OmniHub 16

User Manual

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About Sencore

Sencore is an engineering leader in the development of high-quality signal transmission solutions for the broadcast, cable, satellite, IPTV, telecommunications, and professional audio/video markets. The company's world-class portfolio includes video delivery products, system monitoring and analysis solutions, test and measurement equipment, all designed to support system interoperability and backed by bestin-class customer support. Sencore meets the rapidly changing needs of modern media by ensuring the efficient delivery of high-quality video from the source to the home. For more information, visit www.sencore.com.

Revision History

Date	Version	Description	Author
08/24/17	1.0	First Version	ZM
06/06/18	1.1	Add New Modules, New Features and Adjust Management Page	ZM
11/15/18	1.2	Modify the Product Picture	DA
02/15/19	1.3	Add New Modules, New Features and Adjust Management Page	DA
04/02/19	1.4	Add New Modules and New Features	DA
05/23/19	1.5	Add New Modules	RS
12/06/19	1.6	Add New Modules and Features	EH
05/-25/20	1.7	Update UI and add new modules	NB
07/27/20	1.8	Update Descrambling configuration descriptions	SW

This guide contains some symbols to call your attention.

DANGER	The DANGER symbol calls your attention to a situation that, if ignored, may cause physical harm to the user.
CAUTION	The CAUTION symbol calls your attention to a situation that, if ignored, may cause damage to Our product.
NOTE	The NOTE symbol calls your attention to important information.
TIP	The TIP symbol calls your attention to additional information that, if followed, can make procedures more efficient.
Red Arrow	The Red Arrow symbols point to import details mention the context above or below an image.
Blue Arrow	The Blue Arrow symbol indicates the motion path of an item in an operation step.
Thick Arrow	The thick Arrow symbol calls your attention to a serial of operation steps mentioned in the context.

This guide also contains the following text conventions.

Safety Instructions

- Read these instructions
- Keep these instructions
- Heed all warnings
- Follow all instructions
- Do not use this apparatus near water
- Clean only with dry cloth
- Do not block any ventilation openings. Install the unit in accordance with the manufacturer's instructions
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat
- Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- Only use attachments/accessories specified by the manufacturer.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
- Do not expose this apparatus to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the apparatus.
- To completely disconnect this apparatus from the AC Mains, disconnect the power supply cord plug from the AC receptacle.
- The mains plug of the power supply cord shall remain readily operable.
- **Damage Requiring Service**: Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
    - When the power-supply cord or plug is damaged.
    - If liquid has been spilled, or objects have fallen into the product.
    - If the product has been exposed to rain or water.
    - If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of the controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
    - If the product has been dropped or damaged in any way.
    - The product exhibits a distinct change in performance.
- **Replacement Parts**: When replacement parts are required, be sure the service technician uses replacement parts specified by Sencore, or parts having the same operating characteristics as the original parts. Unauthorized part substitutions made may result in fire, electric shock or other hazards.

SAFETY PRECAUTIONS

There is always a danger present when using electronic equipment.

Unexpected high voltages can be present at unusual locations in defective equipment and signal distribution systems. Become familiar with the equipment that you are working with and observe the following safety precautions.

- Every precaution has been taken in the design of your product to ensure that it is as safe as possible. However, safe operation depends on you the operator.
- Always be sure your equipment is in good working order. Ensure that all points of connection are secure to the chassis and that protective covers are in place and secured with fasteners.
- Never work alone when working in hazardous conditions. Always have another person close by in case of an accident.
- Always refer to the manual for safe operation. If you have a question about the application or operation email ProCare@Sencore.com
- WARNING – To reduce the risk of fire or electrical shock never allow your equipment to be exposed to water, rain or high moisture environments. If it is exposed to a liquid, remove power safely (at the breaker) and send your equipment to be serviced by a qualified technician.
- To reduce the risk of shock the power supply must be connected to a mains socket outlet with a protective earthing connection.
- For the mains plug the main disconnect and should remain readily accessible and operable at all times.
- When utilizing DC power supply, the power supply MUST be used in conjunction with an over-current protective device rated at 50 V, 5 A, type: Slow-blow, as part of battery-supply circuit.
- To reduce the risk of shock and damage to equipment, it is recommended to ground the unit to the installation's rack, the vehicle's chassis, the battery's negative terminal, and/or earth ground.

⚠**Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.**

Package Contents

The following is a list of the items should be contained:

1. OmniHub 16 chassis
2. OmniHub 16 software
3. AC power cables
4. Breakout or adapter cables depending on option modules

If any of these items were omitted from the packaging please email ProCare@Sencore.com to obtain a replacement.

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Section 1 Overview

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1.1 Product Introduction

OmniHub 16 is a compact, highly integrated and flexible solutions that focuses on both cost-effective commercial TV market and traditional DTV market. Thanks to the benefits of high-density, strong-performance and large-flexibility, OmniHub 16 can meet all the major video delivery requirements of receiving, descrambling, encoding, multiplexing, modulation, and IP processing of signal in one unit.

With optional commercial/broadcast encoder, multi-mode receiver and modulator module, it can be configured flexibly to meet any video delivery requirements. Due to its compact design and powerful function, it can be widely used at hotel, hospital, communities, clubs, campuses or other places with DTV headend, where massive programs are required to be processed in a cost-effective way. OmniHub 16 provides a straight-forward web interface accessible via all major browsers and complete control of the unit. Every OmniHub 16 is shipped with the software suite pre-loaded on appropriate hardware. There are optional input and output configurations that will change the physical connectors available on the chassis.

1.2 Front Panel Overview

1. Power Status, Baseboard Status and Reset button
2. Four 1GbE RJ45 ports: two for management and two for transport stream
3. Vent holes for cooling intake
4. 16 hot-swappable modules, each module have assigned IP address depending on the Slot number.
5. Dual redundant power supplies

1.3 Rear Panel Overview

The OmniHub 16 has 3 exhaust fans at the back of the unit. Please mind not to obstruct the air intake at the front and air exhaust at the back. Device can be ordered with AC3 and AAC which enable AC3 and AAC for HDMI or SDI encoder modules in OmniHub 16.

1.4 Option Module Overview

This describe the OmniHub 16 platform and all available modules that can expand the functionality of the OmniHub 16 chassis.

OmniHub 16 chassis	Description
OmniHub 16	4RU chassis, Dual PSU, 4xGbE ports (2 for management and 2 port IP stream in/out)
OH-AC3-AAC-4CH	AC3 (2-channel stereo audio) and AAC license per 4 channels encoder module
OH-AC3-AAC-8CH	AC3 (2-channel stereo audio) and AAC license per 8 channels encoder module
OH16-OPT-00	Rear attachment bracket for OmniHub 16, including 2pcs telescoping side metal strip, 2pcs rear metal strip and screws

Receiver Modules	Description
OHR-DVBC-00	4 channel DVB-C Annex A/C/DTMB receiving module, 1 RF input connector with 4 tuners and 2 CI slots
OHR-DVBC-ISDBT-01	4 channel DVB-C Annex B/ISDBT receiving module, 1 RF input connected with 4 tuners and 2 CI slots
OHR-8VSB-00	4 channel 8VSB receiving module, 4 input connectors with 4 tuners.
OHR-DVBT2CI-00	4 channel DVB-T/T2 receiving module, 1 input connected with 4 tuners and 2 CI slots. Support internal signal
OHR-DVBS2CI-00	4 channel DVB-S2 receiving module, 2 input connectors each with 2 transponders receiving, with 2 CI slots and independent power supplies for each LNB.
OHR-DVBS2FTA-00	4 channel DVB-S2 receiving module, 4

	input connectors. Support internal signal passthrough from one tuner to the others, Independent power supplies for LNB 1 and 3 only, LNB-2 shares power with LNB-1, LNB-4 with LNB-3
OHR-DVBS2FTA-00A	8 channel DVB-S2 receiving module, another interface card added o OHR-DVBS2FTA-00, each module occupies 2 slots.
OHR-DVBS2FTA-01	4 channel DVB-S2/S2X receiving module (QPSK, 8PSK, 64APSK), 4 input connectors (LNB1/2/3/4), Independent power supplies for each LNB.

*OHR-DVBC-00, OHR-DVBC-ISDBT-01, OHR-DVBT2CI-00, OHR-DVBS2CI-00 are Different Hardware but share the same Software.
*OHR-DVBS2FTA-00, OHR-DVBS2FTA-00A are Different Hardware but share the same Software.

Encoder Modules	Description
OHE-HDMI-00	4 channel HDMI encoding module, supports H.264 HD/SD, MPEG-2 SD, MPEG1L2, and optional AC3/AAC. (professional chip)
OHEA-HDMI-00	4 channel HDMI encoding module, supports H.264 HD/SD, MPEG-2 SD, MPEG1L2, and AC3/AAC (professional chip)
OHE-HDMI-05	4 channel HDMI encoding module, supports H.264/H.265 HD/SD, MPEG-2 SD, MPEG1L2, optional AC3/AAC, and support OSD subtitle, logo picture and QR code overlay (commercial chip).
OHE-HDMI-05A	8 channel HDMI encoding module, supports H.264/H.265 HD/SD, MPEG-2 SD, MPEG1L2, optional AC3/AAC, and support OSD subtitle, logo picture and QR code overlay, each module occupies 2 slots (commercial chip)
OHE-HDMI-02	2 channel HDMI encoding module, supports H.264 HD/SD, MPEG-2 SD, MPEG1L2, optional AC3/AAC, and supports CC input.
OHE-HDMI-02C	2 channel HDMI encoding module,

	supports H.264 HD/SD, MPEG-2 SD, MPEG1L2, optional AC3/AAC and supports CC and analog audio input.
OHE-CVBS-00	6 channel CVBS encoding module, supports H.264/MPEG-2 SD, MPEG1L2 (professional ship).
OHE-CVBS-R01	8 channel CVBS encoding module, supports H.264, MPEG1L2.
OHE-CVBS-R01A	16 channel CVBS encoding module, supports H.264, MPEG1L2, the modules occupy 2 slots.
OHE-SDI-00	2 channel SDI encoder bitrate supports H.264/MPEG-2 HD/SD, MPEG1L2, AAC and AC3 are optional, and supports CC and analog audio input.

Modulator Module	**Description**
OHM-QAMA-R00	16 channel QAM modulator module, Annex A/C, non-adjacent output, and 1 RF female port for output
OHM-QAMB-R00	16 channel QAM modulator module, Annex B, non-adjacent output, and 1 RF female port for output
OHM-QAMA-R01	4 channel QAM modulator module, Annex A/C, adjacent output, and 1 RF female port for output
OHM-QAMA-R01A	8 channel QAM modulation module, Annex A/C, adjacent output, and 1 RF female port for output
OHM-QAMB-R01	4 channel QAM modulation module, Annex B, adjacent output, and 1 RF female port for output
OHM-QAMB-R01A	8 channel QAM modulation module, Annex B, adjacent output, and 1 RF female port for output
OHM-OFDM-R01	4 channel OFDM modulation module, adjacent output, and 1 RF female port for output

OHM-OFDM-R01A	8 channel OFDM modulation module, adjacent output, and 1 RF female port for output.
OHM-ISDBT-R01	4 channel ISDBT modulation module, adjacent output, and 1 RF female port for output.
OHM-ISDBT-R01A	8 channel ISDBT modulation module, adjacent output, and 1 RF female port for output
OHM-8VSB-R01	4 channel 8VSB (ATSC) modulation module, adjacent output, and 1 RF female port for output
OHM-8VSB-R01A	8 channel 8VSB (ATSC) modulation module, adjacent output, and 1 RF female port for output.

*All -R01 model share the same hardware, and all -R01A models share the same hardware.

Function Modules	**Description**
OHP-EAS-00	EAS processing module, supports EAS triggering by analogue EAS input and Digital EAS input.
OHS-CAM-00	Xcrypt scrambler
OHP-EIT-00	EIT processing module, supports up to 16TS per module

Section 2 Installation

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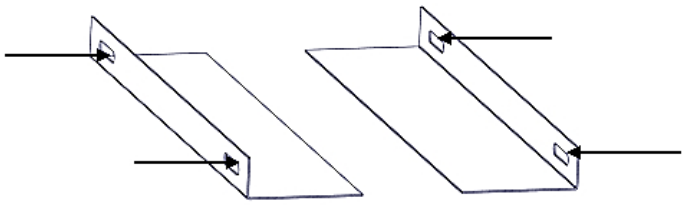
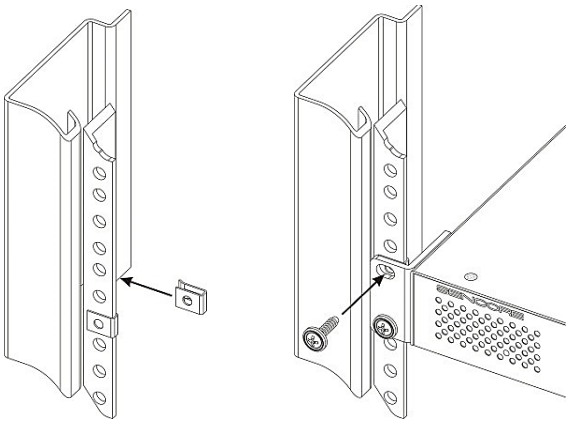
2.1 Rack Installation

The OmniHub 16 is designed to be mounted in a standard 19” rack. It takes 445mm x 177mm x 428mm (W x H x D) or 4RU of rack space. To install it into a rack, please use the following steps:

- Determine the desired position in the rack for the OmniHub 16. Make sure that the air intake on the top of the unit and the exhausts on the back of the unit will not be blocked.
- Install the brackets at the desired position if there is no supporting plate in the rack.



- Insert the rack mount clips into the place over the mounting holes in the rack.
- Slide the OmniHub 16 into the position in the rack.
- Secure the chassis to the rack by installing the four supplied screws through the front mounting holes and tightening.



2.2 AC Power Connection

The Dual Redundant option allows the OmniHub 16 to be powered by two separate supplies either operating 110V or 220V systems. The power supply will automatically detect the system it is connected to. To hook up the power use the following steps:

- Locate the power cords that are contained. Please only use the supplied 3-prong power connector or one with equal specifications. NEVER tamper with or remove the grounding pin. This could cause damage to OmniHub 16, personnel, or property.
- Plug the female end of the power cords into the front of the unit.
- Locate a protected outlet to plug the male ends of the power cables into.

When you take the equipment from a cold condition into a much warmer and humid condition, the equipment should be acclimated to the warm and humidity condition for at least 30 minutes. Powering up a non-acclimated unit may lead to shortcut or other damage to electronic components.

A professional UPS system is recommended for better performance of your content distribution system.

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3.1 OmniHub 16 Web Interface Overview

3.1.1 Connecting to the Management Port

OmniHub 16 has an embedded 4 ports gigabit switch. The four network ports are respectively used for managing and data reception/streaming. From left to right, port 1 and 2 are used for management and, port 3 and 4 are used for IP reception or streaming.

If an external IP switch needs to be installed between OmniHub 16 and other headend devices, this switch should support IGMP V2 and IGMP snooping function.

3.1.2 Logging into the OmniHub 16 Web Interface

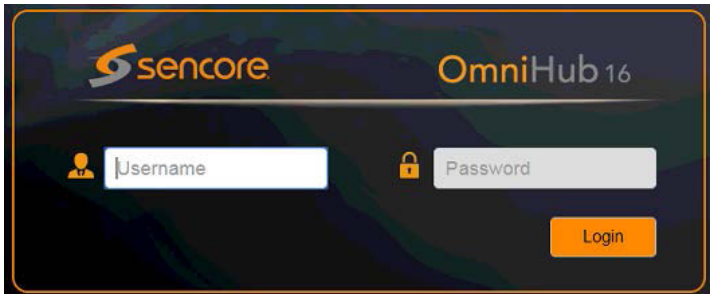
To open the OmniHub 16 web interface use one of the following supported browsers and navigate to the unit's IP address:

- Firefox
- Google Chrome

Factory network settings of the Management Port:

- IP address: 192.168.1.10
- Subnet Mask: 255.255.255.0
- Gateway: 192.168.1.254

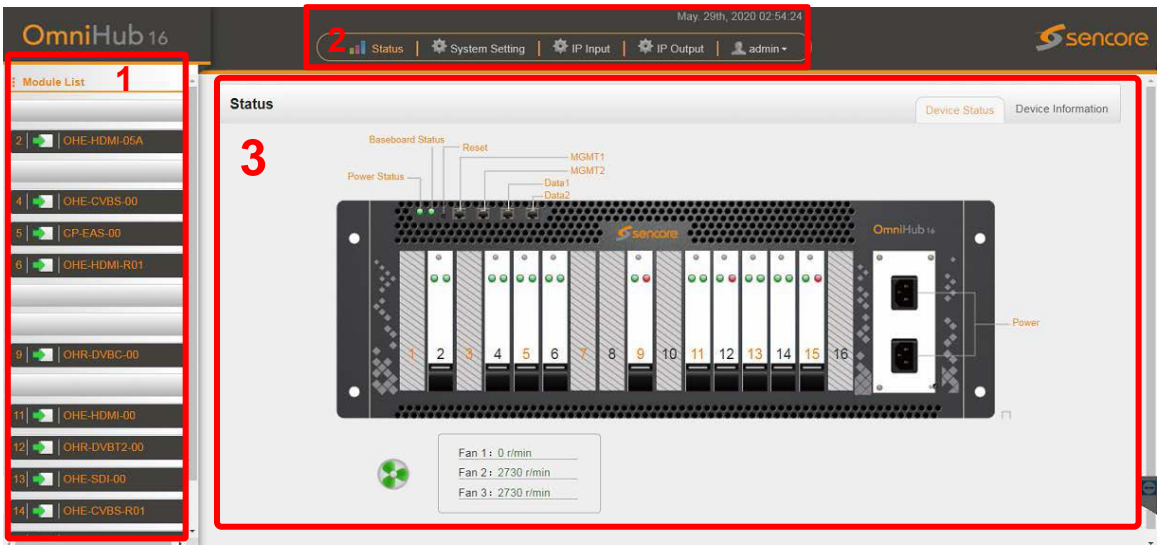
The user will need to login to the web interface. The default **username**/**password** are **admin/admin.** Click the login button to login to the web interface.



3.2 Status Overview

After a successful login, a welcome screen is displayed. The welcome screen allows you to navigate to:

1. Module List shows the module (s) installed inside the chassis
2. Settings buttons shows status, system settings, IP inputs, IP outputs, admin
3. Device host operation status



You can return to the welcome screen by clicking the button Status and then button Device Status Device Information Above is the picture displaying Status View for OmniHub 16 front view.

3.2.1 Status

Device Status will show once you login to the OmniHub 16 web interface as shown in the picture above. It also shows the front and rear-view image of OmniHub 16 with friendly label that show the status of each module connected in the 6 slots.

Device Information page shows the firmware version, software version, and hardware version of the baseboard and every module physically installed. You can access Device Information Status page by clicking the button Status and then the button Device Status Device Information

Status Device Status Device Information

Module	Firmware Version	Software Version	Hardware Version
Baseboard	V0.2.586	V1.4.23	V1.0.1
2.OHR-DVBC-01	V46.3.256	V1.4.15	V0.1.0
3.OHM-QAMB-R01	V65.2.258	V1.4.7	V0.0.1
4.OHE-CVBS-00	V0.0.565	V1.4.4	V0.1.0
5.OHE-HDMI-01	V0.0.574	V1.4.4	V0.0.1
6.OHE-HDMI-R01	V0.0.574	V1.4.4	V1.1.1
9.OHR-DVBC-00	V46.3.256	V1.4.15	V0.0.1
11.OHE-HDMI-00	V0.0.565	V1.4.7	V0.0.1
12.OHR-DVBT2-00	V46.3.256	V1.4.15	V0.1.0
13.OHE-SDI-00	V20.1.60	V1.4.9	V0.1.0
14.OHE-CVBS-R01	V0.0.574	V1.4.6	V0.0.0
15.OHE-CVBS-01	V0.0.574	V1.4.5	V0.0.0
16.OHM-OFDM-R01	V113.1.258	V1.3.2	V1.0.0

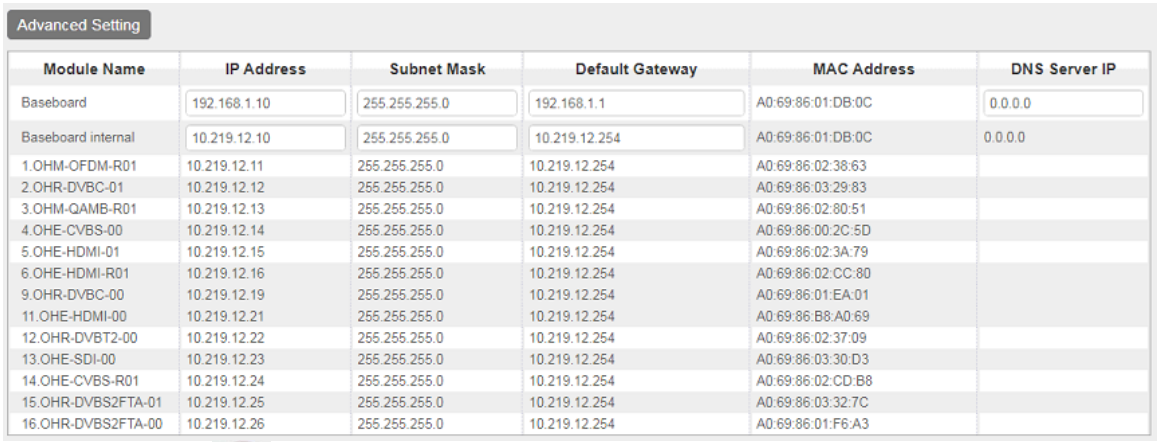
3.2.2 System Settings

This menu allows you to configure the following:

- Network
- Time

- System
- Password
- SNMP

Network tab allows user to assign a static IP address to OmniHub 16 mainboard. There will be a separate internal IP for the Baseboard and sub-board which user can find in 'Advance Setting" as shown in the picture below.

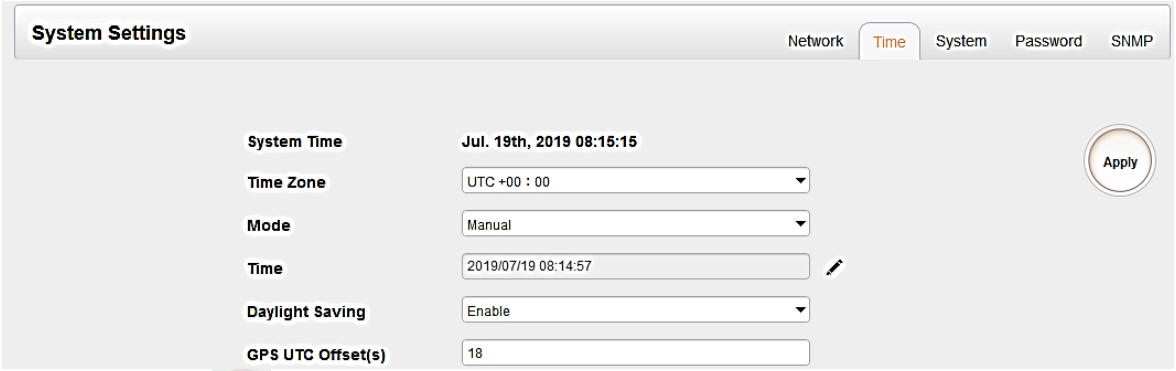


Module Name	IP Address	Subnet Mask	Default Gateway	MAC Address	DNS Server IP
Baseboard	192.168.1.10	255.255.255.0	192.168.1.1	A0:69:86:01:DB:0C	0.0.0.0
Baseboard internal	10.219.12.10	255.255.255.0	10.219.12.254	A0:69:86:01:DB:0C	0.0.0.0
1.OHM-OFDM-R01	10.219.12.11	255.255.255.0	10.219.12.254	A0:69:86:02:38:63	
2.OHR-DVBC-01	10.219.12.12	255.255.255.0	10.219.12.254	A0:69:86:03:29:83	
3.OHM-QAMB-R01	10.219.12.13	255.255.255.0	10.219.12.254	A0:69:86:02:80:51	
4.OHE-CVBS-00	10.219.12.14	255.255.255.0	10.219.12.254	A0:69:86:00:2C:5D	
5.OHE-HDMI-01	10.219.12.15	255.255.255.0	10.219.12.254	A0:69:86:02:3A:79	
6.OHE-HDMI-R01	10.219.12.16	255.255.255.0	10.219.12.254	A0:69:86:02:CC:80	
9.OHR-DVBC-00	10.219.12.19	255.255.255.0	10.219.12.254	A0:69:86:01:EA:01	
11.OHE-HDMI-00	10.219.12.21	255.255.255.0	10.219.12.254	A0:69:86:B8:A0:69	
12.OHR-DVBT2-00	10.219.12.22	255.255.255.0	10.219.12.254	A0:69:86:02:37:09	
13.OHE-SDI-00	10.219.12.23	255.255.255.0	10.219.12.254	A0:69:86:03:30:D3	
14.OHE-CVBS-R01	10.219.12.24	255.255.255.0	10.219.12.254	A0:69:86:02:CD:B8	
15.OHR-DVBS2FTA-01	10.219.12.25	255.255.255.0	10.219.12.254	A0:69:86:03:32:7C	
16.OHR-DVBS2FTA-00	10.219.12.26	255.255.255.0	10.219.12.254	A0:69:86:01:F6:A3	

Click the button

on the right side for the changes to take effect.

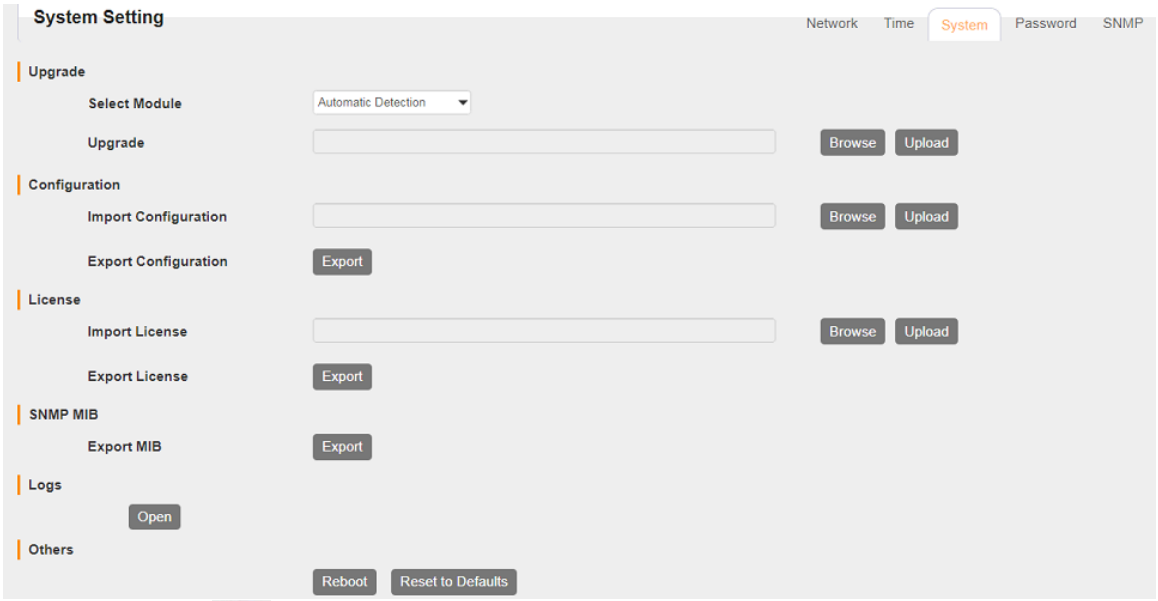
Time tab allows you to check the current system time, change the time zone, choose system time Mode (Manual or Automatic), enable/disable Auto Sync and modify NTP Server Address in Automatic mode and change the current system Time in Manual mode.



Click the button

on the right side for the changes to take effect.

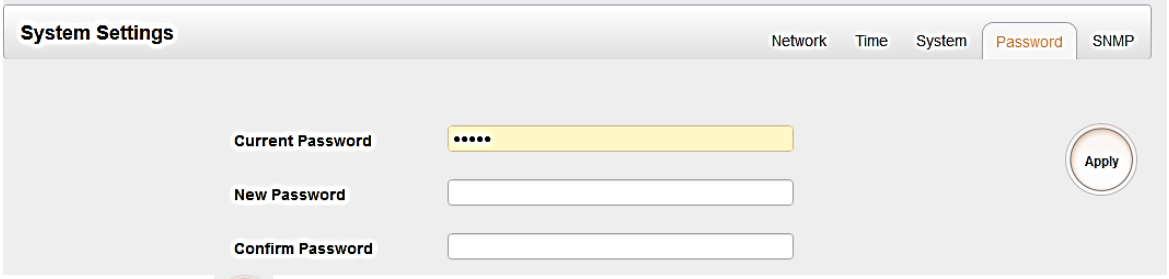
System tab allows you to do upgrade, import or export configuration, import or export licenses *(only baseboard)*, reboot the whole unit, restore to factory default *(only baseboard)* and export logs and clear log (only baseboard).



Click the button

on the right side for the changes to take effect.

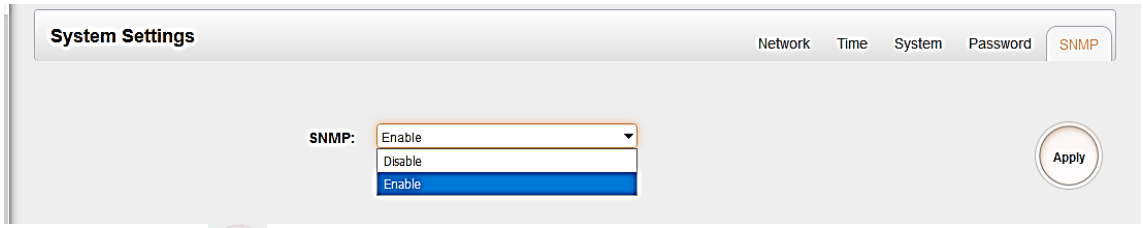
Password tab allows you to change the login password.



Click the button

on the right side for the changes to take effect.

SNMP tab is for you to disable or enable the SNMP function.



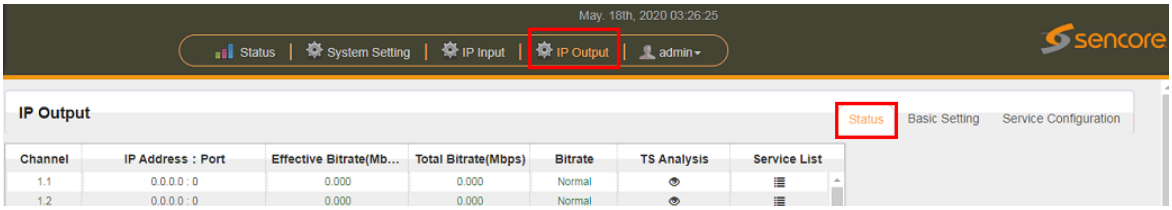
Click the button on the right side for the changes to take effect.

3.2.3 IP Input

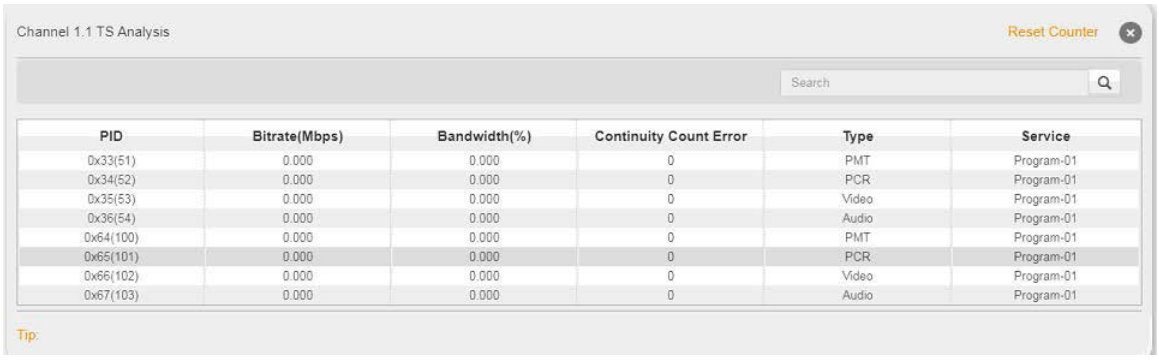
This menu allows you to configure and access the IP input:

- Status
- Basic Settings
- Service Configuration

Status tab displays a table of Channels with IP Address, IP Port, Effective Bitrate,Total Bitrate, TS Analysis and Service List for each IP input stream. OmniHub 16 IP input has a total of 120 channels which means it can accommodate 120 IP address multicast. Once a channel is enabled, the IP address and IP port configured for the channel will appear in the table. If the source multicast is good, there will be a value under the total bitrate and effective bitrate showing the actual bitrate of the transport stream.

