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Reference Manual

PEC 1464

H.265 Streamer and Recorder

Revision 1.1 – Feb 2025

This manual supports PEC 1464 Version 1049 or higher

LYNXTechnik AG®

Broadcast Television Equipment

Contents

Warranty

LYNX Technik AG warrants that the product will be free from defects in materials and workmanship for a period of three (3) years from the date of shipment. If this product proves defective during the warranty period, LYNX Technik AG at its option will either repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product.

In order to obtain service under this warranty, customer must notify LYNX Technik AG of the defect before expiration of the warranty period and make suitable arrangements for the performance of service. Customer shall be responsible for packaging and shipping the defective product to the service center designated by LYNX Technik AG, with shipping charges prepaid. LYNX Technik AG shall pay for the return of the product to the customer if the shipment is within the country which the LYNX Technik AG service center is located. Customer shall be responsible for payment of all shipping charges, duties, taxes and any other charges for products returned to any other locations.

This warranty shall not apply to any defect, failure, or damage caused by improper use or improper or inadequate maintenance and care. LYNX Technik AG shall not be obligated to furnish service under this warranty a) to repair damage resulting from attempts by personnel other than LYNX Technik AG representatives to install, repair or service the product; b) to repair damage resulting from improper use or connection to incompatible equipment; c) to repair any damage or malfunction caused by the use of non-LYNX Technik AG supplies; or d) to service a product which has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty servicing the product.

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

Regulatory information

Europe: Declaration of Conformity

We LYNX Technik AG
Brunnenweg 3
D-64331 Weiterstadt
Germany

Declare under our sole responsibility that the product

TYPE: **PEC 1464**

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

EN 55103-1 /1996

EN 55103-2 /1996

EN 60950-1 /2006

Following the provisions of 2014/30/EU and 2014/35/EU directives.

Weiterstadt, Feb 2025

Place and date of issue *Legal Signature*

USA: FCC 47 Part 15

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

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to the part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the users will be required to correct the interference at their own expense.

Product Overview

Product Description

The PEC 1464 is a compact 12G-SDI / HDMI to H.264/H.265 streamer and recorder designed for a wide range of applications in the broadcast and pro AV industry.

The module can be configured to stream, record or do both simultaneously. The H.264 and H.265 encoders support a wide range of presets from baseline compression to high quality 4K UHD video with YCbCr 4:2:2 subsampling at 10bit.

The PEC 1464 offers an image resolution down-converter and a framerate converter. In case the signal drops out, a fallback image generator can display a custom image and text overlay. Real time logo insertion is possible on its video stream.

The PEC 1464 supports up to four stereo audio streams from the SDI stream, as well as a line level analog audio input. All of which can be embedded to the video stream, if supported by the streaming protocol. The device is compatible with both mp4 and mov file/stream containers.

A wide range of streaming standards are supported, as well as unicast and multicast modes of operation. The PEC 1464 can be used to stream live to a Content Delivery Network using RTMP/RTMPS, view the stream on one or more computers using RTP/RTSP unicast/multicast, or stream to a dedicated decoder or multicast address using TS over UDP or RTP.

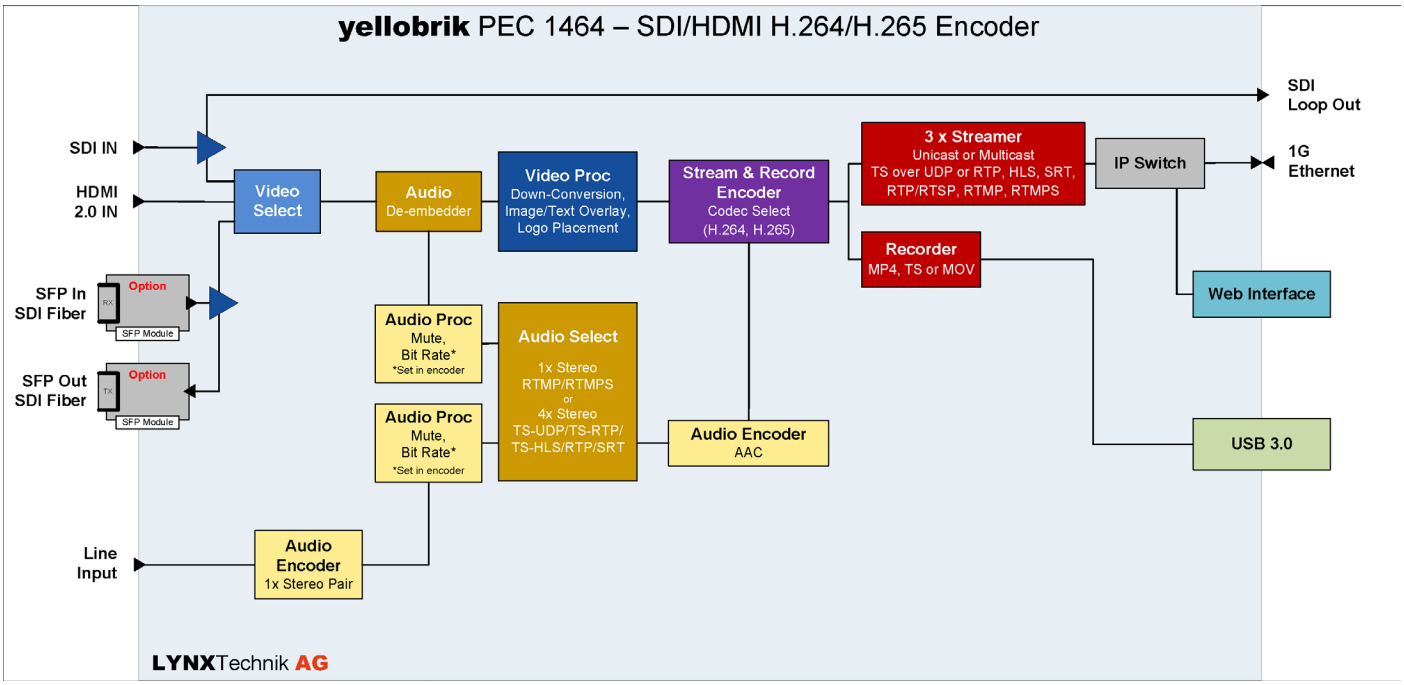
Other areas the PEC 1464 is ideal for:

- Live events
- Webcasts
- Corporate presentations and conferences
- AV system monitoring
- Live house of worship proceedings
- and many more

