B-QAM-SDI-IP-4CH-LL
User Manual
About This Manual

Intended Audience

This user manual has been written to help people who have to use, to integrate and to install the product. Some chapters require some prerequisite knowledge in electronics and especially in broadcast technologies and standards.

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Chapter 1 Introduction

1.1 Product Overview

B-QAM-SDI-IP-4CH-LL series products are QuestTel’s new breakthrough all-in-one devices which integrate encoding (MPEG-2 HD/SD, MPEG-4/AVC H.264 HD/SD) and modulating to convert V/A signals into DVB-C RF output. It has equipped with 4 SDI channels input and 1 ASI input and output with 2 ASI ports and 1 UDP IP port.

Delay problem has been greatly reduced to achieve an extremely low value from the encoding progress to the decoding terminals.

It adopts inner drawer-type structural design which greatly facilitates the change of encoding modules (HDMI/SDI/…) as needed.

The signals source could be from satellite receivers, closed-circuit television cameras, Blue-ray players, and antenna etc. Its output signals are to be received by DVB-C TVs or STBs and etc.

1.2 Key Features

- MPEG2 & MPEG4 AVC/H.264 HD/SD encoding
- Up to 1920*1080@50P/60P supported (MPEG4 AVC/H.264 HD)
- Up to 1920*1080@50I/60I supported (MPEG2 HD)
- 4* SDI input; 1*ASI input for re-mux; 1*RF input for mix
- 4* DVB-C RF out (4 carriers combined output)
- Support 4 * SPTS output
- Extremely low delay
- LCN support (Logical Channel Number)
- Excellent modulation quality MER≥42dB
- RF Frequency range 30Mhz~960Mhz
- LCD display, Remote control and firmware
- Web NMS management; Updates via web
- Lowest cost per channel
### 1.3 Specifications

#### Encoding Section

**Video**

<table>
<thead>
<tr>
<th>Encoding</th>
<th>MPEG2, MPEG4 AVC/H.264</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input</td>
<td>SDI*4</td>
</tr>
<tr>
<td>Resolution</td>
<td>1920<em>1080_60P, 1920</em>1080_50P, (for MPEG4 AVC/H.264) 1920<em>1080_60i, 1920</em>1080_50i, 1280<em>720_60p, 1280</em>720_50P 720<em>480_60i, 720</em>576_50i</td>
</tr>
</tbody>
</table>

**Audio**

<table>
<thead>
<tr>
<th>encoding</th>
<th>MPEG1 Layer II, MPEG2-AAC, MPEG4-AAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample rate</td>
<td>48KHz</td>
</tr>
<tr>
<td>Bit rate</td>
<td>64kbps, 96kbps, 128kbps, 192kbps, 256kbps, 320kbps</td>
</tr>
</tbody>
</table>

#### DVB-C Modulator Section

<table>
<thead>
<tr>
<th>Standard</th>
<th>J.83A, J.83B, J.83C</th>
</tr>
</thead>
<tbody>
<tr>
<td>MER</td>
<td>≥42dB</td>
</tr>
<tr>
<td>RF frequency</td>
<td>30~960MHz, 1kHz step</td>
</tr>
<tr>
<td>Symbol rate</td>
<td>5.000~9.000Msp adjustable</td>
</tr>
<tr>
<td>RF output level</td>
<td>-30~-10dbm (81~97 dbµ V), 0.1db step</td>
</tr>
</tbody>
</table>

**J.83A**

- Constellation: 16/32/64/128/256QAM
- Bandwidth: 8M

**J.83B**

- Constellation: 64QAM/256QAM
- Bandwidth: 6M

**J.83C**

- Constellation: 64QAM/256QAM
- Bandwidth: 6M

#### System

<table>
<thead>
<tr>
<th>Local interface</th>
<th>LCD + control buttons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote management</td>
<td>Web NMS</td>
</tr>
<tr>
<td>Output</td>
<td>ASI out (BNC type); 4*SPTS out (RJ45, 100M)</td>
</tr>
<tr>
<td>NMS interface</td>
<td>RJ45, 100M</td>
</tr>
</tbody>
</table>

