

Hi5-3G

3G/Dual-link/HD/SD-SDI To HDMI 1.3a Video and Audio Converter

User Manual



HDMI[™]
HIGH DEFINITION MULTIMEDIA INTERFACE

AJA[®]
VIDEO SYSTEMS

November 4, 2009

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Contacting Support

To contact AJA Video for sales or support, use any of the following methods:

180 Litton Drive, Grass Valley, CA. 95945 USA

Telephone: 800.251.4224 or 530.274.2048

Fax: 530.274.9442

Web: <http://www.aja.com>

Support Email: support@aja.com

Sales Email: sales@aja.com

When calling for support, have all information at hand prior to calling.

Limited Warranty

AJA Video warrants that this product will be free from defects in materials and workmanship for a period of five years from the date of purchase. If a product proves to be defective during this warranty period, AJA Video, at its option, will either repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product.

In order to obtain service under this warranty, you the Customer, must notify AJA Video of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. The Customer shall be responsible for packaging and shipping the defective product to a designated service center nominated by AJA Video, with shipping charges prepaid. AJA Video shall pay for the return of the product to the Customer if the shipment is to a location within the country in which the AJA Video service center is located. Customer shall be responsible for paying all shipping charges, insurance, duties, taxes, and any other charges for products returned to any other locations.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. AJA Video shall not be obligated to furnish service under this warranty a) to repair damage resulting from attempts by personnel other than AJA Video representatives to install, repair or service the product, b) to repair damage resulting from improper use or connection to incompatible equipment, c) to repair any damage or malfunction caused by the use of non-AJA Video parts or supplies, or d) to service a product that has been modified or integrated with other products when the effect of such a modification or integration increases the time or difficulty of servicing the product.

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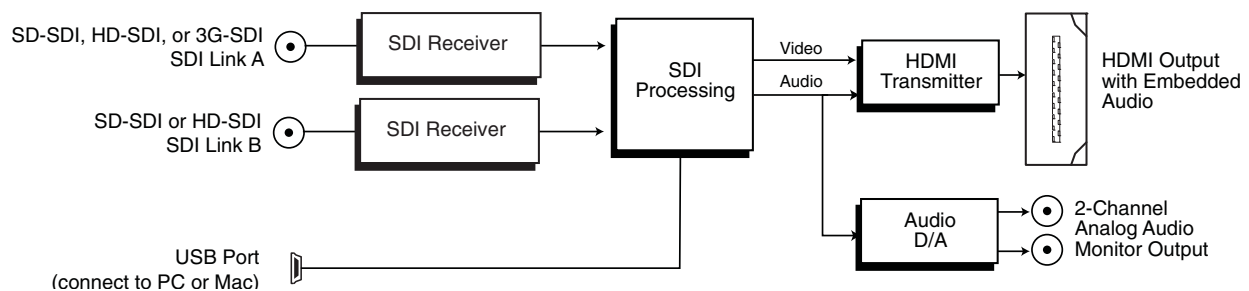
Introduction

The Hi5-3G converts 3G-SDI, dual or single link HD-SDI, or SD-SDI to HDMI v1.3a for driving HDMI monitors. HDMI v1.3a capability at 30 bits per pixel allows full support of the latest 10 bit monitors. Audio is supported in the HDMI output allowing a convenient single cable audio/video connection. The Hi5-3G provides 2 Channel RCA style audio outputs for separate audio monitoring if needed. USB connectivity allows for easy PC/Mac setup and field upgrades.

