Creator 8

Manual

Version 8.3.0 · 2026-11-17



Streetview Technology Jan Mantkowski · www.panohopper.com

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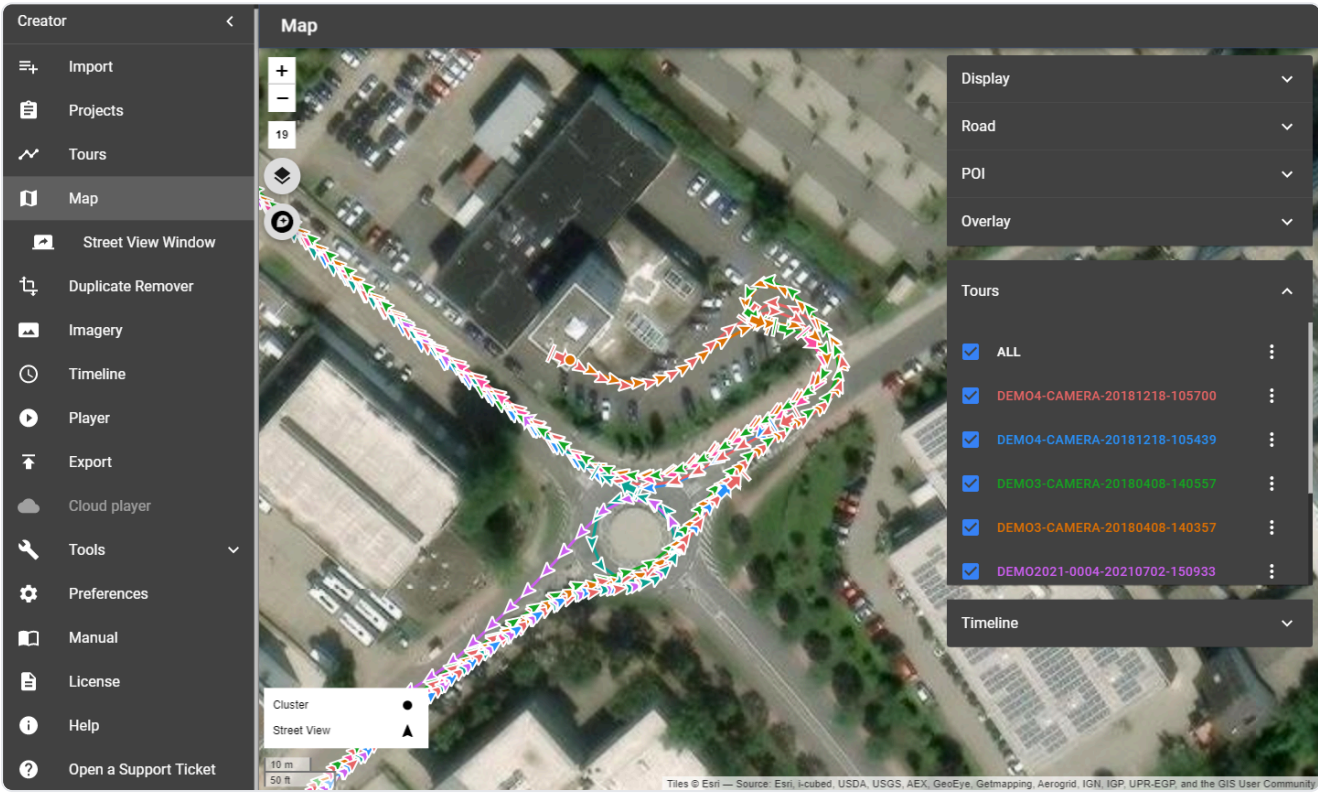
1 Introduction

Creator 8 turns the recordings of the Applied Streetview 360° camera into Street Views and publishes them as a Street View player: On your PC, on your own web server or in the Amazon cloud.

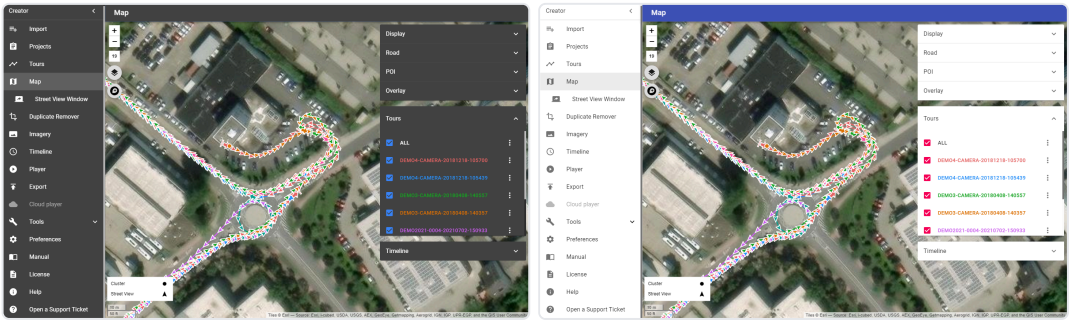


Creator 8 in the Dark layout (Map page)

1.1 Main features

- **Large projects:** From a few Street Views to country-size projects with millions of Street Views.
- **Fast stitching on the graphics card:** The stitcher for NVIDIA RTX 20 series and newer graphics cards turns the six photos of each recording into a 360° Street View. No CUDA installation is needed.
- **Three players:** Player 3 (free and open source, default), Player 2 (krpano) and the Legacy player. See Preferences → Player.
- **Clean data:** Remove duplicates and unneeded Street Views, fix directions and altitudes, add road names from OpenStreetMap, level the camera, brighten shadows. See Map, Duplicate Remover and Tools.
- **Timelines:** Show the same streets recorded at different dates. See Timeline.
- **Publishing:** To any web server (static files, no database) or with one click to the Amazon cloud. See Export and Publishing on Amazon Web Services.
- **Your own map and branding:** About 40 map providers, your own map tiles or Mapbox styles, your logo, watermarks and a nadir logo.
- **Integration:** Link your assets to the player with a simple web address, or control it from your own web pages. See Player API.
- **Privacy:** Everything runs on your PC; nothing is uploaded unless you publish.

1.2 What is new in Creator 8.2.0

Area	Change
Stitcher	New stitcher on the graphics card for NVIDIA RTX 20, 30, 40 and 50 series. Even sky colour between the lenses, no blown-out highlights, sharper details.
Players	Choice of Player 3 (default), Player 2 and Legacy in Preferences → Player.
Layout	**Dark** layout (default) or **Light** layout, the look of earlier Creator versions, see Preferences → General. 
Player maps	No more "Map data not yet available" tiles when zooming in; the last available map level is enlarged.
Support	Open a Support Ticket sends your request with logs directly to the support team.
Requirements	Works with Windows 11 PCs with NVIDIA RTX 20, 30, 40 and 50 series graphics cards. GTX 10 series and older graphics cards are no longer supported; keep using Creator 8.1.0 on those PCs.

The full list of changes is in **Help** → **About** → **Release notes**.

1.3 About this manual

- Menu names are written like this: **Menu** → **Tools** → **Skip**.
- Blue text is a link to another part of the manual.
- The screenshots show the demo project *Demo2-3-4-2021* in the Dark layout.

2 Requirements and installation

2.1 Requirements

Part	Requirement
Operating system	Windows 11, 64-bit
Graphics card	NVIDIA RTX 20 series or newer (RTX 20, 30, 40, 50), with an up-to-date NVIDIA driver. No CUDA installation is needed.
Memory	16 GB RAM or more recommended
Disk	SSDs for the input and output folders give the best speed. Separate drives for input and output help. A NAS works, but can be slow.
Internet	Needed for map tiles, publishing to Amazon, road names from OpenStreetMap, the altitude tool and support tickets. Stitching works offline.

Help → NVIDIA graphics card shows the graphics card of your PC and the list of compatible cards.

> **Note:** GTX 10 series and older graphics cards can't run the new stitcher. Keep using Creator 8.1.0 on those PCs.

2.2 Installation

1. Download the installer from https://www.panohopper.com/downloads.html (file `Creator.<version>.exe`), run it and confirm the Windows prompt for administrator rights.
2. Accept the licence agreement and click **Install**.
3. On the last page, leave **Run Creator 8** ticked and click **Finish**.

Creator is installed for the current Windows user, with a desktop icon and a Start menu entry *Creator 8*. You can install Creator 8 next to older Creator versions; just don't run them at the same time.

Only one Creator can be open at a time. If you start Creator while it is already open, the open window comes to the front.

2.3 First start

Create these folders before you start, for example on your data drive:

Folder	Purpose
In	your recordings
Out	everything Creator creates: Players, Street View tiles, panoramas
Camera calibration files	the `.pto` files of your cameras
Creator backups	project backups

Then set them in Preferences → Folders. Optional folders that help to stay organised: *Masks*, *Logos*, *Export*.

2.4 Windows settings for speed

- **Graphics preference:** On laptops and PCs with several graphics adapters, open **Windows Settings** → **System** → **Display** → **Graphics**, add Creator 8 and set it to **High performance**.
- **Virus scanner:** Add your In and Out folders as exclusions in **Windows Security** → **Virus & threat protection** → **Exclusions** (and in other virus scanners). This can make Creator up to three times faster.

2.5 Updating from an earlier Creator

1. In the old Creator: **Projects** → **Backup all** (in Creator 6 and 7: **Projects** → **More** → **Backup all**).
2. In Creator 8: **Projects** → **Import backups**.

Backups contain only Creator's own data (projects, tours, settings), not the recordings. See Projects.

2.6 Updating to a new version

Creator checks for a new version **at every start**. When one is available, a window shows the new version number and what is new in **every version after yours**, newest first.

- **Update** downloads the new version and checks that the file is complete and unchanged. Creator then closes and the installer starts. Confirm the Windows prompt for administrator rights and follow the installer. Your projects, tours and settings stay as they are.
- **Later** closes the window. Creator asks again at the next start.

You can also check by hand: **Menu** → **Help** → **About** → **Check for update**. Without a newer version, Creator shows *Creator is up to date*.

Without an internet connection, Creator shows no update notice and works as usual.

If the download fails, download the newest version from https://www.panohopper.com/downloads.html and run it. It installs over your current version.

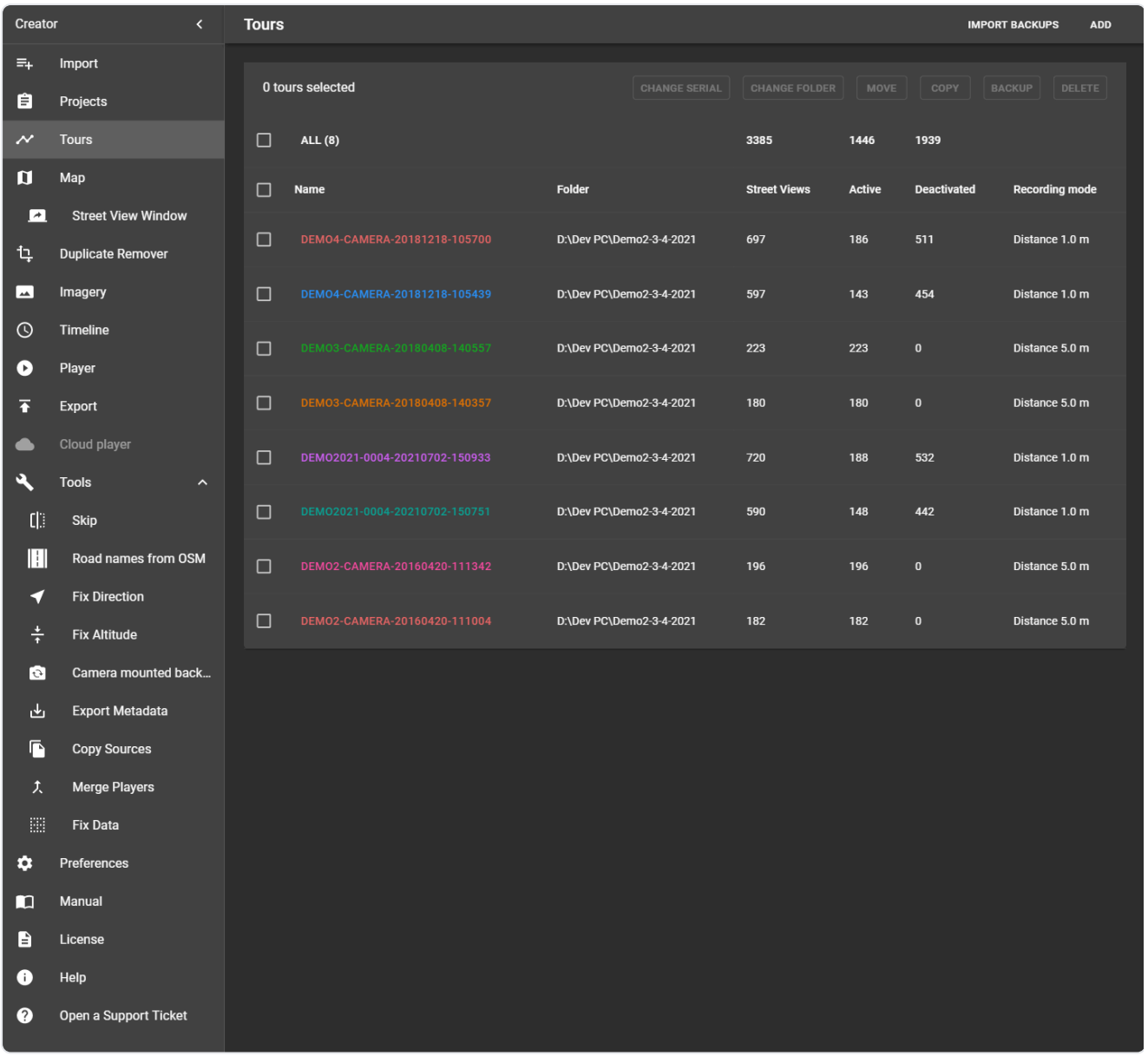
The manual in **Menu** → **Manual** is updated together with Creator. The newest manual is always available at https://downloads.panohopper.com/creator/Creator_manual.pdf.

> **Note:** Creator 8.2.0 does not check for updates yet. On 8.2.0, download the next version once from the website; from then on, Creator tells you about new versions.

3 Workflow

Follow the menu from top to bottom and skip what your project doesn't need. You can go back and forth at any time to review and adjust.

Step	Menu	What you do
1	Import	Create a project from a folder of recordings.
2	Tours	Check the tours; add more recordings.
3	Map	Check positions; deactivate unwanted Street Views; add road names and POIs.
4	Duplicate Remover and Tools → Skip	Remove streets recorded twice and thin out dense recordings.
5	Imagery	Add watermarks and masks; level the camera; adjust brightness.
6	Timeline	Optional: Group tours by date.
7	Player	Set up the player's look and behaviour; check it in the preview.
8	Export	Create the Street Views and the player; publish.



