

LYNX | Centraal

Reference Manual



LYNX Technik General Control Software

Revision 1.0 – May 2022

LYNXTechnik **AG**
Broadcast Television Equipment

THIS MANUAL SUPPORTS:	
LynxCentraal upwards from revision	0.9 Beta

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LYNX REDUNDANCY

Attention: LynxCentraal contains an enhanced redundancy management engine for synchronizing operator account information, custom patterns for greenMachine Testor, custom control panels and other data between all workstations in the LYNX universe. This redundancy management engine is not backward-compatible with the existing redundancy management of legacy greenMachine software releases. Files designated for redundant storage will not be shared with those devices. The affected features are usable on those devices with restrictions only.

Beware: New device software supporting the new redundancy version is not yet available jointly with the initial beta version of LynxCentraal. For the time being, all files designated for redundant storage will be stored locally on the workstation only. The development of such new device software is in progress.

USB CONNECTIONS

Attention: Simultaneous use of devices connected via USB with several LYNX applications on the same PC is not possible. USB devices are always only connected to the first started LYNX application.

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INTRODUCTION

LynxCentraal is the unified front end for all Lynx Technik's hardware products, including the popular greenMachine, 5000 series and yellobrik product lines. LynxCentraal succeeds and replaces the separate front-end applications greenGUI, APPolo and yellowGUI.



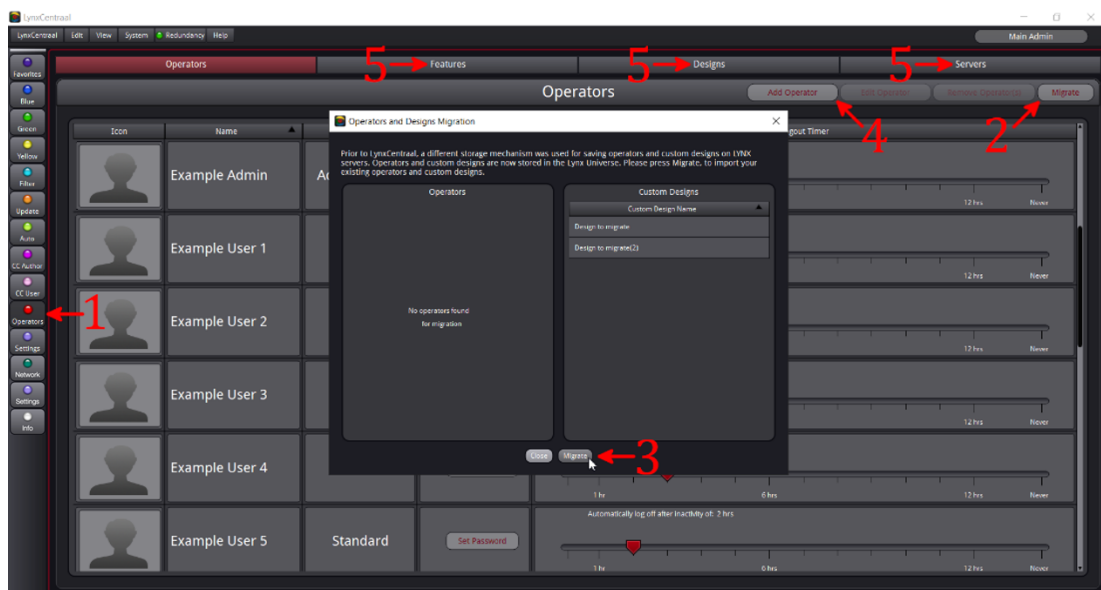
SYSTEM REQUIREMENTS

LynxCentraal is designed to run on a Windows-compatible PC or a Mac. The supported Windows platforms are Windows 7, Windows 8 and Windows 10 (recommended). The supported Mac versions are High Sierra, Catalina and Big Sur.

MINIMUM AND RECOMMENDED REQUIREMENTS

System Requirements	Minimum	Recommended
CPU	Core-2 CPU 1.6GHz	Quad Core CPU 2.5GHz
RAM	4 GB	8 GB
Free HDD space	1 GB	1 GB
Graphics	1280x960	1920x1080

QUICK START



- Install LynxCentraal on a PC in the same network as your devices.
- Start the application.
- Login as Main Admin with the default password 1main\$admin
- Select the Operator Feature Page (item 1).
- Migrate existing users and designs (click item 2). It is best to do this first, rather than waiting until new operators have been added. The migrate function lists all operators and designs it finds in the network, and you have a choice which ones you would like to keep. How? Confirm your selection with *Migrate* (item 3).
- Add new Operators and Administrators - press *Add Operator* (item 4) and set a name, initial password and operator type.
- For each newly added operator, use drag & drop to select features, designs and servers (items 5) which are permitted to him or her.

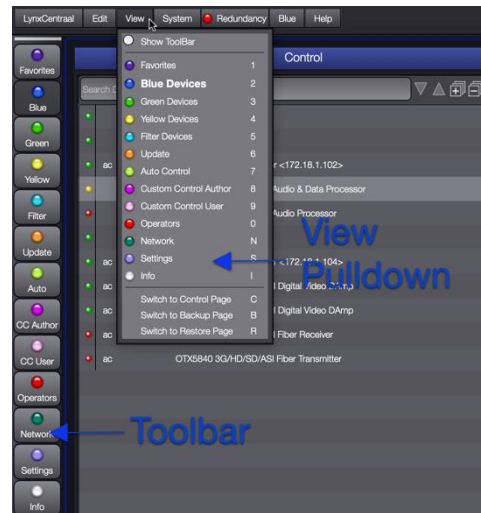
FEATURES (MAIN PAGES)

Lynx Centraal has 13 Features. Each feature corresponds to one Main Page. Each page has UI elements for performing specific functions. Pages are often further divided into sub-pages.

You can navigate between pages using the toolbar on the left, the view pulldown or hot-keys.

There is a dedicated page for each of the hardware device types: Series 5000 (blue), greenMachine (green) and yellobrik (yellow). Functions which all devices share are available as additional pages, such as Update, Operators, Settings and Info. There are some pages such as Custom Control which are only shared by blue and green. Operators, Settings and Info are for setting up users, preferences and hotkeys.

It is possible to limit which features an operator can see and edit. Filter, Settings, Operators and Info are always available. It is not possible to turn these pages off for any operator.



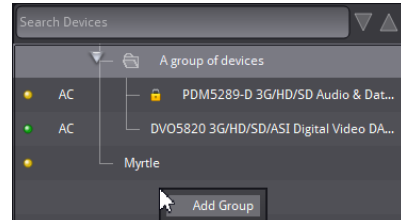
	Favorites	All Devices
	Blue Devices	Blue Devices (Series 5000)
	Green Devices	Green Devices
	Yellow Devices	Yellow Devices (yellobrik)
	Filter Devices	All Devices
	Update	All Devices
	Auto Control	Blue Devices (Series 5000)
	Custom Control Author	Blue and Green Devices
	Custom Control User	Blue and Green Devices
	Operators	General Control
	Network	Blue and Yellow Devices
	Settings	General Settings
	Info	General Information

FAVORITES

The favorites page allows you to interact with and edit only filtered servers. Each user can filter his permitted servers into a smaller more streamlined list of servers which are necessary for a given job.

Favorited servers are a mix of green, blue and yellow devices. Selected devices in the Favorites tree display the Control page for blue and green devices and the full interface for yellow devices.

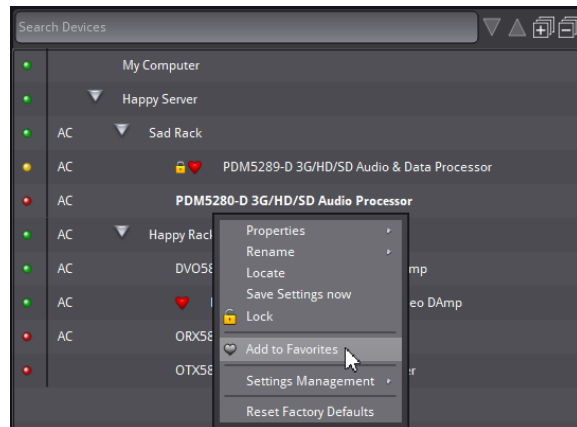
The favorites tree can be customized by an operator. Using the context menu, you can add a new group and give it a name. Using drag and drop, items can be reordered and added to groups and sub-groups.



ADDING DEVICES TO FAVORITES

A server can be favorited from device tree views, in the blue, green and yellow device pages. Only real servers can be favorited, it is not possible to favorite simulated machines.

To add a server to your favorites list, open the context menu over a device in the tree and select *Add to Favorites*. Once a server has been favorited, you can unfavorite it at any time using the context menu from the blue, green, yellow and favorites page.



NAVIGATING IN FAVORITES

All **servers'** devices are arranged in the favorite's device tree. Select a server in the tree to view its settings in the flowgraph view. The view presents the same information as the control sub-page in blue, green or yellow.

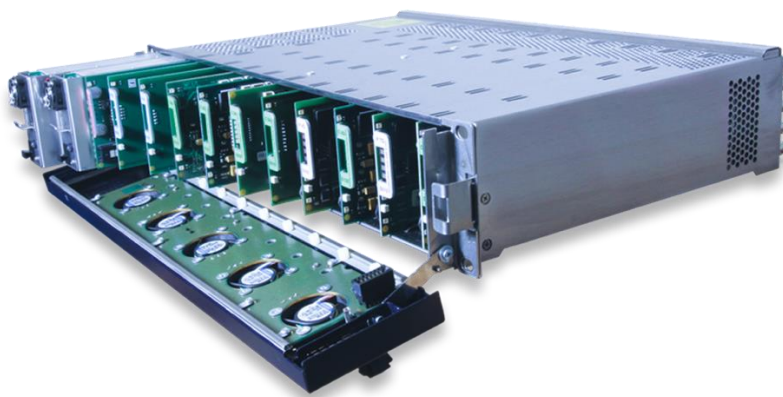
BLUE

The Blue devices page allows you to view and edit all series 5000 servers and devices. It has functionality and appearance similar to what was available in the previous APPolo front end.

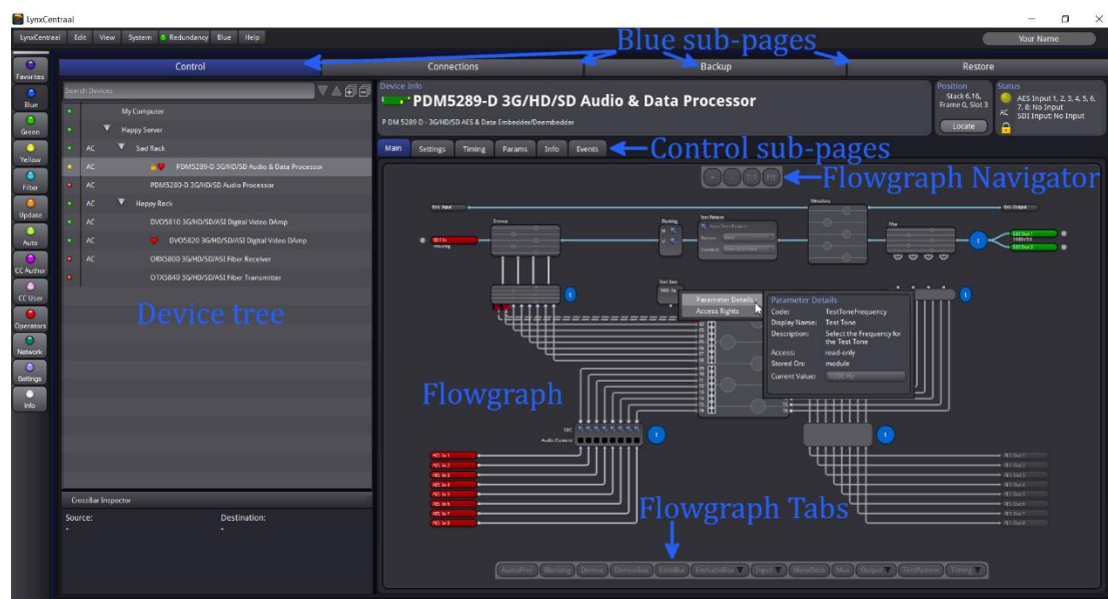
Series 5000 is a rack based terminal equipment solution which is user configured with any combination of Card Modules from the extensive range of available solutions. This includes audio distribution, conversion and processing as well as video distribution, conversion, embedding and de-embedding, frame synchronization, test generators, down converters and video processors.

The Card Modules are extremely compact and use state-of-the-art technology and fabrication techniques to deliver unmatched performance, feature sets and reliability.

Series | 5000®



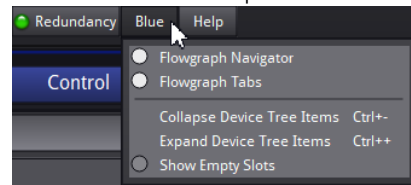
THE BLUE PAGE



BLUE MENU

A *Blue pulldown-menu* is added to the main menu bar when the blue page is visible. Items specific to working with the blue pages are available in the menu pulldown.

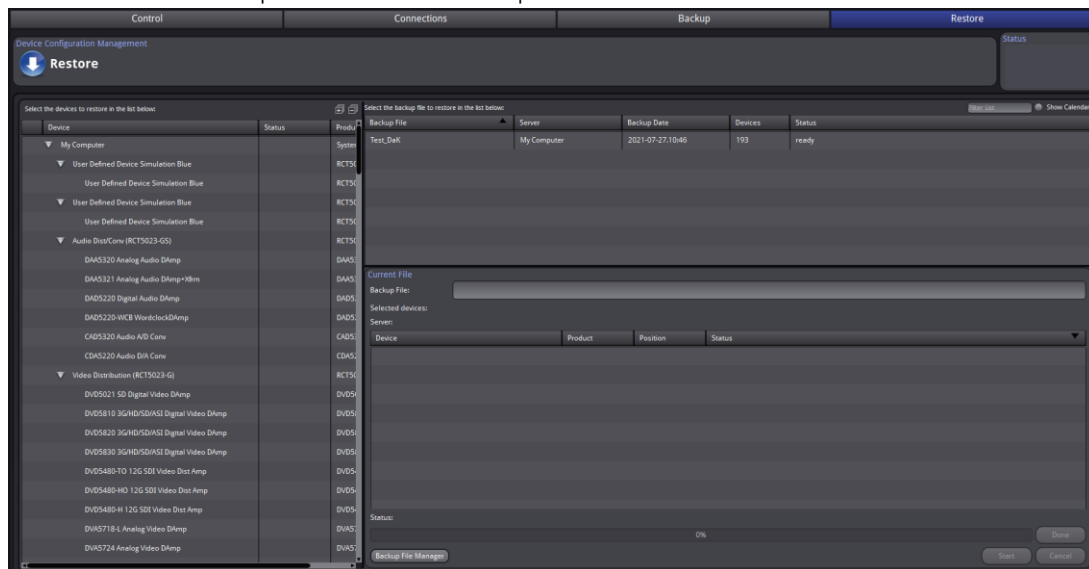
- Collapse device tree items
- Expand device tree items
- Show empty slots
- Flowgraph navigator
- Flowgraph tabs



BLUE SUB-PAGES

BACKUP AND RESTORE

With some of the more complex modules having 1000s of editable parameters, a backup policy is vital. While module settings are always stored in non-volatile Flash RAM, which will survive power failures, it does not protect against hardware failure which requires the device to be exchanged for a new unit. Exchanging the hardware requires all settings to be manually reset, assuming the settings were documented somewhere. LYNX provides two backup solutions.



System Wide Backup/Restore

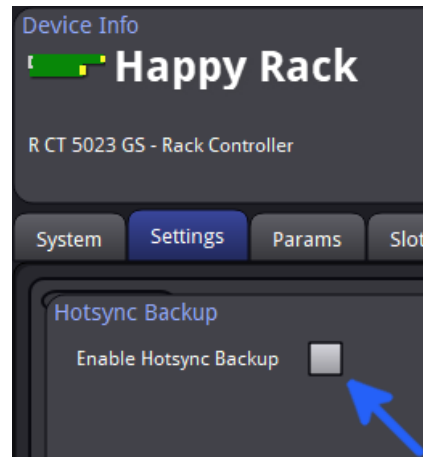
There may also be a need to back up a complete system configuration. This is addressed with the Backup and Restore sub-pages. The backup process is a function of the OH_RCT5023_SERVER and requires the OC-RSL-FUNC software option in the OH_RCT5023_SERVER.

The settings are stored as a file, or backup set, on the server. It is possible to export and import the backup files to and from the LynxCentraal front end.

The Backup/Restore function is useful if the LYNX system is used for different functionli-cations or sessions and the system configuration needs to be globally changed on a regular basis.

HotSync Backup

HotSync Backup is designed to provide protection against hardware failure. HotSync Backup is a function of the individual RCT 5023 controller cards installed in each rack frame and can be activated in the control sub-page. When enabled for the specific controller, it will immediately take an inventory of the modules installed in the rack and make a copy of all module settings which are backed up on **the controller's own internal Flash RAM**. When **the module's settings are changed**, the backup copy is immediately and automatically updated with the new settings. This ensures the module backup is always current and up to date. The system will detect when the module is removed and exchanged for a new unit and will automatically restore the backup copy of the settings onto the new module. This process takes only a few seconds. There is no backup to initiate or schedule and it is 100% automatic, always running in the background.



CONTROL

The control page consists of control interfaces for editing and setting up individual Series 5000 cards.

Device Tree

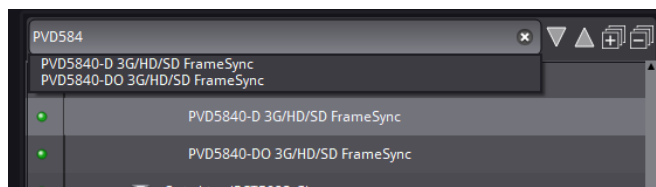
The device tree is found on the left of the control page. All racks and modules are listed in a server/device hierarchy. It is the main navigation area for selecting and editing the processing modules, controller cards and servers attached to your system.

To the left of each device entry is a colored LED – green, yellow, or red. It is a representation of the general alarm LED located on the front of module. When the module is selected in the device tree you can see the alarm displayed in the top right corner of the UI along with an error message.



SEARCH

To search for a specific device, begin typing in the *Search Devices* edit box. All matches are shown in the drop-down as you type. You can navigate forward and backward in the drop-down list using the up/down arrows.



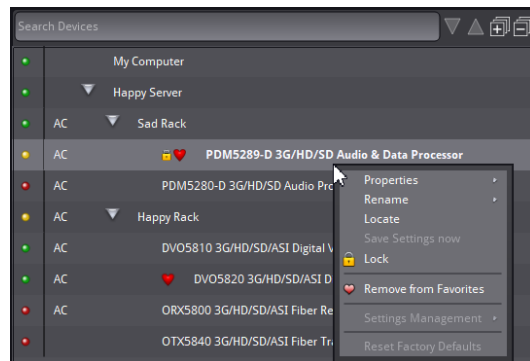
Device Context Menu

Properties

Device information, including rack positions are displayed here.

RENAME

The names of each individual module can be customized. Customized names are stored on the server together with the slot position and board type. Even if you replace the module with another module of the same type, the customized name will remain.



LOCATE

Selecting locate will cause the LED on the device to flash, aiding in finding physical devices in a rack.

SAVE SETTINGS

Saves the current state of parameter settings to the non-volatile flash RAM.

LOCK

Locks the device so **parameter changes can't be performed**.

ADD TO FAVORITES

The device will be added to the favorites page.

SETTINGS MANAGEMENT

When working with a larger system it is likely that modules of the same type need to be set up in the same way. Settings management allows you copy and paste the parameter settings from one module to another.

RESET FACTORY DEFAULTS

Resets all parameters of the device to factory defaults.

Control Sub-Pages

The control sub-page consists of the card based specific control interfaces for editing and setting up the Series 5000 card you selected in the device tree.

MAIN

The tree of available devices is on the left and the selected device is visualized on the right. The view on the right is a flowgraph view, so all flowgraph based navigation is applicable. The control sub-page has further tabs, which are visualized based on device features.

Using a context menu on any parameter control you can inspect the associated parameter, its origins and current state.

Please see the Flowgraph **section of the "Central UI elements" section**

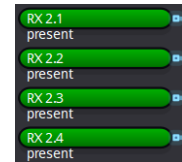
FLOWGRAPH NODES

(Not all devices have all of these features)

The following node descriptions only refer to cards with flex-flowgraph designs.

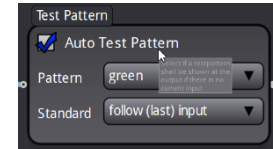
INPUT DETECTION

The audio and video input connections on the left-hand side display the current signal presence status. Green means a signal is present, yellow indicates a possible conflict or problem and red means not present.



TEST PATTERN

Test Pattern is a simple video signal generator with a wide range of still test patterns. The output video standard can be set to follow the last detected video standard of the respective processing channel or to a fixed video standard.



The Test Pattern Generator can be configured to react to the TRS detection on the input of the Frame Sync node and can be output to a freeze. This is a great way to identify TRS errors on the incoming signal. The Test Pattern Generator can also be configured to kick in if the input signal of the respective processing path is lost.

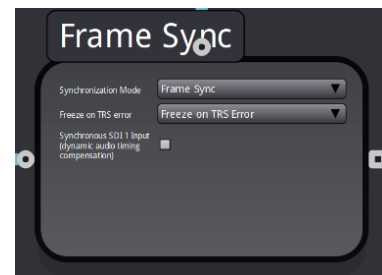
METADATA

The Metadata node allows you to manage the metadata of all video signals. Time Code, Closed Captions, Teletext and more can be monitored, converted and/or repositioned.

FRAME SYNC

Three different modes of synchronization are available for the frame sync function.

- Frame Synchronization:
 - The input signal is always buffered for one video frame. If TRS errors are detected in the input frame, the last good input frame is delivered repeatedly to the output. Differences between the input and REF clocks will be synchronized by repeating or dropping individual video frames on the output. The total video processing time from input to output is 1 video frame minimum plus the timing difference of input signal to Reference.
- Line Sync (H):
 - In the case of clock synchronized signals the line synchronizer H mode can be activated to achieve minimum delay. The input signal is buffered for one line to correct timing differences. This mode can only be used with clock-synchronized signals, never with an asynchronous SDI input.
- Line Sync (V):
 - In this mode the synchronizer delays the input signal towards the next frame start to achieve horizontally and vertically aligned pictures. The delay is the timing difference between the input signal and the Frame Pulse of the Reference. This results in frame aligned signals without the additional one frame delay of the frame synchronizer mode.
- Freeze Mode:
 - 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 through to the output.



AUDIO

All audio signals, external and deembedded AES, can be processed individually. The following functions are available. Left and right channels are handled separately.

- Test Tone (ON/OFF)
- Mute
- Phase Inversion

- Mono-Downmix - per output mono-channel: enable the addition of the other (sibling) mono-channel as a simple $(a+b)/2$ downmix.
- Gain adjustment (+18dB .. -66.3dB)
- Overload detection - a yellow warning indication will be displayed, if the signal content reaches potential digital clipping.
- Silence detection - a yellow warning indication will be displayed if the signal content is detected as silent (<60dB) for more than 10 sec)

DE-EMBEDDER

The SDI Audio Deembedder deembeds up to four Audio Group simultaneously. When the deembedder detects an incoming SDI signal, the deembedding process starts for all groups, and all groups will be deembedded with correct phase alignment between all channels.

EMBEDDER

All four embedded audio-groups can be re-embedded into the SDI output. An existing embedded group can also be removed from the SDI signal, even without embedding anything. (Re-)embedding a group will implicitly remove this same group from the input SDI signal, if applicable.

An embedded audio-group can only be embedded as a complete group, containing two AES streams. If you want to replace only one of the two AES streams in the SDI, you need to feed the other AES stream from the de-embedder through the audio-processing block and the output crossbar to the embedder. This will replace the complete embedded group in the SDI signal.

Embedding audio into an HD-SDI and 3G-SDI stream will always be done in 24bit resolution.

COLOR CORRECTION

This is a simple primary color correction function in RGB color space. It offers two modes:

- Gain & Offset
- Peak & Black

The sliders can be ganged to force Red, Green and Blue to the same value.

NOISE REDUCTION

Adaptive noise reduction processes input data in either progressive or interlaced format. Applying noise reduction to noisy interlaced signals can optimize de-interlacer performance.

Different algorithms are provided. Each of them is optimized for a particular type of noise artifact in the video content.

- General Noise Reduction:
- General noise reduction is comprised of both adaptive 2D and 3D noise reduction. 3D noise reduction corrects for temporal and spatial noise, while 2D noise reduction corrects for spatial noise only. 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.
- Level:
- This parameter controls the level of the horizontal, vertical and diagonal high pass filtered picture content, which will be added to the original signal.
- Threshold:
- This parameter controls the level of signal, which is passed through for level control. All amplitudes in the signal below this threshold will not be used for the detail enhancement.

VIDEO PROCESSING

Video processing provides a range of video processing functions including image processing (saturation, black level, gain, hue, aperture) and blanking interval deletion.

- 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 HANC and/or VANC area of the SDI input signal will be blanked completely before the signal is delivered to the audio embedding stage.
- Output if no input:
- Specifies the content of the SDI output signal to be generated if no SDI input signal can be detected. If OFF is selected, the SDI output will be electrically dead while no input signal is received.
- Freeze Mode:
- Specifies the exact content (Field 1, field 2 or Full Frame) that will be delivered to the output, when *Freeze* mode becomes active. This selection is applicable for interlaced SDI formats only.

Freeze mode selection options are:

- Test Pattern preselect:
- A wide range of patterns is provided which can be selected using the drop-down selection. The pre-selected pattern will be used if freeze mode is set to *Test Pattern* or if a test pattern is enabled manually.
 - 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 standalone test generator. Using this selection is possible to configure the test pattern to any of the supported standards, or it can be set to follow the last input standard.
 - Follow last input (default)
 - Fixed standards (half, same or double or current reference frame rate)
- Test Pattern Enable:
- This checkbox switches on the pre-selected test Pattern.
- Video Adjustments:
- Four 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.

SCALER (UPXD)

The Scaler is a high-quality broadcast converter which allows an almost endless amount of conversion and scaling possibilities.

Image Input Control

- Control Mode:
- The input aspect ratio and other settings can either be specified manually, the default, or they can be derived from one of the supported standard format description indications: AFD, WSS or VI.
- Input Aspect Ratio:
- For SDTV input signals, the source aspect ratio can be set to 4:3 or 16:9. This setting can be derived from AFD, WSS or VI, see above.

Image Output Control

- Output Format:
- Specifies the output video format. The available selections are qualified by the frequency pre-selection and the attached reference signal. For SDTV output formats aspect ratio is also part of the selection. This choice influences the aspect ratio operation mode, as well as the value of the inserted WSS, AFD, VI code, if applicable.
- Conversion Mode:
- Provides different modes for aspect ratio conversion operations.
- Motion Adaptive Filtering:
- This type of filtering is used to improve picture quality for moving images and reduces motion blur and should be selected for normal use. For still images and conversion from progressive-to-progressive standards the checkbox should be switched off.
- Input Cropping:
- Cropping controls make it possible to crop the input image that will be used for conversion.
- Output Sizing / Positioning:
- Sizing and positioning controls alter the size and positioning of the output image. Any remaining parts of the resulting image which have no content will be filled with black. Editing is possible by manually dragging the input and output cropping handles using the mouse. Simply position the mouse over the green line you wish to move, click and drag the line to the desired point on the image. If a non-standard setting is used, the Conversion setting will automatically switch to *Custom*.

TIMING

Select cards have a timing sub-page. Please see [Central UI Elements/Timing](#) for a complete description.

INFO

Info presents visual information about the selected device or server.

BLOCK DIAGRAM

The Block Diagram depicts the signal flow through the device in a pictorial form. You can zoom and pan through the image using the mouse or hotkeys.

BACKPLANE

The Backplane diagram depicts the backplane of the device in pictorial form.

AUDIO PINNING

The audio pinning diagram depicts the pinning of an audio cable in labelled pictorial form.

