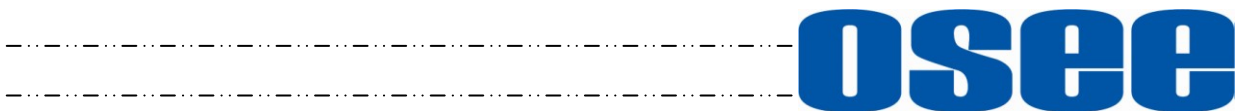


# **HCC6830N Series**

## **HD/SD Digital Video Signal Cross Converter**

### **User Manual**





**Product Information**

**Model:** HCC6830N Series HD/SD Digital Video Signal Cross Converter  
**Version:** V010001  
**Release Date:** August 21th, 2013

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**Company**  
OSEE TECHNOLOGY CO., LTD.

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# About this manual

## Important

The following symbols are used in this manual:

### **Tips**

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- The further information or know-how for described subjects above which helps user to understand them better.
- 

### **Warning**

---

- The safety matters or operations that user must pay attention to when using this product.
- 

## Contents

The user manual applies to the following device types:

- ❖ **HCC6830N**
- ❖ **HCC6830NS**

The images of HCC6830N are adopted in the following descriptions.

Any of the different specifications between the device types are elaborated.

Before reading the manual, please confirm the device type.

# Contents

<b>Contents .....</b>	<b>1</b>
<b>Chapter 1 Product Overview .....</b>	<b>1</b>
<b>Chapter 2 Safety.....</b>	<b>5</b>
<b>Chapter 3 Unpack and Installation .....</b>	<b>7</b>
<b>Chapter 4 Features .....</b>	<b>13</b>
<b>4.1 Front Panel Features .....</b>	<b>13</b>
<b>4.2 Rear Panel Features.....</b>	<b>14</b>
<b>Chapter 5 Operation and Control .....</b>	<b>17</b>
<b>5.1 Instructions on Control and Operation .....</b>	<b>17</b>
<b>5.2 Instructions on Parameter Settings.....</b>	<b>18</b>
5.2.1 Parameter Settings .....	18
5.2.2 Menu Items.....	19
<b>5.3 LED Indicator.....</b>	<b>21</b>
<b>5.4 HDMI Input/Output Module .....</b>	<b>23</b>
5.4.1 Installation .....	23
5.4.2 Network Control.....	24
<b>Chapter 6 Specifications .....</b>	<b>27</b>
<b>Chapter 7 Appendix .....</b>	<b>31</b>
<b>7.1 AFD in 4:3 Mode .....</b>	<b>31</b>
<b>7.2 AFD in 16:9 Mode .....</b>	<b>32</b>
<b>7.3 Converting from 4:3 to 16:9.....</b>	<b>33</b>
<b>7.4 Converting from 16:9 to 4:3.....</b>	<b>35</b>



## Chapter 1 Product Overview

This article is mainly about HCC6830N series models, which are HD/SD digital signal cross converter that can be installed in 6800N series frame.

HCC6830N series models are high- integrated, they are the platform for synchronizing and converting between HD and SD signals, and processing HD and SD signals to mixed signals. They support signal cross converting and AFD control. They use the advanced dynamic interlace analysis technology to achieve high-quality video, and achieve the converting among various formats video signals.

HCC6830N Series HD/SD Digital Video Signal Cross Converter support one HDMI input, two SD-SDI output which have been cross converted and one video loop output with clock recovery.



**Figure 1-1 The Module of HCC6830N/HCC6830NS**

HCC6830N/ HCC6830NS models support the following features:

### Features

- synchronous frame and cross conversion (only HCC6830NS has this feature)
- converting HD/SD-SDI input signals
- using the advanced dynamic interlace analysis technology to achieve high-quality video
- ARC: automatic, using AFD(SMPTE-2016)
- build-in framelock function and adjustment (only HCC6830NS model has the framelock function)
- build-in black field signal generator
- build-in color corrector

### Functionality

## Product Overview

---

- process or convert the auxiliary data, such as CC(608/708) and time code (LTC、VITC)
- alarm when video lost, static frame or detecting black field
- supports SNMP for native and remote users to configure models
- GPIO used to pre-set and parameter selection

## Product Model

**Table 1-1 Introduction of HCC6830N/ HCC6830N**

Model Type	Description
HCC6830N	HCC6830N Series HD/SD Digital Video Signal Cross Converter, supports HD/SD-SDI/HDMI.
HCC6830NS	HCC6830N Series HD/SD Digital Video Signal Cross Converter, supports HD/SD-SDI/HDMI and frame synchronization.

## Tips

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- The HCC6830N series models will support 3G video signals after upgrading by getting the authorization code which is as a selection. Using the authorization code to upgrade the module by WEB.
  - The HCC6830N series models will support one HDMI output by mounting a HDMI input/output module as a selection.
-

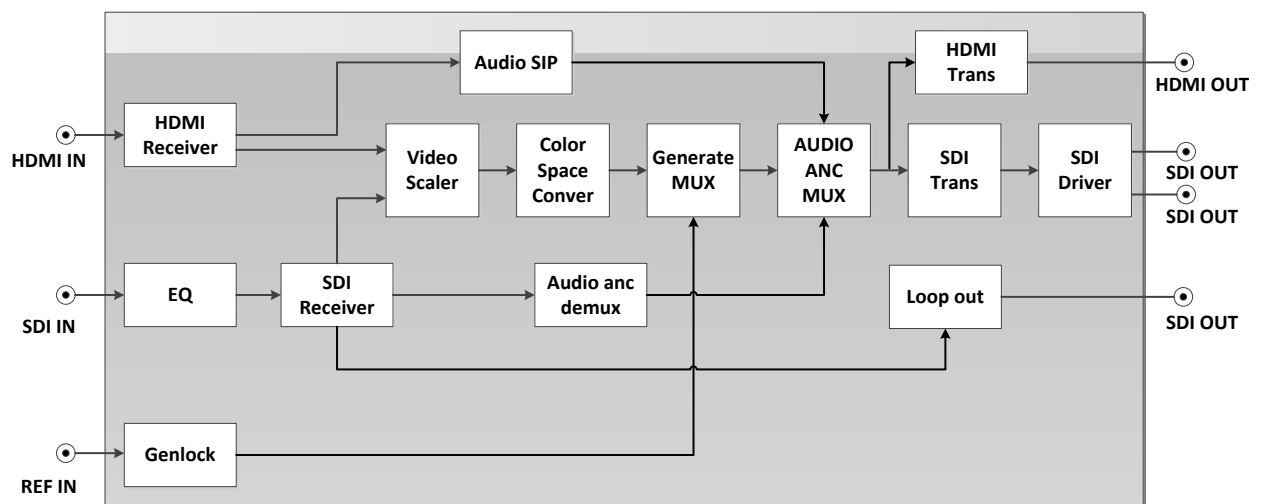


**Table 1-2 Input/Output Signals Supported by HCC6830N/ HCC6830NS**

Model Type	Input	Output
HCC6830N	one adaptive HD/SD-SDI video input one HDMI input(achieved when selecting HDMI input&output module)	two HD-SDI output of cross converted Video loop output with clock recovery one HDMI output(achieved when selecting HDMI input&output module)
HCC6830NS	one adaptive HD/SD-SDI video input one HDMI input (achieved when selecting HDMI input&output module)	two HD-SDI output of cross converted with synchronous frame Video loop output with clock recovery one HDMI output (achieved when selecting HDMI input&output module)

### Signal Flow Chart

The signal flow chart for this unit is shown as in Figure 1-2:


**Figure 1-2 The Signal Flow Chart of HCC6830N/HCC6830NS**

032222

## **Chapter 2 Safety**

### **FCC Caution:**

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules.

Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

## Warnings:

Read, keep and follow all of these instructions for your safety. Heed all warnings.

### **Warning**

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- **Converter**
    - Upgrading of the converter is subject to change without notice.。
    - Contact your Customer Service representative if parts are missing or damaged.
- 

### **Warning**

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- **Position**
    - Do not block any ventilation openings.
    - Do not use this unit near water.
    - Do not expose the unit to rain or moisture.
    - Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that product heat.
    - A nameplate indicating operating voltage, etc., is located on the rear panel.
    - The socket-outlet shall be installed near the equipment and shall be easily accessible.
-

## Chapter 3 Unpack and Installation

### Unpack

When unpacking the components of this converter, please verify that none of the components listed in Table 3-1 are damaged or lack. If there is any missing, contact your distributors or OSEE for it.

**Table 3-1 Packing List**

No.	Item	Quantity	Comments
1	Converter	1	HCC6830N/HCC6830NS
2	Interface board	1	
3	Attachments	1	
4	User manual	1	
5	warranty card	1	

### Tips

---

- **About Unpacking and Shipping**
  - This product was carefully inspected, tested, and calibrated before shipment to ensure years of stable and trouble-free service. Before you install this unit, do the followings:
    - Check the equipment for any visible damage that may have occurred during transit.
    - Confirm receipt of all items on the packing list.
    - Contact your dealer if any item on the packing list is missing.
    - Contact the carrier if any item is damaged.
    - Remove all packaging material from the product before you install the unit.
    - Retain at least one set of the original packaging materials, in the event that you need to return a product for servicing.

- If the original package is not available, you can supply your own packaging as long as it meets the following criteria:
    - The packaging must be able to withstand the product's weight.
    - The product must be held rigid within the packaging
    - There must be at least 5 cm of space between the product and the container.
    - The corners of the product must be protected.
  - Ship products back to us for servicing prepaid and, if possible, in the original packaging material. If the product is still within the warranty period, we will return the product prepaid after servicing.
- 

## Installation

### 1. Prepare for installation

Make sure you have prepared the followings before mount the converter:

- Inspect for any apparent physical damage that may have occurred in transit.
- Make sure you have received all the components listed in packing list.
- if there are any anti-static package or other packages, please take off them.
- Keep the package in case of future usage.

## Warning

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- The safety matters or operations that user must pay attention to when using this product.
- Check out the consumption of model and the maximum power of frame before installation, The maximum power ratings for different frames are shown as in Table 3-2.
- Ensure that all handling precautions are taken to avoid electrostatic discharge or other damage to sensitive electronic components. Wear an earth strap and perform all PCB assembly at an appropriate anti-static work

station. Follow the instructions carefully to fit the models.

**Table 3-2 Maximum Power Ratings for 6800N Series Frames**

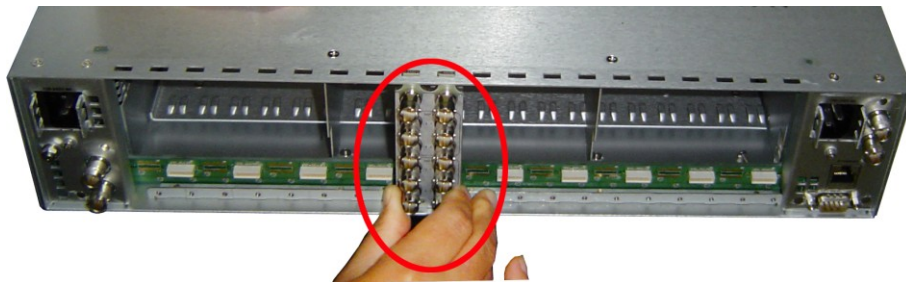
Frame	Maximum Voltage	Redundant Power Supplies	Numbers of Slots
6800N-C1	40W	Yes	4
6800N-C2	60W	Yes	10

**2. Install the module**

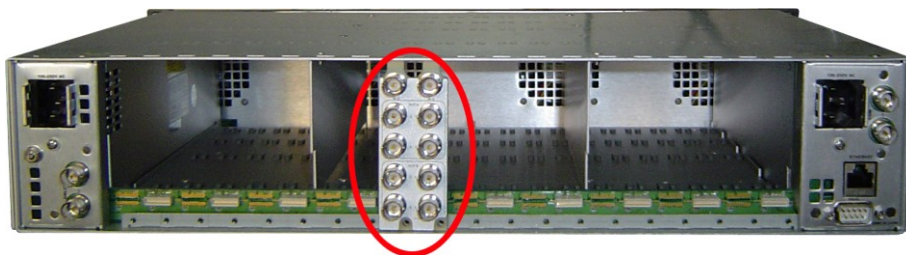
Follow the following steps to install the module:

**Step 1 Install a back connector**

First, install the back connector at the rear of the frame. Locate the position for back connector and insert the back connector along the slot, as shown in Figure 3-1 and Figure 3-2.

