VAM6800 A/D Conversion and Audio Embedder

USER MANUAL

OSEE TECHNOLOGY CO., LTD.

Product Information

Model: VAM6800 A/D Conversion and Audio Embedder
Version: V010002
Release Date: July 19th, 2010

Company

OSEE TECHNOLOGY CO., LTD.

Contact Information

Address: No.22 Building, No.68 zone, Beiqing Road, Haidian District, Beijing, China
Post Code: 100094
Tel: (+86) 010-62434168
Fax: (+86) 010-62434169
Web: http://www.osee-dig.com/
E-mail: sales@osee-dig.com

Contents

Chapter 1 Introduction

Overview

In this manual, the analog video module and audio embedder module for VAM6800 are introduced.

The modules for VAM6800 include decoder and line buffer that can remove the jitter, one analog video input, two balanced analog audio inputs and three SDI outputs with embedded audio.

The VAM6800S has one analog video input, one analog reference input, two balanced analog audio inputs and three SDI outputs with embedded audio. In addition to the functions that VAM6800 provides, the VAM6800S also features in frame synchronizer and can synchronize to the external reference signal. The system synchronization must be in consistency with the standard of analog composite input, otherwise the VAM6800S cannot work properly. It prefers BB signal as system synchronization and it must comply with standard of analog composite signal.
The VAM6800 can be housed in 6800N series frame.

General Description

The VAM6800 is a decoder and audio embedder with broadcast quality. It converts analog composite NTSC/PAL signal and analog audio signal into SDI component signal with embedded audio. The VAM6800 can be used in the broadcast and production system, where converting analog composite video and audio signal into SDI component signal with embedded audio is required.

The VAM6800 incorporates the latest technology in circuit design and low power dissipation. Each card can complete a variety of functions, such as the conversion between A/D, frame synchronization and embedded audio. The VAM6800 can output three SDI component signals (SMPTE-259M) simultaneously. The VAM6800 provides multi-function on card-edge.

The VAM6800 analog video and audio embedder can be controlled via the switches on the front panel. Table 1-1 is the description for different modules.

Table 1-1 VAM6800 Analog Video/Audio Embedder

Module	Description
VAM6800	Analog audio embedder, with three SDI outputs with embedded audio.
VAM6800S	Analog audio embedder, with three SDI outputs with embedded audio, and frame synchronizer.

Features

- Compact Design

  The VAM6800 includes 12-bit A/D conversion, 4X oversampling, digital decoding, frame synchronization, conversion between parallel and serial, external synchronization, audio embedding and all circuits. No extra circuit cards are needed for VAM6800S. Owing to the

low power dissipation, 6800N series frame can house up to 10 pieces of VAM6800 cards.

- Application in Multi-Standard
  The VAM6800 can work in both 525 and 625 standards, and auto sensing on standards can be achieved.
- Advance Decoding
  High performance is secured by adopting 12-bit decoding. The full digital processing in signal and luminance decoding ensures the precision of decoding, and thus no more readjustments are needed, and system can work in high reliability for long hours. In the meantime, digital decoding allows to adopt 5-line adaptive comb filter, thus effects on separating chrominance and luminance of analog composite signal can be secured.
- Advanced Built-In Technology
  The VAM6800 adopts 4X oversampling and built-in filter to guarantee better frequency response, high signal noise ratio and low distortion.
- Frame Synchronizer
  The built-in frame synchronizer of VAM6800 can solve the synchronizing and timing issues of the system, and can provide frame freeze as well.
- Fully Functioned Processing Amplifier
  The VAM6800 provides fully functioned processing amplifier to achieve the adjustment on luminance level, black level, chrominance level and Hue.
- SETUP Control
  Working in the 525 standard, the VAM6800 can control SETUP.
- Synchronization
  The VAM6800S can set the H-phase and V-phase.

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.

Module Descriptions

The Front Part of the Module

Figure 1-1 shows control switches and module status LEDs for VAM6800

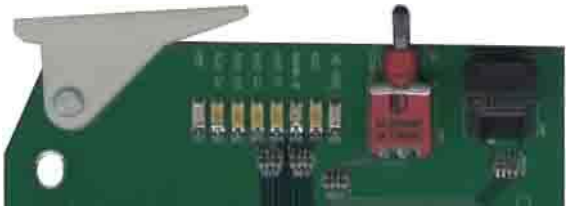


Figure 1-1 Control Switches and Module Status LEDs for VAM6800

Table 1-1 briefly describes control switches and module status LEDs. Refer to chapter three for more information on control switches and module status LEDs.

