

LYNXTechnik AG

Broadcast Television Equipment

Reference Manual

P IE 5610

**Multi Format Image Enhancer with
Optional UP/DOWN/CROSS Conversion**

Revision 2.6 – November 2010

This Manual Supports Device Revisions:	
P IE 5610 Firmware Revision	402
Control System GUI Release	4.8.2



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Contents

Contents	2
Warranty	5
Regulatory information	6
<i>Europe.....</i>	6
Declaration of Conformity	6
<i>USA.....</i>	6
FCC 47 Part 15	6
Getting Started.....	7
<i>Packaging.....</i>	7
<i>ESD Warning.....</i>	7
Preventing ESD Damage.....	7
Product Description	8
<i>Input Video Formats.....</i>	9
<i>Output Video Formats.....</i>	9
<i>Audio Processing</i>	10
<i>Video Processing</i>	10
Proc Amp Functions.....	10
Aperture Correction.....	10
Test Patterns.....	10
Programmable Video Output Delay	10
Fixed Processing Delays	11
<i>GPI Function</i>	13
Freeze input with GPI	13
User Presets – GPI Switch	13
<i>Functional Diagram</i>	14
Module Layout	15
<i>Connections</i>	16
Installation.....	17
Firmware Options	18
<i>Aspect Ratio Conversion (optional: OC-5610-ARC).....</i>	18
Conversion from 16:9 to 4:3 Aspect Ratios	18
Conversions from 4:3 to 16:9 Aspect Ratio	19
ARC Image Size and Positioning.....	19
<i>Programmable Video Delay (optional: OC-5610-VDLY).....</i>	19
<i>Up/Down/Cross Conv. (optional: OC-5610-UPXD).....</i>	20
Down conversion	20
4:3 Letterbox.....	20
4:3 Center Cut	20
4:3 Stretch to Fill.....	20
Up Conversion	21
16:9 Center Cut	21
16:9 PillarBox.....	21
16:9 Stretch to Fill.....	21

Cross Conversion	21
Image size and Positioning	21
Color Space Conversion	22
Noise Reduction (optional: OC-5610-NR)	23
Color Correction (optional: OC-5610-COCO)	23
Settings and Control	24
Multi Function Switch	24
Using the Local Display Menus	24
Menu Structure	25
LED Status Indicators	26
SDI in Status LED 1	26
ALARM LED	26
Control System GUI	27
Main Tab	28
Signal Routing	28
Video Proc Tab	29
DVITC Input Line Selection	29
Teletext Decoder	29
High Quality Up and Cross Conversion (OC-5610_XUPD) and Aspect Ration Conversion (OC-5610_ARC)	30
SDTV Aspect Ratio Converter Mode	30
Output Format	31
Conversion Mode	31
Input Cropping	31
Output Insertion	31
Control Mode	32
Inserted Format Description	32
Advanced Metadata Settings	33
Closed Captions:	33
Time Code:	34
Teletext	36
Noise Reduction Tab	39
General Noise Reduction	39
Block Artifact Reduction	39
Mosquito Noise Reduction	39
Detail Enhancement (Sharpness and Texture)	39
Color Correction Tab	41
Mode Gain & Offset	41
Mode Peak & Black	42
Output Proc Tabs	43
Color Space Conversion	43
Aperture Correction	43
Clip CR/Cb Headroom	44
H and V Blanking	44
Video Output Delay Adjustment	44
Settings	44
Output if no input	44
Freeze Mode	44

Test Pattern Pre-select	45
Test Pattern Standard	45
Test Pattern Enable	45
Video Adjustments	45
<i>User Presets Tab</i>	46
To save a preset	46
To load a saved preset	46
Setting GPI control of Preset selections	47
GPI Influence	47
<i>Options Tab</i>	48
<i>Events Tab</i>	49
Log in GUI Function	49
Alarm Activation	49
SNMP Support	49
Specifications	50
Service	51
<i>Parts List</i>	51
<i>Technical Support</i>	51
Contact Information	51

Warranty

LYNX Technik AG warrants that the product will be free from defects in materials and workmanship for a period of two (2) year 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.

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Regulatory information

Europe

Declaration of Conformity

We LYNX Technik AG
Brunnenweg 3
D-64331 Weiterstadt
Germany
Declare under our sole responsibility that the product

TYPE: **P IE 5610**

To which this declaration relates is in conformity with the following standards (environments E1-E3):

EN 55103-1 /1996

EN 55103-2 /1996

EN 60950-1 /2006

Following the provisions of 89/336/EEC and 73/23/EEC directives.

Winfried Deckelmann

Weiterstadt, April 2009



Place and date of issue

Legal Signature

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 IE 5610 module is a high performance Multi-Format Image Enhancer with several options for video processing, i.e. 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*)
- SDTV Aspect Ratio Converter (*option code OC-5610-ARC*)
- Advanced Noise Reduction (*option code OC-5610-NR*)
- Color Correction (RGB Gain & Lift) (*option code OC-5610-COCO*)

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

The basic module has no options installed, without any option the module just performs basic video proc amp functions.

All options can be used concurrently, no restrictions of option use and interoperability.

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 / 50Hz
625 / 50Hz	1080i / 59.94Hz
	1080i / 60Hz
	1080p / 23.98Hz
	1080p / 24Hz
	1080p / 25Hz
	1080p / 29.97Hz
	1080p / 30Hz
	1080psf / 23.98Hz
	1080psf / 24Hz
	1080psf / 25Hz
	720p / 23.98Hz
	720p / 24Hz
	720p / 25Hz
	720p / 29.97Hz
	720p / 30Hz
	720p / 50Hz
	720p / 59.94Hz
	720p / 60Hz

Output Video Formats

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

SDTV Formats	HDTV Formats
525 / 59.94Hz	1080i / 50Hz
625 / 50Hz	1080i / 59.94Hz
	1080i / 60Hz
	1080p / 23.98Hz
	1080p / 24Hz
	1080p / 25Hz
	1080p / 29.97Hz
	1080p / 30Hz
	1080psf / 23.98Hz
	1080psf / 24Hz
	1080psf / 25Hz
	720p / 23.98Hz
	720p / 24Hz
	720p / 25Hz
	720p / 29.97Hz
	720p / 30Hz
	720p / 50Hz
	720p / 59.94Hz
	720p / 60Hz

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.

Video Processing

Proc Amp Functions

Each of the two output channels has an associated video processing 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.

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

Programmable Video Output Delay

Each of the two SDI outputs has separate programmable video output delay which can be set (independently) between 0 and 3 frames (max). The adjustment is available in pixel, line and full frame increments.

***Note** The Module (including the OC-5610-UPXD option, if installed) has fixed frame delays depending on the signal path and selected function (see below). The 0 > 3 frame user adjustment is additional delay relative to the fixed delays.*

***Note** With the option OC-5610-VDLY the manual delay range will be extended to 12 frames per output*

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

Fixed Processing Delays

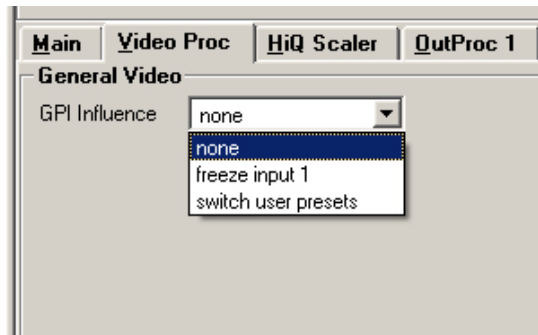
The module (including the OC-5610_VDLY, OC-5610_ARC and OC-5610_UPXD options, if installed) has fixed frame delays depending on the signal path and selected function - see below :

Input Standard	Output Standard	Delay (ms)	Delay (Frames - rounded to ½ frame)
1080i 50	1080i 50	120	3
1080i 50	720p 50	80	4
1080i 50	1080p 25	120	3
1080i 50	720p 25	120	3
720p 50	1080i 50	80	2
720p 50	720p 50	60	3
720p 50	1080p 25	60	1.5
720p 50	720p 25	80	2
1080p 25	1080i 50	99	2.5
1080p 25	720p 50	60	3
1080p 25	1080p 25	120	3
1080p 25	720p 25	120	3
1080i 59.94	1080i 59.94	99	3
1080i 59.94	720p 59.94	66	4
1080i 59.94	1080p 29.97	99	3
1080i 59.94	720p 29.97	99	3
720p 59.94	1080i 59.94	66	2
720p 59.94	720p 59.94	49	3
720p 59.94	1080p 29.97	66	2
720p 59.94	720p 29.97	66	2
1080p 29.97	1080i 59.94	66	2
1080p 29.97	720p 59.94	49	3
1080p 29.97	1080p 29.97	99	3
1080p 29.97	720p 29.97	99	3
1080i 60	1080i 60	99	3
1080i 60	720p 60	66	4
1080i 60	1080p 30	99	3
1080i 60	720p 30	99	3
720p 60	1080i 60	49	1.5
720p 60	720p 60	49	3
720p 60	1080p 30	66	2
720p 60	720p 30	83	2
1080p 30	1080i 60	82	2.5
1080p 30	720p 60	49	3
1080p 30	1080p 30	99	3
1080p 30	720p 30	99	3
1080p 24	1080p 24	125	3
1080p 24	720p 24	125	3
1080p 24	1080psF 24	83	1
1080psF 24	1080p 24	125	3
1080psF 24	720p 24	125	3
1080psF 24	1080psF 24	125	1.5
1080p 23.97	1080p 23.97	103	2.5
1080p 23.97	720p 23.97	125	3
1080p 23.97	1080psF 23.97	83	1
1080psF 23.97	1080p 23.97	125	3
1080psF 23.97	720p 23.97	125	3
1080psF 23.97	1080psF 23.97	125	1.5
1080i 50	625	118	3
720p 50	625	80	2
1080p 25	625	80	2
1080i 59.94	525	99	3
720p 59.94	525	83	2.5
1080p 29.97	525	83	2.5
625	625	120	3
525	525	66	2
625	1080i 50	80	2

625	720p 50	80	4
625	1080p 25	120	3
625	720p 25	120	3
525	1080i 59.94	66	2
525	720p 59.94	49	3
525	1080p 29.97	66	2
525	720p 29.97	99	3

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 or User Preset Tab..



