Master Unit EKOAX IPC-M

User Manual

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1. Introduction

The IP through coaxial cable system provided by EKSELANS, **EKOAX**, has been especially designed to convert the coaxial network into a data network in a very easy manner. The **EKOAX** equipment enables the transmission and reception of an internet signal via the existing coaxial cable of a television installation, without having to undertake any actions on the infrastructure.

Simply by adding a headend master equipment (IPC-M) and a slave (IPC-S) at each point where the internet signal has to be carried, the television installation is upgraded to transmit IP data at high speed. The IPC-S slave also acts as a Wi-Fi router allowing the creation of a wireless network easily wherever the IPC-S is installed.

A single IPC-M master equipment supports up to 253 slaves with encrypted communications. It is also possible to increase the number of IPC-S using the same network by simply installing new master equipment in tandem (up to 4 IPC-M for the same coaxial cable).

This user manual includes instructions to manage an IPC-M master unit.

1.1. Requirements

The IPC-M master unit can be manage through its web management interface. The following runtime environment is recommended in order to use this web management interface properly:

- Operating system: Windows 2000, Windows XP, Windows NT, Windows Vista, Windows 7 or Windows 10
- Hardware requirement: CPU PIII 800 MHz, 256M RAM memory, 1 GB disk space and 10/100M Ethernet interface.
-

1.2. Functional Features

The web management interface supports the functions shown in the following table:

Item	Sub-item	Description
Slave Management	Authorization Management	To manage the slave by authorized and unauthorized slaves lists.
	Online Slave List	Show online authorized slaves
	Configuring Template	Manage the slave configuration templates
	Auto Upgrade	To manage the upgrading of slaves
	MAC Limit	To limit the number of MACs per slave
	WiFi upgrade	To manage the WiFi upgrade of slaves
RF	RF Info	To show RF information
Network	Status	To show running network status of the IPC-M
	Config	To configure the IP type, IP, subnet mask, gateway of the In-band network interface.
	VLAN	To set the VLAN of uplink
	SNID	To set the SNID of the master unit
	Filter	To enable broadcast and multicast limiting function and set the threshold parameters.
	Igmp	IGMP query configuration
Service	Service configuration	To turn on or turn off some system services
System	Information	To display the system information, including chip model, device type, software version, hardware version, serial number, MAC addresses and amount of online slaves.
	Running status	To display the system running status, such online time, memory size, remaining memory, storage space, remaining space, space utilization.
	Slave Type	To add, edit and delete the slave types
	IP Access Control	To enable the IP access control and configure the IP addresses from where the access is allowed.
	System Time	To setup date and time of the system.
	System Log	To display the system log and set the log options.
	Account	To manage the administrator account.

Item	Sub-item	Description
	Reboot	To reboot the system
	Factory	To restore factory settings
	Upgrade	To upgrade the system from a FTP server.
	Backup restore	To backup the current configuration and restore it from a FTP server.
Exit	Exit	To exit from the web interface

Table *1*

2. Web management interface reference

This section describes the usage and meanings of all the menus and parameters which can be configure through the web interface of the IPC-M master unit.

2.1. Login

This topic describes the procedure to login to the web interface.

The following table shows the default parameters needed to connect to IPC-M web interface.

Item	Description
User name and password	Default settings: Administrator: - User name: admin - Password: admin
LAN IP address and subnet mask of the IPC-M	Default settings: IP address: 192.168.1.2 (Out-band Network – this is the network available using the MGMT Ethernet port of the unit) IP address: 192.168.2,2 (In-band Network- this is the network available using the 10/100/1000Mbps Ethernet port of the unit Subnet mask: 255.255.255.0
LAN IP address and subnet mask of the PC used for management	Configure the IP address of the PC to be in the same subnet as the LAN IP address of the IPC-M unit. For example: IP address: 192.168.1.100 (from Out-band) IP address: 192.168.2.100 (from In-band) Subnet mask: 255.255.255.0

Table *2*

Procedure:

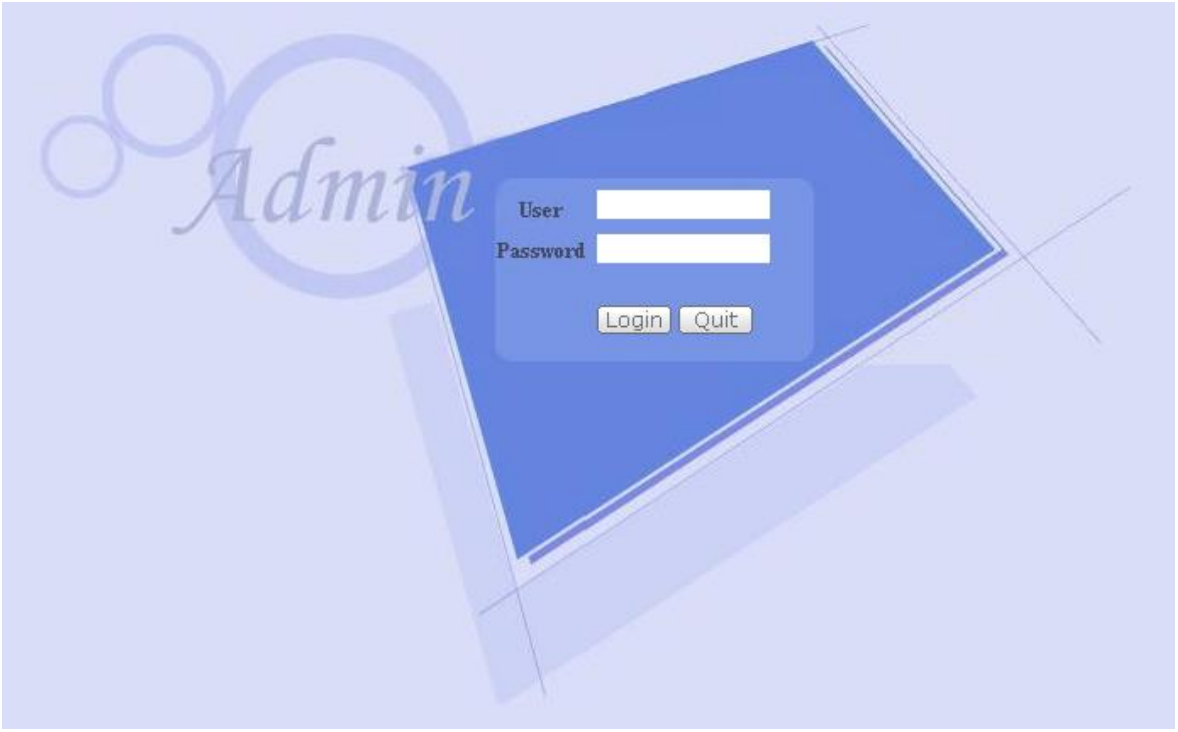
Step 1: Use a network cable to connect the MGMT Ethernet port of the IPC-M unit to a PC.

Step 2: Ensure that your web browser does not use a proxy server.

Step 3: Set the IP address and subnet mask of the PC. For details, see Table Table Table Table

Step 4: Login to the web interface:

1. Enter http://192.168.1.2 in the address bar of the web browser (192.168.1.2 is the default IP address of the MGMT Ethernet interface of the IPC-M unit) and press Enter to display the login interface, as shown in Picture



Picture *1*

2. In the login interface, enter the user name and password. For the details about the default setting of the user name and password, see Table.

2.2. Web interface introduction

After successfully login, web interface shows a web page as shown in Picture

Picture *2*

On the left side of the page, there is a menu showing the following items:

- SLAVE
- RF
- NETWORK
- SERVICE
- SYSTEM
- EXIT

On the right side, the screen shows the following information:

- **System information**: it includes
  - Chip model
  - Device type
  - Software version
  - PIB (Parameter Information Block) and NVM (Non-volatile Memory) files versions
  - HW versions
  - Serial number
  - MAC address of the main system block.
  - MAC address of Ethernet over coaxial cable block.
  - Number of online slave units (IPC-S).
- **Device information**: it includes

- Name of the unit
- Contact of the company.
- Company location.

2.3. SLAVE menu

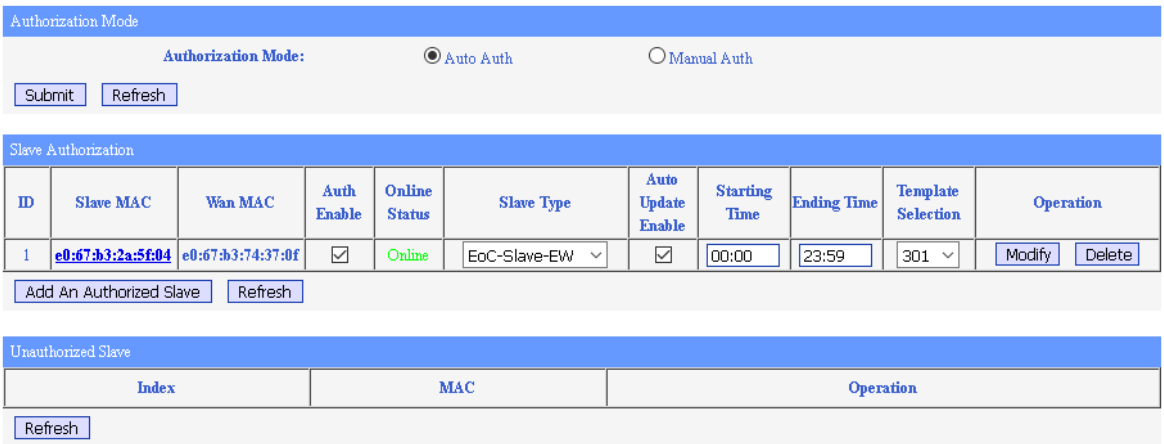
This topic describes how to manage the authorization of slaves, the online slave configuration, the configuration template and the upgrading of slaves.

Picture *3*

Important note: Before starting to set up the IPC-S slave, it is necessary to apply the template 1 created by default in the IPC-M master. Thus the IPC-S remains properly bound to IPC-M.

2.3.1. Authorization

Selecting the Slave→ Authorization menu, the web interface returns the management authorization of slave, as shown on Picture:



Picture *4*

There are two possible authorization modes which can be configured here:

- **Auto Authorization**: If this mode is selected, the slave is automatically added to the list of the authorized slaves as soon as it is connected to the network through the coaxial cable. This list is shown in the Slave Authorization table and it is also called the **White List**.

- **Manual Authorization**: If this mode is selected, the slave is added to the list of unauthorized slaves as soon as it is connected to the network through the coaxial cable. This list is shown in the Unauthorized Slave table.

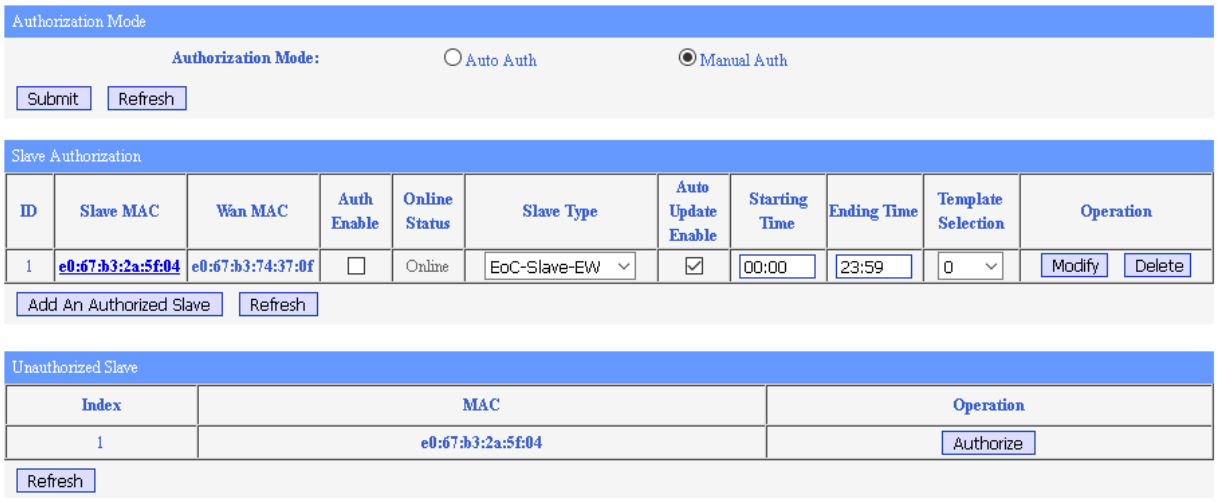
If a slave is not in the White List cannot use the network. In order to really change the authorization mode, the Submit button must be clicked.

Note: The authorization process can take until one minute, please wait patiently and click the Refresh buttons in order to check the current authorization status of the slaves after changes.

You can do the following operations for each of the slaves included in the Slave Authorization table:

- **Enabling/disabling the authorization**:

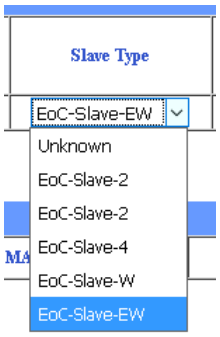
  If you uncheck the Auth Enable checkbox and click the Modify button, the corresponding slave will be unauthorized and it will be added to the Unauthorized Slave table (click on the Refresh buttons to update the status) but it will not be removed from the Slave Authorization table as it is shown in Picture. If the check the Auth Enable checkbox and click the Modify button, the corresponding slave will be authorized and it will be removed from the Unauthorized Slave table (click on the Refresh buttons to update the status).



