

# Series | 5000<sup>®</sup>

## Reference Manual PVD 5400 0

### 12G-SDI Frame Synchronizer

Revision 1.1 – May 2025

This Manual Supports Device Revisions:	
PVD 5400 Firmware Revision	1249
LynxCentraal	1.8.0
APPolo Server	8.22.0

**LYNX**Technik **AG**<sup>®</sup>  
Broadcast Television Equipment

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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 three (3) 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: <b>PVD 5400</b>	
<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 60950-1 /2006	
<i>Following the provisions of 2014/30/EU and 2014/35/EU directives.</i>	
	
Weiterstadt, Nov 2024	Winfried Deckelmann

### 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.

## ESD Warning



This product is static sensitive. Please use caution and use preventative measures to avoid static discharge that could damage the card 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.

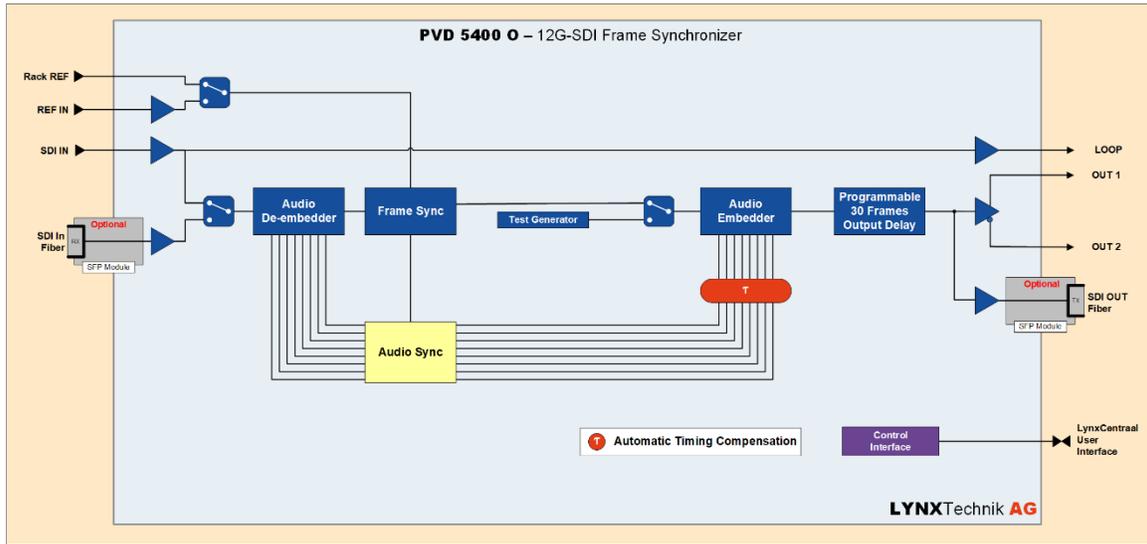
## Product Description

The PVD 5400-O is a high-performance 12G-SDI multi-format frame synchronizer designed for professional broadcast and production environments. It is an evolution of the PVD 5800-O 3G-SDI. The PVD 5400-O is a 12G-SDI card that supports video formats up to 4K 2160p60. It can embed up to 64 audio channels, doubling its predecessor's capacity. Remote management is done exclusively through the LynxCentraal application, making it ideal for centralized control setups in modern workflows. Its robust frame synchronization algorithms ensure seamless performance, even under challenging signal conditions, while its versatile synchronization modes cater to applications requiring precise timing or minimal latency.

The PVD 5400-O offers extensive audio embedding/de-embedding and adjustments, including gain, phase invert, mute, stereo-to-mono mixdown, overload and silence detection for audio fine-tuning. Integrated with a programmable delay feature, the module provides up to 30 frames of delay adjustment for precise alignment. For audio, it supports up to 64 channels ensuring clear and synchronized audio output, even during frame rate mismatches or signal interruptions. The integrated test pattern generator and freeze-frame functionality enhance operational stability, making it a reliable solution for demanding workflows.

Installation is straightforward, with the module occupying a single slot in the Series 5000 Card Frame and requiring minimal physical setup. All configuration and monitoring are handled via the LynxCentraal application, which provides intuitive access to synchronization settings, video and audio adjustments, and error logging. LED indicators on the module offer quick visual feedback on system status for on-site troubleshooting. The PVD 5400-O is a robust, scalable, and reliable tool for managing high-bandwidth video workflows, providing unparalleled flexibility and performance for modern broadcast applications.

# Functional Diagram



## Supported Video Input Standards

### 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.

Currently this module supports 4:2:2 YCbCr 10bit signals.

SMPTE 292M (1.5G-SDI)	720p						50	59.94	60
	1080i						50	59.94	60
	1080p	25	29.97	30					
SMPTE 424M (3G-SDI)	1080p						50	59.94	60
SMPTE 2081 (6G-SDI)	2160p	25	29.97	30					
SMPTE 2082 (12G-SDI)	2160p				47.95	48	50	59.94	60

### Output Video Formats

Output Video Formats are identical to Input Video Formats.

The output format frequency (or frame rate) is determined by the connected reference signal and the output will remain fixed to this reference regardless of the connected input signal.

For input signals mismatched with the connected reference frame rate, the synchronizer will show this as an asynchronous source (indicated by a yellow status indication in the GUI) and any output signal derived from this "async" source can show video disturbances.

## Input Reference Signal

The PVD 5400-0 features a highly adaptable input reference system that supports both SDTV analog bi-level sync (commonly known as black burst) and HDTV analog tri-level sync. This flexibility includes "cross-lock" compatibility, which means you can use an SD reference signal to synchronize HD outputs or vice versa. The module automatically detects the type of reference signal connected and ensures seamless synchronization without manual intervention.

Supported reference signals are shown below.

Sync Signal	Standard								
SD Analog Bi-level Sync	525							59.94	
	625						50		
	720p	23.98	24	25	29.97	30	50	59.94	60
HD Analog Tri-Level Sync	1080i						50	59.94	60
	1080p	23.98	24	25	29.97	30			
	1080psf	23.98	24	25					

## Reference Lock

For the PVD 5400-0 to operate seamlessly without any limitations, the input frame rate, output frame rate, and reference signal frame rate must either be identical, exactly half, or exactly double that of one another. When these conditions are met, the system synchronizes perfectly across all modes. Here's how synchronization behaves under these conditions:

- For input frame rates of 25 Hz or 50 Hz, the system will synchronize to any reference signal running at either 25 Hz or 50 Hz.
- Similarly, input frame rates of 30 Hz or 60 Hz will synchronize to reference signals of the same rates (30 Hz or 60 Hz), with output rates also configurable to match
- For broadcast-standard frame rates like 29.97 Hz and 59.94 Hz, the system synchronizes to reference signals of the same values, and the output can be set to either 29.97 Hz or 59.94 Hz as required.
- Frame rates of 23.98 Hz align with a 23.98 Hz reference signal, and the output can match this frame rate precisely.
- Likewise, 24 Hz inputs synchronize to a 24 Hz reference signal, and the output can be set to this standard as well.