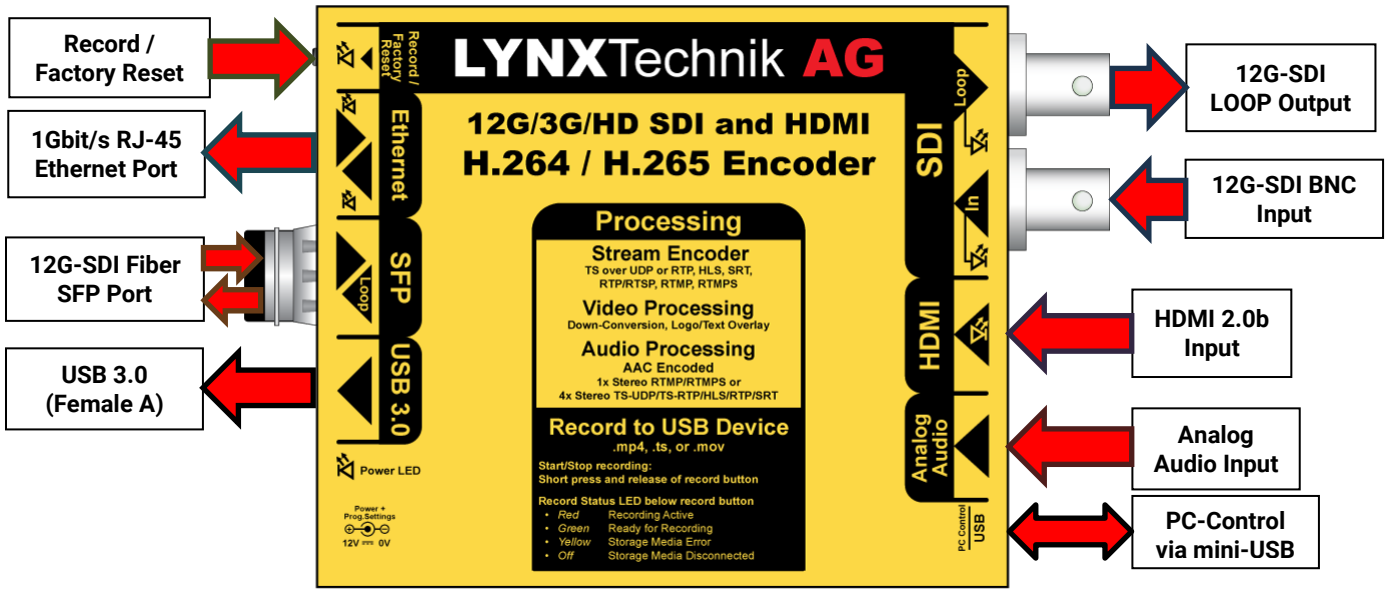
The PEC 1464 embeds an intuitive Web-based user interface for control and configuration. It is accessible from any PC, Mac, or mobile device with a browser and a network connection.

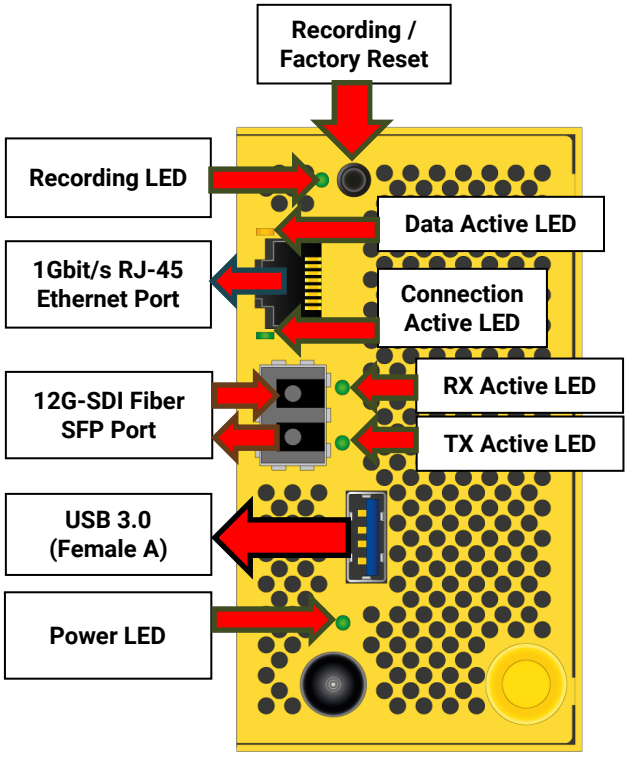
Network settings can be set via LynxCentraal and yelloGUI. Other parameters can only be read via the control software. If an SRV 1000 and RCT 1012 are used to connect the PEC 1464 via USB to the network, parameters can be monitored via SNMPv2.

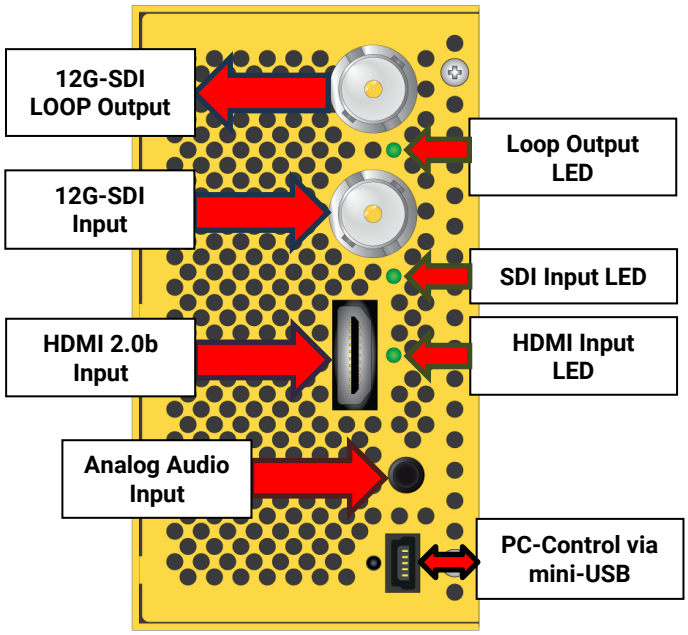
Functional Diagram



Connections and Local Controls







LED Description

Record LED

Color		Description
	Red	Recording Active
	Green	Ready for Recording
	Yellow	Storage Media Error (for example wrong formatting)
	Off	Storage Media Disconnected (LED turns off after safely ejecting the device in the Web GUI

SDI and HDMI LED

The input detection for SDI and HDMI works independently from each other i.e. the LED status for SDI (top) and HDMI (bottom) will work regardless of if the respective input is being used for encoding:

Color		Description
	Red/Green Alternating	Input Recognized, but video format not compatible
	Green	Valid Signal
	Off	No Signal Detected

Power LED

Color		Description
	Green	Power OK Factory Default settings
	Yellow	Power OK Some settings have been made using the Web GUI or LynxCentraal
	Red (blinking)	Hardware issues
	Off	Power not present

LAN LED

Color		Description
	Yellow (blinking)	Data transfer active (Upload, Download or both)
	Green	Ethernet Connection OK
	Off	Storage Media Disconnected (LED turns off after safely ejecting the device in the Web GUI

Push Button

Record / Factory Reset Button

	Description	LED Change
Short press (<100ms)	Start or Stop Recording ***Note:*** *For MOV and MP4 the record time is limited to 4 hours*	Recording LED will switch from Red to Green or Green to Red
Long press (>100ms, <20s)	User Reset ***Note:*** *This will reset ALL settings except Network and System*	Power LED will flash Green once, before flashing a second time shortly after to indicate the reset.
Very Long press (>20s)	Reset to factory settings ***Note:*** *This will reset ALL settings including the IP address*	Power LED will flash Green once, before flashing a second time shortly after to indicate the reset.

Factory Reset: Using the Web UI

The module's user data (all settings except Network settings and System Settings) can be reset to factory defaults using the "Factory Reset" command in the Web UI

USB 3.0 Interface

USB Specifications

- Female USB A
- USB 3.0

Supported Formats

- FAT32
- exFAT
- vFAT
- Ext2
- Ext3
- Ext4

Note: *It is not recommended to use a USB hub to connect multiple storage devices. A single device with multiple partitions will only write to a single partition.*

Supported Video Input Standards

SDI Input

SMPTE 292M (1.5G-SDI)	720p				50	59.94	60
	1080i				50	59.94	60
	1080p	25	29.97	30			
SMPTE 424M (3G-SDI)	1080p				50	59.94	60
SMPTE 2081 (6G-SDI)	3840 x 2160p	25	29.97	30			
SMPTE 2082 (12G-SDI)	3840 x 2160p				50	59.94	60

Color precision: YCbCr 4:2:2 10-Bit

HDMI Input

The HDMI input of the PEC 1464 can accept video signals according to EIA/CEA-861-D.

