

CMTS 2-00

WebGUI Manual



Foreword

Target Readers

This Manual is applicable to the following readers:

- ✓ Network administrators
- ✓ System maintenance personnel

Conventions in the Manual

1. Conventions on General Format

Format	Meaning
Calibri	All English texts except titles are prepared by use of Calibri font.

2. Conventions on Command Line Format

Format	Meaning
Bold	Keywords in the command line (the part to be typed in and remaining unchanged in the command line) shall be prepared in bold font.
<i>Italics</i>	Command line parameters (the part to be replaced with actual values in the command line) shall be prepared in italics.
[]	Those in [] are optional.
(x y ...)	Means selecting one from two or more options.
[x y ...]	Means selecting one or none from two or more options.
<x-y>	Means selecting one from x to y.
\$	Means the notes.

3. Conventions on Keyboard Operation

Format	Meaning
Characters in angle brackets	Refer to the key name. For example, <Enter>, <Tab>, <Backspace>, <a>, <?> etc. refer to Enter, Tab, Backspace, lowercase letter a, and ? respectively.
<Key 1 + Key 2>	<Key 1 + Key 2> refers to pressing key 1 and key 2 on the keyboard at the same time. For example, <Ctrl+Alt+A> refers to pressing "Ctrl", "Alt" and "A" keys at the same time.
< Key 1, Key 2>	< Key 1, Key 2> refers to pressing Key 1 first on the keyboard, releasing, and then pressing Key 2; for instance, <Alt, F> refers to pressing <Alt> key first, releasing, and then pressing <F> key.

4. Special Information

The following are examples of how special information is presented in this document.



Danger — Danger indicates that the described activity or situation may result in serious personal injury or death, for example, high voltage or electric shock hazards.



Warning — Warning indicates that the described activity or situation may, or will, cause equipment damage or serious performance problems.



Note — Note indicates that the information is, or may be, of special interest.

5. Conventions on Term

CMTS: CMTS in this Manual refers to the small CMTS and complies with C-DOCSIS standard unless otherwise specified.

6. Prompt

The input of command lines in this system is case sensitive.

Statement: your understanding will be greatly appreciated if any contents of this Manual may not be sufficiently in conformity with the actual product due to the constant update and improvement of product and technology. For the information of product update, please contact local office.

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1. Introduction

1.1 CMTS 2-00 Stand-alone Web Network Management Software

Stand-alone WEB management software is applicable to integrated CMTS 2-00 products. The stand-alone WEB management software can provide WEB access supporting real-time query and setting of device parameters, and can greatly improve the efficiency of device control.

CMTS 2-00 series stand-alone Web network management software includes the following key modules:

- **Basic Information**
Provides basic device information and network information and supports the view of running time of device, management of tool upgrade and device reboot, as well as configure SNMP.
- **Network Management**
Configure the device IP, manage the uplink port and configure the port speed limit. View and configure DHCP Relay information of the device, such as adding, deleting, modifying and viewing DHCP server, relay, etc. View and configure VLAN, subnet VLAN, VLAN conversion, ACL and IP blacklist. Configure static routing of the device.
- **RF Information**
Manage the upstream and downstream channels of the device. The upstream channel supports viewing the upstream channel information of the device and the setting of common upstream channel parameters, such as channel ON/OFF, channel frequency, bandwidth, receiving level and channel offset by batch, etc, as well as viewing the signal quality of upstream channel and SNR of the device, and other parameters. The downstream channel supports viewing the downstream channel information of the device, including DOCSIS channel, EQAM channel and closed channels, and the setting of common downstream channel parameters, such as channel ON/OFF, center frequency, modulation mode, emission level and channel modification by batch, etc.
- **EQAM Management**
Program stream mapping information supports viewing the overall output program stream, number of configured programs and bandwidth occupation, adding the program stream by batch and modifying the program stream parameters. EQAM receives TS stream from the designated port and analyzes it. The analysis result will be displayed on the page of program stream information. EQAM configures and displays the table interval at CMTS level. ERM configures D6/R6 parameters.
- **Terminal Device Management**
CM/CPE management supports viewing the information of CM and CPE on the device. CPE information will be displayed by MAC classification of CM. CM list displays CM data collected by RemoteQuery. Relevant RemoteQuery parameters are configured on RemoteQuery Configuration screen. DOCSIS3.0 configures MDD, MTC, MRC and MDF. The load balancing enables each working channel to maintain a certain balance, and supports the configuration of load balancing parameters, load balancing groups and load balancing exception of CM. Piggyback function is used to control whether CM has the ability to request the next data transmission in the process of data transmission, and supports enabling/disabling of this function.
- **Device Monitoring**
Monitor the channel traffic, upstream signal, uplink port, temperature, power supply and optical module of the device, and monitor the spectral noise of upstream channel.
- **Log Management**
It is used to record the system log to facilitate users to track the system running and solve possible abnormalities and failures during system running.

Attentions:

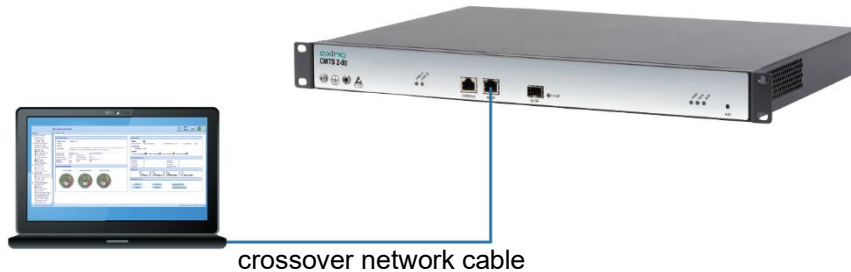
Avoid using the following characters, causing the server exception:

- +: URL of the sign indicates a space
- \: separate directories and subdirectories
- ?: Separating the actual URL and parameters
- %: Specifies the special characters
- #: Indicates bookmark
- &: Split between symbols and specified parameters
- =: Value of the specified parameter in the URL

2.Login

2.1 Login

This system supports the browser of IE8 or above. IE8 browser is recommended.



Connect the PC to the RJ-45 Ethernet connection **MGMT**. Enter the device IP address (e.g. http://192.168.0.10) in the address bar of the browser and press Enter. The login dialogue will appear.



Figure 2.1-1 Login Screen

The default username and password are both "admin". Please modify the default password after login to the system to ensure the security of use. Then click [Login] to make the home page appear as follows:

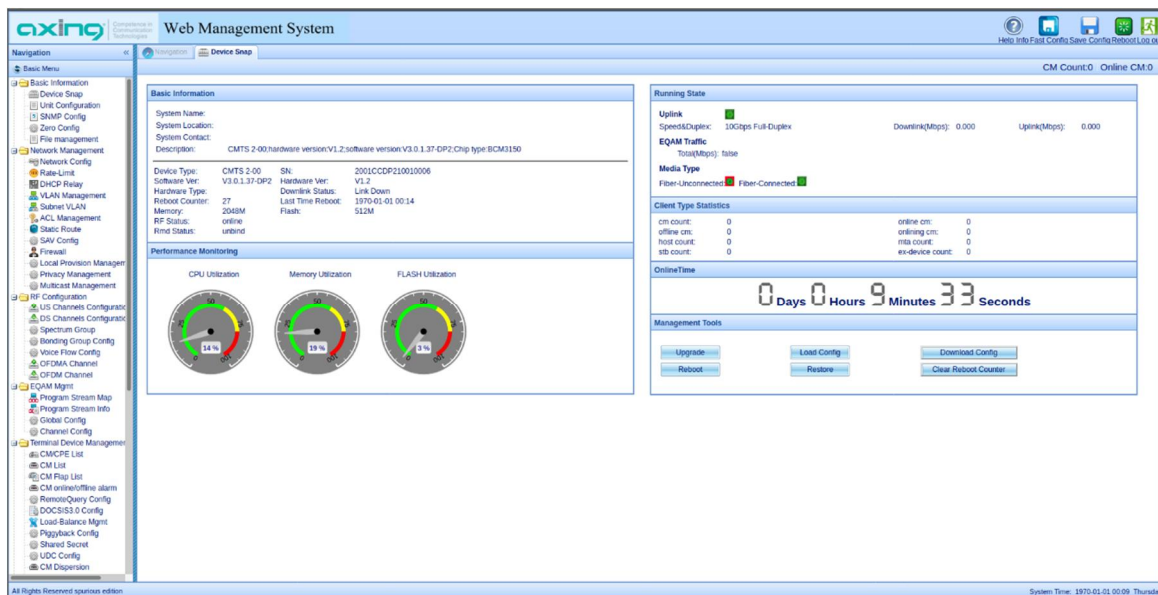


Figure 2.1-2 WEB Home Page

The network management is divided into four parts: navigation bar on the left, shortcut buttons at the top, status information at the bottom and main interface in the middle.

The modules of navigation bar on the left display functions including basic information, network management, RF information, EQAM management, terminal device management, log management and system management. The functions of each module will be described in detail in the following.

The shortcut buttons at the top include [Fast Config], [Save Config], [Reboot] and [Logout].

- “Save Config” button is used to save the configurations of device in the running, which will take effect after restarting the device. The modified configurations will not take effect after rebooting if they are modified on the network management screen but not be saved.
- “Reboot” button is used to restart the device.
- “Logout” button is used to cancel the login of user.

The status information at the bottom displays the system time of device in UTC.

2.2 Function Description

The network management is divided into four parts: navigation bar on the left, shortcut buttons at the top, status information at the bottom and main interface in the middle.

The modules of navigation bar on the left display functions including basic information, network management, RF information, EQAM management, terminal device management, log management and system management. The functions of each module will be described in detail in the following.

The shortcut buttons at the top include [Help Info],[Fast Config], [Save Config], [Reboot] and [Logout].

- “Help Info” button is used to check the device help information to help know the device better.
- “Fast Config” button is used to load the local configuration to config the device quickly.
- “Save Config” button is used to save the configurations of device in the running, which will take effect after restarting the device. The modified configurations will not take effect after rebooting if they are modified on the network management screen but not be saved.
- “Reboot” button is used to restart the device.
- “Logout” button is used to cancel the login of user.

The status information at the bottom displays the system time of device in UTC.

3. Basic Information

3.1 Device Snapshot

Device snapshot displays basic information of the device and supports device management, including basic information, online time, running status, performance monitoring, terminal device statistics and management tools.

3.1.1 Basic Information

CMTS basic information includes device name, device location information, contact, device management IP, system descriptions, RF status, software and hardware versions of device, device restart times, memory capacity and Flash capacity.

Basic Information			
System Name:			
System Location:			
System Contact:			
Description:	CMTS 2-00;hardware version:V1.2;software version:V3.0.1.37-DP2;Chip type:BCM3150		
Device Type:	CMTS 2-00	SN:	2001CCDP210010006
Software Ver:	V3.0.1.37-DP2	Hardware Ver:	V1.2
Hardware Type:		Downlink Status:	Link Down
Reboot Counter:	27	Last Time Reboot:	1970-01-01 00:14
Memory:	2048M	Flash:	512M
RF Status:	online		
Rmd Status:	unbind		

Figure 3.1-1 Basic Information of Device

3.1.2 Performance Monitoring

Performance monitoring displays CPU utilization, memory utilization and Flash utilization of the device. Have the mouse stay on the performance monitoring interface to display the current utilization, total size and current value.

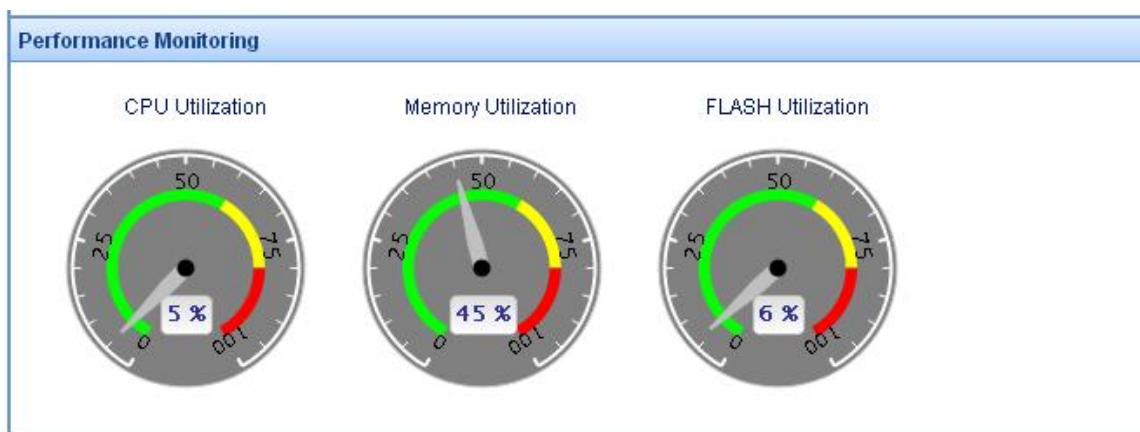


Figure 3.1-2 Device Performance Monitoring

3.1.3 Online Time

This function displays the online time of the device



Figure 3.1-3 Online time of Device

3.1.4 Running Status

The function displays information of two uplink ports, device traffic and EQAM traffic.

It supports the display of uplink type, connection status, media type, speed&duplex, downstream and upstream rate of the port.

Media Type: electric port (copper) or optical port (fiber)

Speed&Duplex: 100Mbps full duplex, 100Mbps half duplex, 1Gbps full duplex or 1Gbps half duplex.

Device Traffic function is used to view overall traffic of the device, including IP traffic, UDP traffic and Gbe traffic.

EQAM Traffic is used to view overall input program stream.

The running status information is updated every minute.

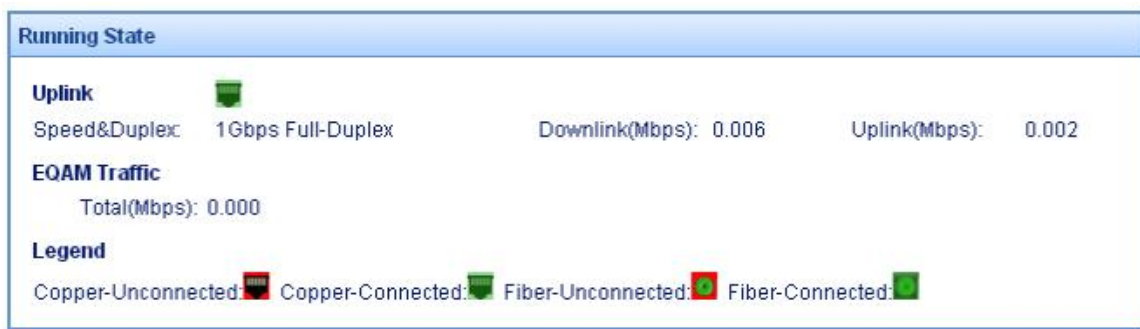


Figure 3.1-4 Running Status of Device

3.1.5 Terminal Device Statistics

Displays the number of terminal devices connected to the cmts, including total number of CM, number of online CM, number of offline CM, number of CM online, total number of HOST, total number of MTA, total number of STB and number of expanded devices.

3.1.6 Management Tools

Supports CMTS management, such as software upgrade, device reboot, exporting configuration to server, restoring to factory configuration, import configuration to device and resetting the count of reboot.



Figure 3.1-5 Management Tools of Device

➤ [Upgrade]

Select a local file to be upgraded to the device. It requires confirming online CMTS, otherwise the upgrade will be unsuccessful. View the RF status shown in the Figure 2.1-2 to view whether CMTS is online. Online means that it is connected to the network.

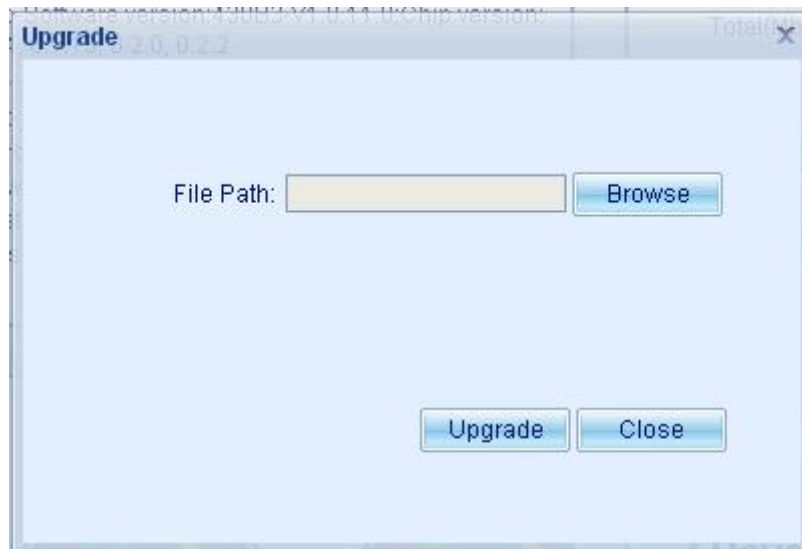


Figure 3.1-6 Software Upgrade of Device

➔ Click "Browse" and select a local file.

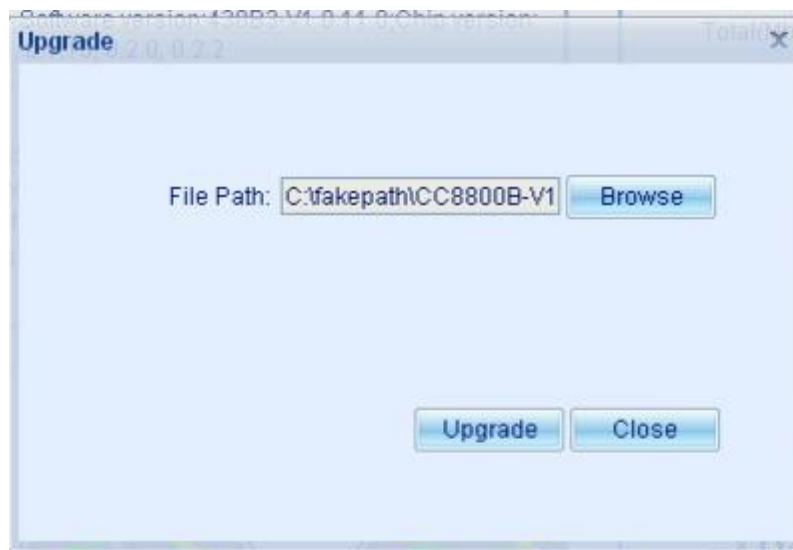


Figure 3.1-7 Selection of Software Upgrade File of Device

➔ Upgrade

After selecting the file, click "Upgrade" button to start the upgrade.

