

# HDMI MODULATORS MHD001, MHD001P

## PRODUCT DESCRIPTION

HDMI modulators MHD001, MHD001P are intended to encode HDMI video and audio signal to DVB-T signal and modulate it in VHF and UHF ranges. MHD001P is packed with external mains power supply.

The modulators are intended for indoor use only. Suitable for moderate and tropical climates.

## SAFETY INSTRUCTIONS

Installation of the modulator must be done according IEC60728-11 and national safety standards.

The modulator is powered from external power supply +12 V. This voltage is not dangerous to life.

Any repairs must be done by a qualified personnel.

To avoid the electric shock follow these instructions:

Do not plug mains power supply of the modulator into the mains until all cables have been connected correctly;

To disconnect the modulator from mains completely, disconnect plug of modulator power supply from mains socket;

Modulator shall not be exposed to dripping or splashing water and no objects filled with liquids, such as vases, shall be placed on it;

Avoid placing modulator next to central heating components, near highly combustible materials and in areas of high humidity;

Before connecting the modulator to multimedia system, be sure that system is installed in accordance to national safety standards;

Devices of multimedia system should have easy access to disconnect them from the mains supply;

No naked flame sources, such as lighted candles, should be placed on modulator;

If the modulator has been kept in cold conditions for a long time, keep it in a warm room no less than 2 hours before plugging into the mains;

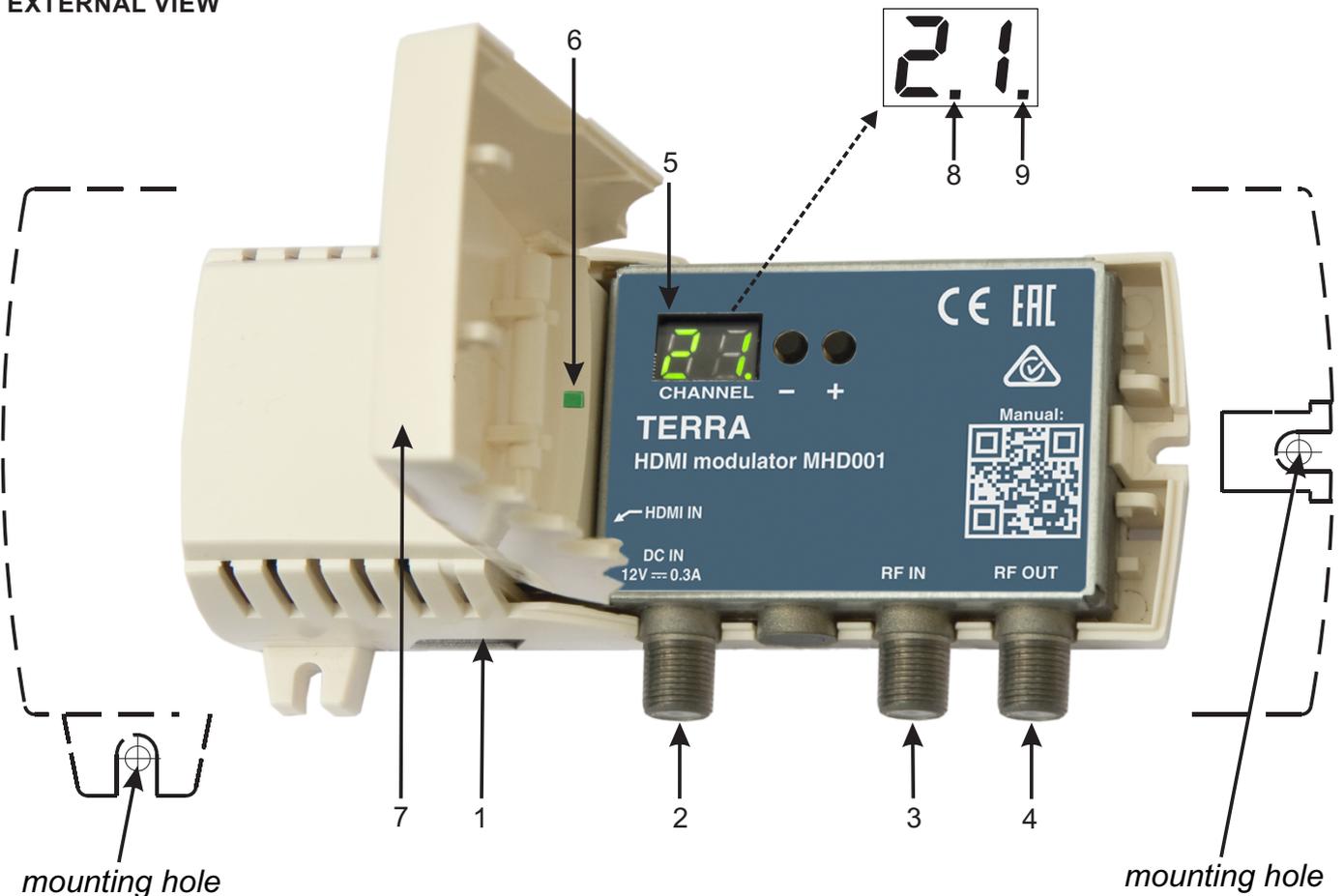
Do not insert any objects into ventilation openings;