Picture *5*

- **Changing the Slave Type**:

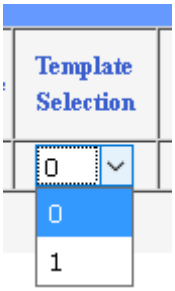
  The Slave Type is used to identify the slave by the type defined by the manufacturer (see 2.7.3). The Slave Type combo box displays a list of type as shown in Picture . For more information about the available Slave Types, you can go to the SYSTEM→ SLAVE_TYPE menu. The type is usually detected automatically by the IPC-M.



Picture 6

- **Changing the Template Selection**:

  The Template Selection combo box (see Picture) allows to select a configuration which it is uploaded from the IPC-M to the slave as soon as the slave is connected to the network (Auto Update check box should be checked). For more information about the template, you can go to SLAVE→ Template menu.



Picture 7

- **Changing Starting Time, Ending time**:

  Currently not used. Please, keep Starting Time to 00:00 and Ending Time to 23:59.

- **Enabling/Disabling auto-update template**:

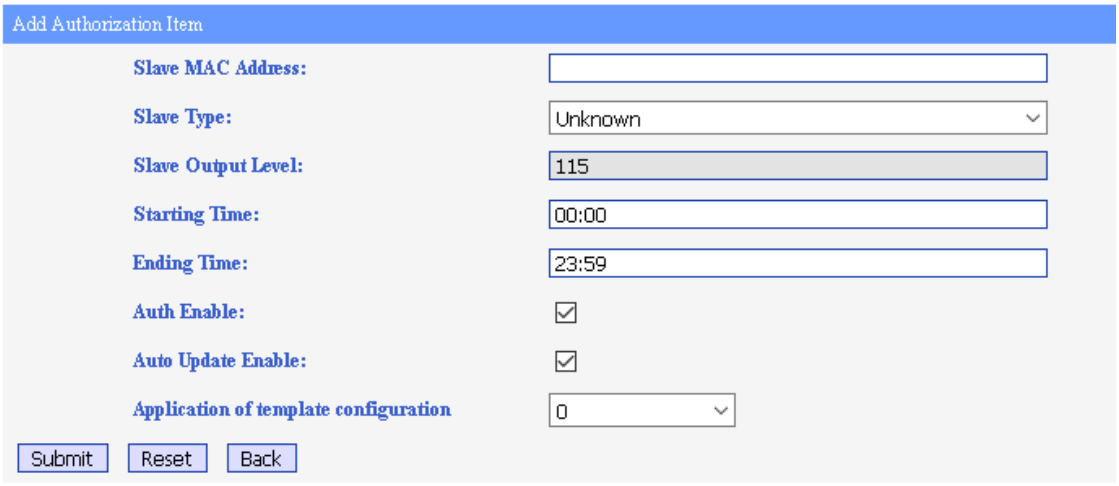
  If the Auto Update Enable check box is checked, the slaves will get the configuration template configured automatically as soon as they are connected to the network. If this check box is unchecked, the slaves will not get the configuration template automatically.

The Add An Authorized Slave button allows to add a slave to the Slave Authorization list. If this button is clicked the screen shown in Picture is displayed. Input the desired value in the following boxes:

- Slave MAC address,
- Slave Type,
- Starting Time: currently not used. Please, keep value to 00:00.
- Ending Time: currently not used. Please, keep value to 23:59.
- Authorization Enable,

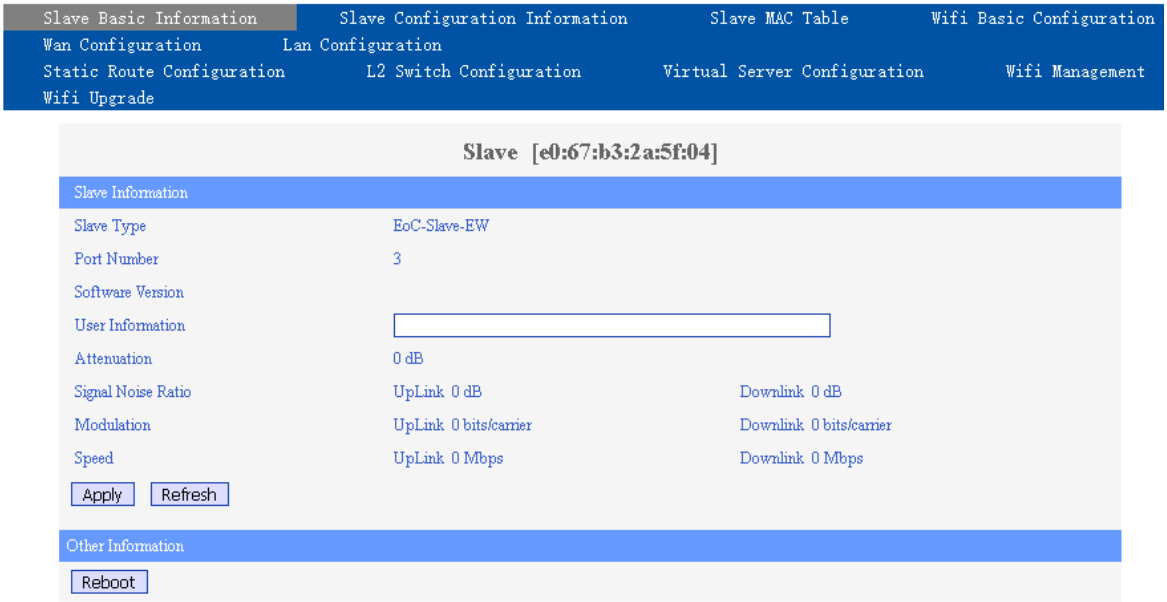
- Auto update Enable,
- Application of template configuration.

Click Submit to submit your request or Reset to return to all the default values, or Back to return to the previous page.



Picture *8*

If you click in the MAC address of one of the slaves shown in the Slaves Authorization list (the white list) the related slave management page is displayed as it is shown in Picture



Picture *9*

On the top of the page, you can see the available sub-menus:

- Slave Basic Information
- Slave Configuration Information
- Slave MAC Table

- WiFi Basic Configuration
- Wan Configuration
- Lan Configuration
- Static Route Configuration
- L2 Switch Configuration
- Virtual Server Configuration
- WiFi Management
- WiFi Upgrade

Some of these sub-menus cannot be available for some types of slaves. The following table shows the available menus depending on the Slave types defined.

Slave Type	Available Menus
EoC-Slave-2	Slave Basic Information Slave Configuration Information Slave MAC Table
EoC-Slave-4	Slave Basic Information Slave Configuration Information Slave MAC Table
EoC-Slave-W	Slave Basic Information Slave MAC Table WiFi Basic Configuration Wan Configuration LAN Configuration Static Route Configuration L2 Switch Configuration Virtual Server Configuration WiFi Management WiFi Upgrade
EoC-Slave-EW	Slave Basic Information Slave Configuration Information Slave MAC Table WiFi Basic Configuration Wan Configuration LAN Configuration Static Route Configuration L2 Switch Configuration Virtual Server Configuration WiFi Management WiFi Upgrade

Table *3*

2.3.1.1. Slave Basic Information

The following table describes the items displayed in this page. See Picture.

Item	Description
Slave Type	Slave type provided by the manufacturer. See 2.7.3
Port Number	This field displays the number of available internal ports for the slave. Some internal ports can be shared by the external ports in some slave types. For example, EoC-Slave-EW has 4 external Ethernet ports and a WiFi port which are mapped as it is shown below:
Software Version	A unique version number of the slave software
User Information	A name which can be assigned by the user to identify uniquely to the slave. The table displayed in the Slave→ Online menu will show the user information (see 2.3.2)
Attenuation	The attenuation between the IPC-M master unit and the slave.
Signal Noise Ratio	SNR of the slave. This parameter is very useful to evaluate continuously the quality of the link between the master and the slave.
Modulation	The modulation efficiency in bits/carrier
Speed	The speed of the uplink and downlink in Mbps

External Port	Internal Port
STB1	1
STB2	2
LAN1	3
LAN2	3
WiFi	3

Table *4*

The Apply button allows to save the changes in this page.

The Refresh button allows to update the information in this section.

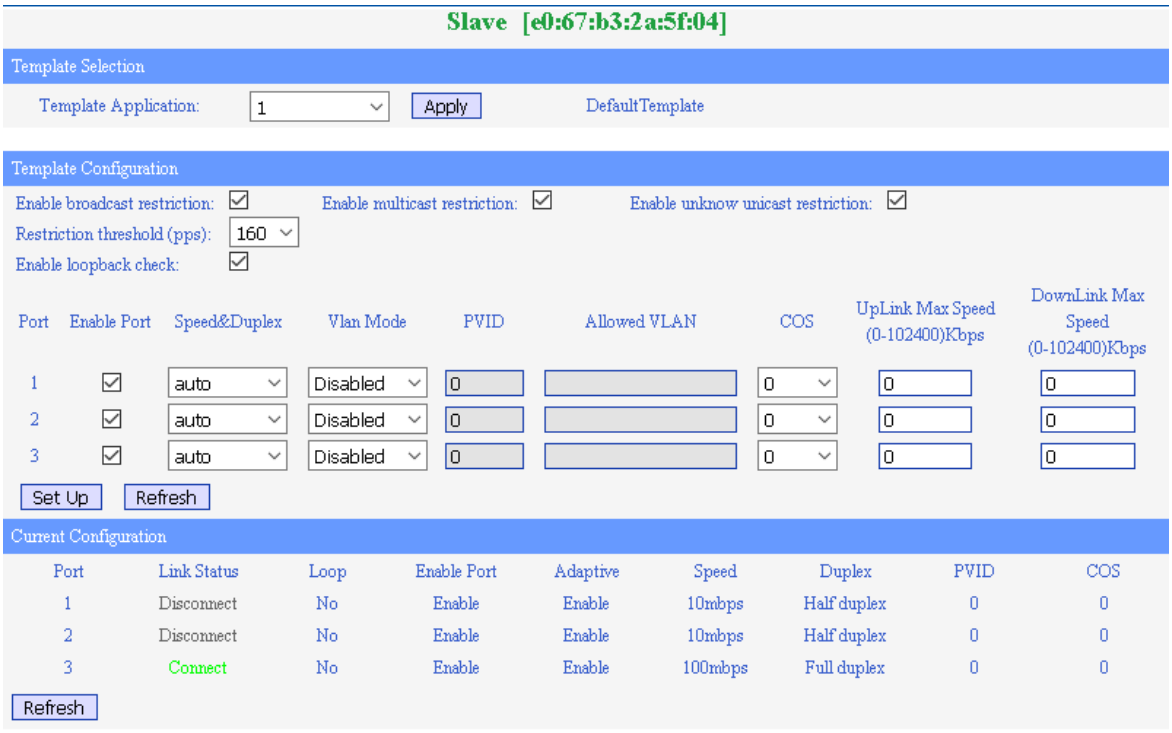
The Reboot button restart the device. This does NOT affect the device's configuration.

2.3.1.2. Slave Configuration Information

The Picture show the information displayed in this page. The information is organized in several panes:

- **Slave**: it shows current slave MAC address.
- **Template Selection**: the user can select here the slave template to apply to the slave. The template can configure in the SLAVE→Template menu (see 2.3.3).
- **Template configuration**: the user can configure the slave and save the configuration as a private template for the slave.

- **Current Configuration**: it shows the current status of the slave configuration related to the internal ports available (see Port Number item in Table).



Picture *10*

The following table describes the items displayed in this page:

Item	Description
Pane 1:Slave	
Slave	It shows the current slave MAC address.
Pane 2: Template Selection	
Template Application	It allows to select the slave template to apply to the slave. Slave templates can be configure in the SLAVE→Template menu (see 2.3.3). The Apply button is used to save the template selection done.
Pane 3: Template Configuration	
Enable broadcast restriction	The broadcast restriction function prevents the LAN interfaces from being disrupted by a broadcast storm. You can enable this feature by checking the 'Enable broadcast restriction' check box.
Enable multicast restriction	The multicast restriction function prevents the LAN interfaces from being disrupted by a high multicast traffic. You can enable this feature by checking the 'Enable multicast restriction' check box.
Enable unknown unicast restriction	The unknown unicast restriction function prevents the LAN interfaces from being disrupted by a high unknown unicast traffic. You can enable this feature by checking the 'Enable unknown unicast restriction' check box.
Restriction threshold (packets per second)	The restriction threshold is used to configure the maximum number of packets per second allowed before one of any of the restriction functions, which the user can enable in this pane, starts to be applied. The user can select any of the values available in the combo box.
Enable loopback check	The loopback check function allows to the device to detect loops and disable a port that is on the receiving end of a loop. A loop is detected by sending a test packet. You can enable this feature by checking the 'Enable loopback check' check box.
Port	This is the column in the slave internal ports table showing the internal port number of each of the available slave internal ports. The slave internal ports are mapped with the slave external ports depending on the slave type, see Port Number item in Table for more details.
Enable port	This is the column in the slave internal ports table where you can enable or disable each port displayed checking or unchecking the corresponding check box.
Speed & Duplex	This is the column in the slave internal ports table where you can set the speed and duplex mode of each port. The available values in the related combo boxes are:

Item	Description
	Auto – The port is using auto-negotiation to set its operating speed and duplex mode. This is the default setting for all the ports. The actual operating speed and duplex mode of the port are displayed in the Current Configuration pane. **100M/Full** – 100 Mbps in full-duplex mode **10M/Full** – 10 Mbps in full-duplex mode. **100M/Half** – 100 Mbps in half-duplex mode **10M/Half** – 10 Mbps in half-duplex mode

Item	Description
VLAN	This is the column in the slave internal ports table where you can configure ports as access ports or trunk ports. The available options in the related combo boxes are: **Disable**: no VLAN configured. **Access**: The port is configured in VLAN access mode. An access port can have only one VLAN configured on the interface; it can carry traffic for only one VLAN. The behaviour is as follows: • If it receives a packet tagged with a VLAN ID != PVID (PVID is the value configure in the PVID column for this port), it drops the packet. • If it receives a packet tagged with a VLAN ID = PVID, it drops the packet. • If it receives a packet untagged, it accepts the packet and adds a tag with PVID. • If it has to transmit a packet tagged with a VLAN ID = PVID, it forwards the packet and removes tag. • If it has to transmit a packet tagged with a VLAN ID != PVID, it forwards the packet and removes tag. **Trunk**: The port is configured in VLAN trunk mode. A trunk port can have two or more VLANs configured on the interface; it can carry traffic for several VLANs simultaneously. The behaviour is as follows: • If it receives a packet tagged with a VLAN ID != PVID, it process the packet and doesn't change anything. VLAN ID has to be included in the list of the allowed VLANs, if not the packet is dropped. • If it receives a packet tagged with a VLAN ID = PVID, it process the packet and doesn't change anything. • If it receives a packet untagged, it accepts the packet and adds a tag with PVID. • If it has to transmit a packet tagged with a VLAN ID = PVID, it forwards the packet and removes tag. • If it has to transmit a packet tagged with a VLAN ID != PVID, it forwards the packet and removes tag. VLAN ID has to be included in the list of the allowed VLANs, if not the packet is dropped.
PVID	This is the column in the internal ports table where you can configure the port VLAN ID (PVID). PVID is a tag which is added to incoming untagged frames received on a port. This value must be between 1 and 4095. A packet with a VLAN ID matching PVID is inserted in the frame forwarded through the port.