If the reference frame rate does not meet these relationships (equal, half, or double), most functionality remains operational. However, the programmable video delay feature will not function as expected since the output frame rate cannot synchronize fully with the reference.

## Frame Synchronization

The PVD 5400-0 employs highly reliable algorithms for frame synchronization, designed to handle even poor-quality input signals with exceptional resilience. One key feature is its "Flywheel" functionality, which intelligently compensates for missing synchronization pulses in the input signal. By accurately predicting the timing of these missing pulses, the module seamlessly restores them, ensuring a stable and uninterrupted output.

## Video Processing

### Video Adjustment Functions

The output channel has an associated video processing amp which provides user-adjustable **Gain** / **Saturation** / **Black Level** and **Hue** using on-screen slides.

### Aperture Correction

An adjustable horizontal aperture corrector is provided. This can be used to add (or remove) image sharpness as required.

### Test Patterns

The output processor provides a test pattern generator with a wide range of test patterns to choose from.

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:

Transparent, Freeze, Black, Test pattern.

### Programmable Output Delay

The SDI output has a separate programmable video output delay which can be set (independently) between 0 and 30 frames (max). The adjustment is available in pixel, line and full frame increments or can be switched to a ms increment entry.

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

## Audio Processing

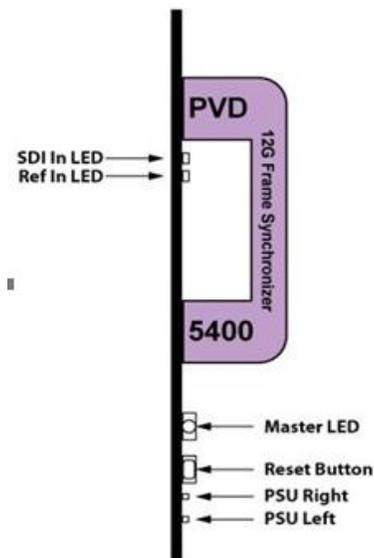
The module will de-embed the complete audio payload from the incoming SDI stream signal, i.e. up to 16 AES groups = 32 AES channels.

The type of audio (PCM or Audio Data) is detected by the module automatically.

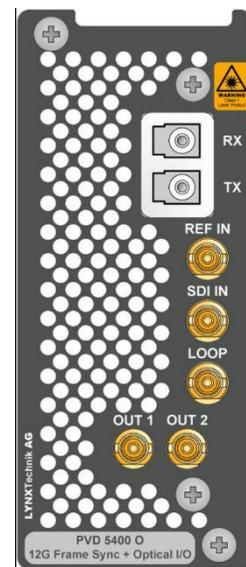
The audio is fed through sample rate converters (SRCs) where the audio is re-sampled and synchronized.

PCM Audio using the sample rate converters will be free from any audio interference (“pops and clicks”) when frames are dropped or repeated by the frame synchronizer.

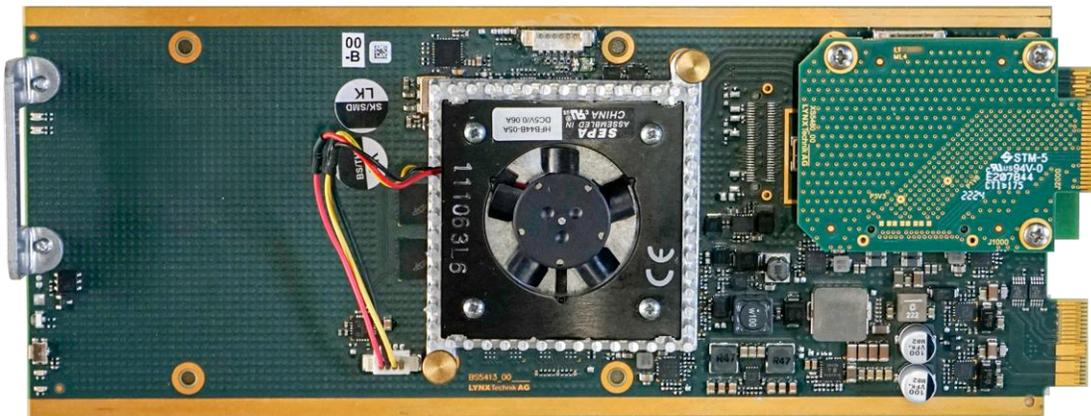
## Module Layout



Module Front



Module Rear Termination Panels



## Connections

### Video

The PVD 5400 uses standard 75 Ohm BNC connectors. We recommend the use of high-quality video cables for digital video connections to reduce the risk of errors due to excessive cable attenuation. The maximum cable lengths the module will support are shown below.

SDTV	250m	Belden 8281 (270Mbits/s)
HDTV	140m	Belden 1694A (1.4Gbits/s)
3GBit/s	80m	Belden 1694A (2.97Gbits/s)
12GBit/s	60m	Belden 4794-R (11.88Gbits/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.

### Optional Fiber (PVD 5400 O)

PVD 5400 O provides optional LC/PC connectors for single-mode fiber cables.

The fiber interfaces can be selected from a variety of different SFP-style modules. Also, an SFP module can be selected from all 18 CWDM wavelengths.

LYNX also provides Multimode SFPs for use with Multimode fiber cables, but this will limit the maximum fiber length to approximately 1km.

**Note:** Please ensure that the surfaces of fiber cables and LC connectors are always protected against scratching and dust when no fiber cables are connected. Dust and/or scratches will lead to high attenuation of the optical power transmitted.



## 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 the card. Please see ESD warnings on Page 7.*

This module has a single-width rear connection panel, it will occupy one slot of a standard Series 5000 Card Rack. This is to accommodate the additional connections needed for this module and to provide adequate space for cooling in the rack. Up to ten PVD 5400 modules can be accommodated in a single Series 5000 rack frame.

**Note:** *When using this module, the RFR 5018 Fan Front Rack Frame should be used, which provides additional airflow into the rack.*

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 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 to 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 illumination. 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.*

## Settings and Control

The PVD 5400 has an integrated microcontroller, which enables the module to be configured and controlled locally via remote when using one of the optional controllers and LynxCentraal software.

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

### Auto Store

If no parameters are changed for 10 seconds, then the current settings will be written into the flash memory automatically. This can be seen by the channel status LEDs flashing yellow three times.

### Reset Button

If this button is pressed for 5 seconds all parameters will be reset to their factory default settings. To confirm this reset, the device will blink all LEDs once (OFF – ON – OFF) and then return to their normal state.