- ➔ Display upgrading status in realtime



Figure 3.1-8 Upload the Upgrade File

The real-time upgrade progress will be displayed in the prompt message. It supports the display of uploaded file, initialization of device, Kernel upgrade, Rootfs upgrade, and CmcApp upgrade. When "All finish OK" is displayed, it means that the upgrade is completed successfully.



Figure 3.1-9 Result of Software Upgrade of Device

- ➔ Restart and verify the upgrade result

The upgrade will be prompted success or failure after it is completed. In case of successful upgrade, the device is required to restart and connect to the web network management software again to view the software and hardware versions and other configuration information.

- [Reboot]

Supports the device reboot.

- [Restore]

Restores the device to factory configurations.

- [Clear Reboot Counter]

The number of device reboot will be displayed in basic information. After click "Reset the number of device reboot", the number of device reboot will start from 0.

- [Download Config]
Supports exporting the configuration of device to local workstation for view.
- [Load Config]
Supports importing local configuration file to the device.

3.2 Basic Information Configuration

3.2.1 Basic Configuration

Basic Configuration is used to modify and configure the device name, contact and location. The textbox can be modified.

Click [Submit] to have your modification take effect. then you will be prompted whether the configuration is successful or not.

Click [Clear] to discard your modification which hasn't been submitted.

Click [Refresh] to obtain the configuration information from the device again.

3.2.2 NTP Configuration

NTP configuration is used to configure the time server of device. Manual modification of device time is acceptable.

Automatic acquisition of time: configure NTP server and synchronization interval. The device will synchronize the time automatically on a timing basis.

NTP supports domain name and IP address. The time interval value is an integer between 0 and 2595599.

Manual modification of device time: the current system time is displayed in the item of system time, where the system time can be modified manually.

Time Zone displays current time zone of system. The time zone of device can be modified, with value ranging from -12 to +12, i.e., West Zone 12 to East Zone 12.

3.3 SNMP Configuration

Supports configuring the read-only community name and read/write community name.

3.4 Zero Configuration

Zero configuration means that CMTS in the factory, without user's action, can directly get the configuration file from the server through the zero configuration function.

Zero configuration radio button: Open/close zero configuration function

The time of the led indicated: When zero configuration is completed, the RUN light and CABLE light will bright. You can set the time.

4. Network Management

4.1 Network Configuration

Network configuration supports the modification of IP information.

IP address can be acquired automatically or manually.

Automatic acquisition: select "Auto". Device will acquire IP via DHCP. You can configure Option60 and limit the timeouts.

Manual configuration: select "Static". The static IP address supports manual configuration of IP address, subnet mask and gateway.

Note: After modifying IP information of the device successfully, the device uses the parameters acquired automatically or configured manually. The current stand-alone web network management software net connection may be broken. It requires new IP address of the device for network management login. Please be careful of the modification.

4.2 Rate Limit

The rate limit includes port rate limit function and storm control function.

- Port rate limit function includes uplink port rate limit, cable port rate limit and CPU rate limit.
 - ➔ The uplink port rate limit supports ICMP and IGMP rate limit, with direction uplink-egress and range of 1-65535, where ICMP/IGMP rate limit exempts the ICMP/IGMP packets from CPU to uplink port.
 - ➔ The cable port rate limit supports ARP and DHCP rate limit, with direction cable-ingress. It is to limit the rate of ARP packet and DHCP packet of each CM, with range of 0-30.
 - ➔ The CPU rate limit supports ARP rate limit, unicast rate limit, UDP rate limit (some versions don't support UDP rate limit), and DHCP rate limit. ARP/DHCP speed limit exempts the ARP/DHCP packets with destination MAC as CPU MAC. The unicast speed limit targets at the unicast packet submitted to CPU and with destination MAC as CPU MAC. The unicast packet will not subject to this limit in case it has already been in the queue of UDP speed limit. The range of ARP rate limit, unicast rate limit, UDP rate limit is 1-65535, and DHCP rate limit is 1-500.
- The storm control function includes the storm control of uplink port and the storm control of cable port.
 - ➔ The storm control of uplink port and that of cable port support the broadcast speed limit and multicast speed limit, with range of 1-65535.

4.3 DHCP Relay

DHCP Relay configuration includes three parts: "DHCP Relay base config", "DHCP L3 Relay configuration" and "DHCP Snooping and DHCP L2 Relay configuration".

To configure DHCP Relay, configure the base config first: select the terminal device to use DHCP L3 Relay, DHCP Snooping or DHCP L2 Relay. Then configure Bundle. In case of DHCP L3 Relay, configure Bundle policy, terminal device Option60, DHCP server and relay. In case of DHCP Snooping and DHCP L2 Relay, configure IP address and VLAN Tag.

4.3.1 Basic Settings

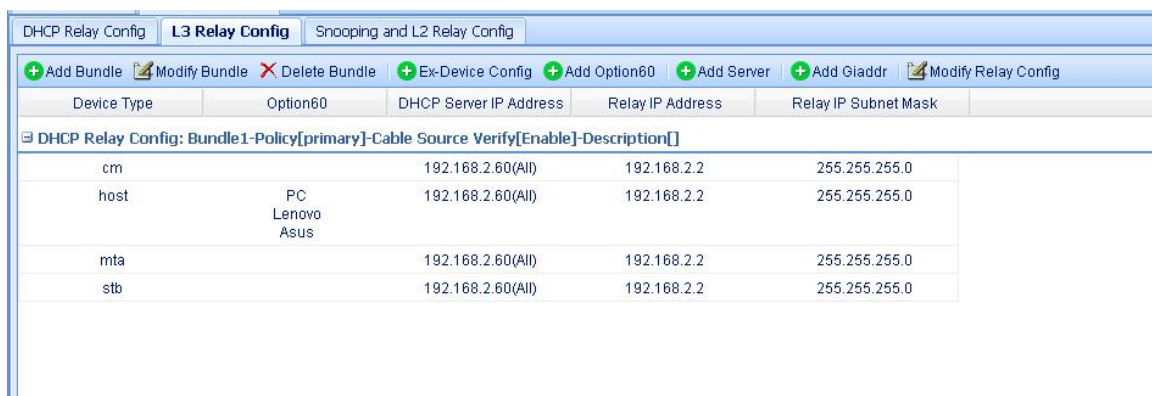
Basic settings of DHCP Relay includes Cable Source Verify switch and DHCP Relay settings for terminal device.

- Cable Source Verify switch
If the source verify switch is on, the device will discard the packets which with the static source IP address; else the packets will be forwarded.
- DHCP Relay settings for terminal device
DHCP Relay settings for terminal device support DHCP Snooping DHCP L2 Relay and DHCP L3 Relay. The terminal device supported here includes CM, HOST, MTA and STB. To enable DHCP Snooping of terminal devices such as CM, HOST, MTA and STB, it only requires to setting corresponding items of DHCP settings as DHCP Snooping.
- Interface-Id and Circuit ID Config
Support a configurable DHCP option 82.1 and DHCPv6 option 18 identifier value, the default value is hostname.

4.3.2 DHCP L3 Relay Configuration

DHCP Relay information screen supports the display and management of DHCP Relay information.

DHCP Relay information screen can display the configuration information of DHCP Relay, and is divided into the toolbar and display list.



Device Type	Option60	DHCP Server IP Address	Relay IP Address	Relay IP Subnet Mask
cm		192.168.2.60(All)	192.168.2.2	255.255.255.0
host	PC Lenovo Asus	192.168.2.60(All)	192.168.2.2	255.255.255.0
mta		192.168.2.60(All)	192.168.2.2	255.255.255.0
stb		192.168.2.60(All)	192.168.2.2	255.255.255.0

Figure 4.3-1 DHCP Relay Configuration Screen

- The toolbar
The toolbar supports adding Bundle, modifying Bundle, deleting Bundle, adding Option60, adding DHCP server, adding giaddr, modifying Relay configuration and refreshing Relay configuration. Modifying Relay configuration will open DHCP Relay Information Management screen to support the management of specific Bundle, Option60 of specific terminal device, DHCP server and giaddr.

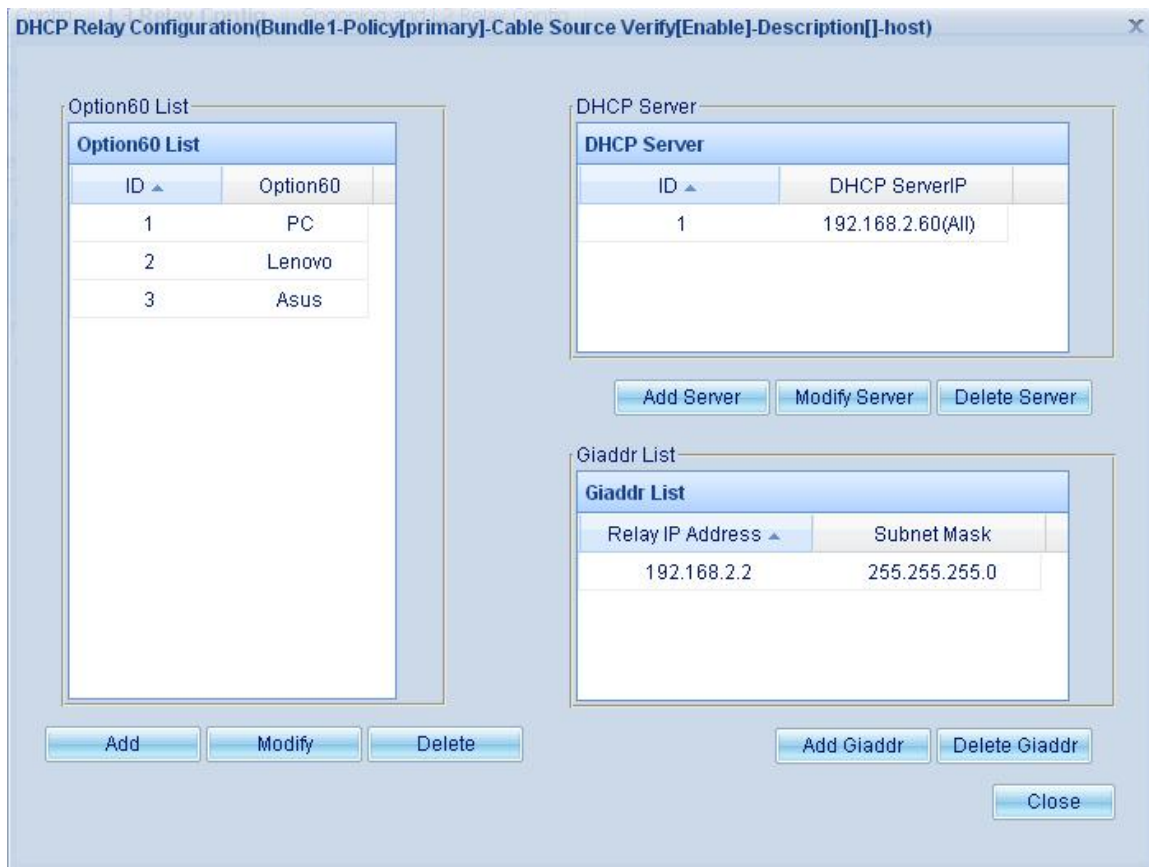


Figure 4.3-2 DHCP Relay Configuration Items

- The display list

The display list displays DHCP Relay configuration information. For the management of Bundle, the toolbar provides the buttons of [Add Bundle], [Modify Bundle] and [Delete Bundle].
- Bundle Management
 - ➔ Display Bundle

Display DHCP Relay configuration information, including Bundle name, device type, Option60, DHCP server address, relay IP and relay subnet mask.
 - ➔ Add Bundle

Select Bundle, policy and cable source verify switch to add the configuration to the device.



Figure 4.3-3 Add Bundle Configuration

- The device support 32 bundles. And the value of bundle ID as 1 or 1.1-31.
- policy can be divided into three kinds: primary, policy and strict.
 - Primary: configuration of only one relay is supported under this strategy, and this relay is applicable to all terminal types (CM, HOST, MTA, STB and extension device).

Policy: configuration of only two kinds of relay is supported under this strategy, including CM and other device (HOST, MTA, STB and extension device). One relay applicable to cm and one applicable to other devices can be configured.

Strict: each type of device under this strategy corresponds one relay (CM, HOST, MTA, STB and extension device).

- cable source verify switch.

It is allowed to set whether cable source verify is acceptable under the DHCP Bundle.

➔ Modify Bundle

Support modifying the Bundle policy and cable source verify switch.

➔ Delete Bundle

If this configuration is deleted, the corresponding Option60, DHCP server address and relay of the Bundle will be deleted either.

➤ Configuration of extensive device

Support manually creating the equipment type, namely, in addition to the existing four equipment types, support customizing equipment type.

➔ Display The Extension Device List

Display the configuration information of extension device, including the extension device type, Option60.

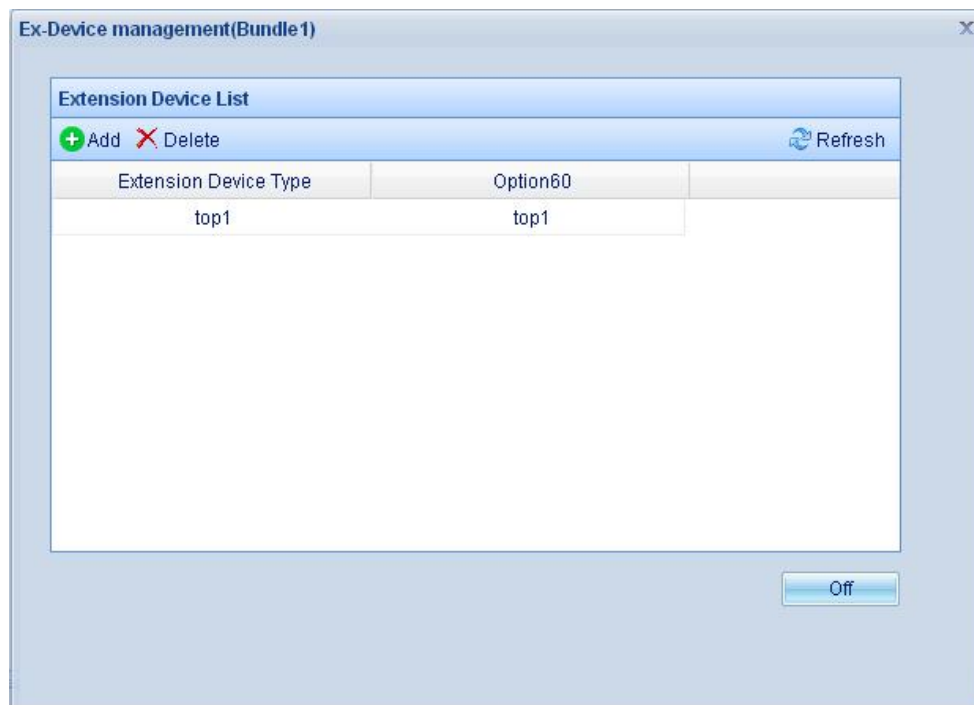


Figure 4.3-4 Extension Device Configuration Information

➔ Add Extension Device

Fill in the extension device name and option60 field to add the extension device.

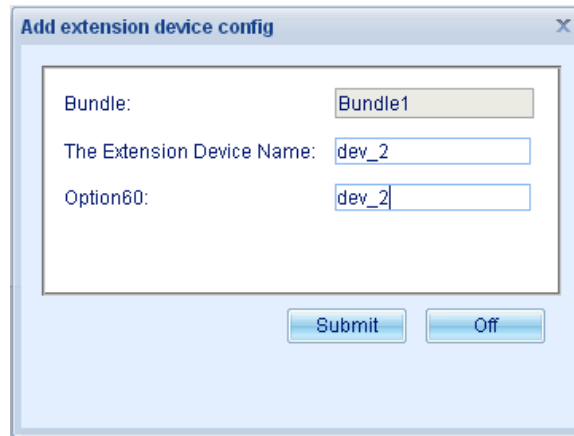


Figure 4.3-5 Add Extension Device

➔ Delete Extension Device

Deletes such extension device, and corresponding Option60, DHCP server address and relay, etc. of the Bundle will also be deleted.

➤ Option60 Management

Option60 management includes the display, addition, modification and deletion of Option60.

➔ Display Option60

Option60 list displays all configured Option60 of the device type under the Bundle.

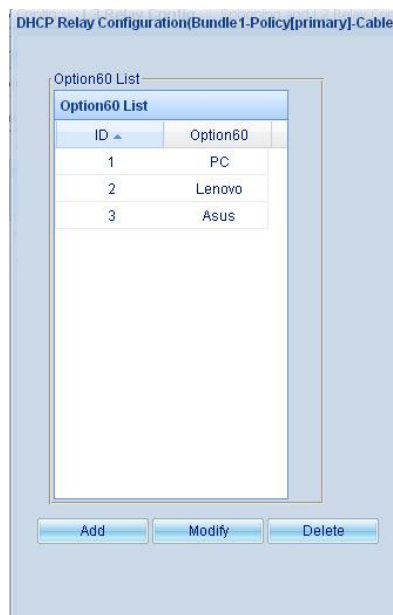


Figure 4.3-6 Option60 Configuration Information

➔ Add Option60

Allows to add Option60 to the designated Bundle.

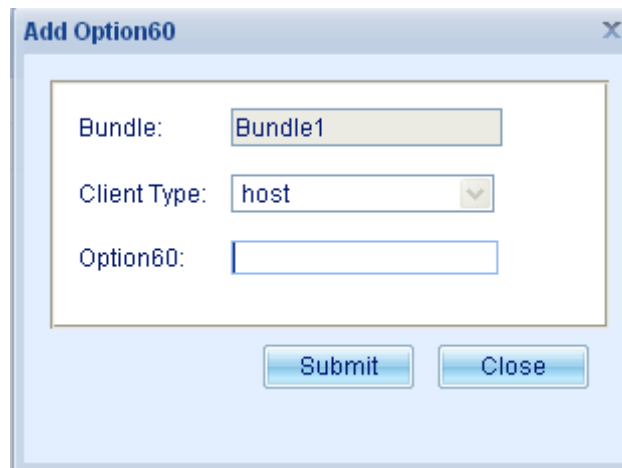


Figure 4.3-7 Add Option60

When adding Bundle, default Option60 string of corresponding device will be added. The default of CM is "DOCSIS", that of STB is "stb", that of MTA is "mta" and that of HOST is null.



