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CLOUDLESSCAM

DOCUMENTATION

VERSION
2026.05.21.0600

CLOUDLESSCAM.DE

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1 Introduction

1.1 What is CloudlessCam?

CloudlessCam is local security camera recording software that allows you to continuously capture, store, and manage live streams from IP cameras. The software is designed to enable decentralized video surveillance without relying on cloud services. You retain full control over your recordings and can store them locally or

save to user-selected storage locations.
CloudlessCam is suitable for both private users who want to monitor their homes and small and medium-sized businesses that need a professional surveillance solution for offices, warehouses, or other facilities. The software runs on Windows, Linux, and macOS and offers a graphical user interface as well as a full command-line interface for use on servers or for automated tasks.

1.1.1 Functional Overview

CloudlessCam offers a comprehensive range of features for managing and recording from security cameras. The main features of the software are described below:

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— **Camera management:** You can have cameras automatically detected on the network or add them manually. The software supports ONVIF and RTSP as well as other URL-based streams.

— **Recordings:** Video, audio and still image recordings are made under-
It supports [the system]. You can create schedules and configure various quality and performance parameters.

— **Storage destinations:** Recordings can be stored on local hard drives, network shares, ben or various cloud storage services such as WebDAV, SFTP, S3-compatible services, OneDrive, Dropbox, Google Drive, ... can be backed up.

— **Live monitoring:** You can view individual camera streams or multiple cameras simultaneously in a video wall view.

— **Playback:** Recordings can be played and searched via an integrated player with calendar and timeline view.

— **Desktop Player:** An optional desktop player allows you to access recordings in a separate, streamlined application without having to deal with all the CloudlessCam settings.

— **Web Player:** An optional web player allows you to view recordings in your browser, which is ideal for access via your local network or VPN.

— **PTZ control:** With compatible cameras, you can pan, tilt, and zoom.
Control, save and recall PTZ presets, and automate entire PTZ movement sequences and execute them based on events (e.g., time of day & day of the week).

— **Background operation:** For continuous operation, a CLI daemon with Pacemaker monitoring is available, enabling stable 24/7 operation.

1.1.2 Supported security cameras and video streams

CloudlessCam supports a wide variety of IP cameras and video streams via
Various protocols. The software is designed to be compatible with most common security cameras.

ONVIF

ONVIF (Open Network Video Interface Forum) is an open industry standard.
For communication between IP cameras and recording software. Cloudless.
Cam supports automatic detection of ONVIF-enabled cameras on the network. After detection, available stream profiles are automatically queried. For compatible cameras, the software can also support PTZ functions (pan, tilt, and retract).

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Control (tilt, zoom) via ONVIF.

Please note: CloudlessCam is not ONVIF certified and therefore cannot guarantee that all aspects of the ONVIF protocol are supported.
are fully and correctly implemented, which is why incompatibilities can occur.

RTSP

The Real-Time Streaming Protocol (RTSP) is the most widely used protocol for camera streams.
CloudlessCam supports RTSP streams with and without [unclear - possibly referring to a specific feature or protocol].
Authentication. Most IP cameras offer at least one main stream.
in high resolution and a substream in lower resolution. For the
For live viewing, it is recommended to use the substream, while the main stream can be used for recordings.

Further protocols

Manual input also allows you to integrate streams via other protocols, including HTTP, HTTPS, HLS (HTTP Live Streaming) and DASH (Dynamic).
Adaptive Streaming over HTTP). This enables the integration of webcams,
Streaming servers and other video sources.

Audio

If a video stream contains audio, CloudlessCam can record it, provided
Audio recording is enabled in the recording configuration. The integrated
The player also supports audio playback.

Compatibility notes

It should be noted that not all cameras implement ONVIF or RTSP identically. Codec, container format, and frame rate can vary depending on the manufacturer and...
Models vary. If a camera is not automatically detected, it is recommended to obtain the RTSP URL from the camera manufacturer's documentation and enter it manually. If you experience problems with automatic detection, you should check whether ONVIF and/or RTSP are enabled in your camera's settings.
Camera is activated.

1.1.3 Supported Memory

CloudlessCam offers flexible options for storing your recordings.
Here we distinguish between directly supported storage devices, and de-

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CloudlessCam establishes the connection itself, and indirectly supported storage devices that use an external synchronization tool.

Directly supported storage

CloudlessCam establishes the connection itself and transfers the recordings directly to the following storage types:

— **File system:** Local hard drives and directories on Windows, Linux, and macOS. Windows also supports network shares via UNC paths (for example, \\Server\Share).

— **WebDAV:** Storage on WebDAV servers via HTTP or HTTPS. You need the server URL as well as username and password.

— **SFTP:** Secure file transfer via SSH. This method is used for transferring files to other devices. Transfer to remote servers is recommended.

— **FTP:** Classic File Transfer Protocol. Note that FTP transmits data unencrypted. For sensitive recordings, you should use SFTP or WebDAV with HTTPS.

— **S3 compatible:** Storage on Amazon S3 or S3-compatible services Examples include MinIO, Wasabi, and DigitalOcean Spaces.

— **Backblaze:** Integration with Backblaze B2 Cloud Storage.

— **OneDrive:** Storage on Microsoft OneDrive via OAuth authentication.

— **Dropbox:** Integration with Dropbox Cloud Storage.

— **Google Drive:** Storage on Google Drive via OAuth authentication.

Indirectly supported storage:

Alternatively, you can configure CloudlessCam to save recordings to a local folder monitored by an external synchronization tool. This allows the use of services such as iCloud Drive, Syncthing, Nextcloud Sync Client, etc.

However, it should be noted that synchronization delays may occur with this method and that transfer monitoring must be carried out via the respective sync tool of the cloud storage provider.

1.1.4 Recommendations for operating the software

For stable and secure operation of CloudlessCam, please note the following:

the following recommendations:

network

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— If possible, use static IP addresses or DHCP reservations for your cameras. *(CloudlessCam should automatically determine the new IP address shortly after a change.)*
— Prefer wired LAN connections over WLAN, especially for high-resolution cameras. *(Additionally, a wired connection protects against Wi-Fi deauthentication attacks or Wi-Fi jammers.)*

performance

— For live view and video wall, use the substreams of your Cameras to reduce the CPU load of your system and the cameras.
— You can use the main stream in full quality for recording.
— Adjust frame rate and quality settings to the available bandwidth. and storage capacity.

memory

— Regularly check the available storage space on your target device. Save.
— Use the retention settings to automatically delete old recordings and free up storage space.
— Configure maximum storage sizes per recording configuration for storage-based storage allocation. *(For example, only 100 GiB for a network folder. When the storage fills up, as many of the oldest files as necessary will be deleted until enough storage is free for new recordings.)*

Security

— Use strong passwords for your cameras and storage destinations.
— If necessary, enable configuration encryption to protect sensitive data. To protect access data.
— Restrict access to the storage destinations to the necessary uses. user.

Continuous operation

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— For 24/7 operation, it is recommended to use the CLI daemon in combination with the Pacemaker, which monitors the recording processes and restarts them if necessary.

1.2 Installation

The application was developed as a cross-platform solution and is available for Windows, Linux, and macOS. With a few exceptions, the functionality is largely identical across all platforms, although there are some platform-specific differences during installation.

1.2.1 Preparation and first start

Before installing and launching CloudlessCam, you should check the following prerequisites:

— **Network:** Make sure that the cameras and the computer on which CloudlessCam is running, located on the same network, or reachable via appropriate firewall rules.

After the initial launch, an introductory dialog will appear where you can set the language and appearance of the application. For detailed instructions on setting up your first camera and recording configuration, please refer to the Quick Start section.

1.2.2 CloudlessCam release packages

The following release packages are available for download on the official website:

Windows packages

— **Installer (Admin):** CloudlessCam-Setup.exe (64-bit) installs the application for all users by default in C:\Program Files\CloudlessCam. This version requires administrator rights.

— **Installer (User):** CloudlessCam-User-Setup.exe (64-bit) installs the application in the user profile without administrator rights.

— **No installation required / Portable:** CloudlessCam-win-x64.zip can be extracted and di- be carried out correctly.

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Linux packages

— CloudlessCam-linux-x64.zip for Intel and AMD processors (64-bit).
— CloudlessCam-linux-arm64.zip for ARM processors (64-bit), for example Raspberry Pi 4 or newer.

macOS packages

— **App bundle:** CloudlessCam-osx-x64-app.tar.zip contains the application as a macOS version. App bundle.
— **Portable:** CloudlessCam-osx-x64.zip contains the application as a directory.

1.2.3 Windows

Installation under Windows can be done via the installer or as
A portable version will be available.

Installation program

To install using the installer, proceed as follows:

1. Download the desired installer from CloudlessCam-
   Download the website.
2. Start the downloaded file.
3. Follow the instructions of the installation wizard.
4. After the installation is complete, you can access CloudlessCam via the Start menu.
   Start menu.

The installer creates shortcuts in the Start menu for Cloudless Cam and the Cloudless Cam Player. If a Windows Firewall message appears on first launch, allow network access for private networks.
to enable camera recognition.

ZIP file

For portable installation, extract the ZIP file to a directory of your
Select and start the application via CloudlessCamGUI.exe.

1.2.4 Linux

CloudlessCam is provided for Linux as a ZIP archive.

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installation

To install under Linux, proceed as follows:

1. Download the ZIP file for your processor architecture.
2. Unzip the ZIP file: unzip CloudlessCam-linux-x64.zip 3. Unzip the included TAR file: tar -xf CloudlessCam-linux-x64.tar 4. Make the application executable: chmod +x CloudlessCamGUI 5. Start the application: ./ CloudlessCamGUI

If dependencies are missing at startup, CloudlessCam will display a corresponding message. In this case, install the missing packages using your distribution's package manager.

Raspberry Pi

CloudlessCam can be run on a Raspberry Pi 4 or newer with a 64-bit operating system. Please note the following guidelines for operation on a Raspberry Pi:

— Limit the number of simultaneous streams to reduce CPU load reduce.
— Save recordings to external storage (such as NAS via SFTP) instead of the SD card to minimize wear and tear.
— For background operation, use the CLI daemon with Pacemaker.

1.2.5 macOS

CloudlessCam is provided for macOS as an app bundle and as a portable version.

App bundle

To install as an app bundle, proceed as follows:

1. Unzip the downloaded file CloudlessCam-osx-x64-app.tar.zip.
2. Move CloudlessCam.app to the /Applications folder.
3. On first launch, right-click on the application and select "Open" from the context menu.
4. Confirm the security prompt with "Open".

Moving the application to the /Applications folder before the first launch is important to avoid problems with the macOS security feature App Translocation.

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ZIP file

Alternatively, you can extract the ZIP file and launch the application directly from the extracted directory. In this case, you may need to remove the quarantine attributes if macOS blocks execution.

Remove the quarantine attribute.

If macOS is blocking CloudlessCam from running, you can remove the quarantine attribute via Terminal. To do this, open Terminal and run the following command:

Execute the following commands:

```
# Change to the Applications directory cd /
Applications

# Remove app from quarantine xattr -dr
com.apple.quarantine "CloudlessCam.app"
```

If you have placed the application in a different directory, adjust the path accordingly. After removing the quarantine attribute, you can start the application as usual.

1.3 Licensing

CloudlessCam can also be used without a purchased license. In this case, the free license is automatically activated, providing exactly one recording slot. One recording slot allows one camera or stream to be active for recording at a time. Multiple recording configurations from the same camera or stream can run simultaneously and share the same license slot. If multiple cameras or streams are to record simultaneously and not enough slots are available, the additional camera or stream recordings cannot be started. Existing recordings and the configuration remain unaffected.

Purchased licenses increase the number of available recording slots. The free slot remains available and is added to the licensed slots.

This means that a license for three cameras allows, for example, a total of four simultaneously usable local recording slots.

1.3.1 Online Activation

Activation takes place via the program page "Software License". There you enter the license key and start the online activation. For this process

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An internet connection is required.

Upon successful activation, a license confirmation is saved locally. This contains, among other things, the license key, the expiration date, and a device-specific identifier. CloudlessCam uses this local confirmation for license verification on subsequent launches, so the software does not need to be permanently connected to the license server after successful activation.

The software license page also shows:

— saved licenses with expiry date and number of slots, — the free license, — current license usage by license, computer and active camera or Streaming usage,
— Cameras or streams that cannot be used due to a lack of free slots are active.

If no valid purchased license is active, the window title will be supplemented with FREE .

Expired licenses remain visible in the list but no longer provide additional slots. In this case, CloudlessCam reverts to the free version.

License returned.

1.3.2 Offline Activation

For systems without direct internet access, CloudlessCam supports offline activation. The process consists of three steps:

1. On the offline system, a request file with the extension .prelicensed is created. created.
2. On a computer with internet access, an activation file with the extension .fulllicensed is created from this together with the license key.
3. The activation file is imported back onto the offline system.

After import, a local license confirmation is also available on the offline system. The system is then fully licensed without an internet connection.

1.3.3 License usage and data protection

CloudlessCam can display current license usage, making it easy to track which computers, cameras, and streams are occupying slots. For this purpose, a computer name is transmitted to the license server. You can define this name yourself on the software license page.

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Optionally, you can disable the sharing of readable device names. In this case, only device identifiers will be sent to the license server. Camera streams, recording files, and the content of your recordings will not be uploaded for licensing.

1.3.4 CLI support

License management is also available via the command line. Important commands include:

— license status for a summary of the license status, — license list for saved licenses,
— license activate for online activation, for current slot
usage, — license usage

— license offline request, license offline generation and license offline import for
Offline activation.

Further details can be found in the description of the software license page (see section 3.2.8) and in the CLI command reference (see section 4.7).

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2 Quick Start

This section will guide you through the first steps with CloudlessCam. In just a few moments...
You can set up your first camera and start recording in minutes.
no.

2.1 Prerequisites

Before you begin, make sure that the following prerequisites are met:

— Your camera is accessible on the same network as your computer.
— You know the login details (username and password) for your camera.
— ONVIF or RTSP is enabled on your camera (if available).

2.2 First Start

2.2.1 Step 1: Initial Setup

Start CloudlessCam and, if necessary, adjust the basic settings, such as language and brightness/darkness settings, in the program bar at the top. The program will greet you with a welcome message and brief explanation upon first launch.

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2.2.2 Step 2: Add camera

CloudlessCam offers three ways to add a camera:

Automatic detection (recommended)

1. Navigate to the "Cameras" page in the sidebar.
2. Click on “Add device”.
3. The automatic search starts and displays the ONVIF and RTSP devices found.
   to.
4. Select your camera from the list.
5. Enter your username and password and click on "With device".
   connect".
6. After a successful connection, the available streams will be displayed.
7. Select the desired stream and confirm with "Add-
   gene".

RTSP find

If the automatic search finds an RTSP device that does not support ONVIF
has:

1. The RTSP URL is displayed pre-filled with IP address and port.
2. If necessary, add the stream path (for example, /stream1 or
   /ch=1&subtype=0).
3. Enter username and password if required.
4. Confirm with “Add”.

Add manually

For cameras that are not automatically detected:

1. In the “Add Device” dialog, click “Add Manually”.
2. Enter the full stream URL (for example, rtsp://192.168.1.100:554/stream1).
3. Supported protocols are: RTSP, HTTP, HTTPS, HLS, RTP, SRT and DASH.
4. If necessary, enter your username and password separately.
   are not included in the URL.
5. Confirm with “Add”.

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2.2.3 Step 3: Test the connection

After adding a camera, you can test the connection:

— Click on “Update preview” to see a current preview image.
load.

— Use the live view to check the quality of the stream.

It should be noted that the “main stream” usually offers the highest quality, while the “substream” requires less bandwidth and computing power.

2.2.4 Step 4: Create recording configuration

Now you can create a recording configuration that defines what is recorded and how:

1. Click on “Add recording configuration”.
2. Select the recording type:
   — **Video:** Records video and optionally audio. The recording is divided into segments (default: 5 minutes).
   — **Audio:** Only records the audio channel.
   — **Image:** Creates individual images at regular intervals (default: every 60 seconds).
3. Configure the desired settings:
   — **Segment length:** Duration of a video segment (standard: 300 seconds) the).
   — **Video quality:** Choose between “Very high”, “High”, “Medium”, “Low” or “Very low”.
   — **Record audio:** Enable or disable audio recording.
   — **Schedule:** Optionally, you can specify which days and at at what times recording should take place.
   — **Retention period:** Determine how long recordings will be stored- They should be secured.
   — **Maximum storage space:** Limit the storage space used- place.
4. Assign at least one storage location to the configuration.
5. Activate the configuration and confirm with "Save".

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2.2.5 Step 5: Setting up the storage location

By clicking on “Add storage destination”, you can now set a storage location for your recording configuration where the recordings should be saved. Depending on the storage location type, you can configure your storage destination as follows:

Local storage

1. Navigate to “Settings” and then to “Storage locations”.
2. Click on “Add location”.
3. Select “Local File System” as the storage type.
4. Enter the desired directory path (for example, C:\CloudlessCam\) Recordings or /home/user/CloudlessCam).
5. Confirm with “Save”.

Network storage (SFTP, FTP, WebDAV)

1. Select the appropriate storage type (SFTP, FTP or WebDAV).
2. Enter the server address (host).
3. Enter your username and password.
4. Specify the remote path where the recordings will be saved. should.
5. Click on “Test connection” to check availability.
6. Confirm with “Save”.

Cloud storage

CloudlessCam supports the following cloud services:

— Google Drive
— OneDrive
— Dropbox
— S3-compatible storage (for example, AWS S3, MinIO)
— Backblaze B2
— ...

Cloud services typically require OAuth authentication. Follow the instructions in the dialog box to establish the connection.

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2.2.6 Step 6: Check recordings

Once recording is active, you can check the recordings as follows:

1. Navigate to the "Photos" page in the sidebar.
2. Select the desired date from the calendar.
3. The existing recordings are displayed in a timeline.
4. Click on a recording to play it.

Please note that new recordings are first cached locally and then transferred to the target storage according to the configured interval.

2.3 Background operation (admins and power users)

This section describes how to run CloudlessCam in the background without the need for the graphical user interface to be permanently open.
This is particularly useful for servers, NAS systems or mini-PCs.

2.3.1 Procedure

1. First, create the complete configuration (cameras, recording configurations, storage locations) via the GUI.
2. Enable the background service in the program settings. (For technical information about the background service, see section 4.5)

2.4 CloudlessCam Player (view recordings)

The CloudlessCam Player is an additional application for playing back recordings. It is suitable for both end users and administrators who want to review or archive recordings without having to use the more comprehensive main application.

Below is a brief step-by-step explanation of how to set up the CloudlessCam Player application:

2.4.1 Step 1: Start the player

Start the CloudlessCam Player.

2.4.2 Step 2: Configure storage locations

You have two options for setting up storage locations in the player:

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Import from CloudlessCam

1. Click on “Import configuration”.
2. Select the CloudlessCam configuration file (.config).
3. If required, enter the password if the configuration is encrypted.
   is.
4. The storage locations are imported automatically.

Manually adding
locations: You can also add storage locations manually, similar to the configuration in CloudlessCam (see step 4 in the "User Interface" section).

2.4.3 Step 3: Loading recordings

1. Click on “Synchronize” to load the available recordings.
2. Depending on the storage location and number of recordings, this process may take some time.
   Take time.

2.4.4 Step 4: Playback of recordings

1. Select the desired date from the date filter.
2. The recordings found for that date will subsequently be listed in the daily...
   Timeline displayed

2.5 If something doesn't work

Here is a short checklist for common problems:

2.5.1 The automatic search finds no cameras

— Is ONVIF and/or RTSP enabled on the camera?
— Are the camera and computer on the same network?
Is a firewall or VLAN configuration blocking communication?
— When attempting to connect: Are the login details correct?

2.5.2 No picture or choppy playback

— Try testing the substream instead of the main stream.
— Reduce the resolution or frame rate (FPS) in the camera settings.
gene.

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— Check if the codec being used is supported.
— Reduce the number of cameras displayed simultaneously in the video-
owand.

2.5.3 No recordings will be made.

— Is the recording configuration enabled?
— Is at least one configuration storage location assigned and enabled?
— Check the interval for file transfer to the destination storage.

2.5.4 Problems with updates or license

— Check the update page for the latest information. — Check
your license status and available slots.
— Make sure that the date and time on your system are set correctly.
are.

2.5.5 Diagnostics and Support

If you need further assistance:

1. Create a support ZIP file (containing log files and system information) via the support window.
2. Note the relevant time periods in which the problem occurred.
is.
3. Send us a support email with a detailed problem description.
exercise and what you have already tried to correct.

For further information on configuration and troubleshooting, please refer to the following chapters of this documentation.

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3

User interface (GUI)

3.1 Program window

3.1.1 Title bar

The title bar is located at the top of the program window and contains both controls for the application's appearance and the standard window controls.

If no valid license is active, CloudlessCam adds the following to the window title: FREE. This indicates that no valid purchased license is on file.

Title bar elements

Language selection: This button allows you to change the application's display language. Clicking it opens a dialog box for language selection (see Section 3.3.1). After selecting a new language, the user interface is displayed in the selected language.

Theme switching: This button allows you to switch between different display modes:

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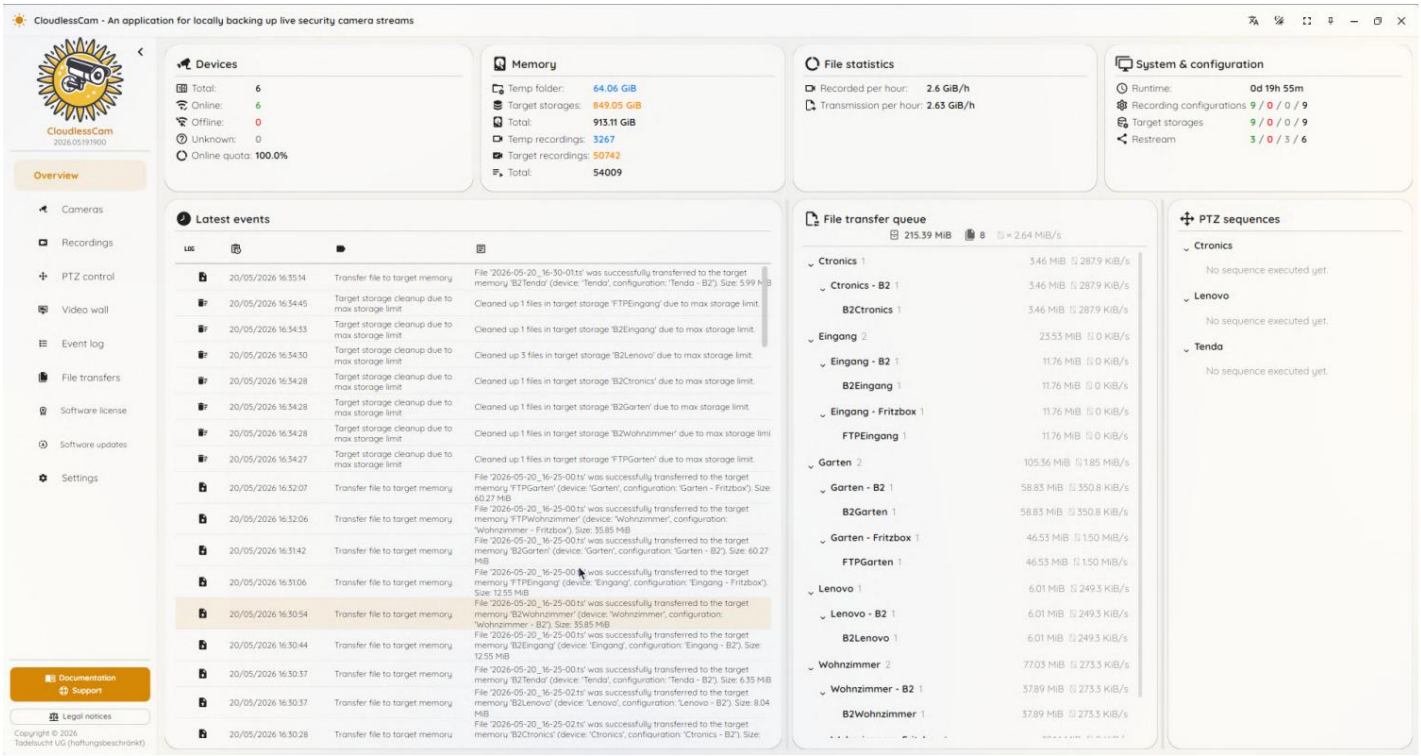
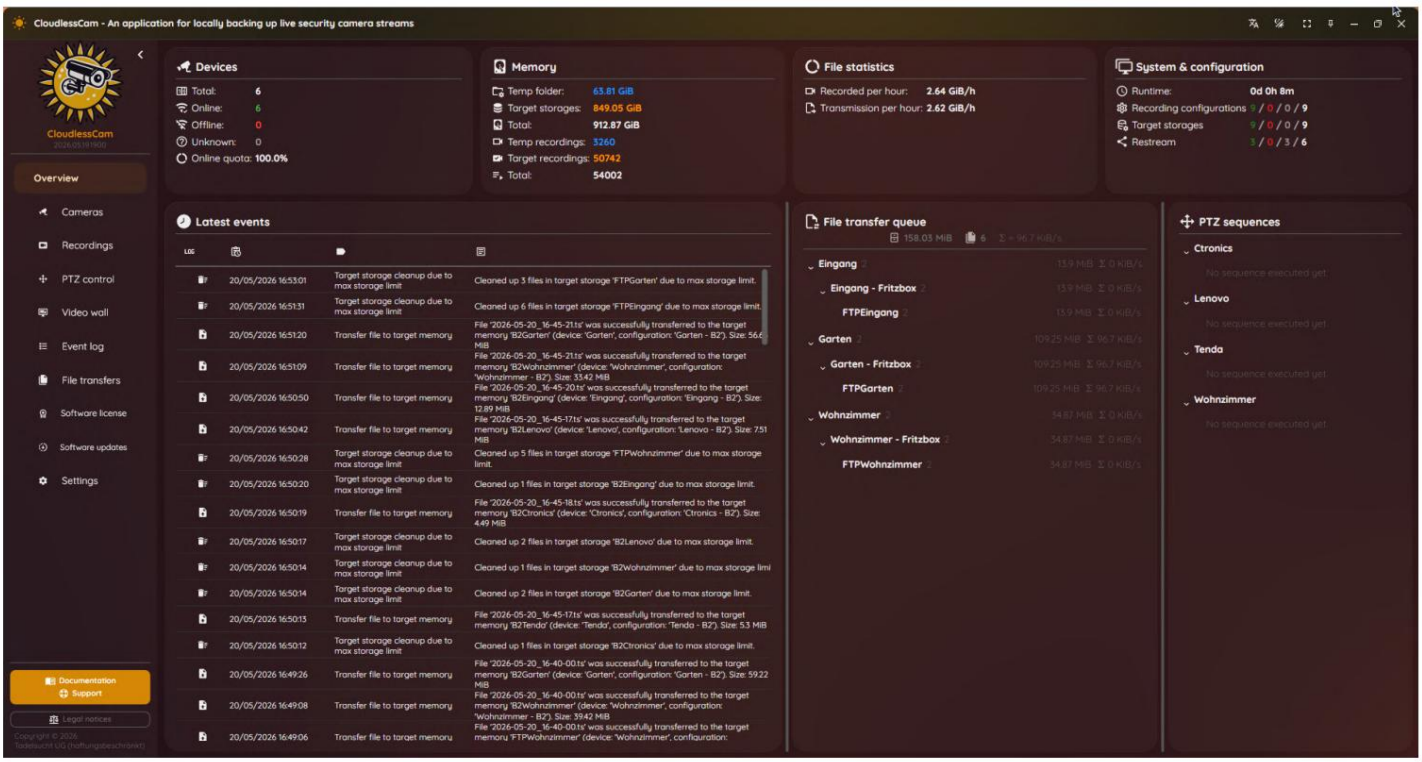
— **Light:** Light background with dark text



— **Dark:** Dark background with light text



Window controls: The window controls are located on the right side of the title bar:

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— **Full screen:** Switches to full-screen mode. In full-screen mode, the contents disappear.
The title bar. Move your mouse to the top of the screen to show the title bar again. Click the full-screen button again.
to exit full-screen mode

— **Always in the foreground:** Keeps the window above all other windows

— **Minimize:** Minimizes the window to the taskbar

— **Maximize / Restore:** Switches between maximized and normalized values
painter window size

— **Close:** Closes the application

Behavior when minimizing

If the "Always in taskbar" setting is disabled in the program settings, CloudlessCam will disappear from the taskbar when minimized.

In this case, you can restore the application via the tray icon in the notification area of the taskbar. Double-clicking the tray icon will reopen the main window.

Platform-specific differences

On Linux and macOS, the title bar may look or behave differently depending on the desktop environment or system configuration. However, the basic functionality remains the same on all platforms.

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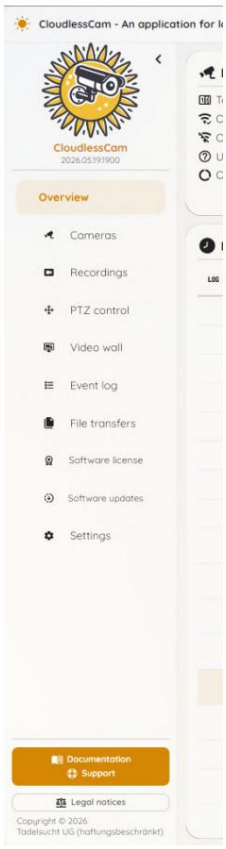
3.1.2 Menu bar



The menu bar, also called the side menu, is located on the left edge of the program window and is used for navigation between the different program menus.
pages.

Head area

The currently installed program version number can be found at the top of the menu bar.

Page navigation

Below the header are the navigation buttons to the various program pages:

— **Overview:** Dashboard with system statistics and current events
— **Cameras:** Managing devices, recording configurations, and destination storage
— **Recordings:** Playback of saved recordings with timeline
— **PTZ control:** Control of pan and tilt cameras
— **Video wall:** Simultaneous display of multiple live camera images

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— **Event log:** Full list of all system events
— **File transfers:** Monitoring of ongoing file transfers to the destination
Save
— **Software license:** License management and activation
— **Software updates:** Application update
— **Settings:** Configuration of all program options

foot area

At the bottom of the menu bar are buttons for the document-
station as well as for support and legal information.

3.1.3 Tray icon, notifications, multiple launch options and taskbar Behave

CloudlessCam features a tray icon in the notification area of the taskbar as well as an integrated notification system for important events.

Tray icon

When the application starts, a tray icon is created in the notification area of the taskbar (system tray next to the clock). This icon allows quick access to the application, even if the main window is minimized or hidden.

Available actions:

— **Double-click the icon:** Displays the program window and brings it to the foreground
— **Right-click on the icon:** Opens a context menu with the following options:
tions:
– **Show window:** Opens the main window
– **End program:** Closes CloudlessCam completely

Starting behavior

The behavior at program startup depends on the configured settings:

— **Start minimized is enabled and Always in taskbar is enabled:** The Fen-
ster starts minimized and is visible in the taskbar.

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— **Start minimized is enabled and Always in taskbar is disabled:** This
The window starts hidden and is not visible in the taskbar. The application-
In this case, the dung is only accessible via the tray icon.

This configuration is particularly useful for 24/7 operation, where Cloud-lessCam should run in the background without disturbing the user.

minimizing behavior

If the "Always in taskbar" setting is disabled, the window will
When minimized, it is completely removed from the taskbar. In this case,
You can only restore the window via the tray icon.

Notifications

CloudlessCam displays notifications as small pop-up windows (toasts) in the
upper right corner of the program window. These notifications inform you about:

— Successful connection tests to cameras
— Failed connections or recordings
— Completed file transfers
— License activations and warnings
— General status messages

A maximum of three notifications are displayed at the same time. Each notification disappears automatically after a few seconds.

Multiple start

If CloudlessCam is already running and you try to start a second instance, a new instance will not be opened. Instead, the window will open.
The already running instance is brought to the foreground. This prevents conflicts in device communication and file storage.

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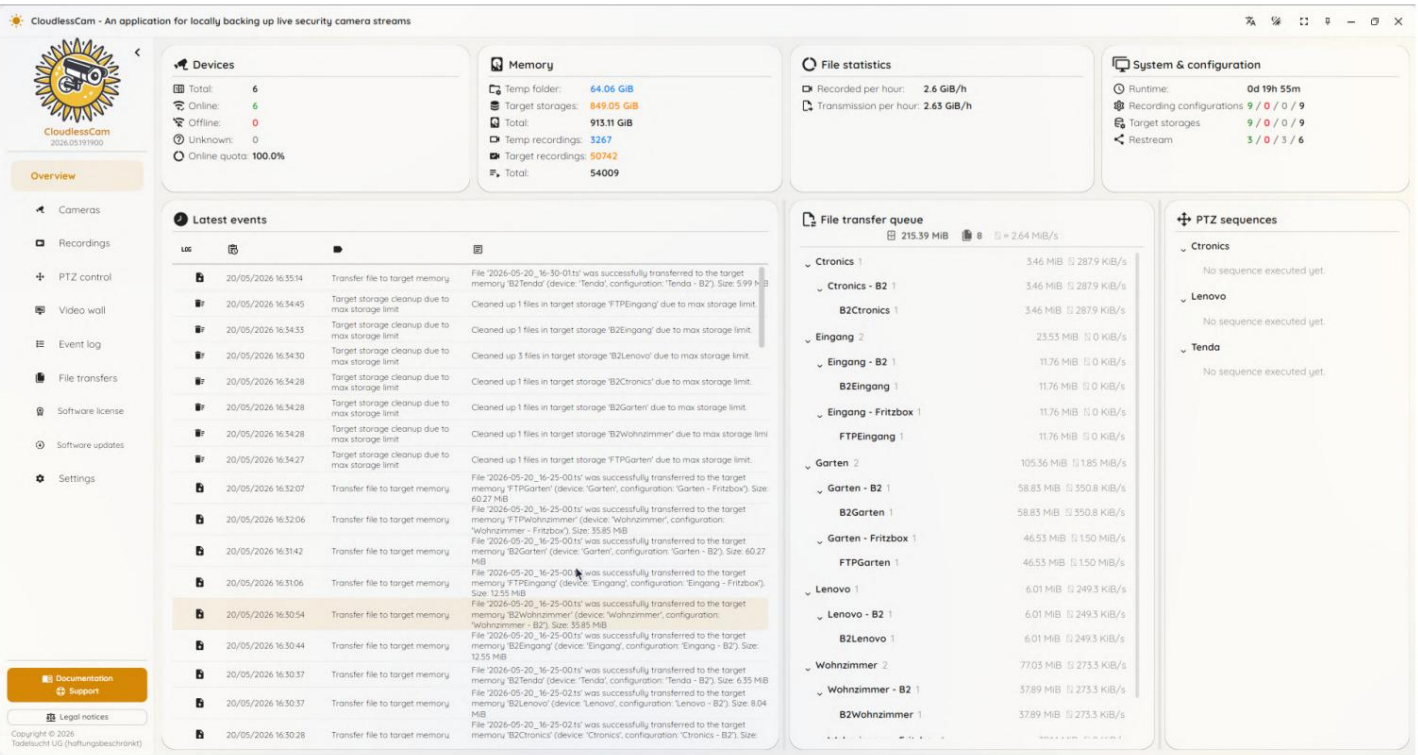
3.2 Program pages

3.2.1 Overview



The overview page serves as a central dashboard and provides a quick overview.
about the current system status. Here you can see the status of all cameras, storage usage and current events at a glance.

Information strips

Context-sensitive help bars can be displayed at the top of the overview page.
appear:

Update notification: A notification will appear when a new program version is available. You can hide the message or proceed directly to the update process.

Autostart Notice: After initial installation, it is recommended to enable automatic program startup. This notice explains the advantages of autostart and offers the "Start minimized" option for uninterrupted background operation.
You can activate autostart directly via the displayed button or permanently hide the notification.

Pacemaker Notice: The Pacemaker is a separate monitoring service that automatically restarts CloudlessCam in the event of an unexpected program crash.

Machine Translated by Google

This service is especially recommended for 24/7 operation. You can enable Pacemaker autostart or hide the notification.

Device statistics

The device statistics card shows the connection status of all configured cameras.
eras:

— **Total:** Total number of configured devices
— **Online:** Number of devices currently reachable (green)
— **Offline:** Number of unreachable devices (red)
— **Unknown:** Devices whose status has not yet been determined (grey)
— **Online share:** Percentage of reachable devices

Storage statistics

The memory statistics map shows the current memory usage:

— **Temporary folder:** Storage space for local caching before the
Transmission (blue)
— **Target Storage:** Used storage space across all configured target storage locations
(orange)
— **Total:** Total storage consumption across all storage locations

File statistics

This map shows information about the recording capacity and transmission speed:

— **Recorded per hour:** Average amount of data recorded per hour
is being recorded
— **Transferred per hour:** Average amount of data transferred to target storage per
hour

These values are calculated based on a 24-hour time window.

System and configuration statistics

This card shows general configuration information:

— **Operating time:** Time since the last program start (Format: days, hours,
(minutes)

Machine Translated by Google

— **Recording configurations:** Number of configured recording profiles
— **Target memory:** Number of different target memories
— **Restream enabled:** Number of devices with Restream enabled

Recent Events

The table on the right shows the latest system events:

— **Type:** Symbol to indicate the event type
— **Date:** Time of the event
— **Name:** Category of the event
— **Text:** Detailed description

The table displays the last 100 entries and is automatically updated with new events. For a complete event view with filter options, use the Event Log page.

File transfers

Current file transfers are summarized on the left side of the lower section:

— Number of pending transfers
— Total size of the files to be transferred
— Current transmission speed

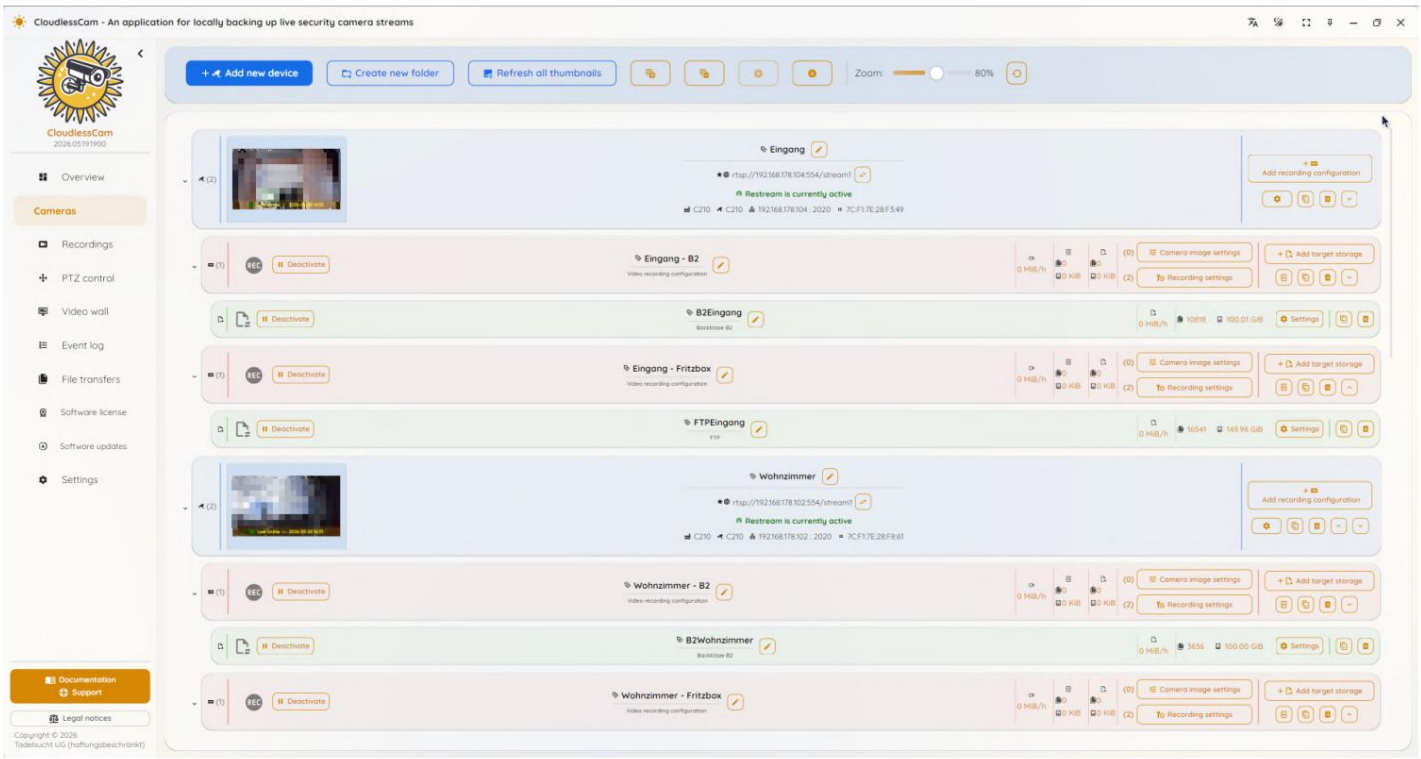
The display is hierarchically grouped by device and target storage.

update

The statistics are updated periodically. Events are also updated in real time.