The menu with an open project

3.1 Project size

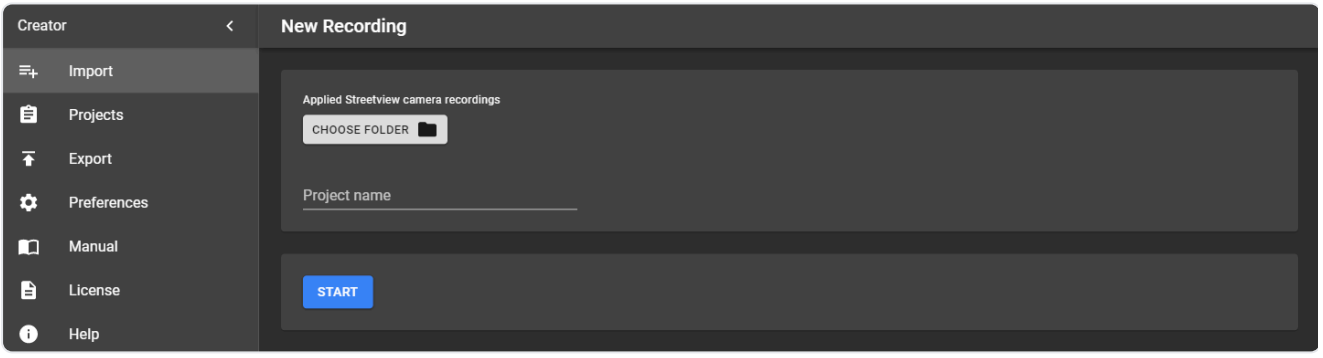
Start with a small project (fewer than 100 Street Views in a few short tours) to learn Creator. Changes then take seconds.

3.2 Large projects

- Split country-size projects into smaller projects, for example by city or county.
- Process each project, then combine the players with Tools → Merge Players.
- Recordings of different Applied Streetview cameras can be in the same project; Creator picks the right camera calibration file for each tour.
- Add new recordings to an existing project on the Tours page with **Add**.
- Move or copy tours between projects on the Tours page.

4 Import

Menu → Import creates a new project from a folder of recordings (*New Recording*).



Import → New Recording

Field	What to enter
Applied Streetview camera recordings	The folder that holds your tour folders. It must contain at least one tour.
Project name	Taken from the folder name; you can change it. Project names must be unique.

Click **Start** to create the project. Creator then opens the Tours page.

4.1 Applied Streetview camera recordings

Item	Format
Photos	6 JPEG photos per Street View, 2560 × 1920 pixels (4:3), without EXIF data
Tour folder	One folder per tour, with the subfolders `1` … `6` (photos of the six lenses) and `7` (position and log data, `panoramas.csv`)
Project folder	One or more tour folders

Each tour needs the **camera calibration file** of its camera, `<camera serial number>.pto`. Creator looks for it in the camera calibration files folder first, then in the project folder (the folder that holds the tour folders). See Troubleshooting → Camera calibration files.

4.2 Adding recordings later

To add new tours to an existing project, use **Add** on the Tours page instead of Import.

5 Projects

Menu → Projects lists all projects. Click a project's name to open it; the menu then shows the project pages (Tours, Map, Imagery ...).

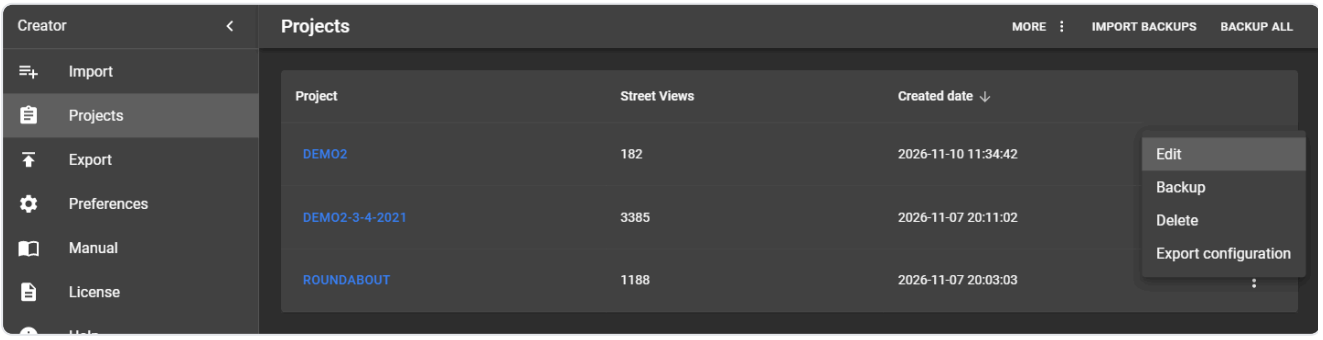


Projects

Column	Meaning
Project	Project name; click to open the project
Street Views	Number of Street Views in the project
Created date	When the project was created; click the column title to sort

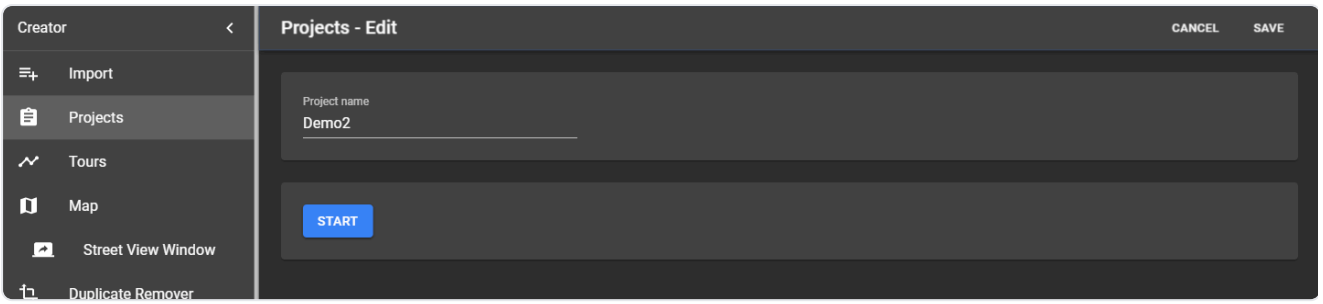
5.1 Project menu

The ⋮ button at the end of each row opens the project menu:



Project menu

Item	What it does
Edit	Change the project name or folder (opens the project page shown below).
Backup	Save a backup of this project.
Export configuration	Save the project's settings (player, imagery, map) as a file, for example to start a new project with the same settings.
Delete	Delete the project from Creator. Your recordings and created files are not deleted.



Project → Edit

5.2 Buttons in the top right corner

Button	What it does
More → Add project from configuration	Create a project from a configuration file saved with *Export configuration*.
Import backups	Restore one or many project backups, also from Creator 3, 5, 6 and 7.
Backup all	Back up all projects at once. Each backup goes into a new subfolder named after the date and time, in the backup folder. When finished, **Open** opens that folder.

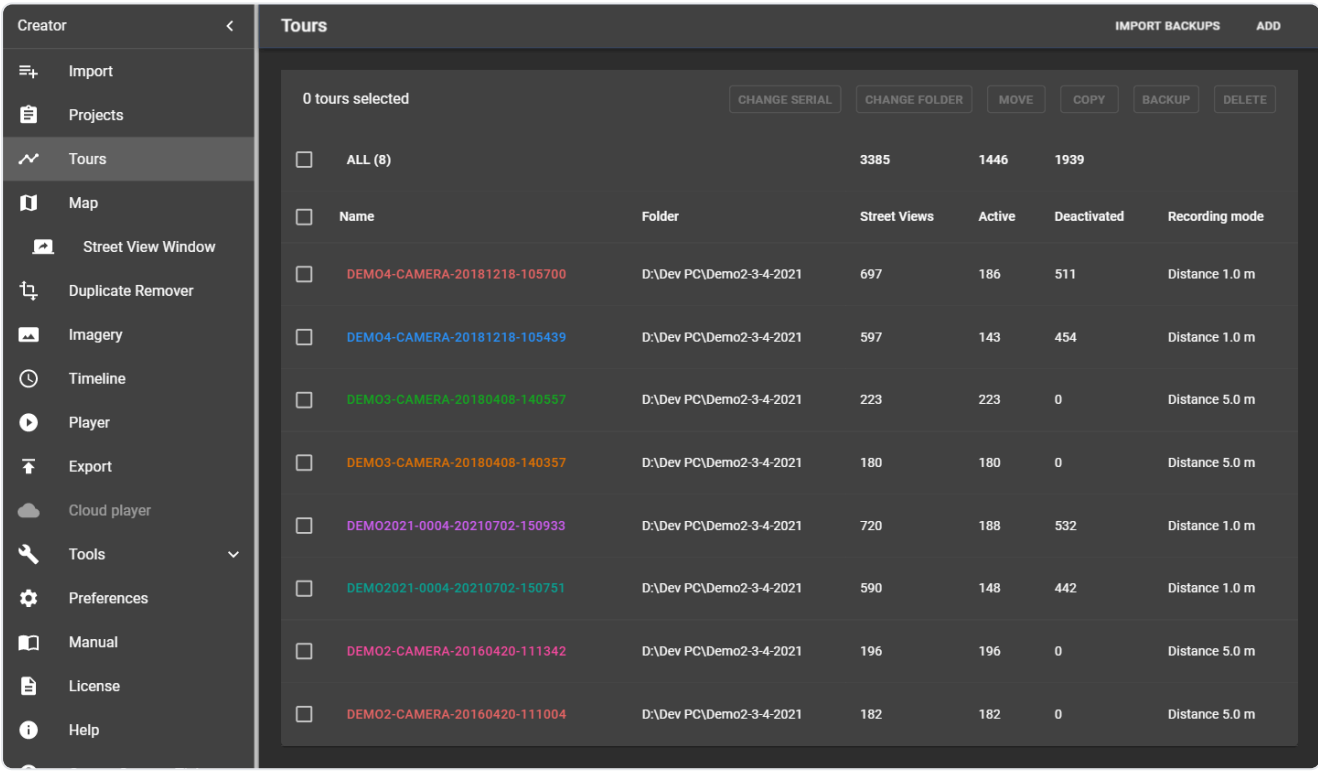


Projects → More

> **Note:** Backups contain only Creator's data (projects, tours, settings, leveling, deactivated Street Views). Recordings and created files are not part of a backup; back them up separately. Creator never changes or deletes your recordings.

6 Tours

Menu → **Tours** lists all tours of the open project. Tours can come from different cameras.



Tours

Column	Meaning
Name	Tour name; click it to show the tour on the Map. **All** shows all tours.
Folder	Where the tour's recordings are
Street Views	Number of Street Views
Active / **Deactivated**	Street Views that will / won't be published
Recording mode	Distance or interval mode of the camera, for example *Distance 5.0 m*

6.1 Buttons

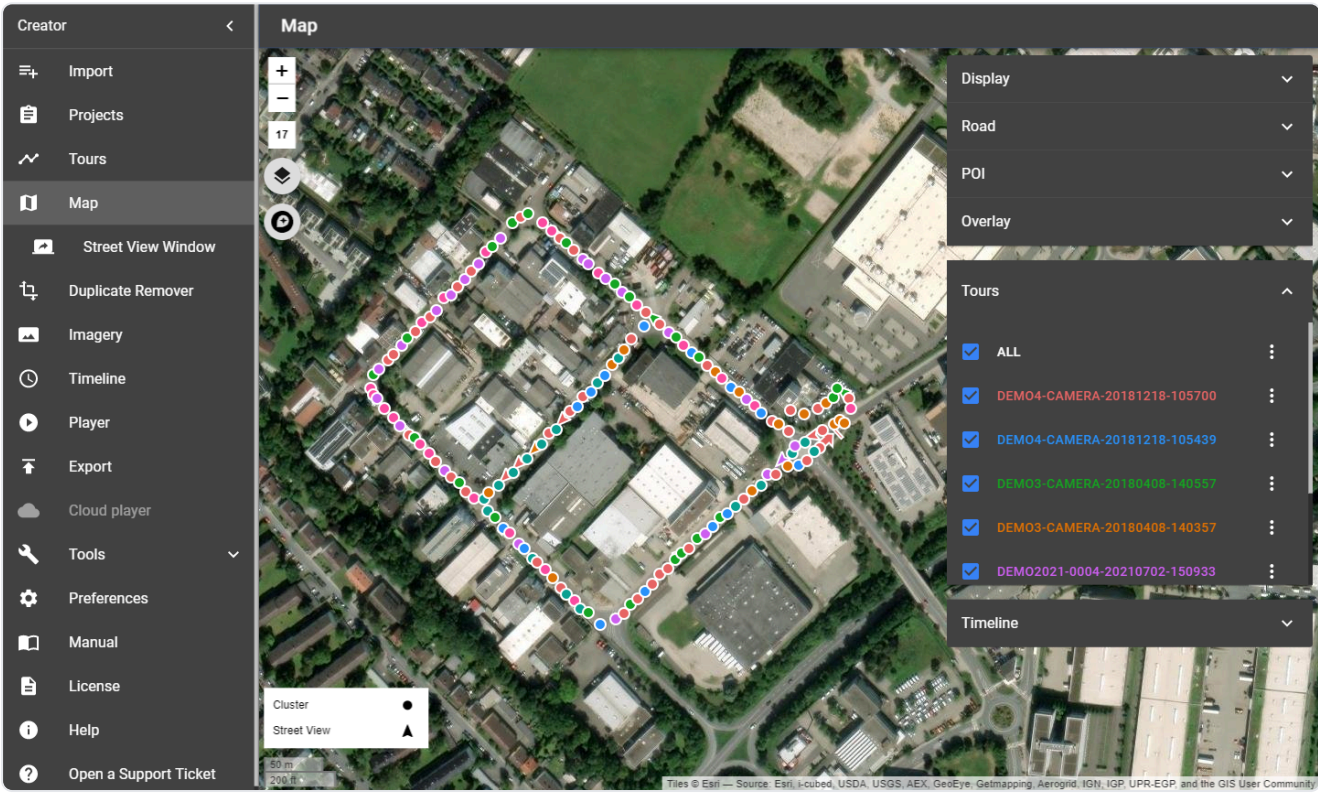
Button	What it does
Import backups (top right)	Restore one or many tour backups into this project.
Add (top right)	Add one or more tours of the Applied Streetview camera to this project, for example recordings made months later.
Change serial	Change the camera serial number of the selected tours. Use it only when support asks you to; the serial number selects the camera calibration file.

Button	What it does
Change folder	Set a new folder for the selected tours, for example after moving recordings to another drive or PC.
Move	Move the selected tours to another project.
Copy	Copy the selected tours to another project.
Backup	Back up the selected tours.
Delete	Remove the selected tours from the project. The recordings are not deleted.

Tick tours in the first column to select them; the buttons apply to the selected tours.

7 Map

Menu → **Map** shows all Street Views of the project on a map. Here you check positions, select Street Views, deactivate the ones you don't want to publish, and add road names, POIs and overlays.