The ventilation should not be impeded by covering the ventilation openings with items, such as newspapers, table-cloths, curtains;

Mount the modulator on not flammable wall or in not flammable installation box in vertical position with power supply located on the left. The modulator must be fixed with steel screws  $\varnothing$  3.5-4 mm. The screws are not included in a package;

From top, front and bottom of installed modulator must be at least 10 cm free space.

## EXTERNAL VIEW



- 1 - HDMI input connector
- 2 - DC IN - DC entry 3.5/1.3 mm (DC jack)
- 3 - RF IN - RF signal input connector (F type)
- 4 - RF OUT - RF signal output connector (F type)
- 5 - two-digit LED display
- 6 - DC voltage indicator
- 7 - exterior lid (open by hand)
- 8 - setting mode indicator
- 9 - HDMI signal presence indicator

Manual:



Figure 1.

## INSTALLATION INSTRUCTIONS

Read the safety instruction first.

Installation of system according standard IEC60728-11 ensures safety of personnel and prevents apparatus against damaging due to lightning or other sources of overvoltage surges.

To change the modulator settings, open the plastic cover.

If RF IN connector on the modulator is not used, connect the 75 Ω load supplied.

To wall mount the modulator - screw the modulator to the wall (see Figure 1).

**Do not connect TV antennas to modulator RF IN connector directly. If you intend to combine TV signals of antennas and the modulator, plug in booster with output-to-input isolation ≥20 dB between antenna output and RF IN connector.**

## DEFAULT SETTINGS

1. Output channel **21**;
2. Protection from unauthorized access **OFF** (Preset **oF**);
3. Service name **MHD001 CH\_21** (Preset **00**);
4. Output signal attenuator **15 dB** (Preset **15**);
5. Output signal **ON** (Preset **on**);
6. Region Europe (Preset **EU**).

## OPERATING

### CHANGING OF SETTINGS

The modulator has two modes of operating:

1. normal: sets after plug in;

Output channel can be selected in normal mode by pressing buttons “-“ or “+” (see tables 2-6).

2. setting: to enter the setting mode press “-“ and “+” buttons simultaneously, to exit setting mode press “-“ and “+” buttons simultaneously for 1 second. The setting mode is indicated by point after first digit.

Select of necessary to change parameter by pressing button “-“ and set necessary parameter value by pressing “+” button.

1. Protection from unauthorized access setting (displayed **L.C**):

- a) after switching settings mode, indicator displays protection from unauthorized access parameter name **L.C**;
- b) select protection from unauthorized access parameter value by pressing “-“ button (displayed **o.n** or **o.F**);
- c) change protection from unauthorized access parameter value by pressing “+” button.

In the normal operation mode the symbol “**L0**” appears, if you try to change output channel in locked mode and output channel remains unchanged.

2. service number:

- a) press “-“ button (displayed **n.0**);
- b) press “-“ button again (displayed number from 00 to 99);
- c) change service name by pressing “+” button.

When the service number is set to number greater that 00, the logical channel number will be added and service name is set to MHD001 CH\_service number. For New Zeland region service name is set according Table 7. When the service number is set to 00, the logical channel numbering is off and service name is set to MHD001 CH\_channel number.

**Note:** set different service numbers for cascaded modulators.

3. output attenuator:

- a) press “-“ button (displayed **A.k**);
- b) press “-“ button again (displayed number from 00 to 30);
- c) change attenuator value by pressing “+” button.

