MUL-HDENC-C-100-NA
High Definition Digital Encoder
User Manual

Multicom, Inc.
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www.multicominc.com
April 2019 (Version 1p)

Safety Precautions

The presence of this symbol is to alert the installer and user to the presence of uninsulated potentially dangerous voltages within the product's enclosure that may be of sufficient magnitude to produce a risk of electric shock.

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS DEVICE TO RAIN OR MOISTURE. DO NOT OPEN THE UNIT. REFER SERVICING TO QUALIFIED AUTHORIZED PERSONNEL ONLY.

- DO NOT terminate, change or uninstall any wiring without first disconnecting the unit's power adapter from the device.
- This device is supplied with the appropriately rated power supply. The use of any other power supply could cause damage and invalidate the manufacturer's warranty.
- DO NOT connect the power cord to the device if the power cord or unit is damaged.
- DO NOT cut the power cord.
- DO NOT plug the power cord into an AC outlet until all cables and connections to the device have been properly connected.
- The device should be installed in an environment consistent with its operating temperature specifications. Placement next to heating devices and ducts is to be avoided as doing so may cause damage. The device should not be placed in areas of high humidity.
- DO NOT cover any of the device's ventilation openings.
- If the device has been in a cold environment allow it to warm to room temperature for at least 2 hours before connecting to an AC outlet.

IMPORTANT
- ALWAYS remove any network/ethernet connection from the HD Encoder after configuring it to insure its security and highest performance
- Use high quality cables and connectors and insure all connections are tight
- Test the coaxial cable RF output at the TV to insure the levels are well within the TV input range
- Use Google Chrome, Microsoft Edge, or Mozilla Firefox as the web browser when configuring the HD Encoder. Google Chrome is preferred.
- During the web browser Admin Reboot process, use a new Google Chrome "Incognito Window" to eliminate caching-related confusion and issues.
- **The factory Default is for J.83B RF output. If ATSC output is desired (example: for LATAM installation) then the RF Setup Menu > Channel Type must be changed to ATSC, etc.**

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1.0 HD Encoder Introduction

The Multicom MUL-HDENC-C-100-NA is a High Definition Agile Digital Encoder/Modulator for North America (USA and Canada) used to convert a single unencrypted HDMI input of up to 1080i/1080p into a J.83B QAM 64/QAM 256 RF or ATSC (8VSB) output. The Multicom MUL-HDENC-C-100-NA is feature rich, very flexible, powerful, user friendly, and is easy to use for both Residential and Commercial applications. The high quality HD performance allows action packed movies and sports channels on any HDTV.

FRONT VIEW:

REAR VIEW:

(800) 423-2594
(407) 331-7779
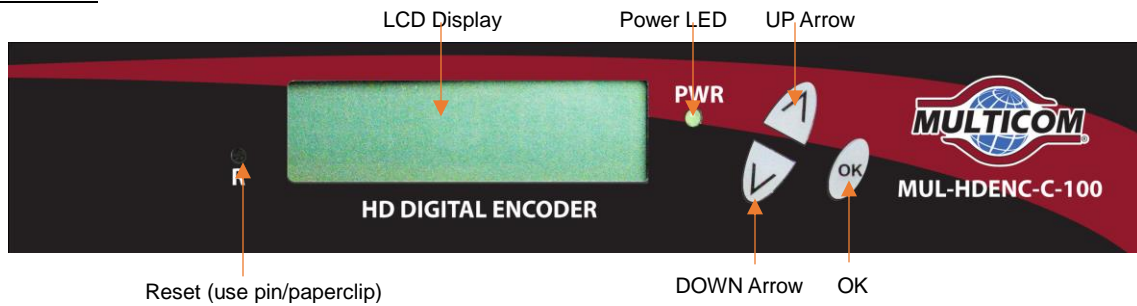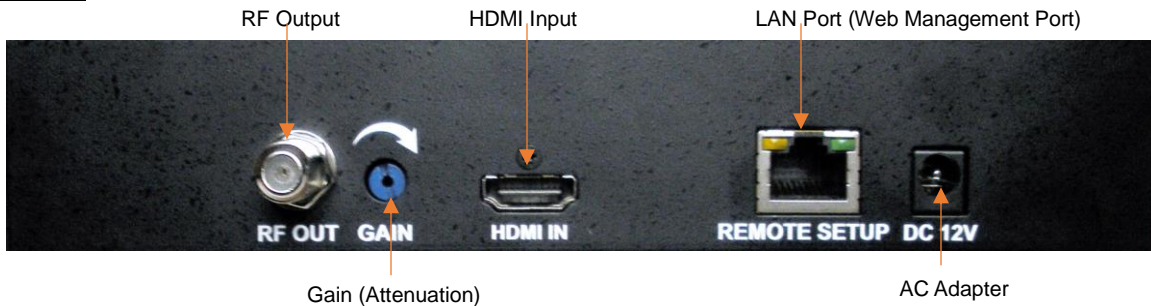
2.0 Specifications