Freeze input with GPI

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

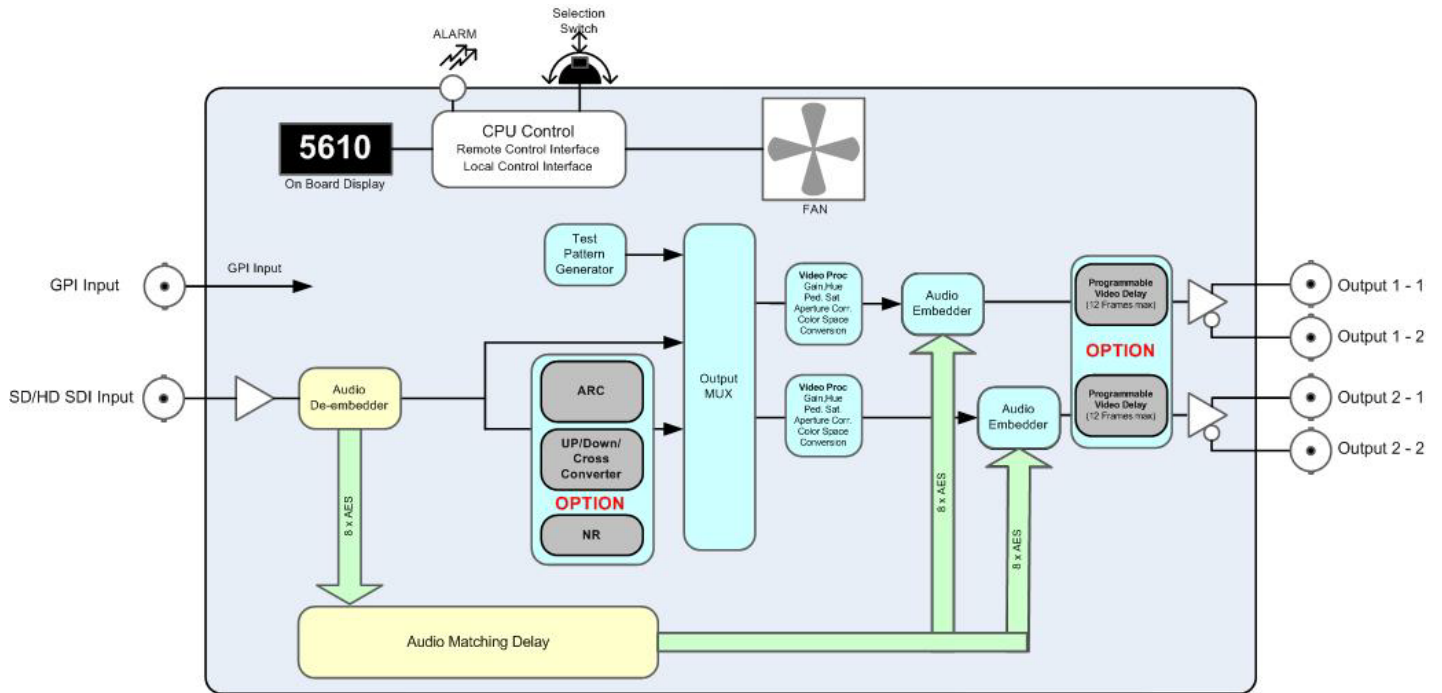
- With GPI open the module processes all input signals as usual
- With GPI closed the inputs will be frozen (volatile freeze, i.e. frozen frame is not retained through power cycle)

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

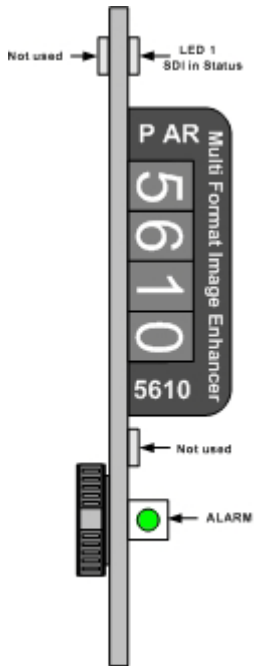
User Presets – GPI Switch

User Presets allow the user to store 7 additional sets of module settings (snapshots) in addition to the current settings in module flash RAM. The GPI can then be configured to toggle between any 2 of the 8 stored presets by selecting “*switch user presets*” as the GPI influence setting. (Refer to the *User Settings* section in the GUI part of this manual for more details)

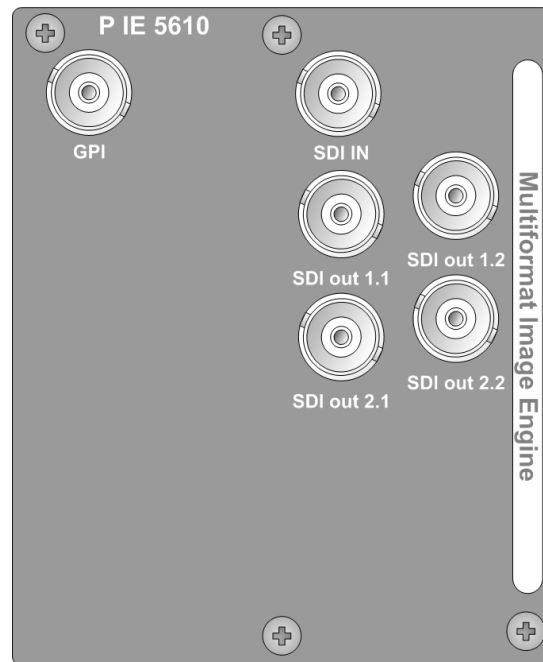
Functional Diagram



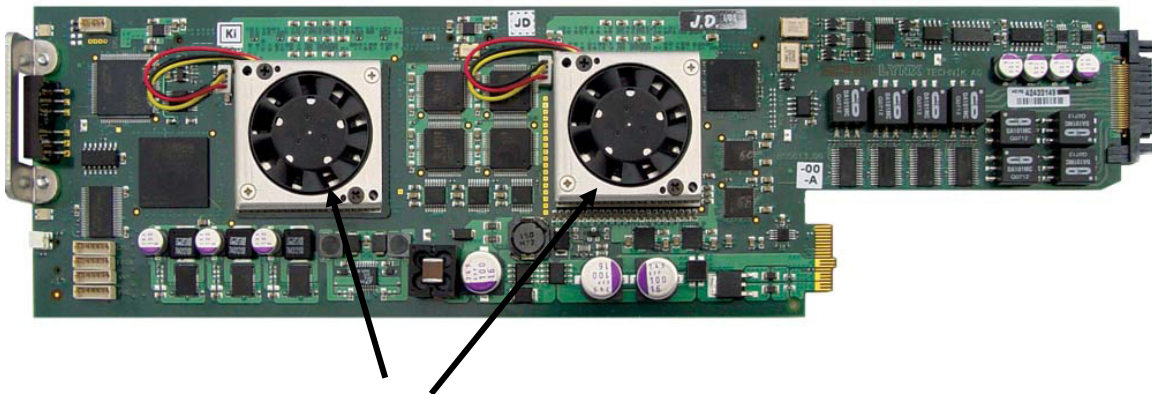
Module Layout



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.

Connections

Video

The P IE 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 (270Mbps/s)

HDTV = 120m Belden 1694A (1.4Gbps/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.*

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 7.

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 IE 5610 modules can be accommodated in a single Series 5000 rack frame.

NOTE. When using this module the **R FR 5011 or R FR 5012 Fan Front Rack Frame** should be used 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 installation with the LYNX control system.

Firmware Options

The basic module just performs basic video proc amp functions. 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.

Aspect Ratio Conversion (optional: **OC-5610-ARC**)

The module provides one optional High Quality ARC (**A**spect **R**atio **C**onverter) 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

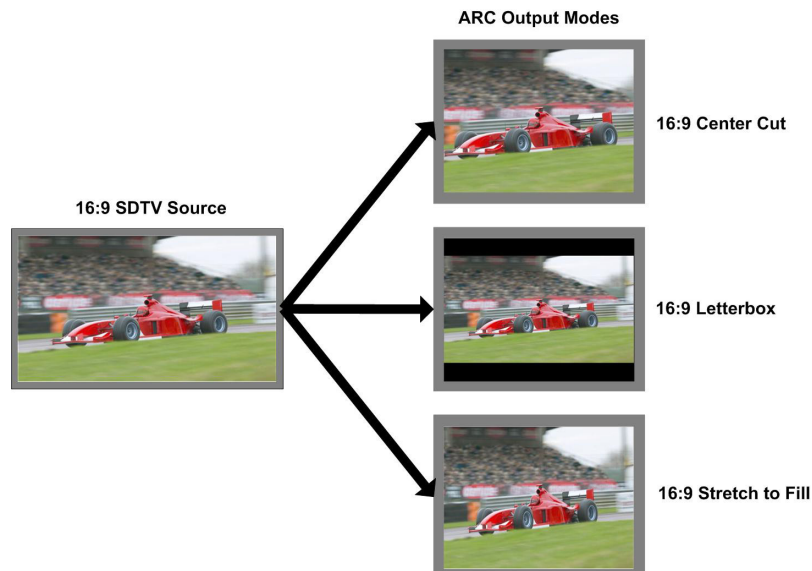
This takes the 16:9 aspect ratio of the input signal and fits it horizontally into the 4:3 SD image area with black bars at the top and bottom of the image.

