

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

May 14, 2009

Trademarks

AJA®, KONA®, and XENA® are registered trademarks of AJA Video, Inc. Io HD™ and Io™ are trademarks of AJA Video, Inc. HDMI, the HDMI logo and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI Licensing LLC. DVI is a registered trademark of DDWG. All other trademarks are the property of their respective holders.

Notice

Copyright © 2009 AJA Video, Inc. All rights reserved. All information in this manual is subject to change without notice. No part of the document may be reproduced or transmitted in any form, or by any means, electronic or mechanical, including photocopying or recording, without the express written permission of AJA Inc.

FCC Emission Information

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Changes or modifications not expressly approved by AJA Video can effect emission compliance and could void the user's authority to operate this equipment.

Contacting Support

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

443 Crown Point Circle, 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.

THIS WARRANTY IS GIVEN BY AJA VIDEO IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED. AJA VIDEO AND ITS VENDORS DISCLAIM ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. AJA VIDEO'S RESPONSIBILITY TO REPAIR OR REPLACE DEFECTIVE PRODUCTS IS THE WHOLE AND EXCLUSIVE REMEDY PROVIDED TO THE CUSTOMER FOR ANY INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES IRRESPECTIVE OF WHETHER AJA VIDEO OR THE VENDOR HAS ADVANCE NOTICE OF THE POSSIBILITY OF SUCH DAMAGES.

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.

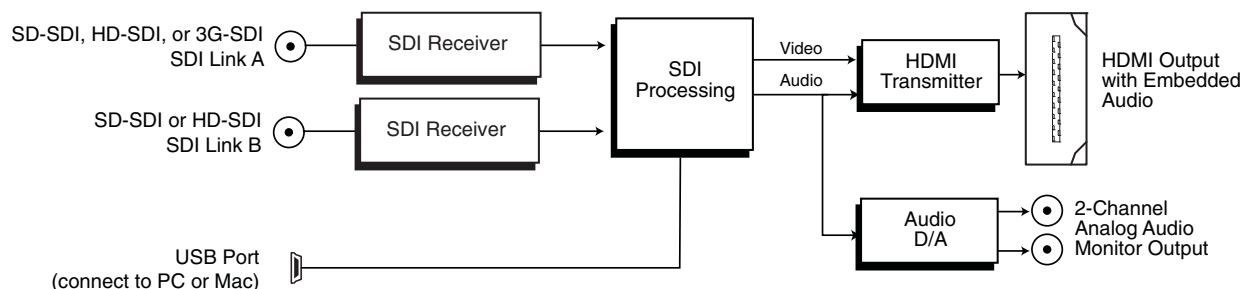
Features

- 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)

Note: At the time this manual was published, the USB driver and Mini Config software are only supported on Windows XP and Vista. Mac OSX software will be provided in a future version (visit www.aja.com for updates). You can run the current software on a Mac by running Windows under Bootcamp, VMware or Parallels.

