IRENIS® HDM

HD/SD Encoder & Modulator
HDMI/YPbPr/S-Video/AV to DVB-C Digital RF

--- Home Use

User Manual
Thank you for choosing our encoder modulator.

Please read this manual carefully to install, use and maintain the encoder modulator in the best conditions of performance. Keep this manual for future reference.

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CHAPTER 1 Product Introductions

General Description

HDM series encoder & modulator is IRENIS’s consumer electronics which allow audio/video signal input in TV distributions with applications in home entertainment, surveillance control, hotel Digital Signage, shops etc.

It is an all-in-one device integrating MPEG-4 AVC/H.264 encoding and modulating to convert audio/video signals into DVB-C RF out.

The USB port is designed to record encoded video (TS) and save it in ts files in the USB Keys or Hard Disks, and then the ts files can be playback through the USB port. The ts files can be also generated on a computer with IRENIS’s TS Creator.exe program.

The signals source could be from satellite receivers, closed-circuit television cameras, Blue-ray players, antenna and a USB key or Hard Disk etc. Its output signal is to be received by TV sets or STBs etc.
### Encoding Section

**HDMI**

<table>
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<tr>
<th>Encoding</th>
<th>MPEG-4 AVC/H.264</th>
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<tr>
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**Video**

<table>
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<tbody>
<tr>
<td>Bit rate</td>
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**Audio**

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</thead>
<tbody>
<tr>
<td>Sample rate</td>
<td>48KHz</td>
</tr>
</tbody>
</table>
### Video

**Encoding**

MPEG-4 AVC/H.264

**Interface**

CVBS & S-Video: 720x576, 720x60i (PAL); 720x480, 720x60i (NTSC)
YPbPr: 1920*1080, 1920*1080, 1280*720, 1280*720

**Resolution**

YPbPr/CVBS/S-Video (with an adapter to VGA)

**Bit rate**

0.500~19.500 Mbps

### Audio

**Encoding**

MPEG1 Layer II, MPEG2-AAC, MPEG4-AAC

**Interface**

1*Stereo /2*mono

**Sample rate**

48KHz

**Bit rate**

MPEG1 Layer II: 64, 96, 128, 192, 256, 384kbps
MPEG2-AAC: 128, 192, 256, 320, 384kbps
MPEG4-AAC: 64, 96, 128, 192, 256kbps

### DVB-C Modulator Section

**Standard**

J.83A (DVB-C), J.83B, J.83C

**MER**

≥43dB

**RF frequency**

35-960MHz, 1KHz step

**RF output level**

-16~ -36 dBm (71~91dbµV), 0.1db step

**Symbol rate**

5000-9000KHz

**Constellation**

J.83A: 16/32/64/128/256 QAM
J.83B: 64/256 QAM
J.83C: 64/256 QAM

**Bandwidth**

8M
6M
6M

### System

**Management**

Local control: LCD + control buttons
Remote control: web NMS

**Language**

English

**LCN Insert**

support

**RF Combine in ATT**

10dB

**Upgrade**

USB/Web-server

### General

**Power supply**

DC 12V

**Dimensions**

183*110*45mm

**Weight**

< 1kg

**Operation temperature**

0~45°C
CHAPTER 2 Safety Instruction and Installations

Safety Instructions

⚠️ WARNING: Hot plug is not allowed since it may cause system halted.

To prevent fire or electrical shock, do not expose the device to rain or moisture.

❌ The encoder modulator is powered with a voltage of 12V DC. The power supply voltage must not exceed the recommended voltage, which otherwise may cause irreparable damage to the device and the invalidation of the warranty. Therefore:

- Do not replace power supply with a voltage greater than 12V DC.
- Do not connect the device to the power if the power cord is damaged.
- Do not plug the device into mains supply until all cables have been connected correctly.
- Do not cut the cord.

⚠️ Avoid placing the device next to central heating components and in areas of high humidity.

Do not cover the device with elements that obstruct the ventilation slots.

If the encoder modulator has been kept in cold conditions for a long time, keep it in a warm room minimum 2 hours before plugging into the mains.

