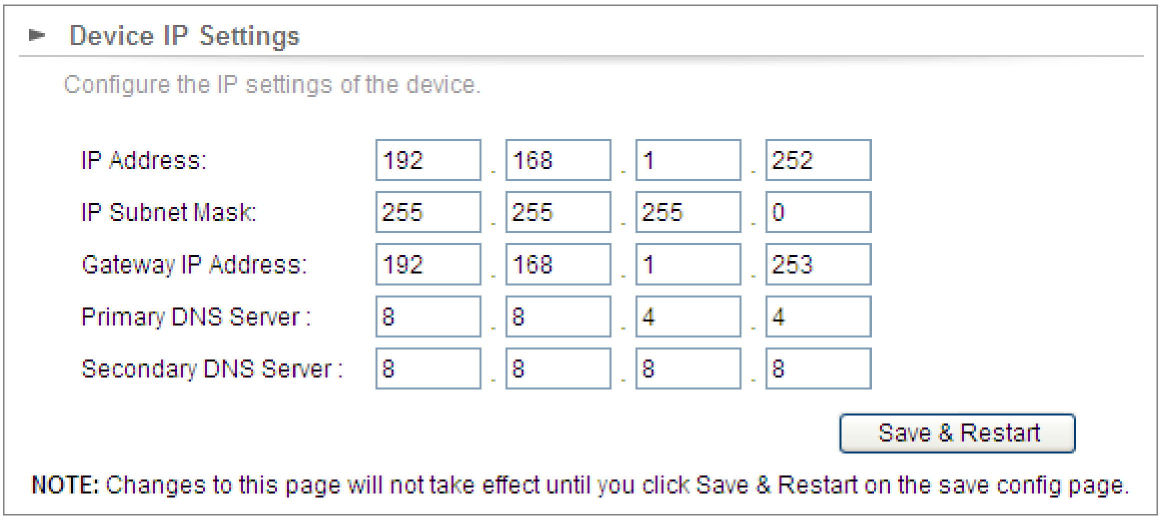
Encryption Type: ○ TKIP ● AES ○ Auto

Pre-Shared Key: 12345678

[Save] [Cancel]

Step 4. In AP-2, modify the default IP to the same IP range but different from AP-1.

In this case, the IP is changed to **192.168.1.252**.



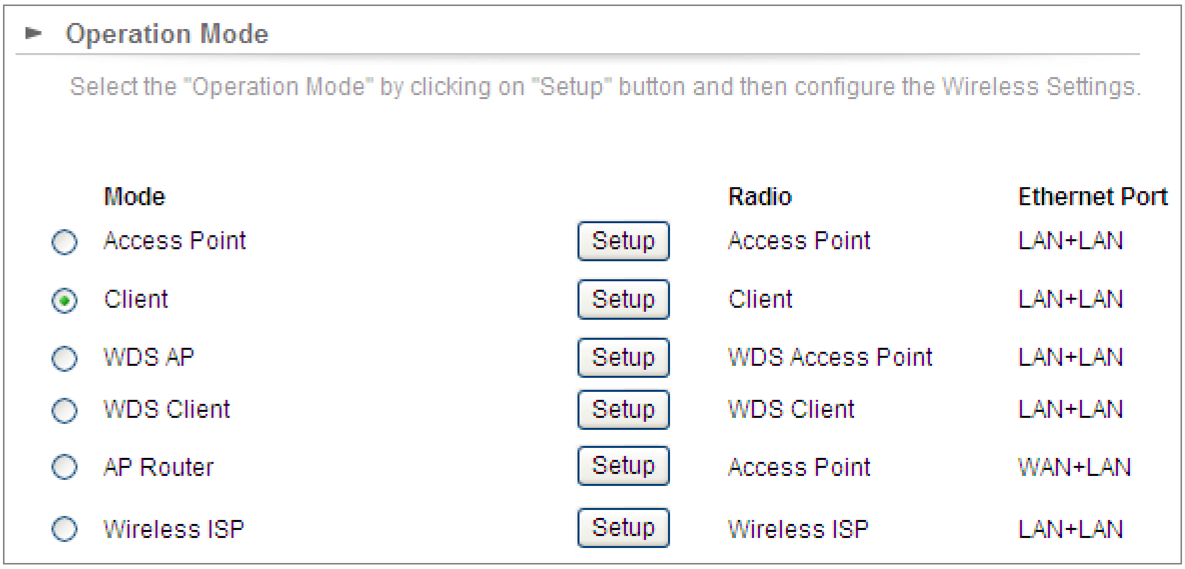
► Device IP Settings

Configure the IP settings of the device.

IP Address:	192	168	1	252
IP Subnet Mask:	255	255	255	0
Gateway IP Address:	192	168	1	253
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.

Step 5. In AP-2, configure it in “**Client**” mode and click “**Setup**”.

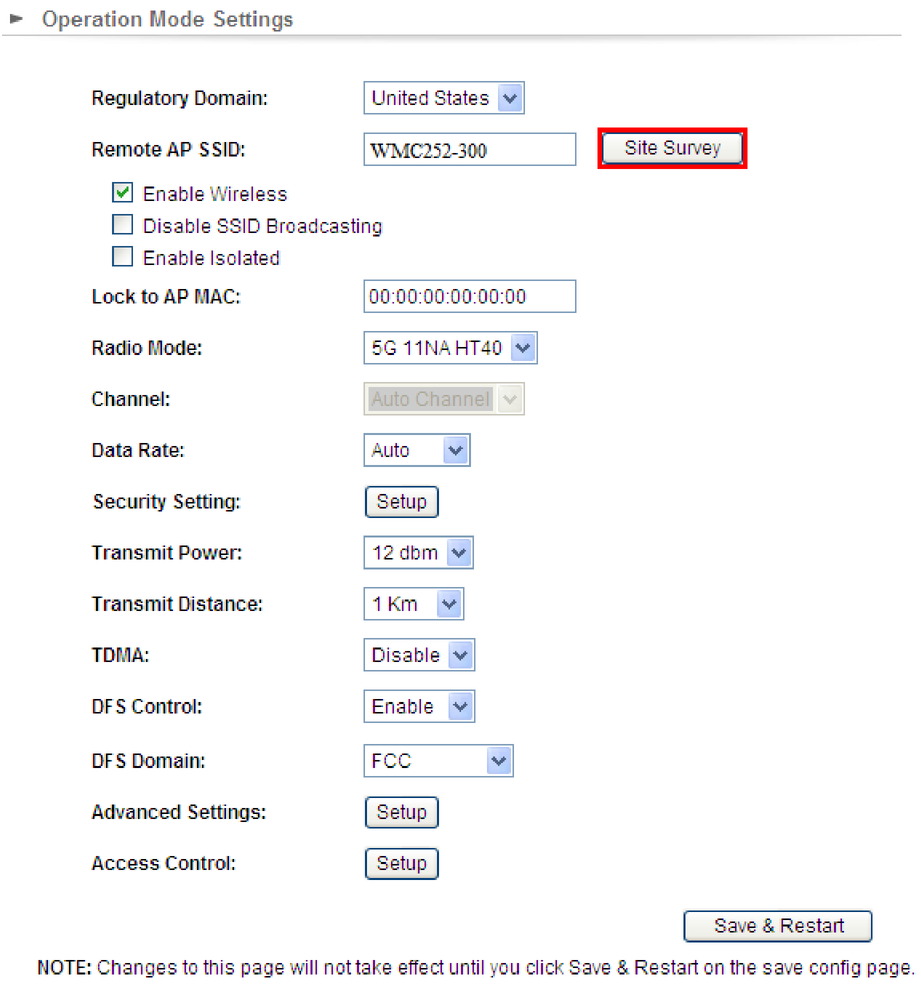


► Operation Mode

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 AP	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

Step 6. Click “**Setup**” and then click **Site Survey** to find the AP-1.