HD 720p				50	59.94	60
HD 1080i				50	59.94	60
HD 1080p	25	29.97	30	50	59.94	60
UHD 3840 x 2160p	25	29.97	30	50	59.94	60

1x 3.5mm stereo jack

- Unbalanced
- AC-coupled
- 10k Ohm

Power Specifications

- Power Input: 12V DC
- Power Consumption: 16W @ 12V nominal
- Power Input Range: 10V - 24V

Connect the PEC 1464 to your Network

Default IP Settings & Web UI Access

By default, the PEC 1464 is set to DHCP. The device is assigned an IP address by the DHCP server. To access the Web UI through its IP address please follow these steps:

1. Connect the PEC 1464 via its USB Control Port to a PC or Mac with the included mini-USB cable.
2. Make sure to install the latest version of LynxCentraal or yelloGUI installed
3. Navigate to the MAIN tab of the device settings. The IP address should be visible in the overview.
4. Click the IP address shown at the top of the MAIN tab's control interface or copy the IP address into a web browser's address bar and access the Web UI
5. Enter the default password **yellobrik$admin** and access the Web UI.

Note: *The browser may warn that the server you're trying to connect to is missing an SSL Certificate for HTTPS. A custom SSL certificate can be uploaded to the device. You can click "Advanced" on most browsers and continue to the login site.*

The password can be changed in the device settings. If the device is fully reset to factory settings the password will also reset to the default password (only possible on the physical device itself by pressing the button for more than 20 seconds).

Change IP Mode to Static Address

1. Connect the PEC 1464 with your PC or MAC via the USB Control Port with the included mini-USB cable.
2. Make sure the latest version of LynxCentraal or yelloGUI is installed
3. Navigate to the MAIN tab of the device settings.
4. Click on IP Mode's DHCP to open the dropdown menu.
5. Select "Static".
6. Change the IP settings of the PEC 1464 to the target static IP address.

Note: *The PEC 1464 is delivered* ***with DHCP enabled****. If connected to a switch in a network with a DHCP server,* ***the IP Address does not need to be changed!***

Web User Interface (Web UI)

The Web User Interface (Web UI) is an easy and intuitive way to configure PEC 1464. The Web UI was specifically designed as a mobile friendly application. Therefore, it can also be displayed and used with a tablet or smartphone.

Supported desktop browsers:

- Chrome Version 57+
- Firefox Version 45+
- Safari Version 10+
- Microsoft Edge 13+

Note: *Microsoft Internet Explorer is not supported.*

Supported mobile browsers (iOS):

- Chrome Version 57+
- Firefox Version 45+
- Safari Version 10+
- Microsoft Edge 13+

Note: *Microsoft Internet Explorer is not supported.*

Supported mobile browsers (Android):

- Chrome Version 57+
- Firefox Version 45+
- Safari Version 10+
- Microsoft Edge 13+

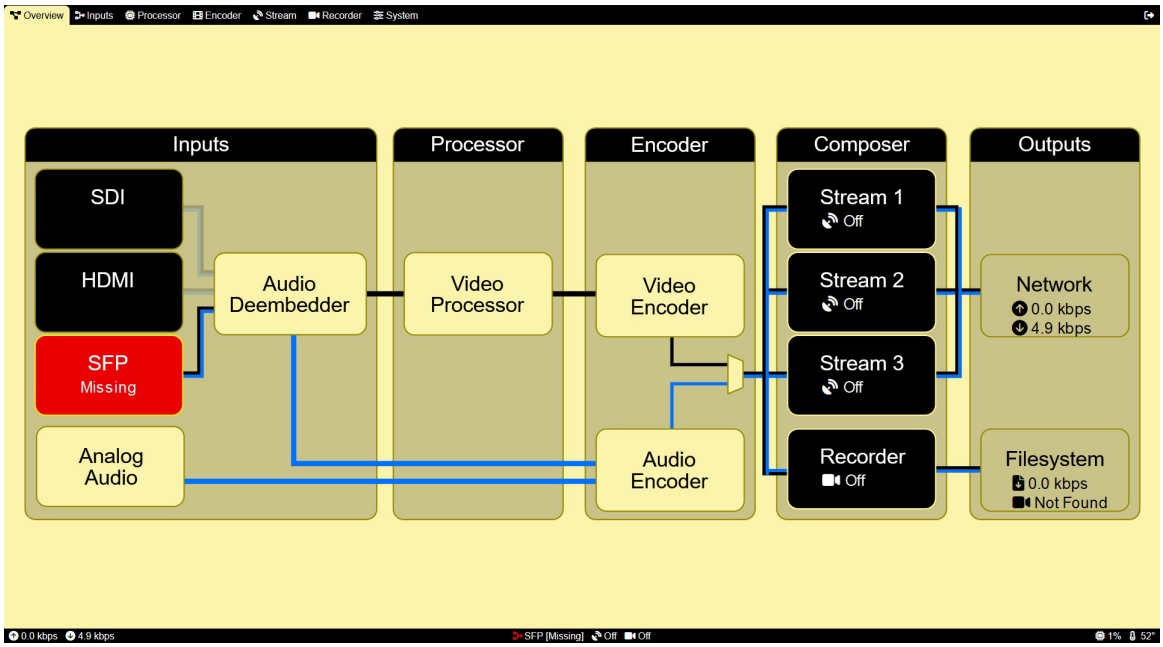
Note: *Microsoft Internet Explorer is not supported.*

Login Page

The Login Page requests the user to enter a password and offers the possibility to remember the password in a cookie stored in the browser cache.

The login is executed when the user presses the “Login” button.

Overview Page



The main page of the Web UI shows the basic functional signal diagram of the module.

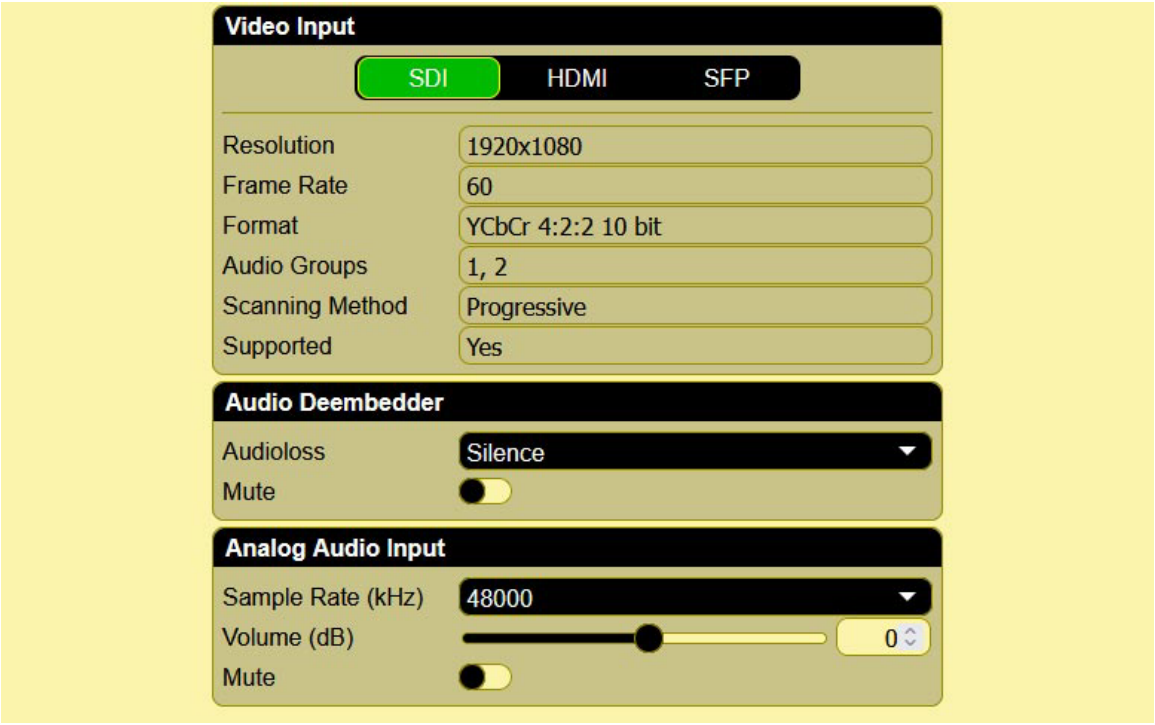
To access more detailed settings, the user simply clicks on the respective functional block.