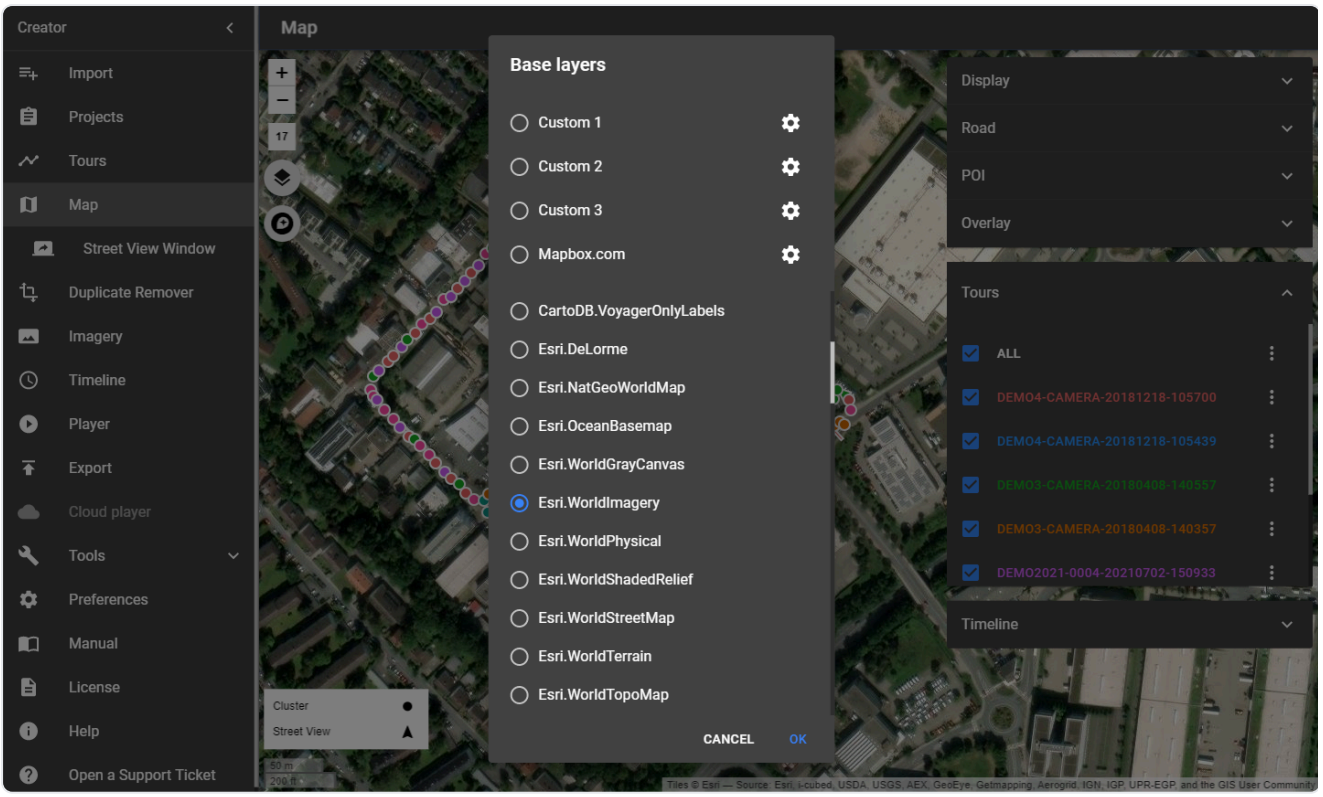
Map

To show many Street Views quickly, Creator groups nearby Street Views into **clusters** (the numbers in circles) up to zoom level 19. Zoom in further to see single Street Views. The small box at the bottom left explains the symbols; the number on the left shows the current zoom level.

When the map zooms to the tours (when it opens for the first time, or with **All** or a tour in the *Tours* panel), the tours fill the left two thirds of the map, so the panels on the right don't cover them. Below **Map** in the menu, the Street View Window shows the selected Street View in a second window.

7.1 Base layer

The **layers button** at the top left opens the list of map providers (base layers). The default is *Esri.WorldImagery* (aerial images).



Map → Base layer

- **Built-in providers:** About 40 map and aerial image providers.
- **Custom 1 – 3:** Your own map tiles, for example from your own map server. Enter a **Label**, the **URL** and the **Attribution** (copyright text shown at the bottom of the map).
- Online: `https://www.your-company.com/map-tiles/{z}/{x}/{y}.png`
- Local folder or NAS: `file://D:\map-tiles\{z}\{x}\{y}.png`
- `{z}` is the zoom level, `{x}` and `{y}` are the tile coordinates (Google/OSM scheme). For the TMS scheme use `{-y}`.
- **Mapbox.com:** Your own Mapbox style: **Map provider label**, **Style URL** (vector tiles only), **Access token** and **Map data legal notices**. In Mapbox Studio, click **Share** to copy the style URL and the access token.

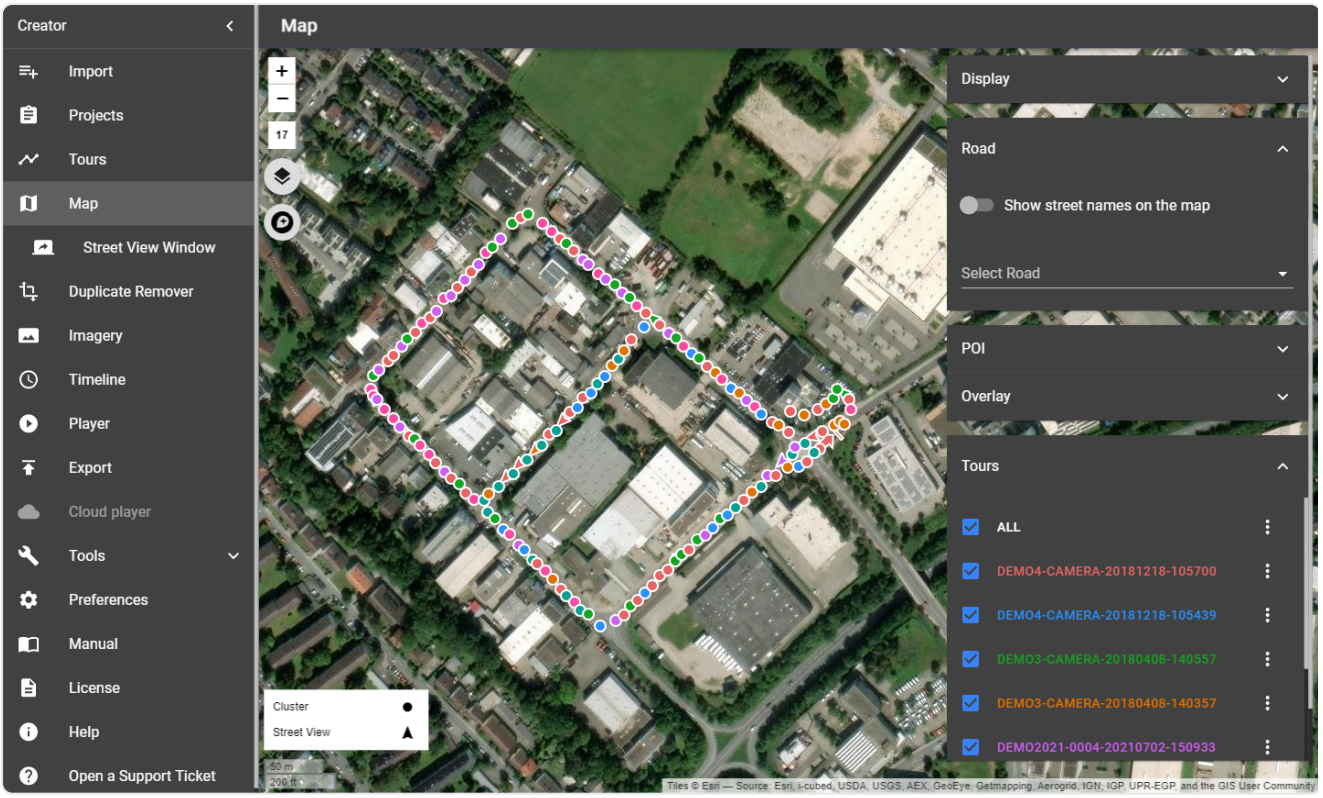
The base layers chosen here are also offered in the player, see Player → Map.

7.2 Panels

The panels on the right open and close with a click on their title.

Panel	What it does
Display	Show or hide **Activated** and **Deactivated** Street Views. Activated Street Views have a white outline, deactivated ones a grey outline.
Road	**Show street names on the map** shows each Street View's street name. **Select Road** selects and zooms to all Street Views of one road. Type a **Road name** and click **Update Street Views** to give it to the selected Street Views.
POI	Points of interest, used like *Road*: **Show POI on Map**, **Select POI**, **POI name**, **Update Street Views**. One selected Street View gets a point POI, several get a line POI.

Panel	What it does
Overlay	**Add a vector overlay to the map** from a KML file, for example planned routes. The clear button next to the name removes it.
Tours	Show or hide tours. **All** zooms to all tours. The ⋮ button of a tour offers *Select a Street View* (by its image ID), *Select all Street Views*, *Zoom to first Street View* and *Zoom to last Street View*.
Timeline	Only with timelines: Show or hide timelines, like tours.



Map → Road panel

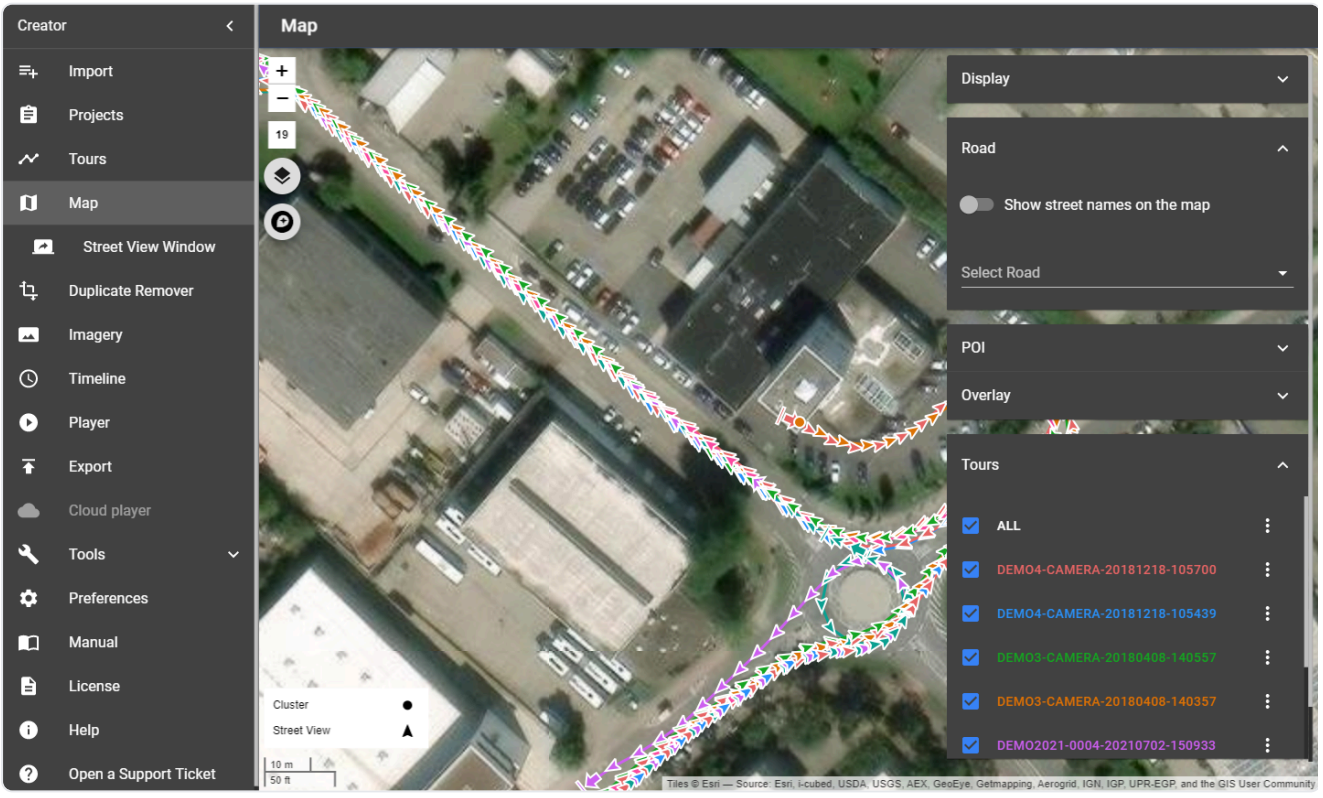
7.3 Selecting Street Views

Most actions work on the selected Street Views. A selected Street View turns orange.

Action	Mouse / keys
Select one Street View	Click it
Add to the selection	Hold **Ctrl** and click
Select all in a rectangle	Hold **Shift** and draw a rectangle
Add a rectangle to the selection	Hold **Ctrl + Shift** and draw
Select a line of Street Views	Select the first, hold **Alt** and click the last
Select all Street Views visible on the map	**Ctrl + A**
Clear the selection	Click on an empty spot of the map or press **Esc**

When Street Views are selected, more panels appear:

Panel	What it does
Deactivate and activate	**Deactivate Street Views** / **Activate Street Views** for the selection. Deactivated Street Views are not published.
History	**Undo** (Ctrl + Z) and **Redo** (Ctrl + Y) of your changes on the map.
Information	The data of one selected Street View: Image ID, position, altitude, direction, date and more.
Level	**Open in Leveling and brightness** opens the selected Street View in Imagery → Leveling and brightness.



Map with a selected Street View

The selected Street View is also shown in the Street View Window if it is open.

7.4 Keyboard shortcuts

> **Tip:** Print only this page and keep it next to your keyboard for reference. In the print dialog of your PDF viewer, choose *Current page*.

Keys	Action
Drag with the mouse	Move all selected Street Views
Ctrl + L	Align the selected Street Views in a straight line
Delete	Deactivate the selected Street Views
Insert	Activate the selected Street Views
Home / **End**	Rotate the selected Street Views anticlockwise / clockwise
Page Up / **Page Down**	Go to the next / previous Street View
Arrow keys	Move the map
Ctrl + Z / **Ctrl + Y**	Undo / redo
Esc	Clear the selection

8 Street View Window

Menu → Street View Window (directly below **Map** in the menu) opens a second window that shows the Street View selected on the Map page or in the Player → Preview. Move it to a second monitor and switch it to full screen to see positions and images side by side.

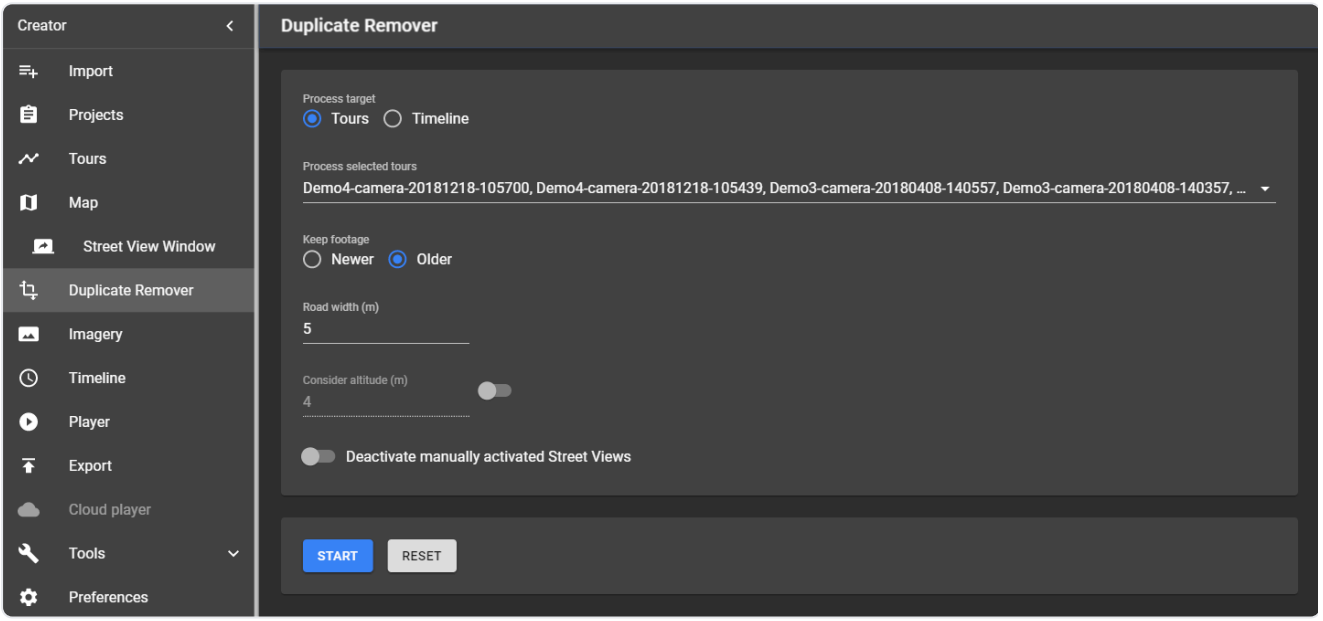


Street View Window

- Select a Street View on the Map: The window shows it.
- If no Street View is selected when you open the window, it shows the first active Street View. On the Map page this Street View is selected too; the map does not move.
- Zoom in and out with the mouse wheel; drag to look around.
- Changing the program language in Preferences → General closes the window.