► Operation Mode Settings

Regulatory Domain: United States

Remote AP SSID: WMC252-300

☑ Enable Wireless

□ Disable SSID Broadcasting

□ Enable Isolated

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

Radio Mode: 5G 11NA HT40

Channel: Auto Channel

Data Rate: Auto

Security Setting:

Transmit Power: 12 dbm

Transmit Distance: 1 Km

TDMA: Disable

DFS Control: Enable

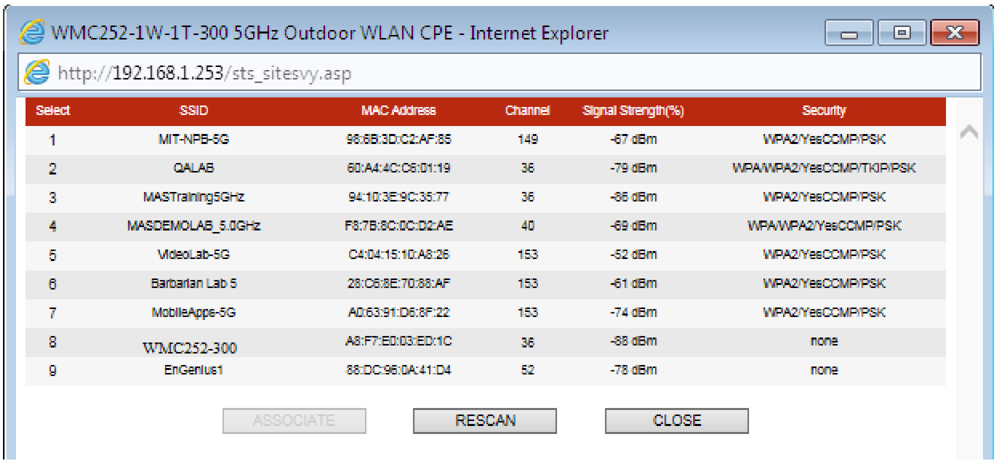
DFS Domain: FCC

Advanced Settings:

Access Control:

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

Step 7. Select the AP-1 from the list.

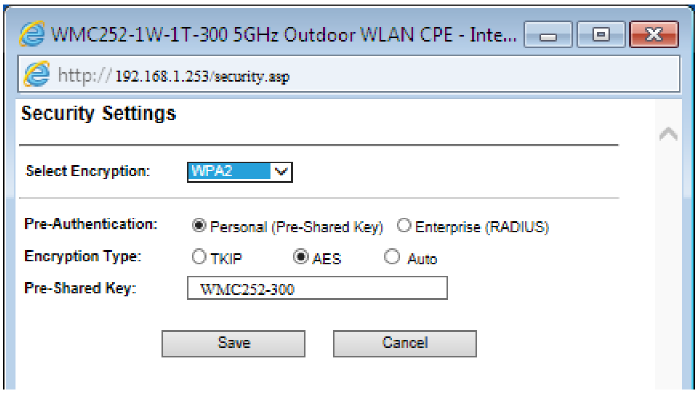


WMC252-1W-1T-300 5GHz Outdoor WLAN CPE - Internet Explorer

http://192.168.1.253/sts_sitesvy.asp

Select	SSID	MAC Address	Channel	Signal Strength(%)	Security
1	MIT-NPB-5G	98:6B:3D:C2:AF:85	149	-67 dBm	WPA2/YesCCMP/PSK
2	QALAB	60:A4:4C:C6:01:19	36	-79 dBm	WPA/WPA2/YesCCMP/TKIP/PSK
3	MASTraining5GHz	94:10:3E:9C:35:77	36	-86 dBm	WPA2/YesCCMP/PSK
4	MASDEMOLAB_5.0GHz	F8:7B:8C:0C:D2:AE	40	-69 dBm	WPA/WPA2/YesCCMP/PSK
5	VideoLab-5G	C4:04:15:10:A8:26	153	-52 dBm	WPA2/YesCCMP/PSK
6	Barbarian Lab 5	28:C6:8E:70:88:AF	153	-61 dBm	WPA2/YesCCMP/PSK
7	MobileApps-5G	A0:63:91:D6:8F:22	153	-74 dBm	WPA2/YesCCMP/PSK
8	WMC252-300	A8:F7:E0:03:ED:1C	36	-88 dBm	none
9	EnGenius1	88:DC:96:0A:41:D4	52	-78 dBm	none

Step 8. Click "**SET SECURITY**" to configure the Pre-Shared Key and then click "**Save**" to close the window.



WMC252-1W-1T-300 5GHz Outdoor WLAN CPE - Inte...
http://192.168.1.253/security.asp

Security Settings

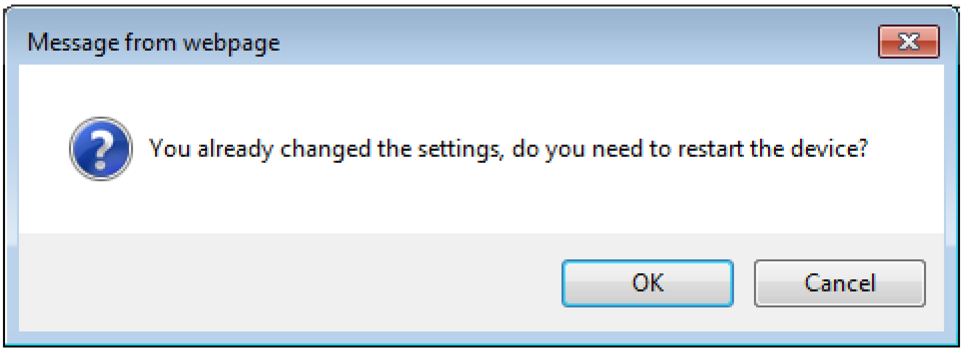
Select Encryption: WPA2

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

Encryption Type: ○ TKIP ● AES ○ Auto

Pre-Shared Key: WMC252-300

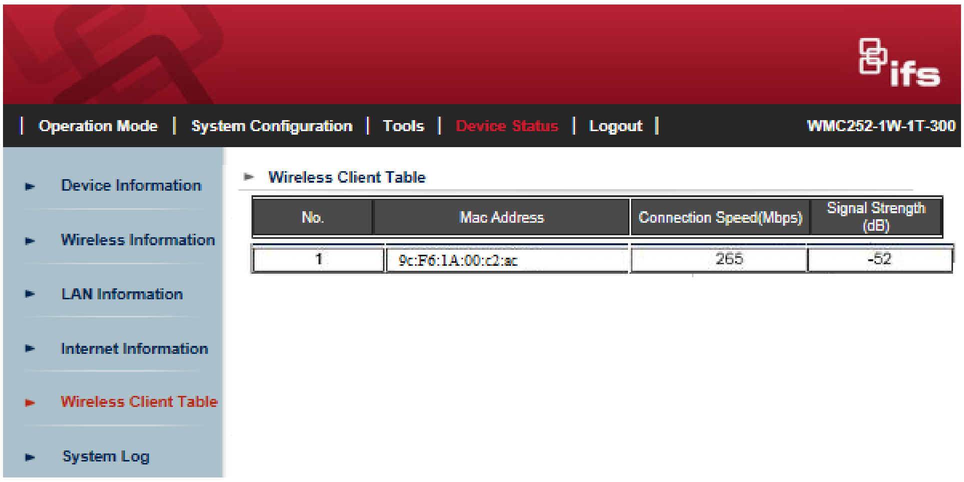
Step 9. Click "OK" and "**Save & Restart**" to apply the setting.



Message from webpage

You already changed the settings, do you need to restart the device?

Step 10. In AP-1, go to “**Device Status-> Wireless Client Table**” to check whether AP-2 should be in the list.

