HD/D1-SDI Frame Memory Board

GG-163

User's Manual

Ver.3.0

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2005.11

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ASTRODESIGN,Inc

Contents

Introduction

Thank you very much for purchasing the GG-163.

This manual describes the operating procedure and precautions for using the GG-163.

Mishandling the GG-163 may lead to accidents, so please be sure to read this manual in order to operate the GG-163 correctly.

After reading this manual, please keep it in an accessible place for future use.

Safety Precautions

⚠ WARNING

- When installing this product in a PC, be sure to turn off the power to the PC, and unplug the power cable from the outlet before installation.
- Do not drop liquid, flammables and metal objects onto this product. Using this product in such a condition will cause fire, electric shock or failure.

⚠ CAUTION

- To prevent damage from static electricity, touch an uncoated surface of the PC chassis, for example, before touching this product so as to discharge static electricity from your body.
- Because this product is composed of precision parts, be careful when handling it.
- Handle this product with care, and never throw this product onto a carpet or a plastic case.
- Never touch the card edge connector section of this product.
- If this product will not be used for an extended period of time, store it in the original product bag in which this product was sealed and shipped.

About Installation and Operating Locations

- Installing this product in the following locations may cause failure or accident.
  - Locations where the ambient temperature of this product will exceed the range of 5 to 40°C
  - (The operating temperature range may vary depending on the PC to be used.
  - Be sure to use a PC with sufficient countermeasures for heat.)
  - Locations where the ambient humidity of this product will exceed the range of 35 to 85%RH (The operating humidity range may vary depending on the PC to be used.)
  - Locations close to air conditioning equipment where sudden temperature change or dew condensation occurs
  - Locations exposed to direct sunlight
  - Locations filled with corrosive gas or dust
  - Locations where strong magnetic fields are formed
  - Locations that may receive sprays of water, oil, chemicals, etc.
  - Locations where vibrations may be transmitted from the floor
  - Unstable locations

About Shock

- Because this product is a precision device, applying shock to it may cause damage. Be extra careful when moving this product.

In Case of Abnormality or Problem

- If any abnormality or problem occurs, please contact your sales representative or our Sales Department (TEL (in Japan): 03-5720-5838).

1 About GG-163

The GG-163 is a PCI64 bus-compatible frame memory board that can output the HD-SDI signal. It is equipped with a large capacity memory of 512 Mbytes, and supports a vast space of 128M words × 32 (bits).

The GG-163 has four channels of HD-SDI signal output, 1 channel of video input, and 1 channel of external key input. It allows a variety of video output settings including two-screen synthesis (key synthesis) output in any area and dual link two-system output.

With support for the PCI64 bus, the GG-163 can access memory space at high speed; thus, it is suitable for applications requiring speed such as animation.