Note:

When adding Option60, the above default strings can not be set, that is, docsis, stb and mta strings can not be set.

- ➔ Modify Option60
It allows to modify Option60 string.
- ➔ Delete Option60
Deletes this Option60.

➤ DHCP Server Management

The management of DHCP server address includes the display, addition, modification and deletion of DHCP server address.

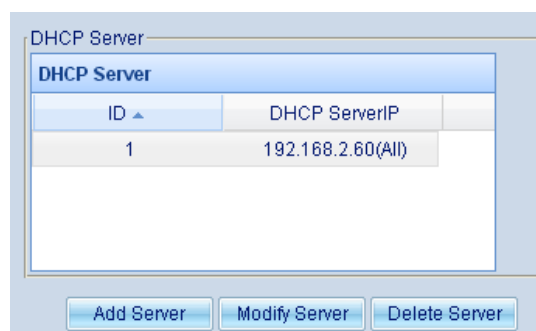


Figure 4.3-8 DHCP Server Configuration Information

- ➔ Display DHCP server address
DHCP server address list displays IP of all configured DHCP server address of the device type under the Bundle (including the DHCP server address with device type as all), with marks following corresponding IP address.
- ➔ Add DHCP server address
Add DHCP server. Select the device type and fill in the server IP address to add the DHCP Server to the designated Bundle. The device type supports the terminal device and all devices.



Figure 4.3-9 Add DHCP Server

→ Modify DHCP server address
It allows to modify IP address of DHCP server.

→ Delete DHCP server address
Deletes the DHCP server address.

➤ DHCP Giaddr(Relay) Management

It includes display, addition, modification and deletion of relay.



Figure 4.3-10 DHCP Relay Configuration Information

→ Display the relay
Relay List displays the configured relay IP and subnet mask of the device type under the Bundle.

→ Add the relay
Fill in the relay IP and subnet mask to add the relay to the designated Bundle.
If the strategy of Bundle is primary, there is only one relay, all terminal device through the relay forwarding DHCP packets.

If the strategy of Bundle is policy, two relays can be added, one of the primary, only forwarding DHCP packets for CM, the other one is secondary, forwarding DHCP packets for CPE.

If the strategy of Bundle is strict, it can be added a relay for each device type. each terminal device by different relay address forwarding DHCP message.

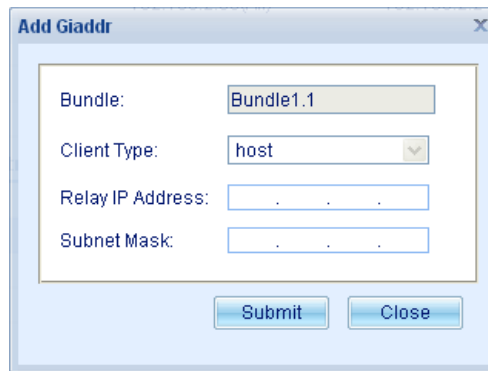


Figure 4.3-11 Add DHCP Relay

- ➔ Modify the relay
Allow to modify the relay IP and subnet mask.
- ➔ Delete the relay
Delete this relay.

4.3.3 DHCP Snooping and DHCP L2 Relay Configuration

In case DHCP L2 Relay or DHCP Snooping is selected, the terminal device will use the IP address configured by using DHCP Snooping and DHCP L2 Relay to match the Bundle, and according to the type of terminal device, use VLAN on the Bundle to give VLAN Tag against VLAN device.

It is divided into two parts: DHCP Relay IP address and DHCP Relay VLAN. DHCP Relay IP is used to use the terminal device IP to match the Bundle, while DHCP Relay VLAN is used to configure VLAN to terminal device in the Bundle.

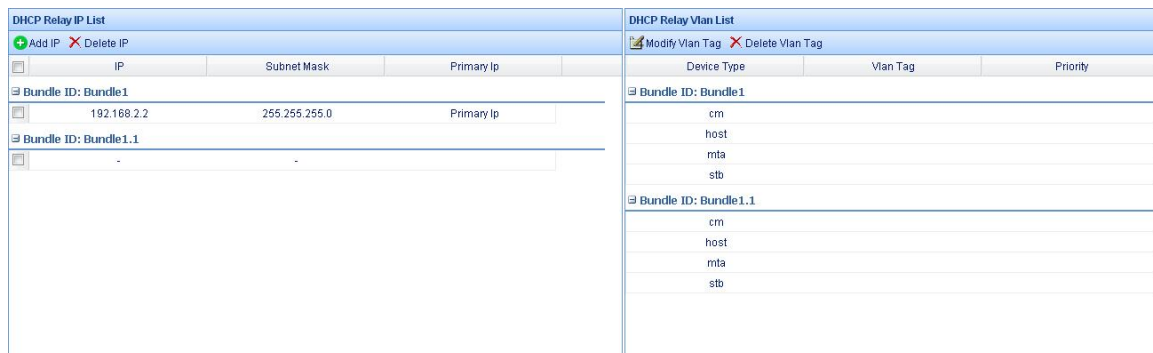


Figure 4.3-12 Relevant Configurations of DHCP Snooping

DHCP Relay IP Address

DHCP Relay IP address includes displaying the configuration, adding IP address and deleting IP address.

➤ Display IP Address

IP address includes Bundle, IP address, subnet mask and whether primary IP or not.

Here IP address and the relay in DHCP L3 Relay are of the corresponding relationship. When Bundle is of Primary mode, the primary IP of IP address is the relay IP; when Bundle is of Policy mode, the primary IP of IP address is the CM relay, and the second sub-IP is the CPE relay; when Bundle is of Strict mode, the primary IP of IP address is the CM relay, and the 2nd-4th sub-IP are the relay of HOST, MTA and STB.

- Add IP Address
 - ➔ Select Bundle.

Select any IP address of corresponding Bundle in DHCP Relay IP Address List. In case the Bundle doesn't exist, add the Bundle to Layer-3 Relay.
 - ➔ Click "Add IP Address" on the toolbar to pop up the screen shown as figure below.

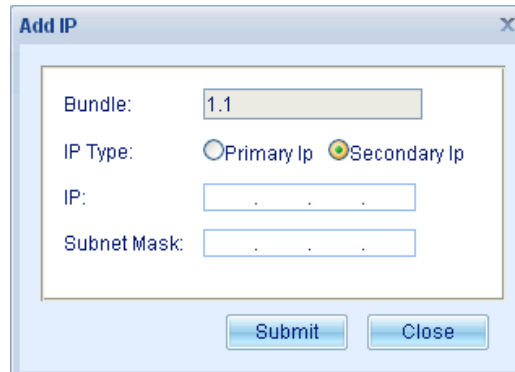


Figure 4.3-13 Add DHCP Relay Address

- ➔ Fill in configurations.

If there's already primary IP, the IP type can not be selected. Fill in IP address and subnet mask.
- ➔ Submit the configurations

Click "OK", and the prompt of success or failure pops up.

➤ Delete IP Address

Select more than one IP address to delete the IP address.

➤ DHCP Relay VLAN List

DHCP Relay VLAN includes the display of configuration, editing VLAN and deleting VLAN.

➤ Display VLAN Configuration

VLAN configuration of Bundle includes Bundle, VLAN ID and priority.

➤ Edit VLAN

- ➔ Select Bundle.

Select corresponding terminal type of corresponding Bundle in DHCP Relay VLAN List. In case the Bundle doesn't exist, add the Bundle to Layer-3 Relay.
- ➔ Click "Edit VLAN Tag" to pop up the screen shown as figure below.



Figure 4.3-14 DHCP VLAN Configuration

- ➔ Fill in configurations.

Fill in VLAN ID and select the priority.
- ➔ Submit configurations.

Click "OK", and the prompt of success or failure pops up.

➤ Delete VLAN

Select one VLAN tag to delete the VLAN tag.

4.4 VLAN Management

VLAN management supports adding VLAN, deleting VLAN, adding VLAN virtual interface and deleting VLAN virtual interface.



VLAN interface IP	Subnet Mask	DHCP Alloc	Option60	Timeouts	IP Type	Operate
VLAN: untag						
192.168.2.2	255.255.255.0	-		0	Primary Ip	
VLAN: 1024						
100.20.0.2	255.255.255.0	-		0	Primary Ip	
VLAN: 4094						
172.16.35.92	255.255.255.0	-		0	Primary Ip	

Figure 4.4-1 VLAN Configuration of System

4.4.1 Display VLAN

VLAN List displays VLAN ID, IP address of VLAN virtual interface, subnet mask, whether automatic acquisition or not, automatic acquisition of Option60 of IP address, and type of IP address (whether primary IP or not).

4.4.2 Add VLAN

To add VLAN, only enter the VLAN ID and click "Add". The prompt of success or failure will pop up.

4.4.3 Delete VLAN

First select VLAN to be deleted (select any IP address of VLAN), and click "Delete VLAN" on the toolbar. The prompt of success or failure will pop up.

4.4.4 Add VLAN Virtual Interface

VLAN virtual interface IP can be acquired by two ways: manual configuration and automatic acquisition.

- Configure VLAN virtual interface IP manually
 - ➔ Select VLAN to select any IP address of VLAN.
 - ➔ Click "Add virtual interface IP" on the toolbar to pop up the screen shown as figure below.

Figure 4.4-2 Add VLAN Interface IP

- ➔ Fill in configurations. Fill in the virtual interface IP, address mask and select the IP type.
- ➔ Click "OK", and the prompt of success or failure pops up.
- Acquire VLAN virtual interface IP automatically
 - ➔ Select "Edit" icon on VLAN IP Address action bar.
 - ➔ Select DHCP client ON and fill in OPTION60.
 - ➔ Click "OK", and the prompt of success or failure pops up. In case of successful acquisition, DHCP server will assign IP address.

4.4.5 Modify VLAN Virtual Interface

- Select "Edit" icon on VLAN IP Address action bar.
- Select DHCP client ON and fill in OPTION60; select DHCP client OFF and fill in virtual interface IP and subnet mask.
- Click "OK", and the prompt of success or failure pops up.

4.5 Subnet VLAN

Classify the services through the subnet VLAN function. The devices of different network segments are offered different VLAN tags by configuring the subnet VLAN function.

The subnet VLAN management includes modifying subnet VLAN configuration, displaying subnet VLAN, adding subnet VLAN and deleting subnet VLAN.

4.5.1 Display Subnet VLAN

The subnet VLAN displays IP address, subnet mask, VLAN ID and priority.

4.5.2 Add Subnet VLAN

To add VLAN, enter IP address, subnet mask, VLAN ID and priority.

The range of VLAN ID value is 1-4094.

The priority value ranges from 1 to 7.

Figure 4.5-1 Add Subnet VLAN

4.5.3 Modify Subnet VLAN Configuration

Allow to modify TPID and CFI.

4.5.4 Delete Subnet VLAN

First select the subnet VLAN to be deleted. It is allowed to click some a line, or select more than one line via the checkbox ahead the lines. Click "Delete subnet VLAN" on the toolbar and the prompt of successful or unsuccessful deletion will pop up.

4.6 ACL Management

ACL (Access Control List) is used mainly to identify the streams. To filter the data packets, the network device is required to configure a series of matching rules to identify the packets to be filtered. After identifying specific packets, corresponding data packets will be allowed to pass or not according to the preset strategy. ACL classifies the data packets through a series of matching conditions, which can be source address, destination address and port number of data packets.

ACL includes displaying ACL, adding ACL, modifying ACL, deleting ACL, deleting rules, binding/unbinding.

4.6.1 Display ACL

ACL displays ACL ID, descriptions, priority, matching rules, processing actions and placing point.

4.6.2 Add ACL

- Click "Add ACL" to pop up the screen for ACL addition.

Figure 4.6-1 Add ACL Basic Attributes

- Fill in ACL basic attributes. Enter ACL ID, descriptions and select the priority. ACL ID value ranges from 1 to 192. The descriptions support 64 characters. Select the priority. The larger the number is, the higher the priority is. A device can create at most 192 ACL.
- Configure ACL rules. Click "Next" or "ACL Rules" on the top to come to the "ACL Rules" screen.

It is "and" relationship among multiple rules.

Figure 4.6-2 Add ACL Rules

- ➔ Configure the processing action.

Click "Next" or "Processing Action" on the top to come to "ACL Processing Action" configuration screen, as shown in figure below.

The default action is no action. It is allowed to set the action as "permit" or "deny". In case of "permit", it is allowed to set detailed conditions of action to modify the contents of packet.

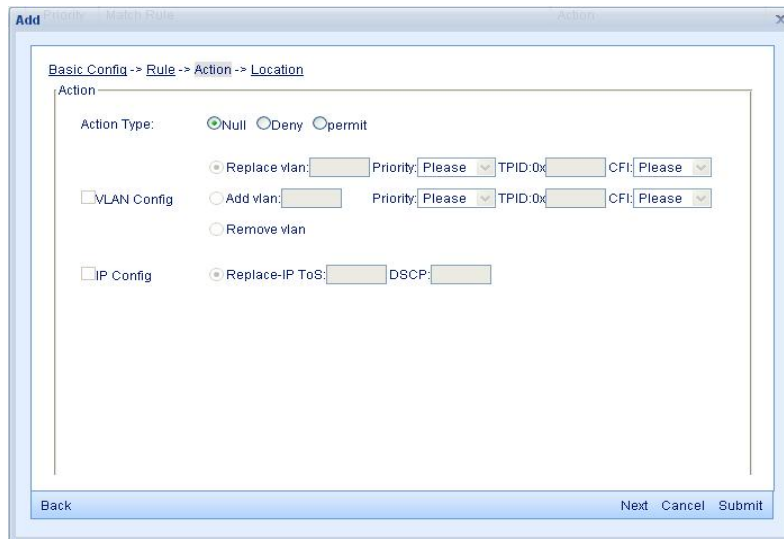


Figure 4.6-3 Add ACL Action



Note:

In some versions, the action doesn't support "Copy the packet to CPU".

➔ Configure the placing point.

Click "Next" or "Placing Point" on the top to come to "ACL Placing Point" configuration screen, as shown in figure below.

After setting the matching rules and actions, if the action is set as "allow to pass" or "discard the packet", the placing point can be set. Any of the four placing points can be select. After setting any placing point, modification of ACL basic information, matching rules and actions is prohibited. To modify them, it requires to cancel all placing points first, otherwise none of any other information can be modified.

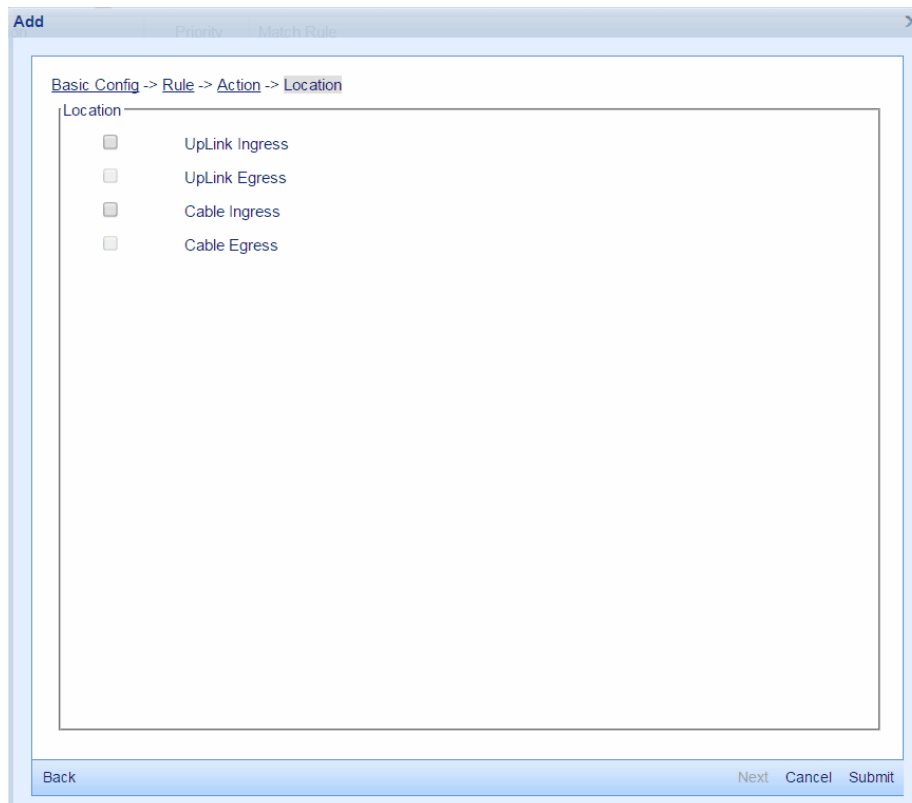


Figure 4.6-4 Add ACL Placing Point

→ Confirm.

Click "OK" and the prompt of successfully adding ACL or not will pop up.

4.6.3 Modify ACL

The modification is conducted by steps same as those of adding ACL. ACL bound to the placing point is not allowed to modify. To modify it, unbind it first.

4.6.4 Delete ACL

Select more than one ACL and click "Delete ACL". The prompt of successful or unsuccessful deletion of ACL will pop up. The ACL bound to the placing point is not allowed to delete. To delete it, unbind it first.

4.6.5 Delete Rules

Select more than one ACL and click "Delete ACL rules". The prompt of successful or unsuccessful deletion of ACL rules will pop up. The ACL rules bound to the placing point is not allowed to delete. To delete them, unbind them first.

4.6.6 Bind/Unbind

The binding/unbinding function is to bind ACL to the placing point so as to make ACL take effect on some a or more placing points. To bind ACL, configure the matching rules and processing actions.

4.7 Static Route

Static routing management supports the configuration of static routing of the device.

Static routing management includes displaying static routing, adding static routing and modifying static routing.

4.7.1 Display Static Routing

Static routing displays the destination IP of static routing, subnet mask, net hop and port passing through.

4.7.2 Add Static Routing

Click "Add static routing" on the toolbar, enter the destination IP address of static routing, subnet mask and next hop and click "OK". The prompt of successful or unsuccessful addition will pop up. After successful addition, the device will calculate the port number automatically.