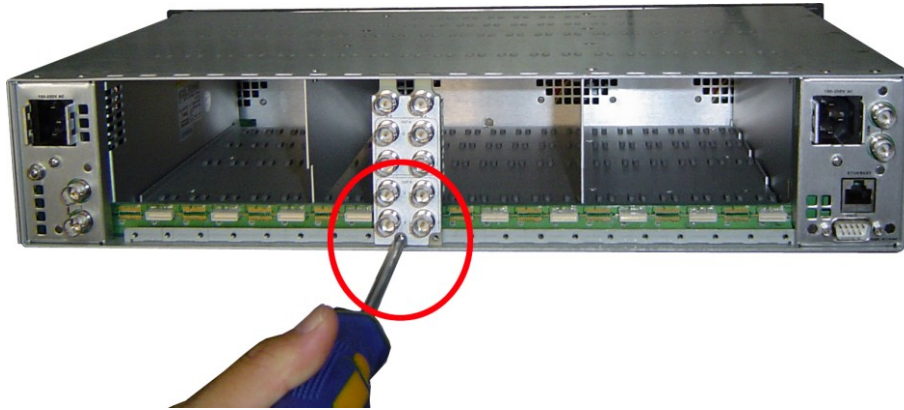


**Figure 3-1 Rear Panel-Insert the Back Connector**



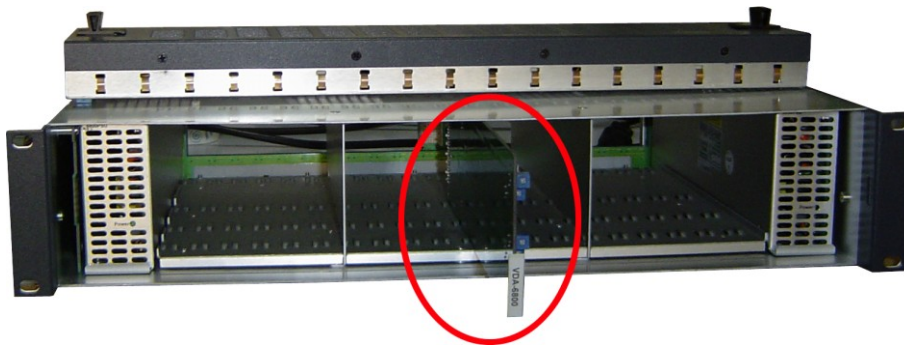
**Figure 3-2 Rear Panel-Fix the Back Connector**

**Step 2 Fasten the screw to fix the back connector, as shown in Figure 3-3.**



**Figure 3-3 Rear Panel-Fasten the Back Connector**

**Step 3 Locate the slot for module, as shown in Figure 3-4.**



**Figure 3-4 Front Panel-Push the Module into the Slot**

**Step 4 Get the module installed in the slot.**

Then, push the module slightly along the slot, press module again to confirm that the module is installed firmly and then close swivel handle, as shown in Figure 3-5.



**Figure 3-5 Front Panel-Close the Swivel Handle of the Module**



### Step 5 Install the front panel.

At last, install the front panel of the frame, as shown in Figure 3-6.



**Figure 3-6 Front Panel-Install the Front Panle**

## Uninstallation

Follow the following steps to remove the module:

### Step 1 Remove the front panel of the frame.

### Step 2 Loosen and take off the module

Press down the swivel handle to loosen the module, as shown in Figure 3-7.



**Figure 3-7 Press Down the Swivel Handle**

Then, hold the swivel handle, and pull out the module along the slot of the frame.

### Step 3 Install the front panel.

Take off the module, and mount the front panel on the frame.

### Step 4 Take off the back connector

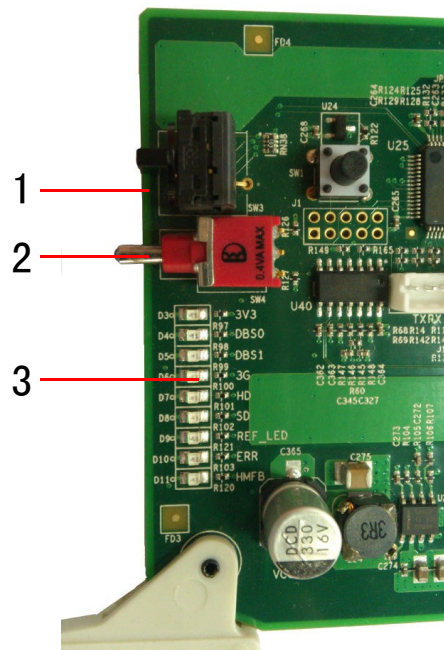
Unscrew the screws of the back connector, and take off the back connector.

032222

## Chapter 4 Features

### 4.1 Front Panel Features

The control switches and the LED indicator lights of HCC6830N series modules are shown as in Figure 4-1:



**Figure 4-1 The Switches and LED Lights of HCC6830N/HCC6830NS**

#### 1. Rotary switch

It is a rotary switch which has 16 positions coded from 0 to F, it is used to select and point to a parameter item.

#### 2. Toggle switch

It is a toggle switch which has 3 positions which will get back to the middle position automatically, It is used to set the parameter value which has been selected by SW1 through toggling up or down the handle.

#### 3. LED Indicator

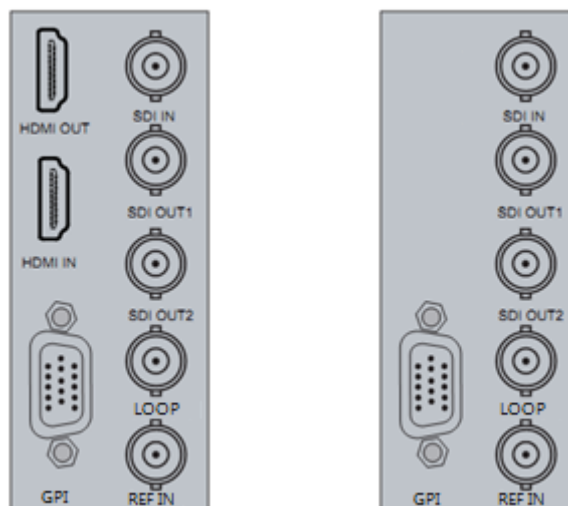
It shows the basic information of the module, refer to “5.3 LED Indicator” for details.

Refer to “Chapter 5 Operation and Control” for the operation instructions of the switches and LED indicators.

## 4.2 Rear Panel Features

### 1. Illustration for back connector

We provide a HDMI input&output module to support HDMI input and output function for HCC6830N/ HCC6830NS module. There are two kinds of back connector for this function, the back connectors are shown as in Figure 4-2:



**Figure 4-2 The Back Connector of HCC6830N/HCC6830NS**

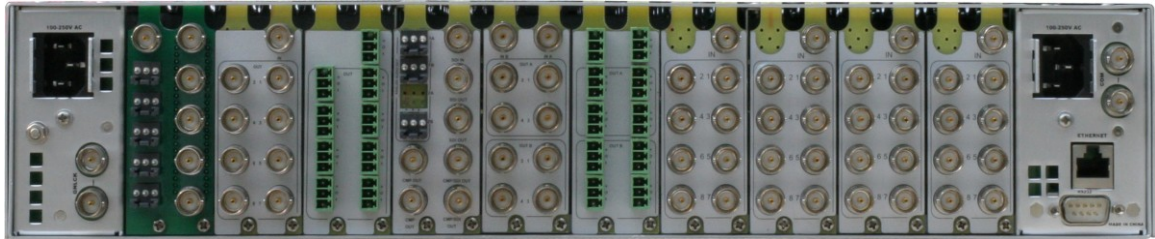
The interfaces on the back connector of HCC6830N/HCC6830NS are shown as Table 4-1:

**Table 4-1 The interfaces on the Back Connector**

Interface	Description
HDMI OUT	HDMI output
HDMI IN	HDMI input
SDI IN	HD/SD-SDI input
SDI OUT 1	HD/SD-SDI output 1
SDI OUT 2	HD/SD-SDI output 2
LOOP	Video loop output with clock recovery
REF IN	Reference input(only HCC6830NS has this interface)
GPI	Reserved

2. Illustration for back panel

After mounting various back connectors to the frame, they are shown as in Figure 4-3:



**Figure 4-3 The Back Connector of a Frame**

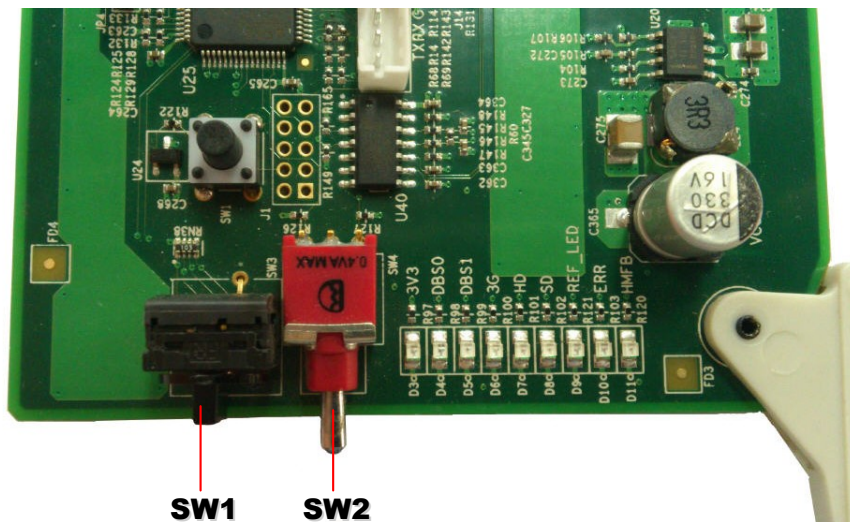
032222

## Chapter 5 Operation and Control

This chapter describes the main functionality and working mode of HCC6830N/HCC6830NS.

### 5.1 Instructions on Control and Operation

The control switches are at the edge of the module, as shown in Figure 5-1:



**Figure 5-1 The Position of Control Switches**

The function and usage of the switch are as follows:

1. SW1: It is a rotary switch which has 16 positions coded from 0 to F, it is used to select and point to a parameter item. The selection range is: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F.



**Figure 5-2 Rotary Switch Pointing at 0**

For example: as shown in Figure 5-2, the pointer is pointing at the position 0, that is Bank Select as shown in Table 5-1.

2. SW2: It is a toggle switch which has 3 positions which will get back to the middle position automatically, It is used to set the parameter value which has been selected by SW1 through toggling up or down the handle.



**Figure 5-3 Toggle Switch Moving Up And Down**

For example: as shown in Figure 5-3, there are three positions of SW2, but the handle will always be back to the middle position automatically after toggling it up or down. After you switching SW1 to a parameter item, toggle SW2 up or down to set the parameter value.

### Tips

- When setting parameters, the LED indicators will indicate the status of the module.
- SW1 identifies the rotary switch, and SW2 identifies the toggle switch in this article.

## 5.2 Instructions on Parameter Settings

It will introduce how to set the parameters and the meanings of LED indicators in the followings.

### 5.2.1 Parameter Settings

HCC6830N/HCC6830NS module has three Banks, they are Bank0, Bank1 and Bank2, each Bank is divided into 16 menu items, and each menu item has a parameter value or a status. Set up these items to control the module or check its status.

You can judge whether you have selected a Bank by DBS0 LED indicator at the edge of the module, refer to Table 5-4 for details.

Do as the following instructions:



- Switch SW1 to position 0, and toggle SW2 to select a proper Bank
- Toggle SW2 up until you select BANK 0, and toggle SW2 down until you select BANK 2.
- Then, switch SW1 to a menu item, and cooperate with SW2 to set its value.

## Tips

- The position 0 of every Bank is always used to select Bank, that is whichever Bank it is, as long as you switch SW1 to position 0, toggle SW2 to select a Bank.

### 5.2.2 Menu Items

The functions and value range of each Bank menu items are as shown in Table 5-1, Table 5-2 and Table 5-3.

**Table 5-1 SW1 Function Settings of Bank 0**

SW1 Position	Function	Value	Default
0	Bank Select	Bank0, Bank1, Bank 2	Bank 0
1~2	RED GAIN SDI/HDMI	0~512	128
3~4	GREEN GAIN SDI/HDMI	0~512	128
5~6	BLUE GAIN SDI/HDMI	0~512	128
7	RED BIAS SDI	0~128	0
8	RED BIAS HDMI	0~128	0
9	BLUE BIAS SDI	0~128	0
A	BLUE BIAS HDMI	0~128	0
B	GREEN BIAS SDI	0~128	0
C	GREEN BIAS HDMI	0~128	0
D	CONTRAST SDI	0~100	50
E	CONTRAST HDMI	0~100	50
F	BRIGHT SDI	0~100	50

**Table 5-2 SW1 Function Settings of Bank 1**

SW1 Position	Function	Value	Default
0	Bank Select	Bank0, Bank1, Bank 2	Bank 0
1	BRIGHT HDMI	0~100	50
2	CHROMA SDI	0~100	50
3	CHROMA HDMI	0~100	50
4	SHARPNESS	0~100	50
5~F	Reserved	-	-

**Table 5-3 SW1 Function Settings of Bank 2**

SW1 Position	Function	Value	Default
0	Bank Select	Bank0, Bank1, Bank 2	Bank 0
1	SDI output synchronous selection	Normal; fs	Normal
2	SDI output format*1	525I60; 625I50; 720P60; 720P59; 720P50; 1080I60; 1080I59; 1080I50; 1080P60; 1080P59; 1080P50; 1080P30; 1080P29; 1080P25; 1080P24; 1080P23; 1080SF24	-
3	Mode selection	SDI; HDMI	SDI
4	Output phase shifting*1	525I60: 0~1716 625I50: 0~1728 720P60: 0~1650 720P59: 0~1650 720P50: 0~1980 1080I60: 0~2200 1080I59: 0~2200 1080I50: 0~2640 1080P24: 0~2750 1080P23: 0~2750 1080P25: 0~2640 1080P30: 0~2200 1080P29: 0~2200	-

SW1 Position	Function	Value	Default
		1080P60: 0~2200 1080P59: 0~2200 1080P50: 0~2640	
5	Output phase shifting*1	525I60: 0~525 625I50: 0~625 720P60: 0~750 720P59: 0~750 720P50: 0~750 1080I60: 0~1125 1080I59: 0~1125 1080I50: 0~1125 1080P24: 0~1125 1080P23: 0~1125 1080P25: 0~1125 1080P30: 0~1125 1080P29: 0~1125 1080P60: 0~1125 1080P59: 0~1125 1080P50: 0~1125	-
6	Black field output	Normal; Black	Normal
7	AFD input mode	Auto; Manual	Auto
8	AFD output mode	Auto; Manual	Auto
9	AFD input	Manual Range:0~15	-
A	AFD output	Manual Range:0~15	-
B	Synchronous mode	analog sync; tri level sync signal	analog sync
C~E	Reserved	-	-
F	Factory Default	no operation; factory recall	no operation

Notes: \*1 is the customized setting.