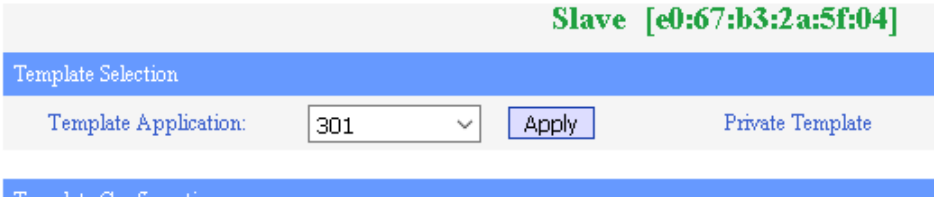
Item	Description
Allowed VLAN	This is the column in the internal ports table where you can configure the allowed VLANs for a trunk port.
COS	This is the column in the internal ports table where you can configure the Class Of Service (COS) of the port traffic. Possible value available in the related combo box are: • 0 — Traffic type is background. • 1 — Traffic type is best effort. • 2 — Traffic type is excellent effort. • 3 — Traffic type is critical applications. • 4 — Traffic type is video <100ms jitter and latency. Latency is the short period of delay between the entrance of an audio signal and when it emerges from a system. Jitter is the deviation from a true period of an assumed period signal in telecommunications. • 5 — Traffic type is voice < 10ms jitter and latency. • 6 — Traffic type is internetwork control. • 7 — Traffic type is network control. This has the highest level of priority.
UpLink Max Speed	This is the column in the internal ports table where you can configure the maximum speed allowed for the slave uplink. The value set must be between 0 and 102400 Kbps. 0 value means not set.
DownLink Max Speed	This is the column in the internal ports table where you can configure the maximum speed allowed for the slave downlink. The value set must be between 0 and 102400 Kbps. 0 value means not set.
Pane 4: Current Configuration	
Port	The column where you can see the port number of the available internal ports. The slave internal ports are mapped with the slave external ports depending on the slave type, see Port Number item in Table for more details.
Link status	The column where the link status of each internal port is shown: connected or disconnected
Loop	The column to see the result of the loop detection check for each internal port.
Enable Port	The column to check which internal ports are enabled and which one are disabled.
Adaptive	This column shows Enable value for all the internal ports which have the Speed&Duplex mode set to auto. For the

Item	Description
	rest of internal ports shows Disable.
Speed	This column shows the current speed of each internal port.
Duplex	This column shows the duplex mode of each internal port.
PVID	This column shows the Port VLAN ID (PVID) configured for each internal port.
COS	This columns shows the Class of Service (COS) configure for each internal port.

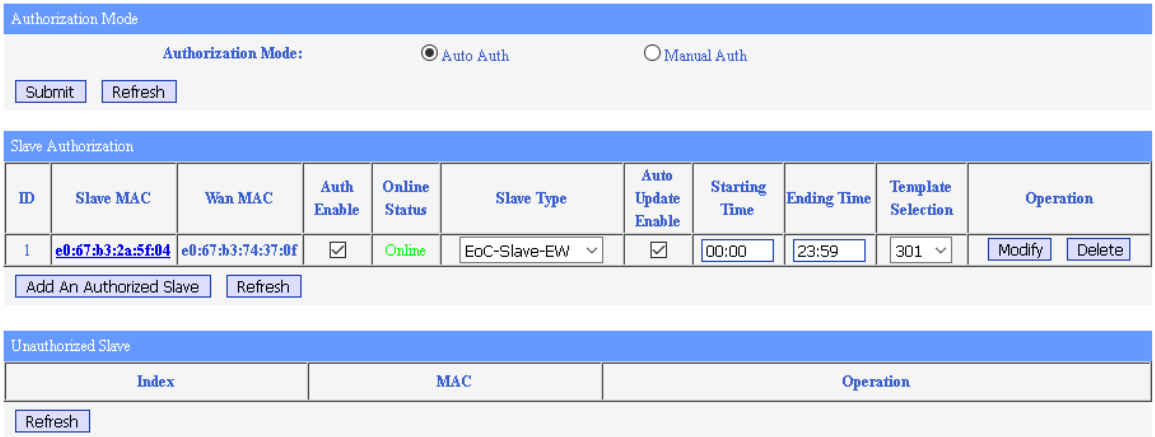
Table *5*

The template configuration selected in the Template Selection pane is applied as soon as the Apply button in this pane is clicked.

All the changes done in the Template Configuration pane are applied when you click on the Set Up button of this pane. Click on the Refresh button to check the value already set up. When a change is done in the Template Configuration pane, the system will save a private template for the slave. The private template number will be 300 + slave ID, as it is shown on Picture. The SLAVE→Authorization page will show the new template used as shown on Picture. The The private template is only available for the slave.



Picture *11*



Picture *12*

You should click on the Refresh button on the Current Configuration pane In order to get updated information.

NOTE: **When the VLAN mode is changed in the Template Configuration for one port, the VLAN mode will be changed automatically for the rest of the internal ports depending on the slave type. The slave internal ports are mapped with the slave external ports depending on the slave type, see Port Number item in Table for more details.**

2.3.1.3. Slave MAC Table

TheError: Reference source not found shows the information displayed in this page. This page shows the MAC addresses table of the slave.

***Picture** 13*

2.3.1.4. WiFi Basic Configuration

TheError: Reference source not found shows the information displayed in this page. The information is organized in several panes:

- **Slave**: it shows current slave MAC address.
- **WifiBase**: it includes the basic configuration parameters of the WiFi interface.
- **AP<n> Setting**: here is where the user can configure all the parameters related to the access point with the identifier <n>. The number of AP<n> panes shown depends on the number of access point configured in the WifiBase pane.
- **Saving Setting**: it includes the Saving Setting button which is used by the user to save the current settings to the slave flash memory.

Picture *14*

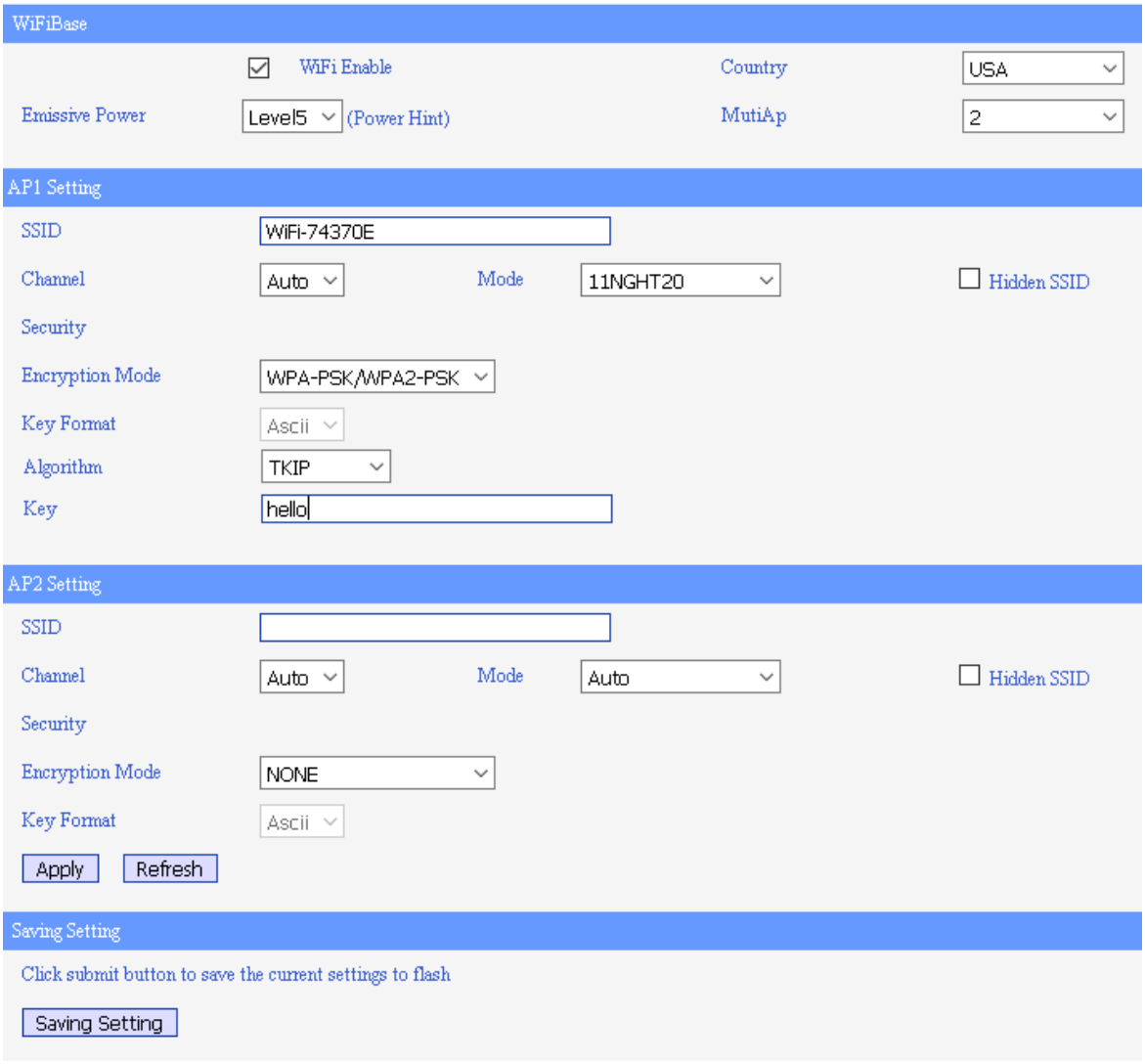
The following table describes the items displayed in this page:

Item	Description
Pane: WifiBase	
WiFi enable	It is a check box which allows to enable or disable the WiFi interface of the slave unit. If the check box is disabled, the AP<n> setting panes are hidden. When the WiFi is enabled, any wireless device connected to the slave can transmit or receive from slave.
Country	It is the country where the slave is installed. The combo box shows the list of available countries. **Note: it might be illegal to operate the slave in a region other than the countries listed.**
Emissive Power	It is the level of power emitted by the slave WiFi interface. The check box shows the available levels of emission. The following table explain the meaning of these levels:
MultiAp	It is an option to set the number of access points available from the WiFi interface of the slave. The related combo box shows the available values of this option. The value set fixes the number AP<n> settings panes shown in this page. The Picture shown and example with 2 access points.
Pane: AP<n> Settings	
SSID	It is the Service Set Identifier (SSID) of the access point. It is a 32 alphanumeric unique identifier which is used to identify uniquely the access point and it is also known as the wireless network name. This field is case-sensitive. If you use a wireless computer to change the wireless network name (SSID) or the security options, you will be disconnected when you click Apply. To avoid this problem, use a computer with a wired connection to access the slave.
Channel	It is the wireless channel used by the slave WiFi interface. The related check box shows the

Level	Power
Level1	20%
Level2	40%
Level3	60%
Level4	80%
Level5	100%

Item	Description
	available values. If the value "auto" is selected, the slave will select the wireless channel automatically.
Mode	It is the wireless mode used. The available values shown by the related check box are: • auto • 11B: 802.11 b • 11G: 802.11 g • 11NGHT20: 802.11 n/g HT20 • 11NGHT40PLUS: 802.11 n/g HT40plus • 11NGHT40MINUS: 802.11 n/g HT40minus The default mode is 11NGHT40PLUS (up to 145 Mbps).
Hidden SSID	If this check box is checked, the SSID is hidden in the outgoing beacon frame so a station cannot obtain the SSID through scanning using a site survey tool. To turn off the SSID broadcast, check the check box and click the Apply button.
Encryption method	The encryption method used for the WiFi connection. The encryption method encrypts data transmissions and ensures that only trusted devices receive authorization to connect to the WiFi network. The following methods are available in the related check box: • None • WEP • WPA-PSK • WPA2-PSK • WPA2/WPA-PSK If you choose WEP encryption method, you need to configure the authentication method and the key. If you choose WiFi Protected Access (WPA-PSK, WPA2-PSK or WPA2/WPA-PSK), you need to configure the algorithm and the key.

