
HFS6860N

High-definition Digital Frame Synchronizer

USER MANUAL

The logo for 'osee' is displayed in a bold, blue, sans-serif font. The letters are lowercase and closely spaced. The logo is positioned at the bottom right of the page, with two horizontal dashed lines extending from the left edge of the page towards it.

Product Information

Model: HFS6860N High-definition Digital Frame Synchronizer
Version: V010001
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Company

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About this manual

The manual applies to the following models:

- HFS6860N
- HFS6860N-3G

Any different specifications are detailed in the manual.

Please make sure your device model before you read it.

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HFS6860N High-definition Digital Frame Synchronizer

Chapter 1 Overview

1.1 Introduction

The HFS6860N High-definition Digital Frame Synchronizer modules can be installed in 6800N series frame.

HFS6860N high-definition digital frame synchronizer can support the synchronization and delay mode. It supports EDH/CRC error detection and reinsertion. It has the built-in video test signal generator (color bars and black), can support video loss detection.

The difference between HFS6860N and HFS6860N-3G:

HFS6860N: Support HD/SD-SDI video input.

HFS6860N-3G: Using the 3G authorization code, the modules can also support 3G video signal format.

Note: The 3G high-definition video signal authorization code is optional. The user can enter the license key to upgrade the module through the WEB.

There is 1 channel HDMI output for monitoring.

Table 1-1 describes the input and output signals HFS6860N supports.

Table 1-1 Input and output

Module	Input	Output
HFS6860N	<ul style="list-style-type: none"> • 1 channel 3G/HD/SD-SDI video input • 1 channel HDMI input • 1 channel reference video signal input 	<ul style="list-style-type: none"> • 3-channel 3G/HD/SD-SDI video after synchronization • 1 channel HDMI output

1.2 Feature

The HFS6860N offers the following features:

- ◆ 10-bit/ 20-bit serial 4:2:2 frame synchronizer
- ◆ Support multiple formats of standard input
- ◆ Support manual control of the static frame and the output of the black
- ◆ Support analog black and tri-level two synchronous mode, also support the delay mode
- ◆ Support EDH/CRC tracking and reinsertion
- ◆ Horizontal and vertical phase adjustable
- ◆ Support 8-channel embedded audio monitoring

- ◆ Video input loss detection
- ◆ Built-in video test signal generator (color bars and black)
- ◆ Built-in audio test signal
- ◆ Provide network control functions, for the local and remote set of modules

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.

1.3 Module Descriptions

1.3.1 The Front Part of Module

Figure 1-1 shows the control switch and LED indicator in front of the module HFS6860N.

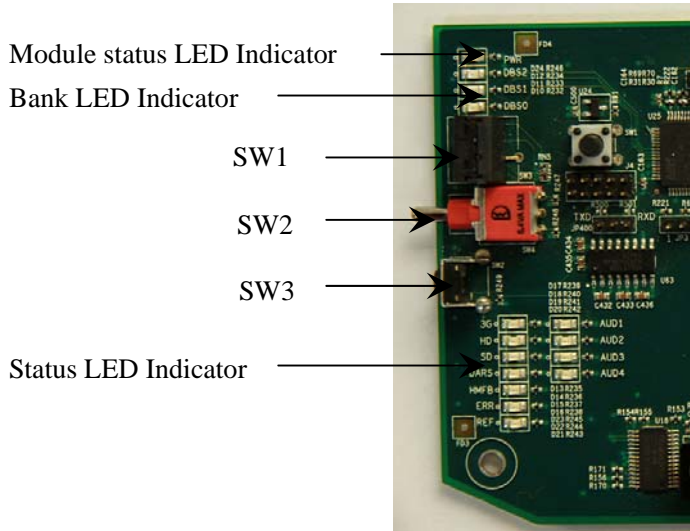


Fig. 1-1 The control switch and LED indicator of HFS6860N

Table 1-2 describes the control switch and status LED. About the detailed instructions, refer to Chapter 3: Operation and Control.

Table 1-2 the control switch and LED indicator

Function	Description
Module status LED	Used to indicate the working status of the module. Refer to Chapter 3 LED instructions for more information.
BANK LED	Display the module BANK choice, for more detail information refer to Table 3-2.
SW1	Used to select various settings and parameters.
SW2	Through the switch up (UP) or down (DOWN) to toggle to set various control parameters.
SW3	(Reserved)
Status LED	Shows some basic information of the module, for more detail information refer to Table 3-2.

