

**1 x HDMI to DVB-T (COFDM)
"Home" modulator**

HDMOD-4

Operation Manual



1. IMPORTANT SAFETY PRECAUTIONS INFORMATION

READ THE FOLLOWING WARNINGS BEFORE YOU USE YOUR DEVICE

WARNING

The following safety precautions must be observed to prevent fire or electric shock hazard. Safety precautions include but are not restricted to the following:

Power supply / Mains cord

- Operate the unit only within the voltage range defined as appropriate by the manufacturer.
- Occasionally check the power connector and remove dirt or dust that may have accumulated.
- Use only the mains cord that comes with your unit.
- Do not operate the unit or plug in the mains cord if it is broken, split, or damaged in any way.
- Do not place the mains cord next to heating devices. Do not pull it, place heavy objects on it or damage it in any way. Keep it out of reach of children.
- Ensure that the device is plugged in a properly grounded socket. Insufficient grounding may cause electrocution.
- Always carefully disconnect all plugs by pulling on the plug and not on the cord. Make sure the unit's power switch is turned off before removing the cord from an outlet.
- Disconnect the mains cord when the unit is not in use for long periods of time or during storms.
- Do not connect the unit to a multiple-outlet to avoid plug overheating.

Disassembling

- This unit contains parts that cannot be repaired by the user. Do not disassemble or try to repair it as this will void all warranties. Please contact the manufacturer if you experience any problems with your unit.

Water/humidity

- Do not keep the unit in a humid place or near water.
- Do not plug/unplug the unit with wet hands.

Fire

- Never place a candle or another source of fire on the unit as it may fall and start a fire.
- If the mains cord or the power connector is damaged or destroyed, or if there is a sudden loss of picture during operation, or if you notice a strange smell or there is smoke, immediately switch the unit off, disconnect the mains cord and contact the manufacturer's technical support department.

Installation / Storage

- This unit contains high precision pieces of electronics. To ensure optimal performance and avoid damage, do not store it in any location where it may collect dirt, dust, lint, etc. Do not expose it to extreme heat or cold (e.g. in direct sunlight, near a heater or in the car during the day). Place the unit in a secure place to avoid falls.
- Before moving the unit, always unplug all cords first.
- When installing the unit, make sure that an outlet is within easy reach. In case of malfunction, switch the unit off and unplug the power cord. When the unit is not in use for a long period of time, make sure that the mains cord is disconnected.

Connectivity

- Before connecting the unit to other electronic devices, always switch off and unplug all devices.

Maintenance

- Do not spill liquids on the unit. Do not use any diluents or volatile liquid to clean the unit. Instead, use a soft slightly damp cloth and allow the unit to dry completely before using again.

Handling

- Do not poke your finger into the openings on your unit.
- Never put paper, metal parts or other objects into the openings of your unit. If you suspect that there are foreign parts in your unit, switch it off and unplug the mains cord. Contact the manufacturer's technical support department.
- Do not step on or place heavy objects on top of the unit. To avoid hardware damage, handle all buttons, connectors and switches gently.

2. INTRO

Congratulations on purchasing the HDMOD-4. You now own a high quality, "Home" DVB-T HD modulator with Bluetooth interface. To get the most out of your purchase, please take the time to carefully read through this manual

3. INSTRUCTIONS

3.1 DESCRIPTION

The HDMOD-4 is a high quality DVB-T "Home" modulator which receives one HDMI input and converts it into one RF DVB-T channel on its output. The excellent picture (Full HD 1920*1080-30p) and modulation quality (MER~35dB) renders the HDMOD-4 an ideal solution for distributing SD/HD digital signals received from any device with an HDMI output (e.g. a DVD player, STB or camera in a CATV network using the DVB-T technology).

The user has the ability to control the device remotely using a Bluetooth interface by downloading and using the appropriate application from the Android or IOS market for free.