9 Duplicate Remover

Menu → Duplicate Remover finds streets that were recorded more than once and deactivates the extra Street Views, so each street is published once.



Duplicate Remover

Record with the camera's distance mode set to 5 m or less (for example 1 m). After the Duplicate Remover, use Tools → Skip to thin out dense recordings. Always run Skip **after** the Duplicate Remover.

Setting	What it does
Process target	Only with timelines: Process the selected **Tours** or the selected **Timeline**s. With timelines, duplicates are removed within each timeline, so every timeline keeps its own Street Views.
Tours / Timeline	The tours or timelines to process.
Keep footage	**Older** (best for most projects): Keeps the existing, older Street Views and adds new Street Views only for newly recorded roads. **Newer**: Replaces existing Street Views with newer footage; the data is more up to date, but reversing out of a dead-end road leaves the bad footage.
Road width (m)	Street Views closer than this distance count as the same road.
Consider altitude (m)	Off by default. Use it for bridges and tunnels: Street Views more than this height apart are not duplicates.
Deactivate manually activated Street Views	Off by default: Street Views you activated by hand on the Map stay active. On: They are deactivated too.

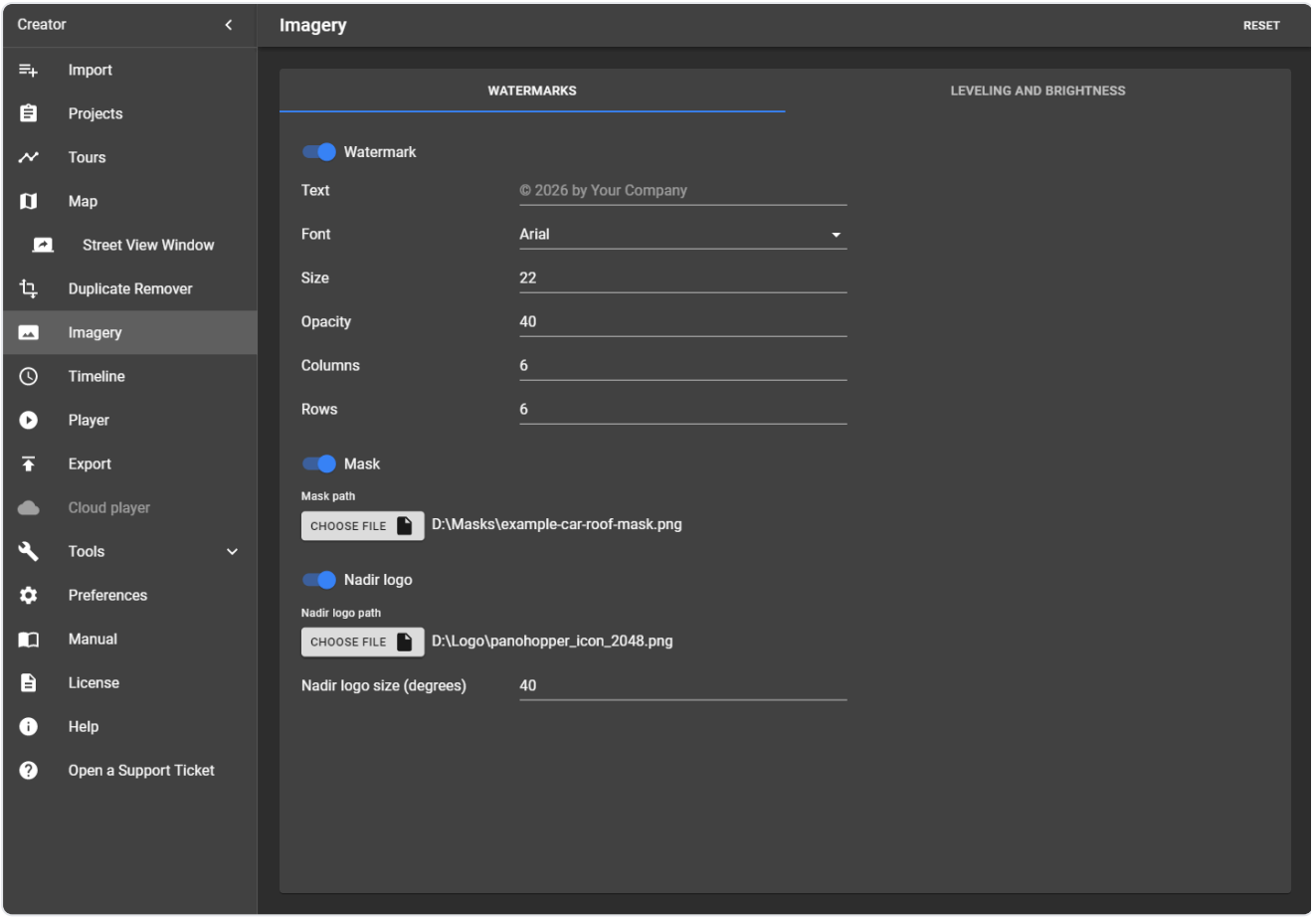
Click **Start** to remove duplicates. The page then shows how many Street Views were marked as duplicates, for the project and for each tour. Try a few settings to find the best result for your footage.

Reset activates all Street Views deactivated by the Duplicate Remover **and** by Skip.

10 Imagery

Menu → **Imagery** sets what the Street View images look like: Watermarks and masks, the leveling of the camera, and the brightness. The page has two tabs: **Watermarks** and **Leveling and brightness**.

10.1 Watermarks



Imagery → Watermarks

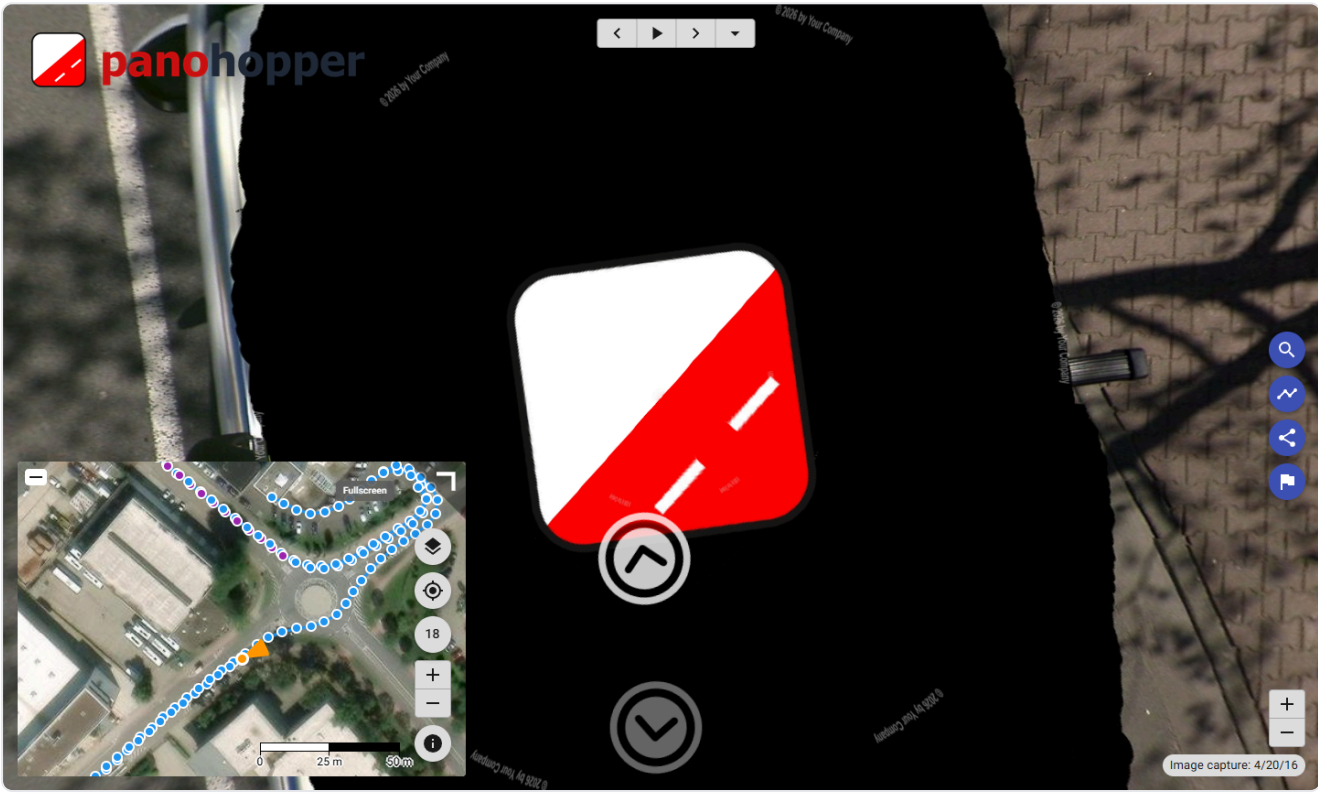
Setting	What it does
Watermark	Writes a text into every Street View, for example your copyright.
Text	The watermark text, for example *© 2026 by Your Company*.
Font	One of the fonts installed in Windows.
Size	Text size.
Opacity	How visible the text is.
Columns / **Rows**	How often the text repeats from left to right / top to bottom.
Mask	Lays a transparent PNG image over every Street View, usually to hide the car roof at the bottom (nadir).
Mask path	The PNG image. An example is in Creator's folder: `resources\vendor\masks`.

Setting	What it does
Nadir logo	Puts your logo straight below the camera, on top of the mask. See Nadir logo.
Nadir logo path	Your logo as PNG (with transparency) or JPEG.
Nadir logo size (degrees)	How wide the logo appears from the camera, edge to edge. Default 40.

Reset (top right) sets the tab back to its defaults. Check the result in the Leveling and brightness preview.

10.2 Nadir logo

A nadir logo is your logo at the bottom of the Street View, where the car roof is. It is also the only addition Google allows for 360° photos ("superimposed content must be limited to either the zenith or nadir").

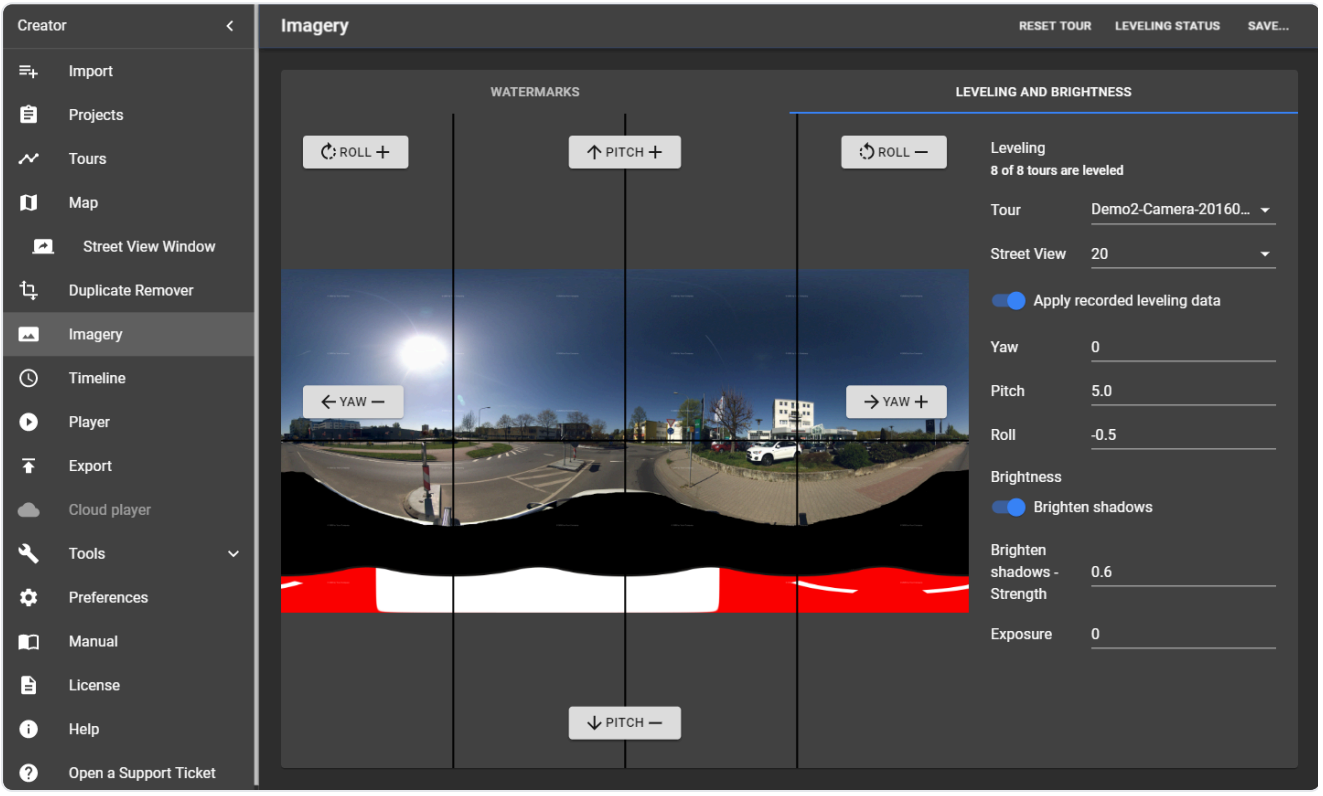


Nadir logo in the player, looking straight down

1. Have your logo ready: a square PNG with a transparent background, at least 1024 × 1024 pixels.
2. On the **Watermarks** tab, switch on **Nadir logo** and choose the file as **Nadir logo path**.
3. Set the **Nadir logo size**: 40 degrees covers the middle of the car roof; use a larger value to cover more of it.
4. Check the result in the Leveling and brightness preview.
5. In Player → Street View, set **Look down limit** to -90. The default (-50) hides the car roof and the logo. Check the result in the Player → Preview. Don't forget to change the **Look down limit** back to -50.
6. Export with **Skip existing Street Views** switched off. Street Views created before keep their old look until they are processed again.

Creator projects the flat logo onto the panorama, so it looks flat and undistorted when you look straight down. The top of the logo points in driving direction. With **Mask** switched on as well, the logo is placed on top of the mask.

10.3 Leveling and brightness



Imagery → Leveling and brightness

The preview shows one Street View, stitched with the current settings. It is available for recordings of the Applied Streetview camera.

Leveling

The camera on the roof and the leveling sensor in the car are never mounted perfectly straight. Leveling corrects the three angles between them, so the horizon is level.

