

MAC-HOME HD

REF. 4482

High Definition Standalone Modulator
DVB-T / DVB-C Outputs
CVBS . HDMI Inputs



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General safety instructions

- Read this entire user manual carefully before plugging in the unit.
- Keep these instructions to hand during unit installation.
- Follow all the instructions and safety notices when handling the unit.

Types of notices

The safety notices used in this manual and their meanings are described below:



DANGER OF DEATH OR INJURY

This safety notice indicates a potential hazard to people's lives and/or health. Failure to follow these instructions can lead to severe health consequences and may even cause fatal injuries.

- Do not install the unit during electrical storms. This could lead to electro-static discharge from lightning.
- Do not open the unit. You may suffer an electric shock.



RISK OF DAMAGE TO THE UNIT

This safety notice indicates a potentially hazardous situation. Failure to follow these instructions may cause material damage to the unit.

- Keep the unit well-ventilated at all times. Install the unit in an area free of dust. Do not place the unit in a place where the ventilation slots may become blocked or obstructed.
Leave a distance of at least 20 cm all around the unit's sides. We recommend installing the unit in the VERTICAL position.
- Do not expose the unit to rain or moisture. Install in a dry location where potential leaks or condensation will not occur. In the event that liquid gets into the device, disconnect it immediately from the alternating current.
- Keep flammable objects, candles and anything that may cause a fire away from the unit.
- Connect the unit to an easily-accessible mains outlet, so that the unit can be quickly disconnected from the outlet in case of emergency.
- Do not expose the unit to sources of heat (sunlight, radiators, etc).

NOTE. Do not expose the unit to sources of heat (sunlight, radiators, etc).



DO NOT HANDLE ANY OF THE UNIT'S INTERNAL PARTS

This notice indicates that users should not handle any internal parts that could affect its working order or warranty.

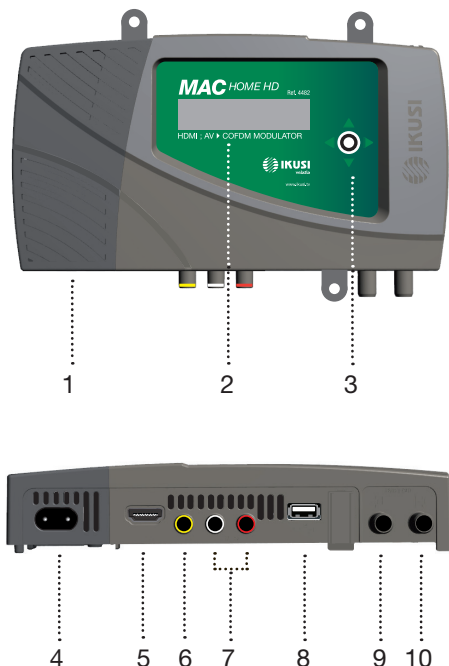


DO NOT DISPOSE OF UNIT AS NORMAL DOMESTIC URBAN WASTE

This type of notice indicates that the unit should not be disposed of as unselected domestic urban waste.

Introduction

General description



LEGEND

- 1 Removable power source
- 2 Screen (LCD)
- 3 Control button for configuration
- 4 Network connector
- 5 HDMI input connector
- 6 CVBS video input connector
- 7 L and R audio analogue inputs
- 8 USB input for video playback and firmware upgrade
- 9 Loop-through for combination of external RF TV signals.
- 10 DVB-T/C RF output

Main characteristics

The MAC HOME HD model is a standalone modulator unit which can handle different Audio and Video formats to make up a high-definition COFDM/QAM channel.

The unit has two types of input:

- An analogue audio and video channel through 3 RCA jacks.
- A digital audio and video channel in HDMI format through HDMI connector.

The multiplex signals allow the following operation modes:

- Ch1 HDMI SD/HD + USB
- Ch1 CVBS SD + USB

This product aims to meet video signal distribution requirements in residential facilities, hotels and landmark buildings, along with video surveillance installations with COFDM/QAM digital TV modulation, through a standalone unit.

Programming:

- User interface with LCD screen and control button for basic configuration.
- All adjustments are stored automatically.
- Reprogrammable as often as necessary.
- Easily configurable.

