

BLANKOM

BLANKOM IRD-6100 HD IRD



User Manual

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Chapter 1 Product Outline

Outline

This BLANKOM IRD-6100 HD IRD receives Transponder RF-signals from the installed tuner (DVB-S/S2 /C/ T/T2 /ISDB-T/ATSC optional), ASI and IP-Input sources and multiplexed signals out to ASI, IP as well as various video/audio interface outputs at the same time after multiplexing and de-encryption with a CA module. It is featured with a LCD video monitor on the front panel. Its video/audio outputs support professional HD/SD-SDI, YPbPr, HDMI, XLR balanced audio, and S/PDIF digital audio as well as CVBS. With the CAM slot (CI/CI+) support, The BLANKOM IRD-6100 HD IRD can support one channel (Tuner, ASI or IP) de-scrambling and output a transparent signal. The user can operate the device with the front panel keypad or by Web-Interface based. Additional, the user can choose to use an optional ASI output interface which can pass through the Frontend Input TS directly. Optional available with modules for DVB-T/2 SFN network 10MHz Sync / MIP.

Statement:

Text and pictures herein are subject to changes w/o notifications.

The user manual will be updated in real time without special notice.

This user manual is provided only as a reference guide for technicians as examples.

Default Values

*The factory default administrator account: **admin***

*The factory-default user password: **admin***

*The factory default IP address: **192.168.0.136 NM 255.255.255 GW 192.168.0.1***

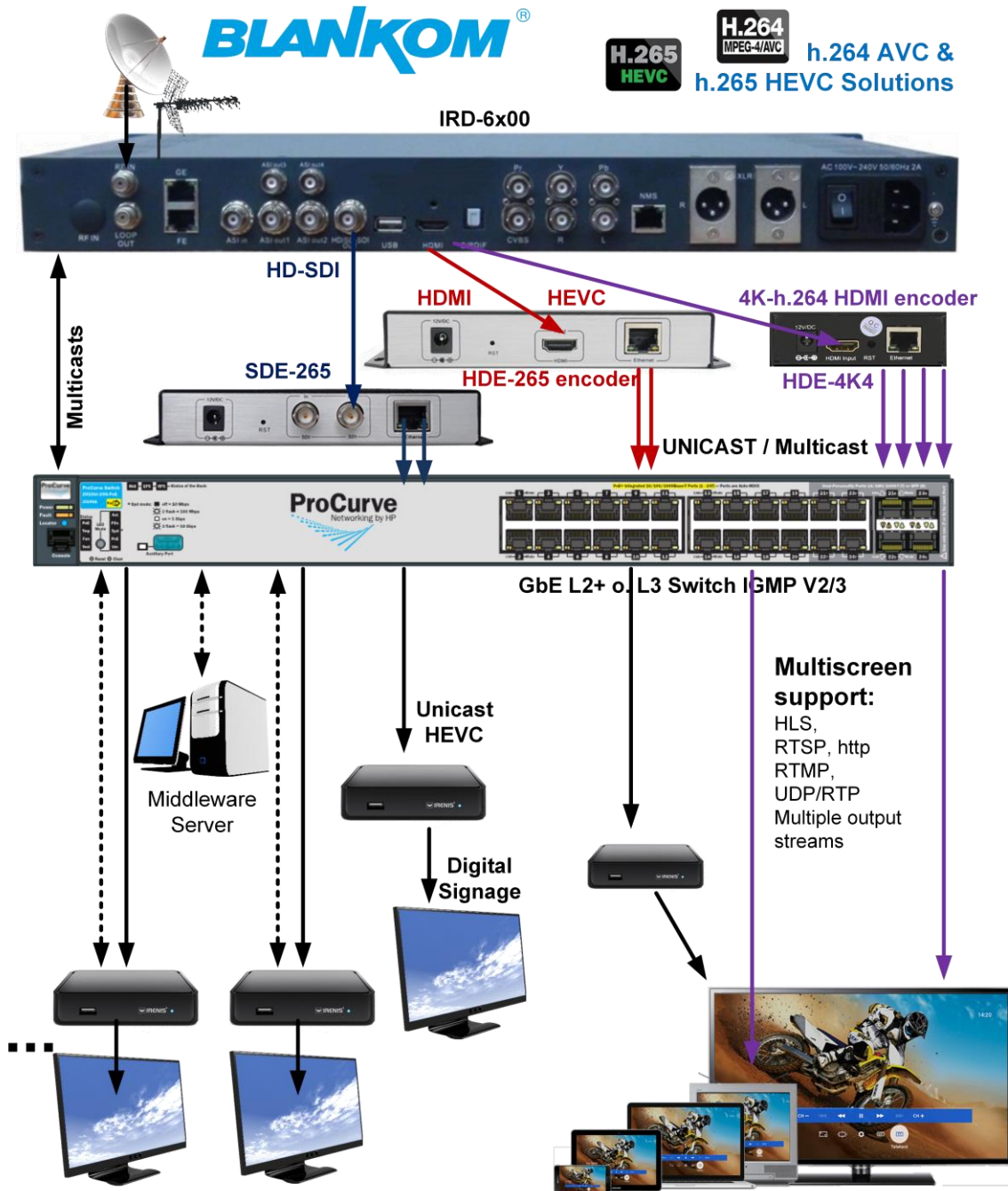
Set the administrator's computer IP as: 192.168.0.* to avoid IP conflicting with the units own IP address 192.168.0.136.

192.168.0.*: use an IP setting "*" in the number range 2-254 and except the units default IP.

Remark: .0 is often the network router, .1 often the Gateway of the used router, .255 might be a network broadcasting address.

Please change these account settings according to your local policy and network. -> Do not forget to safe and backup the configuration by Web-Interface and its related system-sub-menu.

Application Example

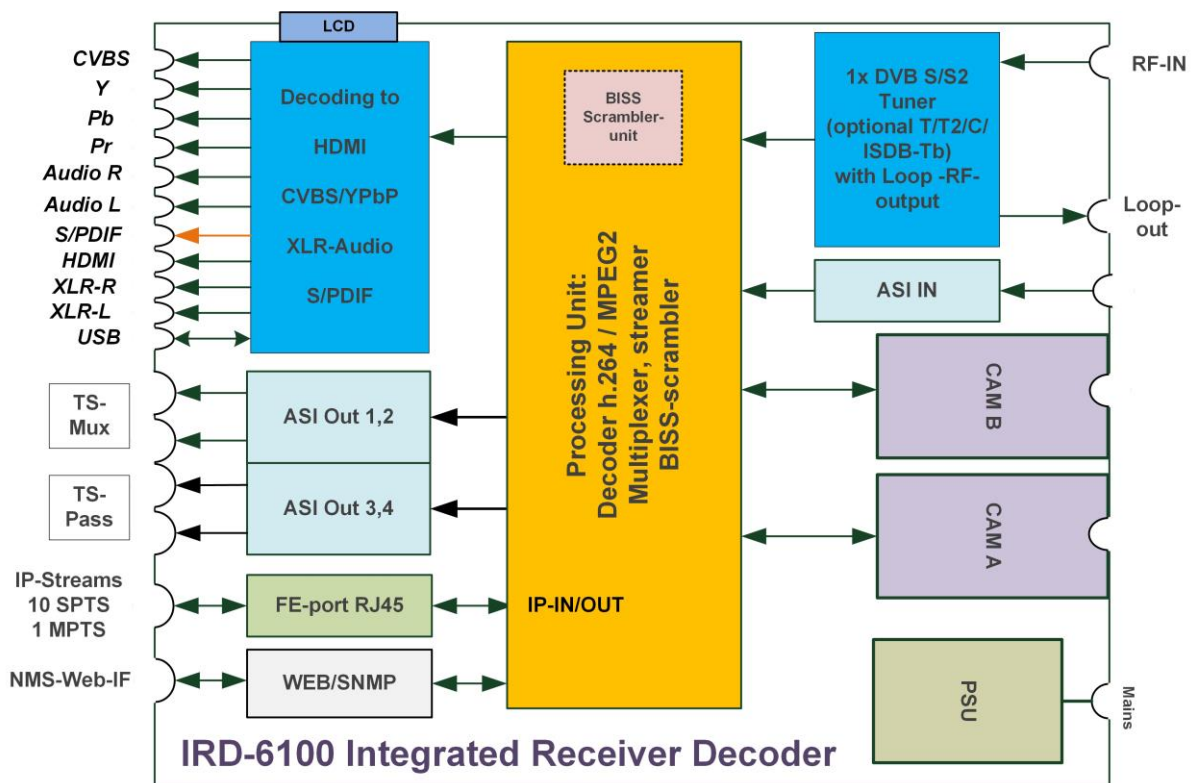


Of course, instead of the HDMI-Encoder a usage of the HD-SDI-encoder SDE-264/265 is possible too. IP MPTS Inputs can be used as well as ASI-Inputs to multiplex a new MPTS output from different sources.

Features

- Available Frontends: DVB-C/DVB-S/S2 DMB-T/DVB-T/ISDB-T/ATSC-T external RF Input (T2 under development – please ask)
- Various tuner versions available with RF demodulation range:
 - 1) DVB-C: 47 MHz...860 MHz, 16/32/64/128/256 QAM
 - 2) DVB-S: 950 MHz...2150 MHz, symbol rate: 2...45Mbauds
 - 3) DVB-S2: 950 MHz...2150 MHz, symbol rate: QPSK 1...45Mbauds, 8PSK 2...30Mbauds
 - 4) DMB-T: 146MHz ...862 MHz, 6/7/8 MHz bandwidth
 - 5) DVB-T: 146MHz ...862 MHz, 6/7/8 MHz bandwidth
 - 6) ISDB-T: 153 MHz ...862 MHz, 6/7/8 MHz bandwidth
 - 7) ATSC-T: 54MHz...858MHz, 6MHz bandwidth
- Extra LCD display for control of the selected decoded live video
- Supporting MPEG-2 & MPEG-4 video decoding
- Re-multiplexer embedded
- Tuner, IP, ASI Input at the same time
- IP, ASI, Decoding output at the same time
- CAM card insert (CI/CI+)
- Front Panel Keypad and Web-based NMS and SNMP network management
- 10x SPTS / 32x SPTS (opt.) and 1x MPTS IP output
- Embedded BISS decryption

Block diagram



Specifications:

Input Interface	Tuner	1 Tuner (DVB-C, DVB-S/S2, DMB-T/DVB-T/T2, ISDB-T/ATSC-T optional)
	ASI	1 ASI IN(support 188/204 package format)
	IP	1 IP(100M, RJ45 Port)
Output	ASI Output	2 ASI output (with internal multiplexer)
		2 ASI output (tuner input pass through)
	IP output	1 MPTS output
		10 SPTS output
	Video Output	1x CVBS(BNC): 576i@25fps, 480i@29.97fps
		1x YPbPr(BNC): 1080i@25, 29.97, 30fps; 720p@50, 59.94fps
1x HD/SD-SDI(BNC): 1080i@25, 29.97, 30fps; 720p@50, 59.94fps; 576i@25fps; 480i@29.97fps		
1x HDMI: 1080i@25, 29.97, 30fps; 720p@50, 59.94fps		
Audio Output	Stereo unbalanced audio: BNC interface Stereo balanced audio: XLR interface Digital audio: S/PDIF	
Video Decoding	MPEG-2, MPEG-4	
Audio Decoding	MPEG1 layer 2, AC3, HE-AAC(v2), LC-AAC	
NMS Port	Ethernet Port	10/100M
	Protocols	TS Over IP : UDP NMS : TCP/IP
System	Front panel Keypad/LCD and WEB-based management (NMS/SNMP)	
	English interface	
	Ethernet web based software upgrade	
	LCD decoding display for the actual selected video service	
Miscellaneous	Dimensions	482mm*455mm*44.5mm(L×W×H)
	Approx. weight	3.2kg
	Power consumt.	< 20W(Max)
	Temperature	0...45°C (Operating), -20...80°C (Storage)

Appearance and description

Front Panel Illustration:



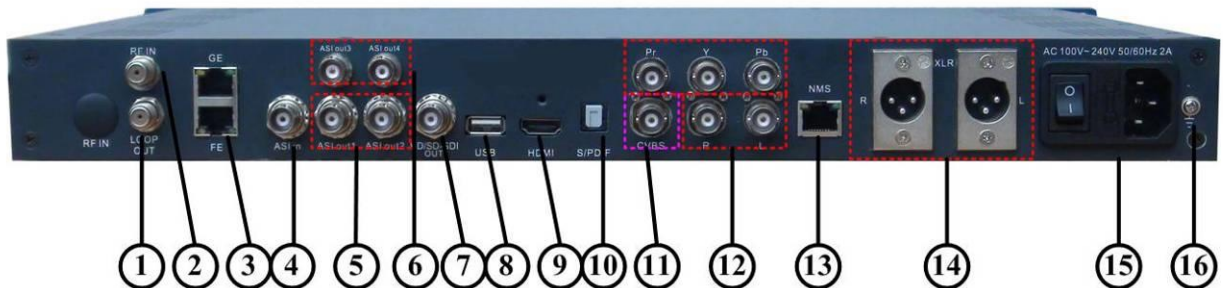
1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

Indicators area (2):

All the LEDs will be on if the BLANKOM IRD-6100 HD IRD works in its current configured mode.

