Technology Leadership
for Digital Cinema

GHX-10

User Manual

Version 2.2

Compliant with GHX-10 Firmware version 1.4.0
and Doremi Universal Interface version 4.0.2

Table Of Contents

Software License Agreement

The software license agreement can be found at the following location:
http://www.doremilabs.com/support/proav-support/proav-warranties/

Hardware Warranty

The hardware warranty can be found at the following location:
http://www.doremilabs.com/support/proav-support/proav-warranties/

HDMI

The terms HDMI and HDMI High-Definition Multimedia Interface, and the HDMI Logo are trademarks or registered trademarks of HDMI Licensing LLC in the United States and other countries.

1 Introduction

This document provides guidance on how to use the GHX-10 device. It explains the front panel, the infrared remote control, and the Doremi Universal Interface usage. It also details how to upgrade the firmware on the GHX-10.

1.1 Contact Information

If in need of help or assistance, please contact Doremi Labs Technical Services at **+ 1-818-562-1101** or email at proavsupport@doremilabs.com.

2 GHX-10 Overview

2.1 GHX-10 Description

The GHX-10 is a Universal Cross Converter that incorporates High-Definition Multimedia Interface technology, and SDI connectors that allow for any input to be converted to any output format or scan rate. It supports both SD and HD video and employs high quality 12 bit bi-cubic interpolation to ensure the highest quality picture. The GHX-10 can tackle many conversion tasks. It can be used as a computer DVI to HD-SDI converter (using a DVI to HDMI® adapter cable), HDMI resolution converter, or as an HD video up-converter or down-converter. It supports up to 8 channels of AES, HDMI and SDI audio. A two lines LCD display and scroll wheel simplify navigation through the GHX-10's menus.

2.1.1 GHX-10 Front Panel

This is a snap shot of the front panel:

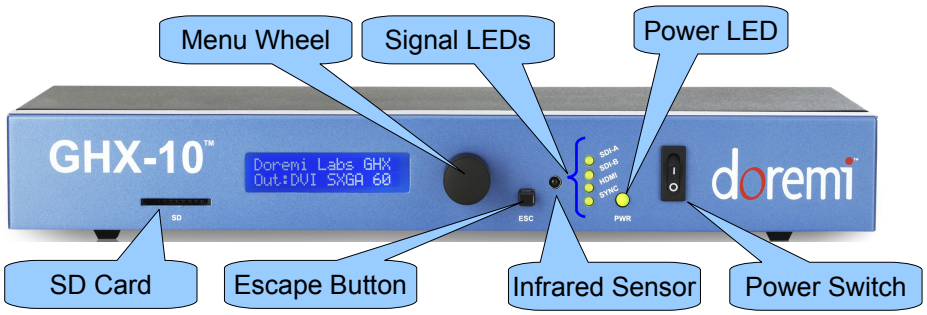

Figure 1: GHX-10 Front View

An LCD screen is available in the middle of the front panel to facilitate controlling the GHX-10 without using the On Screen Display.

The scroll wheel with built in Select button and the ESC button can be used to navigate the menu structure and setup the unit.

The four LED indicators reflect the status of the various input signals:

- SDI-A LED
- SDI-B LED
- HDMI LED
- SYNC LED

The “PWR” LED lights up when the GHX-10 is powered ON.

The infra-red sensor can be used to remotely control of the GHX-10, see Section 4.

A SD Memory connector is available and can be used to perform firmware update.

2.1.2 GHX-10 Rear Panel

Below is a snap shot of the GHX-10 rear panel:

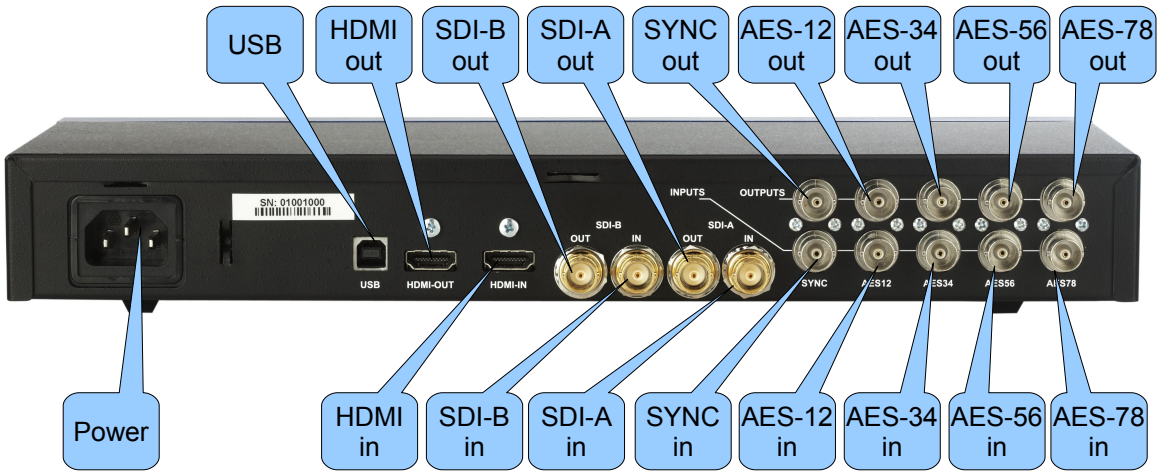

Figure 2: GHX-10 Rear Panel

The rear panel has the following connectors:

Connector	Description
USB	USB connector
HDMI in	HDMI input connector
HDMI out	HDMI output connector
SDI-A out	SDI output connector – Link A
SDI-B out	SDI output connector – Link B
SDI-A in	SDI input connector – Link A
SDI-B in	SDI input connector – Link B
SYNC in	Sync input connector
SYNC out	Sync output connector
AES-12 in	AES audio input connector for audio tracks 1 and 2
AES-12 out	AES audio output connector for audio tracks 1 and 2
AES-34 in	AES audio input connector for audio tracks 3 and 4
AES-34 out	AES audio output connector for audio tracks 3 and 4
AES-56 in	AES audio input connector for audio tracks 5 and 6
AES-56 out	AES audio output connector for audio tracks 5 and 6
AES-78 in	AES audio input connector for audio tracks 7 and 8
AES-78 out	AES audio output connector for audio tracks 7 and 8

2.2 Supported Formats

The table below summarizes all supported inputs and outputs available on the GHX-10.

Supported Input(s)	Supported Output(s)
SD-SDI: NTSC, PAL	**SD-SDI**: NTSC, PAL
HD-SDI: all HD +2K formats (SMPTE 274, SMPTE296, SMPTE372)	**HD-SDI**: all HD +2K formats (SMPTE 274, SMPTE296, SMPTE372)
HDMI/DVI:	**HDMI/DVI:**
640x480 = VGA	640x480 = VGA
720x480i = 480i	720x480i = 480i
720x480p = 480p	720x480p = 480p
1440x480i = 480i	720x576i = 576i
720x576i = 576i	720x576p = 576p
720x576p = 576p	800x600 = SVGA
1440x576i = 576i	1280x720 = 720p
800x600 = SVGA	1024x768 = XGA
1280x720 = 720p	1366x768 = WXGA
1024x768 = XGA	1280x1024 = SXGA
1280x768 = WXGA	1400x1050 = SXGA+
1364x768 = WXGA	1680x1050 = WSXGA+
1366x768 = WXGA	1920x1080i = 1080i
1536x768 = 1536x768	1920x1080p = 1080p
1152x864 = XGA+	1920x1200 = WUXGA
1280x960 = SXGA-	
1280x1024 = SXGA	
1364x1024 = 1364x1024	
1400x1050 = SXGA+	
1680x1050 = WSXGA+	
1920x1080i = 1080i	
1920x1080p = 1080p	
2048x1080 = 2Kp	
1600x1200 = UXGA	
1920x1200 = WUXGA	

3 GHX-10 Front Panel Controller

Throughout this chapter “press Select” refers to pressing the front panel scroll wheel button of the GHX-10 – see Figure 1.