Signal processing:

- CVBS video and mono/stereo audio input.
- HDMI input.
- SD and HD standard signal quality.
- Video resolution (480i, 576i, 480p, 576p, 720p50, 720p60, 1080i50, 1080i60).
- Video compression MPEG2 and H.264.
- Audio compression MPEG2 L1/L2, LC-AAAC, HE-AAC.
- PAL/SECAM/NTSC/B&W colour standards supported.
- DVB-T/C RF output throughout the CATV band (45MHz-858MHz).
- Loop-through for combination of external RF TV signals.
- User interface with LCD and joystick.
- USB interface to upgrade firmware or electronic signage applications.
- Removable power source.



General use of the unit

The following sections describe how to operate the unit using the control button and how to interpret the visual prompts displayed on the LCD screen. The programme comprises a main menu made up of submenus that can be selected to modify the unit's basic operation settings.

Visual prompts on LCD screen



This symbol indicates that you can scroll vertically.

Vertical button movement



In the menus and submenus, you can move the button up or down to scroll upwards or downwards, one step at a time.

In the settings, move the button up or down to change the values, one step at a time.



NOTE. To browse or modify the values faster, keep the button pressed up or down.

Horizontal button movement



In the menus, you can move the button to the left or right to select or go back, one step at a time.

In the settings, move the button to the left or to the right to browse, select or go back, step by step.



NOTE. To browse faster, keep the button pressed to the left or to the right.

Press button



In the menus, this selects the submenu.

In the submenus, this selects the settings.

In the settings, this selects the parameter value.

Unit installation and configuration

The unit can be adjusted with just the LCD screen and control button. Follow the steps indicated below to install the unit and configure the different parameters accessible from the user interface in the LCD screen.

Module assembly and connectorising



RISK OF DAMAGE TO THE UNIT

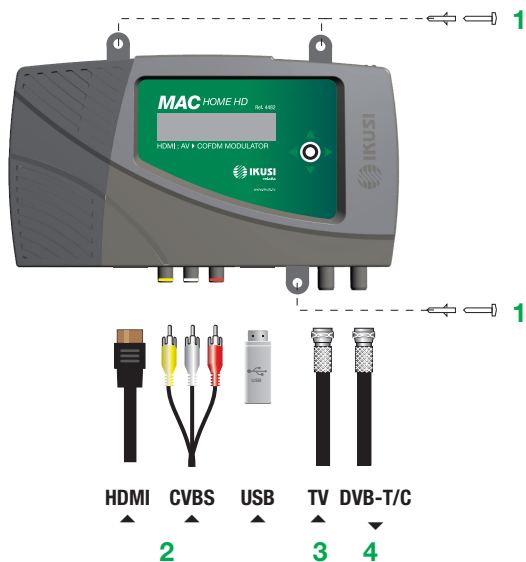
Handling the unit mechanically may result in damage. Do not connect the unit to the power supply before or during assembly.

- 1 Assemble the mounts (*) and tighten the screws and plugs to secure the unit to the wall.
- 2 Connect the inputs (HDMI or CVBS) in the corresponding connectors.
- 3 Optionally, connect the loop-through TV input coaxial cable (F connector).
- 4 Connect the output cable to the DVB-T/C unit.

(*) The 3 wall attachments are supplied disassembled in order to install the unit horizontally. Their straightforward assembly consists of positioning the fastenings in the corresponding holes and pushing as far as possible (be sure to take your time doing this).



NOTE. It is recommended to assemble the equipment in upright position.



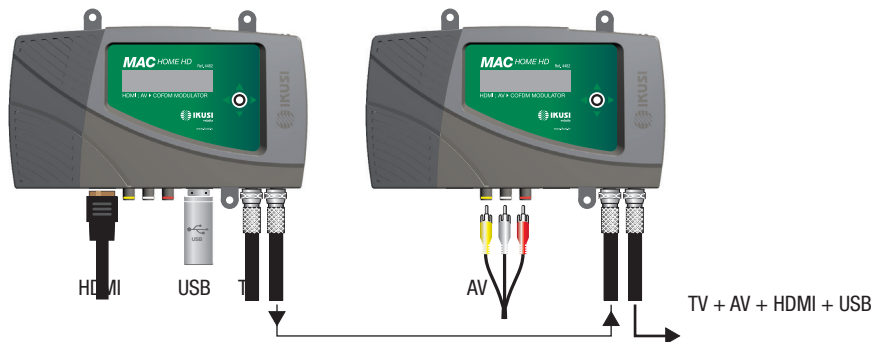
Signal sources



Cascade installation

Several MAC HOME HD units can be cascaded in order to increase services capacity. To do this, connect the RF output of the preceding unit to the TV input (loop-through) of the next unit (see assembly example). The number of modules depends on the available channels and the output level.

