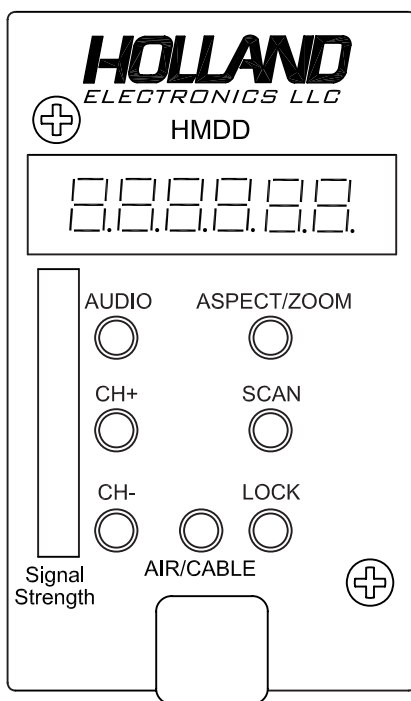




INSTALLATION MANUAL

Model: HMDD

ATSC/QAM Digital Mini Demodulator



PACKAGE CONTENTS

This package contains:

- One HMDD ATSC/QAM Mini Demodulator
- One HMDD Installation Manual

PRODUCT DESCRIPTION

The HMDD is an ATSC/QAM professional grade mini demodulator designed for cost effective digital-to-analog conversion of an unencrypted 8VSB (Off-Air SD/HD TV signal) or QAM unencrypted (digital CATV) RF signal to baseband NTSC video and left and right stereo audio outputs. All of the 18 ATSC video formats including HD format can be received by the HMDD and then converted for display on non-digital TV sets over analog channels with the use of a modulator.

SPECIFICATIONS

RF	
1. Input frequency range	54 – 860MHz
2. Channels	2-13 (VHF) 14-69 (UHF)
3. 8VSB input channel bandwidth	6 MHz
4. Data rate	19.392 Mbps.
5. Noise figure	< 8dB
6. QAM input frequency range	CATV 2-135
7. QAM data rate	27 Mbps
8. QAM 256 data rate	38 Mbps
9. Input level range	-7 dBm to -80 dBm
10. Adjacent channel rejection	60dB
11. Image rejection	40dB
12. Demodulation mode	8VSB, 8VSB MP @ ML
13. Symbol clock frequency	10.762 MHz
14. Input connector	75 ohm F-female
GENERAL	
1. Video output (analog)	
Frequency response	30Hz to 4.2MHz, +/-1.5dB
Video output level	1 Vp-p +/- 0.2Vp-p
Impedance	75ohms
Connector type	RCA
2. Audio L/R outputs	
Impedance	600 ohms.
Level	1 Vp-p +/- 0.2Vp-p
Frequency response	30Hz to 20kHz, +/-2dB
Distortion	1% max
Connector	RCA
3. Power	
Power Consumption	DC5V/850mA + DC12V/150mA
Dimensions	219 x 88 x 53mm

INSTALLATION AND OPERATION

1. UNPACKING and HANDLING

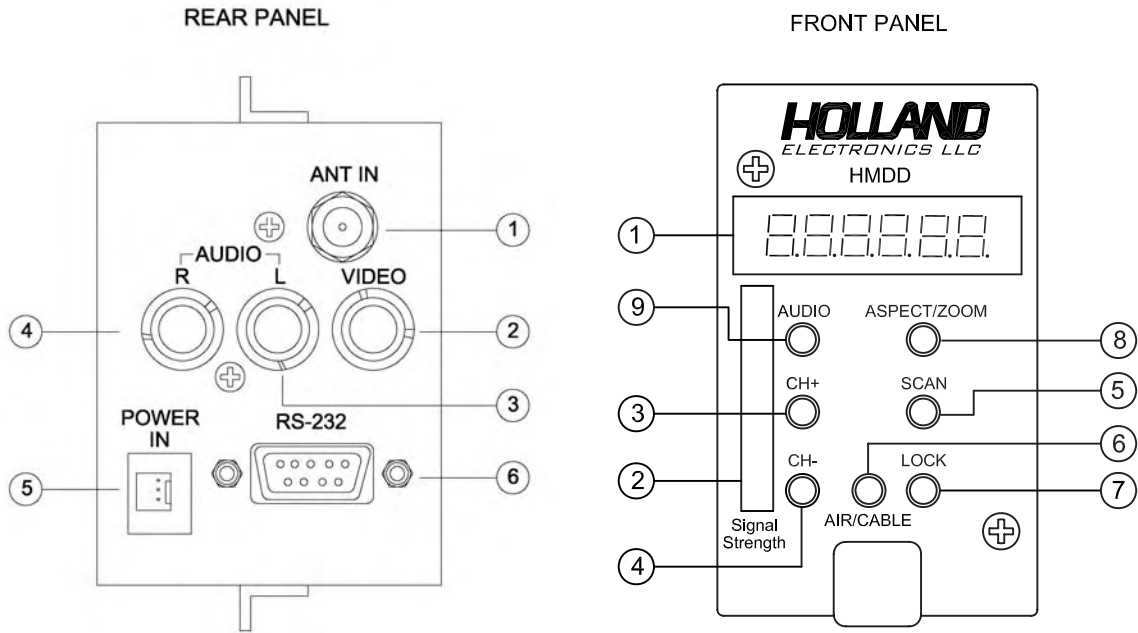
Each unit is shipped assembled and factory tested.