1	LCD operation display
2	LED Indicators
3	Up/Down/Left/Right Buttons - Keypad
4	Enter Key
5	Menu Key
6	Lock Key
7	LCD Monitor
8	Switch Button
9	PCMCIA CAM interface

Rear Panel Illustration



1	Loop Out Interface F-connector
2	RF IN Interface F-connector
3	IP IN/OUT Interface RJ45: FE is working , GE is not in use!
4	ASI IN Interface
5	ASI Out1 and ASI Out2 Interface: Output multiplexed or separated TS Stream from tuner, ASI and IP.
6	ASI Out3 and ASI Out4 Interface: Output Single TS Stream from tuner.
7	HD-SDI-OUT Interface: HD/SD digital decoded output interface
8	USB interface: Software updating option
9	HDMI Output Interface
10	S/PDIF: Digital audio output interface
11	CVBS: Composite video output interface

12	Audio (L/R channel) output interface YPbPr: Audio and Video component output interface
13	Web-Interface NMS Ethernet Port (10-100Mbps)
14	Balanced audio output interface
15	Integrated power switch and socket
16	Grounding Wire connection

Chapter 2 Installation Guide

Accessories

- When you open the package of the device, it is recommended to check delivered items according to the packing list. Normally it should include the following items:
 - BLANKOM IRD-6100 HD IRD 1 pcs
 - User's Manual (*optional as download PDF*) 1 pcs
 - ASI Cable BNC-BNC 1 pcs
 - Power Cord *depending on country* 1 pcs
- If any item is missing or mismatching with the list above, please contact our sales rep.

Installation Preparation

When users install device, please follow the below steps. The details of installation will be described at the rest part of this chapter. Users can also refer rear panel chart during the installation.

The main content of this chapter including:

- Checking the possible device missing or damage during the transportation
- Preparing relevant environment for installation
- Installing modulator
- Connecting signal cables
- Connecting communication port (if it is necessary)

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: $1 \times 10^7 \dots 1 \times 10^{10} \Omega$, Grounding current limiting resistance: $1M\Omega$ (Floor bearing should be greater than $450Kg/m^2$)
Environment Temperature	5...40°C (sustainable), 0...45°C(short time), installing air-conditioning is recommended

Relative Humidity	20%...80% sustainable 10%...90% short time
Pressure	86...105kpa
Door & Window	Installing rubber strip for sealing door-gaps and dual level glasses for window
Wall	It can be covered with wallpaper, or brightness less paint.
Fire Protection	Fire alarm system and extinguisher
Power	Requiring device power, air-conditioning power and lighting power are independent to each other. Device power requires AC power 100-240V 50-60Hz. Please carefully check before running.

Grounding Requirement

- All function modules' good grounding is the basis of reliability and stability of devices. Also, they are the most important guarantee of lightning arresting and interference rejection. Therefore, this system must follow this rule.
- Coaxial cables outer conductor and isolation layer should keep proper electric conducting with the metal housing of device.
- Grounding conductor must adopt 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 and be antirust.
- It is prohibited to use any other device as part of grounding electric circuit
- The area of the conduction between grounding wire and device's frame should be no less than 25mm².

Frame / Rack Grounding

All the machine frames should be connected with protective copper strip. The grounding wire should be as short as possible and avoid circling. The area of the conduction between grounding wire and grounding strip should be no less than 25mm².

Device Grounding

Connecting the device's grounding rod to frame's grounding pole with copper wire.

Wire Connection

The grounding wire conductive screw is located at the right end of rear panel, and the power switch, fuse, power supply socket is just beside, whose order goes like this, power switch is on the left, power supply socket is on the right and the fuse is just between them.

- Connecting Power Cord
The user can insert one end into the power supply socket, while insert the other end to AC power.
- Connecting Grounding Wire
When the device solely connects to protective ground, it should adopt independent way, say, share the same ground with other devices. When the device adopts united way, the grounding resistance should be less than 1Ω.

⚠ Caution:

Before connecting the power cord to the BLANKOM IRD-6100 HD IRD, the user should set the power switch to “OFF”.

Signal Cable Connection

We assume, that the installation will be done by an experienced technician and all to be installed connection cables are used according to their specifications.

Example: XLR Interface Cable (unbalanced Audio)



IRD-6100 HD IRD Satellite Receiver Signal Cable Connections:

RF IN and LOOP OUT Connection:

The User can find the RF IN and LOOP OUT interface on the device according to the connectors marked and described on the rear panel illustration, and connect the right cables. One end is connected to the RF IN interface of satellite receiver (or DVB T/T2/C/...) while the other end is connected to the satellite signal source equipment or LOOP OUT interface of the previous satellite receiver when several satellite receivers are in serial connection (See remark below).



We recommend to avoid using the loop RF-output in particular for the SAT Input because of 13/18Volt vertical/horizontal and 22KHz / highband signals for multiswitch and LNB signalizing. Attenuation takes affect too.

●ASI IN and ASI OUT Connection:

Users can find the ASI IN and ASI OUT interface on the device according to the connectors marked and described on the rear panel illustration. One end is connected to ASI IN interface of the BLANKOM IRD-6100 HD IRD, the other end is connected to any device that has ASI output. If connecting the ASI OUT interface, the other end of the connection is mostly used for encoders and multiplexers:



●Component Output, CVBS and Audio Output Connection:

The User can connect the YPbPr, CVBS and Left/Right sound channel interfaces on the device according to the connectors described on the rear panel illustration. The other end of the wire is connected to encoders or other equipment.



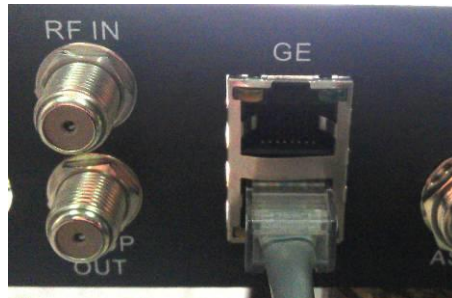
●HDMI Output Connection:

The User can find the HDMI interface on the device according to the connector described on the rear panel illustration, and then connect the wire. One end of the wire should be connected to the HDMI output interface of the BLANKOM IRD-6100 HD IRD, while the other end can be connected to an encoder or other equipment like a TV set:



●IP Input and Output Connection:

The user can find the IP IN/OUTPUT interface on rear of the device according to the connector described on the rear panel illustration. One end of the wire is connected to the RJ45 Ethernet IP output interface of the BLANKOM IRD-6100 HD IRD, the other end should go to a streaming switch:



GE is not in use. FE
-Port is for the IP-IN
and -Out Streams.

●XLR Output Connection Illustration:

The User can find the XLR interface on the device according to the connector described on the rear panel illustration. One end of the wire is connected to the XLR output interface of the BLANKOM IRD-6100 HD IRD, the other end of the wire is connected to i.e. an IP encoder or a studio mixing device / amplifier, ...:



Chapter 3 Operation

The front panel of the BLANKOM IRD-6100 HD IRD is one of the user-operating interfaces and the equipment can be conveniently operated and used by the user according to the procedures displayed on the LCD; the simple using method for the machine is as follows:

Keypad Function Description:

MENU: Cancel current entered value, resume previous setting; Return to previous menu.

ENTER: Activate the parameters which need modifications, or confirm the change after modification.

LEFT/RIGHT: Choose and set the parameters.

UP/DOWN: Modify activated parameter or paging up/down when parameter is inactivated.

LOCK: Lock the screen/cancel the lock state. After pressing the lock key, the LCD will display the current configuring state.

Main Interface

After switching on the IRD and pressing the “LOCK” key on the front panel to enter to the main menu, the LCD will display the following pages:

1. Input Setting
2. Output Setting
3. Decoder Setting
4. Descramble Set
5. Network Setting
6. Saving Config
7. Loading Config
8. Version

General Setting

User could do all the settings according to the 8 directions displayed on the LCD.

Input Setting

User can press “Enter” key to enter into the menu of the input setting.

- 1.1 Tuner (DVB-S2)
- 1.2 ASI
- 1.3 IP

Tuner In (taking DVB-S2 HD IRD module as an example)

The menu from 1.1 to 1.3 represents the tuner, ASI and IP input ports of the IRD. User can multiplex the input programs from any port to output any program or all the programs at the same time. By pressing the “Enter” key, the device will take a while to analyze the input TS or signal and then display the program list at the submenu, say, 1.1.1-1.1.6

- 1.1.1 Prog Parse
- 1.1.2 Sat freq Set
- 1.1.3 LNB freq Set
- 1.1.4 Symbol rate
- 1.1.5 LNB Voltage
- 1.1.6 22KHZ Switch

By pressing the “Enter” key to enter the submenu of 1.1.1

- 1.1.1 Prog Parse
- Prog:00 Mux:00

At the submenu 1.1.1, it displays the quantity of total parsed programs and multiplexed programs.

User also could check and set the Satellite frequency, LNB frequency, Symbol rate and LNB voltage in its corresponding submenu "1.1.2", "1.1.3", "1.1.4", "1.1.5".


1.1.2 Sat freq Set
3150MHZ

1.1.3 LNB freq Set
5150MHZ

1.1.4 Symbol rate
17500KHZ

1.1.5 LNB Voltage
Horizonta(18v)

At the submenu 1.1.6, user can decide whether to turn on/off the 22 KHZ Switch.

1.1.6 22KHZ Switch
 OFF ON

ASI IN

By pressing the "Enter" key to enter into the submenu of 1.2.1

1.2.1 Prog Parse
Prog:00 Mux:00

IP IN

By pressing the "Enter" key, it displays below page:

1.3.1 Prog Parse
1.3.2 Input Ip Addr
1.3.3 Input Port

By pressing the “Enter” key to enter the submenu of 1.3.1, 1.3.2 and 1.3.3 respectively, it will display below pages:

1.3.1 Prog Parse
Prog:00 Mux:00

1.3.2 Input Ip Addr
224.002.002.002

1.3.3 Input Port
1234


Output Setting

User can press “Enter” key to enter into below menu of the output setting.

2.1 Multiplex Set
2.2 Output Bitrate
2.3 Transtream ID
2.4 Original NetID
2.5 IP Output

Multiplex Setting

User can enter to the menu 2.1 and select the modes of outputting. By pressing UP/DOWN key after pressing Enter key, user can see the four modes of outputting the Signals in turn: ASI, IP, Tuner passthrough and Mux.