Table 1-1 VAM6800 Module Features

Feature	**Description**
Module status LEDs	Different colors and lighting combinations of these LEDs indicate the module state. See “Instruction on LEDs” in chapter 3 for more information.
Mode select rotary switch (SW1)	The SW1 is a rotary switch with 16 locations and used to select specific settings.
Navigation toggle switch (SW2)	The SW2 is a navigation toggle switch with 3 positions having auto performance back to the middle location.

Back Connector

VAM6800

Figure 1-2 and Table 1-2 show the back connector for VAM6800.

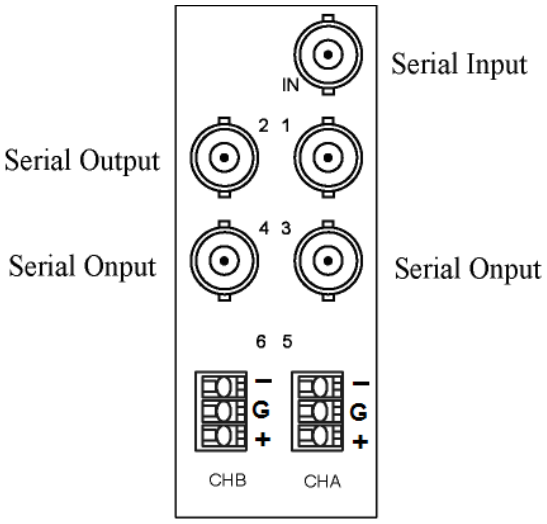


Figure 1-2 VAM6800 Back Connector

Table 1-2 VAM6800 Back Connector

Location	Description
IN	Analog composite input
1	Not in use
2	SDI output: SDI output with embedded audio.
3	SDI output: SDI output with embedded audio.
4	SDI output: SDI output with embedded audio.
5	CHA INPUT: analog audio input of channel A
6	CHB INPUT: analog audio input of channel B

VAM6800S

Figure 1-3 and Table 1-3 show the back connector for VAM6800S.

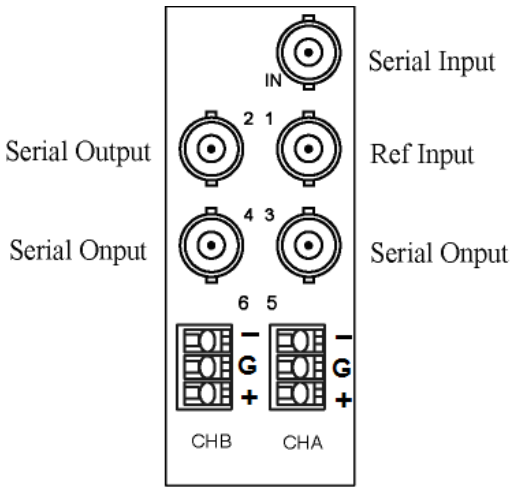


Figure 1-3 VAM6800S Back Connector

Table 1-3 VAM6800S Back Connector

Location	Description
IN	Analog composite input
1	REF INPUT: reference input
2	SDI Output: SDI output with embedded audio.
3	SDI Output: SDI output with embedded audio.
4	SDI Output: SDI output with embedded audio.
5	CHA INPUT: analog audio input of channel A
6	CHB INPUT: analog audio input of channel B