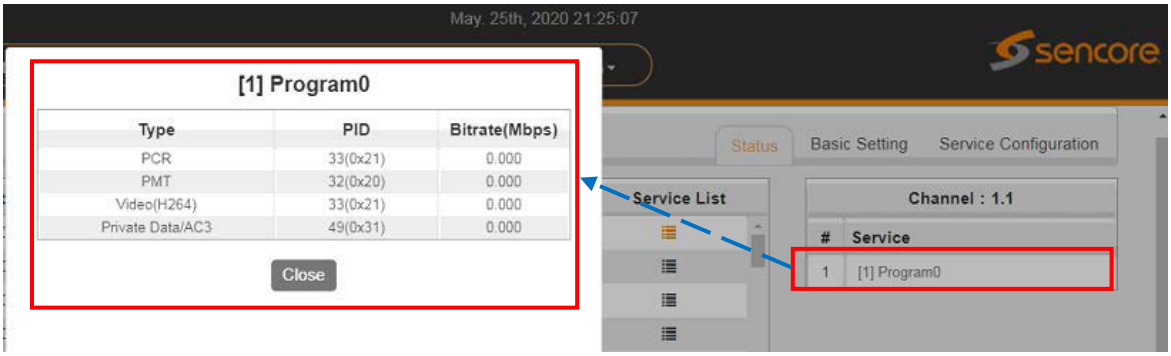


Clicking under TS Analysis button will display the information on the structure of the transport stream.

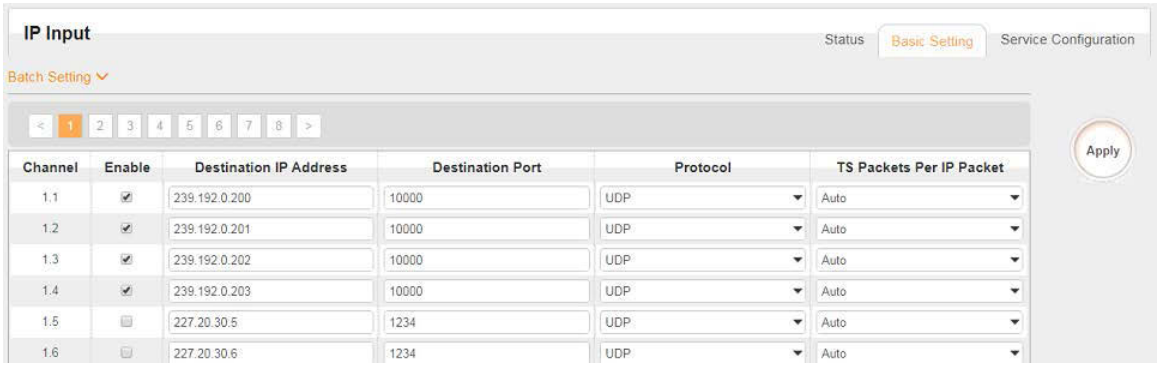


Clicking under Service List will display information on the services included in the transport stream. A list of services in the TS will be shown as the picture below.

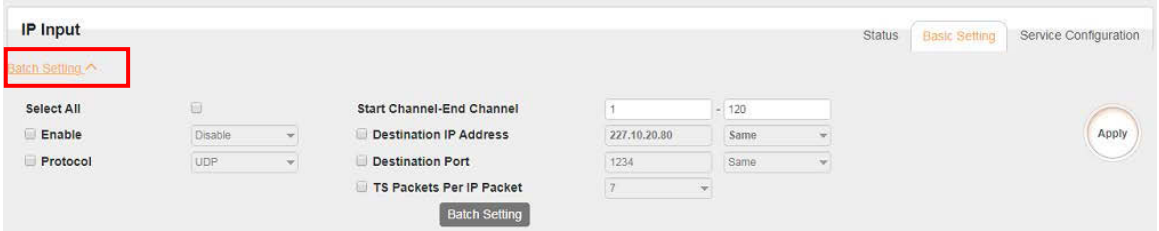
Clicking on the service in the list will display its detailed information: PCR, PMT, Video and Audio PID and Bitrate. See the picture below



Basic Settings tab displays the configuration page of the IP input. You can enable the TS and set the input IP Address, IP port and Protocol of the source multicast.

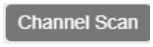


To enter many IP addressed for the inputs, click the Batch Setting Batch Setting button and fill in the following fields. You can only set the source when the IP addresses are in a consecutive order.

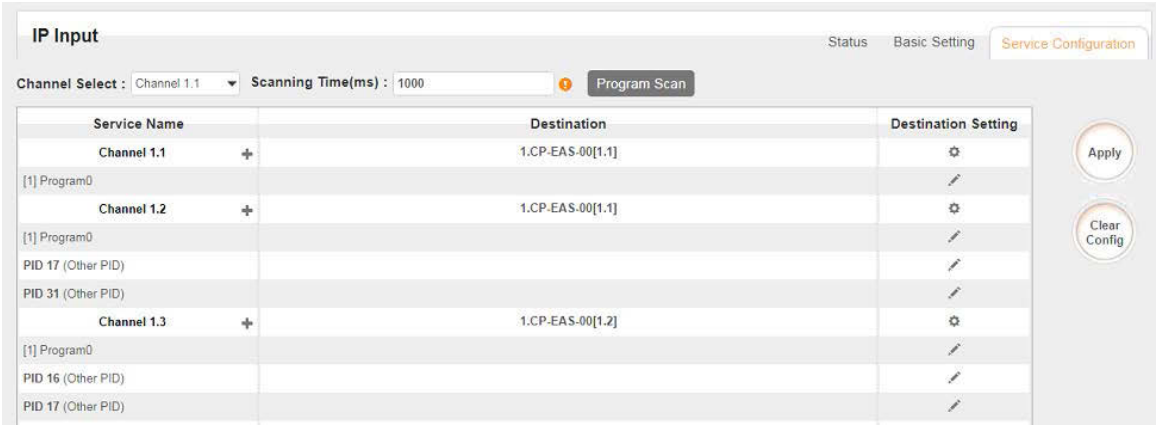


Click the Apply button on the right side to make the change takes effect.

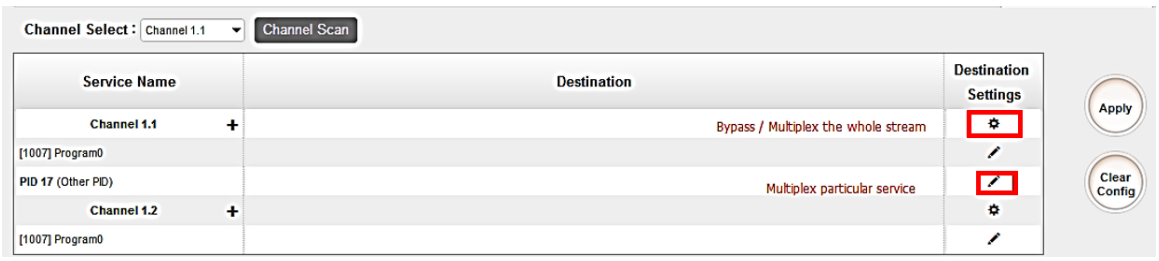
Service Configuration tab displays the configuration page where you can manage the received services and output them to their designated interface. Configuration steps for IP input and all receiving and encoding modules in OmniHub 16 are mostly the same.

First, you need to  the port on each TS with LOCKED signal status. Each port might be scanned automatically or need to be scanned when its source signal is replaced.
After scanning each channel, you can output each transport stream or service by clicking the icon and below "Destination Settings". You can route the whole stream or a service/s from the input channel toward the available output channel (IP or RF). Two types of routing are possible.

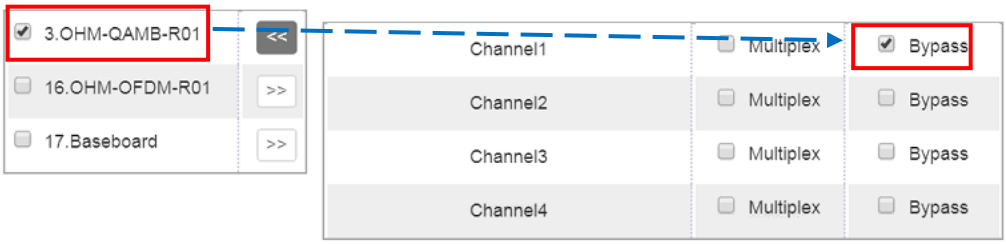
1. **Bypass mode. In this mode,** routes can only be done when outputting a whole input transport stream towards an output TS channel - this cannot be done when outputting a single service only. Bypass mode activation will not allow other services from other input TS to be mixed in the current TS output. Any attempts of routing other stream/services towards this channel will result in *"this channel won't be available at this time".*
2. **Multiplex mode** is used to create a new SPTS or MPTS. This mode allows the administrator to perform the following operation:
   a. Routes a single service towards an output channel to create SPTS
   b. Routes services towards a single output channel to create MPTS
   c. Route service/s AND stream/s from multiple channels towards a single output channel to create MPTS.



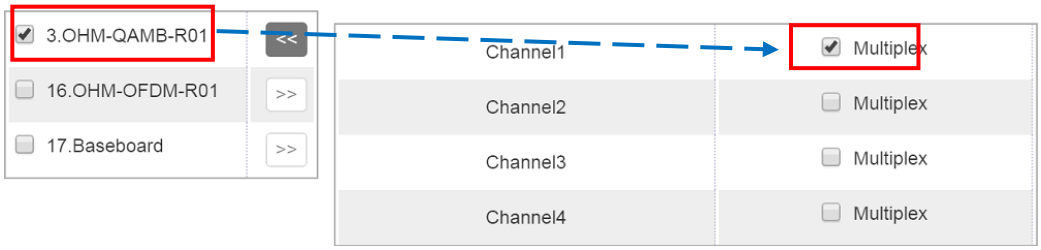
Service Configuration page interface



To use **Bypass** or **multiplex mode on stream level**, click the icon ⚙. When a new window appears, select the output stream/channel where the stream will be bypassed or multiplexed.



To use **Multiplexing mode on service level** click on pencil icon ✎ on the right side in the line with the proper service. Then select the output stream (channel) where the service will be multiplexed.



Do not forget to click the Apply button

on the right side to make the change take effect.

To clear the whole routing table click

button.

There is a channel scan button

top. Normally the input service list of each channel will be loaded in this page automatically, but when you change the input source, you should refresh the changed channel manually by selecting the channel and clicking **Channel Scan** button.

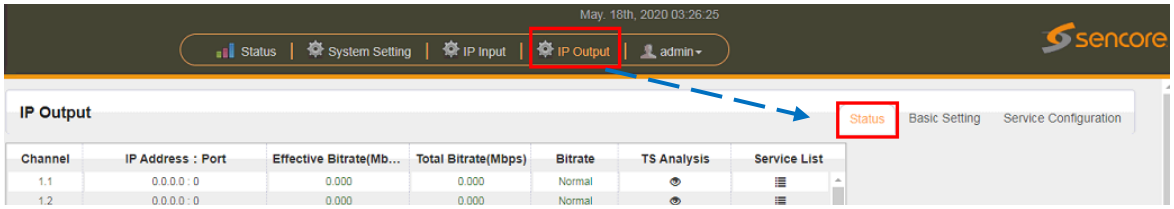
3.2.4 IP Output

This menu allows you to configure and access the IP output:

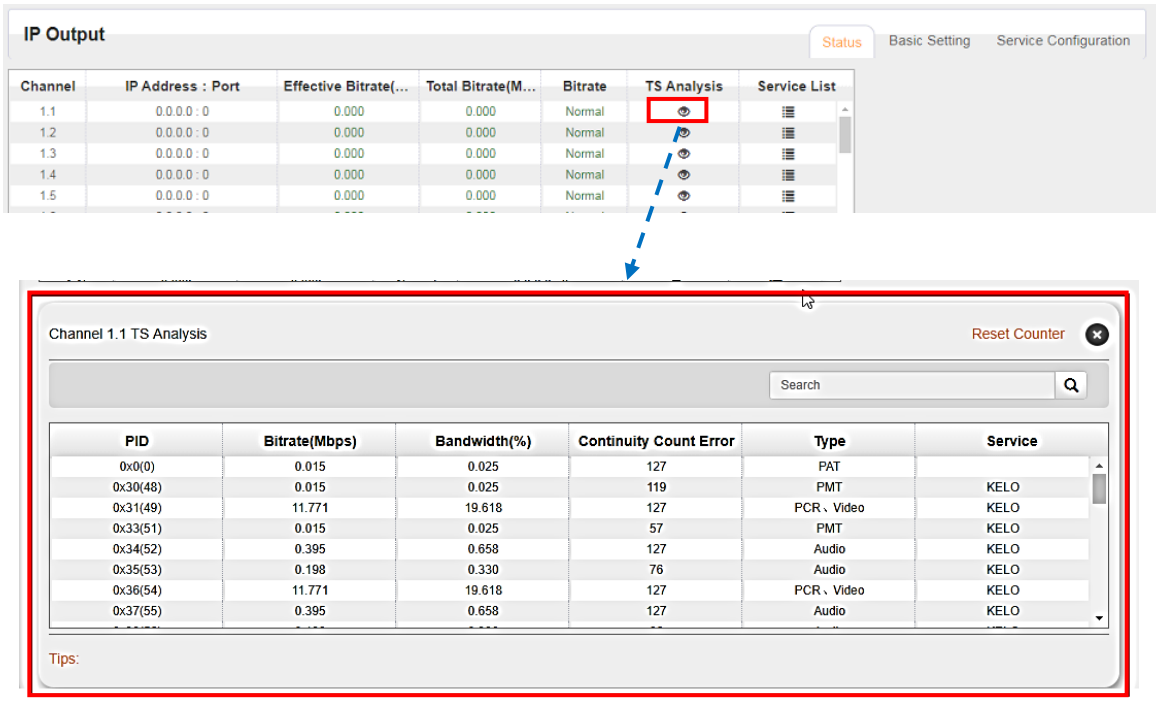
- Status
- Basic Settings
- Service Configuration

Status tab displays the table of Channels, IP Address, IP port, Effective Bitrate, Total Bitrate,Bitrate Status (Normal/Overload), TS Analysis and Service List for each IP output stream. OmniHub 16 IP output has a total of 120 channels which means it can output 120 multicast IP addresses. Once a channel is enabled, the IP address and IP port configured on the channel will appear in the table. If there are services output in the channel, the status will display the effective and total bitrate. Total bitrate is the set

maximum bitrate set and the effective bitrate is the actual bitrate of the service/s. If the actual bitrate is higher than the total bitrate, Bitrate status will display “overload” which indicates some errors in the channel.

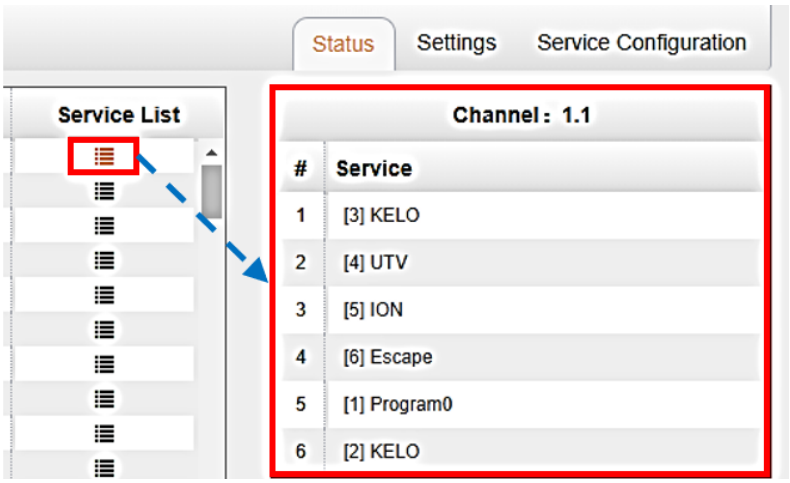


Clicking the icon under the TS Analysis button will display the information on the structure of the transport stream.

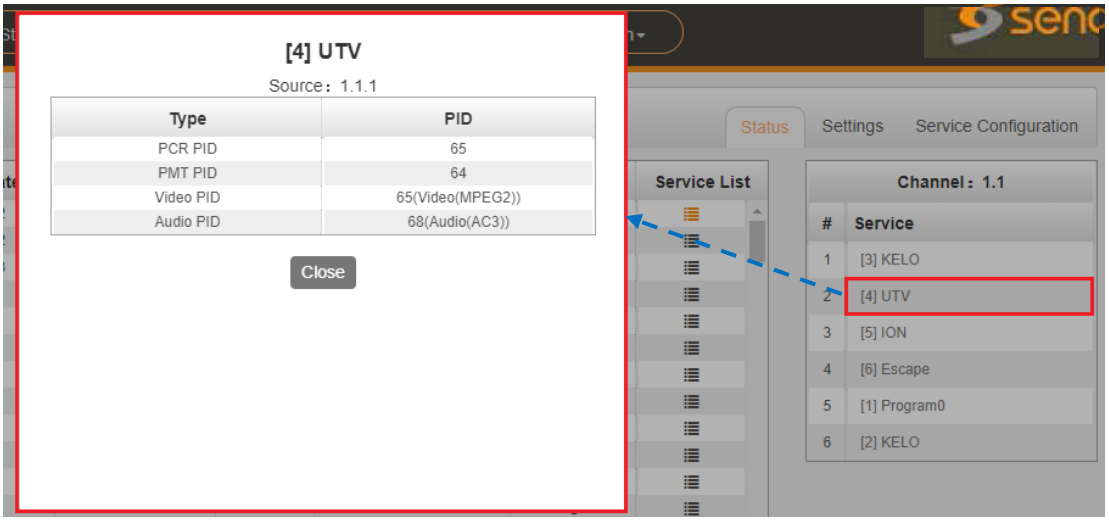


Clicking under Service List will display information on the services included in the transport stream. This will display the list of services in a TS as shown in the picture below.

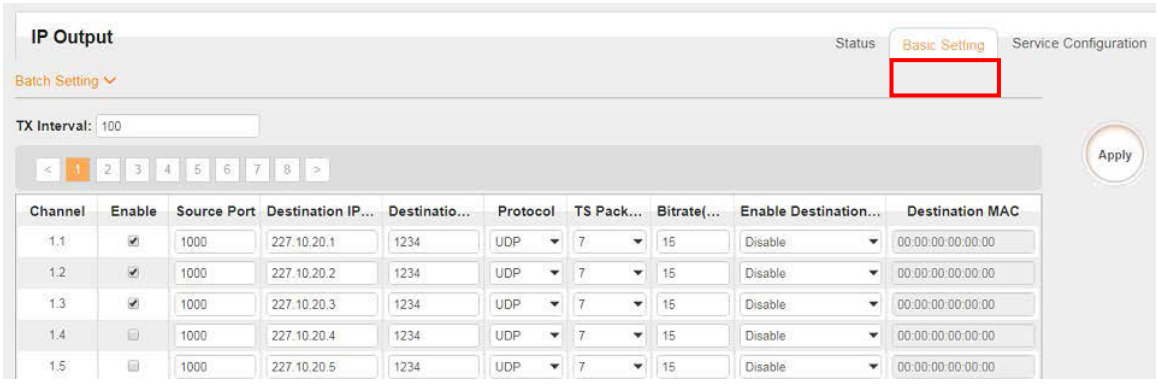
.



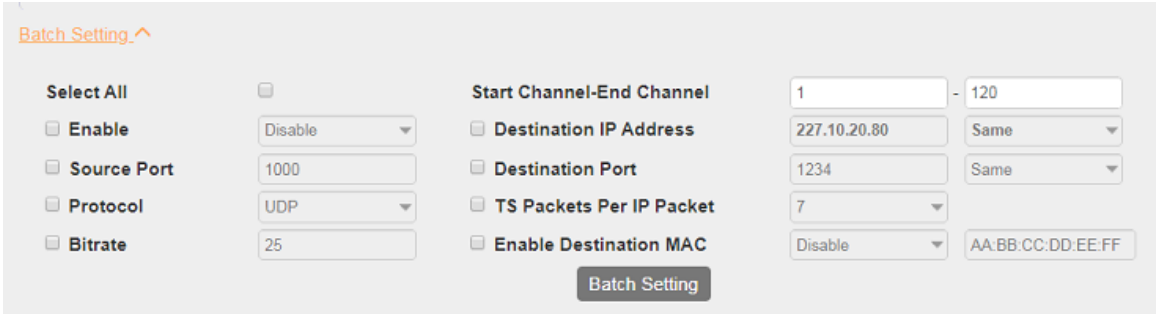
Clicking on the service name in the list will display the detailed information of the service: PCR, PMT, Video and Audio PID and Bitrate as shown in the picture below.



Basic Settings tab displays the configuration page of the IP output. You can enable the TS and set the output IP Address, IP port and Protocol of the Destination IP multicast.



To enter many IP addresses, use the Batch Setting button and fill in the following fields. You can only set the destination IP address when the IP addresses are in a consecutive order

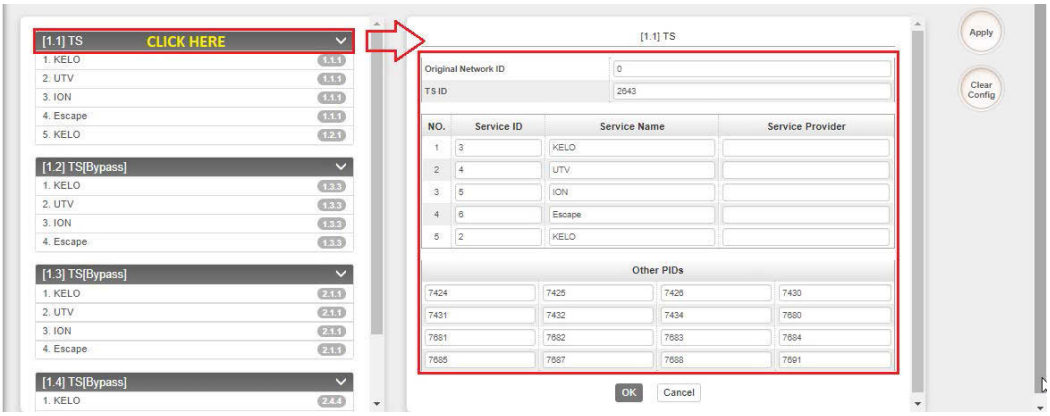


Click the Apply button on the right side to make the change take effect.

Service Configuration tab display the page where you can check/edit output TS or services that are part of output IP streams. Streams can originates either from IP input, receiver modules or encoder modules. In picture below, clicking the area marked as "click here", you can make changes to the transport stream, i.e.:

- edit Original Network ID
- edit TS ID
- edit Service ID, Service Name and Service Provider
- edit PID ID for other PIDs

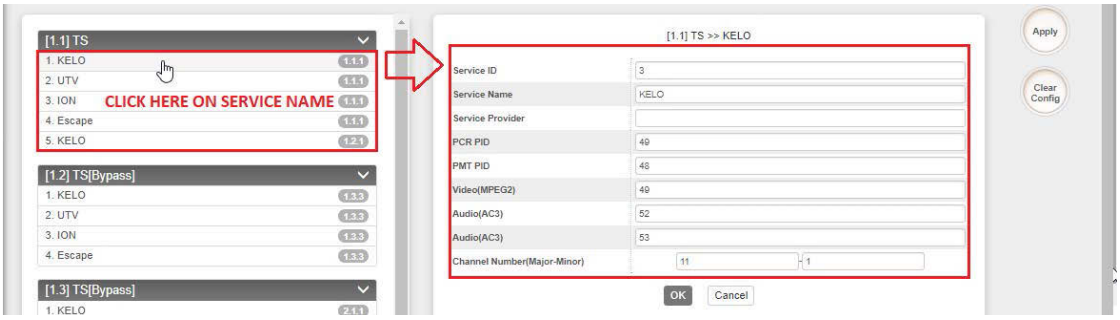
Click the Apply button on the right side to make the change take effect.



In picture below, clicking the area marked as "click here", the user can make changes to particular service (s), i.e.:

- edit Service ID, service name and service provider
- edit PCR, PMT PIDs
- edit Elementary Stream PIDs (video, audio/s)
- edit Logical Channel Number

Click the Apply button on the right side to make the change take effect.



3.2.5 Admin

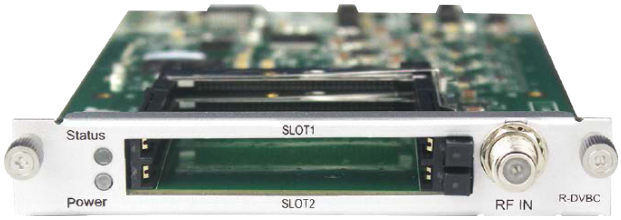
Click **Admin** and you can choose to go into Password setting page or Log Out.

3.3 Module Configuration

Receiver Modules

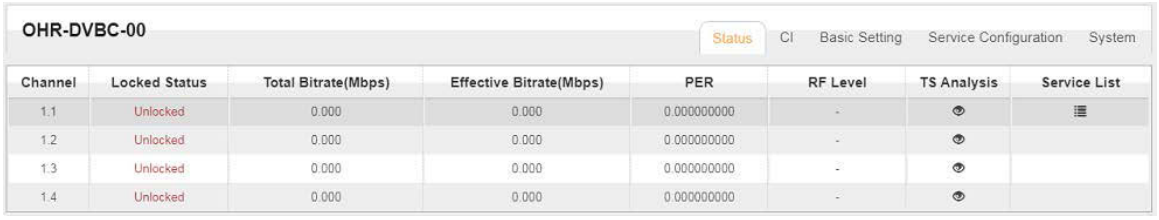
3.3.1 OHR-DVBC-00

OHR-DVBC-00 is a 4-channel DVBC receiving and descrambling module with 1 RF female connector and 2 CI slots. It can receive 4 DVBC signals simultaneously and support 2 CAM cards for descrambling.



3.3.1.1 Module Status

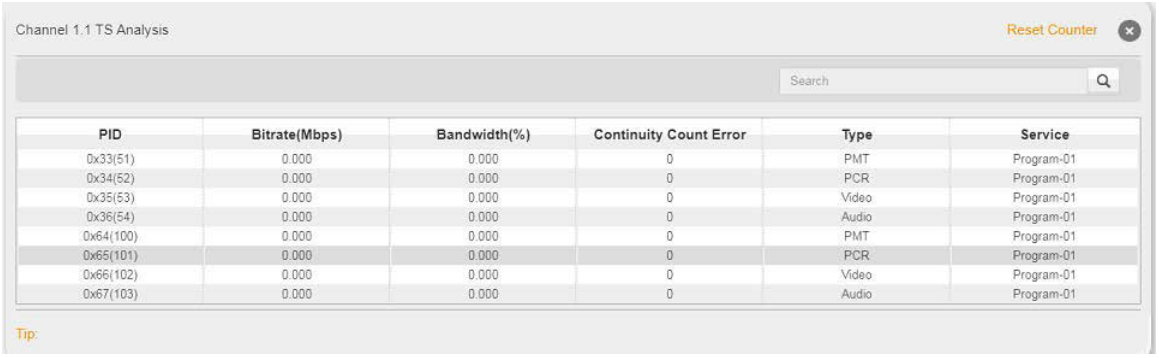
By selecting the OHR-DVBC-00 on the module list, you will be automatically redirected to the Status page of the module. This will display the channels from 1.1 to 1.4 that represent the 4 input -channels of the module. Once a channel is connected to the source and configured with correct parameters. The status of the channel will display ‘locked’ and you can see the values of the total bitrate and the actual bitrate.



Channel	Locked Status	Total Bitrate(Mbps)	Effective Bitrate(Mbps)	PER	RF Level	TS Analysis	Service List
1.1	Unlocked	0.000	0.000	0.000000000	-		
1.2	Unlocked	0.000	0.000	0.000000000	-		
1.3	Unlocked	0.000	0.000	0.000000000	-		
1.4	Unlocked	0.000	0.000	0.000000000	-		

Total Bit rate in Mbps shows the bitrate of receiving signals of each channel with LOCKED status, while the Effective Bit Rate in Mbps shows its actual bitrate. RF Level of the input signal will show you the level of each locked channel.

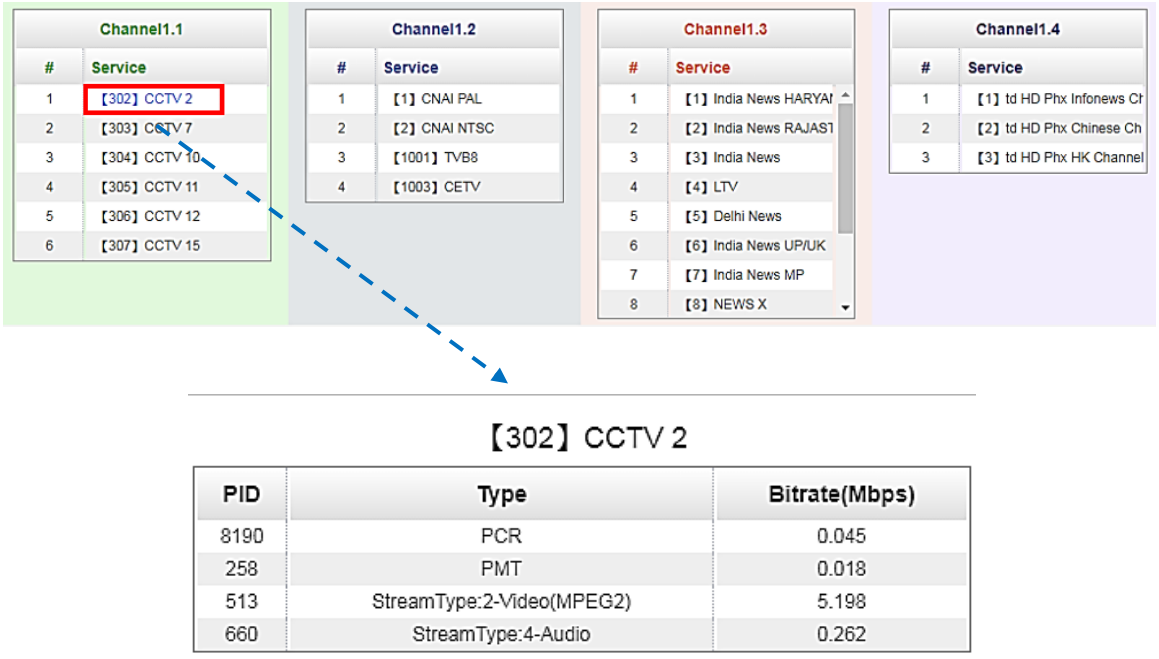
Clicking under TS Analysis will display the information on the structure of the transport stream as shown in the picture below.



PID	Bitrate(Mbps)	Bandwidth(%)	Continuity Count Error	Type	Service
0x33(51)	0.000	0.000	0	PMT	Program-01
0x34(52)	0.000	0.000	0	PCR	Program-01
0x35(53)	0.000	0.000	0	Video	Program-01
0x36(54)	0.000	0.000	0	Audio	Program-01
0x64(100)	0.000	0.000	0	PMT	Program-01
0x65(101)	0.000	0.000	0	PCR	Program-01
0x66(102)	0.000	0.000	0	Video	Program-01
0x67(103)	0.000	0.000	0	Audio	Program-01

Clicking under Service List will display information on the services included in the transport stream. This will display the list of services in a TS as shown in the picture below.

Clicking on the service name in the list will display the detailed information of the service: PCR, PMT, Video and Audio PID and Bitrate as shown in the picture below.

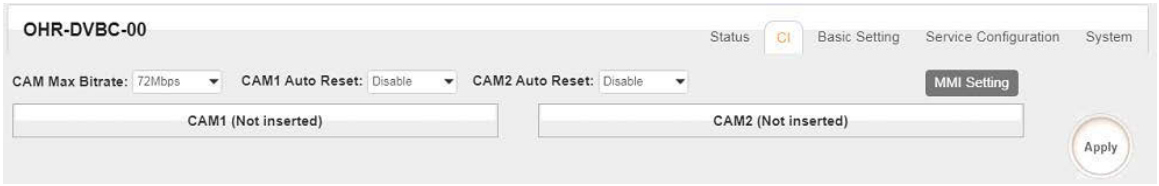


【302】CCTV 2

PID	Type	Bitrate(Mbps)
8190	PCR	0.045
258	PMT	0.018
513	StreamType:2-Video(MPEG2)	5.198
660	StreamType:4-Audio	0.262

3.3.1.2 Module CI

For the encrypted services received on OHR-DVBC-00 module receiver, CI slot is needed to decrypt and re-broadcast the services. The OHR-DVBC-00 has 2 CAM slots and can decrypt services depending on the capability of the CAM module and Smart Card. You can select the CAM Max Bit Rate from 48Mbps to 108Mbps in pull-down list depending on the total effective bitrate of services you want to decrypt at.