2.1 Multiplex Set
Tuner Passthrough 

2.1 Multiplex Set
ASI

2.1 Multiplex Set
IP

2.1 Multiplex Set
Mux

Output Bit rate

By pressing the “Enter” key to enter into the menu of 2.2

2.2 Output Bitrate
060Mbps

Transportstream ID

By pressing the “Enter” key to enter into the menu of 2.3

2.3 Transtream ID
00000

Original Network ID


By pressing the “Enter” key to enter into the menu of 2.4

2.4 Original NetID
00000

IP Output

By pressing the “Enter” key to enter into the submenu of 2.5, it will display below pages. User can set the output IP address, output port and decide whether to output the signals from IP port.

2.5.1 IP Out Enable
2.5.2 Out IP Addr
2.5.3 Out Port

2.5.1 IP Out Enable
 ON OFF

2.5.2 Out IP Addr
224.002.002.002

2.5.2 Out Port
1001

Decoder Setting

User can press “Enter” key to enter into below menu of the decoder setting and execute video setting, audio setting, program selecting, searching and decoder selecting.

3.1 Video Setting
3.2 Audio Setting
3.3 Program Select
3.4 Search
3.5 Decoder Select

Video Setting


After pressing enter key, user can enter into the submenus: 3.1.1, 3.1.2, 3.1.3, 3.1.4, 3.1.5, 3.1.6.

3.1.1 Resolution
Auto

By pressing UP/DOWN after entering into above menu, user can see all the options of the resolution: 1080I@50, 1080I@60, 720P, 576P, 576I, 480I, 480P, 1080I@59.94, 720P@59.94.

3.1.2 Standard
PALBDGHI

By pressing UP/DOWN after entering into above menu, user can see all the options of standard.

3.1.3 Subtitle
 OFF ON

3.1.4 CC Switch
OFF
ELA608
ELA708

3.1.5 Finger Switch
OFF

3.1.6 Aspect Ratio
16:9 FULL

Audio Setting

User can enter into below submenu by pressing the "Enter" key. Then select the audio, choose the ES mode (consists of stereo, left channel, right channel), adjust the volume, select modes of Audio SPDIF and Audio channel.

3.2.1 Audio Select
3.2.2 ES Mode
3.2.3 Volume
3.2.4 Audio SPDIF
3.2.5 Audio Channel

3.2.1 Audio Select
eng

3.2.2 ES Mode
Stereo

3.2.3 Volume
12


3.2.4 Audio SPDIF
Auto

3.2.4 Audio Channel
Auto

Program Selecting

Before entering into below menu to select the programs, user should enter the menu 3.5 and 3.4 in turn to find the programs.

3.3 Program Select

1 Das Erste HD 

By pressing UP/DOWN after entering into above menu, all the searched programs will be displayed individually as below:

3.3 Program Select

2 ZDF HD 

Searching


The device will start searching the programs automatically after user select the mode of decoding in the menu 3.5.

3.4 Search
Start Searching

Decoder Selecting

There are three ways of decoding: Tuner, ASI and IP. User can press UP/DOWN to see the way individually after entering below menu.

3.5 Decoder Select

1 Tuner 

Descramble Setting

User can press “Enter” key to enter into below menu of the descramble setting. The detailed operations about the descramble functions will be explained in the NMS operation part.

4.1 Card Setting
4.2 Biss

Two functions of descrambling,
each option works alone.

Card Setting

After enter into the submenu of 4.1, it will display the following page:

4.1.1 Input Select
4.1.2 A Card Info
4.1.3 B Card Info
4.1.4 Pro Select
4.1.5 CI Bitrate

User can set the input signals here.
If users don't insert any card, after
entering into the menu of 4.1.2 and 4.1.3,
it will show “Empty” to indicate there is no
card information.

BISS

BISS is one of the descrambling functions which support two modes: mode 1 and mode E. And the application needs to be matched with BISS scrambler. User can select the mode based on the kind of BISS scrambler.

4.2.1 Select Mode
4.2.2 Mode 1
4.2.3 Mode E

Network Setting

User can press “Enter” key to enter into below menu of the network setting.

5.1 IP Address
5.2 Subnet Mask
5.3 Gateway
5.4 MAC Address
5.5 Service IP
5.6 SPTS Net Config

IP Address

After entering into the menu 5.1, it will display the following page:

5.1 IP Address
192.168.000.136

Subnet Mask

After entering into the menu 5.2, it will display the following page:

5.2 Subnet Mask
255.255.255.000

Gateway

After entering 5.3, it will display the following page:

5.3 Gateway
192.168.002.001

MAC Address

After entering into the menu 5.4, it will display the following page:

5.4 MAC Address
201205071337

Service IP

After entering into the menu 5.5, it will display the following page:

5.5 Service IP
192.168.003.137

SPTS Net Configuration

After entering into the menu 5.6, it will display the following page:

5.6.1 SPTS Config
5.6.2 SPTS IP Addr
5.6.3 SPTS Gateway
5.6.4 SPTS Enable
5.6.5 SPTS Para Prog

SPTS Configuration

After entering into the menu of 5.6.1, it will display the following page:

5.6 Output Disable
Digital 1

Enable Select
ON OFF

5.6.1 IP Addr Set
224.002.002.002

5.6.2 IP Port Set
1001

By pressing UP/DOWN button after entering this interface, user can see 10 programs in turn.

By selecting ON/OFF to output the program through GE port.

Device supports multicast under this IP Address and unicast under the IP Address 192.168.xxx.xxx

SPTS IP Address

After entering into the menu of 5.6.2, it will display the following page:

5.6.2 SPTS IP Addr
192.168.012.138

SPTS Gateway

After entering into the menu of 5.6.3, it will display the following page:

5.6.3 SPTS Gateway
192.168.012.075

SPTS Enable

After entering 5.6.4, it will display the following page:

5.6.4 SPTS Enable
ON OFF

By turning ON/OFF button to enable or disable the SPTS output function.

SPTS Parse Program

After entering into the menu of 5.6.5, it will display the following page:

5.6.5 SPTS Para Prg
Analysis Finish ##

By pressing "Enter" key to parse the programs to be outputted through GE port.

Saving Configuration

User can choose "Yes" or "No" to save the current configuration parameters in this menu.

6 Saving Config ?
Yes No

Loading Configuration

User can restore the device into the last saved configuration by choosing the menu 7.1"Saved Config", and also user can restore the device into factory default configuration by choosing the menu 7.2"Default Config".

7.1 Saved Config
7.1 Saved Config ?
Yes No

7.2 Default Config ?
Yes No

Version

User can check the device's hardware version and software version in this menu.

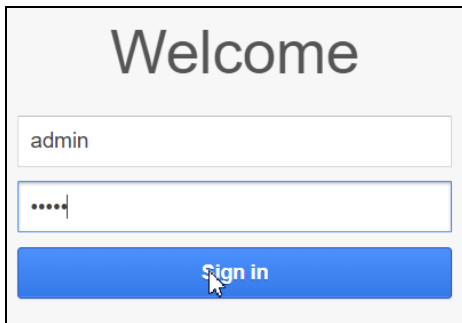
XXX Electronic
SW 2.10 HW 1.06

Chapter 4 Web Browser configuration

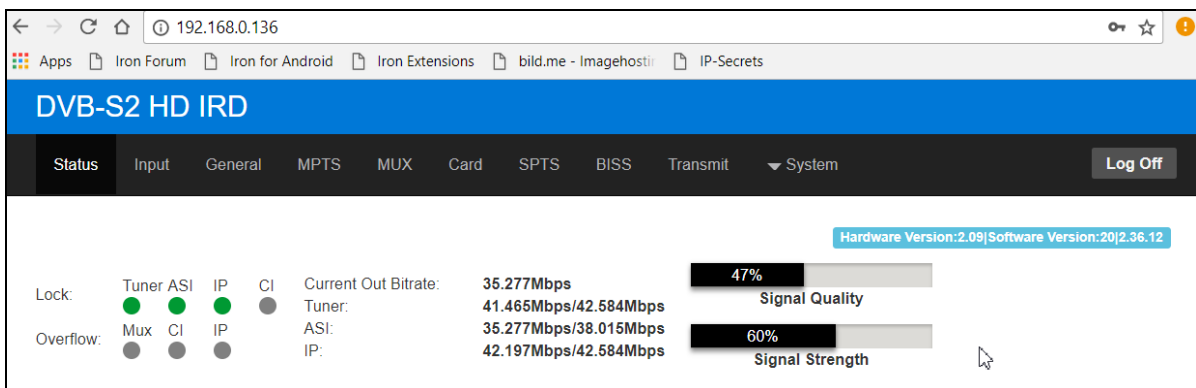
We recommend to use the latest Firefox browser on your PC/Laptop for this operation.

Login Interface

A login interface will pop up firstly when the software is running and give a user prompt to input user name and password (The default user name is admin and password is admin). User can add users and passwords as needed. Details please refer to below ... other Settings). The menu shows up as follows:

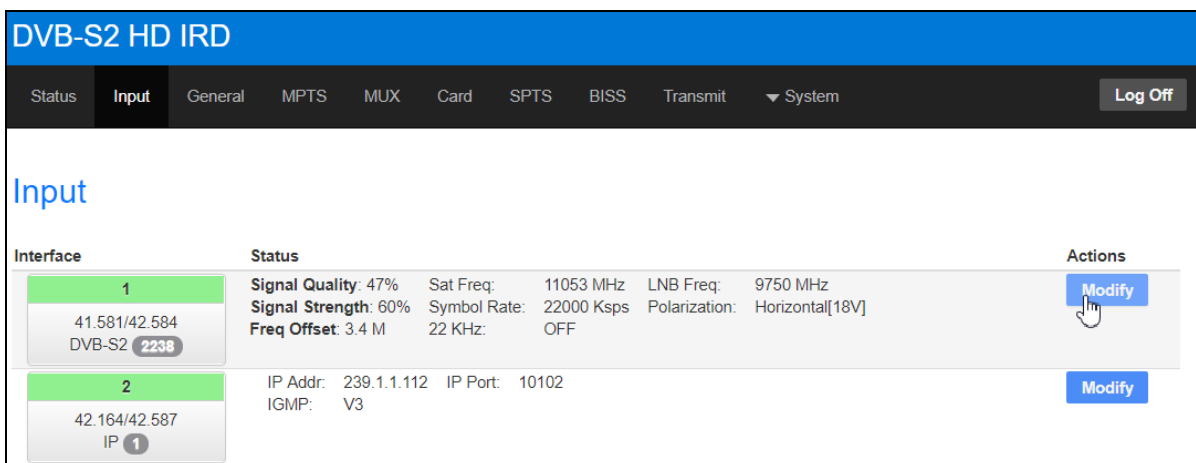


depending on browser used (Mozilla preferred), The following status window will appear:



The user can login to the WEB-IF-NMS by **Sign In** after the input of the login data.

Main Interface



The INPUT menu shows already connected and configured Inputs and let you modify them:

DVB-S2 HD IRD

Input

Interface	Status	Actions
1 41.531/42.585 DVB-S2 2238	Signal Quality: 47% Signal Strength: 60% Freq Offset: 3.4 M	Modify
2 42.181/42.582 IP 1	IP Addr: 239.1.1.112 IGMP: V3	Modify

Tuner Set

Channel 1

Sat Freq(MHz): 11053

LNB Freq(MHz): 9750

Symbol Rate(kSymb): 22000

Polarization: Horizontal[18V]

22 kHz: OFF

Sweep Range(10 KHz): 0

Close Set

DVB-S2 HD IRD

Input

Interface	Status	Actions
1 41.459/42.585 DVB-S2 2238	Signal Quality: 47% Signal Strength: 60% Freq Offset: 3.4 M	Modify
2 42.17/42.585 IP 1	IP Addr: 239.1.1.112 IGMP: V3	Modify

Tuner Set

Channel 2

IP Addr: 239.1.1.112

IP Port: 10102

IGMP: V3

Close Set

IGMP-Version can be chosen for IP-Inputs.