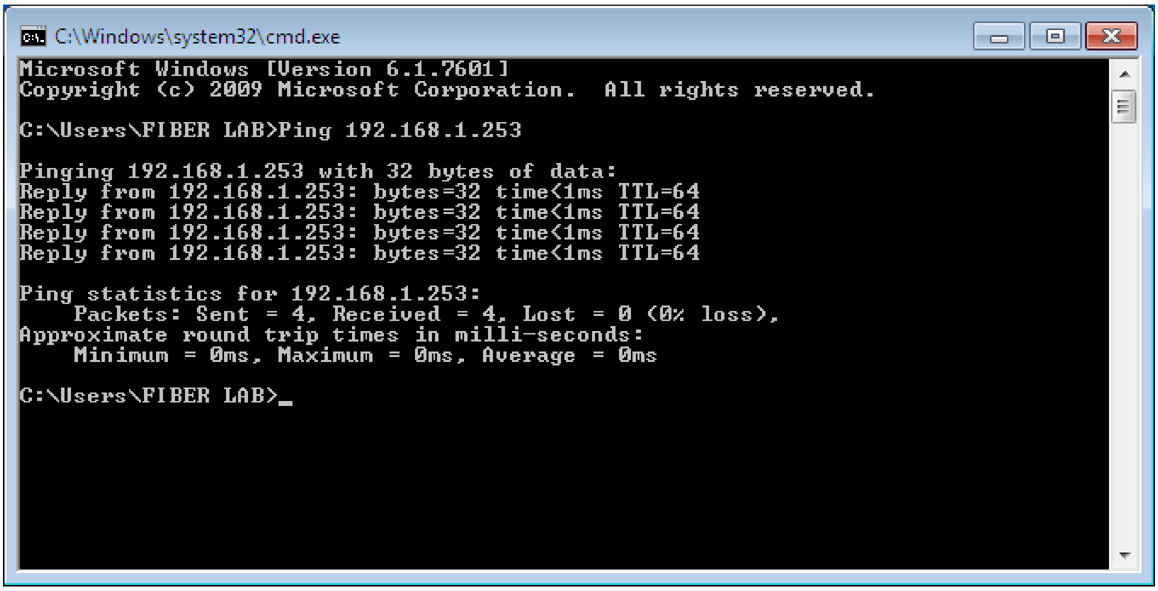


Wireless Client Table

No.	Mac Address	Connection Speed(Mbps)	Signal Strength (dB)
1	9c:F6:1A:00:c2:ac	265	-52

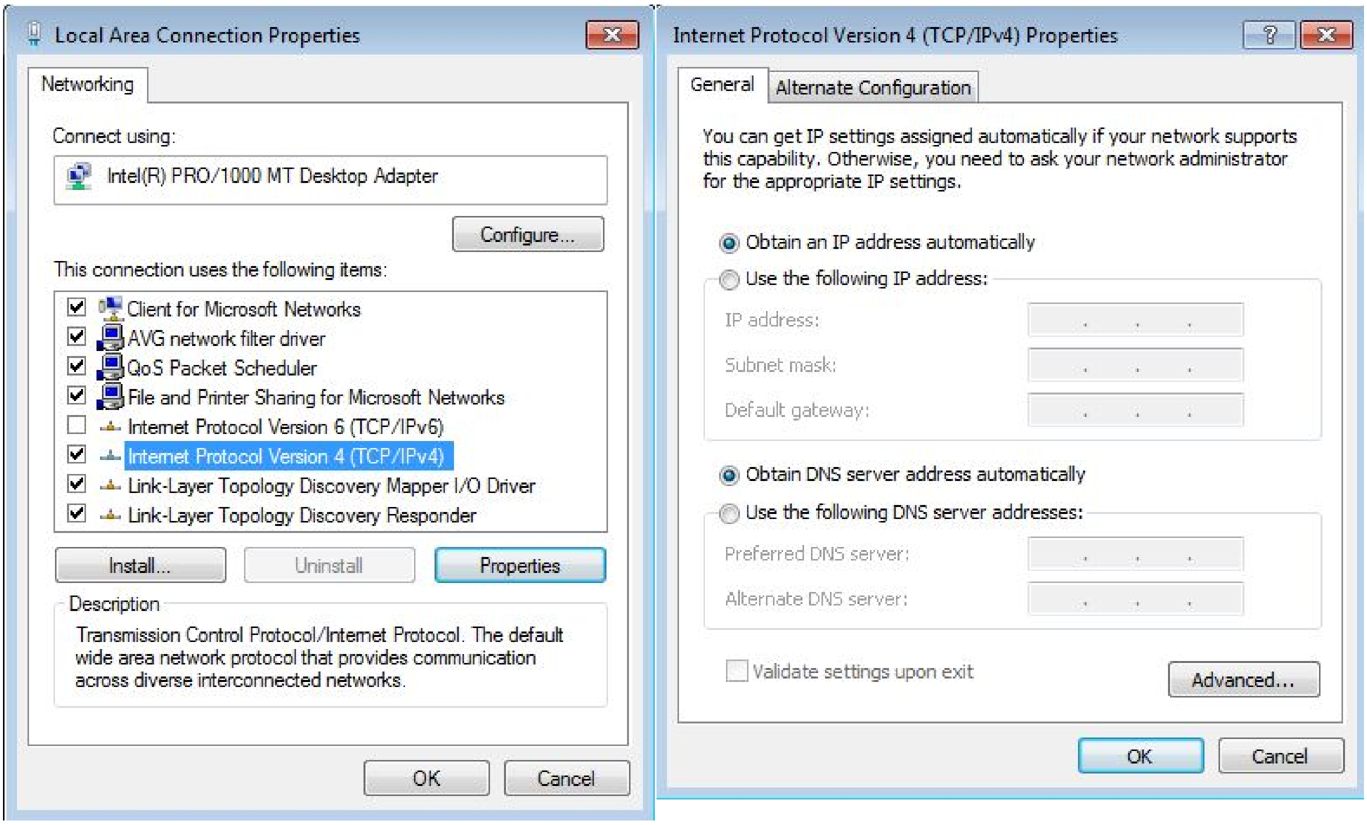
Step 11. Use command line tool to ping each other to ensure the link is successfully established.

From Site-1, ping 192.168.0.100.



```
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation.  All rights reserved.

C:\Users\FIBER LAB>Ping 192.168.1.253

Pinging 192.168.1.253 with 32 bytes of data:
Reply from 192.168.1.253: bytes=32 time<1ms TTL=64
Reply from 192.168.1.253: bytes=32 time<1ms TTL=64
Reply from 192.168.1.253: bytes=32 time<1ms TTL=64
Reply from 192.168.1.253: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.1.253:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\FIBER LAB>_
```

Step 12. Configure the TCP/IP settings of Site-2 to "**Obtain an IP address automatically**".



Local Area Connection Properties

Networking

Connect using:

Intel(R) PRO/1000 MT Desktop Adapter

This connection uses the following items:

- ☑ Client for Microsoft Networks
- ☑ AVG network filter driver
- ☑ QoS Packet Scheduler
- ☑ File and Printer Sharing for Microsoft Networks
- □ Internet Protocol Version 6 (TCP/IPv6)
- ☑ Internet Protocol Version 4 (TCP/IPv4)
- ☑ Link-Layer Topology Discovery Mapper I/O Driver
- ☑ Link-Layer Topology Discovery Responder

Description

Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

Internet Protocol Version 4 (TCP/IPv4) Properties

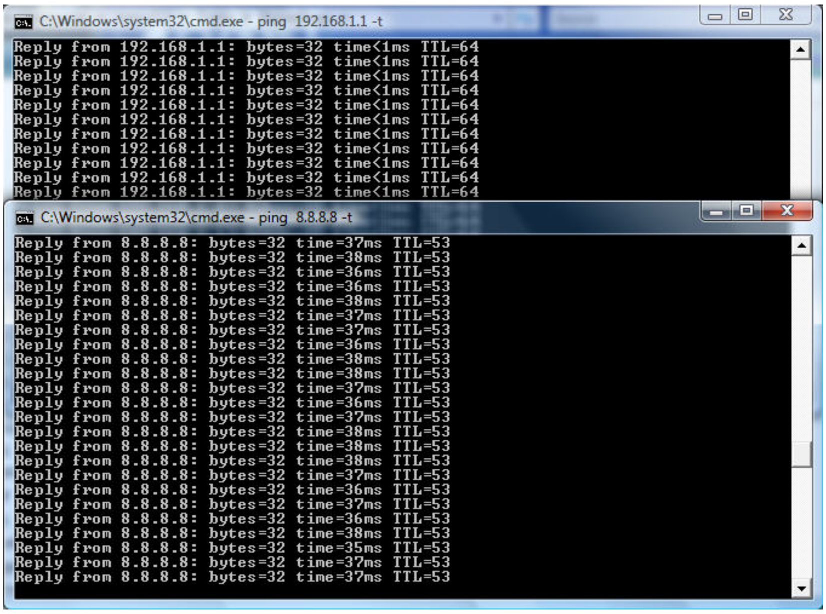
General | Alternate Configuration

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: . . .
  - Subnet mask: . . .
  - Default gateway: . . .
- ● Obtain DNS server address automatically
- ○ Use the following DNS server addresses:
  - Preferred DNS server: . . .
  - Alternate DNS server: . . .

