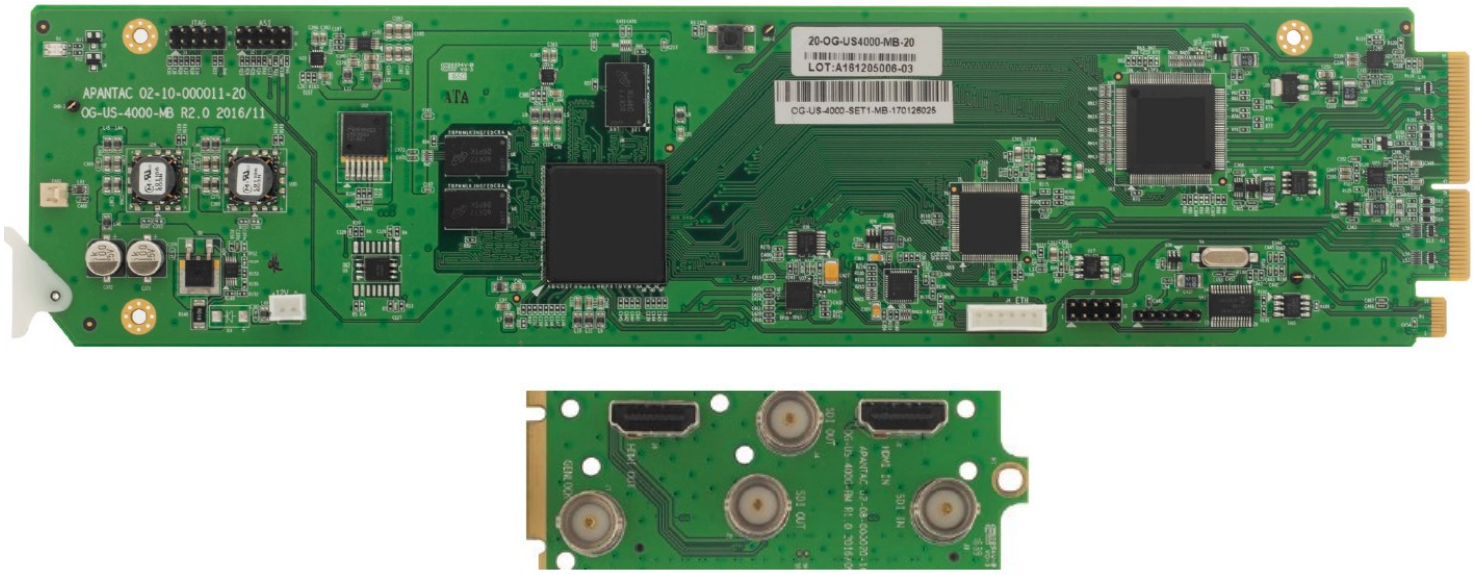

OG-US-4000

APANTAC openGear

Bi-Directional Universal Scaler with Genlock

User Manual

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Features:

- openGear 3.0 card-based form factor
- Dashboard control enabled
- Supports HDMI or SDI inputs
- Supports HDMI and SDI outputs
- Supports Genlock via openGear frame
- Scales any SDI input resolution to HDMI & SDI
- Scales any HDMI input resolutions to HDMI & SDI
- SDI output supports 720P, 480/576i, 480/576P, 1080i/P in 23.98, 24, 25, 29.97, 30, 50, 59.94, 60Hz
- HDMI output supports 720P, 480/576i, 480/576P, 1080i/p in 50 and 60Hz
- Low power consumption
- 5 year limited warranty

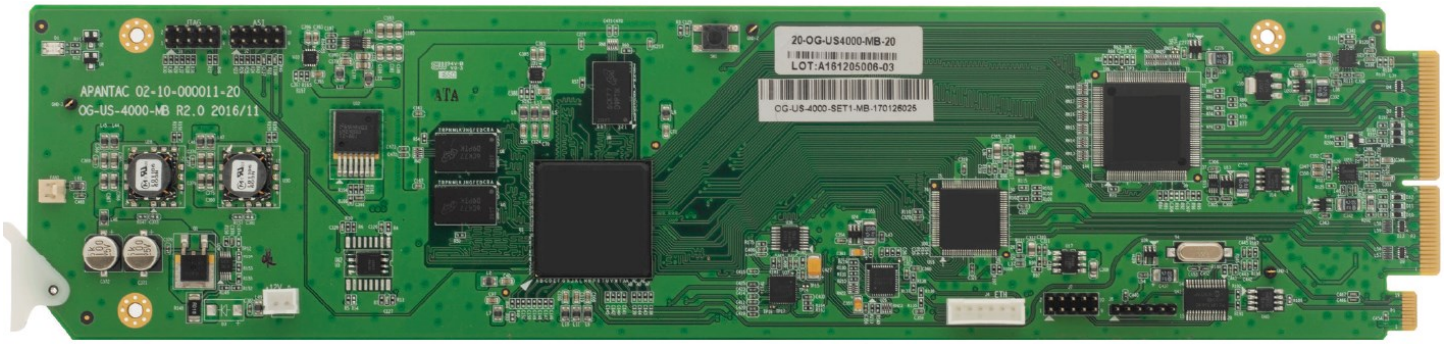
Contents:

1 x OG-US-4000-MB, main board

1 x OG-US-4000-RM, rear module

1 x 75 ohm Terminator

1 x Screw and washer







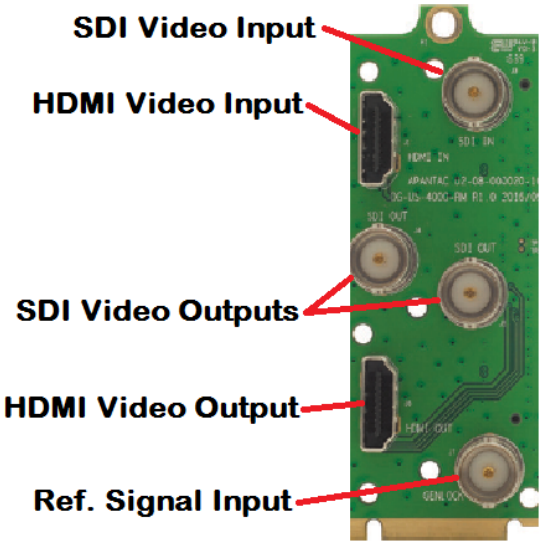
Installation:

Card Installation

Install the Apantac OG-US-4000 rear module (RM). Secure with the included screw and washer.