System config:

DVB-S2 HD IRD

Status Input General MPTS MUX Card SPTS BISS Transmit System Log Off

Save Configuration Set

When you change the parameter,you should save configuration ,otherwise the new configuration will

Restore Configuration Set

Load latest saved configuration,after click the "Restore" then please click the "Save config" button,otherwise the "Restore" parameter will lost after reboot

Factory Set Set

Set all configuration back to default, after click the "Factory Set" then please click the "Save config" button,otherwise the default parameter will lost after reboot

Save/Restore/Factory set are selfexplaining...

DVB-S2 HD IRD

Status Input General MPTS MUX Card SPTS BISS Transmit System

Network

IP Address

192.168.000.136

The manege address,use this address to visit the manege web.The format is xxx.xxx.xxx.xxx(like as 192.168.0.1). After set the IP address,you must use the new address to visit the manege web.

Subnet Mask

255.255.255.000

General is 255.255.255.0,it is must the same in a local area network.

Gateway

192.168.000.001

If the device is in different net segment,you must set the gateway.

Web Listen Port

80

(0~65535) After saving restart valid

As well as NMS-Port settings of the device and password changing:

General Settings for the DECODER & Output values:

First of all the user should understand, that the Decoder parameters and other functions (like i.e. MUX) depending from each other. See above screenshot: 2 CAMs are inserted and initial connected.

Select decoding source Input:

General Parameters

ES Mode	Stereo	▼	Audio Select	[1] deu	▼
Resolution	Auto	▼	Program Select	[2] ONE HD	▼
Output Mode	IP	▼	CI Max Bitrate	80	▼
Decoder	Tuner	▼	Output Bitrate (Mbps)	75	
Descramble	Tuner	▼	De Jitter	ON	▼
TV Standard	ASI	▼	CC Switch	OFF	▼
Volume (0~25)	IP	▼	Aspect Ratio	16:9 Full	▼
Audio Channel	Two-Channel	▼	Audio Spdif	Auto	▼
Subtitle	OFF	▼	<input checked="" type="checkbox"/> Auto Search		<input checked="" type="checkbox"/> Finger Switch

Card A Info [Initial-OK](#) Card B Info [Initial-OK](#)

[Get](#) [Apply](#) [Search](#)

The selected Program will be decoded to SDI-Out, YPbPr, HDMI and the AUDIO outputs:

General Parameters

ES Mode	Stereo	▼	Audio Select	[1] deu	▼
Resolution	Auto	▼	Program Select	[1] tagesschau24 HD	▼
Output Mode	MUX	▼	CI Max Bitrate	[1] tagesschau24 HD	▼
Decoder	Tuner	▼	Output Bitrate (Mbps)	[2] ONE HD	▼
Descramble	Tuner	▼	De Jitter	ON	▼
TV Standard	NTSCM	▼	CC Switch	OFF	▼
Volume (0~25)	10		Aspect Ratio	16:9 Full	▼
Audio Channel	Two-Channel	▼	Audio Spdif	Auto	▼
Subtitle	OFF	▼	<input checked="" type="checkbox"/> Auto Search		<input checked="" type="checkbox"/> Finger Switch

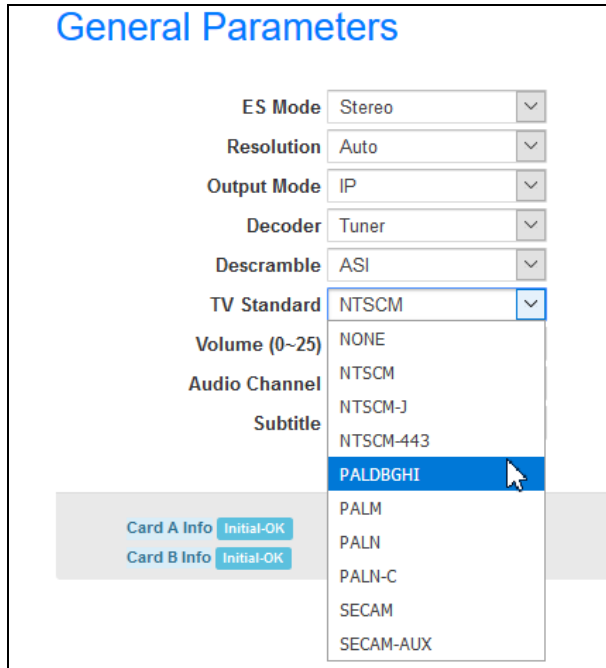
Card A Info [Initial-OK](#) Card B Info [Initial-OK](#)

[Get](#) [Apply](#) [Search](#)

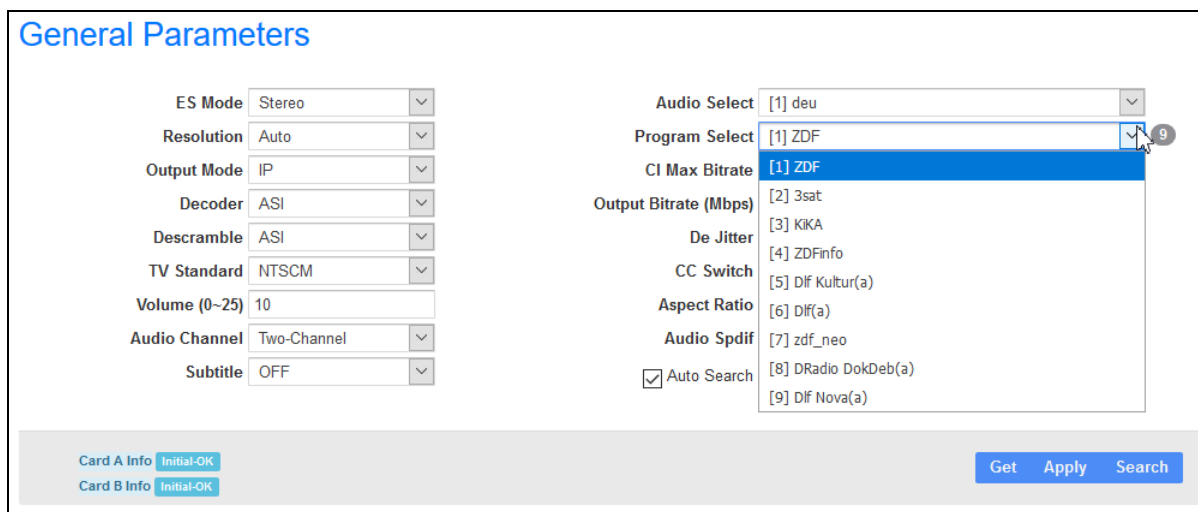
Descrambling selection:

ES Mode	Stereo	▼
Resolution	Auto	▼
Output Mode	IP	▼
Decoder	Tuner	▼
Descramble	ASI	▼
TV Standard	ASI	▼
Volume (0~25)	IP	▼
Audio Channel	Tuner	▼
Subtitle	None	▼
	OFF	▼

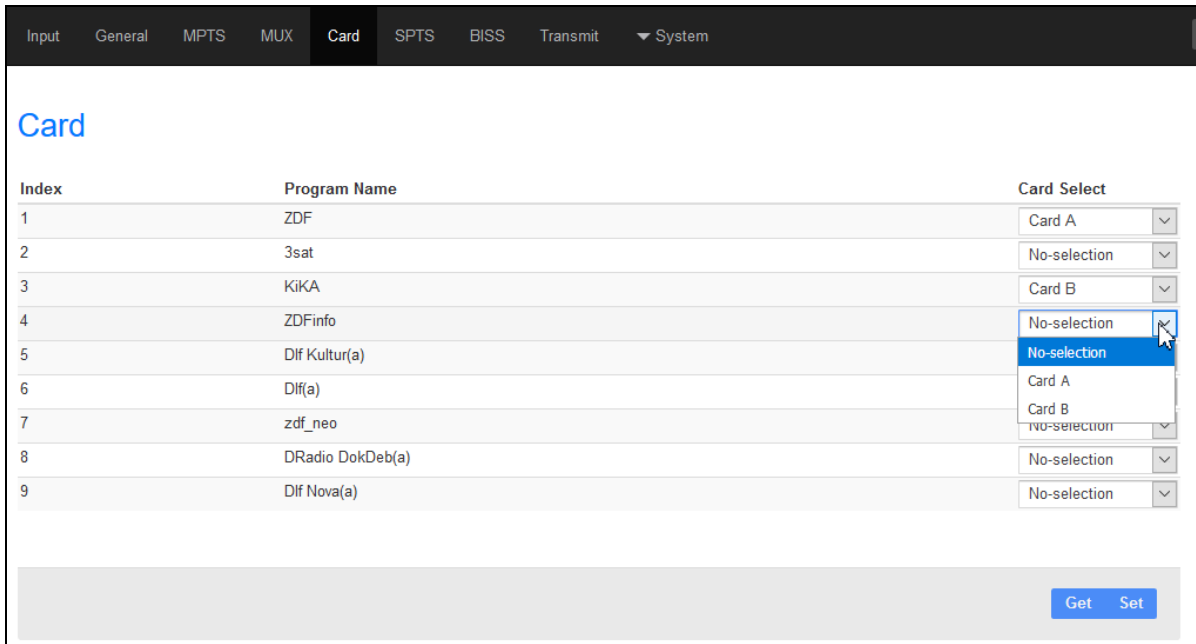
Decoding standard can be set but its almost automatic – so don't worry if it stays i.e. @ NTSC...:



After changing the Decoder Input, you need to check GET and maybe Auto Search and Finger Switch to re-load the Input device into this menu:

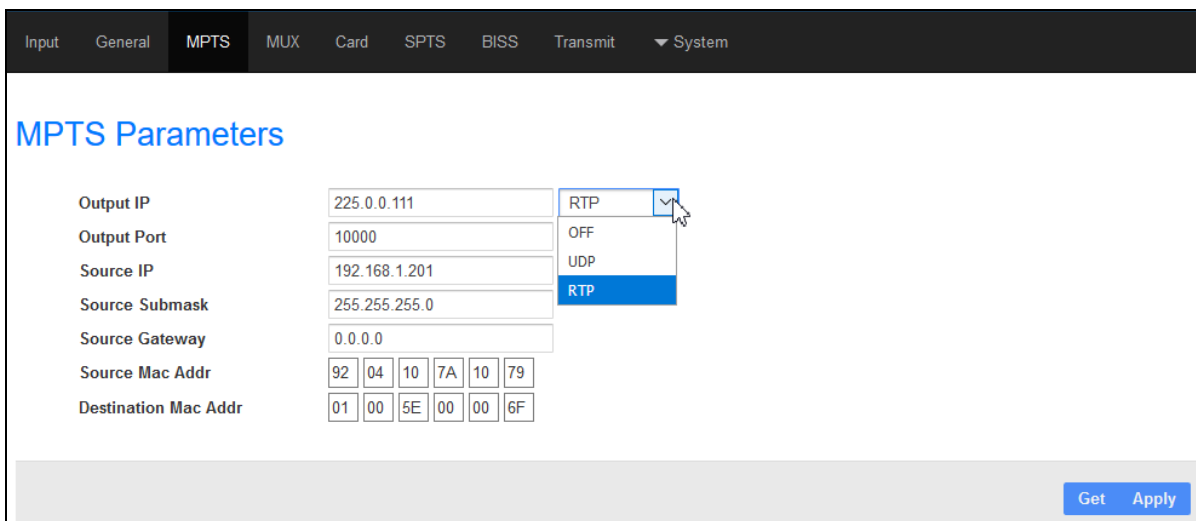


Cross connection to the **CAM-CARD-Menu**:



The CAM's can be used independently but only for the selected TS Input and descramble settings formerly chosen in the General-Menu.