1.3.2 Rear panel connector

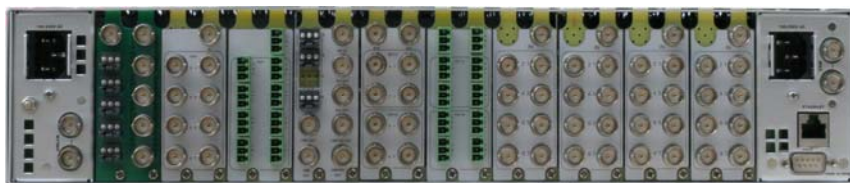


Fig. 1-2 Rear panel connector

1.3.3 The back of HFS6860N

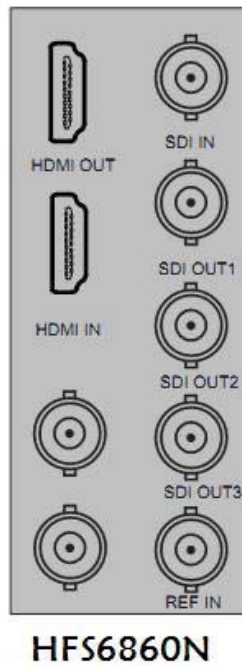


Fig. 1-3 The back of HFS6860N

The Back Connector of HFS6860N is showed as fig 1-3.

Table 1-3 Description of HFS6860N Back Connector

Item	Description
HDMI OUT	HDMI output
HDMI IN	HDMI input
SDI IN	3G/HD/SD-SDI input
SDI OUT 1	3G/HD/SD-SDI output channel 1
SDI OUT 2	3G/HD/SD-SDI output channel 2
SDI OUT 3	3G/HD/SD-SDI output channel 3
REF IN	Reference video signal input

1.4 Signal Flow

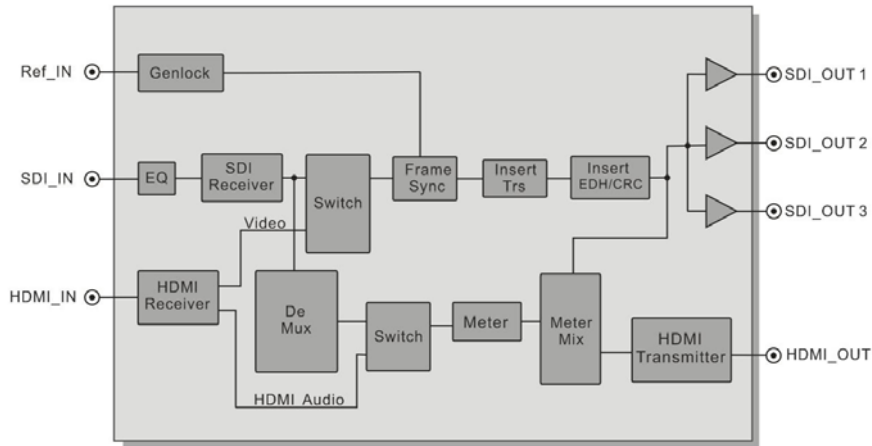


Fig. 1-4 Signal Flow of HFS6860N

Chapter 2 Installation

2.1 Overview

The power consumption for module and the maximum power ratings that frame can sustain have to be confirmed before installing the module.

In this chapter, the following topics on installation process for HFS6860N are discussed below:

- Unpacking the module
- Installing the module
- Making the connections
- Removing the module

2.2 Maximum Power Ratings for Frame

The maximum power ratings that different types of frames can sustain are listed in the Table 2-1

Tab. 2-1 Maximum Power Consumption

Frame	Maximum Voltage	Redundant Power Supplies	Numbers of Slots
6800N-1U	40W	Yes	4
6800N-2U	60W	Yes	10

2.3 Unpacking the Module

2.3.1 Preparing the Product for Installation

Contact your dealer right now if any items are missing. Please follow the procedures below before

installing the module:

- Check the equipment for any invisible damage that may have occurred during transit.
- Confirm all the items listed on the packing list have been received.
- Remove all the packing material including electrostatic-resistant packing.
- Retain these packing for future use.