Insert main board in the appropriate slot to match the RM card edge connector. Insure the main board is firmly seated into the RM connector.

Note: *Apantac rear modules typically occupy two openGear card slots. The slot the main board will utilize depends on the position of the card edge connector on the rear module, which varies by model.*



Output Video - SDI

Connect the SDI output to the receiving/down-stream equipment.

If only one output is to be used, terminate the unused SDI output with the included 75-ohm BNC terminator.

Output Video - HDMI

Connect the HDMI output to the receiving/down-stream equipment using any standard HDMI cable.

HDMI extenders which draw power from the HDMI port must comply with HDMI power specifications.

Input Video - SDI

Connect an SDI video source to the SDI video input BNC connector using any standard 75ohm SDI cable.

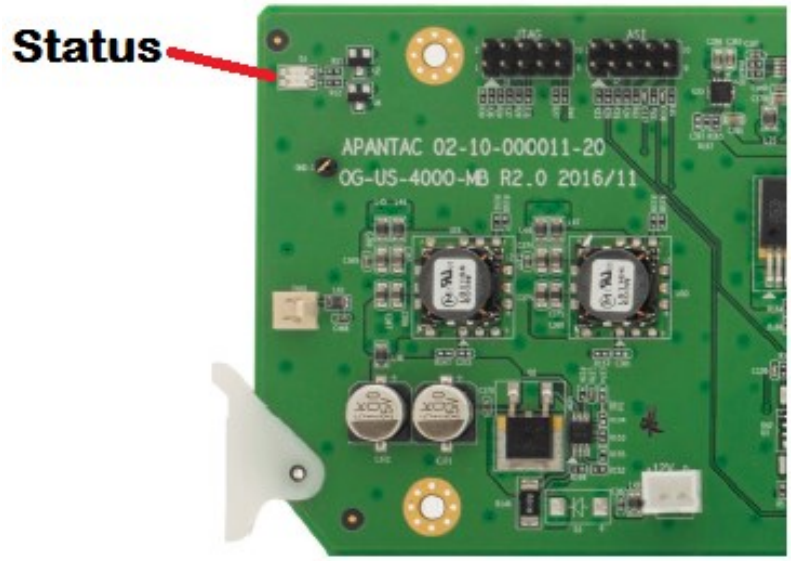
Input Video - HDMI

Connect an HDMI video source to the HDMI video input connector with any standard HDMI cable.

Notes:

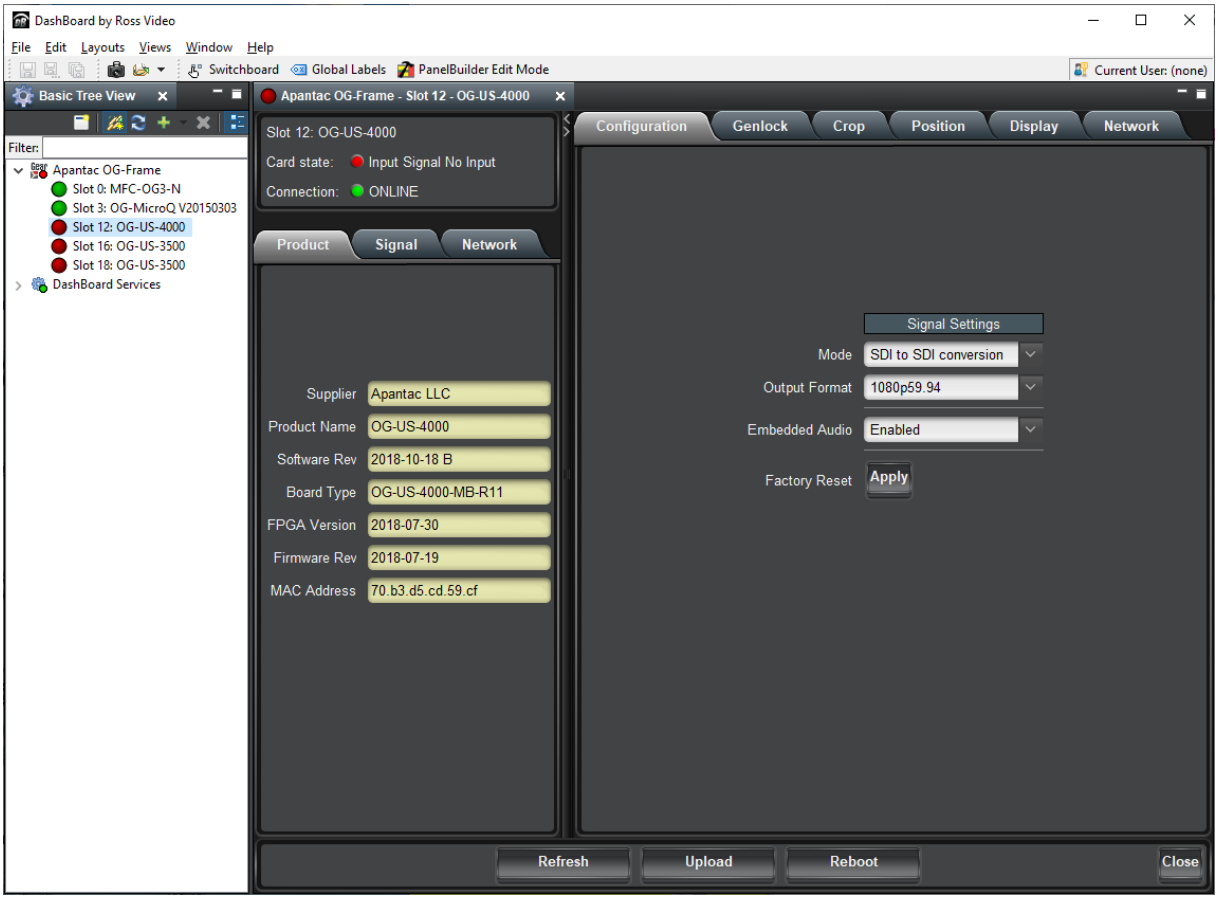
- *The OG-US-4000 video input is not auto-detecting. The unit must be configured to identify which video input source is to be processed.*
- *The OG-US-4000 is currently limited to 1080p-60Hz signals and below. UHD and 4k signals are not currently supported.*
- *For sources containing content protection (HDCP) content Apantac technical support.*

Indicators:



STATUS Indicator: Lights green when the OG-US-4000 has recognized and locked on to the video input signal.