Ensure that all accessories are removed from the container before discarding packing material

2. MECHANICAL INSPECTION

Inspect the front and rear of the equipment for shipping damage. Make sure the equipment is clean, and no connectors are broken, damaged, or loose.

4. PRODUCT CONTROLS and CONNECTIONS



REAR PANEL

- 1 Antenna Input for Off-Air or CATV (F connector)
- 2 Video Output (RCA connector)
- 3 Audio Left Output (RCA connector)
- 4 Audio Right Output (RCA connector)
- 5 Power In Connector
- 6 RS-232 Input (For Future Use)

FRONT PANEL

- 1 Message and Channel Display
- 2 Signal Strength Indicator
- 3 CH+ Channel up button
- 4 CH- Channel down button
- 5 Scan button (searches for digital RF input signals)
- 6 AIR/CABLE button selects OFF-AIR (8VSB) or CABLE (QAM)
- 7 LOCK LED indicate signal/channel locked
- 8 ASPECT/ZOOM button (user selectable screen format for 4:3/16:9 letterbox, full, zoom, or center)
- 9 AUDIO button (select between English and SAP)

5. HARDWARE CONNECTIONS

a. The HMDD is designed for installation in a chassis designed for mini demodulators. Mini demodulator chassis such as the HOLLAND HMR can be mounted in standard 19" EIA racks.

b. The HOLLAND HMR 12-unit rack chassis and HOLLAND HMPS single 12-unit power supply should be used with the HMDD. Up to 5 HMDDs can be configured into a single HMPS with the HMR's stabilizer bar in place or 6 HMDDs with the stabilizer bar removed. Some chassis and power supplies from other vendors and distributors may also be used, but actual configurations will vary by vendor. Contact your distributor for more information.

c. When configuring the HMDD in the chassis and power supply it is critical that the power harness being used is from the same vendor as the power supply, and is designed for that specific supply. Power supply harnesses among vendors are not interchangeable and can severely damage the HMDD.

d. The use of a surge protector and a UPS is highly recommended. Product warranty does not cover surge or spike damages.

e. Connect a 75-ohm coaxial cable with proper connectors from the **HMDD Antenna Input Port** to the Off-Air antenna or other cable source.

f. For mono audio output connect an audio patch cable with RCA male connectors on both ends between the **HMDD Audio LEFT (White) output port** to the **modulator's audio input port**. For output to a stereo modulator use patch cables from the **HMDD Audio LEFT (White) and Audio RIGHT (Red) Output ports**.

g. Connect a coaxial cable using an RCA male connector to the **HMDD Video Output PORT** and a male F-connector to the **modulator's video input port**.

h. Note you will require 1 HMDD for each channel or subcarrier to be converted and demodulated. You will also require 1 modulator for each channel to be remodulated.

i. Connect the HMDD to the power harness and power supply installed in the mini demodulator chassis.

6. SETTINGS

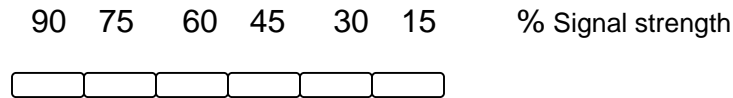
a. Confirm the HMDD is powered on and the input signal cable is connected to the antenna input port on the rear of the HMDD.

b. Select input signal type, Off-Air (8VSB) or Cable (QAM) using the HMDD **Air/Cable Selection Button**.

c. Press the **HMDD SCAN button**. The HMDD will initiate a channel scan for available signals/channels in the given area. **“SEARCH”** will appear in the **HMDD Display**. The scan process can take several minutes. You should know what channels are available in that area so you can determine which of those signals needs to be converted and demodulated.

d. When the channel scan is complete one of the found channels numbers will be shown in the **HMDD Display**. The HMDD may find multiple channels. Use the **CH+** and **CH-** **Buttons** to scroll through the available channels until you find the desired channel to be converted and demodulated. The **HMDD Lock LED** will light up indicating a channel has been found and selected.

e. The desired channel should have sufficient signal strength to produce a quality image. Use the **HMDD Signal Strength Meter**. Each segment on the meter represents 15% signal strength ranging from 15% or less for the bottom (red) bar up to 90% or greater for the top and last bar.



f. The HMDD includes an alternate **Audio** function (SAP) which allows the user to select from English or Spanish audio content (if available). To select English audio press the **Audio** button on the HMDD until the display reads **Lang1**. To select Spanish audio press the **Audio** button on the HMDD until the display reads **Lang2**.