Signal Flow

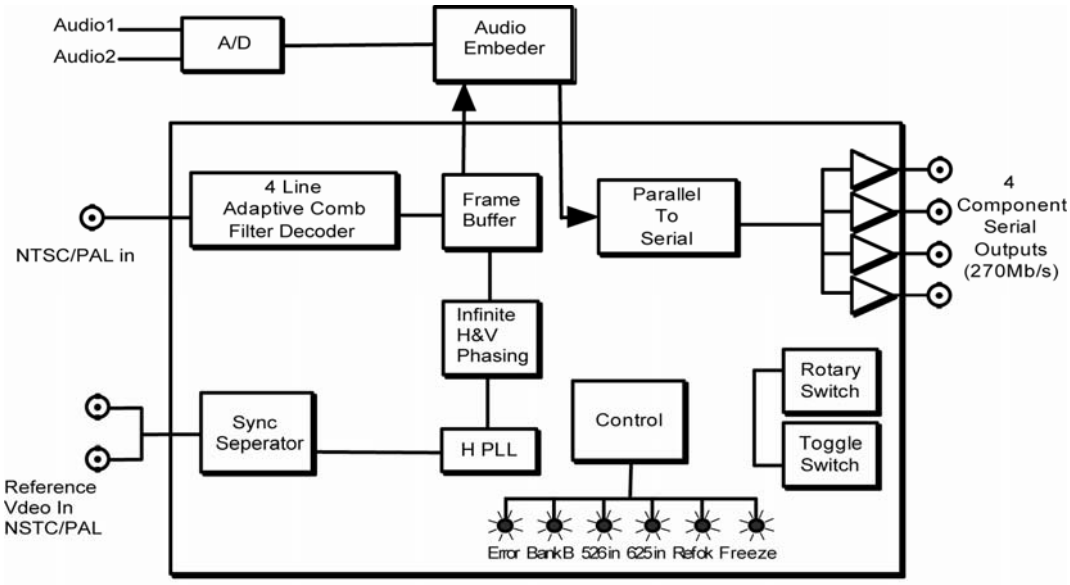


Figure 1-4 VAM6800 Signal Flow Diagram

Chapter 2 Installation

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 VAM6800 are discussed below:

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

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

Unpacking the Module

Preparing the Product for Installation

Contact your dealer right now if any items are missing.

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.

Check the Packing List

Tab. 2-2 Packed Components

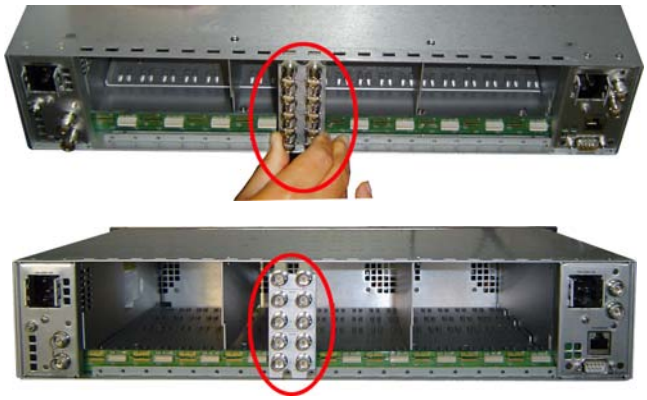
Model Name	Description
VAM6800	VAM6800 module (1pc); back connector (1pc), and other accessories

Installing the Module

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

Follow the following 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.

Making the Connections

Please connect signals based on Fig. 1-2.

Removing the Module

Follow the following steps to remove VAM6800 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.

Setting Jumper

The jumper serves to set input level of analog audio. Four groups of jumpers of VAM6800 have to be set when needed. The four groups are: CH1, CH2, CH3 and CH4.

Note: Shown as the following figure, follow the Table 2-3 indication to set jumpers for audio input level.