1. Choose a **Tour** and a **Street View** on the right.
2. Use **Roll +/–**, **Pitch +/–** and **Yaw +/–** around the preview until the Street View is level, or enter the values in **Yaw**, **Pitch** and **Roll**.
3. Check a few other Street Views of the same tour.
4. Click **Save...** (top right) and choose where the values apply:

Save option	Applies to
Save to this tour	the current tour
Save to all tours	all tours of the project
Save to all tours of the same day	all tours recorded on the same day
Save to all tours of this timeline	all tours of the current timeline

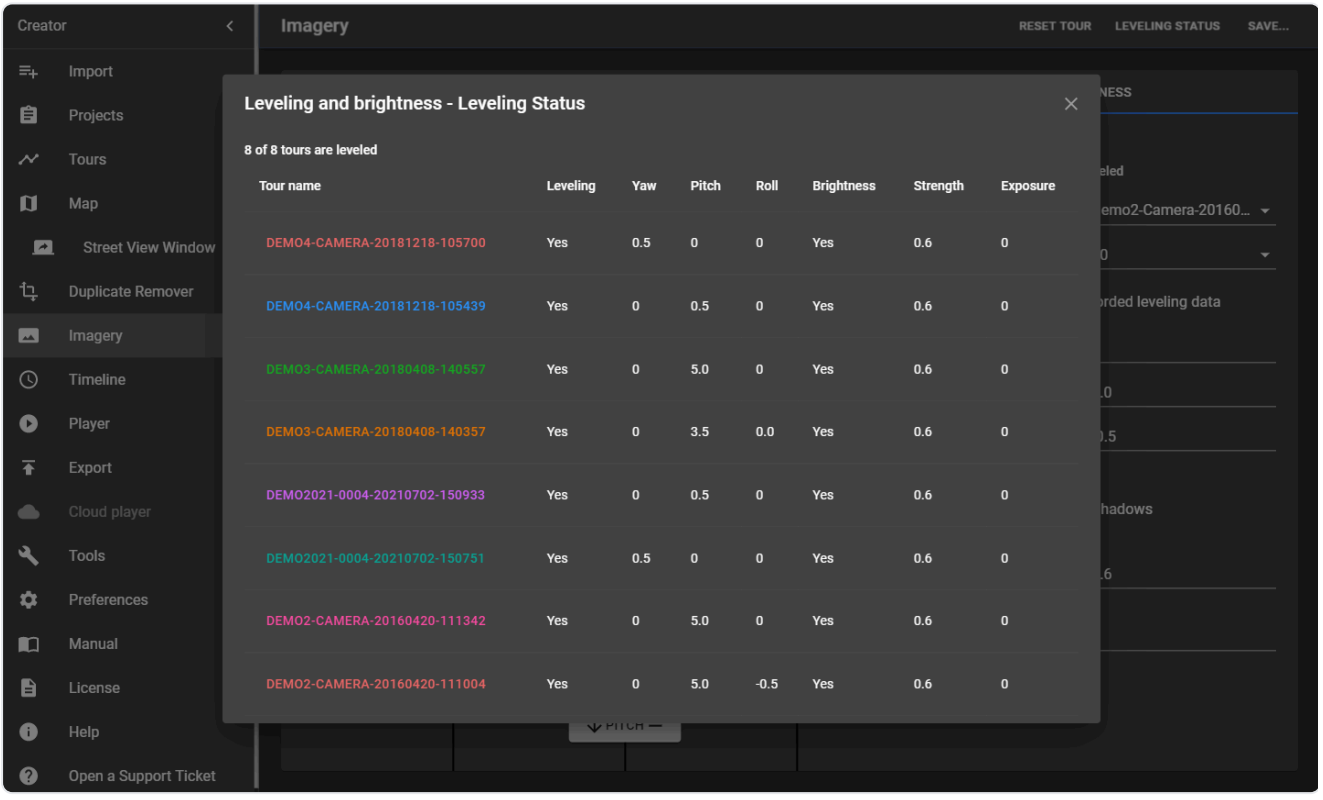
If the camera mount and the sensor holder stay on the car, the same values usually fit all tours.

Apply recorded leveling data uses the angles that the camera recorded while driving (on by default).

Brightness

Setting	What it does
Brighten shadows	Brightens dark areas automatically.
Brighten shadows – Strength	How much, from 0.1 to 1. Default 0.6 (the standard look).
Exposure	Overall brightness, from 0 (no change) to 5. Default 0.

Leveling Status and Reset tour



Imagery → Leveling Status

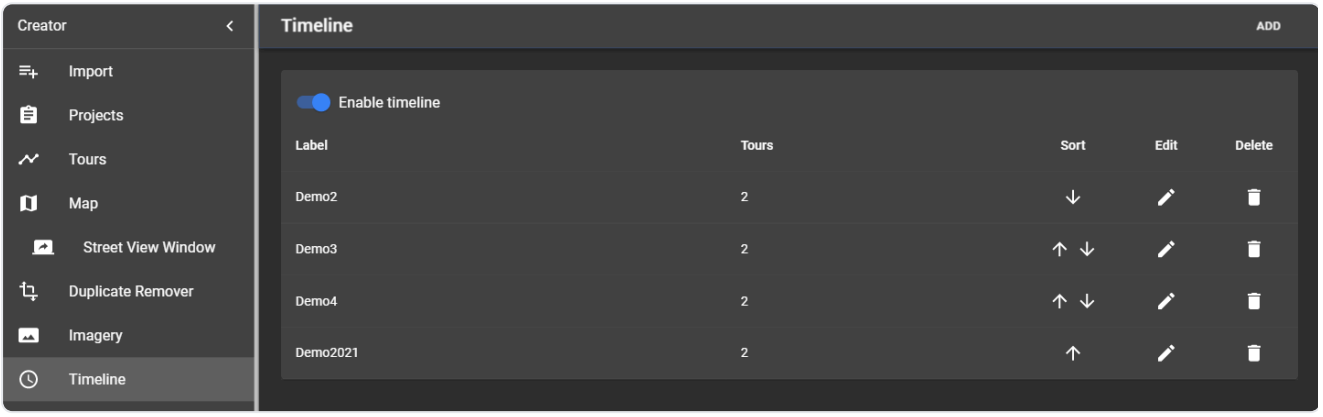
- **Leveling Status** (top right) lists all tours with their leveling and brightness values and shows how many tours are leveled.
- **Reset tour** sets the current tour back to its defaults.

Missing or damaged photos

If photos of the shown Street View are missing or can't be read, the page lists their full paths with a **Copy to Clipboard** button instead of the preview. See Troubleshooting.

11 Timeline

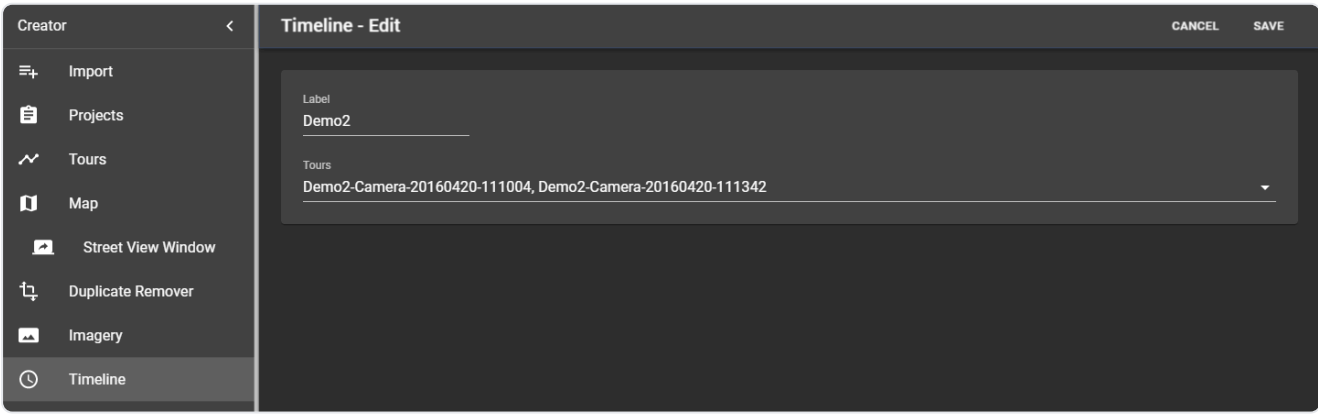
Menu → **Timeline** groups tours by recording date, so users can compare the same streets recorded at different times, for example *2021* and *2023*. In the player, users switch between the timelines.



Timeline

Item	What it does
Enable timeline	Switches timelines on for this project.
Add (top right)	Creates a new timeline.
List	**Label**, the **Tours** of each timeline, and **Sort**, **Edit** and **Delete** buttons.

11.1 Add or edit a timeline



Timeline → Edit

1. Click **Add**, or **Edit** next to a timeline.
2. Enter the **Label**, for example *2021*.
3. Select the **Tours** that belong to it.
4. Click **Save** (top right). **Cancel** discards the changes.

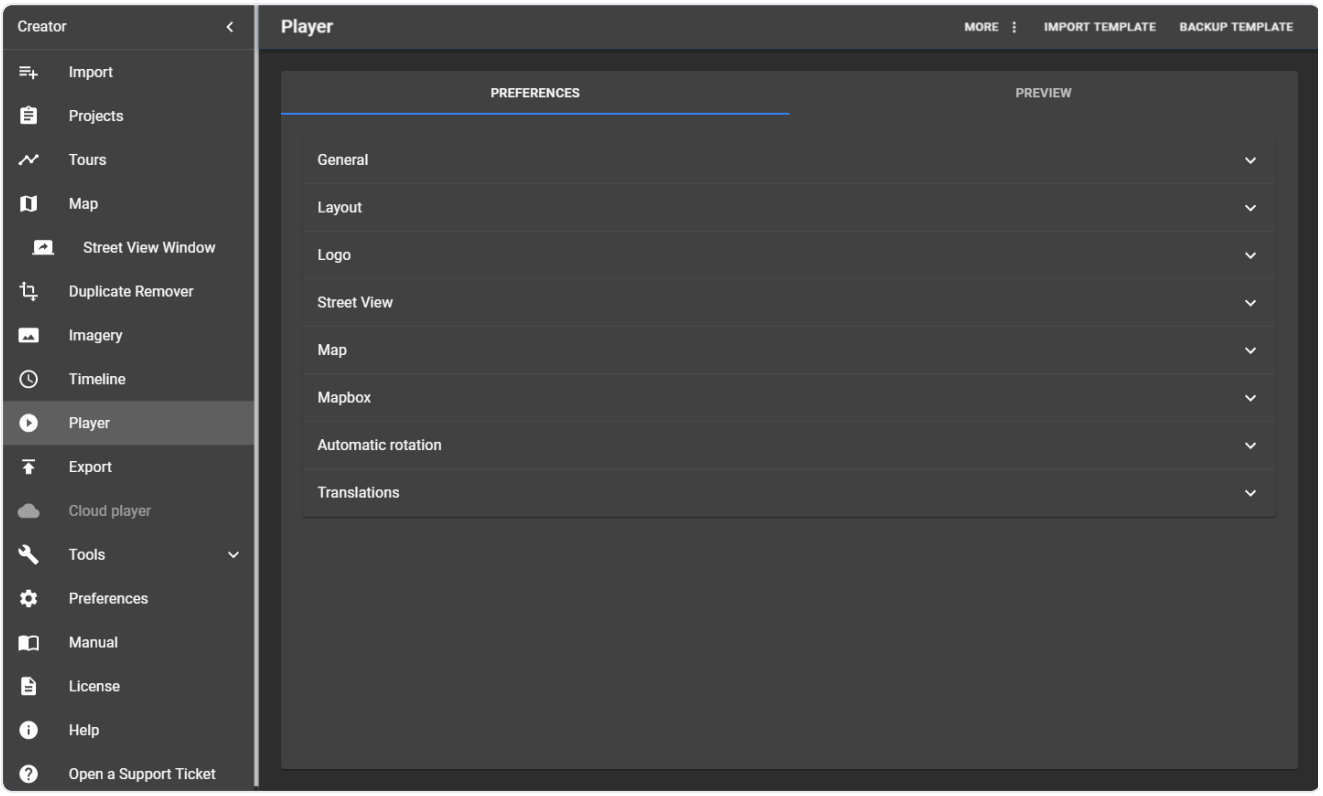
Delete removes a timeline after a confirmation; its tours stay in the project.

11.2 Tips

- After assigning all tours, run the Duplicate Remover with **Process target** → **Timeline**, so duplicates are removed within each timeline.
- The Map has a **Timeline** panel to show timelines one by one.
- In the player, the timeline panel can start opened: Player → Layout.

12 Player

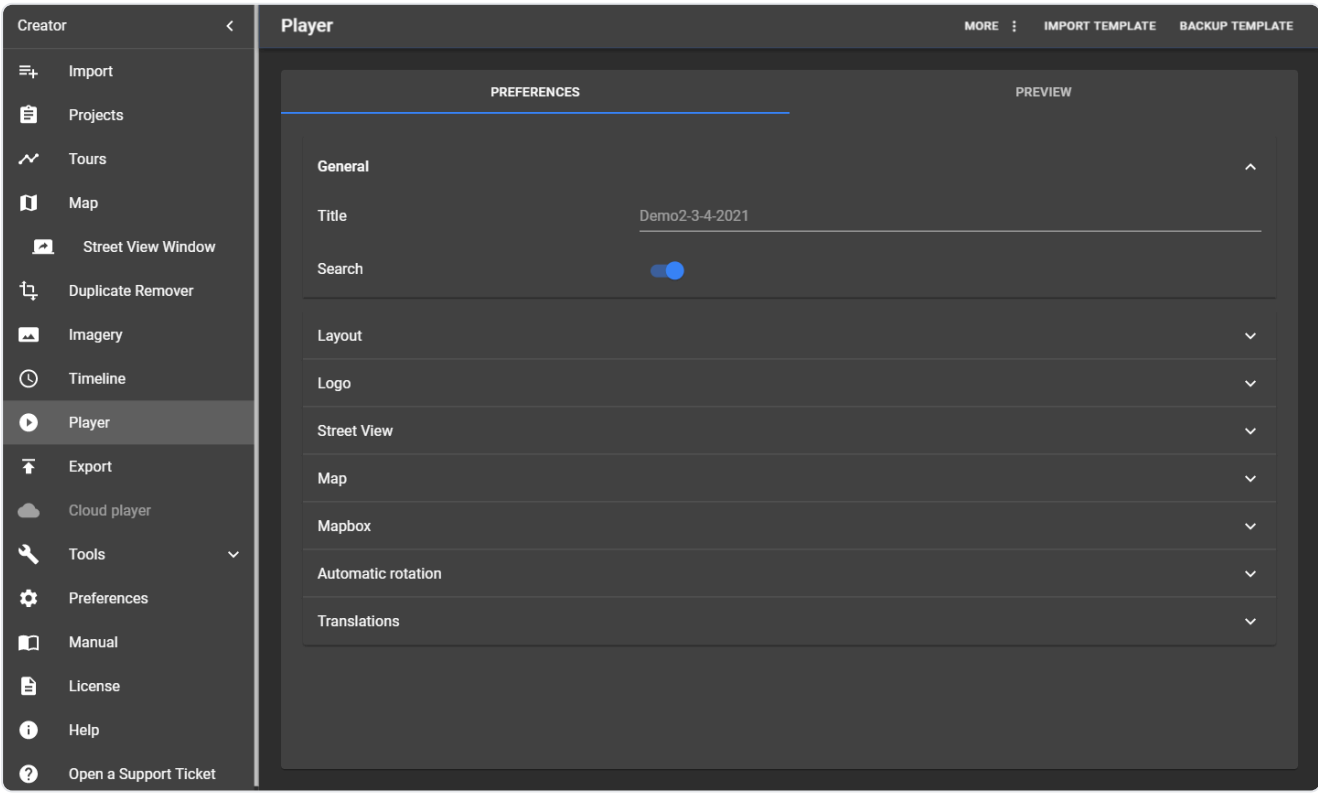
Menu → Player sets up the player that Export creates: Its look, its map and its texts. Which player is created (Player 3, Player 2 or Legacy) is chosen in Preferences → Player. The page has two tabs: **Preferences** and **Preview**. Go back and forth between them until the player looks the way you want.