□ Validate settings upon exit

Step 13. Use command line tool to ping the DNS (e.g., Google) to ensure Site-2 can access internet through the wireless connection.



C:\Windows\system32\cmd.exe - ping 192.168.1.1 -t

```
Reply from 192.168.1.1: bytes=32 time<1ms TTL=64
Reply from 192.168.1.1: bytes=32 time<1ms TTL=64
Reply from 192.168.1.1: bytes=32 time<1ms TTL=64
Reply from 192.168.1.1: bytes=32 time<1ms TTL=64
Reply from 192.168.1.1: bytes=32 time<1ms TTL=64
Reply from 192.168.1.1: bytes=32 time<1ms TTL=64
Reply from 192.168.1.1: bytes=32 time<1ms TTL=64
Reply from 192.168.1.1: bytes=32 time<1ms TTL=64
Reply from 192.168.1.1: bytes=32 time<1ms TTL=64
Reply from 192.168.1.1: bytes=32 time<1ms TTL=64
Reply from 192.168.1.1: bytes=32 time<1ms TTL=64
```

C:\Windows\system32\cmd.exe - ping 8.8.8.8 -t

```
Reply from 8.8.8.8: bytes=32 time=37ms TTL=53
Reply from 8.8.8.8: bytes=32 time=38ms TTL=53
Reply from 8.8.8.8: bytes=32 time=36ms TTL=53
Reply from 8.8.8.8: bytes=32 time=36ms TTL=53
Reply from 8.8.8.8: bytes=32 time=38ms TTL=53
Reply from 8.8.8.8: bytes=32 time=37ms TTL=53
Reply from 8.8.8.8: bytes=32 time=37ms TTL=53
Reply from 8.8.8.8: bytes=32 time=36ms TTL=53
Reply from 8.8.8.8: bytes=32 time=38ms TTL=53
Reply from 8.8.8.8: bytes=32 time=38ms TTL=53
Reply from 8.8.8.8: bytes=32 time=37ms TTL=53
Reply from 8.8.8.8: bytes=32 time=36ms TTL=53
Reply from 8.8.8.8: bytes=32 time=37ms TTL=53
Reply from 8.8.8.8: bytes=32 time=38ms TTL=53
Reply from 8.8.8.8: bytes=32 time=38ms TTL=53
Reply from 8.8.8.8: bytes=32 time=38ms TTL=53
Reply from 8.8.8.8: bytes=32 time=37ms TTL=53
Reply from 8.8.8.8: bytes=32 time=36ms TTL=53
Reply from 8.8.8.8: bytes=32 time=37ms TTL=53
Reply from 8.8.8.8: bytes=32 time=36ms TTL=53
Reply from 8.8.8.8: bytes=32 time=38ms TTL=53
Reply from 8.8.8.8: bytes=32 time=35ms TTL=53
Reply from 8.8.8.8: bytes=32 time=37ms TTL=53
Reply from 8.8.8.8: bytes=32 time=37ms TTL=53
```

Note

The attention of the following hints should be paid:

1) The encryption method must be the same as that of both sites if configured.

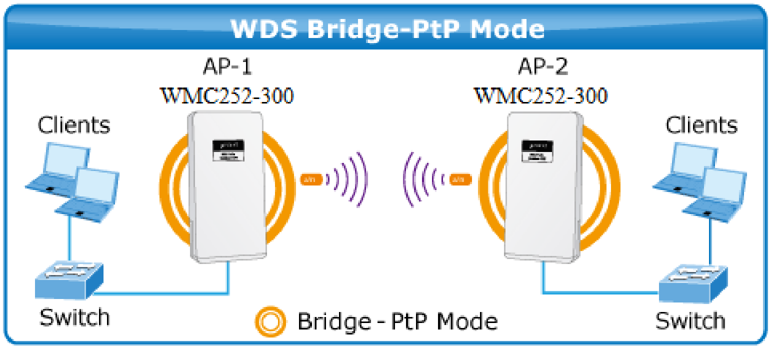
2) Both sites should be Line-of-Sight.

3) For the short distance connection less than 1km, please reduce the "Transmit power" of both sites.

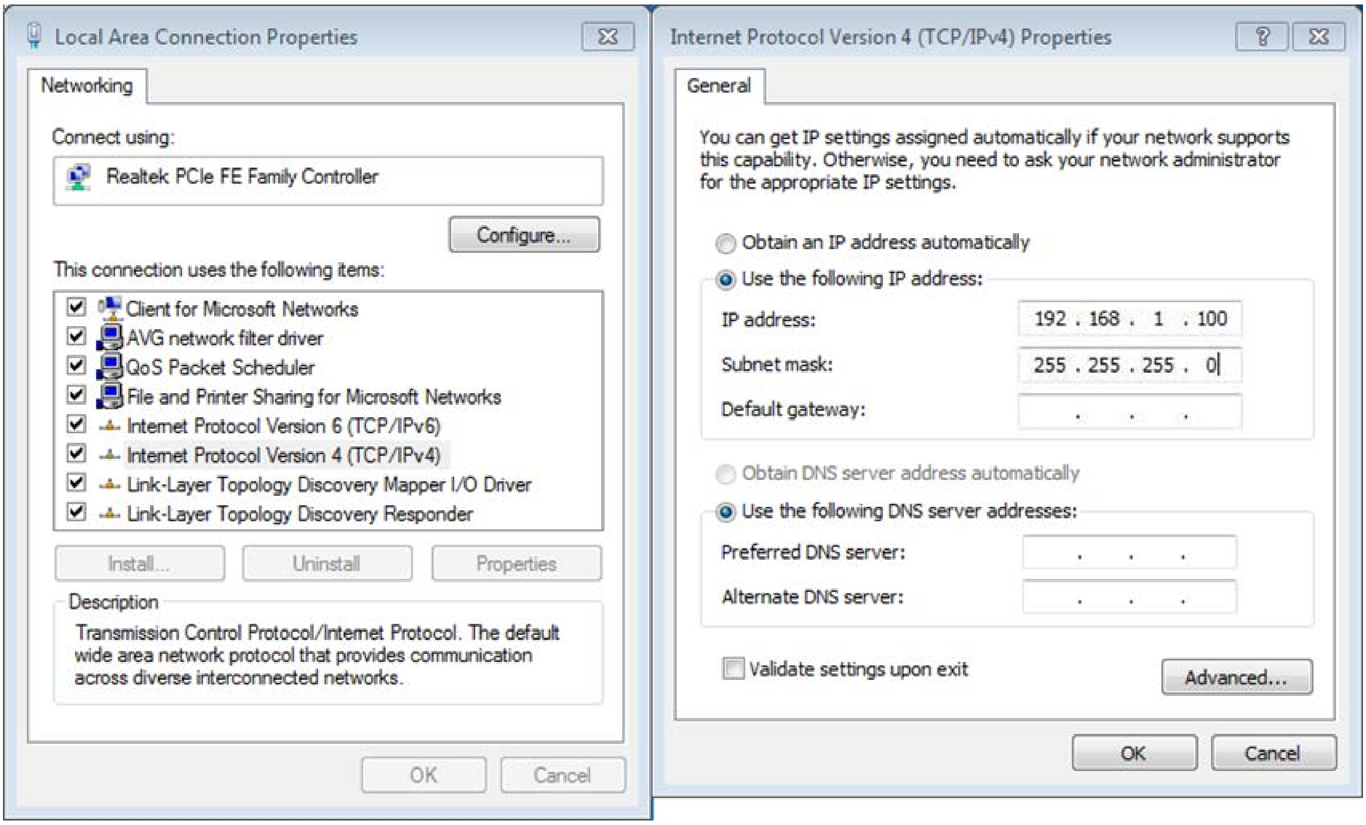
4) For the long distance connection over 1km, please adjust the "Transmit Distance" to the actual distance or double of the actual distance.