Features

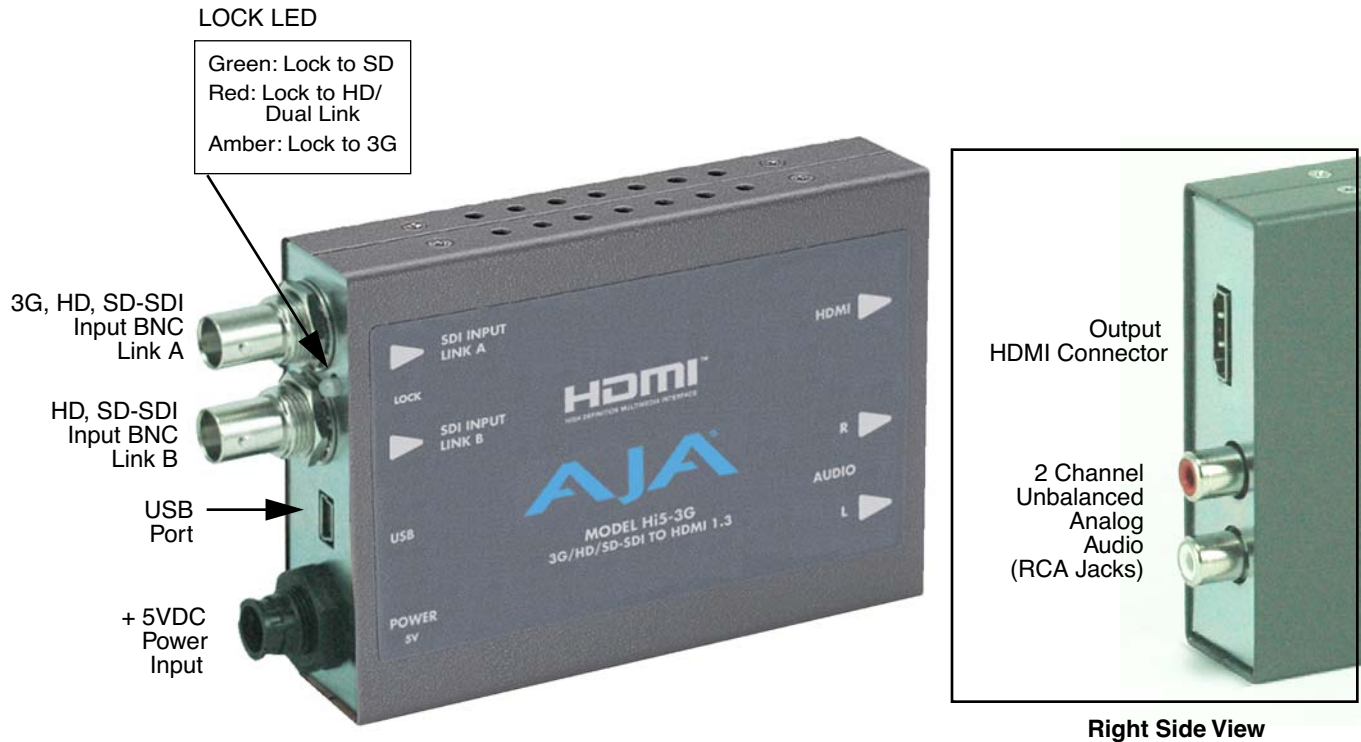
- 3G/HD/SD-SDI to HDMI
- SMPTE425M-AB input
- Full HDMI 1.3a support including:
 - Deep Color 30- and 36-bit video per pixel (24-bit also supported)
 - 2 or 8 channels of embedded audio
- Additional 2 channel RCA analog audio output (User assignable channels)
- Setup via PC/Mac using USB port and supplied USB cable (USB configuration software application supplied on CD)
- HDMI cable supplied
- Uses 5V power (supply sold separately)
- 5 year warranty

Block Diagram



Hi5-3G Converter, Simplified Block Diagram

I/O Connections



Hi5-3G Converter

Installation

Typically, Hi5-3G installation consists of the following steps:

1. Ensure the Hi5-3G is disconnected from power.
2. Connect video equipment to the converter BNCs and HDMI connector.
3. Connect audio equipment to RCA connectors (optional)
4. Apply +5VDC power to the converter (AJA power supply model DWP or DWP-U).
5. The Hi5-3G will now run using the default factory settings. If you wish to alter the factory settings, you'll need to install the AJA Mini Config software (supplied on CD) on a computer, attach the Hi5-3G via USB to the computer, and then make your changes. This process is detailed on the following pages.

USB Control and Setup—Using AJA *Mini Config*

The Hi5-3G can usually be used right out of the box for most applications since it is designed to recognize inputs and perform standard actions automatically by default. However you can also manually configure the Hi5-3G using a supplied software application for PCs and Macs called “Mini Config.” This same application can be used to update software on the Hi5-3G in the event newer software is released by AJA.