To enable an assembly with 2 or more units, it is necessary to identify each service with a different SID and TSID value. The MAC HOME HD unit automatically adjusts these values when programming the channel of each modulator.



Two input modes:

- 1 SD/HD channel (HDMI) + 1 USB channel (through inserted flash-memory)
- 1 SD channel (CVBS) + 1 USB channel (through inserted flash-memory)

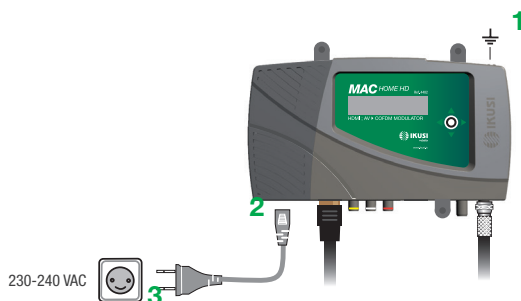
Electricity supply connection

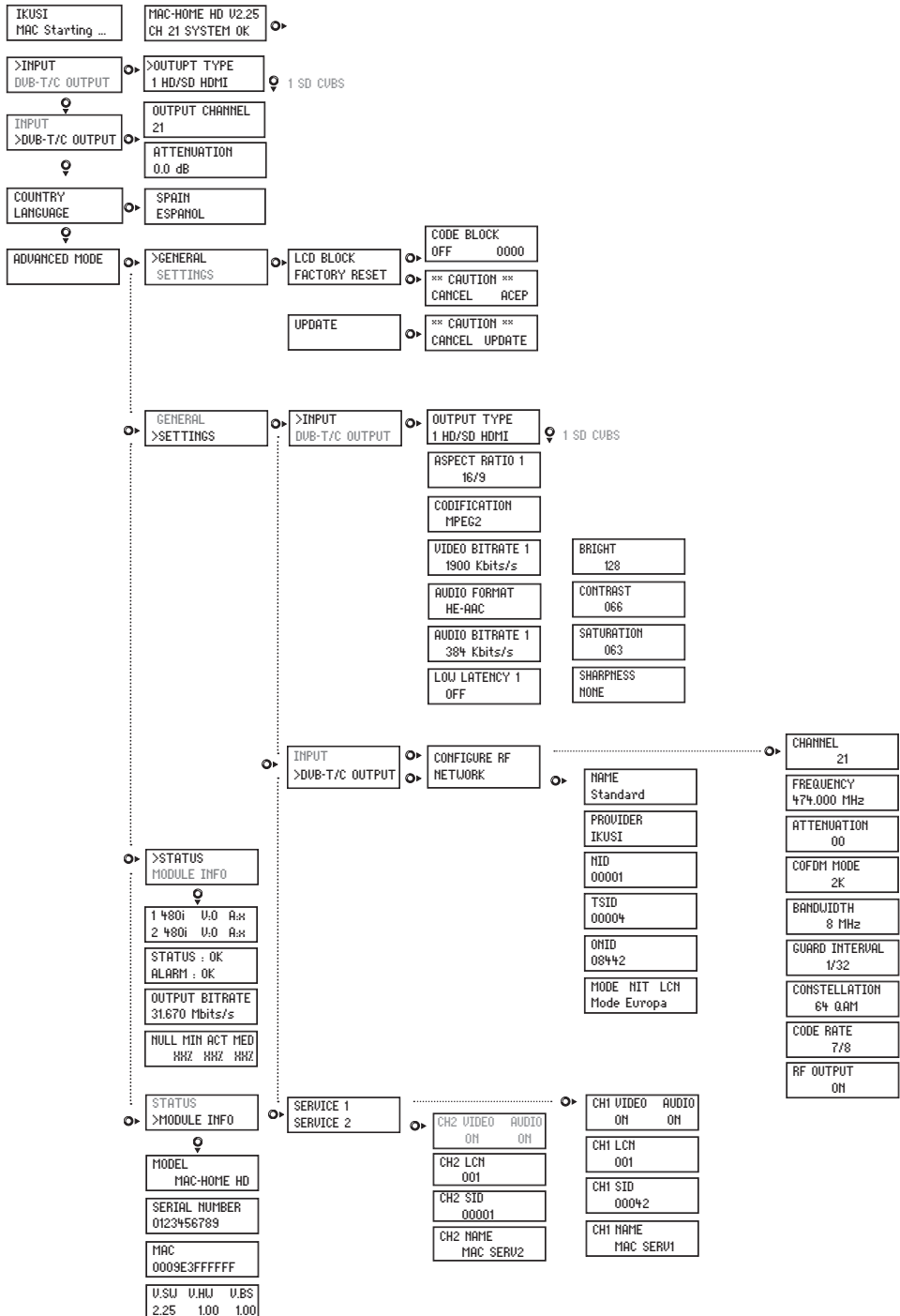


RISK OF DEATH OR INJURY

Connecting the power supply incorrectly can cause electrical shock. Follow these steps for the unit's electrical installation.