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

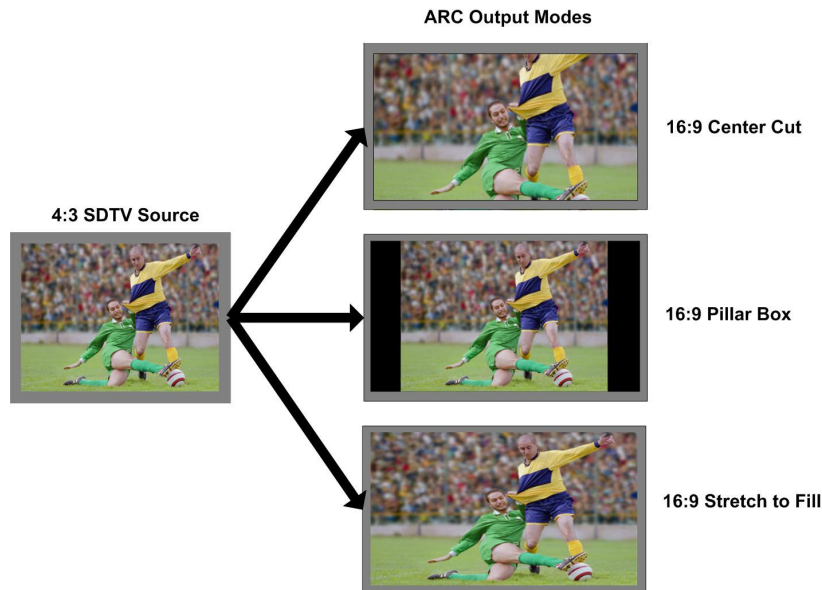
This takes the 4:3 aspect ratio of the input signal and fits it vertically into the 16:9 SD image area with black bars at the left and right of the image.

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.

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 P IE 5610 (including the OC-5610-UPXD and OC-5610_ARC 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)

Up/Down/Cross Conv. (optional: **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

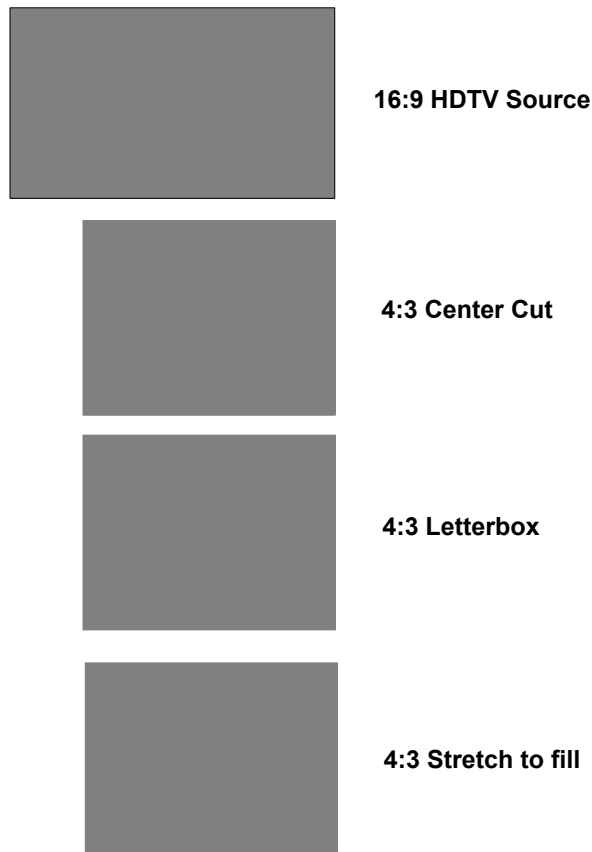
This takes the 16:9 aspect ratio of the input HD signal and fits it into the 4:3 SD aspect ratio screen with black bars at the top and bottom of the image.

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.



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

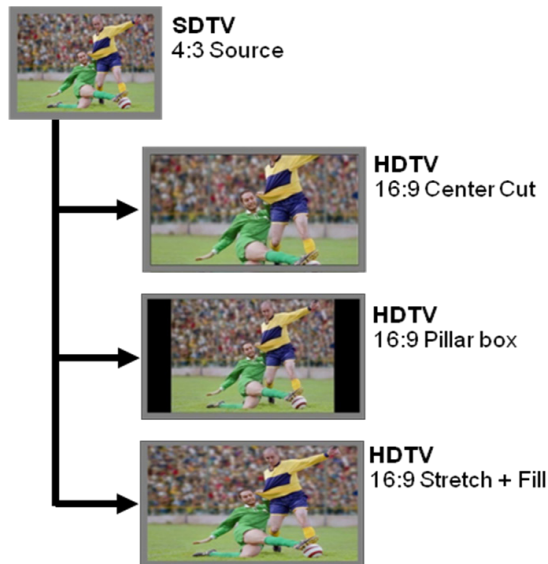
This mode cuts the horizontal center portion of the 4:3 SD input signal and fills the 16:9 HD aspect ratio image area. (top and bottom of image are cropped)

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.*

Noise Reduction (optional: *OC-5610-NR*)

The module provides optional Noise Reduction functionality:

The adaptive noise reduction function processes the input data in either progressive or interlaced format. Application of noise reduction to noisy interlaced signals can optimize the de-interlacer performance.

General Noise Reduction

General noise reduction comprises of both adaptive 2D and 3D noise reduction. 3D noise reduction corrects for temporal and spatial noise; and 2D noise reduction corrects spatial. 3D noise reduction is applied to any interlaced or progressive signal with a pixel rate less than or equal to 75Mp/s. 2D noise reduction is applied to any interlaced or progressive signal. The selection of 2D or 3D noise reduction processing is automatically controlled by the firmware in accordance with the video signal being processed.

Block Artifact Reduction

Block Artifact Reduction (BAR) locates and reduces block edges produced by DCT based compression processing. BAR can be applied to any interlaced or progressive input signal.

Mosquito Noise Reduction

Mosquito Noise Reduction (MNR) dynamically adapts to image content, effectively reducing mosquito artifacts around sharp edges in DCT based compression. It can be applied to any interlaced or progressive signal.

Detail Enhancement (Sharpness and Texture)

The detail enhancement function provides both sharpness and texture enhancement, realized by adaptive horizontal, vertical and diagonal large edge and small edge enhancement processes. Overshoot / undershoot control is provided to minimize ringing on the enhanced edges. In addition, noise rejection is provided to minimize the amount of enhancement applied to the noisy areas of the image.

For ease of use the various controls are combined into two parameters: Level and Threshold

Level: controls the level of the horizontal, vertical as well as the diagonal high pass filtered picture content, which will be added to the original signal again, i.e. the gain of the high frequencies in the signal

Threshold: This parameter controls the level of signal which is passed through for level control, i.e. all amplitudes in the signal below this threshold will not be used for the detail enhancement

Color Correction (optional: *OC-5610-COCO*)

The module provides optional basic Color Correction functionality, which includes RGB Gain and RGB Lift. Two modes are provided to control the color correction: Gain & Offset and Peak & Black.

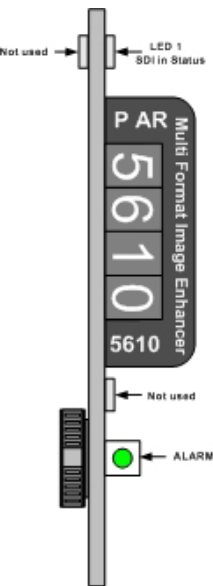
For more information on the controls and use of this feature please refer to the GUI section of this manual for more details.

Settings and Control

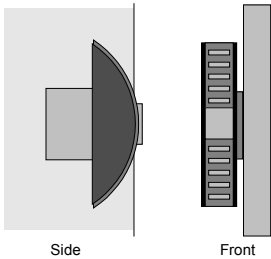
The P IE 5610 module has an integrated micro-controller, which enables the module to be configured and controlled locally using the multifunction switch and 4 character dot matrix display, or from remote using a GUI interface when using one of the optional controllers and control software.

! **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.*

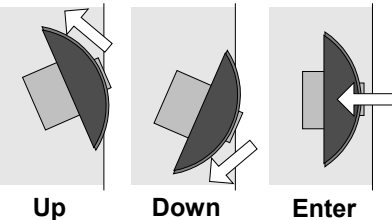
Once set, all settings are automatically saved in non-volatile internal memory. (Flash RAM) The module will always recall the last used settings.