Note: The next hop must be on the same network segment of the device.

4.7.3 Modify Static Routing

The directly-connected static routing can not be modified.

4.7.4 Delete Static Routing

Select one or more static routings and click "Delete static routing" on the toolbar. The prompt of successful or unsuccessful deletion of static routing will pop up.

4.8 SAV Configuration

Configuring the SAV Function.

4.8.1 SAV Exception

Under the SAV Exception tab, you can add, delete or show the configuration of SAV Exception.

4.9 Firewall

Firewall can limit the network access by configuring the access protocol and IP address to improve the network security.

Telnet, SSH, SNMP and web protocol are supported by firewall. Each of them has two tables named access-permit table and access-deny table. The IP or IP segment in the access-deny table is prohibited to access the network of the device and which in the access-permit table is allowed to access the network of the device. The maximum number of the records in every table can't exceed 10.

The access-permit table and access-deny table are inefficient at the default state. Just when firewall enable the access protocols the tables can take effect. When enable a protocol with an empty access-permit table, a prompt will be given to tell you should add one permit-rule first.

5. Local-Provision Management

Local provisioning configuration consists of three parts, local provisioning IPv4 configuration, local provisioning IPv6 configuration and status of local provisioning address pool.

Local provisioning IPv4 configuration: Primary management CM and CPE IPv4 address pool assignment. 3.0 CM and 2.0 CM can obtain IPv4 addresses.

Local provisioning IPv6 configuration: Primary management CM and CPE IPv6 address pool assignment. IPv6 addresses can be obtained only by 3.0CM.

Status of local provisioning address pool: Primary display the information of all IPv4 and IPv6 addresses assigned to CM and CPE.

5.1.1 Local-Provision IPv4 Config

Enable local IPv4 Provisioning feature, DHCP Relay for CM / CPE of IPv4 forwarding mode (including dhcp-snooping, dhcp-l2-relay, dhcp-l3-relay) will cease to have effect.

➤ Local-Provision Switch

Global DHCP: Enable or disable the global IPv4 Provisioning switch, When this this feature is enabled, other configurations take effect.

CPE Switch: Enable or disable the feature of allocation IPv4 address for CPE. When this this feature is disabled, the CMTS device will use the DHCP relay mode of system configuration to forward DHCP packets of CPE.

Enable 3.0CM Profiles: When the function enabled, 3.0CM and 2.0CM can use separate configuration files, to achieve a more meticulous management. If the 3.0CM not import the separate configuration file, it will use the default configuration file. When the function disabled, 3.0CM and 2.0CM will use the default configuration file.

➤ DHCP Time Configuration

Lease Time: IP address lease time of the IP address pool. The format is: DD-HH-MM-SS, range: 30 minutes – 10 days.

➤ DNS Server Address Configuration

Primary DNS Server(P): Configure the primary DNS address of IP address pool.

Secondary DNS Server(P): Configure the secondary DNS address of IP address pool.

➤ DHCP Address Pool Configuration

IP Address Pool: Configure the IP address, assigned IP address combined with the subnet mask to the access device.

Subnet Mask: Configure the subnet mask of the IP address pool.

Default Route: Configure the default route of the IP address pool.

➤ Load CM Config

Load CM config file: CMTS device is not configured CM file in default. CM will load CM config form the Provisioning and be online after the CM configuration file manually import the device and CM complete DHCP process. CM profile provisioning used also use this feature to import.

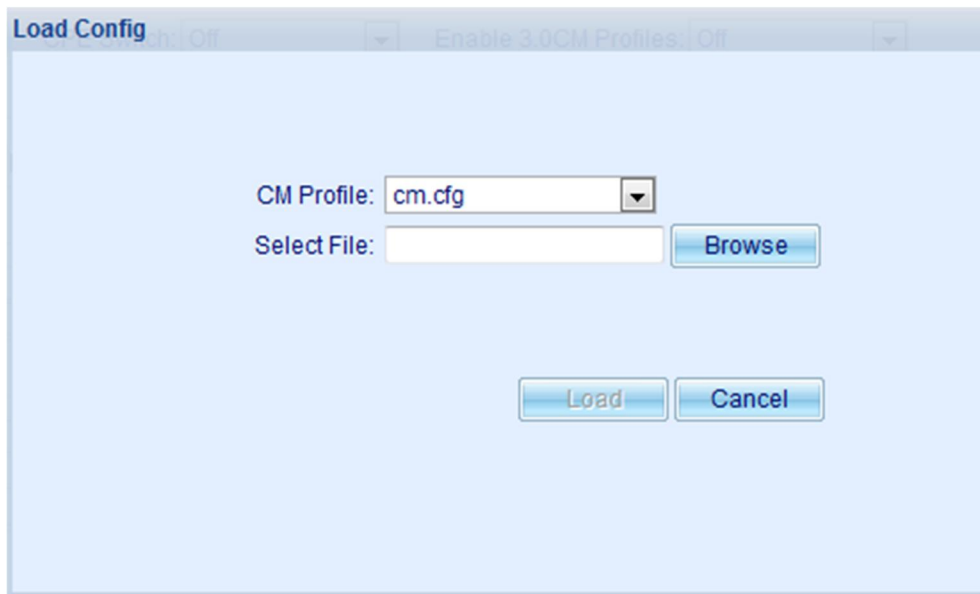


Figure 4.9-1 Load Config

➤ Download CM Config

Download CM config file: If the configuration file does not exist, the CMTS device will create an empty configuration file in the user side.

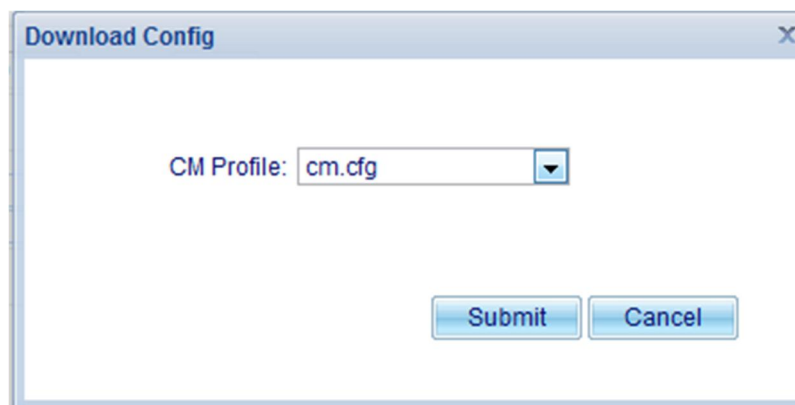


Figure 4.9-2 Download Config

5.1.2 Local-Provision IPv6 Config

Enable local IPv6 Provisioning feature, DHCP Relay for CM / CPE of IPv6 forwarding mode (including dhcpv6-snooping, dhcpv6-l2-relay, dhcpv6-l3-relay) will cease to have effect.

➤ Local-Provision Switch

Global DHCP: Enable or disable the global IPv6 Provisioning switch, When this this feature is enabled, other configurations take effect.

CPE Switch: Enable or disable the feature of allocation IPv6 address for CPE. When this this feature is disabled, the CMTS device will use the DHCP relay mode of system configuration to forward DHCP packets of CPE.

Enable 3.0CM Profiles: When the function enabled, 3.0CM and 2.0CM can use separate configuration files, to achieve a more meticulous management. If the 3.0CM not import the separate configuration file, it will use the default configuration file. When the function disabled, 3.0CM and 2.0CM will use the default configuration file.

- DHCP Time Configuration

Address-Pool Valid Lifetime: Configure the valid lifetime of the IPv6 address pool. The format is: DD-HH-MM-SS, the valid lifetime cannot be less than the preferred lifetime.

Address-Pool Preferred Lifetime: Configure the preferred lifetime of the IPv6 address pool. The format is: DD-HH-MM-SS.

PD Valid Lifetime: Configure the valid lifetime of the PD address pool. The format is: DD-HH-MM-SS, the valid lifetime cannot be less than the preferred lifetime.

PD Preferred Lifetime: Configure the preferred lifetime of the PD address pool. The format is: DD-HH-MM-SS.
- DNS Server Address Configuration

Primary DNS Server(P): If there are two DNS addresses, use the primary DNS address priority.

Primary DNS Server(P): If there are two DNS addresses, use the primary DNS address priority.
- DHCP Address Pool configuration

IP address pool is assigned an address to the access device, and PD is assigned an address range to the access equipment.

Address Pool: IPv6 address and prefix length, is mainly used to assign a single IPv6 address.

Default Route: IPv6 address, set matching route IPv6 address based on the device address.

Prefix Delegate: IPv6 address. PD is assigned an address range to the access equipment.

The Length Of The Address Pool Assigned: The length of the IPv6 address pool must be greater than PD prefix length.
- TFTP Server Configuration

TFTP Server Address: IPv6 address. It is used to configure local Provisioning DHCP server IP address. the IP address of FTP server must be the same as with the address of the device to remain connected.

5.1.3 Local-Provision Address Pool Status

- IP Address

Filter conditions: All / IPv4 / IPv6. Find the assigned IP address information depending on the filter conditions.

5.2 Multicast Management

5.2.1 Multicast CM Move

Move CM2.0 switch: Move the same session of the CM to a multicast channel when it is turned on. e.g If CM#1 is receiving multicast CNN on RF channel 50 and CM#2 is receiving multicast on ESPN RF channel 51. Then CM#2 tunes CNN to a stream that is on RF channel 50 then the CMTS must talk to CM#2 and send stream on RF Channel 50.

6.RF information

6.1 Upstream Channel

Click [US Channel] on the left navigation bar to enter the CMTS Upstream Channel screen.

In the upstream channel, you can view the upstream channel information of CMTS device, including the basic information and signal quality.

6.1.1 Basic Information

The Basic Information screen includes Upstream Channel Display and Upstream Channel Management. The upstream channel management supports basic information settings (modifying parameters of a single channel or modifying the parameters of multiple channels), channel ON/OFF by batch, center frequency offset of channel by batch and modification of universal configurations.

➤ Basic information display

Basic information display includes channel ID, center frequency, bandwidth, receiving level, modulation configuration template, management status, ranging backoff start, ranging backoff end, data backoff start, data backoff end, channel mode, SNR, channel pre-equalization, channel type and channel status.



Cha...	Status	Central Freq	Freq W...	Modulate Template	Channel M...	Chann...	Receive ...	Chann...	SNR	Range Bac...	Range Bac...	Data Backo...	Data Backo...
1	✓	9 MHz	3.2 MHz	QPSK-ATDMA	DOCSIS2.0	ATDMA	6 dBmV	ACTIVE	37.1 dB	3	6	2	8
2	✓	15.4 MHz	3.2 MHz	QPSK-ATDMA	DOCSIS2.0	ATDMA	6 dBmV	ACTIVE	36.5 dB	3	6	2	8
3	✓	21.8 MHz	3.2 MHz	QPSK-ATDMA	DOCSIS2.0	ATDMA	6 dBmV	ACTIVE	38.6 dB	3	6	2	8
4	✓	28.2 MHz	3.2 MHz	QPSK-ATDMA	DOCSIS2.0	ATDMA	6 dBmV	ACTIVE	40.3 dB	3	6	2	8

Figure 6.1-1 Upstream Channel Configuration Information

➤ Basic Information Settings

The channel parameters can be configured in two ways: set different parameters of different channels on "Basic Information Display" screen; set different parameters of some a channel on "Basic Information Settings of Upstream Channel" screen.

➔ Modify different parameters of a single channel

Click on channel ID of some a line of channel to open the "Basic Information Settings of Upstream Channel" screen, where the basic information of upstream channel can be set, as shown in Fig. 5-2.

For modulation configuration template, 13 SCDMA and 4 ATDMA can be selected; for bandwidth, there are 1.6M Hz, 3.2M Hz and 6.4M Hz; the center frequency can be set as value between 5.0M Hz and 65.0M Hz; the management status allows setting channel ON/OFF; the receiving level can be set as value between -13.0 dBmV and +26.0 dBmV; channel mode is allowed to set the channel as DOCSIS 2.0 mode or DOCSIS 3.0 mode.

Figure 6.1-2 Upstream Channel Configuration

After finishing parameter setting, click [Submit]; after finishing the modification, there will be corresponding prompt of success or failure.

➔ Modify different parameters of multiple channels

Double click some a cell to modify the parameter. In the cell, black font means the field can be modified, while grey font means it can not be modified. After finishing the modification, click [Submit] on the toolbar. To give up the modification, click [Clear] on the toolbar.

Parameters to be set include management status, center frequency, bandwidth, modulation configuration template, channel mode, channel type and receiving level.

The modification can be divided into two modes: advanced and simple.

Simple mode: set the number of channel modified simultaneously. If the parameters of a channel are modified, the corresponding number of channels below will be modified simultaneously.

Advanced mode: if parameters of a channel are modified, only the parameters of the channel change with those of other channels remain unchanged.

➤ Channel ON/OFF by batch

Click the checkbox ahead of each line to select multiple channels. Click [Channel Off] or [Channel ON] on the toolbar to enable/disable multiple channels by batch.

➤ Channel Center Frequency Offset

Provide channel center frequency offset by batch. Conduct overall center frequency offset of the selected channel.

➔ Select the channel

- Tick the selection box on the left of each line to select the channel.
- Key combination
 - <Ctrl+click a line> to select the lines apart.
 - <Shift+click a line> to select the consecutive lines.

➔ Enter the channel offset

Enter the channel offset in "Channel Offset" input box on the toolbar. The modified channel center frequency will be displayed in red font in the line checked.

Ch...	Status	Central Freq	Freq W...	Modulate Template	Channel M...	Chann...	Receiv...	Chann...	SNR	Range Bac...	Range Bac...	Data Backo...	Data Backo...
1	✓	9 MHz	3.2 MHz	QPSK-ATDMA	DOCSIS2.0	ATDMA	6 dBmV	ACTIVE	37.5 dB	3	6	2	8
2	✓	15.4 MHz	3.2 MHz	QPSK-ATDMA	DOCSIS2.0	ATDMA	6 dBmV	ACTIVE	36.9 dB	3	6	2	8
3	✓	31.8(21.8) MHz	3.2 MHz	QPSK-ATDMA	DOCSIS2.0	ATDMA	6 dBmV	ACTIVE	39.9 dB	3	6	2	8
4	✓	38.2(28.2) MHz	3.2 MHz	QPSK-ATDMA	DOCSIS2.0	ATDMA	6 dBmV	ACTIVE	39.9 dB	3	6	2	8

Figure 6.1-3 Configuration of Center Frequency of Upstream Channel

➔ Modify

Click [OK] button to make the offset center frequency take effect.

➤ Universal Configuration Modification

Universal configuration modification can be used to configure the ranging backoff start, ranging backoff end, data backoff start and data backoff end.

6.1.2 Signal Quality

Signal Quality displays the communication quality of channel, including channel ID, competitive time slot, non-error code number/percentage of total, correctable error code number/percentage of total, uncorrectable error code number/percentage of total and SNR.

Channel ID	Signal Quality	Time Slot Compete	Corrected Code/Percentage	Correctable Code/Percentage	Uncorrectable Code/Percentage	SNR
1	No	No	179720/100.0%	0/0.0%	88/0.0%	37.5 dB
2	No	No	177711/100.0%	0/0.0%	25/0.0%	36.9 dB
3	No	No	173025/100.0%	0/0.0%	46/0.0%	39.9 dB
4	No	No	126559/100.0%	0/0.0%	6/0.0%	39.9 dB

Figure 6.1-4 Signal Quality of Upstream Channel

6.2 Downstream Channel

Click [DS Channel] on the left navigation bar to enter the CMTS Downstream Channel Configuration screen.

In the Downstream Channel Configuration screen, you can view and set the basic information of downstream channel on CMTS device.

The downstream channel is divided into two parts: the upper half part enables DOCSIS channels and the closed channels, while the lower half part enables EQAM channels.

Channel ID	Status	Central Freq	Freq Width	Modulation	Power	Mode	Interleaving ...	Symbol Rate
5	✓	472 MHz	8 MHz	QAM256	45 dBmV	annex A	(12, 17)	6.952
6	✓	480 MHz	8 MHz	QAM256	45 dBmV	annex A	(12, 17)	6.952
7	✓	488 MHz	8 MHz	QAM256	45 dBmV	annex A	(12, 17)	6.952
8	✓	496 MHz	8 MHz	QAM256	45 dBmV	annex A	(12, 17)	6.952
9	✓	504 MHz	8 MHz	QAM256	45 dBmV	annex A	(12, 17)	6.952
10	✓	512 MHz	8 MHz	QAM256	45 dBmV	annex A	(12, 17)	6.952
11	✓	520 MHz	8 MHz	QAM256	45 dBmV	annex A	(12, 17)	6.952
12	✓	528 MHz	8 MHz	QAM256	45 dBmV	annex A	(12, 17)	6.952
13	✓	536 MHz	8 MHz	QAM256	45 dBmV	annex A	(12, 17)	6.952
14	✓	544 MHz	8 MHz	QAM256	45 dBmV	annex A	(12, 17)	6.952
15	✓	552 MHz	8 MHz	QAM256	45 dBmV	annex A	(12, 17)	6.952

Channel ID	Status	Central Freq	Freq Width	Modulation	Power	Mode	Interleaving ...	Symbol Rate	Transp Stream ID	QAM Group Name	QAM Manager	Original Network ID	Atten	Dts Adjust
1	✗	440 MHz	8 MHz	QAM256	45 dBmV	annex A	(12, 17)	6.952	2	NULL	VOD	1	0.0	Disable
2	✗	448 MHz	8 MHz	QAM256	45 dBmV	annex A	(12, 17)	6.952	3	NULL	VOD	1	0.0	Disable
3	✗	456 MHz	8 MHz	QAM256	45 dBmV	annex A	(12, 17)	6.952	4	NULL	VOD	1	0.0	Disable
4	✗	464 MHz	8 MHz	QAM256	45 dBmV	annex A	(12, 17)	6.952	5	NULL	VOD	1	0.0	Disable
16	✗	560 MHz	8 MHz	QAM256	45 dBmV	annex A	(12, 17)	6.952	1	NULL	VOD	1	0.0	Disable

Figure 6.2-1 Basic Configuration Information of Downstream Channel

6.2.1 Downstream Channel Information

DOCSIS and the closed channel display the parameters including channel ID, management status, center frequency, channel bandwidth, modulation mode, level, system, interleaving depth and symbol rate.