Click the Apply button

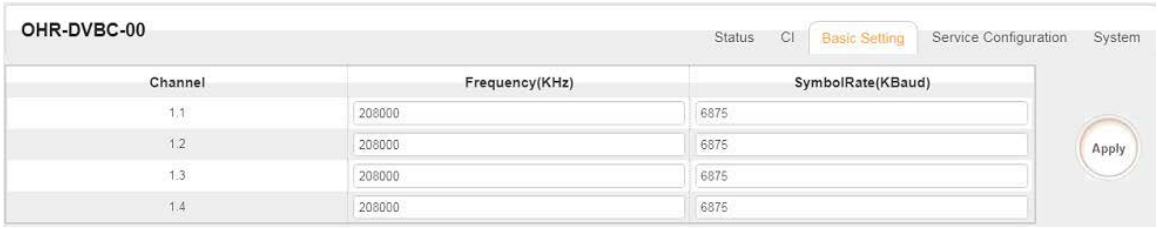
on the right side to make the change takes effect.

3.3.1.3 Module Settings

In this page you can input the parameters of the source signal. For DVBC input, it only needs to have the Frequency and Symbol Rate of the source. The range of the Frequency and Symbol Rate to be input on this page shows on the table below.

Name	Range
Frequency (KHz)	48000~862000
Symbol Rate (KBaud)	3000~7000

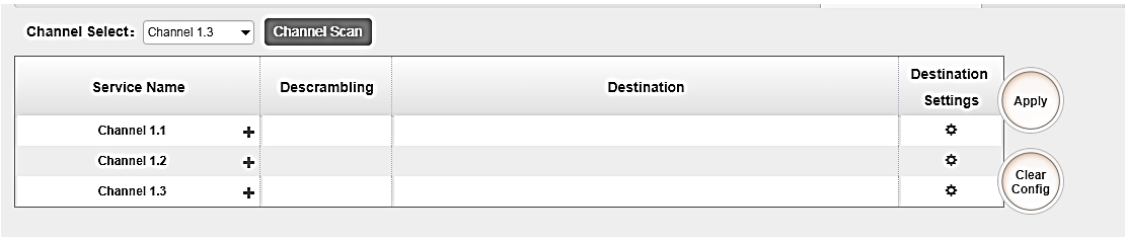
When the parameters are set, click on and check in the Status page if the corresponding channel status is LOCKED.



3.3.1.4 Module Service Configurations

Service Configuration page is where you can manage the received services and output them to their designated interface. The configuration for all modules in OmniHub 16 is mostly same.
First, you need to scan the port on each LOCKED TS. Each port might be scanned automatically or needed to be scanned manually when its source is changed.
After scanning each channel, you can start to configure the services. You need to click ***Apply*** button after you configure service to CAM for descrambling, otherwise the descrambling configuration will not be saved. Then you can choose the services to be routed, you can output each service by clicking the icon ⚙ and ✎ below "Destination Settings". You can route a whole stream or a service/s from the input channel toward the available output channels (IP or RF). Two types of routing are possible.

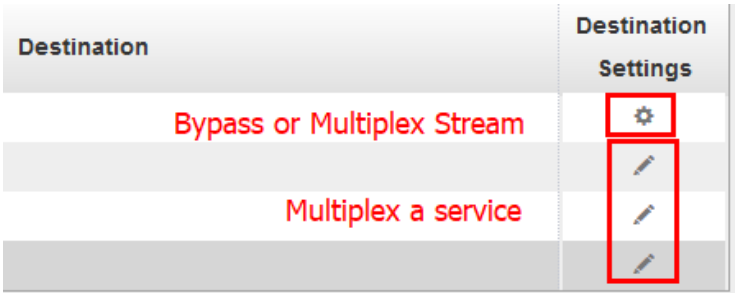
1. **Bypass mode.** In this mode, you can route as whole input transport stream towards an IP or RF output which will be occupied only by this stream. Any attempt of routing other stream/service towards this channel will be an error. This can only be done when you click the icon ⚙ on the TS.
2. **Multiplex mode** is the counter part of the bypass mode. This mode allows the administrator to perform the following operations:
   a. Route a single service towards an output channel to create SPTS.
   b. Route services towards a single output channel to create MPTS.
   c. Route service/s AND stream/s from multiple channels towards a single output channel to create MPTS.

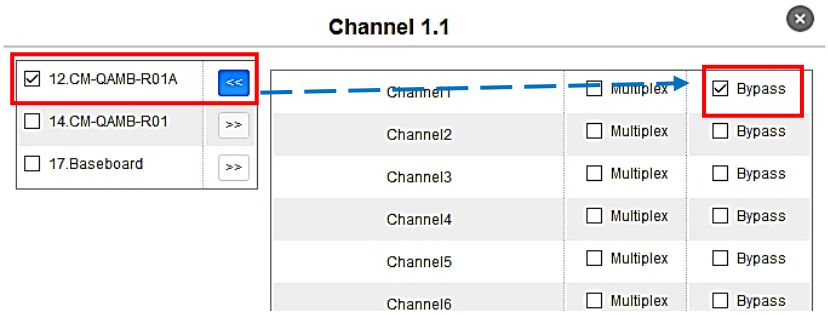


To use **Bypass** or **Multiplexing mode on stream level:**

1. Click on the (cog) icon ⚙. There were always have BaseBoard selection for the IP output and other Output options depending on the modules inserted.

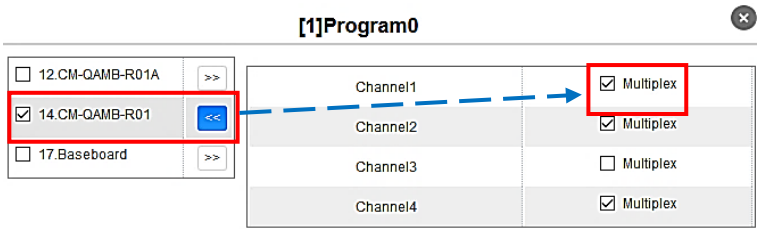
2. Select the correct Output and Channel you want to output the stream to.
3. Check Multiplex or Bypass on the Channel you want to output
4. Click the Apply button on the right side to make the change takes effect.



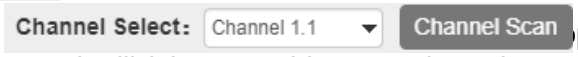


To use **Multiplexing mode on service level,**

1. Click on (pencil) icon. There will be always a BaseBoard selection for the IP output and other Output options depending on the modules inserted.
2. Select the correct Output and Channel you want to output the service to.
3. Check on Multiplex on the channel you want to output. You can output multiple service in one channel or output one service to multiple channels
4. Click the Apply button on the right side to make the change takes effect.

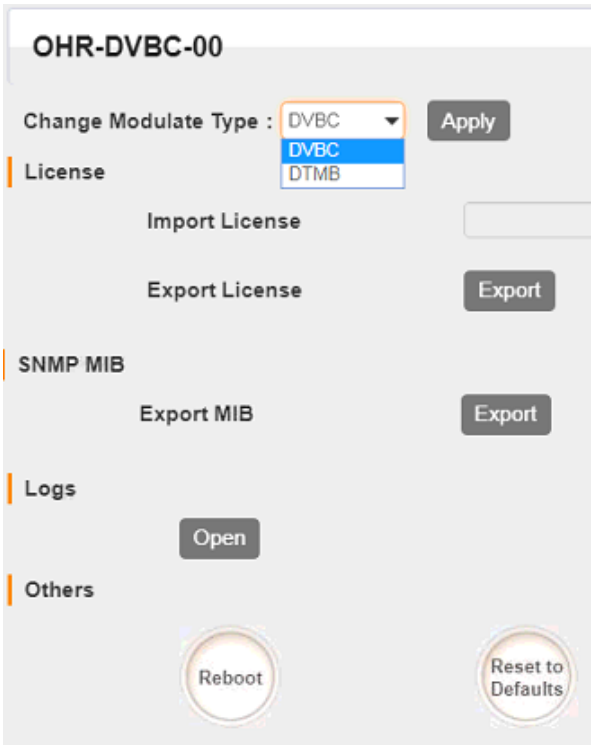


To clear the whole routing table click button.

There is a channel scan button  p,. Normally the input service list of each channel will lshow on this page, but when you change the input source, you should refresh the changed channels manually by selecting the channel and clicking **Channel Scan** button.

3.3.1.5 Module System Operation

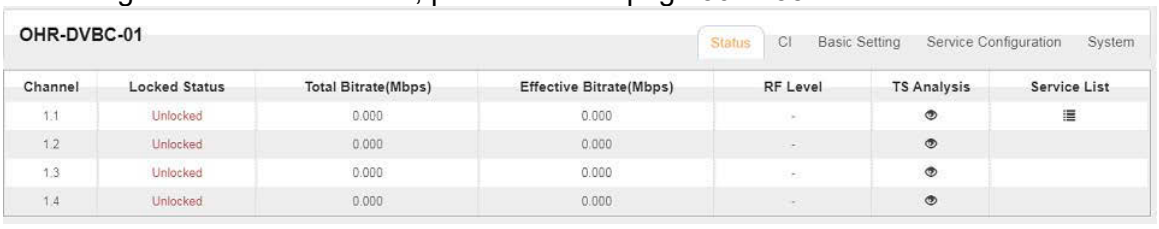
In **System Operation** tab, you can choose the modulation type as DVBC Mode or DTMB Mode. Here you can also perform the following tasks:



- Import / Export License
- Log Manage
- Reboot
- Factory Default the unit

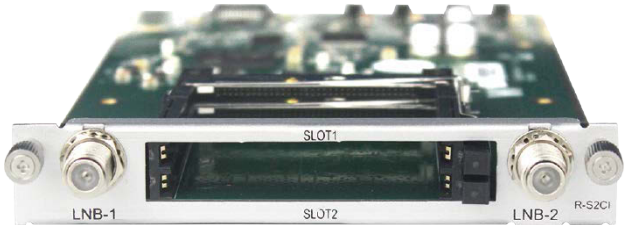
3.3.2 OHR-DVBC-ISDBT-01

OHR-DVBC-ISDBT-01 is a 4-channel DVBC Annex B/ISDBT receiving and descrambling module with 1 RF female connector and 2 CI slots. The module can receive signals via 4 RF channels simultaneously and support 2 CAM cards for descrambling. Configuration of the module is very much similar to that of OHR-DVBC-00. For configuration of this module, please refer to page 30 to 35.



3.3.3 OHR-DVBS2CI-00

OHR-DVBS2CI-00 is a 4-channel DVB-S/S2 receiving and descrambling module with 2 RF connectors and 2 CI slots, each RF connector can connect with 2 transponders. The module has independent power supplies for each LNB.
For Status and CI pages, please refer to OHR-DVBC-00 module section on page 30 to 32.



3.3.3.1 Module Settings

On the Parameter Settings page of OHR-DVBS2CI-00 you can input information of the source signal. The table below show the parameter range of each field. For the LNB power, Channel 1.1 and 1.2 share power with each other from LNB-1, Channel 2.1 and 2.2 share power with each other from LNB-2.

Name	Range
Satellite Frequency (KHz)	950000~2150000
Symbol Rate (KBaud)	1000~45000
LNB Frequency (KHz)	950000~21500000
LNB Power	Off/13V/18V
LNB 22KHz	Off/22KHz

3.3.4 OHR-DVBS2FTA-00/00A

OHR-DVBS2FTA-00 is a 4-channel DVB-S/S2 receiving module with 4RF connectors. The module supports internal signal pass through from one tuner to the others, while OHR-DVBS2FTA-00A is the combination of 2 OHR-DVBS2FTA-00 modules, it occupies 2 slots on the OmniHub 16 chassis and has an 8-channel DVBS-S2 receiving module with 8 RF connectors.

OHR-DVBS2FTA-00

OHR-DVBS2FTA-00A

OHR-DVBS2FTA has a similar Status interface to OHR-DVBS2CI. Differences between the 2 modules: 1) the number of received satellite signals (4/8 Satellite). 2) DVBS2CI can decrypt services using CAM module and Smart Card, while the DVBS2FTA use BISS decryption.

Channel	Locked Status	Total Bitrate(Mbps)	Effective Bitrate(Mbps)	RF Level	TS Analy...	Service List
1.1	Unlocked	0.000	0.000	-		
2.1	Unlocked	0.000	0.000	-		
3.1	Unlocked	0.000	0.000	-		
4.1	Unlocked	0.000	0.000	-		

The parameters for each port in Module Settings are also same with those of the OHR-DVBS2CI and Service Configuration is same with that of OHR-DVBC-00. Please refer to page 32 to 34 for the configuration manual.

3.3.5 OHR-8VSB-00

OHR-8VSB-00 is a 4-channel 8VSB receiving module with 4 RF connectors. Picture below shows the front plate of the 8VSB module.

Module specification:

- 4 RF female connectors
- Frequency range: 50 – 860MHz
- Bandwidth: 6MHz
- Modulation: 8VSB
- Signal Level: -80dBm ~ -20dBm

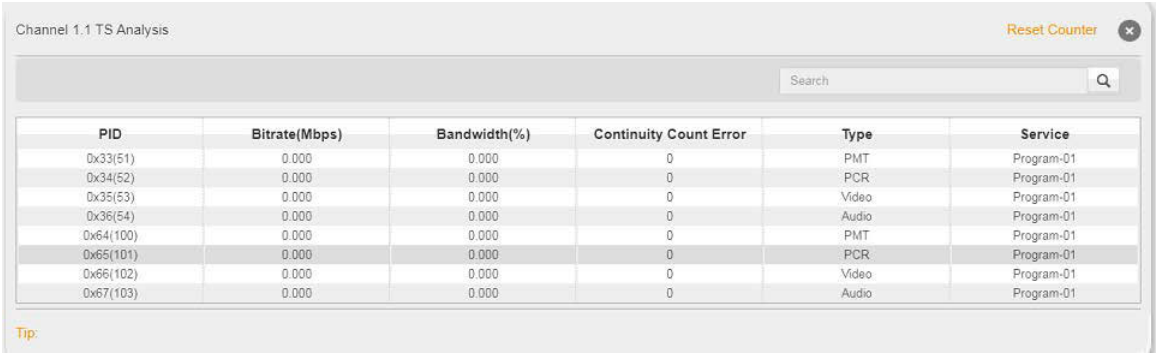
3.3.5.1 Module Status

Status page will display when you select the OHR-8VSB-00 in the channel list. This shows the Channel Number, Locked Status, Total Bit Rate, Effective Bit Rate, TS Analysis and Service List for each 8VSB input stream. Once the channel is connected to the source and is set with the correct parameters. The status of the channel will display ‘locked’ and you can see the total bitrate and actual bitrate. Total Bit rate in Mbps shows the bitrate of receiving signals of each channel with LOCKED status, while the Effective

Bit Rate in Mbps shows the actual bitrate of each receiving Channel. RF Level of the input signal will show you the level of each locked channel.

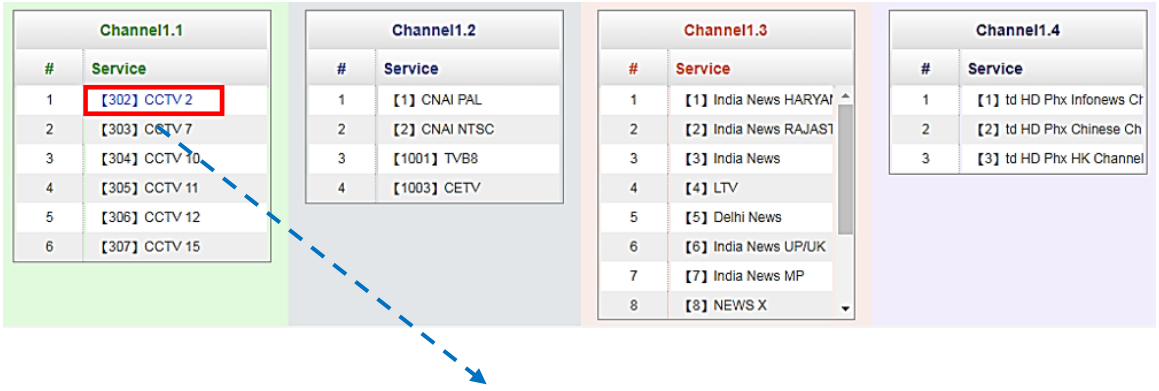
Channel	Locked Status	Total Bitrate(Mbps)	Effective Bitrate(Mbps)	RF Level	TS Analysis	Service List
1.1	Unlocked	0.000	0.000	-		
2.1	Unlocked	0.000	0.000	-		
3.1	Unlocked	0.000	0.000	-		
4.1	Unlocked	0.000	0.000	-		

Clicking the icon under TS Analysis will display the information on the structure of the transport stream as shown in the picture below.



Clicking the icon under Service List will display information on the services included in the transport stream as shown in the picture below.

Clicking on the service name in the list will display the detailed information of the service: PCR, PMT, Video and Audio PID and Bitrate as shown in the picture below.



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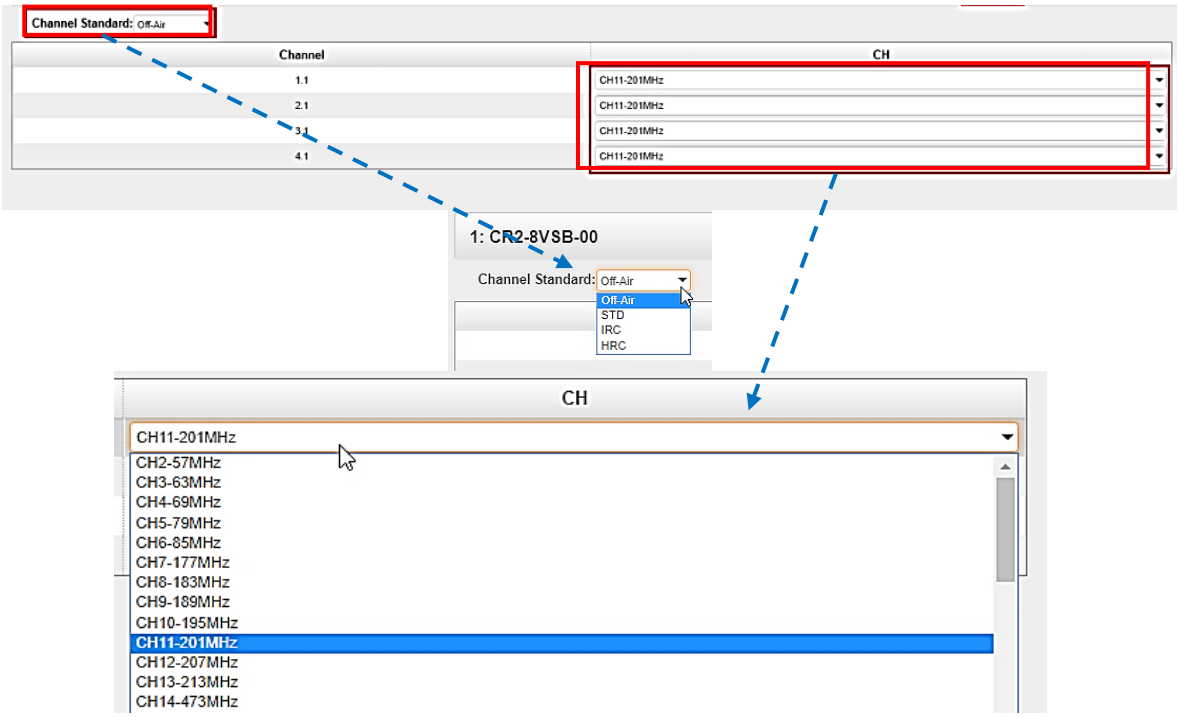
PID	Type	Bitrate(Mbps)
8190	PCR	0.045
258	PMT	0.018
513	StreamType:2-Video(MPEG2)	5.198
660	StreamType:4-Audio	0.262

3.3.5.2 Module Settings

To make configuration changes in the context of the channel plan and the receiving frequency of a specific RF input, select the appropriate receiving module and then click on the **Settings** tab. The channel plan and frequency of a specific receiver can be selected using drop-down lists.

Table below presents supported channel plans.

Channel Plan	Frequency of RF Channels
Off-Air	CH2 57MHz, CH3 63MHz, CH4 69MHz~CH67 791MHz, CH68797MHz, CH69 803MHz
STD	CH2 57MHz, CH363MHz, CH4 69MHz~ CH133 849MHz,CH134855MHz, CH135 861MHz
IRC	CH2 57MHz, CH3 63MHz, CH4 69MHz ~ CH133 849MHz,CH134, 855MHz, CH135 861MHz
HRC	CH2 55.75MHz, CH3 61.75MHz, CH4 67.75MHz~ CH133847.75MHz, CH134 853.75MHz, CH135 859.75MHz

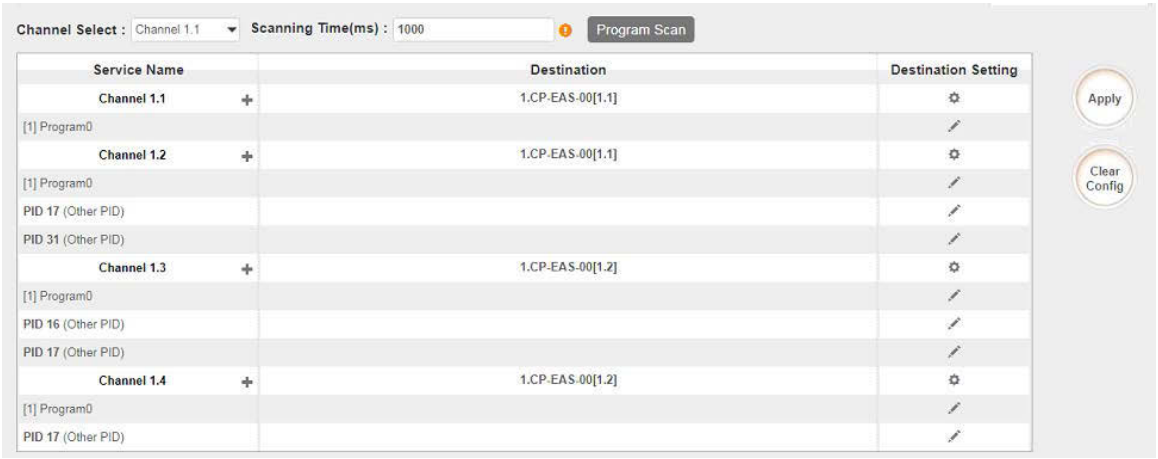


3.3.5.3 Modules Service Configuration

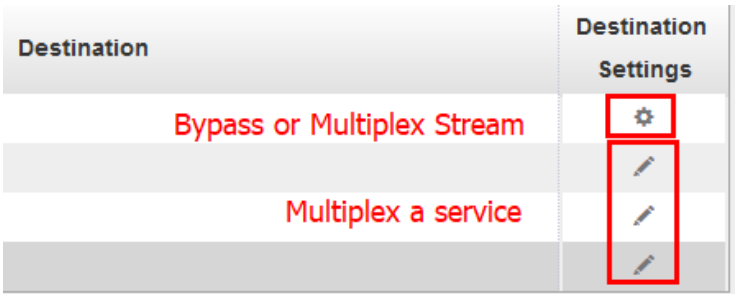
Service Configuration tab displays the configuration page where you can manage the received services and output them to their designated interface. Configuration steps for IP input and all receiving and encoding modules in OmniHub 16 are mostly the same. First, you need to scan the port of each TS with LOCKED signal status. Each port might be scanned automatically or need to be scanned manually one at a time when its source signal is replaced.

After scanning each channel, you can output each transport stream or service by clicking the icon ⚙ and ✎ below "Destination Settings". You can route the whole stream or a service/s from the input channel toward the available output channel (IP or RF). Two types of routing are possible

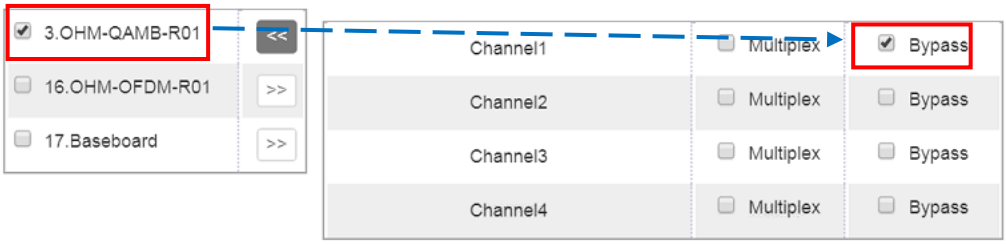
1. **Bypass mode.** In this mode, routes can only be done when outputting a whole input transport stream towards an output TS channel, this cannot be done when outputting a single service only. Bypass mode activation will not allow other services from other input TS to be mixed in the current TS output. Any attempts of routing other streams/services towards this channel will result in *"this channel won't be available at this time".*
2. **Multiplex mode** is used to create a new SPTS or MPTS. This mode allows the administrator to perform the following operations:
   a. Route a single service towards an output channel to create SPTS.
   b. Route services towards a single output channel to create MPTS.
   c. Route service/s AND stream/s from multiple channels towards a single output channel to create MPTS.



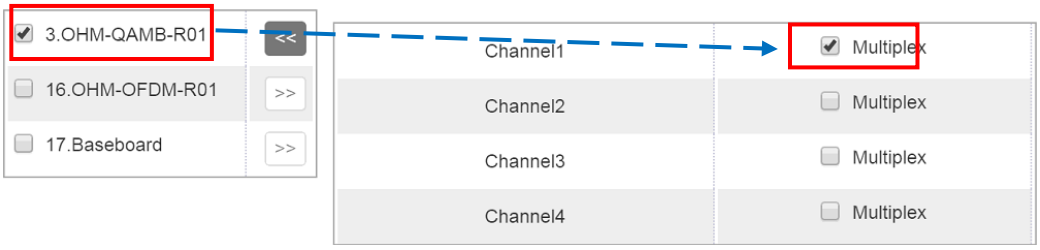
Service Configuration page interface



To use **Bypass** or **multiplex mode on stream level**, click the icon ⚙. When a new window appears, select the output stream/channel where the stream will be bypassed or multiplexed.



To use **Multiplexing mode on service level** click on the pencil icon ✎ on the right side in the line with the proper service. Then select the output stream (channel) where the service will be multiplexed.



Do not forget to click the Apply button

on the right side to make the change takes effect.

To clear the whole routing table, click

button.

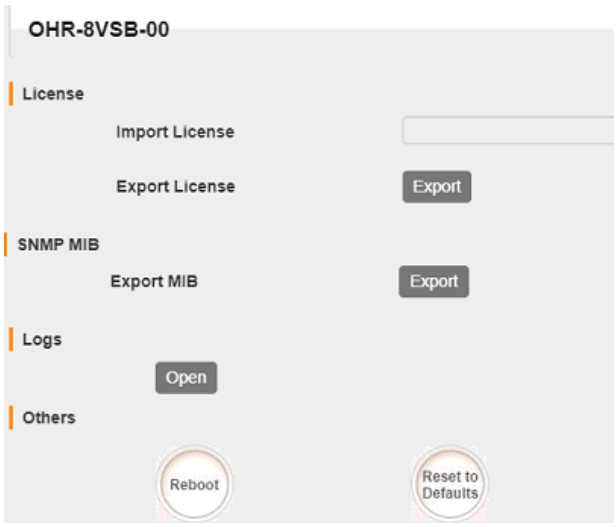
There is a channel scan button

Normally the input service list of each channel will show on this page, but when you change the input source, you should refresh the changed channels manually by selecting the channel and clicking **Channel Scan** button.

3.3.5.4 Modules System

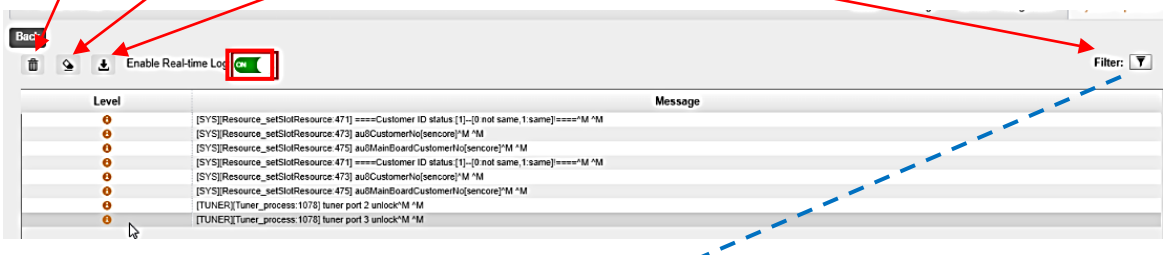
System tab allows you to perform the following tasks:

- Import / export license
- Log manages
- Reboot
- Factory Default



To open the log management menu, click on the **Open** button. The newly opened menu allows you to enable / disable logging.

After login is enabled, additional control buttons will be displayed:
- clean log, clean screen, export logs, filter dialog box



Filter

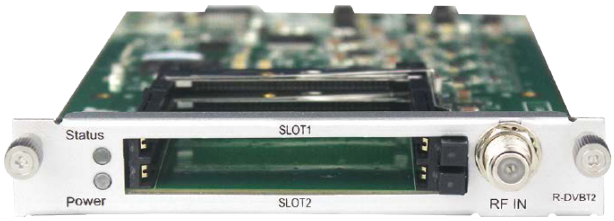
Level	
Level	**Operation**
Error	☑
Warning	☑
Information	☑
Debug	☐

Module List	
Module Name	**Operation**
SYS	☑
PARAMS	☑
UPGRADE	☑
TSPROCESS	☑
SIPROCESS	☑
LICENSE	☑

3.3.6 OHR-DVBT2CI-00

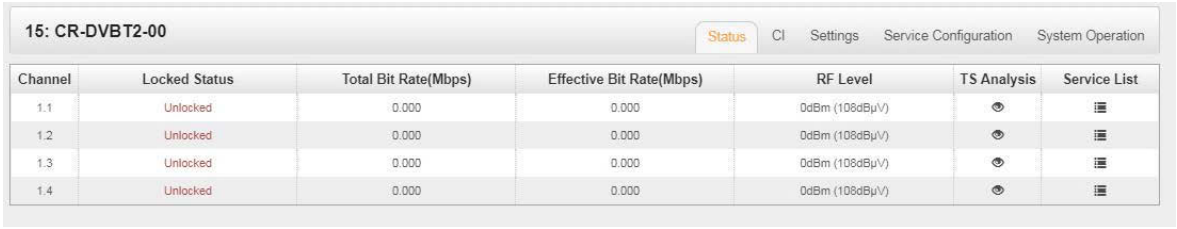
OHR-DVBT2CI-00 is a 4-channel DVBT/T2 receiving and descrambling module with 1 RF female connector and 2 CI slots. It can receive signals via 4 RF channels simultaneously and support 2 CAM cards descrambling.

.



3.3.6.1 Module Status

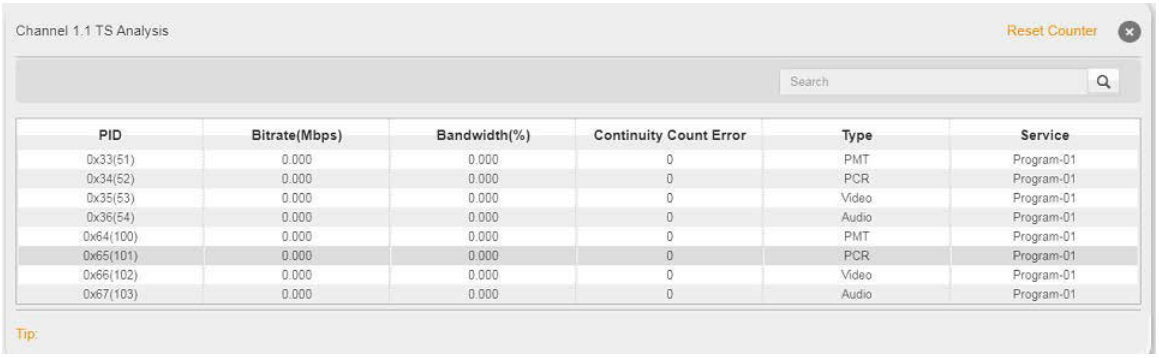
By selecting the OHR-DVBT2CI-00 in the module list, you will be automatically be redirected to the status page of the module. It shows the Chanel 1.1 to 1.4 that corresponds for the 4 input channels of the module. Locked Status of each channel shows the signals if these channels are locked or unlocked. If the signal is good, there will be values of Total Bitrate and Effective Bitrate.



Channel	Locked Status	Total Bit Rate(Mbps)	Effective Bit Rate(Mbps)	RF Level	TS Analysis	Service List
1.1	Unlocked	0.000	0.000	0dBm (108dBµV)		
1.2	Unlocked	0.000	0.000	0dBm (108dBµV)		
1.3	Unlocked	0.000	0.000	0dBm (108dBµV)		
1.4	Unlocked	0.000	0.000	0dBm (108dBµV)		

Total Bit rate in Mbps shows the receiving bitrate of each channel with the LOCKED status. Effective Bit Rate in Mbps which shows the actual bitrate of each receiving channel. RF Level of the input signal will show you the level of each locked channel.

