MAC-HD

REF. 4493

Standalone High-Definition Modulator
DVB-T / DVB-C or IP output
Multiple inputs: 2xCVBS . HDMI . HD-SDI

Contents

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
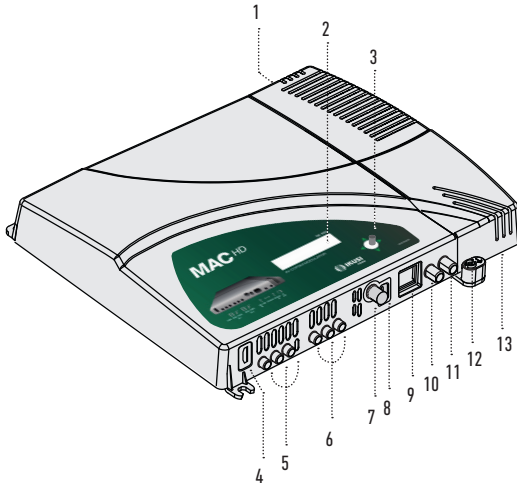
KEY

1 Mains connector

2 Display (LCD)

3 Control button 5-position joystick

4 HDMI input (for HD or SD channels)

5 AV 1 input
1 yellow RCA CVBS video, 1 white RCA and 1 red RCA for analogue audio (L, R)

6 AV 2 Input
1 yellow RCA CVBS video, 1 white RCA and 1 red RCA for analogue audio (L, R)

7 HD-SDI input (BNC) (for HD or SD channels)

8 USB connector

9 IP output / Ethernet (RJ-45)

10 TV Loopthrough input (F)

11 TV COFDM output (F)

12 Earthing

13 Removable power source

Main features

The MAC HD model is a standalone modulator that can process different Video and Audio signals, to form a high-definition COFDM/QAM channel.

The unit has various inputs:

- Two audio and analogue video channels, with 6 RCA connectors.
- One digital video and audio channel in HDMI format, with an HDMI connector.
- One digital video and audio channel in HD-SDI format, with a BNC connector.

This product is ideal for distributing video signals in residential installations, hotels, special buildings or video monitoring systems with digital COFDM/QAM digital TV modulation. The MAC HD unit also has a USB connector and includes new functions thanks to its evolving and upgradable software, such as: video playback from a USB memory stick, digital signage and other potential future developments.

Programming:

- User interface from web browser via Ethernet connection. Download the IKUSI HEADEND DISCOVERY application available on the website (www.ikusi.tv/en/headends/modulators/mac-series/mac-hd).

- IP output configuration by interface web only (guide in www.ikusi.tv).

- User interface with LCD display and control button for basic configuration.

- All settings are automatically memorised.

- Re-programmable as many times as required.

- Firmware updated via Ethernet connection with web browser.

- Easy to configure.

Signal processing:

- CVBS video input and mono/stereo audio.

- HDMI input (does not process HDCP-encrypted signals).

- HD-SDI Input.

- Standard SD and HD quality signal.

- Supported colour encoding systems: PAL/SECAM/NTSC/B&W.

- RF DVB-T/C output, adjustable throughout the whole CATV band (47 MHz-862 MHz).

- IP output configuration via ethernet (software vers. >2.0) only.

- Looptrough for combination of external RF TV signals.

- User interface with LCD and joystick connector.

- User interface with internet.

- USB interface.

- RTC to allow insertion of the TDT, TOT and EITs. To keep the date and time after shutdown, will use a supercapacitor that allows at least keep one days without food.

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. Too 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 LCD screen and the control button should suffice for the unit's basic settings. Follow the steps set out below to install the unit and configure the various parameters accessible from the user interface on the LCD display.

Installation

⚠ ATTENTION

RISK OF DAMAGE TO THE UNIT

Mechanical handling of the unit whilst it is switched on can cause damage to it. Do not plug the unit into the mains before or during installation.

1) Secure the unit to the wall using 3 lag bolts/plugs (no supplied).

2) Connect the AV1 and AV2 inputs to the respective RCA connectors.

3) You may also connect the coaxial cable to the RF loopthrough input (connector F) or use any of the other available inputs (HDMI, HD-SDI).

4) Connect the coaxial cable from the output to the unit (connector F).
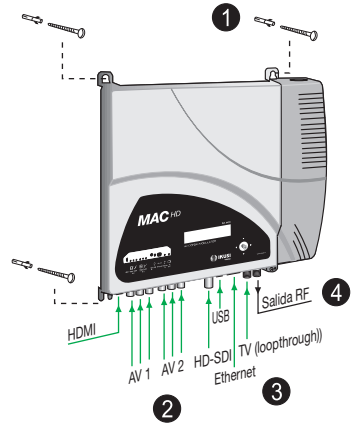
NOTE. We recommend installing the unit in a vertical position.

Power supply connection

⚡ DANGER

DANGER OF DEATH OR INJURY

Incorrect connection of the power supply can cause an electric shock. Follow the steps below to install the unit and connect it to the power supply.

1) Connect the earthing cable.

2) Connect the power plug to the unit's mains connector.

3) Connect the power plug to the mains power outlet.

Inputs configuration

USB RJ-45

HDMI 2x CVBS / Audio HD-SDI TV
IP output DVB-T/C output
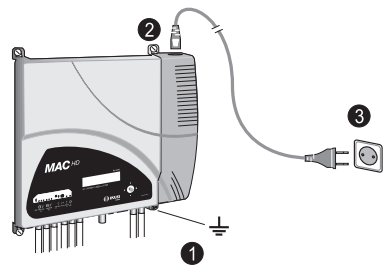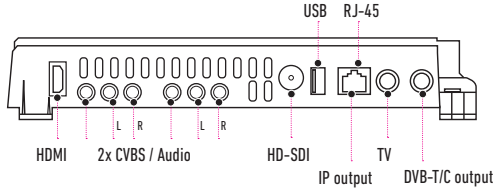
Possible combinations:

• SD CVBS/Audio + SD CVBS/Audio
• SD HDMI + SD CVBS/Audio   2 simultaneous SD channels
• SD SDI + SD CVBS/Audio   1 channel SD + USB
• SD + USB

• HD HDMI   1 channel HD
• HD SDI   1 channel HD + USB
• HD + USB

Cascade installation

It is possible to daisy-chain various MAC-HD units together, to increase the service capacity. To do this, connect the RF output of the first unit to the TV input (loopthrough) of the second unit (see installation example).

For installations with 2 or more units, it is necessary identify each unit with a different TSID value, and to identify each service with different SID values as well.

Configuring the TSID and SID values requires advanced configuration (see the Advanced unit configuration section).