3.1 Menu Items Overview

Press “Select” to enter the GHX-10 menu system then turn the “Wheel” to access the different menus:

- Input
- Output
- Image
- Sync
- Audio
- OSD
- System
- Status

Press “Select” to navigate one of the above menu items and access the list of available sub-menus. Browse the list of available sub-menus by turning the “Wheel”, then press “Select” to change settings of a given sub-menu.

Browse the available values by turning the “Wheel”. To choose the desired value, press “Select”. The selected value should be flagged with the # sign on its right which is the current setting indicator.

To go back to a higher level in this menu tree, press on the “ESC” button – Keep pressing it to exit the menu system.

The following tables list all GHX-10 setup parameters, items in bold are factory defaults. All video formats show frame rates and not the field rates, so 1080i-60 fields per second will be shown as 1080i-30 frames per second.

3.2 Input Menu

This menu can be used to setup the input parameters.

Sub-Menu	Value	Description
Interface	**SDI** HDMI/DVI Pattern	Input interface setting. Pattern produces a color pattern with 16 channels of audio at different frequencies
SDI Color	**Auto** RGB RGB ext YCbCr 601 YCbCr 601 ext YCbCr 709 YCbCr 709 ext XYZ' YCxCz'	SDI input color setting. Auto: Single Link (1.5Gbps) inputs will be treated as 601 (SD) or 709 (HD). Dual link (1.5Gbps) inputs will be treated as RGB. Ext: designates extended color range (full bandwidth) as opposed to limiting the color spectrum to comply with ITU standards.
HDMI/DVI color	**Auto** RGB RGB ext YCbCr 601 YCbCr 601 ext YCbCr 709 YCbCr 709 ext	HDMI/DVI input color setting Auto: Detected using meta-data, if not present the default is RGB Ext: designates extended color range (full bandwidth) as opposed to limiting the color spectrum to comply with ITU standards.
Default EDID	720p 50 720p 60 1080i 25 1080i 30 1080p 50 **1080p 60** WUXGA 50 WUXGA 60	DVI input default setting. When you feed a signal to the HDMI input, the GHX-10 has to report a native resolution over EDID. This menu allows the user to change the default resolution of the GHX-10 between the available formats. **CAUTION**: You must disconnect HDMI/DVI source before changing this setting.

3.3 Output Menu

This menu can be used to setup the output parameters.

Sub-Menu	Value	Description
Interface	**HDMI/DVI** SDI	Set the active output. For common video formats, both outputs can be active simultaneously
SDI color	**Auto** RGB RGB ext YCbCr 601 YCbCr 601 ext YCbCr 709 YCbCr 709 ext XYZ’	Set the SDI output color mode Auto: 601 (SD) 709 (HD), RGB (2K) “ext” designates extended color range (full bandwidth) as opposed to limiting the color spectrum to comply with ITU standards.
SDI Resolution	NTSC PAL 720p **1080i/sf** 1080p 2Kp 2Kp Flat Match Input	Set the SDI output pixel resolution. Match Input: In this mode, the SDI output will have the same resolution as the input source.
SDI Frequency	23.98 24 25 **29.97** 30 47.95 (1080p only) 48 (1080p only) 50 (720p & 1080p only) 59.94 (720p & 1080p only) 60 (720p & 1080p only) Match input	Set the SDI output frame rate Match Input: In this mode, the SDI output frame rate will be equivalent to the input source
SDI Force Interl	**Off** On	Force the SDI output to interlaced (or Segmented Frame)

Sub-Menu	Value	Description
Ancillary out	Off **Bypass SDI**	Off: No VANC on SDI output Bypass SDI: Pass Ancillary data from SDI input to SDI output
HDMI/DVI color	**Auto** RGB RGB ext YCbCr 601 YCbCr 601 ext YCbCr 709 YCbCr 709 ext	Set the HDMI/DVI output colors Auto: RGB unless otherwise communicated over EDID. “ext” designates extended color range (full bandwidth) as opposed to limiting the color spectrum to comply with ITU standards.
DVI Resolution	**Auto** VGA SVGA XGA WXGA SXGA SXGA+ WSXGA+ WUXGA 480p 480i 576p 576i 720p 1080i 1080p Match input	Set the DVI output pixel resolution. Auto: In this mode, the unit will read the default resolution of the connected monitor using EDID and sets the output to match Match Input: In this mode, the unit will set the DVI output resolution to match the input resolution – or to the closest output resolution if the exact input resolution is not available. VGA= 640x480 SVGA= 800x600 XGA= 1024x768 WXGA= 1280x800 SXGA= 1280x1024 SXGA+= 1400x1050 WSXGA+= 1680x1050 WUXGA= 1920x1200

Sub-Menu	Value	Description
DVI Frequency	**Auto** 23.98 24 25 29.97 30 47.95 48 50 59.94 60 Match input Match input *2	Set the DVI output frequency . This list shows all possible frequencies but the GHX-10 menu will only show the allowed frequencies for the DVI output format selected. Auto: In this mode, the unit will read the default frequency of the connected monitor using EDID and sets the output to match Match Input: In this mode, the unit will set the DVI output frequency to match the input resolution. Match input *2: The output is set at double the input frame rate.
Color Depth	**Auto** 8 bits 10 bits 12 bits	Set the color depth Note: If the input is 10bit and the output is set to 8bit for example, the GHX-10 will dither (NOT truncate)
Time Code	Off **Bypass SDI** Free wheel	Off: No embedded timecode on SDI output Bypass SDI: Pass embedded timecode from SDI input to SDI output Free wheel: Generate embedded Time Code starting at the moment this option is enabled.

3.3.1 Color Space

The ITU-R BT.709-5 (HD formats) and ITU-R BT.601-5 (SD formats) Standards define the range of color values in a digital signal to be:

- 16 to 240 for 8bit coding
- 64 to 960 for 10bit coding

The GHX-10 color space conversion supports these standards, but it also supports full range by allowing the color values to be between:

- 0 to 255 for 8bit coding
- 0 to 1023 for 10bit coding

On the GHX-10 the full range modes are designated by the “ext” following the color space conversion mode.

3.4 Image Menu

This menu can be used to setup the image parameters.