DS Channel Basic Info list									
<input checked="" type="checkbox"/> Close Channel <input checked="" type="checkbox"/> Open DOCSIS Channel <input checked="" type="checkbox"/> Open EQAM Channel <input checked="" type="checkbox"/> Batch Modify <input checked="" type="radio"/> Simple <input type="radio"/> Advanced Num of Channel 16									
Channel ID	Status	Central Freq	Freq Width	Modulation	Power	Mode	Interleaving ...	Symbol Rate	
5	✓	472 MHz	8 MHz	QAM256	45 dBmV	annex A	(12, 17)	6.952	
6	✘	480 MHz	8 MHz	QAM256	45 dBmV	annex A	(12, 17)	6.952	
7	✘	488 MHz	8 MHz	QAM256	45 dBmV	annex A	(12, 17)	6.952	
8	✘	496 MHz	8 MHz	QAM256	45 dBmV	annex A	(12, 17)	6.952	
9	✓	504 MHz	8 MHz	QAM256	45 dBmV	annex A	(12, 17)	6.952	
10	✓	512 MHz	8 MHz	QAM256	45 dBmV	annex A	(12, 17)	6.952	
11	✓	520 MHz	8 MHz	QAM256	45 dBmV	annex A	(12, 17)	6.952	
12	✓	528 MHz	8 MHz	QAM256	45 dBmV	annex A	(12, 17)	6.952	
13	✓	536 MHz	8 MHz	QAM256	45 dBmV	annex A	(12, 17)	6.952	
14	✓	544 MHz	8 MHz	QAM256	45 dBmV	annex A	(12, 17)	6.952	
15	✓	552 MHz	8 MHz	QAM256	45 dBmV	annex A	(12, 17)	6.952	

Figure 6.2-2 DOCSIS Channel Information

EQAM channel displays parameters including the channel ID, management status, center frequency, channel bandwidth, modulation mode, Power level, Mode, interleaving depth and symbol rate same as those of DOCSIS channel, as well as Transp Stream ID, QAM Group Name, QAM Manager, Original Network ID and Atten.

6.2.2 Downstream Channel Management

The downstream channel management supports basic information settings (modifying parameters of a single channel or modifying the parameters of multiple channels), channel ON/OFF by batch, center frequency offset of channel by batch and modification by batch. The downstream channel management is similar to the upstream channel management in 5.1. Refer to the function of upstream channel management for channel ON/OFF by batch and center frequency offset of channel by batch.

➤ Basic Information Settings

➔ Downstream DOCSIS Channel

Allow to set the downstream DOCSIS channel ON/OFF, and set the channel center frequency, management status, modulation mode, interleaving depth, level and symbol rate.

Figure 6.2-3 Basic Information of Downstream Channel

The center frequency can be set as value between 55.0MHz and 999.0MMHz; the management status displays DOCSIS or EQAM channel; the modulation mode can be set as different QAM rate; the interleaving

depth is not allowed to set in case of DOCSIS standard as Annex A; while in case of Annex B, it allows to set taps8Increment16/(8,16), taps16Increment8/(16,8), taps32Increment4/(32,4), taps64Increment2/(64,2) and taps128Increment1/(128,1); the range of level is determined according to the different channels ON and the number of channels ON.

Note: Modify the channel management status as EQAM to enable EQAM function of the channel. Currently at most 8 channels of Channel 1-16 can be supported to enable EQAM function.

➔ Downstream EQAM Channel

For EQAM channel, it allows to modify parameters including the center frequency, management status, modulation mode, interleaving depth, power level and Mode, as well as Transp Stream ID, QAM Group Name, QAM Manager, Original Network ID and Atten.

Symbol rate: the symbol rate of CMTS downstream DOCSIS channel is fixed, and varies correspondingly by system (Annex A or Annex B) and modulation mode (QAM64 or QAM256). The symbol rate of EQAM channel is fixed in case of Annex B, while supports configuration (6.952 MBaud/s, 6.900 MBaud/s, 6.875MBaud/s) in case of Annex A. The relationship among the channel mode, symbol rate, modulation mode and system is shown as follows:

Table 6.2-1 DOCSIS Channel System/Modulation Mode Correspondence

System/Modulation mode	QAM64	QAM256
Annex A	6.952MBaud/s	6.952MBaud/s
Annex B	5.056941MBaud/s	5.360537MBaud/s

Table 6.2-2 EQAM Channel System/Modulation Mode Correspondence

System/Modulation mode	QAM64	QAM256
Annex A	6.952, 6.900, 6.875MBaud/s	6.952, 6.900, 6.875MBaud/s
Annex B	5.056941MBaud/s	5.360537MBaud/s

QAM Manager boasts VOD, broadcast, NGOD and S_VOD. Currently only VOD, S_VOD and NGOD are supported. S_VOD is applied to the situation of input TS which includes PID-changed streams. While EQAM channel working under the S_VOD channel, if the PIDs of video/audio streams in the input TS changes, EQAM will detected it and apply the new map rule to the TS automatically.

Note: When one EQAM channel works under S_VOD mode, it should be insured that any of the TSs which is pushed to the UDP port configured on this channel is an SPTS TS.

Transp Stream ID: identify the program stream.

Atten and other parameters are reserved for future support of EQAM management protocol.

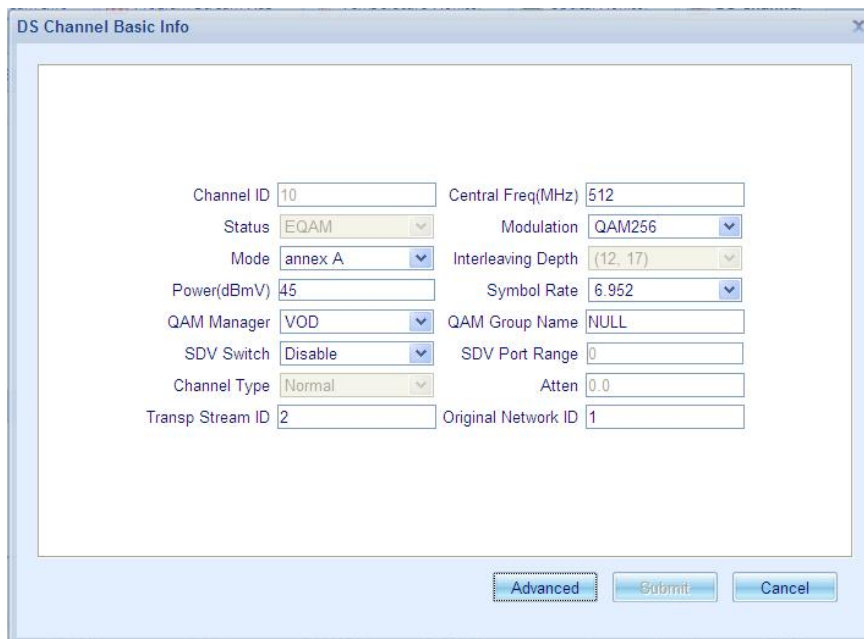


Figure 6.2-4 Downstream Channel Configuration

➤ Advanced Function

EQAM channel supports the advanced function. Click "Advanced" to appear the Table Interval Configuration screen to configure the table release interval of each table. Configure according to the fact.



Figure 6.2-5 Advanced Configuration of Downstream Channel

6.3 Spectrum Group

Spectrum group configuration includes Global Config, Spectrum Group, Channel Config, History Records. Parameters to view includes spectrum group , center frequency of spectrum group, parameters of upstream, and history records of spectrum group.

6.3.1 Global Config

Switch of spectrum group in config view.

Query interval of upstream channel parameters : a interval of upstream real-time statistical data collection.

Max item of history records : spectrum group in the historical record of the maximum number of entries.

6.3.2 Spectrum Group Management

- Spectrum Group List
Display spectrum group ID, management status ,min spectrum adjustment interval , spectrum adjustment mode ,threshold of SNR , threshold of correcteds, threshold of uncorrecteds , threshold of PLR ,policy of priority , spectrum adjustment policy , max times of spectrum adjustment , number of center frequency , number of channels while apply to spectrum group .



Spectr...	Manag...	Min spectru...	Spectr...	Threshold ...	Threshold of Cor...	Threshold of uncor...	Threshold of...	Policy of priority	Spectr...	Max times ...	Num...	Number of ...
1	✓	600 s	SNR	20 (15) dB	12 (20)	15 (20)	20	Channel Modulation Pr...	Chann...	0	0	0
2	✓	600 s	SNR	20 (15) dB	12 (20)	15 (20)	20	Channel Modulation Pr...	Chann...	0	0	0

Figure 6.3-1 Spectrum Group List

- Add Spectrum Group
Show Spectrum adjustment Mode and Threshold of PLR, and set Spectrum Group ID, Management Status, Min spectrum adjustment interval, Max times of spectrum adjustment, Threshold of SNR, Threshold of Correcteds, Threshold of Uncorrectables, and Spectrum adjustment policy.
- Modify Spectrum Group
Show spectrum Group ID, Spectrum adjustment Mode , and Threshold of PLR, and modify Min spectrum adjustment interval, Max times of spectrum adjustment, Threshold of SNR, Threshold of Correcteds, Threshold of Uncorrectables, and Spectrum adjustment policy.
- Delete Spectrum Group
Delete an existing spectrum group or a plurality of existing spectrum groups.
- Enable Spectrum Group
Enable an existing spectrum group or a plurality of existing spectrum groups.
- Disable Spectrum Group
Disable an existing spectrum group or a plurality of existing spectrum groups.
- Clear Apply Of Spectrum Group
Clear Apply Of an existing spectrum group or a plurality of existing spectrum groups.

6.3.3 Center Frequency Management

- Center Frequency List
Display center frequency of spectrum group . Include spectrum group ID , center frequency , max channel width and receiving powerlever.

Spectrum Group ID	Index	Center Frequency	max Channel Width	Rx PowerLevel
1	1	22 MHz	1.6 M	-

Figure 6.3-2 center frequency List

- Add Center Frequency
Add center frequency to the spectrum group, each group can only add 8. The Center Frequency and the maximum Channel Width are required parameters, the Receiving Power Level is optional parameter .
- Modify Center Frequency
Modify the Center Frequency, the maximum Channel Width and the Receiving Power Level.
- Delete Center Frequency
Delete an existing center frequency or a plurality of existing center frequency.

6.3.4 Channel Config

- Channel Parameter List
Display Upstream Channel ID, Spectrum Group ID, Channel Modulation Profile, Backup Channel Modulation Profile, Center Frequency, Channel Width, RxPowerLevel, SNR, PLR, Corrected/total counters, Unerrored, Times of spectrum adjustment, Time of last adjustment spectrum, and Time of last Recovery.

Upstream Channel ID	Spectrum Group ID	Channel Modulation Profile	Backup Channel Modulation Profile	Center Frequency	Channel Width	Rx PowerLevel	SNR	PLR
1	1	QPSK	-/-	9MHz	3.2M	6 dBmV	-	0
2	0	QPSK	-/-	15.4MHz	3.2M	6 dBmV	-	0
3	0	QPSK	-/-	21.8MHz	3.2M	6 dBmV	-	0
4	0	QPSK	-/-	28.2MHz	3.2M	6 dBmV	-	0

Upstream Chann.	Corrected/percent	Uncorrectables/percent	Unerrored	Times of spectrum adjustment	Time of last adjusting spectrum	Time of last Recovery
1	-/-	-/-	-	0	-	-
2	-/-	-/-	-	0	-	-
3	-/-	-/-	-	0	-	-
4	-/-	-/-	-	0	-	-

Figure 6.3-3 Channel Config List

- Config Spectrum Group
Show the upstream channel ID, and set Spectrum Group ID .
- Config channel modulation profile
Show the upstream channel ID, and set Second Mod Profile, and Third Mod Profile.
- Reset
To restore the default configuration.

6.3.5 History Record

Show current record of spectrum group, include Basic Information and Channel state information. Basic Information include Upstream Channel ID, Index, Spectrum Group ID, Max times of spectrum adjustment, Spectrum adjustment policy, Channel Modulation profile, Backup Channel Modulation Profile, Center Frequency, Channel Width, Rx PowerLevel, SNR, and PLR. By selecting the corresponding channel, and click the remove button, the filter button or cancel button, you can realize the corresponding function. Channel state information include Correcteds/percent, Uncorrectables/percent, Unerrored, Times of spectrum adjustment, Time of last adjusting spectrum and Time of last Recovery with the corresponding Upstream Channel ID and Index.



Figure 6.3-4 History Record

7.EQAM Management

7.1 Program Stream Mapping

Click [Program Stream Mapping] on the left navigation bar to enter EQAM list of the CMTS. EQAM List screen includes EQAM information list and program stream mapping information list.

Channel ID	Central Freq(...)	UDP Port Being U...	Bandwidth Being...	Bandwidth Ca...	Bandwidth Util...	Baud Rate(Mb...	Modulation
1	440.000	0	0.015	51.253	0.029	6.952	QAM256
2	448.000	0	0.015	51.253	0.029	6.952	QAM256
3	456.000	0	0.015	51.253	0.029	6.952	QAM256
4	464.000	0	0.015	51.253	0.029	6.952	QAM256
16	560.000	1	0.015	51.253	0.029	6.952	QAM256

Chann...	Source IP	Destination IP	UDP Port	Strea...	Status	Input Progr...	Output Prog...	PMV	Inputstream R...	Inputstream Tra...	PID Map
1	16	0.0.0.0	0.0.0.0	100	SPTS	Enable	0	1	1	Enable	0

Figure 7.1-1 EQAM Configuration Information

7.1.1 EQAM Information List

EQAM information list displays the overall program stream output. You can view the number of configured programs and the bandwidth occupation.

EQAM information list displays parameters including channel ID, center frequency, number of the used UDP port, the used bandwidth, bandwidth capacity, bandwidth utilization, attenuation, symbol rate and modulation mode.

7.1.2 Program Stream Mapping Information List

➤ Display of Program Stream Mapping Information List

Program stream mapping information displays the parameters of program stream, including channel ID used by the program stream, source IP address, destination IP address, UDP port, stream type, status, input program number, output program number, PMV, data transfer rate ON/OFF, data transfer rate and PID mapping.

➤ Management of Program Stream Mapping Information

Program stream mapping information supports adding program, adding program stream by batch, delete program, modifying and filtering parameters.

➔ Add program stream

- Select the channel to be used by the program stream in EQAM Information List.
- Click [Add Program]. The added program will be displayed in Program Stream Mapping Information List.
- Modify the parameters of program stream.

Parameters that can be modified include source IP address, destination IP address, UDP port, stream type, status, input program number, output program number, PMV, data transfer rate ON/OFF, data transfer rate and PID mapping.

Source IP address: the source IP of program stream. 0.0.0.0 represents EQAM will not check the source IP address of the program stream. While the program stream is a multicast stream, the source IP address will not be checked either.

Destination IP address: the destination IP of program stream. 0.0.0.0 represents the IP address to use EQAM. The multicast is used to set the multicast address.

UDP port: port number of program stream. Here the port number shall correspond to port number of each stream on the device to promote program stream. Refer to the following Corresponding Relationship between Frequency Point and Port Number for corresponding relationship between available port number and each frequency point. The corresponding relationship between port number and frequency point is recommended as follows:

It is recommended that the difference between start port numbers of each channel is 256, and the difference between port number of different program stream on the same channel is 2.

Table 7.1-1 Reference of Corresponding Relationship between Frequency Point and Port Number

Frequency Point	Start Port Number	End Port Number	Example of available port number
504	49456	49410	49156, 49158, 49160
512	49412	49666	49412, 49414, 49416
520	49668	49920	49668, 49670, 48672
528	49924	50178	49924, 49926, 49928
536	50180	50434	50180, 50182, 50184
544	50436	50690	50436, 50438, 50440
552	50692	50942	50692, 50694, 50696
560	50948	50212	50948, 50950, 50952

Stream type: support SPTS, MPTS, DataR and Data.

Table 7.1-2 Supported Stream Type List

	Transparent transmission / filter	PMV modifies PID	Manual configuration of PID	PSI table reconstruction	Rate limit
SPTS	Filter	Allowed	N	Y	Y
MPTS	Transparent transmission	Not Allowed	Y	Y	Y
DataR	Transparent transmission	Allowed	N	N	Y
Data	Transparent transmission	Not Allowed	Y	N	Y

Status: status of program stream. The status value includes Enable and Disable. If enabled, the mapped program stream can be sent on corresponding channel; if disabled, the mapped program stream is not sent.

Output program number: the output program number corresponds to the program number searched by STB. The output program numbers on same channel are not allowed to be the same.

Input program number: input program number of program stream. For single program stream, it needs only to select the default value "0". For multiple program streams, enter program number of corresponding programs. It is allowed to select some a specific program. When the program number is 0, it means to take the first program.(for MPTS not supported)

PMV: the value is related to video and audio PID of program stream. If the frequency point has more than one program stream, recommend to take the escalating value not smaller than 2. PMV on a single channel is not allowed to be the same.

Data transfer rate ON/OFF and data transfer rate: if the data transfer rate is enabled, read data in the cache at the data transfer rate, for increasing the transmission bandwidth and avoiding packet loss. PID mapping will change a PID into another one. Only PID of MPTS and Data will be allowed to modify.

■ Confirm the modification.

Click [OK] on the toolbar of Program Stream Mapping Information List to submit the modification. After adding the program stream, EQAM will receive TS stream from the designated port and analyze it. The analysis result will be displayed on the Program Stream Information screen.

Click [Clear the modification] to clear all modifications not submitted.

➔ Add the program stream by batch

Click "Add Program Stream by Batch" to open the "Add Program Stream by Batch" screen. Enter the parameters and click "OK". Corresponding number of program stream will be added according to the number of program stream, start value of each field and its step.

Figure 7.1-2 Add Program Stream

Entering channel ID is not allowed. Parameters allowed to modify includes program number, source IP address, destination IP address, UDP port, input program number, output program number, PMV, status, stream type, data transfer rate ON/OFF and data transfer rate.

Program number is the number of program to be added. Entering parameters of start value and step is allowed. Calculate the parameters with the start value as start and the step as increment.

The start value of UDP port number ranges from 1 to 65535 and the step value ranges from 0 to 65534.

The start value of input program number ranges from 0 to 65535 and the step value ranges from 0 to 65535.