NOTE. The advanced configuration process of the unit is explained in the "Web interface user manual", available at http://www.ikusi.tv

1 CVBS/Audio   SD-SDI   TV   HDMI   USB   TV + AV + SD-SDI + HDMI + USB
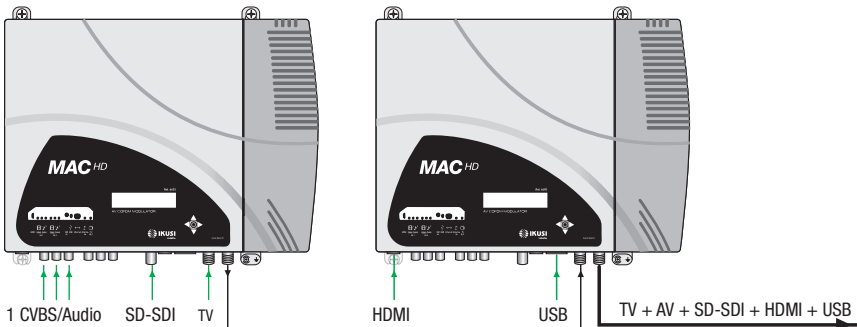
Display menus Quick-guide

```
┌─────────────────┐      ┌─────────────────┐      ┌─────────────────┐      ┌─────────────────┐
│ MAC-HD  V1.00   │      │ IKUSI           │      │ >COUNTRY        │      │ COUNTRY         │
│ IP SYSTEM OK    │      │ MAC Stating ... │      │ Insert country  │      │ GREAT BRITAIN   │
└─────────────────┘      └─────────────────┘      └─────────────────┘      └─────────────────┘

┌─────────────────┐                              ┌─────────────────┐      ┌─────────────────┐
│ MAC-HD  V1.00   │                              │ COUNTRY         │      │ LANGUAGE        │
│ CH 21 SYSTEM OK │                              │ >LANGUE         │      │ ANGLAIS         │
└─────────────────┘                              └─────────────────┘      └─────────────────┘

┌─────────────────┐      ┌─────────────────┐      ┌─────────────────┐      ┌─────────────────┐
│ INPUT           │      │ MAC-HD  V1.00   │      │ INPUT           │      │ CHANNEL         │
│ OUTPUT          │      │ CH 21 SYSTEM OK │      │ >OUTPUT         │      │ 21              │
└─────────────────┘      └─────────────────┘      └─────────────────┘      └─────────────────┘

┌─────────────────┐                                                        ┌─────────────────┐
│ COUNTRY         │                                                        │ ATTENUATION     │
│ >LANGUE         │                                                        │ 00              │
└─────────────────┘                                                        └─────────────────┘
```

```
┌─────────────────┐      ┌─────────────────┐      ┌─────────────────┐      ┌─────────────────┐
│ ADVANCED MODE   │      │ >GENERAL        │      │ IP              │      │ IP ADDRESS      │
│                 │      │ SETTINGS        │      │ DATE-TIME       │      │ 192.168.1.2     │
└─────────────────┘      └─────────────────┘      └─────────────────┘      └─────────────────┘

                                                  ┌─────────────────┐      ┌─────────────────┐
                                                  │ TIME    DATA    │      │ NETWORK MASK    │
                                                  │ 10:10   1-1-2013│      │ 255.255.255.0   │
                                                  └─────────────────┘      └─────────────────┘

                                                  ┌─────────────────┐      ┌─────────────────┐
                                                  │ TIMEZONE        │      │ PUERTA DE ENLACE│
                                                  │ Europa/Madrid   │      │ 192.168.1.1     │
                                                  └─────────────────┘      └─────────────────┘
```

```
                         ┌─────────────────┐      ┌─────────────────┐
                         │ BLOCK LCD       │      │ BLOCK   CODE    │
                         │ FACTORY RESET   │      │ OFF    0000     │
                         └─────────────────┘      └─────────────────┘

                                                  ┌─────────────────┐
                                                  │ ** CAUTION **   │
                                                  │ CANCEL   ACEP   │
                                                  └─────────────────┘

                         ┌─────────────────┐      ┌─────────────────┐
                         │ UPDATE          │      │ ** CAUTION **   │
                         │                 │      │ CANCEL  ACTUALI │
                         └─────────────────┘      └─────────────────┘
```

ASPECT RATIO 1 16/9	ASPECT RATIO 2 16/9
CODIFICATION 1 MPEG2	CODIFICATION 2 MPEG2
BITRATE VIDEO 1 8000 Kbits/s	BITRATE VIDEO 2 8000 Kbits/s
AUDIO FORMAT 1 HE-AAC	AUDIO FORMAT 2 HE-AAC
BITRATE AUDIO 1 384 Kbits/s	BITRATE AUDIO 2 384 Kbits/s
LOW LATENCY 1 OFF	LOW LATENCY 2 OFF

```
┌─────────────────┐      ┌─────────────────┐      ┌─────────────────┐
│ GENERAL         │      │ INPUT           │      │ INPUT TYPE      │
│ >SETTINGS       │      │ OUTPUT DVB-T    │      │ CVBS/HDMI/SDI   │
└─────────────────┘      └─────────────────┘      └─────────────────┘
                                                  ┌─────────────────┐
                         ┌─────────────────┐      │ CONFIGURATION RF│
                         │ INPUT           │      │ NETWORK         │
                         │ OUTPUT IP       │      └─────────────────┘
                         └─────────────────┘
```

```
                              DVB-T/C                               ┌─────────────────┐
                                                                    │ COFDM/QAM OUTPUT│
                                                                    │ ON/OFF          │
                                                                    └─────────────────┘
                         ┌─────────────────┐      ┌─────────────────┐      ┌─────────────────┐
                         │ CONFIGURE RF    │      │ NAME            │      │ Channel         │
                         │ NETWORK         │      │ XXXX            │      │ 21              │
                         └─────────────────┘      └─────────────────┘      └─────────────────┘

                                                  ┌─────────────────┐      ┌─────────────────┐
                                                  │ SUPPLIER        │      │ FREQUENCY       │
                                                  │ IKUSI           │      │ 474.000 MHz     │
                                                  └─────────────────┘      └─────────────────┘
```

```
┌─────────────────┐      ┌─────────────────┐                              ┌─────────────────┐
│ STATUS          │      │ CH1: V:X A:X    │          │ NID              │ ATTENUATION     │
│ INFO MODULE     │      │ CH1: V:X A:X    │          │ 00001            │ 00              │
└─────────────────┘      └─────────────────┘

                         ┌─────────────────┐          │ TSID             │ COFDM MODE      │
                         │ STATUS : OK     │          │ 00004            │ 2K              │
                         │ ALARM : OK      │
                         └─────────────────┘
                                                      │ ONID             │ BANDWIDTH       │
                         ┌─────────────────┐          │ 08442            │ 8 MHz           │
┌─────────────────┐      │ OUTPUT BIT      │
│ MODELE          │      │ 31.670 Mb/s     │          │ MODE NIT LCN     │ INTER GUARDE    │
│ MAC-HD          │      └─────────────────┘          │ Europe model     │ 1/32            │
└─────────────────┘
                         ┌─────────────────┐          │ INSER TDT-TOT    │ CONSTELLATION   │
┌─────────────────┐      │ MIN ACT MAX NULL│          │ ON/OFF           │ 64 QAM          │
│ SERIAL NUMBER   │      │ XX% XX% XX%     │
│ 0123456789      │      └─────────────────┘                             │ CODE RATE       │
└─────────────────┘                                                      │ 7/8             │
                         ┌─────────────────┐
┌─────────────────┐      │ NUM STREAMS     │                             │ RF OUPUT        │
│ MAC             │      │ 02              │                             │ ON              │
│ 0009E3FFFFFF    │      └─────────────────┘
└─────────────────┘

┌─────────────────┐
│ HW  SW  BS      │
│ 1.00 1.00 1.00  │
└─────────────────┘
```

```
┌─────────────────┐                                                      ┌─────────────────┐
│ MAC-HD  1.00    │                                                      │ VID 1    AUD 1  │
│                 │                                                      │ ON      ON      │
└─────────────────┘                                                      └─────────────────┘
                                           ┌─────────────────┐           ┌─────────────────┐
┌─────────────────┐      ┌─────────────────┐│ VID 2 AUD 2     │          │ LCN 1           │
│ BLOCK CODE      │      │ BLOCK CODE      ││ ON   ON         │          │ 001             │
│ INFORMATION     │      │ 0001            │└─────────────────┘          └─────────────────┘
└─────────────────┘      └─────────────────┘
                                           ┌─────────────────┐           ┌─────────────────┐
                         ┌─────────────────┐│ LCN 2          │           │ SID 1           │
                         │ SERIAL NUMBER   ││ 001            │           │ 00001           │
                         │ 4488SA123456    │└─────────────────┘          └─────────────────┘
                         └─────────────────┘
                                           ┌─────────────────┐           ┌─────────────────┐
                         ┌─────────────────┐│ SID 2          │           │ NAME 1          │
                         │ SERVICE 1       ││ 00001          │           │ XXX             │
                         │ SERVICE 2       │└─────────────────┘          └─────────────────┘
                         └─────────────────┘
                                           ┌─────────────────┐
                                           │ NAME 2          │
                                           │ XXX             │
                                           └─────────────────┘
```