Sub-Menu	Value	Description
Brightness	0% to 100% default **50%**	Brightness value setting
Contrast	0% to 100% default **50%**	Contrast value setting
Scaling	One to One **Aspect Ratio** Fill Aspect Fit H Aspect Fit V	Scaling value setting Aspect Ratio: Maintain input aspect ratio Fill: Scale to fill the output resolution Aspect Fit H (V): Scale Horizontally (Vertically) to fill the output resolution One to One: No Scaling
Deinterlacing	**Off** On Motion	Set the Deinterlacing mode Motion: Deinterlacing is based on motion.
SD Ratio	**4:3 Analog** 4:3 Digital 16:9 Analog 16:9 Digital	The pixel aspect ratio for standard definition signals is not square and it depends on the material used. Choose the proper pixel SD ratio based on the source material.

Sub-Menu	Value	Description
Input LUT	User Defined 0.1 to 4.0 default **1.0**	Set the Gamma Curve from 0.1 to 4.0 or choose User Defined to use a custom LUT table uploaded using Doremi Universal Software Interface
Output LUT	User Defined 0.1 to 4.0 default **1.0**	Set the Gamma Curve from 0.1 to 4.0 or choose User Defined to use a custom LUT table uploaded using Doremi Universal Software Interface

3.5 Sync Menu

This menu can be used to setup the sync parameters.

Sub-Menu	Value	Description
Input	**Auto** SDI HDMI/DVI Extern	Sync input setting Auto: Sync is derived from the input source Extern: Sync is derived from the Sync Input connector.
Output	**Auto** Force Bi-Level	Sync output setting Auto: Tri-Level for HD and 2K formats and Bi-Level for SD formats.
H offset	X pixels **default 0**	Horizontal Sync offset in pixels
V offset	X lines **default 0**	Vertical Sync offset in lines

3.6 Audio Menu

This menu can be used to setup the audio parameters.

Sub-Menu	Value	Description
Input	**Auto** SDI DVI/HDMI AES	Audio input format setting Auto: Audio input is the same as video input
Delay	X frames **default 0**	Audio delay setting from -1 to +2 frames

Sub-Menu	Value	Description
Level	-18, -12, -6, **0**, +6, +12, +18 dB	Audio Output level setting
HDMI Channel out	**Auto** 2 4 6 8 Off	Set the HDMI audio output mode Auto: All audio inputs will be present on the HDMI output 2, 4, 6, 8: Total number of audio channels to be present on the HDMI output Off: No audio on HDMI output
SDI Out Groups	**Auto** 1 1+2 1+2+3 1+2+3+4 Off	Set the embedded SDI active audio groups Auto: All audio inputs will be present on the SDI output Each group has 4 audio channels, when 1+2+3+4 is selected, all 16 audio channels will be present. Off: No embedded audio on SDI output
Swap Audio Channels 3 and 4	On **Off**	Channels 3 and 4, commonly used for sub-woofer and central channel can be swapped if needed.

3.7 OSD Menu

This menu can be used to setup the OSD parameters.

Sub-Menu	Value	Description
OSD Enable	**Yes** No	Enable or disable On Screen Display
OSD timeout	X s (seconds) **default 30s** Infinite	On Screen Display timeout in seconds. Set to Infinite to keep it always on.
OSD H Position	1% to 99% **default 25%**	OSD horizontal position in percentage
OSD V position	1% to 99% **default 25%**	OSD vertical position in percentage
OSD Status The OSD Status will show the burn-in window timecode, I/O status and audio levels when the menu OSD is not active. OSD Status Position can only be set using the Doremi Universal Interface Software	**Off** TC BIW Input Status Output Status	Burn In Window and Status display - Off: BIW and Status not displayed - TC BIW: Timecode is shown in a burn-in window on the GHX output - Input Status: In addition to the BIW timecode, the GHX output will display the Input Status including Audio levels, Closed Caption presence, Input Format and CRC errors (flashing red dot) - Output Status: In addition to the BIW timecode, the GHX output will display the Output Status.
OSD/TC Color	**White/Black** W/B Zoom Black/White B/W Zoom	Burn In Window type setting

3.8 System Menu

This menu allows to access the system parameters.

Sub-Menu	Description
Save	Save current settings to flash. Select to Save, when you get the “?” Select again to confirm, you should see “#”
Firmware: v.x.y	Firmware version
Serial: zzzzzzz	Serial number
License: uuuuuuuu	License number
Temp: vv C	Temperature (in degree Celsius)
Standby	Standby mode. Put the unit in Power Down mode
Auto Standby **Off**, 60minutes, 120minutes	Auto Standby mode. Set the idle time duration before the unit goes in power down mode automatically
IR 0 to F **default is 0**	Infra-Red. To avoid IR interference when you have multiple GHX units, you can assign each a different IR code from 0x0 to 0xF (16 total). You need to set the DIP switch on your Doremi IR remote accordingly.
MicroSD or SD Memory update	Depending on your unit, you might see “Micro SD” or “SD Memory” firmware update

3.9 Status Menu

This menu can be used to view the Input and Output status.

Sub-Menu	Description
In: Out:	Input and Output format status information

4 Infrared Remote Controller

The buttons on the IR remote are used to access the unit while observing the On Screen Display (OSD). Left and Right arrows are used to navigate between menus and sub-menus. Select is to make a selection, Exit is to go one level up or exit the menu structure.

4.1 Remote Controller Overview

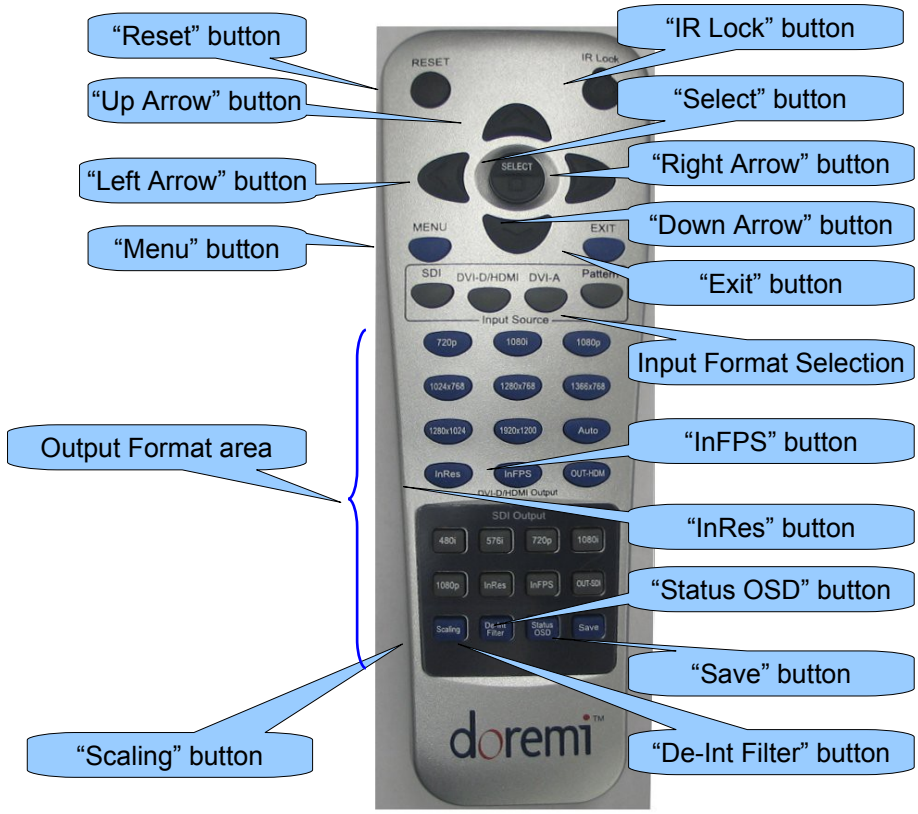

Figure 3: Infrared Remote Controller

The remote controller is divided into Four different areas:

- RESET/IR Lock buttons
- Navigation or Menu System
- Input Format
- Output format

4.2 Remote Controller Functions

Remote Control	Function
Input format selection	Select HD-SDI, SDI, HDMI/DVI (through the DVI-D/HDMI button) or Pattern **Note**: The DVI-A button is not used.
“IR Lock” button	Not used
“RESET” button	Not used
“Menu” button	Invoke the Menu System. Pressing this button on the IR is similar to pressing the scroll button on the GHX-10 front panel
“Exit” button	Back one menu level. Similar to Front Panel ESC button
Output format area	Set the SDI or HDMI/DVI output resolution to: HDMI/DVI: Auto, 720p, 1080i, 1080p, 1024x768, 1280x768, 1366x768, 1280x1024, 1920x1200 SDI: 480i, 576i, 720p, 1080i, 1080p
“Up Arrow” button	Not used
“Down Arrow” button	Not used
“Left Arrow” button	Navigate left. Similar to Wheel counter clockwise
“Right Arrow” button	Navigate right. Similar to Wheel clockwise
“Select” button	Ok/Select, Similar to Select on Front Panel
“InRes” buttons	Force the output resolution to match the input resolution. There is one for SDI and one for HDMI/DVI
“InFPS” buttons	Force the output frame rate to match the input frame rate. There is one for SDI and one for HDMI/DVI
“Scaling” button	Navigate between the available scaling options
“De-Int Filter” button	Toggle De-interlacing Filter ON or OFF
“Status OSD” button	Toggle on screen display ON and OFF
“Save” button	Save settings
OUT-HDM	Set the output interface to HDMI/DVI
OUT-SDI	Set the output interface to SDI

4.3 Quick Input Format Setting

To select the input format, press one of the buttons available at the top of the remote controller.

Figure 4: Quick Input Format Setting

You have the choice between: SDI, HDMI (using the DVI-D/HDMI button) and Pattern. The "Pattern" button will generate color bars with 16 channels of audio at different frequencies.

Note: The DVI-A button is unused.

4.4 Output Format Setting

Since not all formats are common between SDI and HDMI/DVI, the output interface must be selected.

- If the output interface is set to SDI and if the selected output format is a valid HDMI resolution, both SDI and HDMI outputs will be active with proper colors on both outputs. This is due to the presence of a dedicated color space converter on the HDMI output.
- If the output interface is set to DVI (HDMI) and if the selected output format is a valid SDI resolution, both HDMI and SDI outputs will be active but the SDI output colors might be wrong. This is due to the presence of a dedicated color space converter on the SDI output (this might change in future releases).

4.4.1 HDMI/DVI Output Format

To set the output format to a specific HDMI/DVI format, press "OUT-HDM" on the IR controller, then press the corresponding output format: Auto, 720p, 1080i, 1080p, 1024x768, 1280x768, 1366x768, 1280x1024, 1920x1200. More formats are available through the menu system.

4.4.2 SDI Output Format

To set the output format to a specific SDI format, press "SDI-OUT" on the IR controller, then press the format you want to set: 480i, 576i, 720p, 1080i, 1080p. More formats are available through the menu system.

5 Doremi Universal Interface Software (duis)

5.1 Doremi Universal Interface Software Installation

To install the Doremi Universal Interface software, follow the steps below:

1. Plug the provided USB cable between the GHX-10 and an available USB port on your PC - see Figure 2 for USB connector location
2. Power on the GHX-10 by pressing the PWD button
3. If you get the "Found New Hardware Wizard" window at this stage, click “Cancel”
4. Run the installation package by double-clicking on a file like “Doremi_Universal_Interface_Software-4.0.2.0.exe” which can be downloaded from our web site: http://www.doremilabs.com/.
5. After the installation is over, if you get the "Found New Hardware Wizard", go through all the steps shown below:
   - **Step 1**: Select the “No, not this time” option and click on “Next >”

Figure 5: ”Found New Hardware Wizard” Window – Step 1

   - **Step 2**: When asked for software installation, choose the option “Install the software automatically (recommended)”

Figure 6: ”Found New Hardware Wizard” Window – Step 2

- **Last step**: Wait for the driver installation to be completed. Click on the “Finish” button when done.

Figure 7: ”Found New Hardware Wizard” Window – Last Step

- Run the Doremi Universal Interface GUI and verify that you have a proper connection by looking at the “Devices” tab which should show the Model and Serial numbers.

Note: If you get the following message during the installation:

Figure 8: Hardware Installation Warning Window

- Click on the “Continue Anyway” button.

Note: If during the automatic installation you get a message asking you to search for a specific file,

- Hit cancel then uninstall duis.
- While the GHX-10 unit is still connected, go to the Device Manager > Universal Serial Bus Controllers and uninstall Doremi GhX Board.
- Install duis again and recycle power on the GHX-10 which should take you back to Step 1 or Step 2 above.

5.2 Doremi Universal Interface Software Overview

The Doremi Universal Interface Software (duis) consists of a GUI that can control one or more GHX-10 device(s) connected to your workstation through USB.

When starting the Doremi Universal Interface, the following GUI should appear:

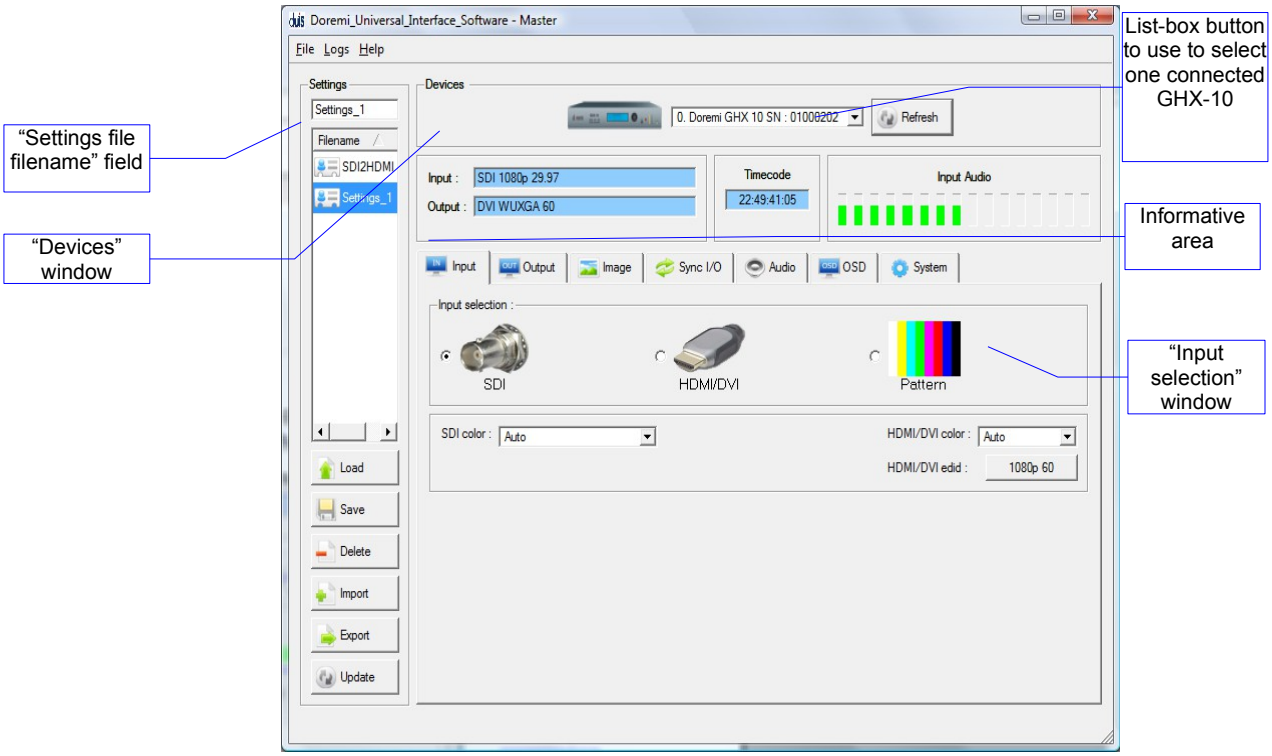

Figure 9: duis – Input Tab

This GUI is composed of the following parts:

- The "Devices" section: Can be used to select one connected GHX-10 from the drop down menu – click on the "Refresh" button to be sure all the connected GHX-10 units are visible.
- The "Information" section: Provides information about the input and output interfaces and resolutions, the current timecode and the audio input level of the connected GHX-10 device.
- The "Control" section: Has tabs that can be used to view or modify various settings on the connected GHX-10 unit: Input settings, Output settings, Image settings, Sync I/O settings, Audio settings, OSD (On Screen Display) settings and System settings. These tabs are presented in Section 5.4 .
- The "Settings" window located on the left of the GUI: Can be used to manage the settings files (loading, saving, importing, exporting etc …). This "Settings" window is presented in the Section 5.3 below.

5.3 Settings Window

The “Settings” window can be used to manage settings files

- To save the current duis settings into a file, enter a settings filename in the top left corner field as shown in below, then click on “Save”.

The saved settings file should appear in the “Settings” window:

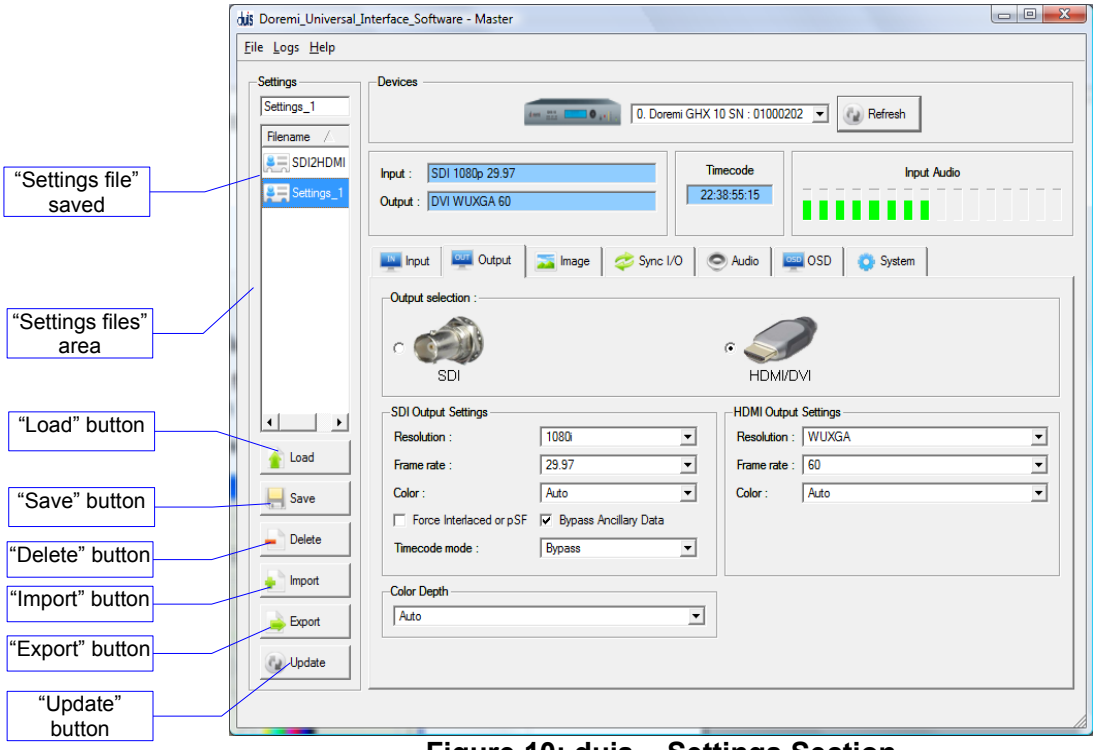

Figure 10: duis – Settings Section

- To export this saved “settings file” so you can use it for another GHX-10 device, select it in the “Settings files” area – see figure above – and click on the “Export” button. You should be asked to confirm where you want to export this file using a standard “Save as” dialog box.
- To import an existing “settings file” from a .ghx file to the connected unit click on the “Import” button. Then browse the files to select the appropriate “settings file” you want to import. The imported file should appear in the “Settings files” area on the left part of the GUI. To apply the settings to the connected GHX-10 unit, you need to select this file then click on the “Load” button. The GHX-10 settings should be updated.
- To delete a settings file present in the “Settings files” area – see figure above – select it and click on the “Delete” button.
- Click on the “Update” button to update the “Settings” window to reflect the content of the “User Settings” folder of the duis (folder where all the settings files are stored).

5.4 Tabs Description

5.4.1 Input Tab

The input tab is presented in Figure 9 above. All parameters are explained earlier in this manual in the chapter titled “GHX-10 Menu”.

5.4.2 Output Tab

Below is a screen shot of the “Output Tab”:

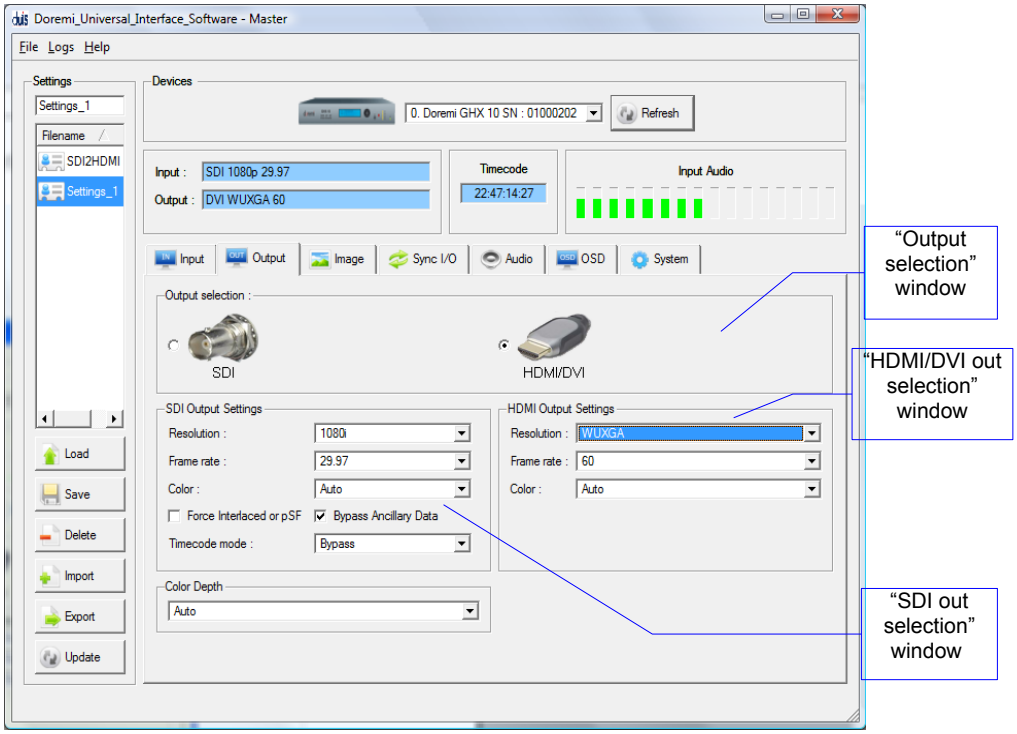

Figure 11: duis – Output Tab

All parameters are explained earlier in this manual in the Section 3 titled, “GHX-10 Front Panel Controller.”

5.4.3 Image Tab

This is a screen shot of the “Image Tab”:

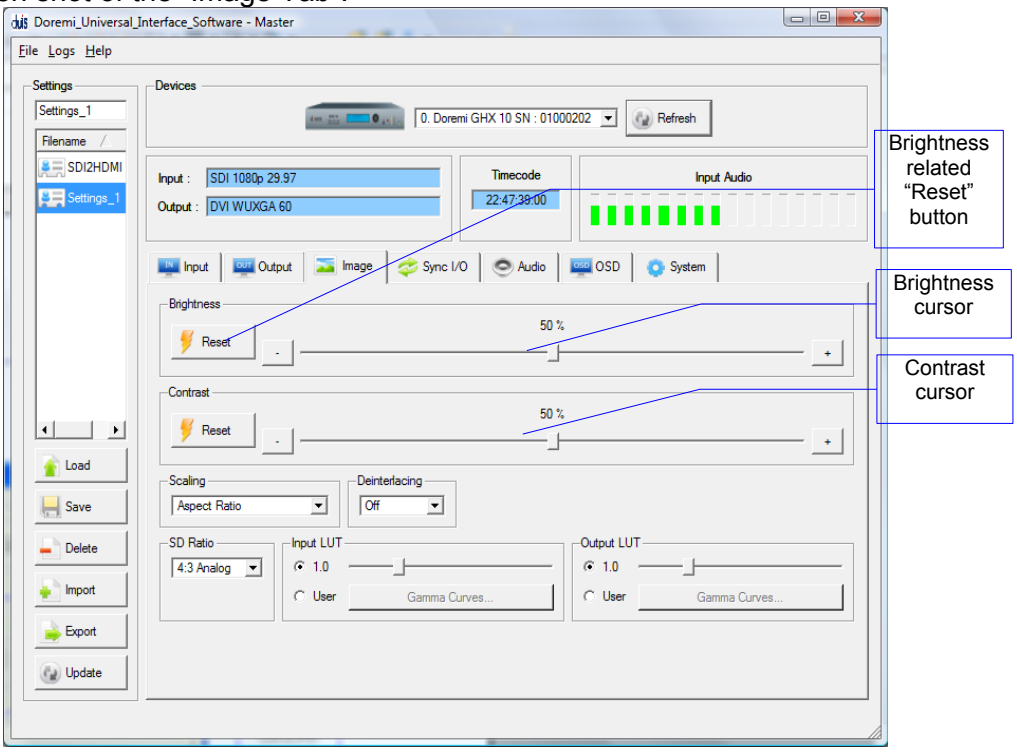

Figure 12: duis – Image Tab

All parameters are explained earlier in this manual in the Section 3 titled, “GHX-10 Front Panel Controller.”

5.4.4 Sync I/O Tab

Below is a screen shot of the “Sync I/O Tab”:

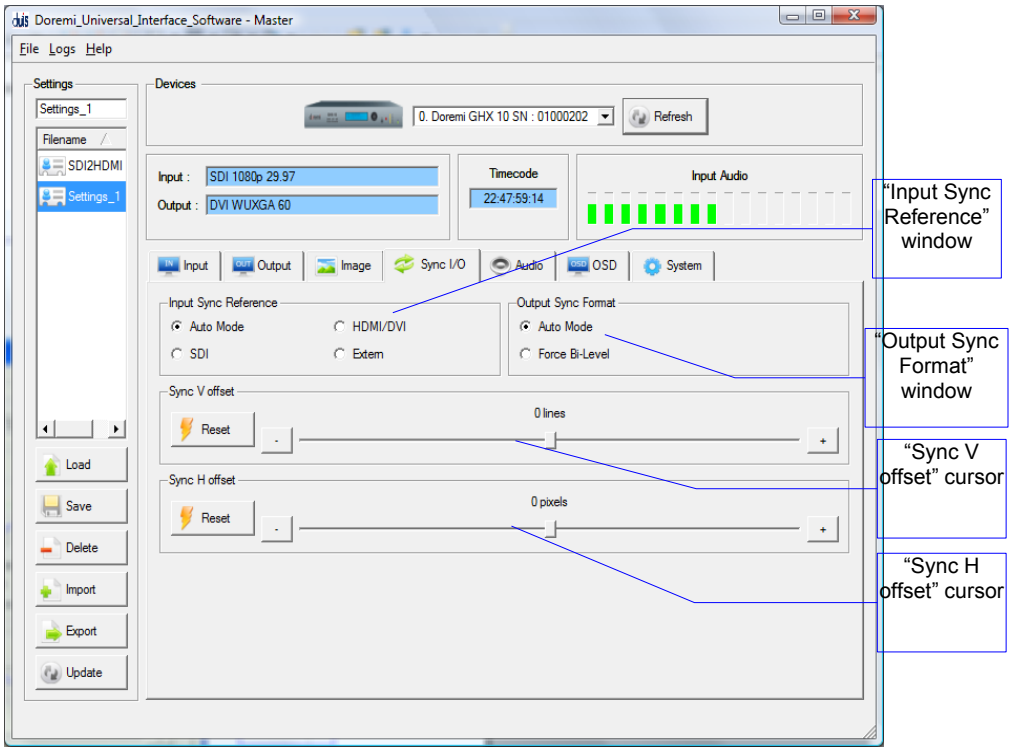

Figure 13: duis – Sync I/O Tab

All parameters are explained earlier in this manual in the Section 3 titled, “GHX-10 Front Panel Controller.”