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
P IE 5610					Root Display
	GPI	NONE			GPI Influence
		FRZE			Freeze Input
		SwPR			Switch User Presets
		back			
	USET				User Preset Settings
		LOAD			Load User Preset to Current
			PRE1		Preset 1
		
			PRE7		Preset 7
			back		
		Gon			GPI on settings
			CURR		Current
			PRE1		Preset 1
		
			PRE3		Preset 7
			back		
		Goff			GPI off settings
			CURR		Current
			PRE1		Preset 1
		
			PRE7		Preset 7
			back		
		back			
	RSET				Factory Reset
		NO			
		YES			
		back			
	back				

LED Status Indicators

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

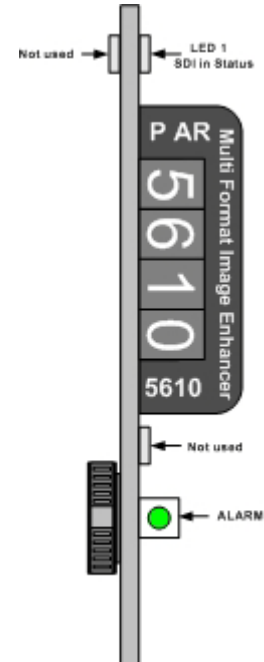
SDI in Status LED 1

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

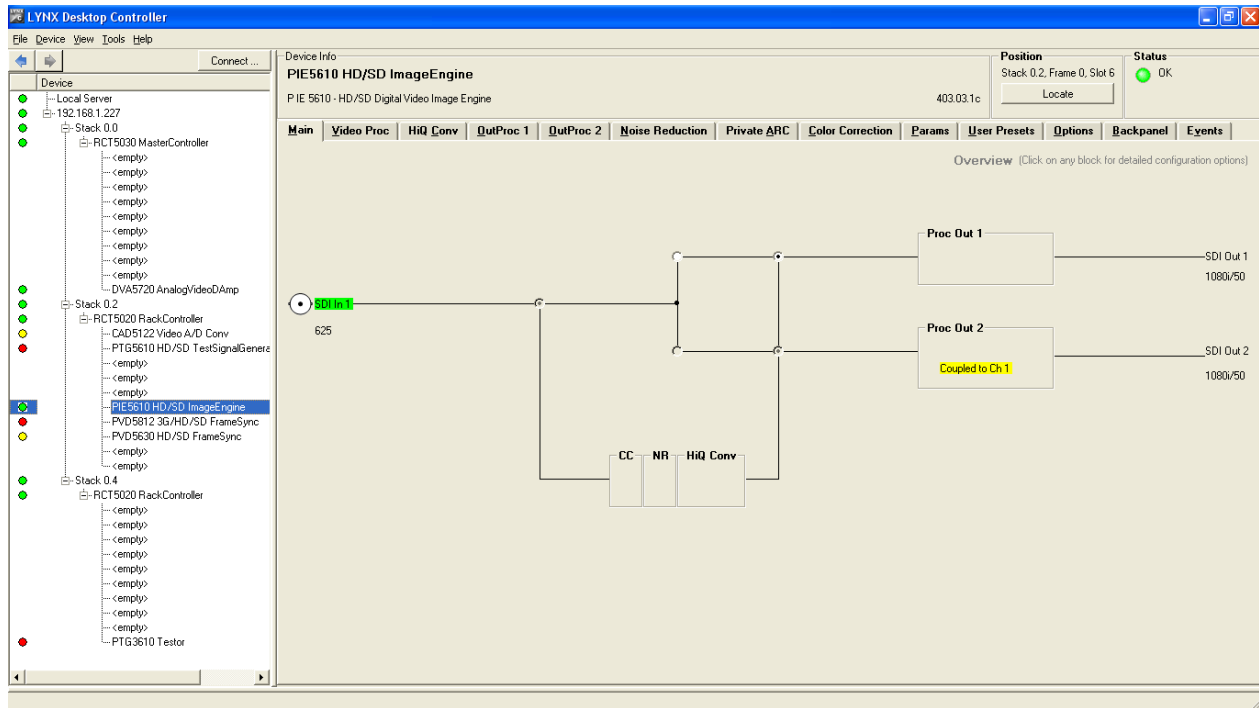


Control System GUI

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

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 IE 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)

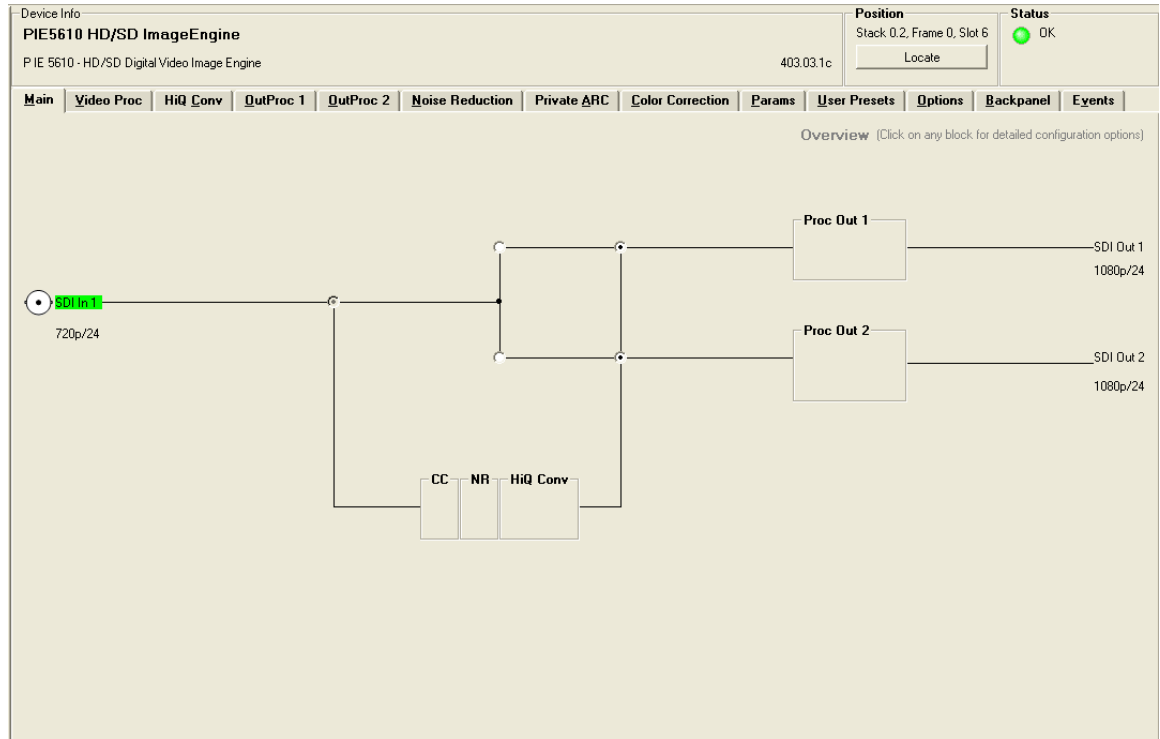
The first screen displayed when the module is selected is the **Main Tab** this is a graphical representation of the modules overall function and signal flow (left to right). Clicking on the processing boxes will link to other GUI screens with more controls for these specific functions.

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) and control for Metadata (DVITC Line Selection and pre-selection for the Teletext Decoder)

Device Info: PIE5610 HD/SD ImageEngine
P IE 5610 - HD/SD Digital Video Image Engine 403.03.1c

Position: Stack 0.2, Frame 0, Slot 6
Status: OK

Locate

Main Video Proc HiQ Conv OutProc 1 OutProc 2 Noise Reduction Private ARC Color Correction Params User Presets Options Backpanel Events

General Video

GPI Influence: none

Metadata Input 1

DVITC Line Selection

Reader A (625): 19
Reader B (625): 21
Reader A (525): 14
Reader B (525): 16

Teletext Decoder

auto-select: ☒
WST (625 only): present ☒
S2031 WST: missing ☐
QP47 SDP: missing ☐

DVITC Input Line Selection

DVITC Line Selection for the two DVITC Readers is provided. If a specific line is selected the presence detection will indicate a DVITC signal only if present in the selected line.

Selecting AUTO will enable a search for DVITC signals in any line.

NOTE: An AUTO search can take longer (up to 15 seconds)

See also Advanced Meta Data Settings (Page 34)

Teletext Decoder

A pre-selection for the Teletext decoder can be set. It is recommended to use the auto-select mode

High Quality Up and Cross Conversion (OC-5610_XUPD) and Aspect Ration Conversion (OC-5610_ARC)

The OC-5610-UPXD and OC-5610-ARC options are required for the HQ up, down and cross and ARC conversion functionality.

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

The screenshot displays the P IE 5610 HD/SD ImageEngine control interface. At the top, the device name 'PIE5610 HD/SD ImageEngine' and version 'P IE 5610 - HD/SD Digital Video Image Engine' are shown. The 'Position' section indicates 'Stack 0.2, Frame 0, Slot 6' with a 'Locate' button. The 'Status' section shows a green 'OK' indicator. Below this is a menu bar with tabs: Main, Video Proc, HiQ Conv, OutProc 1, OutProc 2, Noise Reduction, Private ARC, Color Correction, Params, User Presets, Options, Backpanel, and Events. The 'Main' tab is active, showing 'Input' and 'Output' settings. The 'Input' section includes 'Input Standard' (1080p/30), 'Control Mode' (Manual), and 'Input Aspect Ratio' (16:9). The 'Output' section includes 'Signal used in' (SDI-Out-1, SDI-Out-2) and 'Output Format' (1080p/30). Below these are checkboxes for 'Format Desc.', 'Closed Captions', 'Time Codes', 'Teletext', and 'Audio Metadata'. The 'Image Scaling' section features two grid diagrams for aspect ratio conversion. The 'Conversion' section has radio buttons for 'pillarbox 4:3/letterbox 16:9', 'center cut', '14:9 conversion', 'stretch to fill', and 'custom'. The 'Motion adaptive filtering' checkbox is checked. The 'Advanced Settings' checkbox is unchecked.