The start value of output program number ranges from 0 to 65535 and the step value ranges from 1 to 65535.

The start value of PMV ranges from 1 to 510 while the step value ranges from 1 to 510.

➔ Modify the program stream.

Refer to Step 3 and 4 of Adding Program Stream for the modification of program stream.

Support modifying the program stream by batch. Modify the parameters of more than one program stream and click "OK" to modify by batch.

➔ Delete the program stream

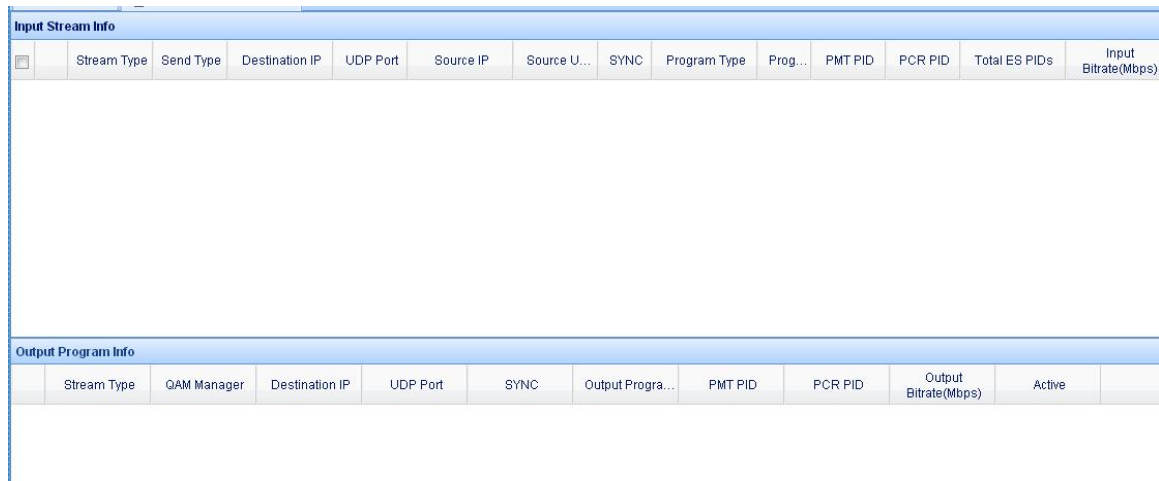
Select the program stream mapping information and click "Delete the program stream". The prompt of successful or unsuccessful deletion will pop up.

➔ Filter

Select the channel, status, stream type and data transfer rate ON/OFF to filter and leave corresponding program stream mapping information.

7.2 Program Stream Information

Click [Program Stream Information] on the left navigation bar to enter the program stream information list of the CMTS. The program stream information list screen includes the input program stream information list and the output program stream information list.



Input Stream Info													
<input type="checkbox"/>	Stream Type	Send Type	Destination IP	UDP Port	Source IP	Source U...	SYNC	Program Type	Prog...	PMT PID	PCR PID	Total ES PIDs	Input Bitrate(Mbps)

Output Program Info										
<input type="checkbox"/>	Stream Type	QAM Manager	Destination IP	UDP Port	SYNC	Output Progra...	PMT PID	PCR PID	Output Bitrate(Mbps)	Active

Figure 7.2-1 Program Stream Information

The Program Stream Information List displays TS stream analyzed by EQAM.

7.2.1 Input Program Stream Information

Input Program Stream Information List displays the input program stream information analyzed by EQAM. The parameters displayed include stream type, transmission type, destination IP address, UDP port, source IP address, source UDP port, SYNC, Prog Type, program number, PMT PID, PCR PID, Total ES PIDs and input bit rate.

7.2.2 Output Program Stream Information

Output Program Stream Information List will display the output program stream according to the channel ID classification used. The parameters displayed include stream type, QAM Manager, destination IP address, UDP port, SYNC, output program number, PMT PID, PCR PID, output bit rate and Active.

Selecting to enter a piece of input program stream information will display corresponding output program stream information.

Note: Only when SYNC status is completed, can the input stream be output via EQAM. If SYNC fails to enter the completed status for a long time, it requires to check whether there's any problem on the input stream.

7.3 EQAM Configuration

EQAM configuration supports the system configuration, table interval configuration at CC level and EQAM service network configuration.

7.3.1 EQAM System configuration

EQAM system configuration, including IGMA version, network jitter time and VLAN ID check mode are supported. While VLAN ID check is enabled, if the program stream is satisfied with the requirement of program stream mapping settings, only ones who tagged the same VLAN ID with EQAM business network can be mapped. The following table represents that weather the program stream will be mapped.

Table 7.3-1 Program stream mapping controlled by VLAN ID check

Weather be mapped Program stream VLAN ID	EQAM business network VLAN ID		
	UNTAG	X ^{note 1}	NULL ^{note 2}
UNTAG	YES	NO	NO
X	NO	YES	NO
Y	NO	NO	NO



Note:

1. X means a vailed VLAN ID value. Y means another VLAN ID value.
2. Only while EQAM business network IP address is set to 0.0.0.0. If the IP address and VLAN ID of EQAM business network is modified, VLAN ID check value will updated automatically.

7.3.2 Table Interval Configuration

The table interval configuration of downstream channel supports the configuration at channel level. The table interval configuration here is global. After the table interval is set, all channels use this configuration.

Table interval configuration supports PAT interval, PMT interval.

7.3.3 EQAM Service Network Configuration

EQAM IP information only supports manual configuration. The IP here requires the existing IP address in the system. If the previously-configured IP address doesn't exist in the system, the status here will display "invalid", otherwise it displays "valid". Before modifying IP address, it requires to configure corresponding VLAN and interface IP address first according to the network situations.



Note:

After modifying IP information, ensure normal communication with the device promoting the program stream. In case of direct connection, IP address can be modified as the IP in the same network segment of device promoting the program stream.

This service ip is not recommended for service management.

7.3.4 EQAM Management Network Configuration

EQAM management IP information supports manual and auto configuration. Manual configuration is similar to business IP configuration. Auto configuration requires a certain VLAN ID whose IP is acquired by DHCP.

7.4 ERM Configuration

The device supports NGOD D6/R6 protocol.

ERM switch is to enable or disable ERM function.

Status: whether to establish connection with the server.

IP Address: IP address of ERM server;

ERM TCP Port: Listening port of ERM server;

EQAM Name: EQAM name used in OPEN message of D6 protocol;

Streaming Zone: Streaming zone used in OPEN message of D6 protocol;

Bandwidth Update Threshold: the allowed deviation from the current output rate of the device;

Routing cost: A topology independent attribute which represents the relative cost associated with the resources from a resource manager or of a data plane component;

RTSP Port: port number used by RTSP;

ERM Keep Alive: The duration between the keep-alive messages transmitted by the EQAM to the ERM;

Connection Retry Threshold: When the connection is not established, establish TCP connection with ERM server at this time interval;

Hold Time: ERM application resources are not used in the period of Hold Time. Recover the resources.

8. Terminal Device Management

8.1 CM/CPE Management

Click [CM/CPE List] on the left navigation bar to enter CM/CPE list of the CMTS. CM/CPE List screen includes CM list and CPE list.

CM List displays all CM devices under the CMTS. You can view CM statistics, display CM list, clear OFFLINE CM, restart CM, view CM classifier information, view CM service flow information, view CM static IP, view CM L2VPN and DOCSIS Ping and clear CM online/offline times.

CPE list displays CPE information under the CMTS according to the CM classification.

8.1.1 CM Statistics

CM list supports viewing the number of CM under the CMTS device, and the number of registered CM.



CM Count:11 Registered CM:11

Figure 8.1-1 Display of Terminal Device Number

8.1.2 CM Display List

CM Display List displays the brief information of all CM under current CMTS device, including MAC address of CM, downstream channel and upstream channel used, total online time, channel type, DOCSIS version, round time offset, online/offline times, last online time, DHCPv4 BootFile name and DHCPv6 BootFile name.

8.1.3 Clear CM

- Clear Offline CM
Clear all Offline CM under the CMTS.
- Restart the selected CM
Restart the selected CM.

8.1.4 View CM Classifier Information

Select a CM to view the CM classifier information.

8.1.5 View CM Service Flow Information

Select a CM to view the statistics of CM upstream/downstream service flow.

8.1.6 View CM Static IP

Select a CM to view the static IP under CM supported by CPE.

8.1.7 View CM L2VPN

Select a CM to view CM L2VPN information, including COS, VLAN ID, service flow ID, status and VPN ID.

8.1.8 View CM Registration Information

Select a CM to view CM registration information, including Modem Capabilities, Packet Classification, Upstream Service Flow, Downstream Service Flow, DSID Encodings.

8.1.9 DOCSIS Ping

Ping CM under the device to view the network conditions.

8.1.10 Clear CM Online/Offline Times

Clear CM online/offline times to be 0.

8.1.11 Display CPE Information

CPE List displays the total number of CPE and CPE basic information.

CPE List						Real CPE Num under the Selected CM:0
<input type="checkbox"/>	CPE ID	CPE MAC Address	CPE IP Address	CPE Type	Lease Time	Operate

Figure 8.1-2 Display of CPE Terminal Information

➤ CPE statistics

CPE statistics displays the total number of CPE.


Real CPE Num under the Selected CM:2


Figure 8.1-3 Statistics of CPE Terminal Number

➤ CPE Display List

CPE Display List displays CM of CPE, CPE number, MAC address of CPE, IP address of CPE, CPE type and CPE lease time.

CPE information is displayed according to CM classification. Select more than one CM in the CM list. CPE information of the selected CM will be displayed in CPE list.

Click CM list or  symbol at the right of CPE list header to shrink the CM information or CPE information. Click

 symbol to expand CM information or CPE information. Clicking these two symbols can display only CM information, or only CPE information or both CM information and CPE information.

8.1.12 CM downstream frequency switch

The function is change the downstream frequency of CM by MAC address. To move a CM downstream frequency, input new frequency in DS-Frequency. Then select an active CM, click on [Move Selected CM] to add. The downstream frequency of selected CM will move to the new frequency. More than one CM can moved at the same time.



Figure 8.1-4 Downstream frequency move and time out set

Change CM downstream frequency.

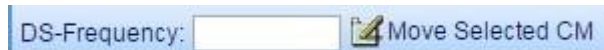


Figure 8.1-5 Downstream frequency move

Input frequency value in the "DS-Frequency" and press "Move selected CM", the downstream of CM will change.

Change time out value.



Figure 8.1-6 Time out set

Input time out value in the "Moving CM timeout value" and press "Submit", the time out value change.

8.2 CM List

CM List displays some important parameters of CM, including MAC address, IP address, status, upstream channel, downstream channel, upstream transmit power level, upstream SNR, downstream receiving level, downstream SNR, downstream MER, primary SID, impaired upstream channel, impaired downstream channel, micro-reflection, forward attenuation, reverse attenuation, update time, exist status, basic description, Ext(Extended) description and DOCSIS version, and can clear OFFLINE CM, reset CM. For 2.0CM, only when RemoteQuery is enabled, can the downstream receiving level, upstream sending level, downstream SNR and micro-reflection be seen. For 3.0CM, you can also get its upstream transmit power level if RemoteQuery is disable. Upstream and downstream channels display all bonding channels of 3.0CM. Upstream transmit power level、upstream SNR、downstream receiving level、downstream SNR and micro-reflection also display all bonding channels of 3.0CM.

Click "CM Details", the basic information of the specified CM, upstream and downstream information will be displayed.

The filtering function supports filtering CM according to the parameters.

The querying function supports a fuzzy match IP, MAC, and description.

The adding remarks CM function supports adding the basic description, Ext(Extended) description.

8.2.1 CM Information

CM information display CM data stored in the CMTS, including the MAC address, Mac version, hardware version, software version, description, power on time, restart times, interface ID, IPv4 and IPv6 address, channel level, service flow, information on the number of referrals, on-line time, configuration files, QoS, capability, Flaps, error, service type, SAV drop, Ethernet and USB port information, CM data acquisition time, In the form of a list of CM on the downstream and upstream channel data, including the level, bit error rate, rate, delay and the number of contract. Displays the Mac address of the CPE device in the form of a list of CM devices, Enable DOCSIS2.0 mode, Prim Sid, Dual stack IP Address, IPv4/IPv6 bundle interface dual stack name, Sid/Said restrictions, support filter selection, waiting to send support, CPE IP, Active Classifiers, The reason why CM initialized, SNR, PHY operation mode, micro reflection, MER.

8.3 CM Flap List

8.3.1 CM Flap

CM Flap records the online Flap times of CM, times of successful and unsuccessful ranging, and times of adjustment of upstream emission level. During the network operation, in case of CM failure, the diagnostic information can be provided to facilitate monitoring the overall operation of long-term running CM and provide the network administrator with valuable monitoring information.

CM Flap parameters in CM Flap list include Hits, Miss, PowerAdjLower, PowerAdjHigher and Ins.

Hits: times of successful ranging.

Miss: times of unsuccessful ranging.

PowerAdjLower: times of downward adjustment of level.

PowerAdjHigher: times of upward adjustment of level.

Ins: times of frequent online.

8.3.2 Flap Time Setting

The default Flap time interval is 180s. You can enter the seconds to be modified in the input box and click "Modify" to set Flap time interval.

8.3.3 Clear CM Flap

Select one or more CM to clear Flap statistics of the CM.

8.3.4 Threshold Configuration

You can configure the threshold of times of unsuccessful ranging and times of upward adjustment of level. CM exceeding the threshold will be marked in special color to facilitate users to discover questioned CM.

8.4 CM Online/Offline Alarm Configuration

The functionality supports taking specific CMs as monitoring objects. It supports CM online alarm and offline alarm. Currently, the device can monitor a maximum of 48 CMs.

It supports adding discription information for each monitoring modem. The maximum length of the discription information is 36 bytes.

8.5 RemoteQuery Configuration

Remotquery can be used to monitor the remote CM at the control terminal, to be further used for daily maintenance and discovery of abnormalities. Therefore the control terminal must provide user interface for user to access CM data. The current approach is summarized as follows: provide the polling way to collect and cache the data for use by users.

RemoteQuery configuration includes ON/OFF, read-only community name used when collecting information, collection interval, IP address used when collecting information.

8.6 DOCSIS3.0 Configuration

DOCSIS3.0 configuration supports the configuration of MDD, MTC, MRC and MDF.

8.6.1 MDD

MAC Domain Description function is used to configure the sending interval of MAC domain descriptor. If MDD is set as 0, MDD message will stop, DOCSIS 3.0CM may become offline and it can be registered only as DOCSIS 2.0 mode in case it is online.

8.6.2 MTC

Multiple Transmit Channel function is an important function of DOCSIS3.0. If MTC function is enabled, 3.0 CM can use the function of upstream channel binding to achieve larger bandwidth.

8.6.3 MRC

Multiple Receive Channel function is an important function of DOCSIS3.0. If MRC function is enabled, 3.0 CM can use the function of downstream channel binding to achieve larger bandwidth.

8.6.4 MDF

Configure MDF function of CMTS. If it is disabled, 3.0 CM will use the multicast forwarding behavior of 2.0, i.e., IGMP Snooping.

8.7 Load Balancing Management

Load balancing configuration includes global configuration, load balancing group management, effective time policy configuration and MAC address segment-exception management. Parameters to be viewed include active CM in load balancing group and active CM with load balancing excluded.

8.7.1 Global Configuration

- Load Balancing ON/OFF
- Cycle of Load Balancing
Cycle: the cycle of real-time statistics collection;
Cycle weighting: number of the cycle of real-time statistics collection, which doesn't work for static load balancing and only targets at channel utilization-based load balancing.
- Way of Load Balancing
Utilization (dynamic) is based on the load balancing of real-time statistics; modem (static) is based on the load balancing of CM number.
- Threshold of Load Balancing
Threshold is the channel overload threshold represented by channel utilization; threshold difference is the moving CM threshold represented by channel utilization difference; this value shall not exceed the threshold.
- Initialization Technology
It is the initialization technology adopted by DCC message and DBC message in case of upstream channel ATDMA, SCDMA multiplexing.
CM moving time interval: the time interval for load balancing to move the same CM, ranging from 0 to 3600, in seconds.
- Moving CM Number
The maximum number of CM that can be moved by the load balancing once.
- RNG-RSP Message ON/OFF
Enable the channel reloading function of RNG-RSP message to allow RNG-RSP message to include the information of adjusting the channel previously used by CM. When DOCSIS stipulates CM to be online, CMTS can adjust the channel used by CM. When the switch is ON, CMTS is allowed to be adjusted when CM is online; if it is OFF, it is not allowed to be adjusted when CM is online.
- Effective Time Strategy
The effective time strategy of load balancing is divided into Always Effective, Always Ineffective and Periodically Ineffective.
- System Threshold
It is used to configure the traffic threshold of the system. When the load-balance mode is "utilization" and the system utilization exceeds the threshold for high-traffic mode, the CMTS will perform the load-balancing based on the real-time traffic statistics; in other cases, it just performs the load balancing based on the minimum reserved bandwidth of service flow.

8.7.2 Load Balancing Group Management

- Display of Load Balancing Group
Display the load balancing group ID, upstream channel and downstream channel used.
- Add Load Balancing Group
When adding the load balancing group, it needs to select the group ID, and configure at least one upstream channel and one downstream channel.
- Modify Load Balancing Group
Modify the upstream/downstream channel of load balancing group.
- Delete Load Balancing Group
Delete one or more existing load balancing groups.
- Add Include All CM of Load Balancing Group
Bind the rest MACRange of CM to the load balancing group.
- Delete All CM of Load Balancing Group
Unbound the rest MACRange of CM to the load balancing group.
- Add CM of Load Balancing Group
Add effective MAC address segment to the load balancing group. At most 16 address segments can be added to each group.
- Delete CM of Load Balancing Group
Delete the existing CM of one or more load balancing groups.
- Add CM Type of Load Balancing Group
Add the type of CM to the load balancing group.
- Delete CM Type of Load Balancing Group
Delete the type of CM from the load balancing group.
- Add Exclude MAC of Load Balancing Group
Add exclude MAC address segment to the load balancing group. Each load-balance group allows add at most 31 MACRange.
- Delete Excluded MAC of Load Balancing Group
Delete the existing excluded MACRange of one or more load balancing groups.