5.4.5 Audio Tab

This is a screen shot of the “Audio Tab”:

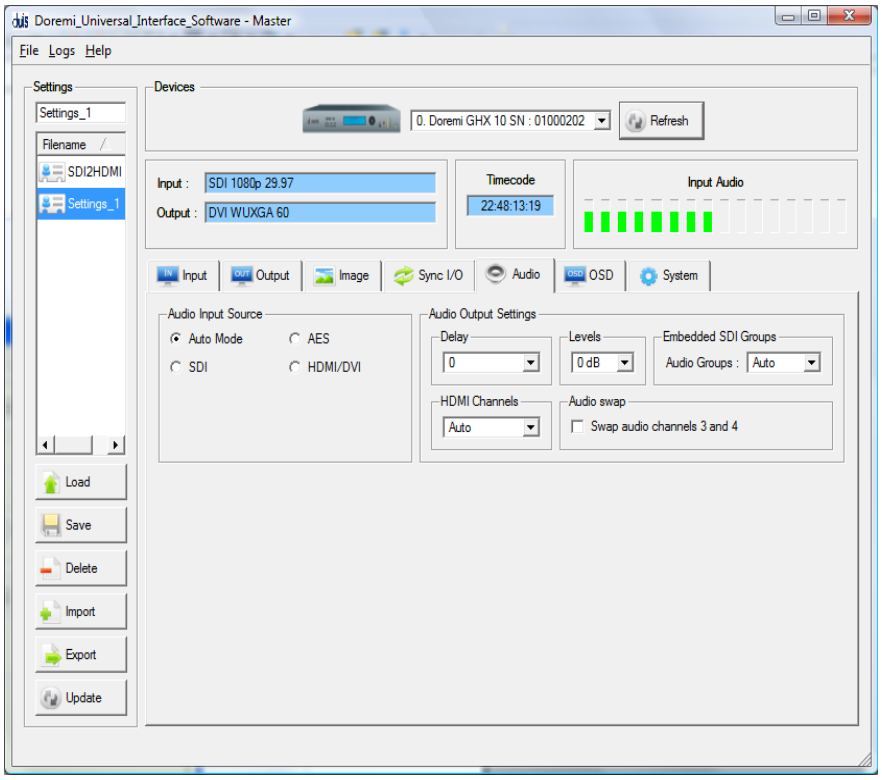

Figure 14: duis – Audio Tab

All parameters are explained earlier in this manual in the Section 3 titled, “GHX-10 Front Panel Controller.”

5.4.6 OSD Tab

Below is a screen shot of the “OSD Tab”:

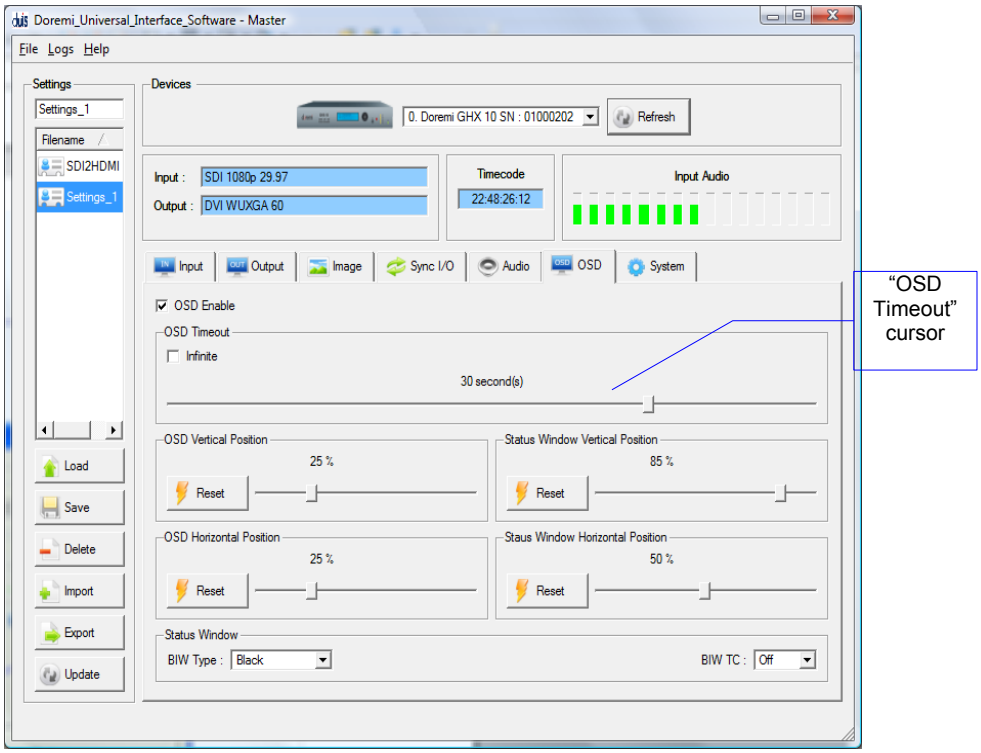

Figure 15: duis – OSD Tab

All parameters are explained earlier in this manual in the Section 3 titled, “GHX-10 Front Panel Controller.”

The Status Window Vertical and Horizontal positions are available only through duis. They set the position of the Status OSD window that shows only when the main OSD is off and the Status OSD is ON.

5.4.7 System Tab

This is a screen shot of the “System Tab”:

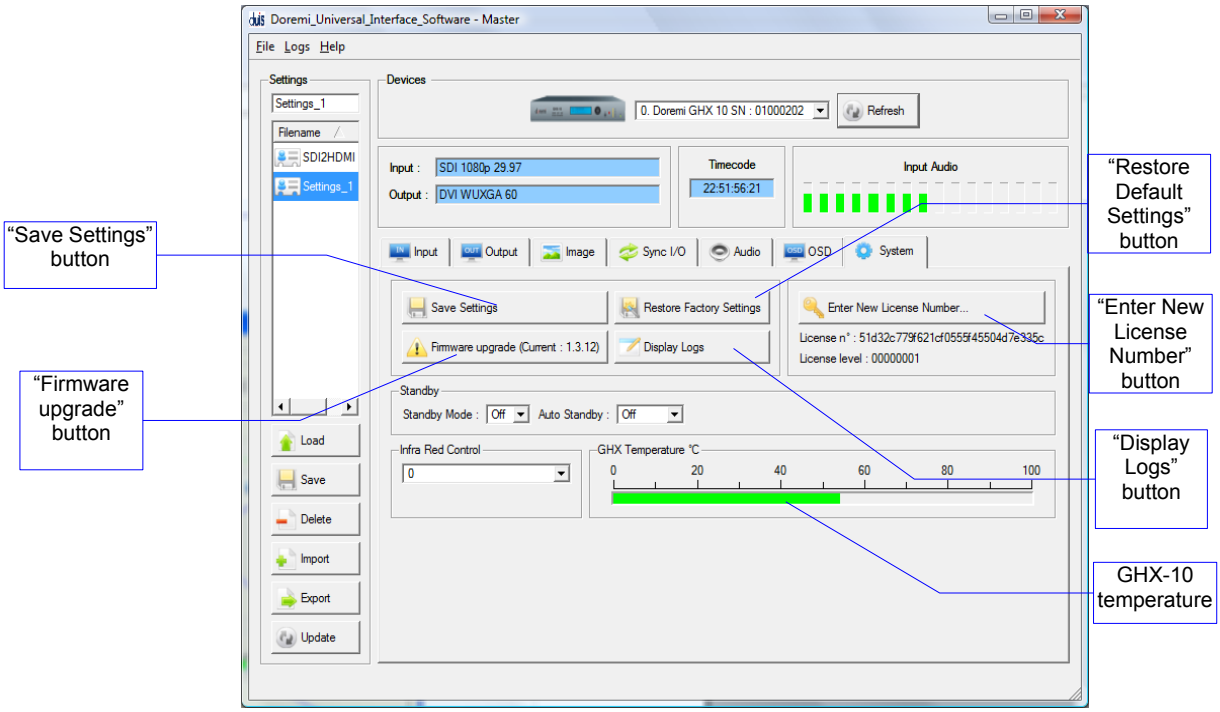

Figure 16: duis – System Tab

All parameters are explained earlier in this manual in the Section 3 titled, “GHX-10 Front Panel Controller.”

