

Reference Manual

P AR 5610

**Aspect Ratio Converter with
optional UP/DOWN/CROSS Conversion**

Revision 1.1 - January 2009

This Manual Supports Device Revisions:	
P AR 5610 Firmware Revision	282
Control System GUI Release	4.4.0



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Warranty

LYNX Technik AG warrants that the product will be free from defects in materials and workmanship for a period of two (2) years from the date of shipment. If this product proves defective during the warranty period, LYNX Technik AG 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, customer must notify LYNX Technik of the defect before expiration of the warranty period and make suitable arrangements for the performance of service. Customer shall be responsible for packaging and shipping the defective product to the service center designated by LYNX Technik, with shipping charges prepaid. LYNX Technik shall pay for the return of the product to the customer if the shipment is within the country which the LYNX Technik service center is located. Customer shall be responsible for payment of all shipping charges, 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. LYNX Technik shall not be obligated to furnish service under this warranty a) to repair damage resulting from attempts by personnel other than LYNX Technik 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 LYNX Technik supplies; or d) to service a product which has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty servicing the product.

THIS WARRANTY IS GIVEN BY LYNX TECHNIK WITH RESPECT TO THIS PRODUCT IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED. LYNX TECHNIK AND ITS VENDORS DISCLAIM ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. LYNX TECHNIK'S RESPONSIBILITY TO REPAIR AND REPLACE DEFECTIVE PRODUCTS IS THE SOLE AND EXCLUSIVE REMEDY PROVIDED TO THE CUSTOMER FOR BREACH OF THIS WARRANTY. LYNX TECHNIK AND ITS VENDORS WILL NOT BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES IRRESPECTIVE OF WHETHER LYNX TECHNIK OR THE VENDOR HAS ADVANCE NOTICE OF THE POSSIBILITY OF SUCH DAMAGES.

Regulatory information

Europe

Declaration of Conformity

We	LYNX Technik AG Brunnenweg 3 D-64331 Weiterstadt Germany
<i>Declare under our sole responsibility that the product</i>	
TYPE: P AR 5610	
<i>To which this declaration relates is in conformity with the following standards (environments E1-E3):</i>	
EN 55103-1 /1996	
EN 55103-2 /1996	
EN 60950 /2001	
<i>Following the provisions of 89/336/EEC and 73/23/EEC directives.</i>	
	Winfried Deckelmann
Weiterstadt, November 2008	
<i>Place and date of issue</i>	<i>Legal Signature</i>

USA

FCC 47 Part 15

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to the 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

Getting Started

Most CardModules are installed into the rack frames and system tested in the factory. If this is an upgrade part or service exchange item then the module is supplied in a padded cardboard carton which includes the CardModule, rear connection plate and mounting screws.

Packaging

The shipping carton and packaging materials provide protection for the module during transit. Please retain the shipping cartons in case subsequent shipping of the product becomes necessary. Do not remove the module from its protective static bag unless observing adequate ESD precautions. Please see below.

ESD Warning



This product is static sensitive. Please use caution and use preventative measures to prevent static discharge or damage could result to module.

Preventing ESD Damage

Electrostatic discharge (ESD) damage occurs when electronic assemblies or the components are improperly handled and can result in complete or intermittent failure.

Do not handle the module unless using an ESD-preventative wrist strap and ensure that it makes good skin contact. Connect the strap to any solid grounding source such as any exposed metal on the rack chassis or any other unpainted metal surface.

Caution

Periodically check the resistance value of the antistatic strap. The measurement should be between 1 and 10 Megohms.

Product Description

The P AR 5610 module is a high performance Aspect Ratio Converter with optional Up-/Down- and Cross Conversion.

Firmware options provide the ability to easily add additional options which includes:

- 12 frames video delay (*option code OC-5610-VDLY*)
- HQ Up/Down/Cross Conversion (*option code OC-5610-UPXD*)
- Stored module presets with GPI recall (*option code OC-5610-USET*)
- Metadata Option (AFD/Closed Captions/Timecode) (*option code OC-5610-META*)

Firmware options can be added at any time with a license code. No hardware or Firmware modifications are required.

Input Video Formats

The module has one multi-format serial digital input with automatic input detection. The module will detect the following input standards and configure the input stage automatically for operation in the connected format.

SDTV Formats	HDTV Formats
525 / 59.94Hz	1080i / 59.94Hz
625 / 50Hz	1080i / 60Hz
	1080i / 50Hz
	720P / 59.94Hz
	720P / 60Hz
	720P / 50Hz

Output Video Formats

The module provides four SDI outputs, user assignable in two sets of two outputs; these sets can be mapped independently to any of the two internal channels. Supported output video formats are:

SDTV Formats	HDTV Formats
525 / 59.94Hz	1080i / 59.94Hz
625 / 50Hz	1080i / 60Hz
	1080i / 50Hz
	720P / 59.94Hz
	720P / 60Hz
	720P / 50Hz

The output format frequency (or frame rate) is determined by the frame rate of the input signal.

Audio Processing

The module will de-embed the complete audio payload from the incoming SDI stream (4 AES groups = 8 AES = 16 audio channels) and re-embed the audio with a matching delay, which compensates for the video delay in this module.

DolbyE

Note. The module will support DolbyE in a future release. When implemented the module **will not** be providing DolbyE encoding or decoding capability, but have the capability to de-embed synchronize / delay and re-embed any existing DolbyE signals through the module transparently (while preserving guard band timing).

ARC (Aspect Ratio Conversion)

The module provides one High Quality ARC (Aspect Ratio Converter) which can be used to convert SDTV signals between 4:3 or 16:9 aspect ratios. This ARC is a high quality image processor which has extended functionality including manually adjustable image size and position.

Modes supported are as follows:

Conversion from 16:9 to 4:3 Aspect Ratios

4:3 Letterbox

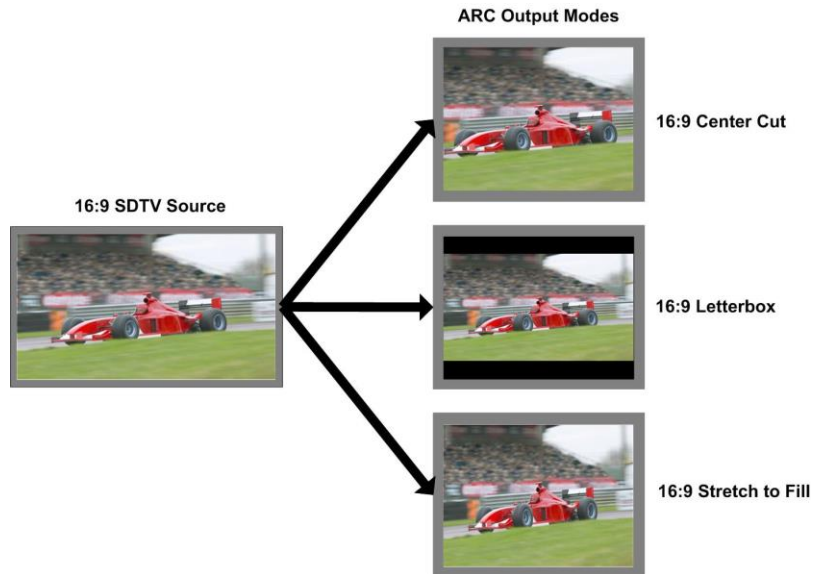
This takes the 16:9 aspect ratio of the input signal and fits it horizontally into the 4:3 SD image area with black bars at the top and bottom of the image.

4:3 Center Cut

This mode cuts the center portion of the 16:9 input signal and fills the 4:3 SD image area

4:3 Stretch to Fill

This mode takes the 16:9 input signal and distorts (vertically stretches) the image to fit the available 4:3 SD image area.