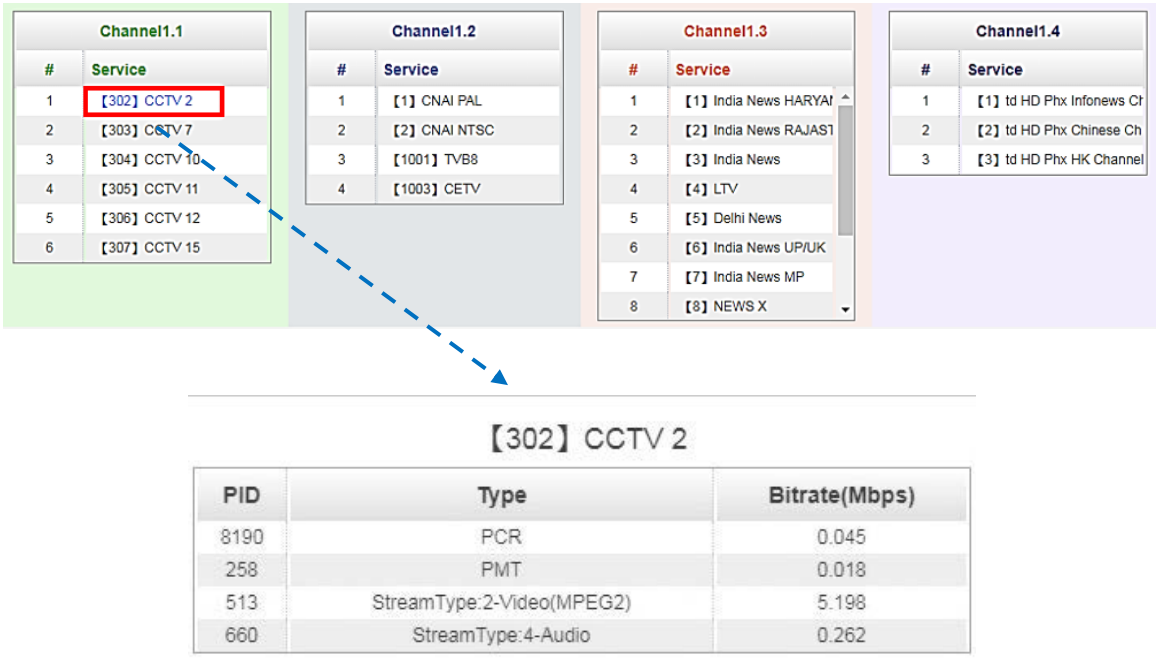
Clicking under the TS Analysis will display the information on the structure of the transport stream as shown in the picture below.



PID	Bitrate(Mbps)	Bandwidth(%)	Continuity Count Error	Type	Service
0x33(51)	0.000	0.000	0	PMT	Program-01
0x34(52)	0.000	0.000	0	PCR	Program-01
0x35(53)	0.000	0.000	0	Video	Program-01
0x36(54)	0.000	0.000	0	Audio	Program-01
0x64(100)	0.000	0.000	0	PMT	Program-01
0x65(101)	0.000	0.000	0	PCR	Program-01
0x66(102)	0.000	0.000	0	Video	Program-01
0x67(103)	0.000	0.000	0	Audio	Program-01

Clicking under Service List will display information of the services included in the transport stream as shown in the picture below.

Clicking on the service name under the service will display the detailed information of the service: PCR, PMT, Video and Audio PID and Bitrate as shown in the picture below.



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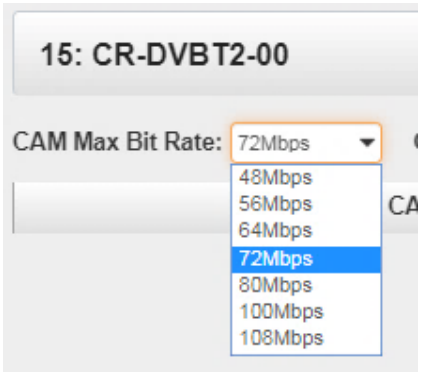
PID	Type	Bitrate(Mbps)
8190	PCR	0.045
258	PMT	0.018
513	StreamType:2-Video(MPEG2)	5.198
660	StreamType:4-Audio	0.262

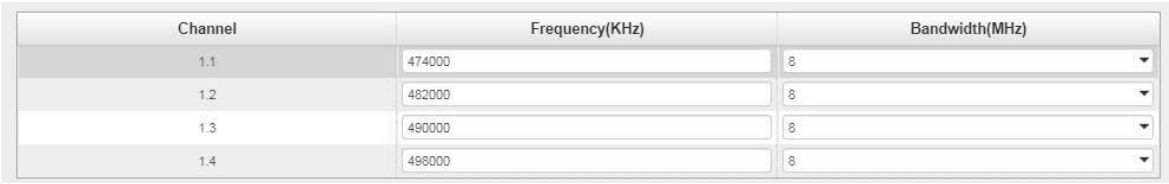
CAM Max Bit Rate (48Mbps to 108Mbps) can be chosen in a pull-down list.



3.3.6.2 Module Settings

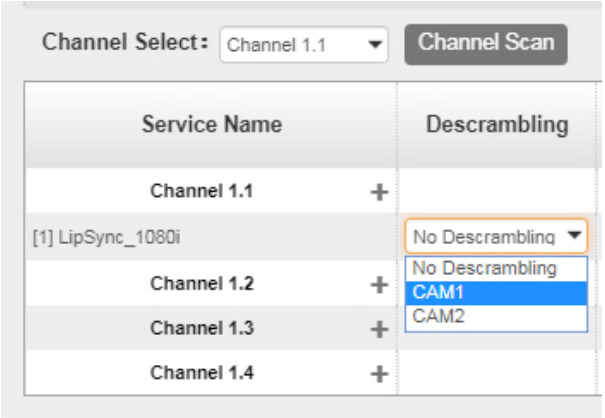
To input parameters of the source you want to receive in OHR-DVBT2-00, click Settings and input the Frequency and Bandwidth. The tables below show the range of Frequency and Bandwidth for the settings parameters.

Name	Range
Frequency (KHz)	48000~862000
Bandwidth (MHz)	6, 7, 8



3.3.6.3 Module Service Configuration

For Service Configuration and System Operation please refer to OHR-DVBC-00 module on page 33 to 34.
In Descrambling Settings there are CAM1, CAM2 and No Descrambling options. Select the correct CAM to decrypt the service and click Apply to make the change take effect or Clear Config button on the right side to clear all configuration.
*You need to click ***Apply*** button after you configure service to CAM for descrambling, otherwise the descrambling configuration will not be saved.



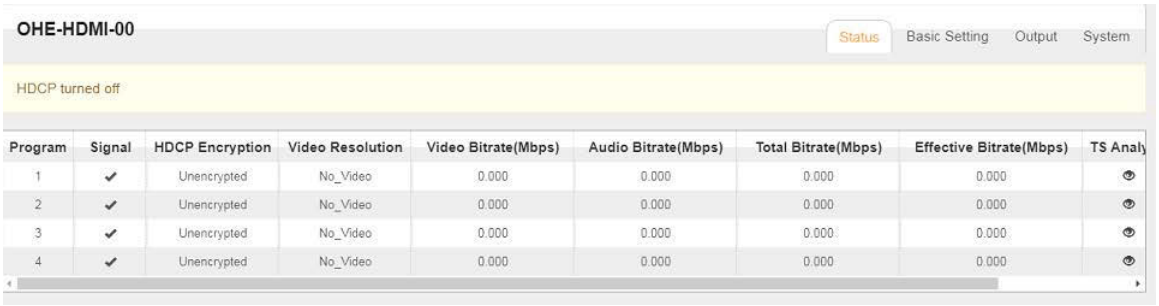
Encoder Modules

3.3.7 OHE-HDMI-00/R01

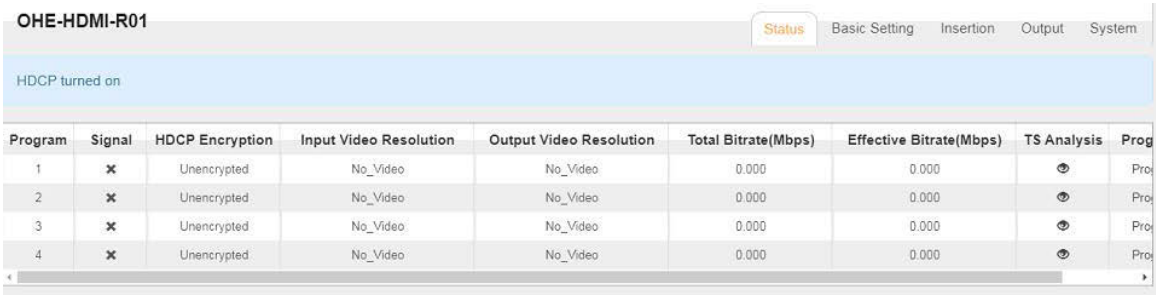
OHE6-HDMI-00/R01 is a 4-channel HDMI input encoder which supports H.264 HD/SD or MPEG-2 SD encoding. The module supports MPEG1-L2, AAC and AC3 audio encoding.

3.3.7.1 Module Status

Module Status for HDMI encoder shows the Bitrate of each port when an HDMI source is connected. Video resolution of the source video will also appear in the status. Other details in status are HDCP encryption, Video Bitrate and Audio Bitrate.

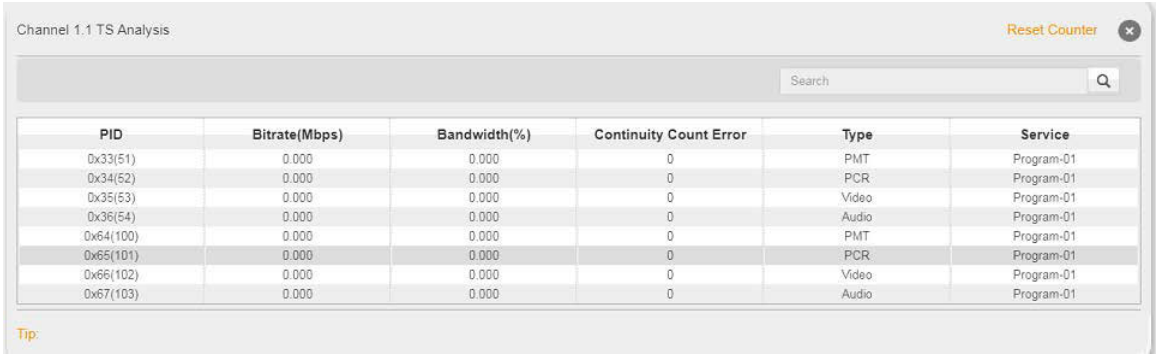


OHE-HDMI-00



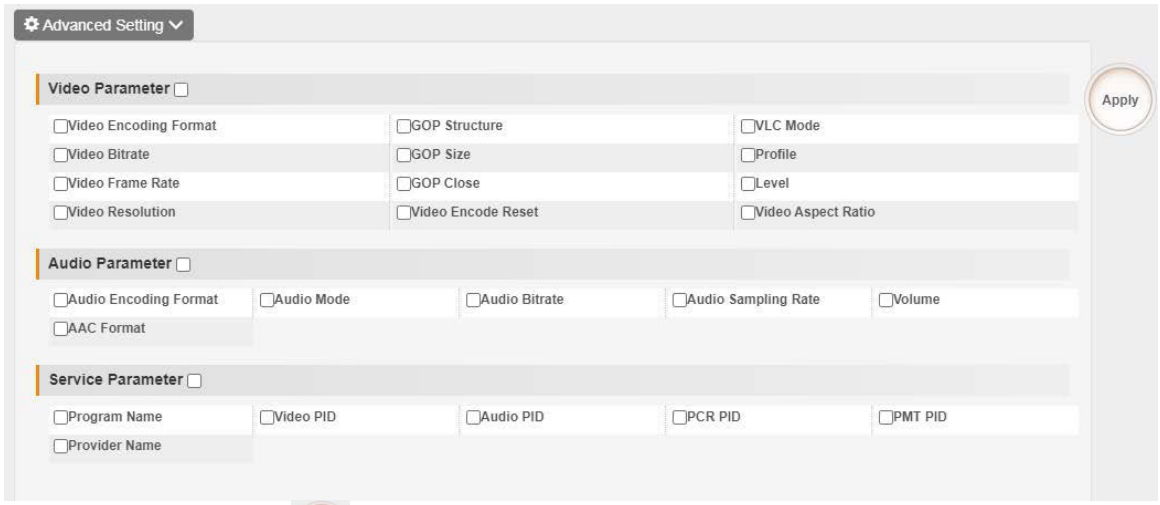
OHE-HDMI-R01

Clicking under the TS Analysis will display the information on the structure of the transport stream as shown in the picture below.



3.3.7.2 Module Basic Settings

Basic Settings for both OHE-HDMI-00 and OHE-HDMI-R01 are the same. Here you can modify the Video, Audio and Service Parameters. Click **Advanced Setting** to see all parameters you can modify and check specific parameters you want to set and see.



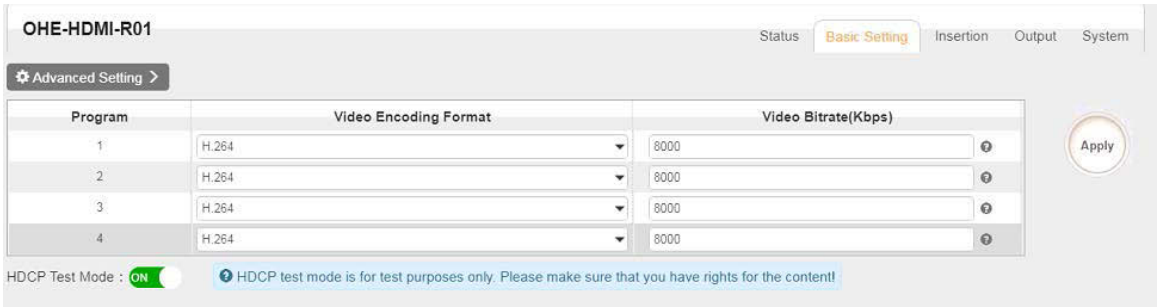
Click the Apply button on the right side for the changes to take effect.

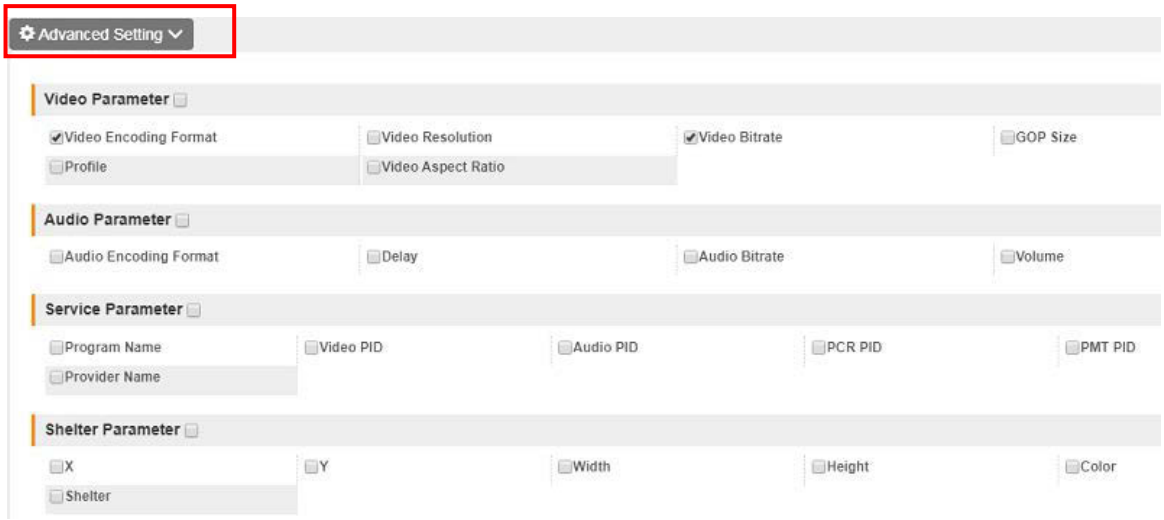
Video Parameter	Range	Video Parameter	Range
Video Encoding Format	H264, MPEG2	**Profile**	HIGH MAIN
Video Bitrate (Kbps)	600~20000	**GOP Size**	6~63
Video Resolution	Auto , 1920×1080_60i, 1920×1080_50i, 1920×1080_30p, 1920×1080_25p, 1080×720_60p, 1080×720_50p, 720×480_60i, 720×576_50i	**Video Aspect Ratio**	Auto 16x9_LetterBox 16x9_CutOff 4x3_PillarBox 4x3_CutOff

Audio Parameter	Range	Audio Parameter	Range
Audio Encoding Format	AC3 MPEG1_Layer2 MPEG2_AAC MPEG4_AAC	**Audio Bitrate (Kbps)**	128~384 (AC3) 64~384 (MPEG1_Layer2) 32~384 (MPEG2_AAC/ MPEG4_AAC)
Delay	Dual Channel Mono Stereo	**Volume**	0~8

OHE-HDMI-R01 is basically the same with OHE-HDMI-00 except a few differences on the parameter setting range.

Service Parameter	Range	Service Parameter	Range
Program Name	Length is 1~16	Audio PID	32~8190
Provider Name	Length is 1~16	PCR PID	32~8190
Video PID	32~8190	PMT PID	32~8190





Video Parameter	Range	Video Parameter	Range
Video Type	H264	**Profile**	HIGH MAIN
Video Resolution	Auto, 1920×1080_60i 1920×1080_50i 1920×1080_30p	**GOP Size**	1~60

	1920×1080_25p 1080×720_60p 1080×720_50p 720×480_60i 720×576_50i		
Video Bitrate (Kbps)	600~12000	**Video Aspect Ratio**	16x9 (HD) 4x3 (SD)

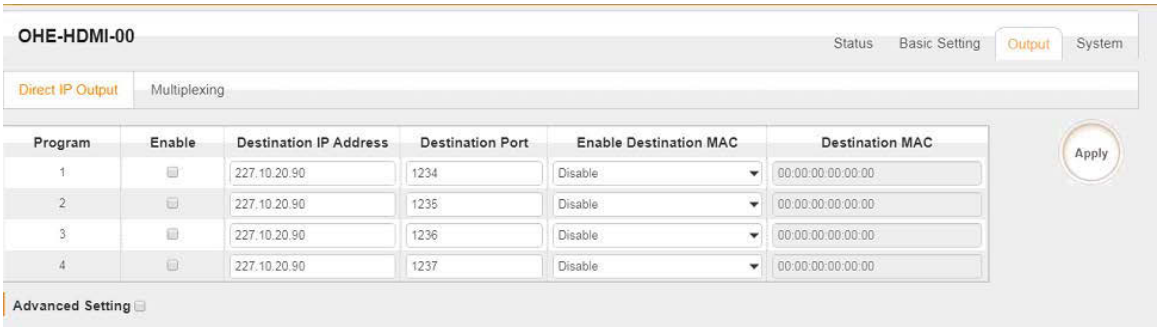
Audio Encoder Details	**Range**	**Audio Encoder Details**	**Range**
Audio Type	MPEG1_Layer2 AC3 AAC	**Volume (dB)**	-20~20
Delays (ms)	-2000~2000	**Audio Bit rate (Kbps)**	32~192 (MPEG1_Layer2 / AAC) 96~192 (AC3)

Shelter Parameters	**Range**	**Shelter Parameters**	**Range**
Shelter	Enable/Disable	**X**	0~1920 (Dual)
Y	0~1080 (Dual)	**Width**	2~1920 (Dual)
Height	2~1080 (Dual)	**Color**	White/Black/Blue/ Green/Red

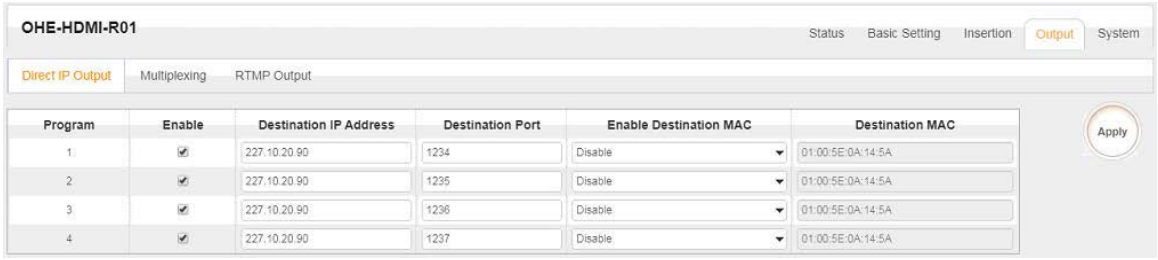
3.3.7.3 Output

For the Output, both models have direct IP output and multiplexing. But only OHE6-HDMI-R01 has RTMP output settings. Direct IP output is specifically for encoding a single program and outputting it directly to IP. This setting will not occupy multicast bandwidth baseboard.

If you want to use IP output channel on the encoder module and the baseboard IP module at same time, you should avoid the multicast IP addresses conflicts. If there are two same IP addresses enabled meantime, all the multicast videos will be affected.



OHE-HDMI-00



OHE-HDMI-R01

- **Destination IP Address** and **Destination Port:** for multicast IP addresses or unicast IP addresses and ports.
- **Enable Destination MAC:** Generally, you do not need to enable this option. This is reserved for exceptional cases when the unicast stream cannot be received with the unicast IP addresses. You can enable destination MAC and streaming out by setting Destination MAC.
- **Advance Setting (only available in OHE-HDMI-00):**

The second eth is reserved to output IP streams in an another different VLAN. Enabling the second eth and set **IP Address**, **Subnet Mask**, **Default Gateway** in the same segment of the Unicast IP (the another different VLAN), you can output the Unicast stream to the another VLAN.

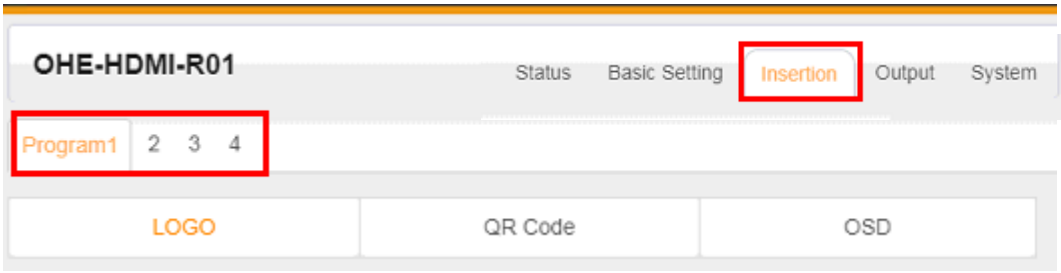
To use **Multiplexing mode on service level**

1. Click on (pencil) icon. There will always be a BaseBoard selection for the IP output and other Output option depending on the modules inserted.
2. Select the correct Output and Channel you want to output the Service.
3. Check Multiplex for the Channel you want to output,. You can output multiple services in same channel or output same service in multiple channels.

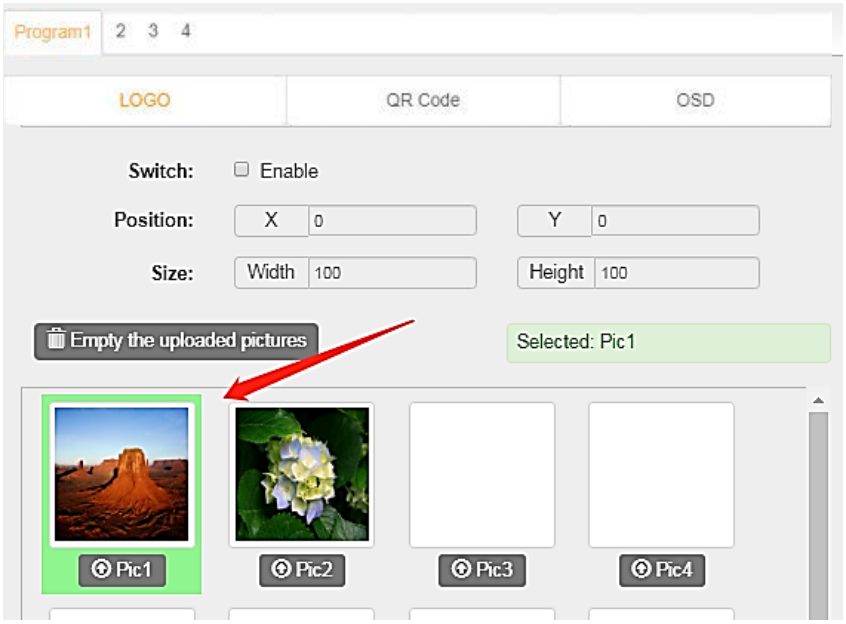
To use RTMP output to configure streaming to any website capable of receiving RTMP, it is necessary to create a new stream instance on the intended receiving platform and enter the corresponding URL and port.

3.3.7.4 Insertion (only available in the OHE-HDMI-R01 module)

You should choose a channel first before you set Insertion.



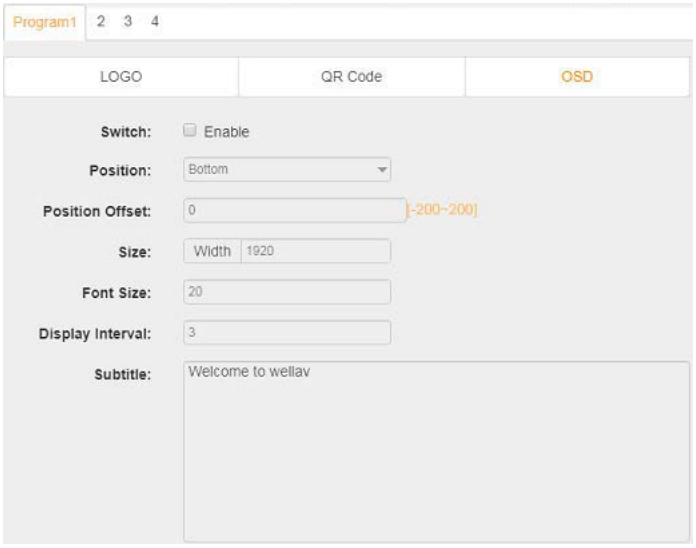
- **LOGO setting:** you can upload several pictures at the same time, and pick one to show on the screen. When you click the one you want to show that picture field will turn green.



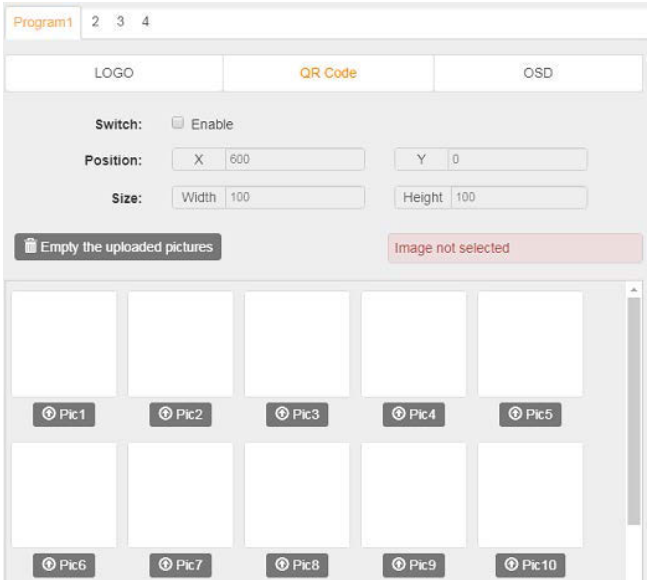
LOGO Parameter	Range	LOGO Parameter	Range
Position X	0~1920 (Dual)	**Position Y**	0~1080 (Dual)
Size width	0~1920 (Dual)	**Size Height**	0~1080 (Dual)

- **Subtitle setting:**

Subtitle Parameter	Range	LOGO Parameter	Range
Position	Bottom/Top/Middle	**Size width**	0~1920 (Dual)
Size Height	0~1080 (Dual)	**Front**	0~100



- **QR Code setting:** QR Code picture selection is same with LOGO setting.



LOGO Parameter	Range	LOGO Parameter	Range
Position X	0~1920 (Dual)	**Position Y**	0~1080 (Dual)
Size width	0~1920 (Dual)	**Size Height**	0~1080 (Dual)

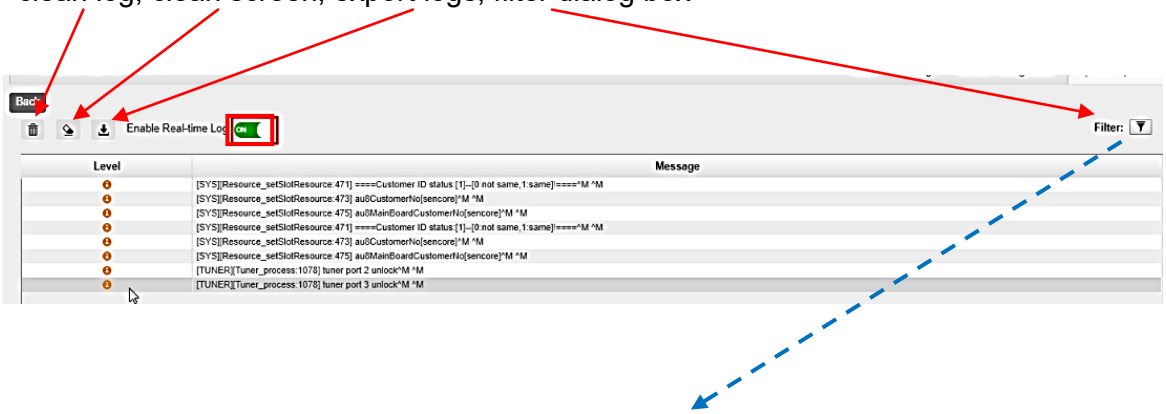
3.3.7.5 System

System tab allows you to perform the following tasks:

- Import / export license
- Log manages
- Reboot
- Factory Default

To open the log management menu, click on the **Open** button. The newly opened menu allows you to enable / disable logging.

After login is enabled, additional control buttons will be displayed:
- clean log, clean screen, export logs, filter dialog box



Filter

Level	
Level	**Operation**
Error	☑
Warning	☑
Information	☑
Debug	☐

Module List	
Module Name	**Operation**
SYS	☑
PARAMS	☑
UPGRADE	☑
TSPROCESS	☑
SIPROCESS	☑
LICENSE	☑

3.3.8 OHE-HDMI-02

OHE-HDMI-02 is a 2-channel HDMI encoder which supports H.264 HD/SD or MPEG-2 HD/SD encoding with 2-channel RCA for CC input. The module supports MPEG1-L2, AAC and AC3 audio encoding.

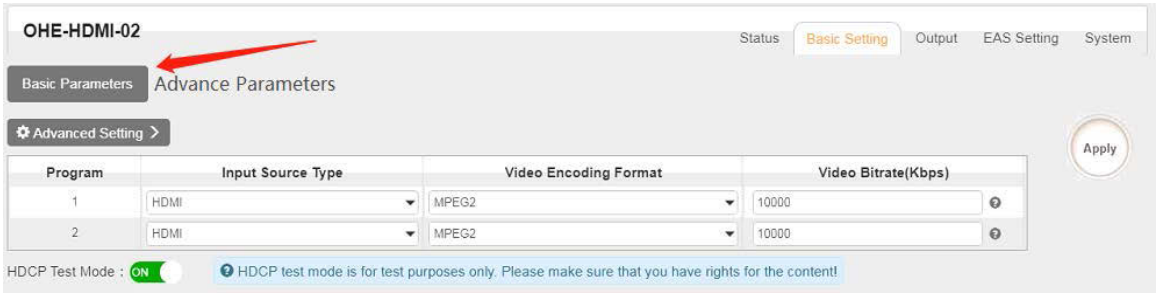
3.3.8.1 Module Status

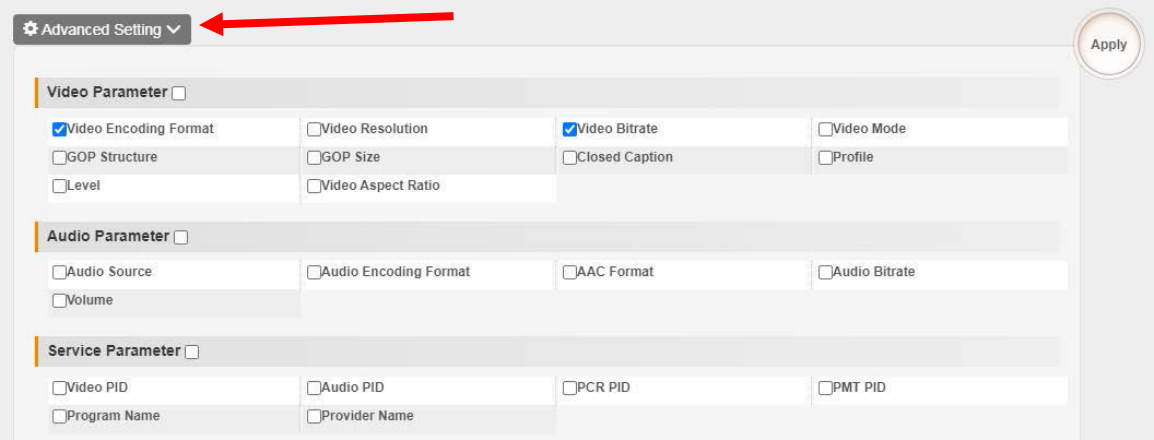
Module Status for the HDMI encoder shows the Bitrate of each port when an HDMI source is connected. The Status for OHE-HDMI-02 is the same with OHE-HDMI-00. The difereces are the number of channels shown in the status and some other parameters for example, OHE-HDMI-00 doesn't have Audio2 Bitrate and the input/output video resolution.