Q2: How to set up the WDS Connection

Topology:



Step 1. Use static IP in the PCs that are connected with WMC252-300-1 (Site-1) and WMC252-300-2 (Site-2). In this case, Site-1 is “**192.168.0.100**”, and Site-2 is “**192.168.1.200**”.



Local Area Connection Properties

Networking

Connect using:

Realtek PCIe FE Family Controller

Configure...

This connection uses the following items:

- ☑ Client for Microsoft Networks
- ☑ AVG network filter driver
- ☑ QoS Packet Scheduler
- ☑ File and Printer Sharing for Microsoft Networks
- ☑ Internet Protocol Version 6 (TCP/IPv6)
- ☑ Internet Protocol Version 4 (TCP/IPv4)
- ☑ Link-Layer Topology Discovery Mapper I/O Driver
- ☑ Link-Layer Topology Discovery Responder

Install... Uninstall Properties

Description

Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

OK Cancel

Internet Protocol Version 4 (TCP/IPv4) Properties

General

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

○ Obtain an IP address automatically

● Use the following IP address:

IP address: 192 . 168 . 1 . 100

Subnet mask: 255 . 255 . 255 . 0

Default gateway: . . .

○ Obtain DNS server address automatically

● Use the following DNS server addresses:

Preferred DNS server: . . .

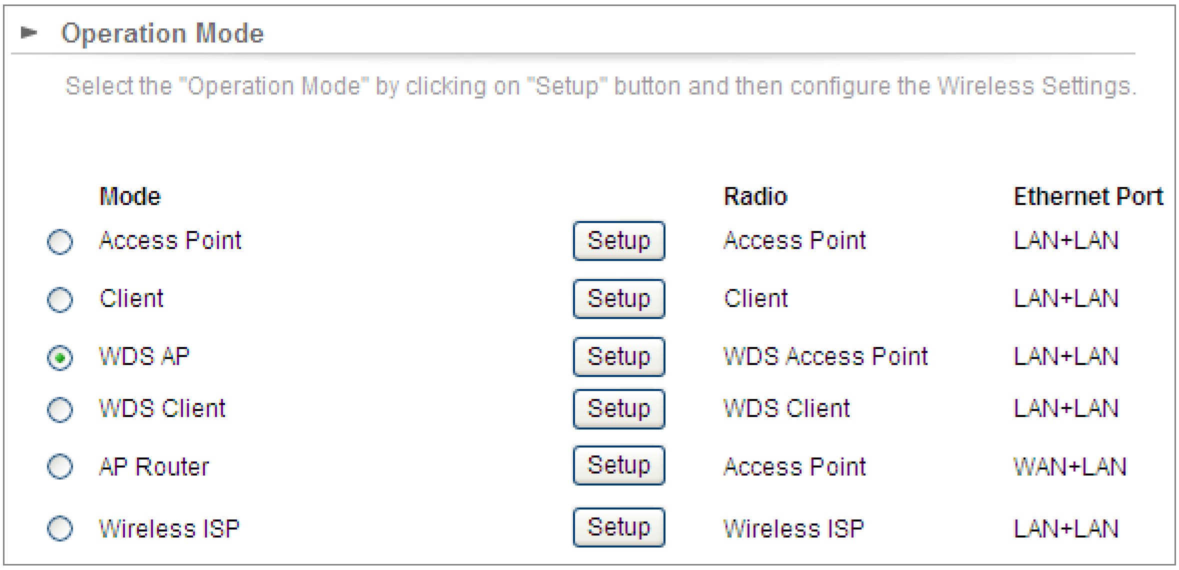
Alternate DNS server: . . .

□ Validate settings upon exit

Advanced...

OK Cancel

Step 2. In AP-1, go to “**Operation Mode**” to configure it in **Access Point** 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 AP	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

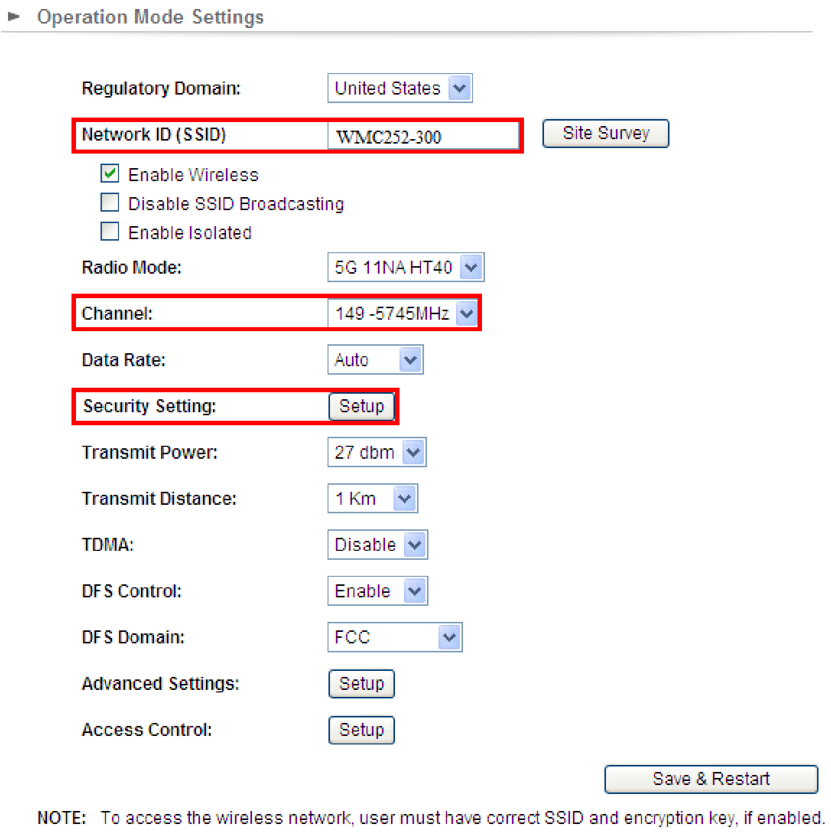
Step 3. Click “**Setup**” to configure the following parameters and then click **Save & Restart** to save the settings.

4) **Network ID (SSID)**: set to a unique value

5) **Channel**: set to a fixed one

6) **Security Setting**: strongly suggested to configure it.