Video / Audio Input	
HDMI 1.4	
Connectors	Single
Audio	Embedded PCM

Output	
QAM	
Standard	**J.83 Annex B** **ATSC-8VSB**
Connector	1 x "F" Female
RF Mode	Normal / Inverted
Channel Type	J.83B: STD / HRC / IRC; ATSC-8VSB
Frequency Range	**J.83 Annex B**: 57 – 861 MHz (Ch2 – Ch135) **ATSC-8VSB**: 57-803 MHz (Ch2 to CH69)
Interleaver	I=128, J=1
Output Level	38 dBmV Typical (With 20dB Range Manually Adjustable)
Flatness Across Full Band	± 2dB Typical
MER	39 dB Typical
Constellation (Output Bitrate)	**J.83 Annex B:** 64-QAM (26.970Mbps) / 256-QAM (38.810Mbps) **ATSC-8VSB:** 8VSB (19.390Mbps)
Output Impedance	75 ohm
RF Output Return Loss	10 dB Typical
VCN	Auto (Major & Minor) / Manual (Major & Minor) / Manual (One Part)

Video / Audio Encoding Profile	
Video	
Video Codecs	MPEG-2 VBR
Bitrate (Adjustable)	**J.83 Annex B:** HD: 12.0 – 24.0 Mbps SD: 1.0 – 9.0 Mbps **ATSC-8VSB:** HD: 12.0 - 18.0 Mbps SD: 1.0 – 9.0 Mbps
Resolution Output	Same as input except: 1080p60 in, 1080p30 out 1080p50 in, 1080p25 out 1080p30 in, 1080p30 out 1080i60 in, 1080p30 out 1080i50 in, 1080p25 out 1080i30 in, 1080p30 out
Audio	
Audio Codecs	MPEG1 Layer II / MPEG4 AAC

General	
Local Monitoring	LCD
Web GUI Supported	Firefox, Chrome, Safari, Edge
Password Protected	GUI: User Settable
Power Supply	12 VDC 1.5A
Consumption	5 Watts
Operational Temperature	0c - +55c
Storage Temperature	-20c - +70c
Dimensions	188mm x 130mm x 37.2mm
Weight	0.95 kg
Language	English

*Subject to change without notification

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3.0 HD Encoder Programming/Setup

To setup and program the MULTICOM HD Digital Encoder you can use either the device's LCD Front Panel and buttons or the Web Interface. The programming of the settings is easiest by using the Web Interface in Section 3.3.

3.1 Using the HD Encoder Front Panel:

Press UP/DOWN ARROW buttons to scroll through the display information.
➢ Main Menu: **Input information and Output Name** >> Short and long name, Bitrate
➢ Main Menu: **VCN information** >> VCN, Channel, and Frequency
➢ Main Menu: **Management IP** >> IP Address

3.2 Using the HD Encoder Front Panel for Setup:

When the unit is powered up it will first go through an internal booting and short self-test and then be ready for operation or initial setup. **The factory Default is for J.83B:STD output. If ATSC RF output is desired (example: for Mexico installation) then the RF Setup Menu > Channel Type must be changed to ATSC, etc.**

Press "OK" Button to enter the setup MAIN MENU system.
The front panel LCD password is: 0000

Enter the password by adjusting each digit by using the UP/DOWN ARROW buttons – then press "OK" when the digit is correct. Press "OK" to enter Main Menu. For security purposes the HD Encoder will timeout and return to a password protected mode if no buttons are pressed for about 10 seconds.