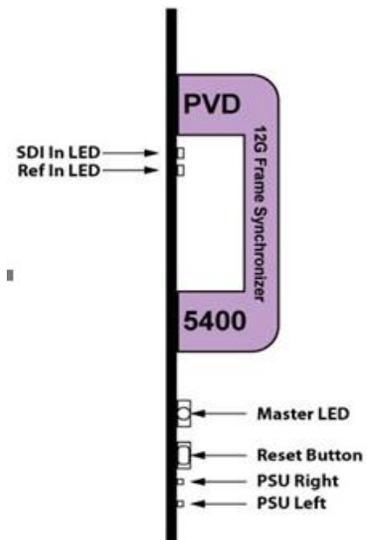
### Alarm/LED Status Indicators

The PVD 5400 module has integral LED indicators, which serve as alarm and status indications for the module. The function is described below.

#### REF Status

This LED indicates the status of the Reference signal

LED Color	Indication
Green	REF present and ok
Yellow	REF missing, but not required (self-lock on SDI input) REF ok, but not matching a fixed frequency setting (odd/even)
Red	REF missing



## SDI Status

This LED indicates the status of the audio input signals

LED Color	Indication
Green	SDI input ok
Yellow	frequency mismatch (see LEDs 1 and 2 above)
Yellow (blinking)	Locate device activated from GUI
Black, triple yellow flash	Save settings to flash of on-board microcontroller
Red	SDI or REF missing

## Master LED

The LED on the lower edge of the module indicates the presence of power supply voltages (main power supply and redundant power supply), and the locate option.

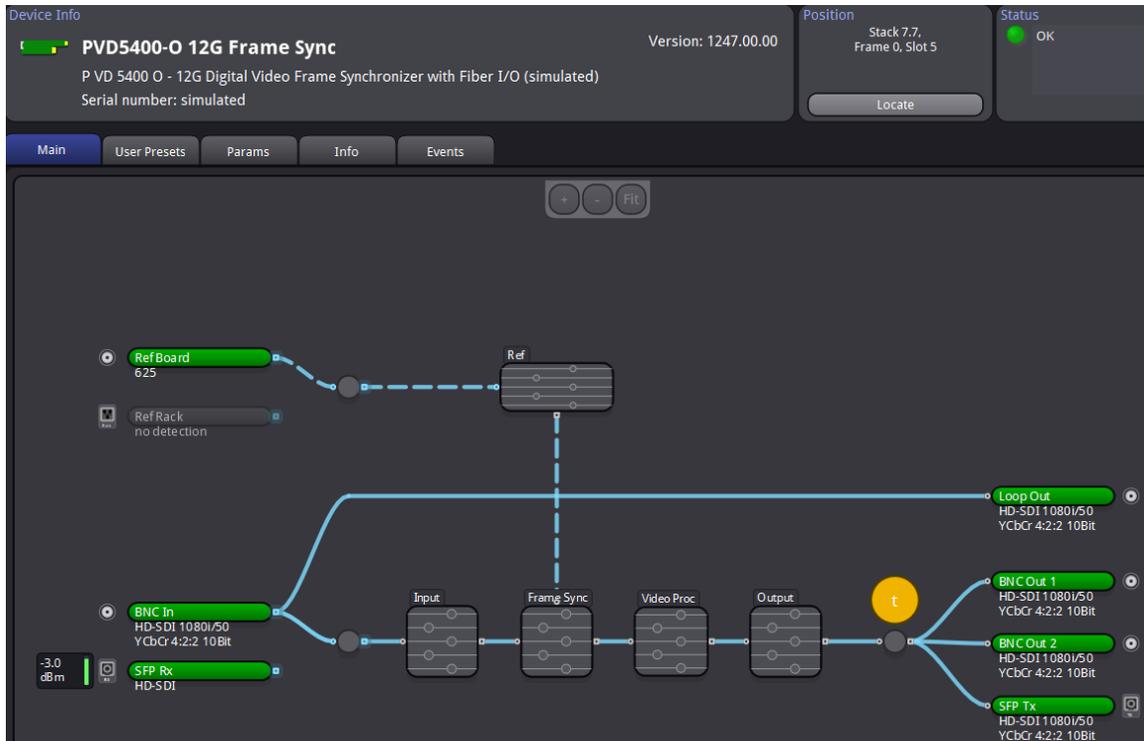
LED 1	Indication
Green	Power from Main PSU is ok
Red (blinking)	<ul style="list-style-type: none"><li>• Fan Failure</li><li>• Over Temperature</li><li>• Wrong backplane</li></ul>

## Control System GUI

All LYNX Card Modules can be configured using the LynxCentraal application. Access to all standard and extended features is possible using the graphical user interface.

**Note:** All settings are stored in an internal flash RAM and will survive power cycles and long-term storage.

The following LynxCentraal screenshots and descriptions shown below describe the settings and adjustments possible for the PVD 5400 Card Module.



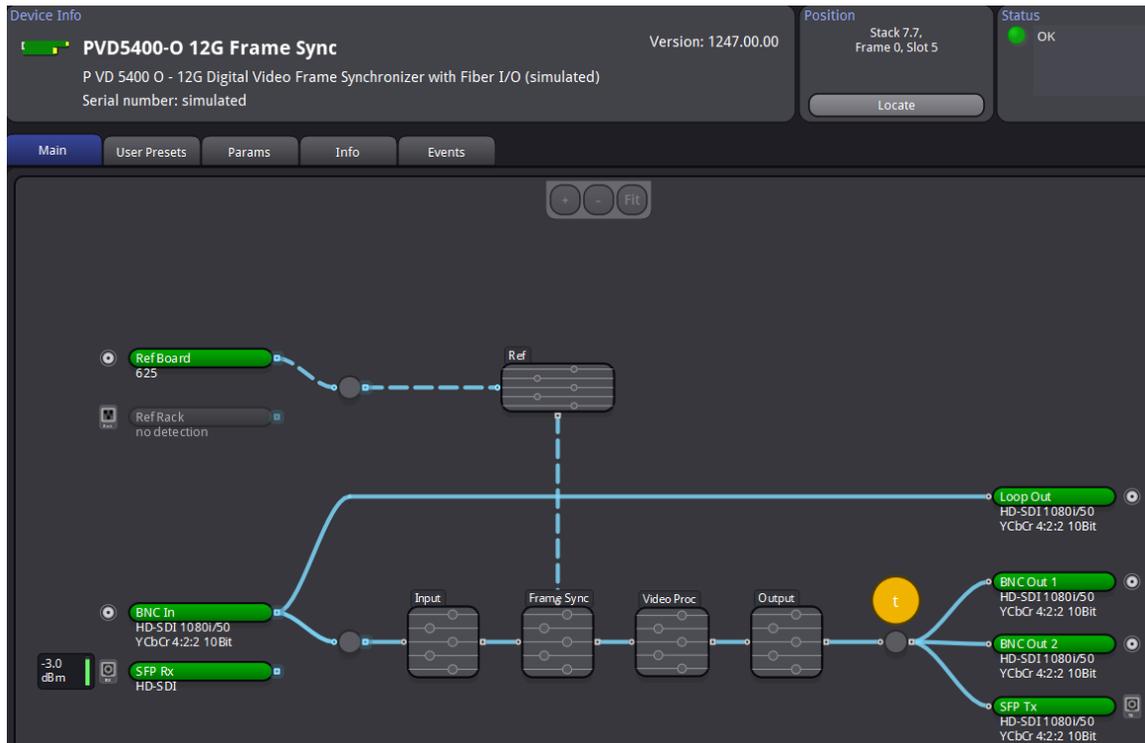
The above screenshot shows the complete module GUI. The Device info area contains information about the module including name and firmware revision. If used as part of a larger system (using the LynxCentraal control system) the module's position and physical location is displayed above the "locate" button.