11

Initial set-up

NOTE. To enter a sequence of digits or characters on the screen, press "up" on the control button to change the value of the current digit or character, and move the control button horizontally to confirm/move between digit or character positions.

Place the cursor to the right of the current value and move the control button vertically, to increase or decrease the current value. Keep the control button pressed upwards or downwards to increase or decrease the current value faster.

1) Once the unit has been switched on, the start-screen will appear, asking you to enter the COUNTRY. Move the button to the right and the cursor will start flashing next to the first country. Press "down" on the button until the correct country is highlighted. Press "OK" to save.

   * The unit will automatically adjust all other technical settings to match those of the country in question (see parameters table).

```
>COUNTRY
 GREAT BRITAIN
```

```
 COUNTRY
>LANGUAGE
```

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

2) Scroll to the left, position the cursor on LANGUAGE, move the button to the right and locate the correct language by scrolling upwards or downwards. Press "OK" to save.

3) Scroll to the left until you reach the start-screen, which displays the model, firmware version, channel and status.

   Status:
   - SYSTEM OK = correct status.
   - NO INPUT = no input signal detected
   - SYSTEM NOK = incorrect status

```
 INPUT
>OUTPUT
```

```
OUTPUT CHANNEL
    21
```

```
ATTENUATION
 0.0 dB
```

Output channel change

1) From the start-screen, move the button to the right until you locate the **OUTPUT CHANNEL**; the cursor will start flashing next to the channel.

2) Scroll horizontally to change from digit position to position and vertically to change the value. Press "OK" to save.

Advanced mode

From the start-screen, move once to the right and then down until you reach the **ADVANCED MODE** screen.

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

```
ADVANCED MODE
```

General

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

```
>GENERAL
 SETTINGS
```

IP Settings

1) Locate and select the **IP** option.

   a) Locate and select IP ADDRESS to establish the unit's IP number. To enter a sequence of digits in the screen, move the control button vertically to change the current digit's value and horizontally to change between digit positions.

   b) Locate and select SUBNET MASK. Enter the corresponding 12-digit sequence.

   c) Locate and select GATEWAY. Enter the 12-digit sequence corresponding to the IP address of the LAN gateway.

```
>IP
 DATA-TIME
```

```
IP ADDRESS
192.168.001.006
```

```
NETWO MASKRK
255.255.255.000
```

```
GATEWAY
192.168.001.001
```

Date and Time settings

1) Locate and select **DATE-TIME.**

    a) Locate and select DATE-TIME to set the time and date of the unit in the format hh:mm yyyy-mm-dd.

    b) Locate and select TIMEZONE to select the time-zone of the country in question.

Block LCD and joystick/control button

1) Locate and select the BLOCK LCD option to block access to the unit's settings from the LCD display through the control button.

    a) Activate (ON) or deactivate (OFF) the blocking option.

    b) Set a code for unblocking the unit if this option has been activated. The code may be used to unblock the unit by means of the web browser interface.

Restoring factory settings

1) Locate and select **FACTORY SETTINGS** to restore the unit's factory settings.

    a) Select the ACCEPT option to delete all the modifications made in the settings by the unit's installer or operator. Press "OK" to save. After a few seconds, the unit will restart, with the original default settings.

Firmware Updates

1) Locate and select the **UPDATE** option

    a) Download the FIRMWARE from the website (www.ikusi.tv).

    b) Unzip the downloaded content and place it in the root directory of a pen drive.

    c) Connect the pen drive to the unit's USB input.

Settings

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

Configuration of input signals.

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 and detect the video (X) and audio (X). In CVBS mode, only video values will be displayed, as there is no audio detection.

    b) Locate and select one of the five possible input combinations. The MAC-HD is able to process 1 HD channel or two SD channels simultaneously. In SD mode with an HADMI or HD-SDI input, the permitted standards are SD 480i and 576i.

Display
>GENERAL   SETTINGS
IP >DATA-TIME
TIME DATA 00:50 2013-01-01
TIMEZONE Europe/London
>LCD BLOCK   RESET FACTORY
CODE BLOCK   OFF   0000
LCD BLOCK >RESET FACTORY
** CAUTION **   CANCEL   ACEPT
>UPDATE
** CAUTION **   CANCEL   UPDATE
GENERAL >SETTINGS
>INPUT   DVB-T OUTPUT
TYPE OF INPUT 1 HD/SD   SDI
TYPE OF INPUT 1 HD/SD   HDMI
TYPE OF INPUT 2 SD   SDI+CVBS
TYPE OF INPUT 2 SD   HDMI+CVBS
TYPE OF INPUT 2 SD   CVBS+CVBS
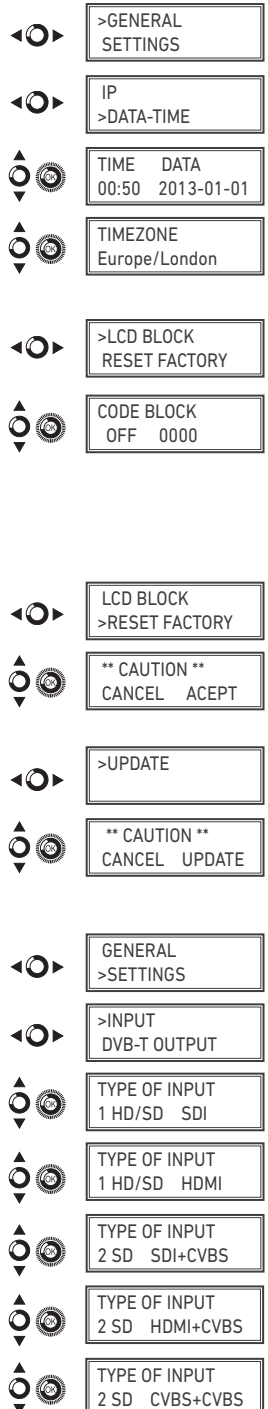
c) Locate and select the option ASPECT RATIO 1 (CVBS1, HDMI, SDI) or ASPECT RATIO 2 (CVBS2). The possible aspect ratio values are 4:3 and 16:9.