Table 6



Picture *15*

After any change on this page, you must click the Apply button. The changes will take effect and store in the slave flash memory as soon as the Save Setting button is clicked.

2.3.1.5. Wan Configuration

This page allows to configure the WAN business here. The slave can support up to four business as you can see in Picture.

The information is organized in several panes:

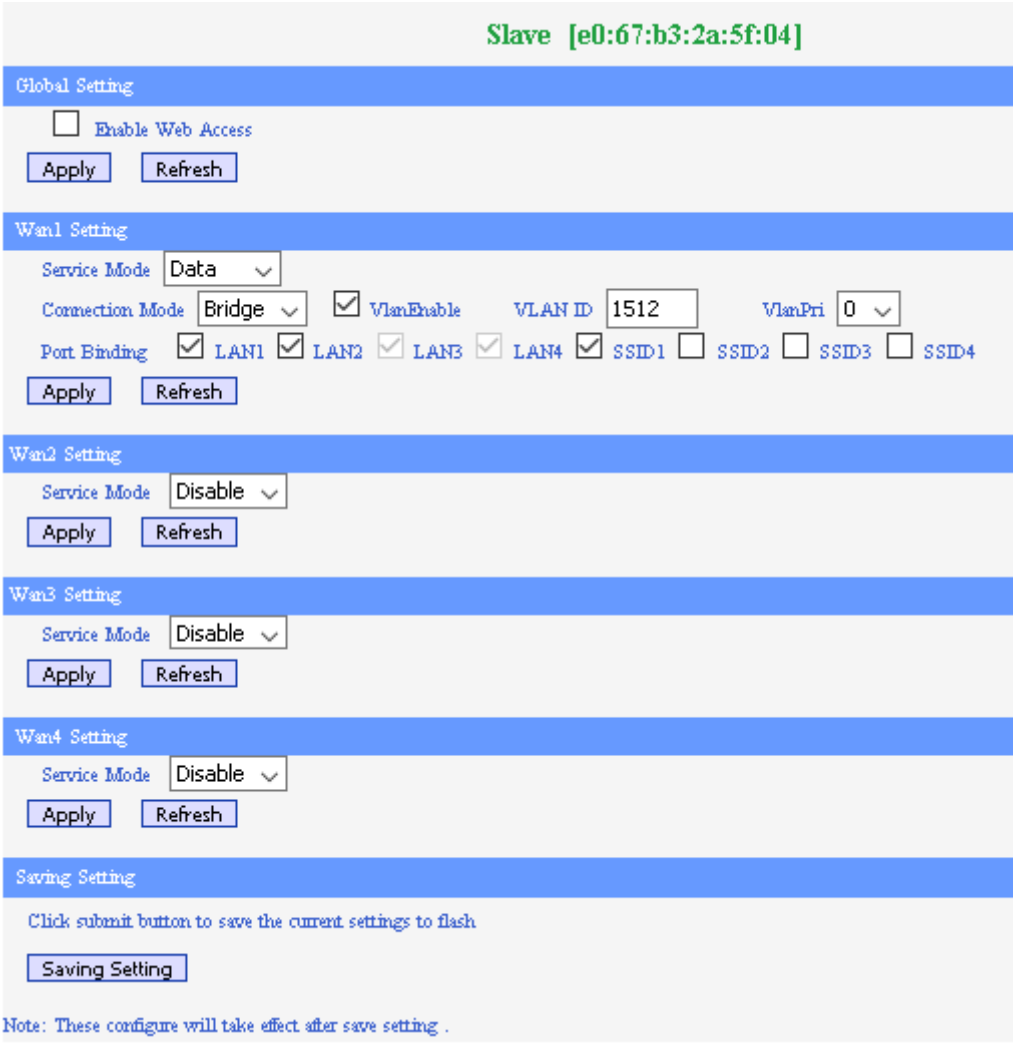
- **Slave**: it shows current slave MAC address.
- **Global Setting**: it includes a check box to enable web access to slave. There are also two buttons, Apply to apply the changes and Refresh to update the current setting.
- **Wlan<n> Setting**: here is where the user can configure all the parameters related to the WAN business with the identifier <n>.
- **Saving Setting**: it includes the Saving Setting button which is used by the user to save the current settings to the slave flash memory.

Picture *16*

The following table describes the items displayed in the WAN<n> Setting pane:

Item	Description
Service Mode	It is the service mode selected for this WAN business. The available values in the combo box are: • Disable • Data
Connection Mode	It is the connection mode selected for this WAN business. The available values in the combo box are: • Route: the slave uses its router features in the selected ports in the Port Binding check boxes • Bridge: the slave disable its router features in the selected ports in the Port Binding check boxes. The Picture shows the pane when this option is chosen. Note: For the slave type EoC-Slave-EW, LAN 3(STB1) y LAN4(STB2) cannot be used in the mode Route.
VlanEnable	If the related checkbox is enabled, the VLAN is enabled for the selected ports in the Port Binding check boxes.
VLAN ID	It is a tag which is added to incoming untagged frames received on a port. This value must be between 1 and 4095. A packet with a VLAN ID matching the VLAN ID set is inserted in the frame forwarded through the port.
VlanPri	Priority of the traffic through the VLAN. The related combo-box provides 8 possible values 0 is the lowest priority and 7 is the highest priority.
Port Binding	The check boxes to select the external ports of the slave which are configured with the current WAN business.

Table *7*

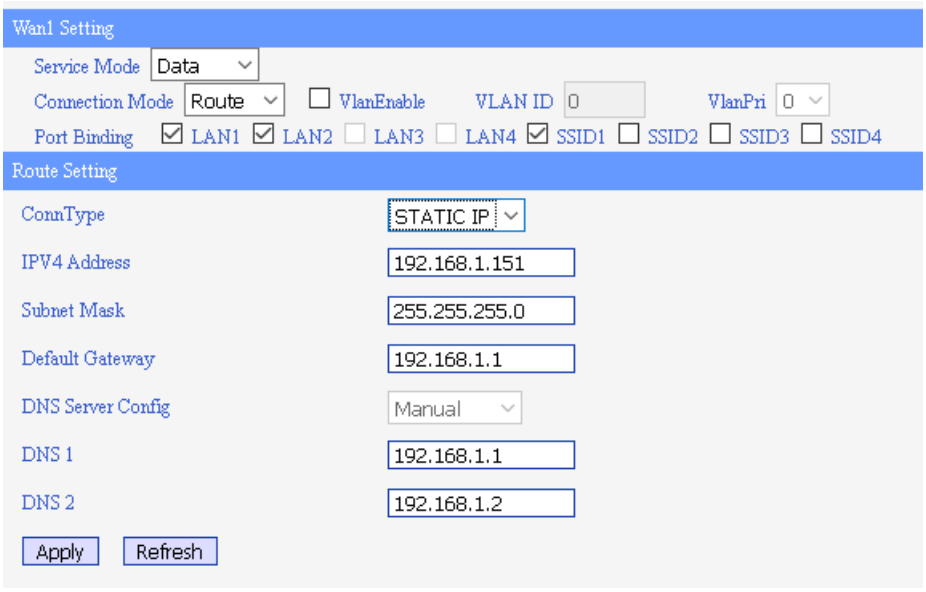


Picture *17*

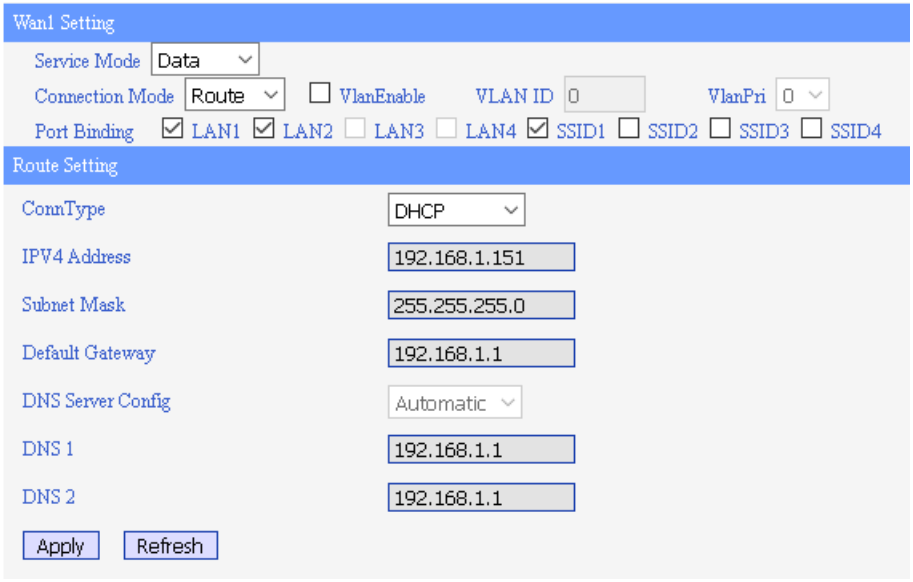
If Connection Mode is selected for a WAN business is selected, the Route Setting pane appears for that WAN business. This pane displays a parameter called ConnType which can be set to the following values:

- **STATIC IP**: If the connection type is a fixed IP address provided by your ISP, you have to configure the IP Address, the sub-net mask, the gateway and the DNS server addresses provided by your ISP, as it is shown in Picture.
- **DHCP**: If the connection type is a IP address provided via the DHCP protocol, the Route Setting pane is displayed as it is shown on the Picture.
- **PPPoE**: If the connection type is PPPoE, you have to configure the username and password provided by your ISP. The Picture displays the pane shown.

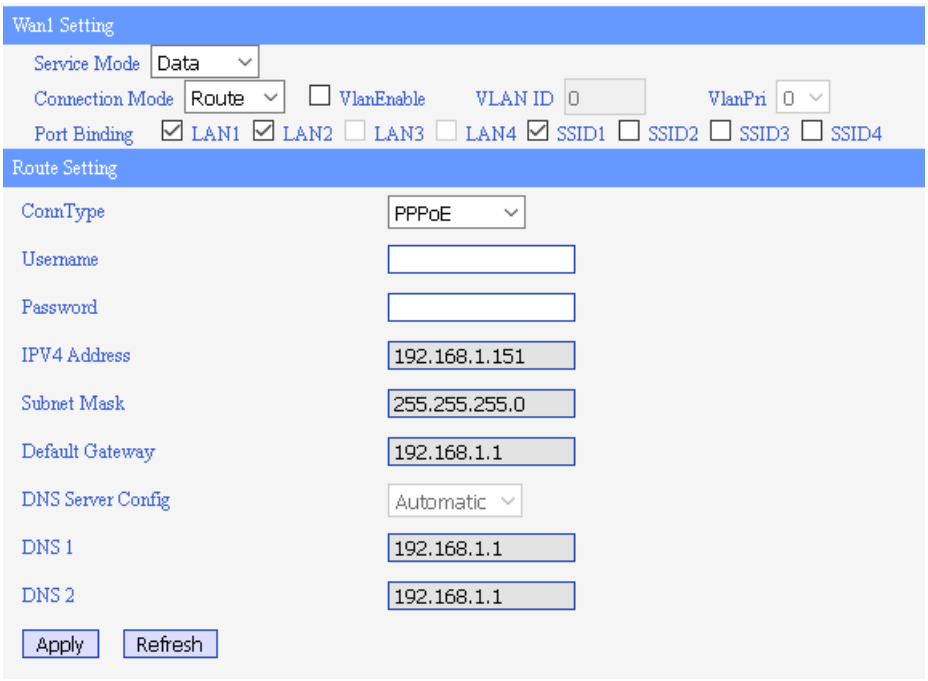
To save the changes in the Route Setting panes, you have to click the Apply button and then, to click the Saving Setting button in the Saving Setting pane.



Picture *18*

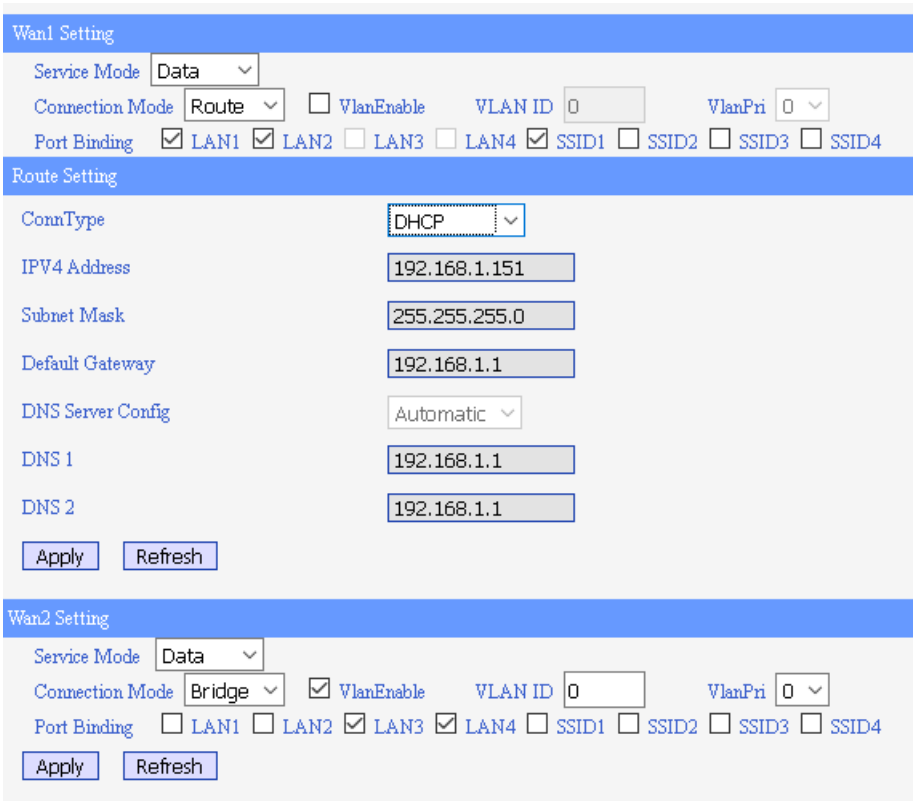


Picture *19*



Picture *20*

The shows an example of a router and a bridge connection mode mixed, where LAN3 (STB1) and LAN4 (STB2) are used to connect two IPTV STBs and LAN1, LAN2 and SSID1 are used for internet business.