### 5.3 LED Indicator

The LED indicators show different color when expressing different meanings, as shown in Table 5-4. You can fix the position of LED indicator by logo printing

on the module, as shown in Figure 5-4

**Table 5-4 The Functionality of Each LED Indicator**

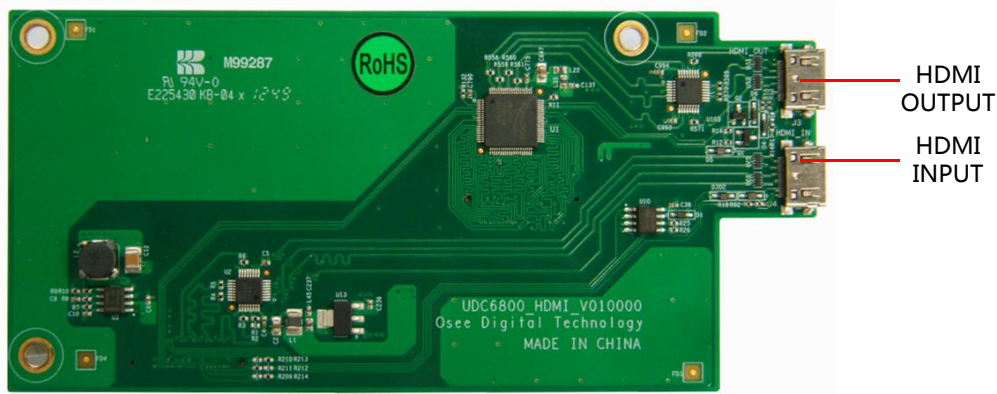
Indicator	Color	Description
3V3	Green	Power indicator. On: power is normal; Off: power is abnormal.
DBS0	Orange	It indicates which Bank you have selected. If it is in BANK0 state, both DBS0 and DBS01 are all off. If it is in BANK1 state, DBS0 is on, and if in BANK2 state, DBS1 is on.
DBS1	Orange	It indicates whether in BANK2 state.
3G	Green	If LED is on, it indicates that is 3G input signal.
HD	Green	If LED is on, it indicates that is HD input signal.
SD	Green	If LED is on, it indicates that is SD input signal.
REF_LED	Green	If LED is on, it indicates that is the reference signal is locked (only for HCC6830NS).
ERR	Green	If LED is on, it indicates there is EDH error or CRC error in input signal.
HMFB	Green	If LED is on, it indicates that this module is working with HDMI input/output module; If LED is off, it indicates that this module is in SDI working mode.



**Figure 5-4 The Logo Printing of LED Indicator**

## 5.4 HDMI Input/Output Module

Add a HDMI Input/Output module( as shown in Figure 5-5) to HCC6830N/ HCC6830NS module to achieve the HDMI input and output function.



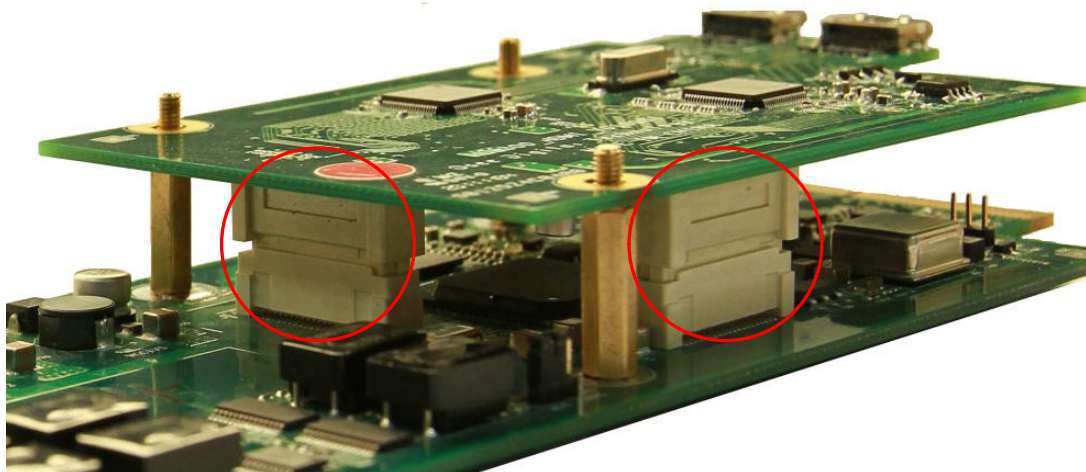
**Figure 5-5 HDMI Input/Output Module**

### 5.4.1 Installation

Follow the instructions below to install a HDMI Input/Output module:

#### Step 5 Connect the module plug

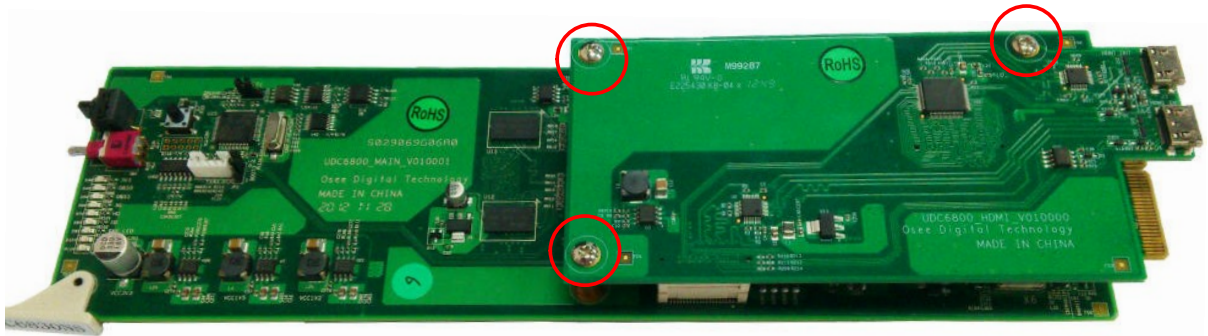
The red circles in Figure 5-6 identify the connection state of male plug and female plug.



**Figure 5-6 Side View- Installing a HDMI Input/Output Module**

### Step 6 Fasten the screws

The red circles in Figure 5-7 identify the screws after fastened.