SDTV Aspect Ratio Converter Mode

The Aspect Ratio Converter provides three modes for 16:9 to 4:3 conversion and three modes for 4:3 to 16:9 conversions, which can be selected using the radio buttons provided:

16:9 to 4:3 Conversion

- Letterbox
- Center cut
- Stretch to Fill (vertical)

4:3 to 16:9 Conversion

- Pillar Box
- Center cut
- Stretch to Fill (horizontal)

The "Input format" and the "signal used on" indicate which input format is routed to the specific conversion channel, and also indicates which of the four outputs the converter output is routed to (these will change if the internal signal routing is changed).

Output Format

With the selection of the output format 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

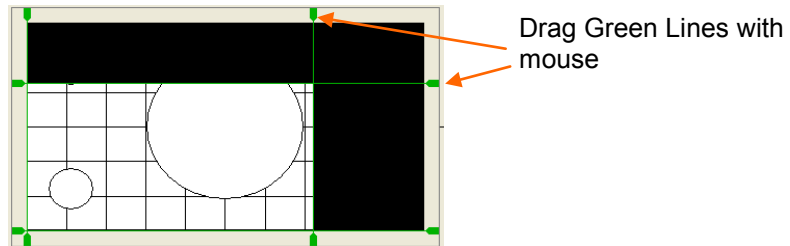
With these controls it's possible to crop the input image which will be used for conversion (cropping will appear on the converted image output).

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. To use this function the “advanced settings” checkbox has to be activated.

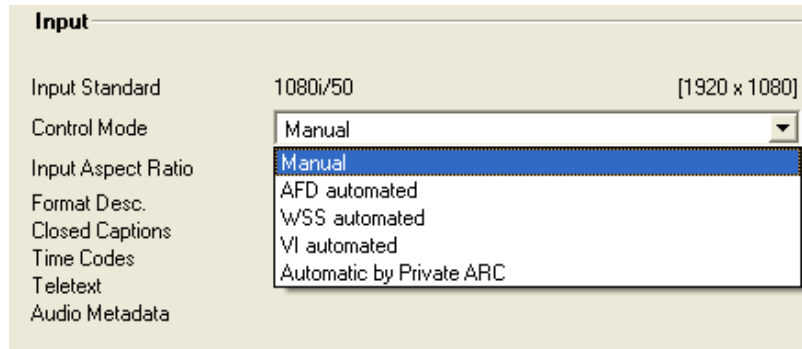
Note. *It is also possible to manually drag the input and output cropping extremities using the mouse pointer on the GUI. Simply position the mouse over the green line you wish to move, click and drag the line to the desired point on the image.*



Note. *If a non-standard setting is used, the Conversion setting will jump to “custom”*

Control Mode

The converter can be automatically controlled by AFD, WSS or VI. Selection is made from the drop down box. Depending on what codes are detected in the input signal and the converted output format; the down converters are automatically preset for this mode of operation.



The screenshot shows a software window titled "Input" with a list of settings on the left and their values on the right. The "Control Mode" setting is highlighted, and its dropdown menu is open, showing several options. The "Input Standard" is set to "1080i/50" and the resolution is "[1920 x 1080]".

Setting	Value
Input Standard	1080i/50 [1920 x 1080]
Control Mode	Manual
Input Aspect Ratio	Manual
Format Desc.	AFD automated
Closed Captions	WSS automated
Time Codes	VI automated
Teletext	Automatic by Private ARC
Audio Metadata	

Inserted Format Description

With the three checkboxes you can select what type of format description will be inserted into the video signal as metadata. This information is derived from the settings made to the converter. If there was already metadata of this type inserted in the input signal they will be overwritten (if the related checkbox is selected).

NOTE: *If the checkbox is not selected then no data will be inserted and any existing data will be blanked*

Advanced Metadata Settings

On the left side all detected Meta Data is displayed, on the right side all (re-) inserted Meta Data is displayed.

Note: The P IE 5610 is transparent for Dolby Metadata (S2020), if Dolby Metadata is detected it will be displayed only in the input part of this window (left side).

To configure the insertion of Meta Data please activate the Checkbox “Advanced Meta Data Settings” in the center.

The following screen will be shown, with the Meta Data Handling in the middle.

Format Desc.
Closed Captions
Time Codes
Teletext
Audio Metadata

Advanced Meta Data Settings ☒

Inserted Format Desc. ☐ AFD ☐ WSS ☐ VI
Inserted Closed Captions
Inserted Time Codes
Inserted Teletext S2031 WST

Closed CaptionsTime CodeTeletext

Detected Closed Captions

S334 CDP

missing

S334 RAW

missing

Line 21

missing

Closed Caption Insertion

S334 CDP

☒

S334 RAW

☒

Line 21

☒

Source Priority

Primary Source

Fallback 1

Fallback 2

S334 CDP

S334 RAW

Line 21

S334 RAW

S334 CDP

Line 21

Line 21

S334 CDP

S334 RAW

☒ Default Priority

Closed Captions:

Detected Closed Captions:

- **S334CDP**: Closed Captions in S334 CDP transport packet (containing CEA-708 and/or CEA-608 data)
- **S334RAW**: Closed Captions in S334 RAW transport packet (containing CEA-608 data)
- **Line21**: Closed Captions in Line 21 (containing CEA-608 data, in 525 video standard only)

Detected Closed Captions transport packets are indicated with “present” with green background.

Closed Captions Re- Insertion:

Activating the respective checkboxes will enable the re-insertion of the different transport packets into the converter output. Transport packets can be generated from different incoming types.

A source priority selection with three levels for the three possible transport packets is provided. If the “Primary Source” is not present, “Fallback 1” will be used, if this is also missing as a source, “Fallback 2” will be used.

Source Priority

Primary Source

Fallback 1

Fallback 2

S334 CDP

S334 RAW

Line 21

S334 RAW

S334 CDP

Line 21

Line 21

S334 CDP

S334 RAW

☐ Default Priority

S334 CDP

S334 RAW

Line 21

Note: If “Default Priority” is active, the Source Priorities are set as shown in the left picture, i.e. the “Primary Source” is set to provide standard transparency

Time Code:

DVITC

Digital Interval Time Code (SMPTE 266M 2008)

Description

D-VITC is an 8-bit digital data representation of the band-limited analog signal corresponding to the vertical interval time code (VITC) of SMPTE 12M and IEC 60461. The 8 bits of D-VITC shall be carried in the 8 most significant bits of the 10 bits of the ANSI/SMPTE 125M or ITU-R BT.601 coding. Since some equipment may be built using only 8 of the 10 bits, both 10- and 8-bit interpretations of the values are given in this standard, with 10 bits the preferred expression. DVITC is only present in SDTV (525/625).

ATC

Ancillary Time Code (SMPTE 291M 2008)

Description

The acronym ATC refers to ancillary packets carried in the Ancillary space (VANC or HANC) of a digital television data stream, as described in SMPTE 12M-2 (formerly SMPTE RP 188), and payloads of these packets convey LTC or VITC codeword data.

The screenshot shows a software interface for configuring time codes. It is divided into four main sections:

- Detected Time Code:** A table showing the status of detected time codes.

Time Code	Status
ATCLTC	present
ATC-VITC	present
DVITC	present

 Below the table, "DVITC Info:" shows "1:28 1:14".
- Time Code Insertion:** A section with checkboxes for inserting time codes.

Time Code	Insertion
ATCLTC	<input checked="" type="checkbox"/>
ATC-VITC	<input checked="" type="checkbox"/>
DVITC	<input type="checkbox"/>
- DVITC Line Select:** A section for selecting DVITC lines.

Reader	Line
Reader A (625)	19
Reader B (625)	21
Reader A (525)	19
Reader B (525)	21

 There is an "Automatic" checkbox which is currently unchecked.
- Source Priority:** A section for setting source priorities.

Primary Source	Fallback 1	Fallback 2
ATCLTC	ATC-VITC	DVITCA
ATC-VITC	ATCLTC	DVITCA
DVITCA	ATC-VITC	ATCLTC

 A "Default Priority" checkbox is also present and is unchecked.

Detected Time Code:

ATC-LTC, **ATC-VITC** and **DVITC** will be detected if present in the incoming video signal

Detected Time Codes are indicated with "present" with green background. For **DVITC** also the insertion lines are indicated. For **DVITC** two insertions per video signals are possible, normally the second insertion is a duplicate of the first one.

For **ATC-VITC** a **DVITC** Index is shown, indicating the original insertion line of the **VITC** signal, which will be used if converted back to **DVITC**

In the Video Proc Tab a **DVITC** Line Selection for the two **DVITC** Readers per input signal is provided. If a specific line is selected the presence detection will indicate a **DVITC** signal only if present in the selected line.

Selecting **AUTO** will enable a search for **DVITC** signals in any line.

NOTE: An *AUTO* search can take longer (up to 15 seconds)

The screenshot shows a "DVITC Line Selection" window with four dropdown menus:

- Reader A (625): 19
- Reader B (625): 21
- Reader A (525): 14
- Reader B (525): 16

Time Code Insertion:

Activating the respective checkboxes will enable the insertion of the different time codes into the converter output. The three time codes can be generated from different incoming types.

A source priority selection with three levels for the three possible time code types is provided. If the primary source is not present, Fallback1 will be used, if this is also missing as a source Fallback 2 will be used.

Note: If “Default Priority” is active, the Source Priorities are set as shown in the picture above, i.e. the “Primary Source” is set to provide standard transparency

Note: DVITC is only present in SDTV

DVITC Line Select:

DVITC can be inserted twice (Inserter A and B) into the output signal with selectable line numbers (line 6..22). See table below.