Picture *21*

2.3.1.6. LAN Configuration

This page allows to configure the LAN settings of the slave. The shows this page:

Picture *22*

The information is organized in several panes:

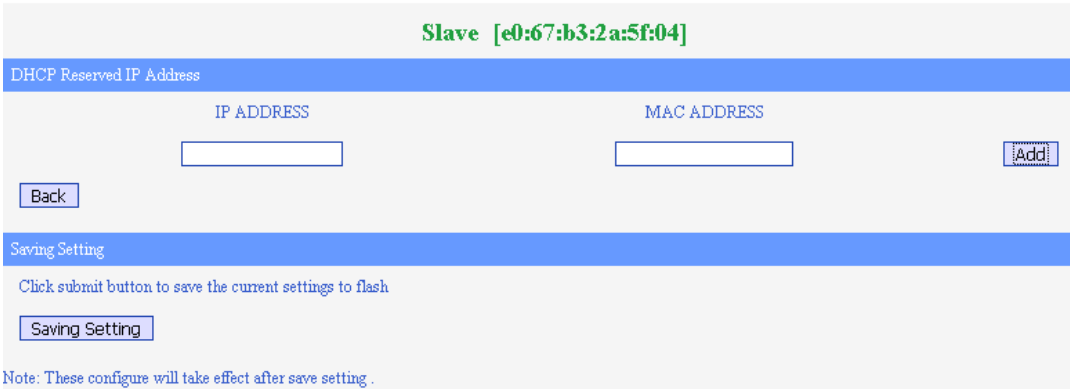
- **Slave**: it shows current slave MAC address.
- **LAN IP and Port**: the IP address and mask of the router in the LAN can be configure here. This IP address is used for the web management access. The factory default value for the IP is 192.168.1.1 and for the mask is 255.255.255.0. All the default gateways of the computer in the LAN should be set as the value of the this IP address.

  Note: if you change the IP address, you will have to use this new IP address to access the management interface of the router.
- **DHCPV4 Server Setting**: DHCP is the acronym of Dynamic Host Configuration Protocol which can assign IP address, subnet mask, default gateway of a LAN client on TCP/IP automatically. If the Enable DHCPV4 server check box is checked, the following items are shown:
  - IP Pool Starting Address: the starting IP address which DHCP Server automatically starts from.
  - IP Pool Ending Address: the ending IP address for the DHCP Server.
  - Lease Time (second): it is the time period during which the DHCP allows the assigned IP addresses to be used by LAN clients. By setting a suitable lease time, you would enable the DHCP to take better advantage of the IP addresses which are not used again.

  The IP address that the DHCP server will assign to the LAN client requesting IP address should be within the IP Pool.

  If the Edit Reserved Addresses is clicked a new page is displayed (as shown in Picture), where the user can add reserved IP addresses which could not be used by the DHCP server to assign it to LAN clients. The changes will be stored when the user clicks the Saving Setting menu.

The Add button allows to add several reserved IP addresses. The Back button will come back the current page to the previous page.



Picture *23*

- **Saving Setting**: it includes the Saving Setting button which is used by the user to save the current settings to the slave flash memory.

2.3.1.7. Static Route Configuration

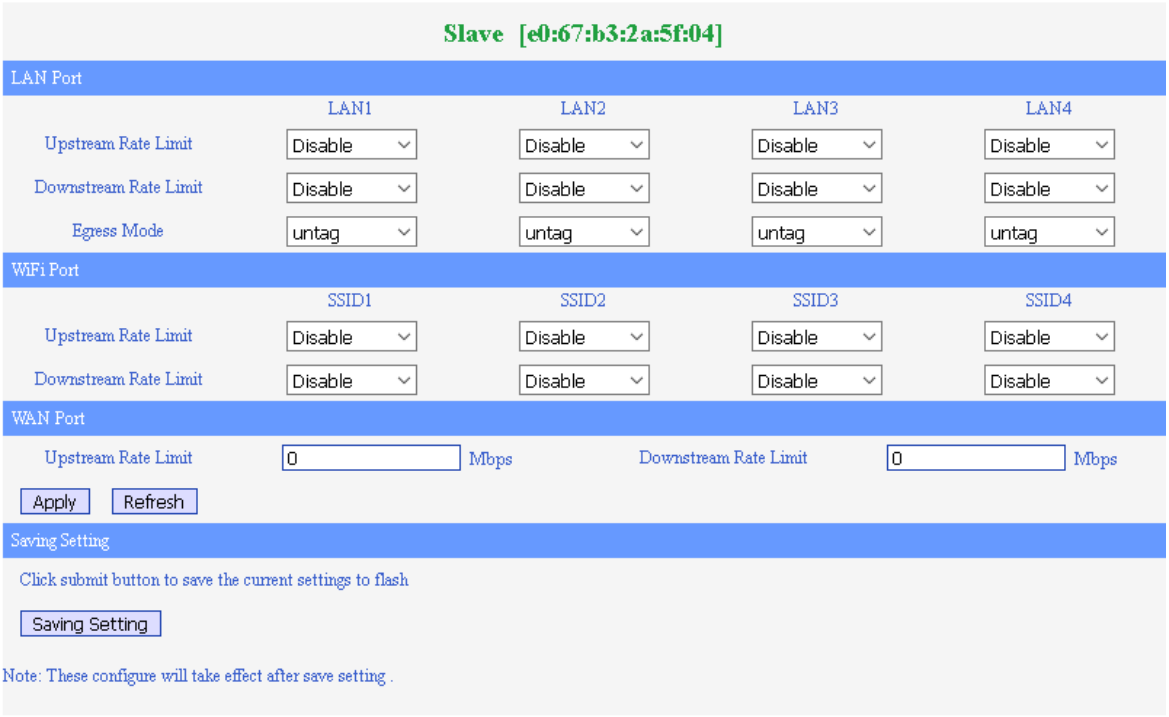
This page allows to add static routes as it is shown in the Picture.

Picture *24*

When the Destination IP and the Gateway are filled, the user must click the Apply button before to add more static routes clicking the Add button. The changes will be stored to the slave flash memory when the Saving Setting button is clicked.

2.3.1.8. L2 Switch Configuration

This page allows to set the downstream and upstream rate for the LAN, WiFi and WLAN interfaces, as it is shown in the Picture.



Picture *25*

NOTE: This page is currently under development, so it is recommended not to modify any parameter shown in this screen.

2.3.1.9. Virtual Server Configuration

This page allows to configure virtual servers as it is shown in the Picture.

Picture *26*

The Apply button must be clicked as soon as all the parameters are filled before to add a new service name using the Add button. A service name can be removed clicking the related delete button. The changes will be stored in the slave flash memory when the Saving Setting button is clicked.

2.3.1.10. WiFi Management

This page has several panes as it is shown in Picture:

Picture *27*

- **Cli User Setting**: it allows to create and modify users and superusers. **This feature is under development so it is recommended not to use it**. To create and modify users and superusers you should use the own slave web management interface of the slave.
- **Web User Setting**: it allows to modify the default superuser (with administrator permissions). You should click the Apply the button to apply the changes.
- **Saving Setting**: after any change, you should click the Saving Setting button to store changes in the slave flash memory.
- **Factory Setting**: the Reset Factory Setting allows to recover the factory settings of the slave.
- **Reboot System**: click the Reboot button to reboot the WiFi interface.

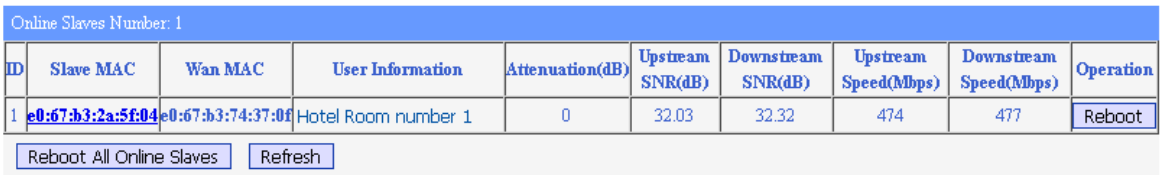
2.3.1.11. WiFi Upgrade

This page allows to configure a FTP server to download a file for upgrading. The Picture shows this page.

Picture *28*

2.3.2. Online

Selecting the Slave→ Online menu, the web interface returns the list of online slaves as it is shown on Picture:



Picture *29*

For each slave, the following information is displayed:

Item	Description
ID	a unique identifier number assigned to each online slave.
Slave MAC	the MAC address of the slave. If you click in the MAC address of one of the slaves shown in the online slaves list, the related slave management page is displayed as it is shown in Picture.
Wan MAC	the WiFi MAC of the slave if it exists.
User information	A name which can be assigned by the user to identify uniquely to the slave. This information can be set in the SLAVE→ Authorization → Slave Basic Configuration menu.
Attenuation (dB)	The attenuation of the link between the IPC-M and the slave unit.
Upstream SNR (dB)	Upstream signal-noise ratio (SNR) of the slave. It is useful to evaluate continuously the quality of the uplink.
Downstream SNR(dB)	Downstream signal-noise ratio (SNR) of the slave. It is useful to evaluate continuously the quality of the downlink.
Upstream speed (Mbps)	This parameter displays the upstream speed of the slave in Mbps.
Downstream speed (Mbps)	This parameter displays the downstream speed of the slave in Mbps.
Operation	It is a button which allows to restart the slave unit. This action does NOT affect to the slave configuration.

Table *8*

The Reboot All Online Slaves button allows to restart all the online slave units simultaneously. This action does NOT affect to the slaves configurations.

The Refresh button allows to keep updated the information in this page.

The reboot process of a slave unit takes between 1 and 2 minutes.

2.3.3. Template

A template is a pre-configured set of configuration settings. Templates allow you to configure slave settings efficiently. The template can then be uploaded to one or more devices thus removing the need to configure the corresponding settings for each device.

This menu shows the page displayed in Picture.

Picture *30*

This page has several panes which are described in the following table:

Item	Description
Pane 1: Default Template	
Default Template	If you select Enable option to upload the default template configuration automatically to any new registered slave. If you select Disable option, no template will be uploaded automatically to any new registered slave.
Submit	If this button is clicked, the option selected in this pane is activated.
Refresh	If this button is clicked, the data on this pane are updated.
Pane 2: Template management	
Template Index	A number which identifies uniquely a template.
Template Name	A name which identifies uniquely a template.
Template Class	The class of the template. Possible values for this parameter are: SW: Only Ethernet ports WiFi: Only WiFi interface. SW+WiFi: Ethernet ports and WiFi interface available.
Operation	Two buttons are available: Modify: Open a new page to modify the template. See Picture. Check the Template Configuration pane of table Table for more information about all the items displayed in the template modification page. Delete: Delete the selected template.

Table *9*

The current template of the all online slaves using this template will be automatically updated as soon you save the template configuration.

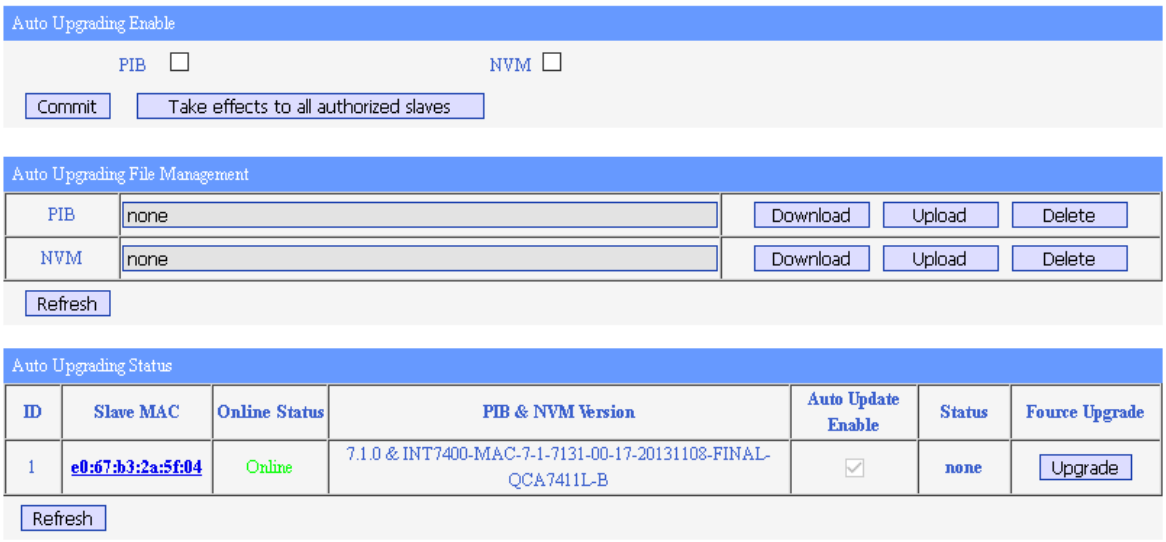
If you click the Add New Template button, a page similar to the one shown in Picture will be displayed.