Program	Signal	HDCP Encryption	Input Video Resolution	Output Video Resolution	Video Bitrate(Mbps)	Audio1 Bitrate(Mbps)	Audio2 Bitrate(Mbps)
1	✖	Unencrypted	No_Video	No_Video	0.000	0.000	off
2	✖	Unencrypted	No_Video	No_Video	0.000	0.000	off

3.3.8.2 Module Basic Settings

Click **Advanced Setting** to see all parameters you can modify and check specific parameters you want to set and see. Click the **Apply** button on the right side to make the change take effect.





Video Parameter	Range	Video Parameter	Range
Video Encoding Format	H264, MPEG2	**GOP Size**	12~48
Video Resolution	Auto 1920×1080_60i 1920×1080_50i 1920×1080_30p 1920×1080_25p 1080×720_60p 1080×720_50p 720×480_60i 720×576_50i	**Level**	Level_3.0 Level_3.1 Level_3.2 Level_4.0 Level_4.1 Level_4.2
Video Bitrate (Kbps)	100 and 18000	**Profile**	High, Main, Baseline
Video Mode	CBR	**Closed Caption**	Enable, Disable
GOP Structure	IBBP, IPPP, IBP	**Video Aspect Ratio**	Auto 16x9 4x3

Audio Encoder Details	Range	Audio Encoder Details	Range
Audio Encoding Format	AC3 AC3_Passthrough	**Audio Bitrate (Kbps)**	128~384 (AC3)

	MPEG1_Layer2 MPEG2_AAC MPEG4_AAC AAC_HE_V2		64~384 (MPEG1_Layer2) 64~384 (MPEG2_AAC/ MPEG4_AAC) 32~384 (AAC_HE_V2)
Audio Source	HDMI	**Volume (dB)**	0~8
AAC Format	ADTS, LATM		

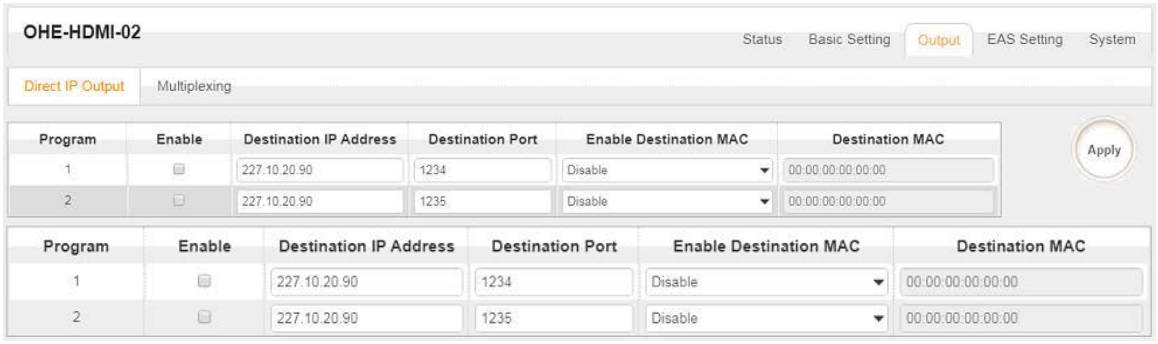
Service Parameter	Range	Service Parameter	Range
Program Name	String between 1~31	Audio PID	32~8190
Provider Name	String between 0~31	PCR PID	32~8190
Video PID	32~8190	PMT PID	32~8190

The OHE-HDMI-02 module supports two sets of audio and video input. Each set includes 1 HDMI port/1 component portand1 analog port. It supports dual audio encoding per channel. Dual audio all come from HDM Iinput with the same content and the encoding format can be the same or different.

3.3.8.3 Module Output

Direct IP output is specifically for encoding a single program and outputting it directly to IP. This setting will not occupy multicast bandwidth of the baseboard.

If you want to use IP output channel on the encoder module and the baseboard IP module at same time, you should avoid the multicast IP addresses conflicts. If there are two same IP addresses enabled meantime, all the multicast videos will be affected.



- **Destination IP Address** and **Destination Port:** for multicast IP addresses or unicast IP addresses and ports.
- **Enable Destination MAC:** Generally, you do not need to enable this option. This is reserved for exceptional cases when the unicast stream cannot be received by with the unicast IP addresses. You can enable destination MAC and streaming out by setting Destination MAC.

To use **Multiplexing mode on service level**

1. Click on (pencil) icon. There will always be a BaseBoard selection for the IP output and other Output options depending on the module inserted.

2. Select the correct Output and Channel you want to output the service to.
3. Check Multiplex on the channel you want to outputt. You can output multiple services to one channel or output one service to multiple channels.

3.3.8.4 EAS Settings

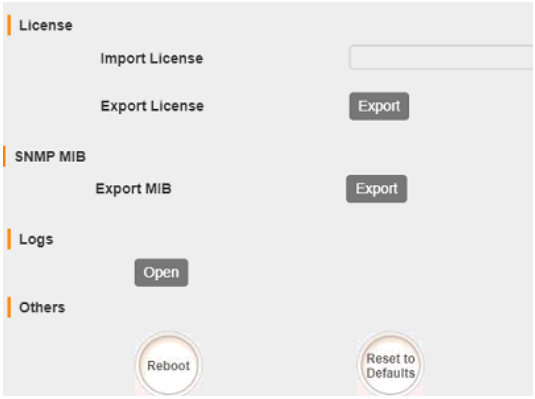
When the EAS source is triggered, the Audio and Video from the encoder will be replaced by the Audio and Video from the EAS module.

On this page, you need to input the EAS Source Multicast Address, Command port and Data port. This information can be seen on the EAS page.

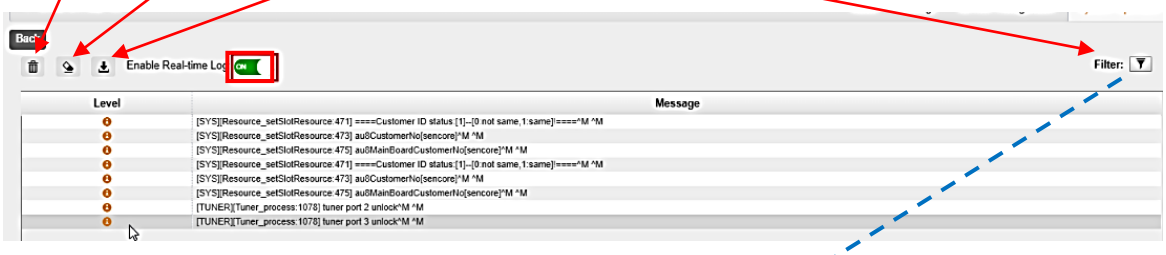
3.3.8.5 System

System tab allows you to perform the following tasks:

- Import / export license
- Log manages
- Reboot
- Factory Default



To open the log management menu, click on the **Open** button. The newly opened menu allows you to enable / disable logging.
After login is enabled, additional control buttons will be displayed:
- clean log, clean screen, export logs, filter dialog box



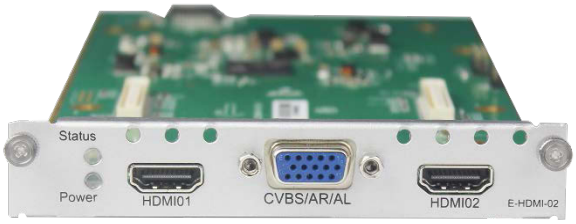
Filter

Level	
Level	**Operation**
Error	☑
Warning	☑
Information	☑
Debug	☐

Module List	
Module Name	**Operation**
SYS	☑
PARAMS	☑
UPGRADE	☑
TSPROCESS	☑
SIPROCESS	☑
LICENSE	☑

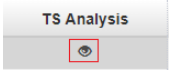
3.3.9 OHE-HDMI-02C

OHE-HDMI-02C is a 2-channel HDMI or component HD encoder. It supports H.264 / MPEG-2 HD/SD, MPEG1L2, AAC (optional), AC3 (optional) audio, CC subtitle and analog audio input.



3.3.9.1 Module Status

Module Status for HDMI-02C encoder shows the Bitrate of each port when an HDMI source is connected. Video resolution of the source video will also appear on the status.

Clicking on the 

button will display information on the structure of the transport stream. This will show more details about the Service in the channel depending on the parameters you set on the Module Setting.

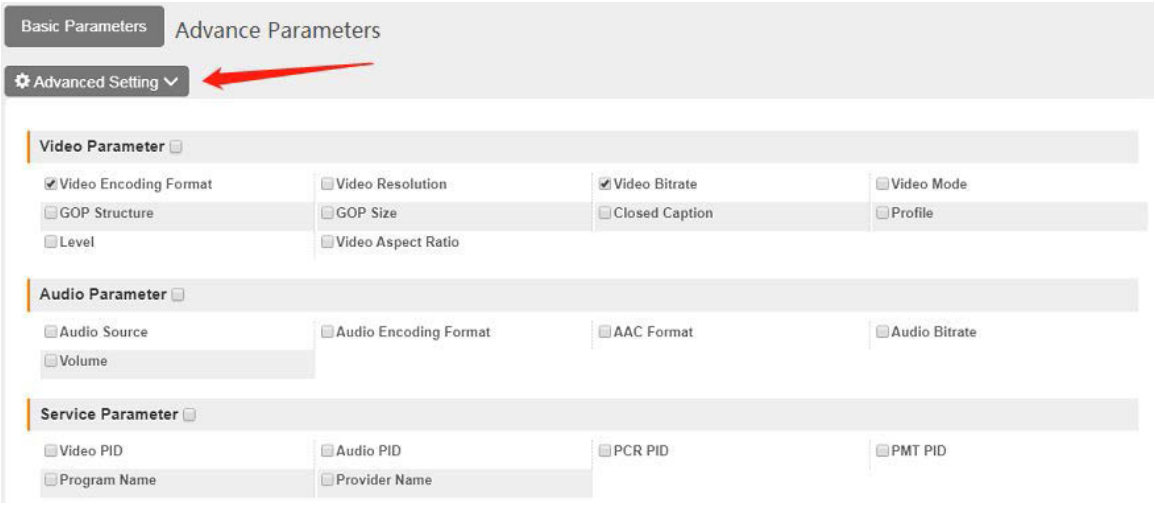
HDCP turned off

Program	Signal	HDCP Encryption	Input Video Resolution	Output Video Resolution	Video Bitrate(Mbps)	Audio1 Bitrate(Mbps)	Audio2 Bitrate(Mbps)
1	✖	Unencrypted	No_Video	No_Video	0.000	0.000	off
2	✖	Unencrypted	No_Video	No_Video	0.000	0.000	off

3.3.9.2 Module Basic Settings

In module Setting, there are Basic and Advanced parameters.
In Basic Parameters, here you can edit or modify Video parameters (resolution, GOP, et c.), audio parameters (bitrate, volume, etc.) and service parameters (PID of Video, audio, PMT etc.)

Click **Advanced Setting** to see all parameters you can modify and check specific parameters you want to set and see. Click the Apply button on the right side to make the changes take effect.



Click **Advanced Setting** in the line to set encoding parameters.

Video Parameter	Range	Video Parameter	Range
Video Encoding Format	H264, MPEG2	**GOP Size**	12~48
Video Resolution	Auto, 1920×1080_60i , 1920×1080_50i , 1920×1080_30p , 1920×1080_25p , 1080×720_60p , 1080×720_50p , 720×480_60i , 720×576_50i	**Level**	Level_3.0 Level_3.1 Level_3.2 Level_4.0 Level_4.1 Level_4.2
Video Bitrate (Kbps)	100 and 18000	**Profile**	High, Main, Baseline
Video Mode	CBR	**Closed Caption**	Enable, Disable
GOP Structure	IBBP, IPPP, IBP	**Video Aspect Ratio**	Auto 16x9 4x3

Audio Encoder Details	Range	Audio Encoder Details	Range
Audio Encoding Format	AC3 AC3_Passthrough MPEG1_Layer2 MPEG2_AAC MPEG4_AAC AAC_HE_V2	**Audio Bitrate (Kbps)**	128~384 (AC3) 64~384 (MPEG1_Layer2) 64~384 (MPEG2_AAC/ MPEG4_AAC) 32~384 (AAC_HE_V2)
Audio Source	HDMI, Analog	**Volume (dB)**	0~8

AAC Format	ADTS, LATM		

Service Parameter	Range	Service Parameter	Range
Program Name	String between 1~31	Audio PID	32~8190
Provider Name	String between 0~31	PCR PID	32~8190
Video PID	32~8190	PMT PID	32~8190

The OHE-HDMI-02C module supports two sets of audio and video input in total. Each set includes 1 HDMI port/1 component portand1 analog port.

If the video comes from HDMI, there are three options for encoding dual audio:

1. One audiocomes from HDMI and the other comes from analog; the encoding format can be the same or different.
2. Dual audio all come from HDMI with the same content and the encoding format can be the same or different.
3. Dual audio all come from the analog input with the same content and the encoding format can be the same or different.

If the video comes from the component, there is only one choicefor encoding dual audio:

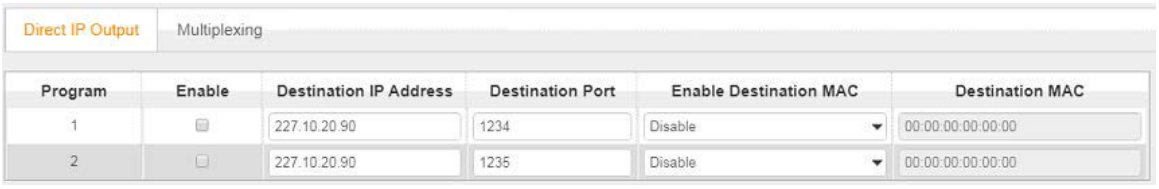
Dual audio all come from the analog input with the same content and the encoding format can be the same or different.

3.3.9.3 IP Output

This feature is specifically for encoding a single program and outputting it directly to IP. It will not occupy multicast bandwidth of the baseboard.

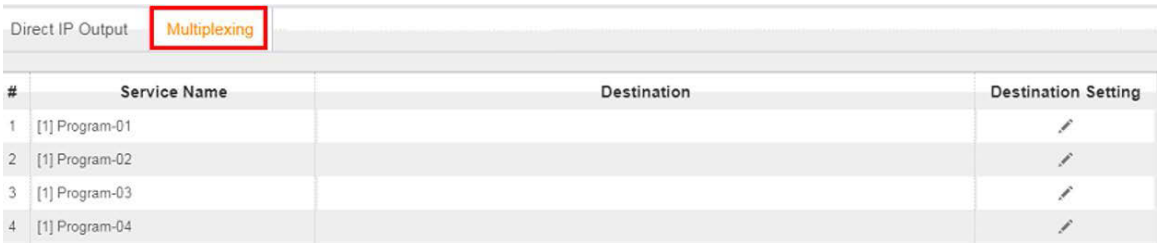
If you want to use IP output channel on the encoder module and the baseboard IP module at same time, you should avoid the multicast IP addresses conflicts. If there are two same IP addresses enabled meantime, all the multicast videos will be affected.

- **Destination IP Address** and **Destination Port:** for multicast IP addresses or unicast IP addresses and ports.
- **Enable Destination MAC:** Generally, you do not need to enable this option. This is reserved for exceptional cases when the unicast stream cannot be received using unicast IP addresses. You can enable destination MAC and streaming out by setting Destination MAC.



To use **Multiplexing mode on service level**:

1. Click on (pencil) icon. There will always be a BaseBoard selection for the IP output and other Output options depending on the module inserted.
2. Select the correct Output and Channel you want to output the service to.
3. Check Multiplex on the channel you want to outputt. You can output multiple services to one channel or output one service to multiple channels.



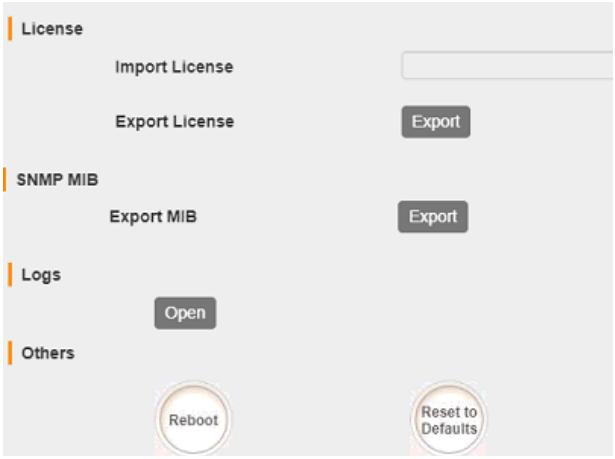
3.3.9.4 EAS Settings

When the EAS source is triggered, the Audio and Video from the encoder will be replaced by the Audio and Video from the EAS module.

3.3.9.5 System Operation

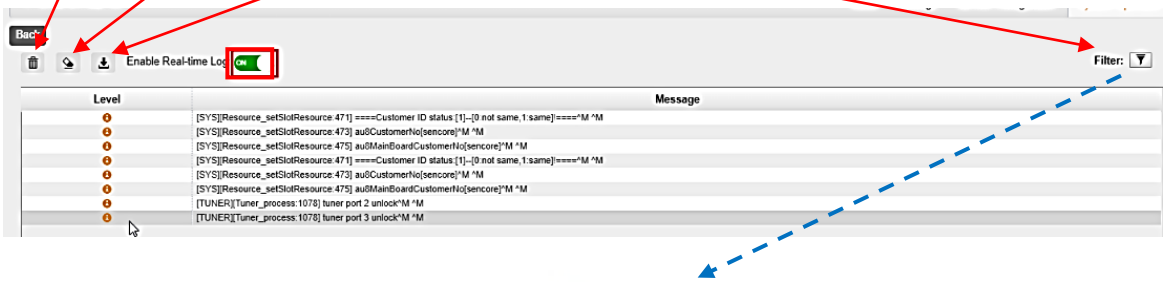
System tab allows you to perform the following tasks:

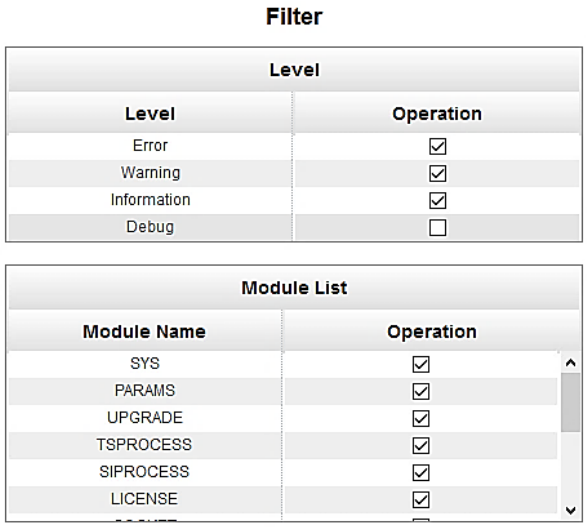
- Import / export license
- Log manages
- Reboot
- Factory Default



To open the log management menu, click on the **Open** button. The newly opened menu allows you to enable / disable logging.

After login is enabled, additional control buttons will be displayed:
- clean log, clean screen, export logs, filter dialog box



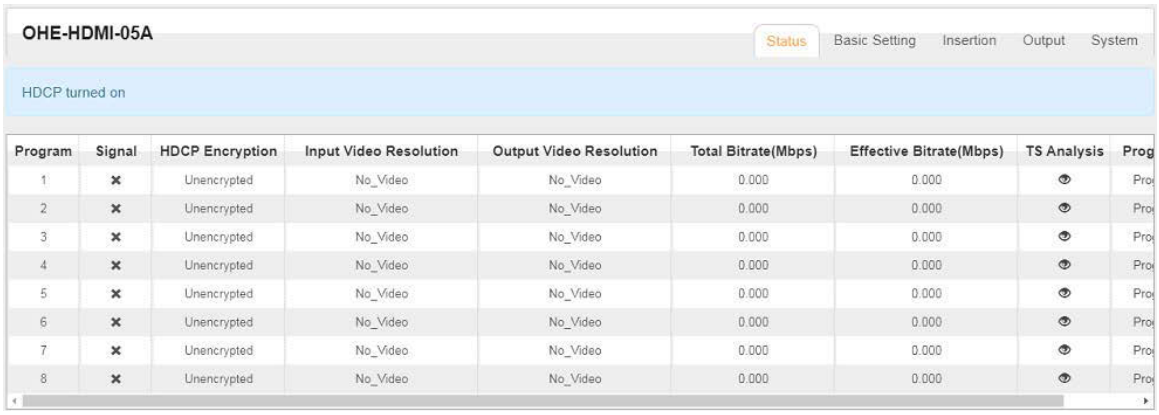


3.3.10 OHE-HDMI-05/05A

OHE-HDMI-05/05A module is a 4/8-channel HDMI encoding module that supports H.264. This supports AC3 and AAC via license and supports OSD Subtitle, logo picture and QR code overlay. OHE-HDMI-05 occupies 1 slot in the chassis and OHE-HDMI-05A occupies 2 slots in OmniHub 16 chassis.

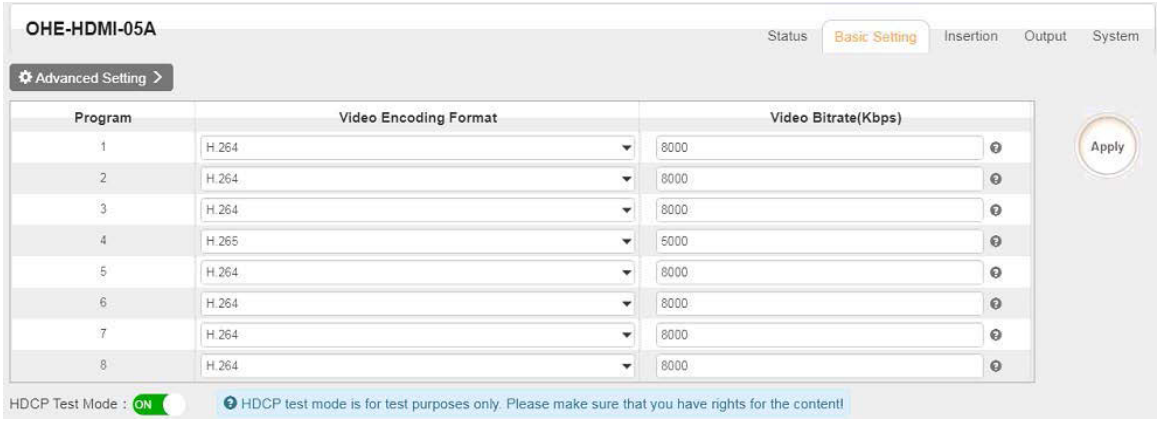
3.3.10.1 Module Status

Like other Hdmi encoder module. The Status of OHE-HDMI-05/05A shows the Bitrate, input and output Resolution, TS analysis and Service List on each channel as shown in the image below.



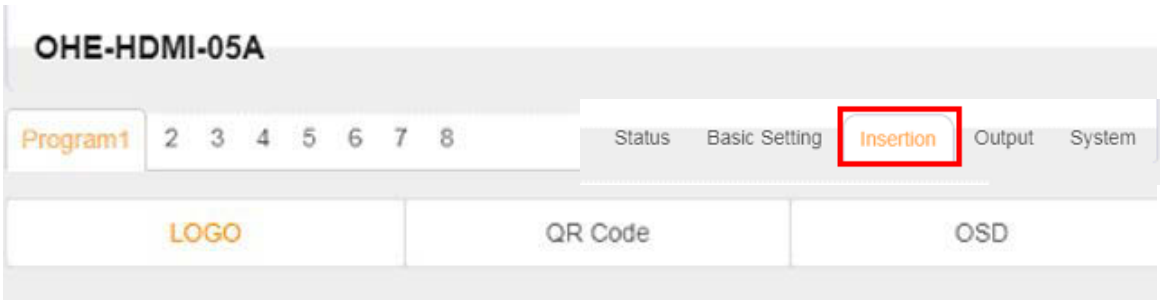
3.3.10.2 Module Basic Settings

This page allows you to modify the Video, Audio and Service Parameters. Click **Advanced Settings** to see all parameters you can modify and check specific parameters you want to set and see. Click the **Apply** button on the right side to make the change take effect.

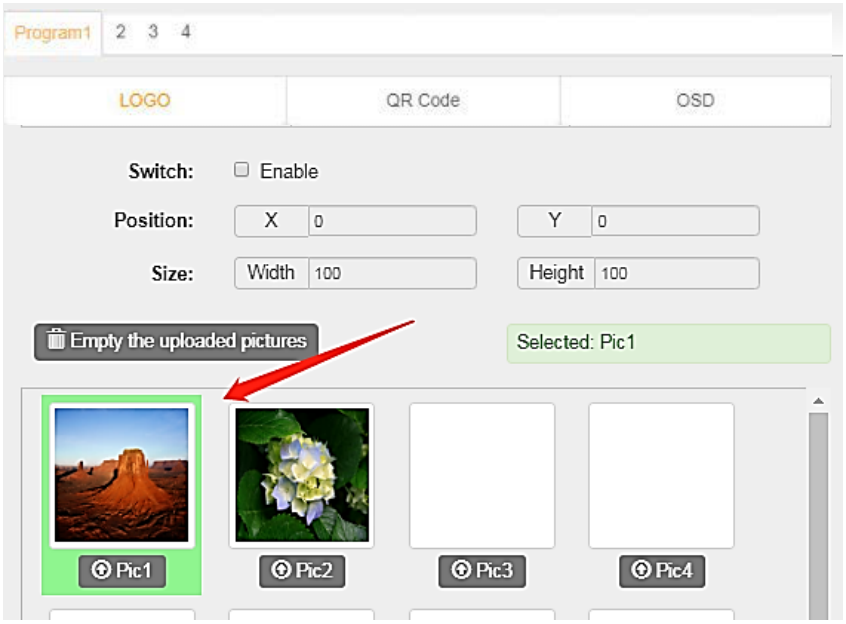


3.3.10.3 Module Insertion Settings

You should choose a channel first before you set Insertion.



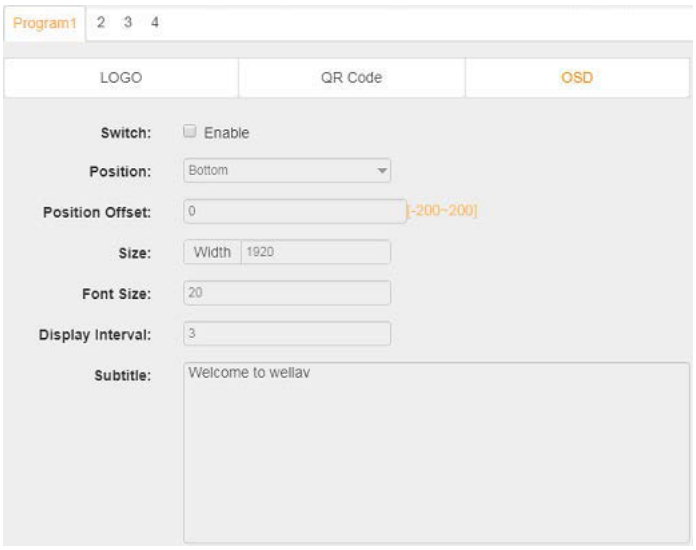
- **LOGO setting:** you can upload several pictures at the same time, and pick one to show on the screen. When you click the one you want to show that picture field will turn green.



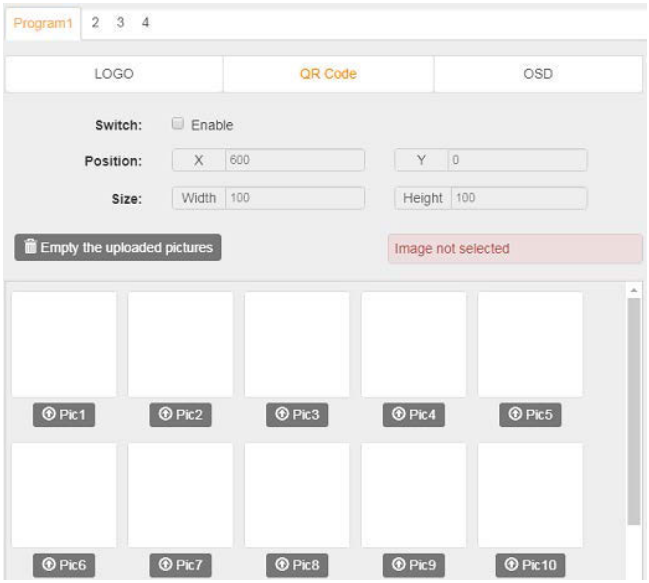
LOGO Parameter	Range	LOGO Parameter	Range
Position X	0~1920 (Dual)	**Position Y**	0~1080 (Dual)
Size width	0~1920 (Dual)	**Size Height**	0~1080 (Dual)

- **Subtitle setting:**

Subtitle Parameter	Range	LOGO Parameter	Range
Position	Bottom/Top/Middle	**Size width**	0~1920 (Dual)
Size Height	0~1080 (Dual)	**Front**	0~100



- **QR Code setting:** QR Code picture selection is same to LOGO setting.

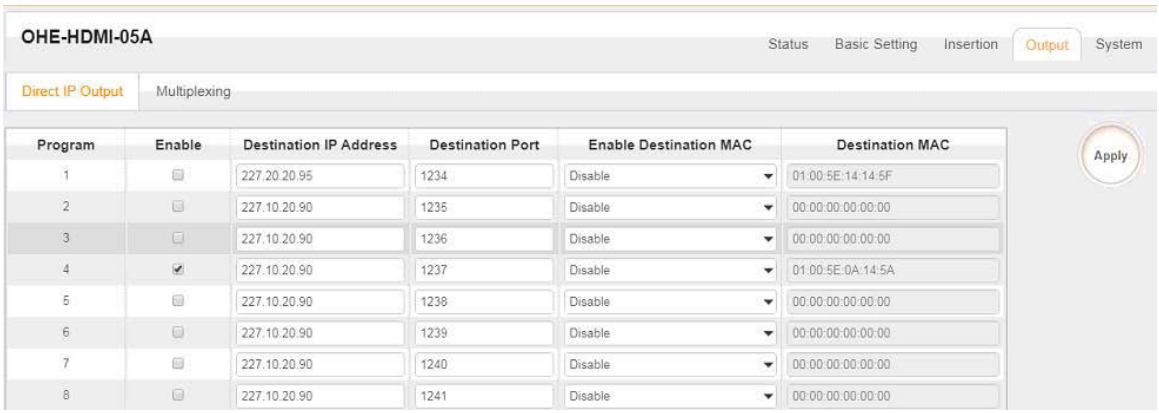


LOGO Parameter	Range	LOGO Parameter	Range
Position X	0~1920 (Dual)	**Position Y**	0~1080 (Dual)
Size width	0~1920 (Dual)	**Size Height**	0~1080 (Dual)

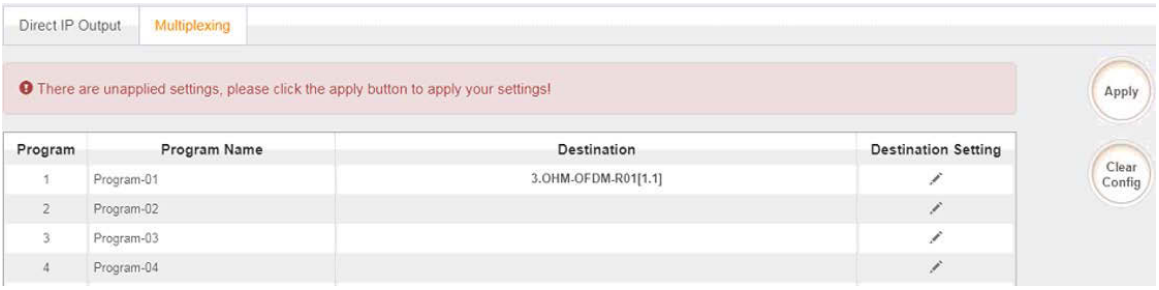
3.3.10.4 Module IP Output

This feature is specifically for encoding a single programand outputting directly to IP. It will not occupy multicast bandwidth of baseboard.