Machine Translated by Google

3.2.2 Cameras



The Cameras page is the central area for managing all devices, recording configurations, and destination storage. Here you can add new cameras, set recording parameters, and specify where the recordings are saved.
to be saved.

Toolbar

At the top of the page is a toolbar with the following functions:

— **Add device:** Opens the wizard for adding new cameras
eras. In an empty configuration, this button flashes as the entry point.
— **Create folder:** Creates a new folder to organize devices
— **Update all preview images:** Updates the preview images of all camera-
eras simultaneously
— **Expand all:** Expands all entries in the tree view
— **Collapse all:** Collapses all entries in the tree view
— **Enable all recording configurations:** Activates all recordings and
Target storage
— **Disable all recording configurations:** Disables all recordings
and target storage

Machine Translated by Google

— **Zoom control:** Adjusts the display size of the tree view (50% to 100%)

Hierarchical tree view

The tree view shows a four-level hierarchy:

1. Folders (device groups): Folders are used to logically group cameras, for example by location or building. Folders are represented by a folder icon and gold highlighting.

2. Devices (cameras): Individual cameras are identified by a camera icon and Each device displays a preview image and the connection status. tus.

3. Recording configurations: Multiple recording configurations can be created for each device. These are displayed with red or pink highlighting.
A recording symbol flashes when recording is active.

4. Destination Storage: Each recording configuration can have multiple destination storage locations. to which the recordings are transferred. These are displayed with a green highlight.

Drag & Drop

Elements can be moved via drag and drop:

— Folders can be moved into other folders
— Devices can be moved between folders
— Recording configurations can be moved between devices
— Target storage locations can be moved between recording configurations- the

When dragging towards the top or bottom edge, the view scrolls up. tomatic.

Actions for folders

The following actions are available for each folder:

— Change name
— Duplicate (creates a complete copy)
— Delete (only possible if the folder is empty)
— Move up or down

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Actions for devices

The following actions are available for each device:

- **Show live stream:** Displays the current camera stream in a dialog box. Window
- **Update preview image:** Loads a new preview image from the camera
- **Change name:** Changes the device's display name
- **Open device settings:** Opens the network and restream settings
- **Change default stream:** Selects the default stream (if multiple are available)
- **Add recording configuration:** Creates a new recording configuration Utilization for this device
- Duplicate, Delete, Move Up/Down

Deleting a device is only possible if no recording configurations exist.

Actions for recording configurations

The following actions are available for each recording configuration:

- **Enable/Disable:** Turns recording on or off
- **Change name:** Changes the display name
- **Recording settings:** Opens the detailed recording options
- **Camera image settings:** Opens the camera's image adjustments.
- **Add target storage:** Adds a new storage location
- **Open temporary folder:** Opens the local clipboard folder
- Duplicate, Delete, Move Up/Down

When recording is activated, a recording icon flashes. Deletion is only possible if no target storage locations are configured.

Actions for target storage

The following actions are available for each target storage location:

- **Enable/Disable:** Switches file transfer to this storage device. Surely on or off
- **Change name:** Changes the display name
- **Storage settings:** Opens the storage location configuration.

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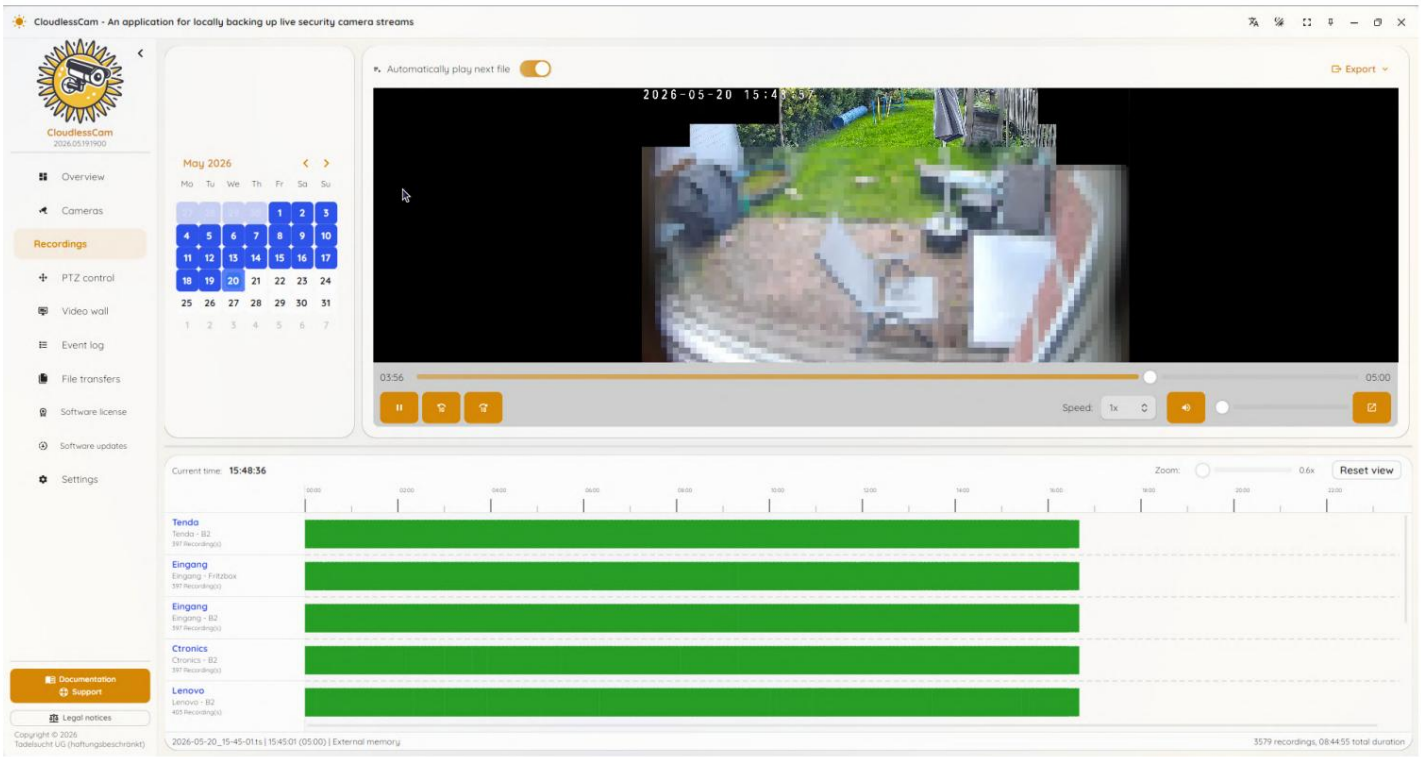
— Duplicate, Delete, Move Up/Down

For each destination storage location, additional statistics are displayed: storage type, number of files transferred, storage space used, and transfer rate.

Preview images

The camera preview images are updated periodically. The update interval can be configured in the settings. You can also manually update individual or all preview images.

3.2.3 Recordings



The Recordings page allows you to play back and export saved video recordings. The page is divided into three main sections: Calendar, Video Player, and Timeline.

calendar

On the left side is a calendar for selecting the desired date.
tums:

— Days with existing photos are highlighted in color.

Machine Translated by Google

— The date range is automatically limited to the period for which
Recordings exist
— After selecting a date, the corresponding recordings will be displayed in the
Timeline loaded

Video player

The video player is located to the right of the calendar:

— **Playback controls:** Play/Pause, position indicator and search bar
— **Automatic continuation:** Playback can be automatically resumed with the next
recording.

Timeline

The timeline is located at the bottom of the page:

— Each camera or recording configuration is displayed as a separate track
shown
— Recordings are displayed as colored segments on the timeline.
— Clicking on a segment will play the corresponding recording in the player
loaded
— Tooltips show details about the selected image

Navigation in the timeline:

— **Zoom:** Enlarging and reducing the visible time range
— **Move:** Navigate left or right through the day

export

The export functions are located in the upper right corner:

Export current recording:

— Exports the recording currently loaded in the player
— The filename is automatically generated from the device name and timestamp.
iert

Export recording area:

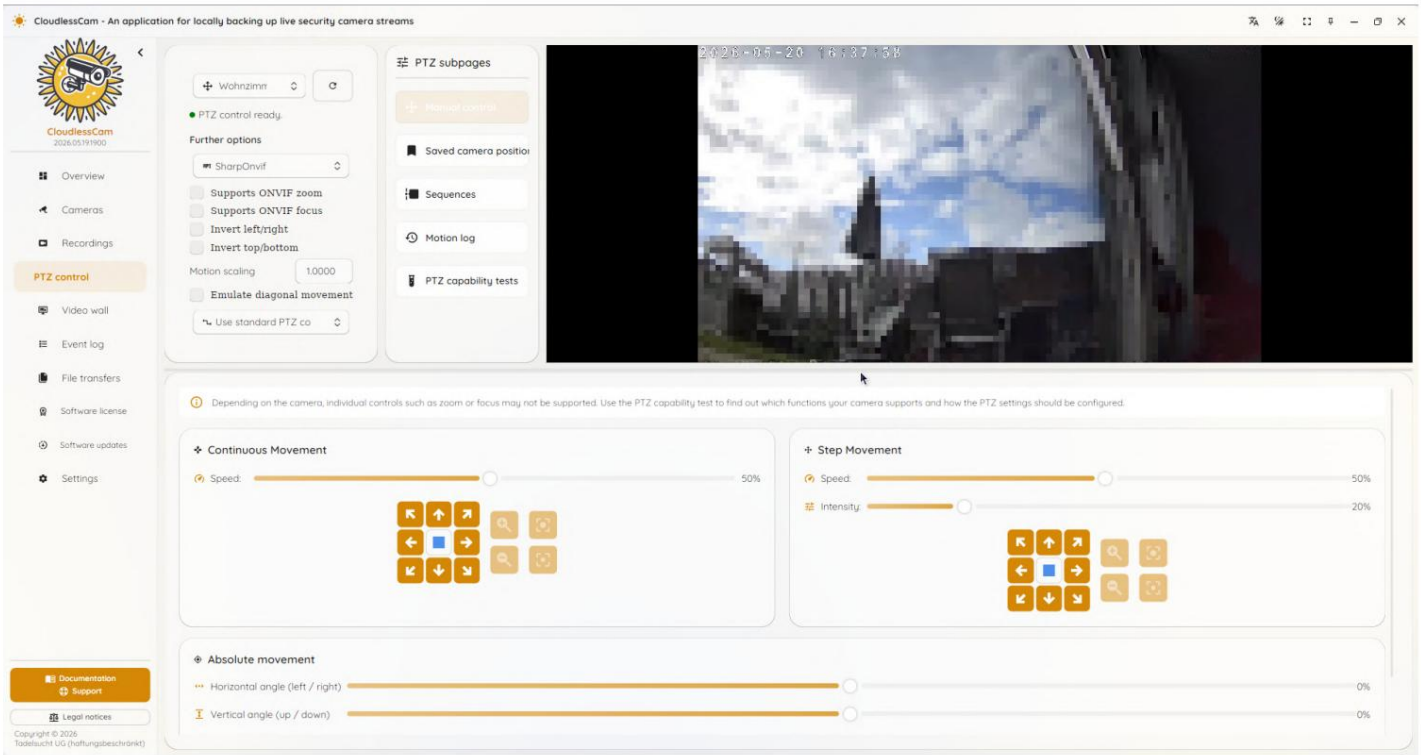
— Enables the export of a contiguous time range
— A dialog box opens to select the start and end time.
— All recordings within the selected time period will be combined into one file.
leads

Machine Translated by Google

Encrypted recordings

When encrypted recordings are played back, they are temporarily decrypted. After playback, the temporary files are automatically deleted.

3.2.4 PTZ control



PTZ control enables remote control of pan-tilt-zoom (PTZ) cameras. This page offers manual control, saved positions, automated movement sequences, and visual PTZ capability tests.

Requirements

In order to use the PTZ control, the following conditions must be met:

— The camera must support PTZ functions.

— ONVIF must be enabled and configured on the camera.

— Valid login details must be on file.

Camera selection

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In the left sidebar you can select the camera to control:

— **Dropdown menu:** Displays all cameras (D-pad: PTZ capability detected; Question mark: PTZ capability is unknown)
— **Update:** Searching again for available PTZ cameras

Status display

The connection status is displayed below the camera selection:

— **Green dot:** PTZ controller is ready and connected
— **Red dot:** No connection or error
— **Status message:** Detailed description of the current status

Further options

Additional PTZ options are available below the status display:

— **PTZ backend:** Selection of the ONVIF program protocol library
— **Horizontal/Vertical Invert:** Reverses the direction of movement for left/right or up/down by
— **Motion scaling:** Scales the pan and tilt coordinates per camera. The default value is 1.0000; values below 1 reduce the movements performed by cameras with a smaller ONVIF coordinate range.
The display always uses four decimal places.
— **Emulate diagonal movement:** Generates diagonal movements across the entire range of motion. Alternating single-axis steps when native PTZ-ONVIF diagonal commands do not work reliably
— **Maximum emulation steps:** Limit for diagonal emulation (only even values from 2 to 32)
— **Optional PTZ command emulation:** Determines how movement commands are processed internally to be carried out

Three modes are available for optional PTZ command emulation:

— **Use standard PTZ commands:** Direct use of native PTZ commands the camera
— **Emulating stepping movements with continuous movements:** Aid-free, if relative movements are not supported
— **Emulating continuous movements with stepping movements:** Helpful when continuous movements are not available

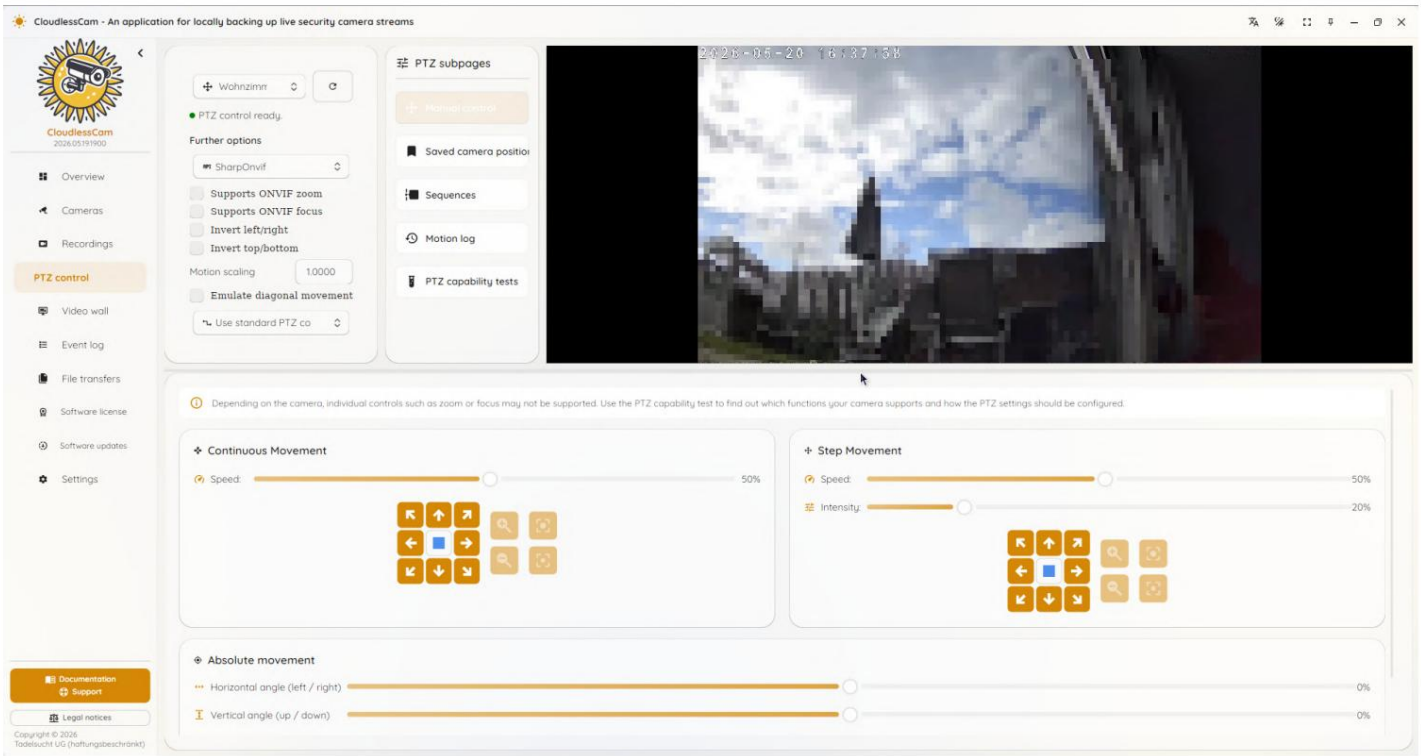
Machine Translated by Google

Live video

A video preview from the selected camera is displayed on the right-hand side.
Click the play button to start the live stream.
Enables visual control during PTZ control.

Subpages

The page offers several subpages, which can be selected via the tabs in the middle:



Manual control:

This area involves continuous, gradual, and absolute movements.
available:

- **Continuous movement:** Directional keys including diagonals, stop-Button, zoom, focus and speed control
- **Stepping movement:** Individual movement steps including diagonals, stop-Button, zoom, focus, speed control and intensity control
- **Absolute movement:** Direct target position via pan, tilt and optional zoom Values with subsequent execution

Which PTZ commands work depends on the camera's PTZ capabilities.
and from the chosen backend.

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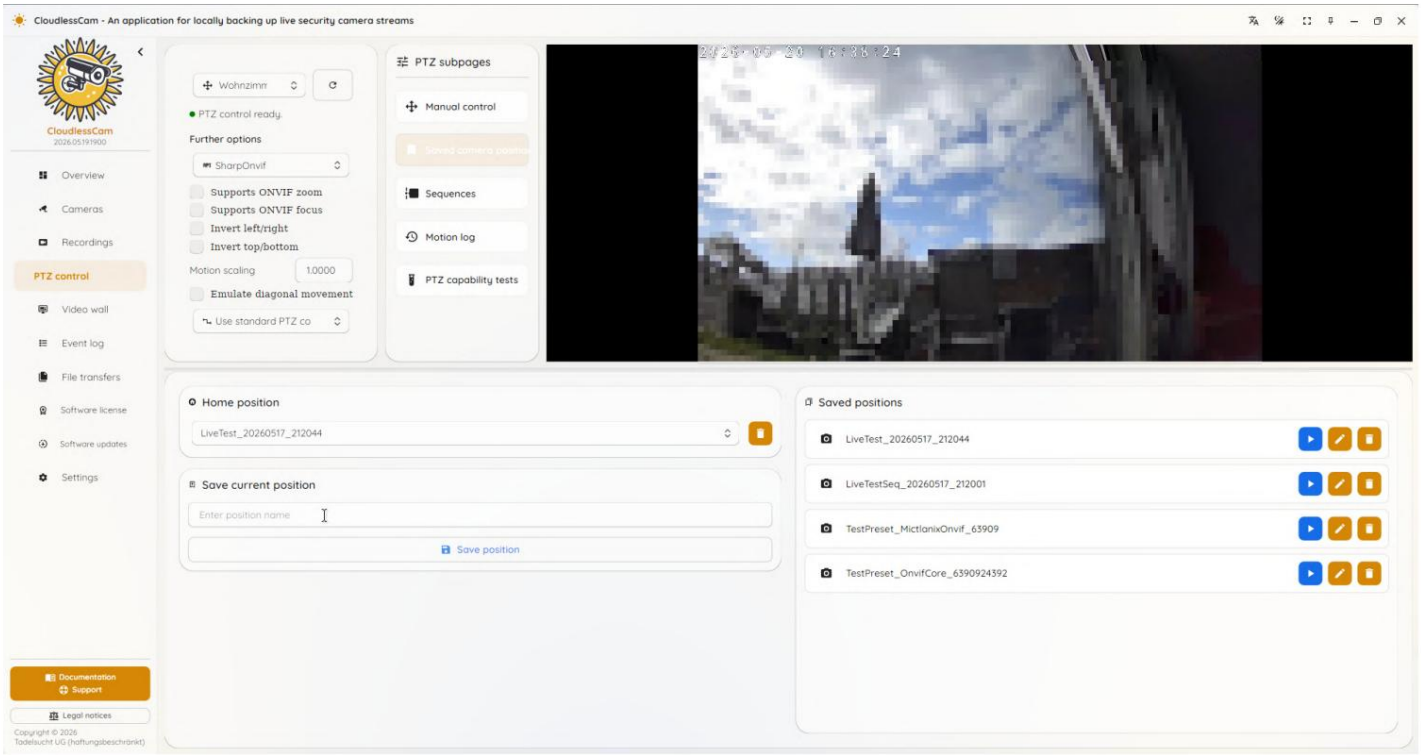

Saved positions:

Here you can save and retrieve camera positions:

— **Save new position:** Enter a name and click on Save

— **Move to position:** Click the play button next to a saved position.

— **Rename position:** Change the name of an existing position

— **Delete position:** Remove positions that are no longer needed.

Each saved position displays, if available, a preview image that was captured during saving.

There is also a privileged home position, which is one of the available stored positions (usually the first one) that serves as the starting position and is accessed in various cases, for example in case of an error.

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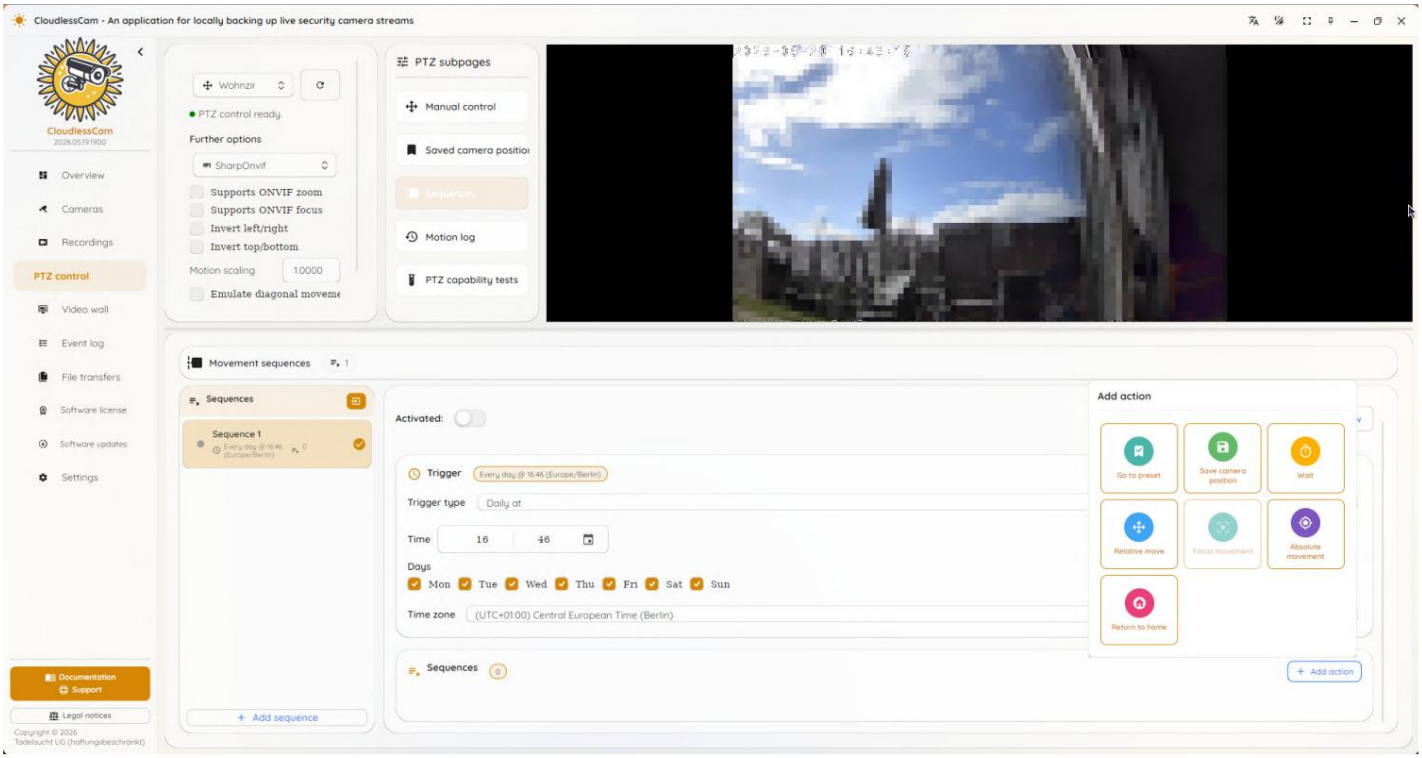


Action sequences:

Automated movement sequences can be created and planned:

— **Add sequence:** Creates a new sequence
— **Enable/Disable:** Turns automatic execution on or off
out of

You can configure a trigger for each sequence:

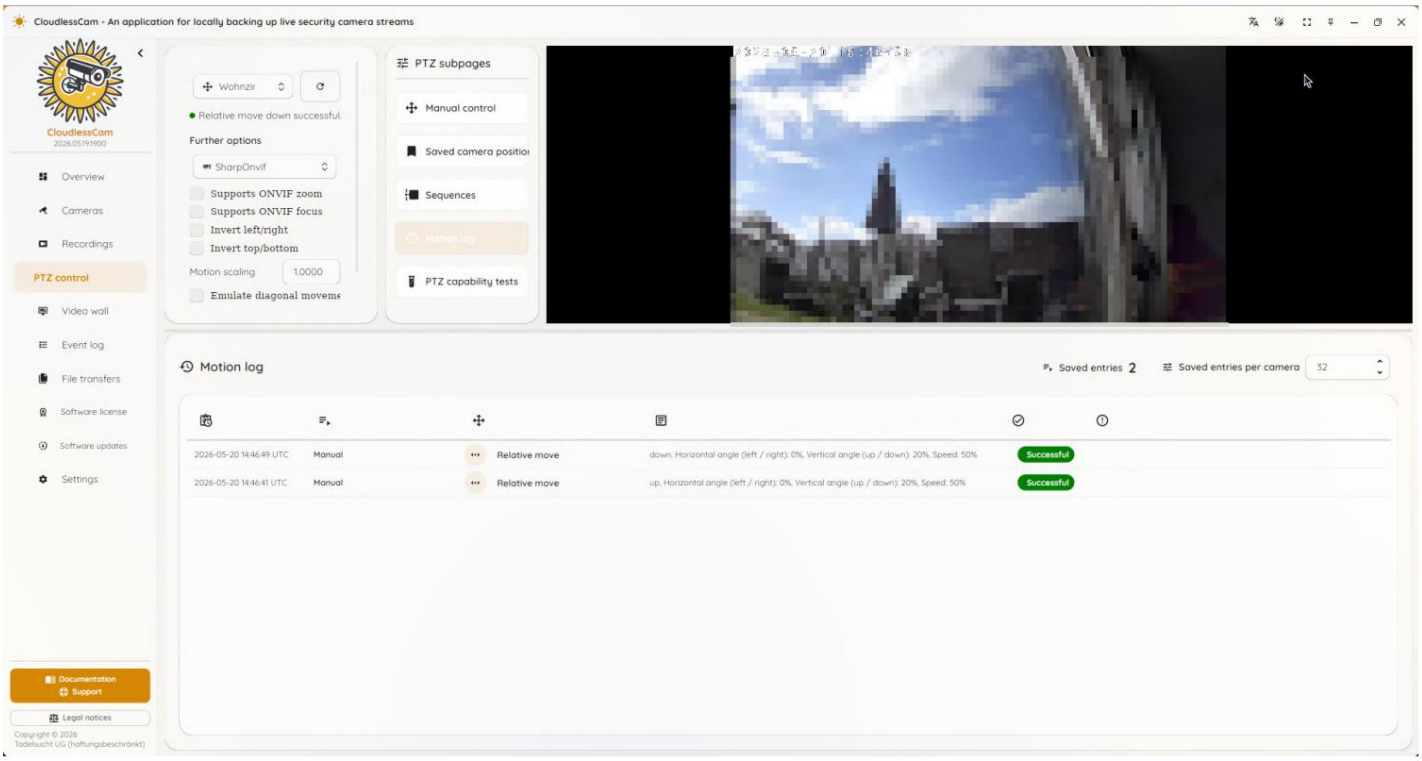
— **Daily at:** Execution at a specific time on selected weeks
days
— **Interval:** Recurring execution at fixed time intervals
— **Loop:** Continuous repetition of the sequence

Each sequence can contain multiple actions:

— **Drive to a saved position:** Drives to a saved position-
position
— **Save current position:** Overwrites a selected saved position
Position with the current camera position
— **Relative movement:** Executes a movement relative to the current position
— **Absolute motion:** Travels to specific coordinates
— **To starting position:** Returns to the starting position
— **Waiting:** Paused for a set period of time
— **Focus:** Adjust camera image focus (camera compatibility required)

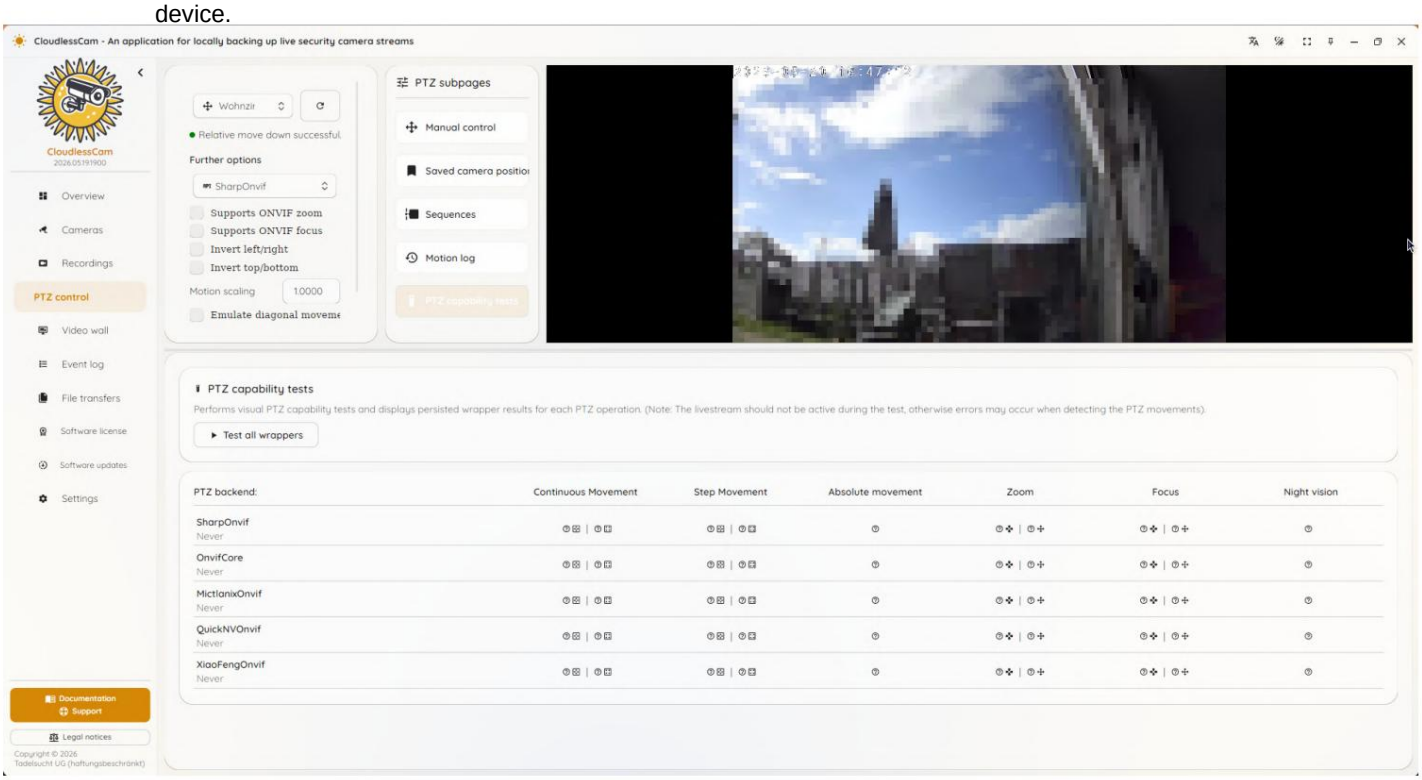
Machine Translated by Google

You can test, duplicate, rename, and change the order of actions in sequences.



Movement Log:

All PTZ actions initiated by CloudlessCam for a device are logged and displayed on this page for that device.



PTZ capability tests:

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This subpage performs visual capability tests for all available PTZ backends and displays the results as a matrix.

— **Test all PTZ backends:** Start the test run one after the other for each backend-
PTZ backend

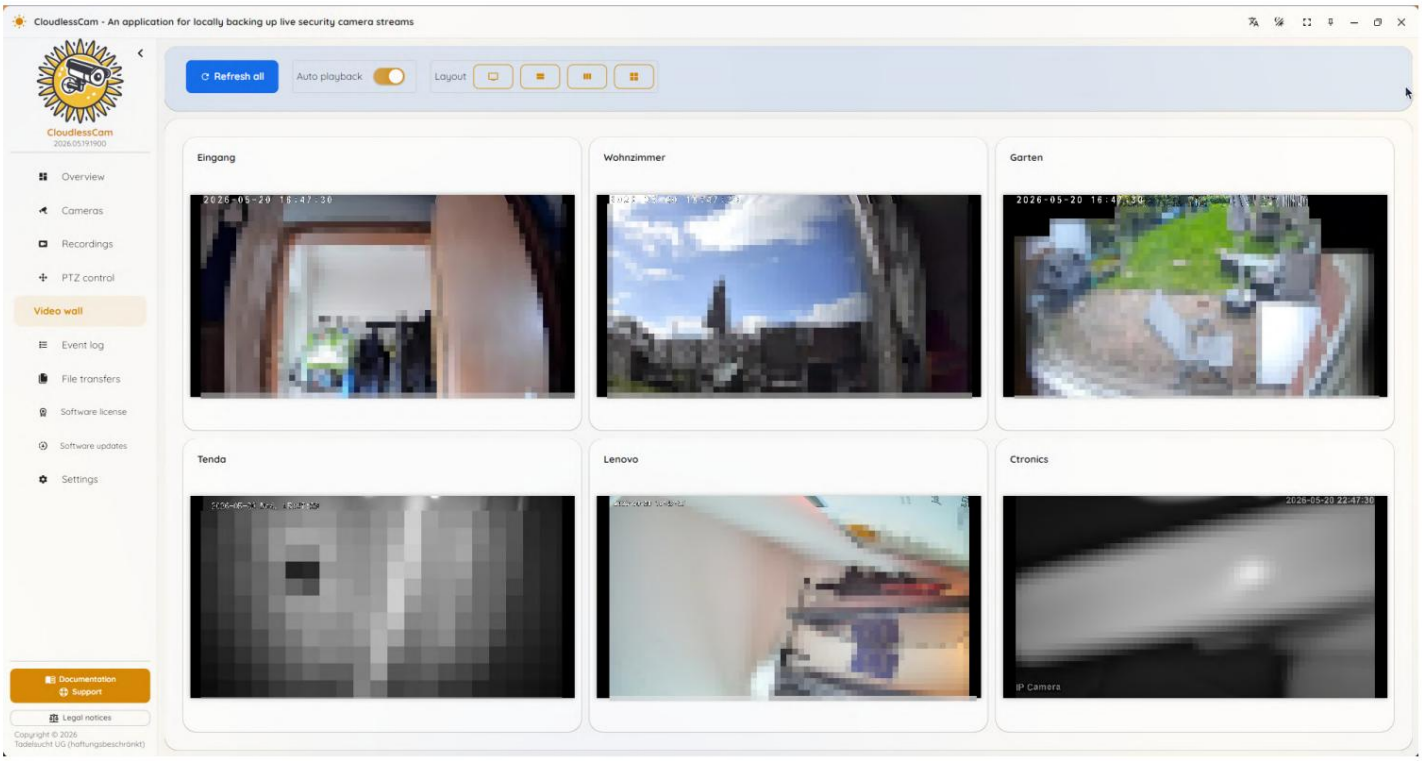
— **Progress indicator:** Shows the current test status and the number of completed tests.
Individual steps and allows for cancellation

— **Matrix per PTZ backend:** Shows the PTZ backend and timestamps for each row
and recognized abilities

— **Column contents:** Continuous movement (cardinal + diagonal), step movement (cardinal +
diagonal), absolute movement, zoom, focus and
Night vision

The results are stored persistently per PTZ backend and displayed again on subsequent calls.

3.2.5 Video wall



The video wall allows the simultaneous display of multiple live camera images in a grid view.

control bar

The controls are located at the top of the page:

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— **Refresh:** Reloads all cameras and restarts the streams.

— **Autoplay:** When enabled, all streams start automatically.
table when opening the page

— **Layout buttons:** Choose between 1, 2, 3 or 4 columns

Layout options

You can adjust the grid layout using the layout buttons:

— **1 column:** Shows a camera in full width (single view)

— **2 columns:** Shows two cameras side by side

— **3 columns:** Shows three cameras side by side

— **4 columns:** Shows four cameras side by side (compact view)

The selected layout setting is saved and restored the next time the page is opened.

Camera tiles

Each camera is displayed in its own tile:

— **Title:** The camera name is displayed above the video

— **Play button:** If autoplay is disabled, you can manually start individual streams.

— **Live video:** The current camera stream is played in the tile.

Automatic playback

If autoplay is enabled, all camera streams will start automatically when the page is opened. If autoplay is disabled, you can start each stream individually using the play button.

Performance notes

Simultaneous playback of multiple video streams requires appropriate system settings.
tem resources.