Mount the device in vertical position with the connectors located on the top side.

When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutes may result in fire, electric shock or other hazards.

Safety check- Upon completion of any service or repairs to this device, ask the service technician to perform safety checks to determine that the device is in proper condition.

Installations

⚠️ RISK OF damage to the unit

Mechanically handling the unit may result in damage. Do not connect the unit to the power supply before or during assembly. Connect the unit as below instructed.

⚠️ NO HOT PLUG!
1. Mount and tighten the screws and plugs to secure the unit to the wall. Leave 10 cm of free space around from each unit.

2. Connect the signal input in the respective connectors. The signal source can be from a surveillance monitor, DVD, set-top box, CCTV and etc.

3. Optionally, connect the loop-through RF input coaxial cable.

4. Connect cable to RF output to STB/TV.

5. Power supply connection: a) Connect the earth cable; b) Connect the power plug to the unit mains connector; c) Connect the power plug to the mains socket.

**Cascade Installation**

IRENIS HDM unit has 1 TV signal to RF output encoded as DVB-C Digital TV signal.

Several IRENIS HDM units can be cascaded in order to increase the capacity. The maximum capacity of a series of N units is 1xN incorporated TV signals. To cascade 2 or more units, connect the RF output of the preceding unit to the TV input (loop-through) of the next unit (see right illustration).
TS Recorder and Save:
- HDM can encode the source video to *.ts files and save them through the USB flash drive.
- Connect the signal source to HDM and start encoding process.
- Start the record process and save the TS generated to the USB flash drive.

*.ts Video Creation Software:
- Users can also create *.ts videos containing pictures, videos and music with our creator software on a PC and save them into the USB flash drive.
- Drag the files to "Creator" application. Formats supported include: Image: JPG, PNG, BMP, GIF
  Audio: MP3, WAV
  Video: WMV, MPG, MP4, TS, AVI...
- Start the conversion process to generate *.ts videos

TS Playback:
- Insert the USB flash drive with *.ts videos in HDM and play back the content in an easy way.
- A single video can be up to 2G in size and multi videos can be played on a loop.

USB Flash Drive Specifications Required: High Speed 2.0/3.0; File System FAT32

TS Creator.exe Download link:
http://www.irenis.com/downloads/TScreator_1.1.7.22.zip
Chapter 3 Operations of TS Creator Software

IRENIS HDM encoder modulator has a function to create TS videos with the software supplied with the product. Users can create *.ts files containing images, videos and audios in a simple and intuitive way, and play them on a television through IRENIS HDM’s USB port.

File format supported include:

**Image**: JPG, PNG, BMP, GIF

**Video**: MP4, WMV, AVI, MPG, TS, MKV...

**Audio**: MP3, WAV

**Installation**

1. Download our “TS Creator” software package on your PC to get the installer and its auxiliary routine.
2. Occasionally, if your PC hasn’t installed “Net Frame 2.0” yet, double-click “NetFx20SP2_x86.exe” until complete the installation.
3. Double-click “Setup.exe” application to install the “TS Creator” and generate a desktop shortcut.

**Operations of “TS Creator”**

Double-click the “TS Creator” shortcut icon, it will trigger an operation interface like below:
To set time duration for every picture when playing the video

To set the resolution for the output video

The video is transformed based on VBR (Variable Bit Rate). The number set here represents the highest bit rate for the output video and bit rate will varies under the number.

Users can select an encode format here according to the standard of receiving terminal.

Users can filter the null packet to boost the video’s effect bit rate.

A single video can be maximum 2.0 GB in size. (IRENIS HDM cannot play a video bigger than 2GB.)

After setting all the parameters, click to start the transformation. Click “OK” when it prompts “The operation completed normally.”

Click this button to stop the transformation before the operation completed.

After finishing the transform operation, users can click this button to play the generated TS video.
File Management

After finishing the transformation, users can find out the videos files generated according the Saving Directory. For example, we save the video in “D:\ABC” so we can find it in Disk D\Folder ABC.