If you want to use IP output channel on the encoder module and the baseboard IP module at same time, you should avoid the multicast IP addresses conflicts. If there are two same IP addresses enabled meantime, all the multicast videos will be affected.



- **Destination IP Address** and **Destination Port:** for multicast IP addresses or unicast IP addresses and ports.
- **Enable Destination MAC:** Generally, you do not need to enable this option. This is reserved for exceptional cases when the unicast stream cannot be received with using unicast IP addresses. You can enable destination MAC and streaming out by setting Destination MAC.



To use **Multiplexing mode on service level**:

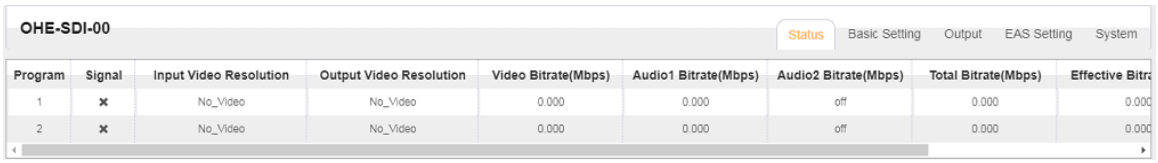
1. Click on (pencil) icon. There will always be a BaseBoard selection for the IP output and other Output options depending on the module inserted.
2. Select the correct Output and Channel you want to output the service to.
3. Check Multiplex on the channel you want to outputt. You can output multiple services to one channel or output one service to multiple channels.

3.3.11 OHE-SDI-00

OHE-SDI-00 module supports 2 CH of H.264/AVC HD/SD (up to 1080p60) or MPEG-2 HD/SD (up to 1080i60) encoding via SDI/CVBS input. MPEG1-L2, AAC and AC3 audio encoding are available with optional licenses, 2×BNC, 2×6-pins interfaces for analog audio inputs

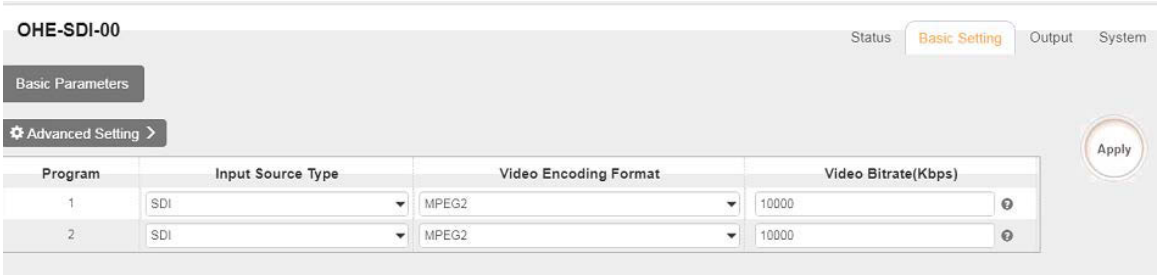
3.3.11.1 Module Status

Status page for OHE-SDI shows the following parameters: Signal Status, Input Video Resolution, Output Video Resolution, Video Bitrate, Audio Bitrate, Audio2 Bitrate, Total Bitrate, Effective Bitrate, TS anaylsis and Program Name. The following parameters will display values once a good SDI source is connected.

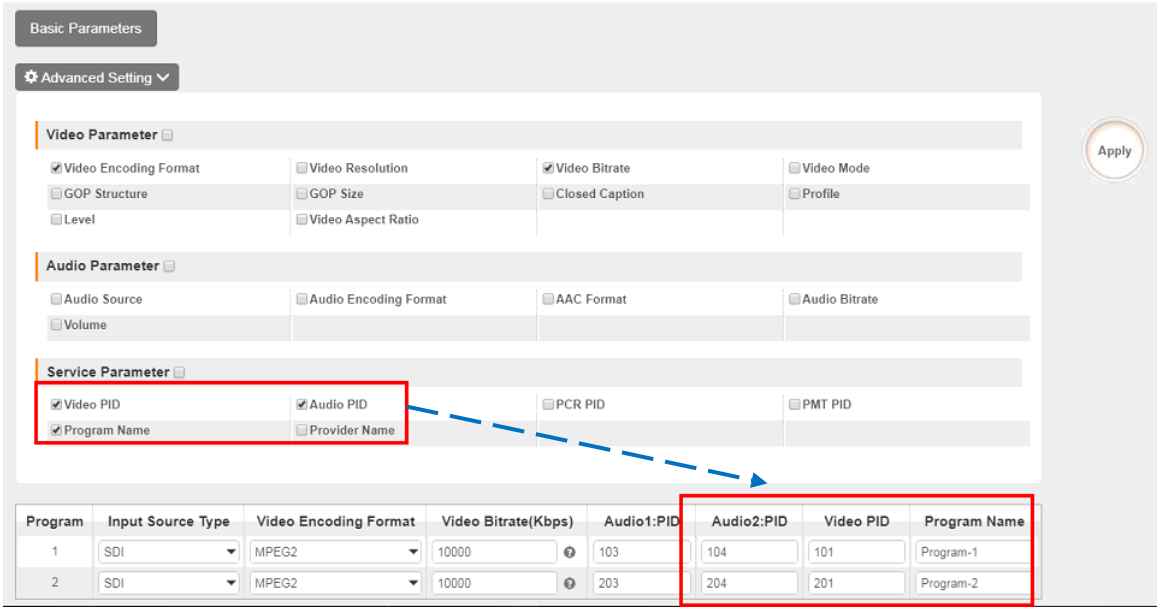


3.3.11.2 Module Basic Settings

The Setting for SDI has Basic and Advanced Parameters. Basic Parameters are the same with the other Encoder Parameters where we can modify the Video, Audio and Service Parameters as shown in the picture below.



Advanced parameters will display the list of parameters that you can enable and modify.



Video Parameter	Range	Video Parameter	Range

Video Encoding Format	H264, MPEG2	GOP Size	12~48
Video Resolution	Auto, 1920×1080_60i , 1920×1080_50i , 1920×1080_30p , 1920×1080_25p , 1080×720_60p , 1080×720_50p , 720×480_60i , 720×576_50i	Level	Level_1,0 Level_1B Level_1.1 Level_1.2 Level_1.3 Level_2.0 Level_2.1 Level_2.2 Level_3.0 Level_3.1 Level_3.2 Level_4.0 Level_4.1 Level_4.2
Video Bitrate (Kbps)	100 ~18000	Profile	High, Main, Baseline
Video Mode	CBR	Closed Caption	Enable, Disable
GOP Structure	IBBP, IPPP, IBP, I	Video Aspect Ratio	Auto 16x9 4x3

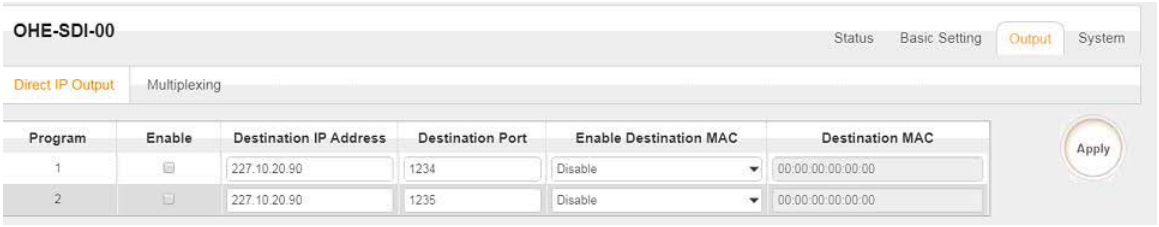
Audio Encoder Details	Range	Audio Encoder Details	Range
Audio Encoding Format	AC3 AC3_Passthrough MPEG1_Layer2 MPEG2_AAC MPEG4_AAC	Audio Bitrate (Kbps)	128~384 (AC3) 64~384 (MPEG1_Layer2) 64~384 (MPEG2_AAC/ MPEG4_AAC)
Audio Source	SDI1 SDI2 SDI3 SDI4 Analog	Volume (dB)	-20~20
AAC Format	ADTS, LATM		

Service Parameter	Range	Service Parameter	Range
Program Name	String between 1~31	Audio PID	32~8190
Provider Name	String between 0~31	PCR PID	32~8190

3.3.11.3 IP Output

This feature is specifically for encoding single program and outputting directly to IP. It will not occupy multicast bandwidth of the baseboard.

If you want to use IP output channel on the encoder module and the baseboard IP module at same time, you should avoid the multicast IP addresses conflicts. If there are two same IP addresses enabled meantime, all the multicast videos will be affected.



- **Destination IP Address** and **Destination Port:** for multicast IP addresses or unicast IP addresses and ports.
- **Enable Destination MAC:** Generally, you do not need to enable this option. This is reserved for exceptional cases when the unicast stream cannot be received by with the unicast IP addresses. You can enable destination MAC and streaming out by setting Destination MAC.

The second eth is reserved to output IP streams in an another different VLAN. Enabling the second eth and set **IP Address**, **Subnet Mask**, **Default Gateway** in the same segment of the Unicast IP (the another different VLAN), you can output the Unicast stream to the another VLAN.

To use **Multiplexing mode on service level**:

1. Click on ✎ (pencil) icon. There will always be a BaseBoard selection for the IP output and other Output options depending on the module inserted.
2. Select the correct Output and Channel you want to output the service to.
3. Check Multiplex on the channel you want to outputt. You can output multiple services to one channel or output one service to multiple channels.

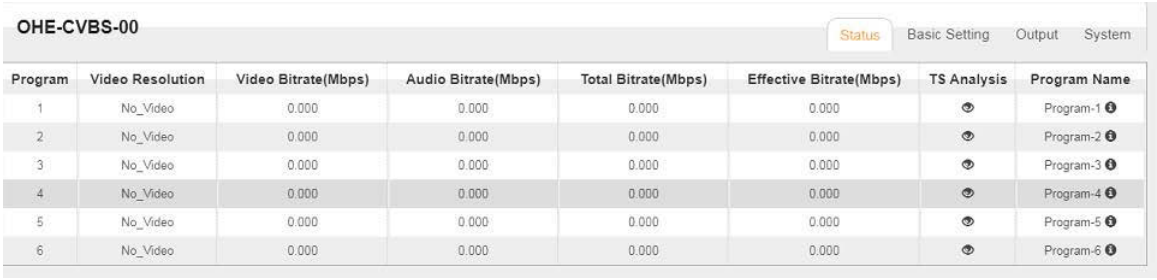
3.3.12 OHE-CVBS-00/R01/R01A

OHE-CVBS-00/R01/R01A is a 6/8/16-channel CVBS encoder with 2/2/4 DB15 connectors (for 3/4/4-channel respectively). It supports H.264/MPEG-2 SD encoding and MPEG1-L2, AAC (optional) and AC3 (optional) audio. One difference of the two modules is, OHE-CVBS-R01 has insertion features while OHE-CVBS-00 doesn't have.

OHE-CVBS-00/R01 (6/8 CH)

OHE-CVBS-R01A (16 CH)

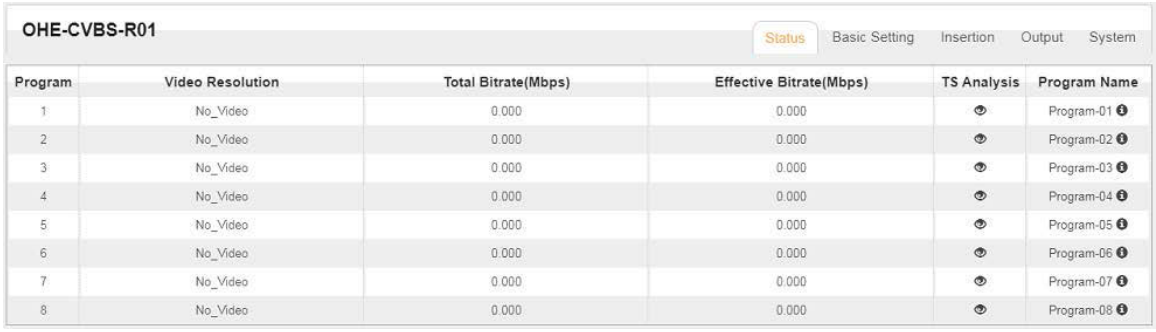
Like all other modules. OHE-CVBS Status shows the bitrate of each channel and you can check the TS Analysis and Service List here. See picture below.



OHE-CVBS-00

Status | Basic Setting | Output | System

Program	Video Resolution	Video Bitrate(Mbps)	Audio Bitrate(Mbps)	Total Bitrate(Mbps)	Effective Bitrate(Mbps)	TS Analysis	Program Name
1	No_Video	0.000	0.000	0.000	0.000		Program-1
2	No_Video	0.000	0.000	0.000	0.000		Program-2
3	No_Video	0.000	0.000	0.000	0.000		Program-3
4	No_Video	0.000	0.000	0.000	0.000		Program-4
5	No_Video	0.000	0.000	0.000	0.000		Program-5
6	No_Video	0.000	0.000	0.000	0.000		Program-6

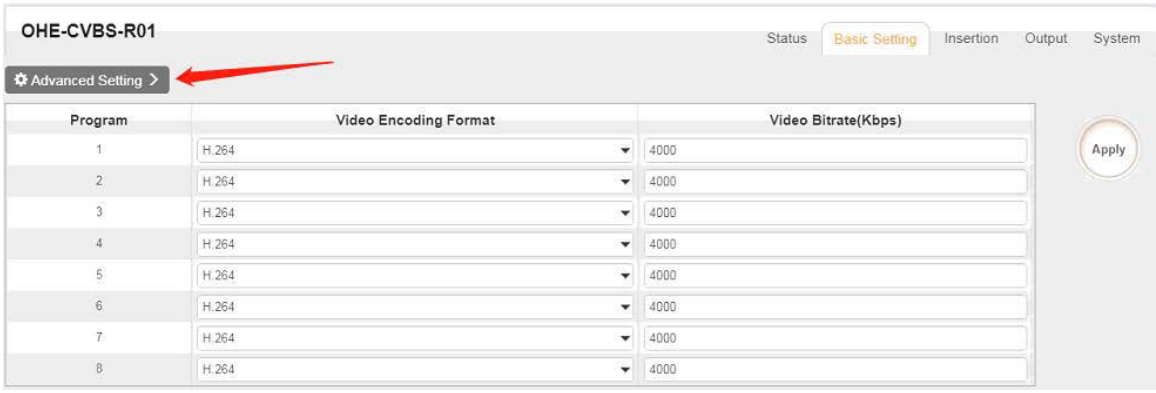


OHE-CVBS-R01

Status | Basic Setting | Insertion | Output | System

Program	Video Resolution	Total Bitrate(Mbps)	Effective Bitrate(Mbps)	TS Analysis	Program Name
1	No_Video	0.000	0.000		Program-01
2	No_Video	0.000	0.000		Program-02
3	No_Video	0.000	0.000		Program-03
4	No_Video	0.000	0.000		Program-04
5	No_Video	0.000	0.000		Program-05
6	No_Video	0.000	0.000		Program-06
7	No_Video	0.000	0.000		Program-07
8	No_Video	0.000	0.000		Program-08

3.3.12.1 Module Basic Settings



OHE-CVBS-R01

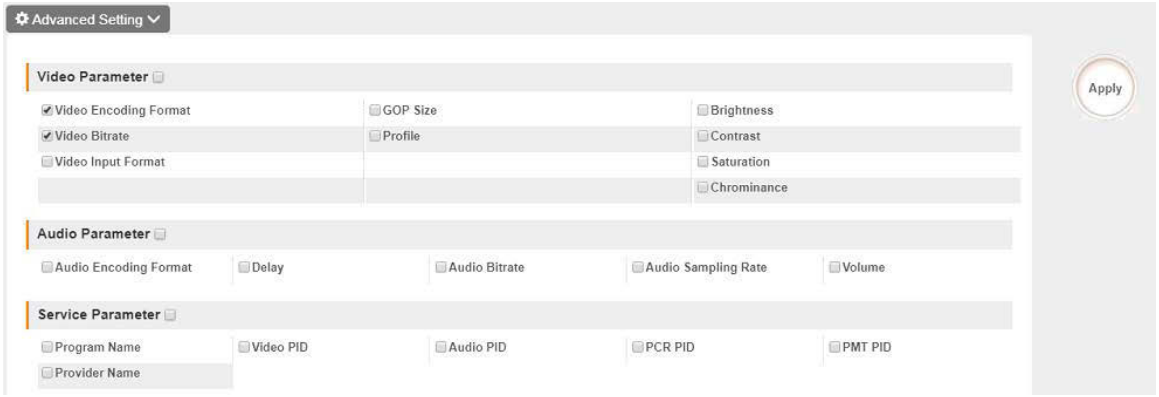
Status | Basic Setting | Insertion | Output | System

Advanced Setting >

Program	Video Encoding Format	Video Bitrate(Kbps)
1	H.264	4000
2	H.264	4000
3	H.264	4000
4	H.264	4000
5	H.264	4000
6	H.264	4000
7	H.264	4000
8	H.264	4000

Apply

Click **Advanced Setting** to see all parameters you can modify and check specific parameters you want to set and see. Click the **Apply** button on the right side to make the change take effect.



Click **Advanced Setting** in the line to set encoding parameters.

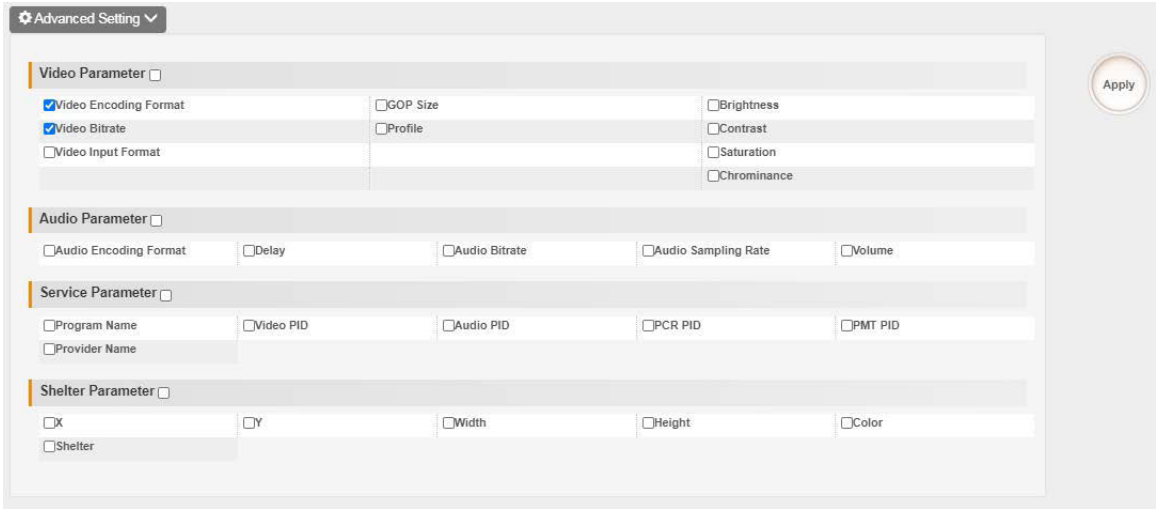
Video Parameter	Range	Video Parameter	Range
Video Iput Format	NTSC, PAL	**Brightness**	0~100
Video Encoding Format	H264	**Contrast**	0~100
Video Bitrate (Kbps)	600~6000	**Saturation**	0~100
GOP Size	1~60	**Chrominance**	0~100
Profile	HIGH MAIN		

Audio Parameter	Range	Audio Parameter	Range
Audio Encoding Format	MPEG1_Layer2	**Audio Bitrate (Kbps)**	32~192
Audio Sampling Rate (KHz)	48	**Volume (dB)**	-20~20
Delay (ms)	-2000~2000		

Service Parameter	Range	Service Parameter	Range
Program Name	String between 1~31	Audio PID	32~8190
Provider Name	String between 0~31	PCR PID	32~8190
Video PID	32~8190	PMT PID	32~8190

OHE6-CVBS-R01/R01A>Settings

OHE6-CVBS-R01 module has 8 channels with 2 DB15 connectors and OHE6-CVBS-R01A module has 16 channels with 4 DB15 connectors. Their configuration is almost the same as OHE6-CVBS-00, except a few differences on parameter setting range.



Video Parameter	Range	Video Parameter	Range
Video Iput Format	NTSC, PAL	**Brightness**	0~100
Video Encoding Format	H264	**Contrast**	0~100
Video Bitrate (Kbps)	600~6000	**Saturation**	0~100
GOP Size	1~60	**Chrominance**	0~100
Profile	HIGH MAIN		

Audio Parameter	Range	Audio Parameter	Range
Audio Encoding Format	MPEG1_Layer2	**Audio Bitrate (Kbps)**	32~192
Audio Sampling Rate (KHz)	48	**Volume (dB)**	-20~20
Delay (ms)	-2000~2000		

Service Parameter	Range	Service Parameter	Range
Program Name	String between 1~31	Audio PID	32~8190
Provider Name	String between 0~31	PCR PID	32~8190
Video PID	32~8190	PMT PID	32~8190

Shelter Parameters	Range	Shelter Parameters	Range
Shelter	Enable/Disable	**X**	0~800 (Dual)
Y	0~600 (Dual)	**Width**	10~800 (Dual)
Height	10~800 (Dual)	**Color**	White/Black/Blue/Green/Red

3.3.12.2 ModuleOutput

Direct IP output is specifically for encoding single program and outputting directly to IP. It will not occupy multicast bandwidth of the baseboard.

If you want to use IP output channel on the encoder module and the baseboard IP module at same time, you should avoid the multicast IP addresses conflicts. If there are two same IP addresses enabled meantime, all the multicast videos will be affected.

- **Destination IP Address** and **Destination Port:** for multicast IP addresses or unicast IP addresses and ports.
- **Enable Destination MAC:** Generally, you do not need to enable this option. This is reserved for exceptional cases when the unicast stream cannot be received by with the unicast IP addresses. You can enable destination MAC and streaming out by setting Destination MAC.

The second eth is reserved to output IP streams in another different VLAN. Enabling the second eth and set **IP Address**, **Subnet Mask**, **Default Gateway** in the same segment of the Unicast IP (the another different VLAN), you can output the Unicast stream to the another VLAN.

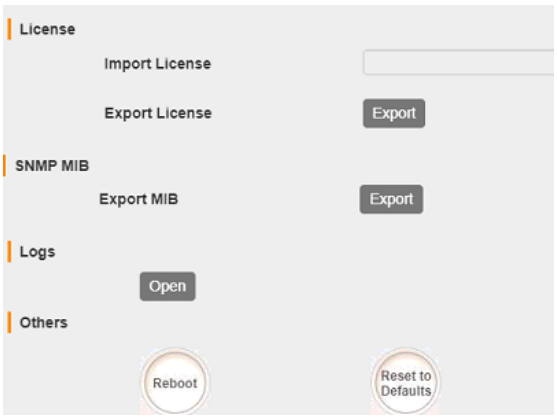
To use **Multiplexing mode on service level**:

1. Click on (pencil) icon. There will always be a BaseBoard selection for the IP output and other Output options depending on the module inserted.
2. Select the correct Output and Channel you want to output the service to.
3. Check Multiplex on the channel you want to outputt. You can output multiple services to one channel or output one service to multiple channels.

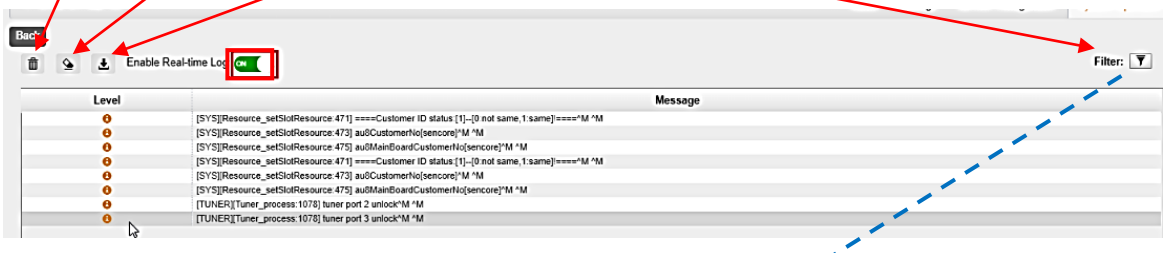
3.3.12.3 System Operation

System tab allows you to perform the following tasks:

- Import / export license
- Log manages
- Reboot
- Factory Default



To open the log management menu, click on the **Open** button. The newly opened menu allows you to enable / disable logging.
After login is enabled, additional control buttons will be displayed:
- clean log, clean screen, export logs, filter dialog box



Filter

Level	
Level	**Operation**
Error	☑
Warning	☑
Information	☑
Debug	☐

Module List	
Module Name	**Operation**
SYS	☑
PARAMS	☑
UPGRADE	☑
TSPROCESS	☑
SIPROCESS	☑
LICENSE	☑

Modulation Modules

3.3.13 OHM-QAMA-00/R00

OHM-QAM-00 / R00 / R01 / R01A module supports modulating 16 non-adjacent channels with 1 RF port and 1 RJ45 network port that is reserved for future use. QAM A

and B share the same Hardware but Different Software. If you need to change the Module from A to B, please contact your local support for assistance.

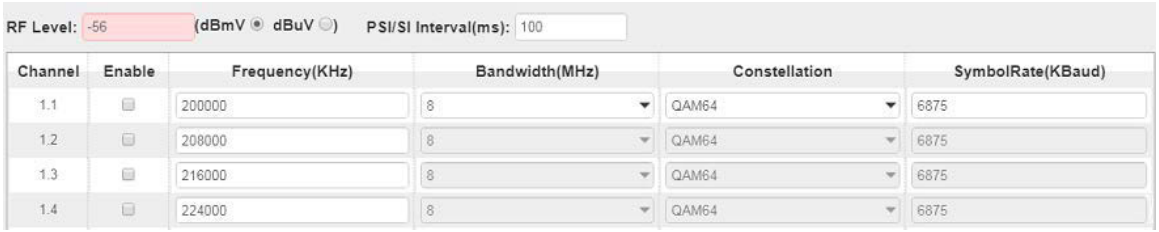
3.3.13.1 Module Status

Status of QAMA6-00 shows the Total Bitrate of a TS and the Effective bitrate, with which you can monitor if the output programs will overflow in a certain TS. Since the Modulator produces a lot of heat, the Module is also designed to automatically powered off when the temperature is higher than 74 degrees Celsius (165.2-degrees Fahrenheit). The status page for all Output modules of OmniHub 16 are mostly the same with each other and with all other modules. You will notice there is not much difference in every link on the status page. See OHR-DVBC-00 on page 30 for reference.

Channel	Effective Bitrate(Mbps)	Total Bitrate(Mbps)	Bitrate	TS Analysis	Service List
1.1	0.000	0.000	Normal		
1.2	0.000	0.000	Normal		
1.3	0.000	0.000	Normal		
1.4	0.000	0.000	Normal		
1.5	0.000	0.000	Normal		
1.6	0.000	0.000	Normal		
1.7	0.000	0.000	Normal		
1.8	0.000	0.000	Normal		
1.9	0.000	0.000	Normal		
1.10	0.000	0.000	Normal		
1.11	0.000	0.000	Normal		
1.12	0.000	0.000	Normal		
1.13	0.000	0.000	Normal		
1.14	0.000	0.000	Normal		
1.15	0.000	0.000	Normal		

3.3.13.2 Module Basic Settings

This page is where you can modify or set the frequency for the RF modulation. OHM-QAMA-R00 has 16 non-adjacent channels while OHM6-QAMA-R01 has 4 adjacent channels both at single port.



Click the Apply button

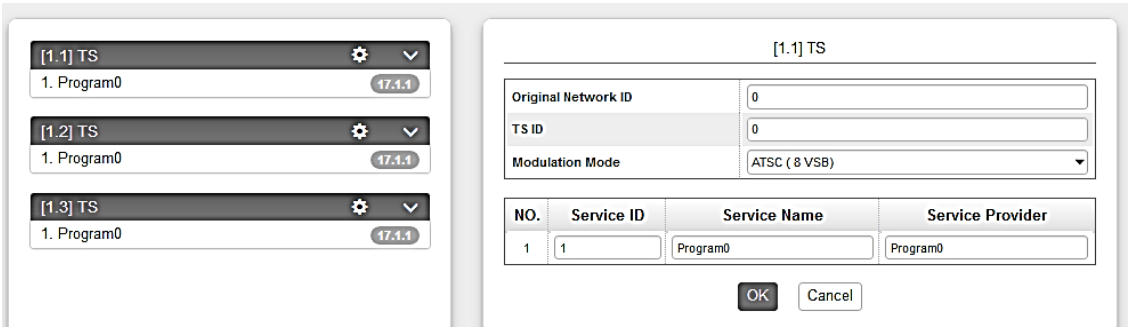
on the right side for the changes to take effect.

Name	Range	Name	Range
QAM Mode	ANNEX A/ ANNEX B	**RF level**	0~63
Bandwidth	6M, 7M, 8M	**Frequency (KHz)**	48000~858000
Symbol Rate (KBaud)	4400~6956	**Constellation**	QAM16/32/64/128 /256
PSI/SI Interval (ms)	50~10000		

3.3.13.3 Module Output

QAM Output will be different from the Receiver and Encoder module. Since the QAM module is an output module like IP output, all service configured in receiver, encoder and IP input will be seen here.

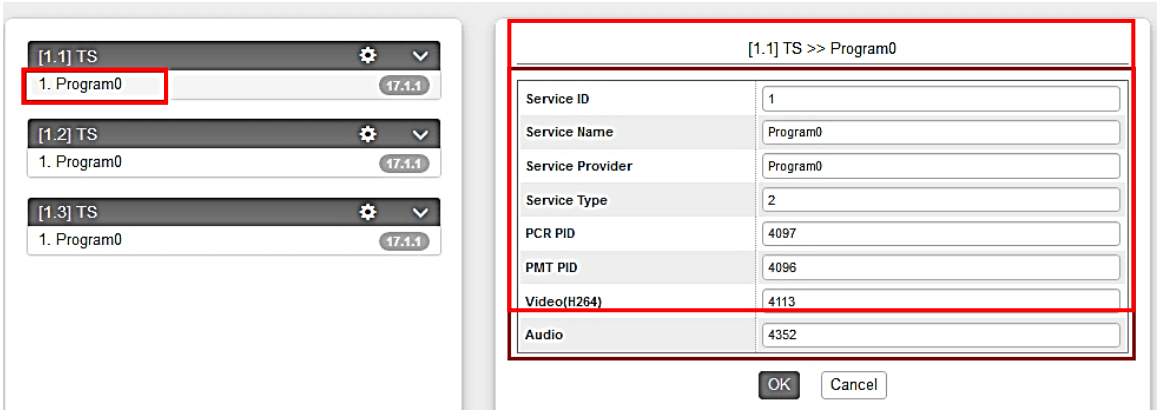
Every Channel in QAM output has Original Network ID and TS ID. It is important to identify the TS ID properly. Labeling the TS will help you to monitor your output services. It is also important for creating NIT for LCN and Cable Descriptors. When you click on the Service Settings, this is the screen you will see first.



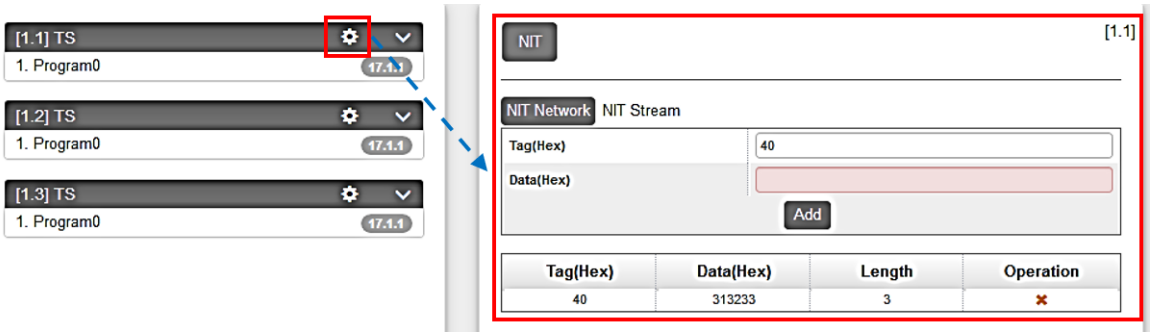
On the Left side, you will see the list of TS where there are output services. If the TS or Channels are enabled but no Service Output, It will not be listed here.