MPTS-Output:



Self explaining? OFF, RTP/UDP Protocol used (for RTP see explanations at the end of this document)

The MPTS-Output will work in parallel on ASI out: Pass mode from Input: ASI 2+4, Muxed-Mode: ASI 1+2 OUT.

The source IP values are necessary for Unicast streaming, where the receiver needs to setup the source address when it comes from. The multicast are the destinations where this unit streams out.

MUX-Mode:

General Parameters

ES Mode	Stereo	Audio Select	[1] deu
Resolution	Auto	Program Select	[1] tagesschau24 HD
Output Mode	MUX	CI Max Bitrate	80
Decoder	Tuner	Output Bitrate (Mbps)	75
Descramble	Tuner	De Jitter	ON
TV Standard	PALDBGHI	CC Switch	OFF
Volume (0-25)	10	Aspect Ratio	16:9 Full
Audio Channel	Two-Channel	Audio Spdif	Auto
Subtitle	OFF	<input checked="" type="checkbox"/> Auto Search	<input checked="" type="checkbox"/> Finger Switch

Card A Info Initial-OK Card B Info Initial-OK Get Apply Search

Prior to use the mux mode, you must enable it in the General settings.

You will start with the input source which are shown but empty -> So you need to select each and PARSE the content:

Mux

⇒ Lost → Locked Parse

Input Program Information

- ⇒ CH01 Tuner Program 0
- ⇒ CH02 ASI Program 0
- ⇒ CH03 IP Program 0

Current Output Mode:
MUX

Refresh

→

←

Modify

Output Program Information

- ⇒ CH01 Program 0

⇒ Lost → Normal → Overflow

⇒ Lost → Locked Parse

Input Program Information

- ⇒ CH01 Tuner Program 0
- ⇒ CH02 ASI Program 0
- ⇒ CH03 IP Program 0

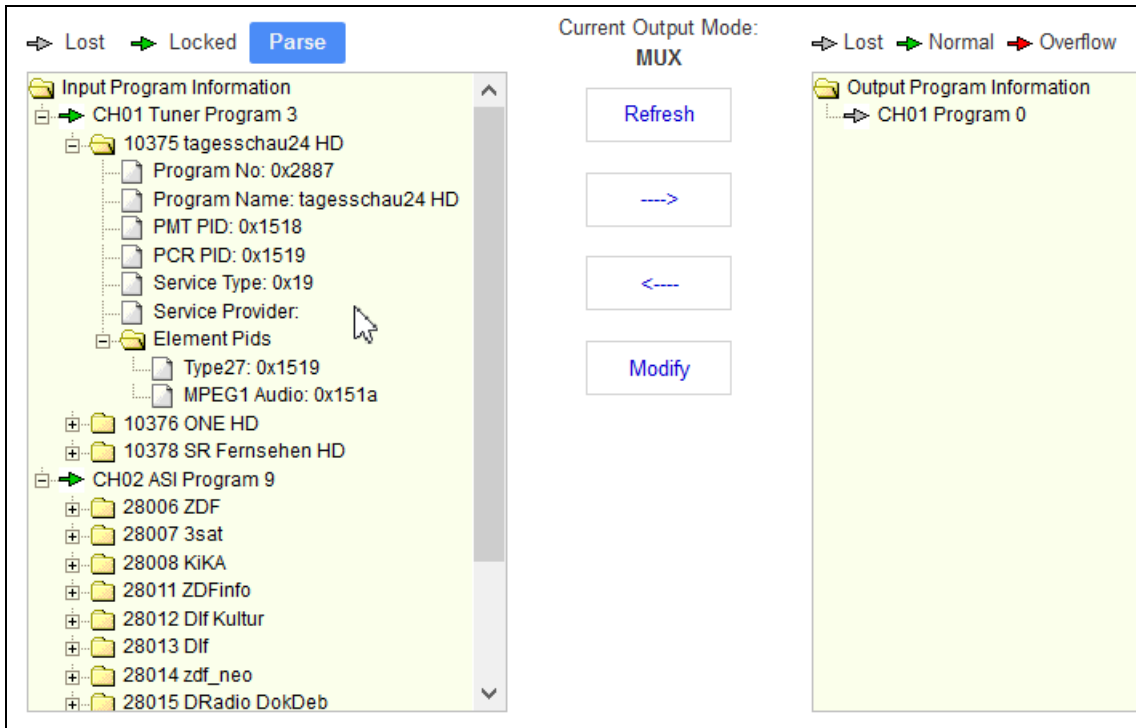
Input Program Information

- CH01 Tuner Program 3
- 10375 tagesschau24 HD
- 10376 ONE HD
- 10378 SR Fernsehen HD
- ⇒ CH02 ASI Program 0
- ⇒ CH03 IP Program 0

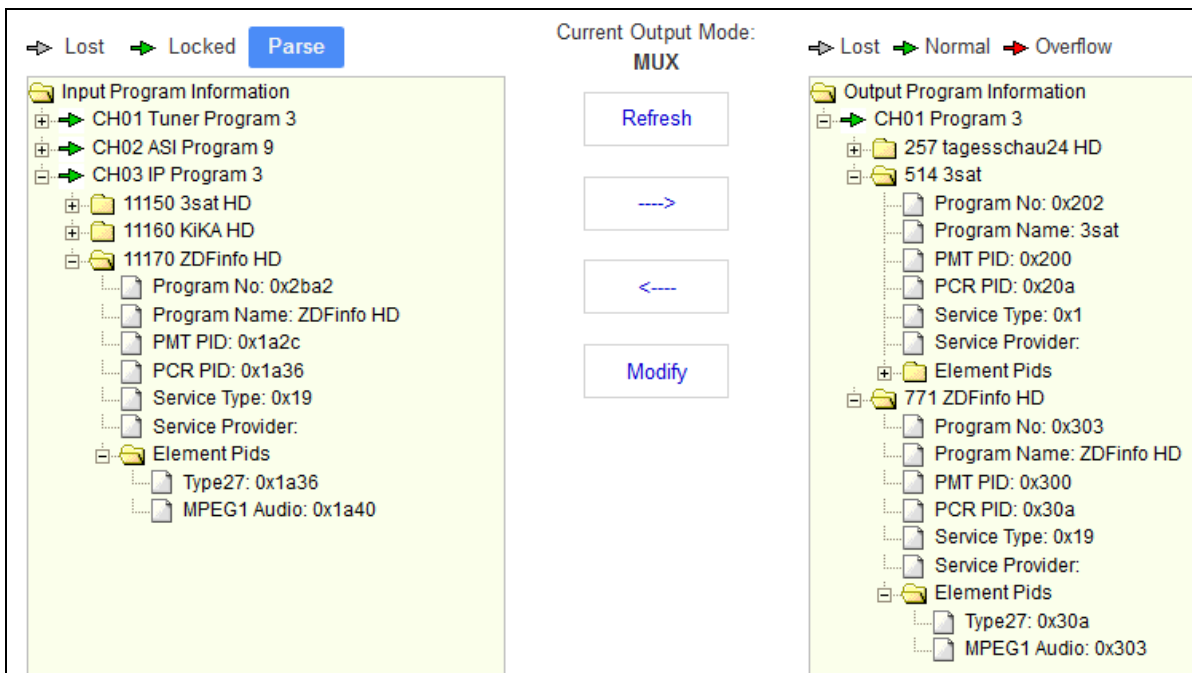
Input Program Information

- CH01 Tuner Program 3
- CH02 ASI Program 9
- CH03 IP Program 3
- 11150 3sat HD
- 11160 KiKA HD
- 11170 ZDFinfo HD

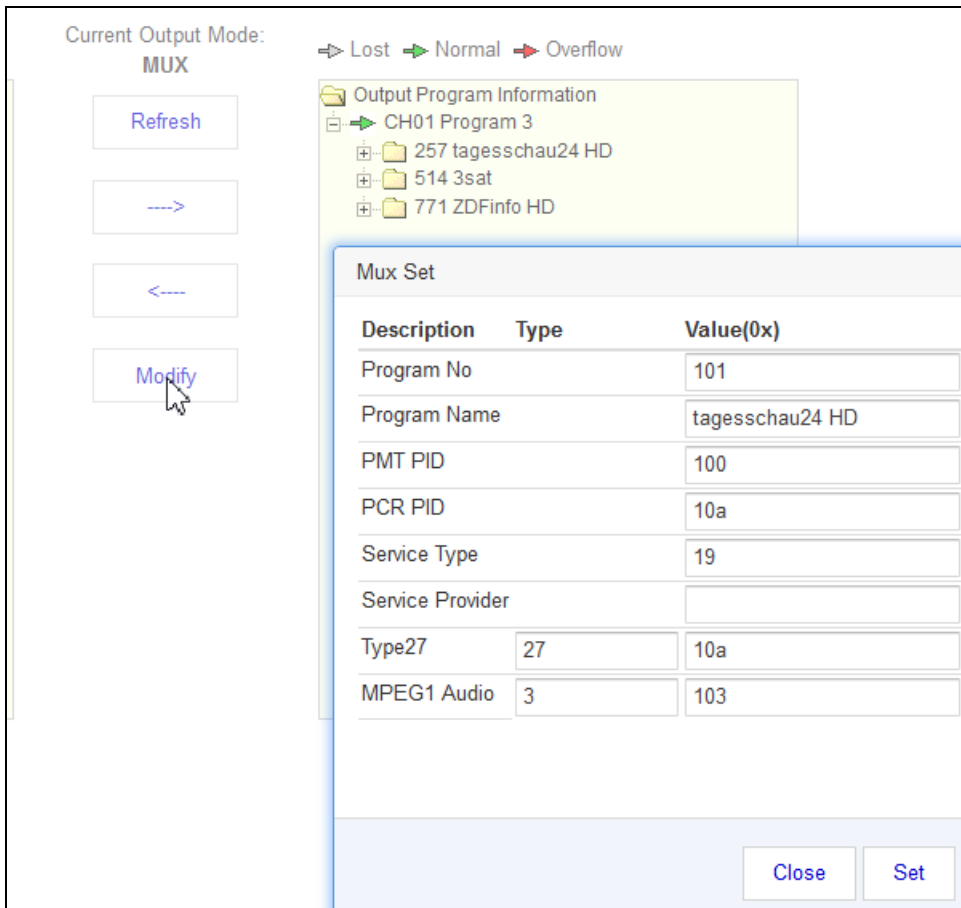
Clicking on the + will open more details:



Now you can select Services from different sources and create a new multiplex to the right-output. As shown here, the PID's will be automatically remapped:

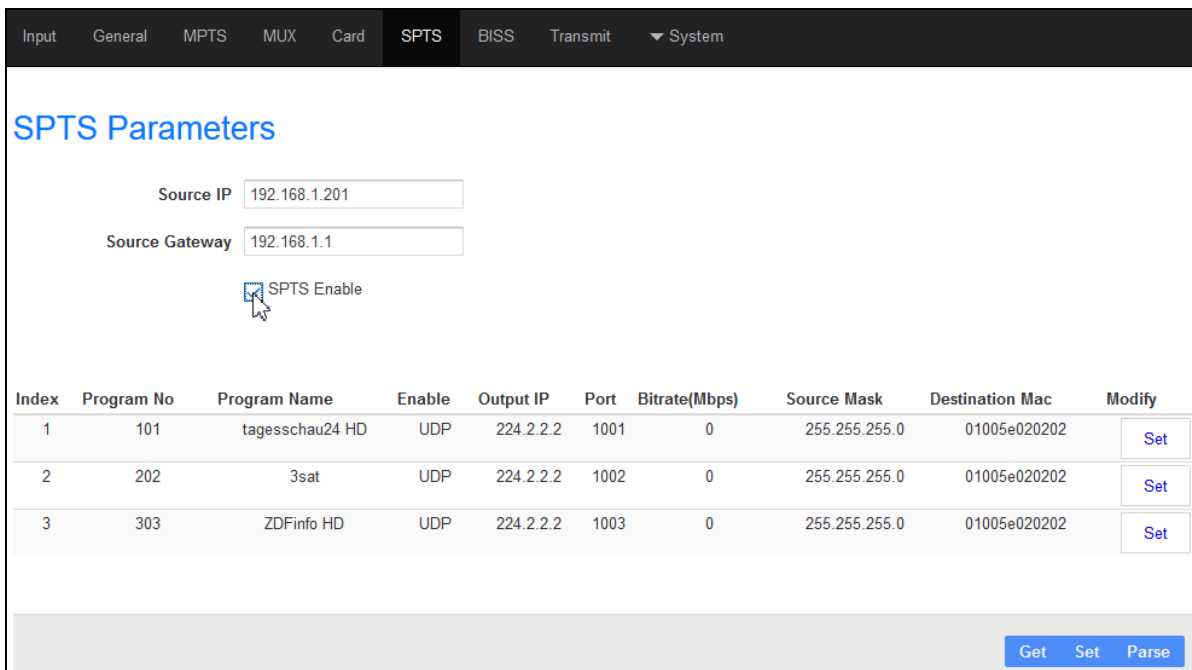


By using the right service selected and press Modify, you are able to change PIDwise:



SPTS-Outputs:

These former selected TV Services from the MUX setup are automatically assigned to the SPTS Menu:



The Source IP ist the Network interface IP Address of the FE-Ethernet RJ45 output port.