2.3.2 Check the Packing List

Tab. 2-2 Packed Components

Model Name	Description
HFS6860N	HFS6860N module (1pc); back connector (1pc), and other accessories

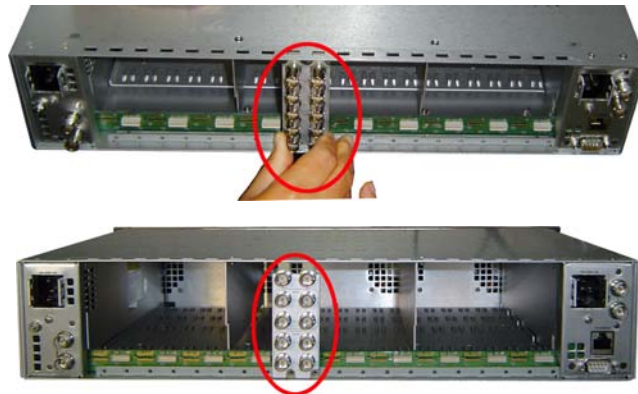
2.4 Installing the Module

Caution: Static electricity may cause sensitive semiconductor out of order. Avoid installing or removing the module in the electrostatic-induced environment.

Please carefully read safety instructions particularly for the information on fire electric shock and personal injury, and strictly observe it before installing the module.

Follow the next steps to install the module:

Step 1



Step2



Step3



Step 4



Step5



Fig. 2-1 Installation of 2U Frame of 6800N Series

- ✓ Locate the position for back connector and insert the back connector.
- ✓ Fasten the screw to fix the back connector.
- ✓ Locate the slot for module.
- ✓ Get the module installed in the slot, push the module slightly along the slot, press module again to confirm that the module is installed firmly and then close swivel handle.
- ✓ Install the front panel.

2.5 Making the Connections

Please connect signals based on Fig. 1-3.

2.6 Removing the Module

Follow the following steps to remove HFS6860N module:

1. Open the front part of frame.
2. Open the swivel handle to the full.



3. First make sure the frame stands firmly, and then pull the module gently along the slot till out of frame.
4. Install the front panel.

Chapter 3 Operation and Control

3.1 Switches

The control switch is shown in Figure 3-1.

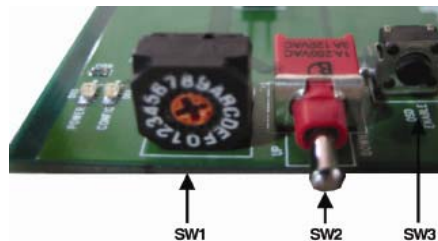


Fig. 3-1 Switches and Key

1. SW1

SW1 is a 16-position rotary switch, which is used to select the specific setting. The selection range is: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F.

2. SW2

SW2 is a 3-position toggle switch, used to adjust the parameters of the setting made by SW1. To keep SW2 at the position of “UP” or “DOWN”, the continuous adjustment can be achieved.

3. SW3

Reserved.

Audio meter is superimposed onto the HDMI output. The users can monitor the audio channels embed in the video source though the meter. The factory default is enabled, also the TC. When set the parameter, the LED will show the module status.

3.2 Parameter settings

The module has only Bank 0 status. In Bank 0, then LED DBS0-2 will not light, and the detail information refers to Table 3-2. There are 16 options in Bank0 and SW1 corresponds to each parameter setup, the user can set these parameters to control module, or monitor the module status.

Turn SW1 to the appropriate location, and then toggle SW2 to set the parameters.

3.2.1 Option Description

Below will describe the parameter and function of Bank 0.

Table 3-1 Bank0 parameter and function setup

SW1	Function	Options	Default
0	Bank Select	Bank 0	Bank 0
1	Video source select	SDI, HDMI, Fiber	SDI
2	Output Black or freeze or normal	Normal, Black, Freeze	Freeze
3	Output select when no signal	Black , Freeze	Black
4	H-Phase	0~2369	0 [Table3-1-1]
5	V-Phase	0~1124	0 [Table 3-1-1]
6	Meter Enable	OFF, ON	ON
7	TC Enable	OFF, ON	ON
8	SDI Output Select	SDI-IN, HDMI-IN output, Color output, Black output	SDI-IN/HDMI-IN output
9	Color or black output format	625i, 525i, 720p50, 720p60&59.94, 1080i50 , 1080i60&59.94, 1080p25 , 1080p30&29.97, 1080p24&23.98, 1080p50, 1080p60&59.94, 1080psf24	1080i50
A	Audio test level	-18db, -20db	-18db
B	Sync Mode	Delay, Frame Sync	Frame Sync
C	Frame Sync Mode	Analog, 3-level	Analog
D	Reserved		
E	Reserved		
F	Factory Recall	Factory Recall	Factory Recall

Note: The module supports analog black and tri-level two synchronous modes. In 3-level sync mode, it only supports 1080i59, 1080i50, 720p59, 720p50 format.