Note: Some broadcasters do not default the SAP audio back to English audio if the program being broadcast does not support SAP. When a program does not support SAP but the HMDD is set to **Lang2**, there will be no audio outputted of the HMDD. This is a function of the broadcasters transmission and in no way means the HMDD is defective.

g. The HMDD also includes a **Aspect/Zoom** feature that allows the selected channel picture to be displayed either as 4:3 Full, Letterbox, Center, and Zoom for standard screen display or 16:9 Letterbox, Center, and Zoom for widescreen display. You may use the **HMDD Aspect/Zoom Button** to select the desired screen format to be displayed on the television. However, the Zoom feature is channel dependent. Further, as the Zoom setting could be considered a viewer preference it may be advisable leave the setting in the default position. Note: The available aspect ratio may be channel and program dependent making selection impossible. Selected aspect ratio and format will be shown on the **HMDD Display**.

h. Six samples of “8” format display as below:

- | | |
|---------------|---------------|
| 1. [Air] | 2. [Cable] |
| 3. [Search] | 4. [NoSig] |
| 5. [A 69.1] | 6. [130.556] |

7. TROUBLESHOOTING

- a. Ensure you are using quality multiple shielded cables to prevent signal ingress.
- b. Ensure the cables center conductors are making solid contact with the HMDD **Antenna Input, Audio Output, and Video Output port.**
- c. If the HMDD is receiving power but no signal, make sure the video cable is securely connected between the HMDD and the video source, and the video and/or audio cables are securely connected between the HMDD and the modulator.
- d. If the HMDD is not receiving power make sure the power cable is firmly connected. Be sure the power source is properly rated to handle the HMDD load especially if other equipment is being powered by that same source.

HOLLAND ELECTRONICS LLC LIMITED WARRANTY

Holland ELECTRONICS LLC, warrants that the product enclosed with this Limited Warranty statement will conform to the manufacturer's specifications and be free of defects in the workmanship and material for a period of five years (5) from the date of original purchase.

WARRANTY PROCEDURE:

If the product appears to be defective contact Holland Electronics LLC at (805) 339-9060. We will analyze the problem and offer solutions to prevent removing the unit from service. If the unit is to be returned for evaluation, you will be issued a Return Material Authorization (RMA) number.

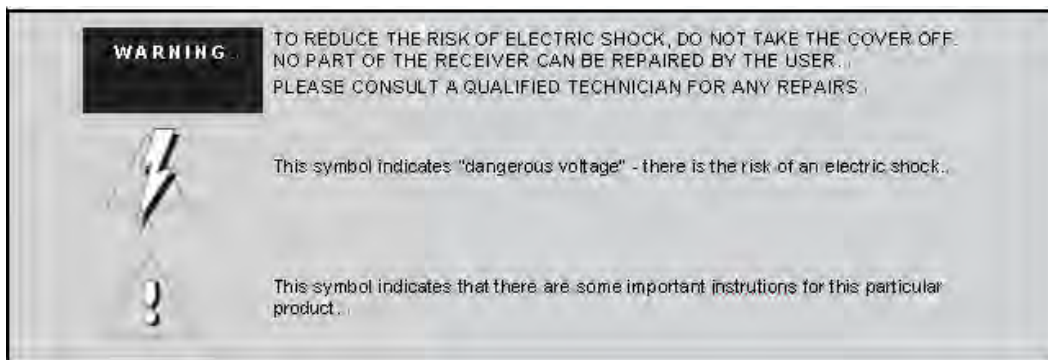
Holland Electronics LLC will, at its option, repair or replace the defective unit, under warranty, without charge for parts or labor. This repair will be subject to charges if signs of tampering or misuse are detected. Incoming shipping costs will be the customer's responsibility. Returns will not be accepted without an RMA number.

The warranty and remedy provided above are exclusive and in lieu of all other express warranties and unless stated herein, any statements or representations made by any other person or firm are void. The duration of any implied warranties of merchantability or fitness for a particular purpose on this product shall be limited to the duration of the express warranty set fourth above. Except as provided in this written warranty, Holland Electronics LLC shall not be liable for any loss, inconvenience, or damage, including direct, special, incidental, or consequential damages, resulting from the use or inability to use this product, whether resulting from breach of warranty or any other legal theory.

Some states do not allow limitations on how long an implied warranty lasts and some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation and exclusion may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

To arrange for Warranty Service: Call Holland Electronics LLC (805) 339-9060



Caution: These servicing instructions are for use by qualified service personnel only. To reduce the risks of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.