Conversions from 4:3 to 16:9 Aspect Ratio

16:9 PillarBox

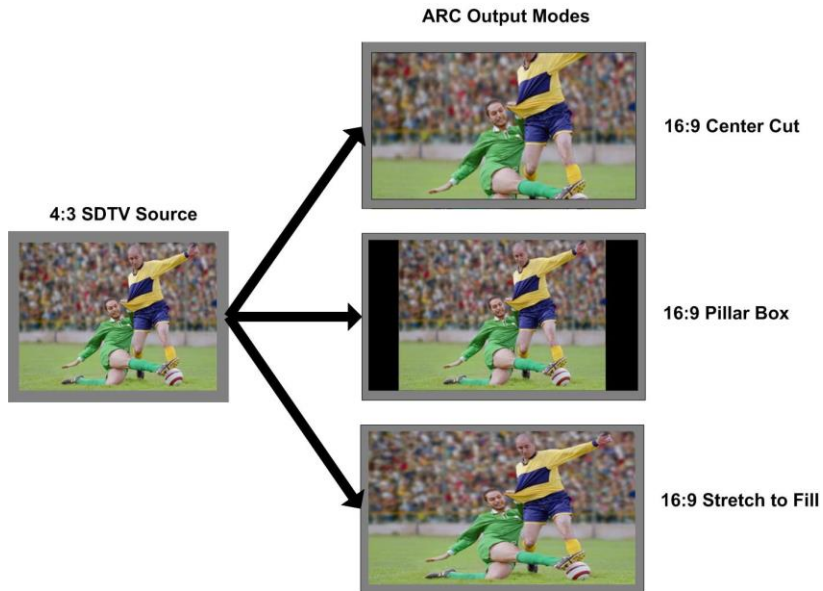
This takes the 4:3 aspect ratio of the input signal and fits it vertically into the 16:9 SD image area with black bars at the left and right of the image.

16:9 Center Cut

This mode cuts the horizontal center portion of the 4:3 input signal and fills the 16:9 SD image area (cropping the top and bottom of the image)

16:9 Stretch to Fill

This mode takes the 4:3 input signal and distorts (horizontally stretches) the image to fit the available 16:9 SD image area



ARC Image Size and Positioning

The single high quality ARC provides the ability to manually adjust image position and size during the conversion process. Please refer to the GUI section of this manual for more information of the controls provided and how to use them.

Video Processing

Proc Amp Functions

Each of the two output channels has an associated video proc amp which provides user adjustable **Gain** / **Saturation** / **Black Level** and **Hue** using on screen sliders.

Aperture Correction

An adjustable horizontal aperture corrector is provided for each of the two output channels. This can be used to add (or remove) image sharpness as required.

***Note.** When using the down converter the filtering process results in a very slight loss of high frequency information (which is normal), the aperture corrector can be used to compensate for this slight loss.*

Test Patterns

Each of the two output channels has its own independent test pattern generator which provides a wide selection of test patterns which can be switched into each output. (*The Test pattern will follow the selected output standard selected for each channel*).

The selected test pattern is also available as one of the modes the synchronizer will switch to when excessive video TRS errors are encountered. Possible synchronizer actions when the input video errors become excessive are:

- Freeze Field 1
- Freeze Field 2
- Freeze Frame
- Selected Test Pattern
- Black

Programmable Video Delay (optional: OC-5610-VDLY)

Each of the two SDI outputs has separate programmable video delays which can be set (independently) between 0 and 12 frames (max). The adjustment is available in pixel, line and full frame increments.

***Note** The ARC (including the OC-5610-UPXD option, if installed) has fixed frame delays depending on the signal path and selected function (see below). The 0 > 12 frame user adjustment is additional delay relative to the fixed delays.*

This adjustment will delay the video output relative to the connected reference by the delay setting specified. (+ fixed delay)

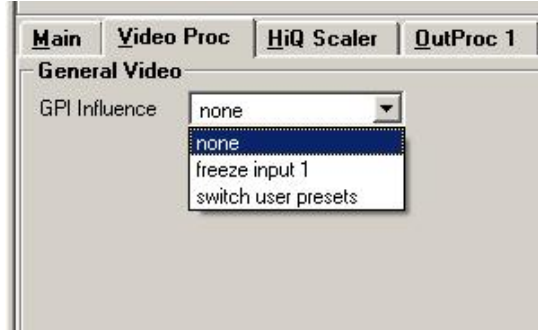
Fixed Delays

The ARC (including the OC-5610_VDLY and OC-5610_UPXD options, if installed) has fixed frame delays depending on the signal path and selected function - see below :

SDI Input	SDI Output	Delay[frames] Timing = 0	Delay[ms] Timing = 0
No Conversion			
525	525	1	33
625	625	1	40
1080i50	1080i50	1	40
1080i59.94	1080i59.94	1	33
720p50	720p50	1 (p)	20
720p59,94	720p59,94	1 (p)	16
SDTV Aspect Ratio Conversion			
525	525	2	66
625	625	2	80
Down Conversion (if OC-5610_UPXD option is installed)			
1080i50	625	3	120
1080i59.94	525	3	99
720p50	625	2	80
720p59,94	525	2,5	82
Up Conversion (if OC-5610_UPXD option is installed)			
525	720p59,94	3 (p)	49
525	1080i59,94	2	66
625	720p50	3 (p)	60
625	1080i50	2	80
Cross Conversion (if OC-5610_UPXD option is installed)			
1080i50	720p50	4 (p)	80
1080i59.94	720p59,94	4 (p)	66
720p50	1080i50	1,5	60
720p59,94	1080i59,94	2	66

GPI Function

The GPI input (**G**eneral **P**urpose **I**nterface) which is a switch input function (contact closure) can be used to perform a number of functions. The influence of this input can be set by the user using the control system on the Video Proc Tab.



Freeze input with GPI

If this mode of the GPI influence is selected then the following functions will be performed:

- With GPI open the module processes the input signal as usual
- With GPI closed the input will be frozen (volatile freeze, i.e. frozen frame is not retained through power cycle)

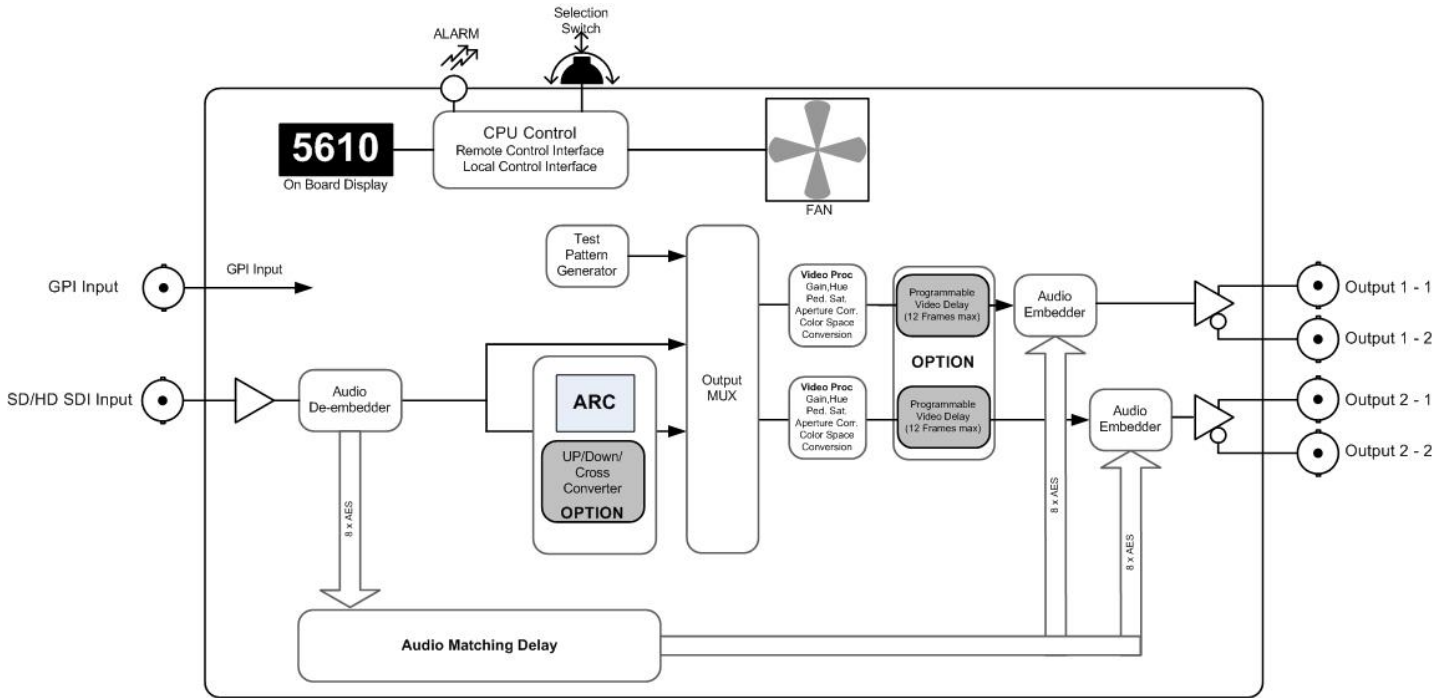
In the case of an activated freeze the module processing performs all functions on the frozen frame.

