HDM-8500 series

Encoder & Modulator

Variants:

HDM-8512C	DVB-C Mod with Mux, OSD	12x HDMI, 1x DVB-C, 128x IP | LogoOSD, MUX, 4x DVB-C, 4x MPTS
HDM-8512T	DVB-T Mod with Mux, OSD	12x HDMI, 1x DVB-C, 128x IP | LogoOSD, MUX, 4x DVB-T, 4x MPTS

HDM-8508C	DVB-C Mod with Mux, OSD	8x HDMI, 1x DVB-C, 128x IP | LogoOSD, MUX, 4x DVB-C, 4x MPTS
HDM-8508T	DVB-T Mod with Mux, OSD	8x HDMI, 1x DVB-C, 128x IP | LogoOSD, MUX, 4x DVB-T, 4x MPTS

Datasheet & Instruction Manual

V1.1

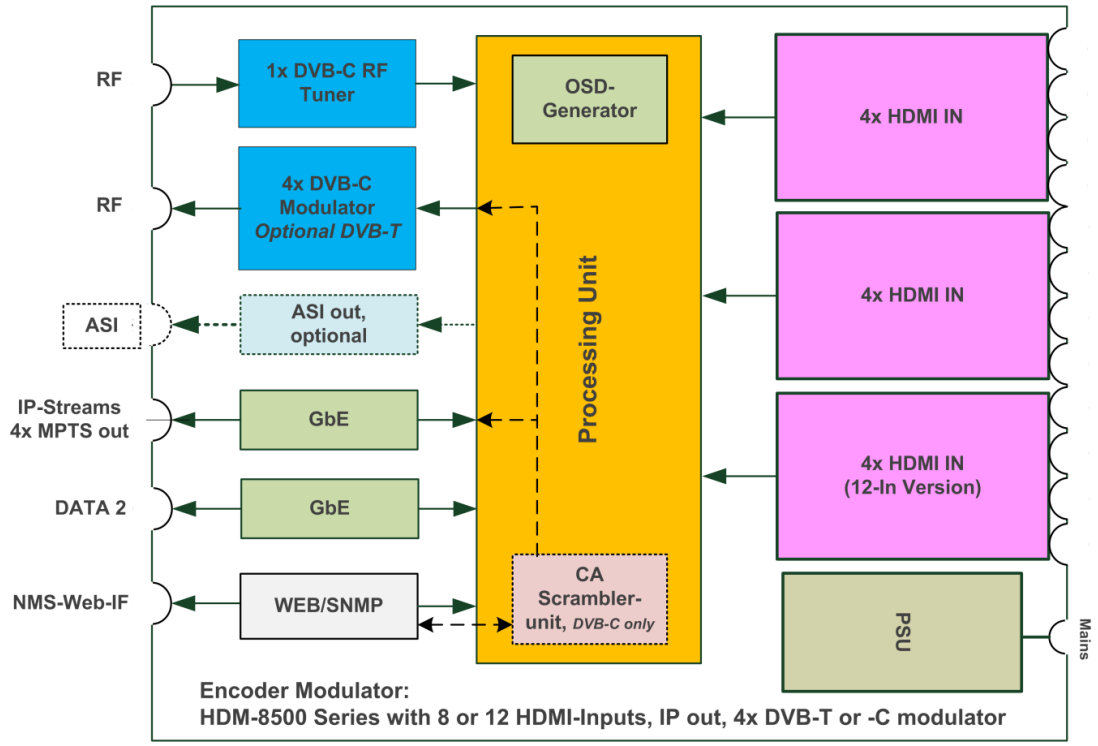
Table of Content:

TABLE OF CONTENT: **2**
CHAPTER 1: INTRODUCTION **3**
PRODUCT OVERVIEW 3
FEATURES 3
SPECIFICATIONS **4**
APPEARANCE AND DESCRIPTION 5
INSTALLATION GUIDE **6**
GENERAL PRECAUTIONS 6
POWER PRECAUTIONS 6
THE DEVICE INSTALLATION FLOW CHART IS ILLUSTRATED AS FOLLOWING: 6
ENVIRONMENT REQUIREMENT 6
GROUNDING REQUIREMENT 6
MANAGEMENT BY WEB-INTERFACE (WEBIF): **7**
UPGRADING THE FIRMWARE: **9**
SAVE AND RESTORE THE CONFIGURATION: **10**
SETTING DEVICE TIME AND DATE INFORMATION: **12**
PASSWORD SETTING: **13**
SYSTEM LOG WINDOW: **13**
CHAPTER 2: ENCODER SETUP **1**
PARAMETERS → MODULE 1- 2 (3) 1
DVB-C TUNER SETTINGS: **1**
PARAMETERS → TS CONFIG: **2**
DVB-C MODULATOR CHANNEL: **5**
PARAMETERS → IP STREAM: **8**
SCRAMBLER **9**
ON SCREEN DISPLAY SETUP: **10**
TROUBLESHOOTING **12**
PACKING LIST **12**
IMPORTANT NOTES! **13**
INSTALLATION NOTES 13
CONTACT: **14**

CHAPTER 1: Introduction

Product Overview

This Encoder – Modulator is a high integrated professional device which includes encoding, multiplexing, scrambling and modulation. It supports 8/12 HDMI input, one DVB-C tuner input and 128 IP input on Data1 (GE) and Data2 (FE) port. It supports DVB-C RF out *(or –T depending on ordered model)* with 4 adjacent channels, and IP output streaming on Data1 (GE) output port with 4 MPTS. These MPTS are containing the TS 1…4 multiplexes exactly as the DVB-C Modulator RF channels.
This full function device makes it ideal for small CATV head end system, and it's a smart choice for hotel TV system, entertainment system in sports bar, hospital, apartment…



Features

- 8/12 HDMI input, MPEG-4 AVC/H.264 Video encoding
- 1 DVB-C tuner input for re-multiplexing (only for DVB-C RF out)
- 128 IP input over UDP and RTP protocol
- MPEG1 Layer II Audio encoding with audio gain adjustment
- 4 groups of multiplexing/scrambling/modulation output channels
- 4 MPTS IP (DATA1 port only) output over UDP and RTP
- Supporting QR code, LOGO, OSD insertion for every local channel
- 1 ASI output *(Optional as ordered)*
- PID remapping/accurate PCR adjusting /PSI/SI editing and inserting
- Control via web management, and easy updates via web

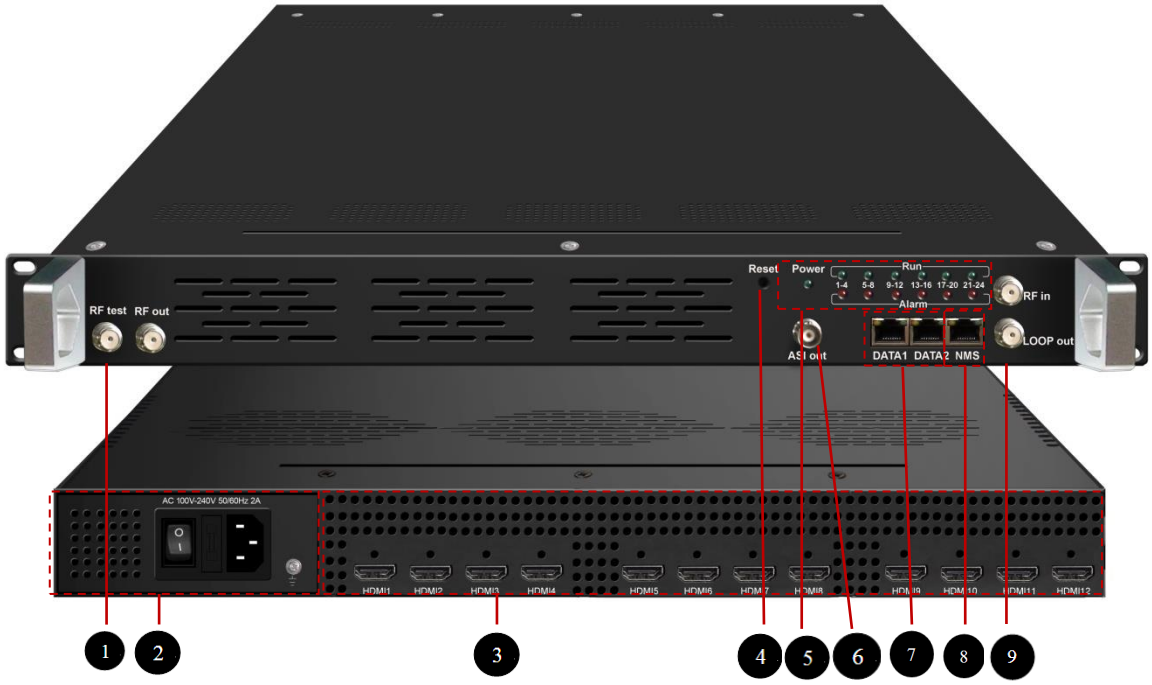
Specifications

Input	8/12 HDMI inputs for option 1 DVB-C Tuner input for remux, F type interface (only for DVB-C RF out) 128 IP input over UDP and RTP			
Video	Encoding	MPEG-4 AVC/H.264		
	Resolution	In-put	1920×1080_60P, 1920×1080_60i, 1920×1080_50P, 1920×1080_50i, 1280×720_60P, 1280×720_50P, 720×576_50i,720×480_60i,	
		Out-put	1920×1080_30P, 1920×1080_25P, 1280×720_30P, 1280×720_25P, 720×576_25P,720×480_30P,	
	Bit-rate	1Mbps...13Mbps each channel		
	Rate Control	CBR/VBR		
	GOP Structure	IP…P (P Frame adjustment, without B Frame)		
Audio	Encoding	MPEG-1 Layer 2		
	Sampling rate	48KHz		
	Resolution	24-bit		
	Bit-rate	64kbps,128Kbps,192kbps,224kbps,256kbps,320kbps,384kbps		
Multiplexing	Maximum PID Remapping	180 input per channel		
	Function	PID remapping (automatically or manually)		
		Accurate PCR adjusting		
		Generate PSI/ SI table automatically		
Scrambling	Maximum simulcrypt CA	4		
	Standard	EN300 429/ITU-T J.83A/B		
	Connection	Local/remote connection		
Modulation	DVB-C	QAM Channel: 4 adjacent Standard: EN300 429/ITU-T J.83A/B MER: ≥40db RF frequency: 50...960MHz, 1KHz steps RF output level: -26…-1dBm (81...106 dbμV), 0.1dBm Symbol Rate: 5.0Msps...7.0Msps, 1ksps stepping Constellation: 16/32/64/128/256QAM		
			Annex A: J.83A	J.83B (US)
		Constellation	16/32/64/128/256QAM	64/256 QAM
		Bandwidth	8M	6M
	or DVB-T	Standard	EN300744	
		FFT mode	2K,	
		Bandwidth	6M, 7M, 8M	
		Constellation	QPSK, 16QAM, 64QAM	
		Guard Interval	1/4, 1/8, 1/16, 1/32	
		FEC	1/2, 2/3, 3/4, 5/6, 7/8	
		MER	≥42 dB	
		RF frequency	50...960MHz, 1KHz step	
		RF out	4*RF COFDM DVB-T out (4 carriers combined output)	
		RF output level	-28... -3 dBm (77...97 dbμV), 0.1db step	

Stream output	RF output (F type interface)	
	4 IP MPTS output over UDP/RTP, 1*1000M Base-T Ethernet interface (DATA1 only)	
	1 ASI output *(Optional as ordered)*	
System function	Network management(WEB)	
	English language	
	software upgrade via Ethernet	
Miscellaneous	Dimension(W×L×H)	482mm×410mm×44mm
	Approx weight	8kg
	Environment	0...45°C(work); -20...80°C（Storage）
	Power requirements	AC 110V± 10%, 50/60Hz, AC 220 ±10%,50/60Hz
	Power consumption	70W

Appearance and Description

Front and Rear Panel Illustration



1	RF test and RF out port
2	Port Power supply and Grounding Pole
3	12HDMI input
4	Reset Key/Data Port Indicator
5	Indicator
6	ASI output port(optional)
7	DATA Port (for IP stream input/output)
8	NMS/CAS
9	RF in and Loop out

Installation Guide

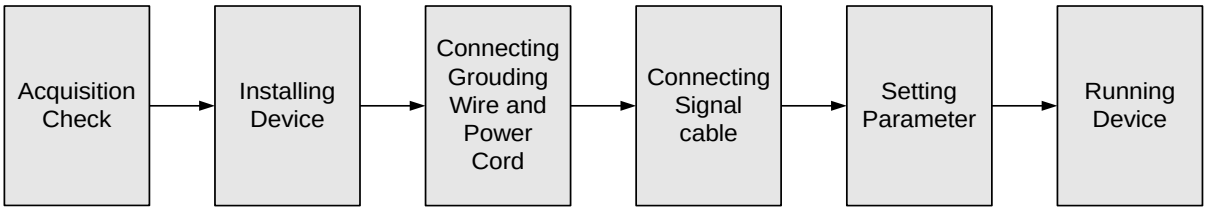
General Precautions

- Must be operated and maintained free of dust or dirty environments
- The chassis should be securely fastened, do not open the top case of the product when power is on.
- After use, securely stow away all loose cables, external antenna, and others.