Control and Configuration:



Software:

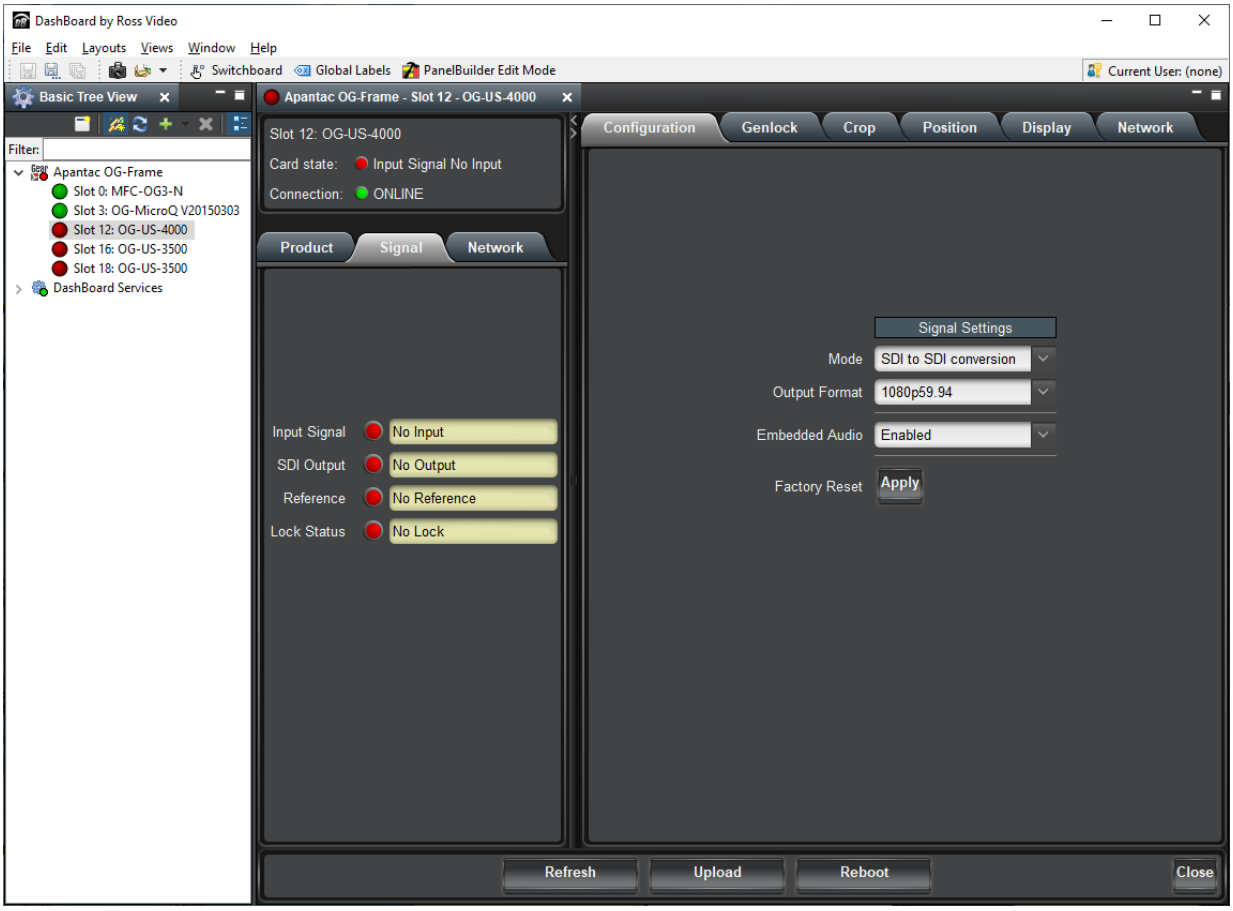
The Apantac OG-US-4000 model is controlled and configured through the openGear frame's control software 'Dashboard' by Ross Video inc. Dashboard can be acquired through the Ross Video website; https://www.rossvideo.com

Dashboard software runs on PC's and connects to the openGear frame's control card via Ethernet. The IP address of the openGear frame is displayed on the LCD panel on the front of the frame. The openGear frame may have a fixed IP address or use DHCP.

The openGear frame's control card communicates to the individual openGear cards via the frame's internal CANBUS (Controlled Area Network). CANBUS communicates to the frame's slots and all control and configuration of the OG-US-4000 cards is through the Dashboard-CANBUS channels.

The Apantac OG-US-4000 Dashboard interface is shown above. Each Apantac OG-US-4000 card should be recognized by Dashboard and displayed by the installed slot number.

Signal Tab:



Unit Status Indicators:

Card State: Indicates whether Dashboard software detects an error state from the card.

Connection: Indicates whether Dashboard software is communicating via CANBUS with the card.

Signal Status Indicators:

Input Signal: Indicates whether the OG-US-4000 has detected and locked-on to the incoming video signal.

SDI Output: Indicates whether the OG-US-4000 is generating an SDI video signal on the outputs. Requires a successful Input Video Signal lock.

Reference: Indicates the OG-US-4000 is receiving a valid genlock reference signal.

Lock Status: Indicates whether the SDI output video signal is locked to the genlock reference signal.