Picture *31*

The system supports up to 253 templates.

2.3.4. Auto Upgrade

If you select the SLAVE → Auto Upgrade menu, the page shown in Picture is displayed.



Picture *32*

This page has 3 panes explained in the following table:

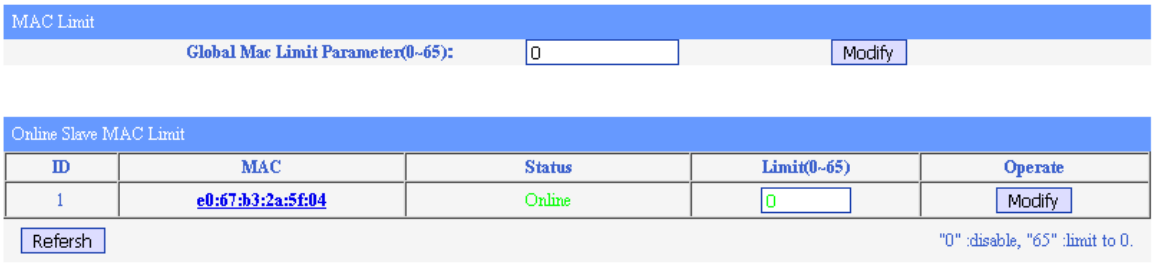
Item	Description
Pane: Auto Upgrading Enable	
PIB	Parameter Information Block. Check this box if you want to upgrade this in the slave during the auto-upgrading process.
NVM	Non-volatile Memory. Check this box if you want to upgrade this in the slave during the auto-upgrading process.
Commit	Click this button to save the auto-upgrading options in all the online slaves.
Take effects to all authorized slaves	Click this button to auto-upgrade all the online authorized slaves.
Auto Upgrading File Management	
PIB	The file to upgrade the Parameter Information Block.
NVM	The file to upgrade the Non-volatile Memory.
Download	Click this button to download the related file.
Upload	Click this button to upload the related file.
Delete	Click this button to delete the related file.
Refresh	Click this button to update all the information shown in this pane.
Pane 3: Auto Upgrading Status	
ID	Slave identifier.
MAC	MAC address of the related slave unit
Status	Slave status.
PIB & NVM version	PIB and NVM file version currently installed on the related slave.
Auto Update Enable	it shows if the related slave unit has its Auto Update option enabled.

Item	Description
Status	It is the upgrading status.
Force Upgrading	If this button is clicked the upgrading process is launched for the related slave unit.
Refresh	If this button is clicked the information shown in this pane is updated.

Table *10*

2.3.5. MAC Limit

When the SLAVE→ MAC limit menu is selected the page shown in Picture is displayed.



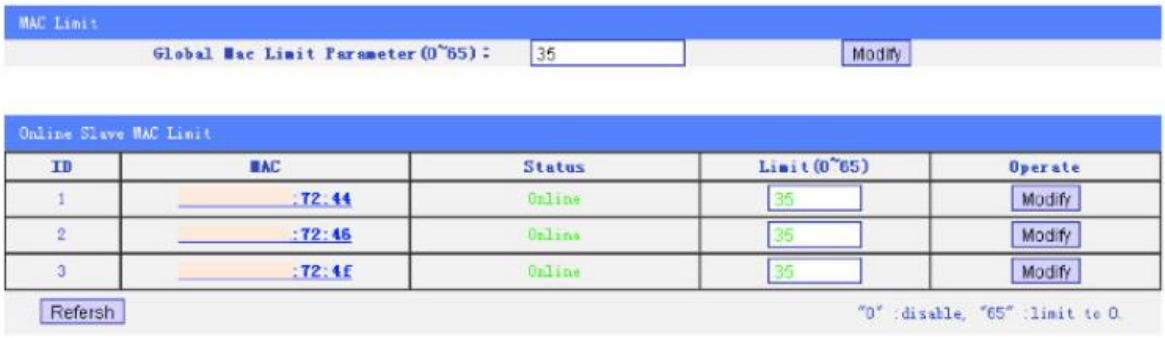
Picture *33*

The Global Mac Limit Parameter is the value of the MAC addresses limit for all the slaves managed by this master, that is, the maximum number of MAC addresses that the slaves can manage. The range of this value is from 0 to 65.

For example, suppose that you have a master managing 3 slaves as shown in Picture.

Picture *34*

If we set the value of Global Mac Limit Parameter to 35 and click the Modify button, all slaves will reboot and the Mac limit for each slave will be set to 35 as it is shown in Picture



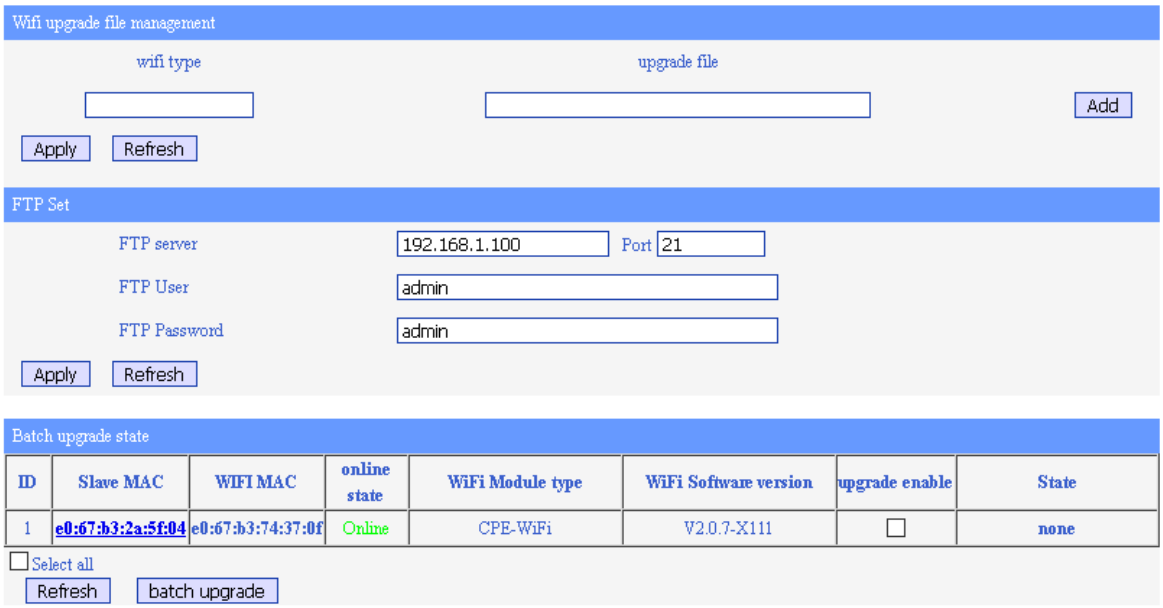
Picture *35*

You can also change the Mac limit parameter separately. For example, we can set the Mac limit of the slave with ID 1 to 38 as it is shown in

Picture *36*

2.3.6. WiFi Upgrade

When SLAVE→WiFi Upgrade menu is selected, the page shown in Picture is displayed.



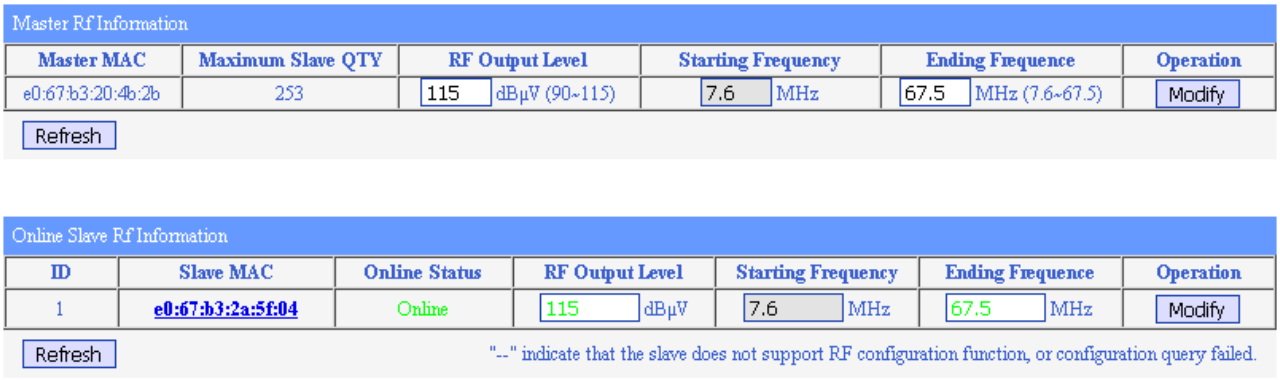
Picture *37*

There are three panes in this page:

- **WiFi upgrade file management**: here you can add an upgrade file for different WiFi Module types, clicking the Add button. The changes are applied clicking the Apply button. The Refresh button allows to keep updated the information shown in this pane.
- **FTP Set**: it allows to configure the ftp server account to be used for the upgrading process.
- **Batch upgrade state**: it is a list of the available slaves, showing the current WiFi software version of each slave, where you can select which ones you want to include to in a batch upgrade. The batch upgrade button launches the upgrading process. The Refresh button updates the information shown in the Batch upgrade state list.

2.4. RF Menu

The SLAVE→ RF menu shows the page displayed in Picture,



Picture *38*

The information is organized in two different tables:

- **Master Rf Information**: This is the RF information related to the master unit. The following table explains the parameters displayed.

Item	Description
Master MAC	MAC address of the IPC-M.
Maximum Slave QTY	it is the maximum number of IPC-S supported by the master unit.
RF Output Level (dBµV)	It is the RF output level of the IPC-M which can be configured here. Range of values: 90 – 115 dBµV.
Starting Frequency	The starting frequency of the range used by the IPC-M to transmit the data.
Ending Frequency	The ending frequency of the range used by the IPC-M to transmit the data.
Operation	It contains the Modify button to apply the changes done in the configurable parameters of this table.

Table *11*

- **Online Slave Rf Information**: This is the RF information related to all the online slaves. The following table explains the parameters displayed.

Item	Description
ID	Number to identify uniquely the slaves.
Slave MAC	MAC address of the related slave.
Online Status	Status of the related slave. If the status is online the slave can be configured.
RF Output Level	It is the RF output level of the related slave in dBµV
Starting Frequency	The starting frequency of the range used by the related slave to transmit the data.
Ending Frequency	The ending frequency of the range used by the related slave to transmit the data.
Operation	It contains the Modify button to apply the changes done in the configurable parameters of this table.

Table *12*

The Refresh buttons allow to update the information shown in this page.

2.5. Network Menu

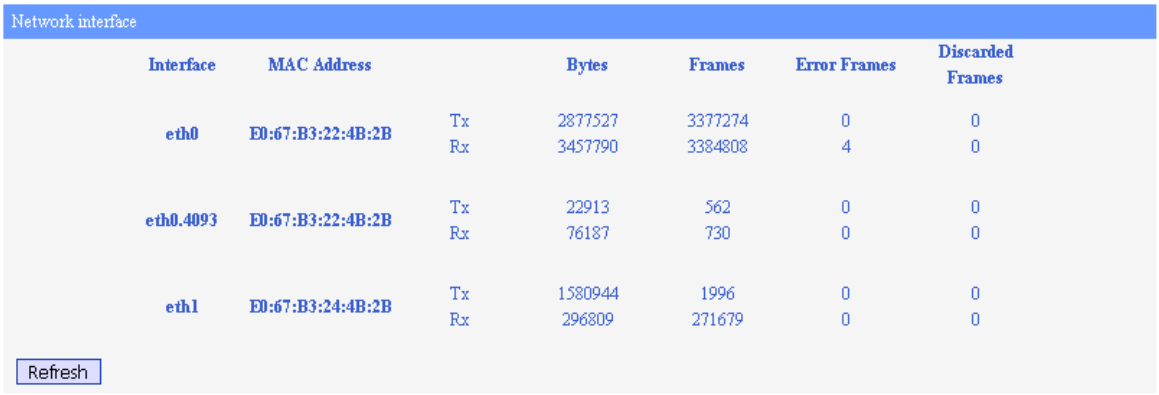
The NETWORK menu provides the pages to check the status of the network interface, to configure network, to manage VLANs and to configure IGMP and network filters.

2.5.1. Status

This menu is available in NETWORK→Status. The status information allows you to view the following information for each of the network interfaces (WAN and LAN interfaces) of the master unit:

- MAC address
- Received and transmitted data in bytes.
- Received and transmitted frames.
- Error frames
- Discarded frames.

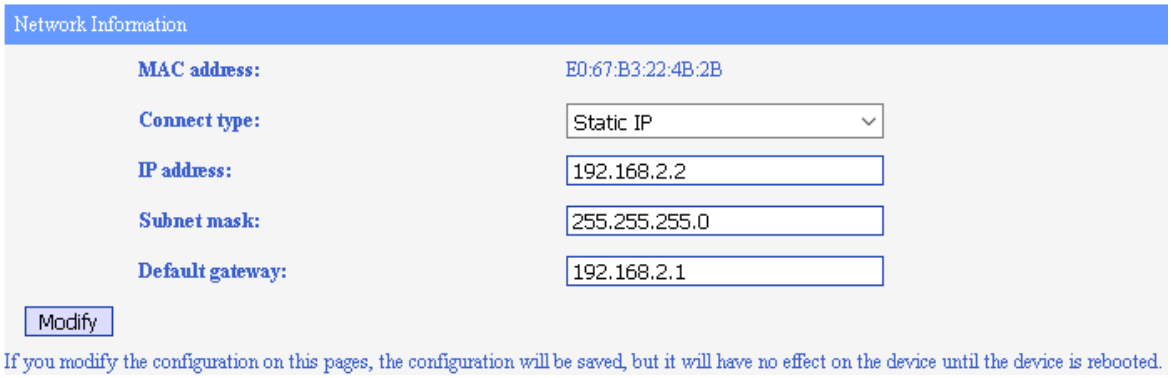
Click Refresh button to update information.