Player → Preferences

The settings are grouped in panels; click a panel's title to open it. Settings are saved at once.

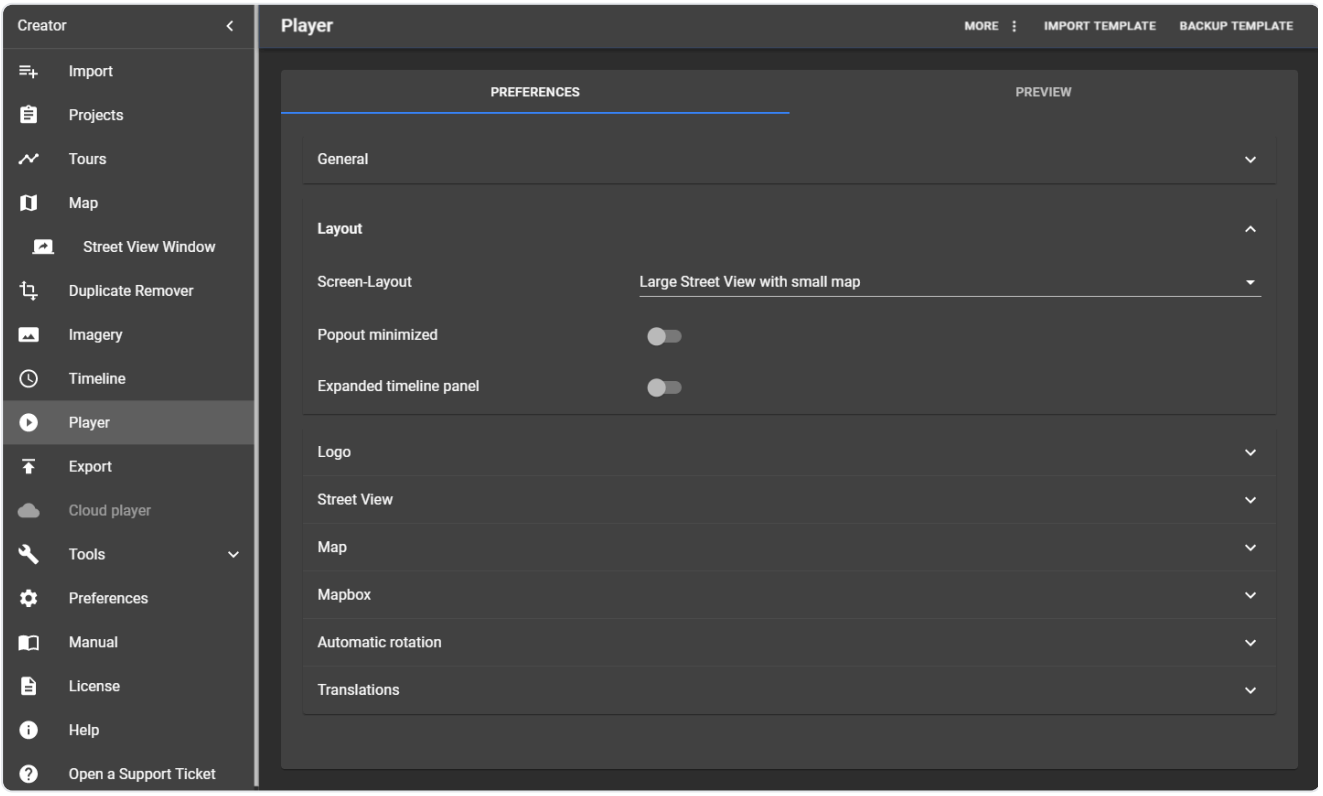
12.1 General



Player → General

Setting	What it does
Title	Title of the player page (browser tab). Empty: The project name.
Search	Shows a search field for places and addresses.

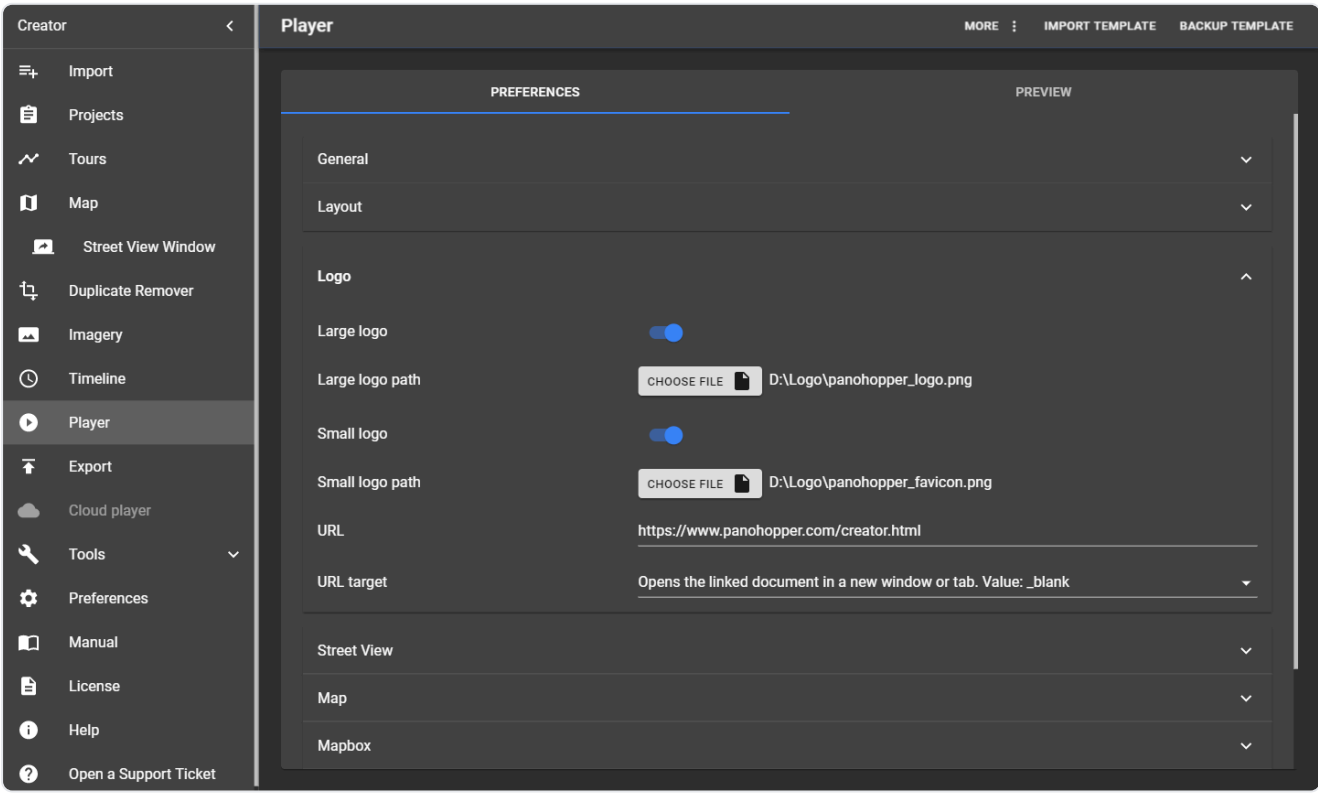
12.2 Layout



Player → Layout

Setting	What it does
Screen-Layout	Start layout: *Large map with small Street View*, *Large Street View with small map*, *Top: Map, Bottom: Street View*, *Top: Street View, Bottom: Map*, or *Street View only*.
Popout minimized	The small window starts minimized.
Expanded timeline panel	The timeline panel starts opened.

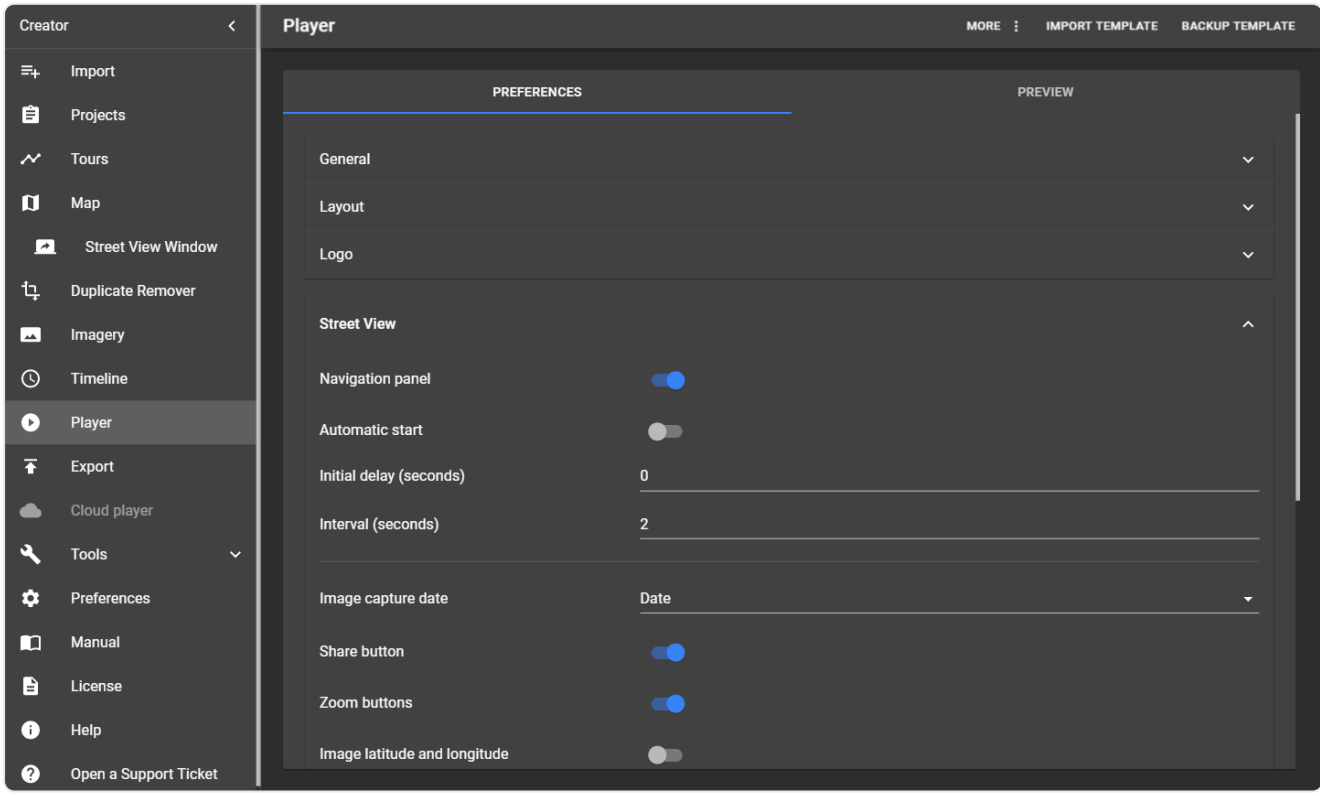
12.3 Logo



Player → Logo

Setting	What it does
Large logo / **Large logo path**	Your logo for large screens (PNG or JPEG).
Small logo / **Small logo path**	Your logo for small screens and phones.
URL	Web page that opens when users click the logo.
URL target	Where it opens: New window or tab (`_blank`), same frame (`_self`), parent frame (`_parent`), full window (`_top`).

12.4 Street View

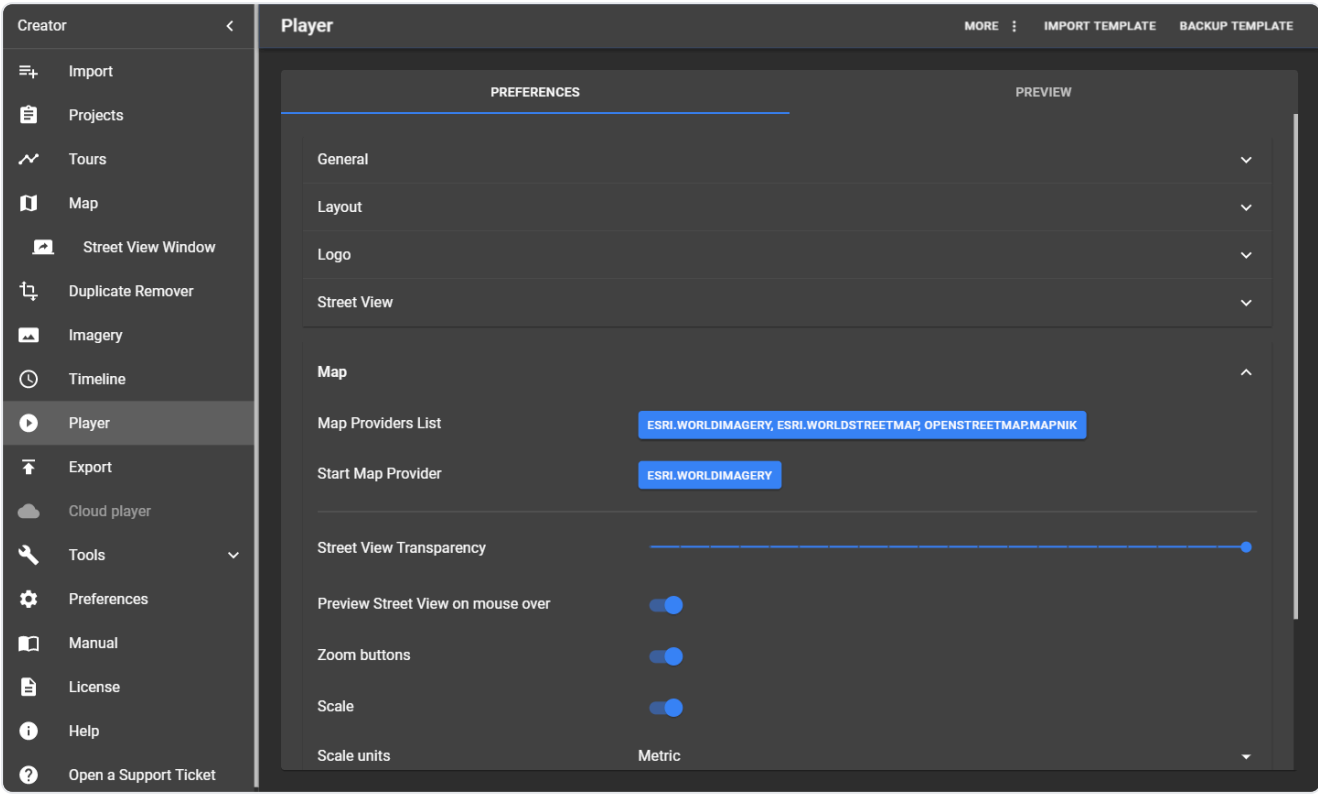


Player → Street View

Setting	What it does
Navigation panel / **Automatic start** / **Initial delay** / **Interval**	Shows the buttons to drive through the Street Views; optionally starts driving automatically after the delay, one step per interval (seconds).
Hotspots / **Hotspot label** / **Minimum** and **Maximum display distance (m)**	Player 2 and Legacy: Clickable markers for nearby Street Views, labelled by *None*, *Auto*, *POI*, *Road* or *Street View ID*, shown between the two distances.
Arrows / **One Street View per section (degrees)** / **Minimum** and **Maximum display distance (m)**	Player 2 and Legacy: Navigation arrows on the street.
Click navigation / **Street Views available from** / **to (m)**	Player 2: Click anywhere on the street to go there.
Image capture date / **Image capture time**	Shows when the Street View was recorded: *None*, *Date*, *Date and time* or *Month and year*.
Share button	Users can copy a link to the current view.
Zoom buttons	Shows + and − buttons.
Image latitude and longitude	Shows the position of the Street View.
Max Zoom-in / **Max Zoom-out (degrees)**	Limits of the zoom (field of view).