Configuration Tab:

Mode:

The OG-US-4000's video input is not auto-detecting. The card must be configured for which input to process.

The mode choices are:

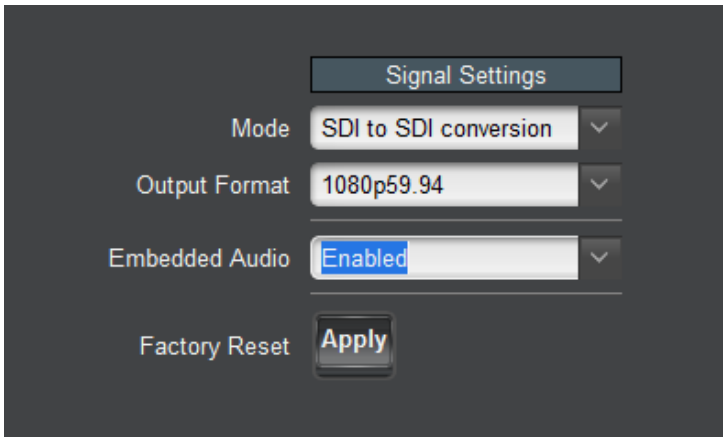
- **SDI to SDI conversion**; chooses the SDI video input signal for conversion to both HDMI and SDI outputs.
- **HDMI to SDI conversion;** chooses the HDMI video input signal for conversion to both HDMI and SDI outputs. *(For HDMI sources requiring HDCP, contact Apantac Technical Support.)*
- **Test Signals;** generates a color-bar test pattern on both outputs.

Output Format:

This option configures the resolutions and refresh rate of the output video signals.

Options are:

- 1080p @ 59.94 Hz
- 1080p @ 50 Hz
- 1080p @ 60 Hz
- 1080p @ 30 Hz
- 1080p @ 29.97 Hz
- 1080p @ 25 Hz
- 1080p @ 24 Hz
- 1080p @ 23.98 Hz
- 1080i @ 59.94 Hz
- 1080i @ 50 Hz
- 1080i @ 60 Hz
- 720p @ 59.94 Hz
- 720p @ 50 Hz
- 720p @ 60 Hz
- 576i (PAL)
- 480i (NTSC)

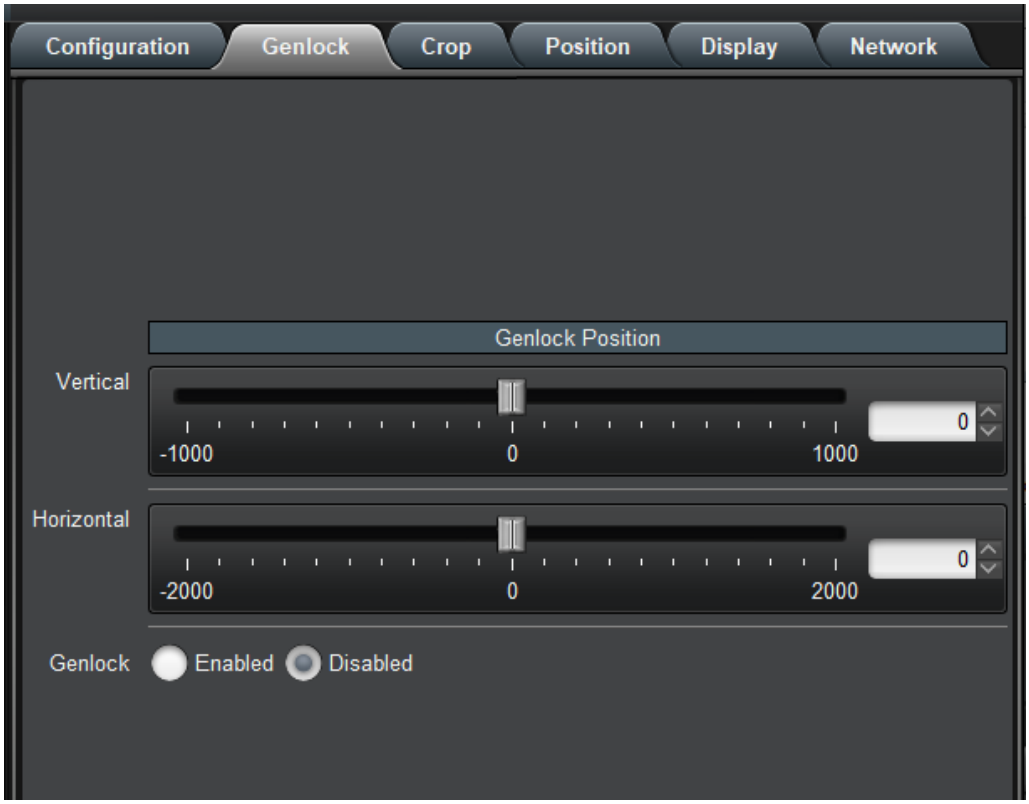


Embedded Audio:

This option configures the SDI video output signal. Options are:

- Enabled
- Disabled (outputs SDI/HDMI video without audio)

Genlock Tab:



Genlock Position - Vertical:

The vertical offset can be adjusted using either moving the slider bar control with a mouse, or by the up or down arrow buttons adjacent to the number on the right of the slider bar.

Genlock Position - Horizontal:

The horizontal offset can be adjusted using either moving the slider bar control with a mouse, or by the up or down arrow buttons adjacent to the number on the right of the slider bar.