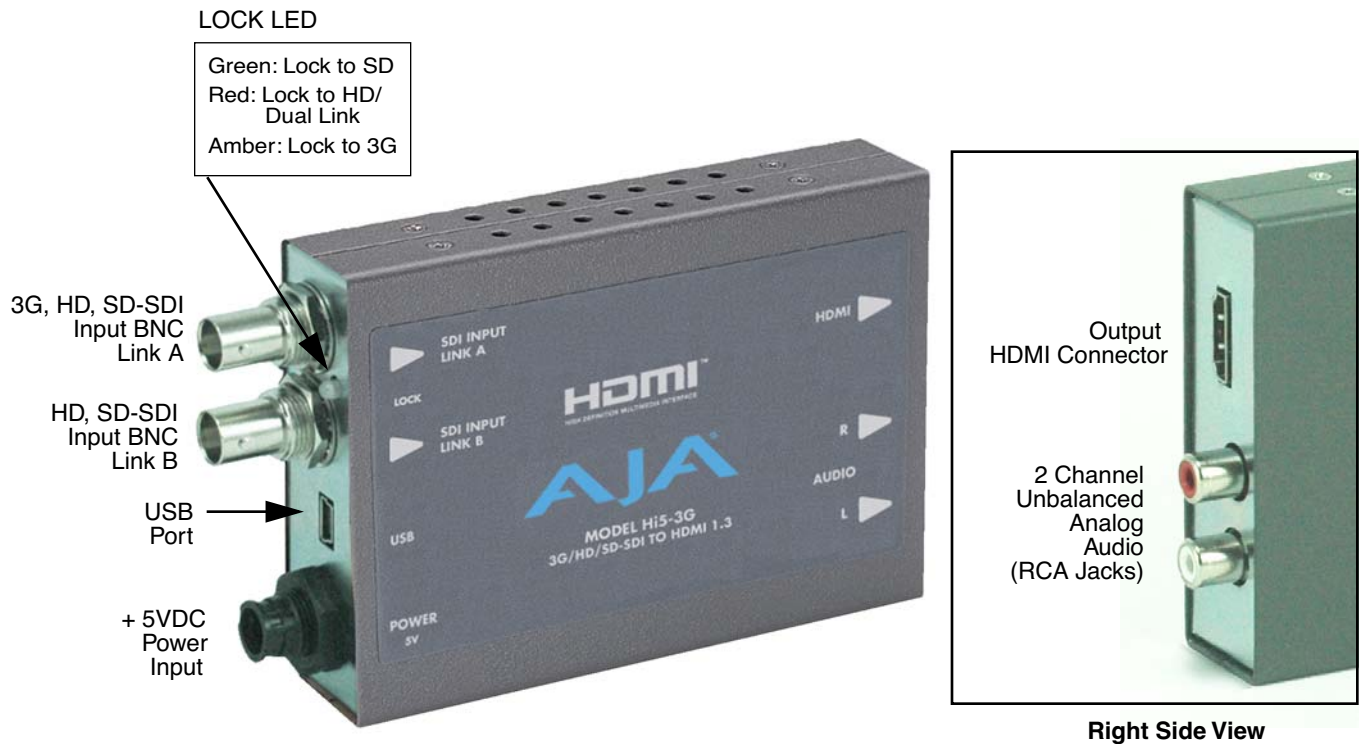
- HDMI cable supplied
- Uses 5V power (supply sold separately)
- 5 year warranty

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.

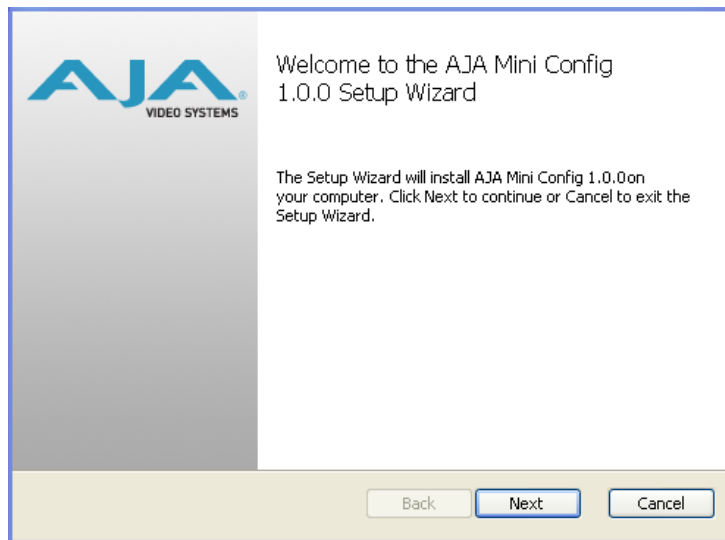
USB Control and Setup—Using AJA *Mini Config*

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 “Mini Config.” This same application can be used to update software on the Hi5-3G in the event newer software is released by AJA.