Management:

1. Three files will be generated if the Null Packet has been filtered.

   ![Files](image1)

   - TS video for preview through the “TS Creator” interface by clicking “Play”
   - TS video and information files: Users need to save the two files together in the USB memory, and then IRENIS HDM can read them and play the video.

2. Two files will be generated if the Null Packet has not been filtered.

   ![Files](image2)

   - TS video for preview through the “TS Creator” interface by clicking “Play”
   - TS video: Users need to save it in the USB memory, and then IRENIS HDM can read it and play the video.

Remarks:

- All the file names are automatically generated.
- Rename the files before creating a new video to avoid covering the previous files.
- If you rename “FinalOutput-204-0.ts” or “FinalOutput-204-0.tsinfo”, always keep the names the same (Extension excluded) and then IRENIS HDM can read them and play the video.
CHAPTER 4 Devices Operations and Management

IRENIS HDM is controlled and managed through the keyboard and LCD display.

**LCD Display** – It presents the selected menu and the parameter settings. The backlight in the display is on when the power is applied.

**LED Indicators** – These lights indicate the working status
- **Power**: It lights on when the power supply is connected.
- **Alarm**: It lights on when there is an error, such as the signal source loss.
- **USB**: It lights on when the USB device is properly connected and blocks out when the USB device gets removed.

**Left/Right/Up/Down buttons** – Use these buttons to turn the screen pages, shift the target items by moving the triangle, or change the parameter settings in the program mode.

**Enter** – Use this button to enter a submenu or save a new setting after adjustment; press it to start adjusting the value of certain items when the corresponding underline flash with Up and Down buttons;

```
Hue 1
Enter
Hue +001
Hue +001
Hue +002
```

Press it to activate the hidden selections and change the setting with Up and Down (or Left and Right) buttons.

**Menu** – Press this button to step back

**Lock** – Locking the screen / cancelling the lock state, and entering the main menu after the initialization of the device. After pressing lock key, the system will question the users to save present setting or not. If not, the LCD will display the current configuration state.

When the power is connected, the LCD will start to initialize the program. The LCD menu goes as below chart.
1) IRENIS HDM: Model number; 1080i: video resolution of signal source; X.XX Mbps: the current encoding bit rate

2) Alarm Status: For example, if the signal cable disconnected, it will display Video 1 Not Lock under this menu.

3) Uptime: It displays the working time duration of the device. It times upon power on.

4) Video Parameters: User needs to set the input interface first according to user’s actual need. User can also view the video status and configure other items (Bit rate: 0.500~19.500
Mbps; Brightness & Contrast & Saturation: 0-255; Hue: -128 - +127. (Items Brightness, contrast, saturation and Hue are for CVBS/S-Video configuration.)

5) Audio Bit rate: Select audio bit rate from the options provided. Different audio format has different bit-rate range. See specification table for details.

   Audio Format: Select audio format among MPEG2, MPEG2-AAC and MPEG4-AAC.

6) Program Information: User can enter the sub-menus to edit the Program Name, Provider Name, Service ID, and PIDs of PMT, PCR, Video and Audio.

7) RF On: User can choose to turn on or turn off the RF under this menu.

8) Standard: It is for selecting the modulating standard. This unit contains 3 modulating standards – J.83A (DVB-C), J.83B and J.83C.

9) Constellation: DVB-C modulator contains 3 modulating standards. Different standard involves different modulating constellations. See the specification table for details.

10) Symbol Rate: adjust the symbol rate at the range of 5000-9000 Ksps.

11) RF Frequency: Adjust it at range of 30 to 999 MHz. Set it according your regional situation or inquire your local services.

12) RF Level: Adjust it at range of -16~ -36dBm.

13) TSID: (Transport Stream ID) User can view or adjust after enter this menu.

14) ONID: (Original Network ID)-User can view or adjust after enter this menu.

15) NIT: (Network Information Table) NIT table is a very important table for describing the network and TS. User can enter the submenus displayed and edit the values or select modes.

16) – 21) Please refer to Chapter 5 for details.

22) IP Address: To configure IP address here.

23) Subnet Mask: To configure subnet mask here.