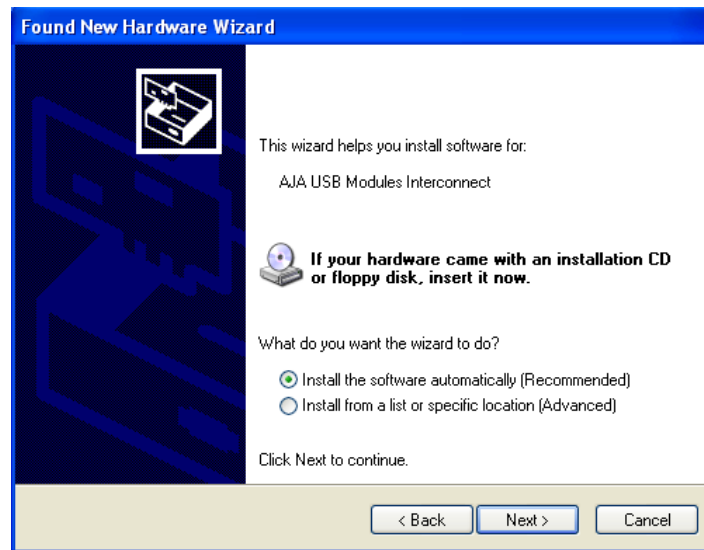
Installing Mini Config—Windows

To install the application on Windows computers, simply insert the CD supplied with the MiniConverter into a PC and run the installer application (normally this will happen automatically as it is an auto-run CD). The installer will guide you with a wizard. First you’ll click Next, then accept an End-User license agreement, and choose an installation location before beginning the install. After installation begins, you’ll be shown the progress until it finishes and you see a “Completed the AJA Mini Config” screen.

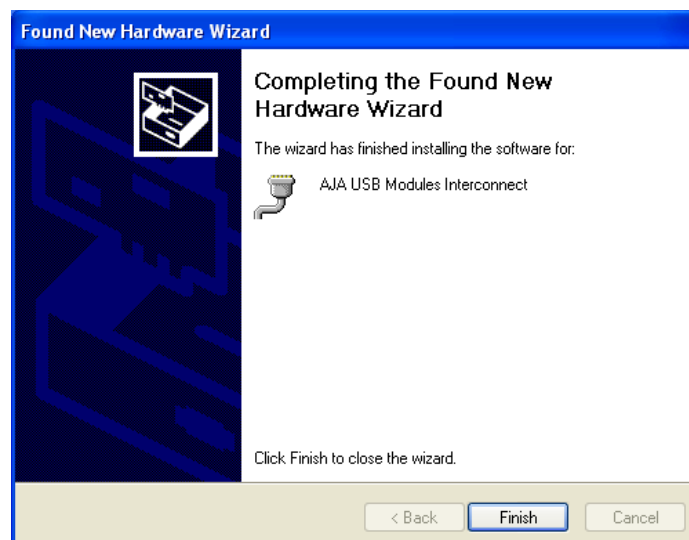
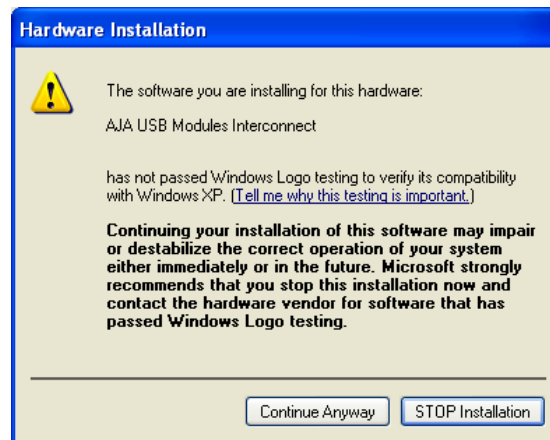


Once the application is on the PC, attach the Hi5-3G you wish to communicate with via a USB cable (supplied). When you do, the Windows OS will display a “Found New Hardware Wizard” dialog.





Click “Next” again. Windows will display a certification warning: click “Continue Anyway” to proceed.



Lastly, the Found New Hardware Wizard will tell you when it’s finished updating the USB driver. Click Finish and the Hi5-3G is ready to be used with the software.

Installing Mini Config—Mac OSX

To install the application, simply insert the CD supplied with the MiniConverter into a Mac.

1. Double-click the CD icon on your desktop. Locate the “AJA Mini Config” application.
2. Drag the AJA Mini Config application icon into your Applications folder (alias is provided in the AJA Mini Config CD folder).



Running Mini Config

Connect a Hi5-3G mini converter to the PC or Mac via the supplied USB cable. Connect power to the mini converter (DWP or DWP-U recommended).

To run Mini Config on a PC, find the AJA directory in the program list and locate the AJA Mini Config application.



To run Mini Config on a Mac, double-click the Applications folder and locate the AJA Mini Config application. Double-click the AJA Mini Config application to launch it.