**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 affect module operation)

The first screen displayed when the module is selected is the **Main Tab**. This is a graphical representation of the module's 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.

There are several "Tabs" along the top of the screen which split up the module settings into several 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. 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. Parameters are displayed in different colors to reflect their status (green = good, red = problem, yellow = caution etc.).

The SDI input can be switched between optical input(option) and electrical input. used as a video delay line.

### Selecting Functions

Functions of the module can be selected by clicking on the tabs on top of the screen or by clicking directly into the respective box (Sync and Video Proc).

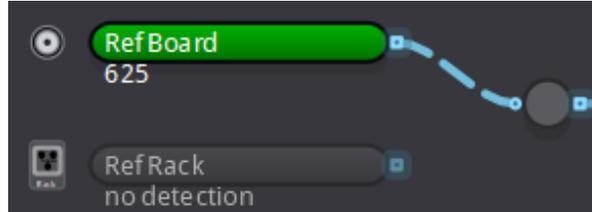
### General Video Settings

The first area covers some General setup parameters for the external reference operation.

## External Reference Source

It is possible to take the external reference signal from two sources. Either from the common rack reference (*an external reference connection to the rack frame which is fed to all cards installed in the rack*) or via the BNC connection provided on the module rear connection panel. Selections provided are:

- External (board) = Via module rear connection panel
- Internal (rack) = Common rack reference



## Frequency Pre-select

The frame synchronizer output frequency can be locked to a specific frame rate, ensuring the output remains constant regardless of any changes to the connected reference signal. This prevents the output frame rate from automatically tracking or adapting to variations in the reference standard, providing stability in the output.



However, if the input reference signal changes, the video output may experience frame repetition, frame drops, or jitter to reconcile the mismatch while maintaining the locked frame rate. It is also possible for the synchronizer to configure the output frame rate based on the connected reference. This is the default setting. Possible settings are:

- Even (24, 25, 30 or 50 Hz)
- Odd (23,98, 29,97 or 59,94 Hz)
- Follow (last) reference (default)

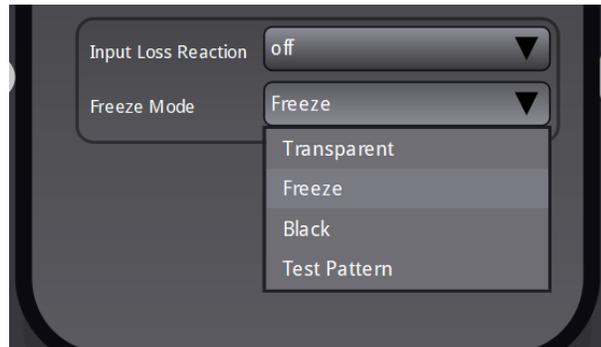
**Note:** The synchronizer is supplied by the factory with the last stored reference as 50Hz. With no reference connected, it is possible to change the last stored reference to something else. Simply select the desired fixed frequency and then re-select “follow last reference”. Now the module will use this new setting through a power cycle.

Also, this value will not be restored to 50Hz following a “Restore Factory Defaults” operation, the stored setting will be preserved.

The “Current Frequency” area shows the frequency the frame synchronizer is running in currently (useful if the *follow last reference* selection is made)

## Freeze Mode

This is where the reaction of the synchronizer is defined in the case of excessive video errors (TRS Errors). The output can be configured to freeze ("Freeze on TRS Error") or pass the input signal transparently when excessive errors are encountered. If configured to pass video transparently ("Transparent") then all video errors and disturbances are passed from the input to the output.



The synchronizer is very robust in its ability to handle poor-quality input signals but there may be occasions where excessive errors cannot be recovered by the synchronizer. This is generally qualified by TRS errors. TRS means "Timing Reference Signals" and is a sequence of digital values embedded in the SDI data streams. If the frame synchronizer cannot recover these errors, then the channel will freeze the video until the errors can be recovered. One function of the synchronizer is to repair any bad TRS values, ensuring a stable and technically correct video stream is delivered on the outputs. Selections for each channel are as follows:

- Transparent
- Freeze
- Black
- Test Pattern

## Input in Sync / Synchronous SDI Input (minimum audio delay)

If activated the embedded audio-to-video delay at the output is always minimal. This should be used for clock-synchronized signals only, because the audio is automatically delayed compensating for the AV delay, which can cause audio disturbances with asynchronous sources.

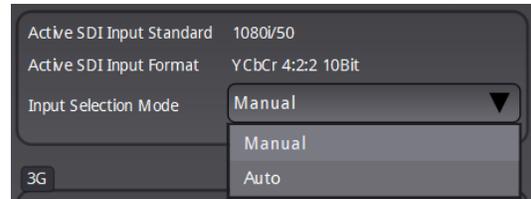
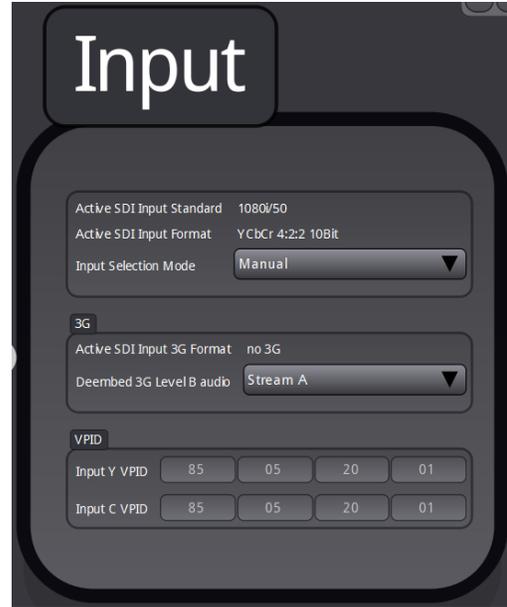
## Input Combo-Box

This is where all incoming signals are detected with option of automatic or manual input selection mode. 3G level A+B audio can be de-embedded here too. VPID metadata information is also shown here.