GPI Options

The GPI functionality can be enhanced with the addition of the OC-5610-USET firmware option. This allows the user to store 4 complete sets of module settings (snapshots) in module flash ram. The GPI can then be configured to toggle between any 2 of the 4 stored presets if required.

Functional Diagram

A functional diagram of the P AR 5610 is shown below.



Connections

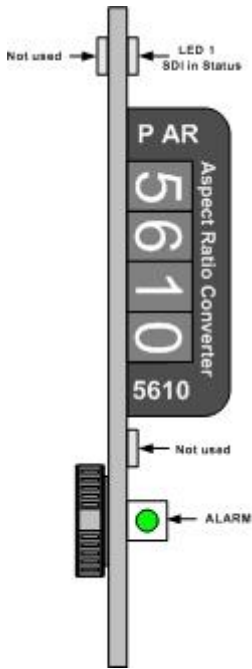
Video

The P AR 5610 uses standard 75 Ohm BNC connectors. We recommend the use of high quality video cable for digital video connections to reduce the risk of errors due to excessive cable attenuation. Max cable lengths the module will support are shown below.

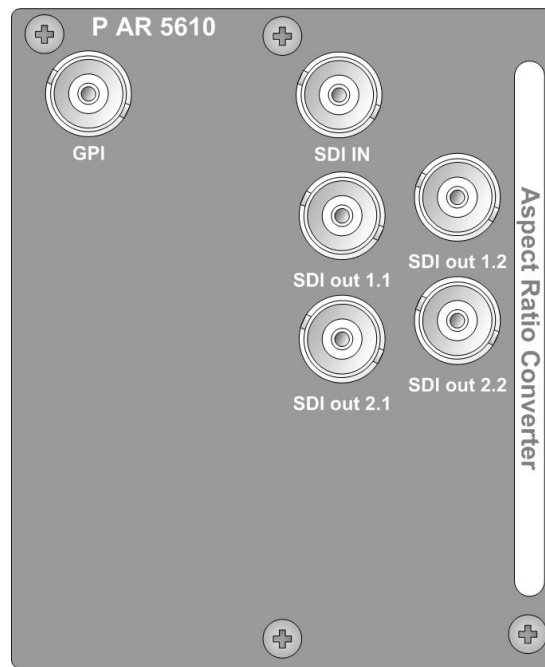
SDTV = 250m Belden 8281 (270Mbits/s)
 HDTV = 140m Belden 1694A (1.4Gbits/s)

Note. Due to the compact design of the connection plate it will be necessary to use a connection tool to secure the BNC video connectors.

Module Layout



Module Front Panel



Module Rear Termination Panel



Cooling Fans

Note. Cooling fan operation is monitored and alarmed with the module alarm LED and also within the LYNX control system.

Installation

If this module was supplied as part of a system it is already installed in the rack enclosure. If the module was supplied as a field upgrade please follow the installation procedure below.



NOTE Observe static precautions when handling card. Please see ESD warnings on Page 5.

This module has a double width rear connection panel, meaning it will occupy two slots of a standard Series 5000 Card Rack. This is to accommodate the additional connections needed for this module and to also provide adequate space for cooling in the rack. Up to five P AR 5610 modules can be accommodated in a single Series 5000 rack frame.

NOTE. When using this module we highly recommend the use of the **R FR 5011 Fan Front Rack Frame** which provides additional airflow into the rack. If you plan to install this module into empty slots in an existing rack with no fan front cover - then please purchase the **R FR 5001 Fan Front update kit**.

Each Card Module is supplied with a rear connection panel and mounting screws. Please follow the procedure below for the installation of the card module into the Series 5000 Card Frame.

We recommend you power the rack down before installing any additional modules into an existing card frame.

1. Select a free two slot space in the card frame where the CardModule will be located.
2. Remove the blank connection panels from the rear of the rack (if fitted)
3. Install the rear connection panel using the screws supplied. Do not tighten the screws fully
4. Slide the card module into the card frame and carefully check the CardModule connects to the rear connection plate. The card should fit easily and should not require excessive force to insert - if you feel any resistance, there could be something wrong with the rear connection panel location. **Do not** try and force the connection this may damage the connectors. Remove the rear connection panel and check alignment with the CardModule.
5. Insert and remove the CardModule a few times to ensure correct alignment and then tighten the two screws to secure the rear connection plate.
6. Power up the rack and check the module LED's and matrix display illuminate. Check the module is automatically logged into the control system device tree. (It may take a few seconds for the control system to "discover" the new module)

NOTE. The use of the optional control system is **mandatory** for the control and setup of this module. If you do not have the control system, then please contact your LYNX representative for details on how to upgrade your rack with the LYNX control system.

Firmware Options

The basic module is a single channel SDTV ARC. With the addition of the following firmware options the performance and features of the module can be greatly enhanced and tailored to meet a specific application.

Note. *Firmware options can be added at any time by simply purchasing and installing a license code string. No hardware or firmware modifications are needed.*

For information on how to install a licensed option please refer to the GUI section of this manual.

User Setting with GPI Control (OC-5610-USET)

This module has a wide variety of user settings and configuration possibilities. The module automatically retains the last used settings in flash ram which will survive power cycles. The addition of the OC-5610-USET firmware option allows the user to store 4 individual sets of module settings (snapshots) into module flash ram. These can then be recalled using the control system to quickly re-purpose the modules settings. The GPI can also be configured to toggle between any 2 of the 4 stored presets if required.

Metadata Option (OC-5610-META)

This option provides support for AFD (automatic format descriptor), closed caption and also Timecode. The module will process and convert this metadata information between the input and outputs when installed.

This is future option and more detailed information will be provided at a later date

Up/Down/Cross Conv. Option (OC-5610-UPXD)

The addition of this option provides a single channel of high quality up, down and cross conversion to the module. Modes of operation are described below.

Note : *Operation mode is switchable i.e. Up Conversion OR Down Conversion OR Cross Conversion OR Aspect Ratio Conversion*

Down conversion

Modes of operation are described below.

4:3 Letterbox

This takes the 16:9 aspect ratio of the input HD signal and fits it into the 4:3 SD aspect ratio screen with black bars at the top and bottom of the image.

4:3 Center Cut

This mode cuts the center portion of the 16:9 input signal and fills the 4:3 SD aspect ratio screen.

4:3 Stretch to Fill

This mode takes the 16:9 input signal and distorts (vertically stretches) the image to fit the available 4:3 SD aspect ratio space.



16:9 HDTV Source



4:3 Center Cut



4:3 Letterbox



4:3 Stretch to fill

Up Conversion

The UP converter will convert the connected SDTV input standard to the selected HD Standard within the same frame rate. See below

525 / 59.94Hz Input Signal Converted to 1080i / 59.94Hz or 720P / 59.94Hz

625 / 50Hz Input Signal Converted to 1080i / 50Hz or 720P / 50Hz

Modes of operation are as follows:

16:9 Center Cut

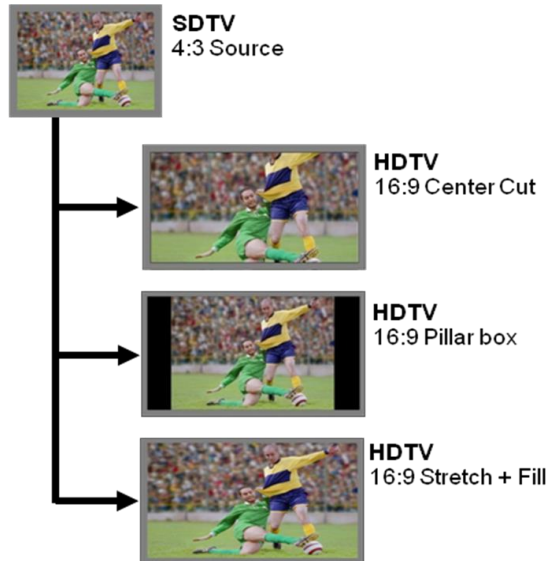
This mode cuts the horizontal center portion of the 4:3 SD input signal and fills the 16:9 HD aspect ratio image area. (top and bottom of image are cropped)

16:9 PillarBox

This takes the 4:3 SD aspect ratio of the input signal and fits it vertically into the 16:9 HD image area with black bars at the left and right of the image.