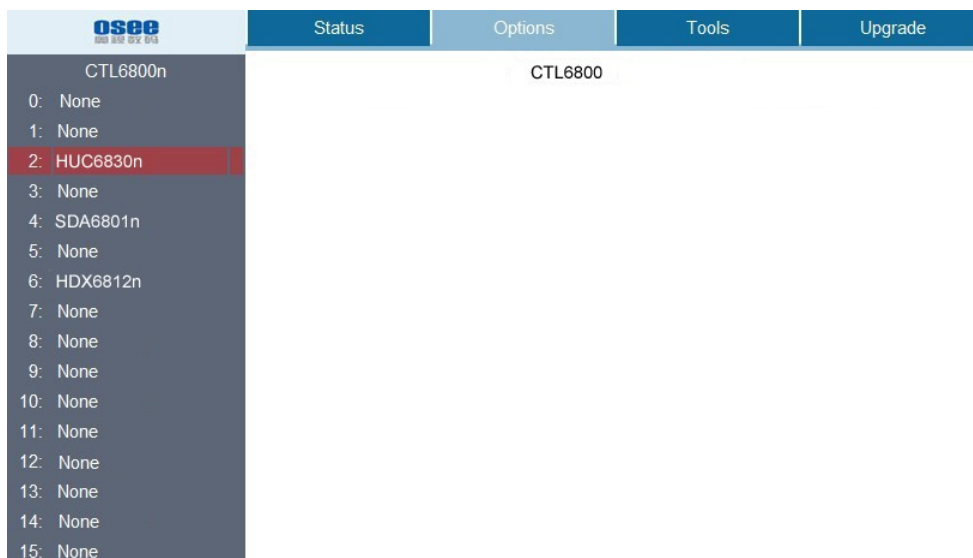


**Figure 5-7 Front View-Installing a HDMI Input/Output Module**

### 5.4.2 Network Control

Install the HCC6830N/ HCC6830NS module into 6800N series frame, it will support upgrade the module by network.

Open a web page through the IP address which 6800-FC module specified, for example: <http://192.168.1.33/web/index.htm>, the web page is shown as in Figure 5-8:



**Figure 5-8 The Network Control Interface**

Click Options tab to set the menu items used in HCC6830N/ HCC6830NS, as shown in Figure 5-9:

The screenshot shows the Osee Network Control Interface. On the left is a sidebar with a list of items: 0: None, 1: None, 2: HUC6830n (highlighted in red), 3: None, 4: SDA6801n, 5: None, 6: HDX6812n, 7: None, 8: None, 9: None, 10: None, 11: None, 12: None, 13: None, 14: None, 15: None. The main panel is titled '3: HUC6830n' and has a 'Refresh' button. Below the title are two tabs: 'bank0' (selected) and 'bank1'. The main panel contains a grid of configuration parameters:

SDIoutputSync	FrameSync	SDIoutputFormat	std-1080i50
InputModeSelect	SDI	OutputHphase	0 [Set]
OutputVphase	0 [Set]	Fsoffset	1477889
BlackOutput	Disable	AFDInputMode	Force
AFDOutputMode	Force	ForceInputAFD	code-0100
ForceOutputAFD	code-1000	InputAFDCode	code-0100
OutputAFDCode	code-1000	FpgaVersion	1
SDIInputLock	Lock	SDIInputError	Normal
SDIInputFormat	std-625i50	ExtReference	Unlock
SyncMode	bb	FactoryRecall	No
HWVersion	10	SWVersion	10

**Figure 5-9 The Options in the Network Control Interface**

You can customize the IP address in the corresponding item in Tools tab, and do upgrading operations in Upgrade tab, refer to "6800N network control software user manual " for details.

032222



## Chapter 6 Specifications

### 1. Product detailed information

Index	Specification	Values
Digital Video Input	Video Standard	SMPTE259m-C(270Mb/s,525/625 component) SD-SDI
		SMPTE292m(1.485,1.485/1.001Gb/s) HD-SDI
		SMPTE424m(2.970,2.970/1.001Gb/s) 3G-SDI
	Connector	BNC(IEC169-8)
	Impedance	75Ω
	Return Loss	>15dB,5MHz to 270MHz SD-SDI
		>15dB,5MHz to 1485Hz HD-SDI
		>15dB up to 3GHz 3G-SDI
	Cable Length	SD-SDI:0~300mBelden1694A
		HD-SDI: 0~100mBelden1694A
3G-SDI: 0~120mBelden1694A		
Supported Format	480i,576i,720p50,720p59.94,1080i50,1080i59.94,1080p23.98,1080pSF23.98,1080p25,1080p29.97,1080p50,1080p59.94	
Digital Video Output	Video Standard	SMPTE259m-C(270Mb/s,525/625 component) SD-SDI
		SMPTE292m(1.485,1.485/1.001Gb/s) HD-SDI
		SMPTE424m(2.970,2.970/1.001Gb/s) 3G-SDI
	Connector	BNC(IEC169-8)
	Impedance	75Ω
	Return Loss	>15dB,5MHz to 270MHz SD-SDI
		>15dB,5MHz to 1485Hz HD-SDI
		>15dB up to 3GHz 3G-SDI
	Output Level	800Mv±10%
	DC Offset	0±0.5V
Rise and Fall Time	400~1500 ps SD-SDI	
	<270 ps HD-SDI	
	<135 ps 3G-SDI	

Index	Specification	Values
	Overshoot	<10% of amplitude
	Jitter	<0.2 UI pk-pk SD-SDI
		<0.2 UI pk-pk HD-SDI
		<0.3 UI pk-pk 3G-SDI
HDMI input & output	Video Standard	HDMI 1.3 (CEA-861-B) 2.25Gbps
	Signal Format	480i、576i、720p50、720p59.94、1080i50、1080i59.94、1080p50、1080p59.94
	Connector	HDMI
	Cable Length	0~15m
Reference Signal	Signal Format	analog composite synchronous signal and tri level sync signal
	Connector	BNC
	Impedance	75Ω
	Input Level	NTSC/PAL: 0.45V, -6dB~+6dB; tri level sync signal: ±300mV, -6dB~+6dB
	Return Loss	>35dB up to 5.75MHz

## 2. Product Outline

The outline of HCC6830N/HCC6830NS is shown as in the following figures:



Figure 6-1 Top View

## 3. Supported Format Conversions

The HCC6830N/HCC6830NS series support the following compatible formats.

Input Formats \ Output formats		SD		HD				3G	
		525	625	720p50	720p59.94	1080i50	1080i59.94	1080p50	1080p59.94
SD	525	○	×	×	○	×	○	×	○
	625	×	○	○	×	○	×	○	×
HD	720p50	×	○	○	×	○	×	○	×
	720p59.94	○	×	×	○	×	○	×	○
	1080i50	×	○	○	×	○	×	○	×
	1080i59.94	○	×	×	○	×	○	×	○
	1080p23.98	○	×	×	○	×	○	×	○
	1080pSF23.98	○	×	×	○	×	○	×	○
	1080p25	×	○	○	×	○	×	○	×
	1080p29.97	○	×	×	○	×	○	×	○
3G	1080p50	×	○	○	×	○	×	○	×
	1080p59.94	○	×	×	○	×	○	×	○



### Tips

- Specifications are subject to change without notice.

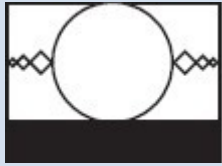
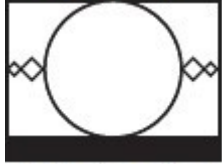
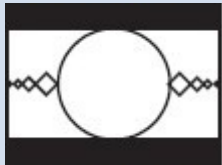
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## Chapter 7 Appendix

### Tips

- The icons used in this appendix are as follows:
  -  : the cut area of an image
  -  : add a black border
  - LetterBox: add a border at the top or bottom of an image
  - Pillarbox: add a border at the left side and right side of an image
  - Edge Crop: cut down the left side and right side of an image
  - Full Frame: cut down the top and bottom of an image
- The automatic output converting will be invalid in manual mode.