EVENTS

Every module has an events sub-page where error reporting can be organized. The events editor allows you to configure and display only log information you are interested in.

There may be circumstances where an input video signal routinely goes missing because input sources are frequently changed. Since this behavior is acceptable for the given situation, you can disable logging input events. Likewise, you may only want to log when a specific event happens, **not when it's corrected**. For instance, if you want to log when a signal goes missing but not when it returns.

It is also possible to configure the SNMP traps sent to an external monitoring or logging device in the same way.

PARAMS

The params sub-page displays all parameters for the selected device in tree format. Selecting one parameter will show a detail of its name, description, access and current value.

The tree can be filtered at the top, to aid in finding the parameter you are searching for.

You can set the current value of the selected parameter on the right in the Parameter Details. Read-only parameters cannot be edited.

You can also perform a factory reset or export parameters to HTML or XML.

USER PRESETS

User Presets provides the ability to store and recall seven different sets of presets. Each preset contains a current value for all parameters of the device. Loading a preset applies the stored values to all parameters at once. It is not possible to affect only a sub-set of parameters.

All User Presets are stored in on-board flash-RAM, where they are preserved even during long periods of no power supply.

SAVING A USER PRESET

- Press the *Save To* button, which will present the *Save Preset* dialog.
- Select one of the *User Preset* slots by clicking on the small button on the right. This will enable that slot. You can optionally rename the preset if you like.
- Click the *Save* button to store the current configuration of the complete device into the selected slot.

LOADING A USER PRESET

- Click the *Load* button next to the User Preset.
- The load dialog will prompt you for confirmation.
- Loading the preset overwrites all parameter values with the state stored in the preset.

OPTIONS

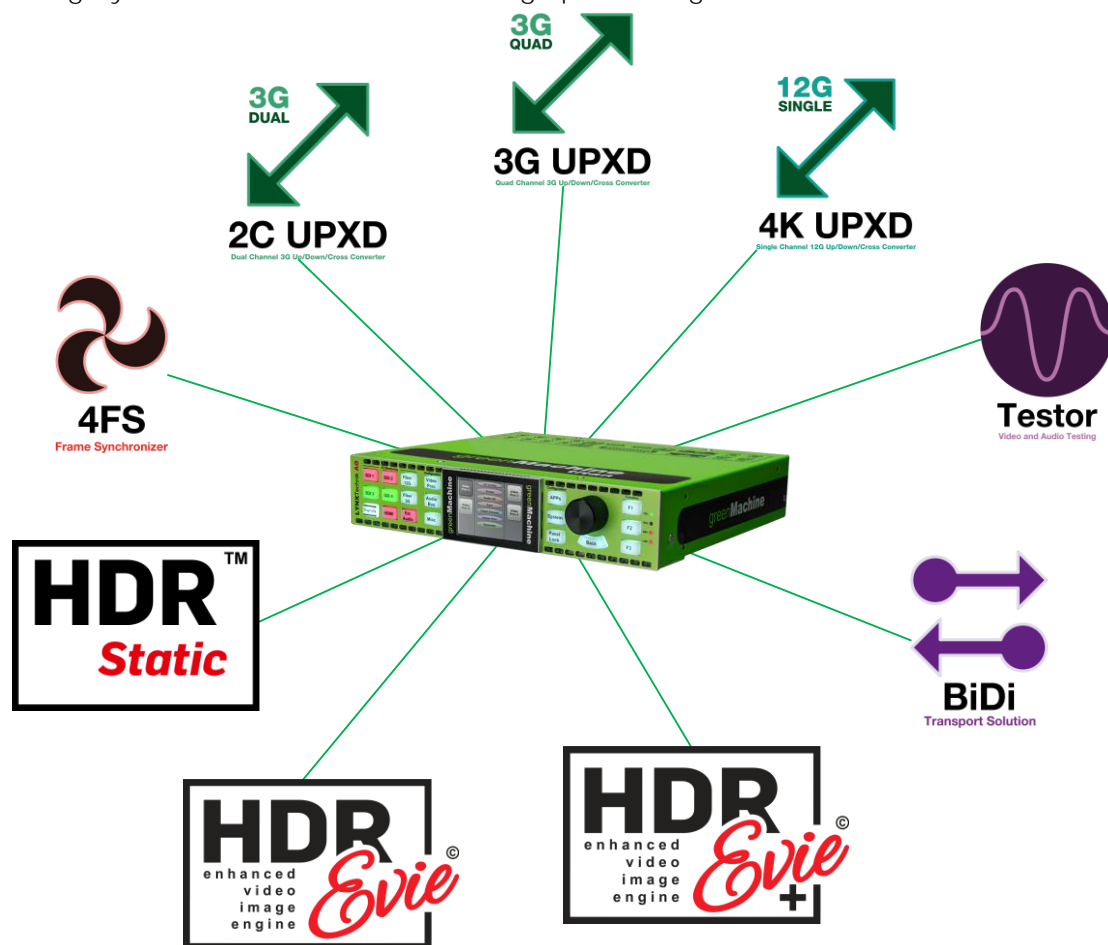
On devices that have options, the option sub-page is where option status can be monitored and modified. You can request option codes, as well as enable, delete and activate options from here.

GREEN

greenMachine®

The Green page allows you to view and edit all greenMachines which are available in the network. It has functionality and appearance similar to what was available in the greenGUI front end.

A greenMachine can be reprogrammed to perform different functions. This is achieved by deploying a constellation onto the machine. A constellation consists of APPs grouped into color coded notches. Each notch describes a basic functional category, such as video convert or image processing.



LynxCentraal works with the 2 available greenMachine hardware devices. The 4 channel 3G / single channel 4k greenMachine titan and the 2 channel 3G greenMachine callisto+.

greenMachine
callisto+

greenMachine
titan

EXPLANATION OF TERMS

UNIVERSE

The green universe includes all discoverable machines in the network. Once a machine has been turned on and an ethernet cable has been attached, it will automatically show up in the UI.

You can import/export the current state of the universe from the green menu in the menu bar. The universe file contains data about the universe state, including positions, galaxies, galaxy positions, size and shape.

CONSTELLATION

A constellation is a collection of APPs. It is basically a template that defines which APP is found on which processing path, and in which order the APPs will be processed. There are several predefined constellations available in LynxCentraal. The list of constellations grows as new functionality for the greenMachine is implemented.

When you deploy a constellation on a greenMachine, it reprograms the machine to perform the defined functions.

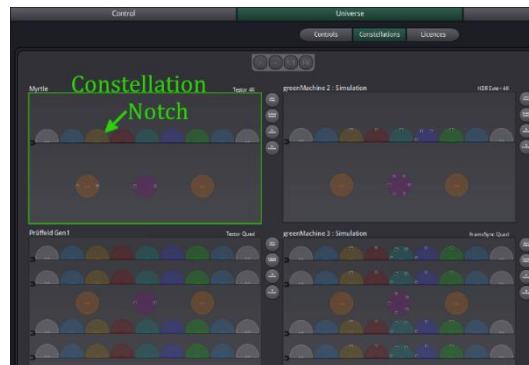
For instructions on constellation deployment see Deploy Constellation.

NOTCH (APP GROUP)

A notch is a group of APPs encapsulated into nodes. Notches are color coded and are presented in a constellation in the order in which APPs in the notch are processed along the signal path. When you view the Green/Universe/Constellations sub-page you will see a constellation graphic with as many signal paths as are available on that greenMachine. One for Titan UHD, two for Callisto or Callisto+, and four for Titan Quad. The notches are represented as colored half domes. The APPs which belong to each notch are presented as icons in the order in which they will be processed on the machine.

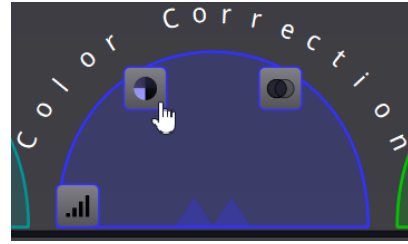
Currently available notches include:

- Analyze In (cyan blue)
- Routing In (grey)
- Mix In (red orange)
- Sync (red)
- Video Convert (aqua)
- Image Proc (violet)
- Generate (green)
- Routing Out (grey)
- Analyze Out (teal)
- Global (orange)
- Audio I/O (yellow orange)



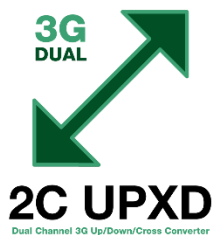
NODE (APP)

A node (APP) is a group of parameters which together perform a specific function such as color correction or scaling. An APP's parameters are encapsulated into a node in the flowgraph. Nodes are the visual containers which encapsulate APP parameters. Some nodes, such as the main notch nodes are containers for other nodes.



CONSTELLATION PALETTE

CALLISTO+ DUAL UPXD



The Callisto+ Dual UPXD constellation is a broadcast quality dual channel up/down/cross converter with frame synchronizer supporting formats up to 3G-SDI (1920 x 1080) per channel. This constellation is designed for functionalization's that require dependable broadcast quality up/down/cross conversion and frame synchronization with full audio processing capability. The included scalars allow for spatial conversions of the video signals including a versatile Region of Interest (ROI) selection. High-performance deinterlacers are also provided for the conversion of interlaced video signals. A bi-level SD reference signal, as well as a tri-level HD reference signal, can be used to synchronize the video signals. A timed reference output (SD or HD) is also provided. Input for processing and the output, both can be BNC, Fiber or HDMI. Multiple additional processing features allow for adjustments of the video content: gain, hue, etc. A basic test pattern generator is also available per channel providing the most common line & fill patterns like color bars, pathological test patterns, full filled colors, etc. The extensive audio processing capability de-embeds all audio as well as providing support for one MADI input and output and four external audio inputs or outputs which can be individually configured to be analog (balanced) or digital (AES) interfaces. Multiple internal crossbars allow for extensive audio shuffling including the MADI streams. It also provides two Dolby E decoders, Dolby E synchronization, full audio processing as well as multiple adjustable user delays for audio and video.

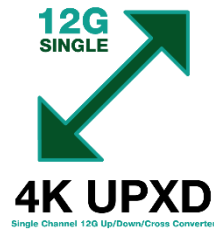
TITAN UPXD 3G



The UPXD 3G constellation is a broadcast quality quad channel up/down/cross converter with frame synchronizer supporting formats up to 3G-SDI (1920 x 1080) per channel. This constellation is designed for applications that require dependable broadcast quality up/down/cross conversion and frame synchronization with full audio processing capability. The included scalars allow for spatial conversions of the video signals including a versatile Region of Interest (ROI) selection. High-performance deinterlacers are also provided for two of the processing channels for the conversion of interlaced video signals. A bi-level SD reference signal, as well as a tri-level HD reference signal, can be used to synchronize the video signals. A timed reference output (SD or HD) is also provided. Input for processing and the output, both can be BNC, Fiber or HDMI. Multiple additional processing features allow for adjustments of the video content: gain, hue, etc. A basic test pattern generator is also available per channel providing the most common line & fill patterns like color bars, pathological test patterns, full filled colors, etc. The extensive audio processing capability de-embeds all audio as

well as providing support for one MADI input and output and four external audio inputs or outputs which can be individually configured to be analog (balanced) or digital (AES) interfaces. Multiple internal crossbars allow for extensive audio shuffling including the MADI streams. It also provides two Dolby E decoders, Dolby E synchronization, full audio processing as well as multiple adjustable user delays for audio and video.

TITAN UPXD 4K



The 4K Up/Down/Cross Converter constellation is a broadcast quality up/down/cross converter supporting formats up to 4K UHD (3840x2160). This constellation is designed for applications that require dependable broadcast quality up/down/cross conversion and frame synchronization with full audio processing capability. The converter includes powerful scaling capabilities that allow a versatile Region of Interest (ROI) selection. The included 3G Level A/B and 3G Deinterlacer makes the greenMachine titan compatible with either SDI standard up to 3G (Level A or Level B). The module also supports 4x3G SDI (2SI Quad Link) or 12G SDI (Single Link) input and outputs for 4K UHD signals. With the 2SI QuadLink<->SingleLink Conversion signals can be interchanged in-between the single link and 2SI quad link. The extensive audio processing capability de-embeds all audio as well as providing support for one MADI input and output and four external audio inputs or outputs which individually can be configured to be analog (balanced) or digital (AES) interfaces. Multiple internal crossbars for extensive audio shuffling including the MADI streams. It also provides two Dolby E decoders, Dolby E synchronization, full audio processing as well as multiple adjustable user delays for audio and video.

TITAN FRAMESYNC QUAD



The 4x3Gbit/s frame synchronizer constellation is a video frame synchronizer for formats up to 3Gbit/s SDI. This constellation is designed for applications that require dependable broadcast quality frame synchronization with full audio processing capability. The included scaler allows for spatial conversions of the video signal including a versatile Region of Interest (ROI) selection. A bi-level SD reference signal as well as a tri-level HD reference signal can be used to synchronize the video signals. A timed reference output (SD or HD) is also provided. Input for processing can be BNC, Fiber or HDMI. Output can also be BNC, fiber or HDMI. Multiple additional processing features allows for adjustments of the video content: gain, hue etc. A basic test pattern generator is also available per channel providing the most common line & fill patterns like color bars, pathological test patterns, colors etc. The extensive audio processing capability de-embeds all audio as well as providing support for one MADI input and output and four external audio inputs or outputs which can be individually configured to be analog (balanced) or digital (AES) interfaces. Multiple internal crossbars allow for extensive audio shuffling including the MADI streams. It also provides two Dolby E decoders, Dolby E synchronization, full audio processing as well as multiple adjustable user delays for audio and video.

TITAN HDR STATIC



The HDR Static constellation is a broadcast quality HDR to SDR, SDR to HDR or cross standard HDR to HDR converter. It includes a frame sync and up/down/cross conversions. Static HDR applies color and contrast parameters uniformly to produce an average brightness/color range through an entire program. The 4K constellation provides a single 12G 4K-UHD

processing channel. The Quad constellation provides 4 independent processing channels for SDI signals up to 1080p 3Gbits. HDR-Static is a powerful tool for handling dynamic ranges and color gamut presenting viewers with more dynamic images than previously seen, even without an up to date HDR display. It provides conversion functionality, simultaneously combining it with a static (real time) tone mapping algorithm. This application allows you to perform up-, down- and cross-conversions between common input and output curves including Gamma, PQ, HLG and Slog3 and conversions between full and narrow ranges through appropriate static tone mapping. Conversion between color spaces including Rec. 601, Rec. 709 and Rec. 2020 is also possible. HDR content can also be displayed, by contrast compression, on non HDR-capable TV monitors thus producing a high level of HDR-enhanced image quality for all possible display types.

TITAN HDR EVIE+



The HDR Evie+ constellation is a broadcast quality, segmented dynamic HDR to SDR converter. Evie stands for enhanced video imaging engine, a term used for describing dynamic tone mapping algorithms. Evie+ incorporates a new approach called, sectional dynamic tone mapping algorithm that

analysis different sections of an image in real-time, frame-by-frame and applies color and contrast parameters dynamically to each individual section. This allows adjustment of light and shadows areas on the image independently of each other. It includes frame sync, metadata processing, audio processing, and basic test generator patterns. It provides a single 12G 4K-UHD processing channel or 4 channels up to 3G. HDR Evie+ is a powerful tool for handling dynamic ranges and color gamut, presenting viewers with more dynamic images than previously seen, even without an up to date HDR display. It provides conversion functionality, simultaneously combining it with a sectional dynamic (real-time) tone mapping algorithm. HDR Evie allows you to perform down-conversion from common input curves such as PQ ST-2084, PQ BT-2100, HLG, Sony Slog3, Arri LogC, Reg Log3G10, BMD film, Panasonic V-log, and Cannon C-Log2 to output curve SDR. Along with the conversion between Full and Narrow range, HDR Evie+ also provides conversion between Rec 709 and Rec 2020 colorimetry as well.

TITAN TESTOR



The Testor constellation is the company's newest offering of test signal generators. Testor is an ideal trouble-shooting A/V tool for technicians and engineers working in the field, in-studio applications and for line-up tasks in master control rooms. Anywhere there is an A/V testing, designing, repairing and troubleshooting environment, the greenMachine Testor will be useful. The Testor constellation is a video and audio test signal generator that comes pre-configured for the greenMachine titan platform. The 4K constellation offers a Single test generator

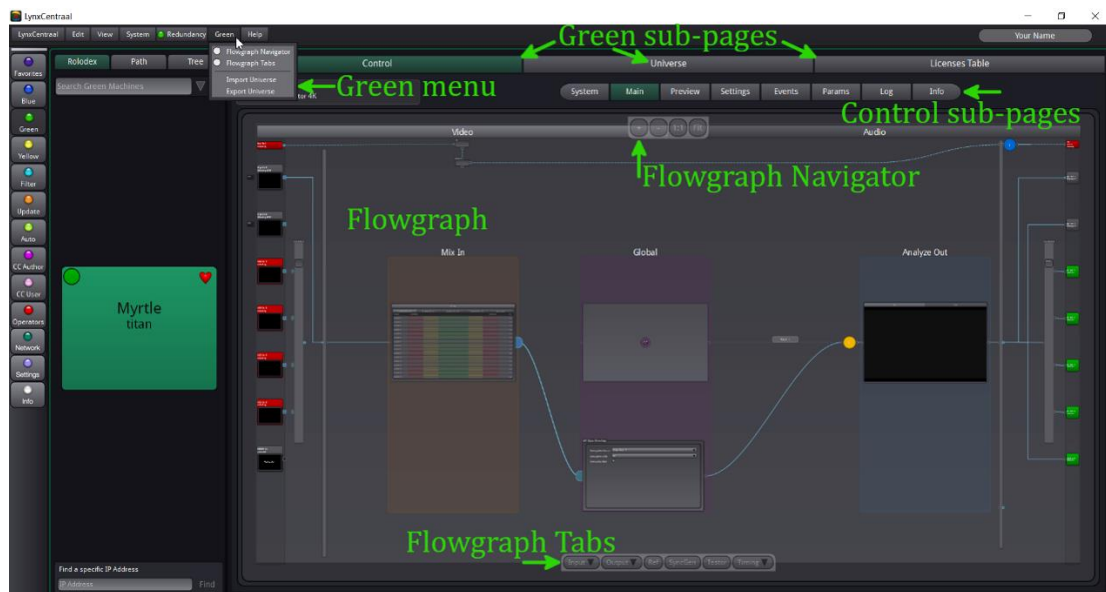
Channel with 4K/UHD (up to 3840 x 2160p) - 12Gbit/s SDI. The Quad constellation offers four independent test generators handling up to 3G SDI video formats. Standard static and dynamic video test signals and patterns are included, and for added flexibility, users can upload their own user defined signal patterns. Logos and text can also be added to the test signals, which is very useful for example for channel identification. The included collection of patterns supports all video standards up to 4K/UHD. User-defined pattern uploads can be resampled for other standards. Plus, the full collection of test signals can be shared with all greenMachine devices in a network. The integrated graphics editor provides a tool for users to place images & logos, add text, and even add user-defined signal patterns and graphics. All items can be moved and edited simply with a computer mouse. A scaler ensures users can scale test patterns to match the format.

TITAN BIDIRECTIONAL TRANSPORT



The BIDI Transport constellation is a cost-effective bidirectional transport solution that allows transportation of video, audio, Ethernet, and GPI efficiently across two greenMachine Titan hardware devices. It is a flexible solution for applications that require an exchange of multiple signals on two single fiber links over long distance. A Master/Slave model of communication is used between the two greenMachine Titan hardware devices where one machine will act as a Master device while the other will be a Slave. One 12G Signal (12 Gbit/s) or four 3G Signals (2.97 Gbit/s) or six HD Signals (1.485Gbit/s), 4 external analog or digital audio signals and four GPIs can be transported via the fiber ports in both directions, simultaneously. The reference of one of the two greenMachines (aka the Master) is also transmitted to the other greenMachine (aka the Slave) and can be used in the remote location to synchronize cameras, as an example. For the signal transport to occur, the two greenMachine Titans need to be connected via two single-mode fiber cables (when used with transceiver SFPs, e.g. the optional LYNX OH-TR-1 LC SFP) or one single-mode fiber cable (when used with the optional Bidirectional SFP modules, e.g. the LYNX OH-BD-1 SFPs).

THE GREEN PAGE

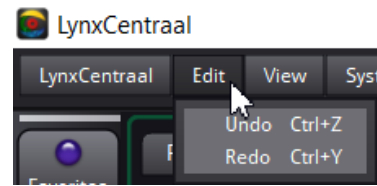


UNDO/REDO

When editing device parameters on the control page, changes are sent directly to the machine and are not undoable. There are some tasks in the UI which are not machine specific which are undoable.

Undo is available in:

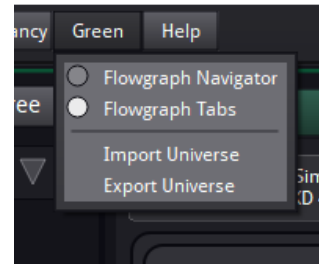
- Universe – moving machines, moving galaxies, adding galaxies, changing galaxies, deleting presets, importing presets



GREEN MENU

A *Green Menu* is added to the main menu bar when the green page is visible. Items specific to working with the green pages are available in the menu pulldown.

- Flowgraph navigator
- Flowgraph tabs
- Import Universe
- Export Universe



TABLES

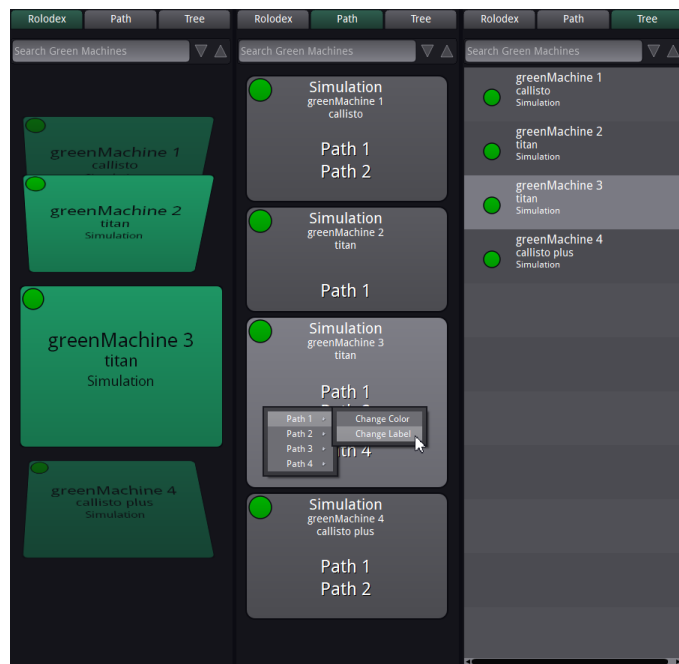
There are 3 different tables for viewing the greenMachines in your network.

The Rolodex table, the Path table and the Tree table. Shown on the right.

ROLODEX

The *Rolodex View* displays the greenMachines in an animated perspective view.

Visualized Data includes the machine name, machine type, IP Address, machine status and LED. Using the context menu, you can add a non-simulated device to favorites.



PATH

The *Path View* displays the greenMachines in list view. In addition to the data visualized in the rolodex, it also displays each signal path name and color. Right clicking on the path text presents a popover where you can change the path name and path color. When you change either of these values, the path label in the middle of the flowgraph will be updated.

TREE

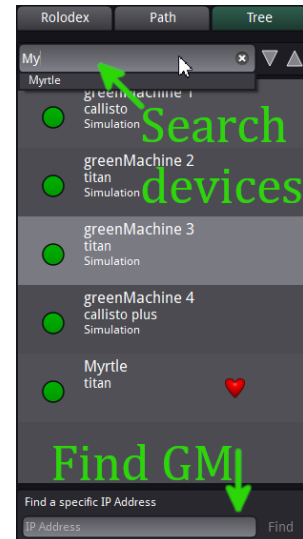
The *Tree View* displays all the machines in a condensed format, the data visualized is the same as the rolodex but in a reduced non-animated format. Using the context menu, you can add a non-simulated device to favorites.

SEARCH

To search for a specific greenMachine, begin typing in the *Search Devices* edit box. All matches are shown in the drop down as you type. You can navigate forward and backward in the list using the up/down arrows.

FIND GREENMACHINE

This is a different function from searching. Searching allows you to scan through the tables for a particular machine, whereas find allows you to look for a greenMachine in a different sub-net because it was not automatically discovered. Enter the IP address of the greenMachine you are looking for and press *Find*. If it is found, it will appear in the table alongside the rest of the automatically discovered machines.



GREEN SUB-PAGES

UNIVERSE



The universe sub-page is where all green machines in the network are visualized. It is also where deployment of constellations is performed. Deploying a new constellation will reconfigure the greenMachine to perform a new set of functions. The universe sub-page layout consists of the device trees on the left, the main view in the center and the constellation and preset tables on the right. Tapping a device on the left will cause the main view to zoom into the graphic representing that device. You can also double click on a device container in the main view to zoom in. The main view is a flowgraph, so all flowgraph based navigation is available. On the right are the constellation and preset tables. Use the constellation table for deploying new functionality and the preset table for loading new parameter settings onto a machine. Both of these operations are accomplished using drag & drop. GOTO buttons are on the right of each machine graphic. Pressing one of the buttons is a shortcut to displaying the main, params or preview sub-pages. You can also save a preset using the *Save Preset* button.

Universe Buttons

At the top right of the Universe page from left to right are the following buttons:



SYNC UNIVERSE

When this button is red, it means the Universe, (machine positions, galaxies etc.) have been changed by this user on a different machine. If you press the button the changes will be synced. If you don't sync, the next time the universe view is shown, syncing will automatically occur.

DEPLOY CONSTELLATION

This button is only enabled when one or more constellations are pending deployment. You can see that pending deployments exist, if there are greenMachine graphics with a strobing green border.

CLEAR PENDING CONSTELLATION(S)

This button is only enabled when one or more constellations are pending deployment. Pressing this button will clear all pending constellations.

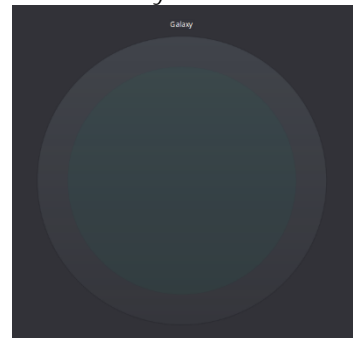
ADD GALAXY

Pressing this button initiates a drag/drop action so you can add a galaxy to the universe. You can also double-click the button and a galaxy will be added to the center of the view.

Universe Items

There are two basic items in the universe, the greenMachine graphic and the galaxy graphic. The greenMachine graphic encapsulates information about greenMachine devices. They can be viewed in control, constellation or licenses mode. The Galaxy graphic is a container for organizing your greenMachines virtually. For instance, if you have greenMachines in different rooms, you can organize them by room.

To add a galaxy to the view, press the *Add Galaxy* button and drag the cursor to the position in the view you would like it. You can also double click the button to add a Galaxy to the center of the view. Galaxies have two shapes: round (the default) and square. The Galaxy context menu contains 3 items: *Delete Galaxy*, *Zoom to Fit Galaxy* and *Square Shape*. Once you have added a galaxy, you can drag greenMachine graphics into it, and order them however you like. The galaxy graphic gets a halo once you have dragged a greenMachine graphic into it, affirming the action to be legal.



All graphics can be moved in the view. Galaxy graphics can be resized by pulling on the resize handles. Movement and resizing are undoable. Selection works by clicking with the mouse onto a graphic. You can multiply select graphics, providing they are the same type. To perform multiple selection, press the command or control key at the same time as clicking with the mouse. You can also draw a marquee selection using the shift modifier key and dragging the cursor over the view.