In this case, we configure it to WPA2-PSK, AES

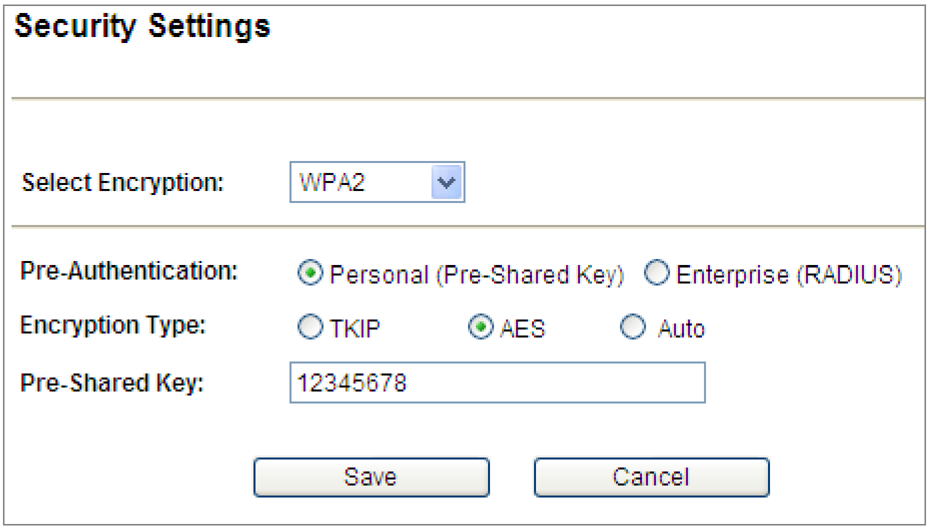


► Operation Mode Settings

Regulatory Domain:	United States
Network ID (SSID)	WMC252-300 Site Survey
	☑ Enable Wireless
	□ Disable SSID Broadcasting
	□ Enable Isolated
Radio Mode:	5G 11NA HT40
Channel:	149 -5745MHz
Data Rate:	Auto
Security Setting:	Setup
Transmit Power:	27 dbm
Transmit Distance:	1 Km
TDMA:	Disable
DFS Control:	Enable
DFS Domain:	FCC
Advanced Settings:	Setup
Access Control:	Setup

Save & Restart

NOTE: To access the wireless network, user must have correct SSID and encryption key, if enabled.



Security Settings

Select Encryption: WPA2

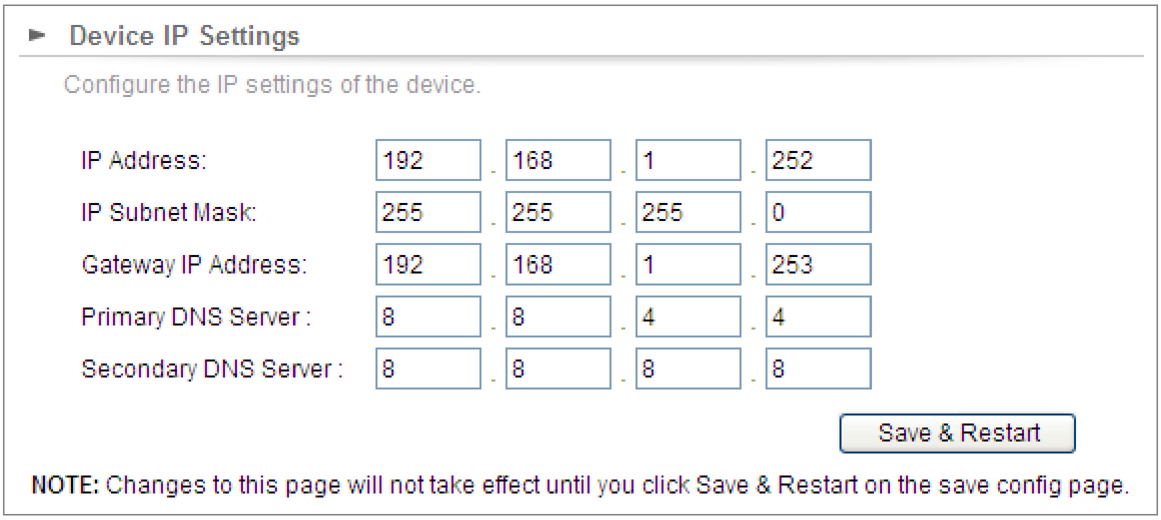
Pre-Authentication: ● Personal (Pre-Shared Key) ○ Enterprise (RADIUS)

Encryption Type: ○ TKIP ● AES ○ Auto

Pre-Shared Key: 12345678

Step 4. In AP-2, modify the default IP to the same IP range but different from AP-1.

In this case, the IP is changed to **192.168.1.252**.



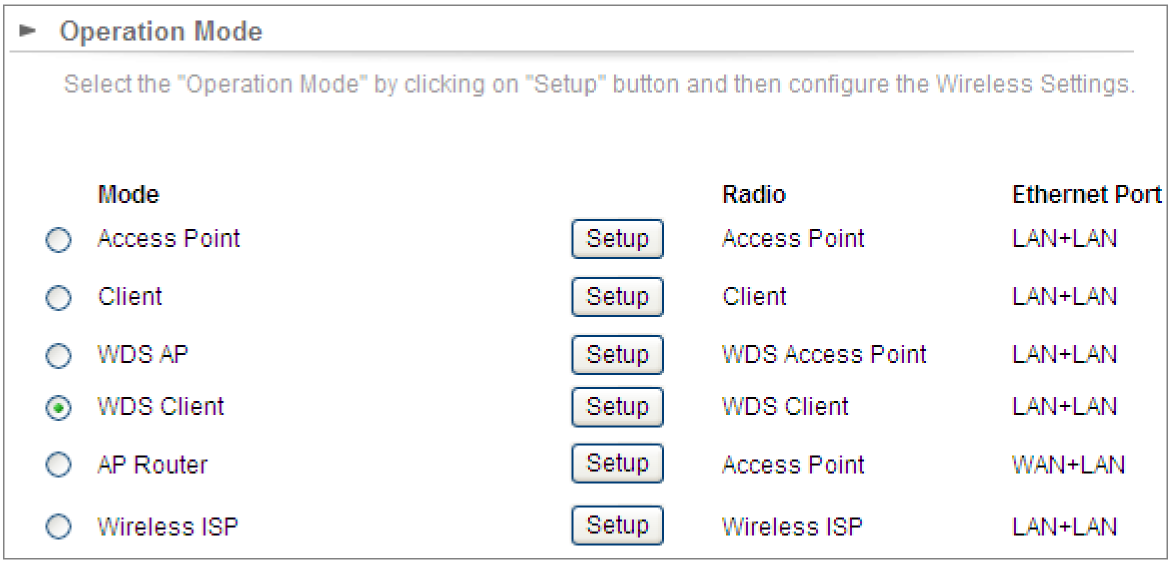
► Device IP Settings

Configure the IP settings of the device.

IP Address:	192	168	1	252
IP Subnet Mask:	255	255	255	0
Gateway IP Address:	192	168	1	253
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.

Step 5. In AP-2, configure it in “**Client**” mode and click “**Setup**”.

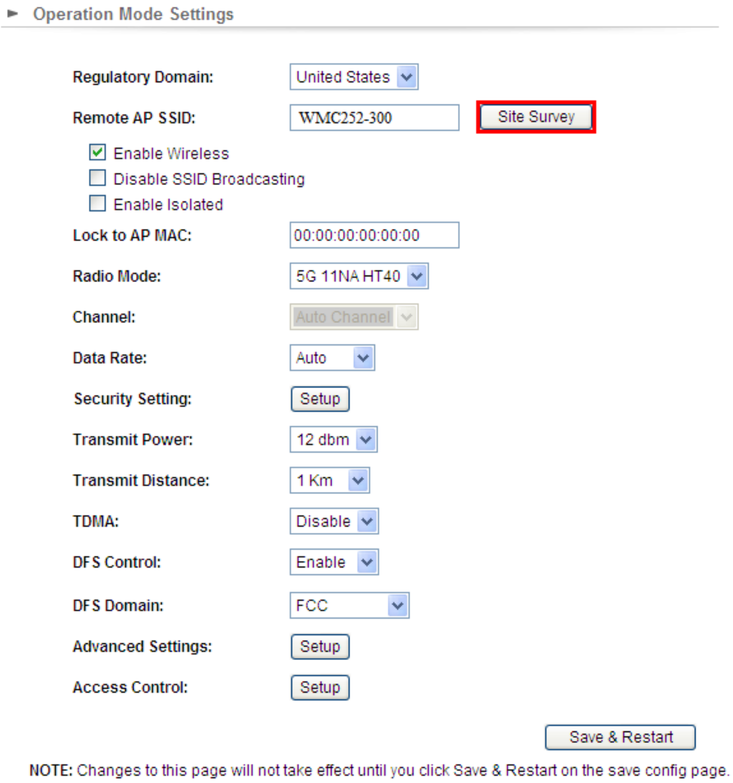


► Operation Mode

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 AP	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

Step 6. Click “**Setup**” and then click **Site Survey** to find AP-1.