To get back to the Overview Page click or touch the “Overview” Tab on PC, MAC or Tablets. On smaller screens the navigation menu is represented by three horizontal bars in the upper right corner.

On the bottom of the page the following system status information can be found (left to right):

Symbol	Description	Values
	Live Upstream Bandwidth usage	
	Live Downstream Bandwidth usage	
	Active Input Source, Status and Format	SDI, HDMI or SFP, in either red or green, resolution in brackets
	Streaming Status	White = Off Green = Live Red = Error
	Recording Status	White = Off Green = Recording Red = Error
	CPU Load	CPU Load in percent
	Temperature	In degrees Celsius

Input Page



Information on select input will be displayed here.

The audio De-Embedder offers options on drop of audio signals (1kHz Test Tone and Mute).

Analog Audio Input offers options for Sample Rate (8, 16, 32, 48kHz), Gain (-34.5 to 33 dB), and Mute.

Processor Page

The Processor Page offers options for the SDI or HDMI video stream that is processed by the PEC 1464. These include Missing Input handling, Downscaling and logo placements as well as automatic timestamping and dating burn in based on the devices time settings.

Missing Input Handling

The missing input handling is a static image that is displayed if the select input signal drops. It can be combined with the Logo Insert and a Text Overlay to relay information about the stream if necessary. An uploaded image is automatically scaled (bicubic scaling) to 3840x2160, 1920x1080, 1280x720, 720x576, 720x480 (Overhang on left and right will be cut in 4:3 formats). For more control over images shown for different resolutions, the advanced tab offers individual uploads. The PEC 1464 automatically chooses the closest matching resolution for custom set outputs.

Please note that even though the PEC 1464 can output standard definition legacy formats it does not accept them as SDI input formats.

Supported File Formats: *JPEG (only RGB), PNG (PNG24 and PNG 8), GIF (only static), BMP, TIFF. Backgrounds with transparency will show as if they were placed on a black background. The maximum file size is 32MB, the maximum number of files is 10.*

Logo Insert

Place a static image onto the stream with custom x and y position (origin is upper left corner of textbox). The position can't be negative and positions which overflow the width or height of the chosen resolution will not leave the frame unless the image itself is wiser or higher than the output format.

Supported File Formats: JPEG (only RGB), PNG (PNG24 and PNG 8), GIF (only static), BMP, Tiff. This image will not be scaled. This image can have full Alpha Transparency (png24) or flat transparency (gif, png8, etc.). The maximum file size per file is 32MB, the maximum number of files is 10.

Text Overlay

Place a text onto the screen with custom x and y position (origin is upper left corner of textbox). Prefix is the static text part. Date and Time timestamps can be added in different formats but cannot be added to video loss text. A Custom font can be used. The size is measured in pixels.

Supported File Formats: *otf, ttf, pcf*

Downscaler

The PEC 1464 offers live video downscaling. This includes an option for custom resolution sizes per side. The resolution can be of a different aspect ratio, but not bigger than the input format. Anything outside of the new resolution areas aspect ratio will be lost.

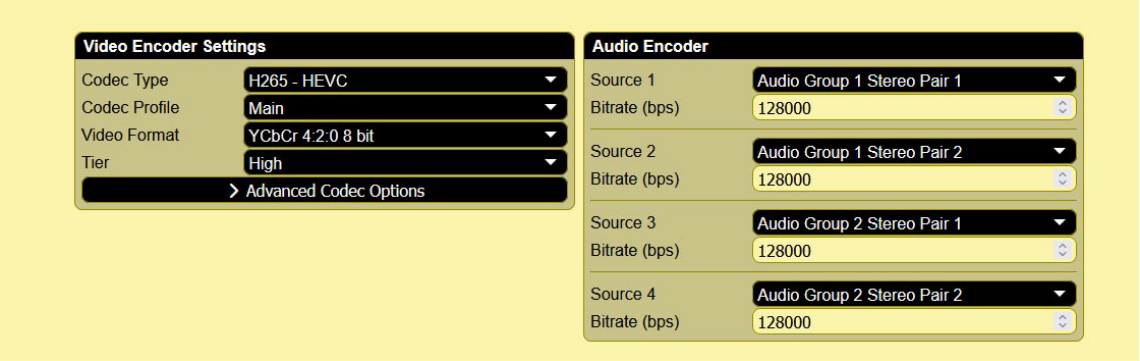
Frame Rate Control

Frame Rate Control can follow the input or be any of the usual odd or even frame rates (**even**: 24, 25, 30, 50, 60; **odd**: 23.98, 29.97, 59.94). We recommend setting the mode to “follow input”.

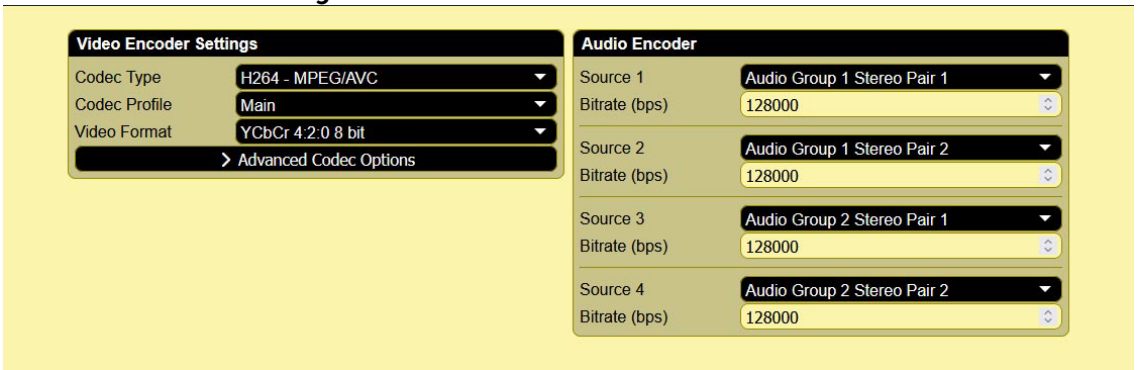
If frame rates between even and odd are converted, frames may be lost.

Encoder Page

H.265 Video Encoder Settings



H.264 Video Encoder Settings



The Encoder Page shows the current encoder settings, split individually for both available codecs, H.265 and H.264. Options include Codec profiles (Baseline, Main, Main 10, etc.), Video Format Options for Subsampling and either 8 or 10 bit per channel. H.265 also offers Tier settings for “High” and “Main”.

Advanced Codec Options offer a wider range of settings for compression of the video stream, if necessary. These settings include a bitrate limitation (in kbit/s), Manual Keyframe Intervals, number of slices for the compression and more.