- 1 Connect the earth cable.
- 2 Connect the base of the network cable to the unit's network connector.
- 3 Connect the network cable input to the electricity supply input.





Initial configuration



NOTE. To enter a digit or character sequence on screen, use the vertical control button to change the value of the current digit or character, and the horizontal control button to move between digits or characters.

Position the cursor to the right of the current value and use the vertical control button to increase or decrease the current value. Keep the control button pressed up or down to increase or decrease the current value more quickly.

- 1) When the unit starts up, the start screen is displayed and prompts to enter **COUNTRY**. Move the button to the right and the cursor will flash next to the first country, then move the button down until you find the reference country. OK to save.

* The unit automatically adjusts to the technical particularities of this country (see parameters table).

- 2) Move to the left and place the arrow in **LANGUAGE**, then move the button to the right and locate the required language by moving the button vertically. OK to save.


- 3) Move to the left through to the start screen, which shows the model, firmware version, channel and status..

Status:

- SYSTEM OK = correct status.
- NO input = input signal not detected
- SYSTEM NOK = no video, CVBS mode without video at input (black video is generated)

Change of output channel


- 1) From the start screen, move the button to the right through to the **OUTPUT CHANNEL**; the cursor will blink next to the channel.
- 2) Use horizontal scrolling to move between the digits and vertical scrolling to change the value. OK to save.



```
MAC HOME HD 1.00
CH 21 SYSTEM OK
```

```
>COUNTRY
SPAIN
```

```
COUNTRY
>LANGUAGE
```



```
INPUT
>OUTPUT
```

```
OUTPUT CHANNEL
21
```



```
ATTENUATION
0.0 dB
```

Advanced mode


From the start menu, move a step to the right and down to locate the **ADVANCED MODE** screen.

General

From the GENERAL screen, move the button to the right to access the following menus:

Block LCD and Joystick

- 1) Locate and select the **LCD BLOCK** to lock access to the configuration of the unit from the LCD display and using the control button.
 - a) Enable (ON) or disable (OFF) the locking option.
 - b) Set a code to unlock the unit whenever this option is enabled.



```
MAC HOME HD 1.00
CH 21 SYSTEM OK
```

```
>ADVANCED MODE
```

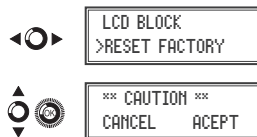
```
>LCD BLOCK
RESET FACTORY
```



```
CODE BLOCK
OFF 0000
```


Restoring factory settings

- 1) Locate and select the **RESET FACTORY** option to restore the default settings.
 - a) Select the **ACCEPT** option to remove all the changes made to the settings by the installer or operator of the unit. OK to save. After a few seconds the unit restarts with the default settings.



Firmware upgrade

- 1) Locate and select the **UPDATE** option.
 - a) Download the **FIRMWARE** from the website (www.ikusi.tv)
 - b) Decompress and enter it in the root directory of a flash-memory.
 - c) Insert the flash-memory in the USB port.



Settings

From the **SETTINGS** screen, move the button to the right to access the following menus:

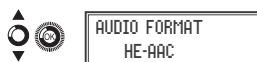
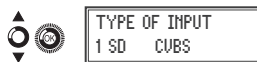
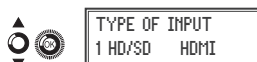
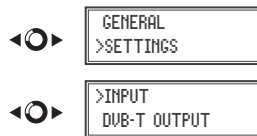
Input signal configuration.

- 1) Locate and select the **INPUT** option



NOTE. Press the control button to the right to access one of the possible input types. Press “down” to access the settings for the following types of input signal.