FRONT PANEL:
Login:
➢ Press "OK" button

Enter Password
➢ Use UP/DOWN arrows to change digit, Press OK to set it and go to next until all 4 digits are entered – the unit will now be in setup MAIN MENU. Pressing the UP/DOWN ARROWS will scroll through the menus/settings. Pressing the OK will select/execute the Menu Item or Setting.

Press UP/DOWN ARROW to scroll through **MAIN MENU** and use **OK** to select a Menu:
➢ Main Menu: **RF Setup**
➢ Main Menu: **Encoder Setup**
➢ Main Menu: **Network Setup**
➢ Main Menu: **Change Password**
➢ Main Menu: **Reset to Default**
➢ Main Menu: **Exit**

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#1. Press UP ARROW to scroll through **RF SETUP** MENU:
- RF Setup Menu: **Channel**   Factory Default: J.83B:STD: CH 2➔ Range 2 - 135
- RF Setup Menu: **TSID**   Factory Default: 1
- RF Setup Menu: **Regional Name**   Factory Default: USA
- RF Setup Menu: **RF**   Factory Default: Normal
- RF Setup Menu: **Channel Type**   Factory Default: J.83B:STD   ➔ATSC or J.83B
- RF Setup Menu: **Constellation**   Factory Default: 256 QAM
- RF Setup Menu: **Exit**

#2. Press UP ARROW to scroll through **ENCODER SETUP** MENU:
- Encoder Setup Menu: **VCN**   Factory Default: 2.1
- Encoder Setup Menu: **VCN Mode**   Factory Default: Auto(two-part)   ➔ **VCN Notes below**
- Encoder Setup Menu: **Short Name**   Factory Default: DTV1   ➔ Up to 7 Char
- Encoder Setup Menu: **Long Name**   Factory Default: ATSC-DTV1   ➔ Up to 16 Char
- Encoder Setup Menu: **HD Bitrate**   Factory Default: 18Mbps   ➔ Range 12 – 24 Mbps
- Encoder Setup Menu: **SD Bitrate**   Factory Default: 4Mbps   ➔ Range 1 – 9 Mbps
- Encoder Setup Menu: **ProgramNumber**Factory Default: 101   ➔ Range 1 - 65534
- Encoder Setup Menu: **Audio Output**   Factory Default: MPEG1 Layer 2 ➔ Or MPEG4 AAC
- Encoder Setup Menu: **Source ID**   Factory Default: 101   ➔ Range 1 - 65535
- Encoder Setup Menu: **Exit**

#3. Press UP ARROW to scroll through **NETWORK SETUP** MENU:
- Network Setup Menu: **Host Name**   Factory Default: HDENC-271616
- Network Setup Menu: **IP Setup**   Factory Default: DHCP Disable   ➔ Enable
- Factory Default: IP Address: 192.168.1.9
- Factory Default: Subnet Mask: 255.255.255.0
- Factory Default: Default Gateway: 000.000.000.000
- Network Setup Menu: **Exit**

Note that the HD Encoder will reboot after using the **NETWORK SETUP** MENU.

#4. Press UP ARROW to **MAIN MENU: CHANGE PASSWORD**

#5. Press UP ARROW to **MAIN MENU: RESET TO DEFAULT**

Note that the HD Encoder will reboot after using the **RESET TO DEFAULT** MENU.

#6. Press UP ARROW to **MAIN MENU: EXIT**

After Selecting the desired Menu – Change Parameter Settings
- Use UP/DOWN arrows to move and select the desired parameter, Press OK to start editing the parameter using the UP/DOWN arrows. After changing the setting, pressing the OK will set the parameter.

3.2.1 VCN RELATED NOTES:

VCN is the Channel number to be shown by the TV. The VCN Modes which will be available depend on whether the output is selected as J.83B or as ATSC.

VCN Mode: Auto (two-part) - VCN will be set based on the Channel output selected in "RF Output Menu: RF".

Example: Output Channel set to 2. VCN for device will be set at 2.1
This is automatically set by the CH output set in the RF Setup section.

VCN Mode (Manual two-part) - VCN Manual 2-part- will allow the installer to control VCN channel regardless of the CH/freq. selected on the RF Output Setup page of the device.