#### General

<table>
<thead>
<tr>
<th>Power supply</th>
<th>AC 100V~240V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>482<em>400</em>44mm</td>
</tr>
<tr>
<td>Weight</td>
<td>5 kgs</td>
</tr>
<tr>
<td>Operation temperature</td>
<td>0~45°C</td>
</tr>
</tbody>
</table>
1.4 Schematic Overview

Inner Construction Overview

The Links between Programs and Carriers
1.5 Principle Chart

1.6 Typical Application of 4 * Carrier Outputs

As we all know, to guarantee the picture quality of 1920x1080@50I/60I resolution HD program, the video bit-rate may exceed 10 Mbps, and even reach up to 15Mbps. However, when the modulating constellation is 64QAM (with 6MHz bandwidth), the maximum possible bit-rate output for single DVB-C carrier is only around 20Mbps. 15Mbps * 4 = 60Mbps > 20Mbps.

It means the single DVB-C carrier simply can't carry the 4 channels 1080i HD program if the average bit-rate exceeds 10Mbps.

That's why we design 4*DVB-C carrier modulation board which quadruples the maximum possible bit-rate bandwidth up to 80Mbps and above when 64QAM constellation is used. This rightly makes it reliably carry 4 channels MPEG2 HD programs output simultaneously.

Below brief chart will help to more clearly illustrate the working principle.
1.7 Appearance and Description

Front Panel Illustration

① LCD window: LCD display
② NMS & DATA ports
③ Power and Alarm Indicators
④ Lock Indicators
⑤ Up and down, left and right button
⑥ Enter button: for confirm
⑦ Menu button: for back step
⑧ Lock button: press to lock set

Rear Panel Illustration

① SDI Module 1: SDI input port 1&2
② SDI Module 2: SDI input port 3&4
③ RF in port (for combiner use)
④ RF out port
⑤ ASI input port
⑥ ASI output ports
⑦ Switch
⑧ Power supply slot
⑨ Grounding
Chapter 2 Installation Guide

This section is to explain the cautions the users must know in some case that possible injury may bring to users when it’s used or installed. For this reason, please read all details here and make in mind before installing or using the product.

2.1 General Precautions

✓ Must be operated and maintained free of dust or dirty.
✓ The cover should be securely fastened, do not open the cover of the products when the power is on.
✓ After use, securely stow away all loose cables, external antenna, and others.

2.2 Power precautions

✓ When you connect the power source, make sure if it may cause overload.
✓ Avoid operating on a wet floor in the open. Make sure the extension cable is in good condition
✓ Make sure the power switch is off before you start to install the device

2.3 Device’s Installation Flow Chart Illustrated as following

![Flow Chart]

2.4 Environment Requirement

<table>
<thead>
<tr>
<th>Item</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine Hall</td>
<td>When user installs machine frame array in one machine hall,</td>
</tr>
</tbody>
</table>
### Space

the distance between 2 rows of machine frames should be 1.2~1.5m and the distance against wall should be no less than 0.8m.

### Machine Hall Floor

<table>
<thead>
<tr>
<th>Electric Isolation, Dust Free</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume resistivity of ground anti-static material: $1 \times 10^7$~$1 \times 10^{10} \Omega$, Grounding current limiting resistance: $1 \Omega$ (Floor bearing should be greater than 450Kg/㎡)</td>
</tr>
</tbody>
</table>

### Environment Temperature

| 5~40°C (sustainable), 0~45°C (short time), installing air-conditioning is recommended |

### Relative Humidity

| 20%~80% sustainable, 10%~90% short time |

### Pressure

| 86~105KPa |

### Door & Window

| Installing rubber strip for sealing door-gaps and dual level glasses for window |

### Wall

| It can be covered with wallpaper, or brightness less paint. |

### Fire Protection

| Fire alarm system and extinguisher |

### Power

| Requiring device power, air-conditioning power and lighting power are independent to each other. Device power requires AC 110V±10%, 50/60Hz or AC 220V±10%, 50/60Hz. Please carefully check before running. |

### 2.5 Grounding Requirement

- All function modules’ good grounding is the basis of reliability and stability of devices. Also, they are the most important guarantee of lightning arresting and interference rejection. Therefore, the system must follow this rule.