Table 3-1-1 H-phase and V-phase maximum

Format	525i	625i	720p/59	720p/50	1080i/59	1080i/50	1080P50	1080P25	1080P59	1080P29
H_Max	858*2	864*2	1650	1980	2200	2640	2640	2640	2200	2200
V_Max	525	625	750	750	1125	1125	1125	1125	1125	1125

3.3 LED Indicator

This section will describe the LED indicator, and the user can validity check the LED by the printing fonts above the module.

Table 3-2 LED Indicator function

Item (color)	Description
POWER (Green)	On: Power is supplied. Off: The power supply is not normal.
DBS2 (Green)	DBS2 shows BANK state. In BANK0 state, DBS0 ~ 2 light is off. In BANK1 state, DBS1 light is on. In BANK2 state, DBS2 light is on. In BANK3 state, DBS1 ~ 2 lights are on.
DBS1 (Green)	DBS1 shows the BANK state, set by SW1.
DBS0 (Green/Orange)	DBS0 (Orange) On: Operated.
3G (Green)	On: 3G signal input
HD (Green)	On: HD signal input
SD (Green)	On: SD signal input
AUD1 (Green)	In the SDI signal group, there is information about Group 1.
AUD2 (Green)	In the SDI signal group, there is information about Group 2.
AUD3 (Green)	In the SDI signal group, there is information about Group 3.
AUD4 (Green)	In the SDI signal group, there is information about Group 4.
REF (Green)	On: There is Reference signal.
ERR (Green)	On: In input signal, there is information about EDH/CRC with error.
HDMI/fiber (Green)	On: In HDMI or optical fiber mode. OFF: In SDI mode.

3.4 Setting Jumper

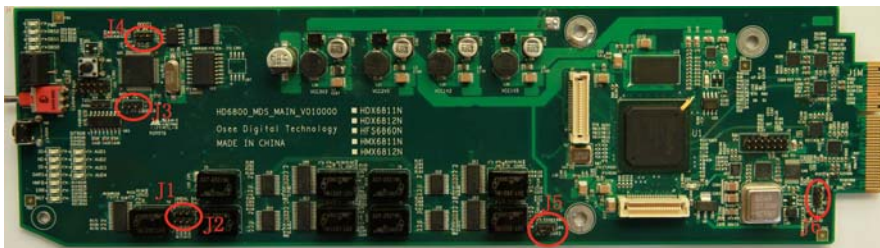


Fig 3-3 Jumper

Table 3-3 Description of Jumper

Item	Description
JP3	
JP4	
JP6	Reference signal source selection, select the REF_BNC it will be analog reference signal sent by an external BNC, and select the REF, it will be internal reference signal.

Chapter 4 HDMI Add-on modules

There is HDMI input sub-module/ HDMI output sub- module / HDMI input and output sub-module as optional add-on modules.

Type	Description
HD_6800N_HI	HDMI output module
HD_6800N_HO	HDMI input module
HD_6800N_HIO	HDMI input and output module