- a) Locate and select the **CH1** option to check the type of input signal, video detection (X) and audio detection (X). Only video values will be indicated in CVBS mode, there is no audio detection.
- b) Locate and select one of the two types of input, **HDMI digital audio and video channel (SD/HD)** or **CVBS analogue audio and video channel (SD)**.
- c) Locate and select the option **ASPECT RATIO (CVBS, HDMI)**. The image ratio values possible are 4:3 and 16:9.
- d) Locate and select the **CODIFICATION** option. Can be used to select the encoding standard of the audio and video digitalised signal from the options: **MPEG2, MPEG4** and **DEFAULT** (if the input signal is SD, the default encoding will be MPEG2; if the signal is HD, encoding will be H.264) (1080p resolution only supports MPEG4).
- e) Locate and select the **VIDEO BITRATE** option. The unit can be configured for an input data encoding speed from 4000 to 19000 Kbits/s.
- g) Locate and select the **AUDIO FORMAT** option. Can be used to select audio encoding from three types: **MPEG2 L1/L2, LC-AAC** or **HE-AAC**.

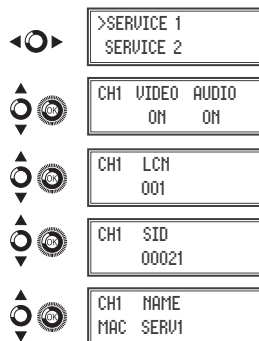


- f) Locate and select the option AUDIO BITRATE (CVBS, HDMI). The unit can be configured for an input data encoding speed of 96; 128; 160; 192; 224; 256; 320 and 384 Kbits/s.
- h) Locate and select the LOW LATENCY option. This reduces encoding time for those applications where reaction time is important (e.g. cameras), offset by a reduction in encoding efficiency and the quality of images with a lot of movement.
- i) Locate and select the option BRIGHT to configure the brightness of the video signal (1 to 255).
- j) Locate and select the option CONTRAST to configure the contrast of the video signal (1 to 255).
- k) Locate and select the option SATURATION to configure the configuration of the video signal (1 to 255).
- l) Locate and select the option SHARPNESS to configure the sharpness of video signal (High, Medium soft or None).



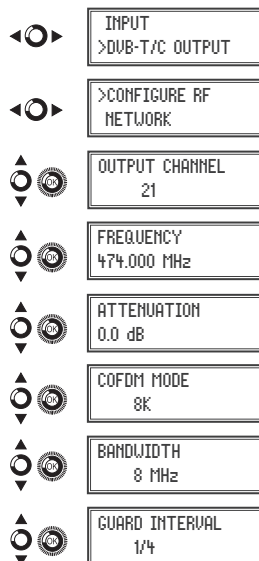
Configuration of carrier services

- 1) Locate and select the **SERVICE 1** and 2 option.
 - a) Locate and select the CH1 VIDEO AUDIO option. Enable (ON) or disable (OFF) the audio and/or video signals of the input (audio and video cannot be locked in the 2nd service).
 - b) Locate and select CH LCN. Configure the signal LCN value.
 - c) Locate and select CH SID (use the output channel value). Configure the Service Identifier.
 - d) Locate and select CH NAME. Assign a name to the signal in CH (see characters table at the end of the manual).

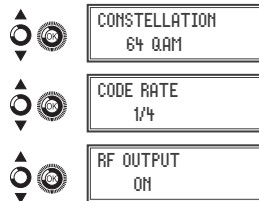


DVB-T/C Output signal configuration

- 1) Locate and select **CONFIGURE RF**.
 - a) Locate and select the OUTPUT CHANNEL. This option automatically modifies the frequency, adapting it to the centre of the channel frequency.
 - b) Locate and select the FREQUENCY option. This option modifies the channel value, adapting it to the frequency. Configure the output frequency value between 474 MHz and 862 MHz in 125 kHz steps.
 - c) Locate and select the ATTENUATION option. Select output attenuation between 0 and 25 dB.
 - d) Locate and select the COFDM MODE option. Select COFDM/QAM mode between 2K and 8K subcarriers.
 - e) Locate and select the BANDWIDTH option. Select the bandwidth between 6, 7 and 8 Mhz.
 - f) Locate and select the GUARD INTERVAL option. Select the save interval between symbols 1/32, 1/16, 1/8 and 1/4.

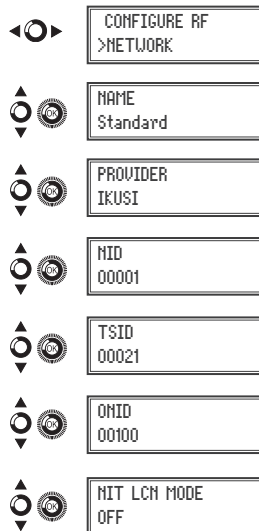


- g) Locate and select the **CONSTELLATION** option. Select modulation constellation between 16QAM and 64QAM.
- h) Locate and select the **CODE RATE** option. Select encoding rate between 1/2, 2/3, 3/4, 5/6 and 7/8.
- i) Locate and select the **RF OUTPUT** option. Allows the RF signal to be enabled/disabled..