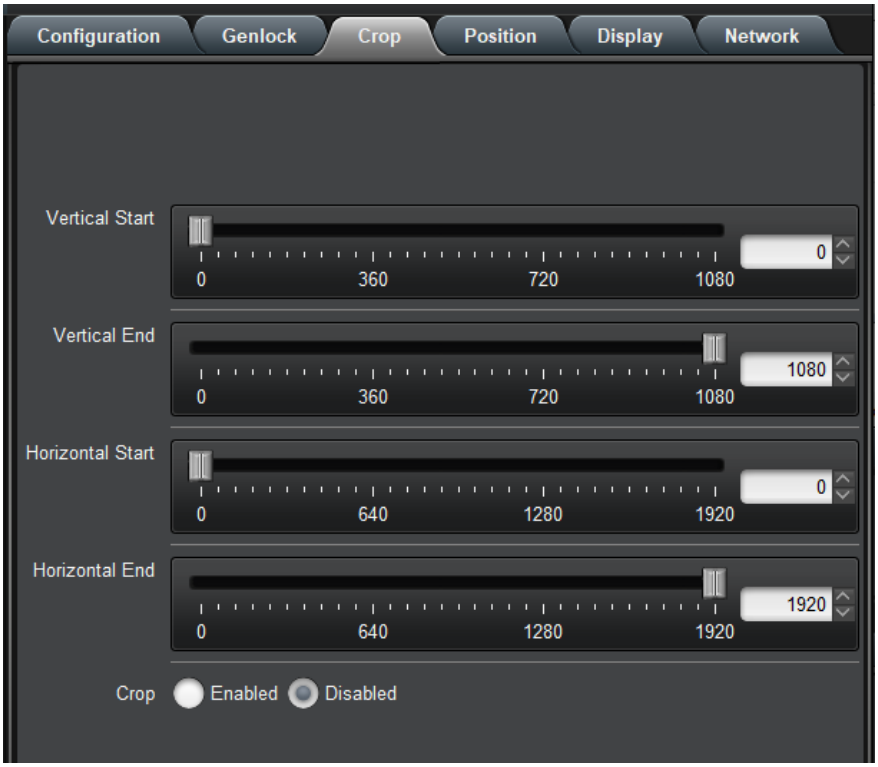
Genlock:

The OG-US-4000 model includes the feature of locking the output video signal timing to the openGear frame's reference signal. This feature can be Enabled or Disabled. (Also refer to the Signal tab section)

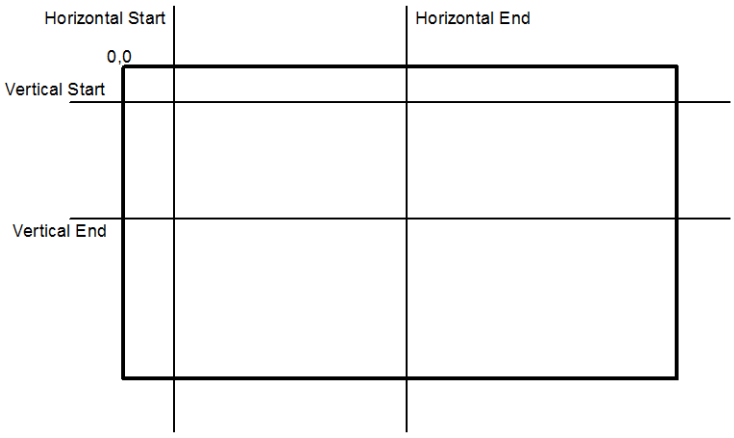
Notes:

1. Genlock adjustments require the use of external test equipment.

Crop Tab:



The cropping function allows selecting a portion of the incoming video image to be scaled to the outputs. One purpose that cropping can be used for is undoing a pillar-boxed or letter-boxed image by selecting only the desired image portion.

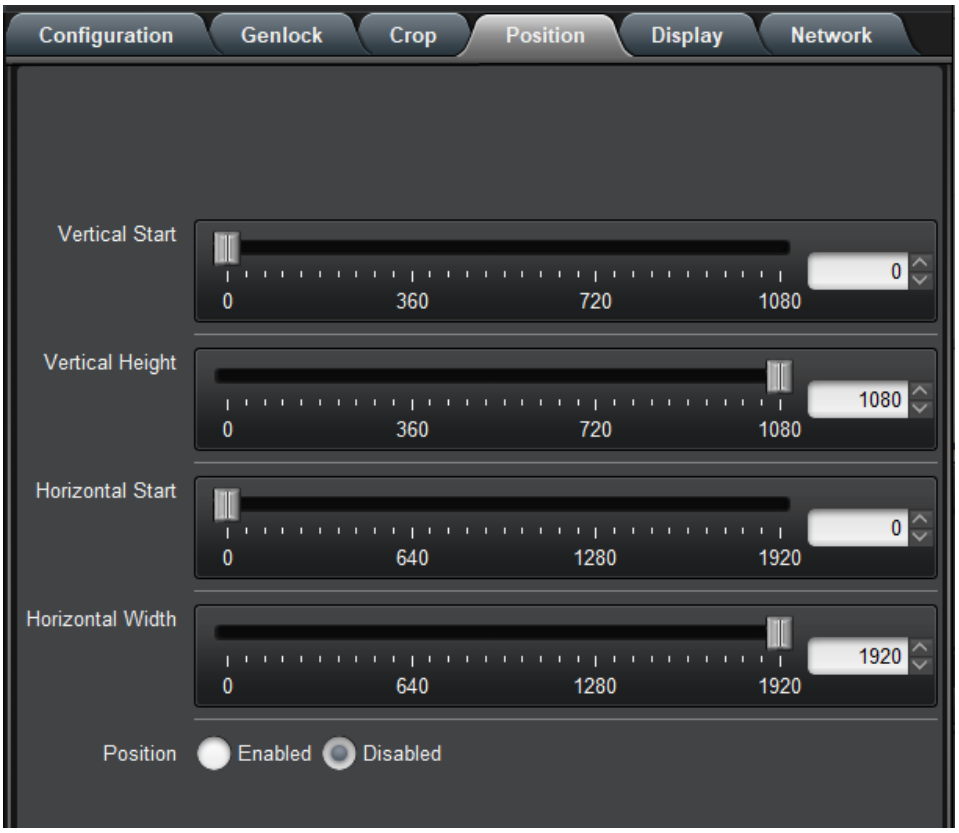


The numbers chosen in the configuration parameters relate to the resolution of the incoming video. Since the maximum input resolution for the OG-US-4000 is 1920 x 1080 (1080p), the sliders include all numbers up to this maximum. The number you choose will relate to the incoming resolution, not necessarily these maximums, and must therefore be numbers less than the incoming resolution. If the number is greater it is ignored.