Note: At the time this manual was published, the USB driver and Mini Config software are only supported on Windows XP and Vista. Mac OSX software will be provided in a future version (visit www.aja.com for updates). You can run the current software on a Mac by running Windows under Bootcamp, VMware or Parallels.

Installing Mini Config

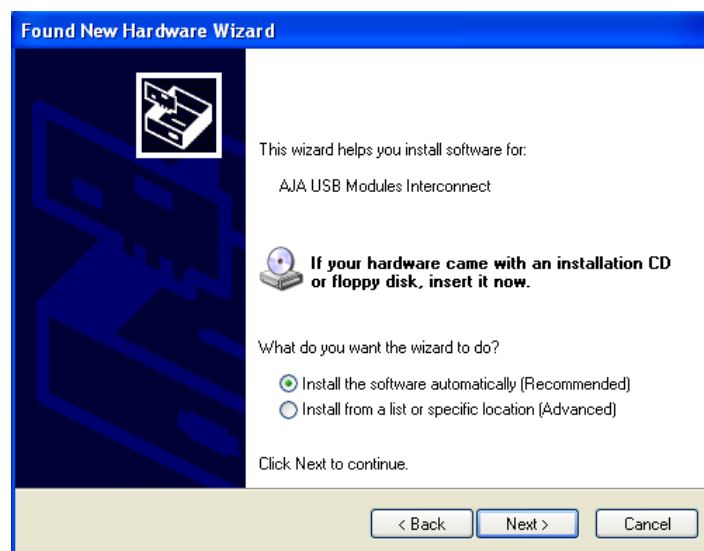
To install the application, simply insert the CD supplied with the MiniConverter into a PC and run the installer application to put Mini Config on your PC. The installer will guide you with a wizard. First you’ll click Next, then accept an End-User license agreement, and choose an installation location 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.

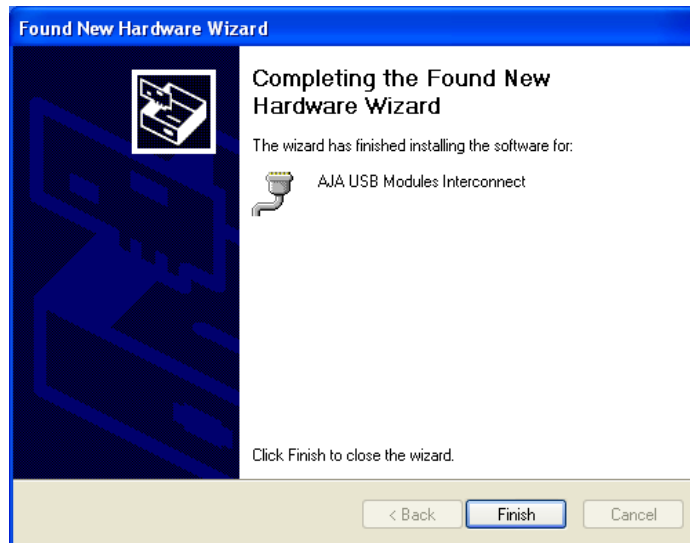


Select “No” and then click the “Next” button.