Power Precautions

- When you connect the power source, assure correct grounding
- Make sure the power switch is off before you start to install the device

The Device Installation Flow Chart is Illustrated as following:



Environment Requirement

Item	Requirement
Machine Hall Space	When user installs machine frame array in one machine hall, the distance between 2 rows of machine frames should be 1.2...1.5m and the distance against wall should be no less than 0.8m.
Machine Hall Floor	Electric Isolation, Dust Free; Volume resistivity of ground anti-static material: $1X10^{7}$...$1X10^{10}\Omega$, Grounding current limiting resistance: 1MΩ (Floor bearing should be greater than 450Kg/㎡)
Environment Temperature	5...40°C (sustainable) , 0...45°C (short time) , air-conditioning is recommended
Relative Humidity	20%...80% sustainable 10%...90% short time
Pressure	86...105KPa
Wall	It can be covered with wallpaper, or brightness less paint.
Fire Protection	Fire alarm system and extinguisher
Power	Device power, air-conditioning power and light power should be independent to each other. Device power requires AC 110V±10%, 50/60Hz or AC 220V±10%, 50/60Hz. Please carefully check before installing.

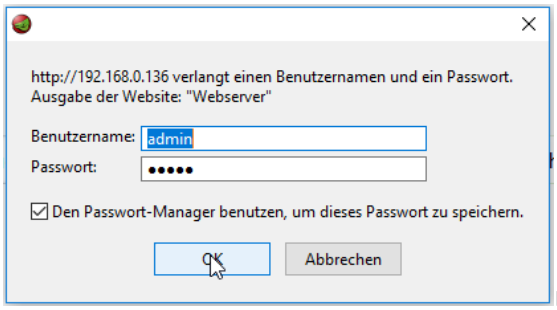
Grounding Requirement

- Sufficient grounding is the basic of reliability and stability of such devices. Also, they are the most important guarantee against lightning and interferences.
- Grounding conductor must be installed with copper conductor in order to reduce high frequency impedance, and the grounding wire must be as thick and short as possible.
- Users should make sure the 2 ends of grounding wire well electric conducted

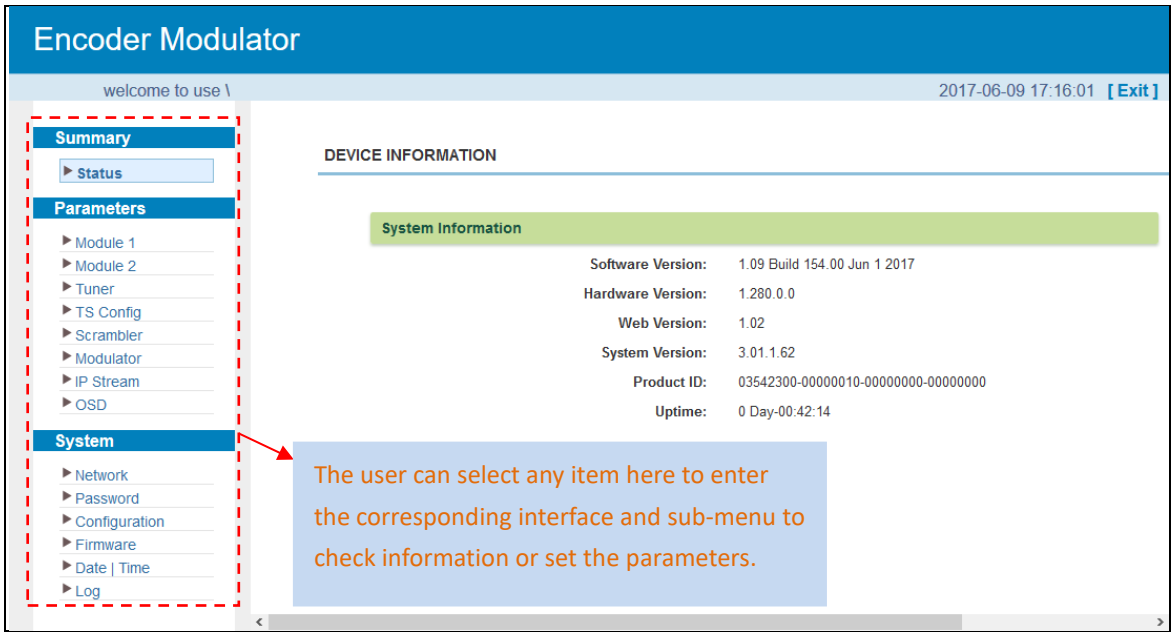
- It is prohibited to use any other device as part of the grounding electric circuit
- The area of the conduction between grounding wire and device's frame as 19'' Racks should be no less than 25 mm^2.

Management by Web-Interface (WebIF):

The user can control and set the configuration of the device with any computer by connecting to web NMS Port. The user should ensure that the computer's IP address is different from other device's IP address; otherwise, it might cause an IP conflict.
Default Login-Data on 192.168.0.136 (default factory address) are **admin/admin**:



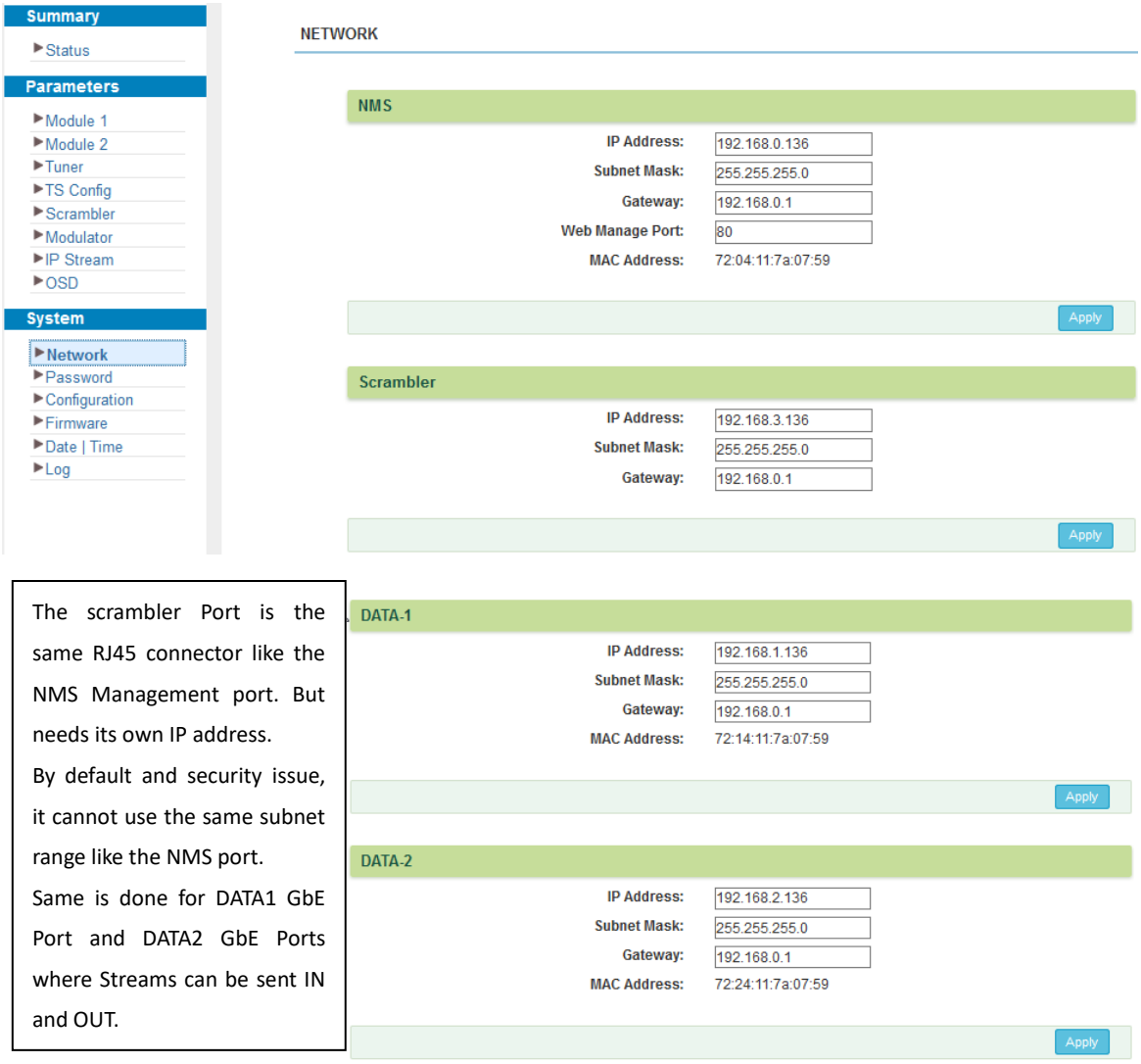
Language and feedback according to your used OS.



This unit is equipped with 2x 4 HDI-Input port modules. The HDM 8512 C (or T) has 3 Modules installed. So all configurations are similar Module by Module.
The **STATUS page** gives an overview of System information HW/SW Versions …. Left frame is the menu-panel to select the different sub-menus. **PARAMETER** Submenu: You are seeing the Input Module 1 … 3, DVB-C Tuner, ASI IN (Option) , TS-configuration for the outputs, Encryption (Scrambler setup) DVB-C Output (4 ch), OSD overlay feature setup. And **SYSTEM** setup.

We start with the Network settings of the NMS- management port:
We assume that the user is familiar with IP settings and already knows his own system to connect the

unit to. **We recommend using 2 separate Switches**: At least a 100BaseT for the Management NMS RJ45 port and a second one with Gigabit Ethernet 10/100/1000BaseT with at least Layer 2+ with IGMP V2 features. Otherwise you might flood your IP-Streaming network with unnecessary Data, which might overload connected IPTV STB's because they almost have only 100BaseT capacity (Never ones use 1GbE ports but too many inputs into a STB can result in side effects. If you need to select a Switch, we recommend HP Procurve 2530 24G or 48G which are cost effective, easy to configure, can be trunked and supporting IGMP V2. If the switch needs routing functions, the bigger brother of this series might be the right choice.

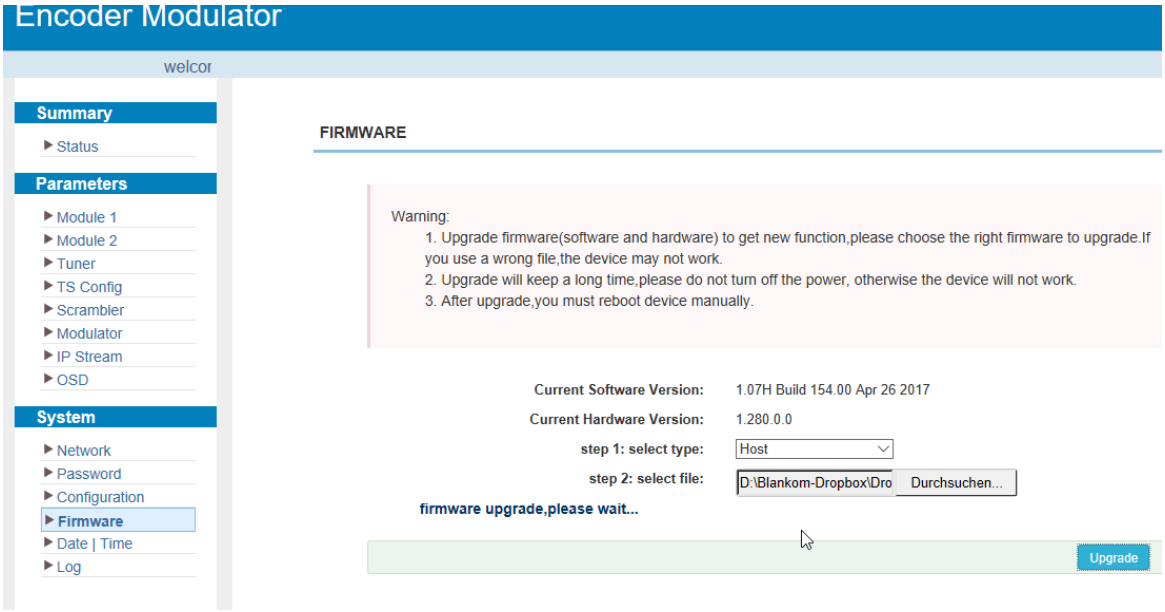


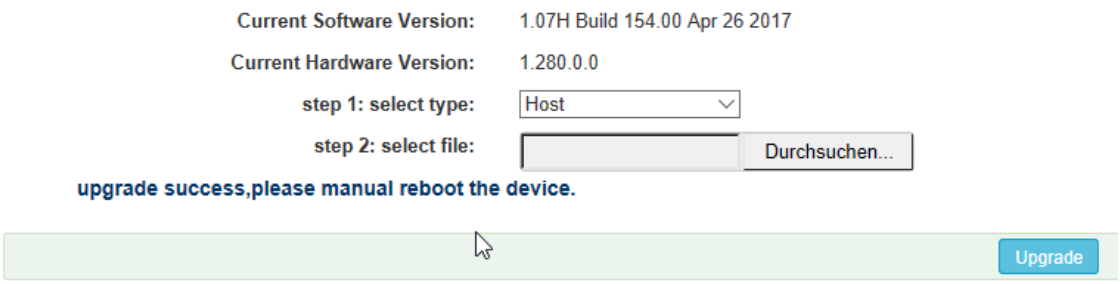
The scrambler Port is the same RJ45 connector like the NMS Management port. But needs its own IP address.

By default and security issue, it cannot use the same subnet range like the NMS port.