24) Gateway: To configure gateway here.


26) MAC Address: To view MAC address here.

27) Save Config: Yes/No-to save/give up the adjustment of setting.

28) Load Saved CFG: Yes/No-to load/ not to load the saved configuration.

29) Reset all sets: Yes/No-choose/not choose the factory’s default configuration.

30) LCD Time out: A time limit that LCD will light off. Choose among 5s, 10s, 45s, 60s, 90s and 120s (seconds).

31) Product ID: User can view the serial number of this device. It is read-only and unique

32) Version: It displays the version information of this device.
Chapter 5 Operations of Record TS and Play TS through USB Disk

The IRENIS HDM encoder modulator has functions of:

1. **.ts Video Creation**
   
   See Chapter 3.

2. **TS Record and Save**

   ![Record mode select](image)

   1) Connect the signal source, enter “Record Start” and then choose one record mode to start recording the encoded TS. And, press UP key and then Enter key to stop recording.

   There are 3 record modes provided:
   - "Single file": For example, when the file size is set as 1000M and the *.ts is recorded up to 1000M, it automatically stops recording TS.
   - "Segment file": For example, when the file size is set as 1000M and the *.ts is recorded up to 1000M, it automatically saves the files and continues to record TS and save it to next file until the USB memory is full.
   - "Loop record": It automatically saves the files and continues to record TS and save it to next file. When the USB memory is full, it replaces the previous file.

2) **Advanced Config**:

   File Name: Users can enter this menu to edit name for the *.ts files to be recorded. For example, if users name it “Record-”, it will give name to the saved *.ts files “Record-001.ts”, “Record-002.ts”... “Record-00N.ts”.

   File Size: users can set the file size for the *.ts to be recorded. A single file can be maximum 2047M in size.

   Data Mode: There are 3 data modes:
- Mode 1 (The ts files will be saved in 188-byte packages with null packet embedded.);
- Mode 2 (The ts files will be saved in 188-byte packages with null packet filtered. However, such ts files cannot be normally played with IRENIS HDM, but can be played on PC with some media player such as VLC.);
- Mode 3 (The ts files will be saved in 204-byte packages with null packet filtered.).

3. TS Playback

![](TSPlaybackDiagram.png)

1) Play Start:
   User can select a play mode for the *.ts files as needed before playing the *.ts file and specify a video under ‘Play one’ / ‘Play one loop’ mode and press “Enter” button to start play. While under ‘Play all’ / ‘Play all loop’ mode, it automatically plays files from first to end.

2) Advanced Config:
   Auto Mode is for saving the play mode for the device. When the auto mode is enabled, the device will automatically apply the play mode set before the power cut off and output ts files stored in the USB device through RF. While the auto mode is off, IRENIS HDM will play the encoded TS through RF when the power is connected.

4. Disk Usage

![](DiskUsageDiagram.png)

Users can enter this menu to view the USB disk’s capacity left.

5. Update

![](UpdateDiagram.png)

Choose one item to be updated and press Enter to confirm. Keep the the update file stored in the USB device in *.dxf format.

6. Connect Device

![](ConnectDeviceDiagram.png)
Press Enter key to re-connect the USB disk.

7. **Remove Device**

Press Enter key to safely remove the USB disk. IRENIS HDM will then automatically resume encoding process and playing the program input from the encoder module.
Chapter 6 Operations of Web-server

In addition to using front buttons to control the encoder modulator and USB device, users can also perform the same operation in an easier way with the web Browser in the PC (Personal Computer).

Login

The default IP address of this device is 192.168.0.136. (We can modify the IP through the front panel.)

Connect the PC and the encoder modulator with a net cable, and use ping command to confirm they are on the same network segment.

I.G. the PC IP address is 192.168.99.252, we then change the device IP to 192.168.99.xxx (xxx can be 1 to 254 except 252 to avoid IP conflict).

Use web browser to connect the device with PC by inputting the device’s IP address in the browser’s address bar and press Enter.

It will display the Login interface as Figure-1. Input the Username and Password (Both the default Username and Password are “admin”.) and then click “LOGIN” to start the device setting.