Table 4 – VITC Line select number (SDTV interfaces only)

(VITC line select number)					525/60		625/50	
					bit b5 = 0	bit b5 = 1	bit b5 = 0	bit b5 = 1
DBB2 bits b4 through b0					VITC on line N	Repeated VITC on line (N+2)	VITC on line N	Repeated VITC on line (N+2)
b4	b3	b2	b1	b0	field 1/field 2 ³	field 1/field 2	field 1/field 2	field 1/field 2
0	0	1	1	0	—	—	6/319	8/321
0	0	1	1	1	—	—	7/320	9/322
0	1	0	0	0	—	—	8/321	10/323
0	1	0	0	1	—	—	9/322	11/324
0	1	0	1	0	10/273	12/275	10/323	12/325
0	1	0	1	1	11/274	13/276	11/324	13/326
0	1	1	0	0	12/275	14/277	12/325	14/327
0	1	1	0	1	13/276	15/278	13/326	15/328
0	1	1	1	0	14/277	16/279	14/327	16/329
0	1	1	1	1	15/278	17/280	15/328	17/330
1	0	0	0	0	16/279	18/281	16/329	18/331
1	0	0	0	1	17/280	19/282	17/330	19/332
1	0	0	1	0	18/281	20/283	18/331	20/333
1	0	0	1	1	19/282	—	19/332	21/334
1	0	1	0	0	20/283	—	20/333	22/335
1	0	1	0	1	—	—	21/334	—
1	0	1	1	0	—	—	22/335	—

Teletext

WST

World System Teletext

Description

Normally analog information designed mainly for PAL TV. In the context of the P IE 5610 it is an emulation of analogue teletext for digital TV.

S2031 WST

SMPTE 2031: Carriage of DVB/SCTE VBI Data in VANC

Description

This Standard specifies how to carry the digital values resulting from defined standardized data streams carried in MPEG-2 Transport Streams (TS) as specified by either DVB/ETSI EN 301 775 or SCTE 127 (or both) as ancillary data packets in the vertical ancillary data space (VANC).

Note: In the P IE 5610 only teletext data (digital teletext data derived from WST) in the data packets will be detected and processed

OP47 SDP

Free TV Australia Operational Practice OP- 47

STORAGE AND DISTRIBUTION OF TELETEXT SUBTITLES and VBI DATA FOR HIGH DEFINITION TELEVISION

Description

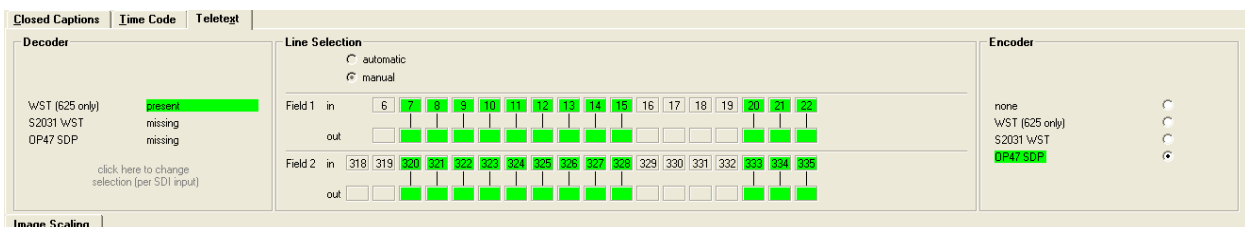
Free TV Operational Practice OP-47 describes the technical/operational practices associated with the storage and distribution of Closed Caption/Subtitling data in the vertical ancillary space of the 10 bit serial HD-SDI signal complying with ITU-R BT.1120-7.

Note: In the P IE 5610 only teletext data (digital teletext data derived from WST) in the data packets will be detected and processed.

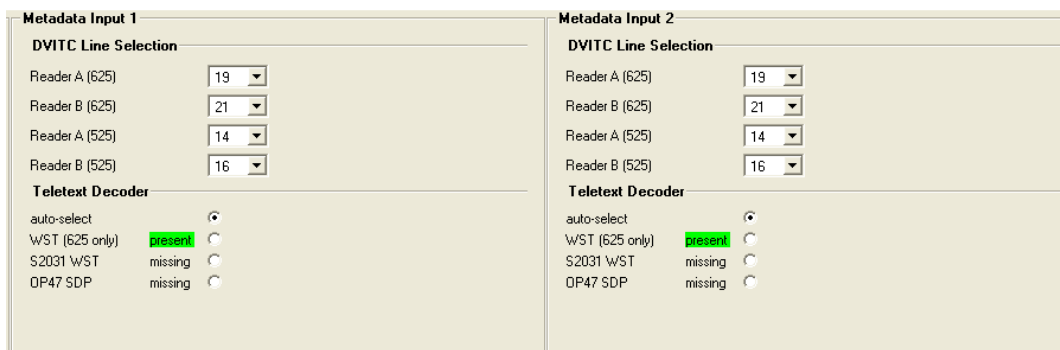
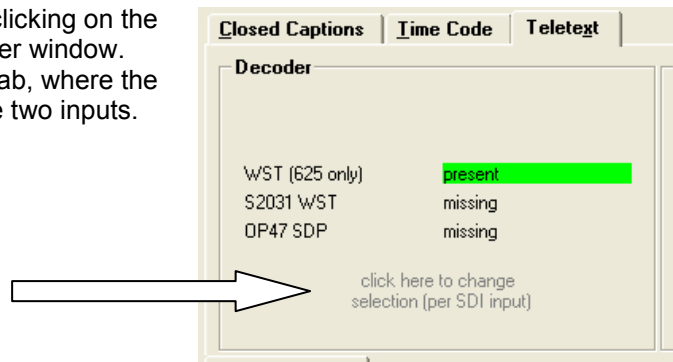
Teletext Decoder

Selecting the teletext tab will show the control window below:

The teletext decoder indicates what type of teletext is detected. A valid teletext is indicated with a green background.

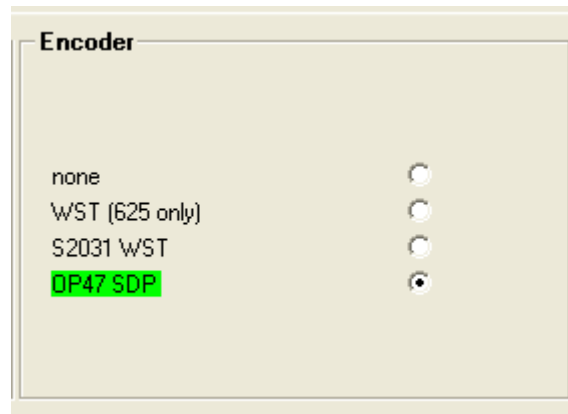


A pre-selection can be set by clicking on the text at the bottom of the decoder window. This will open the Video Proc tab, where the pre-selection can be set for the two inputs.



Teletext Encoder

The encoder is used for the insertion of the teletext data into the respective converter.



If WST teletext data is present / selected then the line numbers containing teletext data on both the input and output are shown. The green designation indicates valid teletext data is present.

Note: If S2031 or OP47 SDP Teletext is detected / selected then no line numbers will be shown

Line Selection

☒ automatic
☐ manual

Field 1 in: 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

Field 1 out: 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

Field 2 in: 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335

Field 2 out: 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335

In automatic mode the output line numbers equal the input line numbers. Manual mode has to be selected to change the output line numbers.

Manual Input to output line mapping can be changed by clicking on the respective line number

Line Selection

☐ automatic
☒ manual

Field 1 in: 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 ⚠

Field 1 out: 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

Field 2 in: 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335

Field 2 out: 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335

The encoder always tries to map the same input line to output line, in our example above line 17 and 19 are not used on the output as they were not used in the input. Clicking on these line numbers would activate their use in the output.

Line numbers in light grey are already occupied by other metadata with analog origin (e.g. DVITC).

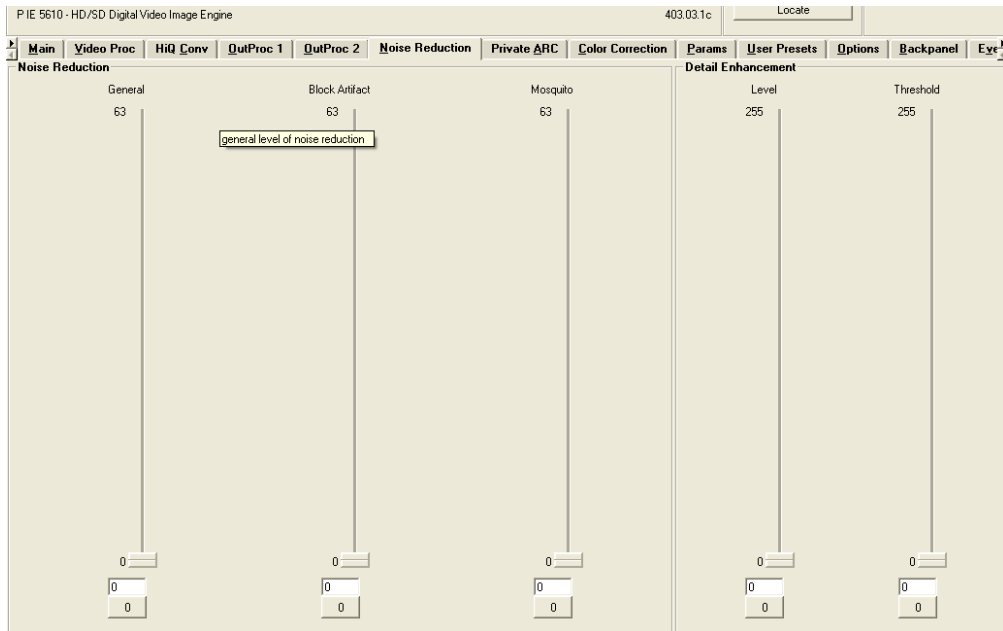
If there is a conflict or problem, (e.g. one line gets lost), a warning in red will be shown as indicated above.