Note: *The Advanced Codec Options should only be changed if necessary. By default, the settings are set to provide the best possible picture at a reasonable bitrate.*

Codec Types and their Profiles and Video Formats

H.264

Codec Profile	Baseline	Main	High	High 10	High 4:2:2
Video Format	YCbCr 4:2:0 8bit	YCbCr 4:2:0 8bit	YCbCr 4:2:0 8bit	YCbCr 4:2:0 8bit	YCbCr 4:2:0 8bit
				YCbCr 4:2:0 10bit	YCbCr 4:2:0 10bit
					YCbCr 4:2:2 8bit*
					YCbCr 4:2:2 10bit*

**Not available for resolutions above 1080p*

H.265

Codec Profile	Main	High 10	High 4:2:2
Video Format	YCbCr 4:2:0 8bit	YCbCr 4:2:0 8bit	YCbCr 4:2:0 8bit
		YCbCr 4:2:0 10bit	YCbCr 4:2:0 10bit
			YCbCr 4:2:2 8bit*
			YCbCr 4:2:2 10bit*

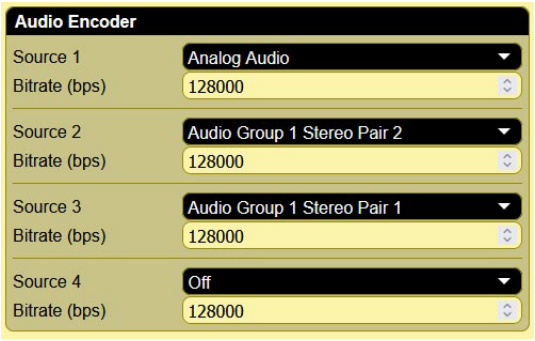
**Not available for resolutions above 1080p*

Audio Encoder

The Audio Encoder settings offer switchable and assignable Audio Groups (including Analog Audio and “Off”) and freely assignable Bitrate (8000 to 256000bps, default = 128000bps).

Line level analog audio can be introduced via the 3.5mm stereo jack connector.

All audio gets encoded to AAC audio.



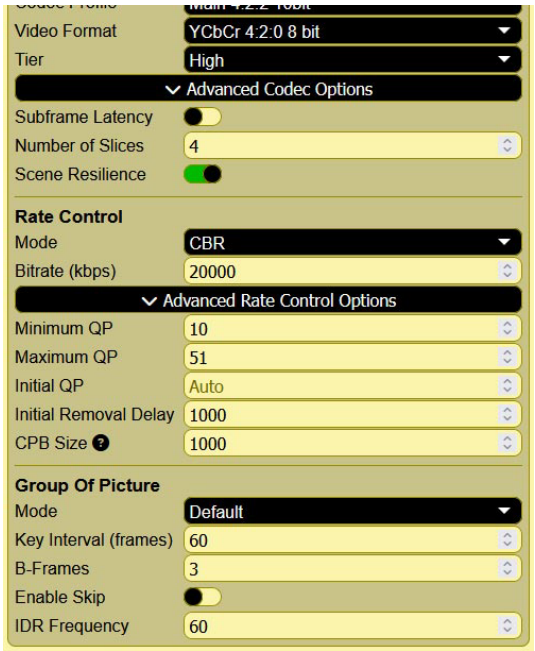
Advanced Settings

Allows toggle between Constant and Variable bit rates. Specify custom bitrate and advanced Group of Picture and I-Frames settings.

Advanced Rate Controls

These settings mostly concern Quantization Parameters and control the amount of compression per block.

Only change these parameters when necessary, as these impact the quality of each segment compressed in H.265 and H.264 defined by the CPB Size.

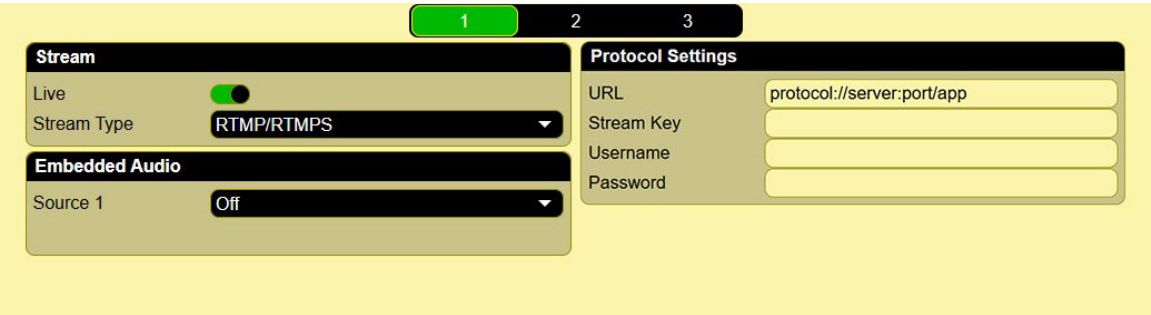


Stream Settings

The Stream Settings Page offers three individual streams with their respective settings. All streams source the actual video from the encoder. The Stream target must be compatible with the encoder settings.

The background colors of the Stream buttons provide visual feedback on the streams health.

RTMP/RTMPS



Ideally used for streaming to Video on Demand (VOD) platforms like Twitch, YouTube, TikTok, etc. This profile can use H.264 as a video encoder in the PEC 1464 and transmits one stereo channel.

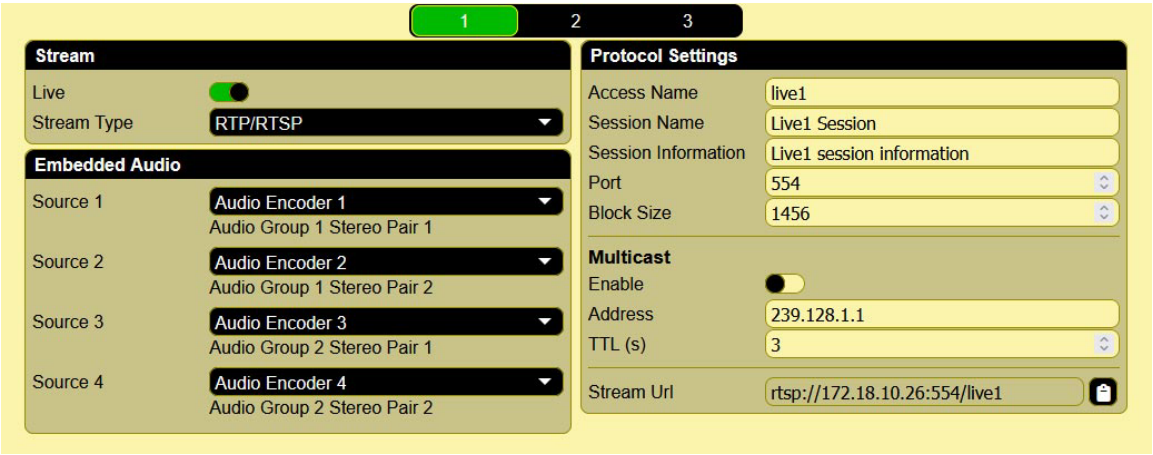
Protocol Settings

General	
URL	Target URL starting with “rtmp://” or “rtmps://”
Stream Key	The individual private key for this stream session
Username	Username on platform
Password	Password for platform

Streaming with RTMP/RTMPS

Most video on demand platforms that offer streaming have concise tutorials on the specific settings they require, if any (Port number, Server URL or IP address). To stream to the platform usually just a URL (identified by starting with “rtmp://” or “rtmps://”) and stream key are required to be copied into the “Stream Key” field of the PEC 1464’s Web UI Stream settings. For more details on whether your username and password are required, please refer to your chosen target platform.