### 7.1 AFD in 4:3 Mode

AFD Code	Illustrations	Description
0010		16:9 LetterBox at the top in a 4:3 Coded Frame
0011		14:9 LetterBox at the top in a 4:3 Coded Frame
0100		Aspect ratio greater than 16:9 LetterBox in a 4:3 Coded Frame

AFD Code	Illustrations	Description
1000		4:3 Full Frame
1010		16:9 LetterBox in 4:3 Coded Frame
1011		14:9 LetterBox, Centered, in 4:3 Coded Frame
1101		4:3 Centered at 14:9, 4:3 Coded Frame
1110		16:9 LetterBox, 14:9 Alternative Centered, in 4:3 Coded Frame
1111		16:9 LetterBox, 4:3 Alternative Centered, in 4:3 Coded Frame

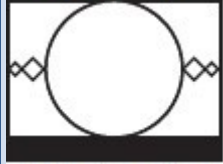
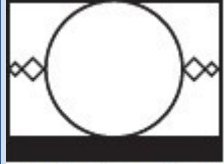
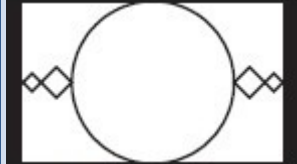
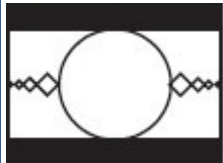
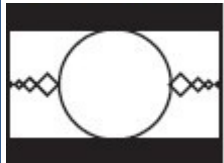
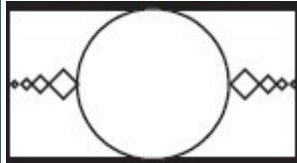
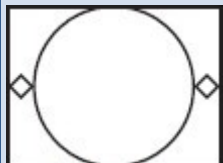
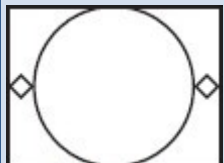
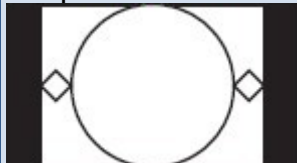
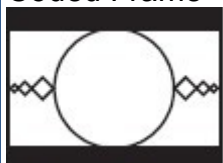
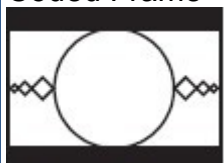
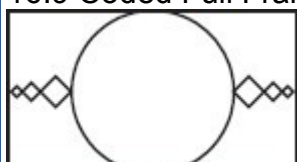
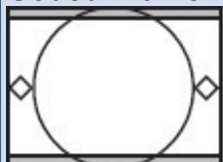
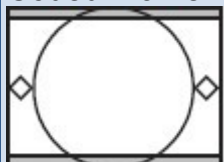
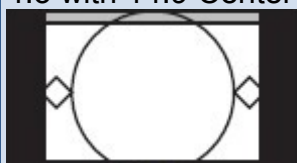
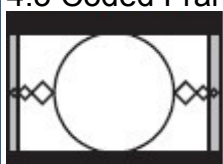
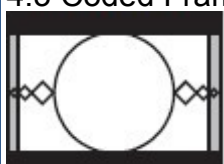
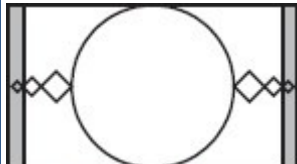
## 7.2 AFD in 16:9 Mode

AFD Code	Illustrations	Description
0100		16:9 LetterBox with aspect ratio greater than 16:9
1000		AFD Code: 1000 16:9 Coded Full Frame


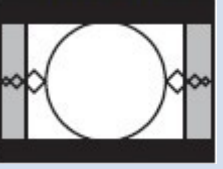
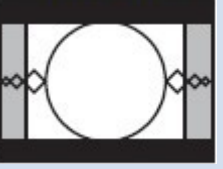
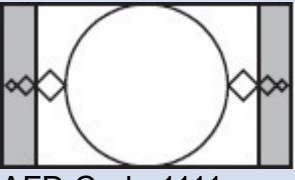
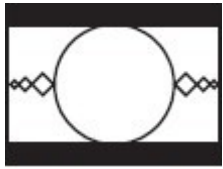
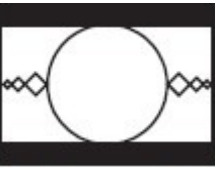
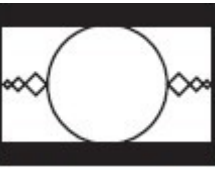
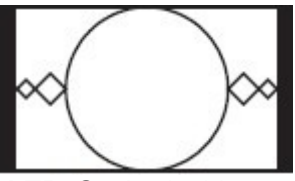
AFD Code	Illustrations	Description
1001		4:3 pillarbox
1010		16:9 Coded Full Frame with Protected Area
1011		14:9 Centered image in a 16:9 Coded Frame
1101		4:3 with 14:9 Center
1110		16:9 with 14:9 Center
1111		16:9 with 4:3 Center

### 7.3 Converting from 4:3 to 16:9

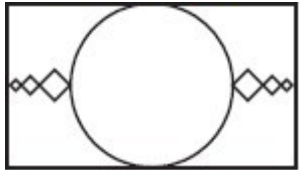
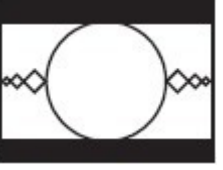
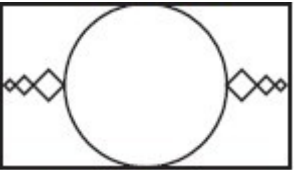
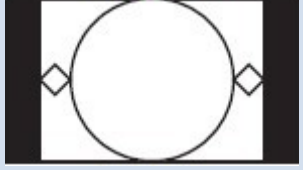
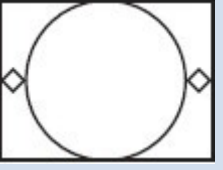
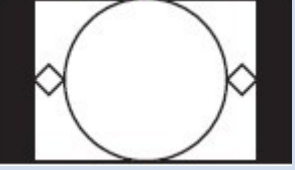
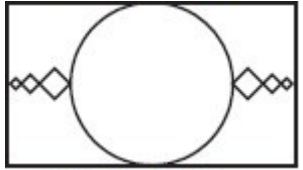
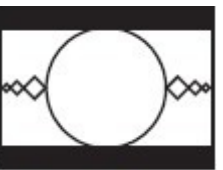
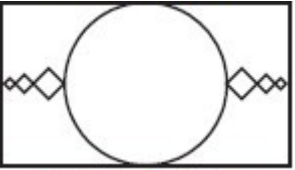
Input AFD	Output AFD	
4:3 Coded Frame	4:3 Coded Frame	16:9 Coded Frame
16:9 LetterBox at the top in a 4:3 Coded Frame  AFD Code:0010	16:9 LetterBox at the top in a 4:3 Coded Frame  AFD Code:0010	16:9 Coded Full Frame  AFD Code:1000
14:9 LetterBox at the top	14:9 LetterBox at the top	14:9 Centered image in a