d) Locate and select the option CODIFICATION. Allows you to select the encoding standard for the digital audio and video signal, from among the following options: MPEG2, MPEG4 and DEFAULT (if the input signal is SD, the default encoding standard will be MPEG2; if the input signal is HD, the encoding standard will be H.264 (1080p resolution only permits MPEG4).

e) Locate and select the option AUDIO BITRATE 1 (CVBS1, HDMI, SDI) or AUDIO BITRATE 2 (CVBS2). The unit can be configured for a data coding speed at input or bit rate of 96; 128; 160; 192; 224; 256; 320 and 384 Kbits/s.

f) Locate and select the option AUDIO FORMAT. Allows you to select the three types of audio coding: MPEG2 L1/L2, LC-AAC ó HE-AAC.

g) Locate and select the option BITRATE VIDEO 1. The unit can be configured for a data coding speed at input or bit rate of 4000 to 19000 Kbits/s.

h) Locate and select the option LOW LATENCY. It reduces the codification time for those applications where the reaction time is important (i.e. cameras). The selection of the mode low latency, has a significant decrease in terms of codification efficiency and images (with much movement) quality.

| ASPECT RATIO 1 |
| 16/9 |

| CODIFICATION |
| MPEG2 |

| BITRATE AUDIO 1 |
| 384 Kbits/s |

| AUDIO FORMAT |
| HE-AAC |

| BITRATE VIDEO 1 |
| 19000 Kbits/s |

| LOW LANTENCY 1 |
| OFF |
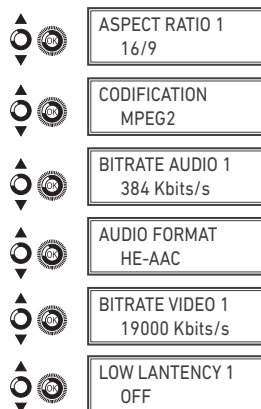
Configuration of carrier services

1) Locate and select the **SERVICES** option.

a) Locate and select the option CH VIDEO AUDIO. Activate (ON) or deactivate (OFF) the input video and/or audio signal.

b) Locate and select CH LCN. Set the LCN value of the signal.

c) Locate and select CH SID (use the output channel value). Set the Service Identifier.

d) Locate and select CH NAME. Assign a name to the signal on CH1.

| >SERVICE 1 |
| SERVICE 2 |

| CH1 VIDEO AUDIO |
| ON   ON |

| CH1   LCN |
| 001 |

| CH1   SID |
| 00021 |

| CH1   NAME |
| MAC SERV1 |
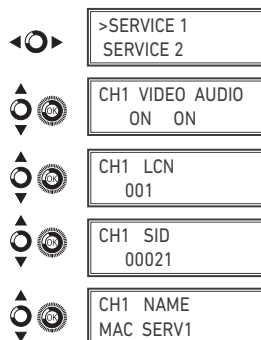
Configuration of output signals

1) Locate and select **CONFIGURE RF**.

a) Locate and select the OUTPUT CHANNEL. This option automatically modifies the frequency, adapting it to the channels' centre.

b) Locate and select the FREQUENCY option. This option modified the channel's value, adapting it to the frequency. Set the output frequency value between 474 MHz and 862 MHz in steps of 125 kHz.

c) Locate and select the option ATTENUATION. Set the output attenuation between 0 and 25.5 dB.

d) Locate and select the OFDM MODE. Select the OFDM mode between 2K and 8K subcarriers.

e) Locate and select the BANDWIDTH option. Set the bandwidth between 6, 7 and 8 Mhz.

| INPUT |
| >DVB-T/C OUTPUT |

| >CONFIGURE RF |
| NETWORK |

| CHANNEL OUTPUT |
| 21 |

| FREQUENCY |
| 474.000 MHz |
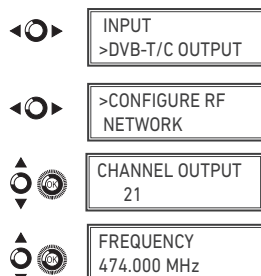
f) Locate and select the GUARD INTERVAL option. Select the guard interval between 1/32, 1/16, 1/8 and 1/4 of symbol.

| ATTENUATION |
| 0.0 dB |

g) Locate and select the CONSTELLATION option. Select the modulation constellation between 16QAM and 64QAM.

| OFDM MODE |
| 8K |

h) Locate and select the CODE RATE option. Select the code rate between 1/2, 2/3, 3/4, 5/6 and 7/8.

| BANDWIDTH |
| 8 MHz |

i) Locate and select the RF OUTPUT option. This allows you activate / deactivate the RF signal.

| GUARD INTERVAL |
| 1/4 |

Network configuration

| CONSTELLATION |
| 64 QAM |

1) Locate and select the **NETWORK** option.

| CODERATE |
| 1/4 |

a) Locate and select the NAME option. Configure the network name.

b) Locate and select the PROVIDER option. Set the name of the network service provider.

| RF OUTPUT |
| ON |

c) Locate and select the NID option. Set the network identifier value.

d) Locate and select the TSID option. Set the transport stream identifier value or TS.

e) Locate and select the ONID option. Set the original network identifier.

| OUTPUT |
| >DVB-T/C OUTPUT |

f) Locate and select the NIT LCN MODE option. This allows you to select the mode of the NIT's LCNs :

| CONFIGURER RF |
| >NETWORK |

- OFF: no LCN descriptor is inserted in the NIT.

| NAME |
| Standard |

- EUROPE MODE: a descriptor for Europe is inserted.
- INDEPENDENT TELEVISION COMMISSION: a descriptor for the UK is inserted.

| SUPPLIER |
| IKUSI |

- NORDIG MODE V1: a descriptor as per the Nordig V1 specification is inserted.

| NID |
| 00001 |

- NORDIG MODE V2: a descriptor as per the Nordig V2 specification is inserted.

| TSID |
| 00021 |

- GENERIC MODE: generic LCN descriptor.

g) Locate and select the TDT-TOT option to insert the tables that provide information pertaining to the date and time, updated according to the country's time difference or season.

| ONID |
| 00100 |

| MODE NIT LCN |
| OFF |

| INSERT TDT-TOT |
| ON |
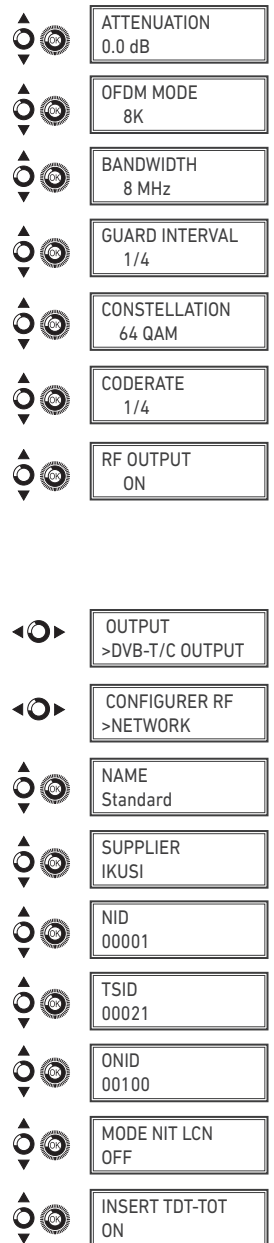
Unit status

NOTE. The unit displays its status in detail along with the alarms active in the module.