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





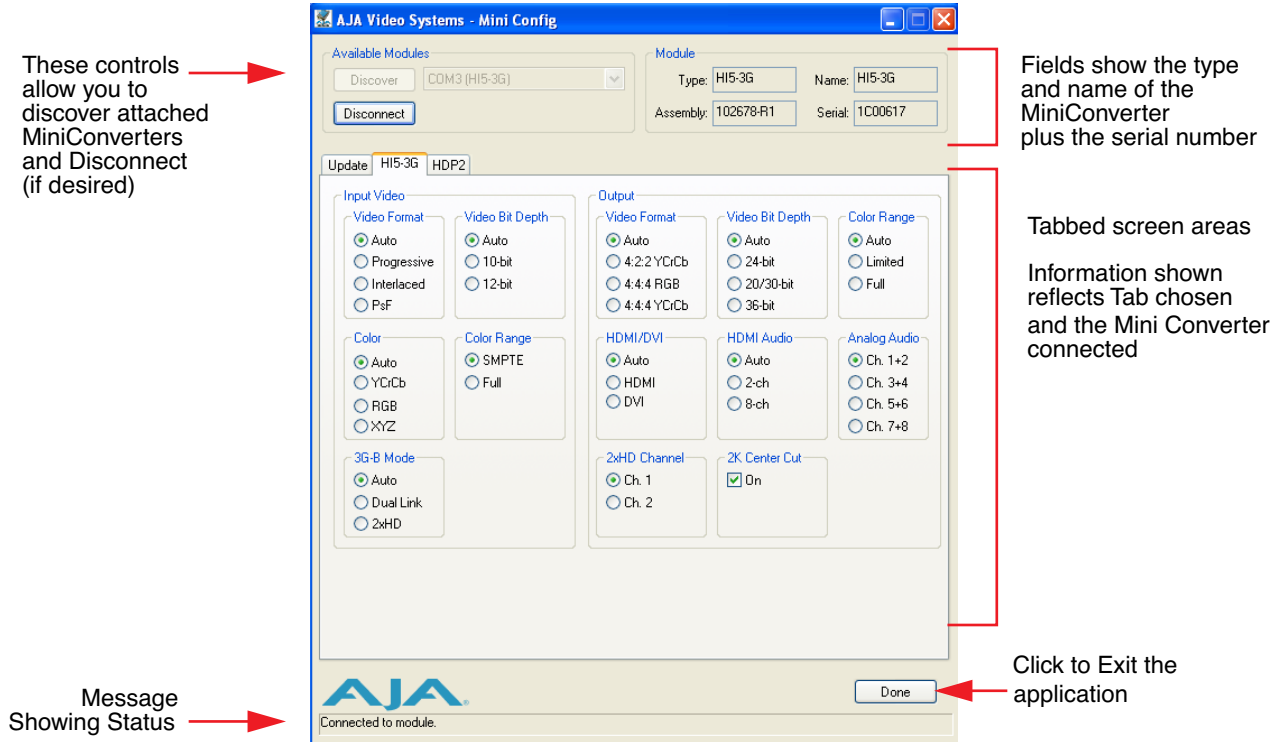
Lastly, the Found New Hardware Wizard will tell you when it's finished updating the USB driver. Click Finish and the Hi5-3G is ready to be used with the software.

Running Mini Config

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



When the application starts, you'll see a simple graphical interface for viewing settings and updating software. This user interface consists of a main window that shows the available MiniConverters attached to the PC via USB (in this case your Hi5-3G), with tabbed screens for the tasks of configuring and updating software. Mini Config can only connect to one module at a time, however multiple MiniConverters can be handled by opening multiple Mini Config applications.



Mini Config, Main Window

Clicking the Discover button finds all MiniConverters connected to the PC. 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 PC 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.

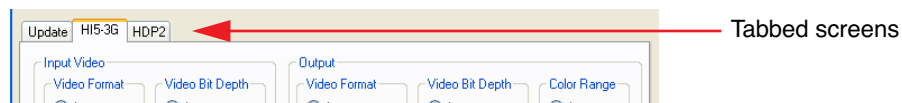
When configuring the Hi5-3G MiniConverter, click the Hi5-3G tab, view the current settings and change any values. Making a change communicates that new value to the MiniConverter’s non-volatile memory.

The Done button at the bottom of the interface closes the Mini Config application.

Clicking on the AJA logo with the left mouse button 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 other tabs correspond to the type of MiniConverter; for the Hi5-3G settings, you'll want to click on the "Hi5-3G" tab.