Finally, the HDMOD-4's small size and metal case provides excellent electromagnetic shielding as well as great temperature dissipation and rigidity.

3.2 FEATURES

- High quality and performance
- Very clean RF spectrum
- MER value ~ 35dB
- RF output frequencies 174...862MHz
- H.264 HD encoder bitrate 1-19Mbps
- HDCP support
- Bluetooth interface
- Very small size
- External power supply

3.3 SETUP

3.3.1 App installation

The HDMOD-4 can be programmed on the field using the following 4 simple steps:

Step 1

Power up the HDMOD-4, connecting the external power supply. The HDMOD-4 will need 20-30secs to initialize and the status indicator will blink until the procedure is finished. After the status indicator remain constantly green, you will be able to connect to the HDMOD-4.

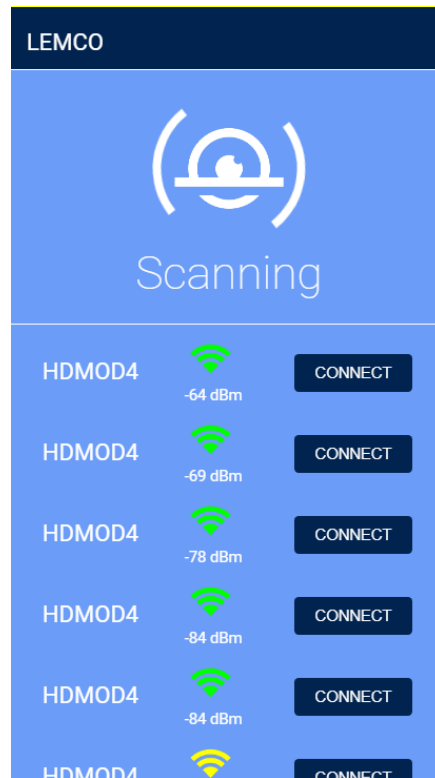
Step 2

Download the “Lemco” app from Google play or App Store:



Step 3

The app will scan for any available devices that are within range (Picture No1). The list that appears, shorts first the device closest to your phone or tablet. If your phone or tablet is moved closer to another device, that device will immediately move on top of the list. Choose the device that you want to connect with and press “Connect” and the status indicator will become red.



(Picture No1)

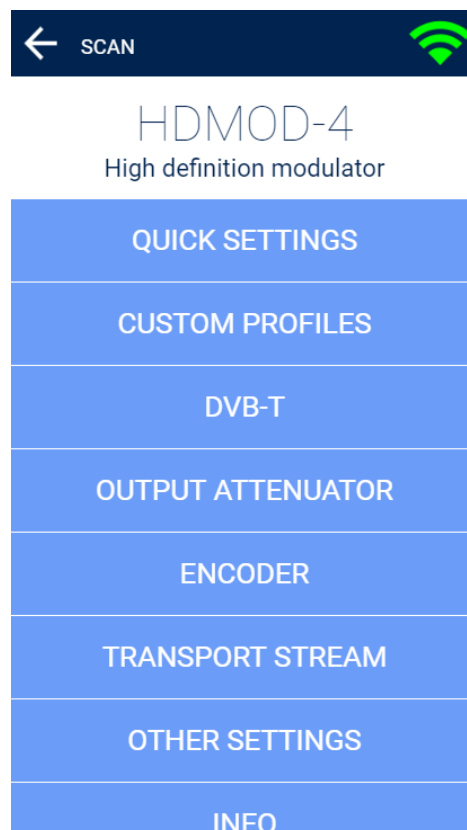
Step 4

To connect to a device you will need to enter the default PIN: 1234 (Picture No2)



3.3.2 Using the app

When the “Lemco” app will be initialized, the main screen will be displayed (Picture No3):



The main menu consists of the following options:

- Quick Settings
- Custom profiles
- DVB-T
- Output attenuator
- Encoder
- Transport Stream
- Other settings
- Info
- Help

3.3.2.1 Quick Settings

This menu provides the ability to program several modulators easily and quickly. All you need is to enter the following parameters:

- The output RF channel
- Set the output level by adjusting the modulator's attenuator
- Set the Profile No.