You will also see the Original Network ID and TS ID where you can modify the details and below will be the list of the service in the Selected TS. Initially, TS 1 is selected when you first select the Service Configuration tab.

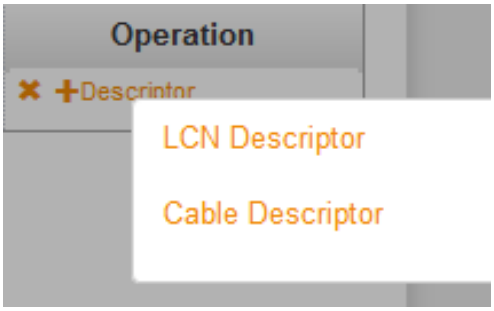
Clicking on the Program name under the TS will show the Programs Basic Parameter where you can modify each detail.



Clicking on the icon will show you the NIT setting where you can create and add NIT Network and NIT Stream.



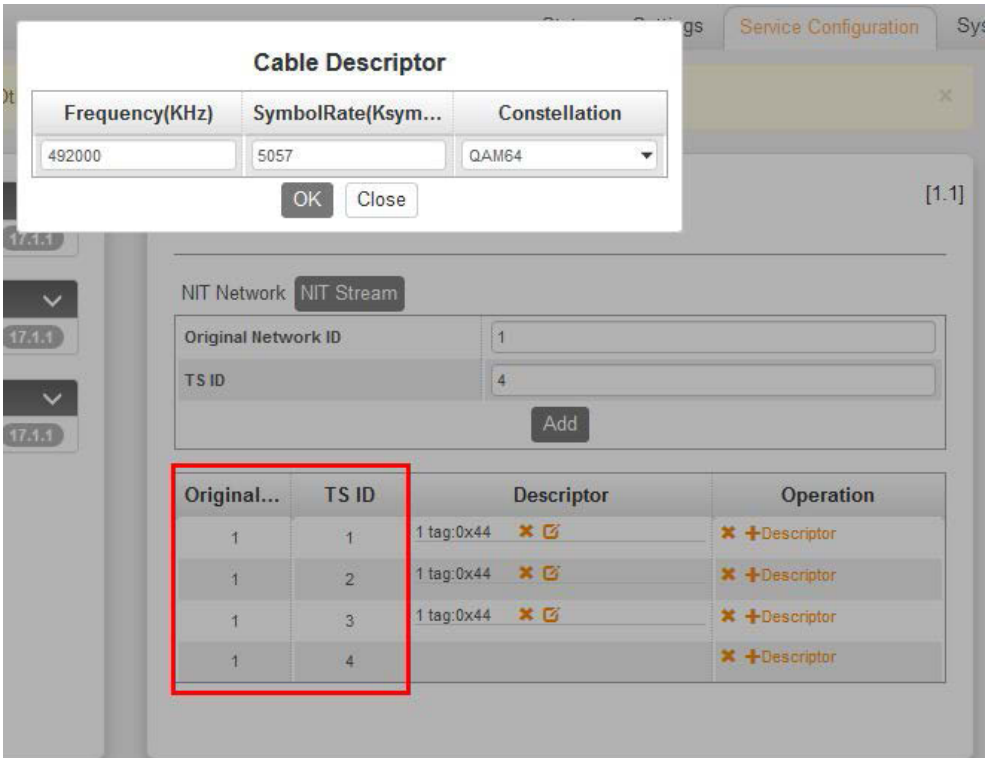
For NIT Stream, you can create Cable Descriptor and Logical Channel Number LCN. You need to Add and Input first the correct Original Network ID and TS ID. Once it is done, click on the plus icon “+” under Operation and select the Descriptor you want to add



For Cable Descriptor, this is used for the STB to scan all configured frequencies on the network given that the STB triggering Frequency is set where the NIT frequency is

created. e.g., If the NIT is created in TS ID 10 with frequency 539MHz and 5057Kbaud Symbol rate, the STB “Autosearch Setup” or setting should has the same parameters for Frequency and Symbol rate.

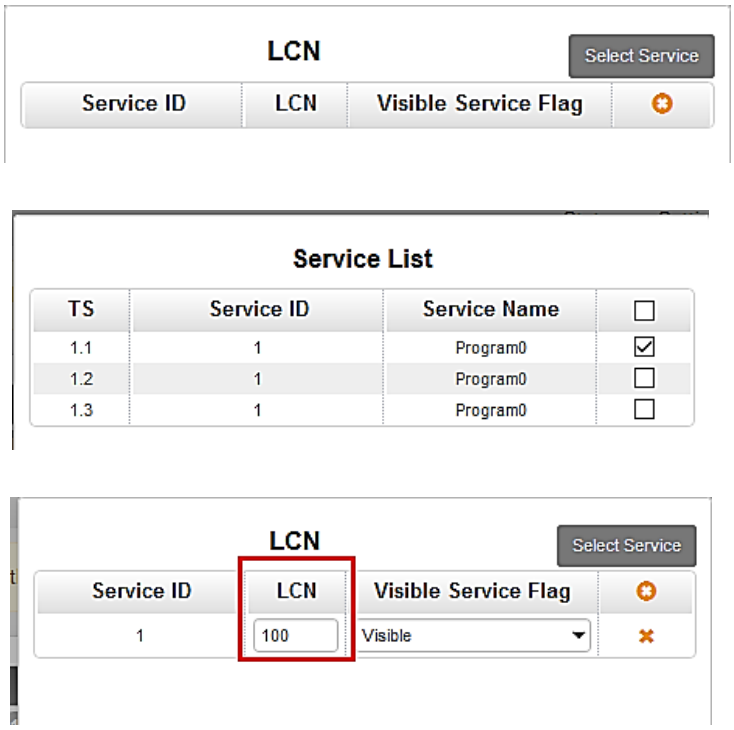
One important information is to know in what frequency and TS you want to create the Cable Descriptor. Once you know the frequency, you need to create the TSID currently used. If you have 4 frequency outputs on the Network, you need to create 4 TSID as shown below. Just input the correct Frequency on each TS and add. Repeat the procedure until all the Frequencies are added.



LCN or Logical Channel Number are created in the same way with Cable Descriptor. On 1 frequency, you will add NIT Stream and create multiple TSID. Here you will add the LCN on each TSID.

To add the LCN:

1. Click LCN Descriptor and see a small window appear.
2. Click Select Service on the upper right corner and select the program name. Make sure that the name is on the correct TS where you are adding the LCN to.
3. Input the Channel number you want that program to appear. Note that the STB sorting settings should be also in LCN. STB has other sorting settings like By Name, By Frequency, By Service ID, By LCN, etc.



3.3.14 OHM-QAMA-R01/R01A

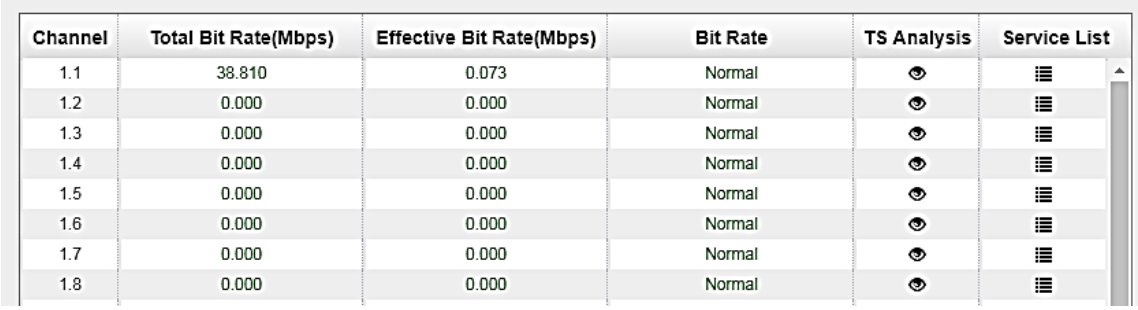
OHM-QAMA-R01 and OHM-QAMA-R01A are 4 channel and 8 channel modulators. They share the same hardware but have different software. For the Status, Settings, Service Configuration and System Operation, please refer to previous module OHM-QAMA-00/R00 at page 74 to 77.

3.3.15 OHM-QAMB-00/R00

OHM-QAMB-00 / R00 module supports up to 16 non-adjacent frequencies modulating with 1 RF female connector for output.

3.3.15.1 Module Status

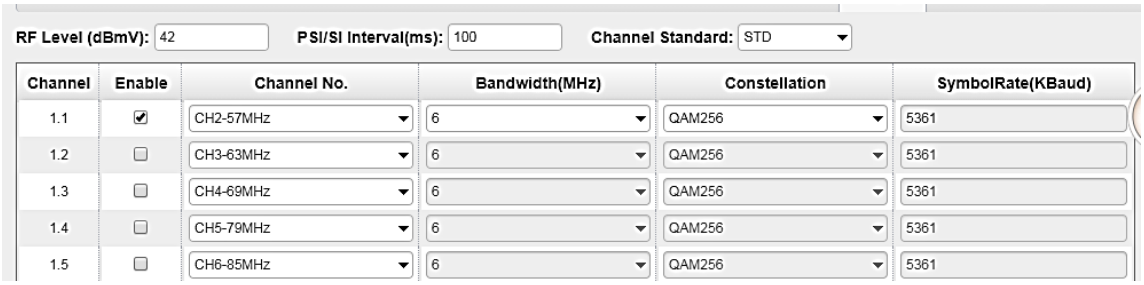
Please see OHR-DVBC-00 on page 30 for reference. See also image for QAMB Status.



Channel	Total Bit Rate(Mbps)	Effective Bit Rate(Mbps)	Bit Rate	TS Analysis	Service List
1.1	38.810	0.073	Normal		
1.2	0.000	0.000	Normal		
1.3	0.000	0.000	Normal		
1.4	0.000	0.000	Normal		
1.5	0.000	0.000	Normal		
1.6	0.000	0.000	Normal		
1.7	0.000	0.000	Normal		
1.8	0.000	0.000	Normal		

3.3.15.2 Module Basic Settings

This page allows you to type in the output parameter for the QAM required by the network.



Click the **Apply** button on the right side to make the change take effect.

Name	Range	Name	Range
Bandwidth (MHz)	6	**Channel Standard**	US cable/STD/IRC/ HRC
Symbol Rate (KB aud)	5056.941 (QAM 64) 5360.537 (QAM 256)	**RF level**	15~48 (dBmV)
PSI/SI Interval (ms)	50~10000	**Constellation**	QAM 64/256
Channel No.	Up to Channel Standard		

3.3.15.3 Module Output

Service Configuration for QAMB are very simple compared to QAMA. You can edit the Original network ID and TSID to the correct label. You can also edit the Service parameter like Service ID, Name, Provider, PID, etc.,

System operation of OHM-QAMB is same with other modules. See page 74 to 77 for reference.

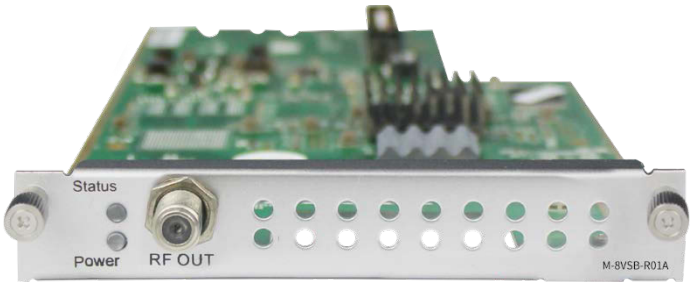
3.3.16 OHM-QAMB-R01/R01A

OHM-QAMB-R01 is a 4 channel QAM B Modulator module while OHM-QAMB-R01A is an 8 channel QAM B modulator. The Status, Setting Service Configuration and System

Operation for these two modules are same with the OHM-QAM-00/R00. See page 74 to 77 for reference.

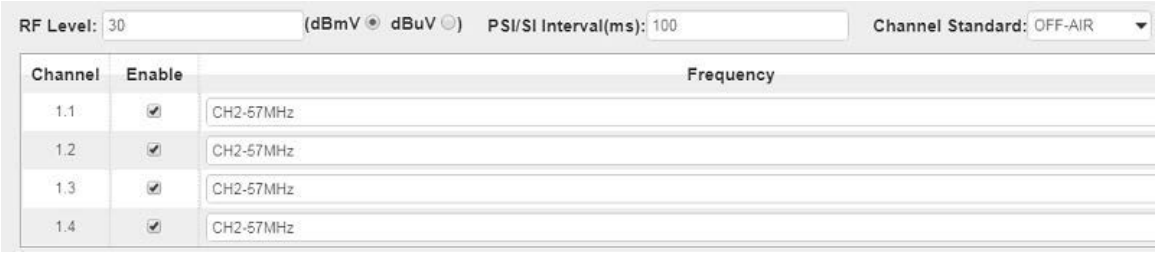
3.3.17 OHM-8VSB-R01/R01A

OHM-8VSB-R01A module supports up to 4/8 adjacent frequencies modulating with 1 RF connector for output.



Please see QAM configuration on page 74 for reference

3.3.17.1 Module Basic Settings

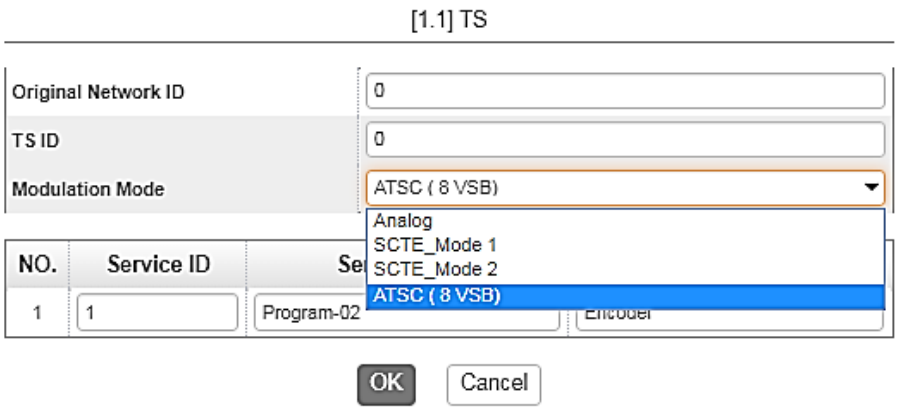


Click the **Apply** button on the right side to make the change take effect.

Name	Range	Name	Range
RF level (dBmV)	28~48	**PSI/SI Interval (ms)**	50~10000
Channel Standard	OFF-AIR, STD, IRC, HRC	**Channel - Frequency**	CH2 - 57MHz ~ CH 69 – 803MHz

3.3.17.2 Module Output

TS setting: Please refer to IP output service configuration on page 26 for reference. Select the modulation mode: Analog, SCTE_Mode 1, SCTE_Mode 2, or ATSC (8VSB)



3.3.18 OHM-OFDM-R01/R01A

OHM-OFDM-R01 / R01A module supports up to 4/8 adjacent frequencies modulating with 1 RF female connector for output. The status for the OHM-OFDM is like in OHM6-QAMA and another modulator module. It will show Lock Status of each channel when the signal is stable.

Channel	Effective Bitrate(Mbps)	Total Bitrate(Mbps)	Bitrate	TS Analysis	Service List
1.1	0.001	23.751	Normal		
1.2	0.000	0.000	Normal		
1.3	0.000	0.000	Normal		
1.4	0.000	0.000	Normal		

3.3.18.1 Module Basic Settings

For the Settings of OHM-OFDM-R01

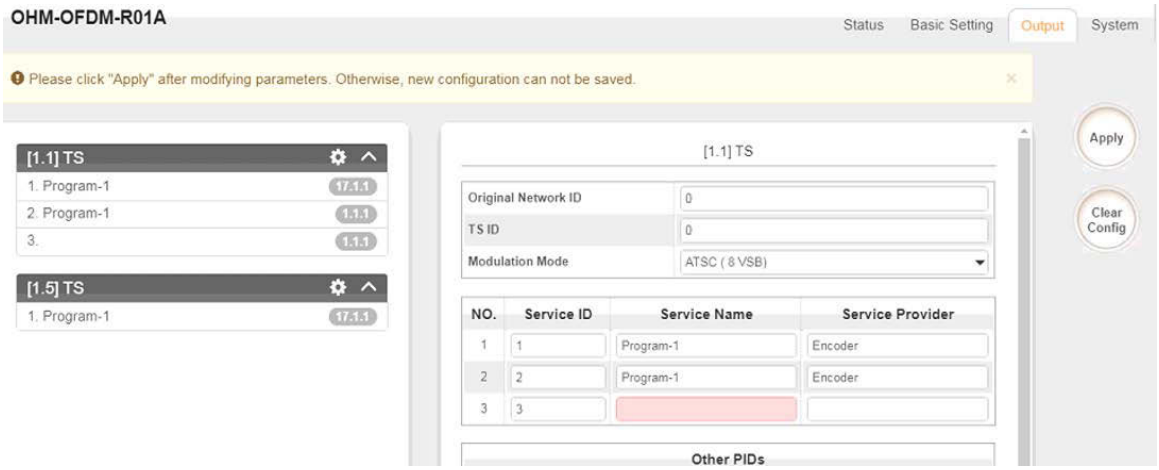
Channel	Enable	Frequency(KHz)	Bandwidth(MHz)	FFT Mode	GI Mode	QAM Mode	Convolutional Coding
1.1	☑	755143	6	2K	1/32	64QAM	7/8
1.2	☑	761143	6	2K	1/32	64QAM	7/8
1.3	☑	767143	6	2K	1/32	64QAM	7/8
1.4	☑	773143	6	2K	1/32	64QAM	7/8

Module Settings is where you can input the source parameters. Once it's done, click on Apply for the changes to take effect and check on the Status of the channel that the signal is Locked.

Name	Range	Name	Range
Bandwidth	6M, 7M, 8M	**RF level**	0~31.5 (dBmV) 60~91.5 (dBuV)
Frequency (KHz)	48000~862000		

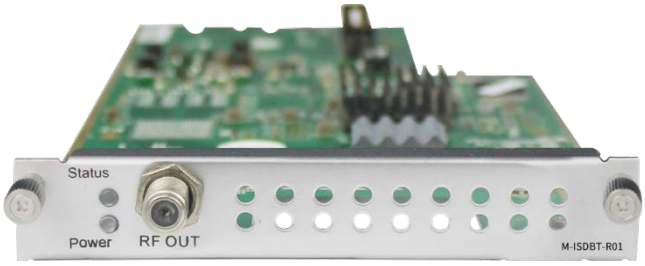
3.3.18.2 Module Output

Configuration of the OFDM module is like the configuration of OHM-QAMA-00/R00. You can also change the Original Network ID, TSID, Service Name, PID and create LCN Descriptor and Cable Descriptor. For more details, please check OHM-QAMA-00 on page 74 for reference.



3.3.19 OHM-ISDBT-R01/R01A

OHM-ISDBT-R01/R01A module supports up to 4/8 adjacent frequencies modulating with 1 RF female connector for output.



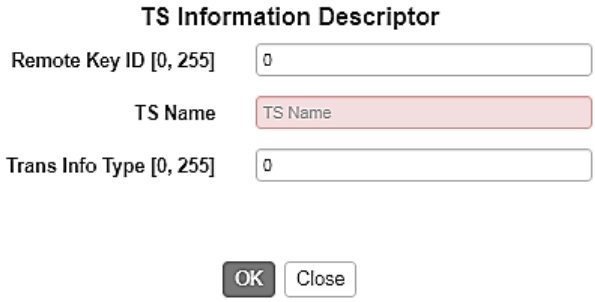
3.3.19.1 Module Basic Settings

After inputting the parameters in the Modules Settings, always click the **Apply** button on the right side to make the change take effect. Make sure the Signal is locked on the Module Status page.

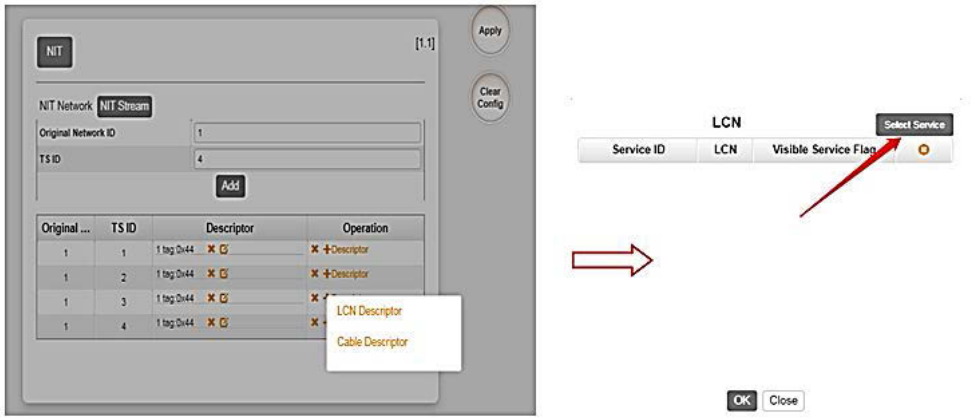
Name	Range	Name	Range
Bandwidth (MHZ)	6M	**RF level**	90~110
Frequency (KHz)	48000~862000	**FFT Mode**	2K
GI Mode	1/4, 1/8, 1/16, 1/32	**RF Level Gain (dB)**	45~55
QAM Mode	QPSK 16QAM 64QAM	**Convolutional Coding**	1/2, 2/3, 3/4, 5/6, 7/8

3.3.19.2 Module Output

- TS setting: Please refer to IP output service configuration on page 30.
- LCN setting: You need to add NIT stream of all frequencies in the base TS (frequency). It is used for your STB to automatically search and identify all the TS (frequencies) LCN information.
- Check or reset each TS (frequency) Original Network ID and TS ID, which should be different in each TS.
- Fill the Original Network ID and TS ID of each TS (frequency) in the field of the base TS (frequency) and then click Add to create a NIT stream of this TS (frequency).
- Click the “+” icon of Descriptor and add the TS Information Descriptor in. Then fill in the correct parameters and click OK. (This operation should be set on Modulator module only)



- Click the “+” icon of Descriptor and add the LCN Descriptor. Then check all the programs which are contained in this frequency. Then set program LCN.



- Do same operations to add next TS (frequency) until NIT streams of all the frequencies have been included. Lastly click Apply button to let all configuration take effect. Then searching programs in your STB, you will get all programs in order of LCN which you set.

Function Modules

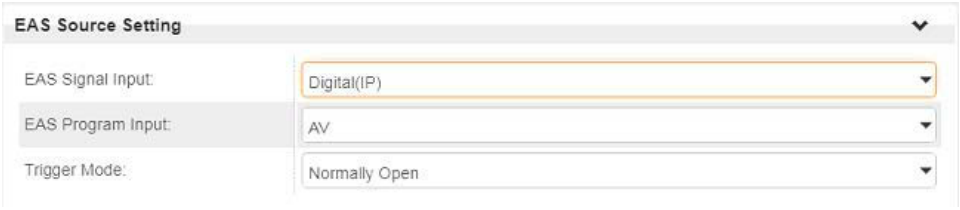
3.3.20 OHP-EAS

The OHP-EAS-00 module provides the ability to interrupt Encoder playback and switch to an external transport stream. This feature is for the US market and requires the OmniHub chassis to be set for ATSC standard. A common application of Emergency Alert Systems is for Broadcast and Audio Muting.

The trigger switched video content on the Encoders can be sensed using a DC contact closure or the SCTE-18 EAS standard over ASI/IP when the EAS is “Paved” or actively replacing the encoder outputs.

3.3.20.1 Module Settings

Below is an example of the EAS module configuration settings with some additional descriptions. Click the **Apply** button on the right side of the EAS settings page to make the change take effect.



EAS Signal Input is where you select how the module senses the trigger:

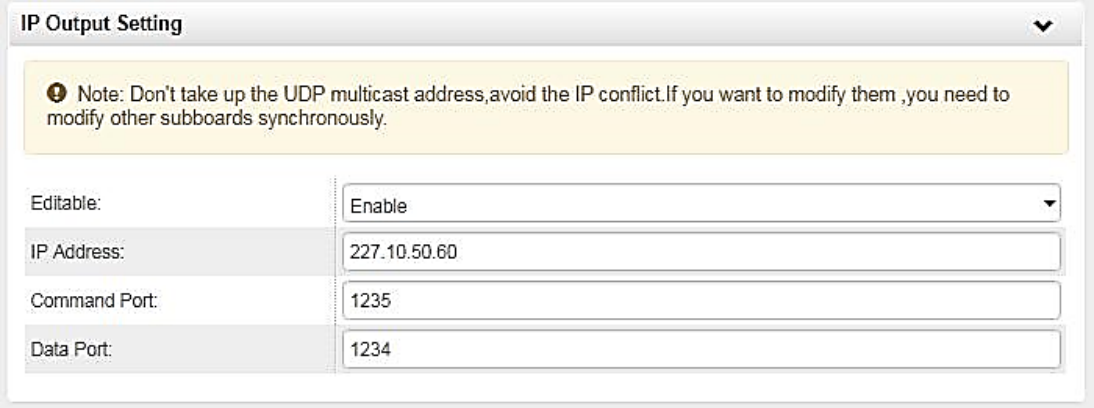
- Digital – Trigger is provided via IP (SCTE-18 Broadcast Standard)
- Analog – Trigger is provided as DC voltage to the EAS Control connector

EAS Program Input. Here you can select where the content originates from.

- AV – Content is provided as RCA/Analog AV inputs to EAS built in the encoder
- ASI – Content is provided as ASI with MPEG Transport Stream

Command Input Settings. You specify the incoming PID, IP, and Port of the SCTE-18 triggers over the Ethernet cable. The **IP EAS IN** RJ45 Ethernet port on the module is where this information must be received.

Encoder Settings. This section is for the RCA / Analog-AV inputs. When the takeover content is provided in this fashion it must be encoded to MPEG ".TS" Transport Stream data. The Video, Audio, and Bitrate settings are used to configure the format.



IP Output Settings. You can configure the command sent from the EAS module to the encoders. The settings applied here must match in the EAS tab of each Encoder Module.

Table of all parameters in the EAS module:

Name	Range	Name	Range
Command Input Setting			
EAS Signal Input	Digital (IP) Analogue (Dry Contact)	**EAS Program Input**	ASI AV
Trigger Mode	Normally Open Normally Closed		
Encoder Setting			
Video Type	H.264, MPEG-2	Audio Type	AC3, Mpeg-1 Layer 2 Mpeg2-AAC, Mpeg4-AAC
Video Bit rate (Kbps)	1500~20000	Audio Bitrate (Kbps)	128，192，256，384
Volume	-10~10		

Example of the EAS module Status Page

EAS Status

EAS Status:	Digital Locked

AV Input

Video Resolution:	720x576_50i

Encoder Status

Total Bit Rate:	8.190 Mbps
Effective Bit Rate:	7.709 Mbps
Video Resolution:	720x576_50i

ASI Input

Signal Lock:	Locked
Total Bit Rate:	8.578 Mbps
Effective Bit Rate:	8.441 Mbps
Program Scan Status:	Normal

IP Output

Total Bit Rate:	8.655 Mbps
Video Bit Rate:	6.172 Mbps
Audio Bit Rate:	0.251 Mbps
Effective Bit Rate:	7.726 Mbps

Version Info

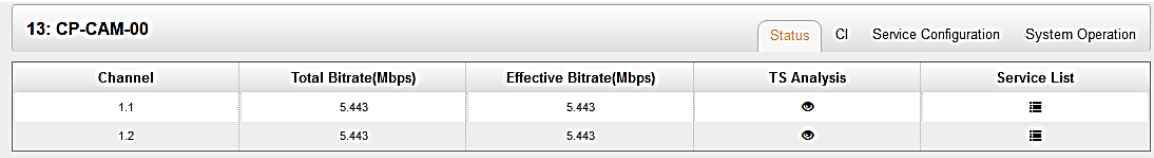
Firmware Version:	V0.2.0
Software Version:	V0.0.32
Hardware Version:	V0.0.0

3.3.21 OHP-CAM-00

OHP-CAM-00 is used to decrypt and encrypt services. It has 2 independent CI card slots that are compatible with mainstream CAM cards but support only Xcrypt CAM CAS for encryption and supports mainstream CAS decryption.

3.3.21.1 Module Status

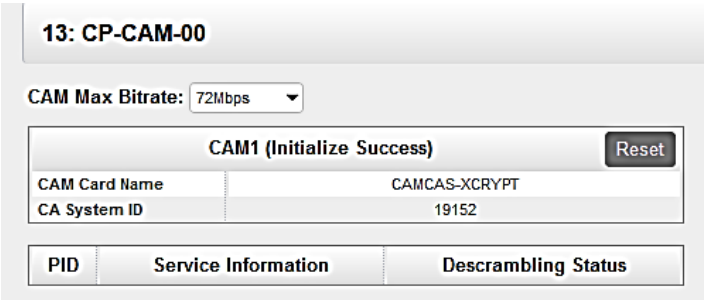
Click the name of OHP-CAM-00 in the module list to view its Status page. This page will show you the status of each channel and the bitrate of each service. See OHR-DVBC-00 on page 30 to 35 for reference.

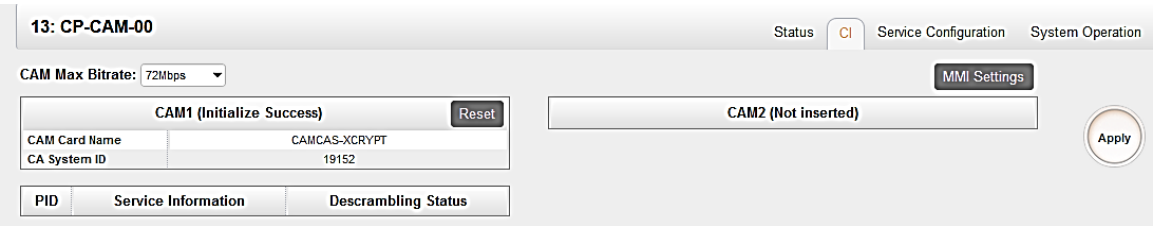


Note that this module has scrambling and descrambling functions. To choose which function you want to use, go to System Operation and select the CAM mode.

3.3.21.2 CI

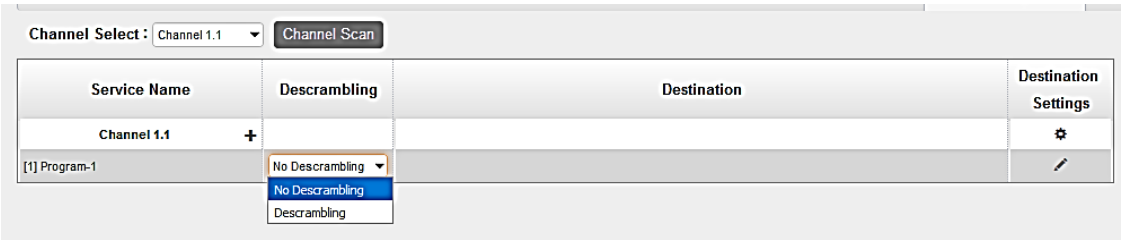
You can output the received encrypted services in DVBS2, DVBC, ISDT, etc. to OHP-CAM-00 to decrypt the service and rebroadcast it to QAM, OFDM, IP, etc. The CI page will show you the list of the successfully-decrypted services in the channel.





3.3.21.2 Service Configuration

For the Service Configuration, you can select Descrambling or No Descrambling for a service before output. To configure the service to output, please refer to service configuration procedures of other modules.
*You need to click ***Apply*** button after you configure service to Descrambling, otherwise the descrambling configuration will not be saved.



3.3.22 OHP-EIT-00

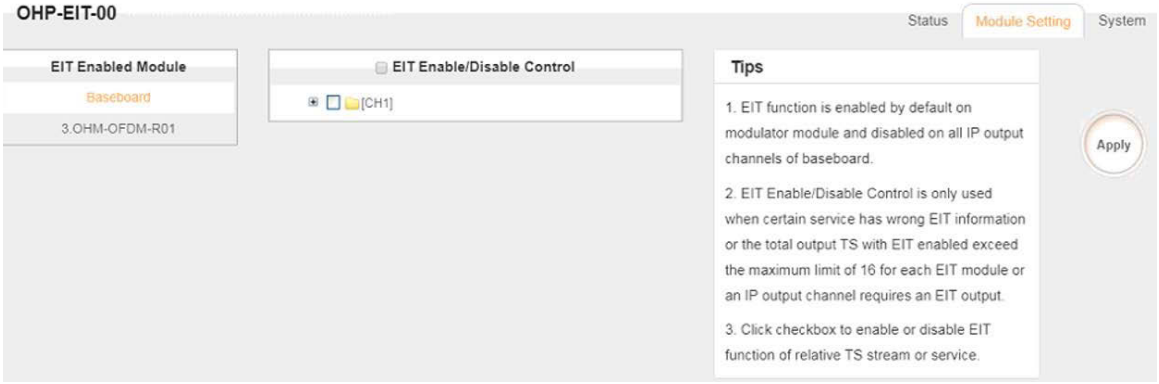
OHP-EIT-00 is a function enabled by default on the modulator and disabled in all IP output channels of the baseboard. This is only used when a certain service has wrong EIT information or the total output TS with EIT enabled exceeds the maximum limit of the 16 for each EIT module or an IP output channel that requires an EIT output.