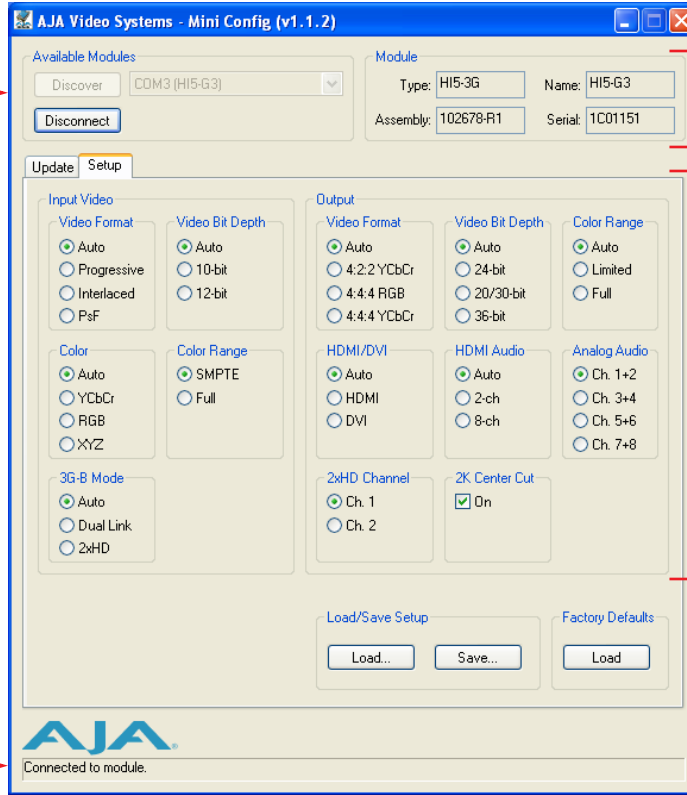
Once AJA Mini Config is running (PC or Mac), it looks pretty much the same, regardless of the platform.

1. At the top of the AJA Mini Config application screen, locate and click the *Discover* button.
2. Also locate and click the *Connect* button. You will see the Hi5-3G *Setup* screen with “Connected to Module” displayed at the bottom of the screen.
3. Mini Config is now installed and working.

Operating Mini Config

When the application is running, you’ll see a simple graphical interface for viewing settings and updating software. This user interface consists of an information area at the top that shows the available MiniConverters attached to the computer via USB (in this case your Hi5-3G), with tabbed screens for the tasks of configuring and updating software. The screens are virtually the same on both PC and Mac, with subtle differences that reflect the general look of the environment. The recommended configuration is Mini Config connecting to a single module at a time. If for some reason you need to connect and control more than one module on a system—and you have multiple USB ports, you can open multiple Mini Config applications, one for each of the modules. If you try this and problems are experienced, please revert to controlling only one MiniConverter on your system.

These controls allow you to discover attached MiniConverters and Disconnect (if desired)



Fields show the type and name of the MiniConverter plus the serial number

Tabbed screen areas

Information shown reflects Tab chosen and the Mini Converter connected

Message Showing Status

Windows Screen Version



Mac Screen Version

Mini Config, Setup Screen—Windows and Mac versions

Clicking the Discover button finds all MiniConverters connected to the computer (PC or Mac). The name of each MiniConverter found can be seen in the menu pulldown next to the Discover button. This allows you to select a desired MiniConverter when there are more than one. The Connect button causes this application to connect to the selected converter. The type of MiniConverter, name, assembly number, and serial number will be shown in the “Module” area of the screen (right side). The Module Type, Assembly, and Serial are set during factory programming, but you can set the Module Name from the Update tab to whatever you’d like.

When you connect a Hi5-3G (or any other AJA MiniConverter with USB support), you must click the Discover button in Mini Config, to ensure it will be seen by the application. Since MiniConverters can be added and removed from the computer while this application is running, you can rerun the discover process at any time by clicking the Discover button again.

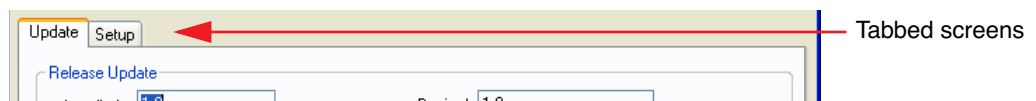
After connecting to a specific MiniConverter, a different one cannot be selected without performing a disconnect. After connection, the Connect button's label changes to Disconnect, and you must press Disconnect to disconnect Mini Config application from the module, before selecting a different MiniConverter. You should always press Disconnect before disconnecting or powering down the Hi5-3G.