How the profile works

In an installation all the modulators (or Mux in general) need to have different values of the following fields to avoid conflict in the automated scan of the TV sets:

Program Name	Service ID	TS ID
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For that reason, the user must always select a unique Profile number in every modulator starting from Number #1.

E.g. If we want to install three modulators in a CATV network, in the profile option we will select:

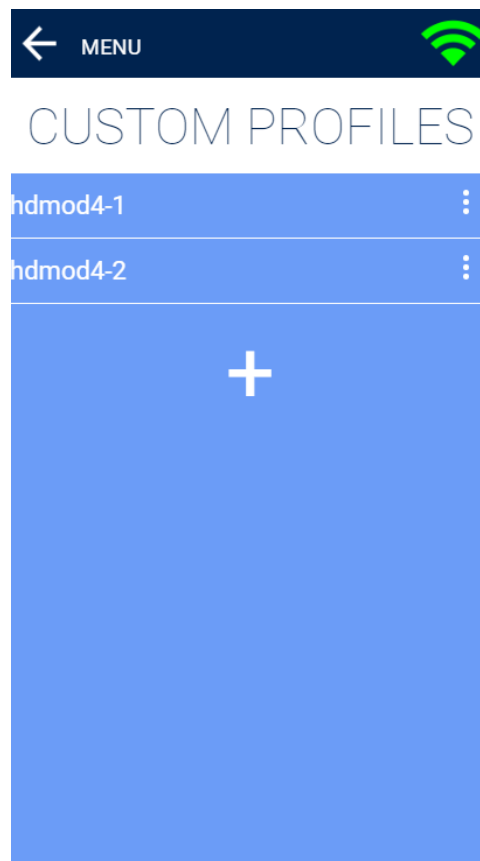
- Profile No **1** for the **1st** modulator
 - meaning: Program Name = DTV **1**
 - meaning: Service ID = **1**
 - meaning: TS ID = 224**0**
- Profile No **2** for the **2nd** modulator
 - meaning: Program Name = DTV **2**
 - meaning: Service ID = **2**
 - meaning: TS ID = 224**1**
 -
- Profile No **3** for the **3rd** modulator
 - meaning: Program Name = DTV **3**
 - meaning: Service ID = **3**
 - meaning: TS ID = 224**2**

As a result, all the above modulators have different values in the above fields.

3.3.2.2 Custom Profiles

The “Lemco” app provides the ability to create custom profiles under your custom name (Picture No4).

By clicking the “+” icon you are able to save the current configuration in your mobile device for future use. You are able to create as many customs profiles as you need, erase them or clone them.



(Picture No4)

3.3.2.3 DVB-T

In the “DVB-T” menu (Picture No5), “Lemco” app provides the ability to setup all the necessary DVB-T parameters according to the standards, as follows:

Channel: Select the desired output RF channel

Frequency: Select the output RF channel frequency

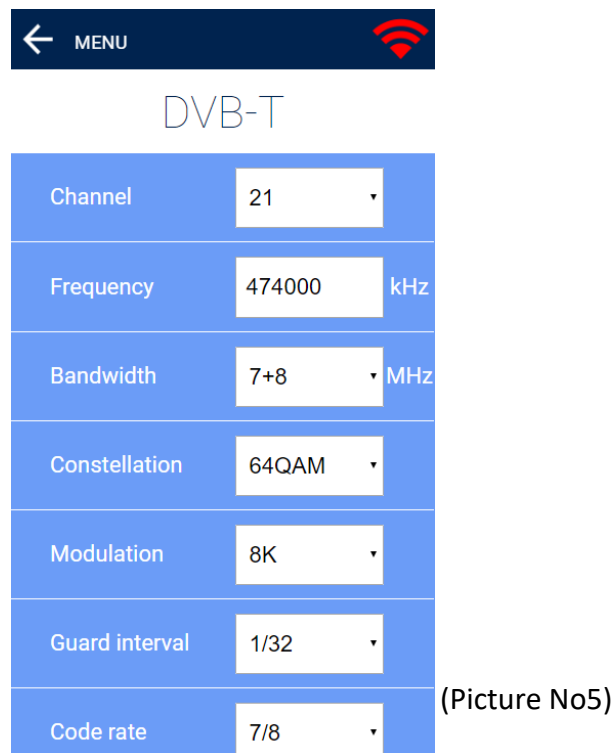
Bandwidth: Select the channel bandwidth

Constellation: Select the channel constellation

Modulation: Select the channel modulation mode

Guard interval: Select the guard interval

Code Rate: Select the desired code rate



← MENU

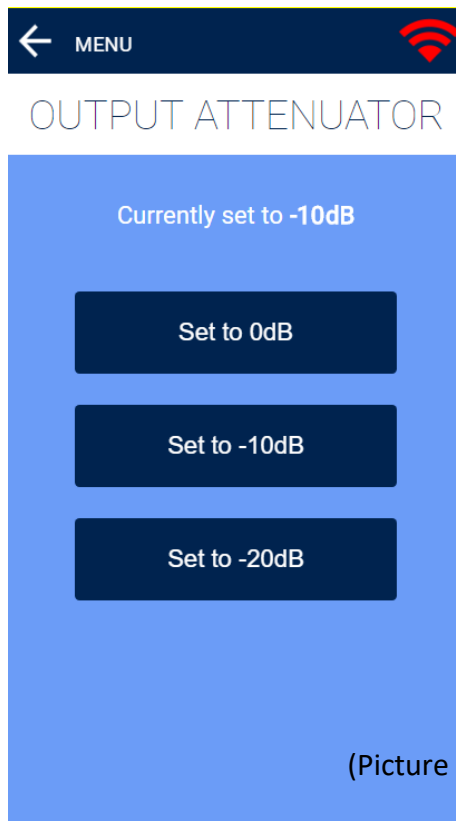
DVB-T

Channel	21	▼
Frequency	474000	kHz
Bandwidth	7+8	▼ MHz
Constellation	64QAM	▼
Modulation	8K	▼
Guard interval	1/32	▼
Code rate	7/8	▼

(Picture No5)

3.3.2.4 Output Attenuator

In the “Output attenuator” (Picture No6) menu, “Lemco” app provides the ability to increase/decrease the output level in steps of 10dB.



(Picture No6)

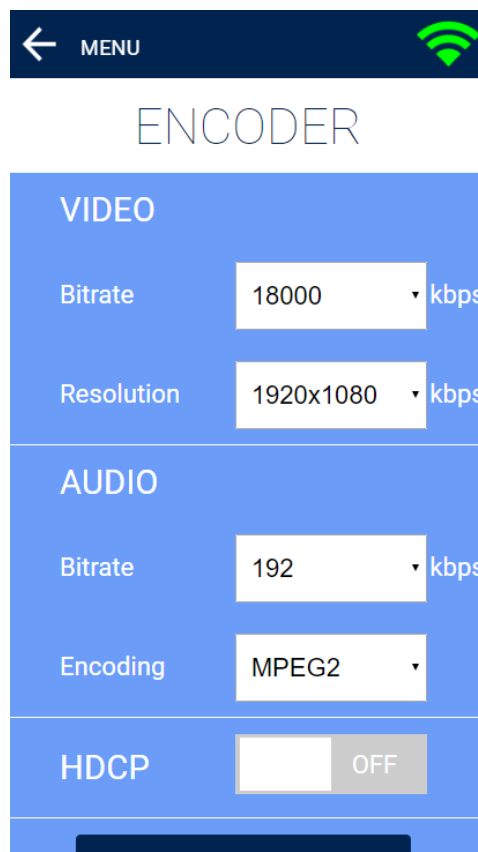
Set to 0dB: Set the output level to 90dB μ V

Set to -10dB: Set the output level to 80dB μ V

Set to -20dB: Set the output level to 70dB μ V

3.3.2.5 Encoder

“Lemco” app provides the ability to set manually all the encoder parameters (Picture No7).