## Input Selection Interface

This provides detailed information and control over the active SDI input settings. This section allows users to monitor the current input standard and format, as well as define how input sources are selected.

- **Active SDI Input Standard:** Displays the current SDI input standard being used. For example, "1080i/50" indicates an interlaced 1080-line video signal with a frame rate of 50 Hz.
- **Active SDI Input Format:** Shows the active video signal format. The displayed format "YCbCr 4:2:2 10Bit" represents a professional video format with 10-bit color depth and a chroma subsampling ratio of 4:2:2.
- **Input Selection Mode:** Provides two operational modes for input source selection:
  - **Manual:** The user manually selects the desired input source, ensuring precise control over the input configuration.
  - **Auto:** The module automatically detects and selects the appropriate input source based on the available source signals.



## 3G

The 3G Input Configuration Interface allows users to monitor and manage 3G-SDI input settings for the PVD 5400-O module.



- **Active SDI Input 3G Format:** Indicates whether the incoming SDI signal is in 3G format. In this case, "no 3G" shows that no 3G signal is currently detected or active.
- **De-embed 3G Level B Audio:** This setting determines which audio stream is selected when working with a 3G Level B input signal. The available options are **Stream A** and **Stream B**, corresponding to the two multiplexed audio streams in a 3G Level B signal.

## Input Y & C VPID Display

The VPID Input Configuration Interface displays and manages the Video Payload Identifier (VPID) information for incoming video signals.

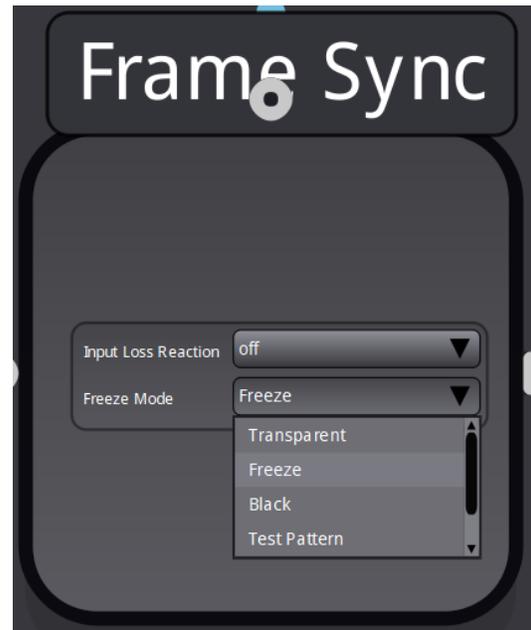


- Input Y-VPID: Shows the VPID values associated with the luma (Y) component of the incoming video signal. The four displayed hexadecimal values (e.g., "85 05 20 01") define the signal's characteristics, such as resolution, frame rate, and format.
- Input C-VPID: Displays the VPID values for the chroma (C) component of the input signal, which should align with the Y component but is independently identified.

## Frame Sync Combo-Box

The Frame Sync Interface allows the user to define how the PVD 5400-O module responds when it detects a loss of input signal.

- **Input Loss Reaction:** This setting lets the user choose the module's behavior in the event of an input signal loss.
- **Freeze Mode:** When **Freeze** is selected in the Input Loss Reaction, this setting determines how the freeze function operates. Available options include Transparent (passing through any signal errors), Freeze (freezing the last valid frame), Black (outputting a black screen), or Test Pattern (activating a predefined test pattern).



## Video Proc Combo-Box

The Video Proc Interface provides tools to adjust video parameters and apply basic processing settings for the PVD 5400-O module. A user can adjust Gain, Saturation, Black Level, and Hue using sliders, which offer precise control over each parameter.

Also included is a checkbox for enabling or disabling Horizontal Flip (H-Flip) and Blanking settings (H-Blanking and V-Blanking), allowing for custom video signal manipulations.

Additionally, a Test Pattern Generator can be activated, letting users select a test pattern and define its standard (e.g., follow last input or fixed settings). The Aperture Correction slider enables adjustments to video sharpness, with positive values increasing sharpness and negative values softening the image. This comprehensive interface is ideal for fine-tuning video output to meet professional quality standards.



## Clip to Narrow

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 Flip

A checkbox selection is provided for H (Horizontal) flip. When selected the video will be flipped horizontally. This is useful e.g. for virtual studio applications to have a mirrored picture for the speaker.

## H and V Blanking

Checkboxes are provided to enable **Horizontal (H)** and **Vertical (V)** blanking. When either option is selected, the video output replaces the existing data in the corresponding blanking intervals with new blanking, effectively clearing any previously embedded information in those areas.

## Test Pattern

### Test Pattern Enable

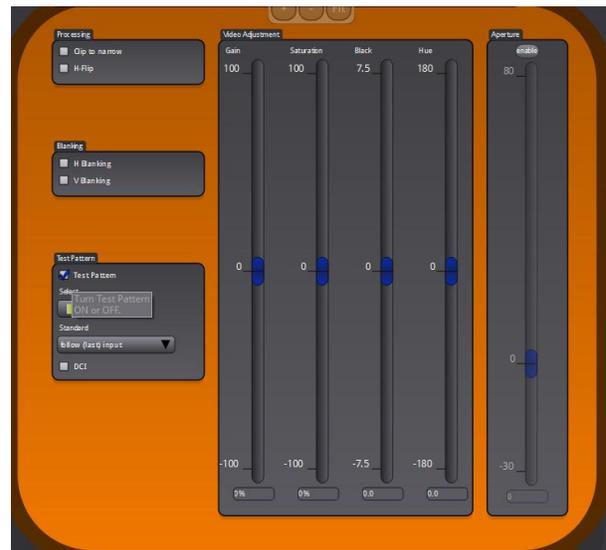
This checkbox simply switches on the pre-selected test Pattern. Activated test pattern will be indicated on the **Video Proc** Combo-box and will turn Orange.

The video output will have the standard and test pattern pre-selected (which will overwrite any information at the output). The switching of even and odd standards can be done just by changing the Frequency Pre-select in the reference node.