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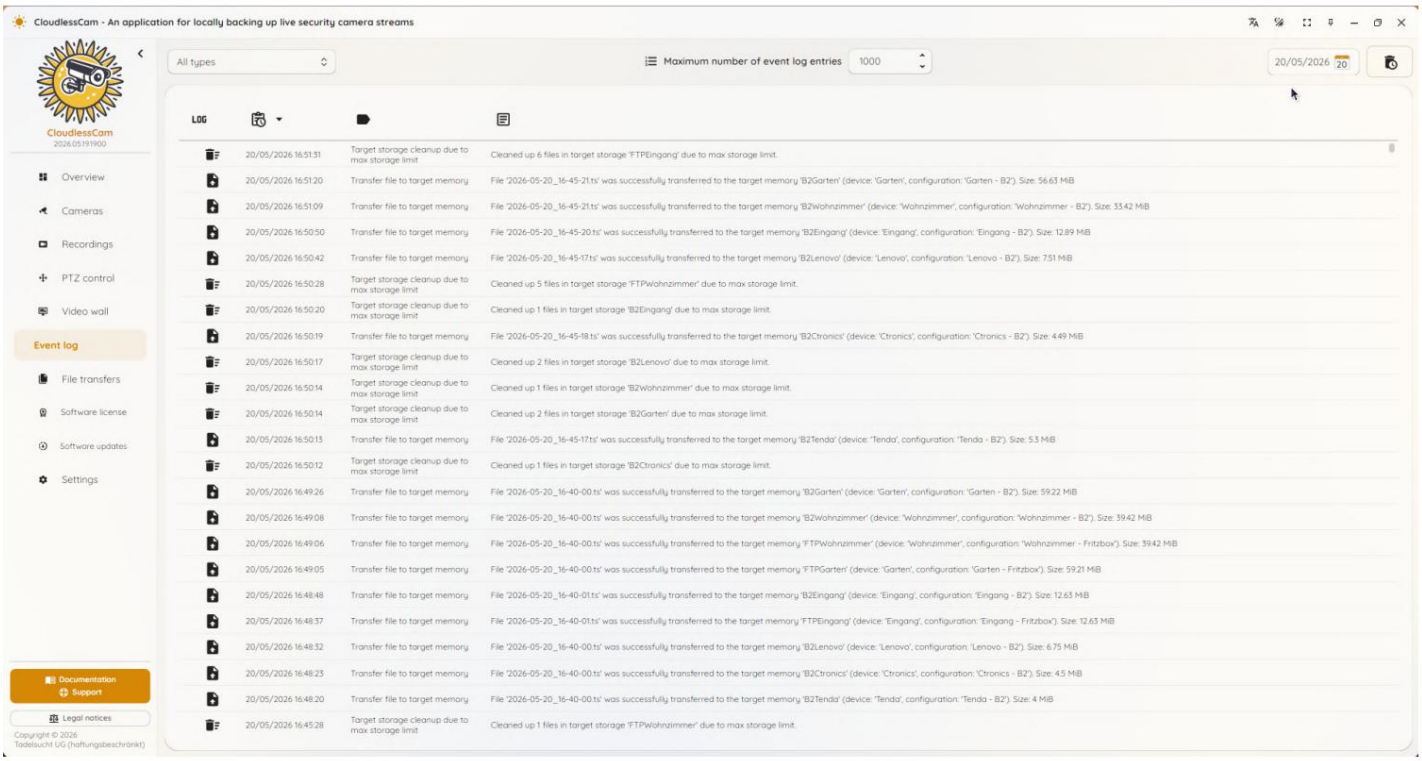
3.2.6 Event Log



The event log shows a complete list of the most important system events.
This page offers advanced filtering and sorting options compared to the compact event view on the overview page.

Table structure

The events are displayed in a table with the following columns:

— **Type:** A symbol to visually indicate the event type
— **Date:** Time of the event (date and time)
— **Event name:** Category or description of the event
— **Event text:** Detailed description of the event

The columns can be adjusted in width and rearranged.

Sorting

By default, events are sorted by date, with the most recent entries first. You can change the sort order by clicking a column header. The following columns support sorting:

- Date

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— Event name
— Event text

Filtering

You can filter the displayed events using the control bar above the table.

Event types

CloudlessCam logs various types of events:

— Recording start and end
— Device detection
— Connection error
— Program start and stop
— Restream status changes
— File transfer events
— License warnings

Each event type is identified by its own symbol.

Clear event log

You can remove older events from the log:

— Use the date picker to select the desired cut-off date.
— All events prior to this date will be deleted.
— Confirmation is required before deletion

Automatic cleanup

You can configure automatic cleanup of the event log via the settings:

— **Deletion interval:** Events are automatically deleted after a specified number of days.
— **Maximum entries:** The log is limited to a specific number of entries.

These settings can be found under Settings in the System section.

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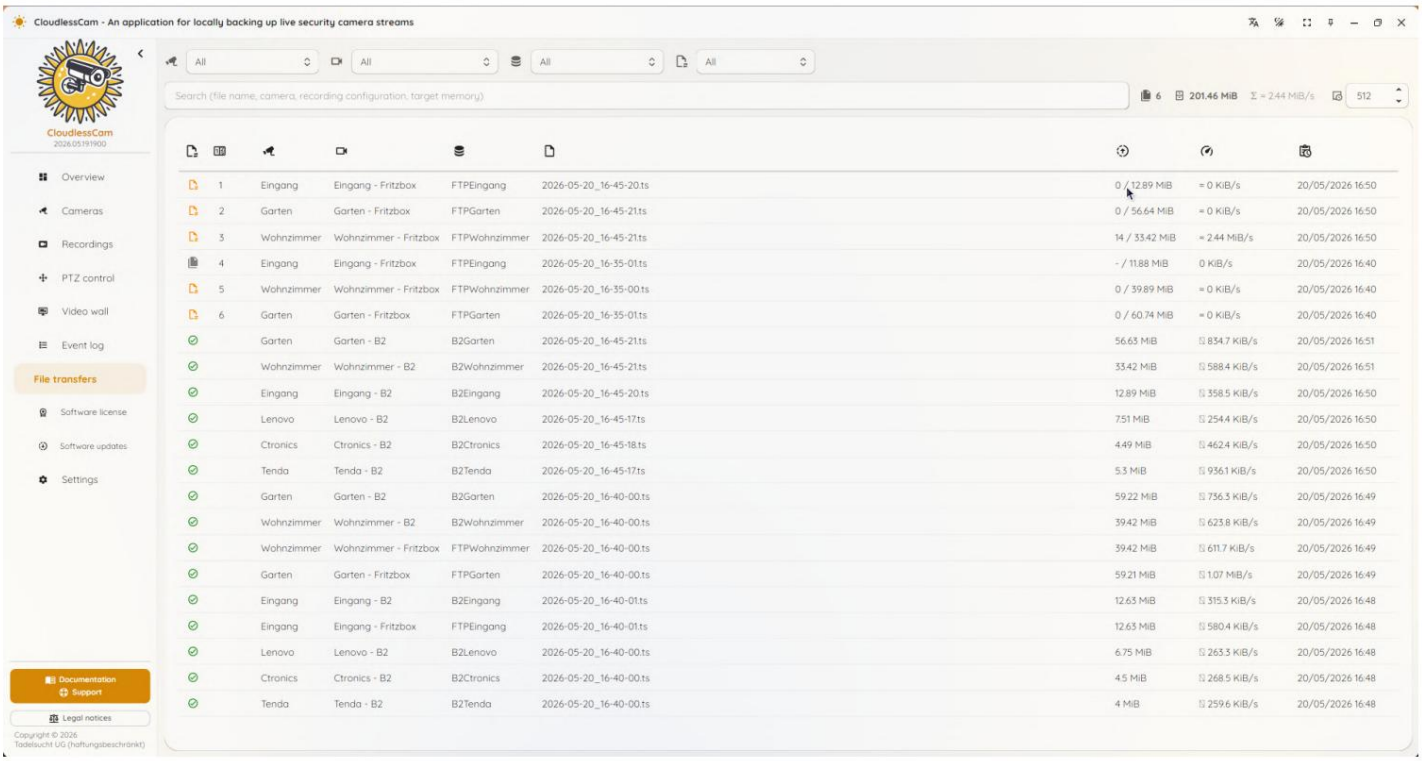
3.2.7 File transfers



The File Transfers page shows the status of all ongoing and recently completed file transfers to the configured target storage locations.

Overview information

Summary statistics are displayed in the upper right corner of the page:

— **Pending transfers:** Number of files in the queue
— **Total size:** Total size of all pending files — **Transfer speed:**
Current total speed of all transfers
carrying

Transfer list

The main view displays all transfer entries in a list:

— **Filename:** Name of the file to be transferred
— **Camera:** Associated camera or recording configuration
— **Destination storage:** Destination of the transfer
— **Status:** Current transfer status (Pending, Transfer in progress, Completed)
— **Progress:** Amount of data transferred and progress indicator
— **Speed:** Current transmission speed

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Filter options

You can refine the view using various filters:

— **Camera:** Shows only transmissions from a specific camera
— **Recording configuration:** Filters by recording configuration
— **Destination Storage:** Shows only transfers to a specific storage location
— **Status:** Filters by Waiting, Transfer in progress, or Completed
— **Search:** Free text search in file names and labels

All filters can be combined. The "All" option resets the respective filter.

Completed transfers

Recently completed transfers are also displayed in the list.
The number of displayed completed entries can be adjusted via a setting.

update

The transfer list is automatically updated every second. Speeds and progress indicators are adjusted in real time.

Typical use cases

This page is useful for:

— Monitoring the transmission progress after a recording phase
— Diagnosis of transfer problems to specific target storage devices —
Verification that all recordings were successfully transferred
— Identification of network bandwidth bottlenecks

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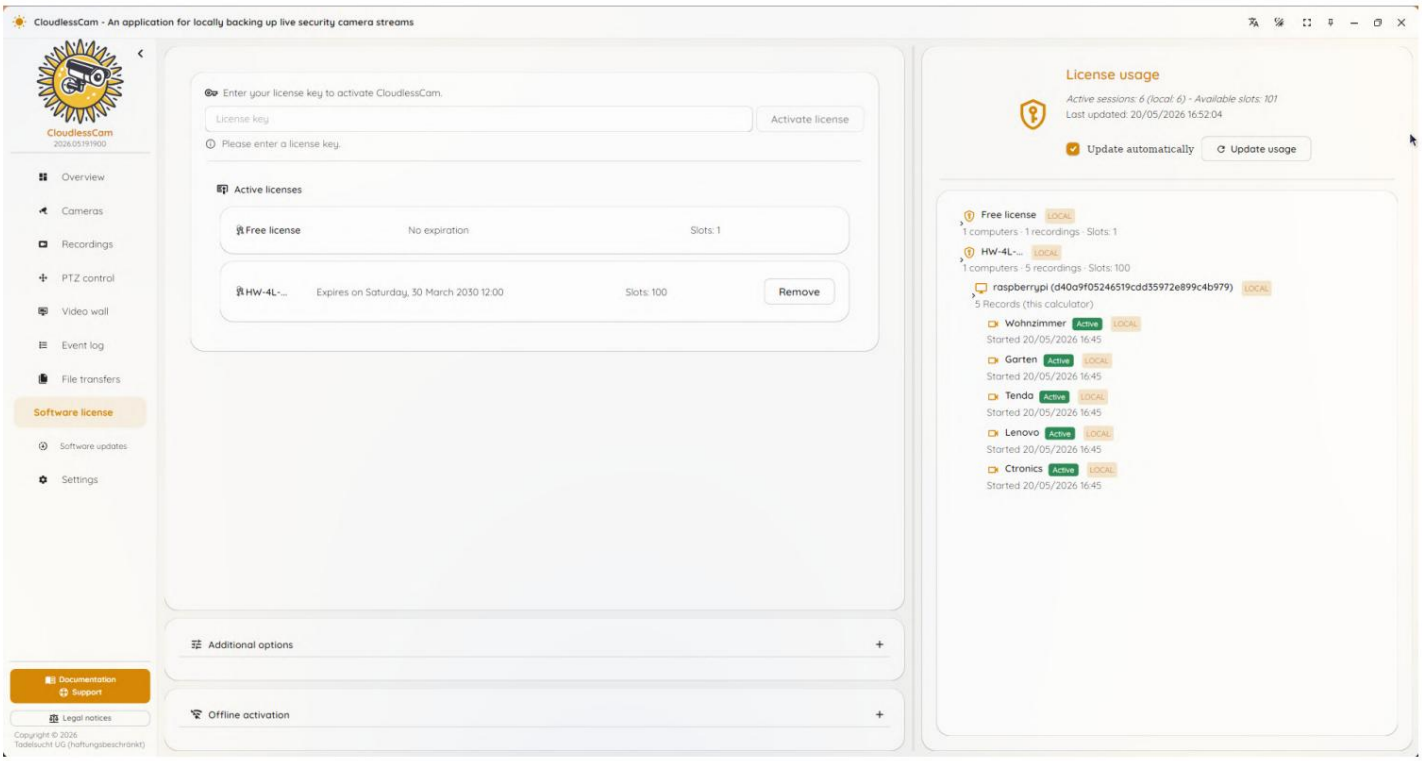
3.2.8 Software License



The software license page is used to activate, view, and monitor CloudlessCam licenses. Here you can see which licenses are stored on the current system, how many recording slots are available, and which cameras or streams are currently occupying a license slot.

Activate license

In the upper left area, you can enter a license key and activate it online:

— **License key:** Input field for the purchased license key
— **Activate license:** Starts online activation via the license server
— **Status indicator:** Directly shows whether the license key format is invalid, whether the key has already been activated, or whether activation is possible.
is

An internet connection is required for online activation. After successful activation, the license is saved and the usage overview is updated.

Active licenses

Machine Translated by Google

Below the activation section are the licenses stored on this system.
displayed:

— **Free license:** CloudlessCam always provides a free license.
A character slot is available. This entry cannot be removed.
— **Purchased licenses:** Activated licenses are displayed with a shortened license
key, expiry date and number of license slots.
— **Expired licenses:** Expired licenses remain visible, but do not provide any functionality.
No more active recording slots.
— **Removal:** Purchased licenses can be removed from the local system.
The free license remains valid.

If no valid purchased license is active, CloudlessCam will continue to use the
Free license. In this state, the window title will also display FREE.
marked.

Additional options

The "Additional Options" section contains settings that affect how
This system appears on the license server:

— **Computer name:** Freely selectable name of the computer that connects to the license server
transmitted and displayed in the license usage.
— **Do not share device names:** When enabled, only device IDs will be shared with the
License server sent. This reduces the amount of readable device information in
the license usage.

The computer name is particularly helpful when a license is used on multiple
installations and you want to differentiate usage by location or device.
want them.

Offline activation

Offline activation is available for systems without an internet connection. The process
consists of three steps:

1. On the offline system, create a request file with the extension .prelicensed er-
place.
2. On a computer with internet access , create an activation file with the
extension .fulllicensed from this request and the license key .
3. Import the activation file back onto the offline system.

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The three buttons "Create request file", "Generate activation file", and "Import activation file" each perform one of these steps. To generate the activation file, the license key must be entered in the upper license key field.

License usage

The right side shows current license usage. This view is structured hierarchically:

- **License:** Top level with license name or abbreviated license-zkey, number of computers, number of slot-required cameras or Stream usage and available slots
- **Computers:** This section displays the computers that have this license. use tulle
- **Recordings:** On the lowest level, the individual slot-dependent Camera or stream recordings displayed

Status indicators show whether a camera or stream is actively using a license slot or is inactive due to a lack of available slots. Entries can also be marked as local or offline.

update

The license usage can be manually refreshed using the "Refresh" button. If "Automatically refresh" is enabled, the view will be updated regularly. Additionally, the page displays the time of the last update and a summary of active sessions and available slots.

License slot behavior

Each simultaneously active camera or stream requires one license slot. Multiple recording configurations from the same camera or stream can run concurrently and share the same slot. The free slot is counted in addition to any purchased licenses.
If not enough slots are available, individual camera or stream recordings cannot be started. The license usage and event log will indicate this.

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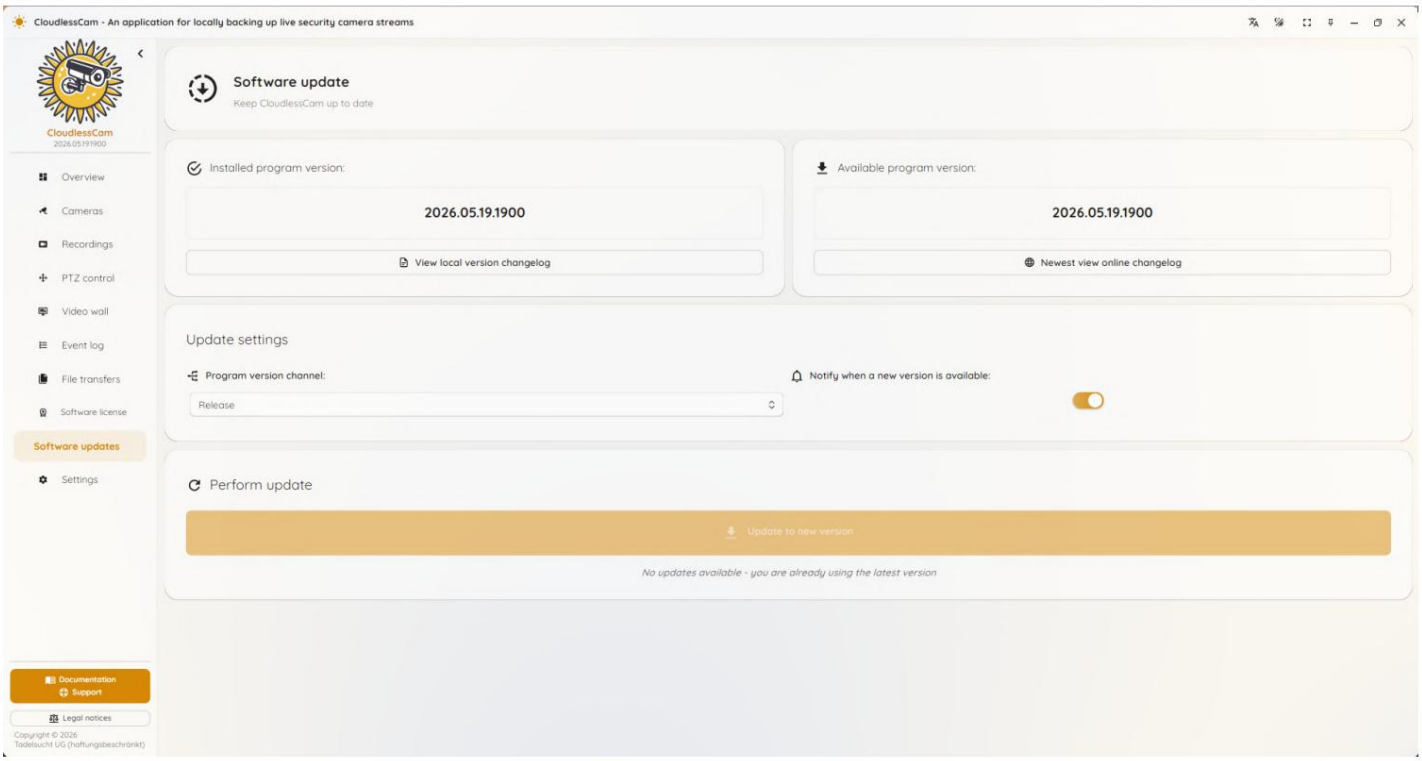
3.2.9 Software Updates



The software updates page allows you to update CloudlessCam to the latest version and configure the update behavior.

Installed version

The currently installed program version is displayed at the top. A button allows you to open the local changelog, which lists all changes and new features in the installed version.

Available version

This section displays information about the latest available version:

— **Version number:** The version number of the available update
— **Check/Update:** Button to manually trigger the update
Test
— **Online changelog:** Opens the changelog of the new version in browser

Update channel

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You can choose between different update channels:

— **Release:** Stable versions for production use
— **Test:** Pre-release versions with new features that are still being tested

The channel selection determines which versions are displayed as available updates.

Notifications

The "Notify me when a new version is available" option lets you choose whether you want to be automatically informed about new updates.
When activated, a notification will appear on the overview page.

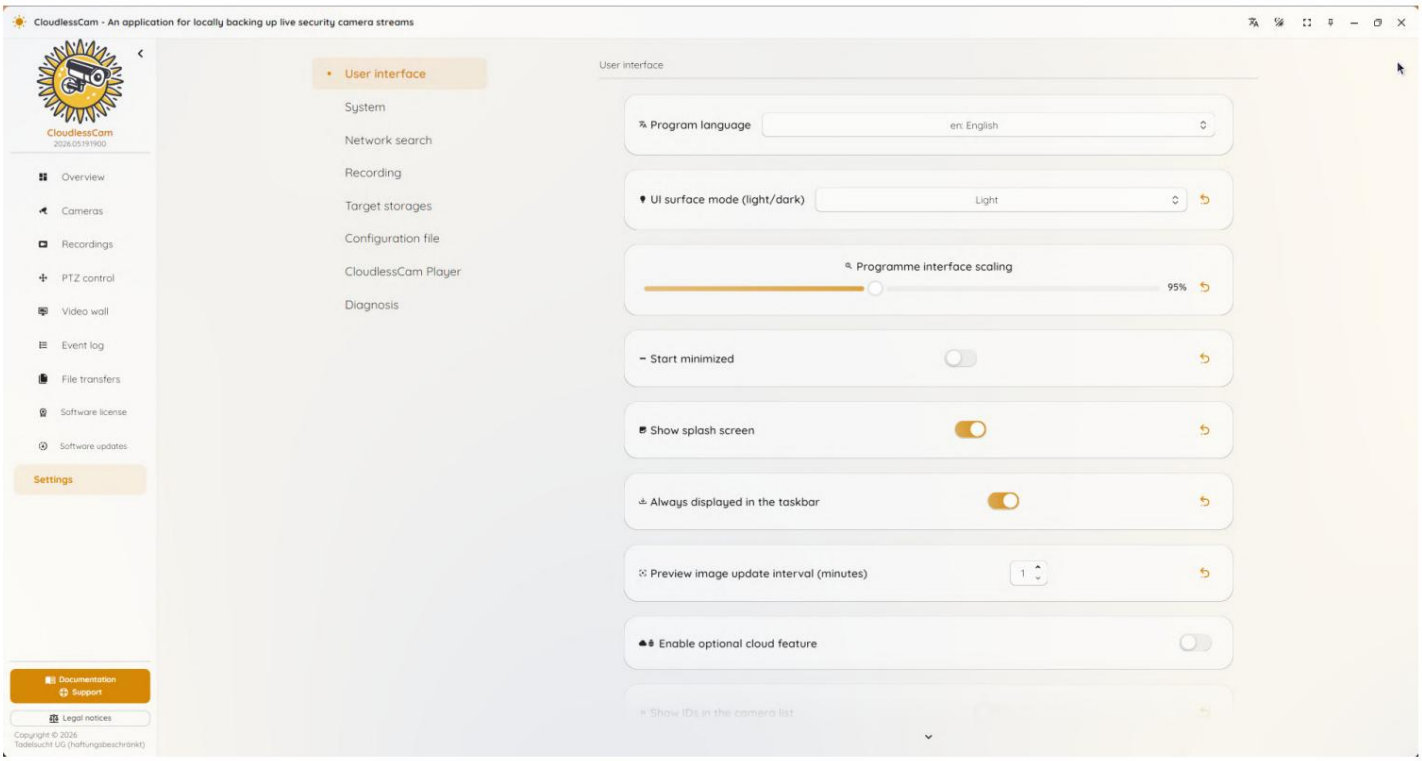
Perform update

If an update is available, you can start the update process by clicking the "Update now" button:

1. The new version is downloaded. 2. A progress dialog shows the download status. 3. After the download is complete, the installation starts. 4. The application closes and the new version is installed. 5. After installation, CloudlessCam restarts automatically.

Machine Translated by Google

3.2.10 Settings



The settings page allows you to configure all program options.
The settings are divided into several categories.

user interface

Language: Select the application's display language. After the change, the program will restart immediately and be displayed in the new language.

Theme Mode: Choose between Light, Dark, or System. In System mode, the application automatically follows the operating system settings.

UI scaling: Adjusts the size of all controls.

Start minimized: When enabled, the application starts minimized in the background.

Show splash screen: Displays a loading screen when the program starts.
If this option is disabled, the application starts without visual feedback.

Always in the taskbar: When disabled, the application disappears from the taskbar when minimized and is only accessible via the tray icon.

Preview image update interval: Determines how often the camera preview images are updated. will be updated automatically.

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Show identifiers: Displays internal GUIDs and IDs in the user interface.
to.

system

Startup mode: Determines how CloudlessCam is started:

— **GUI:** Only the graphical user interface is launched.
— **Background:** Only the background service is started
— **Both:** Both the GUI and the background service are started

Desktop shortcut: Creates a shortcut on the desktop.

Delete event log after X days: Events older than the specified number of days will be automatically deleted.

Maximum event log entries: Limits the number of events that can be stored. Older entries are deleted if this limit is exceeded.

Delete recording metadata archive after X days: Sets the retention period for recording metadata.

Terminate all FFmpeg processes on startup: Terminates all running FFmpeg processes when the program starts. This option can help avoid conflicts caused by orphaned processes, but may also affect other programs.

Terminate all go2rtc processes on startup: Terminates all running go2rtc processes when the program starts. This option can help avoid conflicts caused by orphaned processes, but may also affect other programs.

Debug mode: Enables advanced logging and debugging features. May impact performance.

Open working directory: Opens the folder containing configuration, logs, and backups.

Open installation directory: Opens the folder containing the program files.

Network search

ONVIF Discovery enabled: Enables automatic searching for ONVIF-compatible cameras on the network.

RTSP Discovery enabled: Enables automatic searching for RTSP streams.

Machine Translated by Google

Automatic IP change check: Monitors whether the IP addresses of the
They have changed the cameras.

IP check interval: Determines how often the IP addresses are checked.

Recording

Reconnection interval: Time between reconnection attempts at
Connection interrupted.

Maximum consecutive errors: Number of errors after which a recording is classified as problematic.

Allow direct connection on restream errors: Allows fallback to a
Direct camera connection if the restream fails.

Automatic recording restart: Automatically restarts recordings after a configurable interval.

Automatic restart interval: Time between automatic restarts.

Target storage

Maximum simultaneous global transfers: Total number of simultaneous
ongoing file transfers.

Maximum simultaneous transfers per storage device: Number of simultaneous
Transfers to a single destination storage.

Destination-Storage Timeout: Time after which a transfer is considered to have failed.

Target memory error threshold: Number of errors after which a memory is temporarily blocked.

Target memory error cooldown time: Time before another attempt is made after a series of errors.

Automatic file synchronization restart: Starts the file synchronization process.
tion automatically renews after an interval.

File synchronization standstill timeout: Time without progress before a transfer is considered blocked.

Transmission speed limit: Maximum transmission speed
in KiB per second (0 = unlimited).

Maximum temp directory size: Maximum size of the temporary storage folder in GiB.

Machine Translated by Google

Clean up temp folder: Immediately deletes all temporary files manually.

configuration file

Configuration password: Allows the configuration file to be encrypted with a password.

Automatic save interval: Time in minutes between automatic configuration saves.

Backup management: Enables the creation and restoration of configuration backups.

3.3 Dialog Window

3.3.1 Language selection

The language selection dialog allows you to change the application's display language.

Opening the dialog

The dialog can be opened in two ways:

— Via the translation icon in the title bar — Via the settings page in the user interface section

Selection and application

Select your preferred language from the list. The change will take effect immediately after confirmation and restarting the application.

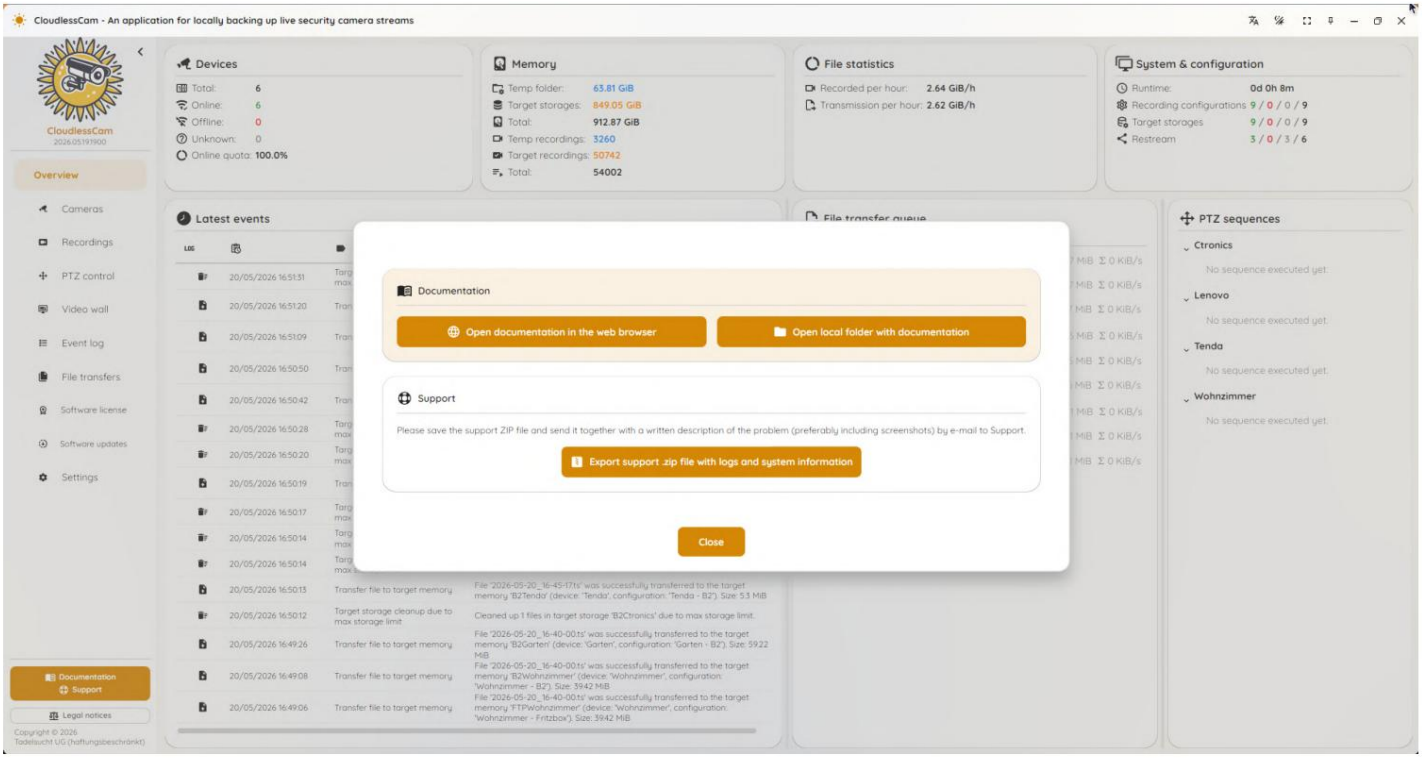
buttons

— **OK:** Adopts the selected language and closes the dialog
— **Cancel:** Closes the dialog without changes

Machine Translated by Google

3.3.2 Documentation / Support

documentation



The documentation dialog provides quick access to help and instructions for CloudlessCam.

Online documentation: Opens the CloudlessCam documentation in the default browser window. browser. This contains the latest instructions and help.

Local documentation: Opens the folder containing the local documentation in File Explorer or Finder. This is useful for offline installations or when no internet connection is available.

Support

The support dialog allows you to create and export diagnostic information for technical support.

Save as ZIP: Creates a ZIP archive containing:

— Full log file
— File containing system information
— Other relevant diagnostic data

Machine Translated by Google

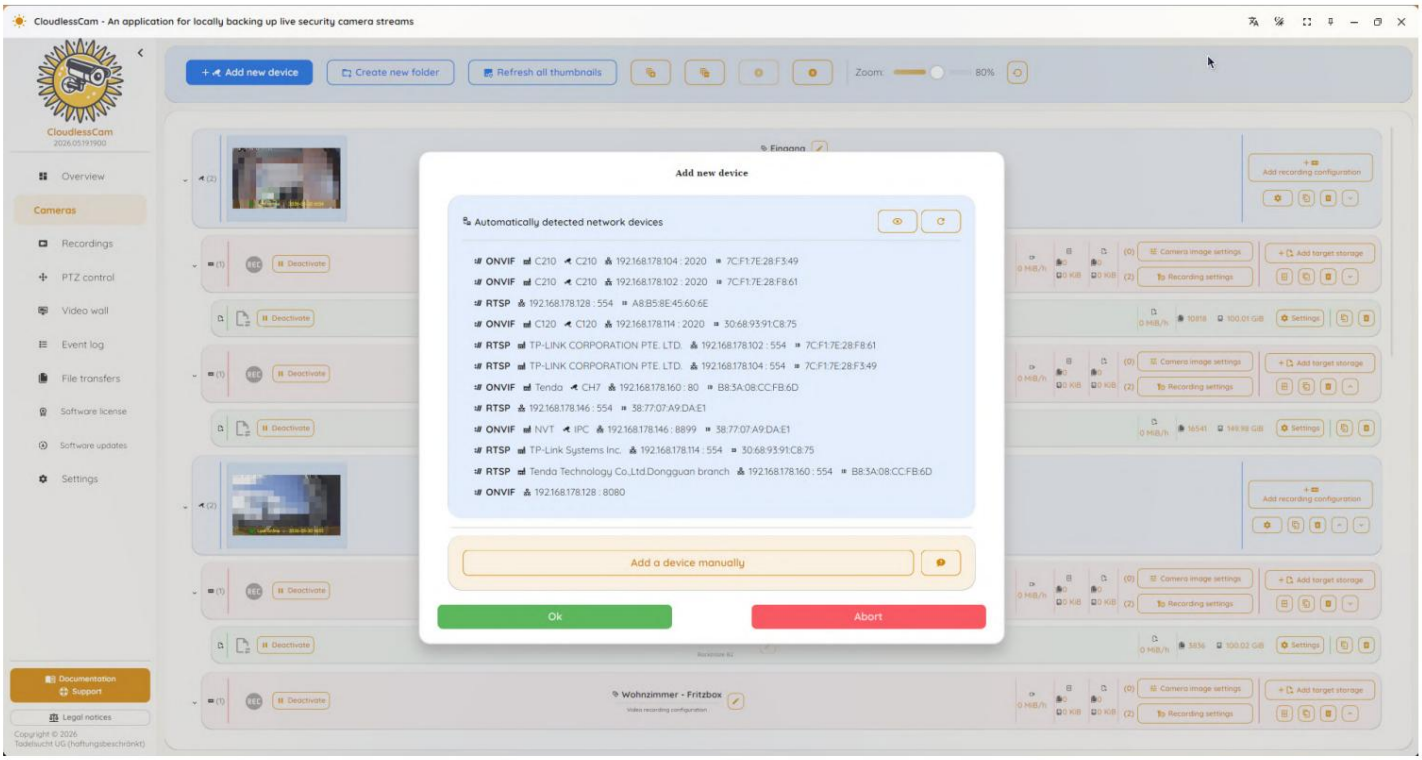
Privacy notice

The exported data may contain sensitive information such as IP addresses, paths, and system information. Review the data before sharing and remove any confidential information if necessary. Passwords should not be included in the log data, as CloudlessCam attempts to filter them out of all log entries before writing them.

3.3.3 Legal Notices

The Legal Notices dialog displays license information and details of used third-party components.

3.3.4 Adding a device (overview)



This dialog allows you to add new cameras and streams to Cloud-lessCam. It offers both automatic device detection and manual input options.

Automatic search

When the dialog is opened, a search for available devices on the network is automatically started:

Machine Translated by Google

— ONVIF-compatible cameras are detected via the ONVIF protocol — RTSP-enabled devices are found via a port scan — During the scan, a status message "Searching for devices..." is displayed — If no devices are found, the message "No devices" appears found"

Results list

Found devices are displayed in a list with the following information:

— **Protocol type:** ONVIF or RTSP
— **Manufacturer:** The camera manufacturer (if available)
— **Model:** The camera model name (if available)
— **IP:Port:** The network address and port of the device.
— **MAC address:** The MAC address of the device (if available)

Filters for known devices

A filter button allows you to hide already configured devices from the list. This prevents accidentally adding a device twice.

Update

You can restart the search using the Refresh button. This is useful if:

— devices were just switched on
— The network configuration was changed
— New cameras have been added to the network

Add manually

If your camera is not automatically detected, you can add it manually.
gene:

— Click on “Add device manually”
— Enter the stream URL (for example , rtsp://IP:Port/stream)
— Optionally, you can enter a username and password

Machine Translated by Google

Continue to configure

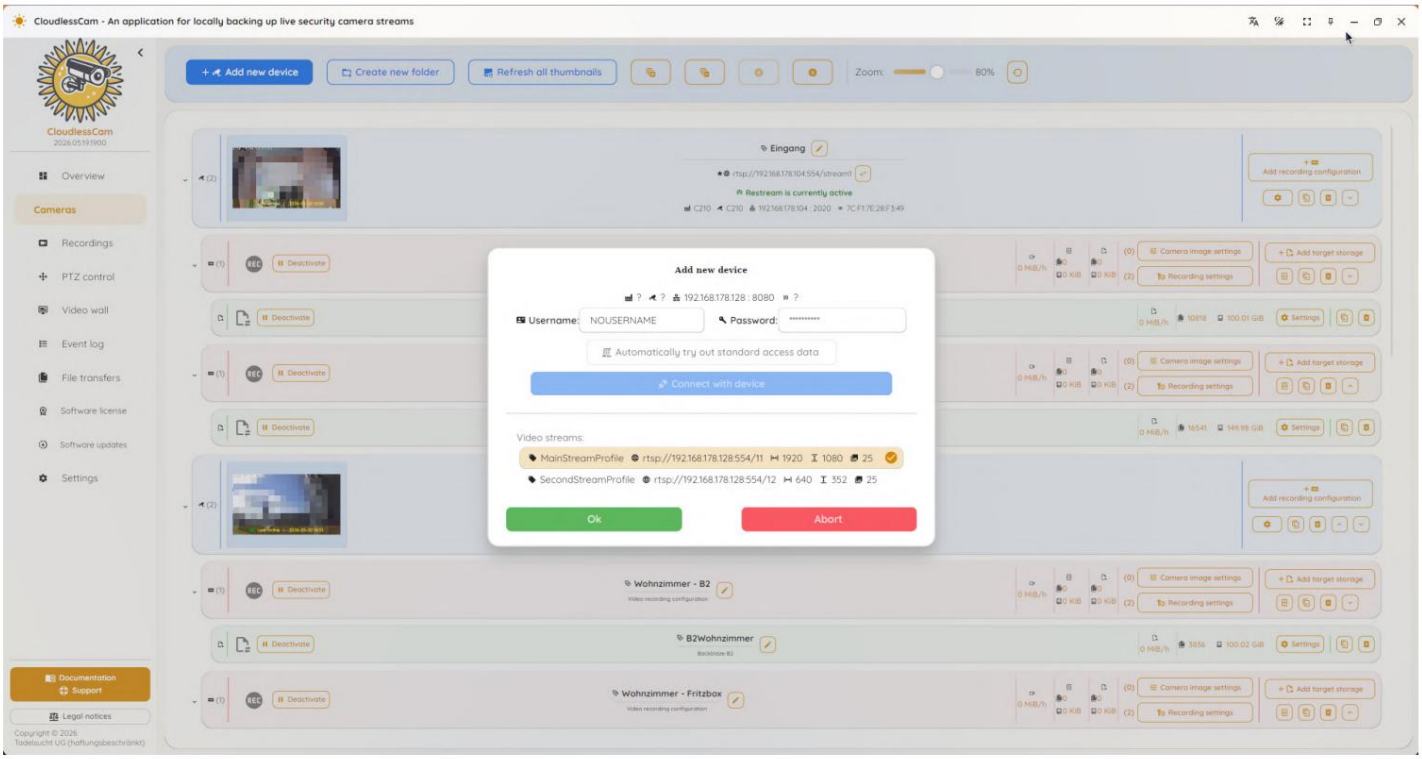
After selecting a device from the list and clicking OK, the appropriate configuration dialog will open depending on the device type.

— If RTSP is detected: Dialog for RTSP configuration
— For ONVIF devices: Automatic configuration dialog

buttons

— **OK:** Opens the configuration dialog for the selected device
— **Cancel:** Closes the dialog and stops the ongoing search.

3.3.5 Add automatically discovered device (ONVIF)



This dialog appears after selecting an automatically detected ONVIF device and allows you to configure the connection.

Device information

The detected device data is displayed in the upper section:

— Camera manufacturer and model

Machine Translated by Google

— IP address and port

— MAC address (if available)

Access data

Enter the login details for the camera:

— **Username:** The camera's ONVIF username

— **Password:** The corresponding password

Many cameras require ONVIF credentials. These may differ from the web interface credentials. If authentication is not required, leave the fields blank.

Automatically try default login credentials

The "Try default login credentials" button allows you to try common login credentials.
Standard username and password combinations will be tried automatically:

— One click starts the process. The progress is displayed directly on the switch.
area displayed (for example, 12/38).

— Clicking again during the process will cancel the search.

— If successful, the username and password will be automatically entered into the input fields.
registered.

— If none of the standard combinations work, a corresponding
Message displayed.

This function is also available as the CLI command ` camera guess-credentials` (see command reference).