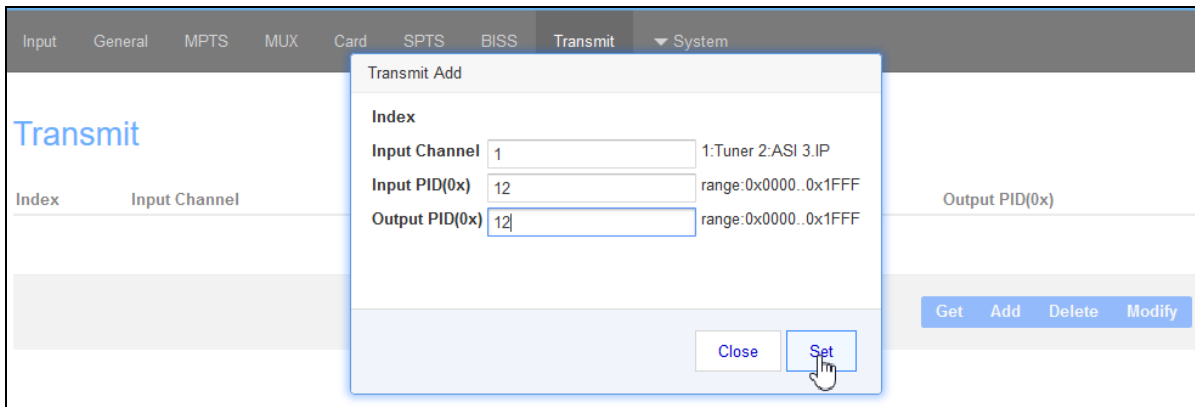
By MODIFY-SET you can change the settings of each stream:

Do not forget to set a valid bitrate:

If setting up same multicast address and RTP please assure that RTP needs a port number usually above 5004 and **it must be an even number** as well as the next odd port shouldn't be in use in any case. So its better to assure that:

Index	Program No	Program Name	Enable	Output IP	Port	Bitrate(Mbps)	Source Mask	Destination Mac	Modify
1	101	tagesschau24HDD	UDP	224.2.2.2	1001	12	255.255.255.0	01005e020202	Set
2	202	3sat	RTP	224.2.2.2	10020	15	255.255.255.0	01005e020202	Set
3	303	ZDFinfo HD	UDP	224.2.2.2	10031	16	255.255.255.0	01005e020202	Set

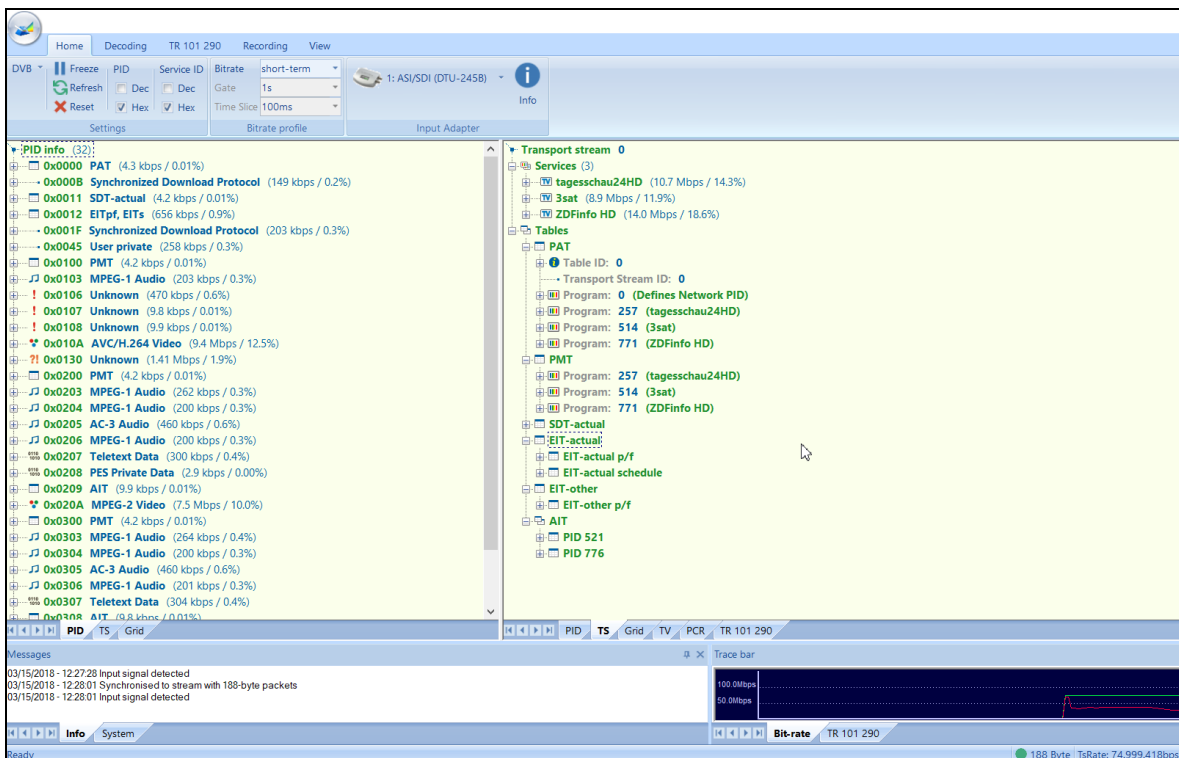
Transmit:



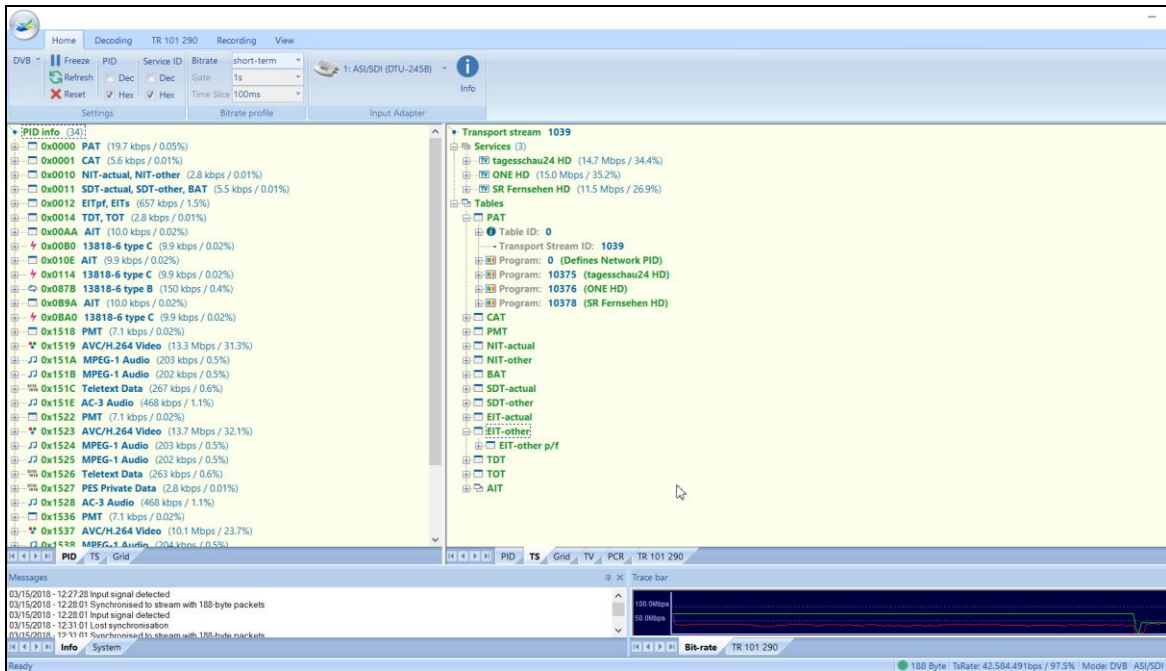
The transmit part is actually the PID Passing. Under some circumstances, there are certain PID's which don't belong to any program, but the user might want to pass them through the multiplexing module without any data missing or changing. This is the main purpose of this function. Enables the passing of particular PID's. Be sure you enter them as hexadecimal values.

Now we crosscheck what we are getting out of the box:

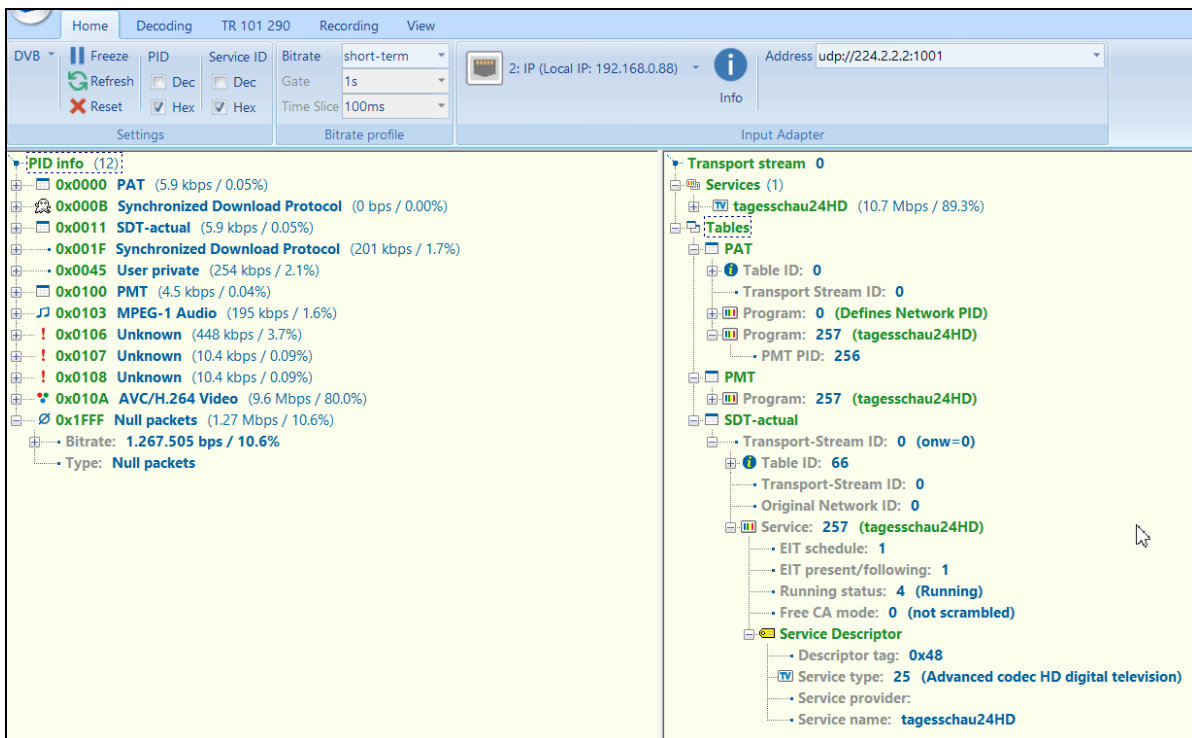
ASI 1+2 MUXED output:



ASI 3+4: PASSTHROUGH



IP Streams: SPTS:



Visually checked the HDMI-Out with a TV Set: tagesschau24HD comes out.