► Operation Mode Settings

Regulatory Domain: United States

Remote AP SSID: WMC252-300 [Site Survey]

☑ Enable Wireless

☐ Disable SSID Broadcasting

☐ Enable Isolated

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

Radio Mode: 5G 11NA HT40

Channel: Auto Channel

Data Rate: Auto

Security Setting: Setup

Transmit Power: 12 dbm

Transmit Distance: 1 Km

TDMA: Disable

DFS Control: Enable

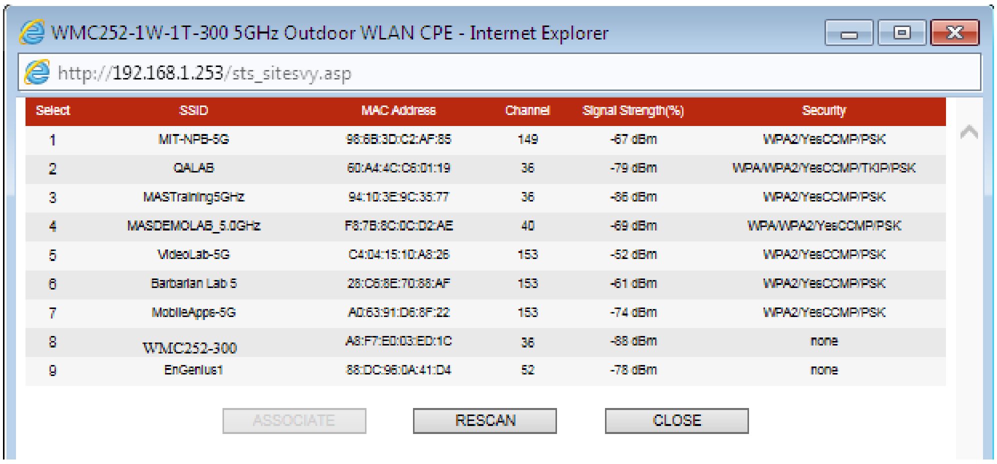
DFS Domain: FCC

Advanced Settings: Setup

Access Control: Setup

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

Step 7. Select AP-1 from the list.

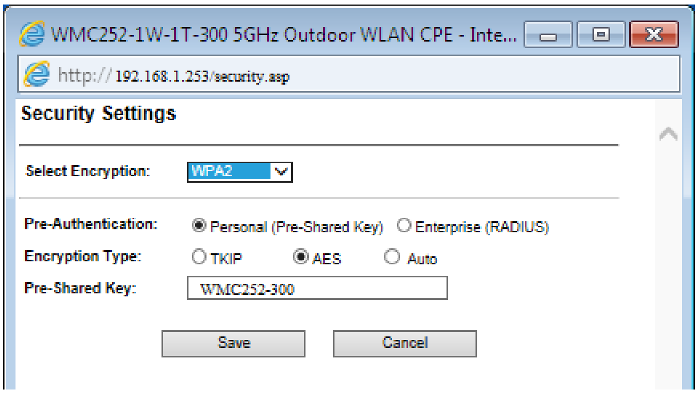


WMC252-1W-1T-300 5GHz Outdoor WLAN CPE - Internet Explorer

http://192.168.1.253/sts_sitesvy.asp

Select	SSID	MAC Address	Channel	Signal Strength(%)	Security
1	MIT-NPB-5G	98:6B:3D:C2:AF:85	149	-67 dBm	WPA2/YesCCMP/PSK
2	QALAB	60:A4:4C:C6:01:19	36	-79 dBm	WPA/WPA2/YesCCMP/TKIP/PSK
3	MASTraining5GHz	94:10:3E:9C:35:77	36	-86 dBm	WPA2/YesCCMP/PSK
4	MASDEMOLAB_5.0GHz	F8:7B:8C:0C:D2:AE	40	-69 dBm	WPA/WPA2/YesCCMP/PSK
5	VideoLab-5G	C4:04:15:10:A8:26	153	-52 dBm	WPA2/YesCCMP/PSK
6	Barbarian Lab 5	28:C6:8E:70:88:AF	153	-61 dBm	WPA2/YesCCMP/PSK
7	MobileApps-5G	A0:63:91:D6:8F:22	153	-74 dBm	WPA2/YesCCMP/PSK
8	WMC252-300	A8:F7:E0:03:ED:1C	36	-88 dBm	none
9	EnGenius1	88:DC:96:0A:41:D4	52	-78 dBm	none

Step 8. Click “**SET SECURITY**” to configure the Pre-Shared Key and then click “**Save**” to close the window.



WMC252-1W-1T-300 5GHz Outdoor WLAN CPE - Inte...

http://192.168.1.253/security.asp

Security Settings

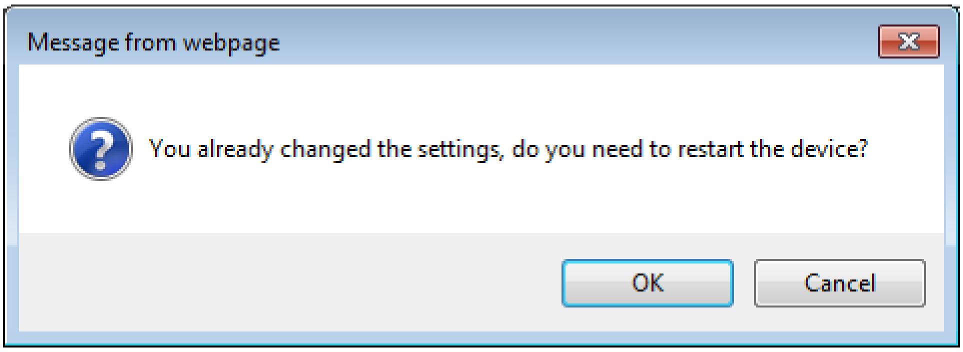
Select Encryption: WPA2

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

Encryption Type: ○ TKIP ● AES ○ Auto

Pre-Shared Key: WMC252-300

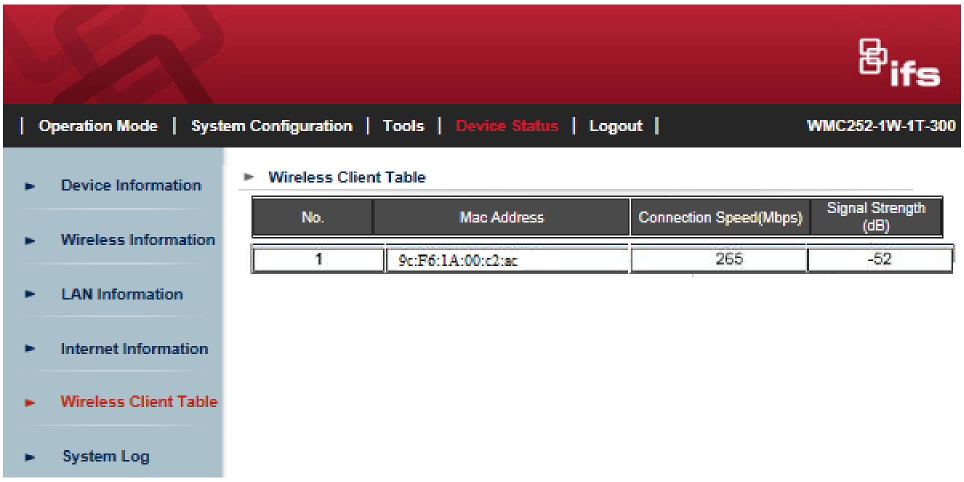
Step 9. Click “OK” and click “**Save & Restart**” to apply the setting.