Establish a connection

Click on “Connect to device” to establish the connection to the camera:

— Authentication is being checked

— The available video streams are being retrieved.

— The button is disabled during the connection.

Machine Translated by Google

Stream selection

Once a connection is successfully established, the available streams will be displayed:

- **Stream name:** Name of the stream (for example, Mainstream, Sub-stream)
- **URL:** The stream URL
- **Resolution:** Width and height in pixels
- **Frame rate:** The maximum frame rate (if available)

If only one stream is found, it will be selected automatically. If multiple streams are available, select your preferred default stream. Typically, the mainstream stream offers higher quality, while the substream requires less bandwidth.

Confirmation

The OK button is only active when:

- The connection was successfully established
- A stream was selected

After confirmation, the camera is added to the configuration and a preview image is loaded.

Troubleshooting

Typical problems and solutions:

- **Incorrect login details:** Check your username and password, or use the "Try default login details" function.
- **ONVIF disabled:** Enable ONVIF in the camera settings.
- **Port blocked:** Check firewall settings
- **Timeout:** Check the network connection
- **No streams detected:** The camera may not support ONVIF-Profile S

buttons

- **OK:** Adds the camera and closes the dialog.
- **Cancel:** Closes the dialog without changes

Machine Translated by Google

3.3.6 Add RTSP-detected device

This dialog appears after selecting a device found via RTSP scan and allows the completion of the stream URL.

Device information

The detected information is displayed in the upper section:

— Protocol: RTSP
— IP address and port
— MAC address (if available)

Configure RTSP URL

The URL is already pre-filled with the IP address and port. You need to add the stream path:

— The path is camera-specific (for example /stream1, /ch=1&subtype=0)
— Consult your camera's manual for the correct path.
— Alternatively, you can use the camera model search tool.

URL format:

rtsp://{{USERNAME}}:{{PASSWORD}}@IP:PORT/stream-path

Access data

If the camera requires authentication:

— Enter your username and password in the separate fields, or
— Insert the login details directly into the URL (replace the placeholders).
ter)

URL help

A help text shows:

— The correct URL format
— Typical examples for different camera brands
— Hints on where to find the stream path

Machine Translated by Google

Validation

Before confirmation, the following is checked:

— The URL must not be empty

— The URL must be in a valid format

A warning will appear if the URL is invalid.

Typical mistakes

— **Incorrect path:** The stream path is camera model-specific.
— **Port blocked:** Port 554 is the standard for RTSP

— **Only one session:** Some cameras only allow one simultaneous RTSP session.
access

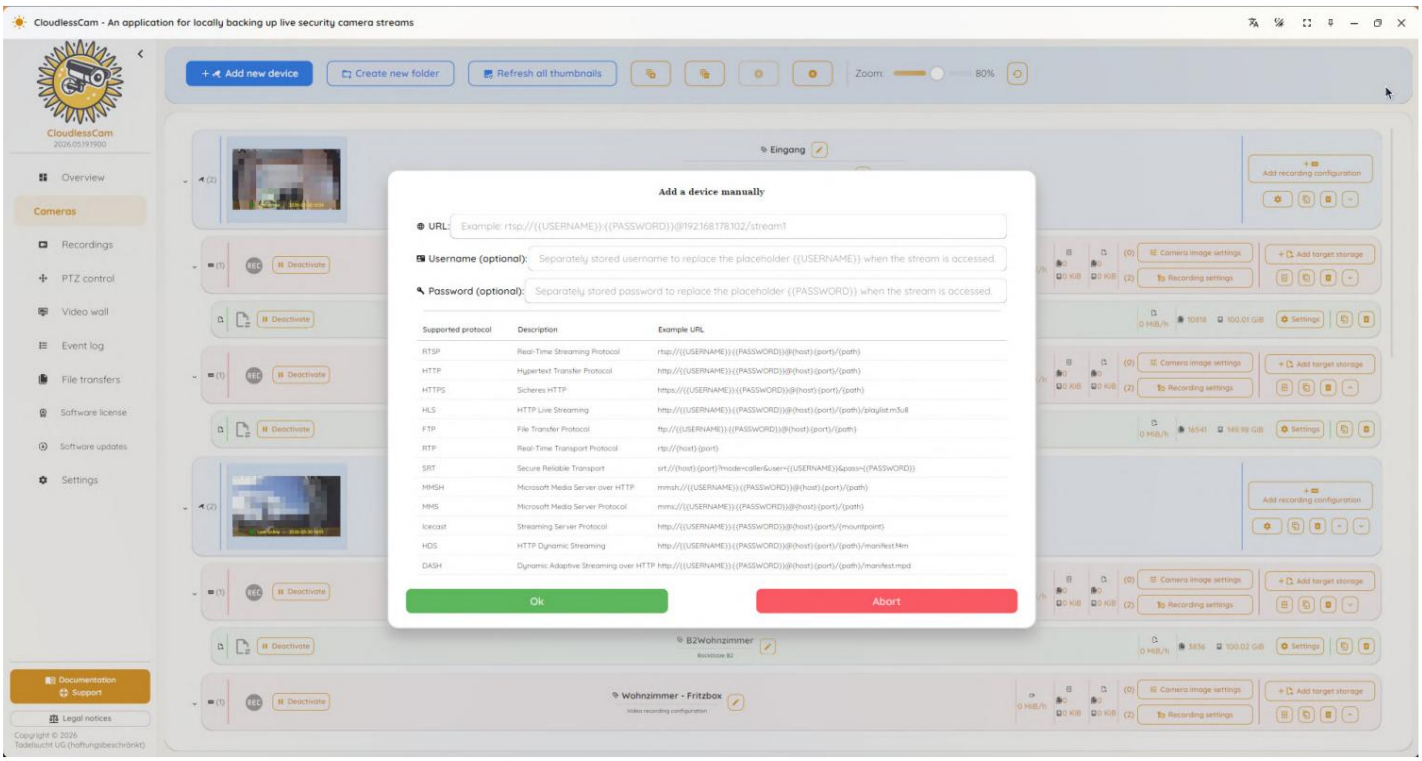
— **Incorrect login details:** Check your username and password.

buttons

— **OK:** Adds the camera with the configured stream

— **Cancel:** Closes the dialog without changes

3.3.7 Adding a device manually



Machine Translated by Google

This dialog allows you to add streams that were not automatically detected.

use

Manual input is useful for:

— Network Video Recorder (NVR)
— HTTP-based camera streams
— Cameras in other network segments
— Special streaming setups

Enter URL

Enter the full stream URL. Supported protocols are:

— **RTSP:** rtsp://IP:554/stream —
HTTP/HTTPS: http://IP/video.mjpeg — **HLS:**
http://IP/stream.m3u8 — **DASH:**
http://IP/manifest.mpd — **RTP:** rtp://
IP:5000 — **SRT:** srt://
IP:9000

A table with example URLs for the different protocols is displayed in the dialog.

Access data

If the stream requires authentication:

— **Username:** Optional, if not included in the URL
— **Password:** Optional, if not included in the URL

Validation

The URL must be specified. A warning will appear if the URL is empty or invalid.

Machine Translated by Google

Result

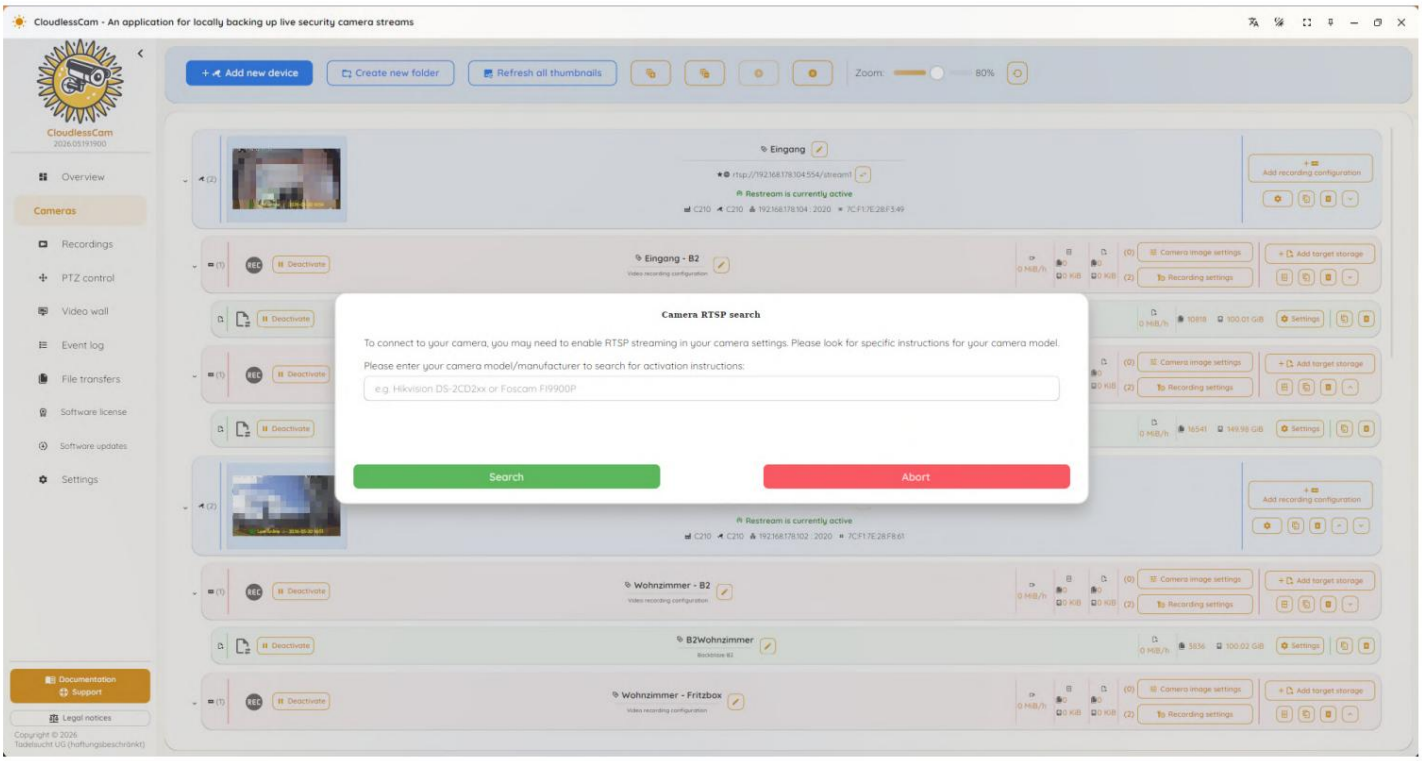
After confirmation:

— The camera with the entered stream was added to the configuration.
— A preview image has loaded

buttons

— **OK:** Adds the camera and closes the dialog.
— **Cancel:** Closes the dialog without changes

3.3.8 Search for camera model



This dialog helps you find the correct RTSP URL for a specific camera model.

Purpose

Each camera manufacturer uses its own RTSP paths. This dialog helps to...
to find the correct stream URL for your camera.

Machine Translated by Google

Procedure

1. Enter the manufacturer and model of your camera.
2. The dialog suggests a search query (for example, "rtsp [model name]"). 3. Opens a search engine with the suggested query. 4. Search the results for RTSP URL documentation.

Typical sources

RTSP URLs are often found in:

— Manufacturer documentation and manuals

— Camera forums and community sites

URL placeholder

You typically need to replace the following in the URLs found:

— IP address: The actual IP address of your camera

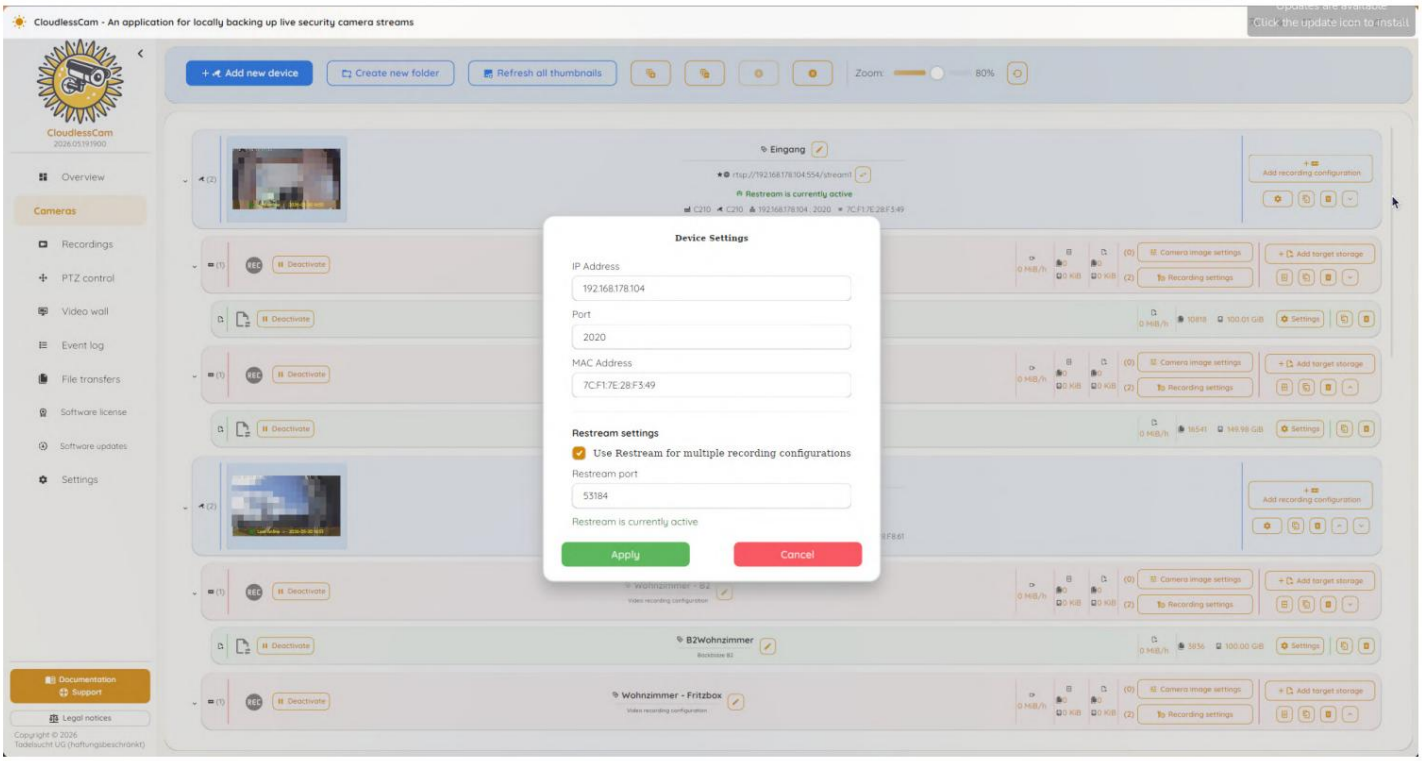
— Port: Typically 554 for RTSP

— Username and password: Your login details

— Channel/Stream: Desired video channel

Machine Translated by Google

3.3.9 Device settings



The Device Settings dialog allows you to adjust the network data and Restream configuration of a detected device.

Network settings

IP address: The device's IP address. A change may be necessary.
if:

— The camera has received a new IP address via DHCP
— The automatic detection returned an incorrect address.
— The device was moved to a different network segment

Port: The ONVIF or RTSP port of the device. Standard ports are typically...
80 for ONVIF and 554 for RTSP.

MAC address: The hardware address of the device (optional). This can be useful for support purposes, unique identification, or device filtering.

Restream configuration

Machine Translated by Google

Use Restream: Activates the internal Restream service. This receives the camera stream once and distributes it internally to multiple recording configurations. Advantages:

— Reduces the load on the camera when taking multiple photos simultaneously
— Reduces network traffic between camera and computer
— Enables more stable recordings with limited camera hardware

Restream Port: The local port for the Restream service. This field is editable only.

Usable when Restream is enabled. The Restream service is restarted when the port is changed.

Status: Indicates whether the restream service is currently active. If restreaming is active, the message "Restream is currently active" appears.

Effects of using

Depending on the changes made, the following actions may be triggered:

— The restream service is started or stopped
— Ongoing camera recordings may be restarted
— The connection to the camera is established with the new settings

Error cases

Possible errors and their causes:

— **Invalid IP address:** The entered IP address does not conform to the valid format

— **Port already in use:** The selected restream port is already being used by another application.
— **Connection failed:** The camera is not reachable at the specified address (firewall, network)

buttons

— **Apply:** Saves the changes and closes the dialog.
— **Cancel:** Closes the dialog without changes

Machine Translated by Google

3.3.10 Stream Selection

The stream selection dialog allows you to set the default stream for a camera.

Purpose

Many cameras offer multiple video streams with different properties. This dialog allows you to select the stream that should be used by default for recording and live viewing.

Stream list

The following will be displayed for each available stream:

— **Stream name:** Label (for example, Mainstream, Substream, Profile1)
— **URL:** The RTSP URL of the stream
— **Resolution:** Width and height in pixels
— **Frame rate:** Maximum frames per second (if available)

buttons

— **OK:** Sets the selected stream as the default
— **Cancel:** Closes the dialog without changes

3.3.11 Live Stream

The live stream dialog allows you to test and view a camera stream in real time.

Purpose

This dialogue serves the purpose of:

— Testing the stream URL before configuring the recording —
Checking the image quality and camera angle
— Verifying the access data
— Check the audio function (if available)

Machine Translated by Google

Controls

Playback control:

— **Play/Pause:** Starts or pauses playback
— **Volume:** Controls audio playback (0 to 100)

The volume control only works if the stream contains an audio channel.

Technical notes

Resource consumption: Live playback requires decoding the video stream, which consumes CPU or GPU resources. When multiple streams are played simultaneously (for example, on a video wall), the resource requirements increase accordingly.

Troubleshooting

No picture:

— Check the stream URL
— Check login details
— Ensure camera connection

Codec not supported: Rare or proprietary codecs may not be supported.
They cannot be decoded.

Image distortions:

— Check network connection (especially for Wi-Fi)
— Check bandwidth
— Check firewall settings

3.3.12 Select recording type

This dialog appears when creating a new recording configuration and allows you to select the recording type.

Machine Translated by Google

Available recording types

Video:

— Continuous video recording
— Optional with audio
— Configurable segment length and quality

Single image (snapshot):

— Storing individual images at set intervals
— Lower storage requirements than video
— Formats: JPEG or PNG

Audio:

— Continuous audio recording
— Without video recording

Selection

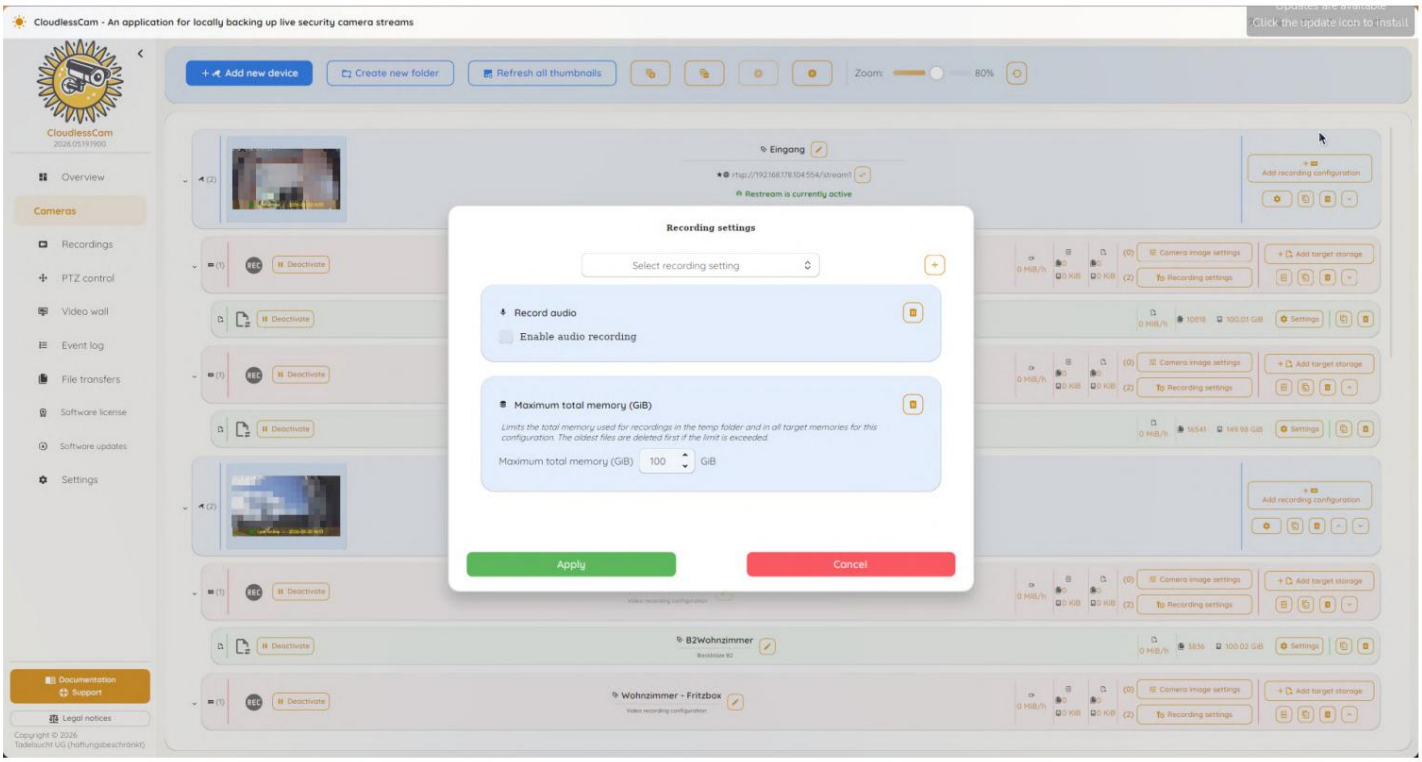
Depending on the selected recording type, different configuration options are available in the recording settings.

buttons

— **OK:** Creates the recording configuration with the selected type
— **Cancel:** Closes the dialog without changes

Machine Translated by Google

3.3.13 Recording settings



The Recording Settings dialog allows for the detailed configuration of all recording parameters for a recording configuration.

structure

The dialogue consists of two parts:

— **Above:** Selection field for setting types with an Add button
— **Below:** List of settings already added as individual cards

Each settings card displays the configured values and offers a delete button.

Basic logic

Important for understanding the recording control:

— Recording only starts if **all** active settings allow it.
— Multiple time windows result in an intersection, not a union
— Without any recording-restricting settings, recording will continue continuously.
men

Machine Translated by Google

Available setting types

Day of the week and time: Defines on which days and at what times
is recorded. The following are configurable:

— Active weekdays
— Start time (default: 9:00 AM)
— End time (default: 5:00 PM)

Only every X seconds: Takes photos only at fixed intervals (1 to 3600 seconds). For single-frame shooting only. Default value: 60 seconds.

Keep only for a specific period: Sets the retention period for the recordings. Older files are automatically deleted. Configurable options are available.
Number and unit (hours, days, weeks, months, years). Default value: 7
Days.

Record audio: Setting to record the audio channel if the camera stream contains audio. By default, the audio channel is also included in the video file.
recorded.

Frames per second: Sets the frame rate of the recording (1 to 120 FPS). Higher These values require more CPU power and memory. Default value: 30 FPS.

Segment length: Defines the length of individual recording files (30 to 3600 seconds). Shorter segments speed up early file transfer. Default value: 300 seconds (5 minutes).

Maximum Total Storage: Limits the storage space for this recording configuration (1 to 10,000 GiB). When the limit is reached, the oldest recordings are deleted. Default value: 10 GiB.

Video codec: Select the codec for video compression:

— H.264 (libx264) - Widely used, good compatibility
— HEVC (H.265) - Better compression, higher CPU requirements
— AV1, VP9, VVC, MPEG4 - Further options for specific requirements
— Copy - Uses the original codec without re-encoding, as long as no
Video processing is required (lowest CPU load)

If a watermark (CloudlessCam branding) is added to a video recording
or custom watermark overlay), a timestamp, image processing
If a setting such as brightness, contrast, reflection, rotation, or scaling, a changed frame rate, video quality, or a different pixel format is active, Cloud-lessCam automatically uses H.264 (libx264) despite the "Copy" setting. This ensures that the selected options are actually applied instead of being silently ignored.

Machine Translated by Google

Video quality: Determines image quality and compression speed:

— Quality levels from ultra-high to low
— Compression speed from Very Slow to Ultra-Fast

Audio codec: Select the codec for audio compression: AAC, MP3, Opus, FLAC, ALAC, WAV or Copy.

Image format: Available for single-image capture only. Choose between JPEG (smaller files) and PNG (lossless).

Custom Watermark: Overlays a local image on video recordings and still images. Configurable options include image file, size (percentage), and X/Y coordinates.
Position and opacity.

Timestamp: Displays the date and time directly onto the captured image. Configurable options include time format, font, font size, color, and X/Y position. The selected time format is shown in the dialog box with a preview. Color selection is made directly in the settings module via an embedded color picker with a material color palette. If no font is selected, Cloudless-Cam uses a monospace font by default.

Customize filenames: Allows you to customize filenames:

— Mode: Prefix + Date + Suffix or fixed name (only for single image)
— Prefix and suffix can be freely defined.
— A preview shows the resulting filename.

File encryption: Enables encryption of recording files:

— Encryption method: 7-Zip with AES-256 encryption — Password for encryption and decryption — Encrypted files are given the extension .encrypted7z.7z

Warning: Encrypted recordings cannot be recovered if the password is lost.

Codec compatibility

When applying the settings, the system checks whether the video and audio codecs are compatible with the selected quality settings. A warning is displayed if any incompatibilities are found.

Machine Translated by Google

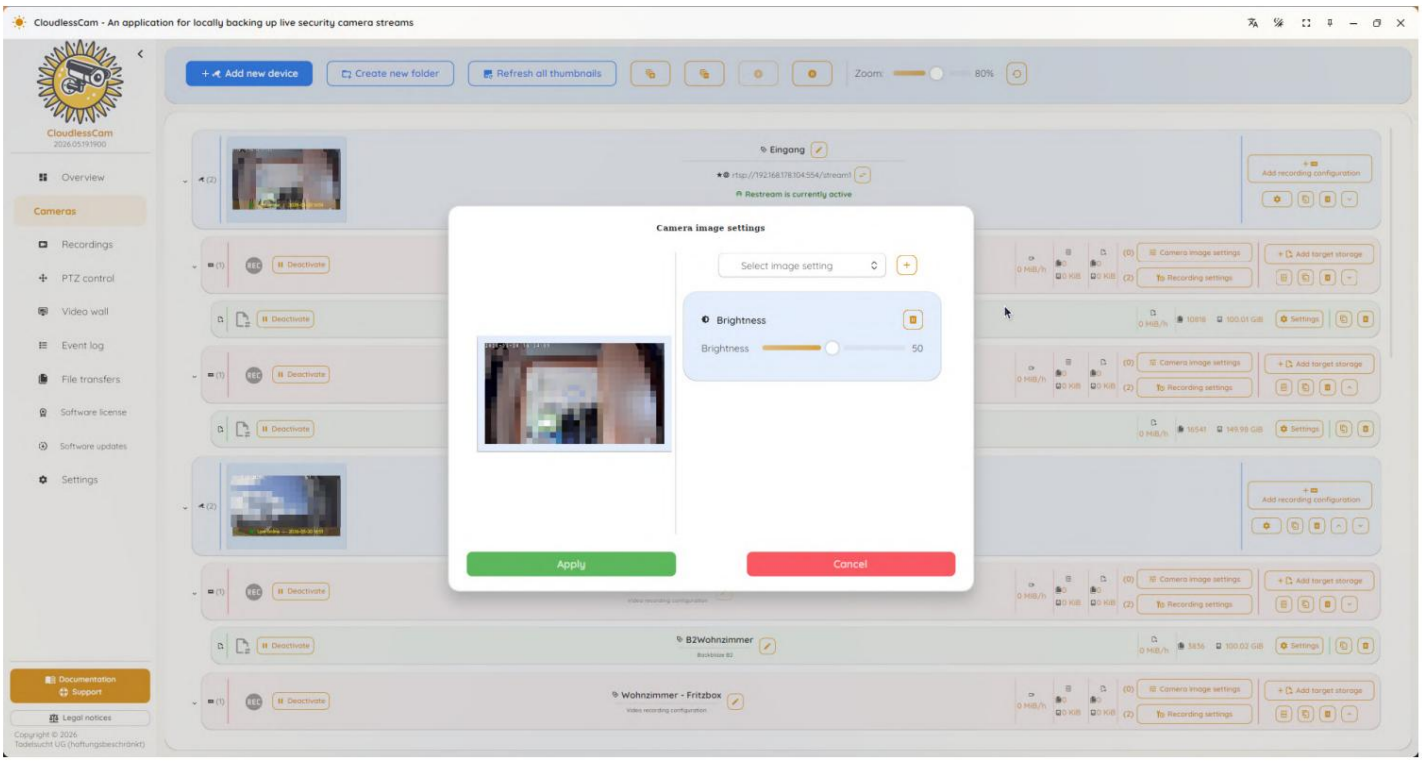
Effects of using

After applying the changes, the configuration is saved. Ongoing recordings from the affected camera will be restarted, which may cause a brief interruption in recording.

buttons

— **Apply:** Saves all changes and closes the dialog.
— **Cancel:** Closes the dialog without changes

3.3.14 Camera image settings



This dialog allows you to adjust the image parameters of a recording.

Available settings

— **Brightness:** Overall brightness of the image
— **Contrast:** Difference between light and dark areas
— **Saturation:** Color intensity
— **Sharpness:** Edge sharpness

Machine Translated by Google

— **White balance:** Color temperature (Auto, Manual, Presets)
— **Exposure:** Exposure parameters
— **Infrared light:** Infrared lighting options (if available and via
(ONVIF adjustable)

Application

Changes are transferred directly to the camera after confirmation and are
Immediately visible in the live image.

buttons

— **Apply:** Transfers the settings to the camera
— **Cancel:** Closes the dialog without changes

3.3.15 Select target storage type

This dialog appears when adding a new target storage location and allows you to select the storage backend.

Available storage types

Choose from the available storage backends:

— **Local file system:** Storage on local drives or network
releases
— **SFTP:** Secure transfer via SSH File Transfer Protocol
— **WebDAV:** Storage on WebDAV-compatible servers
— **S3 compatible:** Amazon S3 or compatible services
— **Backblaze B2:** Backblaze B2 cloud storage
— **Dropbox:** Dropbox cloud storage
— **OneDrive:** Microsoft OneDrive
— **Google Drive:** Google Drive cloud storage

Selection

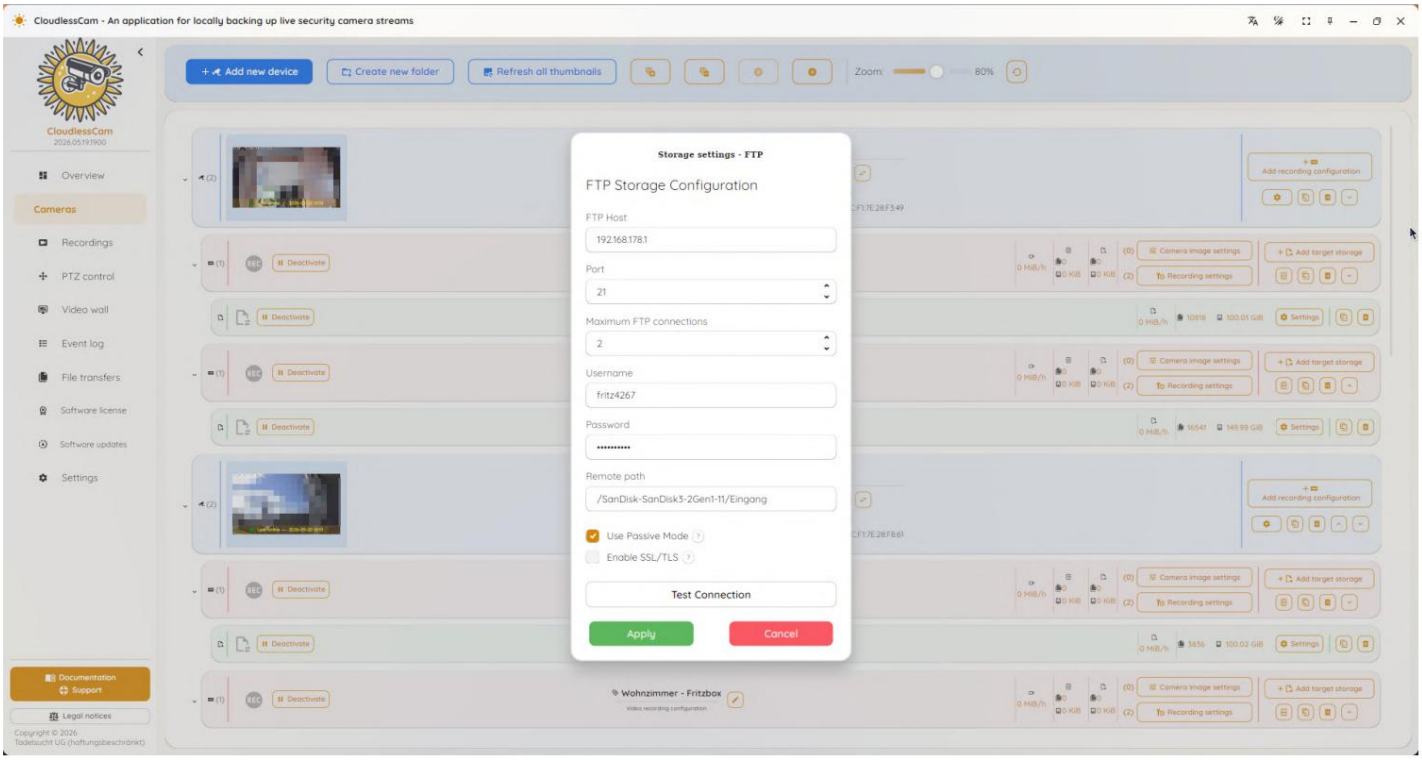
After selecting a storage type, the corresponding configuration dialog opens, where you can make the storage-specific settings.
no.

Machine Translated by Google

buttons

— **OK:** Opens the configuration dialog for the selected type
— **Cancel:** Closes the dialog without changes

3.3.16 Target Storage Settings



The Destination Storage Settings dialog allows you to configure the storage location for recordings. The available options depend on the selected storage type.

Supported memory types

CloudlessCam supports various storage backends:

Local file system:

— **Destination folder:** Select the local folder for the recordings
— **Open folder:** Opens the configured folder in File Explorer.

Please note that the user must have write permissions for the selected folder. UNC paths for network shares are also supported.

SFTP (SSH File Transfer Protocol):

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— **Host:** Hostname or IP address of the SFTP server
— **Port:** Connection port (default: 22)
— **Username:** Login name for the SFTP connection
— **Password:** Associated password
— **Remote path:** Target directory on the server
— **Test connection:** Checks the connection with the entered data

WebDAV:

— **URL:** Full WebDAV URL of the server
— **Username:** Login name for the WebDAV connection
— **Password:** Associated password
— **Remote path:** Target directory on the server
— **Test connection:** Checks the connection

S3-compatible storage:

— **Service URL/Endpoint:** URL of the S3-compatible service
— **Bucket:** Name of the storage bucket
— **Folder path:** Subdirectory in the bucket
— **Access Key:** Access key
— **Secret Key:** Secret Key
— **Force Path Style:** For older S3-compatible services
— **Test connection:** Checks the connection

Backblaze B2:

— **Region:** Storage region of the Backblaze account
— **Key ID:** Application key ID
— **Application Key:** Application key
— **Bucket:** Name of the B2 bucket
— **Folder path:** Subdirectory in the bucket
— **Authenticate:** Performs the login process
— **Delete login data:** Removes saved login data
— **Test connection:** Checks the connection

Dropbox:

— **Authenticate:** Starts the OAuth login process in the browser
— **Folder path:** Target folder in Dropbox
— **Delete access data:** Removes OAuth authorization
— **Test connection:** Checks the connection

Machine Translated by Google

OneDrive:

- **Authenticate:** Starts the OAuth login process in the browser
- **Folder name:** Target folder in OneDrive
- **Delete access data:** Removes OAuth authorization
- **Test connection:** Checks the connection

Google Drive:

- **Authenticate:** Starts the OAuth login process in the browser
- **Folder name:** Target folder in Google Drive
- **Delete access data:** Removes OAuth authorization
- **Test connection:** Checks the connection

Connection test

Each storage type offers a function for testing the connection. The test checks:

- Server availability
- Validity of the access data
- Write permission in the target directory

Typical mistakes

- **Authentication expired:** OAuth token must be renewed
- **Path not found:** The specified directory does not exist
- **Certificate error:** TLS certificate is not accepted
- **Rate limit:** Cloud service has temporary access restrictions activated
- **No write permission:** The user has no write permission.

buttons

- **Apply:** Saves the configuration and closes the dialog.
- **Cancel:** Closes the dialog without changes

3.3.17 Update Download

The update download dialog shows the progress of downloading a new program version.

Machine Translated by Google

Advertisement

The dialogue shows:

— The version number to be downloaded
— A progress bar with a percentage indicator
— The already downloaded and the total size
— The current download speed

Sequence

1. The new version is downloaded from the server. 2. The progress is continuously updated.
3. Once the download is complete, the installation will start.
4. CloudlessCam will close and restart after installation.

Cancel

You can interrupt the download at any time using the Cancel button.
The partially downloaded file is discarded and the current version remains unchanged.

Error cases

If you experience problems during the download:

— Check your internet connection
— Make sure there is enough storage space available.
— Please try the download again later.

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4

Command lines Program (CLI)

CloudlessCam's command-line interface (CLI) allows you to
to use all essential functions of the software without a graphical interface.
The CLI is aimed at administrators and power users who want to configure CloudlessCam.
Scripting, automation, or running on systems without a desktop environment
want.

4.1 Overview

The CLI is particularly suitable for the following use cases:

- **Headless operation:** Running on servers or embedded systems without graphical user interface.
- **Automation:** Integration into scripts, cron jobs or scheduled tasks.
- **Monitoring:** Regular querying of status and statistics.
- **Maintenance:** Backup, configuration changes and cleanup work.

The CLI uses the same configuration as the graphical user interface. Both applications
cannot be run in recording mode simultaneously.
The GUI automatically stops and starts a running CLI daemon at startup.
It happens again when you finish.

The basic principle of all CLI commands follows the following pattern:

Machine Translated by Google

CloudlessCamCLI <Category> <Action> [Options]

4.2 Installation and Launch

The CLI is located in the CloudlessCam installation directory and is called

CloudlessCamCLI.exe on Windows and CloudlessCamCLI on Linux and macOS. After installation, you can run the CLI directly from the installation directory.

Call up ichnis.

For quick startup, you can use the following commands:

— CloudlessCamCLI --help displays general help.

— CloudlessCamCLI camera --help displays help for camera commands.

— CloudlessCamCLI camera list lists all configured cameras.

The CLI uses the same configuration paths as the graphical user interface.

Under Windows, the working directory is located under %APPDATA%\CloudlessCam, under Linux and macOS under ~/.config/CloudlessCam or the corresponding user directory.

4.3 Output formats and global options

The CLI supports various output formats, which you can specify using the --format option :

— **table** (default): Formatted table view for display in the terminal. — **json:** Machine-readable JSON format for further processing in scripts. — **csv:** Comma-separated values for import into spreadsheet programs.

The following global options are available for all commands:

— --no-color or --no-colours: Disables color output. This option is useful for log files, CI/CD pipelines, or terminals without color support. — --help: Displays help for the selected command.