Network configuration

- 1) Locate and select the **NETWORK** option.
- a) Locate and select the **NAME** option. Configure the network name.
- b) Locate and select the **PROVIDER** option. Configure the name of the network service provider.
- c) Locate and select the **NID** option. Configure the network identifier value.
- d) Locate and select the **TSID** option. Configure the TS or transport current identifier value.
- e) Locate and select the **ONID** option. Configure the original network identifier.
- f) Locate and select the **NIT LCN MODE** option. Can be used to select NIT LCN mode:
- **OFF**: LCN descriptor not inserted in the NIT.
 - **EUROPE MODE**: Descriptor for Europe is inserted.
 - **INDEPENDENT TELEVISION COMMISSION**: Descriptor for UK is inserted.
 - **NORDIG MODE V1**: Descriptor is inserted in accordance with the Nordig V1 specification.
 - **NORDIG MODE V2**: Descriptor is inserted in accordance with the Nordig V2 specification.
 - **GENERIC MODE**: Generic LCN descriptor.



DEFAULT PARAMETERS TABLE IN ACCORDANCE WITH THE COUNTRY SELECTED

Country	AUSTRALIA	FRANCE	GREAT BRITAIN	ITALY	PORTUGAL	SPAIN
Ch LCN	100	45	400	0	10	1
Ch SID	38	21	21	21	21	21
Channel	38	21	21	21	21	21
COFDM Mode	8k	8k	2k	8k	8k	8k
Bandwidth	7 MHz	8 MHz	8 MHz	8 MHz	8 MHz	8 MHz
NID	1	1	1	1	1	1
TSID	38	21	21	21	21	21
ONID	100	8442	9018	1	8904	100
NIT MODE	ON	ON	ON	ON	ON	ON

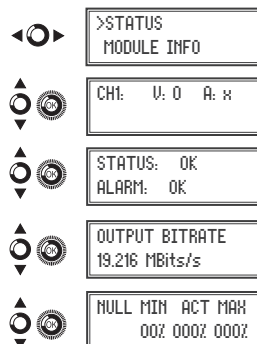
Note: When configuring the country, the equipment is always configured with the first channel allowed, with the frequency of the centre of this channel.

Status of the unit



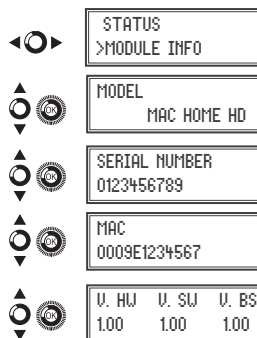
NOTE. The unit shows its status in detail, along with the existence of active alarms in the module.

- 1) Locate and select the **STATUS** option.
 - a) Locate and show STATUS. The unit reports its status and alarms: OK / Error.
 - b) Locate and indicate OUTPUT BITRATE. The unit reports the output data speed as Mbits/s.
 - c) Locate and indicate MIN ACT MAX NULL. The unit reports the volume of null data packages in the output, minimum, current and maximum as a percentage of the total.



Information of the unit

- 1) Locate and select the **MODULE INFO** option.
 - a) Locate and indicate the MODEL option. The unit reports the model and version of the unit.
 - b) Locate and indicate the SERIAL NUMBER option. The unit reports its serial number.
 - c) Locate MAC. Shows the number which identifies the unit for the network connection.
 - d) Locate and indicate the option V.SW V.HW V.BS. The unit reports the software version (V.SW), hardware version (V.HW) and system start-up version (V.BS).



Equipment unlocking

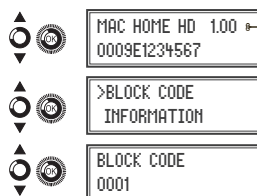
The unit can be locked, thus preventing anybody from using the display and control button to modify the settings.

To unlock the unit:

- 1) Locate and select **LOCK CODE**.
- 2) Enter the unlock code assigned by the unit operator.
- 3) The unit reports the code validity.



NOTE. Once the code has been entered, restart the unit in order to lock. This will remain until disabled by the operator.

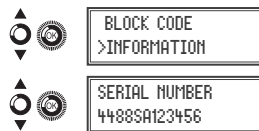


To unlock the unit without lock code:

- 1) Locate and select **INFORMATION**.
- 2) Contact the supplier of the unit and report the serial number.