RTP/RTSP



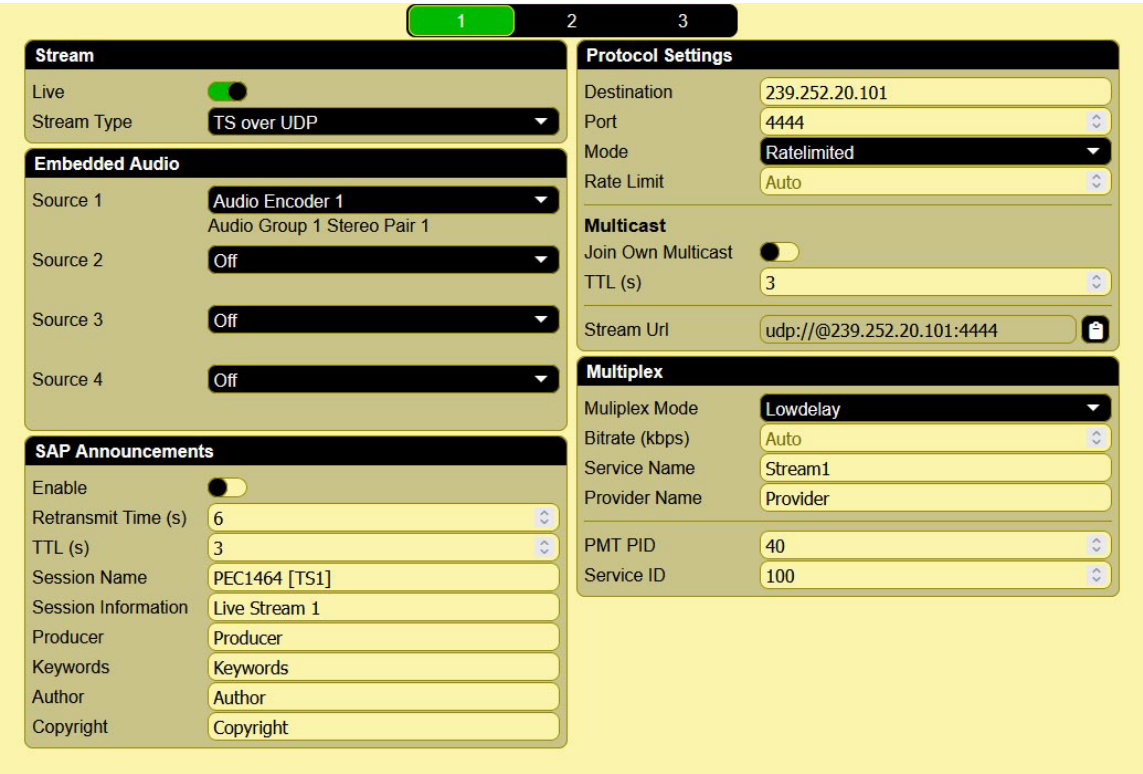
RTP and RTSP protocols have mostly been succeeded by RTMP and RTMPS due to added security features. They can both use H.265 and H.264 as video encoder and transmit all four stereo channels.

RTP and RTSP streaming protocols are recommended for Video Conferences or local/wide area network video feeds.

Protocol Settings

General	
Access Name	Enter the access name for the stream
Session Name	Enter the session name for the steam
Session Information	Enter the session information for the steam
Port	Enter the port number for the steam (default 554)
Block Size	Enter the block size for the steam (default 1456)
Multicast	
Enable	Enable multicast streaming
Address	The individual private key for this stream session
TTL(s)	Username on platform
Other	
Steam URL	Stream URL to share with viewers in local or wide area network

TS over UDP



This stream type uses UDP to stream the encoded MPEG-TS video files. This makes it ideal to deliver the video stream in H.265 to web browsers. In the PEC 1464 both H.265 and H.264 can be used as a video encoder and transmit all four stereo channels.

Streaming TS over the internet is offered either via UDP or the more modern RTP. TS over RTP offers more options for broadcast streamers than UDP.

Protocol Settings

General	
Destination	Target for the Stream
Port	Target destination's Port number
Mode	Mode selection for bitrate mode
Rate Limit	Defined by Bitrate Mode
Multicast	
Join Own Multicast	Loop back Multicast to sender
TTL (s)	Time-to-live each packet has before expiring in transmission
Other	
Stream URL	Stream URL to share with viewers in local or wide area network

SAP Announcements

SAP stands for Session Announcement Protocol. This protocol is used to contain meta information about the stream for recipients to classify content and credit people involved in the creation of the streamed content.

General	
Enabled	Enable or disable the transfer of SAP Information
Retransmit Time (s)	Time to retransmit information if no ACK was returned
TTL (s)	Time to live for IP of session announcements being routed
Session Name	SAP Name
Session Information	SAP Information
Producer	Information on producer of stream
Keywords	Information on keywords of stream
Author	Information on author of stream
Copyright	Information on copyright of stream

Multiplex

General	
Multiplex Mode	Either Low delay or Constant Bit Rate (CBR)
Bitrate (kbps)	Target bitrate of Multiplex stream
Service Name	Identifier Name for stream at multiplex provider
Provider Name	Name of multiplex provider
Other	
PMT PID	Program Map Table Process ID number
Service ID	Service ID number

TS over RTP

This stream type uses RTP to stream the encoded MPEG-TS video files with increased packet delivery rate when compared to TS via UDP. It can use both H.265 and H.264 as a video encoder and transmits all four stereo channels.

Using RTP for TS transmission also offers error correction of transmissions.

Protocol Settings

General	
Destination	Target for the Stream
Port	Target destination's Port number
Mode	Mode selection for bitrate mode
Rate Limit	Defined by Bitrate Mode
Multicast	
Join Own Multicast	Loop back Multicast to sender
TTL (s)	Time-to-live each packet has before expiring in transmission
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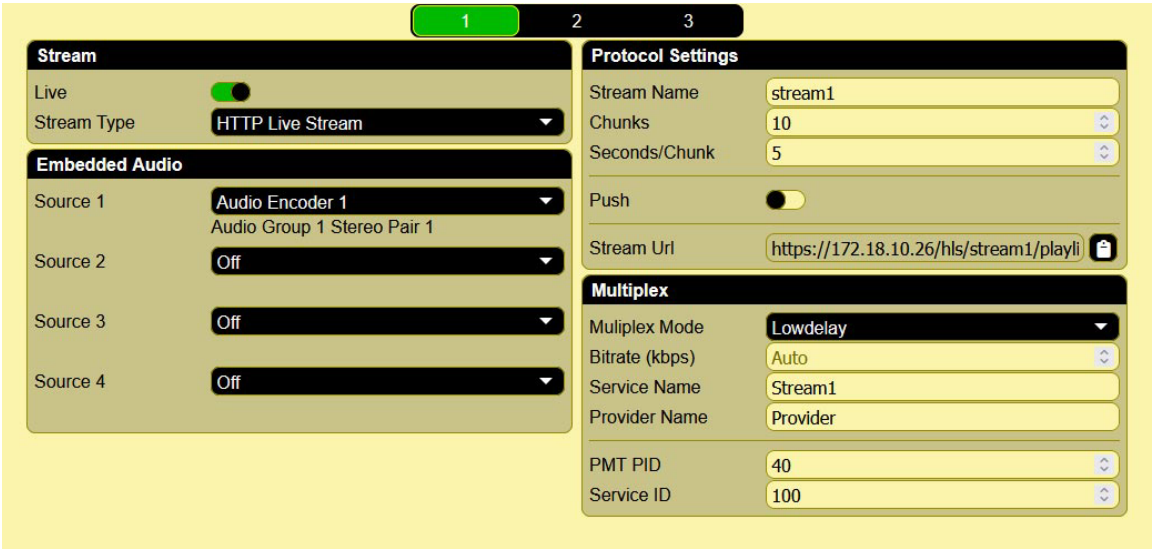
HTTP Live Stream (HLS)



With HTTP Live Stream (HLS) any device that connects to the Stream URL can playback the streamed content provided its hardware is able to handle the video format. One of the key advantages of HLS is the variable bitrate that adjusts the video bitrate to keep a constant stream up.

Protocol Settings

General	
Stream Name	Target URL starting with “http://” or “https://”
Chunks	Number of chunks to send stream in
Seconds/Chunk	Rate at which Chunks are sent
Push Mode (Enable to see options)	
URL	Target URL
Username	Target platform username information
Password	Target platform password
Remove	Delete old stream segments on the ingestion server
Other	
Stream URL	Stream URL to share with viewers in local or wide area network

Multiplex

General	
Multiplex Mode	Either Low delay or Constant Bit Rate (CBR)
Bitrate (kbps)	Target bitrate of Multiplex stream
Service Name	Identifier Name for stream at multiplex provider
Provider Name	Name of multiplex provider
Other	
PMT PID	Program Map Table Process ID number
Service ID	Service ID number

SRT Listener

SRT Listener utilizes the Secure Reliable Transport (SRT) protocol, particularly used in streaming and broadcasting. SRT is designed to optimize streaming performance across unpredictable networks by providing low-latency, secure, and reliable transmission of audio and video data.