HD-SDI output should be there as well.

Before checking MPTS we need to switch MPTS=On

DVB-S2 HD IRD

Status
Input
General
MPTS
MUX
Card
SPTS
BISS
Transmit
▼ System

MPTS Parameters

Output IP	<input type="text" value="225.0.0.111"/>	<input type="text" value="UDP"/>		
Output Port	<input type="text" value="10000"/>			
Source IP	<input type="text" value="192.168.1.201"/>			
Source Submask	<input type="text" value="255.255.255.0"/>			
Source Gateway	<input type="text" value="0.0.0.0"/>			
Source Mac Addr	<input type="text" value="92 04 10 7A 10 79"/>			
Destination Mac Addr	<input type="text" value="01 00 5E 00 00 6F"/>			

The screenshot shows the software interface with the following details:

- Top Bar:** Home, Decoding, TR 101 290, Recording, View
- Left Panel (PID info (32)):**
 - 0x0000 PAT (4.5 kbps / 0.01%)
 - 0x000B Synchronized Download Protocol (149 kbps / 0.2%)
 - 0x0011 SDT-actual (4.5 kbps / 0.01%)
 - 0x0012 EITpf, EITs (657 kbps / 0.9%)
 - 0x001F Synchronized Download Protocol (204 kbps / 0.3%)
 - 0x0045 User private (262 kbps / 0.3%)
 - 0x0100 PMT (4.5 kbps / 0.01%)
 - 0x0103 MPEG-1 Audio (204 kbps / 0.3%)
 - 0x0106 Unknown (469 kbps / 0.6%)
 - 0x0107 Unknown (8.9 kbps / 0.01%)
 - 0x0108 Unknown (10.4 kbps / 0.01%)
 - 0x010A AVC/H.264 Video (10.2 Mbps / 13.6%)
 - 0x0130 Unknown (1.40 Mbps / 1.9%)
 - 0x0200 PMT (4.5 kbps / 0.01%)
 - 0x0203 MPEG-1 Audio (263 kbps / 0.4%)
 - 0x0204 MPEG-1 Audio (201 kbps / 0.3%)
 - 0x0205 AC-3 Audio (460 kbps / 0.6%)
 - 0x0206 MPEG-1 Audio (199 kbps / 0.3%)
 - 0x0207 Teletext Data (302 kbps / 0.4%)
 - 0x0208 PES Private Data (4.4 kbps / 0.01%)
 - 0x0209 AIT (10.3 kbps / 0.01%)
 - 0x020A MPEG-2 Video (3.5 Mbps / 4.7%)
 - 0x0300 PMT (4.5 kbps / 0.01%)
 - 0x0303 MPEG-1 Audio (263 kbps / 0.4%)
 - 0x0304 MPEG-1 Audio (199 kbps / 0.3%)
 - 0x0305 AC-3 Audio (460 kbps / 0.6%)
 - 0x0306 MPEG-1 Audio (201 kbps / 0.3%)
 - 0x0307 Teletext Data (306 kbps / 0.4%)
 - 0x0308 AIT (10.4 kbps / 0.01%)
- Right Panel (Transport stream 0):**
 - Services (3)
 - tagesschau24HD (11.5 Mbps / 15.4%)
 - 3sat (4.9 Mbps / 6.6%)
 - ZDFinfo HD (14.9 Mbps / 19.9%)
 - Tables
 - PAT
 - PMT
 - Program: 257 (tagesschau24HD)
 - Program: 514 (3sat)
 - Program: 771 (ZDFinfo HD)
 - SDT-actual
 - EIT-actual
 - EIT-actual p/f
 - EIT-actual schedule
 - EIT-other
 - EIT-other p/f
 - AIT
 - PID 521
 - PID 776

It's the muxed output as MPTS and we have PID 12hex as well as PID 12->130 (but this is unknown actually because standardised EIT PID x12 has been remapped to a free PID- so receivers of this EIT PID130hex cannot interpret this correctly.

BISS Descrambling (Basic Interoperable Scrambling System)

The BISS descrambling function application needs to be matched with the BISS scrambler Method and keys usually used in the uplink of the SAT-TV Service. The BISS window is showed as follows:

The BISS descrambling only works for the one selected single TV Service to be decoded. This BLANKOM IRD-6100 HD IRD BISS descrambling supports two modes: “Mode 1” and “Mode E”. The User can select one of these two modes in the drop down list:

Explanations regarding BISS scrambling/de-scrambling:

BISS modes: BISS Mode 0: unscrambled (clear), BISS Mode 1: Scrambled with a **session word (SW)**, BISS Mode E: scrambled with encrypted session word (ESW). The session word is the key that is used in the receiver (IRD) to descramble the transmitted data. Remark that BISS-E uses the same scrambling algorithm as BISS Mode 1 but that there is an additional encryption on the session word.

BISS Mode 1 uses a 12 digit hexadecimal key as session word. The session word has to be announced to all parties that are allowed to descramble the received data. Example: 123456ABCDEF. The session word can easily be compromised, there is no protection when communicating it to the receive site(s).

BISS Mode E: Scrambled with encrypted session word (ESW). This mode uses the ID (identifier) of the receiver(s) and a session word to calculate an encrypted session word (16 digits hex). There are two possible IDs - **Buried ID** - **Injected ID**. By encrypting the session word there is an additional protection on the session word. The ESW can be communicated using a non-secure channel since in order to descramble the received signal both the ID and the ESW need to be known.

Buried ID: Each receiver (IRD) holds a unique ID (i.e. the embedded serial number) that can be used to identify that specific receiver: This is called the buried ID. If you want to do a transmission that is

to be received by only one specific receiver, use the buried ID to calculate the encrypted session word (SW).

Injected ID: An identifier can be entered (injected) in a receiver (IRD), this injected ID can be entered in a single or a group of IRDs. This allows a **BISS-E** protected transmission to a group of IRDs.

Operation BISS Mode 1: Connect the scrambler between the encoder and modulator. Select the output interface rate (must be equal or higher than output interface rate of the encoder). Select BISS Mode 1. In case of BISS Mode 1 with clear session word, enter the 12 digit session word **SW**. Communicate the session word to the receive site(s).

Operation BISS Mode E with Buried ID: Connect the scrambler between the encoder and modulator. Select output interface rate (must be equal or higher than output interface rate of the encoder)- Select BISS mode. In case of BISS Mode E with Buried ID, get the Buried ID of the IRD and use this together with a session word to get calculated the **Encrypted Session Word** (using the DES3 algorithm). Communicate the ESW to the receiving site.




Operation BISS mode E with injected ID: Connect the scrambler between the encoder and modulator. Select output interface rate (must be equal or higher than output interface rate of the encoder). Select BISS mode. In case of BISS mode E with injected ID, get the injected ID of the IRD(s) and use this together with a session word to get calculated the encrypted session word (using the DES3 algorithm). Communicate the ESW to the receive site(s).

More details here: <https://tech.ebu.ch/docs/tech/tech3292.pdf>

Mode 1

Under Mode 1, the BISS scrambler applies scrambling by a fixed Control Word (CW), derived from a clear SW (Session Word). In Mode 1, a fixed 12-character SW is inserted into the scrambler. The 64-bit CW is derived from the SW according to DVB-CSA specifications. The User can select Mode 1 in the drop-down menu, and then input the descrambler key. The descrambler key consists of 12 characters based on the Hexadecimal system from 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, and F. The IRD-6100 descrambler key is equal the SW Data on the BISS scrambler side.

After inserting the descrambler key, the user should press "Set" to start descrambling. A few seconds later, the programs will be descrambled.

SW (12 digits hex)	<input type="text" value="FFFFFFFFFFFF"/>	
Injected ID (14 digits hex)	<input type="text" value="FFFFFFFFFFFFFF"/>	
Mode	<input type="text" value="Mode 1"/>	
<input type="checkbox"/> Buried ID		

Mode E

Using Mode E, the BISS scrambler completes scrambling through the **ESW** value and **ID Select**. The ESW value is equal to the Descrambler key on the IRD side, while the ID Select equals the Burned Key on IRD side. The BISS scrambler ID Select has two options: Device and Input. If Users choose Device, the Burned Key needs to be selected when descrambling, while if users choose Input and set Input data, on IRD side, users do not need to select Burned Key and input the Input data as SK. Under Mode E, users can select Burned Key option or not. Under Mode E, the device will calculate a new date which works as descrambling key. The new data is created by Descrambling Key (refers

ESW on scrambler side) and Burned Key (Input or **Device** mode on the scrambler side). If user is selecting Burned Key, it corresponds to the **Device** mode selected on scrambler side; while if Burned Key is unselected, it corresponds to **Input** mode on scrambler side. The **Input** data is SK on the IRD. User can input the SK in the column as showed:

ESW (16 digits hex)	<input type="text" value="FFFFFFFFFFFF0B20"/>	
Injected ID (14 digits hex)	<input type="text" value="FFFFFFFFFFFF"/>	
Mode	<input type="text" value="Mode E"/>	
	<input type="checkbox"/> Buried ID	

Mode E (Buried Key option unselected)

After selecting Mode E and Burned Key unselected, users should input the 16 figures Descrambler Key and 14 characters SK (the SK data refers to the **Input Data** on scrambler side). Users should choose the characters from 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, and F. Lastly users press “Set” to initial descrambling. A few seconds later, the programs will be descrambled.

Note: Under this mode, after inputting the Descrambler Key and SK, it will work out a new data, which can be seen as the SW in Mode 1. The new data resulted from Descrambler Key and SK implements descrambling function.

Mode E (Buried Key option selected)

After selecting Mode E and Burned Key, users should input the 16 figures Descrambler Key (named ESW on scrambler side). The user should choose the characters from 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9, A, B, C, D, E, and F. Under this mode, SK cannot be input in the column, as the data which works with ESW has been embedded inside the device after users select Burned Key (which refers that users choose **Device** mode on the scrambler side). Lastly users press “Set” to initial descrambling. A few seconds later, the programs will be descrambled.

Note: The Buried Key is embedded in the device and it is solely controlled by the device supplier.

Chapter 5 Troubleshooting

Our ISO9001 quality assurance system has been approved by CQC organization for guaranteeing the products’ quality, reliability and stability. All 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 our company. To prevent potential hazard, please strictly follow the operation conditions.

Prevention Measure

- Installing the device at a place in which the environment temperature is between 0 to 45 °C

- Making sure good ventilation for the heat-sink on the rear panel and other heat-sink slots if necessary
- Checking the input AC voltage whether it is within the power supply working range and the connection is correct before switching on the device
- Checking the RF output level varies within tolerant range if it is necessary
- Checking all signal cables have been properly connected
- Frequently switching on/off device is not recommended. The interval between every switching on/off should be longer than 10 seconds.