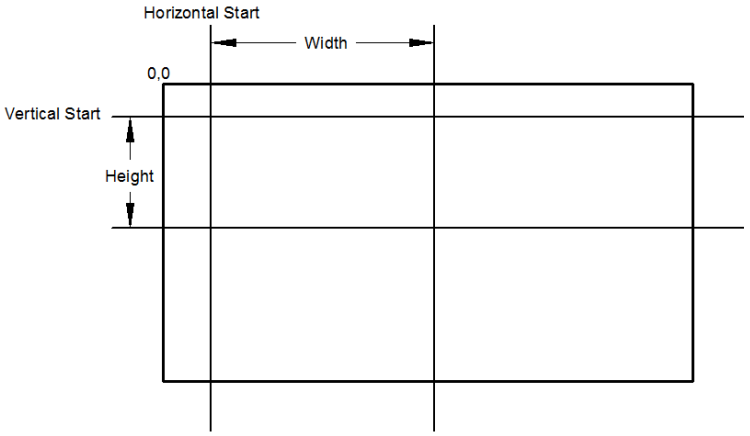
Incoming Image	input	output	Crop Settings V-start	V-end	H-start	H-end
HD letter-boxed within SD	480i	720p	**38**	**443**	*0*	*1920*
HD letter-boxed within SD	480i	1080i/p	**38**	**443**	*0*	*1920*
SD pillar-boxed within HD	720p	480i	*0*	*1080*	**100**	**1180**
SD pillar-boxed within HD	1080i/p	480i	*0*	*1080*	**150**	**1770**

Examples for De-boxing the incoming video to fill the output.

Position Tab:



The positioning function allows scaling and placing the incoming video image in a specific place within the output video's frame. Such a function is useful for pillar-boxing or letter-boxing the input within the output to maintain the input's aspect ratio.

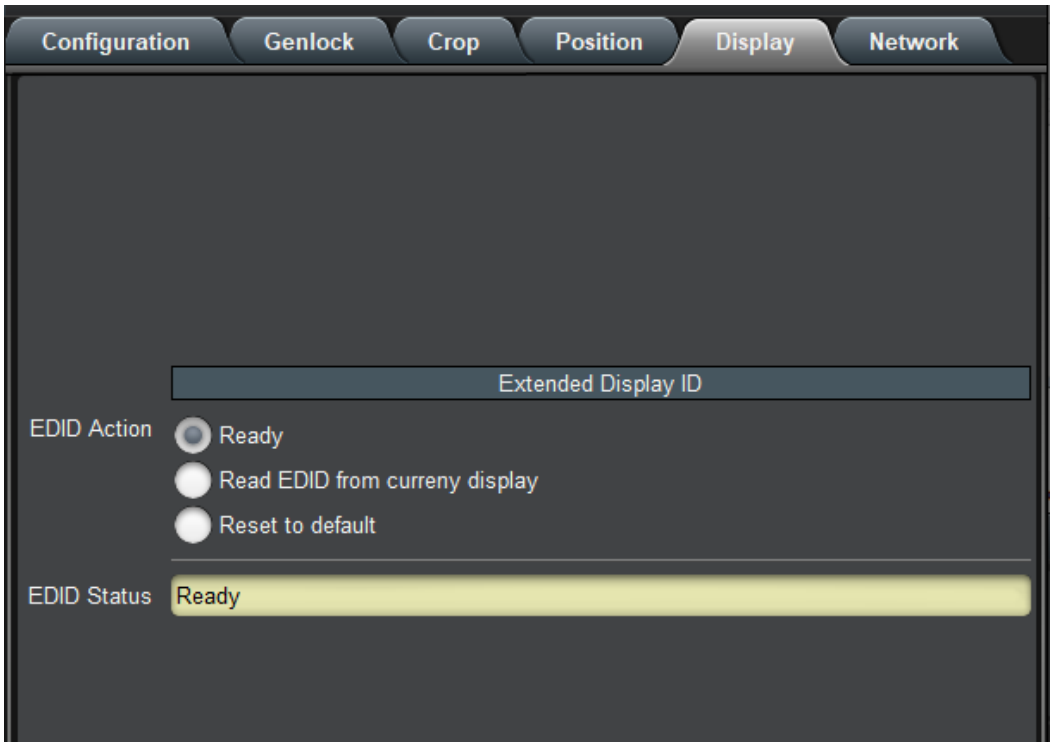


The numbers chosen in the configuration parameters relate to the resolution of the output video. Since the maximum output resolution for the OG-US-4000 is 1920 x 1080 (1080p), the sliders include all numbers up to this maximum. The number you choose will relate to the configured output resolution, not necessarily these maximums, and must therefore be numbers less than the set output resolution. If the number is greater it is ignored.

input	output	Position Settings	V-start	V-height	H-start	H-width
480i	720p	Pillar-Box	*0*	*1080*	**100**	**1080**
480i	1080i/p	Pillar-Box	*0*	*1080*	**150**	**1620**
720p	480i	Letter-Box	**38**	**405**	*0*	*1920*
1080i/p	480i	Letter-Box	**38**	**405**	*0*	*1920*

Examples for Letter-boxing or Pillar-boxing the incoming video within the output.

Display Tab:



Extended Display ID (EDID):

The HDMI video input port of the US-4000 includes a programmable EDID. DVI and HDMI sources will read this EDID and detect the US-4000 as a monitor. The US-4000 EDID can be set to the generic, factory set EDID or it can copy the EDID of any monitor.