All item positions, galaxy sizes and shapes are stored as *Universe State* per user. This means every time you start LynxCentraal your green universe will look the same as you left it. If you are logged into two different machines with the same user, and one user changes the universe layout, the *Sync Universe* button will become enabled and turn red. You can synchronize the changes by pressing the button or ignore them, but be aware, once you leave the Universe page and enter it again, the

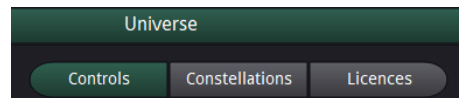
last changes will be synced. Basically, the last change always wins. Therefore, it is best not to leave yourself logged into the LynxCentraal front end with the same user on more than one computer.

Constellation Deployment

To deploy a constellation, drag one of the constellations from the Constellation table onto one of the green machine graphics. Dropping a constellation onto a graphic **can be performed in the controls, constellations or licenses tab. It doesn't matter** if the machine is zoomed in, or all the way zoomed out. Dragging the constellation onto a graphic will result in a green halo around the machine if the action is possible. **If you try to drag a titan constellation onto a Callisto machine, the halo won't appear** and dropping will have no effect. Once you have dropped a legal constellation onto a machine graphic, the halo will strobe, and the *Deploy Constellation* button (upper right corner of the universe page) will be enabled. If you press the button, deployment will be performed. If you decide you would like to cancel the operation, you can press the *Clear Pending Constellation* button, which will remove the pending constellation and the strobing will stop. Note that you can deploy different Constellations to several machines at once.

Universe Navigation

The universe has 3 different views: Controls, Constellations and Licenses. These views affect all greenMachine graphics.



CONTROLS

The *Controls View* displays the editing UI. This displays exactly the view you see in the control/main sub-page. There are two tabs, one for image and one for audio. Each control view looks different, depending on what constellation you have deployed.

CONSTELLATIONS

The *Constellations View* displays the notches and APPs that are available in the currently deployed constellation. If you hover over an APP icon, its name will be displayed.

LICENSES

The *Licenses View* gives you an overview of which licenses are available on each greenMachine, and which are in use. The *Licenses View* is also where you can export, lock and load licenses.

LICENSE HANDLING

Each deployed constellation requires a license in order to avoid a watermark on the output video/audio signals. You can deploy the same constellation onto as many greenMachines as you like. When you run out of licenses, the machine with no license will have watermarks.

Licenses are purchased from a local LYNX representative. Purchased licenses will be sent via e-mail as an attached .lxl file and can be stored in any folder on the computer where you run LynxCentraal.

To install purchases licenses, click on the *Import* button in the Green/Universe/Licenses sub-page.

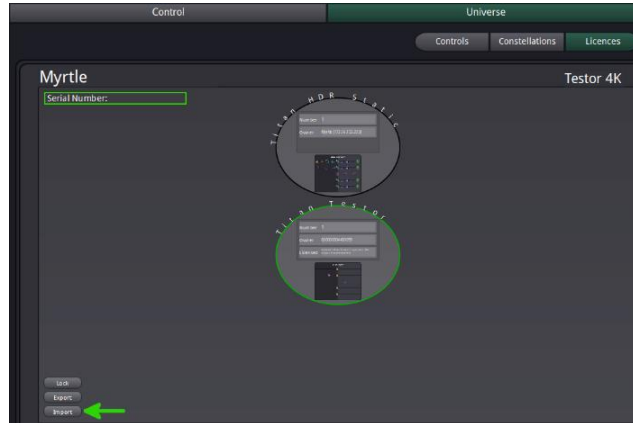
The button can be found on each greenMachine graphic on the lower left. The greenMachine graphic from which you import the licenses be-comes the initial Owner of the licenses. Each license is bound with the **greenMachine's serial number**.

The serial number is displayed at the top left of the greenMachine graphic.

Licenses are shared in the universe. If the original owner of license A for Constellation A, gets Constellation B deployed, license A is now available for a different machine to use. If a different machine deploys Constellation A, it will take license A away from the original machine. When license A is no longer needed on the other machine, for instance, Constellation C with license C is deployed, license A moves back to the original owner. If the original machine is not currently in the network at that time, the license will remain with the other machine. When the original machine comes back into the network the license will automatically move back to the original owner.

To disable license sharing, press the lock button located in the lower left of the greenMachines graphic. For instructions on locking see Locking.

When a greenMachine which has licenses is powered down or removed from the network, its licenses are not available anymore. You can export the licenses to another greenMachine before doing this, using the export dialog. Export is the button directly over the import button. A very important step to think about when exporting a license, is that a serial number must be provided, so the owner of the license can be changed.



LOCKING

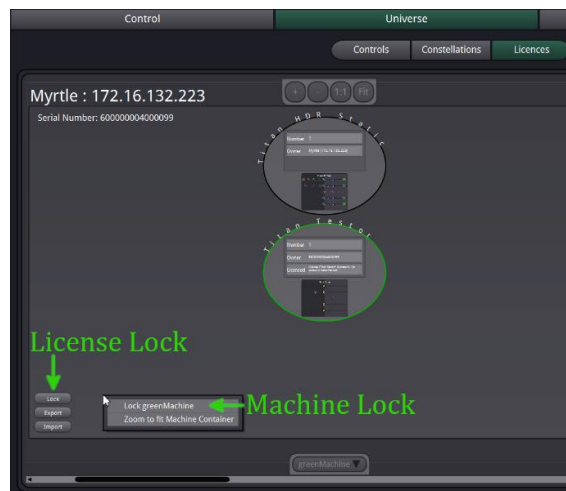
There are two types of locking in the LynxCentraal Green Page.

LICENSE LOCK

This form of locking is performed on the universe/licenses tab. When the lock is on, it takes the machine out of license sharing, meaning it will not give up a license even if it is not using it.

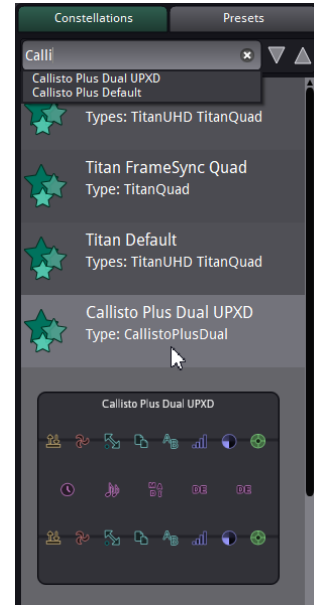
MACHINE LOCK

This form of locking can be activated from the context menu of a selected green-Machine in any universe view. To open the context menu just right-click into the view of the respective greenMachine. It locks the current **constellation configuration in the machine**, meaning it is not possible to deploy a different constellation.



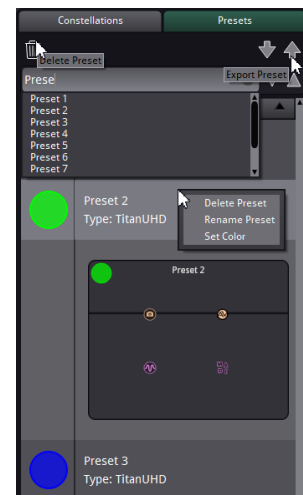
Constellation Table

The *Constellation Table* displays all available constellations. Each constellation in the table displays its name and the type of machine it can be deployed onto. Many Titan constellations work on both Titan UHD and Titan Quad. If you double click on an item, it will show its constellation graphic with all signal paths and a visualization of available APPs. Double-clicking again will close the graphic. Clicking on a different item will also close the graphic. You can search for a specific constellation at the top from the search area.

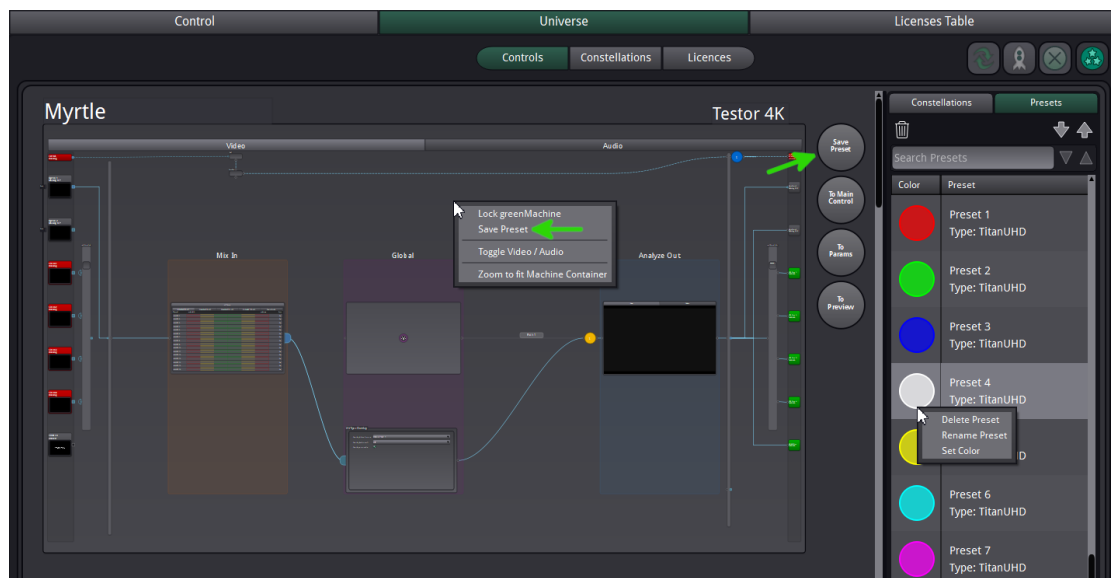


Presets Table

All available presets are listed in the *Presets Table*. Each preset has a color and a label. You can change them using the context menu over an item. The list can be sorted on either color or label, by clicking on the respective headers. If you double click on an item, it will show its preset graphic with all signal paths and a visualization of stored APPs. Double clicking again will close the graphic. Clicking on a different item will also close the graphic. You can search for a specific preset at the top from the search area. Presets are stored in the redundant file sharing system. You can export and import presets to share with users not in your network, or to make a backup copy. A preset can be deleted using the trash can button or the context menu. **There is no “Are you sure” dialog because this action is undoable.**



PRESETS HANDLING



A preset is a snapshot of all the parameters available on a greenMachine. The collection of parameters will vary, depending on the currently deployed

constellation. A preset does not contain any machine specific information, it only knows parameters. You can save a preset in Green/Universe using the *Save Preset* button or the context menu over one of the machine graphics.

Once you have created a preset, it will be visible in the presets table. When you want to apply it, simply drag and drop it onto the machine graphic of choice. The *Apply Preset Dialog* will be presented. It has all APPs listed per signal. You can either apply all or choose precisely which **APP's** parameters you want to apply.

It is not possible to drop a preset onto a machine of the wrong type, for instance a Titan Quad preset can only be dropped onto a machine with a Titan Quad constellation deployed.

LICENSES TABLE

The *Licenses Table* displays similar information to that found in the Universe License view, but in an expandable tree format.

It lists all greenMachines with information about which constellation licenses each contains. Items are collapsed by default. If an item has an arrow on the left it can be expanded to reveal a list of licenses. You can see which licenses are in use and even which are donated from another machine.

CONTROL

System

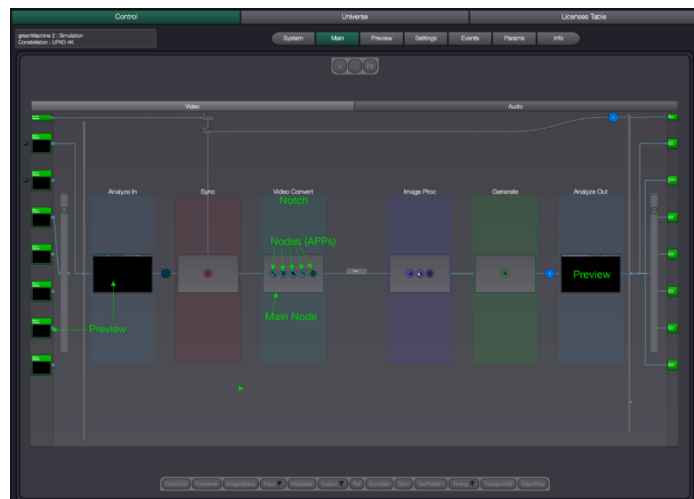
The system sub-page displays information about the selected greenMachine in an overview format. It has a graphic depicting basic processing flow, as well as voltage and temperature widgets. Basic read-only information such as device name, version and status are also listed in the upper left.



Main

The selected greenMachine displays its interface in the main view. All inputs are displayed on the left and outputs on the right. There are separate pages for video and audio editing.

When zoomed out, the main view displays the color-coded notches, with icons depicting which nodes (APPS) each main node encapsulates. Grouped into notches, the various nodes of the deployed constellation flow from left to right.



The main view is a flowgraph view, so all flowgraph based navigation is applicable. To zoom into one of the processing containers, double click on a main node. Using a context menu on any parameter control you can inspect the associated parameter, its origins and current state. Please see the Flowgraph chapter under Central UI elements.

VIDEO

The video page displays as many horizontal signals as the greenMachine has signal paths. There are four signal paths in a Titan Quad, two in Callisto+ and one in Titan UHD. Each input of Titan and Callisto+ greenMachines has a small preview, sub-sampled directly from the original video. Additional larger previews are available downstream from the input video crossbar, which also display metadata for the signal. There is one input and one output preview per signal path. Double clicking on any main node will zoom the flowgraph into that group of nodes. For instance, double clicking the Image Proc main node will display the nodes available for that notch in the current constellation. Image Proc in the *Titan Frame Sync Quad* constellation contains Video Adjust, Color Correction and Global Setting. The nodes are also organized from left to right in tabs. Each tab contains parameter widgets for editing the many parameters available on the greenMachine. Each change affects the machine immediately. There is no undo/redo available for parameter editing.

VIDEO NODES (APPS)

INPUT / OUTPUT STATUS

Input and output status nodes indicate the status of the physical inputs on your machine. Green means a signal is present, yellow indicates a possible conflict or problem and red means not present. Double clicking on a status node will zoom in and display additional information about the input.



QUAD <> SINGLE

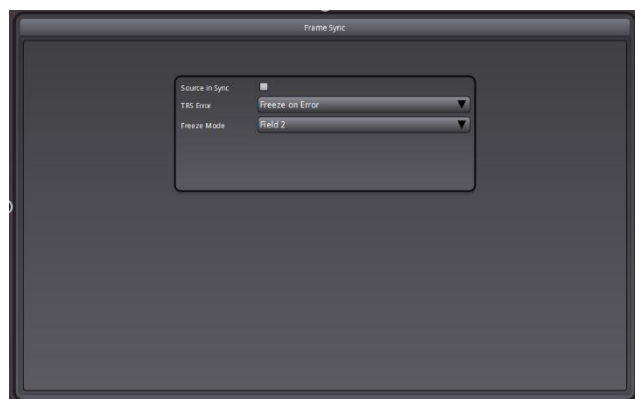
In constellations that have a 4k mode, 4k/UHD signals can be converted between quad link (2SI) and single link.

For incoming 4k/UHD signals, you can specify in the Input UHD Controls which signal type is involved and, in the case of quad link (2SI), how the link order looks. The greenMachine then adapts accordingly.

On the output side, the output standard (quad link (2SI) or single link) for the outgoing 4k/UHD signal can be determined.

FRAME SYNC

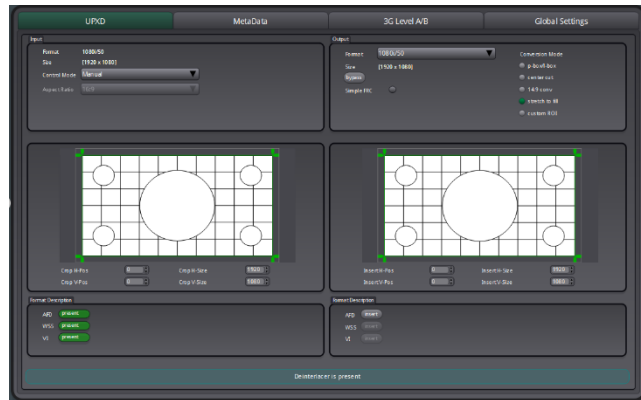
The Frame Synchronizer can be used for basic SDI synchronization issues in broadcast. It offers multiformat support for SDI formats up to 3Gbit/s (auto-detect). The Node utilizes robust flywheel synchronization that accommodates a wide variety of low-quality asynchronous SDI sources. All embedded audio is extracted and delayed automatically to match the video processing delay. Audio is free from disturbances even when dropping or adding frames. In combination with the Embedder and/or Deembedder features, the frame synchronizer also includes Dolby E frame synchronizers. If the input frame rate does



not match the frame rate of the reference signal (which determines the output frame rate) the input signal will automatically be frame rate converted through a simple drop & repeat mechanism.

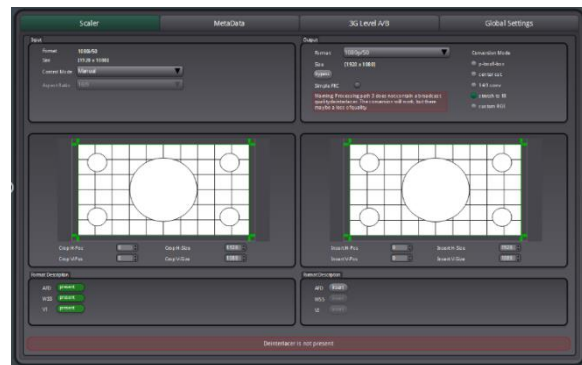
UPXD

The UPXD Node is a high-quality broadcast converter which allows an almost endless amount of conversion and scaling possibilities. Input cropping encompasses full region of interest (ROI) selection. The output image size can be adjusted just as flexibly. Both input and output can be adjusted maintaining aspect ratio. In addition to the ROI feature, the scaler can convert from any supported input format to any supported output format. In combination with high quality De-interlacing the converter offers a pristine conversion quality.



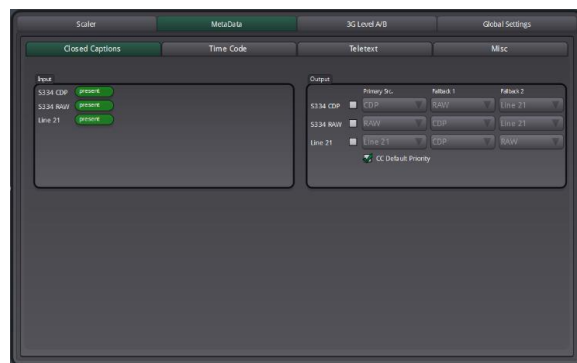
SCALER

The SCALER Node is very similar to the UPXD Node. The only difference is that the SCALER has a lower quality deinterlacer. If you perform an interlaced to progressive conversion, you may experience some motion artifacts on the outgoing signal. A warning in the UI will alert you of this situation.



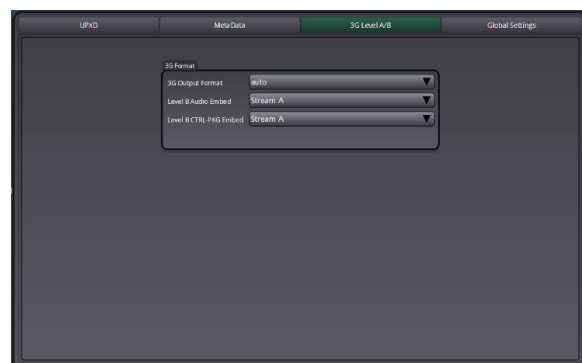
METADATA

The Metadata Node is a powerful tool to manage the metadata of the video signals. Time Code, Closed Captions and Teletext can be monitored, converted and/or repositioned. When the metadata APP is enabled, the processing channel will initially be blanked.



3G LEVEL A/B

The 3G Level A/B Converter can convert a 3G Level A input signal into a 3G Level B output signal and vice versa.



VIDEO ADJUST

The Video Adjust Node provides a range of video processing functions including image processing (saturation, black level, gain, hue, aperture) and blanking interval deletion.



COLOR CORRECTION

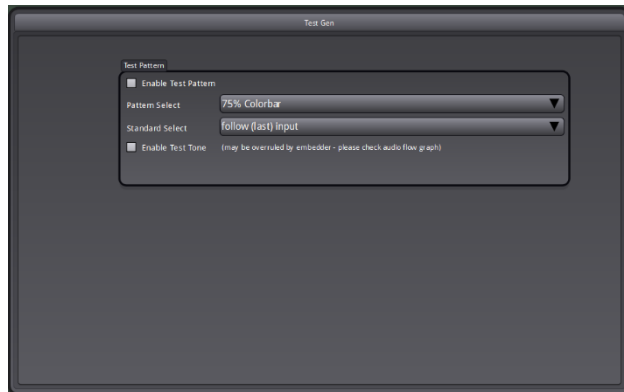
The Color Correction Node offers gain/white, lift/black, gamma, and offset adjustment in RGB and gain and offset adjustments in CMYW.



TEST GEN

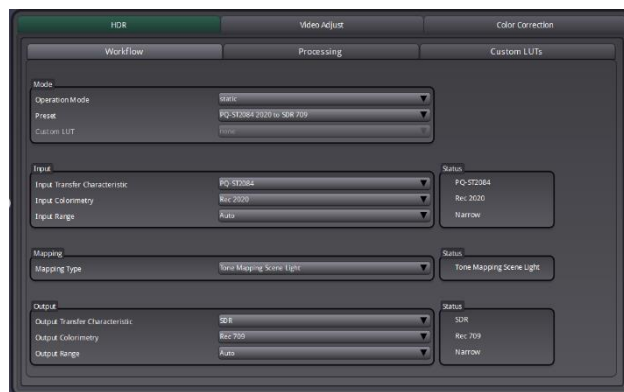
The Test Signal Generator Node is a simple video signal generator with a wide range of still test patterns. The output video standard can be set to follow the last detected video standard of the respective processing channel or to a fixed video standard.

The Test Pattern Generator can be configured to react to the TRS detection on the input of the Frame Sync node and can be output alternatively to a freeze. This is a great way to identify TRS errors on the incoming signal. The Test Pattern Generator can also be configured to kick in if the input signal of the respective processing path is lost.



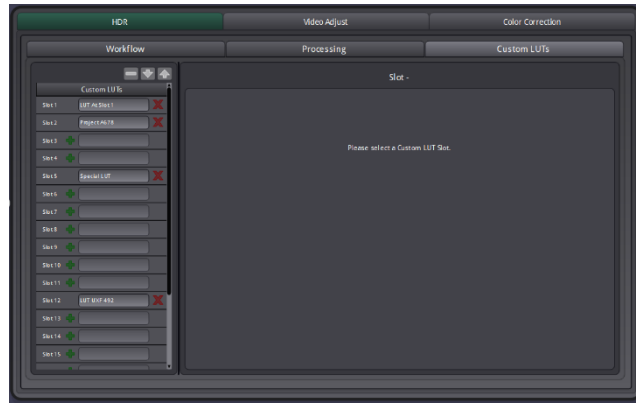
HDR STATIC

The Static HDR Node is a broadcast quality HDR to SDR, SDR to HDR or cross standard HDR to HDR converter. Static HDR applies color and contrast parameters uniformly to produce an average brightness/color range through an entire program. It provides conversion functionality, simultaneously combining it with a static, real time tone mapping algorithm. This node enables up, down and cross-conversions between common input and output curves including Gamma, PQ, HLG and Slog3. Additionally, conversions between full and narrow



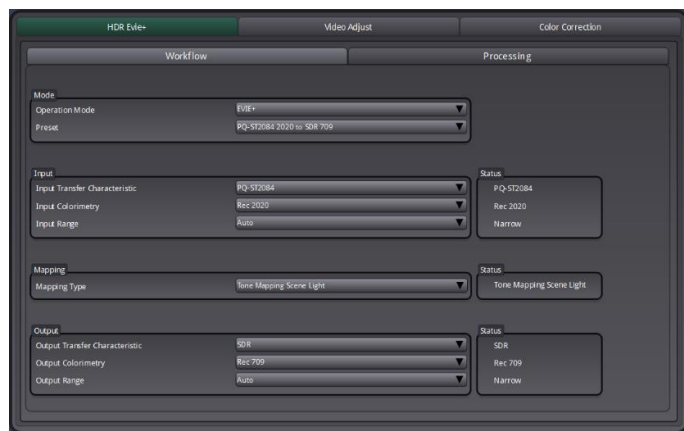
ranges through appropriate static tone mapping can be performed. Conversion between color spaces including Rec. 601, Rec. 709 and Rec. 2020 is also possible. HDR content can also be displayed, by contrast compression, on non HDR-capable TV monitors thus producing a high level of HDR-enhanced image quality for all possible display types.

The Static HDR node has 30 slots for uploading custom LUTs. Each slot can store one LUT. The supported LUT file format is CUBE.

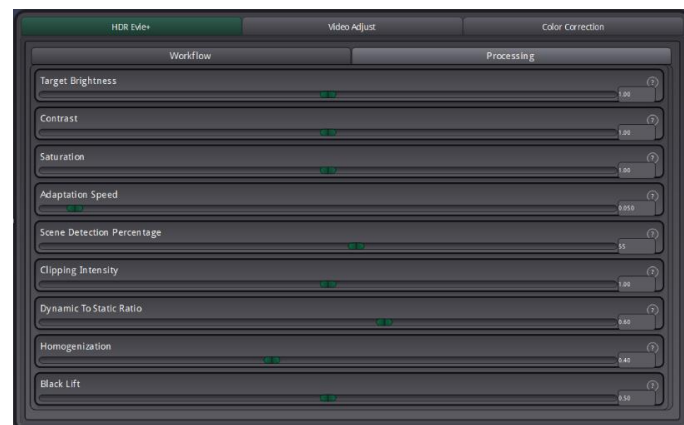


HDR Evie+

The HDR Evie+ Node is a broadcast quality segmented dynamic HDR to SDR converter. HDR Evie+ analyses different sections of an image in real-time, frame-by-frame and applies color and contrast parameters dynamically to each individual section.



It provides user adjustable settings for Dynamic to Static ratio, in which the dynamic tone mapping and static tone mapping are combined or mixed proportionally. It also provides homogenization tool to select the proportion of local dynamic and global dynamic conversion. This feature-rich node allows you to set target brightness, contrast, saturation, adaptation speed, scene detection threshold and clipping intensity to each processing channels in quad 3G mode or the single channel in 4K mode.



TESTOR

The Testor node offers multi-format test signal generator functionality. It's an ideal trouble-shooting tool for technicians and engineers working in the field, studio applications, post-production, as well as a variety of other video source and cable testing test signals.

The Testor node is available on titan hardware and supports 12G, 3G, HD, SD-SDI formats. In UHD mode, Testor can provide a single channel test generator. For 3G video formats (and below) Testor offer four independent test generators with individual logo and text insertions. Standard static and dynamic video test signals

and patterns are included, as well as user-defined signal patterns which can be uploaded. Logos and text can be inserted into test signals for channel identification. Testor also includes an integrated audio test generator with adjustable gain and frequency (4Hz steps), which is embedded into the SDI video.

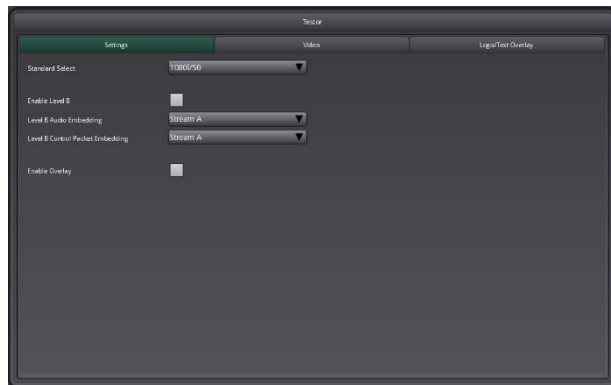
Testor has an additional AV Sync Analyzer feature that provides measurement of audio to video timing and provides the real-time measurement results in the GUI or optionally as an overlay. This Allows an operator to identify AV timing mismatch and avoids guesswork and provides a more accurate measurement. It reduces unwanted errors significantly.

TESTOR NODE UI

The node interface is broken up into 3 sections: Standard, Video and Logo/Text Overlay.