An SRT Listener essentially waits for incoming SRT connections from clients, allowing for the reception of streams, managing multiple clients simultaneously. This makes it a crucial part of live video broadcasting setups, enabling content delivery without dropping packets, even in challenging network conditions. SRT offers forward error correction (FEC).

Protocol Settings

General	
Port	Port to open up as listener
Stream ID	The identifier for this stream session
Latency	Manually set acceptable latency in ms
Encryption	Toggle encryption for stream
Passphrase	Passphrase to access stream
Key Length	Length of encryption key
FEC (Forward Error Correction)	
Dimension	Number of dimensions for Multidimensional parity-check
Rows	Number of rows for parity check
Columns	Number of columns for parity check
Other	
Stream URL	Stream URL to share with viewers in local or wide area network

Multiplex

General	
Multiplex Mode	Either Low delay or Constant Bit Rate (CBR)
Bitrate (kbps)	Target bitrate of Multiplex stream
Service Name	Identifier Name for stream at multiplex provider
Provider Name	Name of multiplex provider
Other	
PMT PID	Program Map Table Process ID number
Service ID	Service ID number

Status

Network Errors	Number of Network Errors

SRT Caller

An SRT Caller as a network component initiates a connection using (SRT) protocol to send audio and video streams to an SRT Listener.

It is responsible for establishing a secure and reliable communication channel, often over unpredictable networks, ensuring low-latency transmission while maintaining content integrity. SRT offers forward error correction (FEC).

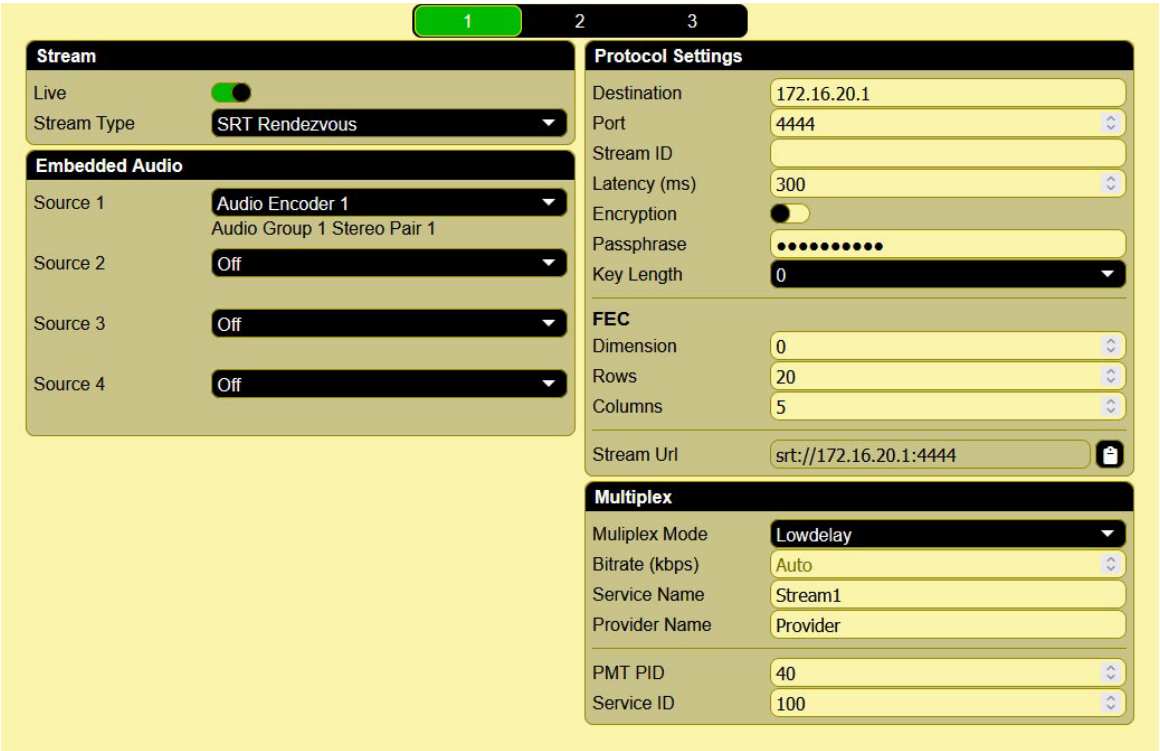
Protocol Settings

General	
Destination	Target IP
Port	Port of target IP
Stream ID	Identifier for stream
Latency	Manually set acceptable latency in ms
Encryption	Enable/disable Encryption
Passphrase	Passphrase for encryption
Key Length	Length of encryption key
FEC (Forward Error Correction)	
Dimension	Number of dimensions for Multidimensional parity-check
Rows	Number of rows for parity check
Columns	Number of columns for parity check
Other	
Stream URL	Stream URL to share with viewers in local or wide area network

Multiplex

General	
Multiplex Mode	Either Low delay or Constant Bit Rate (CBR)
Bitrate (kbps)	Target bitrate of Multiplex stream
Service Name	Identifier Name for stream at multiplex provider
Provider Name	Name of multiplex provider
Other	
PMT PID	Program Map Table Process ID number
Service ID	Service ID number

SRT Rendezvous



As a connection establishment mechanism in the (SRT) protocol, SRT Rendezvous allows devices to locate each other and form a communication link. It facilitates the exchange of connection parameters and metadata between endpoints, ensuring a smooth handshake process.

This feature enhances flexibility in network configurations, particularly in peer-to-peer streaming scenarios. SRT offers forward error correction (FEC).

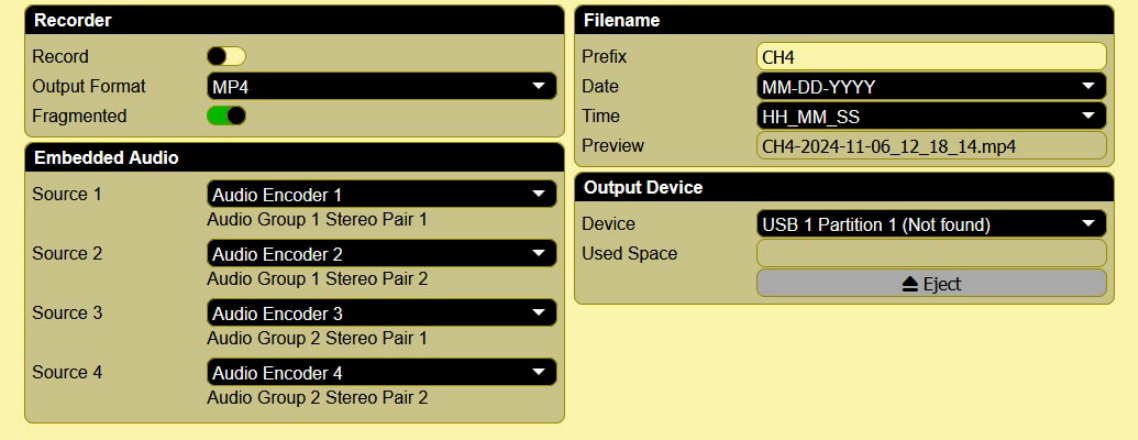
Protocol Settings

General	
Destination	Target IP to rendezvous at
Port	Port of target IP
Stream ID	Identifier for stream
Latency	Manually set acceptable latency in ms
Encryption	Enable/disable Encryption
Passphrase	Passphrase for encryption
Key Length	Length of encryption key
FEC (Forward Error Correction)	
Dimension	Number of dimensions for Multidimensional parity-check
Rows	Number of rows for parity check
Columns	Number of columns for parity check
Other	
Stream URL	Stream URL to share with viewers in local or wide area network

Multiplex

General	
Multiplex Mode	Either Lowdelay or Constant Bit Rate (CBR)
Bitrate (kbps)	Target bitrate of Multiplex stream
Service Name	Identifier Name for stream at multiplex provider
Provider Name	Name of multiplex provider
Other	
PMT PID	Program Map Table Process ID number
Service ID	Service ID number

Recorder Settings



The Recorder uses the same encoder settings as the streamer. The container format for files available are: mp4, mov, and ts. All file formats can embed three audio encoders into the file.