When configuring the Hi5-3G MiniConverter, click the Hi5-3G tab, view the current settings and change any values. Making a change communicates that new value to the MiniConverter’s non-volatile memory.

Clicking on the AJA logo opens the AJA website home page in your web browser.

Tabbed Controls

The Tabs delineate groups of controls for each type of task to be performed. The Update screen is for updating software on a Mini Converter, and the Setup tab is for editing or viewing settings.

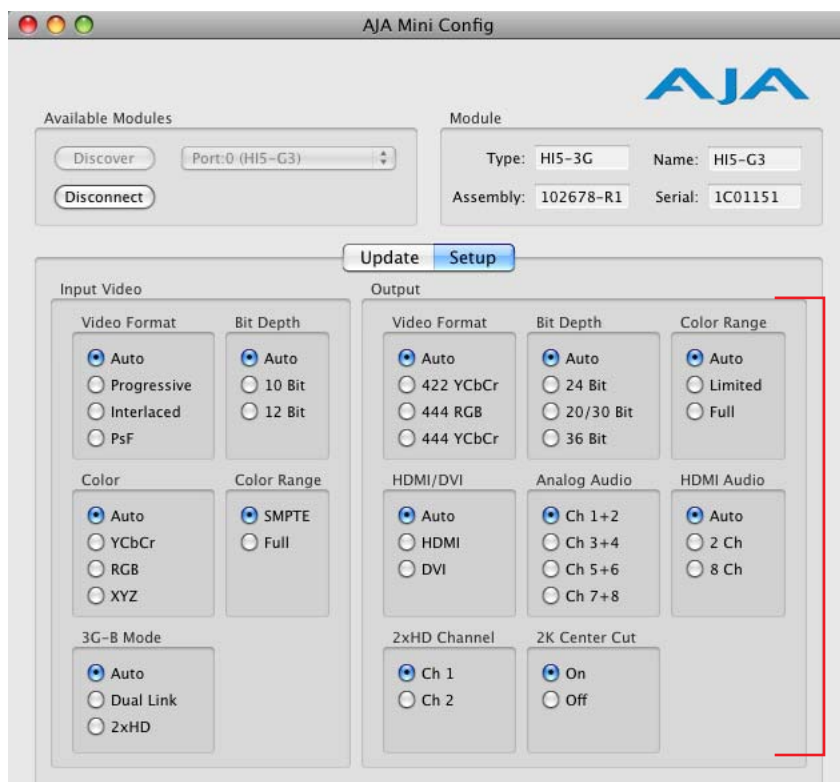


Mini Config, Tabbed Screens (Windows version shown)

Setup Tab Screen

The controls for the actual configuration parameters are specific to each MiniConverter type. With a HI5-3G connected and selected, you’ll click on the Connect button, then click the Setup tab and view the controls presented. The values displayed are fetched from the MiniConverter’s non-volatile memory when the Mini Config application first connects to it.

Any changes you make will be saved, overwriting previous settings.



Input and Output
Parameters
for the Hi5-3G

Mini Config, Setup Tab Screen (Mac Version shown)

Input Video Selections

Video Format—Selects the Input Video Format. Choose from Auto, Progressive (P), Interlaced, or PsF (progressive segmented frame). Choosing “Auto” lets the Hi5-3G automatically select the format based on the input video parameters and the payload ID.

Video Bit Depth—Selects the input video bit depth. Choose Auto, 10-bit or 12-bit. Choosing “Auto” lets the Hi5-3G automatically select the bit depth based on the input video parameters and the payload ID.

Color—Selects the Input Video Color Space. Choose Auto, YCrCb, RGB, or XYZ. Choosing “Auto” lets the Hi5-3G automatically select color mode based on the input video parameters and the payload ID.

Color Range—Selects the Input Video Color Range. Choose SMPTE or Full color range.

3G-B Mode—Selects the 3G level B Video Mode. Choose Auto, Dual Link, or 2xHD.

Output Selections

Video Format—Selects the desired output video format. Choose from Auto, 4:2:2 YCrCb, 4:4:4 RGB, or 4:4:4 YCrCb. Choosing “Auto” lets the Hi5-3G automatically select the video format based on the input video and the attached device's capabilities.

Video Bit Depth—Choose from Auto, 24-bit, 20/30-bit, or 36-bit. Choosing “Auto” lets the Hi5-3G automatically select the bit depth based on the input video and the attached device's capabilities.