- Grounding conductor must adopt copper conductor in order to reduce high frequency impedance, and the grounding wire must be as thick and short as possible.

- Users should make sure the 2 ends of grounding wire well electric conducted and be antirust.

- It is prohibited to use any other device as part of grounding electric circuit

- The area of the conduction between grounding wire and device’s frame should be no less than 25 mm².
Chapter 3 Operation

3.1 LCD Menus

An overview of the LCD menus:

- Switch On
- Initializing
- General Working Status
- 1 Alarm Status

2 Encode Setting

- 2.1 Input 1
  - Video Format
  - Video Bitrate
  - Audio Format
  - Audio Bitrate

- 2.2 Input 2
  - Video Format
  - Video Bitrate
  - Audio Format
  - Audio Bitrate

- 2.3 ASI
  - 2.3.1 Parse Program
  - 2.3.2 Select Program A
  - 2.3.3 Select Program B
  - 2.3.4 Select Program C
  - 2.3.5 Select Program D

3 Modulate Setting

- 3.1 Output A
  - 3.1.1 Standard
  - 3.1.2 Constellation
  - 3.1.3 Symbol Rate
  - 3.1.4 RF Frequency
  - 3.1.5 RF Out Level
  - 3.1.6 RF On

- 3.2 Output B
  - 3.2.1-3.2.6

- 3.3 Output C
  - 3.3.1-3.3.6

- 3.4 Output D
  - 3.4.1-3.4.6

- 3.5 ASI Output

(Same content with 3.1.1-3.1.6)
3.2 Initial Status

Switch on the device and after a few seconds’ initialization, it presents start-up pictures as below:
- **Cable**: indicate the modulation standard of this device is DVB-C.
- **A**: the symbol of different carrier output. “A”, “B”, “C”, and “D” alternate constantly with the following output frequency.
- **XXX.XX MHz** indicates the current output frequency (range: 30~960MHz) of its corresponding carrier output.
- **P1**: Program 1; **P2**: Program 2; **P3**: Program 3; **P4**: Program 4
- **X.XX Mbps**: indicate the encoding bit rate of each channel respectively.

### 3.3 General Settings for Main Menu

Press “Lock” key on the front panel to enter the main menu. The LCD will display the following pages where user can configure the parameters for the device:

1. **1 Alarm Status**
2. **2 Encode Setting**
3. **3 Modulate Setting**
4. **4 IP Output Setting**
5. **5 Network Setting**
6. **6 Saving Config**
7. **7 Loading Config**
8. **8 Version**

User can press UP/DOWN buttons to specify menu item, and then press ENTER to enter the submenus as below:

1) **Alarm Status**

The alarm indicator will turn on if there is no A/V signals inputting or outputting bit rate overflows. User then can enter this menu to check the error type.

2) **Encode Setting**

Under this submenu, the LCD will show “2.1 Input 1”, “2.2 Input 2” and “2.3 ASI”.

1. **2.1 Input 1**
2. **2.2 Input 2**
3. **2.3 ASI**

Under submenus 2.1 or 2.2, user could set the video encoding format and bit rate, and
set audio encoding bit rate and also read the audio encoding format of the program from the SDI input.

“Video Format”: the encoding module supports both MPEG2 and MPEG4 AVC/H.264 formats. Move the triangle mark with LEFT/RIGHT keys to specify the intended format and press ENTER to confirm.