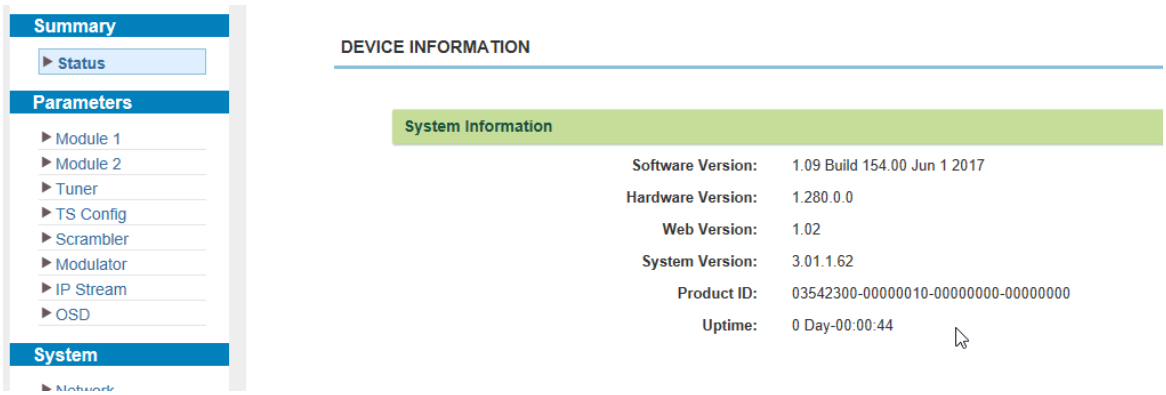
Same is done for DATA1 GbE Port and DATA2 GbE Ports where Streams can be sent IN and OUT.

Upgrading the firmware:



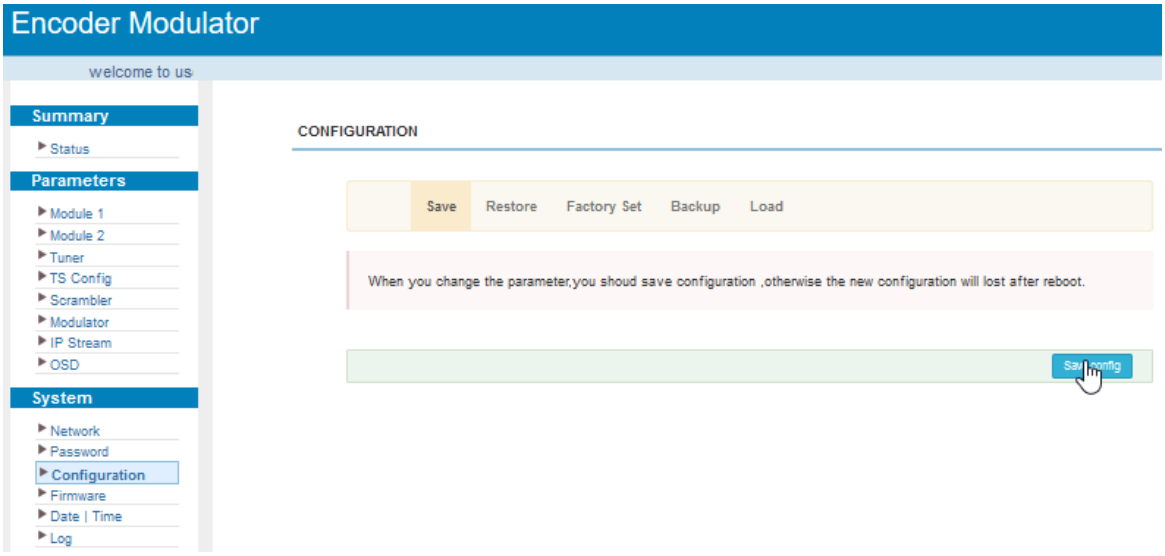


Switch ON / OFF at the rear panel for rebooting the device:

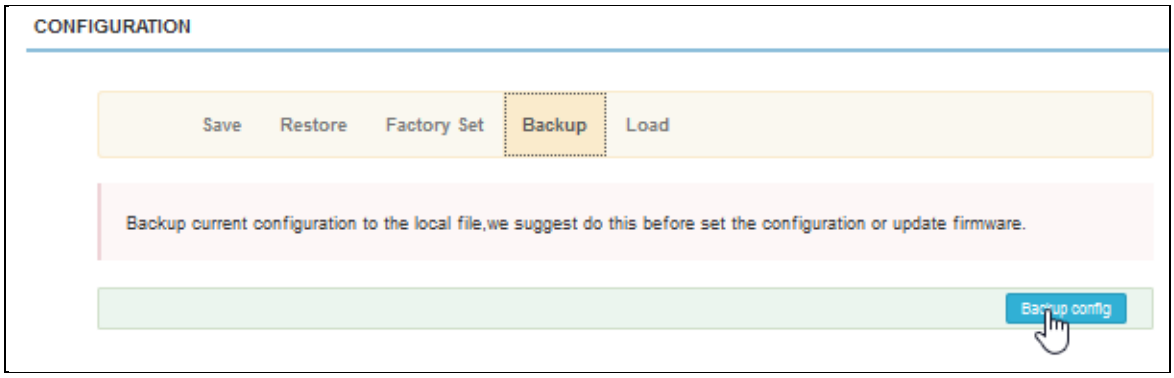


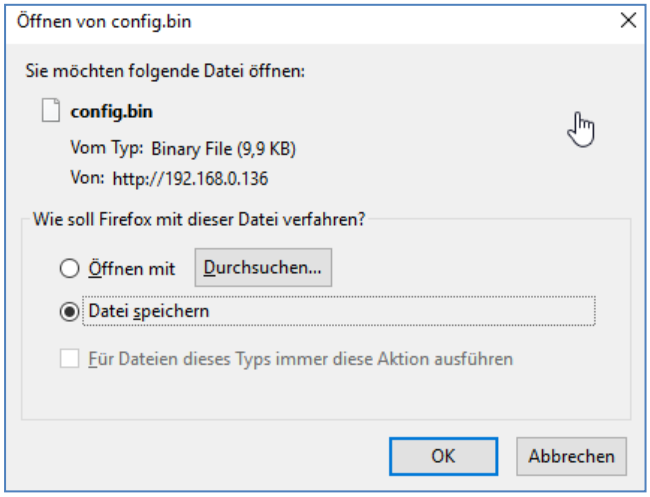
Save and Restore the configuration:

We highly recommend to safe the configuration to be able to restore it at all time just in case the unit was accidently w/o power or any other interruptions happened.



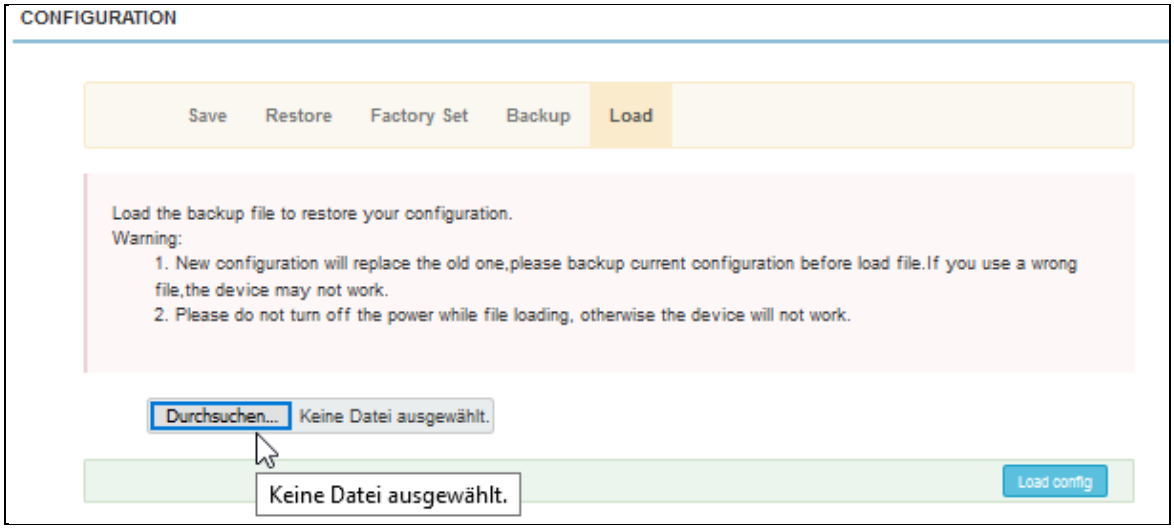
This method is only temporary so we recommend to use the Backup and Load function instead:



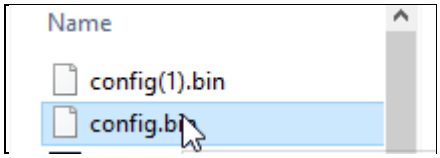


Safe/Store the config.bin file on your local PC.

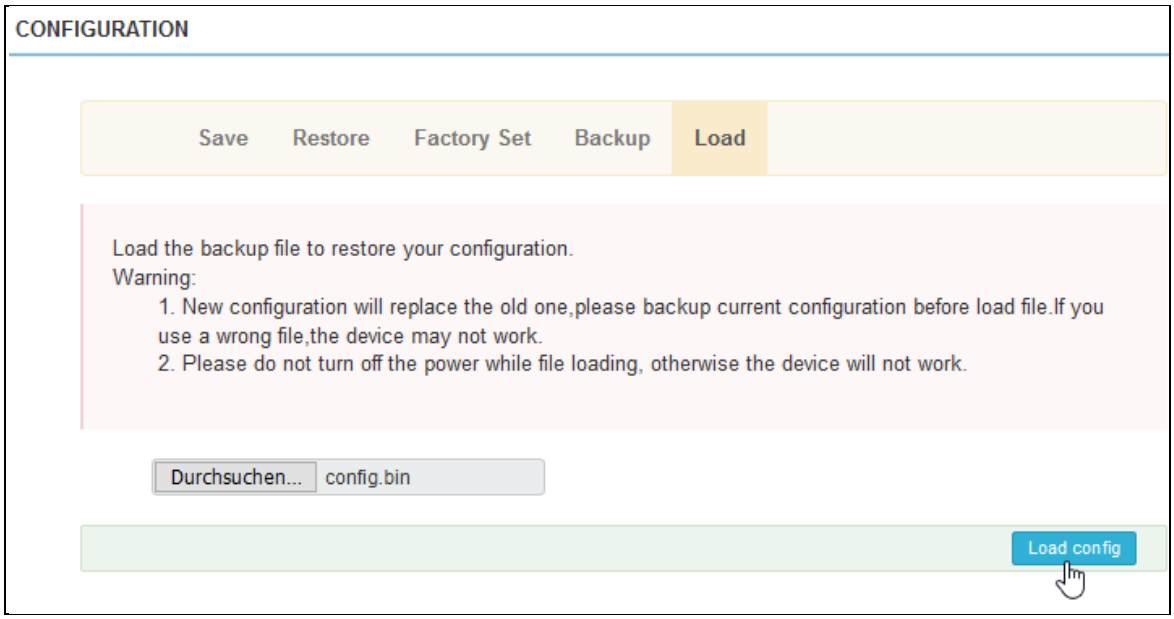
Restoring this config:

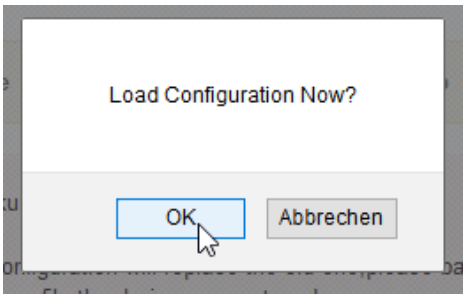


Select the file and start the upload:

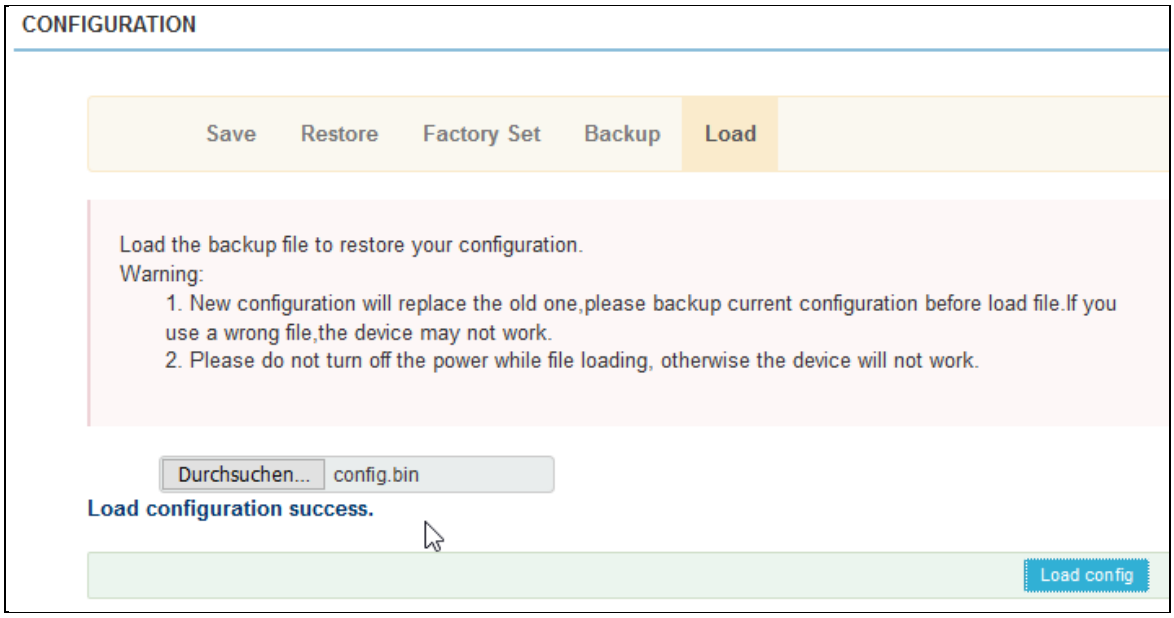


than LOAD config

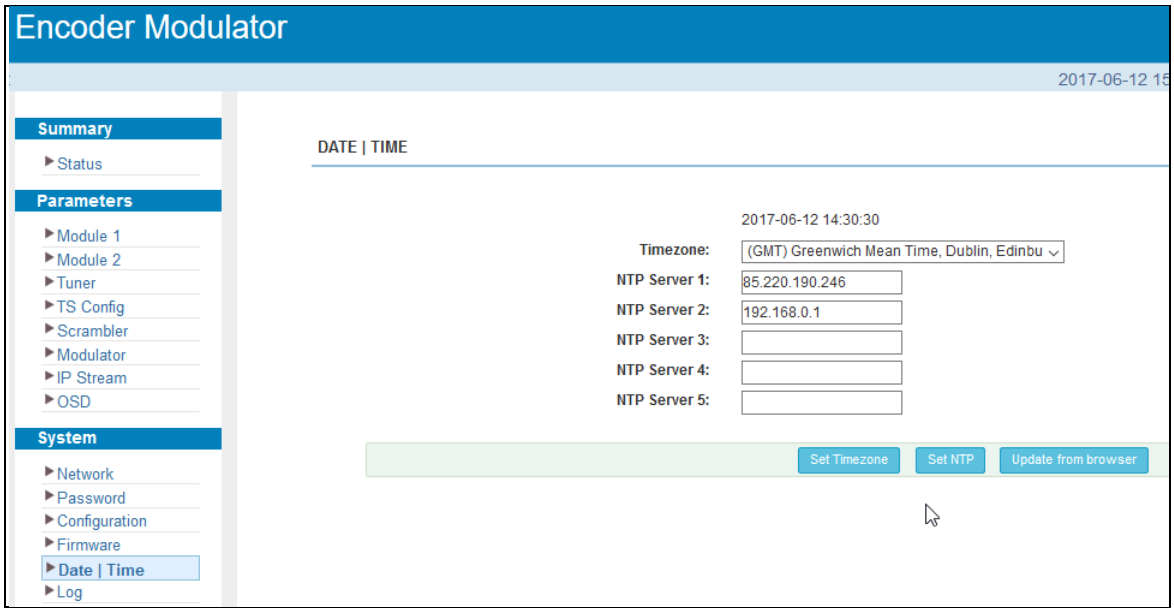




confirm it please…



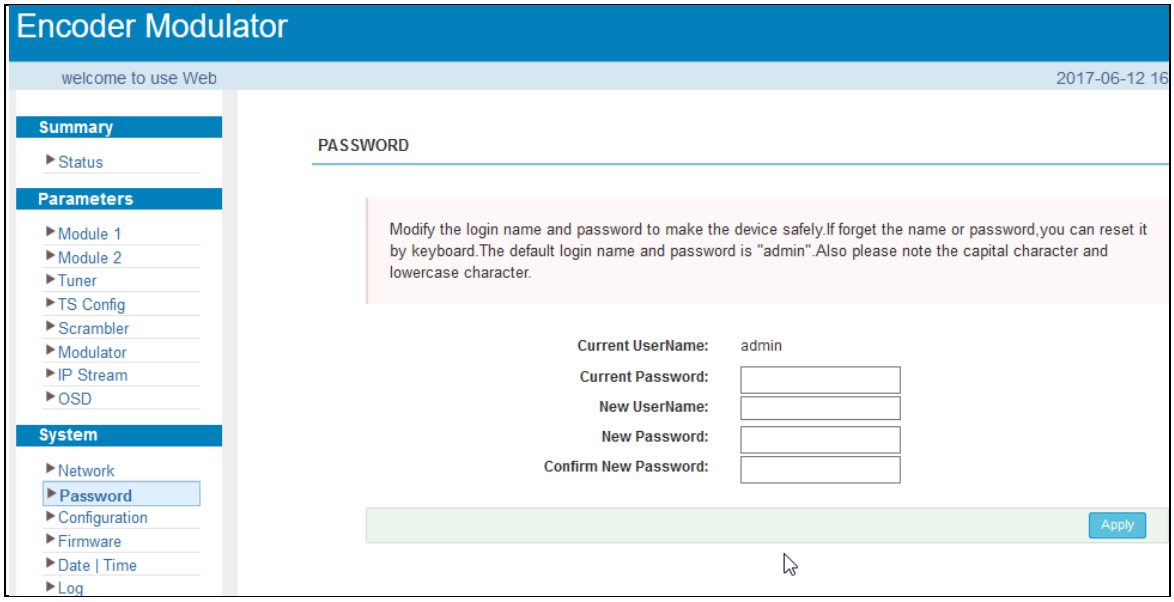
Setting device Time and Date information:



The unit can synchronize its Date and Time information by:

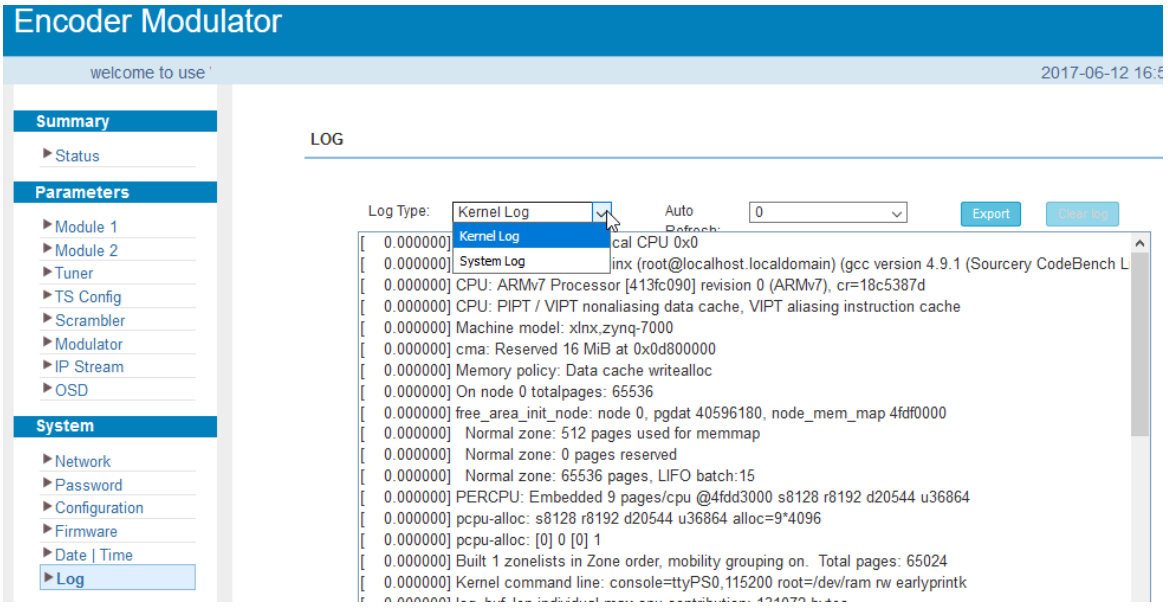
- your local PC via the browser
- or by a connected NTP server either from the internet or the local router if supported

Password setting:



The default username / PW can be changed to your needs. Please make sure you do not lose it or a complete factory Reset (Front panel RESET button) must be initiated.

System Log Window:

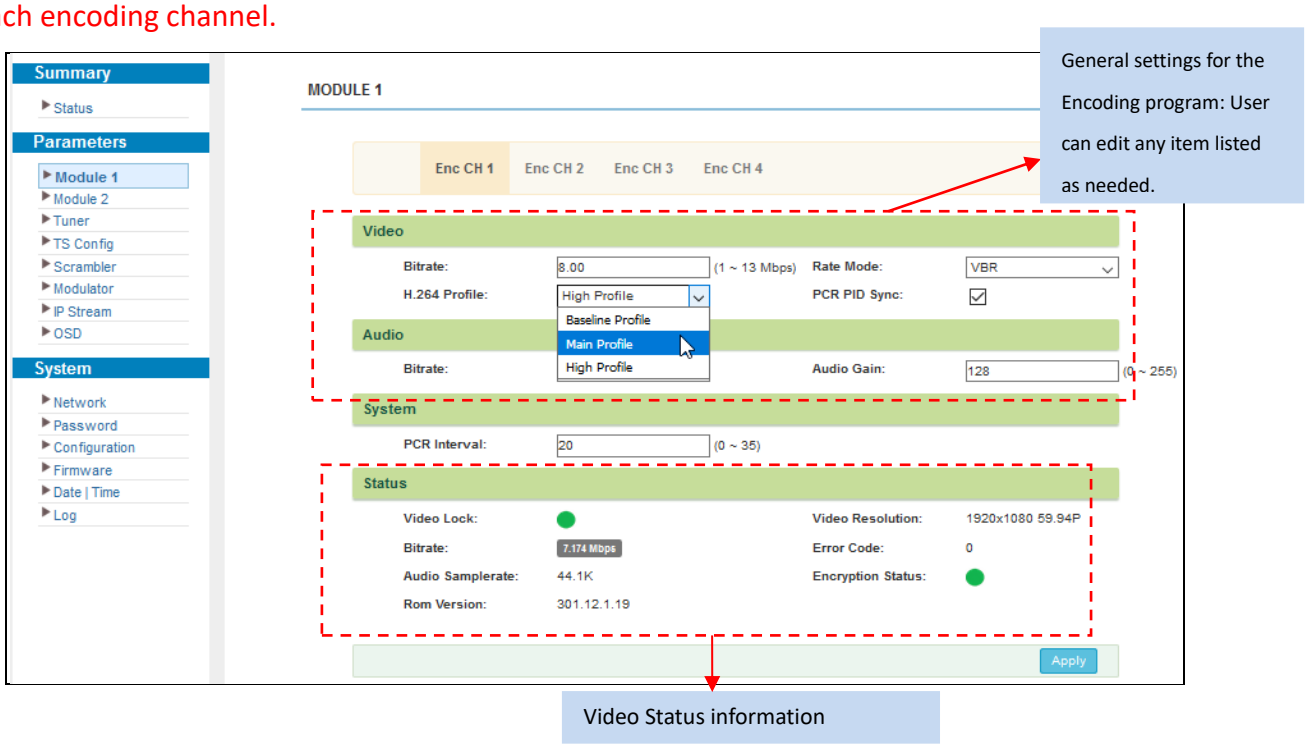


Log information for Kernel or System messages can be exported for your information or passing on to the developers – just in case.

CHAPTER 2: Encoder setup

Parameters → Module 1- 2 (3)

This encoder modulator support up to (2) 3 modules maximum with (8) 12 HDMI input. From the menu on left side of the webpage, clicking “Module1-3”, it displays the information of each encoding channel.

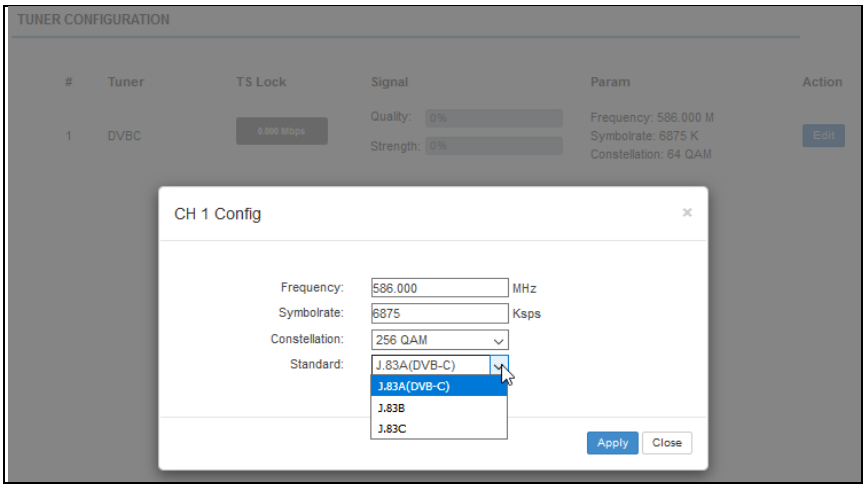


Here the settings are almost self explaining: Video Bitrate 1 … 13Mb/s, Profile, Audio sampling Bitrate, PCR, CBR/VBR, Audio Gain,…

The status window shows incoming HDMI Port values. Just remarkable: This unit is a direct encoder, not a transcoder. So it does not change input resolutions and framerates. ROM –Firmware version is shown as well – which might be important for Service issues.

DVB-C Tuner settings:

Importing an existing DVB-C RF channel is possible to pick or select one or more services out of it for later remultiplexing to the 4 new TS seen in following chapter.