◄O►	>STATUS MODULE INFO

1) Locate and select the **STATUS** option.

▲O▼	CH1: V:0 A:0 CH2: V:0 A:0

a) Locate and highlight STATUS: The unit will display its status and alarms: OK / Error.

▲O▼	ESTATUS: OK ALARM: OK

b) Locate and highlight OUTPUT BITRATE. The unit will display the output data speed in Mbits/s.

▲O▼	OUTPUT BITRATE 19.216 MBits/s

c) Locate and highlight MIN ACT MAX NULL. The unit will display the volume of null data packets at the output, minimum, current, and maximum as a percentage of the total.

▲O▼	NULL MIN ACT MAX 00% 000% 000%
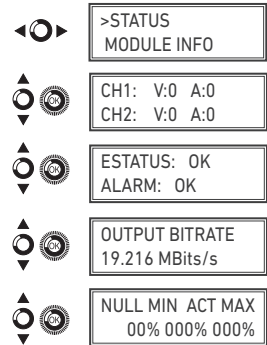
Unit information

1) Locate and select the **MODULE INFO** option.

◄O►	STATUS >MODULE INFO

a) Locate and highlight the MODEL option. The unit will display the unit model and version.

▲O▼	MODEL MAC-HD

b) Locate and highlight the SERIAL NUMBER option. The unit will display the serial number.

▲O▼	SERIAL NUMBER 0123456789

c) Locate MAC. This shows the number identifying the unit for the network connection.

▲O▼	MAC 0009E1234567

d) Locate and highlight the option V.SW V.HW V.BS. The unit displays the software version (V.SW), the hardware version (V.HW) and the start-up system (V.BS).

▲O▼	V. HW V. SW V. BS 1.00 1.00 1.00
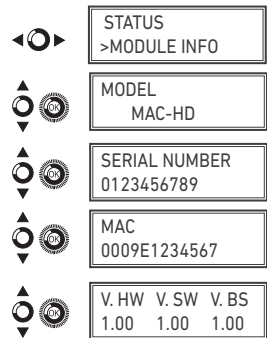
Unblocking the unit

The unit can be blocked, so that the display and control button cannot be used to modify the settings by anyone without the lock code/password.

To unblock the unit:

▲O▼	MAC-HD 1.00 0009E1234567

1) Locate and select **LOCK CODE**.

▲O▼	>BLOCK CODE INFORMATION

2) Enter the unlock password assigned by the unit operator.

3) The unit will display whether the password is accepted or rejected.

▲O▼	BLOCK CODE 0001

NOTE. The unit will remain unblocked until it is restarted or the operator deactivates the block.

To unblock the unit without the blocking password:

▲O▼	BLOCK CODE >INFORMATION

1) Locate and select **INFORMATION**.

2) Contact the supplier of the unit and provide the serial number. The supplier of the unit will provide an unblocking code for the stated serial number.

▲O▼	SERIAL NUMBER 4488SA123456

3) The unit will display whether the password has been accepted or rejected.
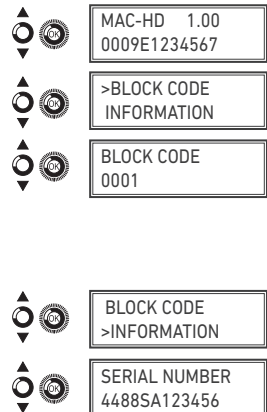
USB Player

NOTE. This device is 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 through the MAC-HD modulator.

Check the firmware version of the unit, USB PLAYER option, available as of version 1.21.

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

Users should install the software on their PC by downloading the setup file "conversor-mac-installer.exe" from the MAC-HD webpage at http://www.ikusi tv/en/headends/modulators/mac-series/mac-hd.

USB Player Video playback

Playback will begin automatically when you insert the pen drive in the MAC-HD Modulator's USB connector (wait for a seconds), without you having to access the menu, provided the "video-final.ts" file was created properly.

The USB PLAYER function overrides the modulator function. If the MAC-HD is working as a modulator, it will automatically playback the video.ts file on any pen drive you connect.

NOTE

The modulator generates a signal for 2 services even though we have one input selected. This allows the TV to memorize the 2nd service which is destined to a future employment of the USB flash drive.

With this we would avoid TV rescanning if the first installation was made without using the USB flash drive.

NOTE

In case of connecting only the USB flash drive, the input mode must be "2xCVBS".

TABLE OF DEFAULT PARAMETERS FOR SELECTED COUNTRY

COUNTRY	LANGUAGE	NIT mode	LCN mode	NID	TSID	ONID	Bandwidth	Channel	Frequencies
Australia	English	ON	Generic	1	38	100	7 MHz	38	599 MHz
France	French	ON	Europe	1	21	8442	8 MHz	21	474 MHz
UK	English	ON	IndTICom(UK)	1	21	9018	8 MHz	21	474 MHz
Italy	Italian	ON	Europe	1	21	1	8 MHz	21	474 MHz
Portugal	English	ON	Generic	1	21	8904	8 MHz	21	474 MHz
Spain	Spanish	ON	OFF	1	21	100	8 MHz	21	474 MHz

Note: When configuring the country settings, the equipment is always configured with the first of the permitted channels, whilst the frequency will be that of the centre channel.

Technical specifications

Model MAC-HD (4493)

Video input		4 (non-simultaneous)
Format		(2x) CVBS, HDMI, HD-SDI
Input level (CVBS)	Vpp	0.7 - 1.4
Video standards		PAL/SECAM/NTSC/B&W

Audio input		1 (Mono and stereo)
Digital audio		Yes (HDMI, HD-SDI)
Audio input level (analog)	Vpp	0.5 - 2.5

Compression	
Video	MPEG2 MP@ML, H.264/MPEG4 AVC MP L4.1
Audio	MPEG1 layer II
Video quality	SD, HD (480i, 576i, 480p, 576p, 720p50, 720p,1080i50, 1080i60, 1080p50, 1080p60)
Max resolution	1080p60

Output		TV digital COFDM/QAM
COFDM Standard		DVB-T as per ETSI EN 300 744 DVB-C as per ETSI EN 300 429
Bandwidth	MHz	6 / 7 / 8
Number of carriers		2K / 8K
MER	dB	≥ 40
Frequency range	MHz	47 - 862
Output level	dBμV	≥ 80
Output pitch attenuation	dB	0.5
Impedance	Ω	75
Frequency pitch	kHz	1
Level adjustment	dB	-25
Frequency stability	ppm	≤±30
Espurious in band	dBc	≤-60
Noise level (ΔB = 8 MHz)	dBc	≤-65
Frequency Loopthrough		45 MHz at 2.5 G
Symbol rate DVB-C	Kbps	3000 - 8000

IP Output

Interfaz	IEEE 802.3 10/100 Base T
IP encapsulated type	According to ETSI TS 102 034 v1.31(2007-10) and SMPTE ST 2022-2:2007
Outflow IP	CBR/VBR
IP address	Unicast/Multicast
Protocols	UDP/RTP
IP encapsulated format	SPTS
Diffserv QoS ; TTL ; VLAN	Yes
SAP service announcement	Yes
DVB processing	PAT, PMT, SDT, TDT, TOT
LCD	16x2 characters
Keyboard	Joystick 5 positions
Web	Ethernet

Processing

NIT adapted	Yes (automatically generated)
SDT adapted	Yes (entering configurable name) TS
Monitoring	Yes
PSI/SI adapted	Generation and insertion of tables PAT, PMT, SDT, NIT
NETWORK Configuration	NID, ONID, TSID, Network name, Provider
SID Configuration	Yes
LCN Treatment	Yes
TDT, TOT Treatment	Yes
Channel name edition	Yes (ex. "camera pool")
EIT edition	Yes (ex. "open 9h from 18h")

Operation

Supply voltage	230 - 240 VAC
Consumption	19 W
Operating temperature	0 to 45 ºC
Firmware updates	Yes, web or USB way
Video playback through USB port	Yes

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.