The unit supplier provides an unlock code for the indicated SERIAL NUMBER.

- 3) The unit reports the code validity.



USB Player

The unit can be used to play back videos through the USB port. Using the software, the user can draw up a personalised list of images and videos in order to create the end file ("video-final.ts"), which can then be played back by the modulator through a pendrive (adding a new channel to the existing one in the input).

Software to create videos for playback through the MAC HOME HD.

Users should install the "converter-mac-installer.exe" on their PC, after downloading it from the website www.ikusi.tv.



Video playback

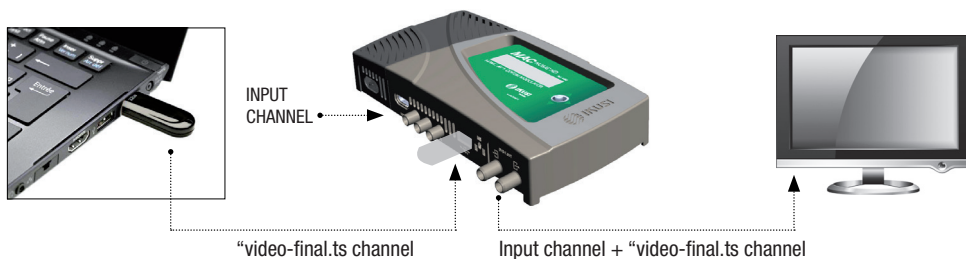
Once the pendrive is inserted in the USB connector of the MAC-HOME HD modulator, playback will start automatically after a few seconds without having to access the menu; if the file is not correct, the system will continue as a modulator (the application manual can be found at www.ikusi.tv).



NOTE. The modulator sends the "USB" service signal for tuning by TVs, even when the pendrive is not connected, thus avoiding having to retune the TVs when connecting the USB pendrive.



NOTE
In case of connecting only the USB flash drive, the input mode must be "CVBS".



Technical specifications

MAC HOME HD model (4482)

Input	CVBS, HDMI	
Video standard	PAL/NTSC/SECAM/B&W	
Audio input	1 (mono and stereo)	
Video	MPEG2 MP@ML, H.264/MPEG4 AVC MP L4.1	
Video quality	SD, HD (480i, 576i, 480P, 576P, 720p50, 720p, 1080i50, 1080i60, 1080p50, 1080p60)	
Maximum resolution	1080p60	
Audio	MPEG2 L1/L2, LC-AAC, HE-AAC	
Analogue audio	Yes	
Digital audio	Yes (HDMI)	
Audio output level (analogue)	0.5 - 2.5	
DVB-T / DVB-C Output	DVB-T accordance with ETSI EN 300 744 DVB-C accordance with ETSI EN 300 429	
Bandwidth	MHz	6/7/8
Number of carriers		2K (UK) / 8K (FR)
MER	dB	≥ 40
Frequency range	MHz	45 - 858
Output level	dBμV	≥ 80
Output attenuation	dB	1
Lever adjustment	dB	-25
Frequency stability	ppm	≤±30
Noise figure (ΔB = 8 MHz)		≤-60
Loophrough frequency		45 MHz to 2.5 GHz
DVB-C symbol rate	Kbps	3000 - 8000
Constellation		DVB-T: 16QAM , 64QAM DVB-C: 16QAM , 32QAM , 64QAM , 128QAM , 256QAM
NIT adaptation		Yes (generated automatically)
SDT adaptation		Yes (entering configurable name)
TS Monitoring		Yes
PSI/SI adaptation		Generation and insertion of tables PAT, PMT, SDT, NIT
Network configuration		NID, ONID, TSID, Network name, Provide
SID configuration		Yes

LCN processing		Yes
LCN modes		OFF, Europe, Independent Television Comision (UK), Nordig mode V1, Nordig mode V2, Generic Mode
Mains voltage	VAC	230 - 240
Firmware upgrade		Yes, web or USB interface
Flujo de salida IP		CBR / VBR
Direccionamiento IP		Unicast / Multicast
Protocolos		UDP / RTP
Formato encapsulado IP		SPTS
Diffserv QoS, TTL, VLAN		Sí
Anuncio SAP de servicios		Sí
Teclado		Joystick 5 posiciones
Web		Ethernet
Consumption		14 W
Operating temperature		0 to 45 °C
Firmware updates		Yes, via USB
Video playback through USB port		Yes
LCD display		16x2 characters
Programming button		Joystick 5 positions

Maintenance

Unit care



HANDLING THE INSIDE OF THE UNIT IS FORBIDDEN

Do not dismantle or try to repair the unit, its accessories or its components. This will render the warranty null and void.