![Figure-1](image-url)
Operation

Summary:
When we confirm the login, it displays the WELCOME interface as Figure-2 where users can have an overview of the device’s system information and working status.

Parameters → Encoder:
From the menu on left side of the webpage, clicking “Encoder”, it displays the interface where users can configure the encoding parameters for the input video/audio. (Figure-3)
Parameters → TS Config:
From the menu on left side of the webpage, clicking “TS Config”, it displays the interface where users can configure the parameters for the transport stream as prompt. (Figure-4)
**Parameters → Modulator:**

From the menu on left side of the webpage, clicking “Modulator”, it displays the interface where users can configure the modulating parameters for the RF output. (Figure-5)
Parameters → USB:

From the menu on the left side of the webpage, clicking “USB”, it displays the interface where users can operate USB device. (Figure-6)

**NOTE:** It is necessary to connect USB device and signal source and activate encoding to operate TS recording.

**NOTE:** It is necessary to connect USB device when operate TS playing.

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**Detailed Explanation:**

There are 3 record modes provided:

- **“Single file”**: For example, when the file size is set as 1000M and the *.ts is recorded up to 1000M, it automatically stops recording TS.

- **“Segment file”**: For example, when the file size is set as 1000M and the *.ts is recorded up to 1000M, it automatically saves the files and continues to record TS and save it to next file until the USB memory is full.

- **“Loop record”**: It automatically saves the files and continues to record TS and save it to next file. When the USB memory is full, it replaces the previous file.

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**Advanced Config:**
File Name: Users can enter this menu to edit name for the *.ts files to be recorded. For example, if users name it “Record-”, it will give name to the saved *.ts files “Record-001.ts”, “Record-002.ts”... “Record-00N.ts”.

File Size: users can set the file size for the *.ts to be recorded. A single file can be maximum 2047M in size.

Data Mode: There are 3 data modes:
- Mode 1 (The ts files will be saved in 188-byte packages with null packet embedded.);
- Mode 2 (The ts files will be saved in 188-byte packages with null packet filtered. However, such ts files cannot be normally played with IRENIS HDM, but can be played on PC with some media player such as VLC.);
- Mode 3 (The ts files will be saved in 204-byte packages with null packet filtered.).

Playing Auto Mode:
Auto Mode is for saving the play mode for the device. When the auto mode is enabled, the device will automatically apply the play mode set before the power cut off and output ts files stored in the USB device through RF. While the auto mode is off, IRENIS HDM will play the encoded TS through RF when the power is connected.

Parameters → NMS:
From the menu on left side of the webpage, clicking “NMS”, it displays the interface where users set the network configuration for the device. (Figure-7)
Parameters ➔ LCD/Key:
From the menu on left side of the webpage, clicking “LCD/Key”, it displays the interface where users can set the time out for the LCD. (Figure-8)

System ➔ Password:
From the menu on left side of the webpage, clicking “Password”, it will display the screen as Figure-9 where to set the login account and password for the web NMS. (Figure-9)

Input this address in the browser to connect the device and PC.
System → Save/Restore:

From the menu on the left side of the webpage, clicking “Save/Restore”, it will display the screen as Figure-10 where you can save or restore your configurations.

System → Backup/Load:

From the menu on the left side of the webpage, clicking “Backup/Load”, it will display the screen as Figure-11 where you can backup or load your configurations.
**System → Update (FPGA)/(CPU)/(Web):**

From the menu on left side of the webpage, clicking “Update”, it will display the screen as Figure-12-14 where to update the corresponding part for the device.
System → Reboot:

From the menu on left side of the webpage, clicking “Reboot”, it will display the screen as Figure-15 where to restart the device manually.
Some configuration will work after reboot the device, such as update.

Reboot
### Appendix

#### Australia Air Channels

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Table 1: Australia Television Frequency/Channels (MHz)
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Table 2 Recommended MPEG-2 Code Rate

General Distributor Emea:
IRENIS GmbH
Owiesenkehre 1
D-22177 Hamburg
Germany
info@irenis.com
http://www.irenis.com