Picture *39*

2.5.2. Config

If you select NETWORK→Config menu, the page shown in Picture is displayed.



Picture *40*

Here you can configure:

- Connection type: Static IP or DHCP.
- IP address: the IP address of the IPC-M unit inside of the LAN.
- Subnet mask
- Default gateway

Note: Changing the IP address, subnet mask, default gateway can lead to failure during the access to the web user interface of the IPC-M.

2.5.3. VLAN

If you enter the NETWORK→ VLAN menu, the screen shown in Picture is displayed:

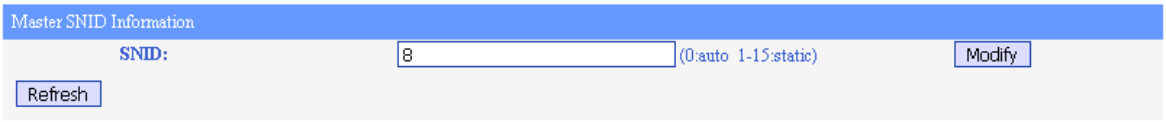
Picture *41*

You can configure the VLAN of IPC-M in this page. Click the modify button after you enter the VLAN ID to active the VLAN.

Note: If you active the VLAN of IPC-M, you should also do some configuration in your PC to keep the connection between the master and the management PC.

2.5.4. SNID

The NETWORK→ SNID menu shows the page displayed in Picture

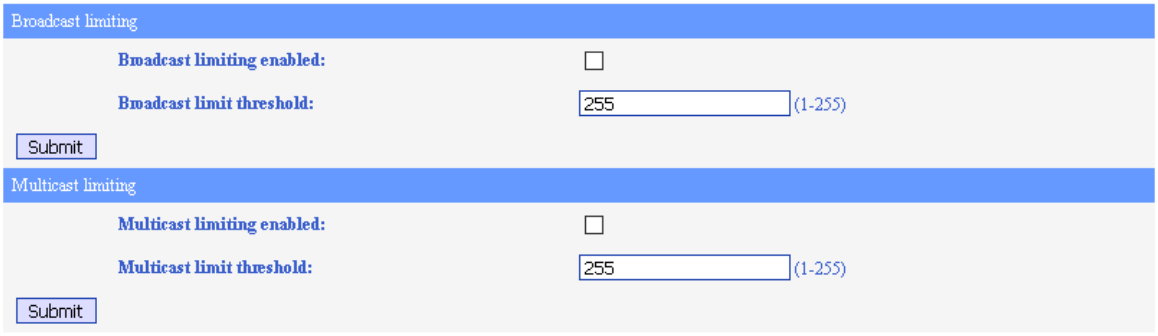


Picture *42*

The SNID is the Serial Number Identification number which is used to identify uniquely to the master unit. If there are several masters placed in the same network, you must set a different SNID for each master in order to avoid the interference among the master units.

2.5.5. Filter

The NETWORK→ Filter menu shows the page displayed in Picture.

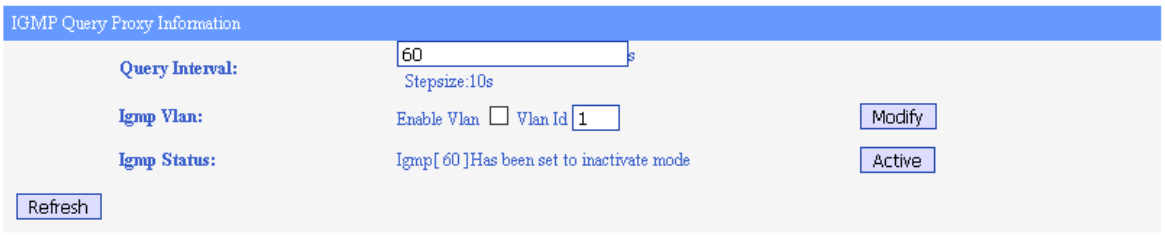


Picture *43*

This page allows to enable the broadcast and multicast limiting function and setting the threshold parameter for each limiting function.

2.5.6. Igmp

The NETWORK→ Igmp menu displays the page shown in Picture



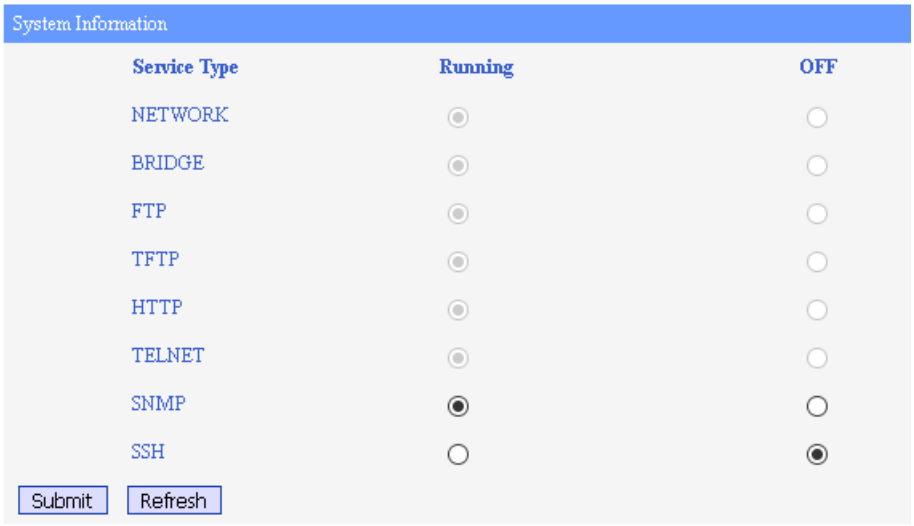
Picture *44*

This page allows to configure:

- The IGMP query interval, needed for multicast traffic. Queries can be activate clicking the Active button.
- The VLAN used by the IGMP traffic.

2.6. Service Menu

The Service menu shows the page displayed in Picture.



Picture *45*

This page allows to enable or disable different network services. Only SNMP and SSH services supports turning on or off.

2.7. System Menu

The system menu provides the access to different menus described in the next sections.

2.7.1. Information

The SYSTEM→ Information shows the page displayed in Picture.

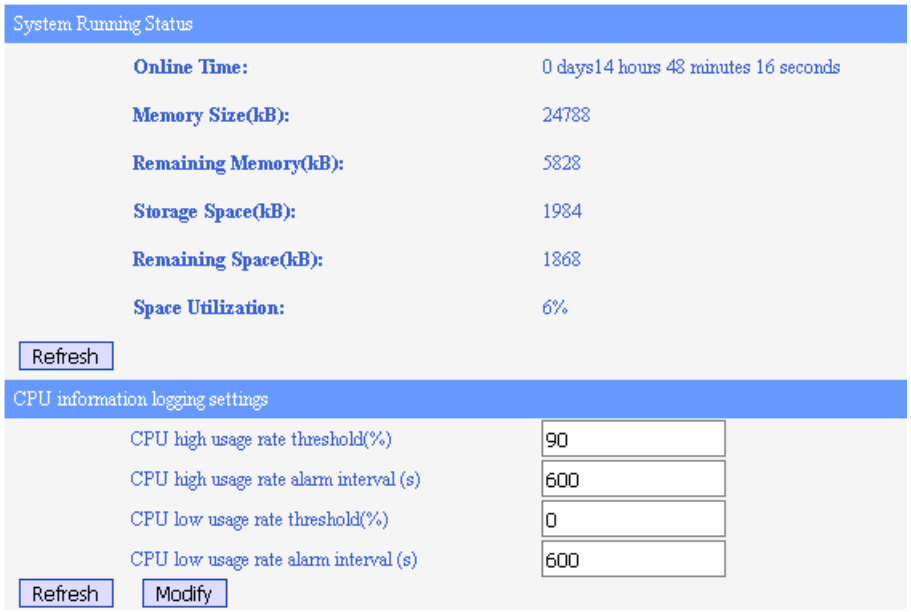
Picture *46*

This page shows the following information:

- **System information**: it includes
  - Chip model
  - Device type
  - Software version
  - PIB (Parameter Information Block) and NVM (Non-volatile Memory) files versions
  - HW versions
  - Serial number
  - MAC address of the main system block.
  - MAC address of Ethernet over coaxial cable block.
  - Number of online slave units (IPC-S).
- **Device information**: it includes
  - Name of the unit
  - Contact of the company.
  - Company location.

2.7.2. Running Status

The SYSTEM→ Running Status shows the page displayed in Picture.



Picture *47*

This page shows two panes:

- **System Running Status**: this block of information shows the items explained in the following table:

Item	Description
Online Time	Time since the IPC-M was switched on.
Memory Size (kB)	Memory size of the IPC-M.
Remaining Memory (kB)	Current available memory in the IPC-M
Storage Space (kB)	Storage space of the IPC-M
Remaining Space (kB)	Current available storage space in the IPC-M
Space Utilization	Percentage of storage space used.

The Refresh button is used to update the information used in this pane.

- **CPU information logging settings:** here you can configure some parameters related with the logging. They are explained in the following table:

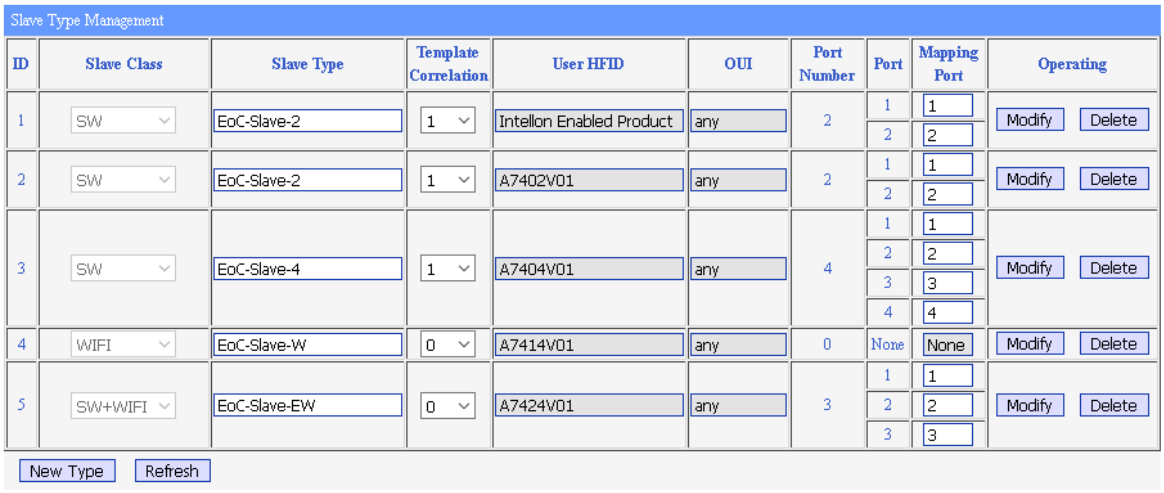
Item	Description
CPU high usage rate threshold (%)	If the CPU usage rate is higher than the configured value, a CPU high usage rate entry will be registered in the log.
CPU high usage rate alarm interval (s)	The time interval used to register the CPU high usage rate alarm.
CPU low usage rate threshold (%)	If the CPU usage rate is lower than the configured value, a CPU low usage rate entry will be registered in the log.
CPU low usage rate alarm interval (s)	The time interval used to register the CPU low usage rate alarm.

Table *13*

The Refresh button updates the information shown in this pane. The Modify button allows to change the values set for these parameters.

2.7.3. Slave Type

If you enter in the SYSTEM→SlaveType menu, the Picture is displayed.



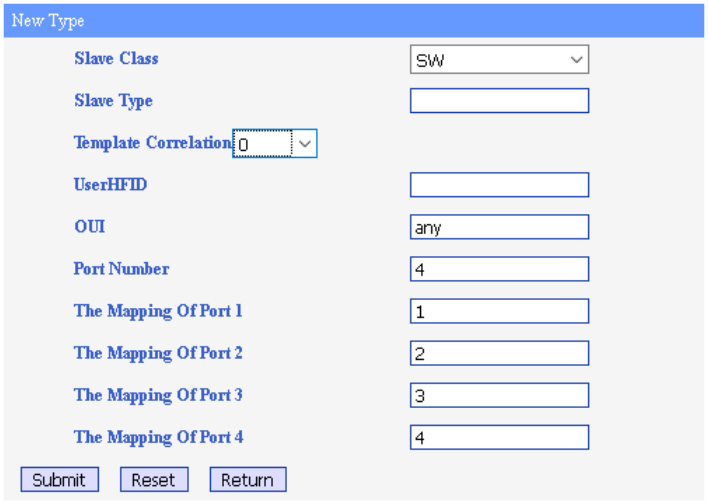
Picture *48*

This page shows the list of Slave Types available. The following table explains the items displayed in this page.

Item	Description
ID	It is a number to identify uniquely the slave type.
Slave Class	It is the class of the slave type. The following classes are available: • SW: only Ethernet interface. • WIFI: only WiFi interface. • SW + WIFI: Ethernet and WiFi interfaces available.
Slave Type	It is the name to identify the slave type.
Template Correlation	It is the default template identifier associated to the related slave type.
User HFID	User High Friendly ID
OUI	Organizationally unique identifier
Port Number	The number of internal ports available
Port	The port number.
Mapping Port	The actual port id assigned.
Operating	The operations you can do with the related slave type: • Modify: to change the parameters of the slave type. • Delete: to remove the slave type.