16:9 Stretch to Fill

This mode takes the 4:3 SD input signal and distorts (horizontally stretches) the image to fit the available 16:9 HD image area.



Cross Conversion

When used in cross conversion mode the module will cross convert the video signal between 1080i and 720P formats within the same frame rate.

Image size and Positioning

This option also provides the ability to manually adjust the image size and position of the converted output. For more information on the controls and use of this feature please refer to the GUI section of this manual for more details.

Color Space Conversion

The conversion options also provide integrated color space conversion capability which will automatically compensate for the conversion of the wider 709 HD color space into the more narrow 601 SDTV color space or vice versa ensuring legal color reproduction.

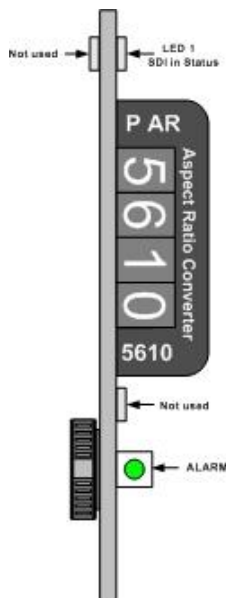
NOTE. *Color space conversion can be bypassed or set to only process chrominance if desired.*

Settings and Control

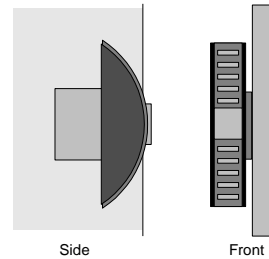
The P AR 5610 module has an integrated micro-controller, which enables the module to be configured and controlled locally using the multifunction switch and 4 character dot matrix display, or from remote using a GUI interface when using one of the optional controllers and control software.

! **NOTE.** *This module is extremely compact and flexible with hundreds of possible user settings. It is not practical to make all these settings available on the local dot matrix display. The use of the control system is **mandatory** to access the vast array of settings possible. Please refer to the **GUI** section of this manual for details on the control provided. Some basic module settings are possible via the local controls, which are detailed below.*

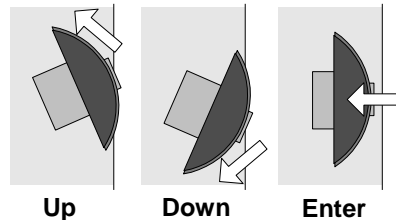
Once set, all settings are automatically saved in non-volatile internal memory. (Flash RAM) The module will always recall the last used settings.



Multi-function Switch



Switch Operations



Multi Function Switch

The CardModule is equipped with a multi-function switch located on the front bottom edge of the card. (See above)

Using the Local Display Menus

Making local adjustments to the module is done using the multifunction switch and the integrated 4-character dot matrix display. The menu system is layered, and navigation through the system is done using the **UP** and **DOWN** functions of the switch. **ENTER** is used to move between menu levels and also enter a selection.

Switch Function	Operation
UP	Move UP within a level
DOWN	Move down within a level
ENTER	Change levels / Make selection

Menu Structure

The Menu structure is defined in the next table, and can be used to help navigating through the menu system.

ENTER moves between levels

UP/DOWN moves between items within the level

When a new setting is entered the system will jump back one level in the menu system.

- The “back” selection in the menu structure will take you back one level when selected.
- When an item is selected which has several setting possibilities the first value displayed will be the value currently stored in the system. The order of the available settings for any menu item in the table supplied does not represent the order the settings will actually be displayed.
- If left unattended, the menu will default to the root display after a short timeout.

Layer 1	Layer 2	Layer 3	Layer 4	Layer 5	Description
PAR 5610					Root Display
	OUT1/2				Output Select
		INPT			Input to output select
			Conv		Converter Output
			No C		No Converter
			back		
		DEL			Delay adjustment
			FRAM		Frame Delay
				0000	
			LINE		Line Delay
				0000	
			PIX		Pixel Delay
				0000	
			back		
		APRT			Apperture Correction
			ENAB		Enable
				ON	
				OFF	
				back	
			LEVL		Level
				+/- 000	
			back		
		TEST			Testpattern Settings
			ENAB		Enable

			ON	
			OFF	
			back	
		PATT		Pattern select
			BAR	75% Colorbar
			BRED	Colorbar over Red
			EQPL	EQ/PLL path.
			PLL	PLL-path
			EQ	EQ-path
			15GR	15% Grey
			WHITE	White
			YELL	Yellow
			MGNT	Magenta
			CYAN	Cyan
			BLUE	Blue
			GREE	Green
			RED	Red
			BLK	Black
			back	
		noIN		Output if no Input
			BLCK	Black
			PATT	Testpattern
			back	
		back		
	CONV			
		MODE		Conversion Mode
			FILL	Stretch to Fill
			CCUT	Center Cut
			BOX	Pillarbox 4:3/Letterbox 16:9
			back	
		InAR		Input Aspect Ratio
			16:9	
			4:3	
			back	
		OUT		Output Format
			SDTV	
			1080	
			720p	
			back	
		back		
	GPI			GPI Influence

	NONE			none
	swPR			Switch User Presets
	back			
USET				User Preset Settings
	LOAD			Load User Preset to Current
		PRE1		Preset 1
		PRE2		Preset 2
		PRE3		Preset 3
		back		
	Gon			GPI on settings
		CURR		Current
		PRE1		Preset 1
		PRE2		Preset 2
		PRE3		Preset 3
		back		
	Goff			GPI Off settings
		CURR		Current
		PRE1		Preset 1
		PRE2		Preset 2
		PRE3		Preset 3
		back		
	back			
RSET				Factory Reset
	NO			
	YES			
	back			
back				

LED Status Indicators

The P AR 5610 module has LED indicators that serve as alarm and status indication for the module. Function is described below.

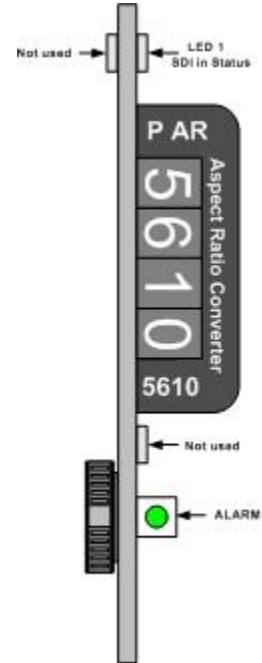
SDI in Status LED 1

LED Color	Indication
Green	SDI 1 Present and OK
Red	No SDI 1 Signal Connected

ALARM LED

LED Color	Indication
Green	Normal Operation
Red	Problem with SDI input
Red Flashing	Cooling Fan Failure