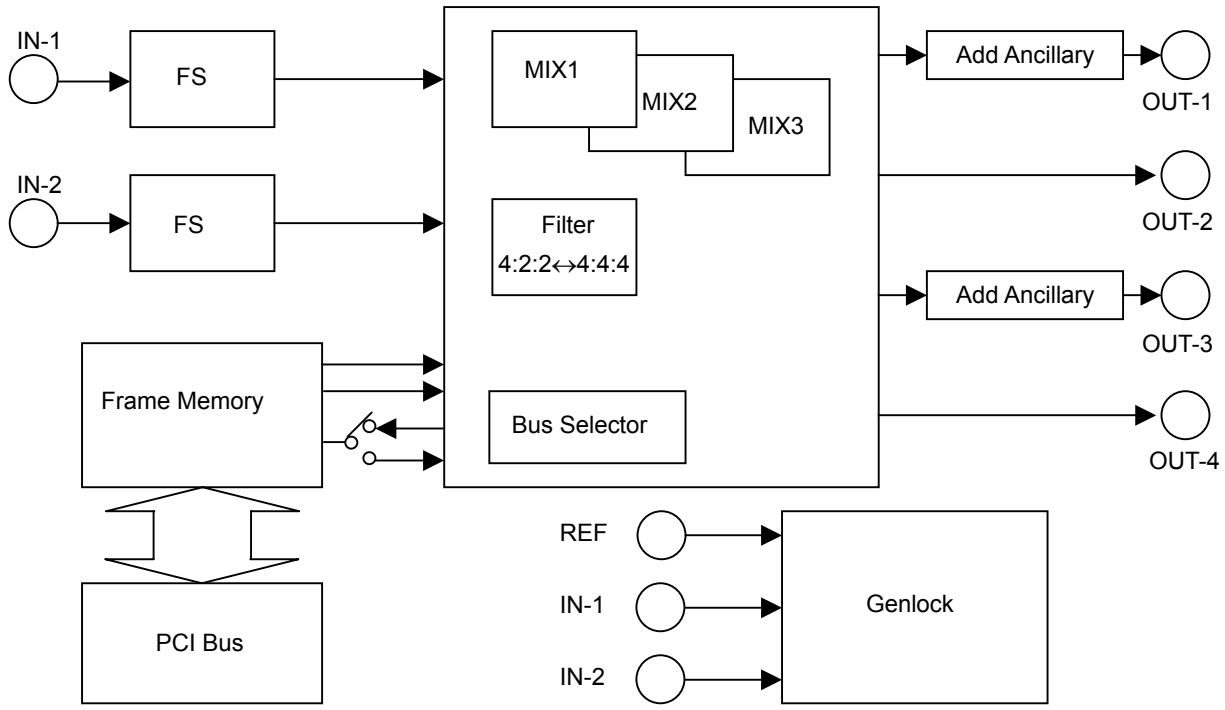
Having the features described above, the GG-163 is an HDTV frame memory board that is most suitable for next generation telop systems, character generators and sport coders, for example.

Overview of the GG-163

- PCI64 bus compatible
- Support for both the HD-SDI and SD-SDI signals (However, both HD and SD cannot be operated together.)
- Equipped with 4 systems of SDI signal output, 1 system of video input, and 1 system of external key input
- The sizes in the horizontal and vertical directions of the mounted 512MB memory can be set to 2K, 4K, 8K, 16K, 32K and 64K each. (However, 32K and 64K can be set only in the vertical direction.)
- Support for various signal formats, including 1080i/720p (each 59.94Hz/60Hz) and 24p/24SF (See page 13.)
- Support for a variety of video output settings, such as two-screen synthesis output in any area.
- Support for RGBK or YPBPRK (4:4:4:4) 8 bit/10 bit dual link output, and RGB or YPBPR (4:4:4) 12 bit dual link output
- Support for scroll in units of 1 dot/1 line.
- Genlock support for external synchronization signals by the input of the BB (black burst) signal or HDTV timing ternary synchronization signal. (See page 13.)