“Video Bit Rate”: Move the underline with LEFT/RIGHT keys and modify the value of frequency with UP/DOWN keys, and press ENTER key to save the settings.

“Audio Format”: the encoding module supports MPEG2 audio format. This is a read-only interface for checking.

“Audio Bit Rate” is to select audio encoding bit rate from the options provided.

Under submenu 2.3, user could parse the inputting programs and select the programs to output.
“Parse Program” is for checking the quantity of input programs from the corresponding Tuner input.

“Select Program A” is for selecting programs from the ASI IN to output through Carrier A. Move the triangle mark to specify the program and press RIGHT/LEFT keys to shift the mark between “√” and “X”. (“√”: to output the corresponding program; “X”: not to output the corresponding program)

**REMARK:** “Select Program B/C/D” shares the same explanation with “Select Program A”.

3) **Modulator Setting**

When entering “Modulator Setting” submenu, user can find below different parameters can be set and the LCD window would show as below:

As the B-QAM-SDI-IP-4CH-LL (DVB-C Modulating) is with 4 carrier outputs, “3.1”-“3.4” represent
the “Carrier A”, “Carrier B”, “Carrier B”, and “Carrier D” respectively. User can enter “3.1”/“3.2”/“3.4” to set the corresponding modulating parameters. Submenus (taking “3.1” as an example) are as below:

- **Standard**

  There are three possible options provided for selecting **Standard**: J.83A (DVB-C), J.83B, J.83C when the display shows them, user just need swift LEFT and RIGHT key to choose.

- **Constellation**

  Three different constellations: J.83A (DVB-C), J.83B, J.83C will show on the LCD window when Constellation been entered.
  
  J.83A (DVB-C) contains 16QAM, 32QAM, 64QAM, 128QAM, and 256QAM;
  J.83B contains 64QAM, 256QAM;
  J.83C contains 64QAM, 256QAM.

  16QAM: Quadrature Amplitude Modulation is 16
  32 QAM: Quadrature Amplitude Modulation is 32
  64QAM: Quadrature Amplitude Modulation is 64
  128QAM: Quadrature Amplitude Modulation is 128
  256QAM: Quadrature Amplitude Modulation is 256

  Setting method is just the same. When the display shows them, user just need swift LEFT and RIGHT key to choose and repressing “ENTER” for confirm.
Symbol Rate

The symbol rate range of both J.83A (DVB-C) & J.83C is 5Msp to 9Msp and J.83B is fixed and cannot be changed.

RF Frequency

The RF output frequency range is from 30 to 960MHz with 1K stepping. After entering the RF frequency setting submenu, users the can press LEFT, RIGHT, UP, and DOWN buttons to adjust the frequency and confirm by press ENTER button.

RF out level

The RF attenuation range is from -30--10dbm (81~97dbµV) with 0.1db step. After entering this setting submenu, user can shift UP/DOWN/LEFT/RIGHT key to set the output level and press ENTER to confirm.

RF On

This interface is to decide whether to enable the RF (carrier A) output or not.
OFF: to disable programs to output through carrier A.
ON: to enable programs to output through carrier A.

NOTE: The setting principle of “3.2”, “3.3”, and “3.4” are the same with “3.1” explained above.

ASI Output:

B-QAM-SDI-IP-4CH-LL encoder & modulator (DVB-C Modulating) is with quad-carrier output: Output A, B, C, and D.
**Output A:** the ASI output programs are same as carrier output A.

**Output B:** the ASI output programs are same as carrier output B.

**Output C:** the ASI output programs are same as carrier output C.

**Output D:** the ASI output programs are same as carrier output D.

4) **IP Output Setting**

B-QAM-SDI-IP-4CH-LL encoder & modulator (DVB-C Modulating) is with quad-carrier output (Output A, B, C, and D), “4.1” to “4.4” are for the settings of the 4 carrier outputs respectively. Submenus go as 4.1.1-4.1.7

User can enter 4.1.1 to decide whether to turn the IP port on or off, and enter to the rest menu items to set the corresponding parameters.