Color Range—Choose Auto, Limited or Full. Choosing “Auto” causes the Hi5-3G to follow the *input* color range setting.

HDMI/DVI—Choose Auto, HDMI, or DVI. Choosing “Auto” lets the Hi5-3G automatically select the output mode based on the input video and the attached device's capabilities.

HDMI Audio—Choose Auto, 2-channel or 8-channel embedded audio. Choosing “Auto” lets the Hi5-3G automatically select the audio channels based on the attached device's capabilities.

Analog Audio—Choose which 2 embedded audio channels are routed to the RCA output pair: Ch 1+2, Ch 3+4, Ch 5+6, or Ch 7+8.

2xHD Channel—Provides output channel selection when in 3G level B 2xHD mode. Choose Ch 1 or 2.

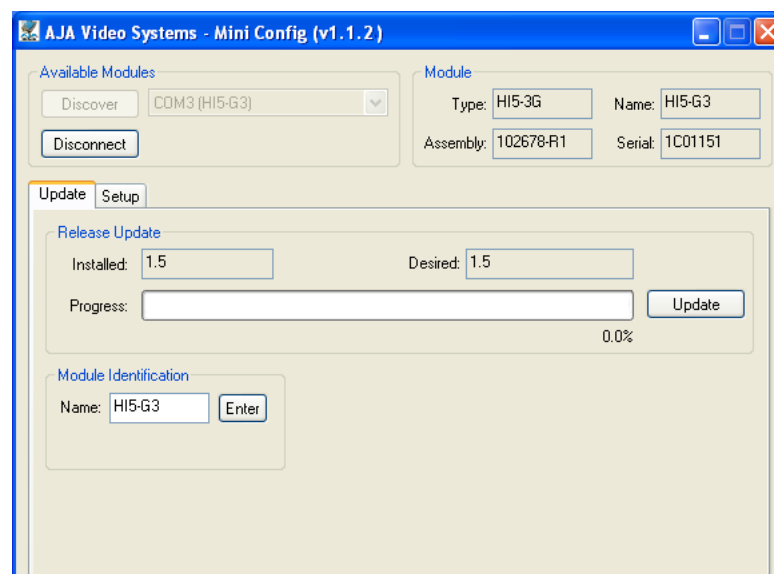
2K Center Cut—Provides the option of center cutting 2Kx1080 video signals to comply with the HDMI standard. Checkbox selects On or Off (not selected).

Update Tab Screen

If a new software release is issued by AJA, you may wish to update your MiniConverter with the newer release. The Update tab screen is how new software is found and loaded into the MiniConverter.

At the top of the Update screen, the currently installed Release version is shown. Next to the installed release is a pulldown listing available releases; choosing one makes it a “Desired” release for updating the MiniConverter. Once one is chosen, press the Update button to begin the update process. When an update is underway, the software will update each component as necessary in the appropriate sequence until all components are at the required version for the Desired Release. If necessary, the MiniConverter will be rebooted when needed. If for some reason an update is not allowed, a pop-up message will inform you that the update cannot be performed and the Update button will be disabled.

The Update screen also allows you to name your MiniConverter. The current name is shown in the “Name” field under Module Identification. To change the name, enter a new name in the field and then click the Enter button.



Update Tab Screen

Specifications

Item	Specification
Input Formats	525i, 625i, 720p 50/59.94/60, 1080i 50/59.94/60, 1080p 23.98/24/25/29.97/30/50/59.94/60 1080psF 23.98/24/25/29.97/30 YCbCr/RGB/XYZ 10/12-bit
Video Inputs	3G, HD, and SD-SDI (auto-selected), SMPTE-259/274/292/296/372/424/425, 2x BNC
HDMI Output	Standard Type A connector Video: HDMI 1.3a/DVI 1.0 4:2:2 YCbCr and 4:4:4 YCbCr/RGB 24/30/36-bit Audio: 24-bit, with 2 or 8 embedded channels RCA-style analog outputs at -10dBV (User Selectable channels)
HDCP	The Hi5-3G does not encode the HDMI output with HDCP encryption. By definition, SDI/HD-SDI inputs to the Hi5-3G are unencrypted. The HDMI specification requires HDMI monitors to support unencrypted inputs.
User Controls	USB port used with supplied cable and software application to configure device via PC/Mac
Size	5.8" x 3.1" x 1 (147mm x 79mm x 25mm)
Power	+5 VDC regulated, 5 watts Requires Power Supply (AJA power supply model DWP or DWP-U recommended)