4. output signal switching:

- a) press “-“ button (displayed **r.F**);
- b) press “-“ button again (displayed **o.n** or **o.F**);
- c) switching between RF ON and RF OFF by pressing button “+”, “**on**” - RF ON, “**oF**” - RF OFF.

5. region switching:

- a) press “-“ button (displayed **r.S**);
- b) press “-“ button again (displayed region name (see Table 1));
- b) switching between regions by pressing button “+”.

## REGION SETTING

Table 1.

Region	Displayed	Channel tables
Europe	<b>EU</b>	Table 2, Table 4
New Zealand	<b>n2</b>	Table 2, Table 4
Australia	<b>AU</b>	Table 3, Table 5
United Kingdom	<b>U</b>	Table 2, Table 4
Russia	<b>rU</b>	Table 2, Table 6

## REQUIREMENTS FOR EXTERNAL POWER SUPPLY UNIT (PSU) FOR MHD001

- Output voltage +12 V ± 1 V
- Output current > 0.3 A
- Ripple at single and/or double mains frequency < 10 mV p-p
- Ripple & noise < 180 mV p-p
- Output connector type 3.5/1.3 (+) plug or 5.5/2.1 mm (+) plug
- Short circuit protection
- Double insulated (marked  )
- Meet EN 55022 class B conducted emissions requirements, measuring with grounded load

## TECHNICAL CHARACTERISTICS

Type		MHD001	MHD001P
Video input	input signal type	HDMI	
	video coding	MPEG-4 AVC/H.264, Baseline profile 4.0	
Audio input	input signal type	HDMI	
	audio coding	MPEG-1 Layer II, AAC	
H.264 encoder	standard	MPEG-4 AVC/H.264	
Output resolution		up to 1920x1080x30p	
Transport stream processing	automatic generation	PAT, SDT, PMTs tables	
RF output	DVB standard	DVB-T	
	frequency range (pr.)	174 - 230 MHz, 470-862 MHz	
	MER, typical	32 dB	
	modulation	QAM64	
	channel bandwidth (pr.)	7 MHz/ 8 MHz	
	shoulder attenuation	> 36 dB	
	level/impedance	90 dBµV/75 Ω	
	output level adjustment (pr.)	0 ÷ -30 dB by 1 dB step	
	loop through frequency range/loss	45-862 MHz / ≤ 2.5 dB	
Current consumption		12 ± 1 V 300 mA	-
Power consumption		-	100-240 V~ 50/60 Hz 4 W
Operating temperature		0° C ÷ +40° C	
Dimensions/Weight (packed)		133x63x39 mm/0.18 kg	133x63x39 mm/0.34 kg

(pr.) software control

## PACKAGE CONTENTS

1. Encoder-modulator ..... 1 pcs.
2. DC power supply adapter from 5.5/2.1 mm to 3.5/1.3 mm..... 1 pcs.
3. Load 75 Ω, type F..... 1 pcs.
4. External mains power supply +12 V 1 A max. (only for MHD001P) ..... 1 pcs.
5. User manual ..... 1 pcs.



Caution (mark on rear side).



Risk of electric shock (mark on rear side).



This product complies with the relevant clauses of the European Directive 2002/96/EC. The unit must be recycled or discarded according to applicable local and national regulations (mark on rear side) .



Equipment intended for indoor usage only (mark on rear side).



This product is in accordance to following norms of EU: EMC norm EN50083-2, safety norm EN60065 and RoHS norm EN50581.



This product is in accordance with Custom Union Technical Regulations: "Electromagnetic compatibility of technical equipment" CU TR 020/2011, "On safety of low-voltage equipment" CU TR 004/2011.



This product is in accordance with safety standard AS/NZS 60065 and EMC standards of Australia.