Examples:
RF CH   VCN Channel
57   55.1
101   101.2

VCN Mode: Manual (one-part) - Use 'VCN (one part) Menu' to set VCN channel.
Example: VCN can be set to a range 1-999.

VCN Mode (Manual one-part) -VCN Manual 1-part- will allow the installer to control VCN channel regardless of the CH/freq. selected on the Output Setup page of the device.
Examples:
RF CH   VCN Channel
57   2
101   105
134   133

3.3 Using the HD Encoder Web Interface:

3.3.1 Overview of the Process

Product Factory Default IP: 192.168.1.9 and with DHCP - Disabled

1. Connect an Ethernet cable directly (**no Cross Over cable required**) to the Web Management Port on the rear panel of the HD Digital Encoder or connect the device's Ethernet cable to an Ethernet switch. Connect Ethernet Cable to your PC/Laptop.
2. Modify your PC/Laptop IP address to static address 192.168.1.10
3. Enter '192.168.1.9' into your web browser to access the Web Interface of the HD Encoder.
4. Enter the Web Interface and make any required device changes.
5. Save all changes as required and then reboot the device.
6. Verify parameters have changed and then end your web session.

As an alternative, the HD ENCODER static IP Address may be configured (or DHCP enabled) on the front panel and then the Web Browser can be used for all other configuration changes by using the IP Address which will be displayed on the LCD. BE VERY CAREFUL WHEN USING THE DEFAULT IP ADDRESS AND CONNECTING TO AN EXISTING NETWORK – THERE MAY BE CONFLICT WITH EXISTING INSTALLED HARDWARE – THIS MUST ALWAYS BE AVOIDED.

3.3.2 Configuring

- Use Google Chrome, Microsoft Edge, or Mozilla Firefox as the web browser when configuring the HD Encoder. Google Chrome is preferred.
- During the web browser Admin Reboot process, use a new Google Chrome "Incognito Window" to eliminate caching-related confusion and issues.

Step 1: Login
Use the PC web browser - type in the IP Address

Step 2: Web Interface Login and Password:
Default User Name: **admin**
Default Password: **Admin123**

IMPORTANT NOTE: Save all changes before leaving each setup page

Step 3: Overview Tab

View the current settings, MAC address, Firmware version, etc.

The other tabs (Encoder Setup, RF Output Setup, Network Setup, and Administration) are used to change the HD Encoder settings and operating parameters.

HD ENCODER

| ATSC / QAM HD Digital Encoder | Overview | Encoder Setup | RF Output Setup | Network Setup | Administration |

Device Name	Model Number	ID Number	MAC Address	Firmware Version	Net Version
HDENC-271616	HD Encoder	1850 271616	F8:0D:EA:84:25:00	20190326_1630	1.0.31

RF Output 1
- 2.1
- Unused

RF Output	Channel	Constellation	Output Bitrate	Channel Name	Video Source	Video Output	Audio Output	Video Bitrate	Status
1	2 (57.0 MHz)	256 QAM	38.810 Mbps	DTV1	HDMI	MPEG-2 VBR	MP2	18.000 Mbps	HD

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It is HIGHLY recommended that after all other tabs have been configured that the HD Encoder be rebooted using the REBOOT button on the ADMINISTRATION tab.

Step 4: Encoder Setup Tab

Select the **Encoder Setup tab** to program desired parameters such as VCN settings, Bitrates, and more. Save changes

The **ENCODER SETUP** MENU:

➢ Encoder Setup Menu: **VCN** Factory Default: 2.1
➢ Encoder Setup Menu: **VCN Mode** Factory Default: Auto(two-part) ➔ **VCN Notes below**
➢ Encoder Setup Menu: **Short Name** Factory Default: DTV1 ➔ Up to 7 Char
➢ Encoder Setup Menu: **Long Name** Factory Default: ATSC-DTV1 ➔ Up to 16 Char
➢ Encoder Setup Menu: **HD Bitrate** Factory Default: 12Mbps ➔ Range 12 – 24 Mbps
➢ Encoder Setup Menu: **SD Bitrate** Factory Default: 4Mbps ➔ Range 1 – 9 Mbps
➢ Encoder Setup Menu: **ProgramNumber** Factory Default: 101 ➔ Range 1 - 65534
➢ Encoder Setup Menu: **Audio Output** Factory Default: MPEG1 Layer 2 ➔ Or MPEG4 AAC
➢ Encoder Setup Menu: **Source ID** Factory Default: 101 ➔ Range 1 - 65535

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VCN RELATED NOTES:

VCN is the Channel number to be shown by the TV. The VCN Modes which will be available depend on whether the output is selected as J.83B QAM or as ATSC.