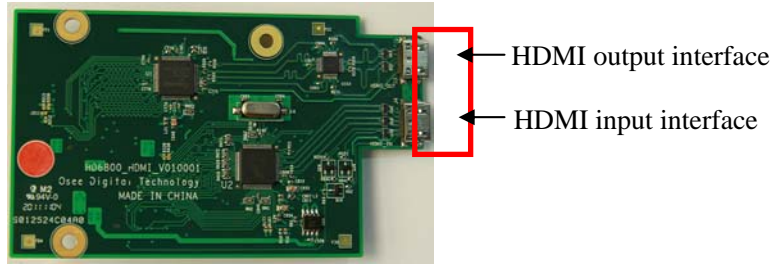


Fig 4-1 HDMI input/output module

4.1 Install

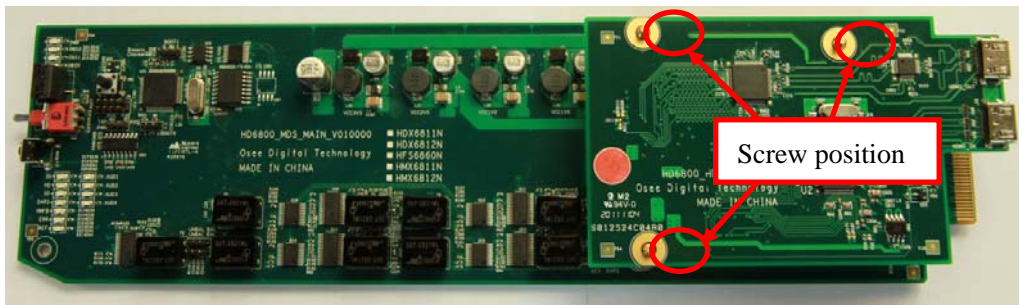


Fig 4-2 Installed state (1)

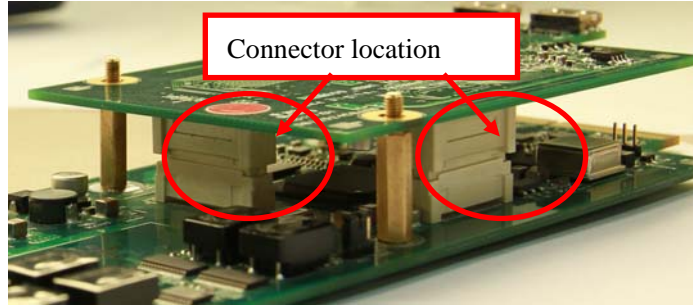


Fig 4-3 Installed state (2)

Installation instructions: (As figs shown)

- 1, Connect the connectors.
- 2, Fix the screws.

4.2 Description

HDMI input module, HDMI output module, and HDMI input and output module are optional sub-module which can be used in the HD 6800 series modules.

Through them, the HD 6800 series modules all can support HDMI input/output.

Chapter 5 Specifications

In this chapter, the specifications in the following subjects are introduced:

- Video Input
- Video Output
- Video REF input
- HDMI input

5.1 Video Input

Table 5-1 Video Input Specifications

Item	Parameter
Standards	SMPTE424M3G-SDI,SMPTE292M HD-SDI,SMPTE259M SD-SDI
Impedance	75 Ω
Return Loss	>15dB,5MHz to 3GHz;
Connector	BNC (IEC169-8)
Equalization	SD-SDI: 0-300mBelden1694A; HD-SDI: 0-100mBelden1694A; 3G-SDI: 0-120m Belden 1694A;
Supported formats	480i、576i、1080i59、1080i50、1080Psf24、1080p59、1080p50、1080p29、 1080p25、720p59、720p50

5.2 Video REF input

Table 5-2 Video REF input Specifications

Item	Parameter
Signal format	Composite sync signal or 3-level sync signal
Impedance	75 Ω
Level	1V pk-pk+6dB/-3.5dB
Return Loss	>40dB to 10MHz

5.3 HDMI Input

Table 5-3 HDMI Input Specifications

Item	Parameter
Signal format	1080i60、1080i50、1080p60、1080p50、1080p30、1080p25、720p60、720p50
Standards	HDMI 1.3 (CEA-861-B) 2.25Gbps
Connector	HDMI
Equalization	0-30m

5.4 Video Output

Table 5-4 Video Output Specifications

Item	Parameter
Standards	SMPTE292M HD-SDI,SMPTE259M SD-SDI,SMPTE424M 3G-SDI
Connector	BNC (IEC169-8)
Impedance	75 Ω
Return Loss	>15dB 5MHz to 3GHz
Signal Level	800Mv \pm 10%
DC Offset	0 \pm 0.5V
Rise/Fall Time	<135ps: 3G , <270ps: HD-SDI, 0.4 to1.5ns: SD-SDI
Overshoot	<10%
Jitter	3 Gb/s: <0.3 UI HD/SD: <0.2 UI
Supported formats	480i、576i、1080i60、1080i50、1080Psf24、1080p60、1080p50、1080p30、1080p25、720p60、720p50

Note: The specs are subject to change without prior notice!