**UHF BAND CHANNELS**  
(REGIONS: EUROPE, NEW ZEALAND,  
UNITED KINGDOM, RUSSIA)

Table 2

Bandwidth	Channel	Center freq.
8 MHz	21	474 MHz
	22	482 MHz
	23	490 MHz
	24	498 MHz
	25	506 MHz
	26	514 MHz
	27	522 MHz
	28	530 MHz
	29	538 MHz
	30	546 MHz
	31	554 MHz
	32	562 MHz
	33	570 MHz
	34	578 MHz
	35	586 MHz
	36	594 MHz
	37	602 MHz
	38	610 MHz
	39	618 MHz
	40	626 MHz
	41	634 MHz
	42	642 MHz
	43	650 MHz
	44	658 MHz
	45	666 MHz
	46	674 MHz
	47	682 MHz
	48	690 MHz
	49	698 MHz
	50	706 MHz
	51	714 MHz
	52	722 MHz
	53	730 MHz
	54	738 MHz
	55	746 MHz
	56	754 MHz
	57	762 MHz
	58	770 MHz
	59	778 MHz
	60	786 MHz
	61	794 MHz
	62	802 MHz
	63	810 MHz
	64	818 MHz
	65	826 MHz
	66	834 MHz
	67	842 MHz
	68	850 MHz
	69	858 MHz

**UHF BAND CHANNELS**  
(REGION: AUSTRALIA)

Table 3

Bandwidth	Channel	Center freq.
7 MHz	20	473.5 MHz
	21	480.5 MHz
	22	487.5 MHz
	23	494.5 MHz
	24	501.5 MHz
	25	508.5 MHz
	26	515.5 MHz
	27	522.5 MHz
	28	529.5 MHz
	29	536.5 MHz
	30	543.5 MHz
	31	550.5 MHz
	32	557.5 MHz
	33	564.5 MHz
	34	571.5 MHz
	35	578.5 MHz
	36	585.5 MHz
	37	592.5 MHz
	38	599.5 MHz
	39	606.5 MHz
	40	613.5 MHz
	41	620.5 MHz
	42	627.5 MHz
	43	634.5 MHz
	44	641.5 MHz
	45	648.5 MHz
	46	655.5 MHz
	47	662.5 MHz
	48	669.5 MHz
	49	676.5 MHz
	50	683.5 MHz
	51	690.5 MHz
	52	697.5 MHz
	53	704.5 MHz
	54	711.5 MHz
	55	718.5 MHz
	56	725.5 MHz
	57	732.5 MHz
	58	739.5 MHz
	59	746.5 MHz
	60	753.5 MHz
	61	760.5 MHz
	62	767.5 MHz
	63	774.5 MHz
	64	781.5 MHz
	65	788.5 MHz
	66	795.5 MHz
	67	802.5 MHz
	68	809.5 MHz
	69	816.5 MHz
	70	823.5 MHz
	71	830.5 MHz
	72	837.5 MHz
	73	844.5 MHz
	74	851.5 MHz
	75	858.5 MHz

**VHF BAND CHANNELS**  
(REGIONS: EUROPE, NEW ZEALAND,  
UNITED KINGDOM)

Table 4

Bandwidth	Channel	Displayed	Center freq.
7 MHz	5	05	177.5 MHz
	6	06	184.5 MHz
	7	07	191.5 MHz
	8	08	198.5 MHz
	9	09	205.5 MHz
	10	10	212.5 MHz
	11	11	219.5 MHz
	12	12	226.5 MHz

**VHF BAND CHANNELS**  
(REGION: AUSTRALIA)

Table 5

Bandwidth	Channel	Displayed	Center freq.
7 MHz	6	06	177.5 MHz
	7	07	184.5 MHz
	8	08	191.5 MHz
	9	09	198.5 MHz
	9A	10	205.5 MHz
	10	11	212.5 MHz
	11	12	219.5 MHz
	12	13	226.5 MHz

**VHF BAND CHANNELS**  
(REGION: RUSSIA)

Table 6

Bandwidth	Channel	Displayed	Center freq.
8 MHz	6	06	178 MHz
	7	07	186 MHz
	8	08	194 MHz
	9	09	202 MHz
	10	10	210 MHz
	11	11	218 MHz
	12	12	226 MHz

**SERVICE NAMES FOR NEW ZEALAND**

Table 7

Displayed service number	Service name
01	SKY1
02	SKY2
03	SKY3
04	SKY4
05	SKY5
06	APPLE TV 1
07	APPLE TV 2
08	APPLE TV 3
09	APPLE TV 4
10	APPLE TV 5
11	BLU-RAY 1
12	BLU-RAY 2
13	BLU-RAY 3
14	BLU-RAY 4
15	BLU-RAY 5