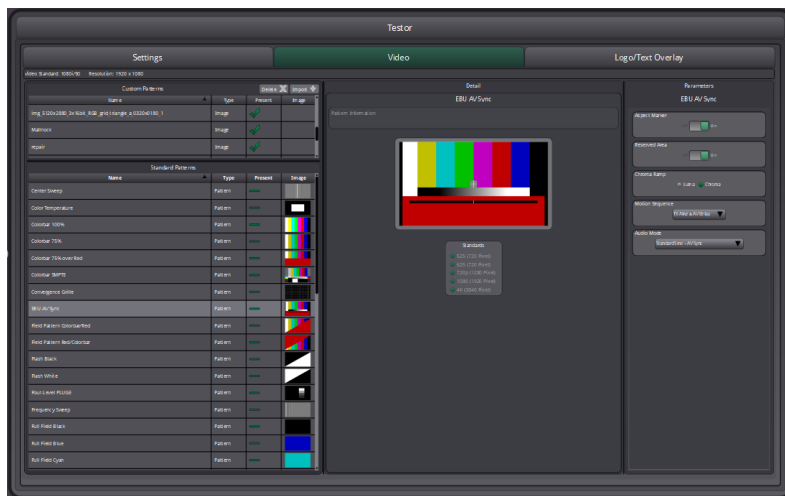
Settings:

The Settings section has settings for Video Standard, Level B and enabling overlay.



Video:

- The video section is where you can set up which pattern you would like to display. Testor offers a variety of test patterns, both still and dynamic. Stills can be broken down further into images and line patterns.

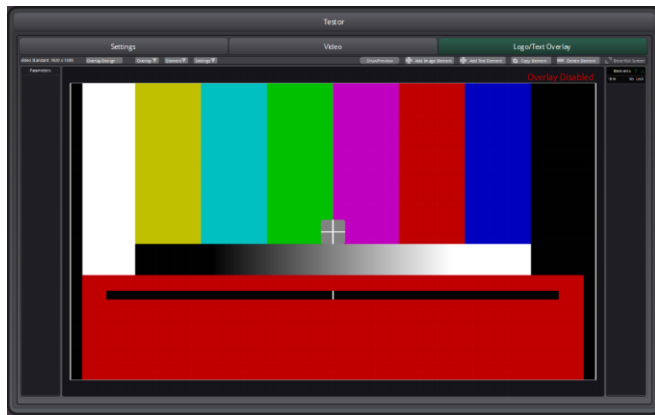


- On the left is the list of all available patterns with thumbnails. In the middle is a detail of the selected pattern, and on the right are additional parameters. Not all patterns have additional parameters.
- The available patterns list is comprised of both the included standard collection and user imported line patterns or images. Only the imported patterns and images will be shared via file redundancy.
- Video standard is an important aspect of line patterns and images. Each line pattern or image fits one standard. Therefore, it is necessary to describe which standards a given pattern supports. The included standard collection supports all video standards. When you import a line pattern or full image you will be presented with a non-exclusive radio button set where you can choose to generate resampled images during import. The standards found in the file are checked and cannot be unchecked. Additional standards which the file does not support can be selected. For all selected items for which no image yet exists, the software will generate them.

- During the resampling process, you also have control over the type of resampling: Scale to fill, Aspect Fit, Aspect Fill and Center.
- The additional parameter section can be closed by dragging the splitter all the way to the right. If there is any metadata or information about the item it will be visualized in short form in the table and long form in the detail. For instance, one bit of information is whether the item is an image or a line pattern and which standards an item supports. The supported standards are visible in the detail.
- If a pattern does not support the selected standard, its *Present* column section is not checked, and the detail says so in the info field.
- The import button allows you to import new line patterns or images. The software will generate the necessary XML file for using the imported data within the system. The software will also generate a thumbnail while importing and store the image on the greenMachine. If you forgo resampling on import, you can still generate missing standards at any time, by selecting the Generate button.

Logo/Text Overlay:

- The last section is the logo / text overlay section. Images and or text can be placed over the video signal. This section consists of a tool bar, an editing view and the elements list. The view is a fully editable, zoomable graphics view, where items can be moved and edited with the mouse. Undo/Redo is available for all changes.
- The header contains buttons for adding an image or text element, copying or deleting elements, for turning on and off the grid and grid snap, as well as a control for going into full screen mode, for a more immersive experience. Import will open a browser to import images into the system. Load will open a browser to display files already in the system.
- All available editing functions are available in the tool bar: position, scale, opacity, background color, text color, font. The text can be edited directly in the view. The image in an image overlay can be changed by selecting the change image button.
- All elements are listed in the elements list. Elements can be hidden by unchecking. Elements can also be locked to avoid unwanted position changes in a finalized element.
- Once an element is added, it will be placed in the middle of the view. To delete an element select it and press minus or press the delete key on the keyboard. When an element is selected it can be moved by dragging. Each element has an opacity, for making semi-transparent overlays.



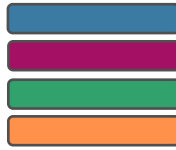
AV SYNC ANALYZER

In Testor Quad, one input can be overlaid with the sync measurements and made available on the OUT 4 electrical port or on optical/HDMI ports. In Testor 4K mode, for quad-link 12G signals, the output with overlay will be available on all ports (electrical, optical, HDMI). For single link 12G signal, the output will be available on OUT 4 electrical port and Optical Out 2 optical ports.

The various types of audio signals are color coded.

Audio Inputs:

- De-embed
- MADI
- AES Ext Audio
- Testor
-



Audio Outputs:

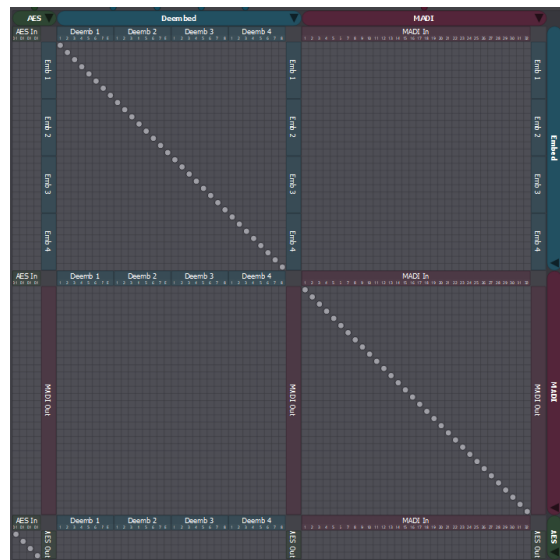
- Embed
- MADI
- AES Ext Audio
- Testor



The crossbars and parameters are variably visible. There is an expanding bar for each of the audio types, both input and output. When expanded it reveals the current crossbar settings or the processing parameters.

CROSSBAR (ROUTING BLOCK)

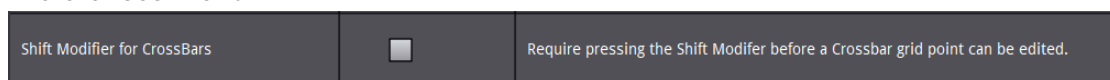
The input or output bars in the routing block can be expanded by a single click anywhere on a bar. This will also expand the corresponding input or output bars which have routed signals. If one input audio type is routed to more than one output audio type, expansion will open all of them. You can expand and collapse portions of the routing box at any time. The crossbar can be zoomed all the way in, to work comfortably. Hovering over a crosspoint will display detail information about the audio channels affected at that point. To change a cross-point, simply click in one of the grid boxes.



Right-click on a crosspoint to activate mono routing for the destination in the context menu by activating *Edit Mono*. Then the audio signals can also be routed on mono level. In the same context menu, you can mute the audio destination. (Stereo or L/R individually)

Important Note:

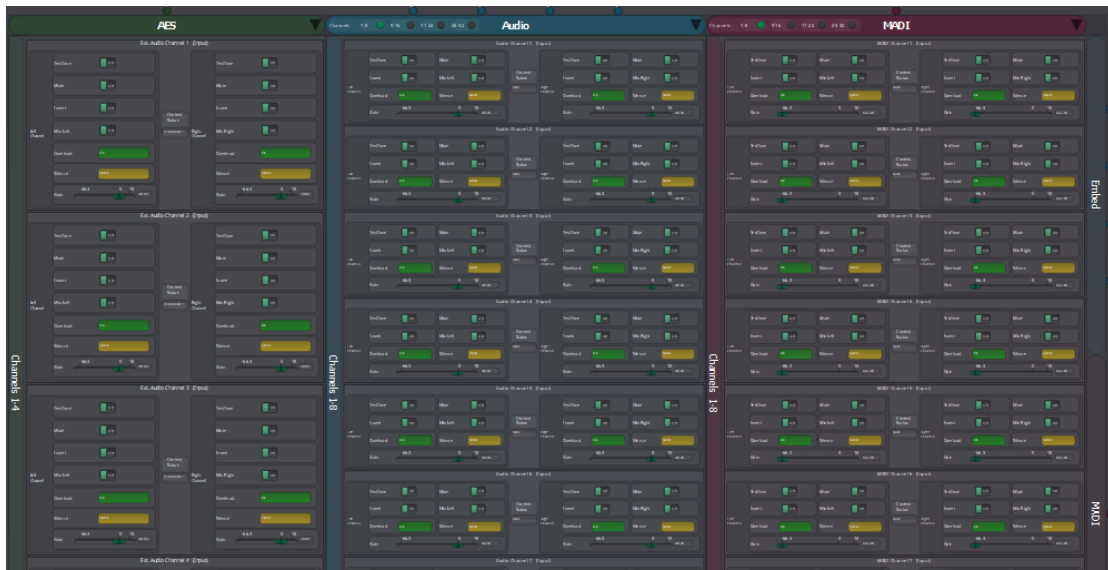
It is possible to lock crossbars globally to avoid operating errors. If locking is active, a single click is not sufficient to effect a change. The shift key must be depressed while clicking. This setting can be activated and deactivated in the General Preferences menu:



PROCESSING

Global Audio Processing is a flexible audio processing APP allowing a multitude of functions. The gain of each mono audio channel can be adjusted, muted or inverted. In addition, each mono audio channel has an individual silence and overload

monitoring as well as a 1kHz test signal generator. Each stereo signal can be mixed down to mono channels.



Input or output processing parameters can be edited in the processing segment. The AES, Audio and MADI sections can be expanded just like they can in the routing block. In addition to the expandable sections, you can choose which audio channels you would like to edit. The more audio channels you enable for editing, the more parameter widgets will be visible. It is best to work on one section of audio channels at a time, it is easier to navigate, and the individual parameter widgets have more space.



DOLBY

Decoding of the Dolby E stream takes place before the audio processing module, enabling you to add gain etc. to the decoded audio.

If there is no Dolby E Audio in the selected source stream, the stream will normally be handled as regular PCM. In this case, the destination streams will not be affected. When the content changes from PCM to Dolby E and vice versa, disturbances in the audio may occur.



If the stream where the Dolby E Audio was decoded is not used for one of the resulting PCM streams it will still contain the full Dolby E information.

For every instance of the Dolby E Decoder APP, you will have to define which AES Stream should be used as Dolby E Source. It is also necessary to define which 4 AES Streams (3 for 5.1 surround content and the 4th channel for the additional tracks) will be used for the resulting PCM streams from the Dolby E destinations. The destinations are defined as a group of 4 consecutive AES streams or stereo

pairs. It is possible to mono shuffle the PCM audio with the output crossbar. In this case, you will lose 3 or 4 AES channels to choose from for the output crossbar.

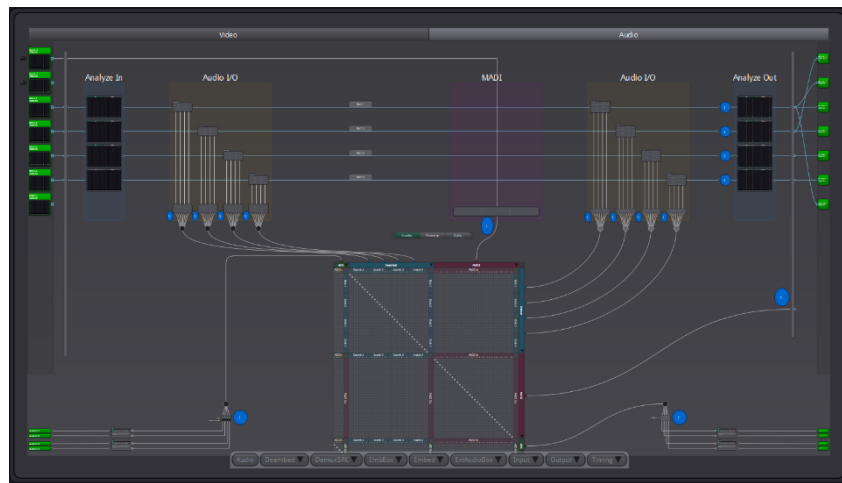
Each instance of the Dolby E Decoder APP has the following parameters for controlling the decoder:

- Source selection:
- Choose from the external AES and the available embedded audio. The selection is one stereo pair. The default will be the first External AES. Click onto one of the ports at the top to change the source.
- Destination selections:
- Channels 1-8: to choose from the external AES and the available embedded audio. The selection is the first of the stereo pairs. The default will be the first External AES. To change the output port, click on the port of choice or click on an enabled link and drag it to the port you are interested in.
- Mute on CRC error

EMBED/DE-EMBED

The Embedder / De-embedder APP is a high-quality multi-format audio embedder which can embed up to 16 mono audio channels into the SDI output. It can be fed with any channel from any processed video or external audio input. The

embedder can also embed Dolby E signals which in conjunction with the Frame Synchronizer will always maintain the Guardband. The node is also a versatile multi-format audio de-embedder which can extract all 16 channels from the incoming SDI. The de-embedded audio can be output to the external audio outputs or re-embedded into the outgoing video when used in conjunction with the Embedder / De-embedder function.



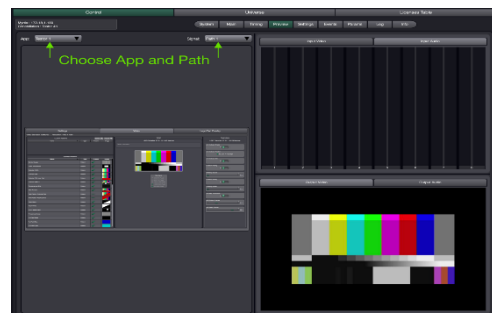
MADI

The MADI APP turns the greenMachine into a processor and multiplexer for MADI audio signals. It offers:

- Audio processing functionality for the MADI audio channels if deployed jointly with the Audio Processing
- Audio delay functionality for the MADI audio channels if deployed jointly with the Timing.
- Multiplexing and channel-shuffling functionality for the MADI audio channels if deployed jointly with CrossBar.

Preview

The preview page is where you can edit parameters for a specific feature on a particular machine with a preview directly next to the parameter controls. The preview is sub-sampled from the original but does afford the possibility of working without an external video monitor in the vicinity. On the



left are a list of all the nodes available for editing. At the top, you can choose which processing path you would like to edit. The chosen feature will display its parameters. On the right you can view audio and video, input or output.

Timing

Select cards have a timing sub-page. Please see [Central UI Elements/Timing](#) for a complete description.

Settings

The settings page is where you can configure basic settings such as device name, IP or SNMP settings for the selected greenMachine.

- Reset or reboot the selected greenMachine
- Edit greenMachine front-panel settings
- Edit audio level meter settings
- Check the GPI state of the physical GPI contacts of the selected greenMachine.

Events

Every greenMachine has an Events sub-page where error reporting can be organized. The events editor allows you to configure and display only log information you are interested in. The Events editor also allows you to configure which events will be stored in the log file.

There may be circumstances where an input video signal routinely goes missing because input sources are frequently changed. Since this behavior is acceptable for the given situation, you can disable logging input events. Likewise, you may only want to log when a specific event happens, **not when it's** corrected. For instance, if you want to log when a signal goes missing but not when it returns.

It is also possible to configure the SNMP traps sent to an external monitoring or logging device in the same way.

Params

The params sub-page displays all parameters for the selected machine in tree format. Selecting one parameter will show a detail of its name, description, access and current value.

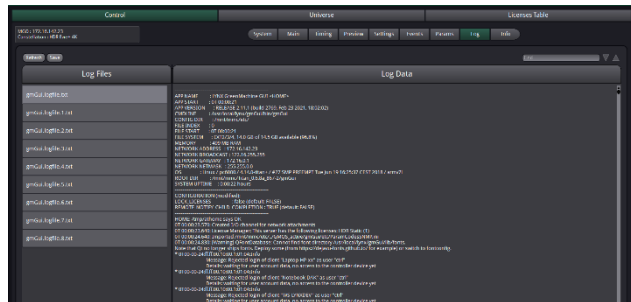
The tree can be filtered at the top, to aid in finding the parameter you are searching for

You can set the current value of the selected parameter on the right in the Parameter Details. Read-only parameters cannot be edited.

You can also perform a factory reset or export parameters to HTML or XML.

Log

You can access the last 9 log files of the selected greenMachine in the log sub-page. Older log files will be overwritten. You can search for desired keywords in one or several log files at once. You can also save the desired files onto your computer. The current log file is called "gmGUI logfile.txt."



Info

The Info sub-page displays various types of general information about the selected greenMachine.

BACKPLANE

The backplane depicts the rear connection panel diagram of the selected greenMachine. You can pan and zoom using mouse and keyboard.

GPI/SERIAL PINNING

The greenMachine titan provides four inputs and four outputs general purpose interfaces (GPI) via an RJ45 connector. The pinning of the RJ45 connector is in accordance with TIA/EIA 568-B.

AUDIO PINNING

The Audio Pinning sub-page displays detailed audio pinning information for the external audio inputs and outputs.

It is recommended to use high quality screened (twisted pair) cable for the balanced audio connections. LYNX Technik provides optional audio breakout cables which will bring out all audio connections to in line XLR connectors: model number R AC MF 25-4/4, R AC M 25-8 or R AC F 25-8.

YELLOW

yellobrik®

The yellow page is dedicated to controlling and monitoring yellobrik devices. It provides extended and enhanced access to internal yellobrik settings and controls, many of which are not accessible from the local controls and switches on the device.



There are numerous small interface “brick” style products available. You can monitor and control many of them using the LynxCentraal front-end.

THE YELLOW PAGE



CONNECTING YELLOBRIKS TO THE YELLOW PAGE

The yellow page can only be used to monitor and control yellobrik modules which are directly connected via USB directly to the PC running LynxCentraal

It is possible to connect several yellobriks via USB at the same time to your PC until it runs out of USB connections.

If you want to use an RCT 1012 yellobrik rack controller to connect several yellobrik devices at the same time, the devices will show up in the Blue page. The necessary controller card structure is only provided on the Blue page.

Additionally, the RCT 1012 from the blue page can be used to integrate yellobrik modules into a fully redundant server system with SNMP support. Using the server structure of the 5000 series,

backup and restore is also available. For more information, see the chapter Fehler! Verweisquelle konnte nicht gefunden werden. in the Blue section.

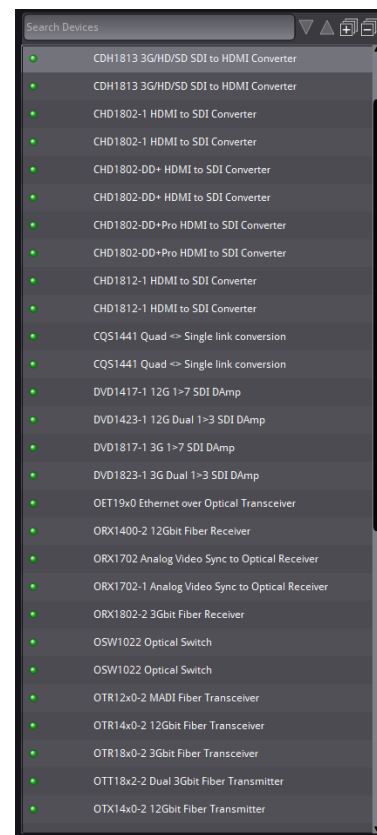
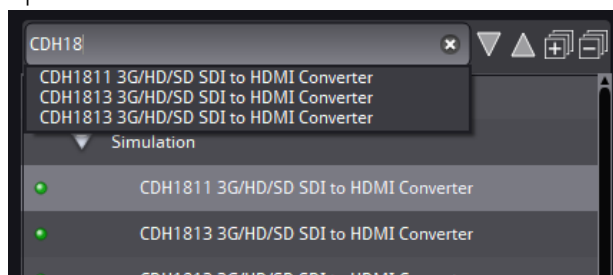


DEVICE TREE

The device tree on the left displays all yellobriks currently connected via USB cable to the LynxCentraal PC, as well as the new yellow server SRV100. It also displays all simulated yellobrik devices if simulation is enabled.

SEARCH

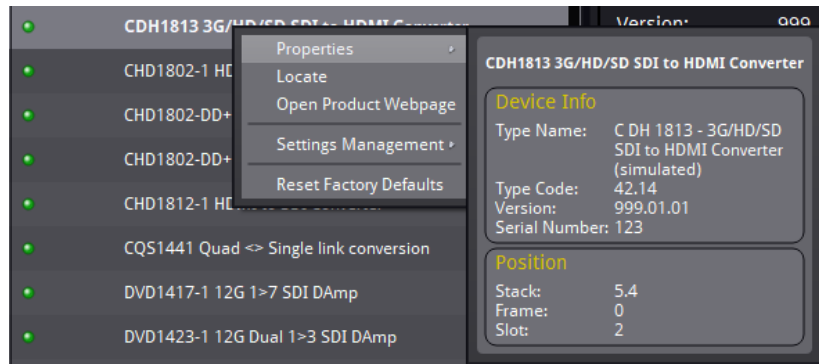
To search for a specific device, begin typing in the *Search Devices* edit box. All matches are shown in the drop-down as you type. You can navigate forward and backward in the drop-down list using the up/down arrows.



DEVICE CONTEXT MENU

Properties

Information about the selected yellobrik, including type, version and serial number.



Locate

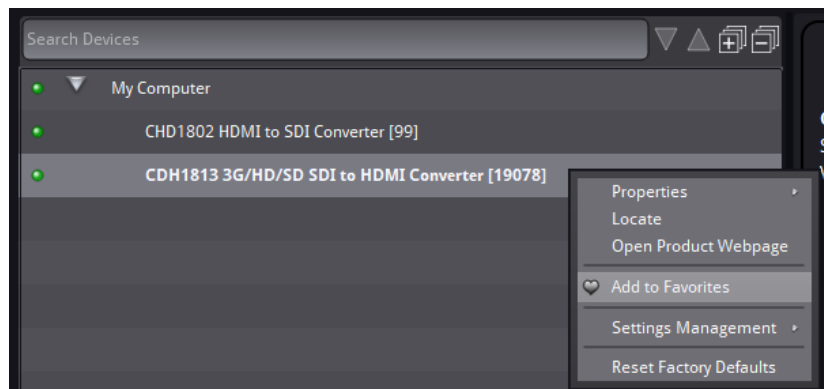
Selecting locate will cause the LED on the device to flash.

Open Product Webpage

This will open the product page from the selected device on the LYNX Technik AG website, if your internet connection is enabled.

Add to Favorites

The yellobrik will be added to the favorites page.



Settings Management

Import and export all yellobrik parameters from and to disk in XML format.

Reset Factory Defaults

Resets all parameters of the device to factory defaults.

VIEW

When you select a yellobrik in the device tree, its contents are displayed in the view on the right. Not all yellobrik are supported by LynxCentraal. Unsupported yellobriks appear in the device tree but do not have a graphical user interface.

The graphical representation of yellobrik devices differ widely, depending on their functional scope and range of features. The tabs on top of the page provide access to all sub-pages.

All yellobriks that have a UI, have a main sub-page. The rest of the sub-pages can differ.

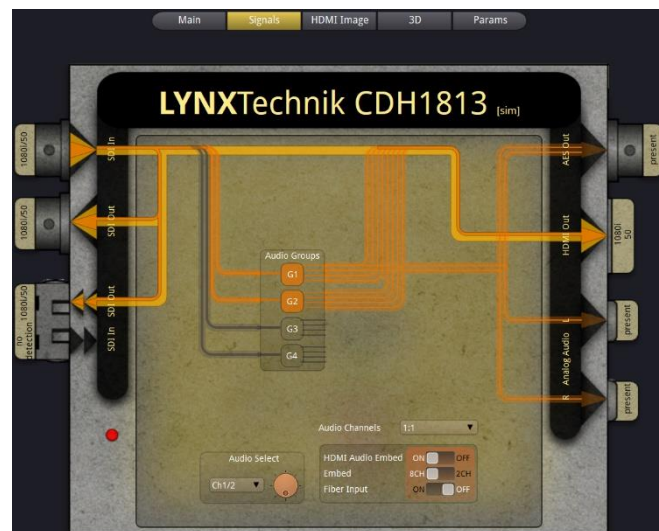
MAIN

The main sub-page displays a stylized yellobrik. The connectors are visualized along the edges, and editable parameters are found in the interior. Each yellobrik has a different arrangement of connectors and parameters. Many yellobriks allow device parameter changes on the device via local dip switch or rotary knob. Since those same parameters can also be modified in LynxCentraal, any discrepancy is visualized by highlighting the affected parameters in orange. There is also cautionary text at the bottom of the stylized brick should discrepancies arise.



SIGNALS

Only yellobriks which have complex signal flows or offer internal routing display the Signals sub-page. The Signals sub-page is primarily read-only status which depicts how signals flow through the yellobrik, but has some control elements for the internal routing.



PARAMS

The params sub-page displays all parameters for the selected yellobrik in tree format. Selecting one parameter will show a detail of its name, description, access and current value. Not all yellobriks have a params sub-page. The tree can be filtered at the top, to aid in finding the parameter you are searching for.

You can set the current value of the selected parameter on the right in the Parameter Details. Read-only parameters cannot be edited.

You can also perform a factory reset or export parameters to HTML or XML on the params sub-page.



HDMI IMAGE

HDMI converters such as CDH 1813 have a HDMI Image sub-page. The HDMI Image sub-page contains settings for arranging overlays for monitoring with HDMI.



OVERLAY

Devices such as the PMV 1841 have an Overlay sub-page. The Overlay sub-page contains settings for arranging overlays for monitoring.



3D

YelloBriks which support 3D output have a 3D sub-page. The 3D sub-page allows you to set the format you would like 3D data to be output in.

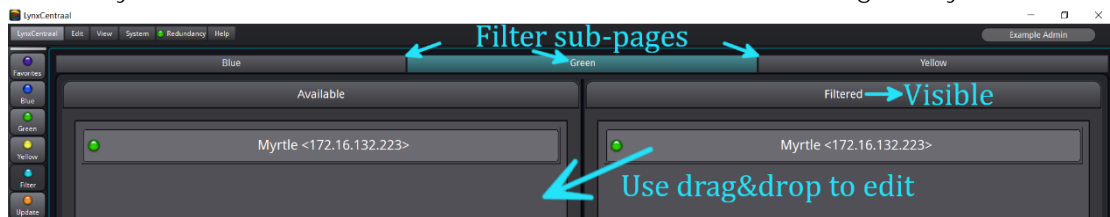


FILTER

THE FILTER PAGE

The Filter page contains functionality for filtering your permitted servers. Permitted servers are established by a system administrator. While a standard user can not change his list of permitted servers, he can filter them.

Filtering affects the entire application, meaning all pages will only present your filtered list of devices. It allows you to streamline your workflow, making only the devices you want to interact with visible. You can edit the filtering at any time.