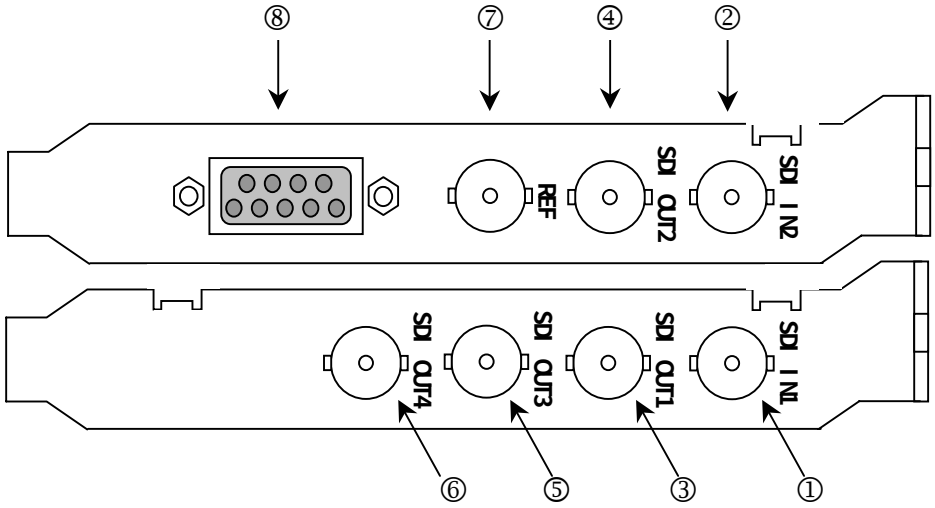
2 Hardware Overview

Block Diagram



3 Names of Parts

GG-163 Connector Parts Names



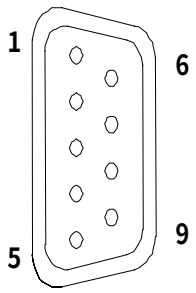
No.	Name	Function
①	SDI IN1	(Video input connector for the SDI signal
②	SDI IN2	External key input connector for the SDI signal
③	SDI OUT1	Output of the SDI signal. Link A of the first system during dual link output. (Note 1)
④	SDI OUT2	Output of the SDI signal. Link B of the first system during dual link output. (Note 1)
⑤	SDI OUT3	Output of the SDI signal. Link A of the second system during dual link output. (Note 1)
⑥	SDI OUT4	Output of the SDI signal. Link B of the second system during dual link output. (Note 1)
⑦	REF	This inputs the reference signal (HD ternary value or BB (black burst)).
⑧	D-sub (9-pin) (*1)	This performs serial communication (RS-422). (Note 2)

(Note 1): Neither the output of two screens nor the synthesis of two screens can be performed during dual link output of 12 bits.

(Note 2): Using the input/output of the RS-422, the input/output of digital sound signals in AES format can also be performed.
However, input/output in AES format cannot be performed when serial communication is used (exclusive use).

*1 D-sub (9-pin) (number ⑧)

When the RS-422 is used:

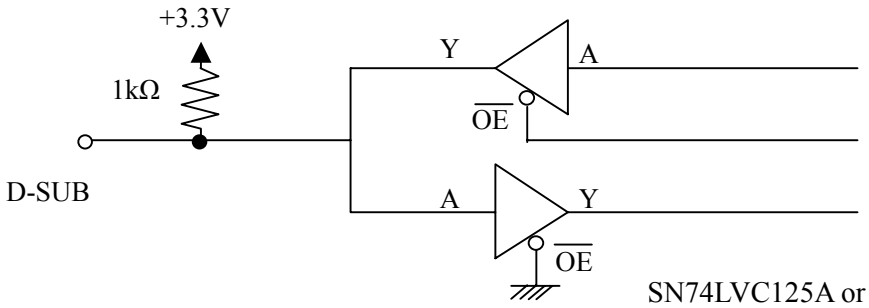


Pin No.	Signal	I/O	Description
1	GND		Signal ground
2	GPIO (Note 3)		User setting
3	GPIO (Note 3)		User setting
4	TXD+	Output	Transmit data (positive)
5	RXD+	Input	Receive data (positive)
6	GPIO (Note 3)		User setting
7	GPIO (Note 3)		User setting
8	TXD-	Output	Transmit data (negative)
9	RXD-	Input	Receive data (negative)

Connector: D-sub 9-pin (socket contact)
Signal level: RS-422
Transmission speed: 9600bps, 19200bps, 38400bps, 76800bps,
Data: 8 bits
Stop bit: 1 bit
Parity: Even, odd, none
XON/XOFF control: None
RTS/CTS control: None

(Caution 3)
GPIO

External I/O side GG-163 side



SN74LVC125A or equivalent product

4 About Operating Status

4.1 LEDs

The LED1 through LED6 indicate the operating status of the GG-163 board.