VCN Mode: Auto (two-part) - VCN will be set based on the Channel output selected in "RF Output Menu: RF".

Example: Output Channel set to 2. VCN for device will be set at 2.1
This is automatically set by the CH output set in the RF Setup section.

VCN Mode (Manual two-part) - VCN Manual 2-part- will allow the installer to control VCN channel regardless of the CH/freq. selected on the RF Output Setup page of the device.
Examples:

RF CH	VCN Channel
57	55.1
101	101.2

VCN Mode: Manual (one-part) - Use 'VCN (one part) Menu' to set VCN channel.
Example: VCN can be set to a range 1-999.

VCN Mode (Manual one-part) -VCN Manual 1-part- will allow the installer to control VCN channel regardless of the CH/freq. selected on the Output Setup page of the device.
Examples:

RF CH	VCN Channel
57	2
101	105
134	133

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Step 5: RF Output Setup Tab

Select any desired changes, including type of RF output: J.83B or ATSC.
Save any changes made.

HD ENCODER

| ATSC / QAM HD Digital Encoder | Overview | Encoder Setup | RF Output Setup | Network Setup | Administration |

RF Output Setup

This page allows the user to configure the RF settings. Enter/Select the required settings for each RF Channel. Use the `Save and Confirm` button to save any changes made.

TSID	Regional Name	RF	Channel Type	CH/freq.	BW MHz	Constellation	Interleaver	Bit Rate Mbps
1	USA	Normal ▾	J.83B: STD ▾	2 (57.0000 MHz) ▾	6	256 QAM ▾	I=128,J=1	18.000/ 38.810

[Save and Confirm] [Reset]

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The **RF SETUP** MENU:

➢ RF Setup Menu: **TSID**   Factory Default: 1
➢ RF Setup Menu: **Regional Name**   Factory Default: USA
➢ RF Setup Menu: **RF**   Factory Default: Normal   ➔ Or Inverted
➢ RF Setup Menu: **Channel Type**   Factory Default: J.83B:STD   ➔ATSC or J.83B
➢ RF Setup Menu: **CH/Freq.**   Factory Default: J.83B:STD: CH2➔ Range 2 - 135
➢ RF Setup Menu: **Constellation**   Factory Default: 256 QAM

Step 6: Network Setup Tab

Set the IP Address, select static or dynamic IP (DHCP), etc.
Save changes.

HD ENCODER

| ATSC / QAM HD Digital Encoder | Overview | Encoder Setup | RF Output Setup | Network Setup | Administration |

Network Setup

This page allows the user to configure the device's network settings.

Hostname	HDENC-271616
MAC Address	F8:0D:EA:84:25:00
DHCP	☐
IP Address	192.168.1.9
Subnet Mask	255.255.255.0
Default Gateway	0.0.0.0

[Save and Confirm] [Reset]

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The **NETWORK SETUP** MENU:

➢   Network Setup Menu: **Host Name**   Factory Default: HDENC-271616
➢   Network Setup Menu: **IP Setup**   Factory Default: DHCP Disable   ➔ Enable
➢   Factory Default: IP Address: 192.168.1.9
➢   Factory Default: Subnet Mask: 255.255.255.0
➢   Factory Default: Default Gateway: 000.000.000.000

Step 7: Administration

It is HIGHLY recommended that after all other tabs have been configured that the HD Encoder be rebooted using the REBOOT button on the ADMINISTRATION tab.

The HD Encoder can be reset to factory default using this menu.

The BACKUP function will save the HD Encoder's current parameter configuration in a file for backup purposes or so that it may be used to easily configure another HD Encoder (or restore this HD Encoder) using the UPLOAD button.

HD ENCODER

| ATSC / QAM HD Digital Encoder | Overview | Encoder Setup | RF Output Setup | Network Setup | Administration |

Administration

REBOOT   RESET TO DEFAULT

Backup / Restore   Password

Download current configuration settings to a local file.