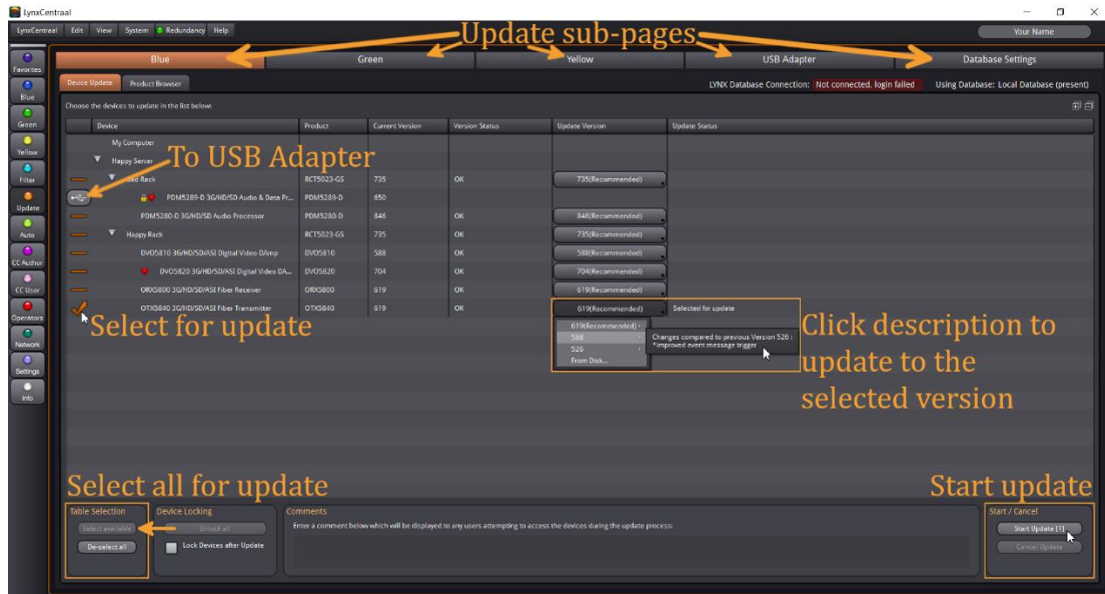
The Filter page has a sub-page for blue, green and yellow devices. On the left side is the column of available servers. These are the servers the admin has given you the rights to see and edit.

Per default, all servers are added to the filtered column, meaning nothing is being filtered out. To filter out a server, drag it from the filtered column to the permitted column. That will make it invisible to all UI elements which display servers: favorites, blue device tree, green device trees, green universe, update page and custom control. This feature makes it possible to reduce the number of servers visible in the UI to speed up workflow.

UPDATE

Update is used to centrally manage all software and firmware versions for your connected Lynx devices.

THE UPDATE PAGE



The Update Page is divided into Blue, Green and Yellow, USB Adapter and Database Settings sub-pages.

UPDATE SUB-PAGES

BLUE, GREEN AND YELLOW

The Blue, Green and Yellow sub-pages are identically designed and operated. Each sub page controls the product line designated by its color: Blue for Series 5000, Green for greenMachine and Yellow for yellobrik.

Device Update

The Device update section displays each device, including state data such as current version and version status. The individual rows are not selectable. The *Update Version* column lists all the updates available, with the recommended update at the top.

To select a version for update, press the check button at the beginning of the row. You can also open the *Update Version* pulldown and select the sub-menu with text describing the version. Once you have marked all the devices you would like to update and chosen the Update Versions you would like to install, press the *Start Update* button in the right lower corner. All selected devices will run through the update process automatically.

At the bottom in the Table Selection box, *Select Available* will select all items for update, where an update is available. De-select all, will remove all items from update.

There is an optional button which can be visible at the start of a row, which will take you to the USB Adapter sub-page.

Product Browser

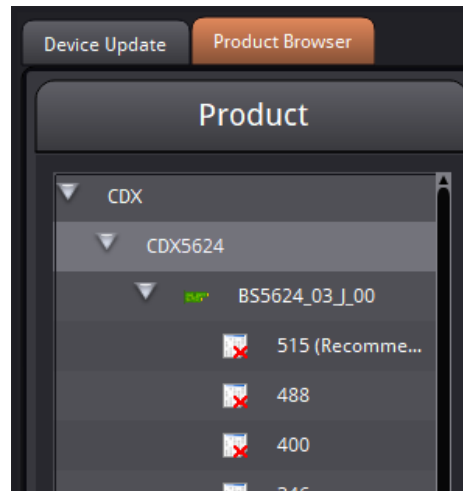
If you are connected to the Lynx Asset DB, all devices and their software versions will be listed in the Product Browser table.

This happens automatically, if your LynxCentraal PC is connected to the internet and you are registered at Lynx. For more information about the registration please see the Database Settings chapter.

For LynxCentraal systems, which do not have access to the internet, Lynx offers an offline database download package on its website, which contains all software and firmware versions of all LynxCentraal compatible devices. The package can be downloaded and installed on the LynxCentraal PC. LynxCentraal then automatically connects to this database, from which all software and firmware versions can be loaded.

The download package is available here:

<https://lynxcentraal.lynx-technik.com/>

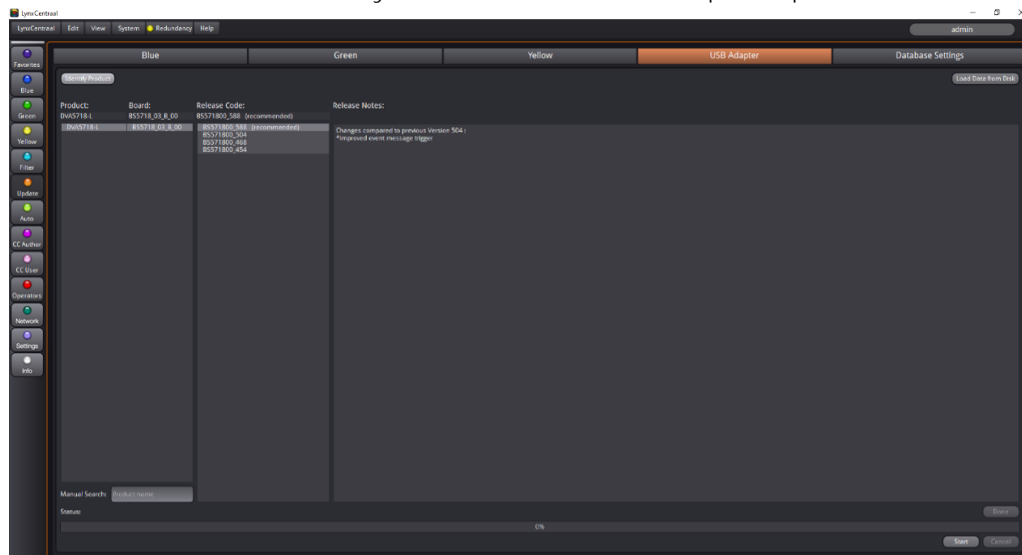


USB ADAPTER

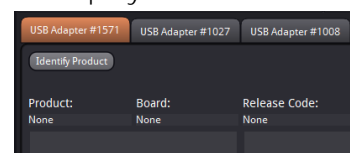
The USB adapter sub-page allows you to update older Series 5000 cards which were previously only possible via USB adapter.

Simply select the card you want to update via USB adapter and click on Identify Product. This will display all available updates.

Select the firmware version you desire and start the update process.



If multiple USB adapters are connected, multiple tabs will be displayed in the USB Adapter subpage. One for each connected USB adapter.



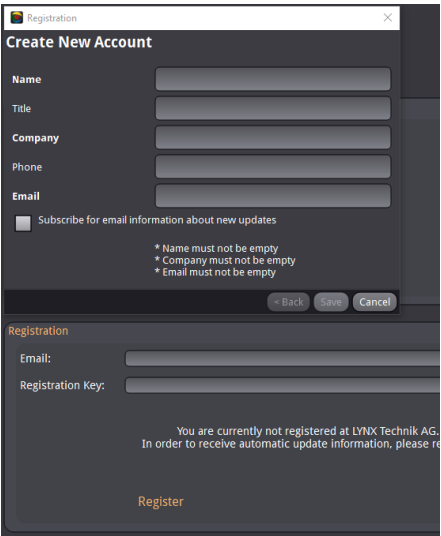
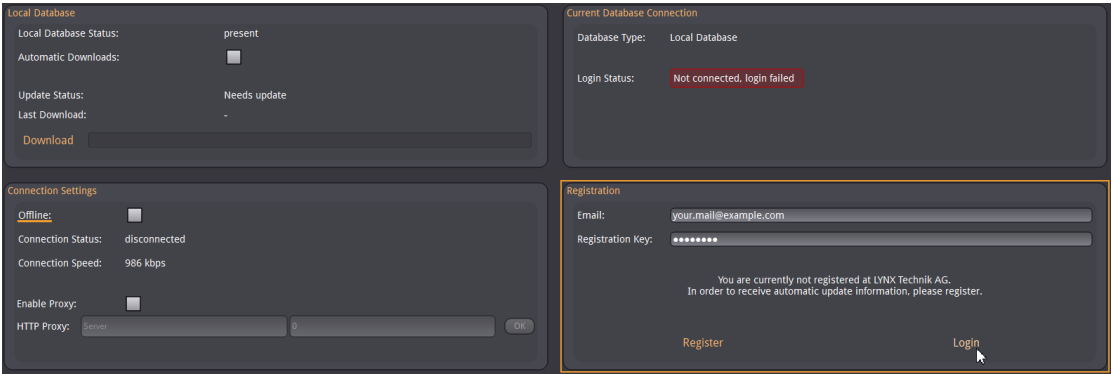
DATABASE SETTINGS

To use the online update functionality, you need to register yourself with Lynx. The registration box allows you to register or log-in with an existing account.

When registering, an input mask opens where the name, the company and the email address must be entered. Title and phone are optional, as well as the simultaneous registration to the Lynx newsletter.

As soon as the registration or the log-in with an existing account is completed, the update manager will mirror the entire Lynx Database onto your local PC.

Download progress can be monitored in the Local Database section.

A registration dialog box titled "Registration" with a close button. It contains a "Create New Account" section with input fields for Name, Title, Company, Phone, and Email. There is a checkbox for "Subscribe for email information about new updates" and three asterisked notes: "* Name must not be empty", "* Company must not be empty", and "* Email must not be empty". Below are "Back", "Save", and "Cancel" buttons. The bottom section is for "Registration" with "Email:" and "Registration Key:" fields. A message states: "You are currently not registered at LYNX Technik AG. In order to receive automatic update information, please register." A "Register" button is at the bottom.A screenshot of the Lynx software interface showing database settings. The "Local Database" section shows "Local Database Status: present", "Automatic Downloads:" with an unchecked checkbox, "Update Status: Needs update", and "Last Download:" with a "Download" button. The "Current Database Connection" section shows "Database Type: Local Database" and "Login Status: Not connected, login failed". The "Connection Settings" section has an "Offline:" checkbox, "Connection Status: disconnected", "Connection Speed: 986 kbps", "Enable Proxy:" checkbox, and an "HTTP Proxy:" field with a "Search" button and an "OK" button. The "Registration" section at the bottom right has "Email:" and "Registration Key:" fields, a message about not being registered, and "Register" and "Login" buttons. A mouse cursor is pointing at the "Login" button.

The system will keep the database up to date as long as you are connected to the internet, the Offline check-box in the Connections Settings section is not checked and the Automatic Updates check-box in the Local database section is set.

It is also possible to enable a specific HTTP proxy for the connection in the Connections Settings section, if required.

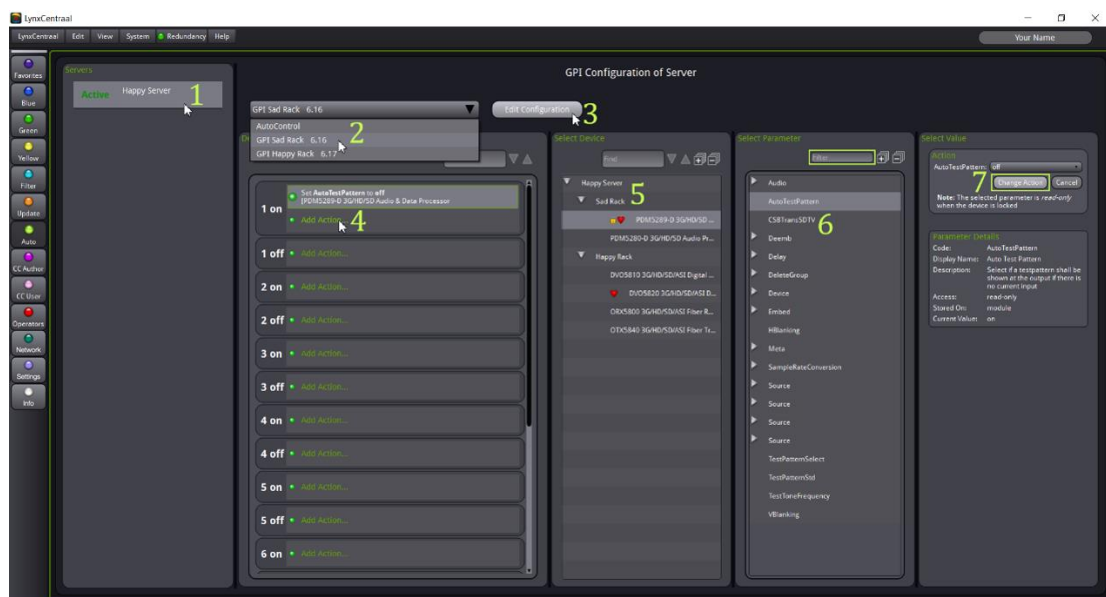
AUTO CONTROL

Auto Control is currently only available for blue (Series 5000 devices). It adds automation and programmable intelligence to terminal equipment, enabling automatic reconfiguration of a module's functions, signal routing and internal signal processing.

LynxCentraal **monitors every module's internal status and configuration, every input and output** for video format and presence, as well as multiple external GPI inputs in the system. Based on these input parameters, you can program an automatic conditional action using logical functions.

A simple example: The video input to a module has embedded audio, however the first embedded audio stream could be dropped or go missing in the input signal. Using Auto Control, you can automatically embed an external audio input if the SDI input is missing embedded audio. You would program LynxCentraal to monitor the first embedded input stream. If audio is present, the system does nothing and transparently passes the audio to the output. If audio is missing, the system will reconfigure the module to route an external audio input to the embedder.

THE AUTO CONTROL PAGE



SERVER CONTROL

Auto Control and GPI Control are both functions of the LYNX Server. The server can be added to any RCT5023 rack controller as an optional hardware extension board (OH_RCT5023_SERVER). The server is already integrated in older the RCT5031 master controller cards.

A server can control all modules of the rack frames that are logically connected to it.

AUTO CONTROL VS GPI CONTROL

Auto control works according to the same principle as the GPI control: an event triggers one or more pre-programmed actions. The only difference between GPI control and auto control is that auto control's trigger is not derived from a GPI Input. Instead, the trigger to start the pre-defined action(s) is derived from the current status of a parameter.

GPI CONTROL

GPI (general purpose interface) is the simplest variant of Auto Control and works based on GPI-Inputs. GPI-Inputs are provided by the LYNX Rack Frame through the RCT5023-G controller board.

GPI Inputs

Each rack frame with a RCT5023-G Rack Controller provides 9 independent GPI inputs.

GPI Outputs

Each rack frame with a RCT5023-G rack controller provides up to 6 programmable GPI Outputs.

Each GPI input contact can be configured to trigger one or multiple actions within the system. For example, one GPI input can be configured to switch the audio embedder in a specific card to ON. Based on this auto control rule, the embedder will be enabled whenever that GPI Input is triggered.

Configuration

The *Servers* column on the left lists all connected servers. Click to select the server you would like to edit (1).

Select GPI from the pulldown (2).

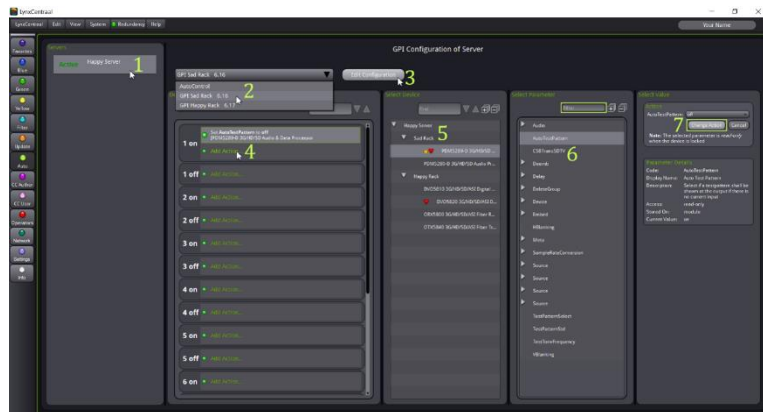
To begin editing, press the *Edit Configuration* button at the top (3).

This allows you to add conditions and actions.

When you are done editing click the button which is labelled *Finish Configuration*.

To review any action, you can click on it (4) and all the columns to the right will update with the current state.

You can add as many actions as you like to each GPI (4). All actions associated with a GPI will be executed simultaneously.



ADD ACTIONS

After pressing the *Add Action* (4) text for one of the GPI on/off items, all connected rack frames and devices are listed in the *Select Device* column (5).

SELECT DEVICE

Once you select a device (5) all parameters for that device are displayed in the *Select Parameter* column (6).

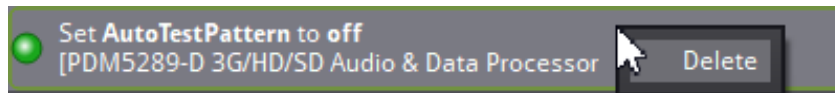
SELECT PARAMETER

You can select a parameter to control from the *Select Parameter* column (6). Depending on the complexity of the module, the list of parameters can be quite long. A filter function is provided to help find the required parameter. Press the X to clear the filter.

SELECT VALUE

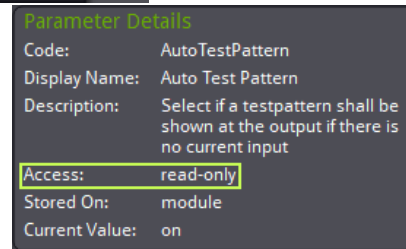
Once a parameter is selected the far-right column allows you to specify the value you desire (7). Once the correct value has been set, click the *Add Action* button to add it to the list of actions for the GPI you were editing. You can remove an action at any time in the *Define Action* column, by clicking on the X on the right. If the X on the right is not visible, the column Define Actions is too slim. If you make it wider, the X will be visible.

It is also possible to delete the Action by doing a right-click on it and then clicking on delete in the context menu.



Some parameters may be set to a read-only state depending on other circumstances.

They can still be selected for GPI Control, **but won't** be modified if they are read-only when the GPI is triggered.



AUTO CONTROL

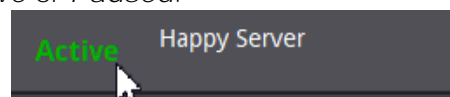
Auto Control Engine

Each LYNX Server has a process called the *Auto Control Engine*. This process is responsible for monitoring GPIs and other programmed conditions. It is also responsible for executing the specified actions according to the current *Auto Control / GPI Control* specifications.

The *Auto Control Engine* of a server can be activated or de-activated. If the *Auto Control Engine* is in de-activated mode, no programmed actions will be executed. The *Auto Control Engine* needs to be *Active* in order to do its pre-programmed work.

To activate the *Auto Control Engine*, use the button to the left of server you like to activate. This button is either labelled either *Active* or *Paused*.

The *Auto Control Engine* is active when this button is green and shows the word *Active*. It is deactivated when the button is gray and shows the word *Paused*.



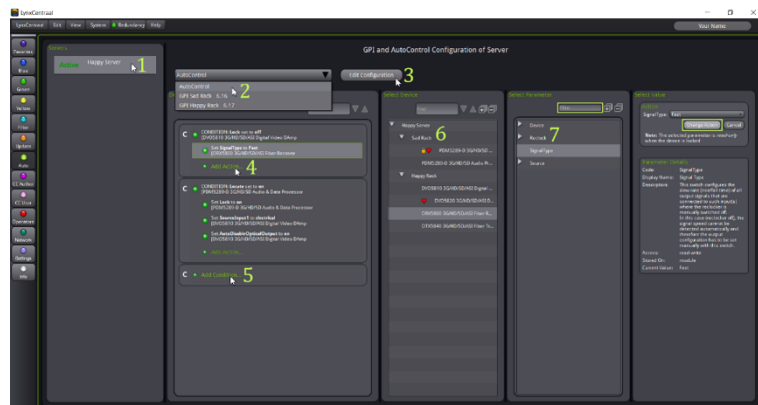
Auto Control Configuration

Defining Auto Control Actions is similar to GPI control in many ways.

The *Servers* column on the left (1) lists all connected servers. Click to select the server you would like to edit and activate it.

Select *Auto Control* from the pulldown (2).

To begin editing, press the *Edit Configuration* button at the top (3). This allows you to add conditions and actions.



When you are done editing click the button which is now labelled *Finish Configuration*.

To review any action, you can click on it (4) and all the columns to the right will update with the current state.

ADD CONDITION

You can define the first rule by adding a Condition (5) that will be the trigger. The workflow is similar to defining an action. Click *Add Condition...* button and the device tree to the right will be activated.

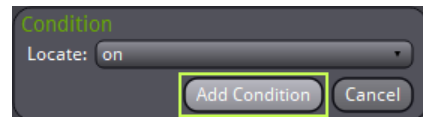
SELECT DEVICE

Once you select a device (6), all parameters for that device are displayed in the *Select Parameter* column (7).

SELECT PARAMETER

You can select a parameter to be your trigger from the *Select Parameter* column (7). Depending on the complexity of the module, the list of parameters can be quite long. A filter function is provided to help find the required parameter. Press the X to clear the filter.

Specify the value of the parameter that should happen, when the condition of the trigger becomes TRUE.



To finalize the configuration of the condition, click the *Add Condition* button on the far right.

Once a condition has been defined, you can add actions (4), similarly to the GPI workflow.

As soon as the current value of the selected parameter in the condition equals the specified value, the condition has been met, and it will trigger all actions you have defined.

PRIORITY OF EXECUTION

If more than one rule is defined in auto control, it is possible that multiple conditions evaluate to TRUE at the same time, triggering multiple actions at the same time.

It can happen that these independent action definitions contradict another action. For example, rule #1 could trigger parameter X to a value of 1, while rule #2 wants to set the same parameter to a different value.

In this case, the rule that appears first in the list, top to bottom, takes precedence.

Use the UP / DOWN buttons to re-arrange the order in which the Rules appear in the list. This will re-arrange the order of priorities between the rules accordingly.

CUSTOM CONTROL AUTHOR

Custom Control Author allows you to design virtual control panels which are accessible via PC.

The designs can be comprised of any parameter from a Series 5000 or greenMachine device. You can create designs for monitoring and/or controlling devices. The controls are fully customizable, allowing you to edit labels, values and even limit the range of possible values.

Custom Control allows you to arrange parameter controls precisely how you want them, avoiding the necessity to find the parameter in various pages, sub-pages, flowgraphs and nodes. Once a design is created it can be called up at any time, by any operator who has the rights to use it (see chapter Operator/Fehler! V erweisquelle konnte nicht gefunden werden. to manage permissions).

Custom Control helps streamline workflow, by giving the operator a dedicated panel of controls to perform specific functions.

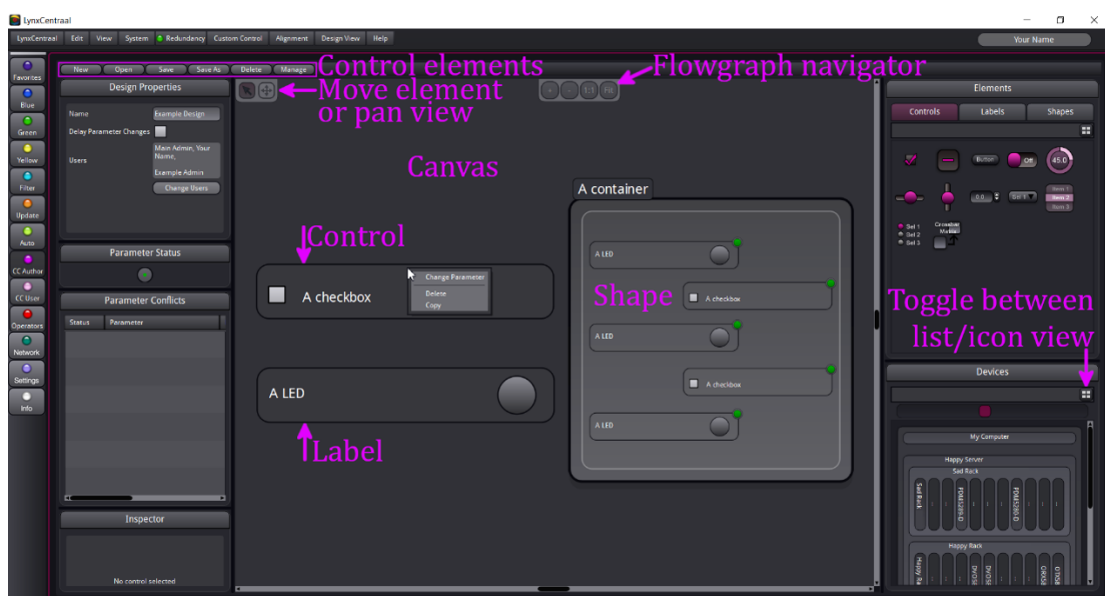
CUSTOM CONTROL DESIGN

A Custom Control Design is an arrangement of control, label and shape elements stored in a reusable XML file. Once a design has been created and LynxCentraal is being used in online mode, the design is immediately stored via the redundancy system. All devices in the network will have access to the design and all future changes made.

AUTO SAVE

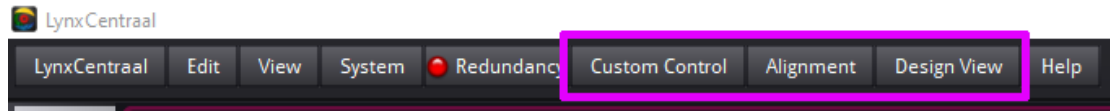
Auto save is available and enabled by default for Custom Control Author. Auto save means saving will occur as you work at a defined interval. The default interval is 5 seconds. You can change these settings in settings/preferences/Custom Control.

THE CUSTOM CONTROL AUTHOR PAGE



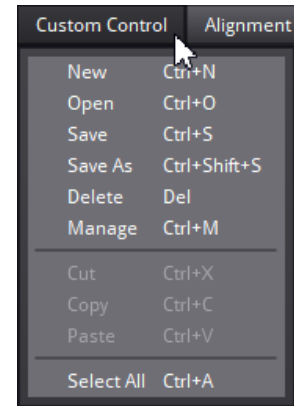
MENUS

Additional menus are displayed in the menu bar when the Custom Control Author page is visible.



CUSTOM CONTROL

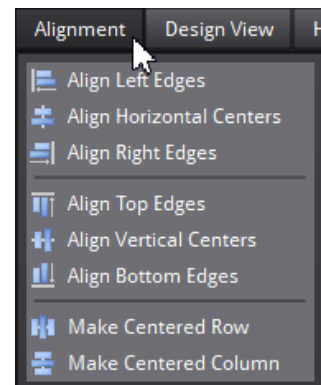
- New
- Creates a new design with a default name
- Open
- Opens the design picker so you can browse all designs available in the system
- Save
- Saves the current design in the system with the current name
- Save As
- Saves the current design in the system with a new name
- Delete
- Deletes the current design. If there are no designs left in the system when you perform delete, you will have “No Design” and will need to create a new one before you can work
- Manage
- Opens the manage designs dialog. You can import, export and delete designs in this dialog.
- Cut
- Cuts the selected element(s) and copies them to the clipboard
- Paste
- Paste the clipboard contents to the point under the mouse, or as close to it as possible.
- Select All
- Selects all



ALIGNMENT

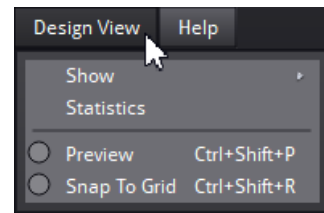
When multiple elements are selected you can align them using the *Alignment Menu*. All alignment actions are undoable.

- Left Edges
- Horizontal Centers
- Right Edges
- Top Edges
- Vertical Centers
- Bottom Edges
- Make Centered Row
- Make Centered Column



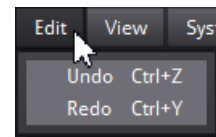
DESIGN VIEW

- Show
 - Grid – an optional grid can be visualized in the canvas
 - Parameter Status – parameter status will be turned on/off. This includes the parameter status ellipse at the top right of each element.
 - Parameter Conflicts – When off, the inspector will not be available.
- Preview
 - A mode you can set to examine what the operator who will use the design will see
- Snap to grid
 - Turns grid snapping on, so you can order your elements on or near to a grid.