- Do not use the power cable if it is damaged.
- To disconnect the power cable, pull carefully on the plug and not the cable.
- To clean the panel and unit connections:
 - Unplug the unit.
 - Clean with a slightly damp, soft cloth.
 - Allow to dry completely before use.
- Do not spill liquid onto the unit.
- Keep ventilation slots free of dust and any foreign bodies.

Troubleshooting

The most frequent problems arising during unit installation are indicated below. If you encounter any other type of problem, please contact the unit sales team.

Problem	Possible cause	What to do
Forgotten unlock code	-----	Contact your supplier
Nothing appears on LCD display	The power cable is not connected properly	Check the power cable

Warranty

Notwithstanding any complaints made to the direct vendor of the product, IKUSI offers unit users a two-year warranty as of the invoice date, which shall become valid on presenting the receipt of purchase.

During the warranty period, IKUSI is responsible for any faults arising due to material or manufacturing defects and shall repair the receiver or replace it for another corresponding to the state of technology at that time. The warranty does not cover any faults or defects due to misuse or non-fulfilment of the information given in this installation manual.

All complaints other than those indicated are not included in the warranty. More specifically, the warranty does not cover services provided by the authorised vendor (e.g. installation, configuration or programme updates) or the repair of any damages or injuries caused to the client or others as a result of the installation or of receiver operations.

Unit recycling

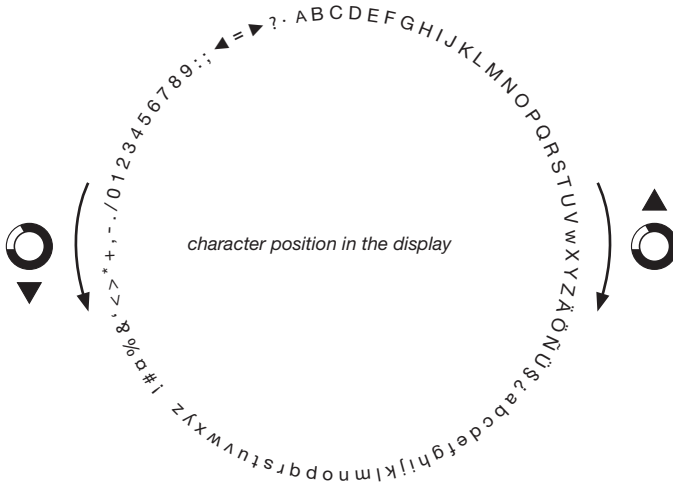


RECYCLING OF ELECTRICAL AND ELECTRONIC EQUIPMENT

(Applicable in the European Union and in European countries with selective waste collection systems.)

This symbol on your unit or its packaging indicates that this product cannot be treated as general domestic waste and must be handed in at the corresponding point of collection for electric and electronic equipment. By ensuring this product is disposed of correctly you will help prevent negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. Recycling of materials helps preserve natural resources. For more detailed information on the recycling of this product, please contact your local council, your nearest collection point or the distributor from whom you purchased the product.

Characters table



CE Certificate

EC-Declaration of Conformity

CE marking

We, Manufacturer
IKUSI, Angel Iglesias, S.A.
 Paseo Miramón, 170
 E-20009 San Sebastián, Spain

declare that the product
HDMI, AV ▶ COFDM Autonomous Modulator
MAC-HOME HD
 is in conformity with

Council Directive 2004/108/CE
(EMC Directive)
 Standards to which conformity is declared :


and

Council Directive 2006/95/CE
(Low Voltage Directive)
 Standards to which conformity is declared :


EN 50083-2 :2007
 Cabled distribution systems for television and sound signals.
 Part 2: Electromagnetic compatibility for equipment.

EN 60728-11 :2005
 Cabled Distribution Systems for Television and Sound
 Signals. Part 11: Safety Requirements.

EN 60065 :2005
 Safety requirements for mains operated electronics
 and related apparatus for household and similar ge-
 neral use.



San Sebastián, may 2014



Luis Rodríguez Navarrete
 — R&D Director —



Pº Miramón, 170
20014 San Sebastián - SPAIN
Tel.: +34 943 44 88 00 - Fax: +34 943 44 88 20
television@ikusi.com - www.ikusi.tv

MAC HOME HD (EN)