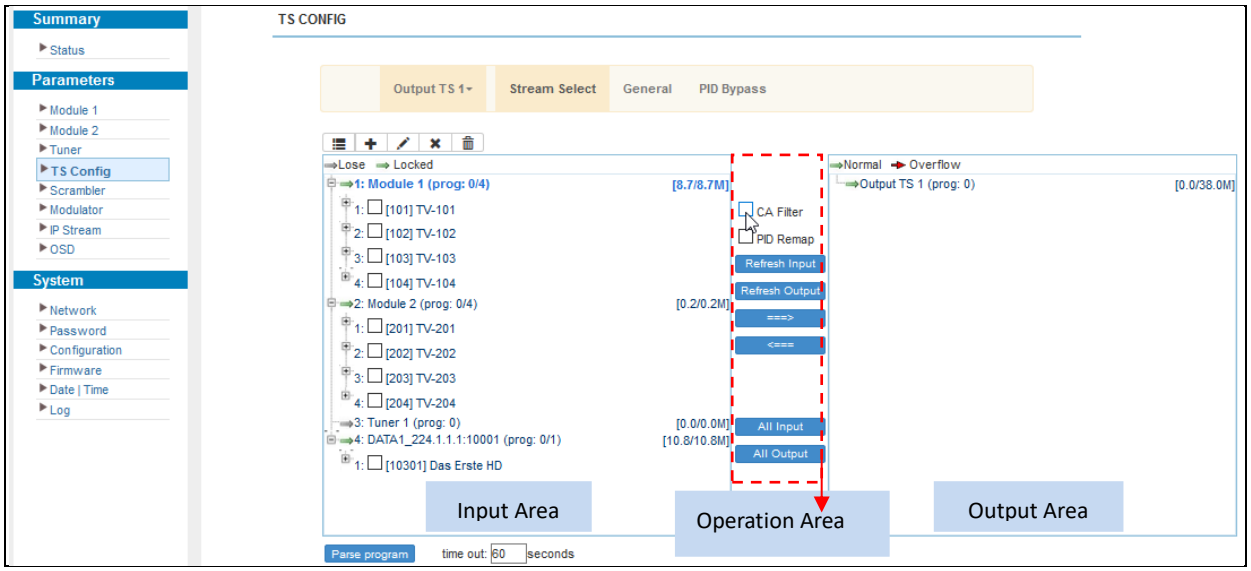


Parameters → TS Config:

From the menu on the left side of the webpage, chosing “TS Config”, opens the interface where users can configure the Transport stream TS output parameters.

- **TS Config→Stream select:**

Select Output TS 1 …4, “Stream select”, shows the interface where users can select program(s) to the TS multiplex output and modify program information:



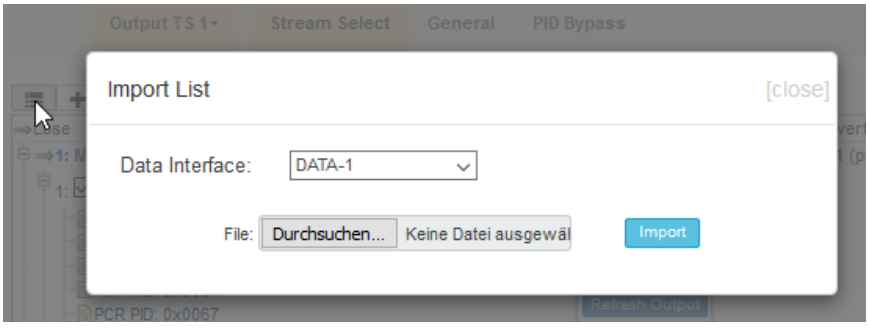
In the operation Area, the PID Remapping can be set to ON, if need only parsing programs which are not interfering each other with similar PID values/numbers, this is not needed. The CA Filter assures the removal of CA-Flag information's if the Services were encrypted before and the source did not support correct CA-Flag removal even after encryption. Often if only some services of an encrypted content were decrypted, the CA Flag and EMM/ECM PID's are still passed within the TS.

Updating Info:

will re-read the input stream content and update info.

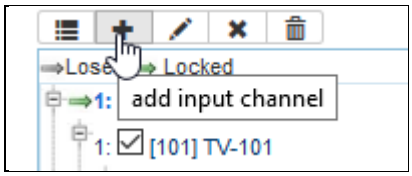
Always Necessary after adding a service!

An INPUT listing File can be imported already for Input stream addresses:

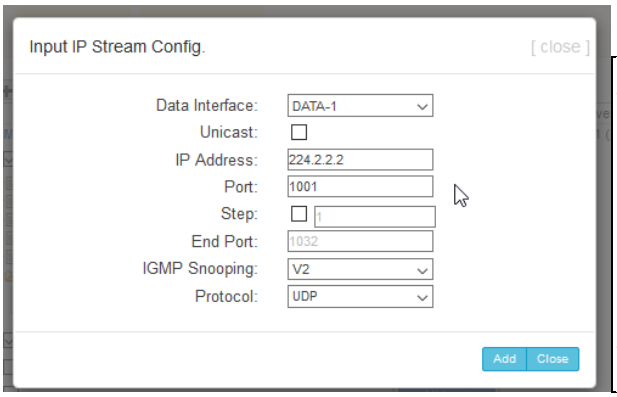


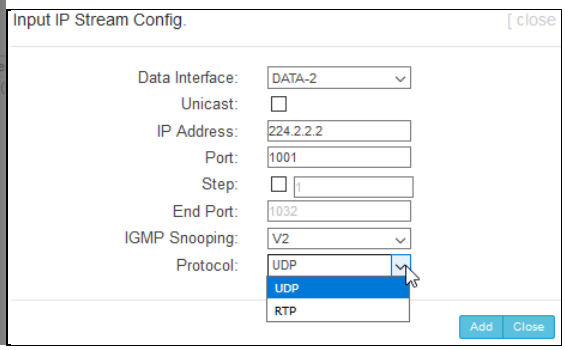
Format? Need to check it…

Add an Input channel by:



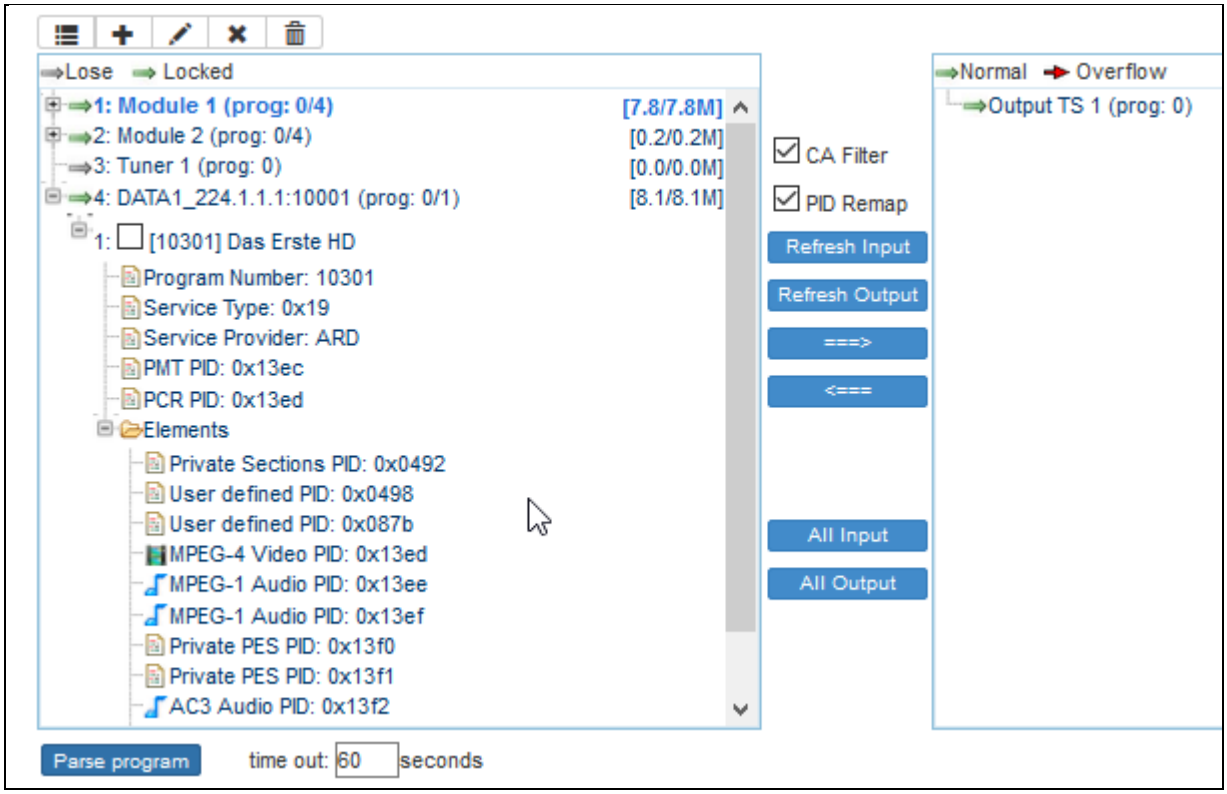
:



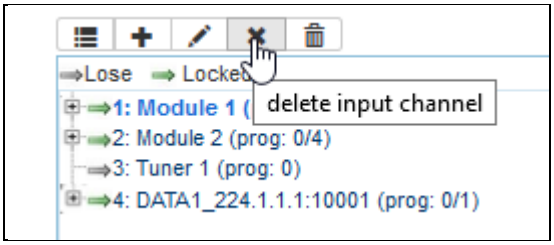


Chose DATA 1 or 2, Multicast is default, Unicast can be chosen, several MC-Address and ports in STEPS, IGMP off/V2/V3 selectable, UDP or RTP as receiving IP protocols.

After adding an IP Input and parsing the info's, the Service Information are shown:

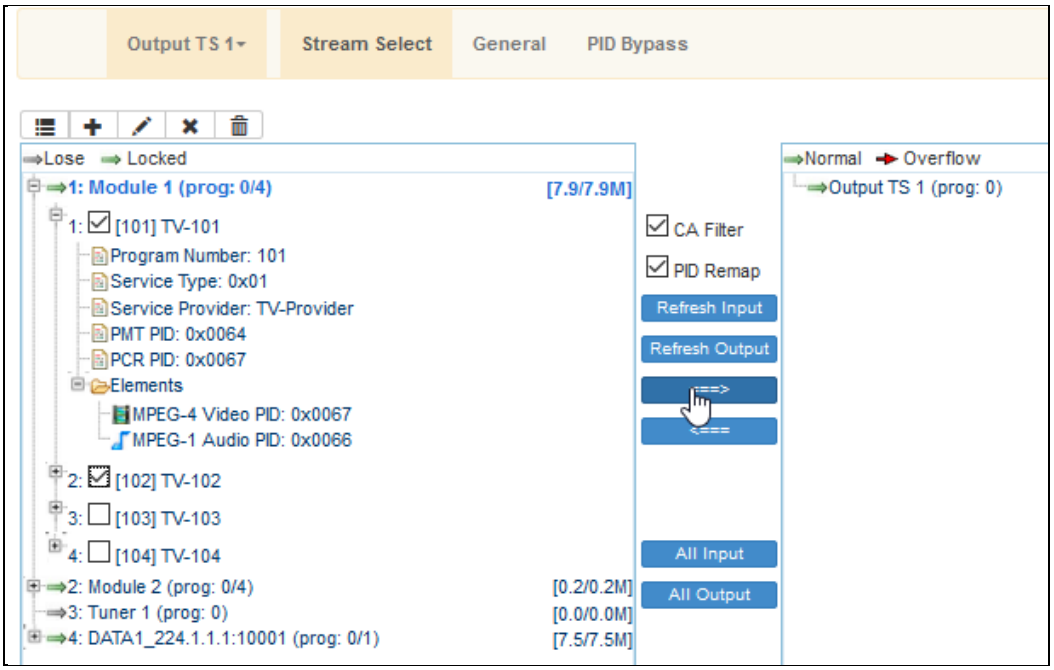


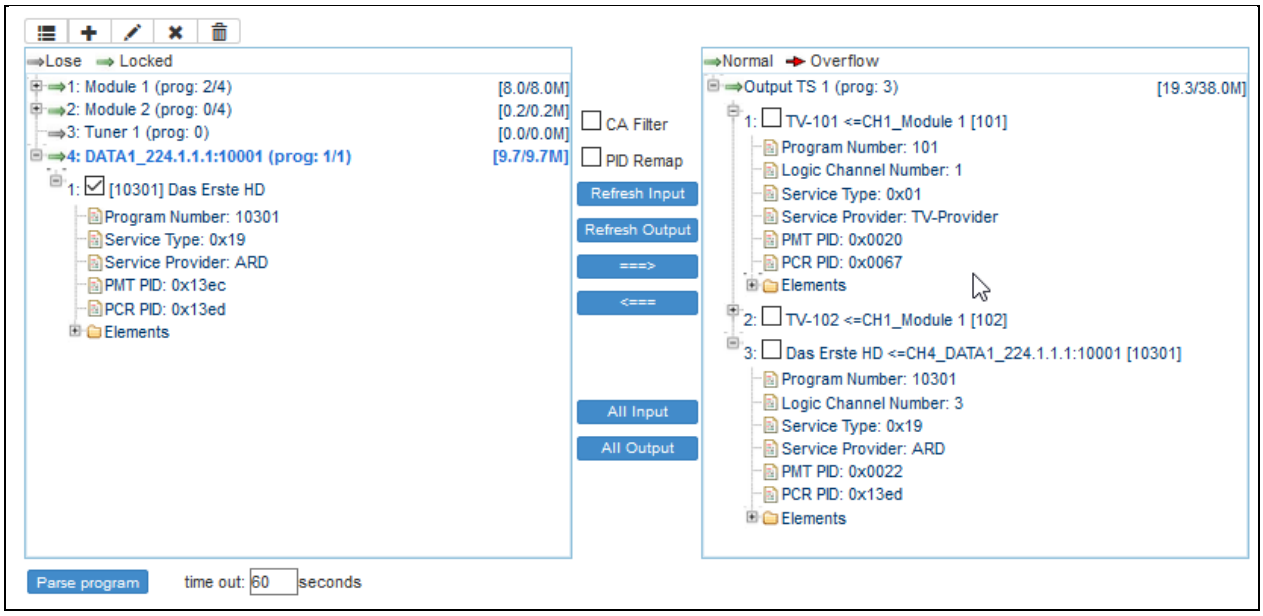
Delete an Input channel:



or **delete ALL** with the wastebasket icon.