Setting	What it does
Look down limit / Look up limit (degrees)	How far users can look down or up. Default -50 hides the car roof; use -90 to look straight down, for example at a nadir logo.

12.5 Map

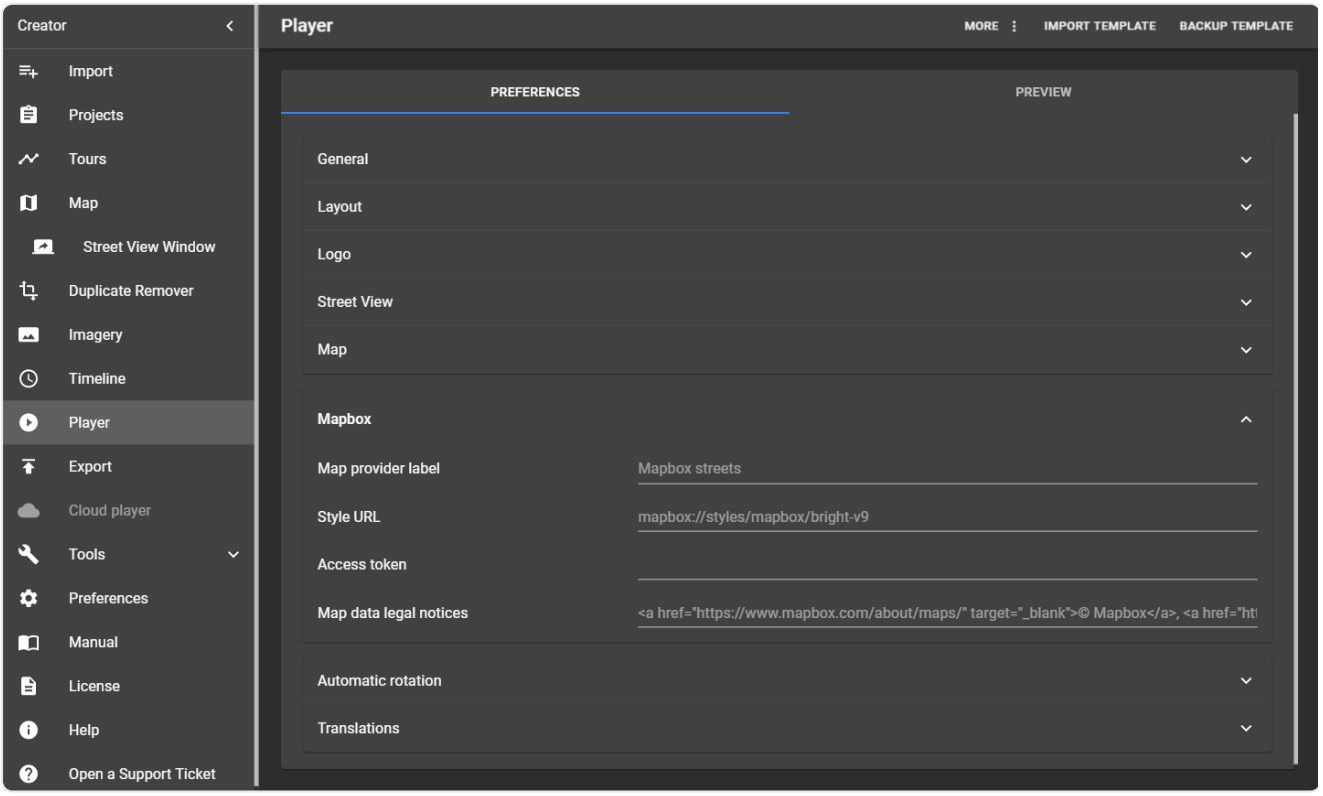


Player → Map

Setting	What it does
Map Providers List	The base layers users can choose in the player. They are set on the Map page.
Start Map Provider	The base layer the player starts with.
Street View Transparency	How transparent the Street View dots and lines are on the map.
Preview Street View on mouse over	Shows a small preview image when the mouse is over a Street View.
Zoom buttons	Shows + and − on the map.
Scale / Scale units	Shows a scale bar in *Metric*, *Imperial inch*, *US inch*, *Nautical mile* or *Degrees*.

Above the zoom level where the map provider has no more detail, the player enlarges the last available level instead of showing "Map data not yet available".

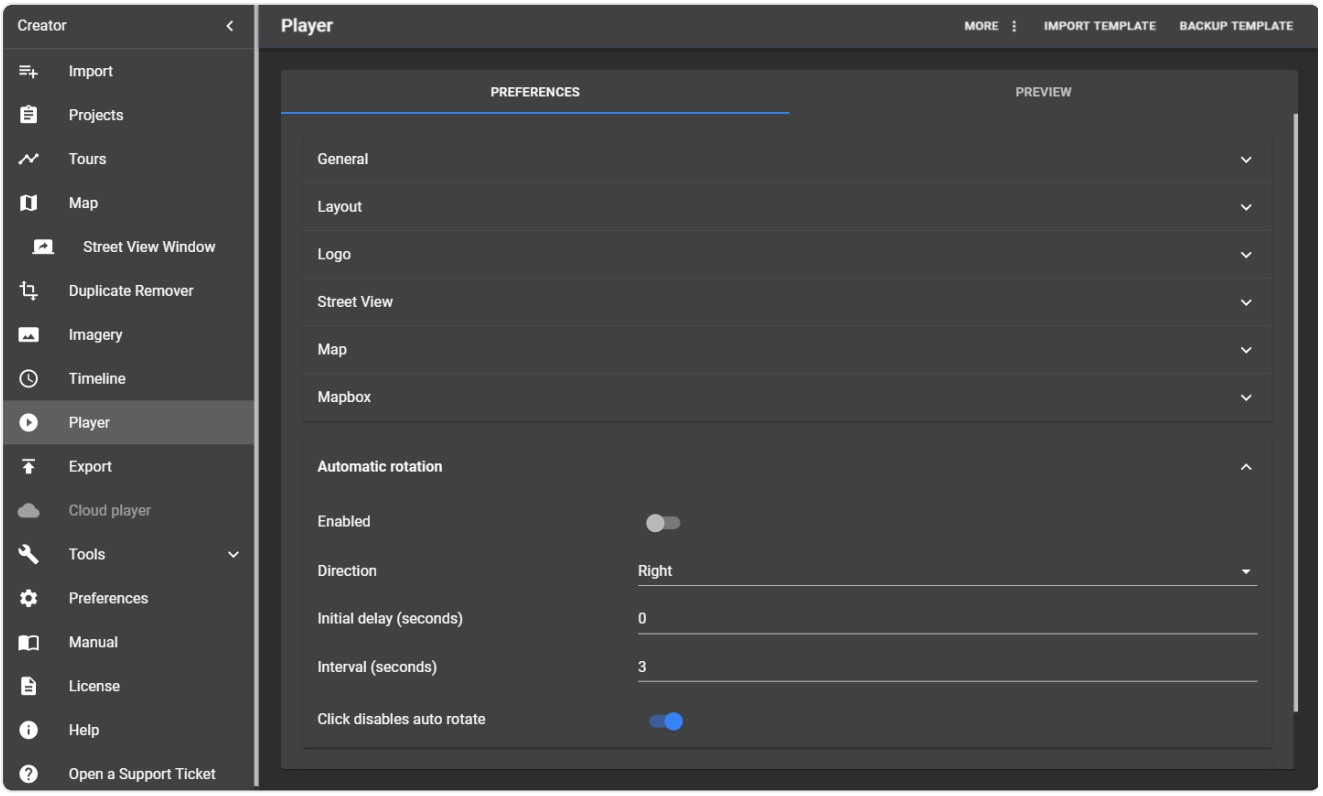
12.6 Mapbox



Player → Mapbox

Your own Mapbox style as a base layer in the player: **Map provider label**, **Style URL**, **Access token** and **Map data legal notices**. In Mapbox Studio, click **Share** to copy the style URL and the access token. Then tick the Mapbox base layer on the Map page.

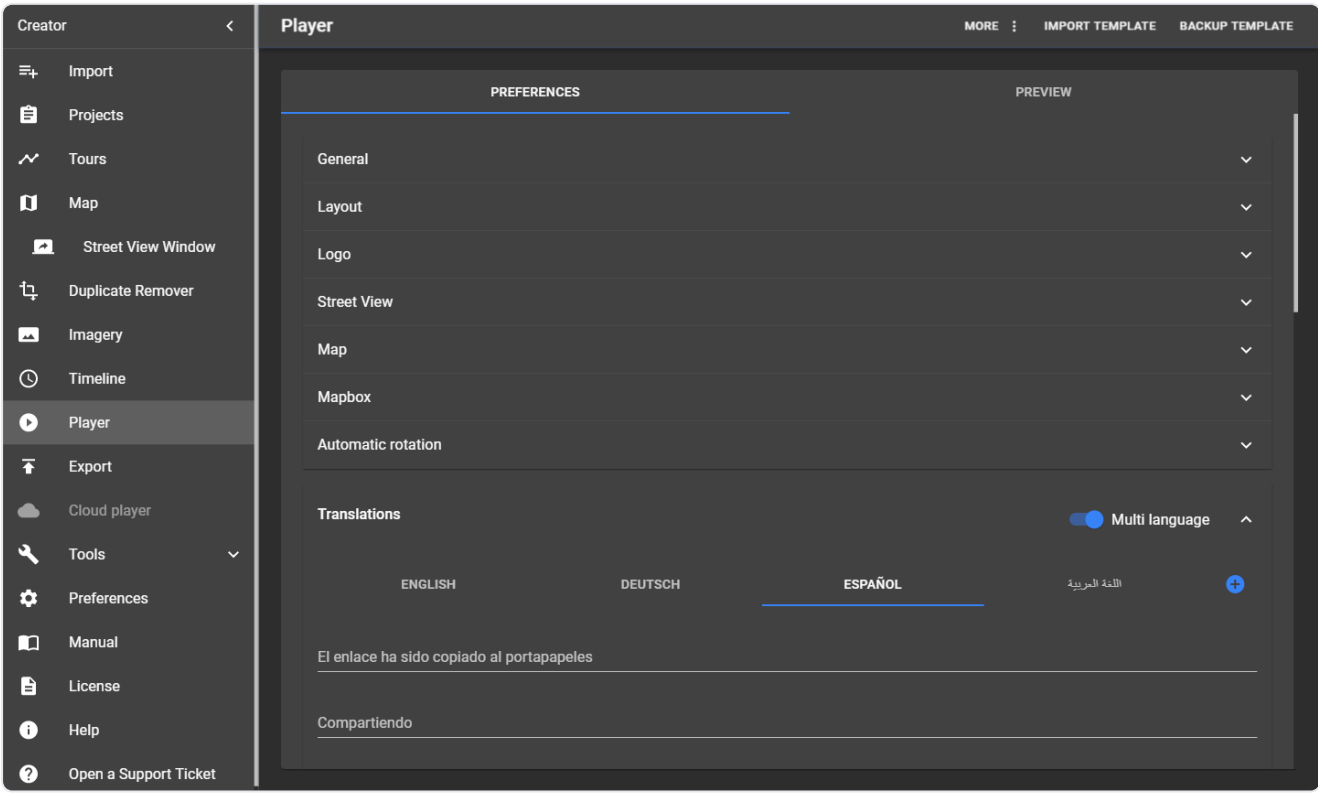
12.7 Automatic rotation



Player → Automatic rotation

Setting	What it does
Enabled	The Street View turns slowly by itself, for example on a screen in a shop window.
Direction	*Left* or *Right*.
Initial delay (seconds)	Wait time before the rotation starts.
Interval (seconds)	Speed of the rotation.
Click disables auto rotate	A click by the user stops the rotation.

12.8 Translations



Player → Translations

The player comes in English, German, Spanish, Arabic and Greek. Each text of the player can be changed here, one tab per language.

Item	What it does
Multi language	Shows a language button in the player. The player picks the language of the user's browser; if there is no match, it uses the first language.
Add a new Language	Adds a language: **Two letter code** (ISO 639-1, for example `fr`) and **Label** (for example *Français*).
Delete Language	Deletes a language and all its texts. Back up the player settings first with **Backup template** (see Templates and Legacy Player). To bring back a built-in language, add it again with its code (`en`, `de`, `es`, `ar`, `el`).

12.9 Preview



Player → Preview

The **Preview** tab shows the player as it will be exported, with your settings and the chosen player. Street Views shown here are stitched on the fly.

> **Note:** Player 2 and Legacy use krpano. Without a krpano licence, the preview and the exported player show a small "krpano demo version" mark. See Help.

12.10 Templates and Legacy Player

The buttons in the top right corner:

Button	What it does
Backup template	Saves all player settings (not the Street Views) as a file, to reuse them in other projects.
Import template	Loads player settings from such a file.
More → Enable Legacy Player	Switches this project to the old Legacy Player of Creator 5 (folder `player`, for Windows Instant Player, Linux/LAMP and Android). The page then shows that player's settings. **More → Disable Legacy Player** switches back.



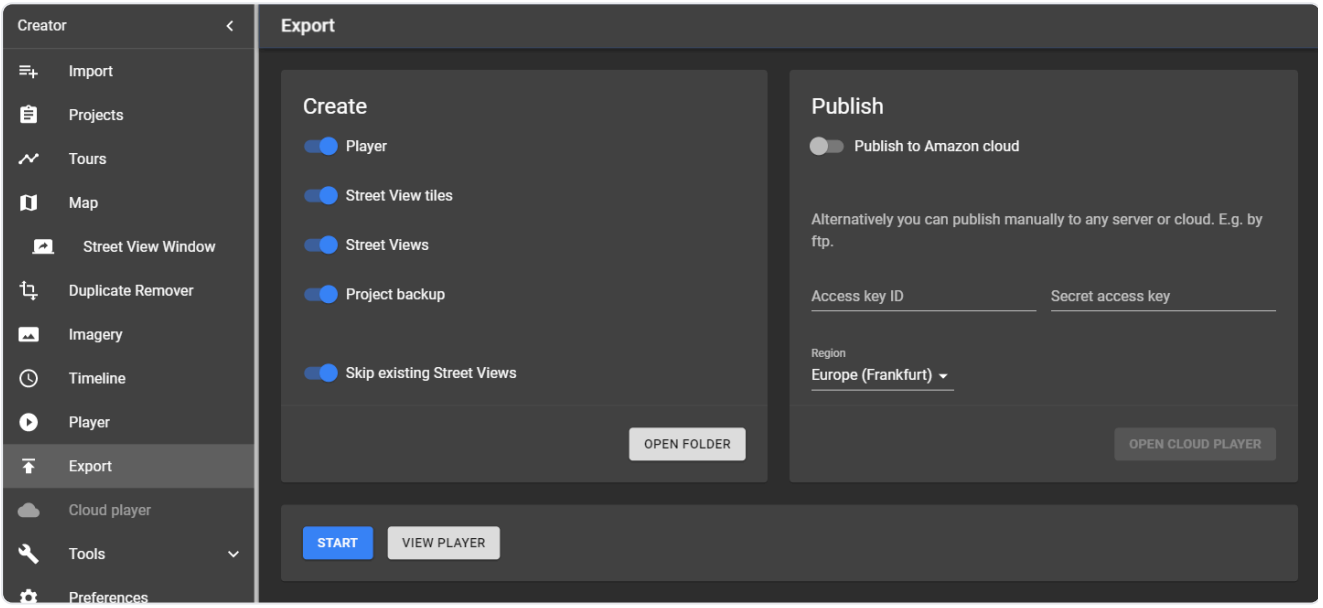
Player → More

12.11 Keyboard shortcuts in the player

Player 2 and Legacy: **Page Up** / **Page Down** go to the next / previous Street View, the **arrow keys** look around, and **Ctrl + Shift + H** hides the hotspots and arrows for screenshots.