- **IP Output**
  - OFF
  - ON

- **Output IP**
  - 224.002.002.002

- **Gateway**
  - 192.168.002.000

- **Filter Null Packet**
  - OFF
  - ON

- **Service IP**
  - 192.168.002.137

- **Subnet mask**
  - 255.255.255.000

- **Port**
  - 01234
5) **Network setting**

After entering Network Setting, there are three submenus shown as the following LCD displays.

![Network Setting Menu](image)

User can press “UP/DOWN” to choose this item and “ENTER” & “LEFT/RIGHT” to set the parameters.

![Network Setting Parameters](image)

**NOTE:** The MAC address is according to the factory setting, and it is unique.

6) **Saving Configuration**

Users can enter Saving Configuration submenu for saving settings. Choose yes and press ENTER to confirm.

![Save Configuration](image)

7) **Loading Configuration**

At this menu, users can press UP/DOWN key to select and repress ENTER to confirm. User can restore the device into the last saved configuration by choosing “7.1” and restore the device into factory configuration by choosing “7.2” the display will show as below:
8) **Version**

User can check the software version and hardware version of this equipment under this submenu.

**Encoder Modulator**

- **SW 1.00**
- **HW 0.3**
Chapter 4 WEB NMS Operation

User not only can use front buttons to set configuration, but also can control and set the configuration in computer by connecting the device to web NMS Port. User should ensure that the computer’s IP address is different from the B-QAM-SDI-IP-4CH-LL’s IP address; otherwise, it would cause IP conflict.

4.1 login

The default IP address of this device is 192.168.0.136. (We can modify the IP through the front panel.) Connect the PC (Personal Computer) and the device with net cable, and use ping command to confirm they are on the same network segment. If the PC IP address is 192.168.99.252, we then change the device IP to 192.168.99.xxx (xxx can be 0 to 255 except 252 to avoid IP conflict). Use web browser to connect the device with PC by inputting the Encoder & Modulator’s IP address in the browser’s address bar and press Enter. It will display the Login interface as Figure-1. Input the Username and Password (Both the default Username and Password are “admin”.) and then click “LOGIN” to start the device setting.

Figure-1
4.2 Operation

When we confirm the login, it displays the WELCOME interface as Figure-2.

User can click any item here to enter the corresponding interface to check information or set the parameters.

It automatically identifies and displays the signal source interface and real-time encoding bit rate of corresponding input channel.

The TS indicators—Green light indicates the TS is normal, which otherwise turns to red.

“A”, “B”, “C” and “D” respectively represent carrier A, carrier B, carrier C, and carrier D.

Input 1

From the menu on left side of the webpage, clicking “Input 1”, it displays the information of the 2 programs from the 1st SDI encoding slot as Figure-3.
Enable or Disable the Carrier Output Function:

The 4 boxes respectively represent Carrier A, B, C, and D. Tick the corresponding box(es) to enable the related program output through the corresponding Carrier. One program can output through a single or multiple Carriers. However, it is suggested that a single carrier outputs only one program to adapt the fluctuant encoding bit rate.

**NOTE**

The different combination of **Video Format**, **Video Bit-rate**, **Low Delay Mode** and the **Resolution** of signal source will have an impact on the delay. Please refer to the Appendix attached for detailed information.
Help For user to turn to refer detailed explanation of terms on this interface

Default Click this button to apply the default setting of Input 1

Apply Click this button to apply the modified parameters.

Input 2

Similarly, from the menu on left side of the webpage, clicking “Input 2”, it displays the information of the 2 programs from the 2nd SDI encoding slot.

ASI Input

Click “ASI Input”, it will display ASI input program information as Figure-4.

![Web Management](image)

Select the carrier output channel for the multiplexed programs.

Passthrough If this item is selected, all the input programs will pass through without any elimination.

Multiplex Selecting this item to allow user select programs as required to output.