Message from webpage

You already changed the settings, do you need to restart the device?

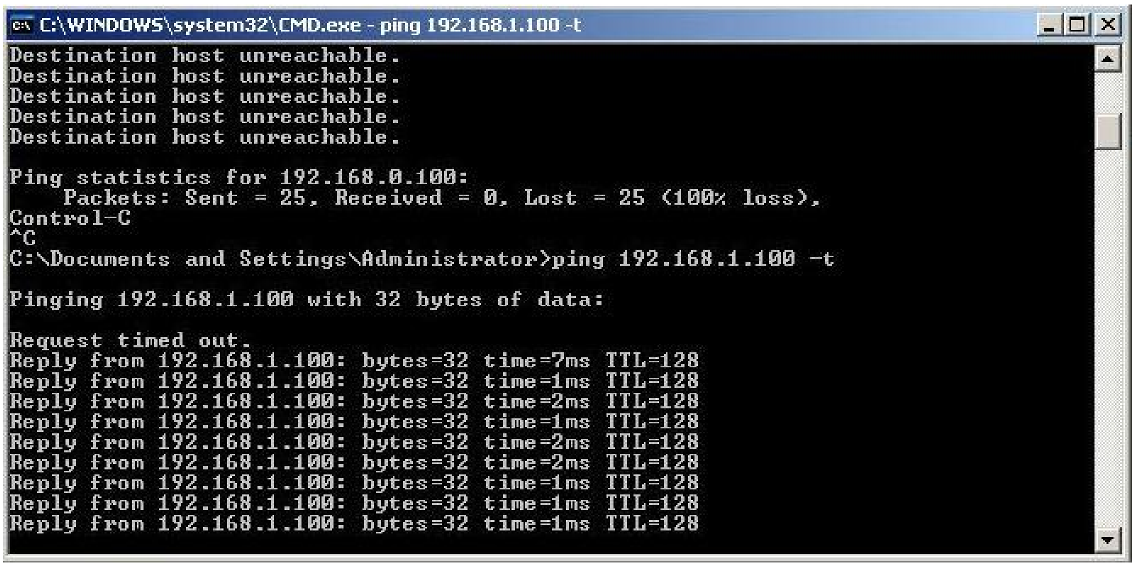
Step 10. In AP-1, go to “**Device Status-> Wireless Client Table**” to check whether AP-2 should be in the list.



Wireless Client Table

No.	Mac Address	Connection Speed(Mbps)	Signal Strength (dB)
1	9c:F6:1A:00:c2:ac	265	-52

Step 11. Use command line tool to ping each other to ensure the link is successfully established. From Site-1, ping 192.168.1.200; and in Site-2, ping 192.168.0.100.



```
Destination host unreachable.
Destination host unreachable.
Destination host unreachable.
Destination host unreachable.
Destination host unreachable.

Ping statistics for 192.168.0.100:
    Packets: Sent = 25, Received = 0, Lost = 25 (100% loss),
Control-C
^C
C:\Documents and Settings\Administrator>ping 192.168.1.100 -t

Pinging 192.168.1.100 with 32 bytes of data:

Request timed out.
Reply from 192.168.1.100: bytes=32 time=7ms TTL=128
Reply from 192.168.1.100: bytes=32 time=1ms TTL=128
Reply from 192.168.1.100: bytes=32 time=2ms TTL=128
Reply from 192.168.1.100: bytes=32 time=1ms TTL=128
Reply from 192.168.1.100: bytes=32 time=2ms TTL=128
Reply from 192.168.1.100: bytes=32 time=2ms TTL=128
Reply from 192.168.1.100: bytes=32 time=1ms TTL=128
Reply from 192.168.1.100: bytes=32 time=1ms TTL=128
Reply from 192.168.1.100: bytes=32 time=1ms TTL=128
```

Note

The attention of the following hints should be paid:

1) The encryption method must be the same as that of both sites if configured.
2) Both sites should be Line-of-Sight.
3) For the short distance connection less than 1km, please reduce the "Transmit power" of both sites.
4) For the long distance connection over 1km, please adjust the "Transmit Distance" to the actual distance or double of the actual distance.

EC Declaration of Conformity

English	Hereby, **IFS** declares that this **300Mbps 802.11a/n Wireless Outdoor CPE** is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.	**Lietuviškai**	Šiuo **IFS**, skelbia, kad **300Mbps 802.11a/n Wireless Outdoor CPE** tenkina visus svarbiausius 1999/5/EC direktyvos reikalavimus ir kitas svarbias nuostatas.
Česky	Společnost **IFS,** tímto prohlašuje, že tato **300Mbps 802.11a/n Wireless Outdoor CPE** splňuje základní požadavky a další příslušná ustanovení směrnice 1999/5/EC.	**Magyar**	A gyártó **IFS,** kijelenti, hogy ez a **300Mbps 802.11a/n Wireless Outdoor CPE** megfelel az 1999/5/EK irányelv alapkövetelményeinek és a kapcsolódó rendelkezéseknek.
Dansk	**IFS,** erklærer herved, at følgende udstyr **300Mbps 802.11a/n Wireless Outdoor CPE** overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF	**Malti**	Hawnhekk, **IFS,** jiddikjara li dan **300Mbps 802.11a/n Wireless Outdoor CPE** jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Dirrettiva 1999/5/EC
Deutsch	Hiermit erklärt **IFS,** dass sich dieses Gerät **300Mbps 802.11a/n Wireless Outdoor CPE** in Übereinstimmung mit den grundlegenden Anforderungen und den anderen relevanten Vorschriften der Richtlinie 1999/5/EG befindet". (BMWi)	**Nederlands**	Hierbij verklaart , **IFS,** dat **300Mbps 802.11a/n Wireless Outdoor CPE** in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG
Eestikeeles	Käesolevaga kinnitab **IFS,** et see **300Mbps 802.11a/n Wireless Outdoor CPE** vastab Euroopa Nõukogu direktiivi 1999/5/EC põhinõuetele ja muudele olulistele tingimustele.	**Polski**	Niniejszym firma **IFS,** oświadcza, że **300Mbps 802.11a/n Wireless Outdoor CPE** spełnia wszystkie istotne wymogi i klauzule zawarte w dokumencie „Directive 1999/5/EC”.
Ελληνικά	*ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ* , **IFS,** *ΔΗΛΩΝΕΙ ΟΤΙ ΑΥΤΟ* **300Mbps 802.11a/n Wireless Outdoor CPE***ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ* *ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ*	**Português**	**IFS,** declara que este **300Mbps 802.11a/n Wireless Outdoor CPE** está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
Español	Por medio de la presente, **IFS,** declara que **300Mbps 802.11a/n Wireless Outdoor CPE** cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE	**Slovensky**	Výrobca **IFS,** týmto deklaruje, že táto **300Mbps 802.11a/n Wireless Outdoor CPE** je v súlade so základnými požiadavkami a ďalšími relevantnými predpismi smernice 1999/5/EC.
Français	Par la présente, **IFS,** déclare que les appareils du **300Mbps 802.11a/n Wireless Outdoor CPE** sont conformes aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE	**Slovensko**	**IFS, s tem potrjuje,** da je ta **300Mbps 802.11a/n Wireless Outdoor CPE** skladen/a z osnovnimi zahtevami in ustreznimi določili Direktive 1999/5/EC.
Italiano	Con la presente , **IFS,** dichiara che questo **300Mbps 802.11a/n Wireless Outdoor CPE** è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.	**Suomi**	**IFS,** vakuuttaa täten että **300Mbps 802.11a/n Wireless Outdoor CPE** tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
Latviski	Ar šo **IFS,** apliecina, ka šī **300Mbps 802.11a/n Wireless Outdoor CPE** atbilst Direktīvas 1999/5/EK pamatprasībām un citiem atbilstošiem noteikumiem.	**Svenska**	Härmed intygar, **IFS,** att denna **300Mbps 802.11a/n Wireless Outdoor CPE** står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.