(Picture No7)

Video Bitrate: Select the video bitrate of the encoder
Resolution: Select the output resolution of the modulator
Audio Bitrate: Select the audio bitrate of the encoder
Audio encoding: Select the audio encoding of the encoder
HDCP: Enable or disable the HDCP function

3.3.2.6 Transport Stream

“Lemco” app provides the ability to set manually all the TS parameters (Picture No8).

Network name: Set the network name
Network ID: Set the network ID
Original Network ID: Set the original network ID
Service name: Set the service name
Service ID: Set the service ID
Service provider: Set the service provider
TS ID: Set the TS ID
PMT ID: Set the PMT PID number
Video PID: Set the video PID number
LCN Enabled: Enable or disable the LCN function
LCN No: Set the LCN number
LCN Provider: Select the LCN provider

The image displays two side-by-side screenshots of the "TRANSPORT STREAM" configuration screen in the Lemco app. Both screens have a dark blue header with a back arrow, the word "MENU", and a Wi-Fi icon. The main content area is light blue and divided into two sections: "Network" and "Service".

Left Screenshot:

- Network Section:**
 - Name: Private
 - ID: 8492
 - Original ID: 8492
- Service Section:**
 - Name: DTV 1
 - ID: 1

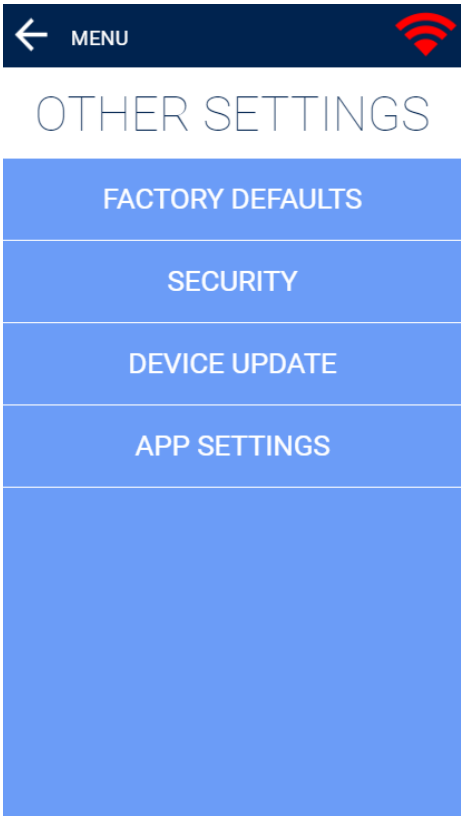
Right Screenshot:

- Network Section:**
 - Name: Private
 - ID: 8492
 - Original ID: 8492
- Service Section:**
 - Name: DTV 1
 - ID: 1

(Picture No8)