Refresh Input Click “Refresh Input” to refresh the input program list.
Click “Refresh Output” to refresh the output program list.

When user checks one input program with “✓”, one can transfer the checked program to the right box to output.

Here user can select the programs which we want to output or we can output all the programs.

Similarly, user can cancel the multiplexed programs from the right box.

To select all the input/output programs with one-time clicking.

Time limitation to parse the input programs

Click this button to trigger a dialog box as below, where to add the PIDs which need pass through.

In some occasions, there are some PIDs which won’t belong to any program, such as EPG, NIT tables and so on which user just wants to pass them through the multiplexing module without changing anything. This is the main purpose of this function.

Click “Add” to add more boxes for filling the Input & Output PIDs, then click “Apply” to confirm.

**NIT Table setting**
Click “NIT” from the menu to trigger the screen as Figure-5. Then click “Add” from this screen to add the program descriptor in NIT Table.

![Figure-5](image)

Select the carrier output channel for the inserted NIT.

Click “Add” from this page, it will display the screen as Figure-6 where it requires to add Service ID and configure other parameters for the programs.

![Figure-6](image)

Here by clicking “Add”, users can set the program LCN in its respective field. After setting all the data, users need to click on “Save” to save the
setting. As Figure-7, click “Update NIT” to update the NIT information.

<table>
<thead>
<tr>
<th>TSID</th>
<th>CNID</th>
<th>Freq(MHz)</th>
<th>Bandwidth</th>
<th>Const</th>
<th>LCN</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x0001</td>
<td>0x0001</td>
<td>750.000</td>
<td>8 MHz</td>
<td>64 QAM</td>
<td>yes</td>
</tr>
</tbody>
</table>

Figure-7

**IP Output**

Click “IP Output” from the left menu, it will display the screen as Figure-8 where to set the multicast IP Output address for the device if needed and set the IP output for the programs.

After setting the parameters, click “Apply” to save the setting.

**Modulator Setting**

Enter in “Modulator” and it will display the Modulator Configuration screen as
Figure-9 where can set modulation parameters.

**RF On** – To decide whether to enable the RF (carrier A/B/C/D) output or not.

**Standard** – Modulating standard selecting.

**Constellation** – QAM type selecting.

**Symbol Rate** – To set the symbol rate

**RF Frequency A/B/C/D** – to set the RF frequency for the 4 carriers

**RF Out level** – to set the RF output level

**ASI Output** – To select carrier output channel for ASI output (Output A: The ASI output programs are same as carrier A; Output B: The ASI output programs are same as carrier B; and the like.)

After setting all the parameters, click “Apply” to save the Modulator Configuration.

![Modulator Configuration Screen](image)

**Save/Restore**

Clicking “Save/Restore” from the menu, it will display the screen as Figure-10 where can save the configuration permanently to the device. Click “Save Configuration”, for store the data permanently to the device.

By using “Restore Configuration” user can restore the latest saved configuration to
the device.

By using “Factory Set” user can import the default factory configuration.

![Web Management](image)

**Restart the Device**

Click “Reboot” from the menu, the screen will display as Figure-11. Here when clicking “Reboot” box, it will restart the device automatically.

![Web Management](image)

**Update the Device**

Click “Firmware” from the menu it will display the screen as Figure-12. Here user can update the device by using the update file.
Click “Browse” to find the path of the device update file for this device then click “Update” to update the device.

After updating the device, user needs to restart the device by using Reboot option.

**Network**

When user clicks “Network”, it will display the screen as Figure-13. It displays the network information of the device. Here user can change the device network configuration as needed.
**Change Password**

When user clicks “Password”, it will display the password screen as Figure-14. Here user can change the Username and Password for login to the device. After putting the current and new Username and Password, click Apply” to save the configuration.

![Change Password Screen](image)

- Keyboard and LCD Lock: If it is marked with “√”, the LCD and keyboard will be locked to avoid unrelated users’ modifying or view the device information and configurations. User can’t operate the keyboard & LCD while only the device IP address can be noted in the LCD window.