Noise Reduction Tab

High Quality Noise Reduction (OC-5610-NR option)

The OC-5610-NR option is required for the HQ Noise Reduction functionality.

The screen below shows the controls provided for this function..



The adaptive noise reduction function processes the input data in either progressive or interlaced format. Application of noise reduction to noisy interlaced signals can optimize de-interlacer performance.

General Noise Reduction

General noise reduction comprises of both adaptive 2D and 3D noise reduction. 3D noise reduction corrects for temporal and spatial noise; and 2D noise reduction corrects spatial. 3D noise reduction is applied to any interlaced or progressive signal with a pixel rate less than or equal to 75Mp/s. 2D noise reduction is applied to any interlaced or progressive signal. The selection of 2D or 3D noise reduction processing is automatically controlled by the firmware in accordance with the video signal being processed.

Block Artifact Reduction

Block Artifact Reduction (BAR) locates and reduces block edges produced by DCT based compression processing. BAR can be applied to any interlaced or progressive input signal.

Mosquito Noise Reduction

Mosquito Noise Reduction (MNR) dynamically adapts to image content, effectively reducing mosquito artifacts around sharp edges in DCT based compression. It can be applied to any interlaced or progressive signal.

Detail Enhancement (Sharpness and Texture)

The detail enhancement function provides both sharpness and texture enhancement, realized by adaptive horizontal, vertical and diagonal large edge and small edge enhancement processes. Overshoot / undershoot control is provided to minimize ringing on the enhanced edges. In addition, noise rejection is provided to minimize the amount of enhancement applied to the noisy areas of the image.

For ease of use the various controls are combined into two parameters: Level and Threshold

- **Level:** controls the level of the horizontal, vertical as well as the diagonal high pass filtered picture content, which will be added to the original signal again, i.e. the gain of the high frequency content in the signal.
- **Threshold:** This parameter controls the level of signal which is passed through for level control, i.e. all amplitudes in the signal below this threshold will not be used for the detail enhancement.

Color Correction Tab

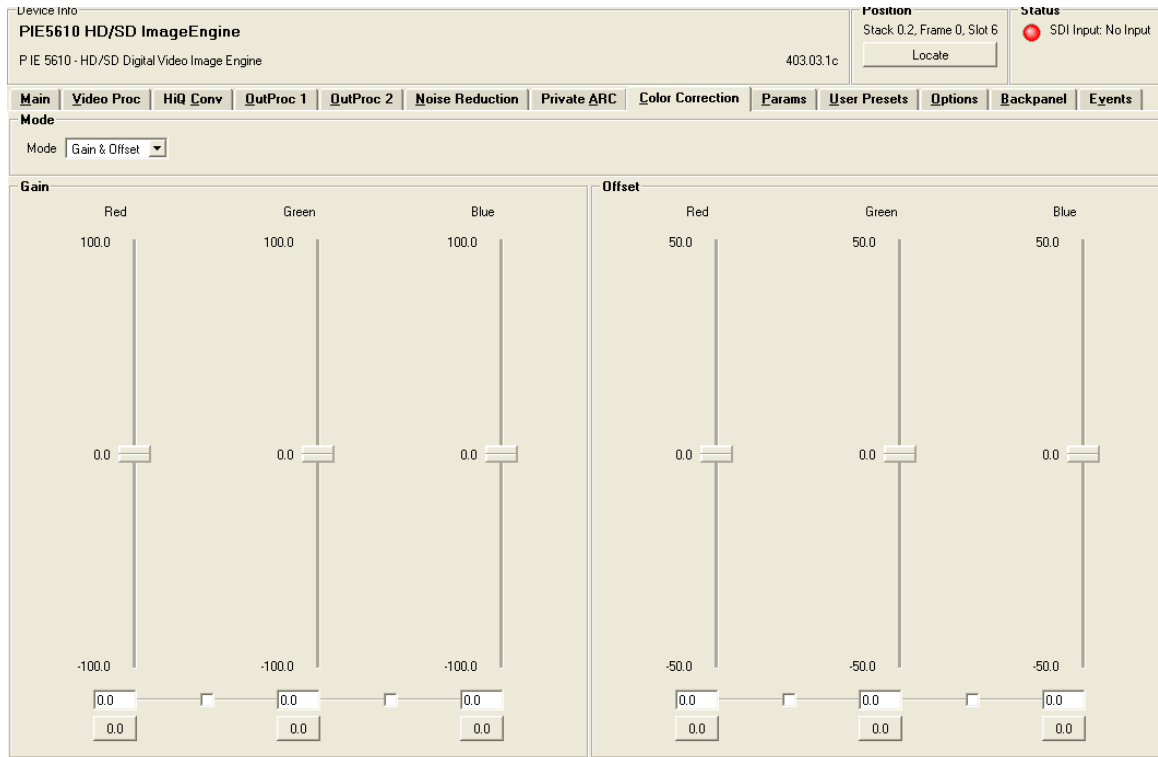
Color Correction (OC-5610-COCO option)

The OC-5610-COCO option is required for the basic Color Correction functionality.

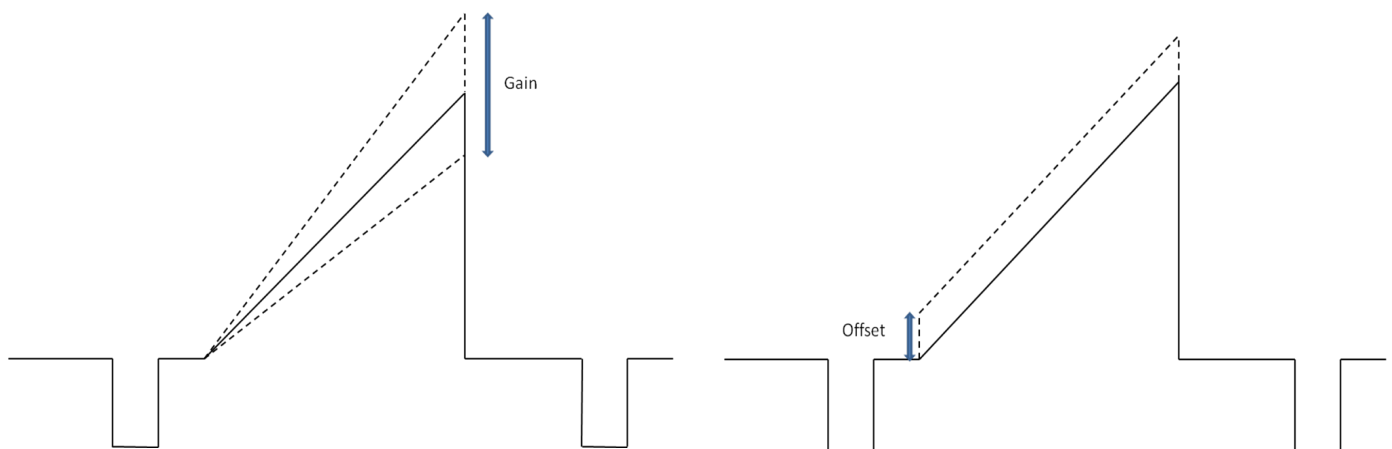
Two Modes of operation are provided: RGB Gain&Offset and RGB Peak&Black. The mode of operation is selected via the drop down menu “Mode” in the upper left corner of the Col or Correction Tab.

Mode Gain & Offset

The screen below shows the controls provided for this function.



Gain amplifies the signal until it is clipped. Offset lifts the black level of the complete signal without impact on the gain.



Mode Peak & Black

The screen below shows the controls provided for this function.

Device Info
PIE5810 3G/HD/SD ImageEngine
 P IE 5810 - 3G/HD/SD Digital Video Image Engine 403.03.1c

Position
 Stack 0.2, Frame 0, Slot 6
 Locate

Status
 OK

Main Video Proc HiQ Conv OutProc 1 OutProc 2 Noise Reduction Private ARC Color Correction Params User Presets Options Backpanel Events