### Test Pattern Pre-Select

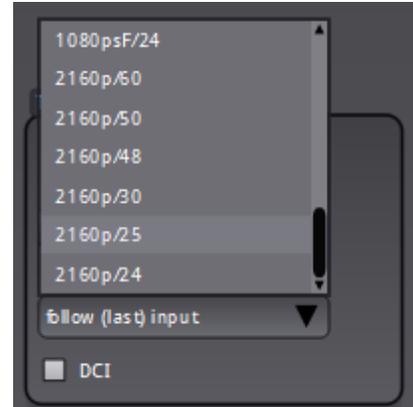
A wide range of patterns is provided which can be selected using the drop-down selection provided. The pre-selected pattern is used when the freeze mode is set to "test pattern" and when "test pattern on" is selected. The following options are available:

- White
- Yellow
- Cyan
- Green
- Magenta
- Red
- Blue
- Black
- Colorbar
- White/black
- Colorbar over red
- EQ/PLL path.
- EQ path.
- PLL path.
- Grey 15%



## Standard

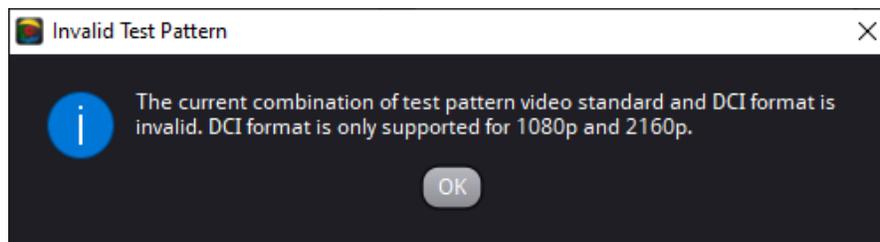
This section has a wide range of standard and frame rates, from 525, 625 to 2160p. Additionally, there is an option of choosing the last selected input standard (follow last input) as your output standard.



## DCI

DCI (Digital Cinema Initiatives) mode ensures compliance with industry standards for digital cinema playback, supporting video formats specifically designed for 2K (2048x1080 pixels) and 4K DCI (4096x2160 pixels) resolutions.

If an interlaced or mismatching signal is selected as the test pattern and the DCI checkbox is activated, this will be invalid, and a pop-up info box will be displayed with the supported formats (See image below)

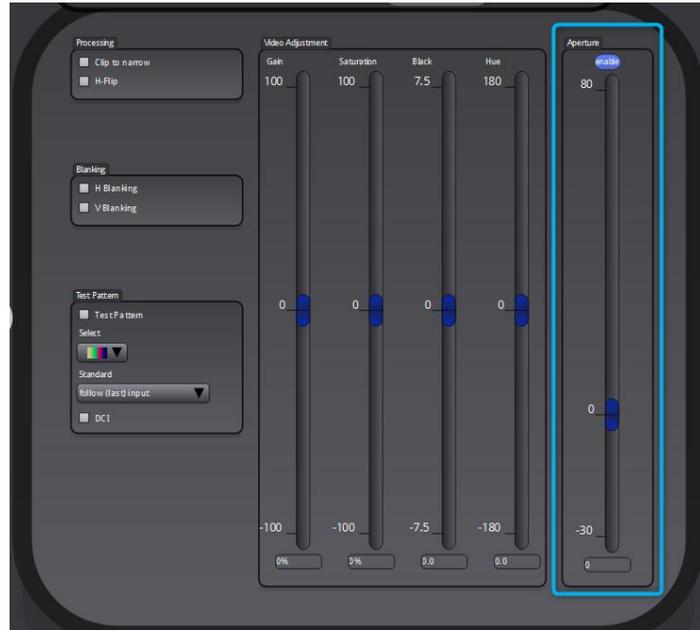


This popup message indicates that the selected test pattern or video standard is incompatible with DCI mode, which supports only 1080p (2K) and 2160p (4K) resolutions. To resolve the issue, ensure the test pattern or video standard is adjusted i.e 1080p for 2K and 2160p for 4K to match one of these DCI-supported formats before proceeding.

## Video Adjustment

This section provides controls for fine-tuning video output parameters using adjustable sliders, each accompanied by a numeric value for precision.

- **Gain:** Adjusts the overall brightness of the video signal. The range is from -100 to +100, with 0% as the default value.
- **Saturation:** Modifies the intensity of colors in the video. The range is also -100 to +100, with 0% representing no alteration.
- **Black:** Alters the black level of the video, affecting the overall contrast. Adjustments range from -7.5 to +7.5, with 0.0 as the neutral setting.
- **Hue:** Changes the hue or color tone of the video, allowing rotation within the color spectrum. The range is -180 to +180, with 0 representing no change.
- **Aperture** : It fine-tunes the video sharpness using a slider with a range from -30 to +80, where positive values enhance edge clarity and negative values soften the image. The enable checkbox activates adjustment, ensuring the feature is applied only when needed for precise output customization.



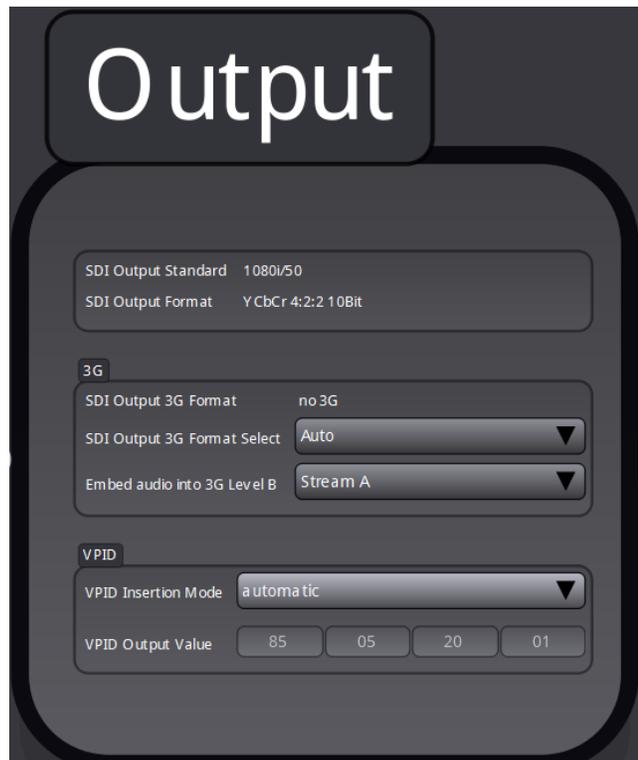
**Note:** Aperture correction OFF is the same as a Zero setting in the adjustment range

## Output Combo-Box

The Output Configuration Interface allows users to control and customize the SDI output settings. The SDI Output Standard and Format displays the active resolution and color format (e.g., 1080i/50, YCbCr 4:2:2 10Bit).

For 3G SDI, users can select the output format mode (Auto, Level A, or Level B - Dual Link) and specify which audio stream (Stream A or Stream B) to embed in the Level B format.

The VPID section provides the option to either automatically generate VPID values or manually define them, ensuring compliance with specific workflow requirements.