4.4 Command Categories

The CLI organizes its commands into categories. Each category contains several commands. tions:

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category	Description
camera	List, add, edit and remove cameras
status	View system overview, camera and storage status
recording	List recordings, view timeline/calendar, export
recording-config	Manage recording configurations
storage	Add, edit, and remove target storage.
settings	View, change, back up and restore settings
license	Manage licenses and perform offline activation
ptz	PTZ control (pan/tilt/zoom) for compatible cameras
image	Manage image settings (brightness, contrast, and others).
update	Check for and install updates
maintenance	Performing maintenance tasks such as cleaning up
demon	Start, stop, and monitor background services

4.5 Daemon and Pacemaker

For continuous operation without a graphical interface, CloudlessCam provides Daemon Mode. In this mode, the CLI runs as a background process and performs the necessary functions.
configured recordings.
The Pacemaker is a separate monitoring program that monitors the Daemon.
and restarts automatically if it unexpectedly terminates. This ensures a
stable 24/7 operation. Further information about the Pacemaker can be found in the documentation.
cut 9.3.

The following daemon commands are available:

— CloudlessCamCLI daemon start: Starts the daemon as a background process.
— CloudlessCamCLI daemon stop: Stops the running daemon.
— CloudlessCamCLI daemon restart: Stops and restarts the daemon.
— CloudlessCamCLI daemon status: Displays the current status of the daemon.
— CloudlessCamCLI daemon logs: Displays the latest log entries of the daemon.

4.6 Call Examples

The following examples show typical use cases of the CLI.

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4.6.1 Windows

```
# List all cameras
CloudlessCamCLI.exe camera list

# Add camera via RTSP URL
CloudlessCamCLI.exe camera add --name "Input" --url "rtsp://192.168.178.27/stream1"

# Search for cameras via network discovery (interactive)
CloudlessCamCLI.exe camera add --name "New Camera" --discover --interactive

# Show system overview
CloudlessCamCLI.exe status overview

# Export camera status as JSON
CloudlessCamCLI.exe status cameras --format json --output cameras.json

# Start Daemon
CloudlessCamCLI.exe daemon start
pause
```

4.6.2 Linux and MacOS

```
# List all cameras
./CloudlessCamCLI camera list

# Add camera via RTSP URL
./CloudlessCamCLI camera add --name "Garden" --url "rtsp://192.168.178.32/stream1"

# Show photos from one day
./CloudlessCamCLI recording list --date 2026-01-15 --format table

# Show storage status
./CloudlessCamCLI status storage --show-usage

# Start Daemon in the background
./CloudlessCamCLI daemon start
```

4.7 Command Reference

The following documents all available CLI commands with their options and examples.

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4.7.1 camera – Camera management

The commands in the camera category allow you to list, add, and manage cameras. Edit, remove, and automatically try default login credentials.

camera list

Lists all configured cameras. By default, this command displays a Table view with the most important camera properties (name, GUID, type and URL). The --status and --detailed options allow you to retrieve additional information such as the current connection status and technical details.

Option	Description	standard
-f|--format	Output format (table|json|csv) -v|--	table
verbose Displays detailed information -s|--status		–
	Displays the connection status	–
-d|--detailed Displays extended camera information –		
-g|--group-id Filters by device group ID -o|--output		–
	Saves the output to a file	–

Example 1: Simple list of all cameras

```
CloudlessCamCLI camera list
```

Output:

```
+--------------------------------------+-------------+--------+-------------------------------+
| GUID                                 | Name        | Type   | URL                           |
+--------------------------------------+-------------+--------+-------------------------------+
| a1b2c3d4-e5f6-7890-abcd-ef1234567890 | Entrance    | ONVIF  | rtsp://192.168.178.27/stream1 |
| b2c3d4e5-f6a7-8901-bcde-f23456789012 | Garden      | RTSP   | rtsp://192.168.178.32/live    |
| c3d4e5f6-a7b8-9012-cdef-345678901234 | Living Room | ONVIF  | rtsp://192.168.178.25/stream1 |
+--------------------------------------+-------------+--------+-------------------------------+
```

Example 2: Displaying camera connection status

```
CloudlessCamCLI camera list --status
```

Output:

```
+--------------------------------------+-------------+--------+---------+
| GUID                                 | Name        | Type   | Status  |
+--------------------------------------+-------------+--------+---------+
| a1b2c3d4-e5f6-7890-abcd-ef1234567890 | Entrance    | ONVIF  | Online  |
| b2c3d4e5-f6a7-8901-bcde-f23456789012 | Garden      | RTSP   | Online  |
| c3d4e5f6-a7b8-9012-cdef-345678901234 | Living Room | ONVIF  | Offline |
+--------------------------------------+-------------+--------+---------+
```

Example 3: Exporting camera list as JSON

```
CloudlessCamCLI camera list --format json --output cameras.json
```

The file cameras.json then contains all camera data in JSON format, that you can further process in scripts or other applications.

Example 4: Detailed information about a group of devices

```
CloudlessCamCLI camera list --group-id "outdoor" --detailed --verbose
```

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camera add

Adds a new camera to the configuration. You must either specify an RTSP URL directly (--url) or use automatic network discovery (--discover).

Use the camera name (--name) . The camera name is always required.

When using network discovery, CloudlessCam scans the local network.

Network for ONVIF-compliant cameras. In interactive mode you can

Select from the cameras found.

option	Description	Necessary
-n|--name	Camera name	Yes
-u|--url	Camera RTSP URL	Alternative to --discover
-d|--discover	Searching for cameras on the network	Alternative to --url
--username	Username for camera authentication	No
--password -t|--	Password for camera authentication	No
timeout	Network discovery timeout in seconds: 30	
-i|--interactive Interactive mode for network discovery		No

Example 1: Adding a camera with a known RTSP URL

CloudlessCamCLI camera add --name "Input" --url "rtsp://192.168.178.27/stream1"

Output:

Camera 'Entrance' successfully added.
GUID: a1b2c3d4-e5f6-7890-abcd-ef1234567890

Example 2: Adding a camera with authentication

For cameras that require authentication, enter your username and

Password as separate options:

```
CloudlessCamCLI camera add --name "Garden" \
    --url "rtsp://192.168.178.32/live" \
    --username admin \
    --password "MySecurePassword123"
```

Alternatively, you can also specify the login details in the URL:

```
CloudlessCamCLI camera add --name "Garden" \
    --url "rtsp://admin:MyPassword@192.168.178.32/live"
```

Example 3: Searching for a camera via network discovery (interactive)

CloudlessCamCLI camera add --name "New Camera" --discover --interactive

In interactive mode, the CLI displays all detected cameras and you can
Select one:

```
Searching for cameras on the network...
Cameras found:
    [1] Hikvision DS-2CD2143G0-I (192.168.178.40)
    [2] Reolink RLC-510A (192.168.178.41)
    [3] Dahua IPC-HDW2431T-AS (192.168.178.42)

Select one camera (1-3):
```

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Example 4: Network Discovery with Increased Timeout

In larger networks or when cameras have a slow response time, an increased timeout may be useful:

```
CloudlessCamCLI camera add --name "Workshop" --discover --timeout 60
```

camera modify

Changes the settings of an existing camera. You will need the GUID of the camera. Cameras that you can identify using `camera list` . At least one change option must be specified.

option	Description	Necessary
<CAMERA-GUID>	GUID of the camera to be changed	Yes
-n|--name	New name for the camera	No
-u|--username	New username	No
-p|--password	New password	No
--url	New RTSP URL	No
--force	Make changes without confirmation: No	

Example 1: Changing camera names

```
CloudlessCamCLI camera modify a1b2c3d4-e5f6-7890-abcd-ef1234567890 --name "Main Entrance"
```

Output:

```
Camera 'Entrance' is being changed:
    Name: Entrance -> Main Entrance
Make a change? [y/n]: y
Camera successfully updated.
```

Example 2: Updating login details

If a camera's password has changed:

```
CloudlessCamCLI camera modify a1b2c3d4-e5f6-7890-abcd-ef1234567890\
      --username admin \
      --password "NewPassword456"
```

Example 3: Changing the RTSP URL (without confirmation)

For use in scripts, you can use --force :

```
CloudlessCamCLI camera modify a1b2c3d4-e5f6-7890-abcd-ef1234567890\
      --url "rtsp://192.168.178.27/stream2" \
      --force
```

Example 4: Changing multiple properties simultaneously

```
CloudlessCamCLI camera modify a1b2c3d4-e5f6-7890-abcd-ef1234567890\
      --name "Input HD" \
      --url "rtsp://192.168.178.27/stream1_hd" \
      --username admin \
      --password "secret123" \
      --force
```

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camera remove

Removes a camera from the configuration. Optionally, you can also remove all associated recording configurations.

option	Description	Necessary
<CAMERA GUID>	GUID of the camera to be removed	Yes
--force	Perform removal without confirmation	No
--remove-recordings Remove associated recording configurations No		

Example 1: Remove camera with confirmation

```
CloudlessCamCLI camera remove a1b2c3d4-e5f6-7890-abcd-ef1234567890
```

Output:

```
Camera 'Entrance' will be removed.
WARNING: This camera has 2 active recording configurations.
Do you wish to continue? [y/n]: y
Camera successfully removed.
```

Example 2: Remove camera and recordings without asking.

For scripts or automations:

```
CloudlessCamCLI camera remove a1b2c3d4-e5f6-7890-abcd-ef1234567890 \
    --force \
    --remove-recordings
```

Output:

```
Camera 'Entrance' removed.
2 recording configurations removed.
```

Note: Removing a camera does not delete previously recorded footage.
Video files. These remain on the storage medium and can be manually
be deleted.

camera guess credentials

Automatically tries common default username/password combinations.
a test is performed on an ONVIF device to determine working credentials.
The command iterates through a list of frequently used default credentials and reports the first successful combination.

Option --	Description	standard
ip	ONVIF camera IP address (required) –	
--port	Camera's ONVIF port	80
--time-out	Timeout per attempt in seconds -f|--format	10
Output format (table|json|csv) -o|--output Saves the output to a		table
file		–

Example 1: Determining the access data of a camera

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```
CloudlessCamCLI camera guess-credentials --ip 192.168.178.27
```

Output upon success:

```
+------------+----------+
| Username | Password |
+------------+----------+
| admin              | admin          |
+------------+----------+
```

Example 2: Camera with custom port and timeout

```
CloudlessCamCLI camera guess-credentials --ip 192.168.178.27 \
      --port 8080 --timeout 5
```

Example 3: Output result as JSON

```
CloudlessCamCLI camera guess-credentials --ip 192.168.178.27 \
      --format json
```

Output upon success:

```
{
   "username": "admin",
   "password": "admin"
}
```

4.7.2 status – Status overview

The commands in the "status" category allow you to query the current state of the system, cameras, and storage. These commands are particularly useful for monitoring scripts and remote monitoring.

status overview

Displays a complete overview of the system with statistics on cameras, recordings, Memory and daemon status.

Option	Description	standard
-f|--format Output format (table|json) -r|--refresh		table
Automatic refresh in seconds –		
-o|--output Saves the output to a file		–

Example 1: Display system overview

```
CloudlessCamCLI status overview
```

Output:

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```
CloudlessCam System Overview
============================
Daemon status:          Running (PID: 12345)
Duration:               3 days, 14:23:45

Cameras:                4 configured
  On-line:              3
  Offline:              1

Recordings today:       847 files (12.4 GiB)
Total recordings: 28,943 files (412.7 GiB)

Memory:
  NAS backup:           78% occupied (1.2 TiB / 1.5 TiB)
  Local SSD:            45% occupied (225 GiB / 500 GiB)
```

Example 2: Continuous monitoring with automatic updates

```
CloudlessCamCLI status overview --refresh 5
```

With this option, the status display will be updated every 5 seconds. You can End the display with Ctrl+C .

Example 3: Exporting the status of a monitoring system

```
CloudlessCamCLI status overview --format json --output /var/monitoring/cloudlescam.json
```

status cameras

Displays detailed status information for all or filtered cameras. You can Filter by online/offline status or device group.

Option	Description	standard
-f|--format -d|--	Output format (table|json|csv) table	
detailed Displays extended information –		
-g|--group -o|--	Filters by device group ID	–
output --online-	Saves the output to a file –	
only Displays only online cameras --offline-only Displays		–
only offline cameras		–

Example 1: Display camera status with details

```
CloudlessCamCLI status cameras --detailed
```

Output:

```
+--------------------------------------+-----------+--------+----------+-----------+-----------+
| GUID                                 | Name      | Type   | Status   | Resolution | Bitrate |
+--------------------------------------+-----------+--------+----------+-----------+-----------+
| a1b2c3d4-e5f6-7890-abcd-ef1234567890 | Input     | ONVIF  | Online   | 1920x1080  | 4096 kbps |
| b2c3d4e5-f6a7-8901-bcde-f23456789012 | Garden    | RTSP   | Online   | 2560x1440  | 6144 kbps |
| c3d4e5f6-a7b8-9012-cdef-345678901234 | Living Room | ONVIF | Offline  | --         | --        |
+--------------------------------------+-----------+--------+----------+-----------+-----------+
```

Example 2: Offline cameras only for alerting

```
CloudlessCamCLI status cameras --offline-only --format json
```

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You can use this command in monitoring scripts to send notifications when cameras fail.

Example 3: Camera status as CSV for reporting

```
CloudlessCamCLI status cameras --format csv --output camera status.csv
```

The options --online-only and --offline-only cannot be used simultaneously.
become.

status storage

Displays status information for all configured storage locations, including occupancy and Availability.

option	Description	standard
-f|--format	Output format (table|json|csv)	table
usage --show-	Displays detailed memory usage --show-	–
recordings Displays the number of recordings per memory location		–
--type	Filters by storage type (filesystem|webdav|sftp|ftp) –	
-o|--output	Saves the output to a file	–

Example 1: Storage status with usage details

```
CloudlessCamCLI status storage --show-usage
```

Output:

```
+--------------------------------------+-----------+----------+---------+---------+---------+
| GUID                                 | Name      | Type     | Status | Occupied | Free    |
+--------------------------------------+-----------+----------+---------+---------+---------+
| d4e5f6a7-b8c9-0123-def4-567890123456 | NAS backup | webdav | e5f6a7b8-
c9d0-1234-ef56-789012345678 | Local SSD | file system | Active | f6a7b8c9-d0e1-2345-
f678-901234567890 | SFTP Cloud | sftp
+--------------------------------------+-----------+----------+---------+---------+---------+
```

Active	1.2 TiB	300 GiB	
	225 GiB	275 GiB	
Inactive	--	--	

Example 2: Memory with recording count

```
CloudlessCamCLI status storage --show-usage --show-recordings
```

Example 3: Show only WebDAV storage

```
CloudlessCamCLI status storage --type webdav --format json
```

4.7.3 Recording – Managing Recordings

The commands in the recording category allow you to edit existing recordings (video,
List audio and images, display them in different views, and organize them into common formats.
Export formats.

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recording list

Lists existing recordings. You can filter by camera, date, and recording type.

Option	Description	standard
-f|--format Output format (table|json|csv) -c|--camera Filters by		table
camera GUID		–
-d|--date	Filter by date (YYYY-MM-DD)	–
-l|--limit Maximum number of results (1-1000) -t|--type		50
	Filters by recording type (video|audio|image)	–
-o|--output Saves the output to a file		–

Example 1: All recordings of recent activities

```
CloudlessCamCLI recording list
```

Output:

```
+----------------------------------------+-----------+----------+---------+--------+---------+
| Filename                               | Camera    | Date     | Type    | Size   |
+----------------------------------------+-----------+----------+---------+--------+---------+
| Entrance_2026-01-31_14-30-00.mp4 | Entrance | 2026-01-31 | video | 245 MiB |
| Entrance_2026-01-31_14-00-00.mp4 | Entrance | 2026-01-31 | video | 238 MiB |
| Garden_2026-01-31_13-30-00.mp4 | Garden | 2026-01-31 | video | 312 MiB |
| Entrance_2026-01-31_13-15-22.jpg | Entrance | 2026-01-31 | image | 2.1 MiB |
+----------------------------------------+-----------+----------+---------+--------+---------+

Showing 4 of 847 images (use --limit for more)
```

Example 2: Recordings from a camera on a specific day

```
CloudlessCamCLI recording list \
    --camera a1b2c3d4-e5f6-7890-abcd-ef1234567890 \
    --date 2026-01-15 \
    --limit 200
```

Example 3: Export only snapshots as JSON

```
CloudlessCamCLI recording list --type image --format json --output snapshots.json
```

Example 4: All video recordings from today

```
CloudlessCamCLI recording list --type video --date 2026-01-31 --limit 500
```

recording timeline

Displays a timeline view of the recordings for a specific camera on a specific day. This visual representation helps you to identify gaps in the recording and to analyze the recording process.

option	Description	standard
<camera-id> Camera GUID (required) -d|--date		–
	Date for the timeline (YYYY-MM-DD)	today
--hours	Number of hours to display (1-24) 24	
--interval Interval in minutes (15, 30 or 60) --show-gaps Shows		60
gaps between recordings -f|--format Output format (table|json|csv)		–
-o|--output Saves the output to a file		table
		–

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Example 1: Timeline for today

CloudlessCamCLI recording timeline a1b2c3d4-e5f6-7890-abcd-ef1234567890

Output:

```
Timeline for camera 'Entrance' on 2026-01-31
==========================================

00:00 [################] 100%
01:00 [################] 100%
02:00 [################] 100%
 ...
12:00 [########--------] 50% <-- Gap detected
13:00 [################] 100%
14:00 [############----] 75%
```

Example 2: Detailed timeline with 15-minute intervals

CloudlessCamCLI recording timeline a1b2c3d4-e5f6-7890-abcd-ef1234567890 \ --date 2026-01-15 \

--interval 15 \
--show-gaps

Example 3: Show only the last 6 hours

CloudlessCamCLI recording timeline a1b2c3d4-e5f6-7890-abcd-ef1234567890 --hours 6

recording calendar

Displays a calendar view of the recordings for a specific camera. This gives you a quick overview of which days have recordings.

Option	Description	standard
<camera-id> Camera GUID (required) -m|--month		–
	Month for calendar view (YYYY-MM) --show-	current month
counts Displays the number of shots per day –		
-f|--format	Output format (table|json|csv)	table
-o|--output	Saves the output to a file	–

Example 1: Calendar for the current month

CloudlessCamCLI recording calendar a1b2c3d4-e5f6-7890-abcd-ef1234567890

Output:

```
Admissions calendar for 'Entrance' - January 2026
==========================================

    Mon Tue Wed Thu Fri Sat Sun
                    1* 2* 3* 4* 5*
     6* 7* 8* 9* 10* 11* 12*
    13* 14* 15* 16* 17* 18* 19*
    20* 21* 22* 23* 24* 25* 26*
    27* 28* 29* 30* 31

    * = Recordings available
```

Example 2: Calendar with number of photos taken per day

CloudlessCamCLI recording calendar a1b2c3d4-e5f6-7890-abcd-ef1234567890 \

--month 2026-01 \
--show-counts

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recording export

Exports a recording to a different file format. You can also choose to do this only in one format.
Export a section of the recording.

Option	Description	standard
<recording-filename> Recording filename (required) -o|--output -f|--format		–
	Target path for the exported file	necessary
	Output format (mp4|avi|mkv)	mp4
-q|--quality	Quality level (high|medium|low|verylow) medium	
--start	Start time (HH:MM:SS)	–
--duration	Duration in seconds	–
--overwrite	Overwrite existing file	–

The available quality levels affect the file size and image quality:

— **high:** Best possible quality, large files
— **medium:** Good compromise between quality and file size (standard)
— **low:** Reduced quality, smaller files
— **verylow:** Minimal quality, very small files (suitable for previewing)

Example 1: Simple export to MP4

```
CloudlessCamCLI recording export input_2026-01-15_12-00-00.mp4\
    --output /home/user/export/eingang_export.mp4
```

Example 2: Export excerpt (60 seconds from minute 5)

```
CloudlessCamCLI recording export input_2026-01-15_12-00-00.mp4\
    --output clip.mp4 \
    --start 00:05:00 \
    --duration 60
```

Example 3: Export to AVI with high quality

```
CloudlessCamCLI recording export video.mp4\
    --output video.avi \
    --format avi \
    --quality high \
    --overwrite
```

4.7.4 recording-config – Manage recording configurations

The commands in the recording-config category allow you to configure recording settings.
create, edit, and remove. A recording configuration defines which
A camera stream is recorded; in what format and with which...
Quality.

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recording-config list

Lists all recording configurations. You can filter by camera or Show only activated configurations.

Option	Description	standard
-c|--camera	Filters by camera GUID	–
--enabled-only Displays	only enabled configurations –	
-v|--verbose	Displays detailed information	–
-f|--format	Output format (table|json|csv)	table
-o|--output	Saves the output to a file	–

Example 1: Show all recording configurations

```
CloudlessCamCLI recording-config list
```

Output:

```
+--------------------------------------+---------------+-----------+--------+--------+---------+
| GUID                                 | Name          | Camera    | Type   | Status | Quality |
+--------------------------------------+---------------+-----------+--------+--------+---------+
| d1e2f3a4-b5c6-7890-def1-234567890123 | Main recording | Input     | video  | Active | high    |
| e2f3a4b5-c6d7-8901-ef23-456789012345 | Snapshots     | Entrance  | image  | Active | medium  |
| f3a4b5c6-d7e8-9012-f345-678901234567 | Garden Video  | Garden    | video  | Inactive | medium |
+--------------------------------------+---------------+-----------+--------+--------+---------+
```

Example 2: Only active configurations of a camera

```
CloudlessCamCLI recording-config list\
    --camera a1b2c3d4-e5f6-7890-abcd-ef1234567890 \
    --enabled-only \
    --verbose
```

recording-config create

Creates a new recording configuration for a camera.

option	Description -c|--	Necessary
camera GUID of the camera		Yes
-n|--name	Recording configuration name -t|--type	Yes
	Recording type (video|image|audio) -s|--stream	video
Stream name		No
--enable	Activate configuration immediately	No
--quality	Quality level (high|medium|low|verylow) medium	

Example 1: Creating and activating video recording

```
CloudlessCamCLI recording-config create\
    --camera a1b2c3d4-e5f6-7890-abcd-ef1234567890 \
    --name "Main Recording" \
    --type video \
    --quality high \
    --enable
```

Output:

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```
Recording configuration 'Main Recording' created.
GUID: d1e2f3a4-b5c6-7890-def1-234567890123
Status: Activated
```

Example 2: Creating a snapshot configuration

```
CloudlessCamCLI recording-config create\
    --camera a1b2c3d4-e5f6-7890-abcd-ef1234567890 \
    --name "Snapshots every 5 minutes" \
    --type image \
    --enable
```

Example 3: Recording with a specific stream

```
CloudlessCamCLI recording-config create\
    --camera a1b2c3d4-e5f6-7890-abcd-ef1234567890 \
    --name "Substream Recording" \
    --stream "substream" \
    --quality low
```

recording-config modify

Modifies an existing recording configuration. You can change the name, type, quality, and activation status.

option	Description	Necessary
<GUID>	Recording configuration GUID	Yes
-n|--name	New name	No
--enable	Activate configuration	No
--disable	Disable configuration -t|--type	No
	New recording type (video|image|audio) No	
-q|--quality Make new quality level change		No
--force	without confirmation	No

The --enable and --disable options cannot be used simultaneously.

Example 1: Activate configuration

```
CloudlessCamCLI recording-config modify d1e2f3a4-b5c6-7890-def1-234567890123 --enable
```

Example 2: Improve quality and rename

```
CloudlessCamCLI recording-config modify d1e2f3a4-b5c6-7890-def1-234567890123\
    --name "Main Recording HD" \
    --quality high \
    --force
```

Example 3: Temporarily disable recording

```
CloudlessCamCLI recording-config modify d1e2f3a4-b5c6-7890-def1-234567890123 --disable
```

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recording-config remove

Removes a recording configuration. Recordings already made will be retained.

Option Description		Necessary
<GUID> GUID of the recording configuration --force		Yes
removal without confirmation No		

Example: Remove configuration without asking

```
CloudlessCamCLI recording-config remove d1e2f3a4-b5c6-7890-def1-234567890123 --force
```

4.7.5 storage – Storage management

The commands in the storage category allow you to specify target storage for recordings. configure.

storage list

Lists all configured storage devices.

option	Description -f|--	standard
format	Output format (table|json|csv) -t|--type	table
	Filters by storage type (filesystem|webdav|sftp|ftp) –	
--enabled-only Shows only enabled memory -v|--verbose		–
	Displays detailed information	–
-o|--output	Saves the output to a file	–

Example 1: Show all storage locations

```
CloudlessCamCLI storage list
```

Output:

```
+--------------------------------------+----------------+------------+---------+
| GUID                                 | Name           | Type       | Status |
+--------------------------------------+----------------+------------+---------+
| d4e5f6a7-b8c9-0123-def4-567890123456 | NAS backup     | webdav     | Active |
| e5f6a7b8-c9d0-1234-ef56-789012345678 | Local SSD      | filesystem | Active |
| f6a7b8c9-d0e1-2345-f678-901234567890 | SFTP Cloud     | sftp       | Inactive |
+--------------------------------------+----------------+------------+---------+
```

Example 2: WebDAV storage only with details

```
CloudlessCamCLI storage list --type webdav --verbose
```

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storage add

Adds a new storage location. By default, the connection is established before the Adding tested.

Option	Description	Necessary
-n|--name	Memory name	Yes
-t|--type -p|--	Storage type (filesystem|webdav|sftp|ftp) Yes	
path	Path or URL to the storage	Yes
-h|--host	Host for network storage	With webdav, sftp, ftp
--port	Port for network storage	WebDAV=443, SFTP=22, FTP=21
-u|--username	Username for authentication	No
--password	Password for authentication	No
--enable	Activate storage immediately	No
--test-connection Test connection before adding		true

Example 1: Local directory as storage

```
CloudlessCamCLI storage add \
    --name "Local Memory" \
    --type filesystem \
    --path "/mnt/recordings" \
    --enable
```

On Windows:

```
CloudlessCamCLI storage add --name "Local SSD" --type filesystem --path "D:\Recordings" --enable
```

Example 2: WebDAV storage (Nextcloud)

```
CloudlessCamCLI storage add \
    --name "Nextcloud Recordings" \
    --type webdav \
    --host "nextcloud.example.com" \
    --path "/remote.php/dav/files/admin/Recordings" \
    --username admin \
    --password "SecretPassword123" \
    --enable
```

Example 3: SFTP server

```
CloudlessCamCLI storage add \
    --name "Backup Server" \
    --type sftp \
    --host backup.example.com \
    --port 22 \
    --path "/home/cloudlescam/recordings" \
    --username cloudlescam \
    --password "sshpassword"
```

Example 4: FTP server with a non-standard port

```
CloudlessCamCLI storage add \
    --name "FTP Archive" \
    --type ftp \
    --host ftp.example.com \
    --port 2121 \
    --path "/videos/security" \
    --username ftpuser \
    --password "ftppassword" \
    --enable
```

Machine Translated by Google

storage modify

Modifies an existing storage location. You can change the name, path, access credentials, and Change activation status.

option	Description	Necessary
<GUID>	GUID of the memory	Yes
-n|--name	New name	No
-p|--path	New path or URL	No
-h|--host	New host	No
--port	New port	No
-u|--username	New username	No
--password	New password	No
--enable	Activate storage	No
--disable	Disable storage. Make	No
--force	changes without confirmation.	No

Example 1: Renaming memory

```
CloudlessCamCLI storage modify d4e5f6a7-b8c9-0123-def4-567890123456\
    --name "NAS Main Storage"
```

Example 2: Updating login details

```
CloudlessCamCLI storage modify d4e5f6a7-b8c9-0123-def4-567890123456\
    --username newuser \
    --password "newpassword" \
    --force
```

Example 3: Activate storage and change path

```
CloudlessCamCLI storage modify f6a7b8c9-d0e1-2345-f678-901234567890\
    --path "/new/storage/path" \
    --enable
```

storage remove

Removes one memory location from the configuration. Optionally, you can also remove all references from recording configurations.

option	Description	Necessary
<GUID>	GUID of the memory	Yes
--force	Perform removal without confirmation	No
--remove-from-recordings	Remove references from recording configurations	No

Example 1: Remove memory with confirmation

```
CloudlessCamCLI storage remove d4e5f6a7-b8c9-0123-def4-567890123456
```

Output:

```
Storage 'NAS-Backup' will be removed.
WARNING: This memory is used by 3 recording configurations.
Do you wish to continue? [y/n]:
```

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Example 2: Complete removal without consultation

```
CloudlessCamCLI storage remove d4e5f6a7-b8c9-0123-def4-567890123456 \
    --force \
    --remove-from-recordings
```

Note: Removing a storage device does not delete the data stored on it.
Recordings. These will be retained and can be deleted manually.

4.7.6 settings – Settings management

The commands in the settings category allow you to adjust the program settings.
View, modify, back up, and restore settings. CloudlessCam stores settings in
INI files, which are organized into categories (sections).

settings list

Displays the current settings. You can filter by category or select a
Query individual settings.

option	Description -c|--	standard
category Category (ui|network|recording|system|all) all		
-k|--key	Displays a specific setting -v|--verbose	–
Displays detailed information -f|--format		–
	Output format (table|json|csv)	table
-o|--output	Saves the output to a file	–

Example 1: Show all settings

```
CloudlessCamCLI settings list
```

Output:

```
+----------------+-----------------+--------------------+
| Category       | Key             | Value              |
+----------------+-----------------+--------------------+
| Core           | Debug           | false              |
| Core           | LogLevel        | Warning            |
| UI             | ThemeMode       | Dark               |
| UI             | Language        | de-DE              |
| Network        | Timeout         | 30                 |
| Recording      | DefaultQuality  | medium             |
+----------------+-----------------+--------------------+
```

Example 2: Show only UI settings

```
CloudlessCamCLI settings list --category ui --verbose
```

Example 3: Querying a single setting

```
CloudlessCamCLI settings list --key Core.Debug
```

Example 4: Exporting settings as JSON

```
CloudlessCamCLI settings list --format json --output settings.json
```

Machine Translated by Google

settings set

Changes settings. There are three ways to set settings:

1. **Individual setting:** Specify key and value directly.
2. **Batch mode:** Set multiple settings at once
3. **From file:** Import settings from an INI file

option	Description of	standard
<key>	setting key (Format: Section.Key)	–
<value>	New value	–
-s|--section	Standard section for keys without a section	general
-b|--batch	Batch mode with multiple key=value pairs	–
-f|--from-file Load settings from INI file		–
--merge	Merge with existing settings –	
--validate	Validate settings before applying	–
--confirm	Interactive confirmation for critical changes –	

Example 1: Changing a single setting

```
CloudlessCamCLI settings set Core.Debug true
```

Output:

```
Setting changed:
    Core.Debug: false -> true
```

Example 2: Changing the design theme

```
CloudlessCamCLI settings set UI.ThemeMode Dark
```

Example 3: Multiple settings in batch mode

```
CloudlessCamCLI settings set --batch \
        "Core.Debug=false" \
        "UI.ThemeMode=Dark" \
        "Network.Timeout=60"
```

Example 4: Importing settings from a backup file

```
CloudlessCamCLI settings set --from-file backup_settings.ini --merge
```

With -- Only the settings contained in the file will be overwritten.
merge. Without this option, all settings are reset and only those from the
File used.

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settings backup

Creates a backup of your current settings. You can restore these later using "settings restore" .

option	Description -o|--	Necessary
output Target path	for the backup file Yes --compress Compress	
backup		No

Example 1: Simple Backup

CloudlessCamCLI settings backup --output settings_backup.ini

Output:

Settings saved to: settings_backup.ini Number of settings: 47

File size: 2.3 KiB

Example 2: Compressed backup with date

CloudlessCamCLI settings backup --output "C:\Backup\CloudlessCam\settings_2026-01-31.ini" --compress

settings restore

Restores settings from a backup file.

option	Description	Necessary
<backup-file> Path to	the backup file	Yes
--force	Perform recovery without confirmation: No	

Example 1: Restore settings with confirmation

CloudlessCamCLI settings restore settings_backup.ini

Output:

Settings will be restored from 'settings_backup.ini'.
WARNING: All current settings will be overwritten.
Do you want to continue? [y/n]: y 47 Settings
restored.
Please restart the daemon for the changes to take effect.

Example 2: Restoration without prompting (for scripts)

CloudlessCamCLI settings restore settings_backup.ini --force CloudlessCamCLI daemon restart

4.7.7 license – License management

The commands in the "license" category allow you to activate, view, and manage licenses. CloudlessCam supports both online and offline activation for systems without internet access.

Machine Translated by Google

Free license

Without a validly activated license, CloudlessCam runs with the free license.
Only one recording slot is available. If multiple cameras are needed...
If a recording slot is in use simultaneously, only the camera with that free slot can continue recording. Other cameras without an available license slot will be stopped.
The title bar indicates this state with "FREE"; the license page and license list also display a "FREE" entry . The free license slot remains active even with valid licenses and is added to the licensed slots.
Slots counted. CloudlessCam preferentially uses the free licensed slot first.
and then paid license slots; when the free license slot becomes available, a
The appropriate ongoing recording is automatically transferred to it. A license for
Three cameras allow for four local recording slots. Expired licenses
They remain visible in the list; the available fallback is then the free license.

license status

Displays an overview of the current license status, including activated licenses and available camera slots.

Example:

```
CloudlessCamCLI license status
```

Output:

```
License status
============
Licenses:          2 active
Camera slots:      8/11 used
License type:      standard
Expiry date:       Unlimited

Active licenses:
  XXXX-XXXX-XXXX-XXXX-1    5 cameras. Activated on: 2025-06-15
  XXXX-XXXX-XXXX-XXXX-1    5 cameras. Activated on: 2025-12-01
```

license list

Lists all saved licenses. The output also includes the entry "FREE " with one available slot.

option	Description -f|--	standard
format Output for	mat (table|json|csv) table	
-o|--output Saves	the output to a file –	

Example:

```
CloudlessCamCLI license list
```

Machine Translated by Google

activate license

Activates a license key online.
necessary.

Option	Description	Necessary
-k|--key License	key in the format XXXX-XXXX-XXXX-XXXX-N Yes	

Example:

CloudlessCamCLI license activate --key XXXX-XXXX-XXXX-XXXX-1

Output:

License is being activated...

Connection to the license server established.

License successfully activated!

Type: Standard
Cameras: 5

Valid until: Indefinitely

license usage

Displays current license usage across all devices. This feature allows you to...
Check how many camera slots are used on which computers.

Option	Description	standard
-f|--format Output format (table|json|csv) -o|--output Saves the		table
output to a file		–
--license	Filters by license hash (prefix possible)	–
--local	Displays only recordings on this computer –	

Example:

CloudlessCamCLI license usage

Output:

```
License usage
=============
+------------------+-------------+------------------+
| Computer         | Cameras     | Recent Activity  |
+------------------+-------------+------------------+
| Office Server    | 4           | 2026-01-31 14:30 |
| Home System      | 2           | 2026-01-31 10:15 |
| Branch office    | 2           | 2026-01-30 23:45 |
+------------------+-------------+------------------+
Total: 8/11 cameras used
```

Machine Translated by Google

license set-computer-name

Sets the computer name that is submitted to the license server. This helps you distinguish between different installations.

option	Description -n|--	Necessary
name Name of	the computer (for example, location or hostname)	Yes

Example:

```
CloudlessCamCLI license set-computer-name --name "Office Server"
```

Offline activation

For systems without an internet connection, CloudlessCam offers a three-step offline activation process. This requires a second device with internet access.

Step 1: Create a request on the offline system

On a system without an internet connection, run the following command:

```
CloudlessCamCLI license offline-request \ --output
    CloudlessCam.prelicensed \
    --computer-name "production server"
```

Copy the created CloudlessCam.prelicensed file to a USB stick or other transfer medium.

Step 2: On a system with an internet connection, generate the activation file-ieren

On a computer with internet access:

```
CloudlessCamCLI license offline-generate \ --key XXXX-
    XXXX-XXXX-XXXX-1 \ --request
    CloudlessCam.prelicensed \
    --output CloudlessCam.fullylicensed
```

Output:

```
Connection to the license server established.
Activation file successfully generated: CloudlessCam.fulllicensed. Please transfer this
file to the offline system.
```

Step 3: Import the activation file onto the offline system

Back on the offline system:

```
CloudlessCamCLI license offline-import --file CloudlessCam.fulllicensed
```

Output:

```
License successfully imported!
  Type: Standard
  Cameras: 5
  Computer: Production server
```

Machine Translated by Google

command	Description
license offline-request creates a request file (.prelicensed) on the offline system	
license offline-generate Generates an activation file (.fulllicensed) with internet access	
license offline import	Imports the activation file onto the offline system

4.7.8 ptz – PTZ control

The commands in the ptz category allow you to use PTZ-enabled cameras (Pan/Tilt/-
Remote control of zoom. The availability of functions depends on the specific model.
It depends on the camera and its ONVIF support. Not all cameras support all features.
PTZ functions.

ptz control

Controls the PTZ functions of a camera.

option	Description
<action>	Action: move, home, preset, capabilities, test-capab
-c|--camera	Camera GUID
-d|--direction	Direction for move (left|right|up|down|up-left|up-
-s|--speed -p|--	Speed (1-100, where 1=slow, 100=fast)
preset -f|--	Preset name or token
format	Output format (table|json|csv) for capabilities, p
--backend	Set PTZ backend (SharpOnvif|OnvifCore|Mictlan
--invert-horizontal / --no-invert-horizontal	Turn horizontal inversion on/off
--invert-vertical / --no-invert-vertical	Turn vertical inversion on/off
--movement-scaling --	Scale pan/tilt coordinates per camera (endl)
enable-diagonal-emulation / --disable-diagonal-emulation Switch diagonal emulation on/off --max-diagonal-moves	
	Maximum single-axis steps for diagonal emulation
--command-emulation-mode	PTZ command emulation (standard|step-via-continuo

Available actions:

— capabilities: Displays detected PTZ capabilities of the camera (PTZ, pan,
Tilt, Zoom, Presets).
— test-capabilities: Performs visual PTZ ability tests sequentially across all
It outputs the matrix for each PTZ backend.
— settings: Displays the current PTZ add-on options and updates them op-
tional via the switches mentioned above.
— move: Performs exactly one PTZ movement step in the specified direction
from (including diagonals and zoom).
— home: Moves the camera to its starting position.
— preset: Without --preset , all presets are listed. With --preset, the
Camera to the specified preset.

Example 1: Querying PTZ capabilities

Machine Translated by Google

```
CloudlessCamCLI ptz control capabilities --camera a1b2c3d4-e5f6-7890-abcd-ef1234567890
```

Output:

```
PTZ Capabilities - Entrance
==========================

Capability Supported Details
PTZ             Yes         Available
Pan             Yes         Available
Tilt            Yes         Available
zoom            Yes         Available
Presets         Yes         8 available
```

Example 2: Run PTZ capability tests across all PTZ backends

```
CloudlessCamCLI ptz control test-capabilities\
    --camera a1b2c3d4-e5f6-7890-abcd-ef1234567890
```

The command tests SharpOnvif, OnvifCore, MictlanixOnvif, QuickN-VOnvif, and XiaoFengOnvif sequentially. The output contains a matrix with the columns Cont, ContDiag, Rel, RelDiag, Abs, AbsDiag, Zoom, NightVision and TestedAtUtc.

Output:

```
PTZ Capability Test Matrix - Input
==================================

PTZ backend     Cont ContDiag Rel RelDiag Abs AbsDiag Zoom NightVision TestedAtUtc
SharpOnvif      Yes  Yes      Yes Yes     Yes No     Yes  No          2026-03-05T11:33:10.421Z
OnvifCore       Yes  No       Yes No      No   No    Yes  No          2026-03-05T11:34:02.904Z
```

Untested values are displayed as N/A in the table view (empty in CSV).

Example 3: Move the camera to the left

```
CloudlessCamCLI ptz control move\
    --camera a1b2c3d4-e5f6-7890-abcd-ef1234567890 \
    --direction left \
    --speed 30
```

This command executes a single movement step. Repeat the command for further steps.

If a camera continues to move, you can explicitly stop the movement:

```
CloudlessCamCLI ptz control move\
    --camera a1b2c3d4-e5f6-7890-abcd-ef1234567890 \
    --direction stop
```

Example 4: Zoom in on the camera a little.