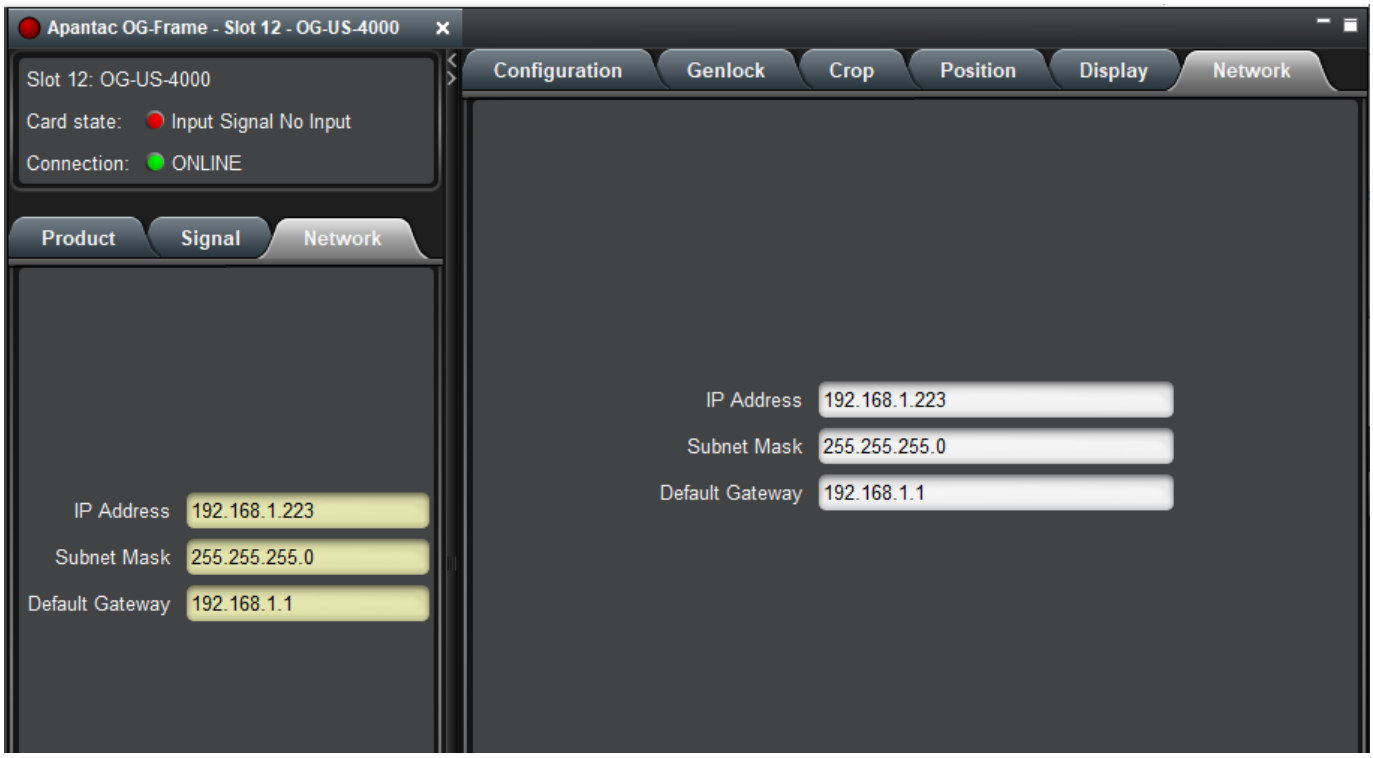
To copy the EDID of a monitor:

- Connect the US-4000 HDMI video output port to an input of the desired monitor or equipment which contains the EDID you wish to copy. Monitor or equipment should be powered on.
- Disconnect both the HDMI and the SDI video inputs to the US-4000. (the unit must be idle)
- Pull and reseat the US-4000 to power-cycle and reboot the unit. Wait 30 seconds for boot to complete.
- Click the "Read EDID from current display" option on this tab page.
- The EDID Status line will indicate the EDID is being copied, and then return to 'ready'.

To reset the EDID to its factory default:

- Disconnect both the HDMI and the SDI video inputs to the US-4000. (the unit must be idle)
- Pull and reseat the US-4000 to power-cycle and reboot the unit. Wait 30 seconds for boot to complete.
- Click the "Reset to default" option on this tab page.
- The EDID Status line will indicate the EDID is being reset, and then return to 'ready'.

Network Tab:



Networking:

To change networking parameters:

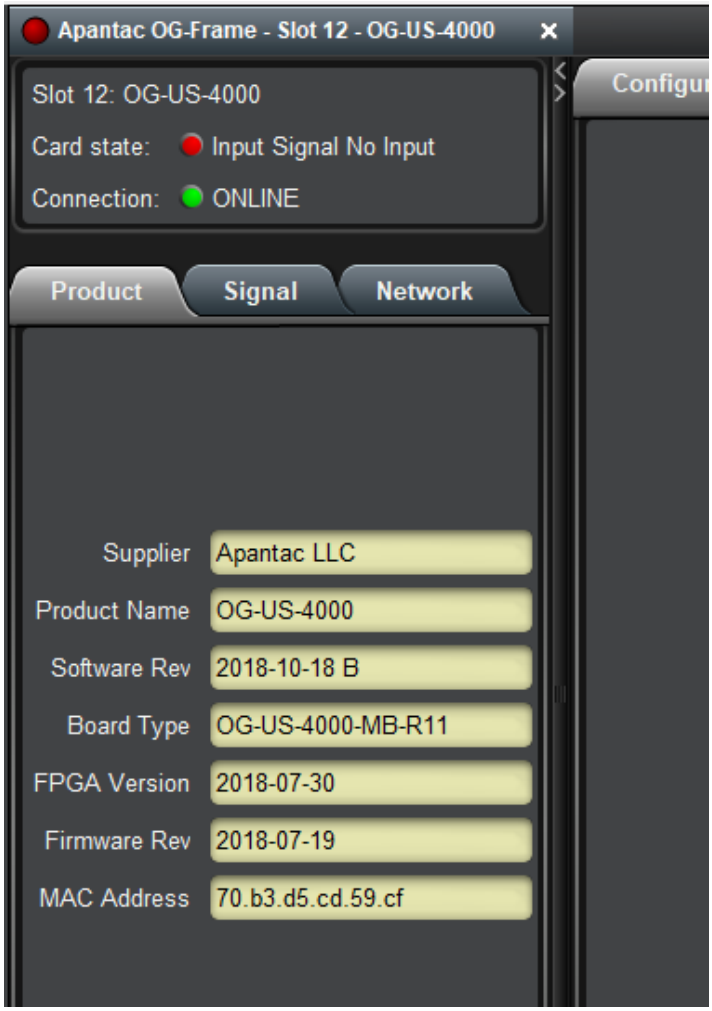
- Make any desired changes on the Network Tab on the right side of the Dashboard screen. After making a change in one text field, click on another field.
- Pull and reseat the US-4000 to power-cycle and reboot the unit. The Ethernet adapter of the card usually requires a power-cycle to make network changes effective.