After setting up the IP, Tuner and HDMI-Inputs from Module 1…3 you can select services to be passed to the output mux TS 1… TS 2 … TS 3 … TS 4 :



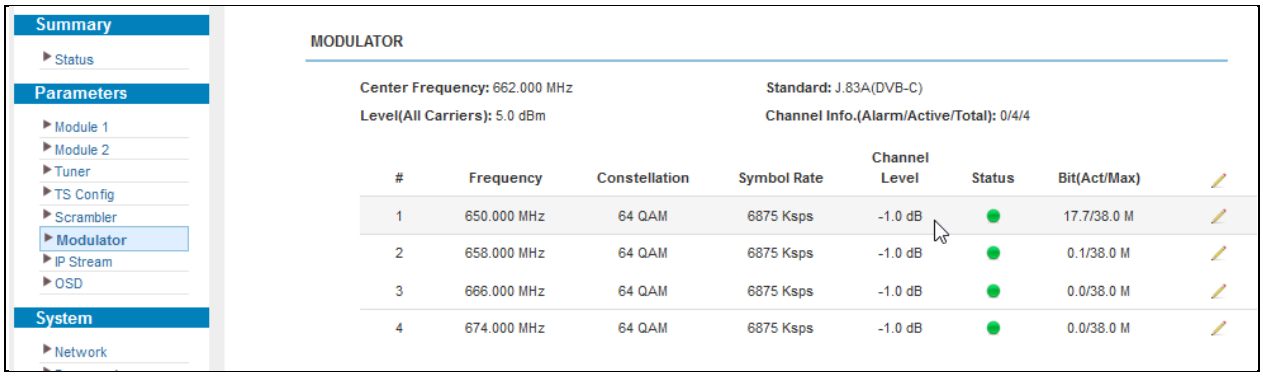


Normal Overflow : To check current whether the TS has too much Inputs: Overflow status: red color means there is too much content … please reduce the number of services accordingly.

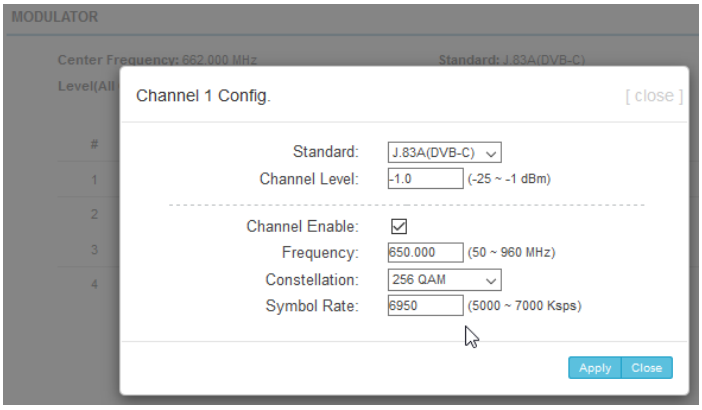
The max datarate of the TS 1 is shown here with 38 Mb/s. This corresponds with the max possible Datarate of the

DVB-C Modulator channel:

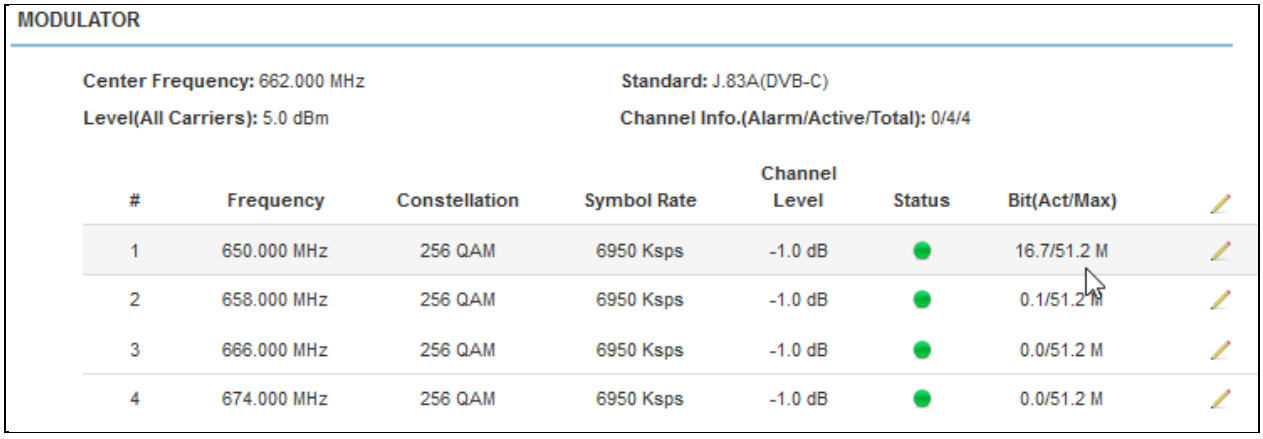
DVB-C 1…4:



So to get more services under this roof, you should increase the Modulator settings i.e. to:

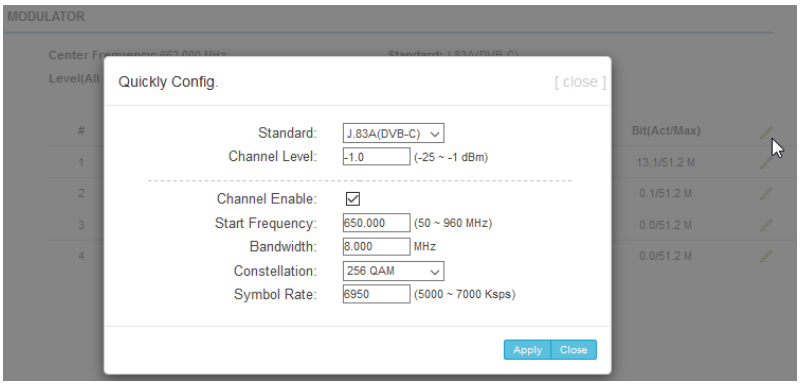


we have now 51.2 Mb/s max datarate:



All 4 channels will be updated to the same constellation. ***DVB-T Modulator settings vary from DVB-C.***

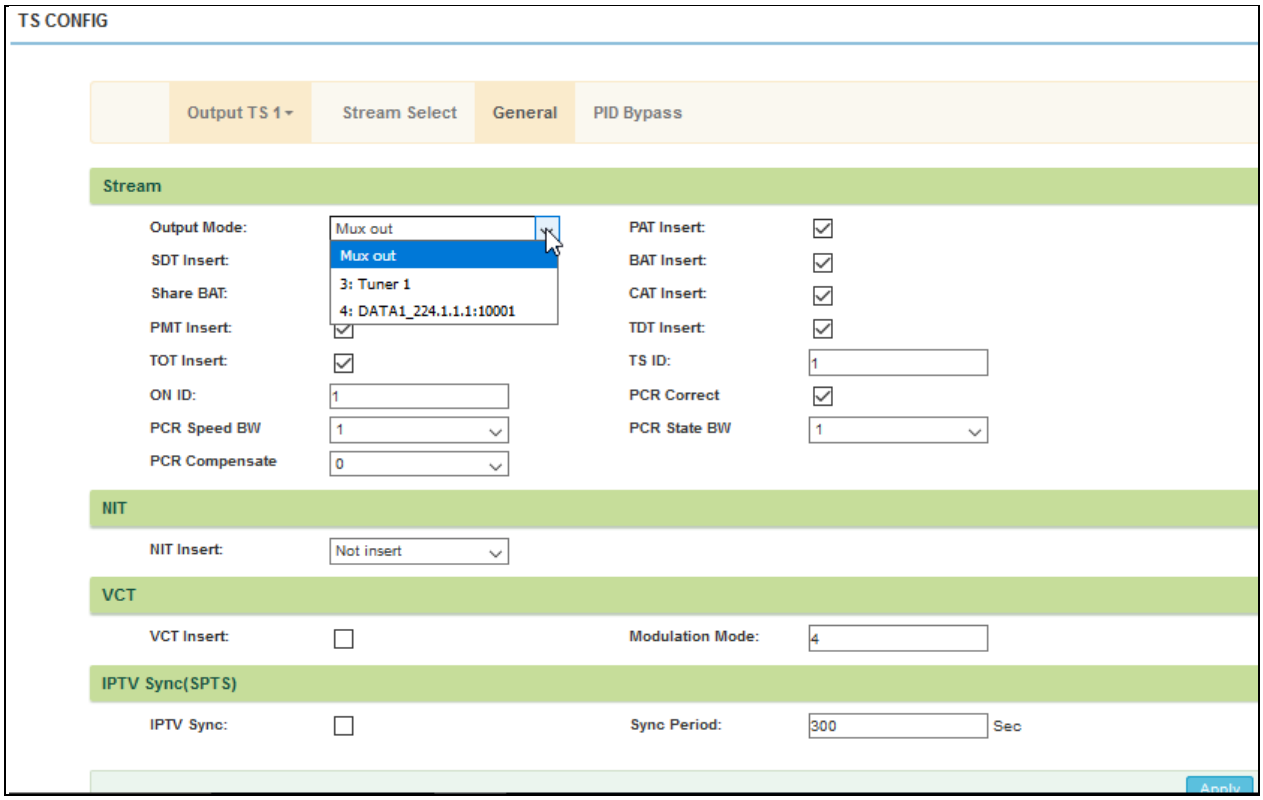
Start Frequency (adjacent channels) and DVB-C Mode can be done with selecting the upper edit pen:



Note:

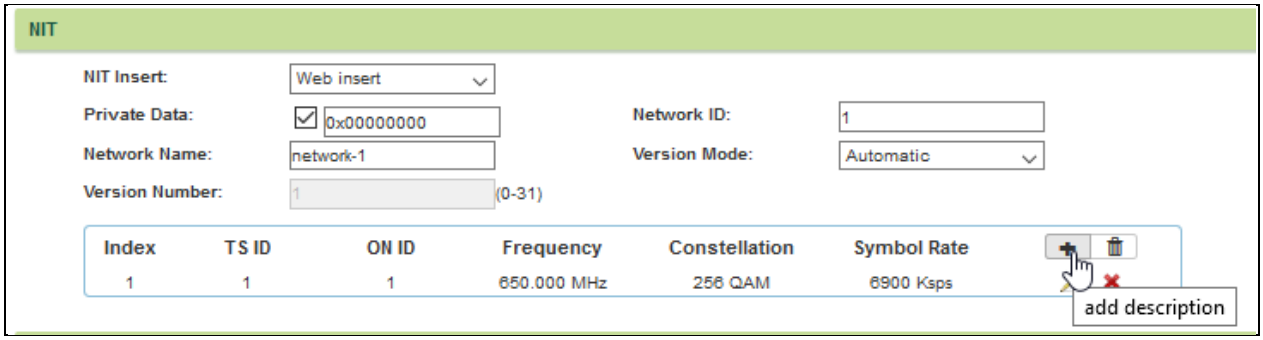
Setting up ITU 83.B also named DVB-C Annex B is according to the 'special Version' of the US Norms. Some TV Tuner or STB's outside the region where it's used (US , Korea, …) might not be able to tune to Annex-B!!!

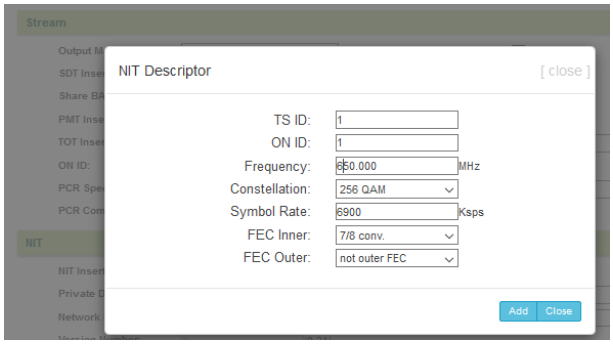
Back to the TS – Configurations:



This menu gives the different possibilities to add or pass or insert PSI/SI table parts.