```
CloudlessCamCLI ptz control move\
    --camera a1b2c3d4-e5f6-7890-abcd-ef1234567890 \
    --direction zoom-in \
    --speed 60
```

Example 5: Return to the starting position

```
CloudlessCamCLI ptz control home --camera a1b2c3d4-e5f6-7890-abcd-ef1234567890
```

Example 6: Listing presets

Machine Translated by Google

```
CloudlessCamCLI ptz control preset --camera a1b2c3d4-e5f6-7890-abcd-ef1234567890
```

Output:

```
+--------+-----------------+
| Token | Name                          |
+--------+-----------------+
| 1             | Entrance                |
| 2             | Parking lot             |
| 3             | Garage                  |
+--------+-----------------+
```

Example 7: Navigate to a preset

```
CloudlessCamCLI ptz control preset \ --camera
    a1b2c3d4-e5f6-7890-abcd-ef1234567890 \
    --preset "Parking lot"
```

Example 8: PTZ capability tests as JSON for scripts

```
CloudlessCamCLI ptz control test-capabilities\
    --camera a1b2c3d4-e5f6-7890-abcd-ef1234567890 \
    --format json
```

JSON contains the fields supports_continuous, supports_continuous_diagonal, supports_relative, supports_relative_diagonal, supports_absolute, supports_absolute_diagonal, supports_zoom and supports_night_vision.

Example 9: Display current PTZ add-on options

```
CloudlessCamCLI ptz control settings\
    --camera a1b2c3d4-e5f6-7890-abcd-ef1234567890
```

Example 10: Setting PTZ additional options

```
CloudlessCamCLI ptz control settings\
    --camera a1b2c3d4-e5f6-7890-abcd-ef1234567890 \
    --backend OnvifCore \
    --invert-horizontal \ --movement-
    scaling 0.01 \ --enable-diagonal-
    emulation \ --max-diagonal-moves 8 \ --
    command-emulation-mode step-
    via-continuous
```

4.7.9 image – Image settings

The commands in the "image" category allow you to view and adjust the image settings of ONVIF-compatible cameras. These settings affect both live video and recorded footage.

Machine Translated by Google

image settings

Displays or changes the image settings of a camera.

option	Description	standard
<action>	Action: list or set	necessary
-c|--camera	Camera GUID	required for set
-b|--brightness	Brightness (-100 to 100, 0=neutral)	–
--contrast	Contrast (-100 to 100, 0=neutral)	–
--saturation	Saturation (-100 to 100, 0=neutral)	–
--hue	Hue (-180 to 180 degrees, 0=neutral)	–
--watermark-path	Path to the watermark image file (PNG, JPG, etc.)	–
--watermark-size	Watermark size in % (5–200, 100=original size)	–
--watermark-x	Horizontal position (0=left, 50=center, 100=right)	–
--watermark-y --	Vertical position (0=top, 50=middle, 100=bottom)	–
watermark-opacity	Watermark opacity (0=invisible, 100=fully visible)	–
	Output format for list (table|json|csv) -f|--format	table
-o|--output	Saves the output to a file	–

The value ranges:

— **Brightness:** Negative values darken the image, positive values brighten it.

— **Contrast:** Negative values reduce contrast (flatter image), positive values increase contrast. Values increase it.

— **Saturation:** Negative values reduce color intensity (grayer), positive values increase it Values reinforce them.

— **Hue:** Shifts the colors in the color wheel (for example, +30 shifts (Towards red).

— **Watermark:** Overlays a custom image onto photos. The image file must be located locally. The size is specified relative to the original size of the watermark. The position determines where the watermark is placed. A watermark is placed in the camera image.

Example 1: Displaying image settings for all cameras

```
CloudlessCamCLI image settings list
```

Output:

```
+-----------+------------+----------+----------+----------+------+
| Camera          | Brightness | Contrast | Saturation | Hue |
+-----------+------------+----------+----------+----------+------+
| Entrance | 0                          | 0              | 0              | 0         |
| Garden | 10                          | 5              | 0              | 0         |
| Living room| -5                         | 0              | -10            | 0         |
+-----------+------------+----------+----------+----------+------+
```

Example 2: Increasing the brightness of a camera

```
CloudlessCamCLI image settings set\
      --camera a1b2c3d4-e5f6-7890-abcd-ef1234567890 \
      --brightness 15
```

Machine Translated by Google

Example 3: Adjusting multiple image settings simultaneously

```
CloudlessCamCLI image settings set\
    --camera a1b2c3d4-e5f6-7890-abcd-ef1234567890 \
    --brightness 10 \
    --contrast 5 \
    --saturation -5
```

Example 4: Adding a watermark

```
CloudlessCamCLI image settings set\
    --camera a1b2c3d4-e5f6-7890-abcd-ef1234567890 \
    --watermark-path /path/to/logo.png \
    --watermark-size 50 \
    --watermark-x 90 \
    --watermark-y 10 \
    --watermark-opacity 70
```

4.7.10 update – Updates

The commands in the update category allow you to search for updates, install them, and configure the update channel.

update check

Checks if a new version of CloudlessCam is available. This function
An internet connection is required.

option	Description	standard
--format	Output format (table|json)	table
--output --	Saves the output to a file	–
check-pre-release	Includes pre-release versions in the check. Overrides the	–
--channel	update channel (release|test)	–
--silent	Output only when an update is available –	

Example 1: Check for updates

```
CloudlessCamCLI update check
```

Output (if update available):

```
Update available!
  Current version: 2026.01.15.1200
  New version:     2026.01.31.0800
  Changes:         https://cloudlescam.de/changelog

To install: CloudlessCamCLI update install
```

Example 2: Silent testing for scripts

```
CloudlessCamCLI update check --silent
```

The `--silent` option suppresses output if no update is available. The exit code is 0 if an update is available and 1 if no update is available.

Example 3: Testing test versions

```
CloudlessCamCLI update check --check-pre-release --channel test
```

Machine Translated by Google

update install

Downloades a new version and starts the update installer.

Before installation, running CloudlessCam processes are cleaned by the updater. finished.

option	Description	standard
--version	Installs a specific version	latest version
--pre-release	Allows the installation of pre-release versions	–
--channel	Overrides the update channel (release|test) –	
--force	Perform installation without confirmation	–
--download-only	Only downloads the update, does not install it –	

Example 1: Install the latest update

```
CloudlessCamCLI update install
```

Output:

```
Update is being downloaded...
  Version: 2026.01.31.0800
  Size: 45.2 MiB
  [####################] 100%

The update installer has started.

Please confirm the administrator prompt if necessary and wait.
until the update installer reports completion.
```

Example 2: Install a specific version

```
CloudlessCamCLI update install --version 2026.01.15.1200
```

Example 3: Download the update only (for later installation)

```
CloudlessCamCLI update install --download-only
```

update channel show

Displays the currently configured update channel.

Example:

```
CloudlessCamCLI update channel show
```

Output:

```
Current update channel: release
```

Machine Translated by Google

update channel set

Changes the update channel.

option	Description	Necessary
<channel>	Update channel (release or test)	Yes

The available channels:

— **release:** Stable, tested versions. Recommended for production systems. — **test:** Also includes test versions with new features. For testing purposes only.

recommended.

Example: Switching to test channel

```
CloudlessCamCLI update channel set test
```

Output:

```
Update channel changed: release -> test
WARNING: The test channel may contain unstable versions.
```

4.7.11 maintenance – Servicing

The commands in the maintenance category allow you to perform maintenance tasks to keep the system clean and performing well.

maintenance clean

Cleans up temporary files and optimizes memory. This command removes:

— Temporary files in the working directory
— Cached data
— Aborted upload/download fragments
— Orphaned thumbnail files

Logs and configuration files will not be deleted.

Example:

```
CloudlessCamCLI maintenance clean
```

Output:

```
Cleanup is being carried out...
  Temporary files: 23 files removed (145 MiB)
  Cache data:      12 files removed (34 MiB)
  Orphaned files: 3 files removed (8 MiB)

Total released: 187 MiB
```

Note: For a complete cleanup, it is recommended to stop the daemon beforehand:

```
CloudlessCamCLI daemon stop
CloudlessCamCLI maintenance clean
CloudlessCamCLI daemon start
```

Machine Translated by Google

4.7.12 daemon – background service

You can control the CloudlessCam background service using the daemon command.
The daemon is the heart of CloudlessCam and executes all configured
Recordings.

option	Description	standard
<action>	Action: start|stop|restart|status|logs required	
-c|--config Path to	configuration file	–

Available actions:

— start: Starts the daemon as a background process.
— stop: Terminates the running daemon.
— restart: Stops and restarts the daemon (for example, after configuration changes).

— status: Displays the current status of the daemon (running/stopped, PID, runtime).
— logs: Displays the daemon's latest log entries.

Example 1: Starting a Daemon

```
CloudlessCamCLI daemon start
```

Output:

```
Daemon is starting...
Daemon successfully started (PID: 12345)
```

Example 2: Checking Daemon Status

```
CloudlessCamCLI daemon status
```

Output (when daemon is running):

```
Daemon Status: Running
  PID:          12345
  Duration:     3 days, 14:23:45
  Memory:       245 MiB
  Cameras:      4 active
  Recordings:   3 active streams
```

Output (when Daemon is stopped):

```
Daemon status: Stopped
```

Example 3: View logs

```
CloudlessCamCLI daemon logs
```

Output:

```
[2026-01-31 14:30:00] INFO Recording started: Entrance
[2026-01-31 14:30:01] INFO Recording started: Garden
[2026-01-31 14:30:15] WARNING: Camera 'Living Room' not reachable
[2026-01-31 14:30:45] INFO Connection to 'Living Room' restored
[2026-01-31 15:00:00] INFO Recording closed: Entrance_2026-01-31_14-30-00.mp4
```

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Example 4: Restarting the daemon after configuration changes

```
CloudlessCamCLI daemon restart
```

Example 5: Starting a daemon with an alternative configuration

```
CloudlessCamCLI daemon start --config /etc/cloudlescam/production.json
```

Note: The daemon can only run as a single instance. If you-

If you try to start a second daemon, you will receive an error message. The GUI automatically stops any running CLI daemon upon startup and restarts it upon exit.

For stable 24/7 operation, it is recommended to use the Daemon together with the Pacemaker. The Pacemaker monitors the Daemon and starts it.

It will automatically restart if it quits unexpectedly. See below for more information.

See section 9.3.

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5

CloudlessCam Player / CloudlessCam Web Player

CloudlessCam offers two specialized applications for playing back recordings: the **CloudlessCam Player** (desktop application) and the **CloudlessCam Web Player** (web server with a browser interface). Both applications operate in player-only mode and cannot configure cameras or

Starting recording.

5.1 Overview

5.1.1 CloudlessCam Player (Desktop)

The CloudlessCam Player is a standalone desktop application for playing and managing recordings created with CloudlessCam.
Unlike the main application, the player does not require any camera configuration.
and is exclusively designed for playing back recordings from target storage devices.

The CloudlessCam Player is particularly suitable for the following scenarios:

— **Playback at the workplace:** You can conveniently play recordings from remote storage locations (for example, NAS, SFTP server or WebDAV).

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— **Quickly check archives:** Administrators can use this to verify the correct transfer and storage of recordings.

— **Export and sharing:** Individual clips or time periods can be exported, for example for the police, insurance companies or for internal documentation.

— **Remote storage control client:** The player allows access to multiple target storage devices simultaneously without requiring camera configuration.

5.1.2 CloudlessCam Web Player (web server)

The CloudlessCam Web Player allows you to conveniently view your recordings in your browser without having to launch the desktop application. Designed as a standalone web server, it offers a password-protected interface for playing back video and audio recordings.
Typical use cases include:

— **Home network:** Access recordings via tablet, smart TV or a other computers on the local network.

— **Control center or kiosk mode:** Browser-based display of recordings on a dedicated monitor.

— **Remote access via LAN or VPN:** Administrators can record footage from check from another workplace.

5.1.3 Target group

The target audience includes both end users who want to view recordings and administrators who need a quick way to check their recording archives.

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5.2 CloudlessCam Player (Desktop)

5.2.1 Configuration and Data Rooms

The CloudlessCam Player uses its own configuration file, completely separate from the main application. This ensures that you can use the player without affecting the camera or recording configuration of the main application.

Configuration file:

— **Filename:** Player.CloudlessCam.json (as opposed to Default.CloudlessCam. (json of the main application)

— **Storage location:** The same mechanism is used as with the main application, so either %appdata%\CloudlessCam\ or the directory next to the executable file.

— **Backups:** Player backups are saved with the prefix Player_ and are also separate from the backups of the main application.

The player only stores information about target storage locations, the last synchronized recordings, and player-specific settings. Camera configurations, recording settings, or similar data from the main application are not modified.

5.2.2 Target Storage and Synchronization

In CloudlessCam Player, you manage a list of target storage locations from which recordings can be loaded. These target storage locations correspond to the same storage types used in the main application (file system, SFTP, FTP/FTPS, WebDAV, S3-compatible, Backblaze B2, Dropbox, Google Drive, OneDrive).

Synchronization:

When you click the "Update" button, the player performs the following steps:

1. **Load metadata:** The player queries all activated target storage locations and loads them. the list of available recordings.
2. **Detect new files:** Recordings added since the last update are included in the local view.
3. **Deduplication:** If the same recording exists on multiple storage devices, it will only be displayed once.

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4. **Update index:** The found recordings are saved in the configuration so that they are available even without resynchronization.
   are.

Notes:

— There is a certain latency between the time of a recording.
  and its visibility in the player. This depends on how quickly the recording is transferred to the target storage and when you refresh.
  carry out.

— With slow or unstable network connections, synchronization may take longer or fail. In this case
  A corresponding error message will be displayed.

5.2.3 Playback and Timeline

The recordings view in the CloudlessCam Player has the same interface as in the main CloudlessCam application. It consists of three main components: calendar, timeline, and video player.

Selection model:

1. **Select a day:** First, select a day from the calendar. Days on which
   Those for which recordings are available will be highlighted.
2. **Select time segment:** In the timeline you will see all recordings of the selected time segment.
   The days are displayed as colored segments. Clicking on a segment starts playback at that point.
3. **Navigating recordings:** During playback, you can switch between
   Switch between different recordings or jump to a specific time.
   gene.

Periods without recordings are displayed as gaps in the timeline.

Export opportunities:

You can either export the currently playing recording or a
Select the time range from which all related clips will be combined and exported.

5.2.4 Encryption

The CloudlessCam Player supports playback of encrypted recordings. If your recordings are password-protected, you will need to...
Enter this password in the player to enable playback.

Password entry:

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If you want to play an encrypted recording and no password has yet been set, an input dialog will appear automatically. The entered
The password is stored in the player configuration, so you don't have to enter it every time.
You will need to re-enter the playback settings.

Supported encryption formats:

— .encrypted7z.7z: 7-Zip archiving with AES-256 password protection.

Decryption:

To decrypt 7-Zip encrypted recordings outside the player
You can use the 7-Zip tool:

```
7z x -p<PASSWORD> <FILE.encrypted7z.7z>
```

Error cases:

— **Incorrect password:** An error message will be displayed stating that the password is invalid or the file may be corrupted.
— **Partially encrypted data sets:** If only some recordings are encrypted (for example, after a migration), the unencrypted recordings can still be played without a password.

5.2.5 Operation

Navigation and action areas

The CloudlessCam Player's user interface is divided into two main areas: the left sidebar with tabs and the right area for playback of
Recordings.

Tabs in the sidebar:

— **Destination Storage:** Here you manage all destination storage from which data is routed.
Recordings are being loaded.
— **Settings:** Here you will find settings for the user interface, the automatic update interval of the storage destinations, etc.
Configuration password, for backups and for the desktop shortcut.

Action bar on the Storages page:

— **Add storage:** Opens a dialog to add a new storage location
Target storage.
— **Update memory:** A large button synchronizes the recording-
List all activated target storage locations.
— **Import from CloudlessCam file:** Imports target storage from an existing file.
whose CloudlessCam configuration file.

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Update on the player page:

— **Update panel above the video area:** Above the playback is a separate panel with a large button for replaying.
Reading the recording list.

Title bar:

You will find additional buttons in the title bar:

— **Switch design:** Changes between light and dark appearance
picture.

— **Change language:** Allows you to select the programming language.

Manage target storage:

Each target storage is displayed as a card with the most important information.

Information displayed:

— **Name:** The name of the target storage (for example, “NAS Living Room” or “SFTP Server”).

— **Device name:** An optional user-defined name for better identification tification.

— **Enabled status:** Indicates whether the memory is taken into account during synchronization.
is seen.

Available actions:

— **Refresh:** Specifically rereads the selected target memory.

— **Change name:** Changes the display name of the target storage.

— **Edit:** Opens the settings of the target storage for editing (path, access data, etc.).

— **Remove:** Deletes the target storage location from the player configuration. Recordings on the storage location itself are not deleted.

— **Enable/Disable:** Use the checkbox to specify whether the storage should be taken into account during synchronization.

View and export recordings. The right
side of the user interface displays the recordings view with calendar, timeline and video player.

Select date:

In the calendar, days with existing photos are highlighted in color.
You can navigate between months and load the recordings for that day by clicking on it.

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Timeline:

The timeline displays all photos from the selected day as colored segments.

— Clicking on a segment will start playback at that point.
— The timeline can be zoomed (1x to 6x magnification) to
To see details more clearly.
— Periods of time without recordings appear as gaps in the timeline.

Video player:

The integrated video player offers the following functions:

— **Play/Pause:** Start and pause the current recording.
— **Timeline:** Jump to any point within the recording.
— **Speed:** Adjustable playback speed (0.5x, 0.75x-
multi-fold, single-fold, 1.25-fold, 1.5-fold, double-fold).
— **Volume:** Volume control and mute.
— **Time display:** Displays the current position and total duration.

Export:

You can export recordings to various video formats:

— **Export current recording:** Saves the currently playing recording as a new file.

— **Export time range:** Allows you to select a start and end time point. All recordings within this period will be combined and exported as a single file.

Settings

In the settings tab you will find various options for customizing the play function.
ers.

User interface:

— **UI scaling:** Adjusts the size of all controls (50% to 150%).
The default value is 95%.
— **Automatic memory update:** Specifies in minutes how often the web player automatically reloads activated memory destinations. The default value is 60 minutes.

Configuration password:

You can protect the player configuration with a password.

— **Set password:** Encrypts the configuration file. You will be asked, whether existing backups should also be encrypted.

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— **Remove password:** Requires entering the current password. The configuration will then be decrypted.

It is important to note that if you lose your password, you will no longer be able to access the encrypted configuration. Therefore, keep your password safe.

Backup management:

The player automatically creates backups of the configuration.

— **Backup list:** Displays all available backups with timestamps.
— **Load backup:** Select a backup and click on "Selected". "Load backup" to restore the previous state.

Backup storage is automatic: All backups from the last hour are kept, then one per hour for the current day, one per day for the last 30 days, and one per month permanently.

Desktop shortcut: The "Create desktop shortcut" button allows you to create a shortcut on your desktop to quickly launch the CloudlessCam Player.

5.2.6 Import from CloudlessCam

The import function allows you to copy target storage from an existing CloudlessCam configuration file. This enables a quick start without having to manually recreate all storage locations.

Procedure:

1. Click on “Import from CloudlessCam file” in the toolbar.
2. Select the CloudlessCam configuration file (usually Default). CloudlessCam.json).
3. If the file is encrypted, you will be prompted to enter the password. demands.
4. After successful import, a summary is displayed showing how many Memory added and how many were skipped.

What will be imported:

— All target storage locations with their settings (path, access data, custom settings) (Names).
— The activated status of the storage.

What will not be imported:

— Camera configurations

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— Recording settings

— General application settings

Duplicate detection:

The import process recognizes existing target storage devices based on their configuration.
If a memory location with identical settings already exists in the player, it will be skipped and not added again.

Safety notice:

The CloudlessCam configuration file may contain access data for remote storage (for example, SFTP passwords). Therefore, keep this file secure and do not share it with unauthorized individuals.

5.2.7 Troubleshooting (Desktop)

No recordings visible

If no recordings are displayed after synchronization, check the following points:

— **Target storage enabled:** Ensure that the desired target storage is enabled (checkbox).

— **Update performed:** Click on “Update” to view the update.
To update the list of participants.

— **Correct path:** Check that the path to the target memory is correct and that the memory is reachable.

— **Permissions:** Make sure you have read permissions for the target storage.
have.

— **Encryption:** If the recordings are encrypted, enter the code-
Enter correct password.

Playback fails

If a recording cannot be played back, the following reasons may be the cause:

— **Corrupted file:** The recording file may be corrupted or
incomplete.

— **Network timeout:** With remote storage, a slow connection can lead to timeouts.

— **Encryption password:** The entered password may be
incorrect.

Check the log file located at %appdata%\CloudlessCam\CloudlessCam.log.xml for detailed error messages.

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5.3 CloudlessCam Web Player (web server)

The web player uses the same player configuration file (Player.CloudlessCam.
JSON) like the desktop player. For the web player to function, the host computer must be able to access all configured target storage. This includes
valid login credentials, network connections and corresponding authorization-
gene.

5.3.1 Safety

The security of the web player is of paramount importance, as it provides a network service. The following security measures are implemented:

Authentication

The web player can optionally be operated with a local password or via an external OAuth/OpenID Connect service. The selection is made...
in the CloudlessCamWebPlayer.appsettings.json file via the setting WebPlayer:Authentication:Mode. Recordings cannot be viewed without valid authentication.
In password mode, a local password login prompt appears when the web player is launched. In OAuth mode, the web player displays a button instead.
which redirects the user to the configured identity provider. After
Upon successful login, a local session is stored as a cookie in the browser. These cookies are marked as HttpOnly, Secure , and SameSite=Strict to prevent unauthorized access. to protect against common attacks.

HTTPS encryption

The web player communicates exclusively via HTTPS. (When starting for the first time...)
If no certificate is configured, a self-signed certificate is automatically created and stored in the CloudlessCamWebPlayer.pfx file in the working directory.
When using a self-signed certificate, your browser will display a security warning. You can bypass this warning by clicking on "Advanced" and then on "Continue to page (unsafe)" or a similar option.
For productive use, a trusted certificate is recommended.
to be used by a certification authority.

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Stream token

Video and audio streams are not directly transmitted via the authenticated session.

Instead of being delivered permanently, the data is distributed via time-limited tokens. These tokens have a standard validity period of 5 minutes. This prevents copied stream URLs from working permanently.

Recommendations for network operation

— **Do not release unprotected onto the internet:** The web player should only be used for this purpose. be accessible on the local network or via a VPN.
— **Firewall rules:** Configure your firewall so that only trusted devices can access the Web Player port.

— **Reverse Proxy:** For advanced scenarios, you can run the Web Player behind a reverse proxy to add additional layers of security.

Logging

The web player logs access and errors in the application logs. These logs may contain IP addresses, timestamps, and error messages. Please keep this in mind when sharing log files and anonymize sensitive information where necessary.

5.3.2 Start, Port and Access

Starting the web player

The web player is provided as a standalone application. On Windows, the executable file is called CloudlessCamWebPlayerServer.exe. You can run this file directly to start the server.

Once started, the web player is accessible at the configured URL. By default, it listens on:

— https://localhost:7141 – Access from the same computer — https://
0.0.0.0:7141 – Access from all network interfaces

To access the web player from another device on the network, use the IP address of the host computer, for example https://192.168.
178.100:7141.

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Firewall configuration

In order for other devices on the network to access the web player, port 7141 (or the port you have configured) must be open in the firewall.

Windows: Open the Windows Firewall settings and create a new inbound rule for TCP port 7141.

Linux: Use ufw or iptables to open the port:

```
sudo ufw allow 7141/tcp
```

macOS: Configure the firewall via System Preferences or use pfctl.

Operation as a service

For continuous operation, it is recommended to run the web player as a system service.
to set up.

Windows: The script Web_Player_TaskScheduler_Install.ps1 is located in the Windows Release folder. It registers the Web Player as a scheduled task for the current user login and starts it immediately.

```
powershell -ExecutionPolicy Bypass -File .\Web_Player_TaskScheduler_Install.ps1
```

To remove the scheduled task, use:

```
powershell -ExecutionPolicy Bypass -File .\Web_Player_TaskScheduler_Deinstall.ps1
```

Linux: Create a systemd unit file to manage the web player as a service.

macOS: Use a LaunchAgent or LaunchDaemon for automatic startup.

5.3.3 Configuration

The web player is configured via the CloudlessCamWebPlayer.appsettings.json file. On first launch, this file is automatically copied from a template into the working directory.

Location of the configuration file

Operating system	path
Windows	%APPDATA%\CloudlessCam\CloudlessCamWebPlayer.appsettings.json
Linux	~/.config/CloudlessCam/CloudlessCamWebPlayer.appsettings.json ~/Library/
macOS	Application Support/CloudlessCam/CloudlessCamWebPlayer.appsettings.json

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Hosting settings

The hosting settings are located in the WebPlayer:Hosting section:

— **ListenUrls:** The URLs on which the web player listens. Multiple URLs
are separated by semicolons, for example https://localhost:7141;https://0.0.0.0:7141.
— **CertificatePath:** The path to the PFX certificate file. Relative paths refer to...
focus on the working directory.
— **CertificatePassword:** The password for the certificate file.

These settings can alternatively be set via environment variables:

environmental variable	Appropriate setting
CLOUDLESSCAM_WEBPLAYER_LISTEN_URLS	ListUrls
CLOUDLESSCAM_WEBPLAYER_CERTIFICATE_PATH	CertificatePath
CLOUDLESSCAM_WEBPLAYER_CERTIFICATE_PASSWORD	CertificatePassword

Authentication

The authentication settings are located in the WebPlayer:Authentication section.

— **Mode:** Determines whether the web player uses local password login (Password) or an external
OAuth/OpenID Connect service (OAuth) .
— **PasswordHash:** A hashed password in PBKDF2 format. This is the
Recommended method for productive use.
— **Password:** A plaintext password as a fallback. This option should only be used for
It is used for testing purposes and is only relevant in password mode.
— **SessionLifetime:** The validity period of a login session. Default value:
It's 8 hours.
— **RememberCookieLifetime:** The lifespan of the additional remember cookie
In password mode. The default value is 30 days.
— **StreamTokenLifetime:** The validity period of the stream tokens. Standard-
It's worth 5 minutes.

For OAuth mode, the section WebPlayer:Authentication:OAuth is also available:

— **Authority** or **MetadataAddress:** Address of the OpenID Connect/OAuth
Service.
— **ClientId:** The client ID of the web player registered with the identity provider.
Application.

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— **ClientSecret:** Optional client secret, if the identity provider requires it.
Web applications are required.
— **DisplayName:** Display name for the login button in the browser.
— **CallbackPath:** Local callback path for the OAuth callback, defaults to /signin-oidc.

— **RequireHttpsMetadata:** Enforces HTTPS for discovery and metadata.
For productive use, this setting should remain active.
— **Scopes:** Requested OAuth/OpenID scopes, default openid, profile
and email.

Authentication can also be configured via environment variables:

environmental variable	Appropriate setting
CLOUDLESSCAM_WEBPLAYER_AUTH_MODE	fashion
CLOUDLESSCAM_WEBPLAYER_PASSWORD	Password
CLOUDLESSCAM_WEBPLAYER_PASSWORD_HASH	PasswordHash
CLOUDLESSCAM_WEBPLAYER_SESSION_LIFETIME	SessionLifetime
CLOUDLESSCAM_WEBPLAYER_REMEMBER_COOKIE_LIFETIME	RememberCookieLifetime
CLOUDLESSCAM_WEBPLAYER_STREAM_TOKEN_LIFETIME	StreamTokenLifetime
CLOUDLESSCAM_WEBPLAYER_OAUTH_AUTHORITY	OAuthority
CLOUDLESSCAM_WEBPLAYER_OAUTH_METADATA_ADDRESS	OAuth.MetadataAddress
CLOUDLESSCAM_WEBPLAYER_OAUTH_CLIENT_ID	OAuth.ClientId
CLOUDLESSCAM_WEBPLAYER_OAUTH_CLIENT_SECRET	OAuth.ClientSecret
CLOUDLESSCAM_WEBPLAYER_OAUTH_DISPLAY_NAME	OAuth.DisplayName
CLOUDLESSCAM_WEBPLAYER_OAUTH_SCOPES	OAuth.Scopes

Important: The default password in the template is ChangeThisPasswordNow. Change this password before using the template in a production environment.

Player configuration

The web player uses the file Player.CloudlessCam.json in the working directory. This file contains information about the configured target storage.
and their metadata.

If the player configuration is encrypted, the decryption password must be provided via the WebPlayer:ConfigurationPassword setting or the CLOUDLESSCAM_PLAYER_CONFIG_PASSWORD environment variable .

Example configuration

```
{
  "WebPlayer": {
```

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```
    "Hosting": {
      "ListenUrls": "https://0.0.0.0:7141",
      "CertificatePath": "CloudlessCamWebPlayer.pfx",
      "CertificatePassword": ""
    },
    "Authentication": {
      "Mode": "Password",
      "Password": "Your SecurePassword",
      "SessionLifetime": "08:00:00"
    }
  }
}
```

Example configuration for OAuth

```
{
  "WebPlayer": {
    "Authentication": {
      "Mode": "OAuth",
      "OAuth": {
        "Authority": "https://login.example.com/realms/cloudlesscam",
        "ClientId": "cloudlesscam-webplayer",
        "ClientSecret": "YourClientSecret",
        "DisplayName": "Company Account"
      }
    }
  }
}
```

5.3.4 Login and Interface

Registration

When you open the web player in your browser, a login screen will appear first. In Password mode , enter your configured password here and click.
click the login button. In OAuth mode , click the toggle switch.

The configured identity provider's area is accessed, and the login process is performed there.

Upon successful authentication, you will be redirected to the main interface.

If the password is incorrect or the external login from the identity provider is unsuccessful.

If the rejection occurs, a corresponding error message will appear.
You will remain on the login screen. The login session will remain at the default settings.

Valid for 8 hours. This duration can be set server-side via WebPlayer:Authentication:SessionLifetime or the environment variable CLOUDLESSCAM_WEBPLAYER_SESSION_LIFETIME can be set. In password mode, the additional persistence cookie can be set via WebPlayer:Authentication:Remembe or CLOUDLESSCAM_WEBPLAYER_REMEMBER_COOKIE_LIFETIME can be limited separately. After You must register again once the current validity period expires.

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Main surface

The main interface of the web player is divided into three areas, between which you can switch using tabs:

— **Player (/player):** Recording selection with filters, recording table, playback and export.

— **Storages (/storages):** Management of target storage (add, import, update, edit, delete).

— **Settings (/settings):** Settings for debug mode, UI scaling, automatic memory update interval, temporary memory, configuration security, backups and support.

Update (Refresh)

On the /storages page, a large "Refresh Storage" button is available. On the /player page, there is also a separate refresh field above the video area with the same function. Both options reload the recording metadata from all enabled storage destinations. This is useful if new recordings have been added after you started the web player. Additionally, an automatic refresh interval in minutes can be set in the /settings tab. By default, the web player automatically refreshes the storage destinations every 60 minutes.

Search and filter

You can filter recordings according to various criteria:

— **Destination storage:** Select a specific storage location.
— **Date:** Select a specific date.
— **Media type:** Distinguish between video, image, and audio recordings.
— **Text search:** Search by file name or other metadata.

5.3.5 Managing Target Storage

The web player allows you to manage the configured target storage locations. You can view, edit, or delete existing storage locations, as well as add new ones.

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Storage overview

The storage overview displays all configured target storage locations as a list. Each The entry contains information such as name, assigned device name, type, activation status, number of files, and storage usage. The order can be changed via The buttons for moving up or down can be adjusted manually and are saved across all players.

Add storage

When adding a new storage device, you have several options to choose from. Disposal:

Cloud services: For cloud services such as Google Drive, OneDrive or Dropbox An OAuth-based wizard is available. This guides you through the authorization process and automatically sets up the connection.

Classic backend types: For other storage types (file system, SFTP, FT-P/FTPS, WebDAV, S3-compatible, Backblaze B2) you can enter the connection details manually.

5.3.6 Import configuration

You can import an existing CloudlessCam configuration into the web player. This is useful for selecting target storage from the desktop application. transmitted.

Import process

1. Open the import dialog in the web player.
2. Select the .CloudlessCam.json file you want to import.
3. If the configuration is encrypted, enter the decryption password. word one.
4. Click on “Import”.

Imported content

The import process takes the configured target storage from the source file. The following rules will be applied:

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— **Duplicates are skipped:** If a memory with identical configuration
If a figuration already exists, it will not be created again.
— **New storage locations are being added:** Non-existent storage locations are being added
Created as new entries.

After importing, it is recommended to run the update function to re-read the metadata of the recordings.

5.3.7 Playback and formats

Playback sources

The web player first attempts to play recordings from local copies.
If no local copy exists, the file will be downloaded from the configured target storage.
For remote storage, this can take some time depending on bandwidth and file size.

Supported formats

The web player supports playback of formats that can be played directly in the browser:

Video formats:

— MP4
— MOV
— WebM

Audio formats:

— MP3
— AAC
— WAV

Automatic format conversion

Recordings in non-browser-friendly formats are automatically converted into a
Converted to a compatible format.
The converted files are cached in the Temp/WebPlayer/Transcoded directory. If the limit configured in MaximumTempDirectorySize is exceeded, the oldest temporary files are automatically deleted.

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Range streaming

The web player supports HTTP range requests. This allows you to fast-forward and rewind within a recording without having to download the entire file.

Download option

You can also download recordings directly to save them locally. The download link also uses a time-limited token.

5.3.8 Troubleshooting (Web server)

Browser displays certificate warning

Cause: The web player uses a self-signed certificate.

Solution: You can ignore the warning in the browser (“Advanced” and “Continue”) or configure a trusted certificate from a certificate authority.

Registration is not working

Possible causes:

- The password you entered is incorrect.
- The configuration does not contain a valid password or hash.
- In OAuth mode, Authority/MetadataAddress or ClientId is incorrect or un-complete.
- The configured callback path does not match the one specified by the identity provider. The registered redirect URL matches.
- The session has ended.

Solution: Depending on the mode, check the settings WebPlayer:Authentication:Password or PasswordHash , or the OAuth configuration under WebPlayer:Authentication:OAuth.

No recordings visible

Possible causes:

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— The player configuration (Player.CloudlessCam.json) is empty or contains errors.

imprisonment.

— The target memory is unreachable.
— The metadata has not yet been read.

Solution: Check the storage configuration and perform an update.

Playback is jerky or slow.

Possible causes:

— Low bandwidth to the target storage.
— High CPU load due to format conversion.
— Many parallel clients.

Solution: Use local storage for frequently accessed recordings or increase the available resources.

Access from other devices is not possible

Possible causes:

— The web player only listens on localhost.
— The firewall is blocking the port.
— The URL is incorrect.

Solution: Configure ListenUrls with 0.0.0.0 or the specific IP address and open the port in the firewall.

5.4 Contacting Support

If you require technical support, please have the following information ready:

— The log file %appdata%\CloudlessCam\CloudlessCam.log.xml — The version of the CloudlessCam Player or CloudlessCam Web used Players
— A description of the problem and the steps taken

Before forwarding the log file, remove any sensitive information such as IP addresses, hostnames, or usernames.

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6

CloudlessCam API Server

The CloudlessCam API Server is CloudlessCam's network-enabled management and automation server. It provides the main application's core functionality via an HTTPS API, making it suitable for integrations.
Scripts, external interfaces, and headless systems.
Unlike the CloudlessCam Web Player, this is not a
Pure playback server. The API server starts the normal CloudlessCam core and works with the regular main configuration.

6.1 Overview

6.1.1 Purpose

The API server enables centralized control of CloudlessCam without a graphical interface. It is particularly suitable when CloudlessCam is running on a
operated on servers, mini-PCs or other systems without constant GUI use
is to be.
Possible use cases include:

— **Automation:** Cameras, recording configurations, storage destinations and
Maintenance functions are controlled via scripts or custom tools.

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— **Integration into external systems:** Home automation, dashboards, monitoring systems or custom management interfaces can connect CloudlessCam directly.

— **Remote administration:** Administrators can remotely manage status, settings, recordings, storage destinations, and PTZ functions via HTTPS.

— **Headless operation:** CloudlessCam runs on a system without a logged-in desktop user and is managed exclusively via API calls.

6.1.2 Differentiation from other CloudlessCam programs

CloudlessCam consists of several specialized programs that perform different tasks. The API server complements these programs but does not completely replace them.

program	focus
CloudlessCam	Main graphical application for full configuration and local operation
CloudlessCamCLI	Command line for automation, scripting, and daemon operation
CloudlessCam Web Player: Browser-based playback of recordings	
CloudlessCam API Server HTTPS API for administration, automation and integration	

6.1.3 Working Method

The API server uses the standard Configuration.CloudlessCam file and not the separate player configuration. Therefore, it is a complete host and not an isolated viewer.

That means:

— Cameras, groups, and recording configurations can be managed via the API-
will prevail.

— Target storage, image processing, PTZ and maintenance functions are also available via the API.

— The server uses the same main configuration as the GUI and CLI.

— If the main configuration is encrypted, the API server can start, but remains technically locked until it is unlocked.

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6.2 Installation and Launch

6.2.1 Starting the API Server

The API server is delivered as a standalone application. On Windows, the executable file is called CloudlessCamAPIServer.exe; on Linux and ma-
cOS CloudlessCamAPIServer.

After starting, the server creates its CloudlessCamAPIServer.appsettings.json file on the first call, if it doesn't already exist. It then loads the standard CloudlessCam main configuration and starts the necessary services.
ste.

6.2.2 Standard URL

The delivered template uses the following by default:

— https://localhost:7142

This means that after the initial installation, the API server is initially only available locally on the host.

System accessible. This was deliberately chosen so that a fresh installation is not immediately and unintentionally visible on the network.

6.2.3 Enable network access

If the API server is accessed from other devices on the local network or via a

If the reverse proxy needs to be reachable, you must consciously adjust the ListUrls . Typical values are:

— https://0.0.0.0:7142 — https://
192.168.178.100:7142

Additionally, the port used must be opened in the firewall.

Windows

If necessary, create an inbound firewall rule for the TCP port being used.
Port.

Linux

When using ufw , the port can be opened as follows, for example:

```
sudo ufw allow 7142/tcp
```

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6.2.4 Swagger and OpenAPI

The API server comes with integrated API documentation:

— **Swagger UI: /**swagger
— **OpenAPI JSON: /**openapi/v1.json —
MCP endpoint: /mcp (for AI assistants, see section 6.5.2)
— **Homepage: /** automatically redirects to /swagger

Swagger is the recommended interface for interactively testing the API and quickly checking the available endpoints, request data, and response formats.

6.3 Security and Authentication

Since the API server provides administrative functions over the network, secure configuration is particularly important.

6.3.1 HTTPS encryption

The API server communicates via HTTPS by default. If no custom certificate has been configured, the server automatically generates a self-signed certificate on first startup.

Notes

— A self-signed certificate is required for test and development environments.
usually sufficient.
— Clients and browsers display a security warning for self-signed certificates.
nung an.
— For production or publicly accessible installations, you should use a ver-
Submit a trustworthy certificate.

6.3.2 Authentication modes

The API server supports two authentication modes:

— **Password:** CloudlessCam uses a local password or a password-based password.
Hash and generates its own bearer tokens.
— **OAuth:** CloudlessCam validates bearer tokens of an external OAuth or
OpenID Connect provider.

The mode is configured via ApiServer:Authentication:Mode .

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Password mode

In password mode, login is done via POST /api/auth/token.
The client sends the configured password to the server. If the verification is successful, a JWT bearer token with administrator privileges is created.

OAuth mode

In OAuth mode, CloudlessCam does not generate its own login tokens. Instead
The user logs in to an external identity provider and uses
The bearer token obtained there is used for API calls. CloudlessCam checks this token against the configured Authority or MetadataAddress.
For the MCP endpoint /mcp, CloudlessCam automatically publishes the required metadata in OAuth mode under /.well-known/oauth-protected-resource/
MCP-enabled AI assistants can use this information to determine the responsible authorization.
CloudlessCam can independently derive servers and supported scopes.
These scopes are not created automatically. They must be defined in the external identity provider and assigned to the respective users, groups, or clients.