CE Certificate

EC-Declaration of Conformity

$C\epsilon$ marking

We, Manufacturer

KLODE MEDIA S.L.
Donostia Ibilbidea, 28
20115 Astigarraga Gipuzkoa, Spain

declare that the product

Stand-alone modulator MAC-HD (4493)

are in conformity with	are in conformity with	are in conformity with
Council Directive 2014/30/EU	**Council Directive 2014/35/EU**	**RoHS 3. Directive 2015/863/EU**
Standards to which conformity is declared :	Standards to which conformity is declared :	Standards to which conformity is declared :

EN 50083-2:2012+A1:2015
Cable networks for television signals, sound signals and interactive services. Part 2: Electromagnetic compatibility for equipment.

EN 61000-3-2:2014
Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase.

EN 61000-3-3:2013
Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current up to 16 A per phase and not subject to conditional connection.

EN 62368-1:2014
Audio/video, information and communication technology equipment - Part 1: Safety requirements (LVD) (Endorsed by AENOR in September of 2014).

UNE-EN 50581:2012
Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances (RoHS) (Endorsed by AENOR in November of 2012)

IKUSI

San Sebastián, October 2019

Jesús Gómez Río

R&D Director

Safety Instructions

Instrucciones de Seguridad ES

- No obstruya ni cubra las ranuras de ventilación del aparato. Para que haya una ventilación correcta, deje al menos un espacio de 20 cm alrededor.
- No exponer el aparato a la lluvia o al goteo de agua. No colocar encima ningún recipiente con líquido. En caso de que un líquido cayera dentro del aparato, desconectar éste inmediatamente de la red alterna.
- Mantenga lejos del aparato los objetos inflamables, velas y todo aquello que pudiera causar un incendio.
- Siguiendo las instrucciones de instalación, fijar firmemente el aparato bien sea en la pared bien sea en la base-soporte especialmente destinada al efecto.
- Conectar el aparato a una toma de tensión de red que sea fácilmente accesible, de forma que en caso de emergencia el aparato pueda ser desconectado rápidamente de la toma.
- No abrir el aparato, ya que existe riesgo de descarga eléctrica.

Instruções de Segurança PT

- Não bloqueie nem cubra as aberturas de ventilação do aparelho. Para uma ventilação melhor, deixe pelo menos 20 cm de espaço à volta do dispositivo.
- Não exponha o aparelho à chuva ou a gotas de água, nem coloque por cima nenhum recipiente com água dentro. Caso entre água no aparelho, retire imediatamente a ficha da tomada.
- Afaste objectos inflamáveis, velas e qualquer coisa que possa provocar um incêndio.
- Seguindo as instruções de instalação, fixe bem o aparelho na parede ou no suporte especialmente destinado para esse efeito.
- Ligue o aparelho a uma tomada eléctrica de acesso fácil para que possa ser rapidamente desligado da tomada em caso de emergência.
- Não abra o aparelho, visto que pode provocar risco de descargas eléctricas.

Veiligheidsinstructies NL

- U mag de ventilatieopeningen van het apparaat niet blokkeren of bedekken. Voor betere ventilatie dient u minstens 20 cm ruimte eromheen vrij te houden.
- Stel het apparaat niet bloot aan regen of waterdruppels. Plaats er geen vloeistofverpakkingen op. In geval er vloeistof in het apparaat komt, dient u het onmiddellijk van de wisselstroom af te sluiten.
- Houdt brandbare voorwerpen, kaarsen en elk voorwerp dat brand kan veroorzaken, uit de buurt van het apparaat.
- Volg de installatie-instructies op. Plaats het apparaat stevig aan de muur of op de basissondersteuning, welke hiervoor is bestemd.
- Sluit het apparaat aan op een eenvoudig te bereiken stopcontact, zodat u in geval van nood het apparaat snel uit het stopcontact kunt halen.
- Maak het apparaat niet open. U riskeert hier elektrische schokken mee.

Instrukcja bezpieczeństwa PL

- Nie należy blokować lub zakrywać otworów wentylacyjnych urządzenia. Aby uzyskać lepszą wentylację, należy pozostawić co najmniej 20 cm wolnego miejsca wokół urządzenia.
- Nie należy wystawiać urządzenia na działanie deszczu lub wody. Nie należy na nim stawiać żadnego pojemnika z płynem. W przypadku przecieku płynu do wnętrza urządzenia, należy je natychmiast odłączyć od źródła prądu zmiennego.
- W pobliżu urządzenia nie należy stawiać żadnych łatwopalnych przedmiotów, świec lub innych rzeczy, które mogą wywołać pożar.
- Zgodnie z instrukcją montażu, należy przymocować urządzenie należycie do ściany lub na podstawie przeznaczonej do tego celu.
- Urządzenie należy przyłączyć do łatwo dostępnego gniazdka elektrycznego, które umożliwia szybkie odłączenie urządzenia w nagłych przypadkach.
- Nie należy otwierać obudowy urządzenia; istnieje zagrożenie porażenia elektrycznego.

Sikkerhedsanvisninger DA

- Blokér eller tildæk ikke anordningens ventilationsåbninger. Lad der være mindst 20 cm frit rum omkring den af hensyn til bedre ventilation.
- Udsæt ikke anordningen for regn eller vanddråber. Anbring ikke nogen form for væskebeholder på den. I tilfælde af, at der kommer væske ind i anordningen, skal den omgående frakobles vekselstrømmen.
- Hold brændbare genstande, stearinlys og alt, hvad der kan forårsage brand, væk fra anordningen.
- Idet installeringsanvisningerne følges, fastgøres anordningen sikkert på væggen eller på den basisholder, som er specielt beregnet til dette formål.
- Tilslut anordningen til en lettilgængelig lysnetkontakt, så anordningen hurtigt kan frakobles stikkontakten i en nødsituation.
- Luk ikke anordningen op. Der er risiko for elektrisk stød.

Drošības instrukcija LV

- Neaizsprostojiet un neapklājiet ierīces ventilācijas atveres. Labākai ventilācijai atstājiet vismaz 20 cm telpu ap tām.
- Nepakļaujiet ierīci lietum vai ūdens pilieniem. Nelieciet uz to šķidrumu saturošus traukus. Gadījumā, ja ūdens iekļūst ierīcē, nekavējoties atvienojiet to no maiņstrāvas.
- Neturiet ierīces tuvumā viegli uzliesmojošus objektus, sveces un citus priekšmetus, kas var aizdegties.
- Sekojot uzstādīšanas instrukcijām, cieši piestipriniet ierīci vai nu pie sienas, vai nu uz pamata, kas īpaši domāts šim nolūkam.
- Pievienojiet ierīci viegli pieejamai jaudas padeves iekārtai, lai ierīce var tikt ātri atvienota no padeves galējas nepieciešamības gadījumā.
- Neatveriet ierīci; pastāv risks saņemt elektrisko šoku.