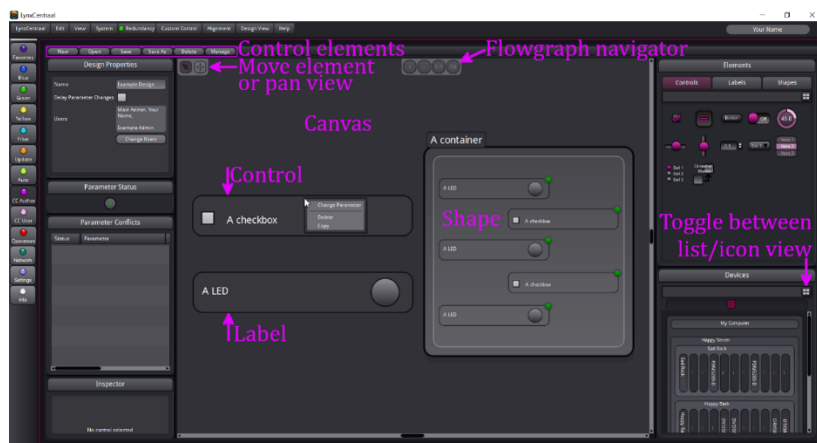


UNDO/REDO

Almost all actions in the Custom Control Author Page are undoable. Exceptions are changing design name and adding or deleting designs.

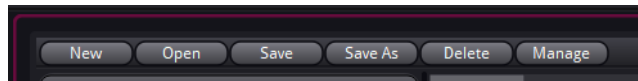


SECTIONS OF THE CUSTOM CONTROL AUTHOR PAGE



MAIN BUTTONS

Located above the Canvas area are the main buttons with the same functions found in the Custom Control menu.



- New
 - Creates a new design with a default name
- Open
 - Opens the design picker so you can browse all designs available in the system
- Save
 - Saves the current design in the system with the current name
- Save As
 - Saves the current design in the system with a new name
- Delete
 - Deletes the current design. If there are no designs left in the system when you perform delete, you will have **"No Design"** and will need to create a new one before you can work

- Manage
Opens the manage designs dialog. You can import, export and delete designs in this dialog.

CANVAS

The canvas is the drawing/editing area for constructing custom designs. It is a flowgraph which is drag and drop enabled. All elements in the scene can be positioned. Container elements can be positioned and resized. Controls can be connected to device parameters. It is possible to copy, paste, move and delete all elements. All actions in the flowgraph are undoable.

While editing a design in author mode, the controls are NOT in a state where you make changes to a device. The controls are in edit mode. You are setting up the arrangement, labels, parameter ranges, etc. that will be stored in the design for later use in *Custom Control User*.

By default, when you first launch Custom Control Author, there is a default design called **"New Design"**. You could immediately start to build an arrangement of controls if you want.

Editing

The canvas is a basic flowgraph view. All flowgraph navigation is available. Since all elements are movable, there is a button at the upper left which puts the canvas into move element or pan view modes. At any time while you are working you can press the space bar and while it is being held down you can pan the view instead of moving an element. Temporary pan mode is finished the moment you release the space bar.

Clicking on a label will allow you to edit the element text. Be aware, when you want to move an element not to press on the text area, since that will initiate text editing. An element is selected by clicking anywhere but on the label.

An element is selected by clicking anywhere but on the label. You can multiple select/deselect using the Alt/Command key. You can also multiply select elements using a marquee. Press the mouse down anywhere in the canvas and drag over the elements you want to select. The selected elements will have a white outlined box.

DESIGN PROPERTIES

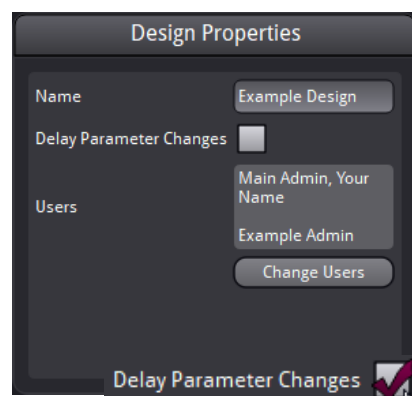
Each design has properties associated with it:

- Name
- Delay Parameter Changes Mode
- Users

The name can be edited in the name field. The change takes effect immediately. It is not undoable. When you first add a new design, all available users have access to it. Press the *Change Users* button to remove users from the list.

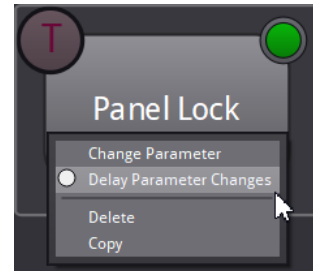
Delayed Parameter Changes

Delayed Parameter Change is a mode which allows a design operator to work offline, only sending parameter changes when desired. With normal parameter controls, changes are sent immediately to the device. When delayed parameter changes is enabled, all parameter changes are collected and only sent to the device when you press the *Take Delayed Parameter Values* button. Delayed parameter changes are only functional on the Custom Control User Page. In authoring mode, *Delayed Parameter Changes* needs to be enabled during construction, and parameter controls which should take part in the feature need to be designated as



delayable. *Delayed Parameter Changes* is a function of the design, not the UI. It must be enabled for each individual design you create.

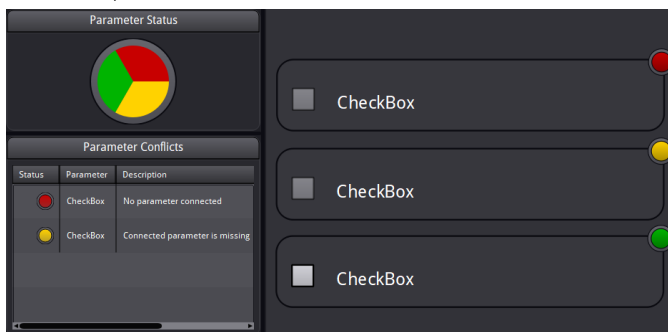
Once you have turned *Delayed Parameter Changes* mode on, there will be an additional item in each control context menu labelled *Delay Parameter Changes*. If you turn this on for a control, it gets a small red “T” in the upper left. This means, when an operator uses this design, and changes one of the *Delayed* controls, the change will not automatically be sent to the device. The author designates which parameters, if any, will be delayed.



PARAMETER STATUS

Parameter status gives you a visual report of how many controls in the canvas have been connected to a parameter. If you have 3 controls in the canvas and only one has been connected, the pie will be 1/3 green and 2/3 red. It is a purely informational window.

Parameter status is also visible at the upper right of each element. If the element status is red, it means no parameter has been set. If it is green, it means the parameter has been set and it is available. If it is yellow, it means the parameter has been set, but it is unavailable because the device may be offline.



PARAMETER CONFLICTS

Parameter conflicts takes this one step further and lists all controls in the canvas which have not been connected to a parameter yet. It is a purely informational window.

INSPECTOR

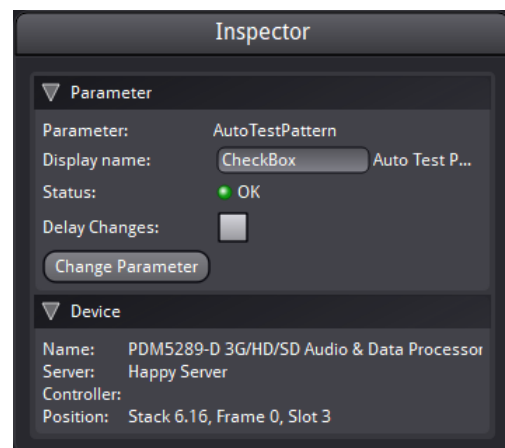
When you select a control in the canvas, its data is displayed in the inspector.

Parameter section

The parameter section displays data associated with the parameter. If the control has not been connected to a parameter yet, it will have an *Assign Parameter* button which will open the Parameter Picker. If the control is already assigned to a parameter, the button will be labelled *Change Parameter*. You can also change the display name, if the parameter will take part in the delayed changes.

Device

The device section displays read-only data about the parameter. This section will not be available if the control has not been connected to a parameter yet.

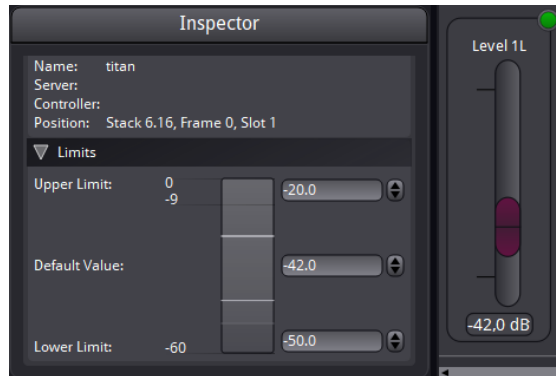


Selections

If the parameter is a selection type, this section is visible. You can turn the selection on and off, for example, if you want the operator using the design to get only 3 options instead of 10.

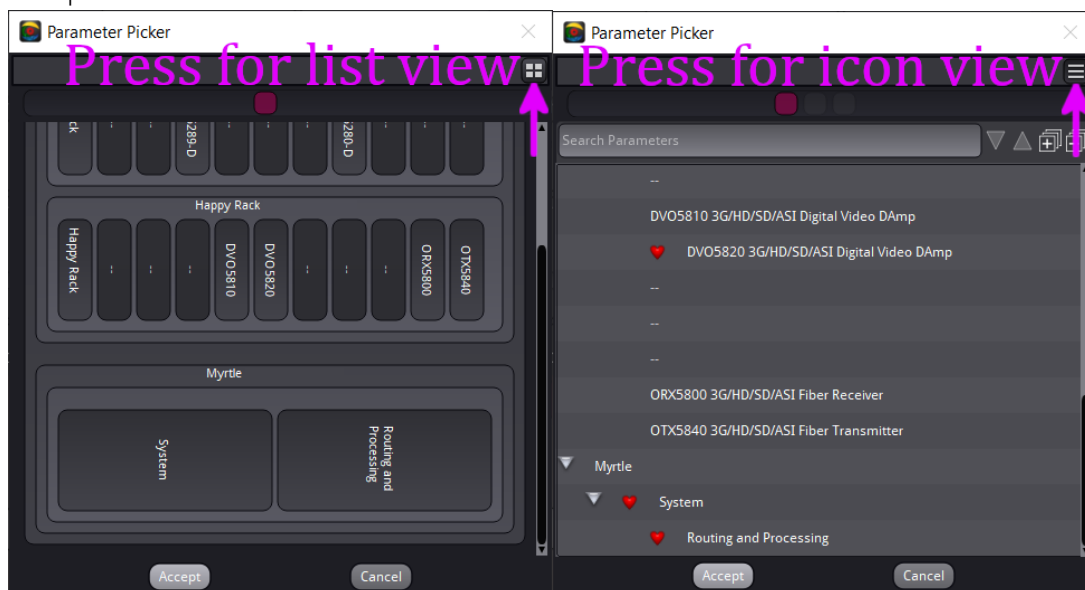
Limits

If the parameter is numeric, either float or integer, the limits editor will be visible. You can set an upper or lower limit to the value range, to limit the **operator's ability to change the parameter**.



DEVICES

The *Devices Toolbox* displays all devices in the system. You can navigate the devices toolbox in icon or list view. As you drill down into the devices you eventually come to all the control widgets available for a certain parameter. You can drag and drop the element onto the canvas to add a control or label which is connected to that parameter.



ELEMENTS

There are 3 types of elements: Controls, Labels and Shapes.

Controls

Controls consist of elements which can be connected to a parameter to effect changes on a device. There are two workflows for adding controls and connecting them with parameters. You can drag a control from the Elements **Toolbox** onto the canvas. This is a “raw” control which has default label and value. Using the context menu select *Assign Parameter*, and you will be presented with the parameter picker. The picker looks very similar to the *Devices Toolbox*. It will only present you with parameters of the correct type for the control. You can navigate in icon or list view. The other way to add a parameter control to the canvas is directly from the *Devices Toolbox*. Again, you can browse in icon or list view. You will navigate through all devices, and drill down to the parameter you are interested in. Upon drag and drop the control will be added to the canvas already connected to the correct parameter.

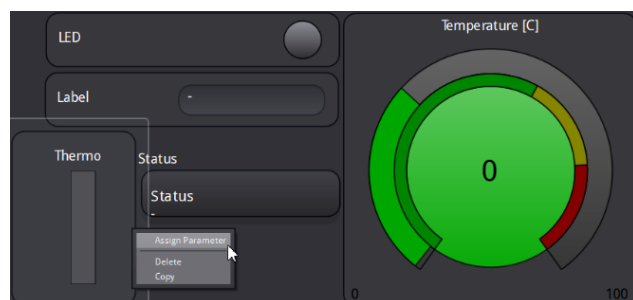
- Checkbox
- Check Button
- Button
- Switch
- Radial Slider
- Horizontal Slider
- Vertical Slider
- Spin Widget
- Combo Box
- Radial Selection
- Radio Button Group
- Crossbar Matrix



Labels

Labels are elements which are connected to a parameter but are not editable. They are for information and status only. They are handled the same way controls are.

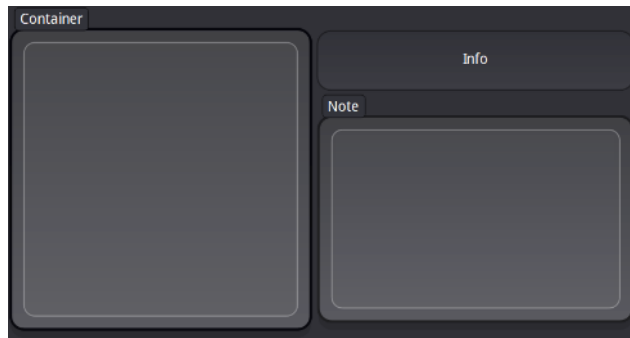
- LED
- Label
- Radial Thermo
- Status
- Thermo



Shapes

Shapes never have a parameter associated with them. They are exclusively for organization. Containers are used to group controls and labels. You can also nest Containers if you have need for additional grouping. Notes are for you to annotate your flowgraph, and Info is a small one-line informational text element.

- Container
- Info
- Note

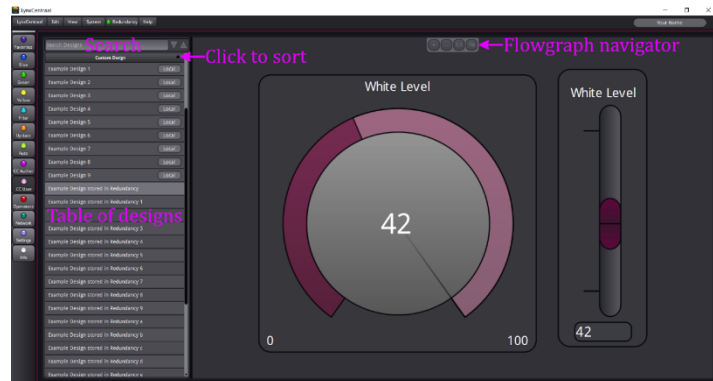


CUSTOM CONTROL USER

Custom Control User is the corresponding page to Custom Control Author. It gives you access to all designs available in the network. You can control devices with a limited parameter set.

THE CUSTOM CONTROL USER PAGE

The Custom Control User Page is used to operate the Custom Control designs created in the Author Page. The page consists of a table where all available designs are listed and a Design View, where the selected design shows its available controls.



CUSTOM DESIGN TABLE

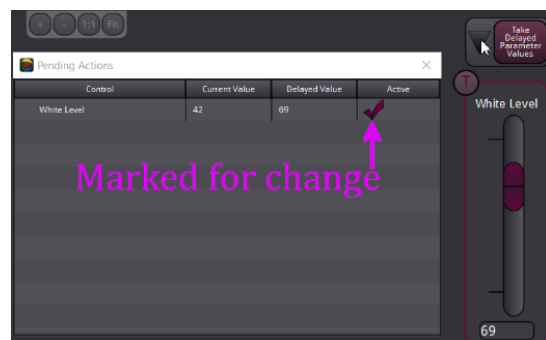
The table can be sorted by name. There is a search at the top to make finding a particular design easier.

DESIGN VIEW

The design view is a flowgraph view, so all flowgraph based navigation is applicable. Each control element is live. Changes to the control will change the assigned parameter on the specific device it comes from. Using a context menu on a control you can inspect the parameter, its origins and current state. The controls cannot be moved or changed in any way.

DELAYED PARAMETER CHANGE WORKFLOW

If the author enabled the *Delayed Parameter Change* workflow, there will be a *Take Delayed Parameter Values* button in the upper right of the view. It will strobe a magenta color when you change a delayable control's parameter value. Each control whose value has been delayed will have a magenta border. When you press on the button, it will send all pending changes to the respective devices. If you press on the downward arrow, it will open a table which lists all the delayed actions. If you press on the active button, it will remove the action from the list. You can also see the current value on the device and the delayed value which will be sent once the pending actions are deployed.



OPERATORS

Operator management is a feature for controlling and organizing software usage and access. **Each operator's settings such as UI arrangement, available features and servers are stored in the operator's account settings.** Each operator account is associated with a username and password. Operator management is a front-end attribute. Operator management state is stored both on PC's and on servers within the system.

LEGACY

User management in series 5000 products consists of various user accounts on servers. Each server comes with a default admin and ctrl user. New users can be created at will. It results in an often-unwieldy conglomeration of users distributed over servers. User management in APPolo also consists of feature usage rights. Certain users only have access to certain features. User management is also found in Custom Control, where certain users only have rights to use certain custom control designs.

DESIGN

All Lynx Products that are controlled from LynxCentraal are included in the operator management system. You must have a user account in order to start the application.

There are two levels of operators: the new LynxCentraal operator and the "old" server user. The LynxCentraal operator will be the only entity that an end-user needs to interact with during day-to-day work. The server user will be there in the background hidden as much as possible.

Backward compatibility to old series 5000 servers has been maintained, therefore no matter what configuration of existing server users exists, it will remain untouched, when updating an APPolo System to LynxCentraal.

The new operator management wrapper hides as much of this as possible. The only person who will still need to deal with it is the Main Admin.

User management is also found in Custom Control, where certain users only have rights to use certain custom control designs.

OPERATOR ACCOUNTS

LynxCentraal ships with two default operators. The first is Main Admin who has admin rights and an uneditable password. The second is Demo, which only has access to specific features in the UI and has no password. The Main Admin operator and password are described in the User Manual and quick installation guide. When initially launching LynxCentraal, the admin should log in with the default password. The next step for the admin is to add new accounts for the rest of the operators in his/her team. Standard operators will generally not have admin rights. There is no limit to the number of accounts that be added or the amount of administrator accounts that can be set up. Operators may also be deleted. Adding and removing operators is not undoable. Operators with identical names are not allowed.

All operators can see the Operators Page, but only admins can edit. A standard operator will only see his account settings. The Main Admin will see the settings of all operators and be able to edit them.

Operator Types

- Main Admin
- Administrator
- Standard
- Custom Control Operator

Basic operator Rights

Main Admin is a non-editable user, who should only be used for initial setup and password resetting. **Main Admin's** password is read-only. The only editable feature for Main Admin is the logout time.

Administrator has almost as many rights as MainAdmin with some restrictions.

Standard operators are given rights and access by the administrators.

Demo Operator only has access to blue, green, yellow, auto control, custom control author, operators and info. The rights for this user to make changes are severely restricted.

Custom Control Operator only has access to custom control user, operators and info.

Any Admin can create a new user and set an initial password.

Only Main Admin can reset the password of any user, including other admins.

Admins can only change their own passwords.

Standard Operators can only change their own passwords.

When changing a password, you need to know what your old password was. Again, only Main Admins can reset passwords.

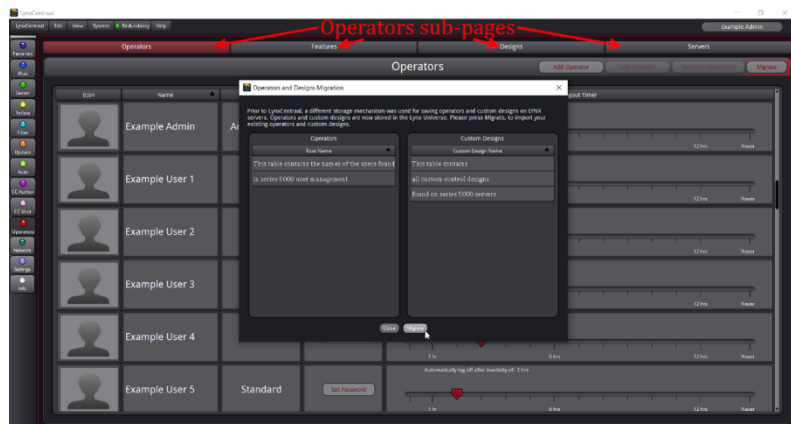
If an Admin or Standard operator forgets the password, s/he must go to the Main Admin to ask for a reset.

THE OPERATORS PAGE

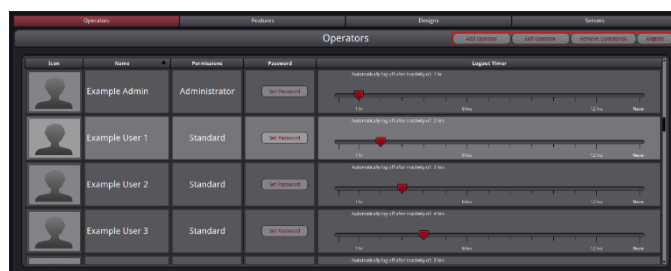
The Operators page is divided into the 4 sub-pages Operators, Features, Designs and Servers.

OPERATORS SUB-PAGES

OPERATORS



The operators page displays a table with all LynxCentraal operators, displaying icon (click to change), name, permissions, password management and logout timer. All admin operators can add, edit and remove operators, but only the Main Admin can reset a password. The migrate button is only available to Admin Operators.



Each standard operator or administrator can edit the operator icon. Simply press on the icon and a chooser will open, allowing you to pick an image from either the still store or from disk. Each operator can also edit the logout time. It can range from a minimum of 5 minutes to a **maximum of “Never log me out”**. Every operator can also change the password.

FEATURES

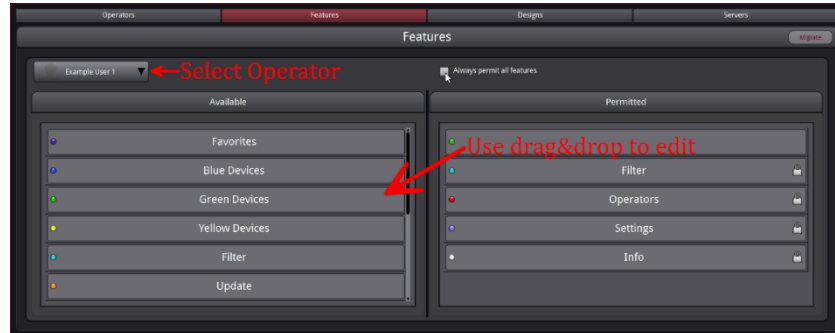
The features page allows an admin to edit which features are available for each operator. The features in LynxCentraal are color coded. Admin operators have all features

per default, and standard operators have only operators, settings, filter and info features.

Operators, settings, filter and info features are locked, it is not possible to create a user that has no access to these central features.

Only an admin can edit permitted features. The admin has a combo box, where he can select the operator he wants to edit. Drag and drop features between the *Available* and *Permitted* columns to change permitted features for each operator. If an admin for some reason decides to reduce his own permitted features, the change to the main toolbar will only be visible once he has logged out and back in again.

The feature page is read-only for standard operators.

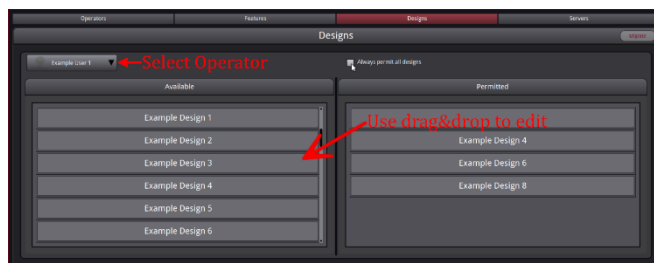


Always permit all features

There is an *Always permit all features* check box which makes all features available. When checked, it will disable editing, meaning drag and drop will no longer function. *Always permit all features* defaults to ON for admin operators and OFF for standard operators. When you check the button for a standard operator, all features are added to the permitted table. When you uncheck it, the features that should not be permitted need to be removed. The list is not emptied by default, it is easier to **remove the features that aren't permitted** than to add all the permitted features back.

DESIGNS

Designs are edited similarly to features. Only admins are allowed to edit permitted custom control designs per operator. All available designs are listed on the left and permitted designs are on the right. Editing is performed by drag and drop.



Always permit all designs

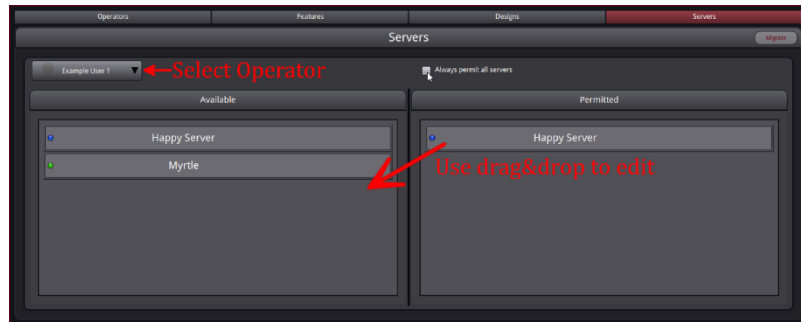
There is an *Always permit all designs* check box which makes all designs available. When checked, it will disable editing, meaning drag and drop will no longer function. *Always permit all designs* defaults to ON for admin operators and OFF for standard operators. When you check the button for a standard operator, all designs are

added to the permitted table. When you uncheck it, the designs that should not be permitted need to be removed. The list is not emptied by default, it is easier to **remove the designs that aren't permitted than to add all the permitted designs back.**

SERVICES

Servers are also edited similarly to features and designs. It is important to note that editing permitted servers means that the admin can designate which servers are visible to which operators.

Each operator has the option to filter his permitted servers later.



Always permit all servers

There is an *Always permit all servers* check box which makes all servers available. When checked, it will disable editing, meaning drag and drop will no longer function. *Always permit all servers* defaults to ON for admin operators and OFF for standard operators. When you check the button for a standard operator, all servers are added to the permitted table. When you uncheck it, the servers that should not be permitted need to be removed. The list is not emptied by default, it is easier to remove the servers **that aren't permitted than to add all the servers designs back.**

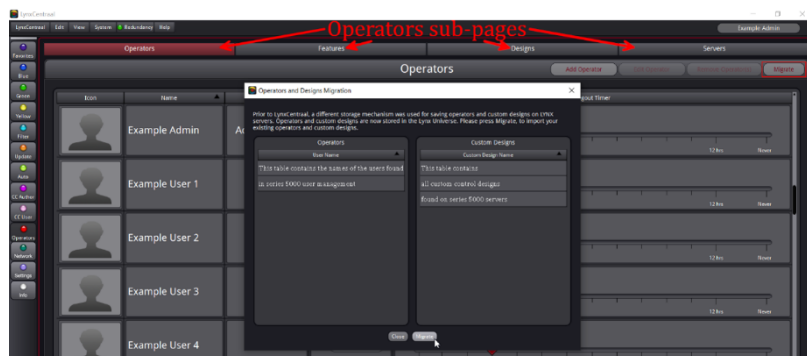
MIGRATE

A migration function is available. This is useful for users who already have several series 5000 servers with an array of users and passwords. The migrate button is only visible to admin operators. This

function gathers all operators on all available servers and creates a LynxCentraal operator for each unique name the algorithm finds.