8.7.3 Effective-Time Strategy Configuration

The strategy is the strategy for effective load balancing, being Always Effective, Always Ineffective and Periodically Ineffective. The strategy includes strategy ID, strategy mode, and ineffective strategy time in case of periodically ineffective. Click "Add strategy" to add a strategy, or delete the strategy by selecting one or more strategies in the list.

Only one of the following can be applied: Always Effective, Always Ineffective and Periodically Ineffective. For periodically ineffective, more than one can be applied.

8.7.4 Management of Excluding MAC Address Segment

Display CM segments excluded by the load balancing. Click “Add CM segment to be excluded” to add a CM address segment; or delete the CM address segment by selecting the CM address segment to be excluded in the list.

8.7.5 Active CM in the Load Balancing Group

View the active (i.e., online) CM in the load balancing group.

8.7.6 Active CM to Be Excluded in the Load Balancing Group

View the active CM excluded in the load balancing group.

8.8 Piggyback Configuration

Piggyback function is used to control whether CM has the ability to request the next data transfer in the process of data transfer. It supports enabling and disabling this function.

The default of Piggyback function switch is “Enabled”.

If it is enabled, 3.0CM will continuously occupy a great number of bandwidth and other CM will have no opportunity for data transfer. Even impossibly basic ping, this function is disabled and other CM will get some bandwidth.

8.9 Shared Secret

When configuring MIC function, CMTS will calculate MIC value according to some reported fields in REG-REQ/REG-REQ-MP sent by CM + the configured MIC authentication string, and according to certain algorithms, then compare with CMTS MIC in REG-REQ/REG-REQ-MP. If they are the same, the CM is considered legitimate, and allowed to be online. Otherwise the CM is not allowed to be online.

8.9.1 Shared Secret Configuration

Shared Secret configuration includes ON/OFF, plaintext or ciphertext and MIC authentication string.

If plaintext is selected, the MIC authentication string length ranges from 1 to 16; if ciphertext is selected, the length must be 32, in hexadecimal, not case sensitive.

8.9.2 Shared Secret Tool

If ciphertext is selected, user is required to enter the ciphertext. This tool can be used to calculate the ciphertext corresponding to the plaintext.

8.10 UDC Config

The CMTS 2-00 series support enabling or disabling UDC(Upstream Drop Classifier).

DOCSIS 3.0 supports two IP protocol filtering methods consisting of the legacy IP filtering mechanism specified in and UDC which is an outgrowth of the QoS classification mechanism. IP filtering continues to operate in DOCSIS 3.0 as it has in previous versions of the specification, though the minimum number of filtering rules has been increased from sixteen (16) to sixty-four (64). IP filters are limited to support of IPv4 protocols, while UDCs can be used for IPv4, IPv6 and LLC in a common framework with QoS classification. UDCs and IP filters are mutually exclusive modes and only one filtering method is permitted to operate at a time.

It is recommended that disabling UDC when using the IP filters.

8.11 CM Dispersion

Upstream transmit power level、upstream SNR、downstream receiving power level and downstream SNR are divided into seven intervals. This feature shows the CM distributed in each interval of each parameter. Intervals with different colors indicate different quality indicators. Click the refresh button on the top of the page, you can get real-time distribution of CM in each parameter range. Click the number of CM of a range , you will see a list of these CMs.

This page also displays the number of CMs in different states. Click on the number of CMs in different states , you can also see a list of these CMs.

8.12 CM Access List

By configuring the CM access list, you can manage the CM whether access to the cable network.

8.12.1 White list Config

Under the White List Config tab, you can add, delete or check the white list configuration.

If the CM in the white list, it can access to the cable network.

8.12.2 Black list Config

Under the Black List Config tab, you can add, delete or check the black list configuration.

If the CM in the black list, it can't access to the cable network.



Note: Black List function just support some version.

8.12.3 Global Configuration

Under the Global Configuration tab, you can modify and check the global configuration.

You can configure the black list switch and white list switch. When both switches turned on, CM priority check the CM whether in the black list.

9. Device Monitoring

9.1 Channel Monitoring

9.1.1 Channel Utilization Monitoring

Display the real-time utilization of upstream and downstream channels, and configure the calculating interval of channel utilization.

9.1.2 Channel Rate Monitoring

Display the real-time rate of upstream/downstream channels.

9.2 Uplink Port Monitoring

9.2.1 Real-time Uplink Port Performance Statistics

Display the real-time information of two uplink ports in the latest 30 seconds, 15 minutes and 24 hours.

9.2.2 Historical Uplink Port Traffic Statistics

Display the traffic information of two uplink ports in the latest 15 minutes and 24 hours.

9.2.3 Historical Uplink Port Performance Statistics

Display the frame information of two uplink ports in the latest 15 minutes and 24 hours.

9.2.4 Configuration of Monitored Uplink Port Parameters

ON/OFF: enable/disable the historical uplink port statistics function.

Clear the historical uplink port statistics.

9.2.5 Historical EQAM Traffic Statistics

Display the traffic information of EQAM in the latest 15 minutes and 24 hours.

9.3 Spectrum

The tree topology of DOCSIS network causes a great deal of noise in upstream frequency band at the network head end, which will influence the upstream data transfer under certain circumstances. The spectrum helps users to discover and solve the problem on bad quality of upstream channel.

Under this tab, users can view real-time upstream channel spectrum information and configure the refresh time interval, as shown below.

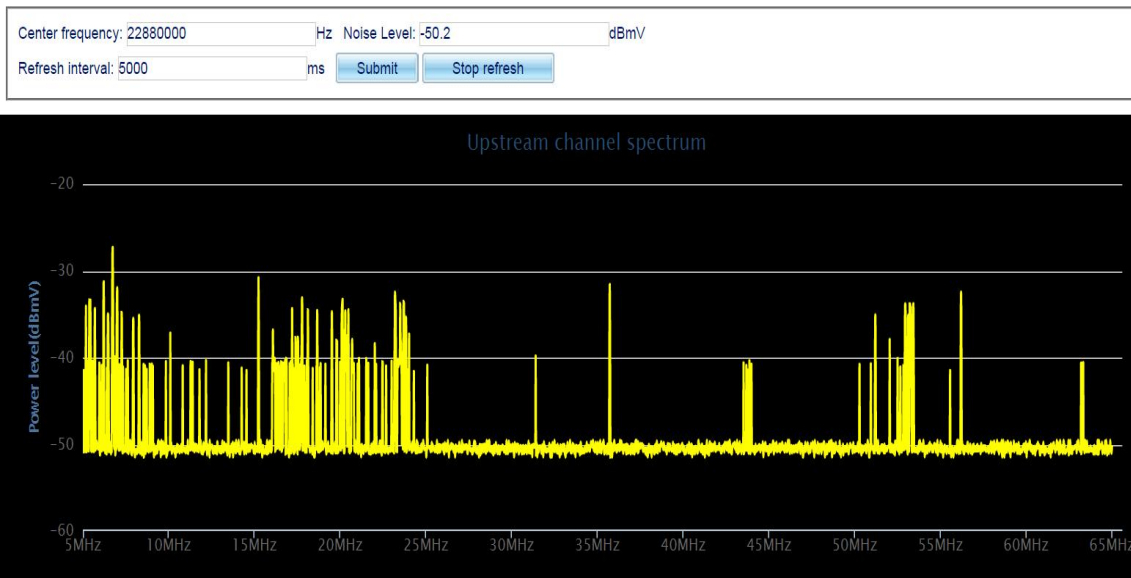


Figure 9.3-1 Upstream Channel Spectrum

- View center frequency and noise level:
when click some point of the spectrogram, [Center frequency] and [Noise Level] will display the current frequency(unit: Hz) and noise level(unit: dBmV).
- Configure refresh interval:
Input the refresh interval(unit: ms),and click [Submit] button, then the spectrogram will refresh based the new interval.
- Configure refresh switch:
Click "Stop refresh" button, the spectrum will stop refresh. Click "Start refresh" button, the spectrum will continue to refresh.

9.4 Temperature Monitoring

Display the temperature of modules of the device.

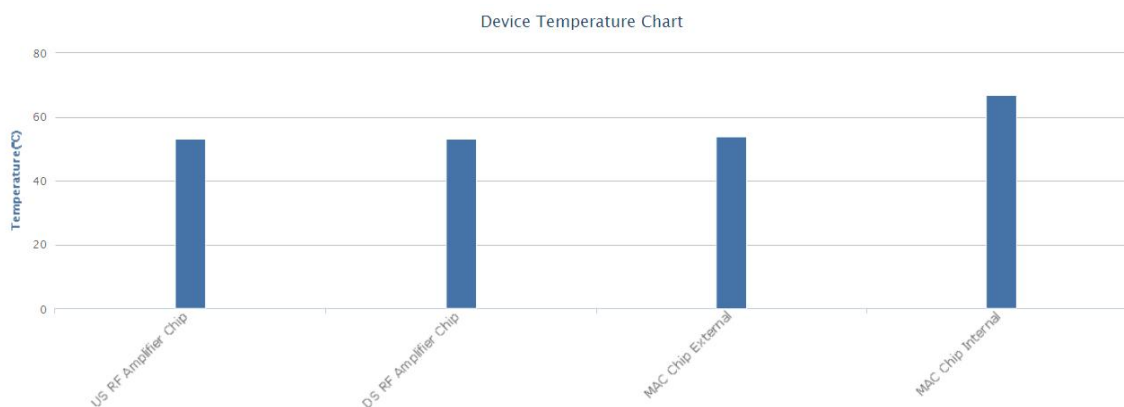


Figure 9.4-1 Display of Device Temperature Monitoring

9.5 Power Supply Monitoring

Display the voltage and current of chip inside the device.

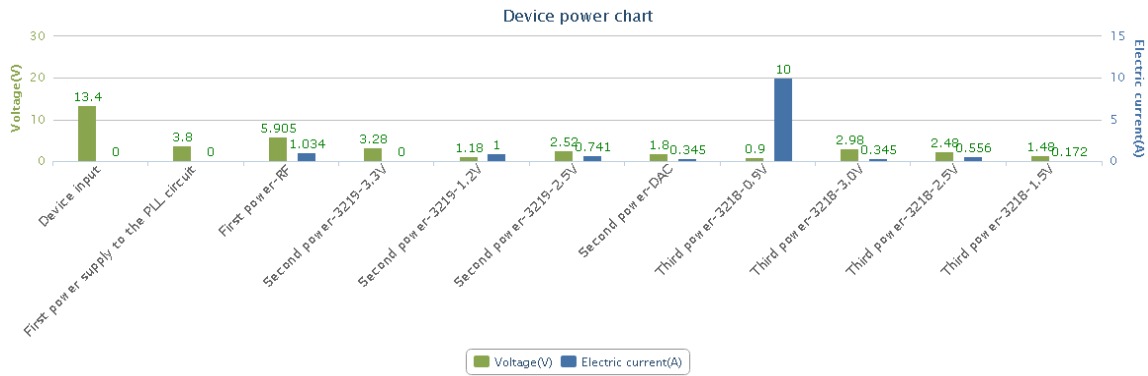


Figure 9.5-1 Display of Power Supply of Chip inside the Device

9.6 Optical Module Monitoring

Display the information of optical module of the two uplink ports, including temperature, voltage, bias current, output power, input power, production date, serial number, product number, manufacturer, wavelength, bit rate and type.

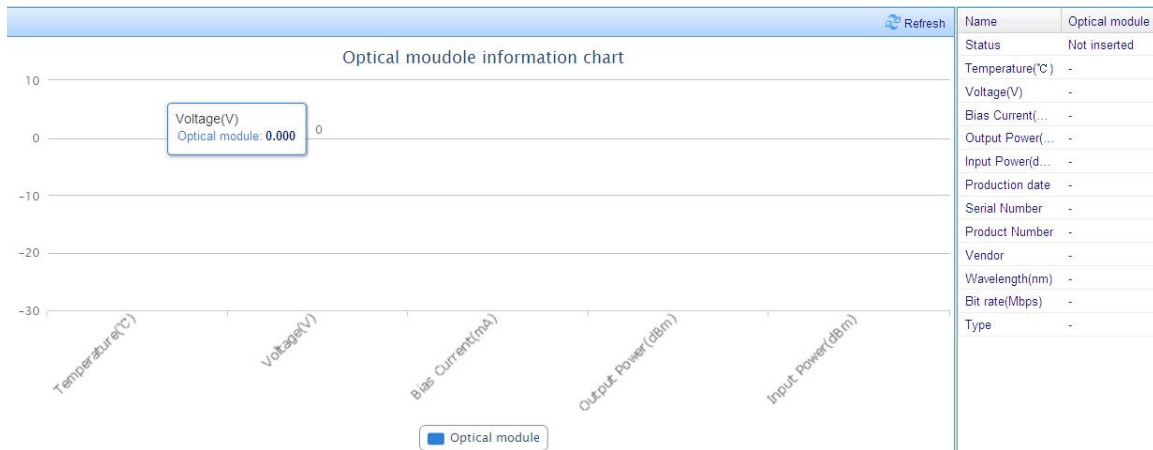


Figure 9.6-1 Display of Optical Module Information of the Device

9.7 Optical Management

At present CMTS 2-00E/CMTS 2-00B series of equipment support of machine management function, because of the different of the support machine type and version implementation differences, including: support specific parameters range difference, specific parameters of the support of different specifications, machine management style is different (serial port management, SNMP management). Machine type support including: CFA0 CFA1 CFB0 CFB1 CFC CFD EF, following tables.

Table 9.7-1 The following table support parameters of CFA0 type machine

Parameters	Support situation	Data type	Unit	Parameter range
A/B optical power(InPowA/B)	only-read	integer	0.1 dBm	N/A
A/B switch control(ABSctl)	only-read	integer	N/A	forcePathA(1) forcePathB(2) preferPathA(3) preferPathB(4) userPathAB(5)
A/B switch current status(ABSSt)	only-read	N/A	N/A	pathA(1) pathB(2)
Optical switch low threshold setting(ABSThr)	only-read	integer	1 dBm	-8~0dBm
type of gain(GainType)	only-read	integer	N/A	constantLevel(1) —AGC pattern constantGain(2) —MGC pattern
AGC input optical power control value(AGCOrg)	read-write	integer	1 dBm	-1~3 dBm
RF output level attenuation settings(RFAtt)	read-write	integer	1 dB	0~14dB
DC power voltage+5(DPowV1)	only-read	integer	0.1V	N/A
DC power voltage+12(DPowV2)	only-read	integer	0.1V	N/A
DC power voltage+24(DPowV3)	only-read	integer	0.1V	N/A
AC power voltage(LPowVolt1)	only-read	integer	0.1V	N/A

Table 9.7-2 The following table support parameters of CFA1 type machine

Parameters	Support situation	Data type	Unit	Parameter range
A/B optical power(InPowA/B)	only-read	integer	0.1 dBm	N/A
A/B switch control(ABSctl)	only-read	integer	N/A	forcePathA(1) forcePathB(2) preferPathA(3) preferPathB(4)
A/B switch current status(ABSSt)	only-read	N/A	N/A	pathA(1) pathB(2)
AGC input optical power control value(AGCOrg)	read-write	integer	1 dBm	-7~-6dBm
RF output switch(RFOut)	read-write	integer	N/A	off(1) on(2)
RF output level attenuation settings(RFAtt)	read-write	integer	1 dB	0~10dB
DC power voltage+12(DPowV2)	only-read	integer	0.1V	N/A
DC power voltage+24(DPowV3)	only-read	integer	0.1V	N/A
RF output port 1, 2, 3, 4 output level(RFLevel1/2/3/4)	only-read	integer	1 dBuv	0-127
Carrier channel number setting(ChanNum)	only-read	integer	N/A	0-200
AC power voltage(LPowVolt1)	only-read	integer	0.1V	unknown

Table 9.7-3 The following table support parameters of CFB0 type machine

Parameters	Support situation	Data type	Unit	Parameter range
A/B optical power(InPowA/B)	only-read	integer	0.1 dBm	(0-65535)
A/B switch control(ABSctl)	only-read	integer	N/A	forcePathA(1) forcePathB(2) preferPathA(3) preferPathB(4)
A/B switch current status(ABSSt)	only-read	N/A	N/A	pathA(1) pathB(2)
Optical switch low threshold setting(ABSThr)	only-read	integer	1 dBm	-9~-4dBm
AGC input optical power control value(AGCOrg)	read-write	integer	1 dBm	-9~-6dBm
RF output level attenuation settings(RFAtt)	read-write	integer	1 dB	0~10dB
DC power voltage+12(DPowV2)	only-read	integer	0.1 V	N/A
DC power voltage+24(DPowV3)	only-read	integer	0.1 V	N/A
RF output port 1, 2, 3, 4 output level(RFLevel1/2/3/4)	only-read	integer	1 dBuv	0-127
Carrier channel number setting(ChanNum)	only-read	integer	N/A	0-200
AC power voltage(LPowVolt1)	only-read	integer	0.1 V	N/A

Table 9.7-4 The following table support parameters of CFB1 type machine

Parameters	Support situation	Data type	Unit	Parameter range
A/B optical power(InPowA/B)	only-read	integer	0.1 dBm	N/A
A/B switch control(ABSctl)	only-read	integer	N/A	forcePathA(1) forcePathB(2) preferPathA(3) preferPathB(4)
A/B switch current status(ABSSt)	only-read	N/A	N/A	pathA(1) pathB(2)
Optical switch low threshold setting(ABSThr)	only-read	integer	1 dBm	-8~0dBm
AGC input optical power control value(AGCOrg)	read-write	integer	1 dBm	-7~-6dBm
RF output level attenuation settings(RFAtt)	read-write	integer	1 dB	0~10dB
DC power voltage+12(DPowV2)	only-read	integer	0.1 V	N/A
DC power voltage+24(DPowV3)	only-read	integer	0.1 V	N/A
RF output port 1, 2, 3, 4 output level(RFLevel1/2/3/4)	only-read	integer	1 dBuv	0-127
Carrier channel number setting(ChanNum)	only-read	integer	N/A	0-200
AC power voltage(LPowVolt1)	only-read	integer	0.1 V	N/A

Table 9.7-5 The following table support parameters of CFC type machine

Parameters	Support situation	Data type	Unit	Parameter range
A/B optical power(InPowA/B)	only supported A road, only-read	integer	0.1dBm	(-100, 30)
RF output switch(RFOut)	read-write	integer	N/A	off(1) on(2)
AGC input optical power control value(AGCOrg)	read-write	integer	1dBm	-6~-7 dBm
RF output level attenuation settings(RFAtt)	read-write	integer	1dBm	0~10dB
DC power voltage+12(DPowV2)	only-read	integer	0.1V	N/A
DC power voltage+24(DPowV3)	only-read	integer	0.1V	N/A
Carrier channel number setting(ChanNum)	only-read	integer	N/A	0-255
AC power voltage(LPowVolt1)	only-read	integer	0.1V	N/A

Table 9.7-6 The following table support parameters of CFD type machine

Parameters	Support situation	Data type	Unit	Parameter range
A/B optical power(InPowA/B)	only supported A road, only-read	integer	0.1dBm	(-100,30)
RF output switch(RFOut)	read-write	integer	N/A	off(1) on(2)
AGC input optical power control value(AGCOrg)	read-write	integer	1dBm	-7~-6 dBm
RF output level attenuation settings(RFAtt)	read-write	integer	1dBm	0~10dB
DC power voltage+12(DPowV2)	only-read	integer	0.1V	N/A
DC power voltage+24(DPowV3)	only-read	integer	0.1V	N/A
RF output port 1, 2, 3, 4 output level(RFLevel1/2/3/4)	supported 1、3 roads, only-read	integer	1dBuv	N/A
Carrier channel number setting(ChanNum)	only-read	integer	N/A	0-255
AC power voltage(LPowVolt1)	only-read	integer	0.1V	N/A

Table 9.7-7 The following table support parameters of EF type machine

Parameters	Support situation	Data type	Unit	Parameter range
A/B optical power(InPowA/B)	only supported A road, only-read	integer	0.1dBm	(-100,30)
AGC input optical power control value(AGCOrg)	read-write	integer	N/A	-7~-6 dBm
DC power voltage+12(DPowV2)	only-read	integer	0.1V	N/A
DC power voltage+24(DPowV3)	only-read	integer	0.1V	N/A
AC power voltage(LPowVolt1)	only-read	integer	0.1V	N/A

10. Log Management

10.1 Log Configuration

Log switch: The switch to turn On/Off the Syslog function.