Biztonsági előírások HU

- Ne zárja el és ne fedje le a készülék szellőztető nyílásait. A megfelelőbb szellőztetés érdekében, hagyjon legalább 20 cm-es nyílt helyet a nyílás körül.
- A készüléket ne tegye ki eső vagy vízcsepek hatásának. Ne helyezzen rá semmilyen folyadéktartályt. Ha a készülékbe folyadék kerül, azonnal válassza le a váltakozó áramforrásról.
- Tartsa távol a készüléktől a gyúlékony tárgyakat, gyertyákat és bármilyen eszközt, mely tüzet okozhat.
- A felszerelési utasításokat követve, biztonságosan rögzítse a készüléket a falra, vagy az erre szánt állványra.
- Csatlakoztassa a készüléket egy könnyen hozzáférhető hálózati csatlakozóaljzathoz, mely sürgősség esetén, lehetővé teszi a készülék gyors leválasztását.
- A készüléket tilos kinyitni; áramütés veszélye áll fenn.

Safety Instructions EN

- Do not block or cover the device ventilation openings. For better ventilation, leave a surrounding space of at least 20 cm.
- Do not expose the device to rain or water drops. Do not put any kind of liquid container on top it. 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 device.
- In accordance with the installation instructions, fix the device firmly either on the wall or on the base-support specially intended for this purpose.
- Connect the device to an easily accessible mains outlet, so that the device may be quickly disconnected from the outlet in case of emergency.
- Do not open the device; there is a risk of electric shock.

Sicherheitshinweise DE

- Die Belüftungsöffnungen des Geräts nicht blockieren oder abdecken. Für eine korrekte Belüftung mindestens 20 cm Abstand um das Gerät einhalten.
- Das Gerät weder Regen noch Wassertropfen aussetzen. Keine Flüssigkeitsbehälter auf dem Gerät abstellen. Bei Eindringen von Flüssigkeit in das Gerät, dieses sofort von der Wechselstromversorgung trennen.
- Brennbare Objekte, Kerzen und andere mögliche Brandauslöser von dem Gerät fernhalten.
- Das Gerät entsprechend den Installationsanweisungen stabil an der Wand oder auf dem speziell für diesen Zweck ausgelegten Sockel befestigen.
- Das Gerät an eine leicht zugängliche Steckdose anschließen, so dass dieses im Notfall schnell von der Steckdose getrennt werden kann.
- Das Gerät nicht öffnen; es besteht Stromschlaggefahr.

Istruzioni di sicurezza IT

- Non ostruire né coprire le aperture di ventilazione dell'apparecchiatura. Per una migliore ventilazione, lasciare attorno uno spazio libero di almeno 20 cm.
- Non esporre l'apparecchiatura alla pioggia o a gocciolamento d'acqua. Non appoggiare sulla superficie contenitori di liquido. Nel caso penetrasse del liquido nell'apparecchiatura, scollegarla immediatamente dalla rete di corrente elettrica alternata.
- Mantenere lontani dall'apparecchiatura gli oggetti infiammabili, le candele o qualsiasi cosa possa causare un incendio.
- Seguendo le istruzioni di installazione, fissare saldamente l'apparecchiatura al muro o all'apposita base di supporto.
- Collegare l'apparecchiatura ad una presa di corrente facilmente accessibile, in modo da poterla scollegare velocemente dalla presa in caso di emergenza.
- Non aprire l'apparecchiatura. Pericolo di scarica elettrica.

Turvaohjeet FI

- Älä peitä laitteen tuuletusaukkoja. Jätä vähintään 20 cm tilaa laitteen ympärille hyvän tuuletuksen varmentamiseksi.
- Älä altista laitetta sateelle tai vedelle. Älä aseta mitään nestettä sisältävää säiliötä sen päälle. Jos nestettä pääsee laitteen sisään, kytke se välittömästi irti pistokkeesta.
- Pidä kaikki palavat esineet, kuten kynttilät ja muut jotka voivat sytyttää tulipalon, poissa laitteen läheltyviltä.
- Noudattaen asennusohjeita, kiinnitä laite tukevasti seinälle tai siihen tarkoitettuun jalustaan.
- Kytke laite pistokkeeseen johon on helppo päästä jotta laite voidaan kytkeä irti nopeasti pistokkeesta hätätilanteen sattuessa.
- Älä avaa laitetta sähköiskuvaaran takia.

Bezpečnostní pokyny CS

- Neomezujte přístup k větracím otvorům zařízení ani je nezakrývejte. Pro lepší větrání kolem nich ponechejte volný prostor nejméně 20 cm.
- Nevystavujte zařízení dešti nebo kapající vodě. Nestavte na ně jakékoli nádoby obsahující kapaliny. V případě, že se do zařízení dostane voda, okamžitě je odpojte od síťového napájení.
- Hořlavé předměty, svíčky a cokoli, co by mohlo způsobit požár, neumísťujte do blízkosti zařízení.
- Postupujte podle pokynů pro instalaci a zařízení řádně upevněte na zeď nebo umístěte na podstavec určený speciálně k tomu účelu.
- Zařízení připojte ke snadno přístupné síťové zásuvce, aby v případě nebezpečí bylo možno je rychle odpojit.
- Neotvírejte zařízení, jinak hrozí nebezpečí úrazu elektrickým proudem.

Bezpečnostné pokyny SK

- Neobmedzujte prístup k vetracím otvorom zariadenia ani ich nezakrývajte. Pre lepšie vetranie nechajte okolo nich voľný priestor najmenej 20 cm.
- Nevystavujte zariadenie dažďu alebo kvapkajúcej vode. Nedávajte na zariadenie žiadne nádoby obsahujúce kvapaliny. V prípade, že sa do zariadenia dostane voda, okamžite ho odpojte od sieťového napájania.
- Horľavé predmety, sviečky a čokoľvek, čo by mohlo spôsobiť požiar, neumiestňujte do blízkosti zariadenia.
- Postupujte podľa pokynov na inštaláciu a zariadenie riadne upevnite na stenu alebo umiestnite na podstavec určený špeciálne na tento účel.
- Zariadenie pripojte k ľahko prístupnej sieťovej zásuvke, aby ho bolo možné v prípade nebezpečenstva rýchlo odpojiť.
- Neotvárajte zariadenie, inak hrozí nebezpečenstvo úrazu elektrickým prúdom.

Saugumo taisyklės LT

- Neuždenkite įrenginio ventiliacinių angų. Laikykite įrenginį bent 20 cm atstumu nuo kitų objektų dėl geresnės ventiliacijos.
- Saugokite įrenginį nuo lietaus ar vandens lašų. Nedėkite jokio indo su skysčiu ant įrenginio. Jei įrenginio vidun pakliūtų skysčio, tuoj pat atjunkite jį nuo kintamosios srovės.
- Laikykite degius daiktus, žvakes ir viską, kas gali sukelti gaisrą, kuo toliau nuo įrenginio.
- Laikydktės instaliavimo instrukcijų, pritvirtinkite įrenginį tvirtai prie sienos arba prie pagrindo, specialiai skirto šiam tikslui.
- Prijunkite įrenginį prie lengvai prieinamo pagrindinio lizdo taip, kad galima būtų lengvai įrenginį atjungti avarinio atveju.
- Neatidarykite įrenginio, gali nutrenkti elektra.