3.3.22.1 Module Status

Status display the EIT enabled module and the list of service that enabled EIT.

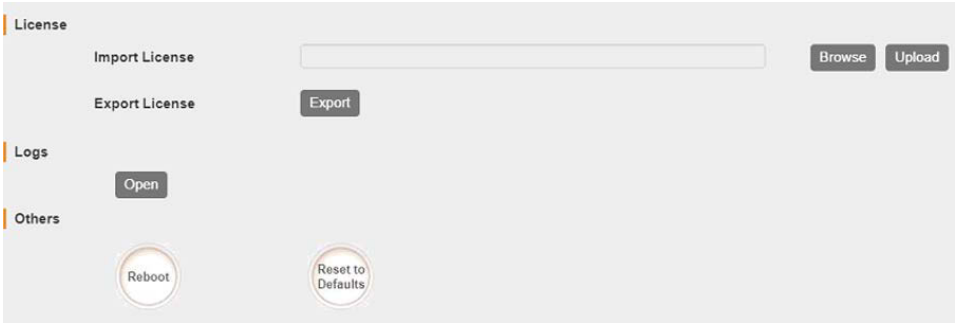
3.3.22.2 Module Setting

You just need to click the checkbox to enable or disable EIT function of relative TS streams or services.



3.3.22.3 Module System

System is for you to upgrade license of the board when needed. Here you can also check logs, reboot and reset the unit to factory default.



Section 4 Appendices

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APPENDIX A - Acronyms and Glossary

AAC	Advanced Audio Coding
AC-3	Also known as Dolby Digital
AES	Audio Engineering Society
ATSC	Advanced Television Systems Committee
AV	Audio Video
BAT	Bouquet Association Table
BER	Bit Error Ratio
Bit Rate	The rate at which the compressed bit stream is delivered
BNC	British Naval Connector
CAM	Conditional Access Module
CAT	Conditional Access Table
CBR	Constant Bitrate
CI	Common Interface
CVBS	Composite Video Broadcast Signal
dB	Decibel
DVB	Digital Video Broadcasting
EAS	Emergency Alert System
EIT	Event Information Table
EPG	Electronic Program Guide
FEC	Forward Error Correction
GOP	Group of Pictures
HD	High Definition
HDCP	High-bandwidth Digital Content Protection
HDMI	High Definition Multimedia Interface
Kbps	1000 bit per second
LED	Light Emitting Diode
LNB	Low-Noise Block
Mbps	1,000,000 bits per second
MER	Modulation Error Ratio
MPEG	Refers to standards developed by the ISO/IEC JTC1/SC29 WG11, Moving Picture Experts Group. MPEG may also refer to the Group.
MPEG-2	Refers to ISO/IEC standards 13818-1 (Systems), 13818-2 (Video), 13818-3 (Audio), 13818-4
MPTS	Multi-program Transport Stream
NIT	Network Information Table
OFDM	Orthogonal Frequency-Division Multiplexing
PAT	Program Association Table
PCR	Program Clock Reference
PID	Packet Identifier
PMT	Program Map Table
PSI	Program Specific Information
PSU	Power Supply Unit

QAM	Quadrature Amplitude Modulation
QPSK	Quadrature Phase-Shift Keying
SD	Standard Definition
SDT	Service Description Table
SI	Service Information
SNMP	Simple Network Management Protocol
SNR	Signal Noise Ration
SPTS	Single Program Transport Stream
TDT	Time and Date Table
TS	Transport Stream
VBR	Variable Bitrate

APPENDIX B - AMonroe OneNetSE Configuration and Testing

For development and testing purposes, the Monroe OneNetSE will be used to supply the SCTE18 messages and the EAS substitutions audio and video. The Monroe box will need to be configured in a very specific way in order to work with the proposed OmniHub 16 EAS features.

External Configuration

1. The first step is to connect an Ethernet cable to the unit and supply power. Turn on the unit using the switch on the back. The unit is configured for DHCP on the management port. If a static IP needs to be assigned, this will need to be done according to the Monroe manual.

2. Connect the CVBS video and analog-unbalanced audio to an encoder module. Outputs shown in the picture below will be where the video and audio substitutions will come out.

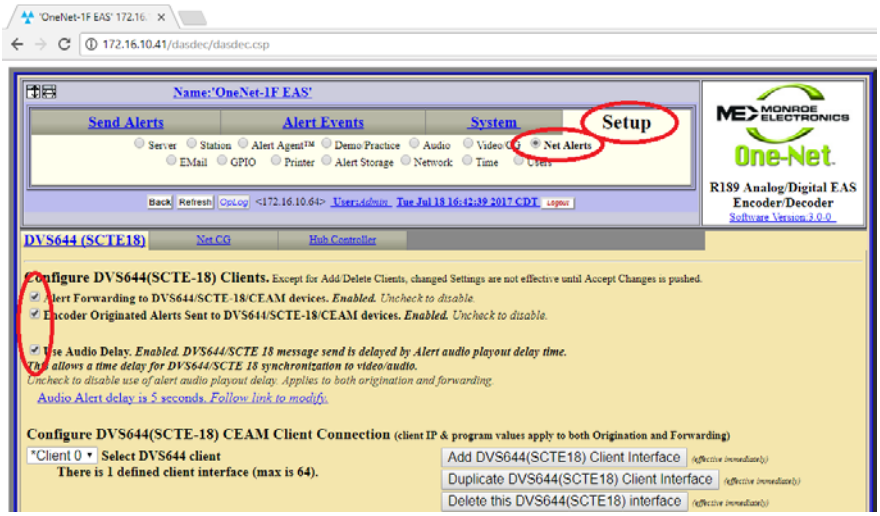
3. Once the unit boots, the front panel display will show the DHCP IP address of the Monroe box. Use this IP address to access the unit with a web browser.

Webpage Configuration

1. The webpage for the Monroe box requires login. The Monroe box has been configured with this login information (The capital “A” in the username is required):

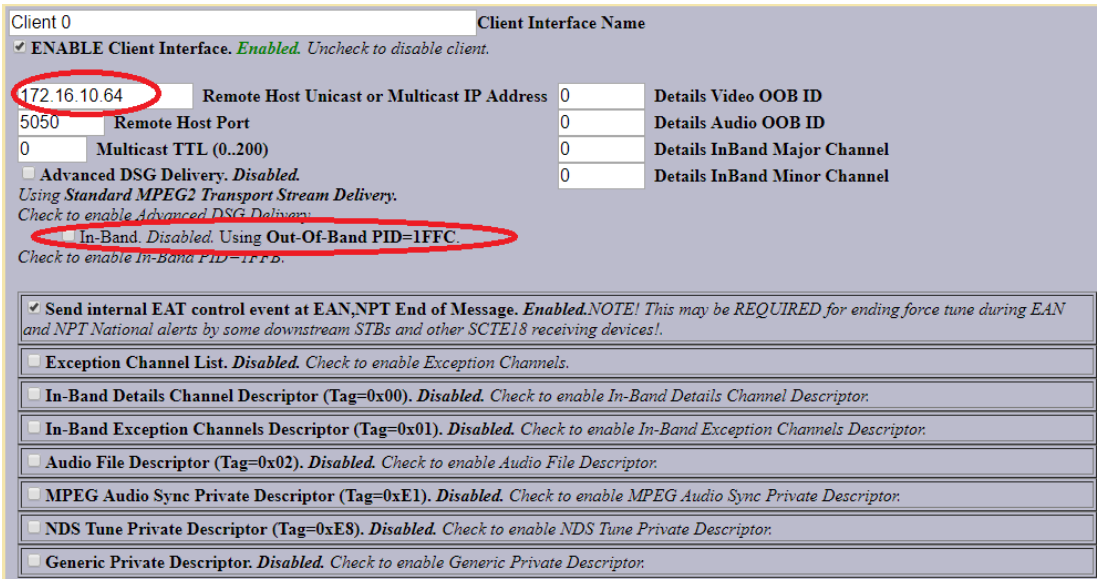
   User: Admin
   Password: sencore12

2. Once logged into the unit, browse to the Setup tab and select Net Alerts.
3. Configure the DVS644 (SCTE18) settings in the Monroe exactly like what are shown below. Enable Alert Forwarding and Encoder Originated Alerts to be sent to DVS644/SCTE18 devices.



4. A DVS644 (SCTE-18) CEAM Client Connection should already be configured. If not, click the **Add DVS644 (SCTE18) Client Interface** button.

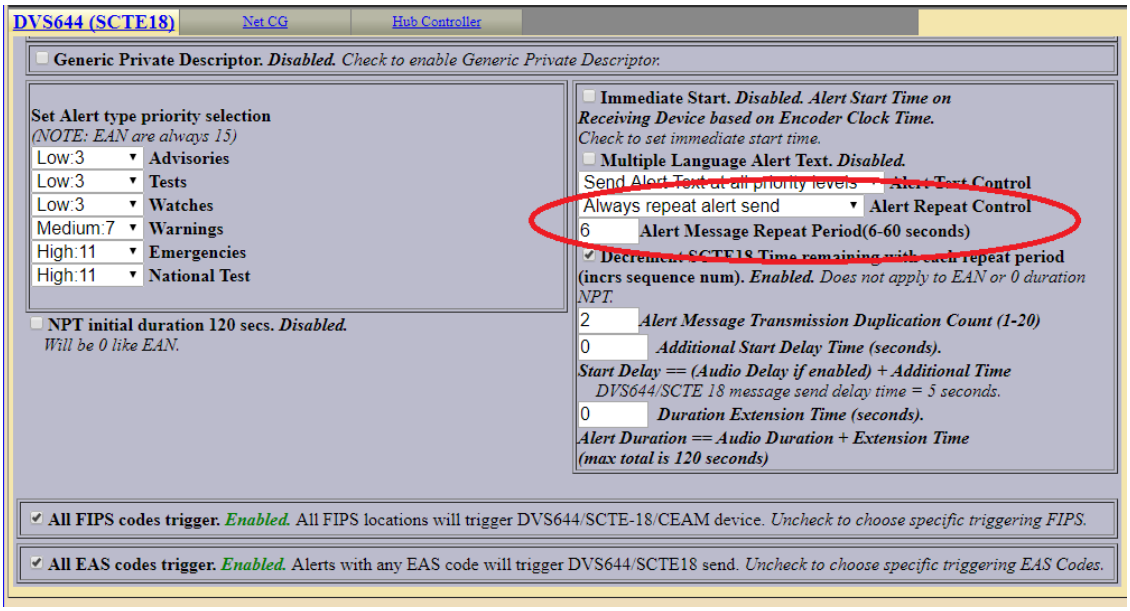
5. Make sure Client 0 is enabled and then input the unicast or multicast address into the “Remote Host Unicast or Multicast IP Address” text box. It is suggested the unicast normally be used, so what should be put in this box is the management IP address of the OmniHub 16. It is also possible to input a multicast address (224.x.x.x – 239.x.x.x).



6. Make sure the “Remote Host Port” is configured to be 5050 as this is the default port for SCTE18 messages and it is not planned to have the OmniHub 16 listen for SCTE18 messages on any other port.

7. Also make sure the **In-Band** checkbox is disabled. The OmniHub 16 will be using the Out-Of-Band PID = 0x1FFC.

8. Another very important configuration is that the **Alert Repeat Control** must be set to “Always repeat alert send” and the **Alert Message Repeat Period** should be set to 6 seconds.



9. Click the Accept Changes button and that should be the last of the configuration.

EAS Testing with Monroe Box

1. To force the Monroe box to do a test and send an SCTE18 message, press the **Select** button on the front panel of the unit **TWO TIMES**.

This will cause the unit to:

a. Display an EAS screen on the CVBS video output
b. Send two SCTE18 messages
c. Start playing the alert audio

2. The SCTE18 messages will continue to be sent during the playing of the EAS audio message every 6 seconds. When the EAS audio message playing is finished, the SCTE18 messages will no longer be sent.

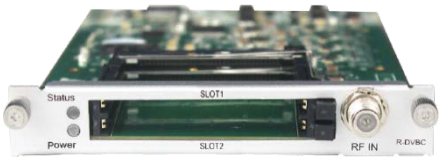
When the OmniHub 16 receives the first SCTE18 message on the management port, it should trigger it to replace all services on the output with an encoded version of the Monroe video and audio outputs. 15 seconds after the last SCTE18 is received, the OmniHub 16 should return all services to their original content.

APPENDIX C - Specification

OmniHub 16- Base unit

Includes -	4RU chassis/case, power supply/line cord
Systems -	
Chassis Dimension	445mm x 177mm x 428mm (WxHxD), 4RU
Front Panel	16 Hot swappable Slots Dual Redundant Power Supplies 4 Gigabit Ethernet port
Remote Operation/Update Interface -	
Type	Ethernet, 10/100
Front Panel Indicators	Link (Green LED). Activity (Amber LED)
Connector	RJ45
Operating Temperature -	0 to 50-degree Celsius
Storage Temperature -	-10 to 70-degree Celsius
Operating Humidity -	<95%
AC Power -	
Operating Voltage	90 - 240VAC
PSU Max Power	350W
Line Cord	Detachable, 3-prong

Receiver Module Specification

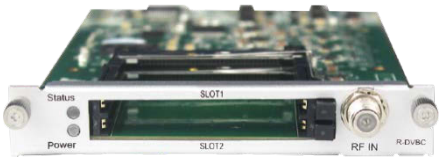


DVB-C Receiver

Input	4 channels via 1 RF Female connector
CI	2 x PCMCIA CI slots
CAM	Descrambled channel quantity depends on CAM capability, 2 CAMs could be different
QAM mode	Annex A/C
Frequency Range	47 ~ 862MHz
Bandwidth	6/7/8MHz
Constellation	16QAM / 32QAM / 64QAM / 128QAM / 256QAM
Symbol Rate	3.6 ~ 6.952Ms/s
Signal Level	40~80dBuV
CA system	Supports mainstream CAS

DTMB Receiver

Input	4 channels via 1 RF female connector
CI	2 x PCMCIA CI slots
CAM	Descrambled channel quantity depends on CAM capability, 2 CAMs could be different
Modulation Mode	TDS-OFDM
Frequency Range	47~862MHz
Constellation	4QAM-NR / 4QAM / 16QAM / 32QAM / 64QAM
Signal Level	-65~-25dm
CA System	Supports mainstream CAS



DVB-C Annex B Receiver

Input	4 channels via 1 RF Female connector
CI	2 x PCMCIA CI slots
CAM	Descrambled channel quantity depends on CAM capability, 2 CAMs could be different
QAM mode	Annex B

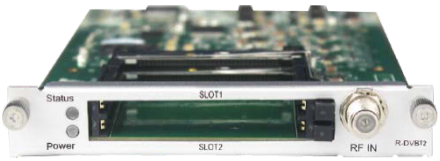
Frequency Range	47 ~ 862MHz
Bandwidth	6MHz
Constellation	64QAM, 256QAM
Symbol Rate	5.057Ms/s (64QAM) 5.360Ms/s (256QAM)
Signal Level	40~80dBuV
CA system	Supports mainstream CAS

ISDB-T Receiver

Input	4 channels via 1 RF Female connector
CI	2 x PCMCIA CI slots
CAM	Descrambled channel quantity depends on CAM capability, 2 CAMs could be different
Frequency Range	177.143~863.143 MHz
Bandwidth	6/7/8MHz
Constellation	DQPSK, QPSK, 16QAM, 64QAM
FEC	51/2, 2/3, 3/4, 5/6, 7/8, Automatic
Signal Level	-80~-20dBm
CA system	Supports mainstream CAS

DVB-S/S2 FTA Receiver

Input	C/Ku Bank, 4 channels via 4 RF female connectors
LNB Power	Independent power supplies for LNB-1 & LNB-3
LNB Current	Max. 400mA
LNB Voltage	13V / 18V
Constellation	QPSK, 8PSK
Frequency Range	950 - 2150MHz
Signal Level	-70~-20dBm
Roll-off Factor	0.15, 0.20, 0.25, 0.35
Symbol Rate	DVB-S: 1~45Msps DVB-S2: 1~45Msps
FEC	DV-S: 1/2, 2/3, 3/4, 5/6, 7/8 DVB-S2: 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10



DVB-T/T2 with CI Receiver

Input	4 channels via 4 RF Female connectors
CI	2 x PCMCIA CI slots
CAM	Descrambled channel quantity depends on CAM capability, 2 CAMs could be different
Frequency Range	47 ~ 862MHz
Bandwidth	6/7/8MHz
Constellation	DVB-T: QPSK / 16QAM / 64QAM DVB-T2: QPSK / 16QAM / 64QAM / 256QAM
Guard Interval	DVB-T: 1/4, 1/8, 1/16, 1/32 DVB-T2: 1/4, 1/8, 1/16, 1/32, 1/128, 19/256, 19/128
FFT Size	DVB-T: 2K, 8K DVB-T2: 1K, 2k, 4K, 8K, 16k, 32K
Signal Level	-80~-20dBm
CA system	Supports mainstream CAS

DVB-S/S2 with CI Receiver

Input	C/Ku Band, 4 channels via 2 RF Female connectors CH1 & CH2 via LNB-1 CH3 & CH4 via LNB-2
LNB Power	Independent power supplies for each LNB
LNB Voltage	13V / 18V
LNB Current	Max. 400mB
CI	2 x PCMCIA CI slots
CAM	Descrambled channel quantity depends on CAM capability, 2 CAMs could be different
Constellation	QPSK, 8PSK
Frequency Range	950 - 2150MHz
Signal Level	-70~-20dBm
Roll-off Factor	0.15, 0.20, 0.25, 0.35

Symbol Rate	DVB-S: 1~45Msps DVB-S2: 1~45Msps
FEC	DVB-S: 1/2, 2/3, 3/4, 5/6, 7/8 DVB-S2: 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10
CA System	Supports mainstream CAS

DVB-S/S2 FTA Receiver

Input	C/Ku Band, 8 channels via 8 RF female connectors
LNB Power	Independent power supplies for LNB-1 & 3, LNB-5 & LNB-7
LNB Current	13V / 18V
LNB Current	Max. 400mA
Constellation	QPSK, 8PSK
Frequency Range	950 - 2150MHz
Signal Level	-70~-20dBm
Roll-off Factor	0.15, 0.20, 0.25, 0.35
Symbol Rate	DVB-S: 1~45Msps DVB-S2: 1~45Msps
FEC	DVB-S: 1/2, 2/3, 3/4, 5/6, 7/8 DVB-S2: 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10

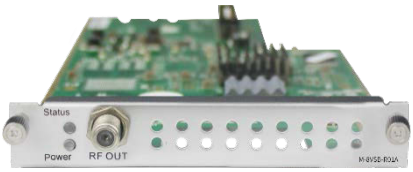
8VSB Receiver

Input	4 channels via 4 RF Female connectors
Frequency Range	50 - 860MHz
Bandwidth	6MHz
Modulation	8VSB
Signal Level	-80~-20dBm

Modulator Module Specification

OFDM Modulation

Output	4/8 frequencies via 1 RF female connector 75Ω
Standard	ETSI EN 300744
Frequency Range	47 ~ 862MHz
Bandwidth	8MHz
Constellation	QPSK / 16QAM / 64QAM
Guard Intervals	1/4, 1/8, 1/16, 1/32
FFT Size	2K, 8K
Code Rates	1/2, 2/3, 3/4, 5/6, 7/8
Output Level	Max. 105dBuV
MER	≥32dB



8VSB Modulation

Output	4/8 frequencies via 1 RF female connector 75Ω
Standard	ATSC A/35
Frequency Range	50 ~ 860MHz
Bandwidth	6MHz
Constellation	8VSB
Output Level	Max. 105dBμV
MER	≥40dB

DTMB Modulation

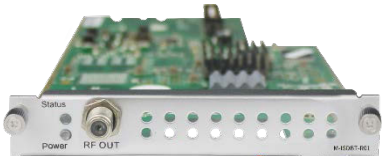
Output	4/8 frequencies via 1 RF female connector 75Ω
Standard	DTMB GB20600-2006
Frequency Range	47 ~ 862MHz
Constellation	4QAM-NR / 4QAM / 16QAM / 32QAM / 64QAM
Output Level	Max. 105dBμV
MER	>32dB

QAMA Modulation

Output	4/8 frequencies via 1 RF female connector 75Ω
Standard	ITU-T J.83 Annex A/C
Frequency Range	47 ~ 862MHz
Bandwidth	6/7/8MHz
Constellation	16QAM / 32QAM / 64QAM / 128QAM / 256QAM
Symbol Rate	3.6~6.9Ms/s
Output Level	Max. 105dBμV
MER	≥32dB

QAMB Modulation

Output	4/8 frequencies via 1 RF female connector 75Ω
Standard	ITU-T J.83 Annex B
Frequency Range	47 ~ 862MHz
Bandwidth	6/7/8MHz
Constellation	64QAM / 256QAM
Symbol Rate	3.6~6.9Ms/s
Output Level	Max. 105dBμV
MER	≥32dB



ISDB-T Modulation

Output	4/8 frequencies via 1 RF female connector, 75Ω
Standard	ARIB STD-B31
Frequency Range	57 - 860MHz
Bandwidth	6MHz
Constellation	QPSK, 16QAM / 64QAM
Transmission Mode	2K
RS Code	RS (204.188)

FEC	1/2, 2/3, 3/4, 5/6, 7/8
Guard Interval	1/4, 1/8, 1/16, 1/32
Hierarchy Mode	Layer A
Segment Mode	Full Seg
Output Level	Max. 104dBμV
MER	≥40dB

Encoder Module Specification

HDMI Encoder (Commercial)

Input	4 channels via 4 HDMI female connectors (HDMI 1.4)
Video	H.264/AVC HD: MP/HP@L4.0/4.1/4.2 SD: MP/HP@L3.0/3.1/3.2
Resolution	SD: 576i50, 480i59.94 HD: 1080p@25/30, 1080i@50/59.94/60, 720p@50/60 *Output supports progressive format only, and resolution support up to 1920*1080p30
Bitrate Control	CBR
Video Bitrate	600 ~ 12,000Kbps
GOP Structure	IPPP
GOP Size	1~99
Aspect Ratio	Automatic or Manual
Audio	MPEG-1 Layer II, AAC (Optional), AC3 (Optional)
Audio Bitrate	32~384Kbps
Audio Mode	Stereo (2.0, including downmix)
Audio Sampling Rate	48KHz
Audio Volume Leveling	-20dB~20dB
OSD Overlay	Text, Image, QR Code

HDMI Encoder (Professional)

Input	4 channels via 4 HDMI female connectors (HDMI 1.4)
Video	H.264 / AVC HD: MP/HP@L4.0 SD: MP/HP@L3.0 MPEG-2 SD: MP@ML
Resolution	SD: 576i50, 480i59.94 HD: 1080p@25/30/50/59.94/60, 1080i@50/59.94/60, 720p@50/60
Bitrate Control	CBR / VBR
Video Bitrate	1,000 ~ 14,000Kbps
GOP Structure	IBBP, IPPP, IBP
GOP Size	6~63
Aspect Ratio	Automatic or Manual
Audio	MPEG-1 Layer II, AAC (Optional), AC3 (Optional)
Audio Bitrate	32~384Kbps
Audio Mode	Stereo (2.0, including downmix)
Audio Sampling Rate	48KHz
Audio Volume Leveling	-20dB~20dB

HDMI Encoder 02

Input	2 channels via 2 HDMI or 2 component female connectors (HDMI 1.4) CC/Component input via DB15 port
Video	H.264/AVC HD: MP/HP@L4.0, SD: MP/HP@L3.0 MPEG-2 SD: MP@ML HD: MP@HL
Resolution	SD: 576i50, 480i59.94f HD: 1080p25/30/50/59.94/60, 1080i50/60, 720p50/60 *The maximum output resolution is 1080i60
Bitrate Control	CBR
Video Bitrate	1000 ~ 18,000Kbps

GOP Structure	IBBP, IPPP, IBP
GOP Size	6~63
Audio	MPEG-1 Layer II, AAC (Optional), AC3 (Optional). Support AC2 pass-through and dual audio encoding.
Audio Mode	Stereo (2.0, including downmix)
Sampling Rate	48KHz

HDMI Encoder with CC

Input	2 channels via 2 HDMI female connectors (HDMI 1.4) CC via RCA connector
Video	H.264/AVC HD: MP/HP@L4.0 SD: MP/HP@L3.0 MPEG-2 SD: MP@ML HD: MP@HL
Resolution	SD: 576i50, 480i59.94 HD: 1080p@25/30/50/59.94/60, 1080i@50/60, 720p@50/60 *The maximum output resolution is 1080i60
Bitrate Control	CBR
Video Bitrate	1000 ~ 18,000Kbps
GOP Structure	IBBP, IPPP, IBP
GOP Size	6~63
Audio	MPEG-1 Layer II, AAC (Optional), AC3 (Optional). Support AC3 pass-through ad dual audio encoding
Audio Mode	Stereo (2.0, including downmix)
Audio Sampling Rate	48KHz

SDI Encoder

Input	2 channels via 2 SDI or CVBS SDI or CVBS via BNC connector Audio via phoenix connector

Video	H.264/AVC HD: MP/HP@L4.0, SD: MP/HP@L3.0 MPEG-2 SD: MP@ML HD: MP@HL
Resolution	SD: 576i50, 480i59.94 HD: 1080p@25/30/50/59.94/60, 1080i@50/60, 720p@50/60 *The maximum output resolution is 1080i60
Bitrate Control	CBR
Video Bitrate	1000 ~ 18,000Kbps
GOP Structure	IBBP, IPPP, IBP
GOP Size	6~63
Audio	MPEG-1 Layer II, AAC (optional), AC3 (optional). Support AC3 pass-through and dual encoding
Audio Mode	Stereo (2.0, including downmix)
Audio Sampling Rate	48KHz

HEVC HDMI Encoder (8-CH)

Input	8 channels via 8 HDMI female connectors (HDMI 1.4)
Video	H.264 / AVC MP/HP@L4.2 H.265 / HEVC MP@L4.1
Resolution	HD: 1080p-29.97 / 30 / 50 / 59.94 / 60 1080i-29.97 / 30 / 50 / 59.94 / 60 720p-50 /59.94 / 60 SD: 576i-50 576p-50 460i-59.84 / 60 460p-59.84 / 60 *Output supports progressive only, and resolution support up to 1080p30
Bitrate Control	CBR
Video Bitrate	600 ~ 20,000Kbps
GOP Structure	IPPP
GOP Size	1~60
Aspect Ratio	Automatic or Manual
Audio	MPEG-1 Layer II, AAC, AC3
Audio Bitrate	32~192Kbps
Audio Mode	Stereo 2.0

Audio Sampling Rate	48KHz
Audio Volume Leveling	-20dB~20dB
OSD overlay	Text, Image, QR Code

HEVC HDMI Encoder (4-CH)

Input	4 channels via 4 HDMI female connectors (HDMI 1.4)
Video	H.264 / AVC MP/HP@L4.2 H.265 / HEVC MP@L4.1
Resolution	HD: 1080p-29.97 / 30 / 50 / 59.94 / 60 1080i-29.97 / 30 / 50 / 59.94 / 60 720p-50 /59.94 / 60 SD: 576i-50 576p-50 460i-59.84 / 60 460p-59.84 / 60 *Output supports progressive only, and resolution support up to 1080p30
Bitrate Control	CBR
Video Bitrate	600 ~ 20,000Kbps
GOP Structure	IPPP
GOP Size	1~60
Aspect Ratio	Automatic or Manual
Audio	MPEG-1 Layer II, AAC, AC3
Audio Bitrate	32~192Kbps
Audio Mode	Stereo 2.0
Audio Sampling Rate	48KHz
Audio Volume Leveling	-20dB~20dB
OSD overlay	Text, Image, QR Code

CVBS Encoder (Commercial)

Input	8 channels via 2 DB15 connectors, each DB15 for 4 channels 2 x RCA-DB15 adaptor cables come along with the module.
Video	H.264/AVC SD: MP/HP@L3.0/3.1/3.2
Resolution	SD: 576i50, 480i59.94
Bitrate Control	CBR

Video Bitrate	600 ~ 6,000Kbps
GOP Structure	IPPP
GOP Size	1~99
Aspect Ratio	Automatic or Manual
Audio	MPEG-1 Layer II
Audio Bitrate	32~384Kbps
Audio Mode	Stereo (2.0, including downmix)
Audio Sampling Rate	48KHz
Audio Volume Leveling	-20dB~20dB
OSD Overlay	Text, Image, QR Code

CVBS Encoder (Professional)

Input	6 channels via 2 DB15 connector, each DB15 for 3 channels 2 x RCA-DB15 adaptor cables come along with the module.
Video	H.264/AVC SD: MP/HP@L3 MPEG-2 SD: MP@ML
Resolution	SD: 576i50, 480i59.94
Bitrate Control	CBR
Video Bitrate	1000 ~ 6,000Kbps
GOP Structure	IBBP, IPPP IBP
GOP Size	6~63
Aspect Ratio	Automatic or Manual
Audio	MPEG-1 Layer II
Audio Bitrate	32~384Kbps
Audio Mode	Stereo (2.0, including downmix)
Audio Sampling Rate	48KHz
Audio Volume Leveling	-20dB~20dB

CVBS Encoder (Professional)

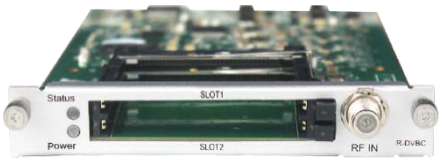
Input	16 channels via 4 DB15 connector, each DB15 for 4 channels 4 x RCA-DB15 adaptor cables come along with the module.
Video	H.264/AVC SD: MP/HP@L3.0/3.1/3.2

Resolution	SD: 576i50, 480i59.94
Bitrate Control	CBR
Video Bitrate	1000 ~ 8,000Kbps
GOP Structure	IPPP
GOP Size	1~99
Aspect Ratio	Automatic or Manual
Audio	MPEG-1 Layer II
Audio Bitrate	32~384Kbps
Audio Mode	Stereo (2.0, including downmix)
Audio Sampling Rate	48KHz
Audio Volume Leveling	-20dB~20dB

Function Module Specification

EAS Processing Module

Input	Digital EAS input (SCTE-18) via 1*RJ45 port Analogue EAS input via 3pin contact closure CVBS input via 1*RCA connector Audio L/R input via 2*RCA connector TS input via 1*BNC connector
Video	H.264 SD: MP/HP@L3.0 MPEG-2 SD: MP @ML (by default)
Resolution	SD: 480i59.94fps
ASI	500Kbps to 100Mbps
Contact Closure	3PIN Connector with dry Contact or 5~12V DC input for EAS trigger
RJ45	10/100M Ethernet for SCTED-18 digital EAS input
Bitrate Control	CBR
Bitrate	500~8,000Kbps
GOP Structure	IBBP, IPPP, IBP
GOP Size	6~63
Audio	MPEG-1 Layer II, AAC-LC/HE, AC3
Audio Mode	Stereo (2.0, including downmix)
Sampling Rate	48KHz



CI Scrambler/Descrambler	
Standard	EN 50221
Interface	2 x PCMCIA CI Slots
CAM Scrambling	Support Xcrypt CAS
CAM Descrambling	Supports mainstream CAS Descrambled channel quantity depends on CAM capability 2 CAMs could be different

APPENDIX D - Warranty

Sencore warrants this instrument against defects from any cause, except acts of God and abusive use, for a period of 1 (one) year from date of purchase. During this warranty period, Sencore will correct any covered defects without charge for parts, labor, or recalibration.

APPENDIX E - Support and Contact information

4.4.1 Returning for Service or Calibration

The OmniHub 16 is a delicate piece of equipment and needs to be serviced and repaired by Sencore. Periodically it is necessary to return a product for repair or calibration. In order to expedite this process please carefully read the instructions below.

4.4.2 RMA Number

Before any product can be returned for service or calibration, an RMA number must be obtained. In order to obtain a RMA number, use the following steps:

1. Contact the Sencore service department by going online to www.sencore.com and select Support.
2. Select Service and Repair from the options given.
3. Fill in the following required information:
   i. First & Last Name
   ii. Company
   iii. Email
   iv. Phone Number
   v. Ship and Bill to Address
   vi. Unit Model and Serial Numbers
4. A RMA number will be emailed to you with return instruction shortly after the form is completed.

4.4.3 Shipping the Product

Once an RMA number has been issued, the unit needs to be packaged and shipped back to Sencore. It's best to use the original box and packaging for the product but if these are not available, check with the customer service representative for the proper packaging instructions.

Note: DO NOT return any power cables or accessories unless instructed to do so by the customer service representative.