By default, the available servers for the operator will correspond to the servers which were found. The same thing will be performed for custom designs. Migrate can be performed at any time, but it is preferable to do it first.

Since no duplicate usernames are allowed, migration performed after some users have already been added may result in an incomplete process.



PERSISTENCE

User management data is stored in XML format. Each user is stored as a separate file. First and foremost, user data is always stored locally.

It must be possible to work with LynxCentraal without any attached servers. In order to achieve persistence in a network with numerous servers and front-end UIs, the

data will also be stored redundantly on servers which have been updated to the new version. If only one server is updated, either series 5000 or greenMachine, that server will de-facto be the central user management server.

OPERATOR PROPERTIES

Each user has a range of properties stored in the data file associated with his login.

- Name
- User interface settings / window arrangement etc.
- Permitted UI Features
- Permitted Designs
- Permitted Servers
- Connection Filter states

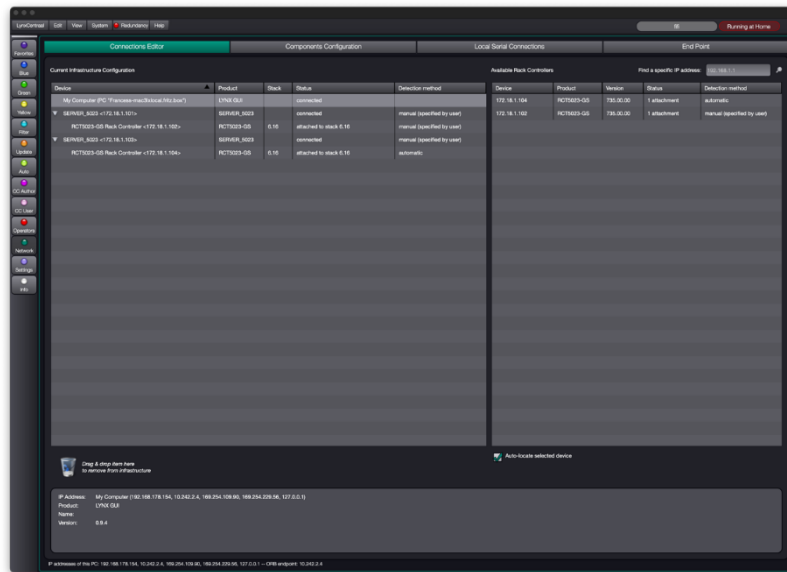
LOGIN DIALOG

When LynxCentraal is launched, you are presented with the login dialog. If you have a login, the username and password need to be entered. Each login has a default time-out. After a certain period of inactivity, LynxCentraal will automatically log you out. Each operator can choose how long the time-out should be on the Operators Page. A time-out setting of Never will leave you logged in permanently. If the UI is closed, and the last logged in operator had the time-out set to Never he/she will be logged in again the next time the UI is launched.

For Standard Users, a *Forgot Password* button is available. However, this is not an automatic password reset, but only a hint to contact the Saystem administrator. The Main Admin can then **reset the password from the Operator's page**.

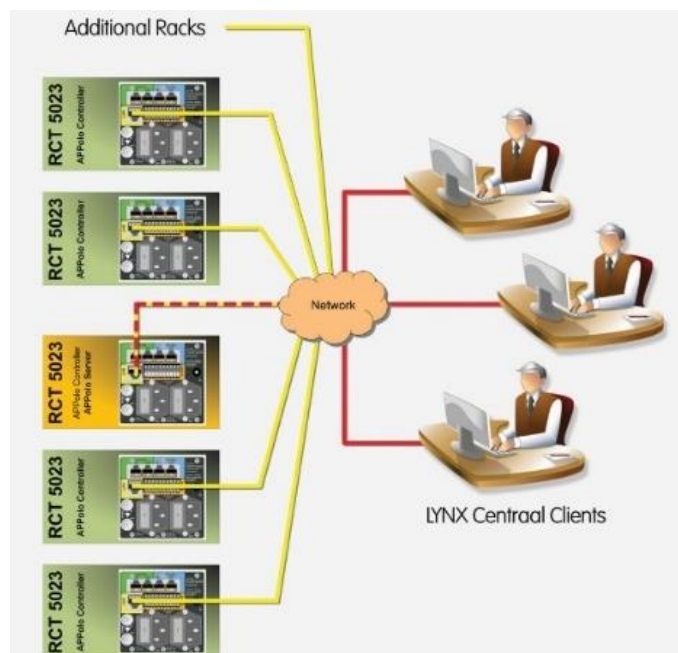
NETWORK

The network feature is where control servers are configured and attachments between control servers and RCT 5023 rack controllers are made. It also where you configure the local COM ports. This feature is available for blue and yellow.



Series 5000 Controller

A typical LYNX Technik Series 5000 signal processing system consists of rack frames with boards, rack controllers, and the LynxCentraal Control system. Each Series 5000 rack frame requires an RCT 5023. For large configurations, an optional dedicated control server running the system software, can be added. The rack controller and the control server are logically attached to each other via an IP network.



RCT 5023-G RACK CONTROLLER



The RCT 5023-G is the basic controller card and is all you need to connect a Series 5000 2RU rack frame to the LynxCentraal Control software. The controller card has a LAN network interface that uses the LAN connection on the terminal plate of the rack frame. All LAN related settings are stored on an internal flash memory. Each controller card in one system needs to have an individual IP-address.

OH-RCT5023-SVR

The OH-RCT5023-SVR option is an independent Linux Server with its own IP-address. For power and LAN connection it is clipped as a piggyback onto the RCT 5023-G controller card.

Adding the OH-RCT5023-SVR option to a system, enables features like full SNMP support, Backup-Restore for the complete system and many more.



Yellobrik Rack Controller

To connect yellobrik devices to a fully redundant server system with SNMP support and backup / restore functionality, the server structure of the 5000 series is required. A yellobrik rack controller can be connected, and will function similarly to the RCT 5023-G rack controller card of the 5000 series.

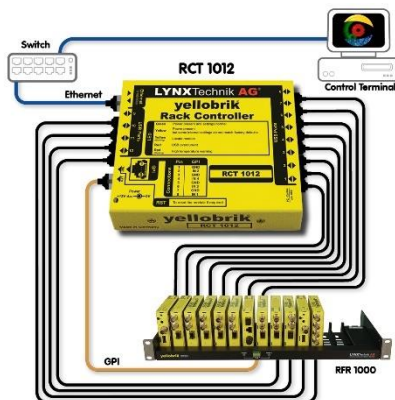


RCT 1012

The RCT 1012 is a yellobrik rack controller in the typical compact, one slot yellobrik module design. It combines control of up to 12 yellobrik modules connected to an ethernet port. It is a one-stop solution for the management and control of several yellobriks in an easy, fast, and efficient manner without requiring an individual connection to each module for setting parameters or updating the firmware. All

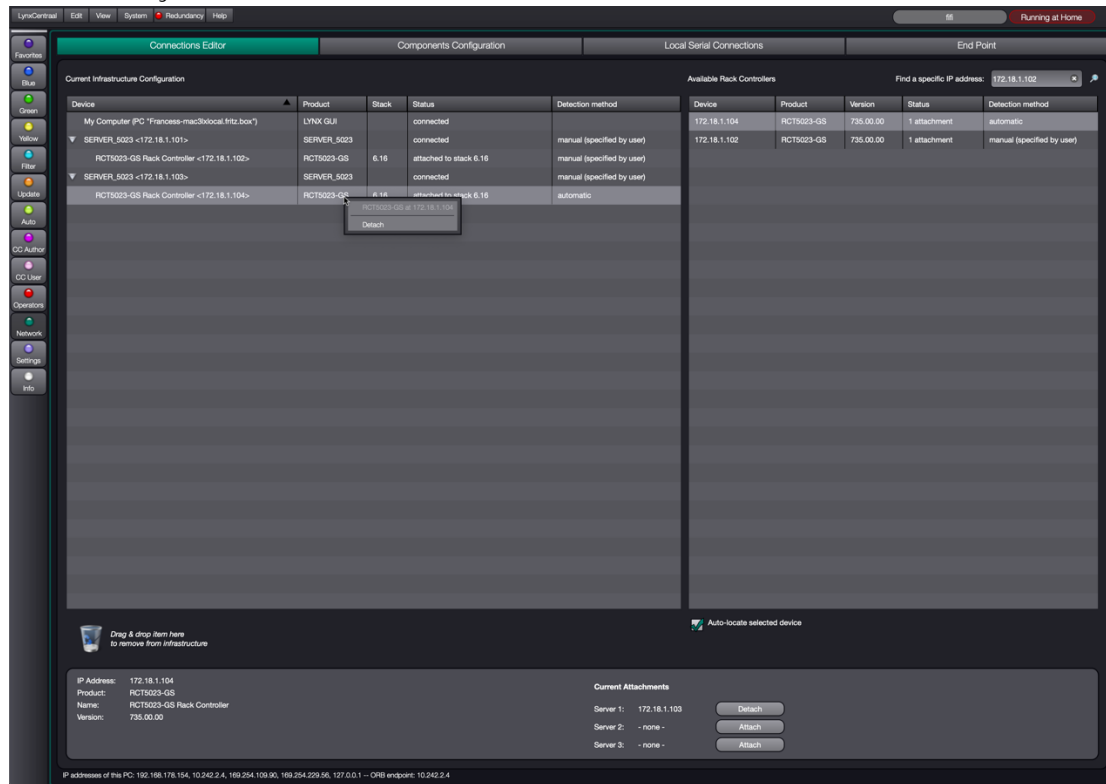
connected yellobrik modules are visible on the network remotely.

The RCT 1012 can be installed in a yellobrik rack frame like a normal yellobrik. It has 12 USB ports to which modules in the same rack can be connected. These up to 12 modules are then bundled and connected to LynxCentraal via network.



Connections Editor

The network connections editor allows you to define the logical attachment between control servers and RCT 5023 and RCT 1012 rack controllers via IP network. It is also where you define clusters of redundant servers.



CURRENT INFRASTRUCTURE CONFIGURATION

The current infrastructure configuration table, on the left, lists all control servers which were discovered in the LynxCentraal IP network via ethernet broadcast. Below each control server, is a list of its current controller attachments. Servers which are not permitted for the current operator, or servers which were filtered out by the current operator do not show up in this table.

AVAILABLE RACK CONTROLLERS

The available rack controllers table, on the right, lists all RCT 5023 and RCT 1012 rack controllers which were discovered in the LynxCentraal IP network via ethernet broadcast.

Control servers, RCT 5023 and RCT 1012 rack controllers which reside in different IP subnets can be added explicitly with the IP find tool in the upper right corner of the page.

ATTACHING AN RCT 5023 RACK CONTROLLER TO A CONTROL SERVER

- Select an RCT 5023 or RCT 1012 rack controller from the Available Rack Controllers table and drag it into the Current Infrastructure Configuration table, dropping it onto the desired control server.
- Select an RCT 5023 or RCT 1012 rack controller in the Available Rack Controllers table, open its context menu and select *Attach*. This will present a dialog which allows you to pick the desired control server.
- Select an RCT 5023 or RCT 1012 rack controller from the Available Rack Controllers table. This action will fill the information area at the bottom with data. Click the *Attach* Button in the Current Attachments section. This will present a dialog which allows you to pick the desired Control Server.

One RCT 5023 or RCT 1012 rack controller can be attached to up to three control servers. Each server can assign an individual name to the controller.

DETACHING AN RCT 5023 RACK CONTROLLER FROM A CONTROL SERVER

- Select the RCT 5023 or RCT 1012 rack controller from the Current Infrastructure Configuration table that you would like to detach. Drag and drop it back to the Available Rack Controllers table or to the trashcan below.
- Select the RCT 5023 or RCT 1012 rack controller from the Current Infrastructure Configuration table that you would like to detach. Open its context menu and select *Detach*.
- Select an RCT 5023 or RCT 1012 rack controller from either of the two tables. This action will fill the information area at the bottom with data. Click the *Detach* Button in the Current Attachment section.

Components Configuration

This section lists all control servers, RCT 5023 and RCT 1012 rack controllers which were discovered in the LynxCentraal IP network via ethernet broadcast. servers and controllers which reside in a different IP subnet can be searched explicitly with the IP find tool below the product table. The selected item detail is visualized below the table. You can change the IP and passwords settings.

Local Serial Connections

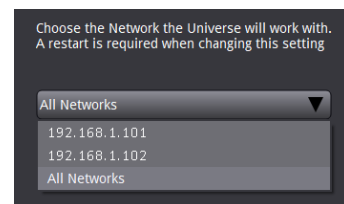
This section shows a list of all available COM ports on your PC. If you connect a COM port to the control socket at the back of a 5000 frame and a suitably configured legacy controller RCT5021 is plugged into the frame, you can activate the COM port on this page via a checkbox and then control the devices in the rack frame via the UI.

Since there are no more COM ports in current PCs and laptops, this list is usually empty. It does becomes usable if one or more USB COM adapters are connected to the PC. These connections can be turned on or off. Uninvolved COM connections can be protected by turning off the COM port in LynxCentraal.

Additionally, the page shows the number of active USB connections to yellobriks.

EndPoint

There is only one setting here. The local network port of the PC running LynxCentraal can be configured. A change in this menu requires a restart of LynxCentraal. It is a user-friendly UI for setting the ORB_ENDPOINT configuration.

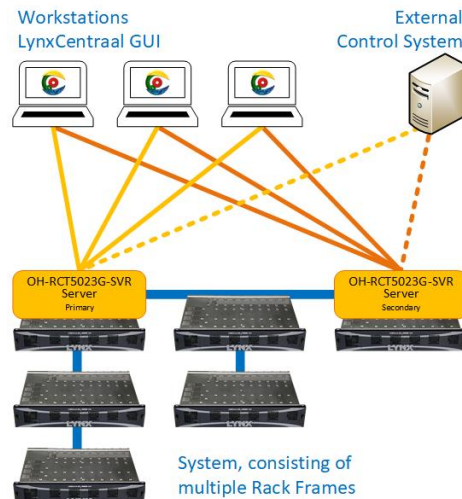


SETUP AND CONFIGURATION OF A REDUNDANT SERVER CLUSTER

Two control servers can be configured to form a cluster of redundant servers in the Current Infrastructure Configuration table.

Since the control server serves as a fundamental part of the system, a backup and failover solution may be required for system servicing and functionality.

Users may add a second control server to a system, which serves as a backup or secondary server. In the case that the primary server is not available on the network, the secondary server takes over the active role, with all functionalities. Therefore, even in the unlikely event of a failure of the primary server, the system's functions are always available.



NOTE: Both servers operate under their own individual IP address. The entire system is accessible under two different IP addresses.

NOTE: The processing boards will continue to work even if the Primary SERVER is not available. In the event of a server failure, only the remote access (e.g. from the GUI) and additional system functions (e.g. AutoControl) will no longer be available.

The LYNX Technik Series5000 system will detect a failure of the primary control server and automatically change control to the secondary control server. The appropriate notifications and alarms will be provided to you.

As part of the creation of a cluster of redundant servers, two existing and independent servers need to be identified as the primary server and the secondary server respectively. The complete current configuration of the primary server will be copied into the secondary server, discarding any previous configuration settings on that v. The complete system will be visible under the defined cluster name in the LynxCentraal UI.

NOTE: A cluster can only be defined if at least one of the participating servers has the appropriate software option enabled. See section on Licensing & Software.

REMOVING A CLUSTER OF REDUNDANT SERVERS

An existing cluster of redundant servers can be removed by the administrator, resulting in two servers that are no longer connected or clustered. After breaking up a cluster, no automatic synchronization of data and no automatic failover will take place anymore. To remove a cluster of redundant servers, right-click the context menu of the cluster in the *Connection Manager* dialog.

CONTROL SERVER OPERATION & HOT FAILOVER

Once a pair of control SERVERs has been configured to work together as a redundant pair of servers, they are referred to as a Cluster of Redundant Servers. By default, the Primary server has the active role and the secondary server has the passive role. All control UIs or external Control Systems are connected to the active server. The passive server is in Hot Standby Mode and ready to become active when required.

The paired servers are constantly connected, and when the Secondary SERVER cannot reach the primary server in the network for more than 15 seconds (this value can be adjusted), then the secondary server automatically switches to ACTIVE mode and takes over control of the complete system. The LynxCentraal UI as well as any Remote Control System will be notified of this switch and adjust its behavior accordingly.

When the cluster of redundant servers goes into failover mode, the entire system will continue to work as usual and you will be able to access all services and functions. Notification of failover mode is provided via the UI, Remote Control, and SNMP functions. The notification provides the administrator with the cause of the problem so that appropriate measures can be taken to fix it.

When the primary server is back in the network, the administrator can use LynxCentraal to change control back to the primary server.

The administrator can manually assign active control to either the primary or secondary server during planned maintenance schedules.

SYNCHRONIZATION OF CONFIGURATION BETWEEN SERVERS

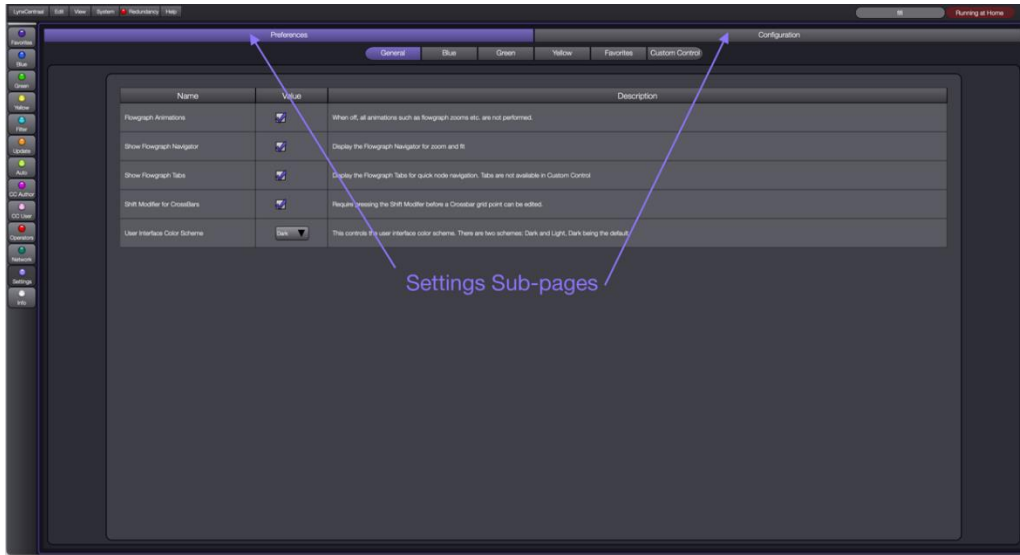
Once a pair of servers has been configured as a cluster of redundant servers, the current configuration of the active server (by default: the primary server) will automatically be mirrored to the passive server (by default: to the secondary). This is how the passive backup server is kept up to date with the latest configuration changes that have been applied to the system. This process is completely automatic. No manual operation is required to keep the two servers in sync.

Should you need to switch the active operation from the primary to the secondary server, the Series5000 system will continue to operate within the same configuration.

SETTINGS

The settings page is where preferences, device and system configurations are administered. Some settings are UI wide and some manage individual product series. You can also initiate a software update from the settings page.

THE SETTINGS PAGE



SETTINGS SUB-PAGES

PREFERENCES

Preferences are persistent UI settings which are stored per operator. Reasonable defaults are set for all of them. To edit a preference, simply change the control value by clicking on check widgets or pulldowns.

General

General includes preferences that are global, such as flowgraph preferences and UI color scheme.

Blue

Blue includes only preferences which affect the blue page.

Green

Green includes only preferences which affect the green page.

Yellow

Yellow includes only preferences which affect the yellow page.

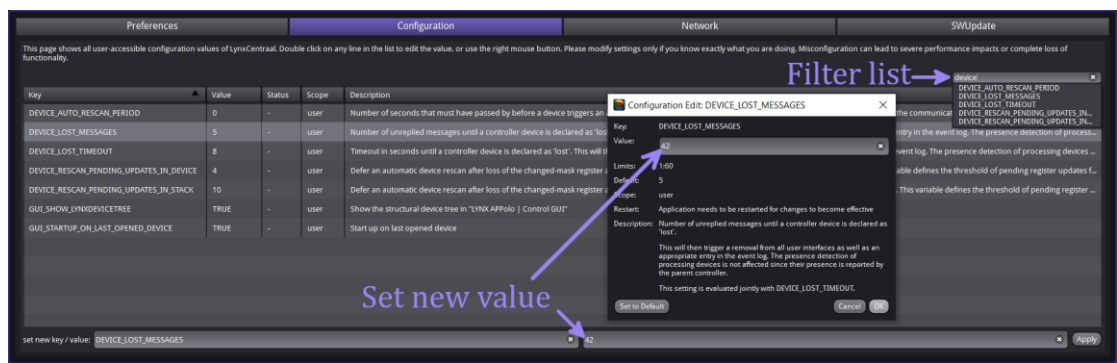
Favorites

Favorites includes only preferences which affect the favorites page.

Custom Control

Custom control includes only preferences which affect the custom control author and user pages.

CONFIGURATION

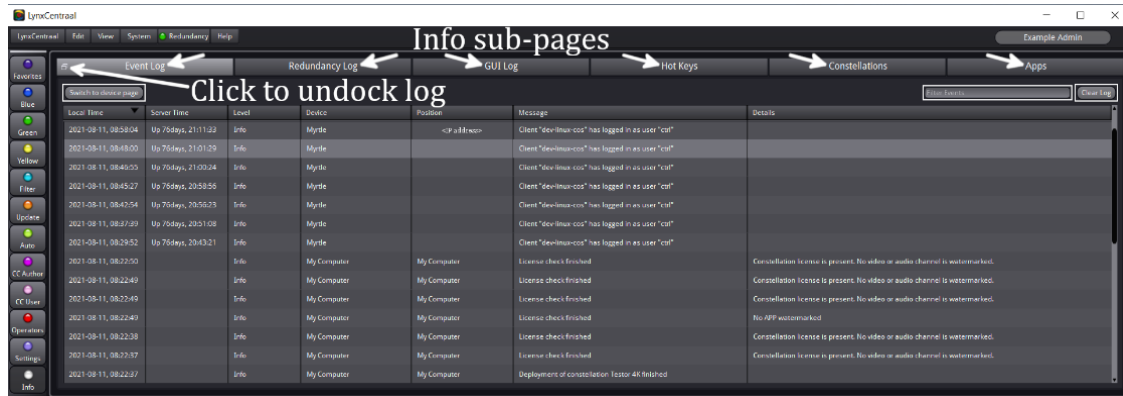


The configuration page has predominantly non-UI settings. The configurations list is quite long, but it can be filtered on the upper right. To change a value, select an item in the list. This will display its key and value in the area below the table. You can also double click on an item anywhere in the row. This will open a dialog with an edit field where you can change the value.

INFO

The Info Page displays various logs and information about LynxCentraal.

THE INFO PAGE



INFO SUB-PAGES

EVENT LOG

The event log is a table of events as they are occurring. You can filter events on the right above the table, as well as clear the log. The *Clear Log* button will clear the table of all items.

If you press on the square icon directly on the Event Log tab, the log will be floated. It can be resized and moved to a location of your choice. Selecting a row enables the *Switch to device page* button on the upper left. Clicking the button will navigate you to the page where the event originated, generally blue, green or yellow. You can achieve the same goal by double clicking a row.

REDUNDANCY LOG

The redundancy log displays state which relates to the redundancy framework. You can filter events and clear the log similar to the Event Log.

GUI LOG

The GUI Log displays LynxCentraal's last 9 log files. The logfiles are listed on the left. When you select a logfile on the left, it displays its detail on the right. You can search for keywords in one or several log files at once by typing something into the Find field.

HOT KEYS

Hotkeys displays a read-only list of which hotkeys are available in LynxCentraal. It is divided into global, blue, green, and custom control pages.

CONSTELLATIONS

The constellation page displays information about constellations. All available constellations are listed and described. Based on the icons and text for each constellation, you can figure out which functions belong to which constellation. Some functions, for instance, Test Gen are found in almost all constellations.

APPS

The APPS page is an informational page which describes all available APPS. Each APP has an icon and a label, which you will see throughout the application.

CENTRAL UI ELEMENTS

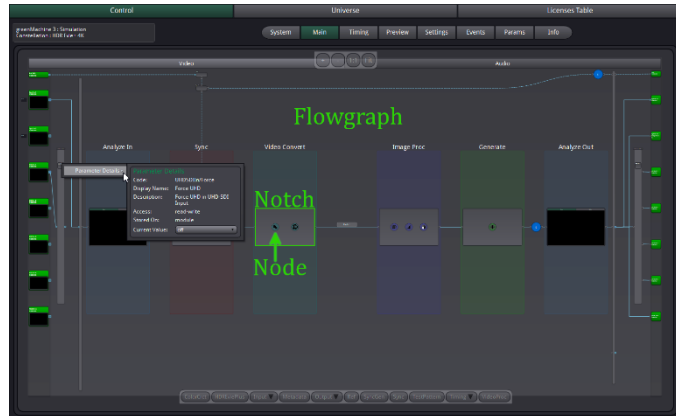
FLOWGRAPH

The flowgraph is available in the Control sub-page for both blue and green devices. It is also available in the Green Universe and in Custom Control.

Device flowgraphs contain nodes which encompass parameters that allow you to edit the node's parameters.

For instance, the HDR node in greenMachine has all parameters that relate to HDR processing.

The Universe flowgraph contains graphics for each machine, each of which contains all the nodes and parameters available in that greenMachine. Zooming all the way out in the universe view gives you an overview of all greenMachines in the universe. In Custom Control, you add your own containers and parameters to build up a custom flowgraph.



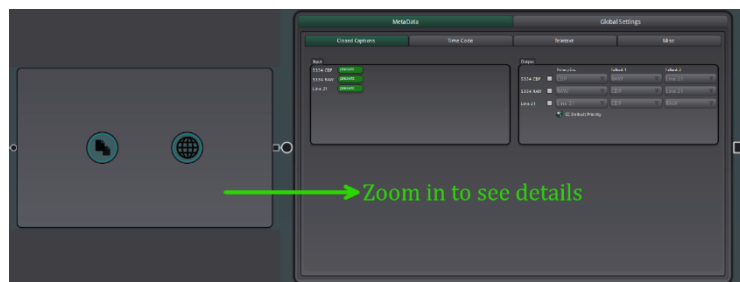
DEEP NAVIGATION - LEVEL OF DETAIL

Flowgraphs are visualized using a principle called Level of Detail. In the furthest zoomed out level, you see the basic overview of the signal path through the various processing nodes.

The further you zoom into the flowgraph, the more detail you are presented with. Initially, a node hides its parameters. You can tell when a node has hidden parameters because it displays a graphic with rows of spheres connected by lines. To zoom into a node, double click anywhere in the node. This will make visible the processing parameters associated with it.

To zoom back out to the overview mode, double click anywhere between items in the flowgraph. You can also use flowgraph navigator described below.

It is also possible to use the mouse wheel for the zoom function.



PAN (GESTURAL AND KEYBOARD)

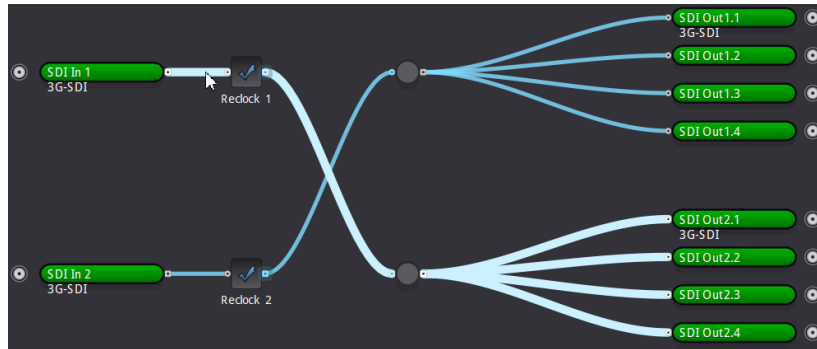
Panning is performed by clicking down on the flowgraph, anywhere but on a parameter. Hold the mouse down and move the mouse. There is also an override pan, which can be performed anywhere in the flowgraph, even on a parameter.