BACKUP

Upload a pre-saved configuration to the device.

BROWSE...   UPLOAD

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Step 8: Changing Password

| ATSC / QAM HD Digital Encoder | Overview | Encoder Setup | RF Output Setup | Network Setup | Administration |

Administration

REBOOT   RESET TO DEFAULT

Backup / Restore   Password

Change Password

CAUTION: The new password must contain:
- 6~8 characters
- At least one digit
- At least one uppercase character
- At least one lowercase character

Old Password:

New Password:

Confirm Password:

Save and Confirm

Step 9: Hardware Installation and Connections

It is highly recommended that the highest quality cables and connectors be used for all video and audio source connections.

1. Ensure the video Source has output.

2. Connect the HDMI cable to the HD Encoder from the Source.

3. Connect the included AC power adapter cord to the HD Encoder's 12VDC Power receptacle at the rear.

4. Connect the AC adapter to an appropriately rated AC power outlet.

5. Test the RF output with a CATV meter to ensure that it is within the input range of the connected TV's

6. Connect to the coaxial distribution using the "F" connector at the rear of the HD Encoder. Use a high quality 75Ω coaxial cable with compression-type "F" connectors from the HD Encoder's RF Output. Ensure that all connections are tight.

7. When the HD Encoder configuration is complete – disconnect the HD Encoder from the network/Ethernet to insure its security and highest performance

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Step 10: Use the TV's AutoScan to add the new modulated channel(s) to the available TV channels

1.   Make sure the correct input type is selected from the TV menu: J.83B requires the TV to be set to "Cable". ATSC requires the TV to be set to "Antenna" or "Air".

2.   Perform a full channel scan from the TV menu to detect all HD Encoders

4. Frequently Asked Questions (FAQ)/Troubleshooting

Most issues can be resolved by insuring the cabling is correctly and tightly connected and that the correct parameter settings are selected in the HD Encoder and the TVs.

No Display on TV	HD Encoder or TV not setup completely or not correctly	1. Ensure the source and the HD Encoder are powered on 2. Ensure that there is output from the video source (direct connect the source with a HDMI to a TV) 3. Ensure that there is output from the HD Encoder – output bit rate should be shown on LCD 4. Ensure that the correct HD Encoder output is selected in RF OUTPUT SETUP, i.e. J.83B or ATSC. 5. Ensure that the TV is set on the correct input type: J.83B QAM requires "CABLE". ATSC requires "ANTENNA" or "AIR". 6. Ensure that the RF level at the coax cable is within the TV input range 7. Ensure that the TV has performed the full Channel scan to detect and setup the new HD Encoder channels. 8. Ensure the TV has been tuned to the correct channel detected from HD Encoder

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		9. Ensure that the ENCODER SETUP specifies a valid Program Number.
No Display on TV/Only Color Bars/Error Message	Encrypted HDMI is being input from encrypted DVD/Blu-Ray/Satellite Receiver/Etc	1. The HD Encoder can only accept unencrypted HDMI input, i.e. user generated video files which do not have restricted content with HDCP protection
No Display/Error Message on TV with DVD/ Blu-Ray Player	Occasionally "No Input" message will appear on TV. HD Encoder output will stop output if no Player input is available	1. See note above about HDCP content restrictions 2. Player output will stop when it is overly slow to read data (old/dirty player) 3. Make sure the DVD/Blu-Ray media is clean, no scratches, no fingerprints, etc
Noise on TV	Occasionally compression artifacts appear	1. Ensure that the source is without noise and compression artifacts 2. Ensure that the RF input levels to the TV are within range
Rebooting	Occasionally HD Encoder reboots	1. Ensure that the HD encoder is disconnected from the ethernet cable to insure it is secure from the internet, hackers, viruses, traffic, etc

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5. After-Sales Service

1. If the equipment malfunctions, immediately contact your local in-country dealer or distributor or directly call our MULTICOM Technical Support Hotline 1 800-423-2594.
2. The onsite installation, maintenance, and operation of equipment must be performed by trained professional technicians to avoid damage.
   Special notice: If the equipment has been installed, maintained, and/or changed by end users, and is damaged, MULTICOM will not be responsible for free maintenance or free replacements.

6. Disclaimer

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