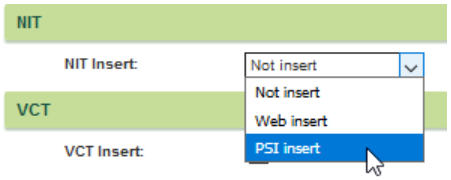
It is also possible to simply pass an Input to the output TS and channel. NIT descriptors can be manually added:





with setting of different channels step by step…

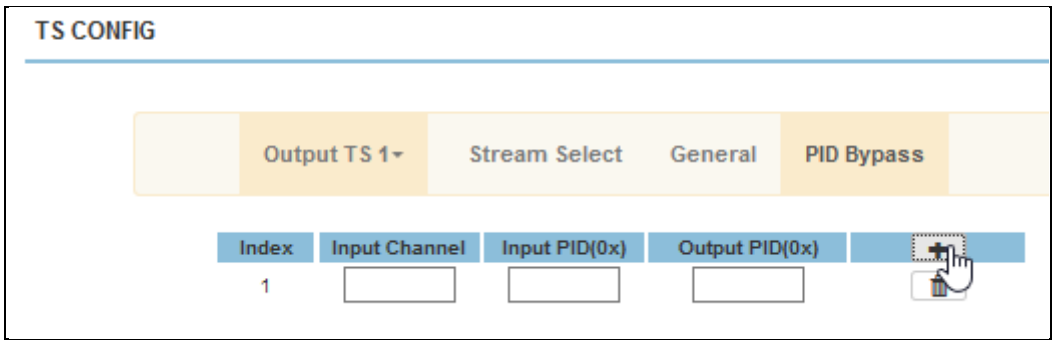
or



no insertion or from an external PSU generator -> as BIN file.

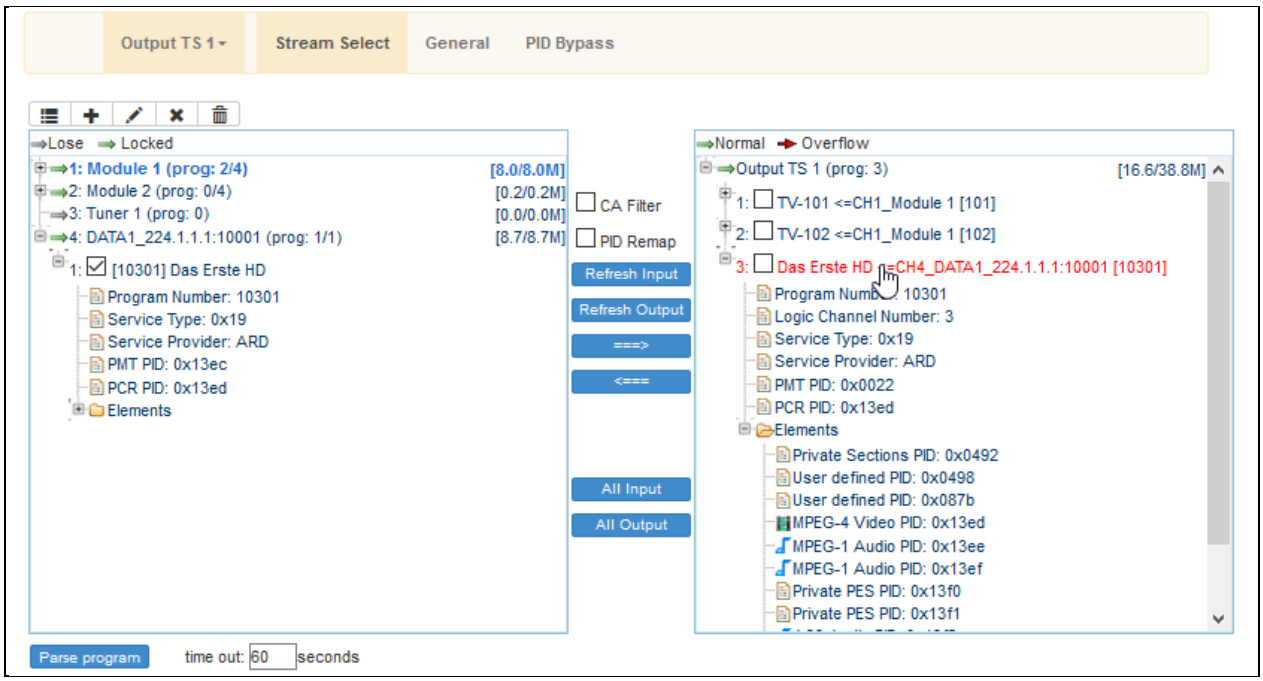
We recommend to setup the NIT by web-Insert and add all channels of your network accordingly at least to the first lowest frequencies of your networks DVB-C channels.

If particular PID's should be simply bypassed from In- to Output use this:

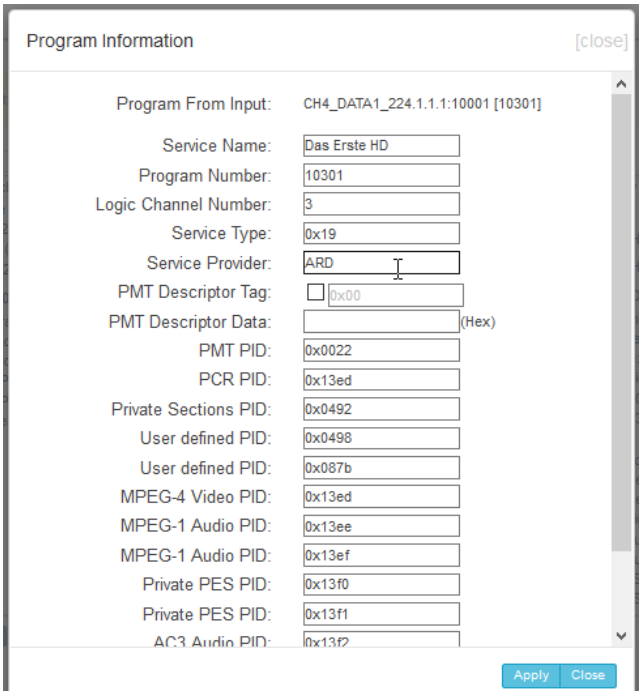


Program Modification:

The multiplexed program information can be modified. For example, when point and click on the selected output service:

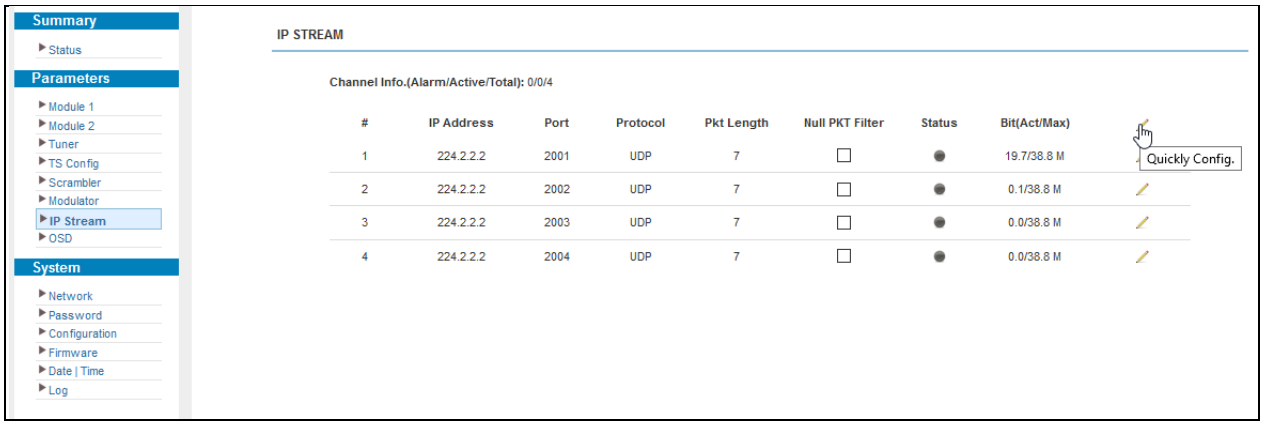


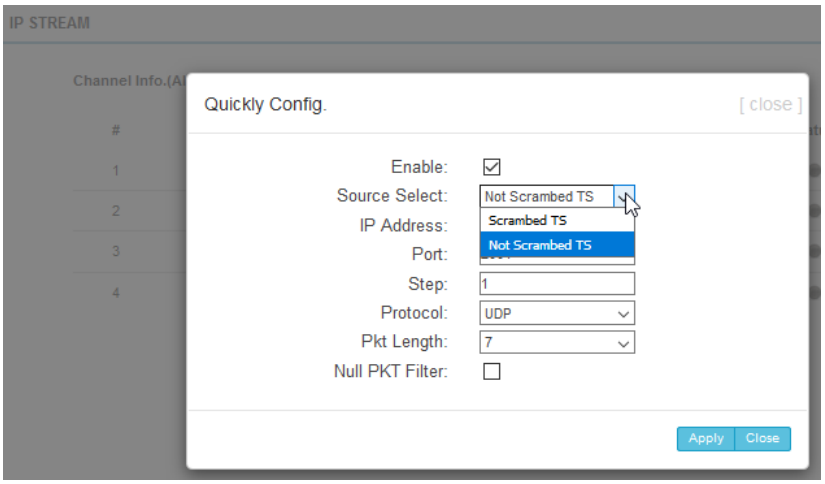
Opens the Pandora's box:



Parameters → IP Stream:

This encoder modulator is able to sent the 4 Transport streams (4xMPTS) to the IP Output on the GbE port through the DATA1 port.



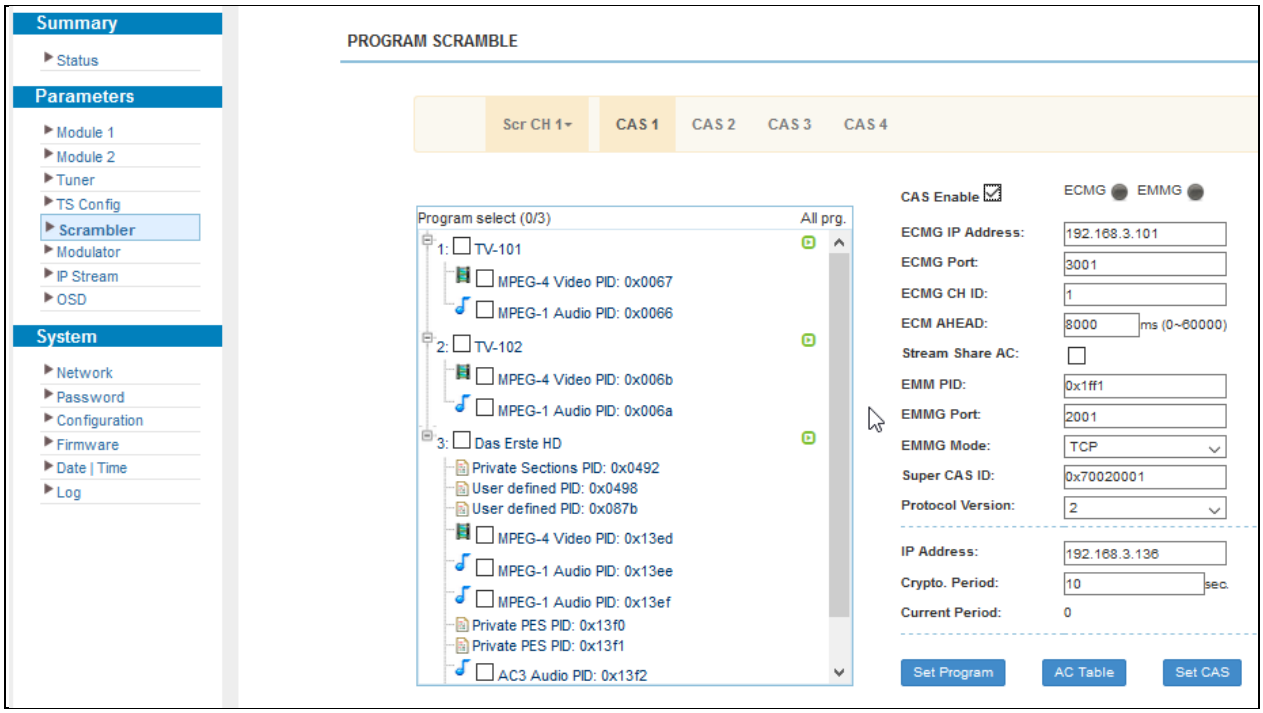


Enable the stream
Chose whether scrambled or FTA
IP Address and Portnumber and multiple steps
UPD or RTP
Paket length
and VBR or CBR

Many IP to something Modulators can only handle CBR – Streams so we recommend to not use Null paket filter here, except you need to safe bandwidth and you really know which IP receiver is on the other side – supporting MPTS with VBR mode (w/0 PID 8191dec: No zero paket filling).
If chosing the scrambler Option, you need to have a connection to a CAS: Conditional Access Server and configure the needed setup values here in the