Simply press the space bar before pressing the mouse down. Once you let up the mouse and space bar, override pan is concluded.

Hot keys left, right, up and down allow you to incrementally move around the flowgraph in small steps. This naturally only works when you are zoomed in.

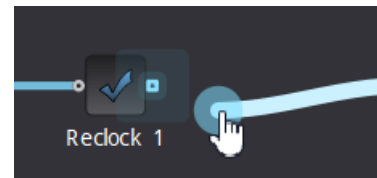
SIGNAL HIGHLIGHTING

Hovering over a link will display the path that that link takes through the flowgraph, from input to output.



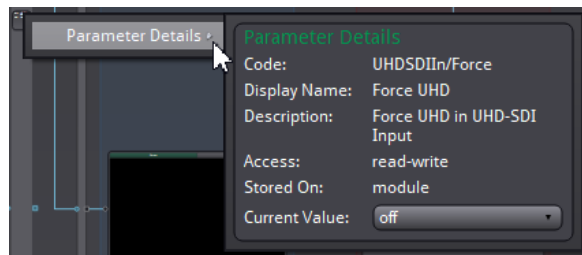
SIGNAL SWITCHING

Video signals can be switched using drag and drop. Editable signals display a circular handle under the mouse when you hover over them. When you see one of these handles, pressing on the link will break the link and all ports where the link can be docked display a halo. If you drag the link close to one of the highlighted ports and drop it, it will snap into place, thereby switching the signal. If you drop the link away from an acceptable port, it will simply snap back to where it was originally.



CONTEXT MENUS

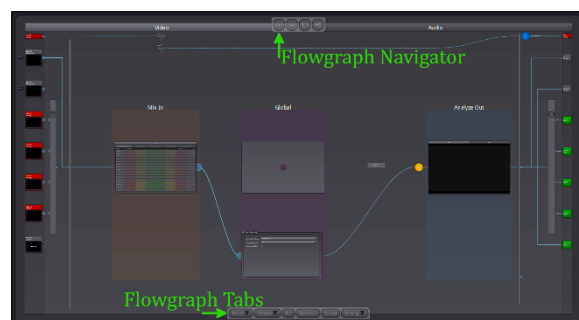
Context menus are also displayed depending on where you right click. Right click over any parameter will open a context menu with information about the parameter associated with UI element. Right click over a machine in the universe will display functions such as save preset. Right click over the flowgraph view will display view navigation such as zoom in and out.



FLOWGRAPH NAVIGATOR

The Flowgraph Navigator is found at the top of every flowgraph. From left to right it has 3 buttons:

- +: Zooms in one level based on the selected node, container or control
- -: Zooms out one level based on the selected node, container or control



- Fit: Zooms the flowgraph to fit all elements in the view.

FLOWGRAPH TABS

All zoomable nodes have a corresponding tab in the flowgraph tabs. If there are multiple nodes of the same type, on different signal paths, the button turns into a pulldown. Selecting a button or a menu item will zoom the flowgraph into that node.

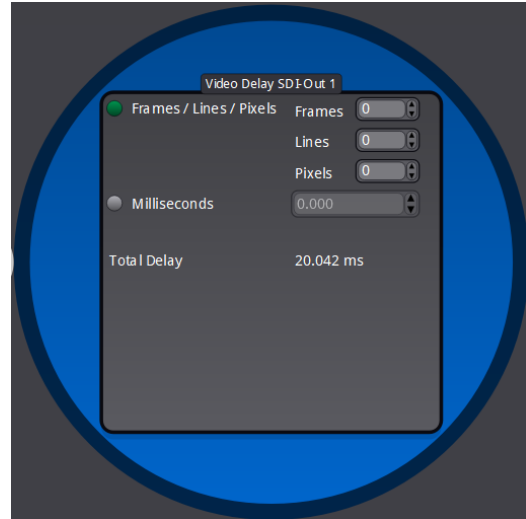
TIMING

TIMING BUBBLES IN FLOWGRAPH

Timing bubbles can be found in both blue and green control/main pages. They are round blue nodes placed in the vicinity of where timing adjustments would have an effect. Double clicking will zoom in the node and you will be presented with audio or video delay parameters.

VIDEO TIMING

By default, all video outputs deliver their SDI stream with a correct H/V alignment to the REF signal. A manual additional user delay can be applied to each SDI output, offering an additional delay of up to a maximum of 12 additional video frames.



This manual user video delay is adjustable in one of two dimensions:

- User Delay in Frames, Lines, Pixels
- The equivalent number of Milliseconds will be calculated, depending on the current video standard, and displayed as read-only value.
- User Delay in Milliseconds
- The equivalent number of Frames, Lines and Pixels will be calculated, depending on the current video standard, and displayed as read-only values.

Adjusting the Video Output delay always delays embedded audio contents together with the video content. It is NOT possible to influence the relative timing between audio and video contents with these controls.

AUDIO TIMING

Audio signals are processed as fast as possible. The minimum processing delay across the complete internal infrastructure is functionrox. 3ms. When an individual audio signal is embedded into any of the SDI output streams, the audio content is implicitly delayed by the appropriate amount of time, so that the relative timing (lip-sync) between the audio and video content on the input is replicated on the output. Additional User Audio Delay can be applied to any internal audio stream. It can be used to correct for mismatched relative audio timing (lip-sync), by delaying an early-audio signal by the appropriate number of milliseconds. User delay is added to the overall internal audio delay.

In the case of late audio, when video is earlier than audio, the timing can be corrected by entering negative values as user audio delay. The negative values are subtracted from the internal audio compensation delay.

INPUT VS. OUTPUT DELAY

User Audio Delay values can sometimes be controlled for Audio Inputs and Outputs. The timing bubbles are located near to the area they influence. Technically, it makes no difference where the timing bubbles are located, since both values are added up, and the resulting total delay is applied.

An important distinction is the presence of audio crossbars between the input and output timing bubbles. The general recommendation is to correct input-related timing issues with the controls that are located near the inputs, and output-related

timing adjustments with the output-related controls. This makes it easier to operate audio crossbars later. **You don't have to go back and** re-adjust the timing compensation afterwards.

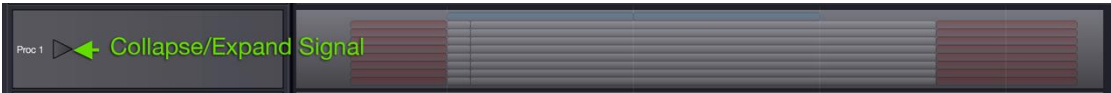
TIMELINE

The timing page is for editing and visualizing delay setting for video, as well as input and output delays for embedded and discrete audio. It is available in both blue and green features. The interface is identical in both. The page is divided into 4 sections: signals, delay editor, parameter detail and zoom controls.



SIGNAL

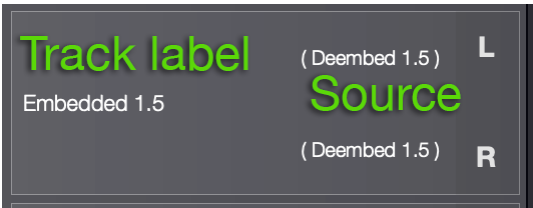
Each signal corresponds to one processing path in the device. A signal has as many tracks as there are timing delays. A signal can be collapsed to save space. It will display a reduced non-editable version.



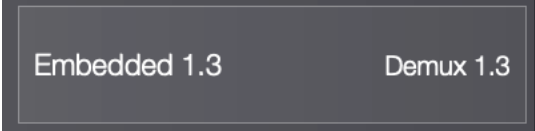
TRACK

A track has 2 channels if the corresponding timing delay has individually editable left and right stereo channels. In delays where mono editing isn't available, only one channel will be visualized. Each track displays its source on the right. As you route the flowgraph, this value will update. If a track has mono editing, the individual channels will be labelled with L or R, for right and left stereo channel.

Track with mono editing:

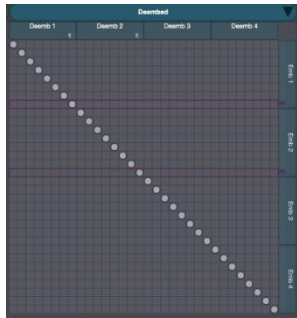


Track with stereo editing

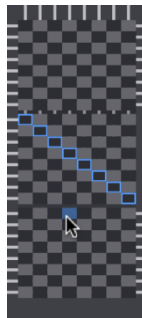


The track source is based on audio routing settings. Routing is performed in the audio crossbars. Green and Blue have different approaches.

Green Routing:



BlueRouting:



To edit the timing of a track, simply pull on the red handles. You will see the parameter value update in the parameter details section.



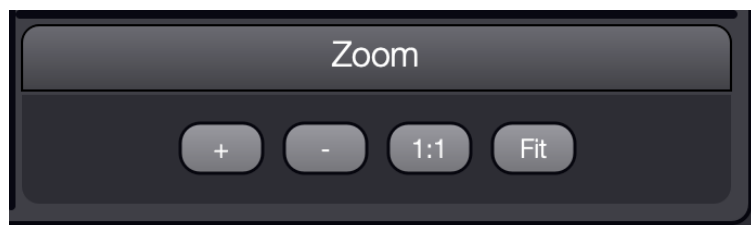
PARAMETER DETAIL

When you select a signal by clicking in any track, the parameter details for that signal will be visualized in the parameter detail section. The selected track will have a pronounced white outline.

The parameter detail and delay editor are always in sync.

NAVIGATION

You can navigate the view with the zoom buttons or hotkeys. Zoom in, zoom out, fit 1:1 and fit. Zoom 1:1 fits the view to actual size, and fit will make sure that all delay clips in the timeline are visible.



HOTKEYS

Zoom: With the control button (windows) command button (Mac) on the keyboard depressed, using the mouse wheel will zoom into and out of the timeline.

Pan: With the control button (windows) command button (Mac) on the keyboard depressed, press into the view with the left mouse button and move around will pan.

The mouse wheel alone without any modifier key will scroll through the timeline.

AUDIO CROSSBARS

BLUE CROSSBAR

To switch audio signals, you have a choice between the same simple drag and drop operation described above for video or a matrix style control or a matrix view and control.

To turn on the matrix style control select *Use Crossbar Matrix* in the blue section of Preferences. The matrix is the default.



When *Use Crossbar*

Matrix is activated and you hover over a crossbar, a checkered surface is displayed showing the state of all cross points. The currently switched cross points are highlighted with a blue frame. The cross point that the mouse pointer is hovering over is highlighted in blue, depicting which cross point will be switched if the mouse button is clicked. Additionally, the *Crossbar Inspector* at the bottom left of the UI indicates the source and destination of the highlighted cross point.

To enable mono controls of a cross point column, right-click on the desired stereo cross point and select *Show Mono Controls* from the context menu. Switching mono channels works the same way as switching stereo channels does.

Using the context menu over a cross point, you can also mute channels.

GREEN CROSSBAR

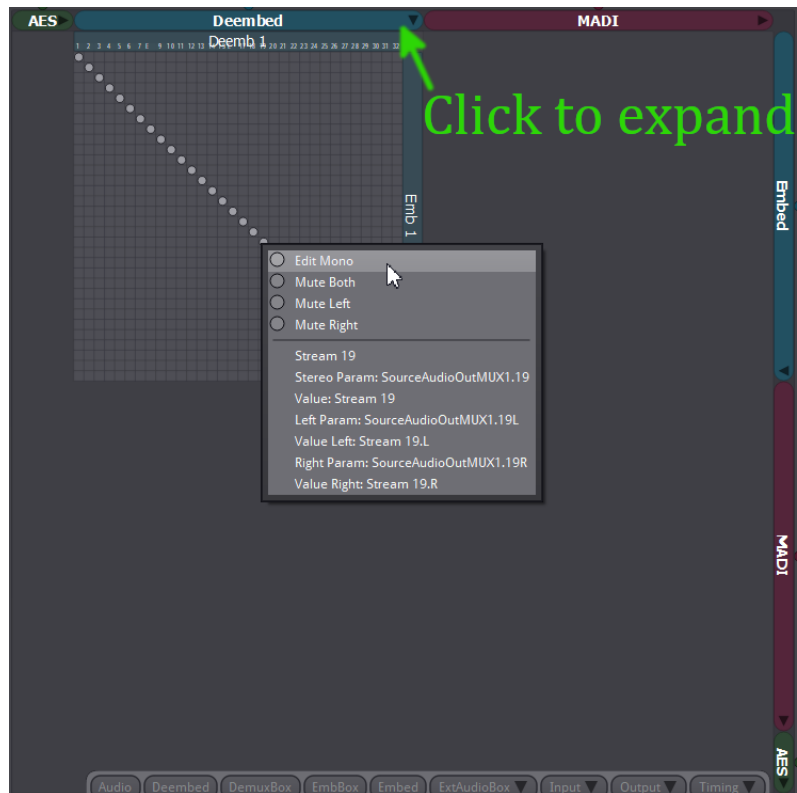
The routing block in the Green Flowgraph is considerably more complex. Depending on the greenMachine hardware and deployed constellation, the inputs and outputs can contain External Audio In, Deembed, MADI In, Testor In, Deembed, MADI Out and External Audio Out.

Input or output bars in the routing block can be expanded by a single click anywhere on the bar. This will also expand the corresponding input or output bars which have routed signals. If

one input audio type is routed to more than one output audio type, expansion will open all of them. You can expand and collapse portions of the routing box at any time. You can zoom the crossbar in all the way to work comfortably. Hovering over a cross-point will display detailed information about the audio channels affected at that point. To change a cross-point, simply click in one of the grid boxes.

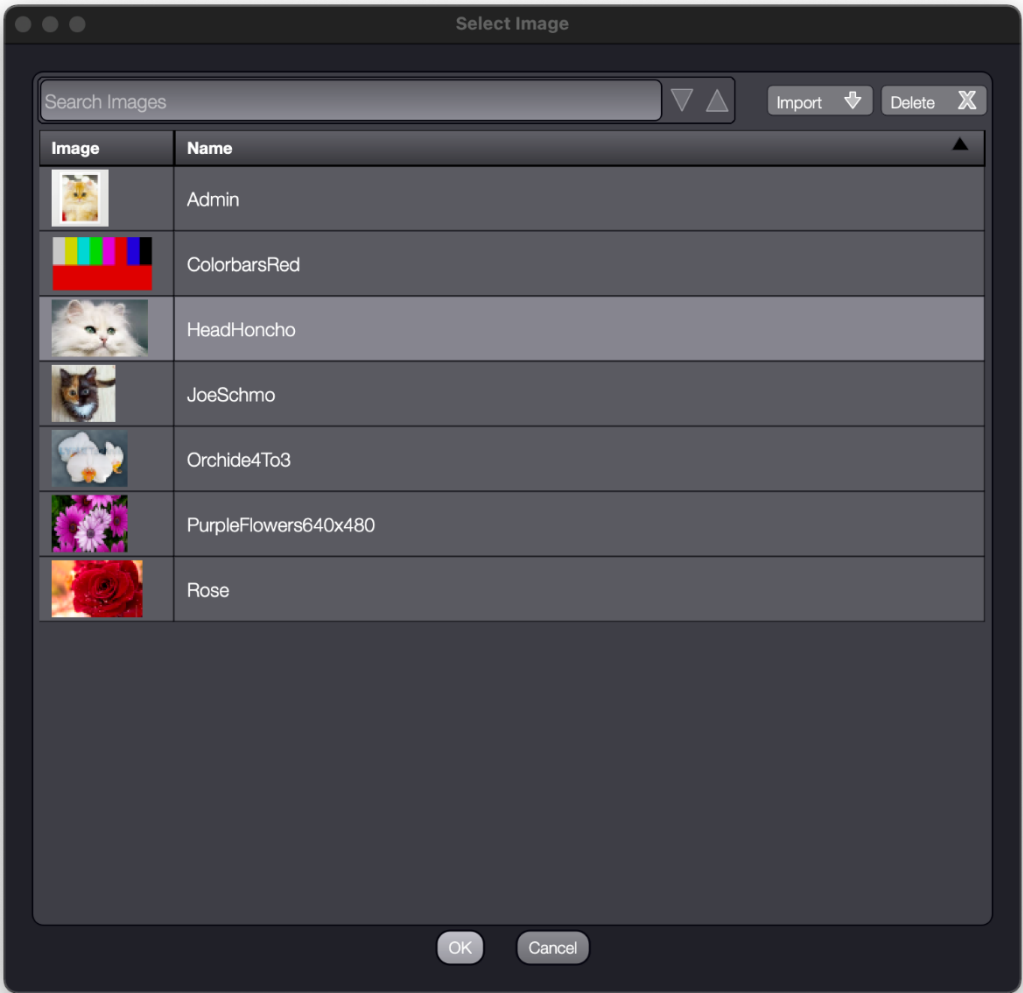
Using the context menu, you can turn on mono editing or mute channels.

When all blocks are collapsed, signal highlighting shows you where the audio is routed.



STILLSTORE

The stillstore view is used in all places where images are loaded. This includes the Testor Node, Operator Page etc. Any image loaded into LynxCentraal is available in all other places that images can be used. All common file formats are supported.



REDUNDANCY

Redundancy is Lynx's file sharing system. The storage in redundancy is distributed over all machines in the network. Every machine has a copy of all redundantly stored files. Redundancy is not cloud storage. There is no central server where everything is stored. Master should not be confused with a central server.

The GUI automatically chooses one master server. This master server syncs redundant data to all redundant servers in its IP subnet. It does not sync servers in other IP subnets.

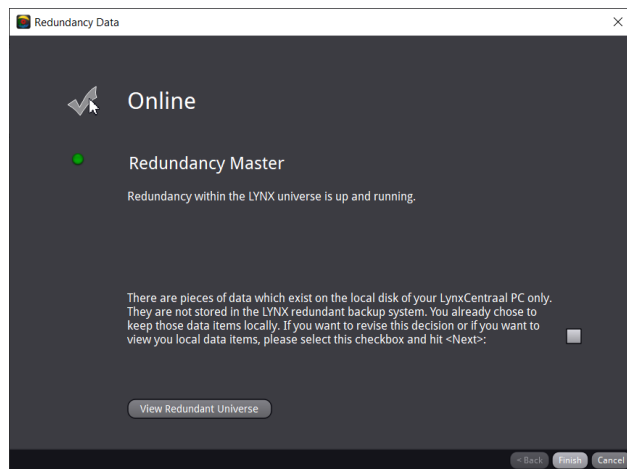
LynxCentraal has two modes of redundant operation:

- Offline - no connection to redundancy
- Online - always connect to a redundancy master, if available

The default mode is ONLINE.

There is a *Redundancy* menu item which displays a LED that depicts the overall state of redundancy. If you press on the Redundancy menu item, a dialog is displayed where you can switch between online/offline mode and obtain information about which server is currently the master.

You can switch between online and offline modes during runtime. When switching to online, the dialog includes a wizard which will walk you through the transition.



Basic rules of offline/online modes:

- Local data will never be lost when switching from offline to online
- Local data will not automatically be transferred to the redundancy master when switching from offline to online. This is especially important if you are running LynxCentraal on a portable device and then connect the GUI to different IP subnets. Automatic data transfer of local files to the new master copies all redundant data from one IP subnet to another, which could be undesirable.
- When switching from offline to online, the software will detect which files were created in offline mode and therefore not stored redundantly yet. It will also detect which files were modified in offline mode and therefore differ from their counterpart on master. For both new and modified files, you are given the choice whether you want to sync them to redundancy or not. The local files will NOT be deleted if you choose not to sync.
- The wizard will go through all data types of changed or added files. You can choose if you want to transfer or not, one after the other.
- The current offline / online state is stored per user when closing the application to make sure the state is consistent.

SERVER REQUIREMENTS

LynxCentraal redundancy requires at least one server running the supported server version in order to function correctly. Older server versions do not sync user data and custom control designs, which is essential for LynxCentraal. In an environment with old servers only, Redundancy is not functional. The Redundancy icon in the

main menu will be red in this case. The Redundancy dialog will ask you to upgrade your server versions.

You can use LynxCentraal in this state, but please be aware that all data, operators, filters, UI layout, Custom Control Designs, Presets, etc. will ONLY be stored locally. If you have 3 LynxCentraal front ends, you will have 3 separate entities. When the first server running the supported server version is added to the network, the UI will prompt you on each separate PC what you would like to do with all your local data.

REDUNDANCY VERSIONS

- V0: No redundancy at all. This is the case with APPolo servers.
- V1: greenMachine only. This version was available on Callisto. If there is a V1 server around it can only be controlled by a very old version of GreenGUI. This version is for all intents and purposes deprecated.
- V2: greenMachine only. This is what is currently available in GreenGUI
- V3: APPolo and GreenMachine. This is the version available in LynxCentraal.
V3 for APPolo servers hasn't been implemented yet.

All servers (greenMachines and APPolo servers) that have the same redundancy version are part of a redundancy group. Every redundancy group has a master which takes care of synchronising redundant data among the servers in the group. Theoretically there could be 3 different masters in a facility if there are V1, V2 and V3 servers. LynxCentraal only accepts a V3 master. All other masters are ignored.

DATA SHARED IN V2 REDUNDANCY

- Presets
- Testor Custom Patterns
- Still Images - StillStore
- Universe State
- Testor Overlay Designs

Custom Control Designs are not shared in Redundancy V2. They are published to greenMachines similar to the implementation in APPolo.

DATA SHARED IN V3 REDUNDANCY

- Presets
- Testor Custom Patterns
- Still Images - StillStore
- Testor Overlay Designs
- Custom Control Designs
- UserData
- Name
- Icon
- User interface settings / window arrangement etc.
- Universe State
- Permitted Servers
- Permitted Designs

- Permitted UI Features
- Connection Filter states

REDUNDANCY MIGRATION

Migration is a feature which allows users to transfer Data from old servers. The only data that can be migrated is APPolo V0 users and Custom Control Designs from both APPolo V0 and GreenMachine V2. All other data can not be migrated and will be locked on the old servers: Testor Data (Stills, Patterns, Overlay Designs), StillStore Images, Green Presets and Green Universe State.

When a server is updated to V3 a dialog is presented allowing you to choose which data to transfer into redundancy and which to keep local.

LYNX CENTRAAL WITH V3 SERVERS

All redundant data is shared between all devices. LynxCentraal was designed to work with V3 servers. It will perform optimally in a V3 only network.

LYNX CENTRAAL WITH V0 AND V2 SERVERS

This mode should only be used as an entry into the new LynxCentraal world, for testing.

- Existing users can be migrated from APPolo V0 servers, but they will be PC locked.
- Existing Custom Control Designs can be migrated from APPolo V0 servers or GreenMachine V2 servers, but they will be PC locked.
- All other existing V2 data (Testor, Stillstore, etc) will be locked on the old servers. The way to migrate this data is to update the machine to V3.
- All Users, UserData, Custom Control Designs, GreenMachine Presets, StillStore Images, Testor Data (User Patterns, Stills and Overlay Designs) created while working in LynxCentraal are locked to the PC they were created on.
- V0 APPolo servers will not partake in storing anything.
- V2 GreenMachines will not partake in storing anything.
- V0 APPolo servers will not be synced to redundancy automatically
- V2 GreenMachine data will not be synced to redundancy automatically.
- With the first V3 server brought into the network, the Redundancy Dialog will pop up automatically, informing the operator that there are local pieces of data that need attention. The operator has the choice to upload the local data into redundancy, to delete the local data or to continue working with the data locally. **If the operator chooses to upload a local user “James” into redundancy and another user “James” already exists, the operator is informed about the duplication and needs to make a conscious decision whether to overwrite or not.**

LYNX CENTRAAL WITH V0, V2 AND V3 SERVERS

- Existing users can be migrated from APPolo V0 servers, but they will be PC locked.
- Existing Custom Control Designs can be migrated from APPolo V0 servers or GreenMachine V2 servers, but they will be PC locked.
- All other existing V2 data (Testor, Stillstore, etc) will be locked on the old servers. The way to migrate this data is to update the machine to V3.
- All Users, UserData, Custom Control Designs, GreenMachine Presets, StillStore Images, Testor Data (User Patterns, Stills and Overlay Designs) created while working in LynxCentraal will be shared between the V3 servers.
- V0 APPolo servers will not partake in storing anything.
- V2 GreenMachines will not partake in storing anything.
- V0 APPolo servers will not be synced to redundancy automatically
- V2 GreenMachine data will not be synced to redundancy automatically.
- Each V0 or V2 server which is updated to V3 will cause the Redundancy Dialog to be displayed and the operator must chose which data to store redundantly.

TRANSPARENCY

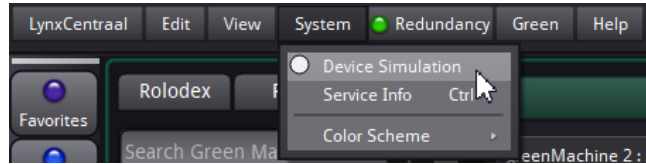
A Redundancy Log is available in the Info page alongside the event log and GUI log. The redundancy log displays all relevant information regarding redundancy:

- changes between offline / online mode
- when the master server changes
- which data is being uploaded / downloaded to / from the redundancy master.

While in online mode, it can still happen that the only redundancy master is disconnected, and redundancy becomes unavailable. Reconnecting the master will turn redundancy back on. State changes like this will be communicated to you in the redundancy log and visibly on the Redundancy Menu item.

SIMULATION

Device simulation can be turned on application wide from the *System Menu*. This will add all blue, green and yellow simulated devices to their respective pages.



Simulated devices are handy to get a sense of parameters and layout. They are not real. There are several pages where they are not available:

- Favorites
- Filter
- Operators/Servers
- Update

SNMP

The greenMachine supports a standard SNMPv2 control interface that allows read and write access to all parameters of the system as well as generating SNMPv2 Traps.

GET/SET

Full GET/SET/WALK access is provided to all the parameters of the greenMachine. Regular SNMPv2 authentication is implemented.

SNMP TRAPS

In addition to the get & set access, all events that a device generates can be sent as SNMPv2 Traps.

Every device provides an individual set of Events. Such Events will be set to ACTIVE state by the device to signal an unusual state (such as **“Video Proc 1: No Input”** or similar). The individual set of events per machine can be seen in LynxCentraal on the *Events* sub-page.

Whenever an event of an individual device changes its state (from passive to active and vice-versa), an appropriate entry is **added to the machine’s Logfile**.

An optional SNMPv2 Trap can be sent to the network when the event status changes. This can be controlled from the **device’s** Events sub-page in LynxCentraal in the relevant SNMP Trap column.

The SNMP trap will be generated and sent from the device to the host that has been **specified in the Server’s SNMP target host**. You can enter a list of multiple IP addresses, separated by a colon ‘:’.

LYNX REMOTE CONTROL INTERFACE

The LYNX Remote Control Interface is a technical alternative to the SNMP Remote Control Interface discussed in the previous section. It is available on port 2306 (TCP and UDP) and provides access to all readable and writeable parameters of an attached system.

There are certain advantages of the LYNX Remote Control Protocol over the SNMP Remote Protocol:

It provides a very effective subscribe / callback mechanism. A remote controller does not have to send repeated read-commands (polling) to monitor an individual parameter.

It provides a dynamic query functionality that makes any kind of static interface description (like SNMP MIBs) obsolete. Instead, the complete capabilities of the current system can be queried at runtime.

It is very easy to develop/script/program since it is based on clear-text ASCII messages.

The LYNX Control system provides integrated debugging support which also makes it very simple to make yourself familiar with the simple scripting syntax.

The technical documentation of the LYNX Remote Control Interface (one HTML page) is available free of charge from LYNX Technik. Please contact your local representative.

TECHNICAL SUPPORT

If you have any questions or require support, please contact your local distributor for further assistance.

Technical support is also available from our website:

<http://support.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 are 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.

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info@lynx-technik.com www.lynx-technik.com	info@lynx-usa.com www.lynx-usa.com	infoasia@lynx-technik.com

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

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Broadcast Television Equipment