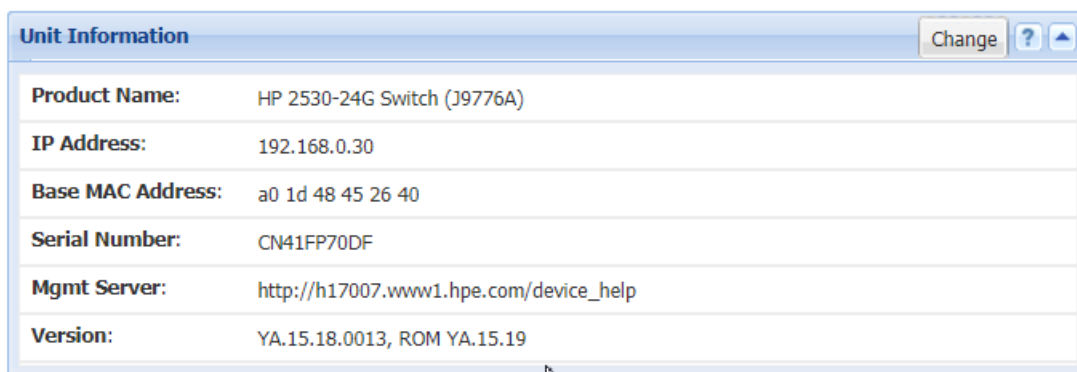
Conditions need to unplug power cord

- 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

Chapter 6 Packing List

BLANKOM IRD-6100 HD IRD	1 piece
User Manual (optional download from Websites)	1 piece
Power Cord for AC Input IEC	1 piece
ASI BNC-cable	1 piece

As a **Multicast capable Switch** we recommend is the HP (ARUVA) 2530 24G or 48G. (For Floor switches we have an own branded one and support IGMP as well) IGMP should be set to ON in the port configs. The latest HP Firmware might not be the best choice. Better to test IGMP functions before installation into a HOT running System and eventually do a downgrade of the Firmware. This one works:



General notes about Streams:

Multicast streams:

Multicast Address Ranges:

We recommend, that the addressing of your Multicast streams should be in conjunction with this listings to avoid conflicts with other network equipment or protocols.

<https://www.iana.org/assignments/multicast-addresses/multicast-addresses.xhtml>

One small part from this:

IPv4 Multicast Address Space Registry

Last Updated

2018-01-05

Expert(s)

Stig Venaas

Note

Host Extensions for IP Multicasting [RFC1112] specifies the extensions required of a host implementation of the Internet Protocol (IP) to support multicasting. The multicast addresses are in the range 224.0.0.0 through 239.255.255.255. Address assignments are listed below.

The range of addresses between 224.0.0.0 and 224.0.0.255, inclusive, is reserved for the use of routing protocols and other low-level topology discovery or maintenance protocols, such as gateway discovery and group membership reporting. Multicast routers should not forward any multicast datagram with destination addresses in this range, regardless of its TTL.

Available Formats  [XML](#)  [HTML](#)  [Plain text](#)

Registries included below

- [Local Network Control Block \(224.0.0.0 - 224.0.0.255 \(224.0.0/24\)\)](#)
- [Internetwork Control Block \(224.0.1.0 - 224.0.1.255 \(224.0.1/24\)\)](#)
- [AD-HOC Block I \(224.0.2.0 - 224.0.255.255\)](#)
- [RESERVED \(224.1.0.0-224.1.255.255 \(224.1/16\)\)](#)
- [SDP/SAP Block \(224.2.0.0-224.2.255.255 \(224.2/16\)\)](#)
- [AD-HOC Block II \(224.3.0.0-224.4.255.255 \(224.3/16, 224.4/16\)\)](#)
- [RESERVED \(224.5.0.0-224.251.255.255 \(251 /16s\)\)](#)
- [DIS Transient Groups 224.252.0.0-224.255.255.255 \(224.252/14\)\)](#)
- [RESERVED \(225.0.0.0-231.255.255.255 \(7 /8s\)\)](#)
- [Source-Specific Multicast Block \(232.0.0.0-232.255.255.255 \(232/8\)\)](#)
- [GLOP Block](#)

- [AD-HOC Block III \(233.252.0.0-233.255.255.255 \(233.252/14\)\)](#)
- [Unicast-Prefix-based IPv4 Multicast Addresses](#)
- [Scoped Multicast Ranges](#)
- [Relative Addresses used with Scoped Multicast Addresses](#)

Multicast (as opposed to unicast) is used to send UDP packets from 1 source to multiple destination servers. This is useful for example for streaming from a satellite/DVB-T receiver to multiple receiving PCs for playback. Multicast can also be used on the output of an encoder to feed multiple streaming servers. Multicast only works with UDP and is not possible with TCP due to the 2 way nature of TCP, most commonly multicast is used with RTP and MPEG2-TS.

A multicast IP address must be chosen according to IANA information, we recommend using an address in the range **239.0.0.0 to 239.255.255.255** as this is reserved for private use. Using multicast addresses in the 224.0.0.0 range may clash with existing services and cause your stream to fail. For more details see <http://www.iana.org/assignments/multicast-addresses/multicast-addresses.xml>

Choosing a UDP port number for multicast streams is also important. Even if you use a different multicast IP for each of your streams, we strongly recommend using different UDP port numbers as well. This is because a server and all software running on the server receives ALL multicast traffic on an open port and extra processing is required to filter out the required traffic. If the each stream arrives on a different port, the server can safely ignore any traffic on ports that are not open. Port numbers **MUST** be chosen so that don't clash with any existing services or ephemeral ranges. The ephemeral range for Windows Vista, 7, 2008 is 49152 to 65535, for older Windows it is 1025 to 5000 and for Linux it is 32768 to 61000. For more information on Windows see <http://support.microsoft.com/kb/929851> Care should also be taken to avoid system ports 0 to 1024. See <http://www.iana.org/assignments/service-names-port-numbers/service-names-port-numbers.xml> Generally one of the unassigned User Ports (**1024-49151**) should be used, you can run the **netstat -abn** (as admin under windows) command to see which ports are currently in use.

Registered port

A **registered port** is a [network port](#) (a sub-address defined within the [Internet Protocol](#), in the range 1024–49151) assigned by the [Internet Assigned Numbers Authority](#) (IANA) (or by [Internet Corporation for Assigned Names and Numbers](#) (ICANN) before March 21, 2001,^[1] or by USC/ISI before 1998) for use with a certain protocol or application.

Ports with numbers 0–1023 are called *system or well-known ports*; ports with numbers 1024-49151 are called *user or registered ports*, and ports with numbers 49152-65535 are

called *dynamic and/or private ports*.^[2] Both system and user ports are used by transport protocols (TCP, UDP, DCCP, SCTP) to indicate an application or service.

- **Ports 0–1023** – system or [well-known ports](#)
- **Ports 1024–49151** – user or registered ports
- **Ports >49151** – dynamic / private ports

https://en.wikipedia.org/wiki/List_of_TCP_and_UDP_port_numbers

Range for Ephemeral port

The [Internet Assigned Numbers Authority](#) (IANA) suggests the range 49152 to 65535 ($2^{15}+2^{14}$ to $2^{16}-1$) for dynamic or private ports.^[1]

Many [Linux kernels](#) use the port range 32768 to 61000.^[note 2] [FreeBSD](#) has used the IANA port range since release 4.6. Previous versions, including the [Berkeley Software Distribution](#) (BSD), use ports 1024 to 5000 as ephemeral ports.^{[2][3]}

[Microsoft Windows](#) operating systems through XP use the range 1025–5000 as ephemeral ports by default.^[4] [Windows Vista](#), [Windows 7](#), and [Server 2008](#) use the IANA range by default.^[5] [Windows Server 2003](#) uses the range 1025–5000 by default, until Microsoft security update MS08-037 from 2008 is installed, after which it uses the IANA range by default.^[6] Windows Server 2008 with Exchange Server 2007 installed has a default port range of 1025–60000.^[7] In addition to the default range, all versions of Windows since Windows 2000 have the option of specifying a custom range anywhere within 1025–65535.^{[8][9]}

Packet structure

		UDP Header																															
Offsets	Octet	0				1				2				3																			
Octet	Bit	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
0	0	Source port																Destination port															
4	32	Length																Checksum															

The UDP header consists of 4 fields, each of which is 2 bytes (16 bits).^[1] The use of the fields "Checksum" and "Source port" is optional in IPv4 (pink background in table). In IPv6 only the source port is optional (see below).

Source port number

This field identifies the sender's port when meaningful and should be assumed to be the port to reply to if needed. If not used, then it should be zero. If the source host is the client, the port number is likely to be an ephemeral port number. If the

source host is the server, the port number is likely to be a well-known port number.^[4]

Destination port number

This field identifies the receiver's port and is required. Similar to source port number, if the client is the destination host then the port number will likely be an ephemeral port number and if the destination host is the server then the port number will likely be a well-known port number.^[4]

Length

A field that specifies the length in bytes of the UDP header and UDP data. The minimum length is 8 bytes because that is the length of the header. The field size sets a theoretical limit of 65,535 bytes (8 byte header + 65,527 bytes of data) for a UDP datagram. However the actual limit for the data length, which is imposed by the underlying [IPv4](#) protocol, is 65,507 bytes (65,535 – 8 byte UDP header – 20 byte [IP header](#)).^[4]

In IPv6 [jumbograms](#) it is possible to have UDP packets of size greater than 65,535 bytes.^[5] [RFC 2675](#) specifies that the length field is set to zero if the length of the UDP header plus UDP data is greater than 65,535.

Checksum

The [checksum](#) field may be used for error-checking of the header and data. This field is optional in IPv4, and mandatory in IPv6.^[6] The field carries all-zeros if unused.^[7]

RTP:

a part from: <https://tools.ietf.org/html/rfc3550>

Chapter 11:

RTP relies on the underlying protocol(s) to provide demultiplexing of RTP data and RTCP control streams. For UDP and similar protocols, RTP SHOULD use an **even** destination port number and the corresponding RTCP stream SHOULD use the next higher (odd) destination port number. For applications that take a single port number as a parameter and derive the RTP and RTCP port pair from that number, if an odd number is supplied then the application SHOULD replace that number with the next lower (even) number to use as the base of the port pair. For applications in which the RTP and RTCP destination port numbers are specified via explicit, separate parameters (using a signaling protocol or other means), the application MAY disregard the restrictions that the port numbers be even/odd and consecutive although the use of an even/odd port pair is still encouraged. The RTP and RTCP port numbers MUST NOT be the same since RTP relies on the port numbers to demultiplex the RTP data and RTCP control streams.

In a unicast session, both participants need to identify a port pair for receiving RTP and RTCP packets. Both participants MAY use the

same port pair. A participant MUST NOT assume that the source port of the incoming RTP or RTCP packet can be used as the destination port for outgoing RTP or RTCP packets. When RTP data packets are being sent in both directions, each participant's RTCP SR packets MUST be sent to the port that the other participant has specified for reception of RTCP. The RTCP SR packets combine sender information for the outgoing data plus reception report information for the incoming data. If a side is not actively sending data (see [Section 6.4](#)), an RTCP RR packet is sent instead.

RTP (Real-Time Transport Protocol)	
Familie:	Netzwerkprotokoll
Einsatzgebiet:	Transport von Medien-Streams
Port:	beliebiger freier, gerader Port größer 1024
RTP im TCP/IP-Protokollstapel:	
Anwendung	RTP
Transport	UDP
Internet	IP (IPv4, IPv6)
Netzzugang	Ethernet Token Bus Token Ring FDDI ...
Standard:	RFC 3550 (RTP: A Transport Protocol for Real-Time Applications, 2003)

any port (even, not odd > 1024)

Note: Regarding SAP (Session Announcement Protocol)

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 SAP 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.

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