Coarse scopes and fine-grained permissions

In OAuth mode, there are two levels of authorization:

- **Broad access barriers:** SwaggerScopes apply to the REST API, McpScopes for the MCP endpoint. If one of these lists is set, the token must contain at least a suitable scope for that area.
- **Fine-grained permissions:** Each protected function has additional an internal CloudlessCam permission, for example status.read, cameras.write, recordings.export or ptz.control. PermissionScopes determines which OAuth scopes fulfill this permission.

Admin scopes are higher-level. A token with a configured admin scope.
May use all protected REST and MCP functions. Without admin scope.
In OAuth mode, a suitable permission scope must exist for each protected function. If no permission scope is assigned to a given permission, the following applies:
When configured, it can only be used with an admin scope in OAuth mode.
become.

CloudlessCam evaluates the claims scope and scp .

They should be separated by spaces, commas, or semicolons. Swagger/OpenAPI publishes the configured REST, admin, permission, and endpoint override scopes. The MCP Protected Resource Metadata publishes the configured
MCP, admin and permission scopes.

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EndpointOverrides:
For users who want to further differentiate individual REST endpoints, there are additional EndpointOverrides. An override consists of an HTTP method, a path pattern, and a scope list. If a REST call matches an override, its scopes replace the normal PermissionScopes mapping for that specific endpoint.
Path segments in curly braces, for example /api/ptz/devices/{deviceId:guid}/move, act as placeholders. EndpointOverrides only apply to REST calls under /api; MCP still uses the normal MCP and permission scopes.

6.3.3 Recommendations for authentication

— Use PasswordHash instead of Password whenever possible.
— Change the placeholder password from the template before going live.
Mission.
— In password mode, additionally set your own strong signing key.
— Do not expose the API to the internet without protection.
— When accessing externally, additionally use firewall rules, VPN, or a
Reverse Proxy.

6.3.4 Registration via Swagger

In password mode, you first log in via POST /api/auth/token and then enter the returned bearer token into Swagger using the "Authorize" button. In OAuth mode, a token from the external provider is used instead.

6.4 Configuration

6.4.1 Location of the configuration file

The API-specific host configuration is located in the CloudlessCamAPIServer.appsettings.json file. Typical locations are:

Operating system	path
Windows	%APPDATA%\CloudlessCam\CloudlessCamAPIServer.appsettings.json
Linux	~/.config/CloudlessCam/CloudlessCamAPIServer.appsettings.json ~/Library/
macOS	Application Support/CloudlessCam/CloudlessCamAPIServer.appsettings.json

The actual main configuration of CloudlessCam remains as Configuration.
CloudlessCam in the same working directory.

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6.4.2 Important hosting settings

The most important settings are located in the ApiServer:Hosting section:

- **ListenUrls:** Which HTTPS addresses the server is listening on
- **CertificatePath:** Path to the PFX certificate file
- **CertificatePassword:** Password of the certificate

6.4.3 Important authentication settings

The authentication data is located in the ApiServer:Authentication section.
Important options include:

- **Mode:** Password or OAuth
- **PasswordHash:** Hashed password variant for production use
- **Password:** Plaintext password as a simple alternative
- **SigningKey:** Own key for locally generated JWTs in password mode
  (If no password is specified, this will be derived from the password)
- **TokenLifetime:** Validity of the administrator token
- **StreamTokenLifetime:** Validity of Recording Stream Tokens

Important:
The template contains the default password "ChangeThisPasswordNow". Be sure to change this password or replace it with a secure password hash before using it in a production environment.

6.4.4 OAuth settings

In OAuth mode, the following additional values are required:

- Authority or MetadataAddress
- Audience
- optional Issuer
- SwaggerScopes as a rough access barrier for the REST API
- McpScopes as a rough access barrier for the MCP endpoint
- AdminScopes for parent administrator tokens
- PermissionScopes for mapping internal CloudlessCam permissions to user-specific OAuth scopes
- EndpointOverrides as an optional REST expert feature for individual HTTP Endpoints

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Example: Read, Operator and Admin Model The
following example separates read users, operators and administrators.
The external identity provider must issue the scopes shown; Cloudless-Cam only
checks if they are included in the bearer token.

```
{
  "ApiServer": {
    "Authentication": {
      "Mode": "OAuth",
      "OAuth": {
        "Authority": "https://id.example.com/realms/cloudlesscam", "Audience":
        "cloudlesscam-api", "SwaggerScopes":
        [ "cloudlesscam.api" ], "McpScopes":
        [ "cloudlesscam.mcp" ], "AdminScopes":
        [ "cloudlesscam.admin" ], "PermissionScopes":
        { "status.read":
          [ "cloudlesscam.read" ], "cameras.read":
          [ "cloudlesscam.read" ],
          "cameras.write": [ "cloudlesscam.operator" ], "recordings.read":
          [ "cloudlesscam.read" ], "recordings.stream":
          [ "cloudlesscam.read" ], "recordings.export":
          [ "cloudlesscam.export", "cloudlesscam.operator" ], "ptz.read": [ "cloudlesscam.read" ], "ptz.control":
          [ "cloudlesscam.ptz", "cloudlesscam.operator" ],
          "settings.read": [ "cloudlesscam.read" ], "settings.write": [ "cloudlesscam.admin" ],
          "updates.install": [ "cloudlesscam.admin" ] },
          "EndpointOverrides": [



          {
            "Methods": [ "POST" ],
            "Path": "/api/ptz/devices/{deviceId:guid}/move", "Scopes":
            [ "customer.camera-yard.ptz" ]
          }
        ]
      }
    }
  }
}
```

For most installations, SwaggerScopes, McpScopes, AdminScopes and PermissionScopes are sufficient.

EndpointOverrides are only necessary if individual REST routes are intentionally required to deviate
from the standard business permission.

6.4.5 Environment Variables

The most important configuration values can alternatively be set via environment
variables. This is particularly useful for servers, containers, or system directories.
enste.

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environmental variable	Appropriate setting
CLOUDLESSCAM_APISERVER_AUTH_MODE	Authentication:Mode
CLOUDLESSCAM_APISERVER_PASSWORD	Authentication: Password
CLOUDLESSCAM_APISERVER_PASSWORD_HASH	Authentication: Password Hash
CLOUDLESSCAM_APISERVER_OAUTH_SWAGGER_SCOPES	Authentication:OAuth:SwaggerScopes
CLOUDLESSCAM_APISERVER_OAUTH_MCP_SCOPES	Authentication:OAuth:McpScopes
CLOUDLESSCAM_APISERVER_OAUTH_ADMIN_SCOPES	Authentication:OAuth:AdminScopes
CLOUDLESSCAM_APISERVER_LISTEN_URLS	Hosting:ListenUrls
CLOUDLESSCAM_APISERVER_CERTIFICATE_PATH	Hosting: CertificatePath
CLOUDLESSCAM_APISERVER_CERTIFICATE_PASSWORD	Hosting:CertificatePassword
CLOUDLESSCAM_APISERVER_CONFIG_PASSWORD	Decryption of the main configuration

Structured OAuth mappings such as PermissionScopes and EndpointOverrides are usually maintained directly in the JSON configuration file.

6.5 API areas

6.5.1 Important API areas

The API is divided into several functional groups. The most important areas include... belong:

- /api/status – Runtime status, lock status and meter readings
- /api/settings – general settings, backups, unlocking, maintenance, Support ZIP
- /api/cameras – Groups, devices, discovery and credential verification
- /api/recording-configurations – Creating and managing recording-meconfigurations
- /api/image-settings – Image processing, watermarking and capture image-Settings
- /api/recordings – List, filter, export and stream recordings
- /api/storages – Manage target storage
- /api/storages/oauth – OAuth connection of cloud storage
- /api/ptz – PTZ control
- /api/event-log – Event log
- /api/licenses – License information
- /api/updates – Update check and update start
- /api/transfer-queue – File transfer queue

6.5.2 AI Assistant Integration (MCP)

In addition to the classic REST API, the API server under /mcp offers an interface for the Model Context Protocol (MCP). AI assistants like Claude can use MCP,

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ChatGPT or GitHub Copilot communicate directly with CloudlessCam. This allows you to CloudlessCam can be operated in natural language without you needing to know the individual API endpoints.

Typical application examples

— “Show me the current status of all cameras.”
— “Are there any recordings from last night of the entrance?”
— “Check if all storage destinations are reachable and if any transfers are pending.”
— “Set up a new camera with IP address 192.168.178.50.”
— “Turn the garden camera to the left and save the position as a preset.”

Furnishings

To connect an AI assistant to CloudlessCam, configure in
Your MCP client should use the endpoint https://<host>:7142/mcp along with the corresponding access data. Authentication is performed using the same bearer token as with the REST API (see section Authentication Modes).

Available functions

The same administrative functions are available via MCP as via the REST API. Available. The AI assistant can thus perform the following tasks, among others:

Area	functions
System status	Retrieve runtime status, lock status and meter readings
Cameras	List, add, edit, and remove cameras and groups and search the network
Recording configurations: Create, edit, activate and deactivate configurations	and manage recording and image settings
Recordings	List recordings, filter by date, stream and export Retrieve links
Storage targets	Manage storage destinations, check connections, and establish OAuth integration. perform cloud storage
PTZ control	Pan, tilt and zoom the camera, manage presets and Control night mode
Transfer queue	View pending file transfers
Settings	Read and change configuration settings, manage backups, Perform maintenance and retrieve support information
Event log	Retrieve and clean up log entries
Licenses and Updates	Check license status, view update availability, and updates start

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Prepared tasks (prompts)

For frequently used tasks, the MCP endpoint offers pre-configured prompts. These automatically provide the AI assistant with the appropriate data and tools so that it can work efficiently:

Prompt	Description
system_review	Checks the overall system status: camera status, transfer status Backlog, current errors and update status
camera_setup	Supports the setup and testing of cameras with an overview of the existing hierarchy
camera_setup_by_id	Like camera_setup, but specifically for a particular camera or Camera group
recording_investigation helps in the	analysis of recordings, for example in case of missing files, Transfer problems or playback errors

Media and Downloads

Files such as recording streams, video exports, or support logs are not transferred directly via MCP. Instead, the MCP endpoint provides short-lived, signed URLs that the AI assistant or a browser can access directly. These URLs are self-contained and do not require an additional bearer token. A public base URL should be configured behind a reverse proxy to ensure that the generated links are also accessible from external clients.

6.5.3 Short-term links for media and downloads

For standard administrative endpoints, the normal bearer token is used. However, for the actual media delivery of recordings and for REST-based download endpoints, the API server uses separate short-term tokens.

The procedure is as follows:

1. The normal bearer token is used for streaming, exporting, or downloading Access requested.
2. The server generates a short-term valid and signed URL.
3. The media player or browser then directly accesses this URL.

This method reduces the risk of long-lasting administrator tokens being passed to media players, browser components, or external download clients. Valid short-term links therefore remain accessible without an additional bearer token. If a download endpoint is accessed without a valid short-term link, normal REST authorization is used again: video exports require `recordings.export`, support logs require `support.download` , and watermark downloads require `image-settings.read`.

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6.6 Cloud storage with OAuth

The API supports cloud storage services such as Dropbox, Google Drive, or OneDrive.
Servers use different OAuth methods:

— **Redirect flow:** The user is redirected to the provider and then back to the API.

— **Manual code flow:** The user copies the displayed code manually.
back.

— **Device code flow:** Registration is done via a separate verification process.
Page with device code.

If the API server is running behind a reverse proxy or under a public domain, you should configure a stable public base URL to ensure OAuth callbacks are generated correctly. This base URL and any provider-specific callback URL overrides are used by both the REST API and the MCP endpoint.

6.7 Operation as a service

6.7.1 Windows

The following scripts are included in the Windows release:

— API_Server_TaskScheduler_Install.ps1 —
API_Server_TaskScheduler_Deinstall.ps1

The installation script sets up the API server as a scheduled task for the current user. This allows the server to start automatically when the user logs in and to be restarted in case of errors.

6.7.2 Linux

The following scripts are included in the Linux release:

— API_Server_systemd_Daemon_Install.sh —
API_Server_systemd_Daemon_Deinstall.sh

6.7.3 Reverse Proxy

For advanced installations, the API server can be run behind a reverse proxy such as nginx, Caddy, Traefik, or IIS. This is particularly useful if:

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— multiple services are published under a common domain
should,
— additional access restrictions are needed,
— a central TLS certificate should be terminated at the proxy.

6.8 Interaction with GUI, CLI and Pacemaker

The API server is a complete host and shares the normal CloudlessCam main configuration with GUI and CLI. Therefore, the same installation should not be used. can be used simultaneously by multiple full hosts in an uncoordinated manner.

Key points

— The GUI can take over running full host instances at startup.
— Whether a previously running CLI daemon or API server is involved when the
Whether the GUI restarts depends on the corresponding settings in CloudlessCam is gone.
— The pacemaker continues to monitor only the CLI daemon and
not the API server.
— The included Windows and Linux distributions are used instead for the API server.
Service scripts are provided.
— The OAuth permission check applies exclusively to API server access.
No changes are required for the GUI or CLI.

6.9 Example configuration

```
{
  "ApiServer": {
    "Hosting": {
      "ListenUrls": "https://localhost:7142",
      "CertificatePath": "",
      "CertificatePassword":          ""
    },
    "Authentication": {
      "Mode": "Password",
      "Password": "ChangeThisPasswordNow",
      "Issuer": "CloudlessCamAPIServer",
      "Audience": "CloudlessCamClients",
      "OAuth": {
        "Authority": "",
        "MetadataAddress": "",
        "Audience": "",
        "SwaggerScopes": [],
        "McpScopes": [],
        "AdminScopes": [],
        "PermissionScopes": {},
```

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```
            "EndpointOverrides": []
        }
    }
  }
}
```

6.10 Example call

The following example shows a typical process in password mode:

```
# Request token curl -k
https://localhost:7142/api/auth/token \
  -H "Content-Type: application/json" \ -d
  '{"password":"ChangeThisPasswordNow"}'

# Retrieve status using bearer token curl -k https://
localhost:7142/api/status \
  -H "Authorization: Bearer <TOKEN>"
```

6.11 Troubleshooting

401 Unauthorized

Possible causes:

— The bearer token is missing.
— The token has expired.
— In password mode, the password or password hash is used.
incorrectly configured.
— In OAuth mode, the issuer, audience, or metadata endpoint does not match the
token issuance.

Solution: Check the authentication settings and first test the login directly via Swagger or a simple HTTP client. For AI assistants in OAuth mode, additionally check whether /.well-known/oauth-protected-resource/mcp is reachable and publishing the expected scopes.

403 Forbidden in OAuth mode

Possible causes:

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— The token is valid, but does not contain a suitable SwaggerScopes scope for REST or no suitable McpScopes scope for MCP.
— The token does not contain a matching scope from the PermissionScopes mapping the called function.
— An EndpointOverrides entry matches the REST endpoint and expects a other user-specific scope.
— The desired permission is not configured in PermissionScopes and the Token does not contain an AdminScopes scope.

Solution: Check the actually issued token in the identity provider and compare the Claims scope or scp with the API server configuration.
With MCP, you also check whether the token meets both the MCP access barrier and the technical permission.

API starts, but remains locked.

Cause: The main configuration Configuration.CloudlessCam is encrypted and was not successfully unlocked at startup.

Solution: Provide the decryption password via ApiServer:ConfigurationPassword or CLOUDLESSCAM_APISERVER_CONFIG_PASSWORD , or unlock the configuration. tion at runtime via the API.

Access from other devices does not work

Possible causes:

— ListenUrls only points to localhost.
— The firewall is blocking the port.
— The URL or IP address used is incorrect.

Solution: Adjust ListenUrls , open the port in the firewall, and check the reachable host address.

OAuth callbacks for cloud storage are failing

Possible causes:

— The external URL does not match the internally generated callback URL.

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— The API server is running behind a reverse proxy without a properly configured
Public base URL.

— The storage provider expects a different redirect URL than the one actually used.
is applied.

Solution: Configure a stable public base URL or a provider-specific callback so that the return path points exactly to the published address.
fits.

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7

Tips and tricks

This section contains practical tips and recommendations for optimal use.
Operation of CloudlessCam. These instructions are intended for both end users and...
also for administrators and power users.

7.1 Performance

The performance of live streams and recorded videos can vary depending on the hardware and configuration. The following information is provided below.
They offer recommendations for optimizing performance.

Use substream instead of main stream

Most IP cameras offer at least two stream profiles: a main stream in full resolution and a substream with reduced resolution.
Resolution and frame rate.

Recommendation:

— Use the main stream for recordings if you want the highest quality.
needed in the archive.
— In the camera settings, you can specify under “Default Stream”,
which stream is used for display by default.

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Optimizing the video wall:

Displaying multiple cameras simultaneously in the video wall significantly increases the system load.

Recommendation:

— Display only as many cameras simultaneously as are necessary for your use case.

— Disable auto-play for cameras that
They don't need to be constantly monitored.
— Choose a video wall layout that matches the capabilities of your system.
corresponds.

Adjust recording parameters

The choice of recording parameters affects both the CPU load and the

Storage requirements.

Recommendation:

— **Video codec:** The “Copy” setting only remains a true direct-
CloudlessCam will automatically switch to H.264 (libx264) if no video processing is required. As soon as you configure a watermark, timestamp, image processing (brightness, contrast, mirroring, rotation, or scaling), a different frame rate, video quality, or pixel format, CloudlessCam will automatically switch to H.264 (libx264). If you intentionally want to transcode, H.264 offers the best compatibility, while H.265 (HEVC) requires less storage space for the same quality.

— **Video quality:** The "Medium" quality level (CRF 23) offers a good balance between file size and image quality. For important cameras, you can select "High" (CRF 18) or "Very High" (CRF 15).
— **Segment length:** The standard segment length of 300 seconds (5 minutes) is suitable for most use cases. Shorter segments allow for faster transfer to target storage, but result in more files.
— **Frame rate:** If your camera delivers a high frame rate (for example, 30 FPS), you can reduce it for recordings to save storage space.
For monitoring purposes, 10 to 15 FPS are usually sufficient.

Diagnosis of stuttering or dropouts: If
playback stutters or dropouts occur, there can be various causes.

Checklist for diagnosis:

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1. Check if the problem only occurs with a specific camera or
   system-wide.
2. Test playback using the substream instead of the main stream.
3. Check the network connection: Wi-Fi connections are prone to failure.
   Higher rates of packet loss than wired connections.
4. Check your system's CPU usage during playback.
5. Check the event log for connection interruptions.
   or timeout messages were logged.
6. If the camera is delivering a high bitrate, this may be the cause of transmission problems. If
   necessary, reduce the quality settings in the camera itself.

7.2 Restream and Stream Sharing

CloudlessCam offers a Restream function that allows a single
To redistribute the camera stream internally. This is especially useful when multiple
Components must access the same stream simultaneously.

When should you enable Restream?

Many IP cameras only support a limited number of simultaneous connections. For example, if you want to view and record from a camera simultaneously, two connections are required.

Typical symptoms without restream:

— The camera only delivers one stable stream, while parallel connections
  This can lead to stuttering or timeouts.
— When opening the live view, the ongoing recording is briefly interrupted.
— The camera is no longer responding to new connection requests.

Solution: Enable the Restream function in the device settings of the affected camera. CloudlessCam will then only establish a connection to the camera.
and provides the stream internally via a local RTSP server. The restream-
The port number is automatically assigned in the range 50000 to 59999.

Safety instructions

The restream server is only accessible locally by default (loopback address).
127.0.0.1). This means the stream is not accessible from other devices on the network. If you want to make the stream available externally, you should use additional
Consider security measures such as VPN or firewall rules.

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Troubleshooting Restream problems

If restreaming doesn't work, check the following points:

— Is the assigned port (50000 to 59999) available on your system and
Not occupied by other applications?
— Is the go2rtc process running? Check this in the event log or
via the process manager.
— Is a local firewall blocking access to the restream port?

7.3 Destination Storage and File Transfer

CloudlessCam supports various storage backends for storing recordings. The following tips will help you with the optimal configuration.

Limit file transfer speed: If you are transferring
recordings to cloud storage or over a limited internet connection, you can limit the transfer speed to avoid interfering with other applications.

Configuration: In the settings, navigate to the "File transfer" section and under "Global transfer limit" set the maximum speed in kibibytes per second (KiB/s). A value of 0 means no limit.

Guideline values:

— 1024 KiB/s is approximately equivalent to 1 MiB/s or 8 Mbit/s.
— For a DSL connection with 10 Mbit/s upload, a limit of about 800 to 1000 KiB/s is
recommended to leave reserves for other applications.

Estimating storage
requirements: The storage requirements depend on the camera's bitrate, the recording duration, and the selected quality settings.

Rule of thumb:

— At a bitrate of 2 Mbit/s (typical for substream), this results in approximately 0.8 GiB
per hour or 20 GiB per day.
— At a bitrate of 8 Mbit/s (typical for main stream in 1080p)
approximately 3.4 GiB per hour or 80 GiB per day.
— At 4K resolution with 15 Mbit/s, this results in approximately 6.3 GiB per hour or 151
Give per day.

Multiply these values by the number of your cameras and the desired retention period to determine the total storage requirement.

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Storage strategies

CloudlessCam offers two ways to automatically clean up old recordings:

- **By date:** Recordings older than a specified number of days are automatically deleted.
- **By storage space:** When a set storage limit is reached, the following occurs: the oldest recordings were deleted.

You can set these settings individually for each recording configuration.

Behavior during connection interruptions: If the connection to the target storage is interrupted, recordings remain cached in the local temporary directory. Once the connection is restored, the pending files are transferred automatically.
The transfer order is chronological (newest files first).

Notes on network storage

When using SFTP or WebDAV, please note the following points:

- Ensure that the remote path exists and the user has write permissions. owns.
- SFTP uses SSH for secure data transfer. Ensure that the SSH server is reachable and that the specified port is not blocked by a firewall.
- When using WebDAV over HTTPS, ensure that the server certificate is valid. Self-signed certificates can cause connection problems.
- Use the “Test Connection” function in the storage settings, to check availability and permissions.

7.4 Temperature Directory and Maintenance

CloudlessCam uses a temporary directory for caching during recording and before transferring to target storage.

Configure the maximum size of the temp directory. To prevent the temporary directory from taking up all the disk space, you can set a maximum size.

Configuration: In the settings, under "Temp directory," you will find the "Maximum size" option. The default value is 23 GiB. CloudlessCam monitors

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The size of the temp directory is monitored, and if it is exceeded, the oldest files are automatically deleted.

Recommendation: Choose a maximum size that allows for at least a few hours of buffering in case the connection to the target storage is interrupted. Take into account the number of your cameras and their bitrates.

Manual cleanup

If you want to manually clean up the temp directory, you can do so via the CLI:

```
cloudlesscam maintenance clean
```

This command removes temporary files and outdated recordings according to the configured limits. Manual cleanup is also possible via a single click on the Cloud-lessCam settings page.

Configuration Backups:

CloudlessCam automatically creates backups of your configuration. The retention strategy for backups is as follows:

— Backups from the last hour are fully retained.
— A backup is kept for each hour of the current day.
— A backup is kept daily for the last 30 days. — Older backups are kept monthly.

Event **Log Retention:** The event log stores
information about recordings, connections, and errors. In the settings, you can specify how long entries should be retained and the maximum number of entries to be stored.

Recommendation: For most applications, a storage period of 30 days is sufficient.

7.5 Network and Reliability

A stable network connection is essential for reliable camera recordings. The following tips will help you optimize your network configuration.

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Use static IP addresses

Cameras should always be accessible via the same IP address. If the

If a camera's IP address changes, CloudlessCam may lose connection.

Recommendation:

— Configure static IP addresses directly in the camera settings, or
— Set up DHCP reservations in your router so that the cameras
Receive the same IP address for every connection.

CloudlessCam can automatically detect changes to the IP address and update its configuration. This feature is enabled by default and can be adjusted in the settings under "Network".

Wired connections are preferable; Wi-Fi connections

are more susceptible to disruptions such as packet loss, jitter, and interference from other devices.

Recommendation: If possible, use wired LAN connections for your cameras, especially if you want to record continuously. If Wi-Fi is unavoidable, position the access point as close to the camera as possible and avoid obstacles such as walls or metal objects.

VLAN and Firewall Configuration In

professional environments, it is common to operate cameras in a separate network segment (VLAN).

Notes:

— If cameras and CloudlessCam are in different VLANs, the firewall rules must allow traffic between the segments.
— Automatic camera discovery (ONVIF Discovery) uses multicast. Ensure that multicast traffic is routed between VLANs, or add cameras manually.

— RTSP uses port 554 by default. Make sure this port is enabled.
is not blocked.
— Avoid accessing cameras or CloudlessCam directly from the internet-
To make yourself visible. Use a VPN for remote access instead.

Time synchronization:

A correct system time is important for consistent timestamps in recordings and logs.

Recommendation:

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— Enable NTP (Network Time Protocol) on the computer where
CloudlessCam is running.

— If your cameras support NTP, configure them for NTP as well.
Time synchronization.

— If possible, use the same NTP server for all devices to avoid time discrepancies.

An incorrect system time can cause recordings to appear in the wrong place in the timeline or for schedule-based recordings to be made at the wrong time.
Times start.

7.6 Security and Data Protection

Security camera footage contains sensitive data. The following tips will help you operate your installation securely.

Use secure passwords

Use strong passwords for all cameras and storage locations. Avoid default passwords provided by the manufacturer.

Recommendation:

— Use a separate password for each camera.

— If your camera supports multiple user accounts, create a separate user for CloudlessCam with only the necessary permissions. — Change the camera's admin password and do not use it.

in CloudlessCam.

CloudlessCam's **configuration**
encryption allows you to encrypt the configuration file with a password. This protects sensitive data such as camera login credentials and storage destinations.

Notes:

— Encryption is performed using AES-GCM, a secure encryption algorithm.
drive.

— The password is not saved in the configuration. You must enter it when
Enter this information every time CloudlessCam is started.

— If you forget your password, you will not be able to recover the encrypted configuration. Keep your password safe.

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Anonymization for support requests: If
you send logs or configuration exports to support, you should anonymize sensitive data beforehand.

Data to be anonymized:

— IP addresses and hostnames
— Usernames and passwords
— Paths that allow conclusions to be drawn about your infrastructure
— URLs of cloud storage

In the event log, you can limit a time period and export only the relevant entries to reduce the amount of data to be checked.

Restrict access to recordings. Ensure
that only authorized persons have access to the recordings.

Recommendation:

— Restrict permissions on the target storage to the necessary ones.
Gen user.
— If you are using the web player, make sure that it is only accessed via
the local network or VPN is accessible.
— Regularly check who has access to the recordings and remove any that do not.
You no longer need permissions.

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8

Frequently Asked Questions (FAQ)

This chapter provides answers to frequently asked questions about Cloudless-Cam. The questions are grouped by topic and are aimed at both end users and end users.
as well as administrators and power users.

8.1 Installation and Startup

Where can I find the working folder of CloudlessCam?

CloudlessCam stores all configuration and log files in a central location.
Working folder. The storage location depends on the operating system:

— **Windows:** %APPDATA%\CloudlessCam\ (typically C:\Users\<username>)
\AppData\Roaming\CloudlessCam\ )
— **Linux:** ~/.config/CloudlessCam/ — **macOS:** ~/
Library/Application Support/CloudlessCam/

This directory contains, among other things:

— Configuration.ini – The main configuration file —
CloudlessCam.log.xml – The technical log —
CloudlessCamEventLog.json – The event log — Temp/ –
Temporary files and cache for recordings

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For more information about the saved files, please see section 9.

Why does the GUI stop a running CLI daemon at startup?

If you start the graphical user interface (GUI) while the CLI daemon is running in the background, the daemon will be automatically stopped. This happens for the following reasons:

— **Resource conservation:** The GUI and CLI daemon cannot perform recordings simultaneously, as this would lead to conflicts when accessing cameras and storage destinations.

— **Consistency:** The GUI takes complete control over all recording processes.

— **Process coordination:** In addition to the CLI daemon, associated
Processes such as ffmpeg and go2rtc have been terminated.

When exiting the GUI, the CLI daemon can be automatically restarted if Pacemaker is active or if you have configured this manually.

How do I completely uninstall CloudlessCam?

To completely uninstall, proceed as follows:

Windows (Installation program) : Open
Windows settings under "Apps" and uninstall Cloud-
lessCam.

Windows (Portable) / Linux / macOS

1. Delete the installation directory.
2. Optionally, delete the working folder.

Please note that recordings on external storage devices are not automatically deleted. You must remove them manually if needed.

8.2 Cameras, Discovery and Streams

Why isn't my camera being detected automatically?

Automatic camera detection is based on the ONVIF standard and uses UDP multicast on address 239.255.255.250 with port 3702. If your camera

If not found, check the following points:

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— **ONVIF enabled:** In your camera's settings, ensure that ONVIF is enabled. Some manufacturers also require a separate ONVIF user to be created.

— **Same subnet:** The camera must be on the same network segment as the computer. Check that both devices are on the same IP range (for example, both in the 192.168.1.x range).

— **Firewall/VLAN:** A firewall or VLAN configuration may be blocking multicast communication. Ensure that UDP port 3702 is not blocked.

If automatic detection fails, you can add the camera manually. To do this, enter the complete RTSP URL (see next question).

Which stream URL do I need to use for "Add manually"?

The stream URL varies depending on the camera manufacturer. The general format is:
rtsp://<username>:<password>@<IP address>:<port>/<path>

Here are some examples of common manufacturers:

— **Hikvision:** rtsp://admin:password@192.168.1.100:554/Streaming/Channels/101 (main stream) or .../102 (substream)

— **Dahua:** rtsp://admin:password@192.168.1.100:554/cam/realmonitor?channel=1&subtype=0 (Main stream) or subtype=1 (Substream)

— **Reolink:** rtsp://admin:password@192.168.1.100:554/h264Preview_01_main —

Generic: /live, /stream1, /profile1 or /H264/ch1/main/av_stream

The standard port for RTSP is 554. If you do not know the port, consult your camera manufacturer's documentation.

What is the difference between main stream and substream?

Most IP cameras offer two video streams:

— **Main Stream:** High resolution and frame rate, ideal for recording- took. Requires more bandwidth and computing power.

— **Substream:** Lower resolution and frame rate, ideal for live viewing and video wall. Saves network and CPU power.

Why is my camera's IP address changing?

If your camera obtains a dynamic IP address via DHCP, this address may change when the router or camera is restarted. CloudlessCam detects this.

This happens automatically and attempts to find the camera on the network using its MAC address.

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If automatic detection does not work reliably, you have the following options:

— **DHCP reservation:** Configure a static IP address assignment in your router.
for the MAC address of the camera.

— **Static IP address:** Configure this in the camera's network settings.
era a static IP address.

8.3 Playback, Video Wall and Performance

The live view is choppy or shows no image. What can I do?

If you experience performance problems with the live view, check the following points:

— **Reduce the number of cameras:** Reduce the number of cameras that are connected simultaneously
Cameras displayed on the video wall.

— **Network connection:** Prefer wired LAN connections over WLAN, especially for high-resolution
streams.

The error message "Connection failed" or "timeout" indicates network problems. In this case, check the camera's accessibility.

What is Restream and when should I activate it?

Restream is a feature where CloudlessCam receives the camera stream once and then redistributes it locally via go2rtc . This is useful if:

— You can use multiple recording configurations for the same camera.

— The camera has problems with multiple simultaneous connections.

— You want to relieve the camera of some of the strain.

You activate Restream in the device settings of the respective camera. The local stream is then available at rtsp://127.0.0.1:<Port>/restream .

Why does CloudlessCam terminate FFmpeg or go2rtc processes?

CloudlessCam terminates external processes such as ffmpeg and go2rtc in the following situations:

— When starting the GUI, to avoid conflicts with the CLI daemon.

— When ending a recording or restream.

— When the application is restarted.

This is by design for resource management. It can be disabled in the settings.

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8.4 Recording and Export

Where are my recordings stored?

Recordings are saved in two steps:

1. **Temporary storage:** New recordings are initially stored in the Temp directory.
   stored in the working folder (<working folder>/Temp/).
2. **Target storage:** According to the configured transfer interval, the recordings are transferred to the target storage (local, SFTP, WebDAV, cloud, etc.).

Please note that new recordings are not immediately visible in the target storage. The transfer is asynchronous.

Why are no new recordings being made?

If no recordings are being made, check the following points:

— **Recording configuration enabled:** Open camera settings and
  Check if the recording configuration is enabled.
— **Storage location assigned:** Ensure that at least one active storage location is assigned to the recording configuration.
— **Schedule:** If a schedule is configured, check if the current time is within the recording period.

— **License:** The error message “No license slot available” in the event log indicates that there are no free license slots.
— **Connection problems:** The error message “Connection failed”
  or “Recording failed” indicates problems with the camera connection.

Check the event log for detailed information about any errors that occurred.

Why are segments missing from the timeline?

Gaps in the timeline can have various causes:

— **Camera offline:** The camera was unreachable during that period.
— **Transfer delay:** The recordings have not yet been transferred to the destination storage. Click "Synchronize" to view the
  update.
— **Storage error:** The error message “Destination storage transfer failed” in the event log indicates problems with the upload.
— **Temp directory full:** The temporary storage limit has been reached and older segments were deleted before they could be transferred.

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When will the "Copy" video codec truly remain without re-encoding?

"Copy" remains a true passthrough mode for video recordings only if
No additional video processing is required. Once you add a watermark,
a timestamp, image processing (brightness, contrast, reflection, rotation)
To configure a different frame rate, video quality, or pixel format (e.g., scaling), the
stream must be re-encoded.
CloudlessCam automatically switches to H.264 (libx264) in this case, even if
The interface still shows "Copy" selected. This is intentional: The
The options you have set should be applied and not be ineffective.
remain.

8.5 Target Storage and Synchronization

Why are no recordings visible in the target storage?

If recordings do not appear in the destination storage, check:

- **Storage location enabled:** Check in the settings whether the target storage location is enabled.
  is activated.
- **Transmission interval:** By default, recordings are not immediately
  Transferred. Check the configured interval.
- **Access data:** The error message “Target storage transfer failed-
  A message with the reason “error” or “timeout” indicates connection or authentication
  problems.
- **Path permissions:** Ensure that the configured path on the target-
  The memory exists and is writable.

Use the "Test connection" function in the location settings to
to check accessibility.

What are some typical errors that occur with SFTP/WebDAV?

The following problems can occur when using SFTP or WebDAV:

problem	Solution
Connection failed. Check host,	port, and firewall settings. The SFTP The standard port is 22, WebDAV uses 80 (HTTP) or 443 (HTTPS).
Authentication error	Check your username and password. With SFTP, a password can also be used. An SSH key may be required.
Certificate error (WebDAV): For self-signed certificates, activate the "Certificate" option.	“ignore” in the storage location settings.
Path not found	Make sure the remote path exists. Pay attention to the Correct spelling (case sensitivity on Linux servers).
Timeout	Increase the timeout value or check your network connection.

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What happens when the temp directory is full?

When the configured limit for the temporary directory is reached, the oldest files are automatically deleted to make room for new recordings. To avoid this:

— Increase the temperature limit in the settings.
— Shorten the transfer interval to the target storage.

8.6 Configuration, Encryption and Migration

How does configuration encryption work?

Enabling the configuration password will encrypt and store sensitive data in the configuration file. Technical details:

— **Algorithm:** AES-256-GCM (Advanced Encryption Standard in Galois/Counter Mode)
— **Key derivation:** PBKDF2 with SHA-256 and 100,000 iterations —
Additional protection: Randomly generated salt (16 bytes) and IV (12 bytes)

The password itself is not stored in the configuration file. If the password is lost, the encrypted data cannot be recovered. Therefore, create regular backups and keep the password secure.

How do I migrate CloudlessCam to a new computer?

To migrate to a new computer, proceed as follows:

1. Export the configuration via *Settings* ÿ *Configuration export port.*
2. Copy the exported file to the new computer.
3. Install CloudlessCam on the new computer.
4. Import the configuration via *Settings* ÿ *Configuration in-port.*
5. If the configuration was encrypted, enter the password.
6. Check the access data for cameras and storage destinations.

Please note that the license will need to be reactivated on the new computer. must.

What to do if you forget your configuration password?

If the configuration password is forgotten, there is no way to recover the encrypted data.

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8.7 CloudlessCam Player

How do I import storage locations from CloudlessCam into the player?
In the CloudlessCam Player, you can import storage locations from CloudlessCam:

1. Open the CloudlessCam Player.
2. Click on “Import configuration”.
3. Select the CloudlessCam configuration file.
4. If the configuration is encrypted, enter the password.

Please note that only the storage location configurations will be imported.
Camera settings and recording configurations are not transferred.

Why isn't the player showing any recordings?
If the CloudlessCam Player is not displaying any recordings, check:

— **Synchronization:** Click on “Synchronize” to load the available recordings.

— **Date filter:** Make sure the correct date is selected.
— **Storage location accessible:** Check if the storage location is accessible (network, access data).

8.8 Updates

Why is the "Update now" button grayed out?
The update button is grayed out if:

— No update is available (you already have the latest version).
— There is no internet connection.
— The update server is unreachable.

What happens during the update process?
The update process proceeds as follows:

1. **Check:** CloudlessCam checks if a new version is available.
2. **Download:** The update file is being downloaded.
3. **Validation:** The file is verified using a hash checksum.
4. **Installation:** The update tool unpacks and installs the new files.
5. **Restart:** CloudlessCam will restart automatically.

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If a CLI daemon is running, it will be stopped before the update and then automatically restarted afterwards.
The error message "The downloaded update installer could not be verified" indicates that the download failed or the file is corrupted. Please try the update again later.

How do I change the update channel?

CloudlessCam offers two update channels:

— **release:** Stable versions for production use (recommended). — **test:** Pre-release versions with new features, may still contain bugs.

You can change the channel under *Settings* ÿ *Updates* ÿ *Update Channel.* Please note that pre-release (test) versions may be unstable and are not recommended for production use.

8.9 Licensing

What does the free license mean?

If no valid license is activated, CloudlessCam remains usable with the free license. The free license provides exactly one recording slot.
If multiple cameras require a recording slot simultaneously, only the camera with that free slot can continue recording. Additional cameras without a free slot will not be able to record.

Available license slots are stopped. In this state, the title bar displays FREE; the license page and the CLI license list show the entry FREE . If all saved licenses have expired, CloudlessCam also reverts to the free license.

How do I activate a license online?

To activate online, proceed as follows:

1. Open *Settings* ÿ *License.*
2. Enter your license key.
3. Click on “Activate”.
4. After successful activation, the license status will be updated.

How do I activate a license offline?

For systems without internet access, you can use offline activation:

1. Export a license request via *Settings* ÿ *License* ÿ *Offline Activation.*

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2. Transfer the exported file to a computer with internet access.
   gang.
3. Send the request to the license server via the license page in the Pro-
   gram.
4. You will receive a confirmation file in return.
5. Import this confirmation file into CloudlessCam on the offline device.
   Computer.

8.10 CLI, Daemon and Pacemaker

How do I start CloudlessCam in the background?

For background operation without a GUI, use the CLI daemon:

```
cloudlesscam daemon start
```

For automatic monitoring and restart in case of problems, use the Pacemaker. The Pacemaker checks every 30 seconds whether the daemon is running and restarts it if necessary.

Which CLI commands are important for monitoring?

The following commands are recommended for monitoring the system:

command	Description:
status overview. Shows an overall view of the system status.	
Status cameras: Lists the status of all cameras.	
status storage Shows the status of all storage destinations.	
daemon status	Shows whether the daemon is running.
daemon logs	Shows the last 50 log entries.

For integration into monitoring systems, you can output the data in JSON or...
Request CSV format:

```
cloudlesscam status overview --output json
```

Why isn't the daemon running or why is it starting twice?

If you experience problems with the daemon, check:

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— **GUI running:** Pacemaker will not start the daemon if the GUI is active. Quit the GUI or wait until it is closed.

— **Single-instance protection:** EinMutex prevents multiple daemon instances from running simultaneously. If you see the error message "Daemon is already running," an instance is already active.

— **Permissions:** Ensure that the working directory is writable.

— **Log files:** Check CloudlessCam.log.xml for error messages.

8.11 Support, Logs and Data Protection

How do I export logs for support?

To export diagnostic data for support:

1. Open *Help* ÿ *Support.*
2. Select “Save as ZIP”.
3. Note the relevant time period in which the problem occurred.

Which files are relevant for troubleshooting?

The most important files in the working folder are:

file	Contents
CloudlessCam.log.xml	Technical protocol with detailed information on Processes, errors, and warnings.
CloudlessCamEventLog.json event log	containing user-relevant events (recording start/stop, connection problems).
Configuration.ini	Main configuration file containing all settings.

Which data should I anonymize before sharing?

Before sharing logs or configuration files, you should review the following sensitive data and remove or replace it if necessary:

— IP addresses of cameras and storage destinations

— Usernames and passwords

— File paths containing personal information (for example, C:\Users\) Your name...)

— URLs with embedded access data — License key

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9 Technical information

This chapter is aimed at advanced users and administrators who
a deeper understanding of the technical workings of CloudlessCam is required.

Here you will learn how the individual components work together, which
Protocols are used and how to optimally configure the system and
can wait.

9.1 Components and Processes

CloudlessCam consists of several specialized programs that can be used
individually or together, depending on the use case. The following...
All programs and their interactions will be thoroughly examined.

9.1.1 Overview of the programs

9.1.2 Operating modes

CloudlessCam can be operated in different modes, depending on the use case:

Desktop mode (GUI)
The graphical interface starts and takes over all tasks: camera-

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program	Description:
CloudlessCam	The main graphical user interface (GUI) for configuration, camera management, and recording control.
CloudlessCamCLI	Command-line tool for administrators and scripting. Can be run as a background service (daemon). Includes a watchdog
CloudlessCamPacemaker	service that automatically restarts the CLI daemon if it terminates unexpectedly.
CloudlessCam Player	Standalone desktop player for playing recordings with its own configuration area.
CloudlessCam Web Player: Web-based player for browser access to recordings with	HTTPS and password protection.
CloudlessCam Update	Utility for installing updates from downloaded files ZIP files.

Overview of CloudlessCam programs

Administration, configuration, and recording control. This mode is suitable for workstations where you want to monitor the application regularly.

Background Mode (Daemon)

The CLI daemon runs in the background without a graphical interface and performs all recordings automatically. This mode is ideal for:

— Servers and NAS systems without a screen
— Raspberry Pi or other single-board computers
— Systems where CloudlessCam is intended to run continuously

Combined operation

You can start the GUI while the daemon is already running. In this case, the GUI will automatically stop the running daemon to avoid conflicts.
The daemon is restarted when the GUI is exited.

9.1.3 Process Coordination

The various CloudlessCam processes are designed so that they do not interfere with each other:

— **GUI starts:** Any CLI daemon that may be running will be automatically stopped (including all subprocesses such as FFmpeg or go2rtc).
— **GUI terminated:** The CLI daemon can optionally be restarted.
— **Pacemaker active:** Monitors the CLI daemon and starts it when needed.
new – but only if the GUI is not running.

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— **Single-instance protection:** A special mutex prevents multiple daemon instances from running simultaneously. If you see an error message indicating that the daemon is already running, this is the reason.

9.1.4 Storage locations

CloudlessCam stores all configuration and log files in a central location.

Location:

Windows: %APPDATA%\CloudlessCam\

Linux: ~/.config/CloudlessCam/

macOS: ~/Library/Application Support/CloudlessCam/

In this directory you will find:

— Configuration.ini – The main configuration file —
CloudlessCam.log.xml – The technical log —
CloudlessCamEventLog.json – The event log — External utilities
such as ffmpeg and go2rtc

Temporary files (for example, during transcoding) are stored in the system temp directory and automatically cleaned up.

9.2 Protocols, Discovery and Media Pipeline

CloudlessCam uses standardized protocols for communication with IP-
Cameras. Understanding these protocols helps with troubleshooting and optimal configuration.

9.2.1 ONVIF – Camera detection and control

ONVIF (Open Network Video Interface Forum) is an open standard supported by many modern IP cameras.

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Automatic camera detection (Discovery)
CloudlessCam automatically searches for cameras on the local network:

— **Protocol:** WS-Discovery over UDP multicast — **Multicast address:** 239.255.255.250:3702
— **How it works:** CloudlessCam sends a search query to all network interfaces and waits for responses from ONVIF-enabled cameras.

Requirements for successful detection

— The camera must be on the same subnet (or multicast routing must be set up)
— ONVIF must be enabled in the camera settings.
— The firewall must not block UDP port 3702.
— Some cameras require an ONVIF user to be created.

Camera control via ONVIF
After detection, CloudlessCam uses ONVIF for:

— Retrieving the available stream profiles (main and secondary stream)
— Determining the RTSP stream URLs
— PTZ control (pan, tilt, zoom) for supported cameras
— Retrieving device information (manufacturer, model, firmware)

9.2.2 RTSP – Video streaming

RTSP (Real Time Streaming Protocol) is the standard protocol for transmitting video streams.

Ports

— **Standard port:** 554
— **Alternative port:** 8554 (on some cameras)

Authentication:
Most cameras require authentication for RTSP access. Cloudless Cam supports:

— Basic authentication (username and password in the URL)
— Digest authentication (more secure, preferred by many cameras)

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Typical stream paths : RTSP

URLs vary depending on the manufacturer. Some examples:

— Hikvision: /Streaming/Channels/101 —
Dahua: /cam/realmonitor?channel=1
— Generic: /live, /profile1, /H264/ch1/main/av_stream

CloudlessCam recognizes over 100 different URL patterns and tries them out when
The requirement is automatically fulfilled.

Note regarding changing IP addresses

If your camera obtains a dynamic IP address via DHCP, this address may change.
change. CloudlessCam detects this automatically: based on the MAC address of the
The camera will attempt to find a new IP address on the network. Therefore, a static IP address is not
strictly necessary.
If automatic detection does not work reliably, you can alternatively:

— Set up a DHCP reservation for the camera in the router.
— Assign a fixed IP address to the camera

9.2.3 Restream – Optimized Stream Distribution

Restream is an optional feature where CloudlessCam acts as an intermediary between the camera and
the recording process.

How it works

1. CloudlessCam receives the stream from the camera. 2. The stream is
provided locally via go2rtc. 3. All recording processes access
the local stream.

Advantages

— **Relief for the camera:** The camera only needs to send one stream, even
when multiple clients access it
— **Improved compatibility:** Some cameras have problems with multiple devices.
simultaneous connections

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Configuration:
In the camera settings, you can enable Restream and specify a local port. The local stream is then available at rtsp://127.0.0.1:<Port>/restream .

9.2.4 External Tools

CloudlessCam uses proven open-source tools for media processing:

Tool	use
go2rtc	enables restreaming and transcoding of video streams. the local provision of camera streams.
FFmpeg	connection tests, video format conversion and uploading Taking the video streams.
7-Zip	compression and encryption.

External tools used

These tools are automatically installed with CloudlessCam and placed in the work directory.
Ichnis filed.

Note regarding the video codec “Copy”
For video recordings, "Copy" is only an unmodified direct pass if FFmpeg doesn't need to perform any additional processing. As soon as CloudlessCam needs to apply a watermark, timestamp, image processing (brightness, contrast, mirroring, rotation, or scaling), a changed frame rate, video quality, or a different pixel format during recording, a simple stream copy is no longer sufficient.

In this case, CloudlessCam automatically switches the FFmpeg recording pipeline to H.264 (libx264). This ensures that the selected recording options remain effective even if the user has not explicitly set a video codec and the default "Copy" setting is active.

9.2.5 Playback

CloudlessCam uses the LibVLC library (the same technology as the VLC Media Player) for video playback. This ensures:

— Support for all common video codecs (H.264, H.265/HEVC, MJPEG)
— Support for all common container formats (MP4, MKV, TS, AVI)
— Hardware acceleration on supported systems

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Common playback problems

— **Black screen:** The codec may not be supported. Check.
You can view the log files.
— **Jerky playback:** Enable hardware acceleration or
Reduce the resolution.
— **No sound:** Check if the camera records audio and if the audio format is supported.

9.3 CloudlessCam Pacemaker Background Service

The Pacemaker is a monitoring service that ensures CloudlessCam runs reliably even without user intervention.

9.3.1 Purpose and Function

The pacemaker continuously monitors the CLI daemon and starts it up.
Automatically restarts if it is unexpectedly terminated. This is important for:

— Headless systems (servers, NAS, Raspberry Pi)
— Long-term operation without human supervision
— Automatic recovery after system restarts or crashes

9.3.2 Functionality

1. The pacemaker checks every 30 seconds whether the CLI daemon is running. 2.
If the daemon is not running and the set waiting time has elapsed, it is restarted. 3. The pacemaker
does not start the daemon
if the GUI is active (conflict prevention).
(avoidance)
4. All activities are logged in the log files.

9.3.3 Command line options

9.3.4 Setting up autostart

The pacemaker can be configured to automatically activate when the system...
start starts.

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option	Short description	
--waiting-time	-w	Waiting time in minutes before restart (Standard: 5, Minimum: 1)
--startup-delay	-s	Delay in seconds at system startup (Standard: 60)
--redirect-output	-r	The output of the CLI daemon in the console off
--no-redirect-output		Suppresses the output of the CLI daemon
--help	-h	Displays the help

Pacemaker command line options

Windows

In the CloudlessCam GUI, under *Settings* ÿ *Pacemaker ,* you can enable autostart. Technically, this creates an entry in the Windows Registry.
HKEY_CURRENT_USER\SOFTWARE\Microsoft\Windows\CurrentVersion\Run

Linux

A desktop file will be created in the startup directory:
~/.config/autostart/cloudlesscam-pacemaker.desktop

macOS

A launch agent will be installed:
~/Library/LaunchAgents/com.CloudlessCam.pacemaker.plist

9.3.5 Behavior under Windows

On Windows, Pacemaker runs in the background by default without a visible console window. You can track its activities in the log files.
pull.

9.3.6 Interaction with GUI and CLI

— **GUI is started:** The Pacemaker detects this and starts the CLI daemon.
It's not new, as long as the GUI is running.

— **GUI will close:** After the set waiting time (default: 5 minutes)
The pacemaker automatically starts the CLI daemon.

— **Manual Daemon Stop:** If you intentionally stop the daemon,
The pacemaker waits for the set time before restarting it.

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9.3.7 Troubleshooting

The CLI daemon is not starting.

— Check if the GUI is running (the Pacemaker will not start the daemon if it is).
— Check the log files for error messages
— Ensure that the working directory is writable.

Antivirus programs:
Some antivirus programs block the automatic starting of processes.
Add CloudlessCam to the exception list.

9.4 Logging, Diagnostics and Support

CloudlessCam logs all important events in log files. These are essential for troubleshooting and support.

9.4.1 Log files

file	Description
CloudlessCam.log.xml	Technical protocol with detailed information on all processes, errors and warnings.
CloudlessCamEventLog.json	event log with user-relevant events such as recording start/stop, connection problems, and more. security actions.

CloudlessCam log files

Both files are located in the working directory (see section Storage Locations).

9.4.2 Log Rotation

To prevent log files from growing indefinitely, they are automatically rotated:

— **Maximum size:** 128 MiB per log file
— **If the limit is exceeded:** The old log file is compressed and timestamped.
pel archived
— **Archive format:**
CloudlessCam.log.xml.YYYYMMDD_HHmm.zip — **Archive location:** Temp directory

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9.4.3 Debug Mode

For advanced error analysis, you can activate debug mode:

1. Open the Configuration.ini file in the working directory. 2. Set the value Debug=true
3. Restart CloudlessCam

In debug mode, additional detailed information is logged that can help with troubleshooting. Note that this is the log files.
makes it grow faster.

9.4.4 Support Export

To facilitate support requests, you can export the relevant diagnostic data:

1. In the GUI, open *Help* ÿ *Support .* 2. Select "Save as ZIP".

The export contains:

— Log entries —
System information — .ini configuration file

Note on anonymization

Before sharing logs, you should review sensitive data and remove it if necessary:

— IP addresses of cameras and storage destinations
— Usernames
— File paths that might contain personal information

9.4.5 Common Error Patterns

Stream timeouts

The camera is not responding in time. Check your network connection and camera settings.

Authentication error:

Username or password is incorrect. Some cameras require separate ONVIF access credentials.

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Storage transfer error: Files
cannot be written to the storage destination. Check login credentials, network connection, and storage space.

9.5 Security and Data Protection

This section explains the safety mechanisms and provides recommendations for safe operation.

9.5.1 Storage of access data

CloudlessCam stores access data for cameras and storage destinations in the configuration file. This data is generally stored in plain text unless you activate the configuration password.

Recommendations

— Use strong, unique passwords for each camera
— For CloudlessCam, create a separate camera user with restricted access.
ten rights to
— Activate the configuration password (see below)

9.5.2 Configuration Password

You can protect the entire configuration with a password:

1. Open *Settings* ÿ *Security* 2. Enable
Configuration Password

9.5.3 Encryption of Recordings

Recordings can optionally be saved in encrypted form. Encrypted files receive the extension .encrypted7z.7z and use 7-Zip with AES-256 encryption.

9.5.4 Network Security

Recommendations

— **Separate VLAN:** Operate cameras in their own network segment
ment

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— **Firewall:** Allow only necessary connections (RTSP port 554, ONVIF-
Ports)
— **No internet access:** Cameras should not have direct internet access.
— **VPN:** For remote access to recordings, use VPN instead of port forwarding.

9.5.5 Sensitive Data in Logs

The log files may contain sensitive information:

— IP addresses of cameras and storage destinations
— File paths and usernames
— Error messages with technical details

Before sharing logs (for example, for support), you should check this information and anonymize it if necessary.

9.6 Versioning and Updates

9.6.1 Update Channels

There are two update channels:

channel	Description:
Release	stable versions, thoroughly tested. Recommended for production environments.
test	Pre-release versions with new features. May still contain errors. ten. For testing purposes.

Update channels

You can change the update channel in the settings.

9.6.2 Update process

1. **Check:** CloudlessCam checks if a new version is available. 2. **Download:** The update file is downloaded. 3. **Validation:** The file is verified using a hash checksum. 4. **Installation:** The update tool extracts and installs the new files. 5. **Restart:** CloudlessCam restarts.

Behavior when the daemon is running

If the daemon is running during the update, it will be automatically stopped and restarted after the update.

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9.6.3 Manual Update

In environments without internet access, you can install updates manually:

1. Download the update ZIP file on another computer. 2. Transfer the file to the target system. 3. Start CloudlessCamUpdate with
the path to the ZIP file as a parameter.

9.6.4 Update Tool Parameters

The CloudlessCamUpdate update tool accepts the following parameters:

parameter	Description
<path>	Path to the update ZIP file (required)
--startAfterFinish	Start the program after the update (CLI or GUI)
--NoPacemakerRestart	Do not automatically restart Pacemaker
--keepOpen	Leave console open in case of errors

CloudlessCamUpdate parameters

9.7 Additional tools and emergency tools

CloudlessCam includes additional tools for special tasks and emergency situations.

9.7.1 CloudlessCam Web Player – Web-based player

The web player allows access to recordings via a web browser.

functions

— Playback of recordings in the browser
— Password-protected access
— HTTPS encryption
— Automatic format conversion for browser compatibility

HTTPS and certificates

— The web player automatically generates a self-signed certificate.
— Validity: 5 years

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— Format: PFX (PKCS#12)
— Location: CloudlessCamWebPlayer.pfx in the working directory

Browsers display a security warning on first access because the certificate is self-signed. You can accept the certificate or install your own.

Authentication

Password protection is mandatory
— Password is stored as a hash (PBKDF2)
— Secure cookies with HttpOnly, Secure and SameSite=Strict

Ports and network

— **Default port:** 7141 (HTTPS)
— **Local access:** https://localhost:7141
— **LAN access:** https://<IP address>:7141

Format conversion: Not all
video formats are supported by browsers. The web player converts automatically if necessary.

— Browser-friendly formats (MP4, WebM, MOV) are played directly.
— Other formats (TS, MKV) are converted to MP4 using FFmpeg.
— Converted files are temporarily cached.

Cache location:
Temporary files are stored in the directory <Temp>/WebPlayer/Transcoded/. The Web Player automatically monitors the shared CloudlessCam temp directory and deletes the oldest temporary files when the MaximumTempDirectorySize is exceeded.

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10

configuration files and other application data

This section explains the configuration files and other application data of CloudlessCam. This information is especially important for Ad-

Relevant for administrators, advanced users, and support cases.

The Working Directory

The so-called **WorkingDirectory** is the central folder where CloudlessCam all configuration files, logs, event logs, temporary files and Backup copies are stored in the default path located in the application data directory of the respective operating system.

— **Windows:** %APPDATA%\CloudlessCam

— **macOS:** ~/Library/Application Support/CloudlessCam — **Linux:** ~/.config/CloudlessCam

If the application data directory is not writable, Cloudless-Cam automatically falls back to the installation directory. If a directory already exists there...

If a local configuration exists, it will be used preferentially.

Access through various processes

Several CloudlessCam components access the WorkingDirectory: the graphical user interface (GUI), the CLI daemon, the Pacemaker and the Player.

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10.1 Folder structure in the Working Directory

The WorkingDirectory contains the following subfolders and files:

10.1.1 Backups folder

The Backups/ folder contains automatically created backup copies of the configuration. The files are named according to the following scheme:
Configuration.YYYY-MM-DD_HH-mm-ss.CloudlessCam
Configuration.YYYY-MM-DD_HH-mm-ss.CloudlessCamPlayer Examples:
Configuration.2026-02-18_14-15-42.CloudlessCam, Configuration.
2026-02-16_11-23-42.CloudlessCamPlayer CloudlessCam
uses a multi-stage storage strategy:

— **Last 60 minutes:** All backups are retained
— **Current day:** One backup per hour
— **Last 30 days:** One backup per day — **Older than**
30 days: One backup per month (permanent)

This strategy ensures that you have granular recovery points for recently occurring problems, while older backups are automatically thinned out.

10.1.2 Temp folder

The Temp/ folder is used for temporary files, for example, during recording, exports, or file transfers to destination storage. This folder can sometimes occupy a significant amount of storage space, especially during active video recording.

In the settings you can set a size limit for the Temp folder (default: 23 Gibibytes).

10.1.3 Log files

— CloudlessCam.log.xml – The technical log with debug, information, warning, and error messages
— CloudlessCam.log.xml.zip
– Archived log files after rotation (when 128 mebibytes are reached)

— CloudlessCamEventLog.json – The event log for the GUI view

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10.2 Local program settings

The Configuration.ini file contains the general program settings.

This file is saved in INI format and can be accessed via the user-
It can be edited both via the user interface and via the command line.

10.2.1 Contents of the Configuration.ini file

All settings are stored in the [CloudlessCam] section . The following table lists all available settings with description, data type, and default value.

User interface and presentation

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Attitude	type	Standard	description
Language	text	system	User interface language (to (Example “de” for German, “en” for English). Will it automatically start from the System language determined.
ThemeMode	text	system	Surface color scheme. Possible values: “Light”, “Dark”, “System” (automatic according to system settings).
GlobalUIScale	Decimal 0.95		Scaling factor for the entire user interface. A value of 1.0 corresponds to 100%. 0.95 corresponds to 95%.
CamerasPageZoomLevel	Decimal 0.9		Zoom level for the camera side. Controls the Camera tile size.
ShowAlwaysInTheTaskbar	Boolean True		Determines whether the program always runs in the The taskbar is displayed, even if it's min- is imitated.
StartMinimized	Boolean False		Determines whether the program starts minified (in the system tray) at startup.
ShowSplashScreen	Boolean True		Determines whether a loading screen (splash screen) is displayed when the program starts.
ShowWelcomeText	Boolean True		Determines whether the welcome text on the The overview page is displayed.
ShowIdentifier	Boolean False		Displays the unique identifiers (GUIDs) of cameras and other objects in the surface. Useful for technical purposes. Troubleshooting.
ShowVideoWallWarning	Boolean False		Determines whether a warning is displayed before use displayed on the video wall.
VideoWallGridColumns	Integer 2		Number of columns in the video wall grid Opinion.
AutoPlayVideoWall	Boolean False		Determines whether the streams on the video wall page are played automatically.
IntroductionHasBeenShown	Boolean False		Saves whether the introductory dialog has already been opened. was displayed. Will automatically be set to True. set after the dialog was closed became.
CameraWorkflowInfoShown	Boolean False		Saves whether the camera workflow help dialog has already been displayed.
TargetStorageInfoShown	Boolean False		Saves whether the target storage info dialog has already been displayed.
HideAutostartInfoPanel	Boolean False		Displays the info panel for the autostart configuration on the overview page. permanently off.
HidePacemakerInfoPanel	Boolean False		Displays the info panel for the pacemaker permanently off the overview page.

Automatic saving

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Attitude	type	Standard	description
AutoSaveEnabled	Boolean	True	Enables automatic saving of Configuration at regular intervals.
AutoSaveInterval	Integer	15	Interval in minutes between automatic- storage locations. Minimum value is 1.
MaxAutoSaveAgeDays	Integer	31	Maximum age of car storage in Days. Older backups will be deleted.
MaxAutoSaveCopies	Integer	5	Maximum number of stored car Storage.
MaximumNumberOfPersistenceObjectStates	Integer	23	Maximum number of state objects that be kept in memory.
MaximumNumberOfSoftwarePageChangesSaved	Integer	5	Number of saved page breaks for the navigation.

Network and device detection

Attitude	type	Standard	description
OnvifDiscoveryEnabled	Boolean	True	Enables automatic detection of ONVIF devices on the network.
RtspDiscoveryEnabled	Boolean	True	Enables automatic detection of RTSP streams on the network.
FilterKnownDevices	Boolean	True	Filters already known devices from the detection range. list of members.
AutoCheckIPAddressChanges	Boolean	True	Enables automatic checking for IP address changes on cameras.
IPAddressCheckIntervalMinutes	Integer	60	Interval in minutes for automatic Checking for IP address changes.
DeviceConnectTimeout	Integer	120	Timeout in seconds for the Establishing a connection to devices. Read-only. via the configuration file.
TimeBetweenReconnectionAttemptsInSeconds	Integer	300	Time in seconds between at Reconnect attempts due to connection problems. Minimum value is 60 seconds.

Target storage and transfer

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Attitude	type	Standard	description
GlobalTargetTransferSpeedLimitKibPerSecond	Integer 0		Global speed limit for transfers to destination storage in kibibytes per Second. A value of 0 means no limit.
MaxConcurrentTargetStorageTransfersGlobal	Integer 23		Maximum number of simultaneous file transfers to all target storage locations in total.
MaxConcurrentTargetStorageTransfersPerTargetStorage	Integer 3		Maximum number of simultaneous file transfers per single destination storage device.
TargetStorageTimeoutSeconds	Integer 1800		Timeout in seconds for operations on Save target. Minimum value is 5 seconds. the.
TargetStorageFilesUpdateIntervalMinutes	Integer 5		Update interval in minutes of the file lists of target storage.
TargetStorageFailureThreshold	Integer 3		Number of consecutive errors before A target memory is marked as faulty. Value range: 1-10.
TargetStorageFailureCooldownMinutes	Integer 5		Waiting time in minutes after an error stalled before transfers to the target storage will be attempted again. Value range: 1-120.
TempFoldersToStoredFilesIntervalSeconds	Integer 10		Interval in seconds for synchronizing temporary folders with saved files. For quick detection new files.
TargetStoragesToStoredFilesIntervalMinutes	Integer 15		Synchronization interval in minutes from target storage with local metadata. For cleanup operations.
TransferQueueCompletedEntriesToShow	Integer 128		Number of completed transfers, which are displayed in the queue.

Recording and restreaming

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Attitude	type	Standard	description
EnableAutoRecordingRestart	Boolean	True	Enables automatic restart of Recordings at regular intervals for Stability improvement.
AutoRecordingRestartIntervalInHours	Integer	24	Interval in hours for the automatic Restart recordings.
EnableAutoFileSynchronizationRestart	Boolean	True	Enables automatic restart of the File synchronization at regular intervals.
AutoFileSynchronizationRestartIntervalInHours	Integer	24	Interval in hours for the automatic Restarting file synchronization.
FileSynchronizationStallTimeoutMinutes	Integer	30	Timeout in minutes, after which a stalled file synchronization is considered blocked This applies. The minimum value is 5.
MaxConsecutiveRecordingFailures	Integer	3	Maximum number of consecutive Recording error before the recording is considered Failed. Value range: 1-10.
RecordingStaleSegmentBufferMinutes	Integer	5	Additional buffer in minutes before a Recording segment treated as outdated The minimum value is 5.
AllowDirectCameraFallbackWhenRestreamFails	Boolean	True	Allows direct camera access if the re-stream repeatedly fails, the camera but is reachable.
ThumbnailPreviewUpdateIntervalMinutes	Integer	1	Update interval in minutes of the preview images.
Automatic Preview Update	Boolean	True	Enables automatic updates of camera preview images.

Event log and cleanup

Attitude	type	Standard	description
DeleteEventLogsAfterXDays	Integer	30	Event entries are sorted according to this number Automatically deleted on certain days.
MaxEventLogEntries	Integer	1000	Maximum number of event entries in Log. Older entries are deleted when the limit is exceeded.
DeleteRecordingFileMetadataArchiveEntriesAfterXDays	Integer	30	Archived metadata of recording- Files will be deleted after this number of days. deleted.
MaximumTempDirectorySize	Integer	23	Maximum size of the temp folder in Gibibytes. If this limit is exceeded, older accounts will be redirected. Temporary files deleted.
StorageCleanupIntervalMinutes	Integer	5	Interval in minutes for automatic Memory cleanup.

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Updates and Debugging

Attitude	type	Standard	description
SelectedUpdateChannel	text	Release	Update channel for automatic updates. Possible values: “Release” (stable versions) or “Test” (pre-release versions).
NotifyWhenANewVersionIsAvailable	Boolean	True	Activates notifications when a A new program version is available.
Skipped Version	text	(empty)	Stores the version number that the user skipped. This version will be Ignored during update checks.
Debug	Boolean	False	Activates debug mode with extended Logging. Always enabled in debug builds.

Process and system control

Attitude	type	Standard	description
TerminateAllFfmpegProcessesOnTheSystemToPreventProgramErrors	Boolean	True	Terminates all FFmpeg processes on the system at program startup to avoid conflicts with to avoid orphaned processes.
TerminateAllGo2rtcProcessesOnTheSystemToPreventProgramErrors	Boolean	True	Terminates all go2rtc processes on the system at program startup, to avoid conflicts with ver- to avoid wasteful processes.
ServiceStartupDelaySeconds	Integer	10	Delay in seconds after program startup before background services are started. Read-only.
RestartHasBeenRequested	Boolean	False	Internal flag that signals that a A restart was requested.
OtherInstanceSaysThisWindowShouldBeVisible	Boolean	False	Internal flag for communication between program instances.

Security and license

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Attitude	type	Standard	description
RememberEncryptionPasswordInSession	Boolean	True	Saves the encryption password during the current session in working memory. If deactivated, the Password requested more frequently.
WebPlayerStorageAutoRefreshIntervalMinutes	Integer	60	Interval in minutes for automatic Updating the storage destinations in the Cloud-lessCam web player. Minimum value is 1. Minute.
PlayerStorageOrderIdentifiers	text	(empty)	Comma-separated GUID list for the manual order of target storage in CloudlessCam Player, CloudlessCam Web Player and CloudlessCam Mobile Player. Unused memory will be used at the end added.
LicenseComputerName	text	(System)	Name of the computer used for license registration. By default, the system name is... Name used. Maximum 256 characters.
LicensePageAutoRefreshEnabled	Boolean	True	Enables automatic updates License page.
LicenseShareDeviceNames	Boolean	True	Allows sharing of device names with the license server for managing the licenses use.

Dashboard and overview

Attitude	type	Standard	description
Dashboard Auto Update Enabled	Boolean	True	Enables automatic updates Dashboards on the overview page.
DashboardUpdateIntervalSeconds	Integer	60	Update interval in seconds of the dashboard.

Paths and Dialogues

Attitude	type	Standard	description
LastOpenFileDialogPath	text	(Working Directory)	Last used path in file opening Dialog.
LastSaveFileDialogPath	text	(Working Directory)	Last used path in the file Save dialog.
LastOpenFolderDialogPath	text	(Working Directory)	Last used path in the folder- Selection dialog.

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10.2.2 Editing the settings

It is recommended to change the settings via the user interface's settings page. Advanced users can also edit the file manually, but should ensure the correct format. You can manage the settings via the command line using the following commands:

— cloudlesscam settings list – Show all settings — cloudlesscam settings set <key> <value> – Change a setting — cloudlesscam settings backup -o <path> – Back up settings — cloudlesscam settings restore <path> – Restore settings

10.3 Configuration files (cameras / recordings / storage)

CloudlessCam's main configuration is stored in a JSON file.
This file contains all information about devices, recording configurations, and target storage locations.

10.3.1 File name and storage location

— **Main program and CLI:** Configuration.CloudlessCam — **Player:** Configuration.CloudlessCamPlayer

Both files are located in the WorkingDirectory. The player uses a separate configuration file.

10.3.2 Contents of the configuration file

The JSON configuration contains the following main sections:

Device structure (Node Hierarchy)
All cameras and device groups are stored here in a hierarchical structure. The following information is stored for each camera:

— Unique identifier
— User-defined name
— Network information (IP address, port, MAC address)
— Manufacturer and model
— Access data (username and password)
— Stream URLs with placeholders for login credentials

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— PTZ settings (pan, tilt, zoom) and presets
— Restream configuration
— ...

Recording configurations

Each recording configuration defines:

— Name and identifier
— Recording mode (video, single image or audio only)
— Assigned target storage
— Specific settings such as segment length, frame rate, codec, quality and
Image overlays
— Image overlays such as custom watermarks and timestamps with
Position, size, color and font
— Retention rules (storage limit, time limit)
— Schedules for automatic recordings
— Encryption settings
— ...

Target storage

The connection details are saved for each configured target storage location:

— Storage type (file system, SFTP, WebDAV, FTP, S3-compatible, Google Drive, OneDrive,
Dropbox, Backblaze, ...)
— Paths and connection parameters —
Access data
— ...

Further data

— Metadata for locally stored recording files
— Metadata about files on target storage
— Process IDs of subprocesses
— ...

10.3.3 Encryption

If you have set a configuration password, the entire configuration file will be stored encrypted.

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10.3.4 Automatic Backups

CloudlessCam automatically creates backups of the configuration in the Backups/ folder. These backups are created whenever the configuration is changed and are managed according to the retention strategy described in the previous section.

10.4 Web Player Configuration

The CloudlessCam Web Player has its own configuration file for hosting, certificates, and authentication. This information is primarily relevant for administrators who want to set up or customize the Web Player.

10.4.1 Configuration file

The file CloudlessCamWebPlayer.appsettings.json is located in the working directory and controls all hosting settings. Its structure is as follows:

```
{
  "WebPlayer":
    { "Hosting":
      { "ListenUrls": "https://0.0.0.0:7141",
      "CertificatePath": "",
      "CertificatePassword":  ""
    },
    "Authentication": {
      "Password": "ChangeThisPasswordNow"
    }
  }
}
```

10.4.2 Initial setup

The first time you start the web player, a template file is automatically copied from the installation directory to the working directory. You will then need to change at least the password.

Important: The default password ChangeThisPasswordNow must be changed before you make the Web Player accessible on a network.

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10.4.3 HTTPS certificate

The web player requires an HTTPS certificate for secure connections. If no certificate is present at startup, a self-signed certificate will be automatically used.
certificate issued:

— **Filename:** CloudlessCamWebPlayer.pfx —
Location: WorkingDirectory — **Validity:**
5 years — **Key strength:**
2048-bit RSA with SHA256 signature

Because the certificate is self-signed, browsers will display a security warning on first access. You can mark the certificate as trusted in your browser or, for production environments, use a certificate from a recognized certificate authority.

To use your own certificate, specify the path and password in the configuration:

— **CertificatePath** – Path to the PFX file (absolute or relative to the WorkingDirectory)
— **CertificatePassword** – Password for the PFX file

10.4.4 Authentication

The web player supports two methods for password storage:

Plain text password (for testing purposes only)

For development and testing purposes, you can specify the password directly:

— Configuration: WebPlayer:Authentication:Password

A warning is displayed upon startup that this method is not suitable for production environments.

Password hash (recommended for production)

For production environments, you should use a hashed password value:

— Configuration: WebPlayer:Authentication:PasswordHash

The hash is created with the ASP.NET Core PasswordHasher and is more secure because The password is not stored in plain text.

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10.4.5 Session settings

— **SessionLifetime** – Lifespan of the login session (default: 8 hours)
— **StreamTokenLifetime** – Validity of stream tokens (default: 5 minutes)

10.4.6 Environment Variables

As an alternative to the configuration file, you can use the following environment variables:

— CLOUDLESSCAM_WEBPLAYER_LISTEN_URLS
— CLOUDLESSCAM_WEBPLAYER_PASSWORD_HASH
— CLOUDLESSCAM_WEBPLAYER_PASSWORD
— CLOUDLESSCAM_WEBPLAYER_CERTIFICATE_PATH
— CLOUDLESSCAM_WEBPLAYER_CERTIFICATE_PASSWORD
— CLOUDLESSCAM_WEBPLAYER_URL (for the public base URL)

Environment variables take precedence over settings in the configuration file.

10.4.7 Player configuration password

If the Configuration.CloudlessCamPlayer file is encrypted, the corresponding password must be provided so that the web player can load the configuration. This can be done via the configuration file or an environment variable.

10.5 Metadata on target storage

CloudlessCam places a metadata file on each configured target storage location, providing a quick overview of the saved recordings.

10.5.1 Purpose

The CloudlessCamMetadata.json file contains an index of all recording files on the respective target storage device. This index allows CloudlessCam and the player to quickly identify existing recordings without having to query each file individually.

10.5.2 Contents

The following information is stored for each recording file:

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— **DeviceIdentifier** – Unique identifier of the camera
— **RecordingConfigurationIdentifier** – Identifier of the recording configuration
— **FileName** – Name of the recording file
— **CreatedAtUtc** – Creation time (UTC)
— **UpdatedAtUtc** – Last modified time (UTC)
— **SizeBytes** – File size in bytes
— **DurationSeconds** – Video length in seconds (for video recordings)
— **FileHash** – Checksum of the file

The file also contains a version number and a timestamp of the last update.

10.5.3 Update

The metadata is automatically updated when:

— New files will be transferred to the target storage.
— Files are deleted through automatic cleanup — Changes are made to existing files

10.5.4 Read-only mode in the player

The CloudlessCam Player (both desktop and web) operates in read-only mode. This means that the player can read the metadata file but not modify it. This ensures that playback devices do not interfere with the recording infrastructure.

10.5.5 Error Cases

If the metadata file is missing or corrupted, CloudlessCam treats the target storage as "without metadata". The metadata can be automatically rebuilt if necessary by re-analyzing the existing files.

10.6 Backups and Recovery

CloudlessCam automatically creates backups of the configuration and offers various options for recovery.

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10.6.1 Automatic Backups

Whenever the configuration is changed, a backup copy is automatically created in the Backups/ folder. The files are named according to the Configuration scheme. YYYY-MM-DD_HH-mm-ss.CloudlessCam or Configuration.YYYY-MM-DD_HH-mm-ss. named CloudlessCamPlayer.

The multi-stage storage strategy ensures that you always have enough restore points without excessively using up storage space.

10.6.2 Manual Backups

It is recommended to create a manual backup before making major changes or updates. You can simply copy the Configuration.CloudlessCam configuration file to a safe location.

10.6.3 Recovery via the user interface

In the GUI, you can restore previous configurations via the "Settings" menu. The application will show you a list of available backups.
gen an.

10.6.4 Recovery via the command line

You can back up and restore settings using the command line:

- cloudlesscam settings backup -o <path> – Creates a backup of the INI settings
- cloudlesscam settings restore <path> – Resets INI settings restore a fuse

The `--force` option skips the confirmation prompt during recovery.

10.6.5 Manual restoration of the JSON configuration

To manually restore the main configuration:

1. Completely stop CloudlessCam and the CLI daemon. 2. Rename the current Configuration.CloudlessCam (as a backup). (Hetoscopy)
3. Copy the desired backup file as Configuration.CloudlessCam to the WorkingDirectory.
4. Restart CloudlessCam

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10.6.6 Troubleshooting Backups

— **“Backup is encrypted”** – If the backup was created with a configuration password, you will need this password to restore it.
— **“File not readable”** – The backup could be restored with a newer version- This may have been set. Check version compatibility — **“Missing Permissions”** — Make sure you have write permissions in the Working Directory

10.7 Encryption and Passwords

CloudlessCam offers the option to encrypt the configuration file with a password. This protects sensitive data such as login credentials for cameras and target storage.

10.7.1 What is encrypted

When configuration encryption is enabled, the entire Configuration file is encrypted. CloudlessCam (or rather, Configuration.CloudlessCamPlayer) is encrypted. This file contains:

— Access data for cameras (username and password)
— Access data for target storage (SFTP, WebDAV, cloud services)
— Stream URLs with embedded access data
— All configuration details for devices and recordings

The Configuration.ini file is not encrypted, but it does not contain any sensitive access data.

10.7.2 Password prompt

When an encrypted configuration is loaded, CloudlessCam will prompt for the password:

— **GUI:** A dialog box appears when the program starts. — **Player:** The player also prompts for the password at startup. — **CLI Daemon:** The daemon cannot start with an encrypted configuration in headless mode. The password must be entered via the GUI or a Environment variables will be provided

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10.8 Configuration migration (moving to a new computer) ner)

If you want to move CloudlessCam to a new computer, follow these instructions.

10.8.1 Files to be copied

Copy the following files and folders from the old WorkingDirectory
Computers:

— Configuration.CloudlessCam – The main configuration — Configuration.ini
– The program settings — Backups/ – The complete backup folder
(optional, but recommended)
— Configuration.CloudlessCamPlayer – If you are using the player

10.8.2 Before copying

1. Stop CloudlessCam and the CLI daemon on the old machine.
2. Note down the configuration password (if set).
3. Note down the login credentials for the target storage, which you may need to enter again.

10.8.3 On the new computer

1. Install CloudlessCam
2. Start the program once to create the working directory. 3. Close the program again. 4. Copy the files from the old computer into the working
directory. 5. Start CloudlessCam.

10.8.4 Check after the move

— **Cameras:** Check if all cameras are connected (green status)
— **Recordings:** Start a test recording
— **Destination storage:** Check if files are being transferred to the destination storage. the
— **Timeline:** Open the timeline to view previous recordings
— **Logs:** Check the logs for error messages.

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10.8.5 Adjusting paths

If you are using local file system target storage, you may need to adjust the paths:

— Drive letters may be different on the new computer
— UNC paths to network shares should continue to function unchanged.
— Check the access rights for the CloudlessCam process

10.9 Program Logs

CloudlessCam maintains various log files that are helpful for troubleshooting and diagnosis.

10.9.1 Technical Protocol

The file CloudlessCam.log.xml contains detailed technical information:

— **Debug messages:** Detailed process information (only when enabled)
(Debug mode)
— **Information messages:** Normal operational events
— **Warning messages:** Indications of potential problems
— **Error messages:** Error messages with stack traces

The log file is automatically rotated when it reaches 128 mebibytes. Older logs are archived as CloudlessCam.log.xml.zip.

10.9.2 Event Log

The CloudlessCamEventLog.json file contains user-friendly events that are displayed in the GUI on the "Event Log" page:

— Recording started/stopped
— Transfer file to target storage
— Camera connected/disconnected
— Application started/ended
— IP address changed
— ...

Retention is controlled by the **settings DeleteEventLogsAfterXDays** (standard: 30 days) and **MaxEventLogEntries** (standard: 1000 entries).

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10.9.3 Support Export

You can create a support export via the support dialog in the GUI.
This contains:

— Protocols

— System information — .ini
configuration file

The export will be created as a ZIP file, which you can send to the support team for analysis.

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References

[1] CloudlessCam

https://CloudlessCam.de/