Scrambler

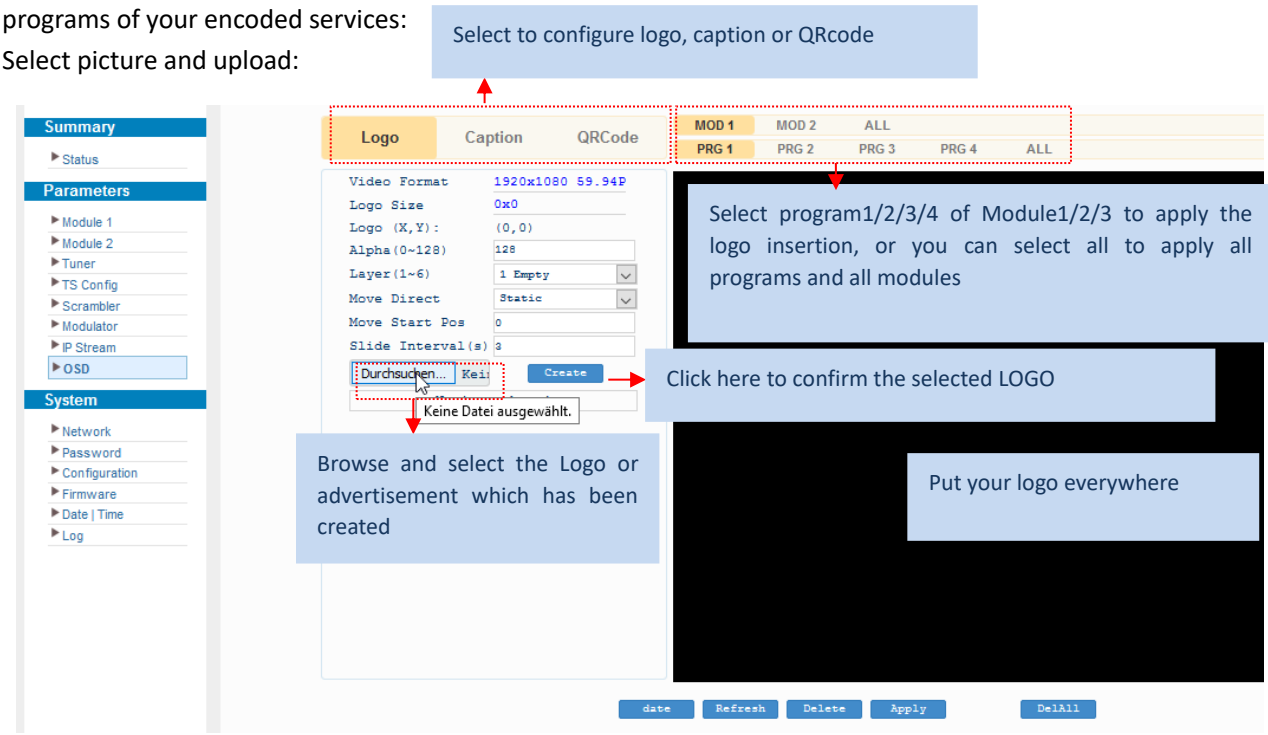
Menu:

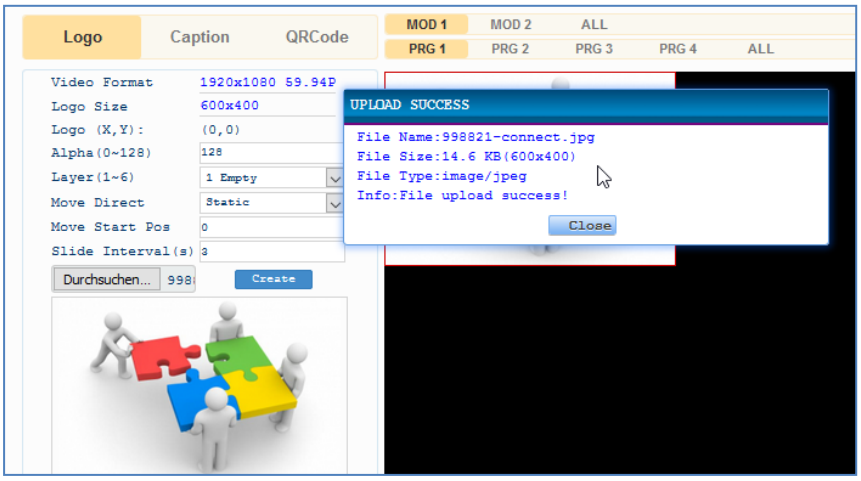


On Screen Display setup:

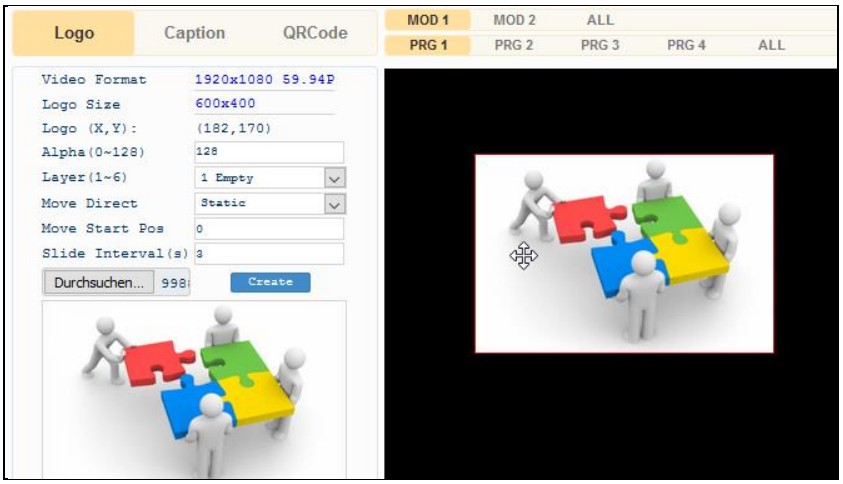
The OSD Menu can be used to "overlay" logos, advertisements and text messages over all or selected programs of your encoded services:

Select picture and upload:

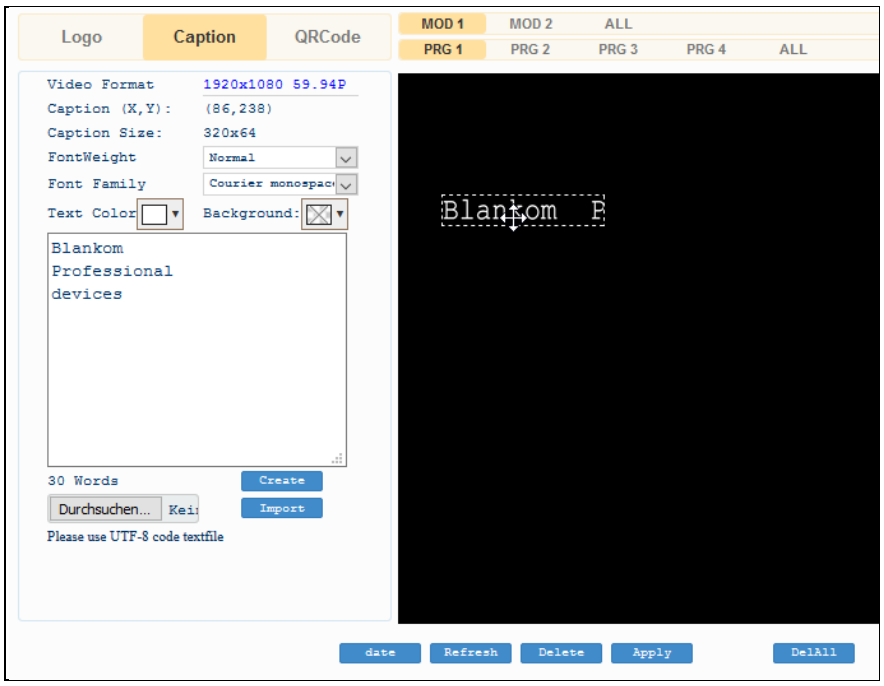




Move the position to where it should appear on screen.

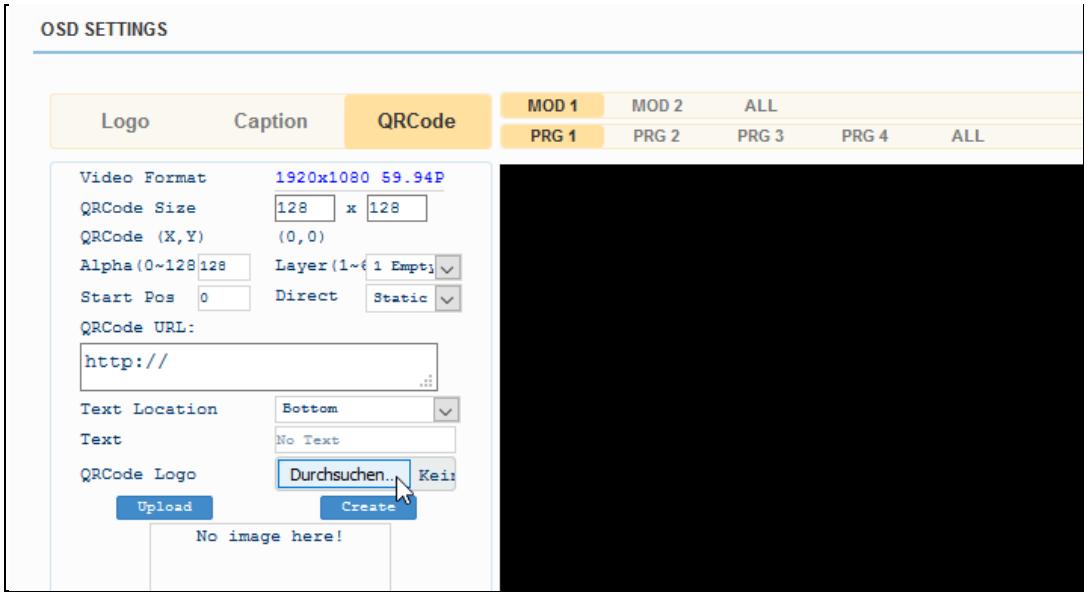


Nearly the same steps can be used to insert Text messages to selected or all channels:



or finally:

QR codes can be overlayed to single or selected or all output pictures:



Please note: This OSD feature can only be used in the encoded channels of the encoder Modules (8 /12 HDMI).

Troubleshooting

Our ISO9001 quality assurance system has been approved by CQC organization guaranteeing the products' quality, reliability and stability. All of our products have been passed the testing and inspection before shipping out of the factory. The testing and inspection scheme already covers all the Optical, Electronic and Mechanical criteria which have been published by us. To prevent potential hazard, please strictly follow the operation conditions.

Prevention Measure

- Installing the device in a place in which environment temperature are between 0 to 45 °C
- Assure good ventilation for the heat-sink on the rear panel and other heat-sink areas if necessary
- Checking the input AC for the power supply about its range of operation and the connection is correct before switching on device by the rear-panel switch
- Checking whether the RF output level varies within tolerant range if necessary
- Checking all signal cables have been properly connected
- Frequently switching on/off device is prohibited; the interval between every switching on/off must greater than 10 seconds.

Conditions for the need to unplug the power cord or use the C14 Socket integrated switch:

- Power cord or socket damaged
- Any liquid flowed into device
- Any stuff causes circuit short
- Device in damp environment
- Device was suffered from physical damage
- Longtime idle
- After switching on and restoring to factory setting, device still cannot work properly.
- Maintenance needed

Packing List

Encoder Modulator	1 pcs
User Manual	1 pcs
HDMI Cables	4 pcs
Power Cord	1 pcs (depending on country where the unit has been delivered to*)

**: Some countries have extraordinary rules about the Power cord importing, so we do not attach one*

Important Notes!

This manual is for use by qualified personnel only. Handling this device or system requires special electronic technical knowledge. To reduce the risk of electrical shock or damage to the equipment, do not perform any servicing other than the installation and operating instructions contained in this manual unless you are qualified to do so. This device operates in the given voltage and frequency range without requiring manual adjustment.

Do not open the top case w/o unplugged power source because serious injury or death may be the result! Inside are components under risk from electrostatic discharge. To avoid equipment damages do not touch these components or, observe the respective handling rules!

For continued protection against fire, the fuses may only be replaced by identical fuses with the same electrical specifications which are designed for the corresponding fuse positions.

Installation Notes

All types of the IRENIS-BLANKOM family are 19“devices with 1 RU height designed for installation in 19” racks. In addition to the front panel screws an internal module support is required at the rack.

Depending on the Frontend used and the operating adjustments, the RF-input port might carry DC Voltage (13V /18V, max. 400 mA) – in particular the DVB-S/S2 versions. Not with DVB-C/T/T2 frontends.

By connecting a mains power cable, the device can become functional without any auxiliary appliances. The power supply units are designed for the wide range of 100-230V AC; a manual adjustment of the voltage is not necessary.

For some models the second power connector is feeding another independent power supply for internal redundancy. For a maximum of redundancy both power supplies should use different power sources with separate fuses.

All the outputs are decoupled from one another. Thus, the circuit does not have any effect on the functioning of the device. Connections that are not required need not to be terminated.

Suggestion: CAT 6E Ethernet cable for GbEthernet. Streaming Ports: double shielded twisted Pair recommended CAT 6 (7) DSTP.

Note:

IPv4 global scope sessions use multicast addresses in the range 224.2.128.0 - 224.2.255.255 with SAP Announcements being sent to 224.2.127.254 Port 9875 (note that 224.2.127.255 is used by the obsolete SAPv0 and MUST NOT be used).

IPv4 administrative scope sessions using administratively scoped IP multicast. The multicast address to be used for announcements is the highest multicast address in the relevant administrative scope zone.

For example, if the scope range is 239.16.32.0 - 239.16.33.255, then 239.16.33.255 is used for SAP Announcements.

Contact:

IRENIS GmbH

Owiesenkehre 1

D-22177 Hamburg - Germany

Managing Director: Dipl.Ing. Riccardo Rossini

Commercial Register: HRB 130657 / District Court Hamburg

Web: www.blankom.de E-Mail: info@blankom.de

Irenis-Direct Phone: +49 40 459747 **Technical Hotline:** +49 40 22864848