In addition this tab can be used to perform the following actions:

- To save the current settings to flash, click on the “Save Settings” button
- To restore the factory default settings, click on the “Restore Default Settings” button
- To enter a new license number, click on the “Enter New License Number ...” button and type the new license number in the pop-up window.
- To perform a firmware upgrade, click on the “Firmware upgrade (Current: x.yy)” button – note that this button provides the current firmware version installed on the connected unit, after “Current: ”. On the above picture, the current firmware is version 1.2.15 for example. See Section **6.1** for detailed upgrade steps to follow.
- To display the logs, click on the “Display Logs” button. A window containing the logs will appear. Select “Auto Update” from that window to see all messages.

6 Firmware Update

The firmware can be updated through USB or SD Memory. This section presents both methods. In case you miss one of the files listed in the procedures below, please contact Doremi Labs (see Section 1.1).

6.1 USB Update

The firmware can be updated through USB using the Doremi Universal Interface Software as presented in Section 5.4.7 .

To perform such update, follow the steps below:

1. Connect the GHX-10 to your computer using the USB cable provided with the unit,
2. Start the Doremi Universal Interface Software – see Section 5
3. Go to the “System Tab” - see Section 5.4.7
4. Click on the “Firmware upgrade” button
5. Select the firmware file (e.g: “ghx_firmware_1.3.11.bin”) and click on the “Upgrade now” button

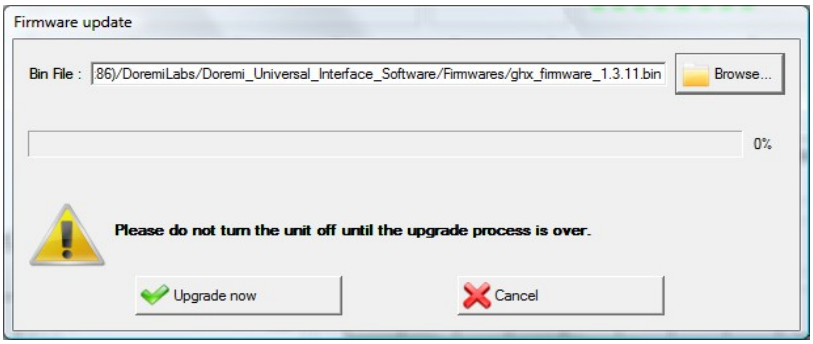

Figure 17: Firmware Update Window

6. Once the update is completed, re-cycle power on the GHX-10 unit. Newer GHX-10 models recycle power on their own.

6.2 SD Memory Update

The SD Memory must be formatted as FAT or FAT32.

This is the update procedure:

1. Copy the firmware file (e.g: “ghx_firmware_1.3.11.bin”) on the SD Memory card
2. Plug the SD Memory into the SD port of the GHX-10 (see Figure 2).
3. Power On the GHX-10 and go to the menu “**System**” – see section **3.8**
4. Select the “**SD Memory update**” sub-menu.
5. Select the file you want to use for the update - using the menu scroll wheel, see Figure 1 - and confirm the update.
6. Once the update is completed, re-cycle power on the GHX-10 unit. Newer GHX-10 models recycle power automatically.

7 Annex A: Specifications

7.1 Inputs

- HDMI without HDCP
- Single or Dual Stream HDSDI (For dual stream HDSDI, the two inputs must comply with SMPTE Standard S372M, i.e., genlocked with no more than 2 to 3 pixels of difference)

7.2 Outputs

- Single or Dual Stream HDSDI
- Single HDMI Output without HDCP

7.3 Audio

- 16 channels of audio supported embedded in HDSDI
- 8 channels using HDMI
- 8 channels of AES audio de-embedded
- Audio delay can be set from the GUI, front panel or IR Remote Control -1 to +2 frames

7.4 Video

Supported Input(s)	Supported Output(s)
SD-SDI: NTSC, PAL **HD-SDI**: all HD +2K formats (SMPTE 274, SMPTE296, SMPTE372) **HDMI/DVI:** 640x480 = VGA 720x480i = 480i 720x480p = 480p 1440x480i = 480i 720x576i = 576i 720x576p = 576p 1440x576i = 576i 800x600 = SVGA 1280x720 = 720p 1024x768 = XGA 1280x768 = WXGA 1364x768 = WXGA 1366x768 = WXGA 1536x768 = 1536x768 1152x864 = XGA+ 1280x960 = SXGA- 1280x1024 = SXGA 1364x1024 = 1364x1024 1400x1050 = SXGA+ 1680x1050 = WSXGA+ 1920x1080i = 1080i 1920x1080p = 1080p 2048x1080 = 2Kp 1600x1200 = UXGA 1920x1200 = WUXGA	**SD-SDI**: NTSC, PAL **HD-SDI**: all HD +2K formats (SMPTE 274, SMPTE296, SMPTE372) **HDMI/DVI:** 640x480 = VGA 720x480i = 480i 720x480p = 480p 720x576i = 576i 720x576p = 576p 800x600 = SVGA 1280x720 = 720p 1024x768 = XGA 1366x768 = WXGA 1280x1024 = SXGA 1400x1050 = SXGA+ 1680x1050 = WSXGA+ 1920x1080i = 1080i 1920x1080p = 1080p 1920x1200 = WUXGA

8 Acronyms

Term	Definition
DVI	Digital Visual Interface
HDMI	High-Definition Multimedia Interface
HD-SDI	High Definition Serial Digital Interface
IR	Infra Red
OSD	On Screen Display
SDI	Serial Digital Interface

9 Document Revision History

Date	Version	Description
10/31/2008	1.0	First version.
11/10/2008	1.2	Editorial changes.
12/11/2008	1.3	GHX Control Panel GUI documented.
04/09/2009	1.4	All sections revised.
04/10/2009	1.5	All sections revised.
09/09/2010	1.6	All sections revised and modified. Old images updated to reflect current version of the Doremi Universal Interface Software. New picture of the IR Doremi remote updated.
10/22/2010	1.7	Section 3.6.1 added to reflect supported audio sample rates.
03/02/2011	1.8	New pictures added.
03/04/2010	2.0	Updated to comply with GHX-10 firmware version 1.4.0 and Doremi Universal Interface version 4.0.2.
07/26/2012	2.1	Logo updated and contact information added.
02/12/2013	2.2	Minor revisions made to Section 1 and Section 2.1.