![IP Address 192.168.000.136](image)

**Backup/Load**

Click “Backup/Load” from the menu, it will display the screen as Figure-15.

- **Backup Configuration** – To back up the device configuration file to a folder
- **Load Configuration** – If user needs to load the old configuration to the device, click “Browse” and find the backup configuration file path. After selecting the file, click
“Load File” to load the backup file to the device.
Chapter 5 Troubleshooting

All QuestTel's products have been passed the testing and inspection before ship out factory. The testing and inspection scheme already covers all the Optical, Electronic and Mechanical criteria which have been published by QuestTel. To prevent potential hazard, please strictly follow the operation conditions.

Prevention Measure

- Installing the device at the place in which environment temperature between 0 to 45 °C
- Making sure good ventilation for the heat-sink on the rear panel and other heat-sink bores if necessary
- Checking the input AC within the power supply working range and the connection is correct before switching on device
- Checking the RF output level varies within tolerant range if it is necessary
- Checking all signal cables have been properly connected
- Frequently switching on/off device is prohibited; the interval between every switching on/off must greater than 10 seconds.

Conditions need to unplug power cord

- Power cord or socket damaged.
- Any liquid flowed into device.
- Any stuff causes circuit short
- Device in damp environment
- Device was suffered from physical damage
- Longtime idle.
- After switching on and restoring to factory setting, device still cannot work properly.
- Maintenance needed
Chapter 6 Application

Application Examples

1). Residences and Private Homes Video content DVB-T/ISDB-T distribution

2) Outside Audio- Video contents ON- AIR DVB- T/ISDB-T distribution

3) Hotel Audio- Video contents DVB- T/ISDB-T distribution

4) Bar Audio- Video contents distribution
5) Cinema Audio - Video contents DVB - T/ISDB-T distribution

6) Company Audio - Video contents distribution
# Chapter 7 Packing List

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
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<tr>
<td>B-QAM-SDI-IP-4CH-LL Encoder Modulator</td>
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<tr>
<td>User's Manual</td>
<td>1 PC</td>
</tr>
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<td>SDI Cables</td>
<td>4 PCs</td>
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<td>Power Cord</td>
<td>1 PC</td>
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### APPENDIX

**INTERNAL TEST REPORT OF DELAY**

(The values of average delay cover the progress from Encoding to Decoding.)

<table>
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<tr>
<th>Decoding Terminal</th>
<th>Resolution</th>
<th>Encoding Bit Rate</th>
<th>Encoding Details</th>
<th>Source Interface</th>
<th>Video Format</th>
<th>Average Delay (ms)</th>
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Safety Instructions

Read before operating equipment.

1. Cleaning - Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
2. Power Sources - Use supplied or equivalent UL/CSA approved low voltage DC plug-in transformer.
3. Outdoor Antenna Grounding - If you connect an outside antenna or cable system to the product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Section 810 of the National Electrical Code, ANSI/NFPA No. 70, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.
4. Lightning - Avoid installation or reconfiguration of wiring during lightning activity.
5. Power Lines - Do not locate an outside antenna system near overhead power lines or other electric light or power circuits or where it can fall into such power lines or circuits. When installing an outside antenna system, refrain from touching such power lines or circuits, as contact with them might be fatal.
6. Overloading - Do not overload wall outlets and extension cords as this can result in a risk of fire or electric shock.
7. Object and Liquid Entry - Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short out parts, resulting in a fire or electric shock. Never spill liquid of any kind on the product.
8. Servicing - Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
9. Damage Requiring Service - Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
   • When the power supply cord or plug is damaged.
   • If liquid spills or objects fall into the product.
   • If the product is exposed to rain or water.
   • If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions. An improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
   • If the video product is dropped or the cabinet is damaged.
   • When the video product exhibits a distinct change in performance, this indicates a need for service.