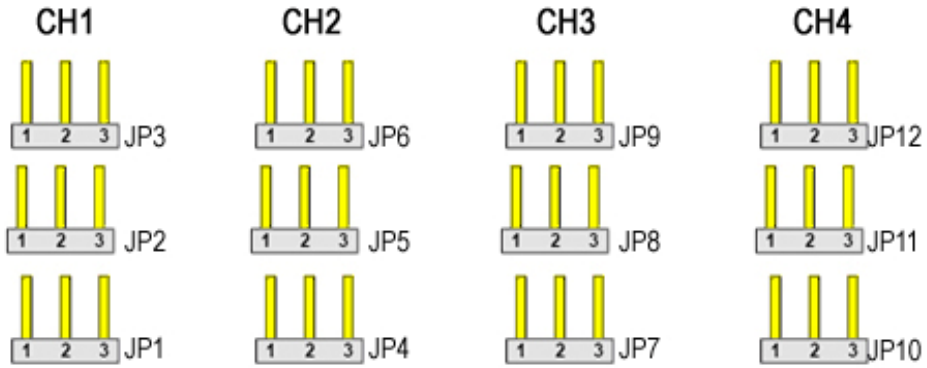


Figure 2-2 schematic diagram of every jumper location

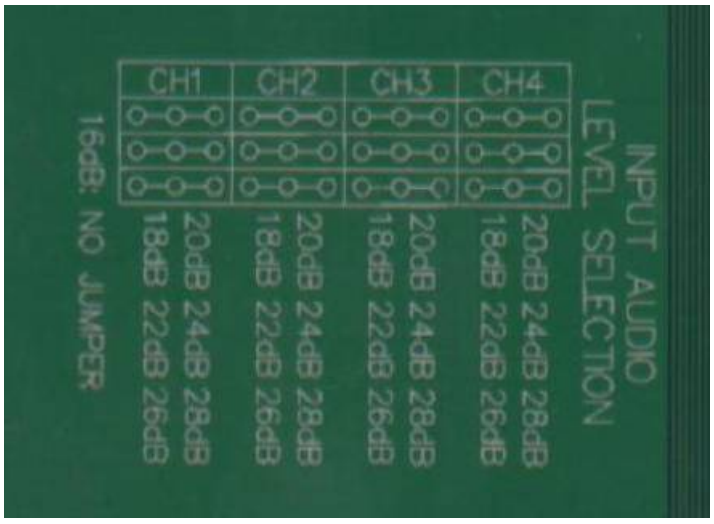


Figure 2-3 Indication on Jumper Location

Table 2-3 the locations for Input Audio Level Selection

Input Audio Level	Pin Numbers
28dB	Pin 2 and 3 of JP1, JP4, JP7, JP10

Input Audio Level	Pin Numbers
26dB	Pin 1 and 2 of JP1, JP4, JP7, JP10
24dB	Pin 2 and 3 of JP2, JP5, JP8, JP11
22dB	Pin 1 and 2 of JP2, JP5, JP8, JP11
20dB	Pin 2 and 3 of JP3, JP6, JP9, JP12
18dB	Pin 1 and 2 of JP3, JP6, JP9, JP12
16dB	No jumper

Figure 2-4 the board of the VAM6800 Module

Chapter 3 Operation and Control

Switches and Key

Refer to **Figure 3-1** or **Table 3-1**（Bank 0）or **Table 3-2**（Bank 1）to complete control

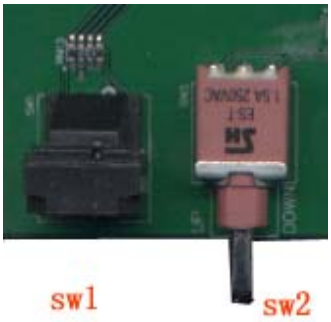


Fig. 3-1 Switches and Key

Rotate SW1 at the position of 0, and select the proper Bank by SW2.
Rotate the SW1 at the position of “0”. The position of “0” is always used to select Bank.
Turn SW2 up or down to select Bank.

1. SW1 Mode Selection

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 Mode Selection

SW2 is a toggle switch, which is used to decide the concrete figure of the setting made by SW1.

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

Table 3-1 BANK A SW1 Setting

Location	**Features**	**UP: SW2+** **DOWN: SW2-**	**Default**
0	BANK selection	+ BANK A - BANK B	BANK A
1	Mode selection	+ Auto-sensing - Manual	Auto-sensing
2	Manual	+: 525 - : 625	
3	SETUP *1	+: SETUP - : Nil	SETUP
4	Auto level control	+: Auto level control - Manual control	Auto level control
5	Manual level input	+ Increase - Decrease	Standard value
6	Luminance Level	+ Increase - Decrease	Standard value
7	Black Level	+ Increase - Decrease	Standard value
8	Chrominance level	+ Increase - Decrease	Standard value
9	Hue	+ Increase - Decrease	Standard value
A	Comb filter	+ On - Off	On
B~D	Reserve		
E	(Decoder) default*3	+Invalid -Set as default	
F	Default*4	+Invalid -Set as default`	

Table 3-2 BANK B SW1 Setting

Location	**Features**	**UP: SW2+** **DOWN: SW2-**	**Default**
0	Select BANK	+ BANK A - BANK B	BANK A
1	H-phase (VAM6800S)	+ Increase - Decrease	0