Maximum number of logs: The maximum number of logs recorded.

Flow control mode: Support the following four modes. No limit the speed of sending logs; Keep the sending rate lower than the threshold; Stop sending when the sending rate is larger than the threshold; Prohibit sending logs to the server.

Cycle: Throttle interval.

Threshold: The maximum permitted threshold of the flow control. The effect of the threshold is defined by the flow control mode as mentioned above.

The level of local memory records, the level of local Flash records, the level of Syslog Server records, and the level of Trap Server records: Events will be output in accordance with the log method selected in the checkbox. The unchecked events will not be output.

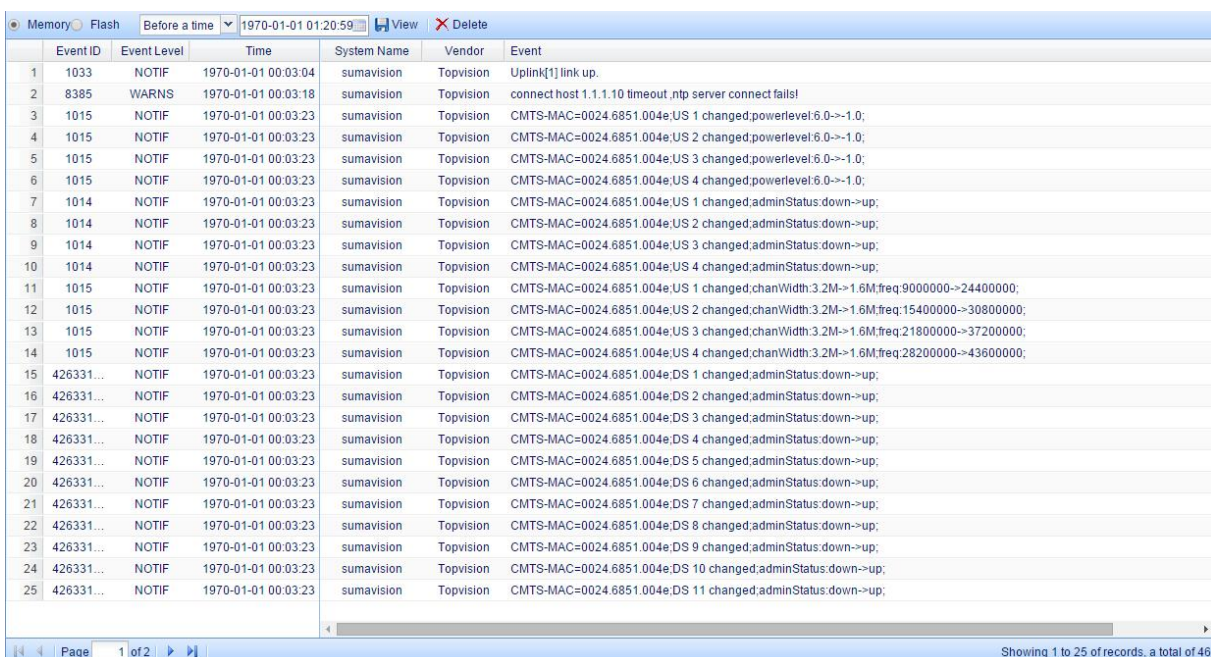
10.2 Threshold Configuration

Judge whether to send an alarm according to the set thresholds, including signal quality threshold, temperature threshold, memory utilization threshold and alarm switch, and CPU utilization threshold.

10.3 Log Viewing

View or delete the logs stored in the internal memory and Flash.

The user can filter the logs by specifying filter conditions such as: before or after a specific time point; or a stipulated Event Level or Event ID. After setting the filter conditions, the user can click the View button to show the applicable logs.



Event ID	Event Level	Time	System Name	Vendor	Event	
1	1033	NOTIF	1970-01-01 00:03:04	sumavision	Topvision	Uplink[1] link up.
2	8385	WARNS	1970-01-01 00:03:18	sumavision	Topvision	connect host 1.1.1.10 timeout. ntp server connect fails!
3	1015	NOTIF	1970-01-01 00:03:23	sumavision	Topvision	CMTS-MAC=0024.6851.004e:US 1 changed;powerlevel:6.0->-1.0;
4	1015	NOTIF	1970-01-01 00:03:23	sumavision	Topvision	CMTS-MAC=0024.6851.004e:US 2 changed;powerlevel:6.0->-1.0;
5	1015	NOTIF	1970-01-01 00:03:23	sumavision	Topvision	CMTS-MAC=0024.6851.004e:US 3 changed;powerlevel:6.0->-1.0;
6	1015	NOTIF	1970-01-01 00:03:23	sumavision	Topvision	CMTS-MAC=0024.6851.004e:US 4 changed;powerlevel:6.0->-1.0;
7	1014	NOTIF	1970-01-01 00:03:23	sumavision	Topvision	CMTS-MAC=0024.6851.004e:US 1 changed;adminStatus:down->up;
8	1014	NOTIF	1970-01-01 00:03:23	sumavision	Topvision	CMTS-MAC=0024.6851.004e:US 2 changed;adminStatus:down->up;
9	1014	NOTIF	1970-01-01 00:03:23	sumavision	Topvision	CMTS-MAC=0024.6851.004e:US 3 changed;adminStatus:down->up;
10	1014	NOTIF	1970-01-01 00:03:23	sumavision	Topvision	CMTS-MAC=0024.6851.004e:US 4 changed;adminStatus:down->up;
11	1015	NOTIF	1970-01-01 00:03:23	sumavision	Topvision	CMTS-MAC=0024.6851.004e:US 1 changed;chanWidth:3.2M->1.6M;freq:9000000->24400000;
12	1015	NOTIF	1970-01-01 00:03:23	sumavision	Topvision	CMTS-MAC=0024.6851.004e:US 2 changed;chanWidth:3.2M->1.6M;freq:15400000->30800000;
13	1015	NOTIF	1970-01-01 00:03:23	sumavision	Topvision	CMTS-MAC=0024.6851.004e:US 3 changed;chanWidth:3.2M->1.6M;freq:21800000->37200000;
14	1015	NOTIF	1970-01-01 00:03:23	sumavision	Topvision	CMTS-MAC=0024.6851.004e:US 4 changed;chanWidth:3.2M->1.6M;freq:28200000->43600000;
15	426331...	NOTIF	1970-01-01 00:03:23	sumavision	Topvision	CMTS-MAC=0024.6851.004e:DS 1 changed;adminStatus:down->up;
16	426331...	NOTIF	1970-01-01 00:03:23	sumavision	Topvision	CMTS-MAC=0024.6851.004e:DS 2 changed;adminStatus:down->up;
17	426331...	NOTIF	1970-01-01 00:03:23	sumavision	Topvision	CMTS-MAC=0024.6851.004e:DS 3 changed;adminStatus:down->up;
18	426331...	NOTIF	1970-01-01 00:03:23	sumavision	Topvision	CMTS-MAC=0024.6851.004e:DS 4 changed;adminStatus:down->up;
19	426331...	NOTIF	1970-01-01 00:03:23	sumavision	Topvision	CMTS-MAC=0024.6851.004e:DS 5 changed;adminStatus:down->up;
20	426331...	NOTIF	1970-01-01 00:03:23	sumavision	Topvision	CMTS-MAC=0024.6851.004e:DS 6 changed;adminStatus:down->up;
21	426331...	NOTIF	1970-01-01 00:03:23	sumavision	Topvision	CMTS-MAC=0024.6851.004e:DS 7 changed;adminStatus:down->up;
22	426331...	NOTIF	1970-01-01 00:03:23	sumavision	Topvision	CMTS-MAC=0024.6851.004e:DS 8 changed;adminStatus:down->up;
23	426331...	NOTIF	1970-01-01 00:03:23	sumavision	Topvision	CMTS-MAC=0024.6851.004e:DS 9 changed;adminStatus:down->up;
24	426331...	NOTIF	1970-01-01 00:03:23	sumavision	Topvision	CMTS-MAC=0024.6851.004e:DS 10 changed;adminStatus:down->up;
25	426331...	NOTIF	1970-01-01 00:03:23	sumavision	Topvision	CMTS-MAC=0024.6851.004e:DS 11 changed;adminStatus:down->up;

Figure 10.3-1 Log view

10.4 Trap Server

The Trap Server page is for users to manage the Trap Server settings on their systems. This includes adding, modifying, and deleting Trap Servers. The device supports a maximum of five Trap Server entries.


10.4.1 Adding a Trap Server

Click on “Add Trap Server” located on the toolbar. In the “Add Trap Server” dialog box that pops out, set the Trap Server, Port, and Community, then click Submit.




Figure 10.4-1 Adding a Trap Server

10.4.2 Modifying a Trap Server

Select the configuration item of the Trap Server you wish to modify from the list of Trap Servers and click the  icon. In the corresponding “Modify Trap Server” dialog box which pops out, set the Trap Server, Port, and Community, then click Submit.

10.4.3 Deleting a Trap Server

Select the configuration item of the Trap Server you wish to delete from the list of Trap Servers and click the  icon to delete the selected Trap Server.

10.5 Syslog Server

The Syslog Server page is for users to manage Syslog Server settings on the system. This includes adding, modifying, and deleting Syslog Servers. The device supports a maximum of five Syslog Server entries.


10.5.1 Adding a Syslog Server

Click on “Add Syslog Server” located on the toolbar. In the “Add Syslog Server” dialog box that pops out, set the Syslog Server and select the user-defined facility, then click Submit.




Figure 10.5-1 Adding a Syslog Server

10.5.2 Modifying a Syslog Server

Select the configuration item of the Syslog Server you wish to modify from the list of Syslog Servers and click the  icon. In the corresponding “Modify Syslog Server” dialog box which pops out, select the user-defined Facility, then click Submit.

10.5.3 Deleting a Syslog Server

Select the configuration item of the Syslog Server you wish to delete from the list of Syslog Servers, and click the  icon to delete the selected Syslog Server.

10.6 Event Level

All events supported by the system have a default level. Users can configure the level of an event using the Event Level table according to the requirements of different scenes. Users can manage the Event Level settings for the device on the Event Level page.


10.6.1 Adding an Event Level

Click on “Add Event Level” located on the toolbar. In the “Add Event Level” dialog box that pops out, set the Event ID and select an Event Level, then click Submit.




Figure 10.6-1 Adding an Event Level

10.6.2 Modifying an Event Level

Select the configuration item of the Event Level you wish to modify from the list of Event Levels, and click the  icon. In the corresponding “Modify Event Level” dialog box which pops out, set the Event Level, then click Submit.

10.6.3 Deleting an Event Level

Select the configuration item of the Event Level you wish to delete from the list of Event Levels, and click the  icon to delete the selected Event Level.

11. System Management

11.1 User Login Param

User Login Parameters is used for modifying parameters about user login, such as try times that can be taken by users, lock-on and extend lock-on time.

Try times is used to set the max try times wrong password can be taken. When the max try time has achieved, the logging user will be locked, even if the password is correct.

If the user already was trying to login, the lock time will extend.

11.2 User Management

User Management module is used for unified management of system users. The administrator can create user and reset user password according to the demand. Each user can have his/her own login name and password.

+ Add User				
Username	Password	Permission	User group	Operate
admin	*****	Super user	administrators	
test	*****	Super user	default	

Figure 11.2-1 System User Configuration Information

11.2.1 Add User

Click [Add User] on the toolbar and set the username, user group, password and confirmation password in the pop-up "Add User" dialog box.

Figure 11.2-2 Add System User

11.2.2 Modify User

Click icon in corresponding user operation and set the information such as password, user group and priority in the pop-up "Modify User" dialog box.

11.2.3 Delete User

Click  icon in corresponding user operation to delete the user, where "admin" user can not be deleted.

11.3 User Group Management

User group management module manage the user group of system, the administrator can create new user group according to the demand.

+ Add user group		
User Group Name	Level	Operation
administrators	15	
default	3	
123	5	 

Figure 11.3-1 User Group Configuration Information

11.3.1 Add User Group


Click the toolbar [Add user group], set user group name and level in the pop-up "Add user group" dialog box.




The dialog box titled "Add user group" contains two input fields: "User Group Name" with an empty text box, and "Level" with a dropdown menu currently showing "0". At the bottom of the dialog are "Submit" and "Close" buttons.

Figure 11.3-2 Add User Group

11.3.2 Modify User Group

Click  icon in corresponding user group operation and set the information such as level in the pop-up "Modify User" dialog box.

11.3.3 Delete User Group

Click  icon in corresponding user group operation to delete the user, where "administrators" user group can not be deleted.

11.4 AAA

11.4.1 AAA config

Enable AAA authentication, the default to the local authentication and authorization, if you do not configure the authentication and authorization. Now the user name and password by using the default configuration. Disable AAA certification, login again equipment no longer for AAA authentication. At the same time, release command for authorization configuration, no longer the command-line AAA authorization.

Enable AAA forced local authentication, before doing this configuration to enable AAA authentication. To enable forced local authentication, the client will use the local authentication replace any configured default authentication mode.

11.4.2 AAA Authentication & Authorization Config

- Login Authentication

Configure the AAA default login authentication mode, you need to enable AAA authentication the configuration before this. Login authentication method including tacacs+, radius, enable, local and none, can be configured with one or more combined. If the configuration of a variety of login authentication mode, then in accordance with the order of invocation configuration. When response without an authentication mode, it will call the next authentication method. If the configuration of the "none", it must be as the last login authentication mode.
- Login Authorization

Configure the user login authorization mode. Authorization including tacacs+, local and none. Can be configured with one or more authorized way. If the configuration of a variety of authorization mode, then in accordance with the order of invocation configuration. When response without an authorization mode, it will call the next authorization method. If the configuration of the "none", it must be as the last login authorization mode.
- Enable Authorization

Configure the AAA default enable authentication mode, you need to enable AAA authentication the configuration before this. Enable authentication method including tacacs+, local and none, can be configured with one or more combined. If the configuration of a variety of enable authentication mode, then in accordance with the order of invocation configuration. When response without an authentication mode, it will call the next authentication method. If the configuration of the "none", it must be as the last enable authentication mode.

11.4.3 AAA Command Authorization Config

Configuration of the specified level of user command authorization, authorization including tacacs+, local and none. Can be configured with one or more authorized way. If the configuration of a variety of authorization mode, then in accordance with the order of invocation configuration. When response without an authorization mode, it will call the next authorization method. When response without an authorization mode, it will call the next authorization method. If the configuration of the "none", it must be as the last authorization mode. The range of user level 0-15. Through this configuration can determine whether the level of user is allowed to run the command.

11.4.4 Config Password of Enable Level

The configuration of the enable level password, password level range of 0-15, To improve user level need to provide this password.

11.4.5 Tacacs+ Server Config

Specify and configure the TACACS+ server. You can configure the primary server and backup server, when the primary server is abnormal, the system will switch to the standby server. In the server parameter, 1-65535 is the range of the port number , the default value is 49. 0-5 is the range of the repeated number, it means number of abnormal server TACACS+ client can try, the default value is 3. Timeout is the value of TACACS+ server timeout (Unit: S), 3-10 is the range of the values , the default value is 5.

11.4.6 Config Radius Server

Specify and configure the RADIUS server. You can configure the primary server and backup server, when the primary server is abnormal, the system will switch to the standby server. In the server parameter, 1-65535 is the range of the port number , the default value is 1812. 0-5 is the range of the repeated number, it means number of abnormal server RADIUS client can try, the default value is 3. Timeout is the value of RADIUS server timeout (Unit: S), 3-10 is the range of the values , the default value is 5.


11.4.7 Config Local Command Level

To configure the local command level for local command authorized to use, 0-15 is the range of the values. By comparing the user and command level, if the user level above or equal command level, then the command can configure, otherwise return error.

11.5 Web Proxy

Web Proxy is used for accessing slave-device's web management system. Master device works as a proxy server by listening on port 81,82 and 83.Each port provide a proxy to slave-device configured in this page. If the IP address is valid, system will open a web page to the slave device. When set a zero IP address, this function will be closed.

Hersteller | Manufacturer
AXING AG
Gewerbehäus Moskau
 8262 Ramsen

EWR-Kontaktadresse | EEA contact address
Bechler GmbH
Am Rebberg 44
 78239 Rielasingen