Note. The Alarm LED can be seen with the rack front cover fitted

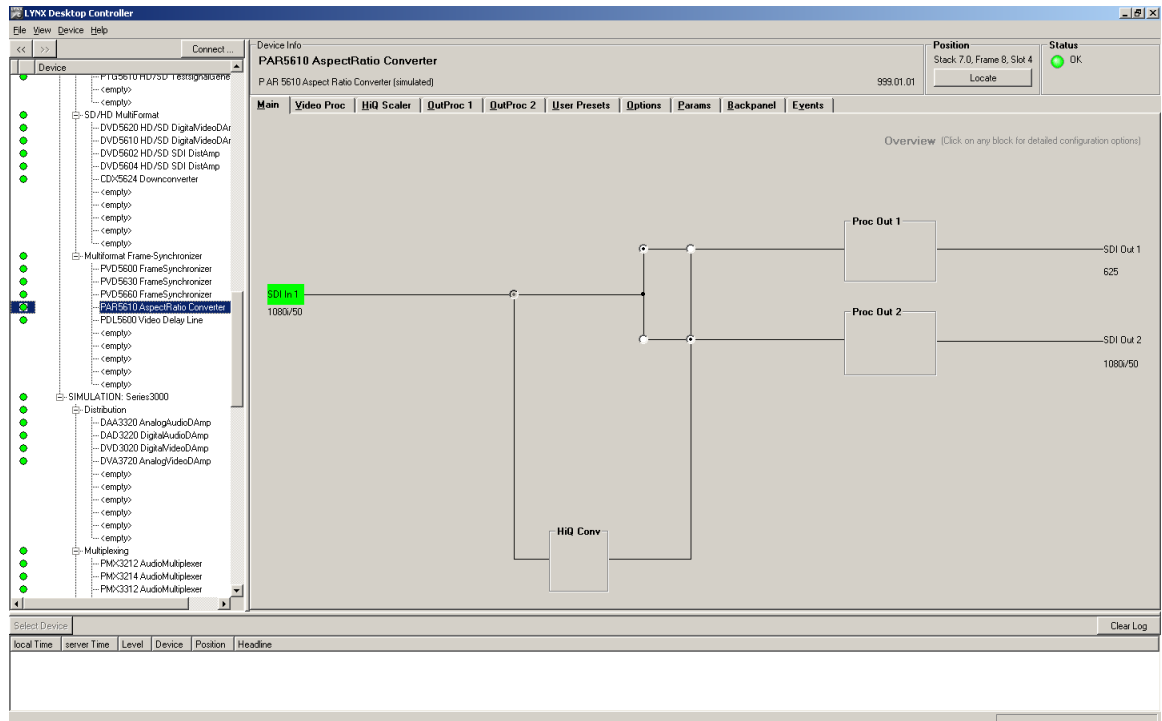


Control System GUI

All LYNX CardModules support a computer interface which allows setting the modules parameters using a simple GUI interface. Access to all standard features *and in some cases* extended features is possible using this interface. Due to the complex nature and extensive user settings provided on the P AR 5610 the use of the control system is recommended.

Note. Any settings made using the control system overrides any local settings made on the module. All settings are stored in internal flash ram and will survive power cycles and long term storage.

The following GUI screenshots and descriptions shown below describe the settings and adjustments possible for the P AR 5610 CardModule.



The above screenshot shows the complete module GUI. The Device info area contains information about the module including name and firmware revision. If used as part of a larger system (using the LYNX central control system) the modules position and physical location is displayed above the “locate” button.

Note. The Locate function is a tool used to quickly identify a module in larger systems. Selecting “locate” will flash the module alarm LED yellow. (This does not effect module operation)

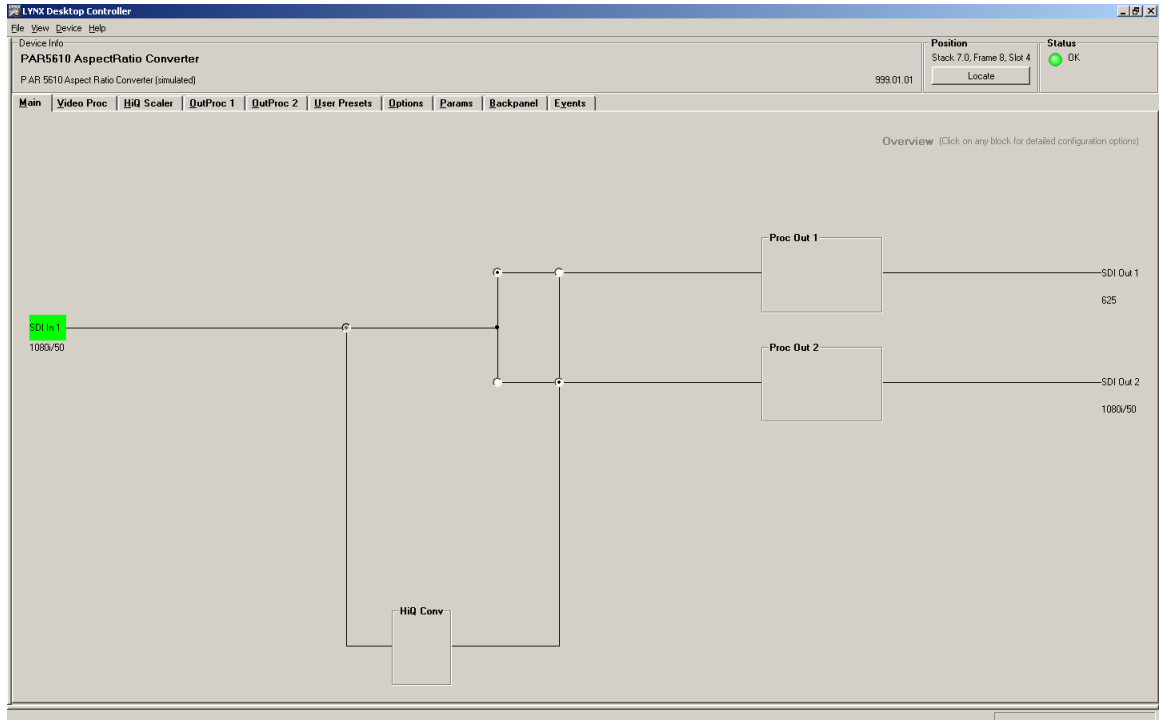
The first screen displayed when the module is selected is the **Main Tab** this is a graphical representation of the modules overall function and signal flow (left to right). Clicking on the processing boxes will link to other GUI screens with more controls for these specific functions.

The area at the bottom of the screen is the error log. Any fault condition (or event) will be time stamped and entered into the log.

There are a number of “Tabs” along the top of the screen which splits up the module settings into a number of logical displays. The various GUI screens and primary functions are described below.

Main Tab

This screen is the main interface and is presented first when the module is displayed in the GUI. The layout replicates module “block” functions and signal flow from left to right.



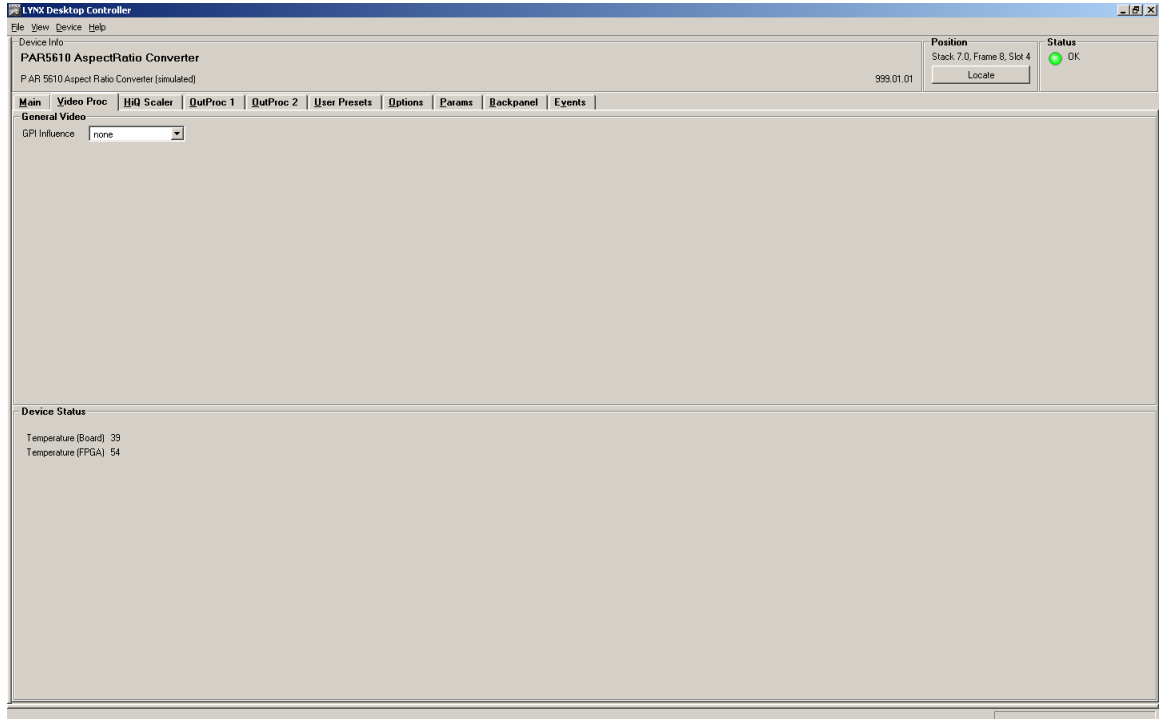
The primary purpose of this screen is to show the overall signal flow through the module and allow easy navigation to other areas. Input standards and formats are auto detected and displayed in the GUI. Parameters will be annunciated in different colors to show status (green = good, red = problem, yellow = caution etc).