Table *14*

The New Type button allows to create new slave types. The Picture shows the page displayed to create a new slave type.



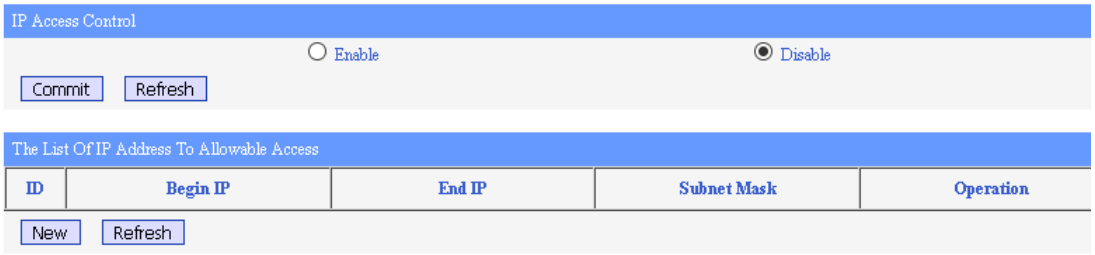
Picture 49

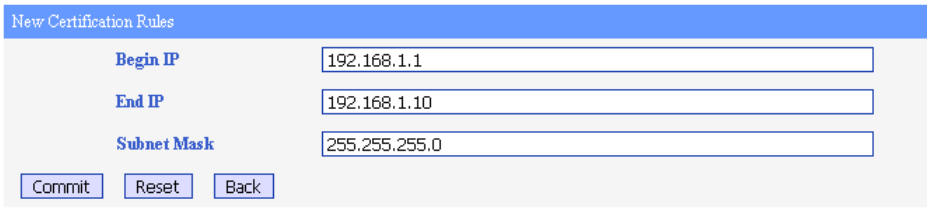
Once you enter the parameters of the new type, you have to click the Submit button to create the new type. This new type will be shown in the Slave Type Management list. The Reset button set the default values to all the parameters. The Return button comes back to the Slave Type Management page.

2.7.4. IP Access Control

The SYSTEM→ IP Access Control menu shows the page displayed in Picture. This page allows to create a list of IP addresses to access the IPC-M master unit. There are two panes:

- **IP Access Control**: where the user can enable or disable this access control clicking the related radio button. The change is applied when the Commit button is clicked. The Refresh button update the information shown here.
- **The List Of IP Address To Allowable Access**: it is the list of IP addresses from which the access to the master unit is allowed when the IP access control is enabled. To add a new set of IP addresses, the user must click the New button which will show the New Certification Rules page displayed in Picture. The user can add one address or a set of addresses with the corresponding subnet mask; the new set of addresses will be saved when the Commit button will be clicked. The Back button is used to come back to the IP Access Control page. The Reset button sets the default values for all the parameters shown in the New Certification Rules page.



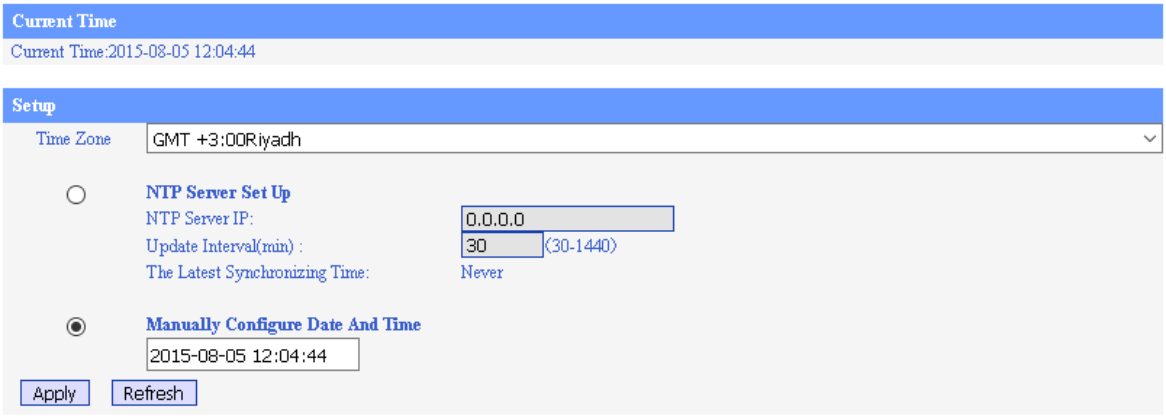


Picture *51*

2.7.5. System Time

The SYSTEM → System Time menu shows the page displayed in Picture. This page has two panes:

- **Current Time**: it displays the current time according to the master unit.
- **Setup**: Here the user can select the time zone. The IPC-M can support manual configuration of the system date and time or NTP Server configuration. In the case of NTP server, the user can enter the IP address of the NTP server and the update interval. The changes are applied when the user clicks the Apply button.



Picture *52*

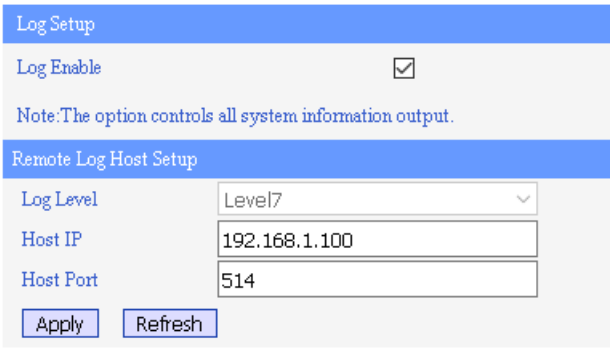
The Refresh button allows to update the information shown in this page.

2.7.6. System Log

The SYSTEM → System Log menu shows two tabs:

- **Log Information**, shown in the Picture where you can read all the log messages generated by the IPC-M master unit. The Refresh button updates the messages shown. The Clear Log button removes all the current messages.

- **Log Options**, shown in the Picture. This page allows to enable and disable the log using the Log Enable check box and to enter the IP address and port of the log server. The changes are stored when the Apply button is clicked. The Refresh button is used to update the information shown in this page.



Picture *54*

2.7.7. Account

The SYSTEM→ Account menu displays the page shown in Picture. This page allows to set a new user name and password to enter in the web management tool. The following table explains the parameters to enter in this page:

Item	Description
Original account	the current user name used to login the web management tool.
Original password	the password used to login the web management tool.
New account	the new user name to be used for login.
New password	the new password to be used for login
Repeat new password	the new password to be used for login

Table *15*

Picture *55*

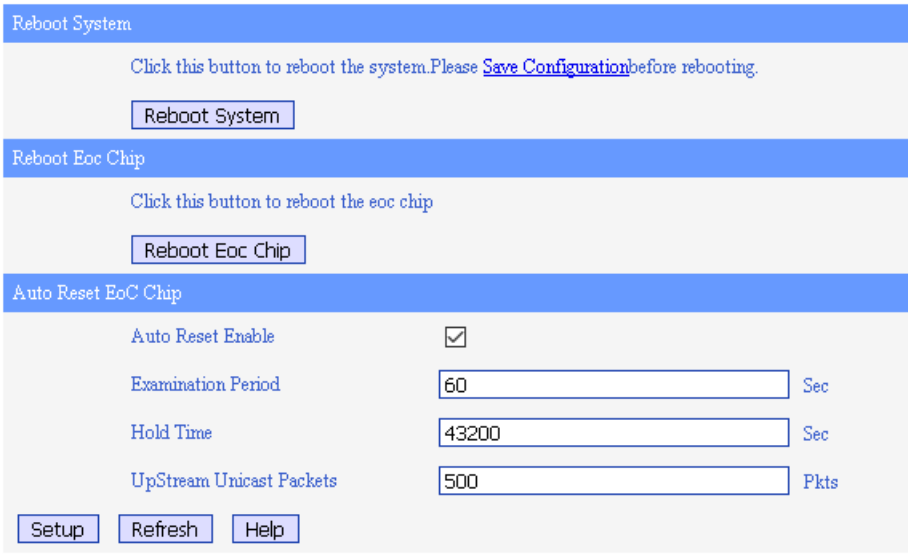
2.7.8. Reboot

The SYSTEM→ Reboot menu shows the screen displayed in Picture. This page has 3 panes:

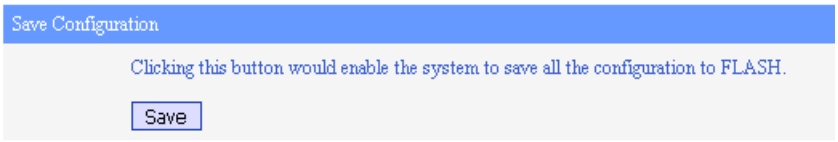
- **Reboot System**: it includes the Reboot System button. If this button is clicked the IPC-M master unit is restarted. If you click the Save Configuration link, the screen shown in Picture will be displayed. Click the Save button in the Save Configuration screen in order to save all the IPC-M configuration to the flash memory.
- **Reboot Eoc Chip**: it includes the Reboot Eoc Chip button. If this button is clicked the chipset related with the Ethernet over coaxial function is restarted.
- **Auto Reset EoC Chip**: the following table describes the parameters shown in this pane:

Item	Description
Auto Reset Enable	This check box allows to enable or disable the auto-reset of the EoC chip.
Examination Period	It is the time period for checking the EoC lock condition which fires the auto-reset.
Hold Time	It is the time used to evaluate the EoC lock condition which fires the auto-reset.
UpStream Unicast Packets	It is the number of upstream unicast packets which has to be received as minimum during the hold time to avoid the lock condition.

Table *16*



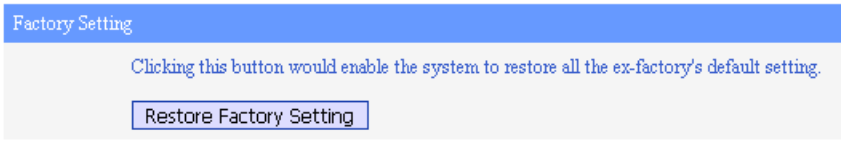
Picture *56*



Picture *57*

2.7.9. Factory

If you select the SYSTEM→Factory menu, the screen shown in Picture is displayed.

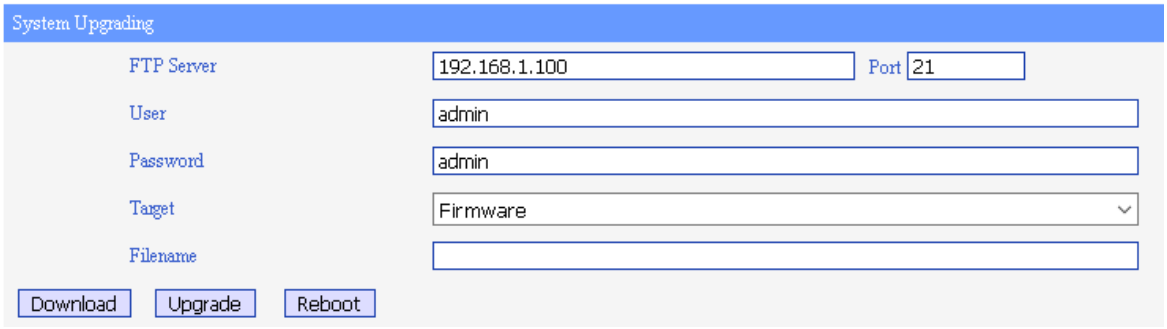


Picture *58*

If you click the Restore Factory Setting button, all the system parameters will be reset to the default values assigned by the manufacturer.

2.7.10. Upgrade

The SYSTEM→ Upgrade menu shows the page displayed in Picture.



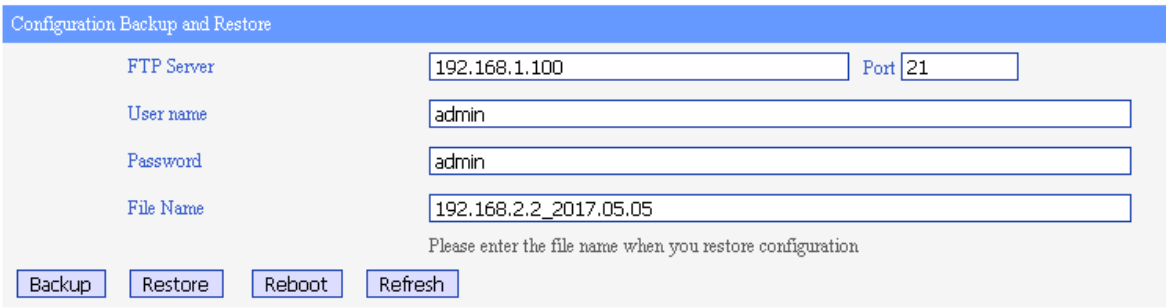
Picture *59*

This page allows to configure a FTP account to be used for upgrading the IPC-M master unit. If you click the Download button, you will download the filename containing the firmware. If you click the Upgrade button, you will upgrade the IPC-M master unit with the firmware downloaded. The Reboot button allows to restart the master unit.

NOTE: Do NOT turn off the device during the updating process, as it may corrupt the firmware and make the selected device unusable.

2.7.11. Backup Restore

The SYSTEM→ Backup Restore menu displays the page shown in Picture.



Picture *60*

Using the FTP server configure in this page, the user can backup the current configuration (clicking the Backup button) and it can also restore a previous configuration backup (clicking the Restore button) which the name set in the File Name parameter.

2.8. Exit Menu

Click the EXIT menu to close the web management tool and to return to the login screen (Picture).