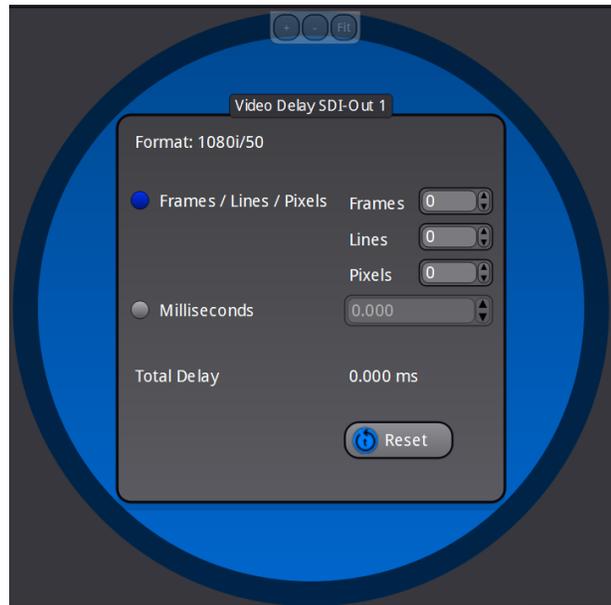


## Output Timing Node

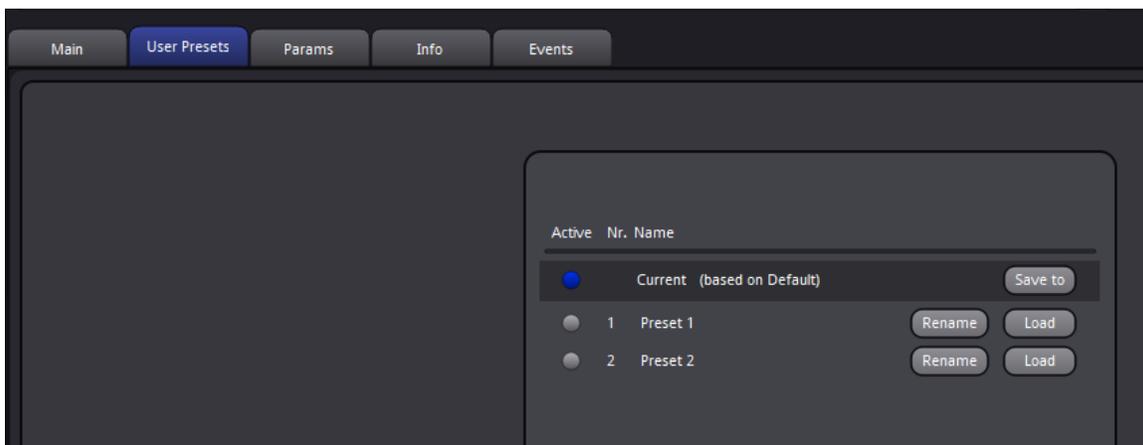
The Video Delay Configuration Interface allows precise adjustment of the output delay for SDI signals on the module. Users can specify the delay in terms of Frames, Lines, and Pixels, or switch to milliseconds for more granular control, depending on the requirements of the workflow. The timing node will turn orange to indicate modified delay settings.

The total calculated delay is displayed in milliseconds, helping to verify the cumulative delay applied.

The **Reset** button restores the delay settings to zero, ensuring a quick return to default values when needed.



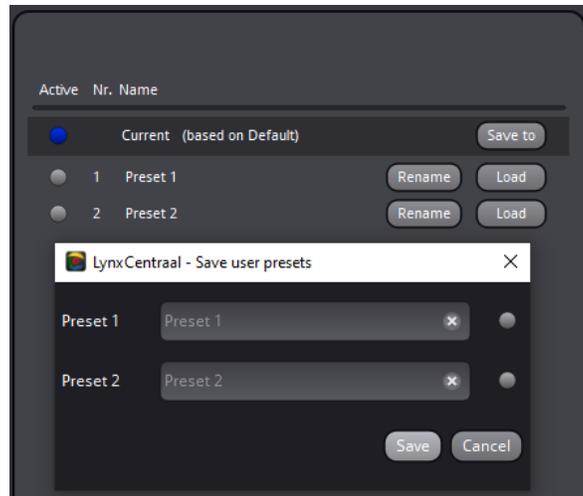
## User Presets Tab



This Tab allows the user to store and recall 2 sets of additional module presets (settings). Presets are stored in module flash RAM and will survive power cycles.

### 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.

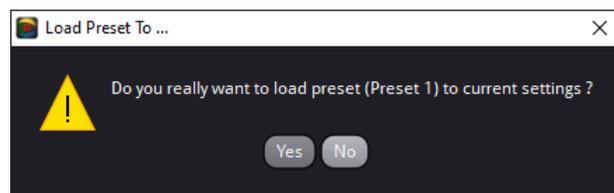


5. Use the “rename” button to rename any stored preset

## Load a Saved Preset

To load the configuration of a selected preset into the current configuration, click on the **“Load”** button next to the preset. This action will display a confirmation dialog, as it will overwrite the current module settings. Alternatively, you can switch to the preset mode, where the device operates in a **“read-only”** state using the selected preset configuration, preventing any further changes until you exit the preset mode.

It is also possible to switch to the preset in which case the device becomes “read-only” with the selected preset configuration



## Params Tab

The Parameters Tab provides a detailed overview and control of all device parameters for the PVD 5400-O module, including device identification, hardware settings, and operational status. Each parameter is displayed in a hierarchical structure under categories such as Device, Hardware, and Event, with associated details like the parameter name, current value, and additional descriptions.

The screenshot shows the 'Params' tab in a web interface. At the top, there are navigation tabs: 'Main', 'User Presets', 'Params' (selected), 'Info', and 'Events'. Below the tabs is a 'Filter Parameters' search bar. The main area is a table with columns 'Code', 'Name', and 'Current Value'. The table is organized into a tree view with categories: 'Device', 'Hardware', and 'Event'. The 'Device' category is expanded, showing parameters like BoardID, displayName, FactoryReset, and many others. The 'Hardware' category is also expanded, showing parameters like Locate, Lock, position, ResetDevice, SNumber, StatusColor, StatusColorRGB, StatusText, Type, typeName, uptime, and Version. The 'Event' category is expanded, showing parameters like Event\_CouldnotlocktoReference and Event\_CouldnotlocktoReference\_SNMP. On the right side, there is a 'Parameter Details' panel for the selected 'displayName' parameter. It shows the Code (displayName), Display Name (Device Name), and Description (Name of device (potentially user-defined), as stored in device-controller). It also shows Access (read-write), Stored On (server), and Current Value (400-O 12G Frame Sync). At the bottom right, there are buttons for 'Factory Reset' (Reset all Settings), 'Export Parameters' (Export to HTML, Export to XML).