3.3.2.7 Other settings

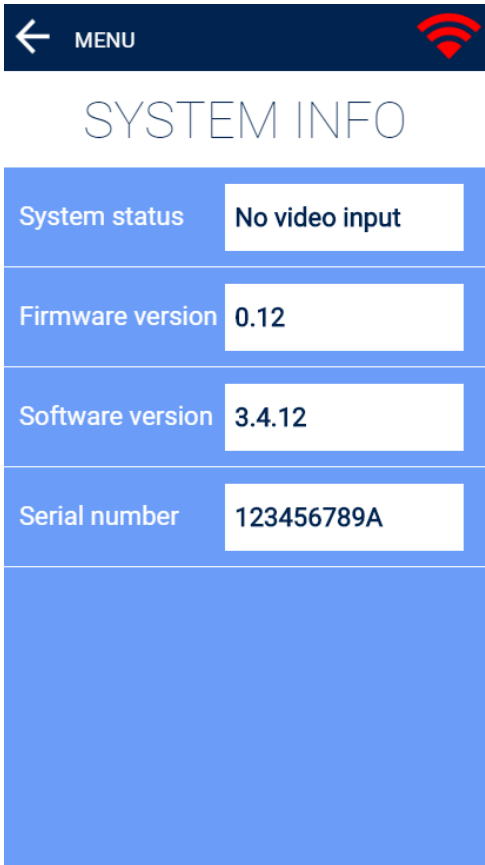
“Lemco” app provides the ability to change the PIN code, apply factory defaults, change the app language or update the device via the Bluetooth interface.
(Picture No9).



(Picture No9)

3.3.2.8 System Info

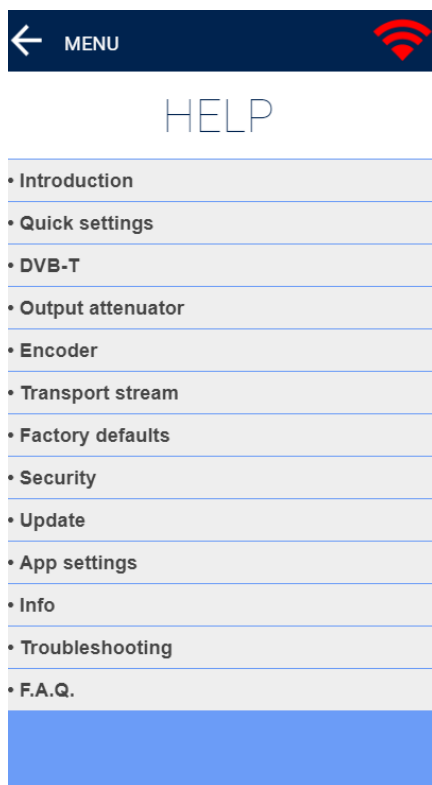
“Lemco” app, in the “System info” menu provides several details of the device.
(Picture No10).



(Picture No10)

3.3.2.9 Help

“Lemco” app, in the “Help” menu provides the device’s manual, as well as the FAQ and the troubleshooting guide (Picture No11).



(Picture No11)

4. TECHNICAL SPECIFICATIONS

Input

Type:	1 x HDMI
Connector:	1 x HDMI Type A
Video coding:	MPEG-4 AVC/H.264
Profile:	High profile 4.0
Resolution:	1920x1080-30p for HDMI PAL 720x576@25fps
HDCP support:	Yes
Audio:	HDMI & Mono/Stereo
Audio encoding:	MPEG2, ACC, AC3
Standard:	MPEG-1 Layer II
Audio Bit Rate:	64, 96, 128, 192, 256, 320, 384 kbps
Level:	0.5Vpp to 1.0Vpp adjustable

H.264 Encoder

Standard:	MPEG-4 AVC/H.264
Bit Rate:	1 – 19 Mb/s adjustable
Configurable parameters:	Service Name, Service ID, Video PID, Audio PID, PMT PID

Transport Stream Processing

Automatic regeneration:	NIT,PAT,CAT,SDT, PMTs, EITs tables
Configurable parameters:	TS ID, Original Network ID, Network ID,Provider Name
LCN support:	Yes
LCN Providers:	Nordig, ITC/UK, EICTA/Europe, New Zealand

DVB-T Output

Standard:	EN 300 744
Bandwidth:	5,6,7,8 MHz
Mode:	2K,8K
Constellation:	QPSK,16QAM, 64QAM
Guard interval:	1/4, 1/8, 1/16, 1/32
Code rate:	1/2, 2/3, 3/4, 5/6, 7/8

RF Output

Type:	RF DVB-T (COFDM)
Output frequencies:	470...862MHz
Output level:	90dbμV max.
Connector:	75Ω - F, female
Output attenuator:	0...25dB
MER:	35dB (Typical)
Shoulder attenuation:	>45dBc
Connectors:	1 x F - female

Programming interface

via Bluetooth

Requires version 4.0 and above

ETSI EN 300 328 and EN 300 440 Class 2 (Europe), FCC CFR47 Part 15 (US) and ARIB STD-T66 (Japan).