Mode
 Mode Peak & Black

Peak

Red Green Blue

100.0 100.0 100.0

0.0 0.0 0.0

-100.0 -100.0 -100.0

0.0 0.0 0.0

Black

Red Green Blue

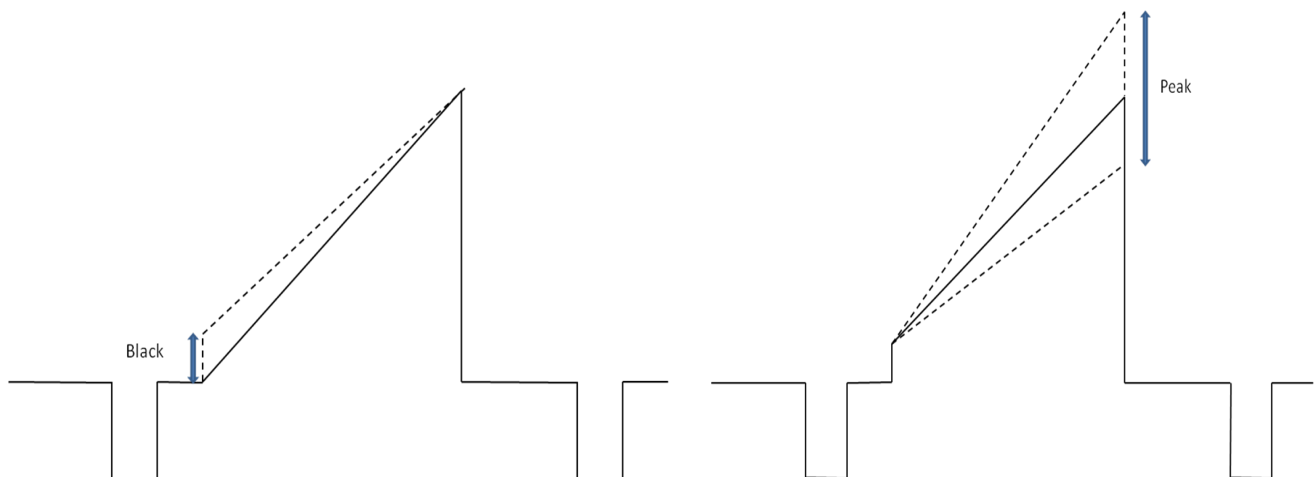
50.0 50.0 50.0

0.0 0.0 0.0

-50.0 -50.0 -50.0

0.0 0.0 0.0

Peak sets the white level of the signal without changing the black level. Black sets the black level of the signal without changing the white (peak) level



Output Proc Tabs

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

Color Space Conversion

Note. This is only active when the conversion option(s) are installed (OC-5610-ARC and/or OC-5610-XUPD)

This is where the color space conversion functionality is configured. This is used to ensure correct color reproduction on the outputs. HD color space is wider than SDTV color space so there is the possibility of some illegal colors being reproduced if the color space is not converted. Possible selections (only for the two down converts, automatic for HD Converter) are:

- Convert (*convert the video signal*)
- Bypass (*perform no conversion*)
- Luma in Bypass (*only convert Chroma portion of signal*)

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

Clip CR/Cb Headroom

If activated all Luminance (Y) values below 64 and above 940, and all Chrominance (Cr,CB) values below 64 and above 864 will be clipped.

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 Output Delay Adjustment

Each video output can be delayed relative to the reference sync up to a maximum of 3 frames. This is usually used for downstream system timing applications. The delay is adjustable in the following increments:

- Frames
- Lines
- Pixels or
- Total Delay in ms

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

If the option

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

Note *With the option OC-5610-VDLY the manual delay range will be extended to 12 frames per output*

Note: *Using the “Fixed Processing Time Time” makes sure the processing delay is always the same (max.delay). This function can be activated in the “OutProc” Tab of the respective output or on the “Timing” Tab.*

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)

Output if no input

Here the behavior of the P IE 5610 can be selected if no input is present

- Freeze
- Black
- Test Pattern

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

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 as 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)
- Fixed standards (half, same or double or current reference frame rate)

Test Pattern Enable

This checkbox simply switches on the pre-selected test Pattern. Activated test pattern will be indicated on the **Main** Tab.

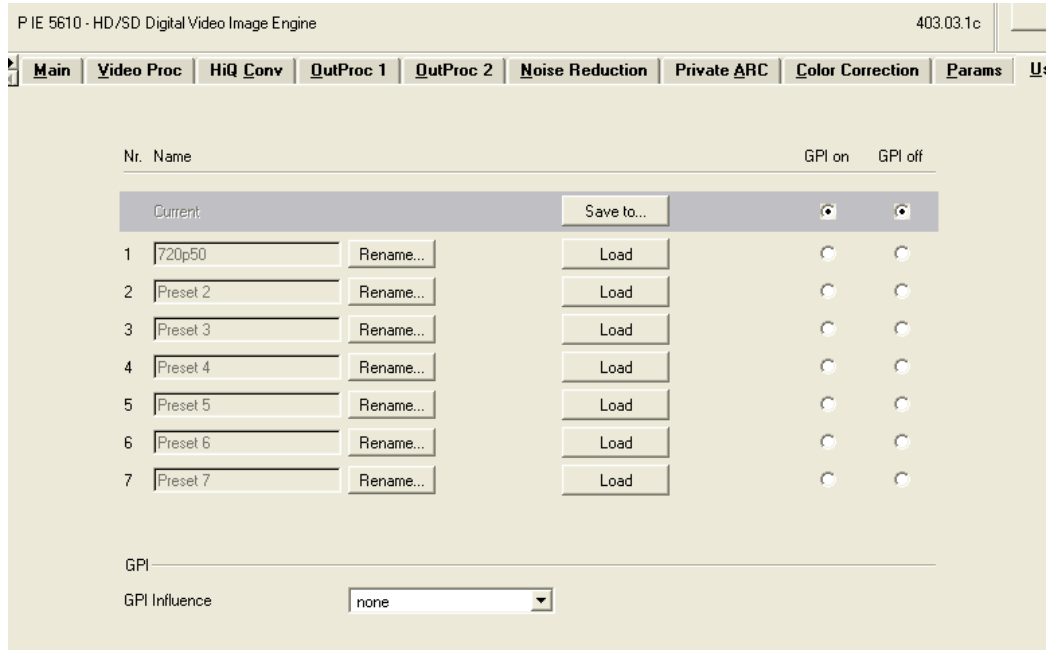
Video Adjustments

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.

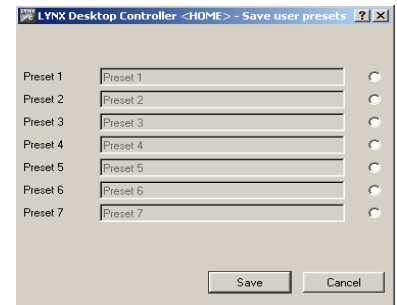
User Presets Tab

This Tab allows the user to store and recall 7 sets of additional module presets (settings), and also configure GPI switching between any two of the 3 stored presets and / or the current module settings (8 total). The presets are stored in module flash ram and will survive power cycles.



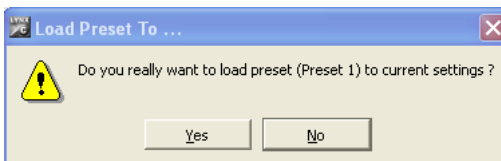
To save a preset

1. First make all the module settings required using the various settings provided for the module.
2. Click the button "Save To" to switch up the dialog box:
3. Using the radio button to select the preset location you wish to save the settings to and type in a name.
4. Click "Save" and the all the current module settings are stored in the named preset.
5. Use the "rename" button to rename any stored preset



To load a saved preset

To load a saved preset into the module simply click on the "load" button adjacent to the preset, this will show the dialog shown below asking you to confirm your selection (as this will overwrite any current stored module settings)



Setting GPI control of Preset selections

In some cases its desirable to switch quickly between two sets of stored presets, this can be achieved using the external GPI trigger

1. Next to each preset there are two radio buttons which allow for the selection of GPI switching

Nr.	Name	GPI on	GPI off
	Current	<input checked="" type="radio"/>	<input type="radio"/>
1	Preset 1	<input type="radio"/>	<input type="radio"/>
2	Preset 2	<input type="radio"/>	<input type="radio"/>
3	Preset 3	<input type="radio"/>	<input type="radio"/>
4	Preset 4	<input type="radio"/>	<input type="radio"/>
5	Preset 5	<input type="radio"/>	<input type="radio"/>
6	Preset 6	<input type="radio"/>	<input type="radio"/>
7	Preset 7	<input type="radio"/>	<input type="radio"/>

GPI Influence: none

2. Simple select any two of the stored presets and the required GPI polarity.
3. Set the GPI influence to “switch user presets” the presets are now toggled based upon the polarity external GPI input signal.
4. The active Preset is indicated by the grey bar behind the Preset (in the picture above behind the “Current” preset)

Note: If a Preset (except “Current”) is active, all control parameters for the P IE 5610 are greyed out.

GPI Influence

The drop down box for GPI influence is used to set the function of the GPI input, in this case we have configured the GPI to switch between 2 stored presets. Other settings include:

- None
- Freeze input 1
- Switch user presets
- Switch Private ARC

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.

P IE 5610 - HD/SD Digital Video Image Engine 403.03.1c Locate

Main Video Proc HiQ Conv OutProc 1 OutProc 2 Noise Reduction Private ARC Color Correction Params User Presets Options Backpanel Exit

Activation of optional features for this Device

Status	Name	Description	
active	OC_5610_NR	Noise Reduction	request code
active	OC_5610_ARC	SDTV ARC Function	request code
active	OC_5610_UPXD	Up/Cross/Down Converter	request code
active	OC_5610_VDLY	Video Delay	request code
active	OC_5610_CDCD	Color Correction	request code

Enter license code for activation: Activate

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.

Activate or deactivate event notifications by clicking the "event enable" boxes.

Enable and disable entry into the logfile for status changes of any event to active ("ON") or to inactive ("OFF") by selecting the respective "log in GUI" boxes.

event enabled		log in GUI (on/off)	SNMP Trap (on/off)
<input checked="" type="checkbox"/>	SDI Input 1: No Input	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
<input checked="" type="checkbox"/>	Fan Failure	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
<input checked="" type="checkbox"/>	High Temperature	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>

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 chose 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	See table on page 8
No. of inputs	1
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	See table on page 9
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) < 0.2UI (1.485GHz, 100kHz)
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 (3)
Color space conversion	601 > 709 or 709 > 601 or transparent (selectable) Note. Requires conversion option(s)
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.