Note: to utilize Ethernet networking directly to the Apantac OG-US-4000 the openGear frame must have an 'Advanced Networking' control card. This control card includes an internal Ethernet switch in addition to the openGear's standard CANBUS communications utilized by the Dashboard software. The control card resides in slot 0 of the frame and will have an 'N' in the model number to indicate advanced networking.

Networking functions:

The primary function of networking is for when this model is used within a stand-alone chassis outside of the openGear frame. The network connection is also used for certain firmware updates.

Product Tab



The Product tab is informational only. There are no settings or options.

Note:

'Software Rev', 'FPGA Version', and 'Firmware Rev' items indicate the currently installed firmware of the OG-US-4000. These values should appear similar to shown above. If they show as '0' or not at all, this may indicate a hardware failure, power cycle the card and check whether firmware numbers are restored.

Trouble-Shooting:

Introduction:

HDMI video involves three requirements that may cause issues; Hot-Plug, EDID, and HDCP.

Hot-Plug (5-Volt and Hot-Plug lines):

Also known as Hot-Plug-Detect, HDMI cables utilize two separate wires to perform this 'hand-shake' between the source and the sink (OG-US-4000). The source provides 5-volts on pin 18, the 5-volt pin. In response the sink provides 5-volts on pin 19, the Hot Plug Detect pin.

EDID (External Display IDentification):

The HDMI input port of the OG-US-4000 provides EDID to your source equipment. This EDID can be the factory default or the user may copy an EDID from a monitor or downstream equipment.

The source reads EDID from the OG-US-4000 through the DDC (Display Data Channel) wire of the HDMI cable. This DDC channel utilizes a version of the I^2C communications protocol. Typically the EDID is read after the HDMI cable is plugged into the monitor or when the source boots up.

Most HDMI sources adjust themselves according to the EDID they see from the equipment they are connected to. For instance; if you connect the source to a monitor it may display fine because it is producing a signal appropriate for that monitor. When you move the source cable from that monitor to the OG-US-4000 it may very well change the signal it is outputting because it is now seeing a different EDID. Changing the OG-US-4000 EDID is one method of changing, or controlling, your source's video signal.

See the "Display Tab" section for instruction on changing the EDID.

If you do not have an appropriate monitor to copy EDID from, Apantac Technical Support can assist with procuring or customizing an EDID.

HDCP (High Definition Content Protection):

If you suspect HDCP may be the cause of your issues please contact Apantac Technical Support. Our telephone number can be found on our website.

Audio issues:

Audio issues can generally be resolved by changing settings within your source equipment or by changing the OG-US-4000's EDID. Most Blu-ray players for example have configuration settings pertaining to their audio output, changing these from Dolby to PCM can often alleviate problems.

EDID can include audio requirements. Changing the EDID may change the audio signal or audio protocol the source provides.

Specifications:

Input	HDMI or SDI	**Output**	HDMI and SDI
Control	Dashboard	**Genlock**	Analog black burst via the openGear frame

Supported Input Resolutions for DVI, HDMI 8/10 bit RGB/YPbPr			
640x480@60 Hz	800x600@60Hz	1024x768@60Hz	1280x720@60Hz
1280x768@60Hz	1280x800@60Hz	1280x960@60Hz	1280x1024@60Hz
1360x768@60Hz	1366x768@60Hz	1440x900@60Hz	1400x1050@60Hz
1680x1050@60Hz	720x480i@59.94Hz	720x576i@50Hz	720x480P@59.94Hz
720x576P@50Hz	1280x720@50/60Hz	1920x1080i@ 50/60Hz	1920x1080P@50/60Hz
1600x1200@60Hz, 1920x1200, 1152x864 NOT SUPPORTED			

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WARRANTY STATEMENT

Apantac LLC (herein after referred to as "Apantac") warrants to the original purchaser of the products manufactured by Apantac (the "Product,") will be free from defects in material and workmanship for a period of three (3) year from the date of shipment of the Product to the purchaser.

If the Product proves to be defective during the three (3) year warranty period, the purchaser's exclusive remedy and Apantac's sole obligation under this warranty is expressly limited, at Apantac's sole option, to:

a) repair the defective Product without charge for parts and labor or,

b) provide a replacement in exchange for the defective Product or,

c) if after a reasonable time, is unable to correct the defect or provide a replacement Product in good working order, then the purchaser shall be entitled to recover damages subject to the limitation of liability set forth below.

Limitation of Liability

Apantac's liability under this warranty shall not exceed the purchase price paid for the defective product. In no event shall Apantac be liable for any incidental, special or consequential damages, including without limitation, loss of profits for any breach of this warranty.

If Apantac replaces the defective Product with a replacement Product as provided under the terms of this Warranty, in no event will the term of the warranty on the replacement Product exceed the number of months remaining on the warranty covering the defective Product.

Equipment manufactured by other suppliers and supplied by Apantac carries the respective manufacturer's warranty. Apantac assumes no warranty responsibility either expressed or implied for equipment manufactured by others and supplied by Apantac.

This hardware warranty shall not apply to any defect, failure or damage:

a) Caused by improper use of the Product or inadequate maintenance and care of the Product;

b) Resulting from attempts by those other than Apantac representatives to install, repair, or service the Product;

c) Caused by installation of the Product in a hostile operating environment or connection of the Product to incompatible equipment;