Platform support:

Android version 4.4.2 and above

iOS version: 9.3 or above

iPhone: 4S or newer

iPad: 3rd gen or newer

General

Power supply:

+12VDC

Power supply consumption:

290 mA max.

Operating temperature:

0 °C to 50 °C

Storage temperature:

-10 °C to +70 °C

Humidity:

Up to 90%

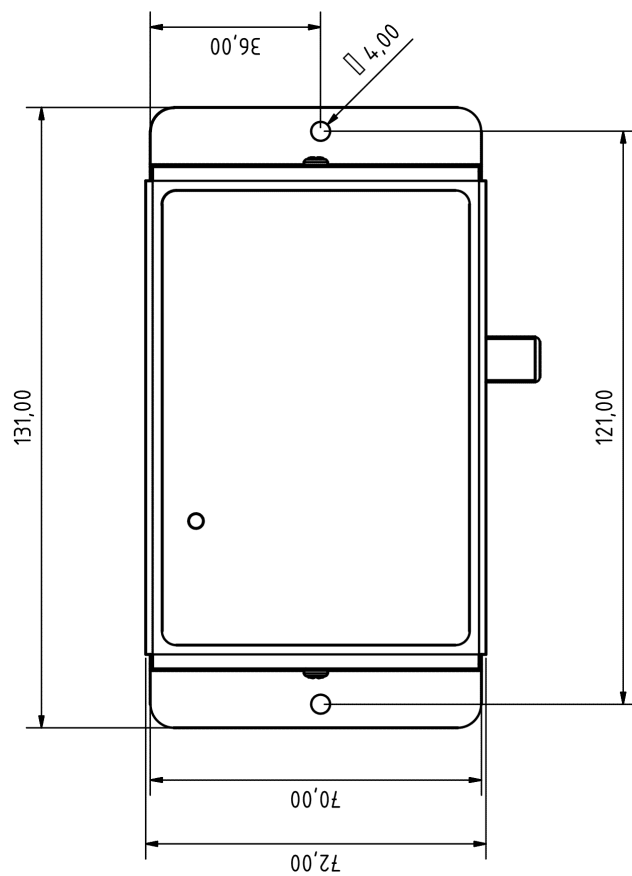
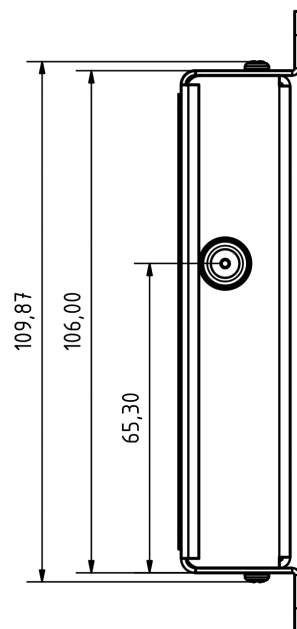
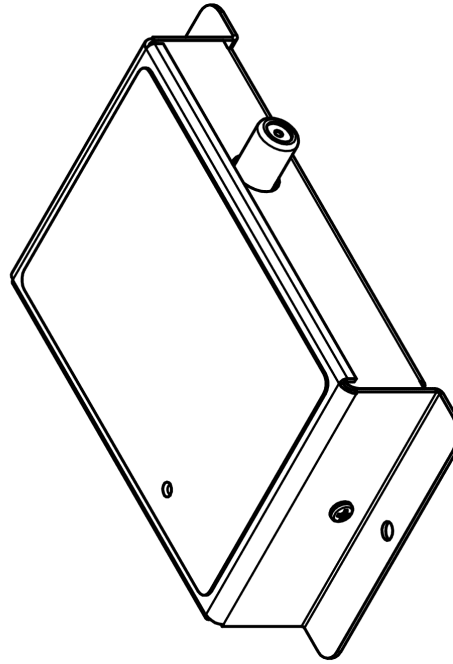
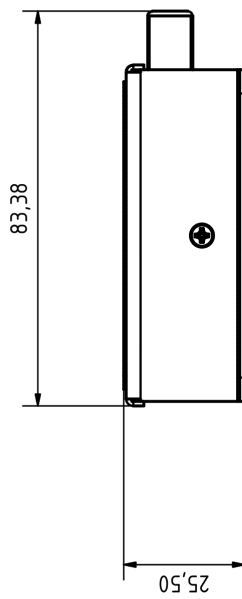
Dimensions:

131x72x25,50 mm

Weight:

0.14Kg

5. DIMENSIONS



*dimensions in mm

6. LEMCO LIMITED WARRANTY

This Lemco unit is guaranteed against defects in workmanship and materials for a period of five (5) years beginning on the date of purchase of the product. During the applicable warranty period, Lemco will repair or replace at our sole option, without charge, any defective component part of the purchased unit. The unit is to be delivered packed in adequate packing AFTER an authorization for return has been received.

The owner's responsibilities are to use the instrument in accordance with its written instructions, to provide transport to and from our facilities in the event service is required, and to provide proof of purchase if requested.

Our warranty does not cover any problem resulting from:

(a) accident; abuse; neglect; shock; electrostatic discharge; heat or humidity beyond product specifications; improper installation, operation, maintenance or modification

(b) any misuse contrary to the instructions in the user manual

(c) malfunctions caused by other equipment.

WARNING!!

Our limited warranty is considered void if a product is returned with removed, damaged or tampered labels or any alterations (including removal of any component or external cover) carried out by unauthorized personnel.

OUT OF WARRANTY SERVICING

We repair and service units of our production even once the warranty has expired, if this is economically the best solution to the customer.

The mechanical and electronic spare parts are replaceable for a five-year period after production when the circuits are assembled with discrete components. When integrated circuits are used, the supply of spare parts is guaranteed up to the depletion of our stock and, depending on the possibility of procuring them on the worldwide market.

To avoid any unnecessary loss of time, it is very important that the instrument be returned to our premises accompanied by a proper delivery note, duly completed with all the required information, as per the legal dispositions currently enforced.

7. WARNINGS

Content warning

This document contains preliminary information about a product of Lemco company. Lemco reserves the right to make any changes or modifications at any time without prior notice.

APPENDIX B

DVB-T bitrates(Mbit/s) for **8 MHz** bandwidth (non-hierarchical systems)

Modulation	Coding Rate	Guard Interval			
		1/4	1/8	1/16	1/32
QPSK	1/2	4.976	5.529	5.855	6.032
	2/3	6.635	7.373	7.806	8.043
	3/4	7.465	8.294	8.782	9.048
	5/6	8.294	9.216	9.758	10.053
	7/8	8.709	9.676	10.246	10.556
16-QAM	1/2	9.953	11.059	11.709	12.064
	2/3	13.271	14.745	15.612	16.086
	3/4	14.929	16.588	17.564	18.096
	5/6	16.588	18.431	19.516	20.107
	7/8	17.418	19.353	20.491	21.112
64-QAM	1/2	14.929	16.588	17.564	18.096
	2/3	19.906	22.118	23.419	24.128
	3/4	22.394	24.882	26.346	27.144
	5/6	24.882	27.647	29.273	30.160
	7/8	26.126	29.029	30.737	31.668

8. NOTES

[illegible]



Contact Information

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