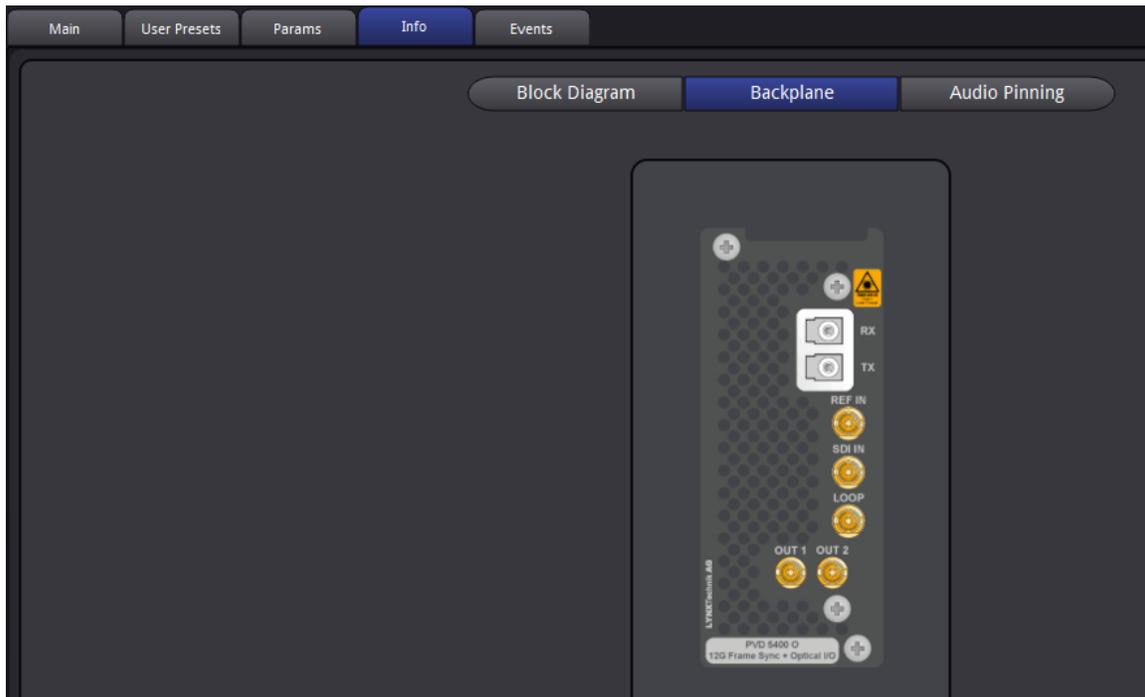
Code	Name	Current Value
BoardID	BoardID	65535
displayName	Device Name	PVD5400-O 12G Frame Sync
FactoryReset	Reset	PRESS
Locate	Locate	off
Lock	Lock	off
position	Position	local COM ports:7.7.0.5
ResetDevice	Reset	reset
SNumber	Serial Number	123
StatusColor	PVD5400-O Status	green
StatusColorRGB	Color	#00ff00
StatusText	Status	OK
Type	Type Code	07.a0
typeName	Product Name	PVD5400-O 12G Frame Sync
uptime	Uptime	23986
Version	Version Code	1247.00.00
Event_CouldnotlocktoReference	Could not lock to Reference	off
Event_CouldnotlocktoReference_SNMP	SNMP: Could not lock to Reference	none

Users can modify writable parameters, such as the Device Name, directly from this interface.

The Factory Reset option allows resetting all module settings to their default values, ensuring a clean configuration.

Additional options include exporting the parameter configurations to HTML or XML formats for backup or further analysis, making this interface essential for monitoring and managing device operations effectively.

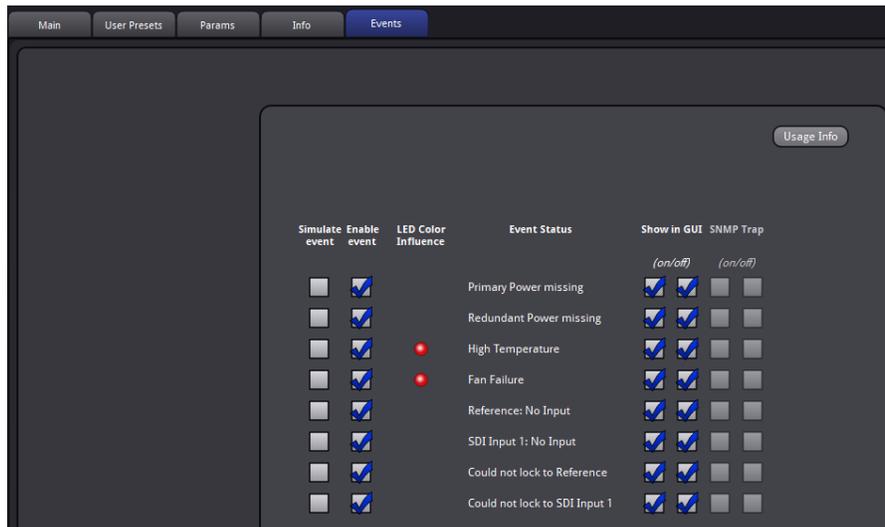
## Info Tab



The Info Tab provides users with detailed technical insights into the PVD 5400-O module through three sections: **Block Diagram**, **Backplane**, and **Audio Pinning**.

- **Block Diagram:** This sub-tab visualizes the internal signal flow and processing stages, including inputs, frame synchronization, audio embedding/de-embedding, programmable delays, and outputs. This helps users understand how signals are processed and routed within the module.
- **Backplane:** This sub-tab displays the rear panel connections of the device, highlighting ports for SDI input, outputs, loop-through, reference input, and optional optical I/O. This illustration aids in correctly identifying and connecting physical interfaces.
- **Audio Pinning:** This sub-tab (if populated) would detail the specific channel mapping for audio streams; however, in this case, no audio pinning data is available.

## Events Tab



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

LynxCentraal 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 (Info Tab ► Event Log) Tab and can be scrolled through using the scrolling bar.

### Log in GUI Function

Events are selectable, the user can choose to record a particular event in the log (or not) or configure it to only record one side of the event. (*For example, to log when an 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 set up using the checkboxes provided.

### Alarm Activation

By default, all alarm conditions are activated (checked), by de-selecting a specific alarm condition. in this column, the module ignores this condition completely. It will not color the alarm LED, log an event in the GUI or send an SNMP trap. This is useful if for example there is nothing connected to AES input 1 and want the card to ignore this input condition completely, simply de-select "AES Input 1 No Input" and it will be ignored.

### SNMP Support

If the system is using a LYNX Server and the SNMP option is installed, then the "SNMP Trap" columns become available.

Here custom event configuration is possible, for example transmit a "SNMP trap" over the network. (This has no impact or influence over the internal error log maintained by the LYNX control system).

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

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

## 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.

[www.lynx-technik.com](http://www.lynx-technik.com)

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:

## 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](http://www.lynx-technik.com)

**E-Mail** [info@lynx-technik.com](mailto: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.