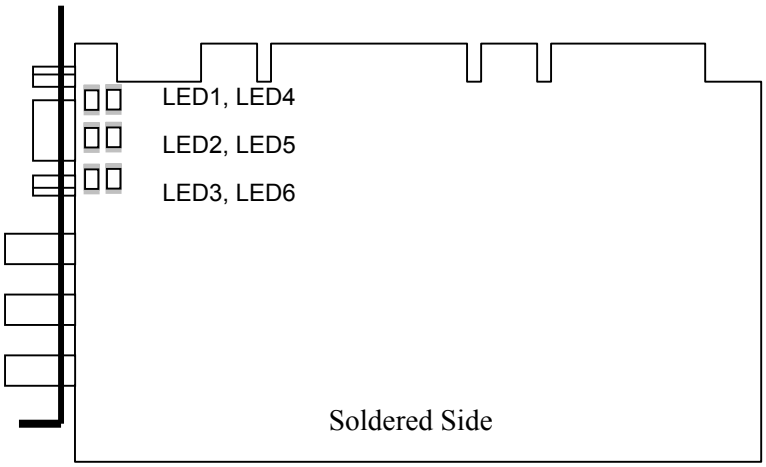
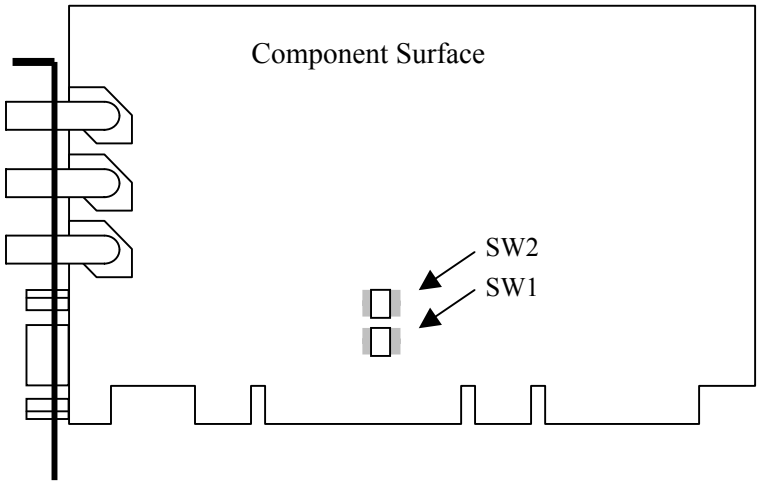


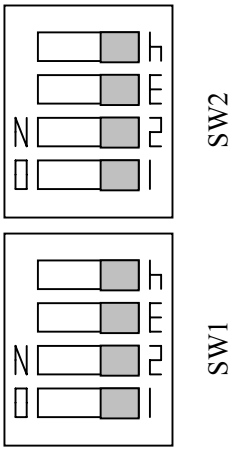
Table 1. GG-163 Operating Status

LED1	Red	Blinks during normal operation (when 33MHz, approximately 8 times/sec; when 66MHz, approximately 16 times/sec)
LED2	Red	Lit for 5V interface
LED3	Red	Lit for 64-bit interface
LED4	Red	User setting (1)
LED5	Red	User setting (2)
LED6	Red	User setting (3)

4.2 DIPSwitches



Set the DIP switches on the board with a PCI edge as follows, and then use (fixed settings).



SW1-1	Sets to class code 04 and prefetchable when OFF (factory setting). Sets to class code 03 and non
SW1-2	Sets the size of the BAR1 space to 512MB when OFF (factory setting). Sets the size of the BAR1 space to 64MB when ON. In this case, only up to 1/8 from the beginning of the frame memory can be accessed from the PCI bus (DMA is possible for the entire area.)
SW1-3	Not used
SW1-4	Not used
SW2-1	User setting
SW2-2	User setting
SW2-3	User setting
SW2-4	User setting

* If you will be mounting/dismounting the daughterboard when changing the DIP switch settings, be careful not to lose the daughterboard fixing screws. Also, after mounting the daughterboard, make sure that the screws are securely tightened.

5 Installing into a PC

5.1 GG-163's Power Consumption

The GG-163 is compliant with PCI standard Rev. 2.2. It can be installed into a PC that is compliant with the PCI standard, but it may not operate normally depending on the system configuration of the PC.

The GG-163 requires the following current capacity.

Power supply voltage	Current consumption
+5V	3A
+3.3V	3A
+12V	-----A
-12V	100mA

5.2 Mounting Method

To operate the GG-163 normally, use it under the following conditions.

Also, when using the GG-163, pay attention that the working environment and ratings of the PC itself into which the GG-163 will be installed are satisfied.

- Do not insert the GG-163 into a slot adjacent to a board that generates excessive noise. Doing so will decrease the video signal performance of the GG-163.
- To avoid interference with other boards, insert the GG-163 into a slot as far as possible from others.
- Store the slot cover of the main unit you removed in a proper location for future use.
- Insert the GG-163 into a slot as far as possible from boards and components that generate intense heat.
- Insert the GG-163 into a slot that can receive the air of the cooling fan of the PC's main unit as much as possible.