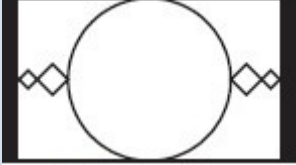
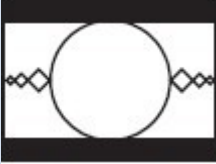
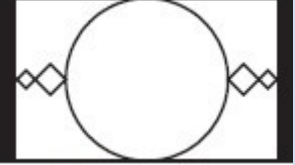
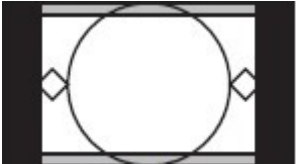
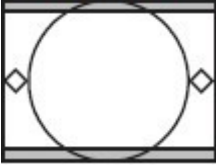
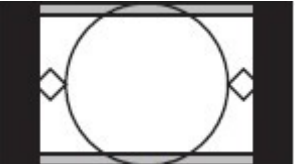
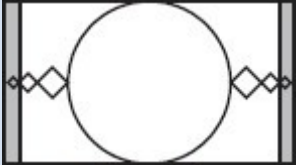
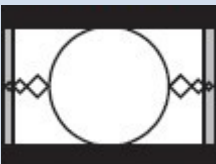
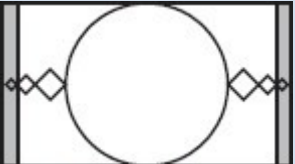
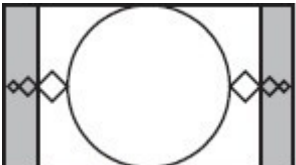
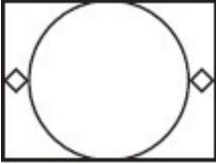
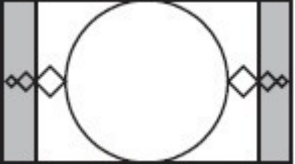
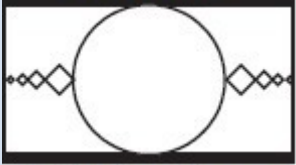
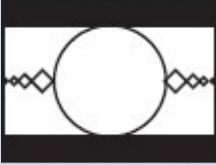
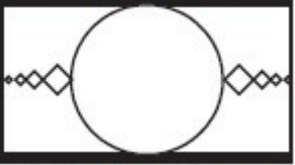
Input AFD	Output AFD	
in a 4:3 Coded Frame  AFD Code:0011	in a 4:3 Coded Frame  AFD Code:0011	16:9 Coded Frame  AFD Code:1011
Aspect ratio greater than 16:9 LetterBox in a 4:3 Coded Frame  AFD Code:0100	Aspect ratio greater than 16:9 LetterBox in a 4:3 Coded Frame  AFD Code:0100	16:9 LetterBox with aspect ratio greater than 16:9  AFD Code:0100
4:3 Full Frame  AFD Code:1000	4:3 Full Frame  AFD Code:1000	4:3 pillarbox  AFD Code:1001
16:9 LetterBox in 4:3 Coded Frame  AFD Code:1010	16:9 LetterBox in 4:3 Coded Frame  AFD Code:1010	16:9 Coded Full Frame  AFD Code:1000
4:3 Centered at 14:9,4:3 Coded Frame  AFD Code:1101	4:3 Centered at 14:9,4:3 Coded Frame  AFD Code:1101	4:3 with 14:9 Center  AFD Code:1101
16:9LetterBox,14:9 Alternative Centered, in 4:3 Coded Frame  AFD Code:1110	16:9LetterBox,14:9 Alternative Centered, in 4:3 Coded Frame  AFD Code:1110	16:9 with 14:9 Center  AFD Code:1110



Input AFD		Output AFD	
16:9 LetterBox, 4:3 Alternative Centered, in 4:3 Coded Frame	16:9 LetterBox, 4:3 Alternative Centered, in 4:3 Coded Frame	16:9 LetterBox, 4:3 Alternative Centered, in 4:3 Coded Frame	16:9 with 4:3 Center
			
AFD Code:1111	AFD Code:1111	AFD Code:1111	AFD Code:1111
14:9 LetterBox, Centered, in 4:3 Coded Frame	14:9 LetterBox, Centered, in 4:3 Coded Frame	14:9 LetterBox, Centered, in 4:3 Coded Frame	14:9 Centered image in a 16:9 Coded Frame
			
AFD Code:1011	AFD Code:1011	AFD Code:1011	AFD Code:1011

### 7.4 Converting from 16:9 to 4:3

Input AFD	Output AFD	
16:9 Coded Frame	4:3 Coded Frame	16:9 Coded Frame
16:9 Coded Full Frame	16:9 LetterBox in 4:3 Coded Frame	16:9 Coded Full Frame
		
AFD Code:1000	AFD Code:1010	AFD Code:1000
4:3 pillarbox	4:3 Full Frame	4:3 pillarbox
		
AFD Code:1001	AFD Code:1000	AFD Code:1001
16:9 Coded Full Frame with Protected Area	16:9 LetterBox in 4:3 Coded Frame	16:9 Coded Full Frame with Protected Area
		
AFD Code:1010		AFD Code:1010

Input AFD	Output AFD	
	AFD Code:1010	
<p>14:9 Centered image in a 16:9 Coded Frame</p>  <p>AFD Code:1011</p>	<p>14:9 LetterBox, Centered, in 4:3 Coded Frame</p>  <p>AFD Code:1011</p>	<p>14:9 Centered image in a 16:9 Coded Frame</p>  <p>AFD Code:1011</p>
<p>4:3 with 14:9 Center</p>  <p>AFD Code:1101</p>	<p>4:3 Centered at 14:9,4:3 Coded Frame</p>  <p>AFD Code:1101</p>	<p>4:3 with 14:9 Center</p>  <p>AFD Code:1101</p>
<p>16:9 with 14:9 Center</p>  <p>AFD Code:1110</p>	<p>16:9LetterBox,14:9 Alternative Centered, in 4:3 Coded Frame</p>  <p>AFD Code:1110</p>	<p>16:9 with 14:9 Center</p>  <p>AFD Code:1110</p>
<p>16:9 with 4:3 Center</p>  <p>AFD Code:1111</p>	<p>4:3 Full Frame</p>  <p>AFD Code:1000</p>	<p>16:9 with 4:3 Center</p>  <p>AFD Code:1111</p>
<p>16:9 LetterBox with aspect ratio greater than 16:9</p>  <p>AFD Code:0100</p>	<p>Aspect ratio greater than 16:9 LetterBox in a 4:3 Coded Frame</p>  <p>AFD Code:0100</p>	<p>16:9 LetterBox with aspect ratio greater than 16:9</p>  <p>AFD Code:0100</p>

-----No Text Below-----



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FOR MORE INFORMATION PLEASE VISIT: <http://www.osee-dig.com/>  
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