Ohutusjuhend ET

- Seadme kaant ega ventilatsiooniavasid ei tohi kinni katta. Paremaks ventileerimiseks peab seadme ümber olema vähemalt 20 cm vaba ruumi.
- Ärge jätke seadet vihma kätte ega niiskesse kohta. Ärge asetage seadmele vedelikke sisaldavaid konteinereid. Juhul, kui vedelik satub seadmesse, tuleb seade viivitamatult vooluvõrgust lahutada.
- Veenduge, et tuleohtlikud esemed (küünlad ja teised objektid, mis võivad tekitada tulekahju) jääksid seadmest piisavalt kaugele.
- Järgides paigaldusjuhiseid kinnitage seade kindlalt seinale või spetsiaalsele tugialusele.
- Ühendage toitejuhe kergelt ligipääsetavas kohta pistikupessa, et hädajuhtumi korral oleks võimalik seadet kiiresti vooluvõrgust lahti ühendada.
- Elektrilöögi vältimiseks ärge avage seadme kaant.

Instructions de sécurité FR

- Ne bloquez ni ne couvrez les orifices d'aération de l'appareil. Pour une meilleure aération, laissez tout autour un espace d'environ 20 cm.
- N'exposez pas l'appareil à la pluie ou aux gouttes d'eau. Ne mettez aucun type de récipient pour liquides sur l'appareil. En cas de renversement de liquide à l'intérieur de l'appareil, débranchez-le immédiatement.
- Gardez les objets inflammables, les bougies et tout élément susceptible de provoquer un incendie loin de l'appareil.
- Conformément aux instructions d'installation, fixez l'appareil fermement au mur ou au support base spécialement conçu à cet effet.
- Branchez l'appareil à une prise de courant facilement accessible, de sorte que l'appareil puisse être rapidement débranché en cas d'urgence.
- N'ouvrez pas l'appareil afin d'éviter tout risque d'électrocution.

Инструкция по безопасности RU

- Не закрывайте и не загораживайте вентиляционные отверстия устройства. Для обеспечения нормальной вентиляции оставьте по меньшей мере 20 см. свободного пространства вблизи устройства.
- Необходимо обеспечит защиту устройства от попадания влаги внутрь: дождь, снег и т.п. Не размещайте сверху устройства сосуды с жидкостью. В случае попадания жидкости внутрь устройства, немедленно отключите его от сети переменного тока.
- Не размещайте вблизи устройства легковоспламеняющиеся предметы, источники огня и все то что может спровоцировать пожар.
- Следуя инструкциям по установке, надежно закрепите устройство на стене или на монтажной панели, специально предназначенной для этой цели.
- Розетка сети переменного тока, к которой подключено устройство, должна быть расположена в легкодоступном месте, чтобы было возможно быстро отключить устройство в экстренном случае.
- Не разбирать устройство, т.к. есть угроза электрического удара.

Οδηγίες ασφαλείας EL

- Μην κλείνετε και μην καλύπτετε τα ανοίγματα εξαερισμού της συσκευής. Για καλύτερο εξαερισμό, αφήστε χώρο τουλάχιστον 20 εκ. γύρω της.
- Μην εκθέτετε τη συσκευή στη βροχή ή σε σταγόνες νερού. Μην τοποθετείτε κανενός είδους δοχείο που περιέχει υγρό πάνω στη συσκευή. Σε περίπτωση που διεισδύσει υγρό στη συσκευή, αποσυνδέστε την αμέσως από το εναλλασσόμενο ρεύμα.
- Διατηρείτε μακριά από τη συσκευή εύφλεκτα υλικά, κεριά και οτιδήποτε θα μπορούσε να προκαλέσει φωτιά.
- Ακολουθώντας τις οδηγίες εγκατάστασης, στερεώστε σταθερά τη συσκευή είτε στον τοίχο είτε στην ειδική γι' αυτόν το σκοπό βάση στήριξης.
- Συνδέστε τη συσκευή σε μια εύκολα προσπελάσιμη πρίζα ηλεκτρικού ρεύματος, έτσι ώστε η συσκευή να μπορεί να αποσυνδεθεί γρήγορα από την πρίζα σε περίπτωση έκτακτης ανάγκης.
- Μην ανοίγετε τη συσκευή, γιατί υπάρχει κίνδυνος ηλεκτροπληξίας.

Varnostna navodila SL

- Ne prekrivajte ali blokirajte prezračevalnih odprtin na napravi. Za boljšo prezračevanje pustite najmanj 20 cm prostora okoli naprave.
- Ne izpostavljate naprave na dež ali vodo. Na napravo ne postavljajte posod s tekočino. Če tekočina pride v napravo jo takoj izključite iz izmenične napetosti.
- Napravi ne približujte vnetljivih predmetov, sveč ali nekaj kar lahko povzroči požar.
- Po navodilih za montažo napravo trdno pritrdite na zid ali podstavek, ki je za to namenjen.
- Napravo priključite v enostavno dostopen vtikač tako, da jo lahko v primeru nevarnosti hitro izključite.
- Naprave ne odpirajte – obstaja nevarnost električnega udara.

Struzzonijiet dwar is-Sigurtà MT

- M'għandekx timpediexi jew tgħatti l-ftuħ ta' ventilazzjoni tat-tagħmir. Għal ventilazzoni aħjar, ħalli spazju ta' mhux anqas minn 20 cm madwaru.
- Tesponiex it-tagħmir għal xita jew taqtir ta' ilma. M'għandekx tqiegħed l-ebda tip ta' reċipient ta' likwidu fuqu. F'każ li likwidu jidħol fit-tagħmir, skonnettja minnufih mill-kurrent li jinbidel.
- Żomm oġġetti fjammabbli, xemgħat u kull ħaga li tista' tikkaġuna xi nar ' il bogħod mit-tagħmir.
- Wara l-istruzzjonijiet ta' installazzjoni, waħħal it-tagħmir sew jew mal-ħajt jew fuq l-appoġġ bażi maħsub speċifikament għal dan il-ħan.
- Ikonnettja t-tagħmir ma' provvista ta' dawl faċilment aċċessibbli, sabiex it-tagħmir ikun jista' jiġi skonnettjat minn mas-sokit f'każ ta' emerġenza.
- M'għandekx tiftaħ it-tagħmir; Hemm riskju ta' xokk elettriku.

Säkerhetsanvisningar SV

- Ventilationsöppningarna på enheten får inte blockeras eller täckas över. För att uppnå en bättre ventilation bör minst 20 cm fritt utrymme lämnas runt enheten.
- Utsätt inte enheten för regn eller vattendroppar. Placera aldrig någon som helst vätskebehållare på den. Om vätska skulle komma in i enheten måste den omedelbart kopplas ur från nätspänningen.
- Brännbara föremål, stearinljus och alla andra föremål som kan orsaka brand får inte förvaras nära enheten.
- Följ installationsanvisningarna och montera enheten antingen på väggen eller på det stativ som är särskilt avsett för ändamålet.
- Anslut enheten till ett lättåtkomligt nätspänningsuttag, så att enheten snabbt kan kopplas ur vid en eventuell nödsituation.
- Öppna inte enheten eftersom det föreligger risk för elektrisk chock.