Signal Routing

In the center of the screen there is an area where the internal signal routing can be changed. Here the internal video signals can be routed through (or bypassing) the internal resources (Up/down/cross conversion option / ARCs etc). Selecting a cross point via the radio button closes the connection (operation is self explanatory)

Video Proc Tab

This tab will display the configuration screen for the GPI functions (GPI influence).



Device Status

This area is used to show the detected internal (FPGA) and external temperature (board) of the Module. If the internal temperature exceeds 80°C then the module will log a "over temperature" event in the control system error log.

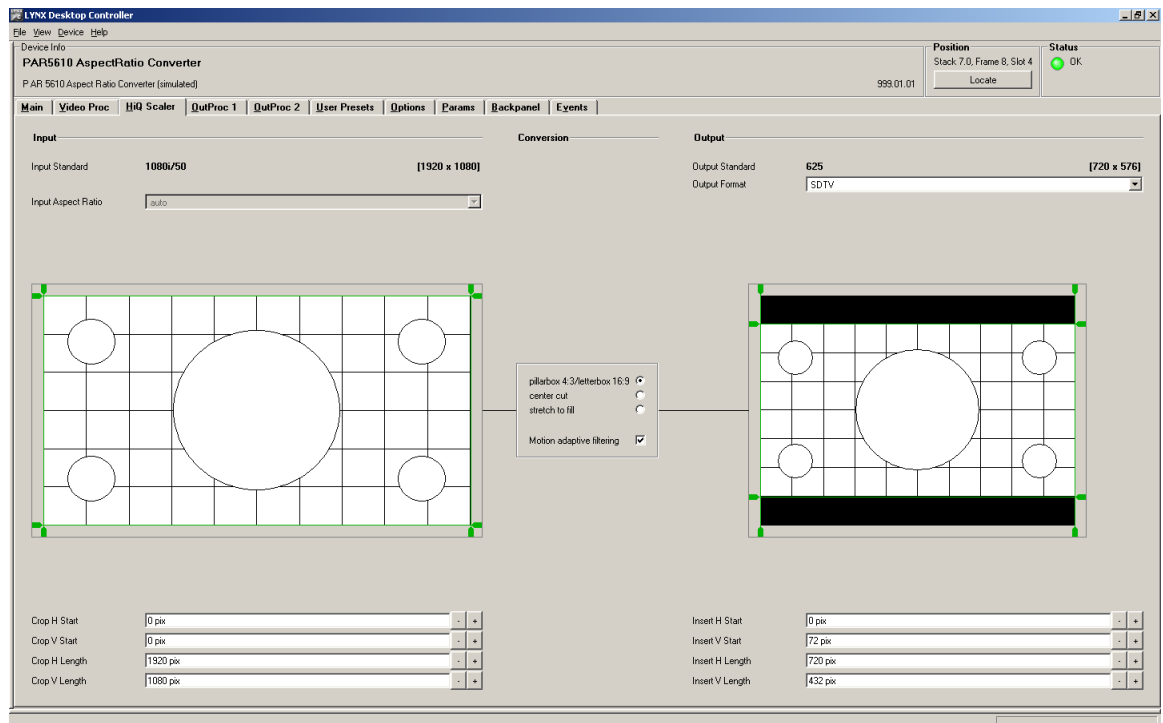
High Quality Up and Cross Conversion (OC-5610-XUPD)

The OC-5610-XUPD option is required for the HQ up, down and cross conversion functionality.

For the basic module without the OC-5610-UXPD option installed this converter provides the HQ SDTV Aspect Ratio Conversion functionality. Please see section Aspect Ratio Conversion Mode above for functionality.

If the OC-5610-UXPD option is activated this also provides Down Conversion functionality as described previously.

The screen below shows the controls provided for the HQ Up, Down, Cross and Aspect Ratio Conversion.



Input Aspect Ratio

For SD input Signals the Aspect Ratio (4:3 or 16:9) can be selected

Output Format

With the selection of SDTV, 720p or 1080i output format then the type of conversion is configured which is based on the connected input format for example, with a SDTV input signal and 1080i output format selected, then the converter will perform an Up conversion from SDTV to 1080i. The conversion is always performed in the same frame rate, e.g. SDTV 525/59.94Hz to 1080i/59.94Hz.

Conversion Mode

With the selection box in the middle of the screen the conversion mode can be selected. The check box “motion adaptive” filtering is used to improve picture quality for moving images to reduce motion blur, and should be selected for normal use. For still images the checkbox should be switched off.

Input Cropping

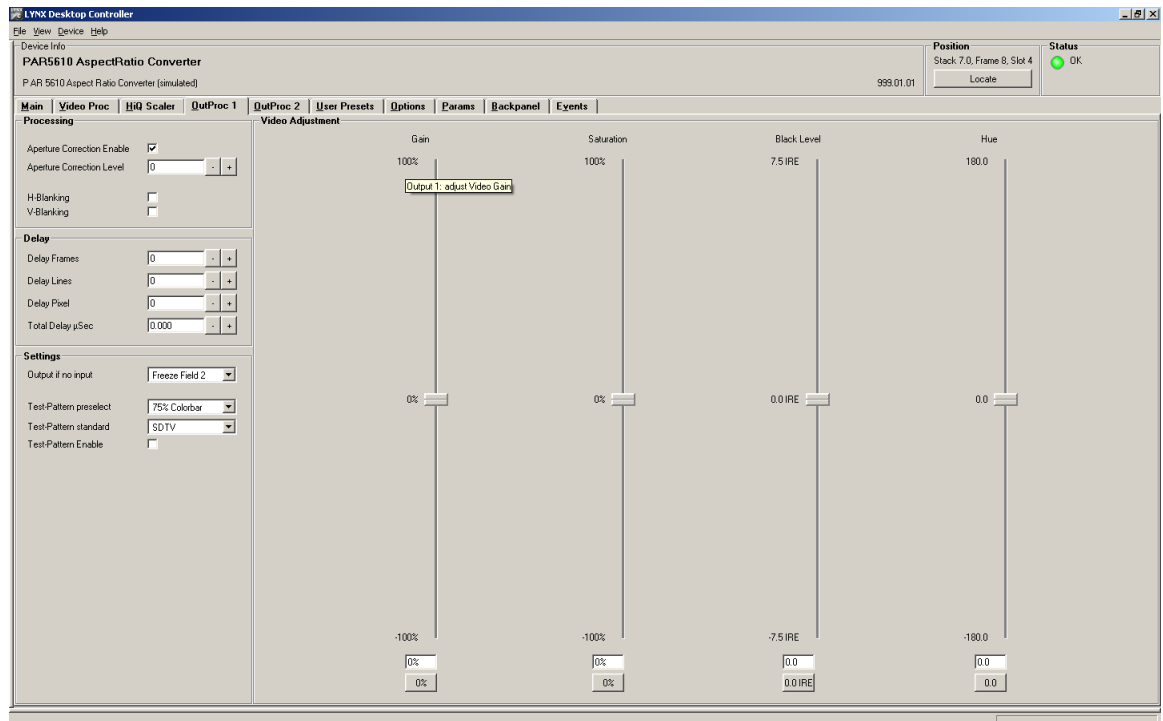
With these controls it’s possible to crop the input image which will be used for conversion (cropping will appear on the converted image output). Values can be set with the numerical entry fields or with the markers on the input picture representative.

Output Insertion

With these controls the size and positioning of the output image can be set. Any parts of the image which has no content (cropped on the input or outside the image extents if shifted or made smaller) will be filled with black. Values can be set with the numerical entry fields or with the markers on the output picture representative.

Output Proc Tabs

There are two “Out Proc” tabs provided, one for each of the two outputs provided. This is where the individual video processing functions are set for each channel. The two tabs have identical adjustments.



Color Space Conversion

Color Space Conversion will automatically be switched according to the conversion mode.

Aperture Correction

Horizontal aperture correction is provided for each output channel, which can be used to sharpen or soften the video signal. (This is sometimes required for down converted video signals as the filtering process rolls off the high frequency very slightly). If adjusted in the positive direction this will increase sharpness, if adjusted in the negative direction this will soften the image.