Location	Features	UP: SW2+ DOWN: SW2-	Default
2	V-phase (VAM6800S)	+ Increase - Decrease	0
3	Audio delay	+ Increase - Decrease	0
4	Audio group selection	+ Increase -Decrease	0
5	CHA 1 Audio input selection	+ Increase Down for once: CHA input Down for twice: 1KHz test audio signal Down for three times: IKHz test audio signal Down for four times: CHB input - Decrease	CHA Input
6	CHB 2 Audio input selection	+ Increase Down for once: CHA input Down for twice: 1KHz test audio signal Down for three times: 1KHz test audio signal Down for four times: CHB input - Decrease	CHA Input
7	Reserve		
8	Reserve		
9	Gain for CH 2	+ Increase - Decrease	Standard value
A	Gain for CH 1	+ Increase - Decrease	Standard value
B	Gain for CH 3	+ Increase - Decrease	Standard value
C	Gain for CH 4	+ Increase - Decrease	Standard value
D~F	Reserve		

Note: *1. SETUP does not function in 625 standard

*2. Hue does not function in 625 standard.

*3. Set the 4, 5, 6, 7, 8, and 9 of BANK A as default.

*4. Set all parameters as defaults.

Instructions on LED

Table 3-3 Functions of LED

VID ERR	Red	On: input signal not exist or incorrect.
625	Green	ON: in 625 standard；OFF: in 525 standard
BANK B	Orange	OFF: current selection is BANK A；ON: current selection is BANK B。
AUD G1	Green	ON: embedded audio is audio group 1.
AUD G2	Green	ON: embedded audio is audio group 2.
AUD G3	Green	ON: embedded audio is audio group 3.
AUD G4	Green	ON: embedded audio is audio group 4.
REF	Orange	ON: input standard is the same with the reference signal; OFF: reference signal does not exist or standard mismatch with input signal.

Chapter 4 Specifications

The technical specifications for VAM6800 module are described on the following sections:

- Digital Video Input
- Digital Video Output
- Analog Audio Input

Composite Video Input

Table 4-1 Composite Video Input Specifications

Content	**Parameter**
Standard	NTSC, PAL-B
Connector	BNC (IEC169-8)
Impedance	75 ohm
Return loss	>40dB to 5MHz

Composite Video Output

Table 4-2 Composite Video Output Technical Specifications

Content	Parameter
Standard	SMPTE 259M-C, 270 Mbps， 525/625 digital component
Quantizing	10-bit
Connector	BNC (IEC169-8)
Frequency response	±0.1 dB to 5.8 MHz
Signal level	800mV±10%
Impedance	75ohm
Return loss	15dB to 270MHz
Differential gain	0.9%
Phase	Step 37ns, infinitely adjustable
Differential phase	0.8
Group delay	+/-10ns to 5MHZ
S/N ratio	60Db 10Bit internal processing

Analog Audio Input

Table 4-3 Analog Audio Input Technical Specifications

Content	Parameter
Format	Electronically balanced
Maximum input level	24dB@full level（balanced）
Maximum adjustable range	16 to 24dBu
Input impedance	High impedance
THD+N	0.004% @ 1 kHz 0dBFS
Frequency response	0±0.15dB, 20 Hz to 20 kHz
S/N ratio	>107 dB

Note: Specifications are subject to change without notice

Warranty for osee product

What the warranty covers:

osee warrants its products to be free from defects in material and workmanship during the warranty period of two year from purchase date. If a product proves to be defective in material or workmanship during the warranty period, osee will, at its sole option, repair or replace the product with a similar product. The replacement unit will be covered by the balance of the time remaining on the customer's original limited warranty.

No sales personnel of the seller or any other person is authorized to make any warranties other than those described above, or to extend the duration of any warranties on behalf of osee, beyond the time period describe above.

This warranty is extended to the first consumer only, and proof of purchase is necessary to honor the warranty. If there is no proof of purchase provided with a warranty claim, osee reserves the right not to honor the warranty set forth above. Therefore, labor and parts may be charged to the consumer.

What the warranty does not cover:

1. Any product on which the serial number has been defaced, modified or removed.
2. Damage, deterioration or malfunction resulting from:
   - Accident, misuse, neglect, fire, water, lightning, or other acts of nature, unauthorized product modification, or failure to follow instructions supplied with the product
   - Repair or attempted repair by anyone not authorized by osee
   - Any damage of the product due to shipment.
   - Removal or installation of the product.
   - Causes external to the product, such as electric power fluctuations or failure.
   - Use of supplies or parts not meeting osee product's specifications.
   - Normal wear and tear.
   - Any other cause which does not relate to a product defect.