The files can automatically be named with a custom Prefix, and varying Date and Year Timestamps.

Both mov and mp4 can be recorded fragmented to avoid video file corruption.

Note: *mp4 and mov recording time is limited to 4 hours.*

Recorder Settings

General	
Record	Start/Stop Recording
Output Format	Change the File format (mp4, mov, ts)
Fragmented	Enable fragmented recording to try to protect recorded video from corruption

Filename

General	
Prefix	Start of filename
Date	Optional Date (start of recording)
Time	Optional Timestamp (start of recording
Preview	Preview of filename as it can be found on USB device

Output Device

General	
Device	Choose partition of device where to save to
Unused Space	Show how much space is free on partition of device
Eject	Safely dismount the filesystem from PEC 1464

Application Example:

H.265 Streaming and Recording to YouTube with HLS

The following guide will explain how to set up an H.265 encoded 4K YouTube stream with recording and a secondary backup stream via RTMP

Note: *HDR is currently not supported, as the PEC 1464 currently does not support YUV 4:2:0 10Bit or SMPTE ST 2084.*

Preparing the Input

The following steps assume that the user already knows how to access the PEC 1464's web UI or find the devices' IP address in LynxCentraal or yelloGUI.

1. Connect the SDI or HDMI feed with the PEC 1464. If the 4K UHD HDMI input cannot be recognized by the PEC 1464, we recommend changing the cable to at least an HDMI 2.0. Please also avoid using USB C to HDMI cables.

Note: *For legal reasons, HDMI capture devices from LYNX Technik AG are designed not to capture, convert or transmit video or audio from HDCP copy-protected sources (e.g. Satellite receivers, Cable receivers, etc.)*

2. Switch to the desired input feed and set the processor settings
3. In the Stream Tab: Change Stram Type to HTTP Live Stream and enable "Push" in the Protocol Settings

Preparing the HLS

1. Log into your verified YouTube account (If the account isn't verified yet, please remember that verification can take up to 24 hours)
2. Switch to YouTube studio
3. Click the "go live" >" Go live now" button
4. In the "Stream Key" Settings click on "Select stream key"
5. Create a new stream key to go live now
6. Name the stream, select HLS (Advanced) as streaming protocol
7. Copy the Stream URL
8. Paste the stream URL generated by YouTube into the "URL" field in the Protocol settings of the PEC 1464 Web User interface
9. Add the desired google account information (Username and Password)
10. Check the select embedded Audio sources
11. Once the stream is setup with the correct name, thumbnail and description on the YouTube studio web interface, simply enable "Live" on the PEC 1464 to go live with the stream.

Note: *Unless the device is reset to factory settings or its firmware is being updated, the settings will be saved.*

Start the Recording and Stream

1. Change to the Recording Tab
2. Select which container you want to save the stream as
3. Select if you want to record the video segmented (only available for mp4 and mov)
4. Start the recording
5. Change to the Stream Tab
6. Start the Stream

System Settings

On this page the system settings of the PEC 1464 including the IP address and date / time can be modified. Information about the SW version can also be found and a module update can be executed.

General Device Information

Locate Device	Causes all LEDs on the device (except the RJ-45 LEDs) to blink yellow. This is useful to identify the device among multiple similar or identical devices.	Switch
Serial Number	Serial Number of the device	Read Only
Uptime	Total time the device has been powered on since last reboot or startup.	Read Only
Password	Change the Password to access the PEC 1464 Web UI.	Opens dialog
Reboot Device	Reboot the device without losing user information or settings applied.	Button (with Confirmation)

Settings Management

Factory Reset	Reset user to default password	Button (with Confirmation)
Import Settings	Import device settings (incl. password)	File Upload
Export Settings	Export device settings (incl. password)	File Download

Note: *You can execute the reset to factory defaults on the PEC 1464 itself. By holding the record button pressed.*

Update and Service

Current Version	Shows the current firmware version installed on this PEC 1464	Read Only
Firmware	Upload firmware updates of the PEC 1464	File Upload
Service Information	Downloads a zip of configuration, device status and general system information.	File Download

Date / Time

Timezone	Set the current time zone (ordered by territory / notable city)	Dropdown List
Date	Set the Date (Year / Month / Day)	Text field
Time	Set Time for the device (Clock will stop during editing, but add time passed after leaving the field)	Text field

Network Settings

DHCP	Enable / Disable	Switch
Hostname	Name of the Device in a network (Default: pec1464)	Text field
IP Address	Shows the current IPv4 Address. This field is automatically filled if the DHCP Server communication worked. If DHCP is switched off the value can be set.	DHCP On: Read Only
		DHCP Off: Text field
Subnet Mask	Shows the current subnet mask. This field is automatically filled if the DHCP Server communication worked. If DHCP is switched off the value can be set.	DHCP On: Read Only
		DHCP Off: Text field
Gateway	Shows the current Gateway. This field is automatically filled if the DHCP Server communication worked. If DHCP is switched off the value can be set	DHCP On: Read Only
		DHCP Off: Text field
MAC Address	Shows the MAC Address of the device	Read Only
DNS Server	IPv4 Address of the DNS Server to use (Optional). Will be set by DHCP if enabled.	DHCP On: Read Only
		DHCP Off: Text field
DNS Domain	Name of the DNS Domain to use (Optional). Will be set by DHCP if enabled.	DHCP On: Read Only
		DHCP Off: Text field
NTP Server	IPv4 Address of the NTP Server to use (Optional). Will be set by DHCP if enabled.	DHCP On: Read Only
		DHCP Off: Text field
Certificate	Upload a custom SSL Certificate.	File Upload

Note: *For RTMP streaming to a server in the public internet a correct DNS configuration is necessary.*

Technical Specifications

SDI Input	1x SDI video on 75 Ohm BNC connector (4:2:2 YCbCr 10bit) SMPTE 2082, 2081, 424M, 292M with automatic video format and standard detection Return Loss: >15dB from 5MHz to 1.5GHz, >10dB from 1.5GHz to 3GHz Automatic cable EQ (Belden 1694A cable) 220m @ 1.5G, 160m @ 3G, 70m @ 12G
HDMI Input	1x 10bit HDMI 2.0b 1920 x 1080p 50/59.94/60 1920 x 1080p 25/29/30 1920 x 1080i 50/59.94/60 1280 x 720p 50/59.94/60 3840 x 2160p 50/59.94/60 3840 x 2160p 25/29.97/30
Audio Input	1x 3.5mm stereo jack Unbalanced AC-coupled 10k Ohm Line level
Power	+12V DC @ 16W (supports 10V to 24V DC input range)
Mechanical	W: 90mm (3.54”), H: 50mm (1.97”), D: 138mm (5.43”) - including connectors Weight: 0.25kg (0.55lb)
Ambient	Temperature: 5°C to 40°C (41 F to 104 F) maintaining specification Humidity: 90% maximum, non-condensing
Model #	PEC 1464 - (EAN# 4250479329492)

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 may be available on our web site:

www.lynx-technik.com

Contact Information

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

LYNX Technik can be contacted directly using the information below.

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D-64331 Weiterstadt
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E-Mail info@lynx-technik.com

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