There is a check box to switch aperture correction ON and OFF and an adjustment range. The numerical adjustment range provided is + 80 to -30, and is changed by clicking on the "+" or "-" Buttons.

Note. *Aperture correction OFF is the same as a Zero setting in the adjustment range*

H and V Blanking

A checkbox selection is provided for H (Horizontal) and V (Vertical) blanking. When selected the video output will have new blanking applied in both of these areas (which will overwrite any information in the vertical and horizontal blanking intervals).

Video Delay Adjustment (optional: OC-5610-VDLY)

Each video output can be delayed up to a maximum of 12 frames. This is usually used for downstream system timing applications. The delay is adjustable in the following increments:

- Frames
- Lines
- Pixels
- Time (ns)

Depending on preferences you can use one or all of the adjustments provided to set the total video delay.

Note. *The adjustable delay applied is **in addition** to the fixed processing delay of the module. Please refer to the table provided in the "Fixed Video Delays" section for more information on processing delays.*

Settings

This area is where the freeze function is defined and also the action (and settings) of the integrated test pattern generator. (Each channel has its own independent test pattern generator)

Freeze Mode

When the synchronizer encounters excessive TRS errors it can be set to freeze or pass the video transparently (selected on the Video Proc tab). If Freeze is selected then the behavior of the freeze function is selected using the drop down selections. These are:

- Freeze Field 1
- Freeze Field 2
- Freeze Frame
- Display (pre selected) Test Pattern
- Black

Note. *If the pre selected test pattern is selected this will be used in the respective channel video format and **NOT** influenced by the “Test Pattern Standard” selection mentioned below.*

Test Pattern Pre-select

A wide range of patterns is provided which can be selected using the drop down selection provided. The pre-selected pattern will be used if the freeze mode is set to “test pattern” and will also be the pattern used if “test pattern on” is selected. Patterns provided are:

- Full field Black
- Full field White
- Full field Yellow
- Full field Cyan
- Full field Green
- Full field Magenta
- Full field Red
- Full field Blue
- 15% Grey (full field)
- 75% Color bars
- 75% Color bars over Red
- Pathological PLL/EQ

Test Pattern Standard

With no input signal connected the module can be used a stand alone test generator using this selection is possible to configure the test pattern into any of the supported standards, or it can be set to follow the last input standard. Settings provided are:

- Follow last input (default)
- SDTV
- 720P
- 1080i

Test Pattern Enable

This checkbox simply switches on the pre-selected test Pattern. (The same can be done using the Test Pattern checkbox on the **Main Tab**)

Video Adjustments

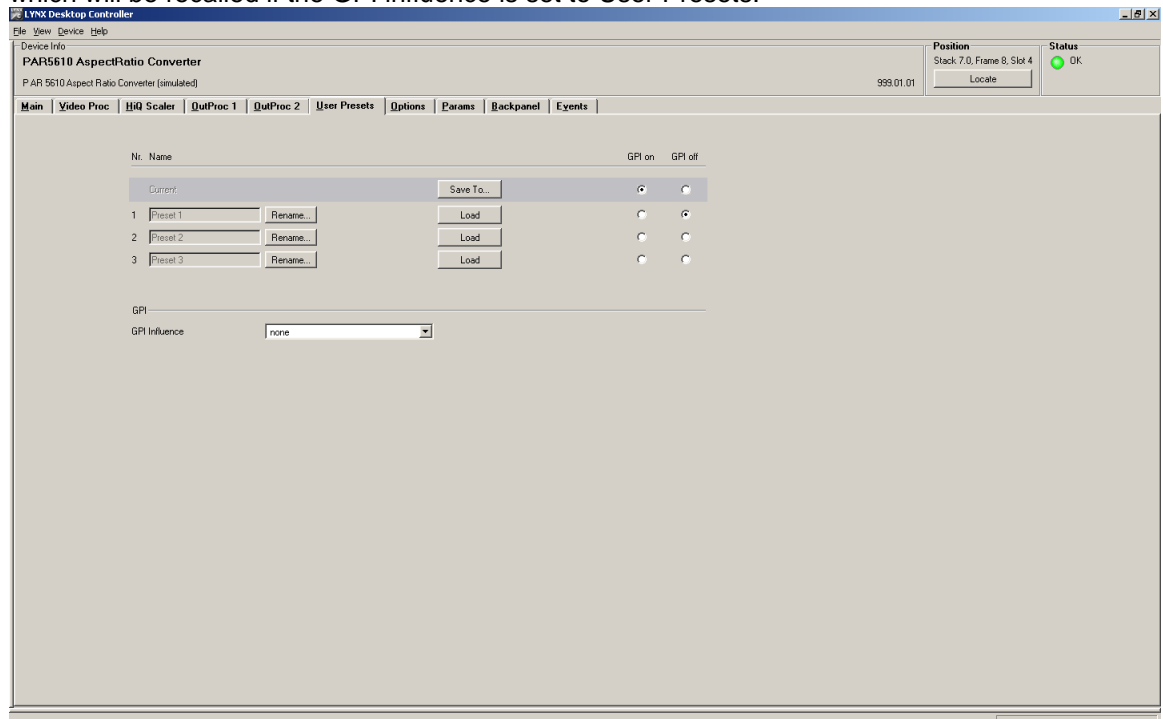
Four on screen sliders are provided to allow for the adjustment of individual video parameters. Separate sliders are provided for video Brightness (gain), Saturation, Pedestal (Black level) and Hue.

Default (null) settings are 0% (this is the default). Sliders can be quickly returned to the factory null (or transparent) settings using the buttons provided at the bottom of each slider.

User Presets (optional: OC-5610-USET)

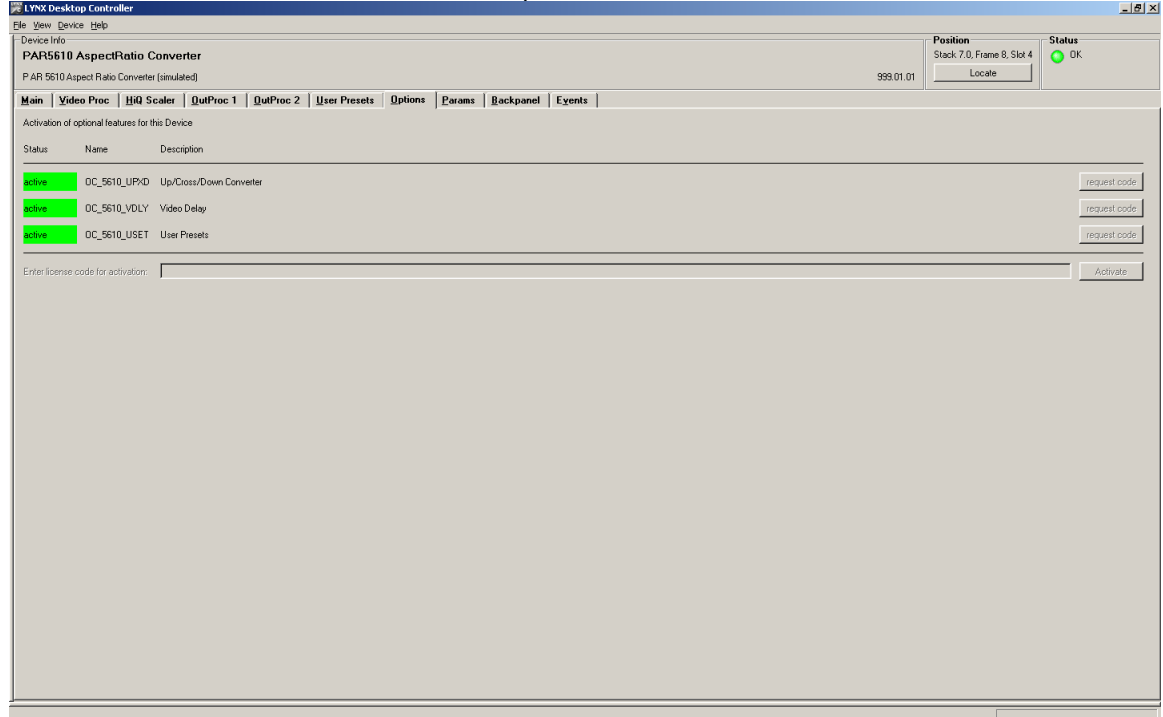
If the Option User Presets (OC-5610-USET) is active the tab for user presets becomes available.