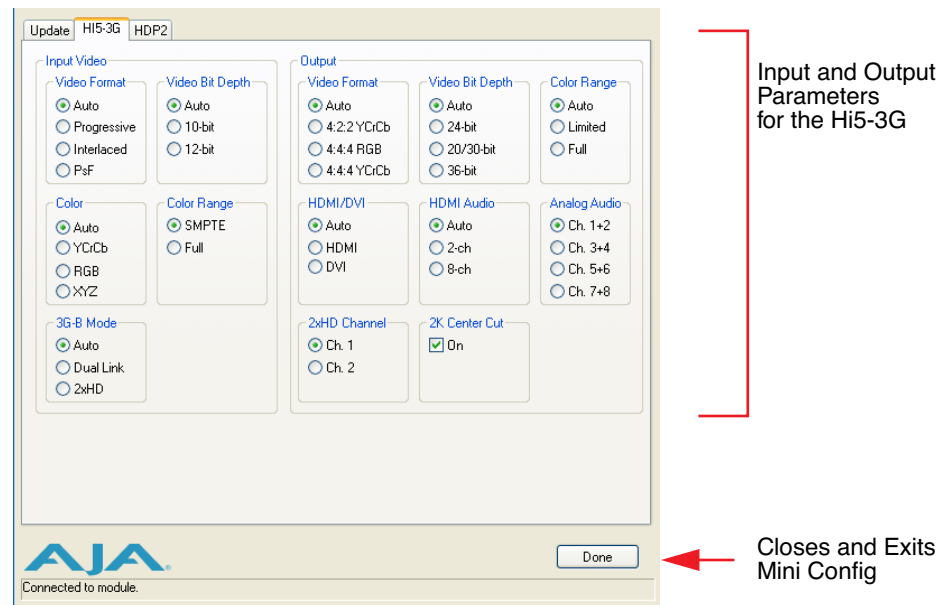


Mini Config, Tabbed Screens

Hi5-3G Tab Screen

The controls for the actual configuration parameters are specific to each MiniConverter type. With a Hi5-3G connected, you'll click on the Connect button, then click the Hi5-3G 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.



Mini Config, Hi5-3G Tab Screen

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.

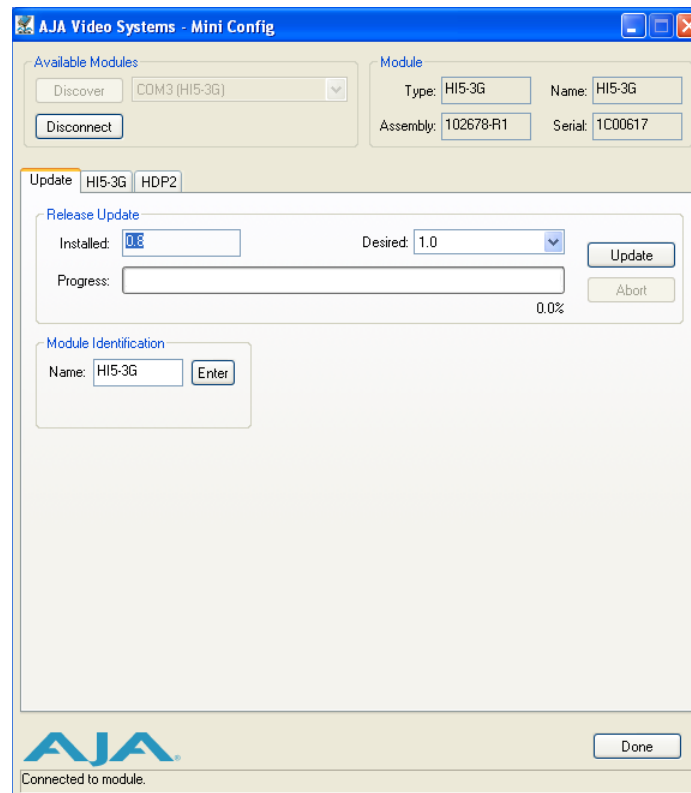
2K Center Cut—Provides the option of center cutting 2Kx1080 video signals to comply with the HDMI standard. Checkbox selects On or Off (not selected).

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)