5.3 Inserting the GG-163

- Before installing, touch an uncoated surface of the PC in order to ground your body.
- Be sure that the power to the PC is turned off.
- Unplug the power cable of the PC.
- Remove the cover of the PC's main unit. For more information about how to open the cover, please refer to the instruction manual of your PC.
- Remove the slot cover of the PC, and then insert the GG-163 into the PCI bus slot of the PC. When inserting the GG-163, exercise caution not to touch the GG-163 and the electrical parts of the PC with your hands. When inserting the GG-163, securely insert the GG-163 perpendicular to the PCI backplane without bending it.
- Fix the metal fitting of the GG-163 securely to the chassis of the PC's main unit using the screw of the slot cover you removed. Be careful not to tilt the board or lean it to one side when inserting it.
- Close the cover of the PC's main unit.

5.4 Connecting to Input/Output Devices

- Connect the SDI output from the GG-163 to an input pin of a device such as a monitor. Check that the SDI output terminates correctly in the device connected.
- Connect the REF input of the GG-163 to the HDTV ternary synchronization signal source of master sync, or the black burst signal source. If the cable is extended, the cable will cause a delay.

  If there is no reference input, it will automatically switch to internally generated synchronization. Set reference switching from software.

5.5 Powering the PC ON/OFF

Before turning on the power to the PC, be sure to check that the GG-163 is connected correctly.

Connect the power cables of the devices connected and the PC's main unit to the 3-pin outlet with ground.

Caution

The GG-163 does not operate normally immediately after powering on. Images are not displayed correctly on the connected monitor until the driver is installed after booting up the OS.

Caution:	Changes to the system settings must be done by technicians with extensive knowledge of computer systems. Otherwise, the system may no longer start. We are not responsible for any abnormality that leads to the reinstallation of software or damage to the hard disk. Be sure to back up the software, and then make necessary changes.

5.6 Installing Software

Mounting the board requires the installation of software such as the driver. Using the software installer provided, install the software required for the GG-163. For more information about the installation procedure, please refer to "README.TXT" and "READMEJ.TXT" on the floppy disk that comes with the product.

For more information about the API functions and others that will be used from applications, please read Help after setup.

6 Main Specifications

Input/Output (BTA S-004B compliant, SMPTE292M compliant, SMPTE259M compliant)	SDI input × 2 systems SDI output × 4 systems REF input × 1 system (HD ternary synchronization or BB signal)
Standard	1920×1035, 60/59.94i 1920×1080, 60/59.94i (30/29.97sf) 1920×1080, 24/23.98p 1920×1080, 24/23.98sf 1920×1080, 25p 1920×1080, 50i (25sf) 1920×1080, 30/29.97p 1280×720, 60/59.94p 1280×720, 24/23.98p 1280×720, 25p 1280×720, 30/29.97p 1280×720, 50p 720×487, 59.94i 720×576, 50i
GEN LOCK	REF input (HD ternary synchronization) REF input (BB (black burst) signal) Internal synchronization (Note 1)

(Note 1) If internal synchronization is used, the jitter value of SDI output may be affected by the PC's power supply and it may not satisfy the standard.

Frame Memory	Memory size: 8K × 16K × 32 bits Hardware scroll function Hardware enlargement display function, V direction reduction display function
Synthesis Function	Two screens in any area of frame memory can be synthesized. Internal signal YPBPR, 10 bit processing Key signal output is supported.
Other Functions	Dual link output (YPBPRK or RGBK 8 bits, 10 bits, 12 bits) (Note 2) Input/output of audio and ancillary data is supported.
PCI Bus	PCI standard Rev. 2.2 compliant 32 bits, 33MHz, 5V/3.3V 64 bits, 33MHz, 5V/3.3V 32 bits, 66MHz, 3.3V 64 bits, 66MHz, 3.3V
Supported Operating Systems	Windows2000 Professional,Windows XP Professional Windows2000 Server, Windows Server 2003 Standard
Operating Temperature Range (Note 3)	5 - 40°C
Operating Humidity Range (Note 3)	35 - 85%RH
External Dimensions	PCI standard compliant half-size card Occupying 2 slots
Items Packaged Together	GG-163 main unit Floppy disks (SDK) Instruction manual (this document)

(Note 2) Neither the output of two screens nor the synthesis of two screens can be performed during dual link output of 12 bits.

(Note 3) It must satisfy the rated value range of the PC used.

Notes:

- Documents with missing or incorrectly collated pages will be replaced.
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