In this tab you can store and recall user settings. GPI on and GPI off defines the presets, which will be recalled if the GPI influence is set to User Presets.



Options Tab

One tab on the GUI is reserved for “Options“ This is where the option license codes are entered to unlock the embedded firmware options.



If the module was purchased with options pre-installed then you will see the option status as green (Active).

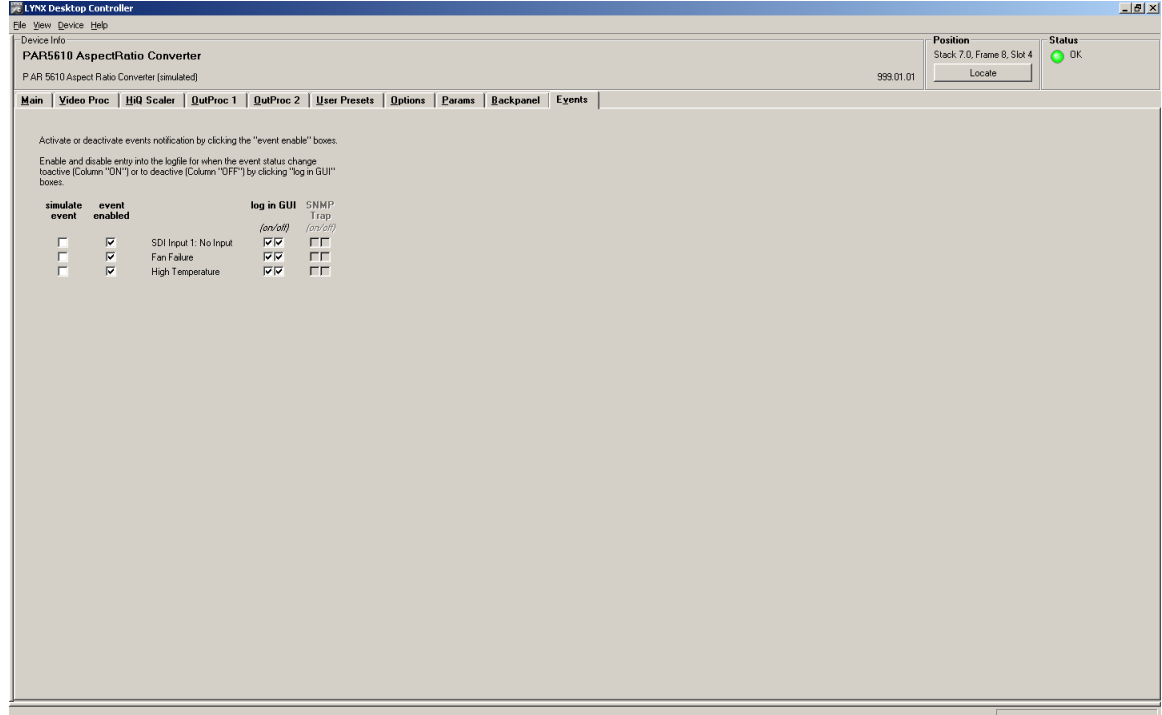
If you would like to add any option after delivery, then you will need to purchase the specific license codes from LYNX Technik.

Click the “request code” button next to the channel you wish to activate. A number will be displayed, Please forward this number with your purchase order to your authorized LYNX dealer or representative. When you receive the license string simply type it (or paste it using the windows clipboard) into the area provided and press “activate”.

Activation is confirmed when the option status turns green.

Events Tab

The Events Tab is where the module alarming and error notifications are configured for the module.



The GUI has an integrated error log, which is a simple text log file stored in the controller PC. This will record an event and timestamp it. The log can be seen at the bottom of the GUI screen and can be scrolled through using the scrolling bar.

Log in GUI Function

Events are selectable, you can choose if you want to record a particular event in the log (or not) or configure it to only record one side of the event. *(For example you might want to log when a SDI input was removed but do not want to log when it came back).* The ON/OFF trigger can be configured for each of the available events shown in the list and is setup using the checkboxes provided.

Alarm Activation

By default all alarm conditions are activated (checked), by de-selecting a specific alarm condition in this column you are telling the module to ignore this condition completely. It will not color the alarm LED, log and event in the GUI or send a SNMP trap. This is useful if for example you never have anything connected to input 2 and want the card to ignore this input condition completely you would simply de-select "SDI Input 2 No Input" and it will be ignored.

SNMP Support

If the system is using a RCT 5030 Master Controller and the SNMP option is installed then the "SNMP Trap" columns become available.

Here you can configure what events you would like to transmit a "SNMP trap" for over the network (this has no impact or influence over the internally error log maintained by the LYNX control system).

(Internal LYNX error logging and external SNMP traps can be configured independently).

Note. *The simulated event is part of the GUI simulator and allows us to force a particular error condition for testing and demonstration purposes.*

Specifications

Video Inputs	
Signal Type	Serial digital video SMPTE 292M, 344M, 259M-C
Input standards	HDTV: 1080i 59.94Hz / 60Hz / 50Hz / 720P 59.94Hz / 60Hz / 50Hz SDTV: 525 59.94Hz / 625 50Hz. (Upgradeable if additional format support is released)
No. of inputs	1 input
Connector	BNC
Impedance	75 Ohm
Cable Equalization	Up to 250m Belden 8281 (270MHz) Up to 140m Belden 1694A (1.485GHz)
Return Loss	> 15 dB (270MHz) > 10dB (1.485GHz)
Video Outputs	
Signal Type	Serial digital video SMPTE 292M, 344M, 259M-C
Output standards	1080i 59.94Hz / 60Hz / 50Hz 720P 59.94Hz / 60Hz / 50Hz 525 59.94Hz / 625 50Hz.
No. Of outputs	2 separate outputs with 2 x SDI out of each output (4 total) (mapped to any available internal resource)
Connector	BNC
Impedance	75 Ohms
Jitter	< 0.2 ui (270MHz) < 0.25 ui (1.485GHz)
Return Loss	> 15 dB (1.5GHz)
Video Processing	
Delay adjustment range	Up to 12 frames of programmable delay in pixel / line / frame increments. Independent for all 2 outputs (optional)
Minimum delay	Variable, depending on selected functionality and installed options. Please refer to "Fixed Video Delays" table in this manual
Video adjustments	Gain / Saturation / Hue / Black Level
Aperture correction	Horizontal only, adjustable for each output channel (2)
Color space conversion	601 > 709 or 709 > 601 or transparent (selectable) Note. Requires conversion option
Control	
Local Controls	Local alphanumeric display with integrated menu system for setting "basic" module parameters.
Remote Control	Comprehensive remote control and status monitoring supported when used with a LYNX Controller option. The use of the control system is mandated for this module
External GPI	Single GPI input on BNC connector. GPI influence configured in control system.
Electrical Specifications	
Operating Voltage	12 VDC
Power Consumption	16 W
Safety	IEC 60950/ EN 60950/ VDE 0805
Mechanical	
Size	283mm x 78mm
Weight	CardModule 160g, connector plate 100g
Rack space	Requires 2 slots in rack frame (max 5 modules per frame)
Ambient	
Temperature	5°C to 40°C Maintaining specifications
Humidity	90% Max non condensing

Service

Parts List

Due to the very dense design and high level of integration there the module is not user serviceable. Please contact LYNX for repairs or to request an exchange unit.

There is one consumable part used on this module which is the cooling fan. A service kit is available to exchange the fan. Ordering information below.

Part type: **Cooling Fan Service Kit Series 5000 CardModules**

Technical Support

If you are experiencing problems, or have questions please contact your local distributor for further assistance.

Technical support is also available from our website.

Please do not return products to LYNX without an RMA. Please contact your authorized dealer or reseller for more details.

More detailed product information and product updates may be available on our web site:

www.lynx-technik.com

Contact Information

Please contact your local distributor; this is your local and fastest method for obtaining support and sales information.

LYNX Technik can be contacted directly using the information below.

Address LYNX Technik AG
 Brunnenweg 3
 D-64331 Weiterstadt
 Germany

Website www.lynx-technik.com

E-Mail info@lynx-technik.com

LYNX Technik manufactures a complete range of high quality modular products for broadcast and Professional markets, please contact your local representative or visit our web site for more product information.