13 Export

Menu → **Export** creates the Street Views and the player, and publishes them to the Amazon cloud if you want. The page has two cards, **Create** and **Publish**, and the buttons **Start** and **View Player**.



Export

13.1 Create

Setting	What it does
Player	Creates the player chosen in Preferences → Player with your Player settings. With *Legacy*, Export also creates the old Legacy Player in the folder `player`.
Street View tiles	Stitches the photos and cuts each Street View into tiles for the player. Needed by all players.
Street Views	Also saves each Street View as one 8192 × 4096 pixel image with position data (EXIF), for review, for G-Publisher or for other programs.
Project backup	Saves a project backup each time you start, in the project's `backups` folder. Recommended.
Skip existing Street Views	When you export a project again, Street Views that already exist are not stitched again. Saves a lot of time.

Open folder opens the project's output folder.

13.2 Start, stop and the log

- **Start** begins the export. A progress bar shows the remaining time; the log below lists every step.
- **Stop** ends the export; you can continue later with **Start** (use *Skip existing Street Views*).
- Street Views with missing or damaged photos are skipped and listed in the log with the full path of the photo, for example `…\camera-20210624-100101\2\000000026.jpg`. See Troubleshooting.

13.3 What Export creates

All files go into the output folder, in a subfolder named after the project:

Folder	Content
`player3`, `player2` or `player2-legacy`	The player of your choice (static web files, no database).
`panorama-tiles` (Player 3 and 2) or `panorama-tiles-legacy` (Legacy)	The Street View tiles.
`player`	Only with Legacy: The old Legacy Player (Windows Instant Player, Linux/LAMP, Android).
`panoramas`	The 8192 × 4096 Street View images (*Street Views*). Not needed for a working player. No need to publish.
`backups`	Project backups (*Project backup*). Not needed for a working player. No need to publish.

The player's map gets a zoom limit for each built-in base layer: For Esri maps, Creator asks Esri which detail levels exist at your Street Views (internet needed, otherwise fixed limits are used). Zooming in further enlarges the last available level instead of showing "Map data not yet available".

13.4 View Player

View Player opens the exported player in your web browser, straight from the output folder.

If you exported the project with more than one player, there is one button per player instead: **View player3**, **View player2** and **View legacy player: Krpano**.

13.5 Publish

Setting	What it does
Publish to Amazon cloud	Uploads the player and the active Street View tiles to your Amazon Web Services account at the next **Start**.
Update existing Cloud player / **Publish a new Cloud Player**	When the project was published before: Update the existing player (same address, only new Street Views are uploaded) or create a new one.
Access key ID / **Secret access key**	Your AWS keys, see Publishing on Amazon Web Services.
Region	The AWS region; choose the one closest to your users.
Open Cloud player	Opens the published player in your browser.

Only active Street Views are uploaded. You can also publish by hand: Copy the player folder and the tiles folder to any web server, see Publishing on your own web server.

13.6 Export without an open project

Without an open project, **Menu** → **Export** asks you to open a project first.

14 Publishing on Amazon Web Services

The easiest way to publish a player is the Amazon cloud: One click on Export, no server to run, low cost, and it scales by itself. The player's address contains a random part (UUID); only people who get the link can find it.

14.1 Create an AWS account and keys

You need this only once.

1. Go to https://aws.amazon.com/console/ and sign in, or create an Amazon Web Services account.
2. Open **IAM** → **Users** → **Create user**, for example with the name *creator*.
3. Give the user the permissions to publish (for example the policy *AdministratorAccess*, or a narrower policy for S3, CloudFront and Lambda if your IT prefers).
4. Open the user → **Security credentials** → **Create access key**. Choose *Application running outside AWS*.
5. Copy the **Access key ID** and the **Secret access key** into Creator: Export → Publish or Preferences → Amazon cloud.
6. Download the keys as a `.csv` file and keep it in a safe place; the secret key is shown only once.

Some regions (for example *Africa (Cape Town)*, *Asia Pacific (Hong Kong)*, *Europe (Milan)*, *Middle East (Bahrain)*) must be enabled in your AWS account settings before you can publish there.

> **Note:** Anyone with both keys can use your AWS account. Don't share them.

14.2 Custom domain and CDN (CloudFront)

For your own domain name or for high traffic from many regions, put a CloudFront distribution in front of the player:

1. Open https://console.aws.amazon.com/cloudfront/ → **Create distribution**.
2. **Origin domain:** The player's address from Creator (S3 bucket), for example `demo3-….s3.eu-central-1.amazonaws.com`.
3. **Viewer protocol policy:** *Redirect HTTP to HTTPS*. Create the distribution.
4. Wait until its status is *Deployed*. The address looks like `https://d2z6fc2o2b33zp.cloudfront.net/index.html`.

A new distribution can take up to 24 hours until it works everywhere. Web address parameters such as `v_lat` and `v_lng` (Player API) work once it is deployed.

14.3 Embed the player in a web page

Add this to your page, with your player's address:

```
<iframe src="https://d2z6fc2o2b33zp.cloudfront.net/index.html"
  width="100%" height="600" frameborder="0" style="border:0" tabindex="0"></iframe>
```

14.4 Publishing on your own web server

The player is a set of static files (HTML, JavaScript, CSS, images), with no database. It runs on any web server: Apache, NGINX, IIS, or any cloud storage.

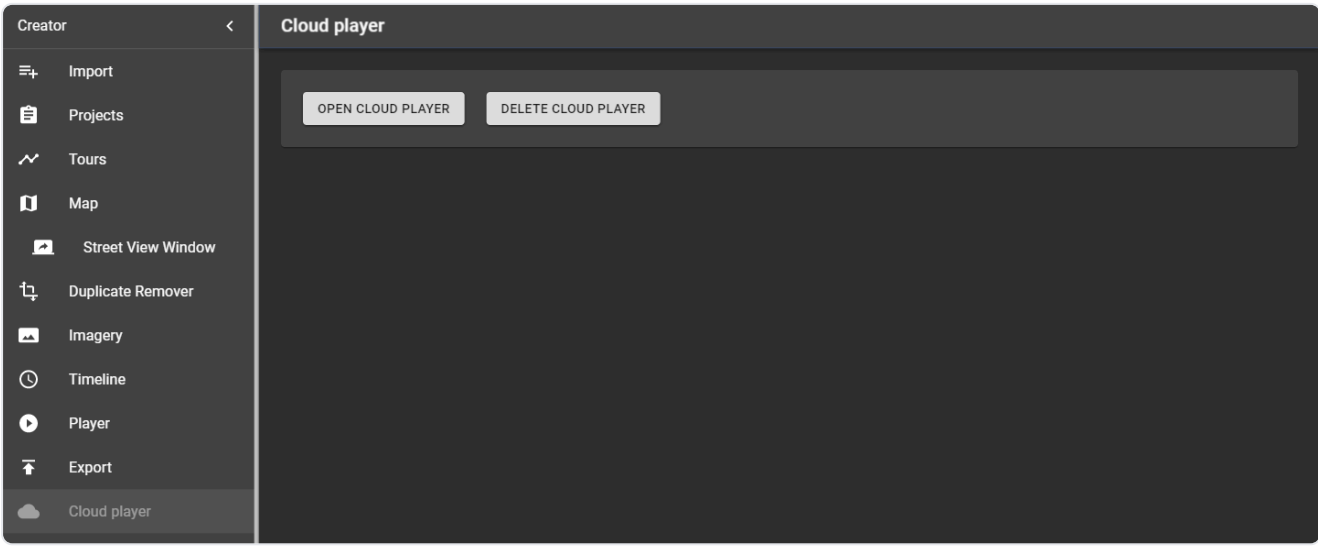
1. Copy the player folder (`player3` , `player2` or `player2-legacy`) and its tiles folder (`panorama-tiles` or `panorama-tiles-legacy`) side by side to your server, for example `https://www.your-server.com/projects/Demo3/player3/` and `…/Demo3/panorama-tiles/` .
2. Open `https://www.your-server.com/projects/Demo3/player3/` in a browser.

To embed it, use an `iframe` with that address, as above.

15 Cloud player

Menu → Cloud player manages the player published to the Amazon cloud with Export → Publish. The menu item is available after the project has been published. The tabs **Users** and **Statistics** appear once the cloud player exists; the screenshot below shows a project before publishing.

15.1 General



Cloud player → General

Button	What it does
Open Cloud player	Opens the published player in your browser.
Delete Cloud player	Deletes the player and its Street View tiles from the Amazon cloud and from the project. You confirm by typing the project name. The same address can't be restored.

To delete the player only from the cloud and keep its address in the project (to publish again to the same address later), use Preferences → Amazon cloud instead.

15.2 Users

Item	What it does
Enable authentication	The player asks for a user name and password.
Add user (top right)	Adds a user: **Username** and **Password**, then **Save**.
Edit / **Delete**	Change or remove a user.

Changes take effect after publishing again (**Export** → **Start**). Only the player is updated; the Street Views are not uploaded again, so this is fast.

15.3 Statistics

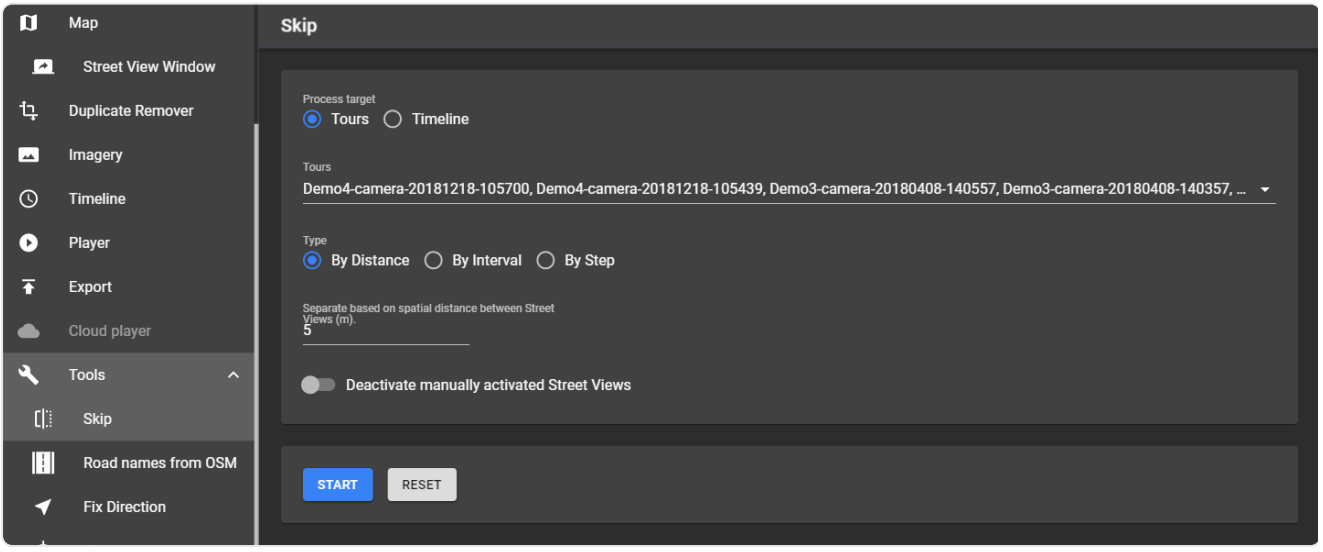
After publishing, the cloud player collects visitor statistics (Amazon CloudWatch). By default the last 7 days are shown; change **From** and **To** in the top right corner for another period. In your AWS account you can build more charts from the same CloudWatch data.

16 Tools

Menu → **Tools** opens a submenu with nine tools; the menu scrolls so that all of them are visible. Most of them change many Street Views at once; most have a **Reset** button to undo their changes.

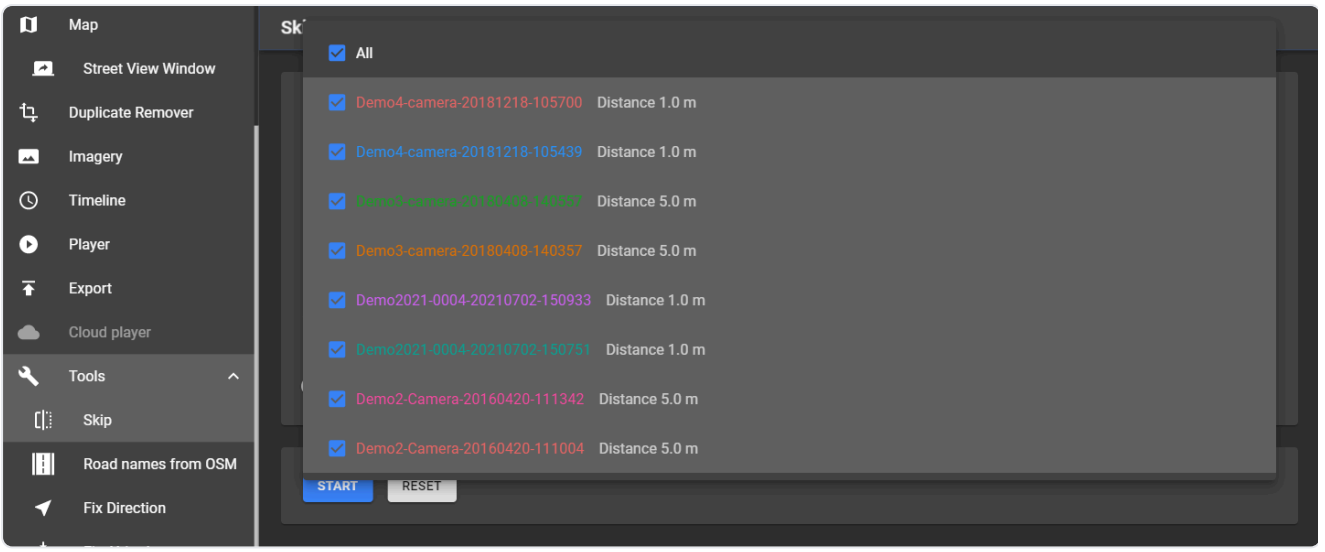
16.1 Skip

Tools → **Skip** thins out the Street Views, for example to turn a recording made every 1 m into one Street View every 5 m, or an interval recording into a distance recording. This greatly reduces the number of Street Views to process. Always run it **after** the Duplicate Remover.



Tools → Skip

Setting	What it does
Process target	Only with timelines: Selected **Tours** or selected **Timeline**s.
Tours	The tours to process. The list shows each tour's recording mode (for example *Distance 1.0 m*), as on the Tours page.
Type	**By Distance**: Metres between Street Views. **By Interval**: Seconds between Street Views. **By Step**: Keep every x-th Street View.
Deactivate manually activated Street Views	Off by default: Street Views activated by hand stay active.

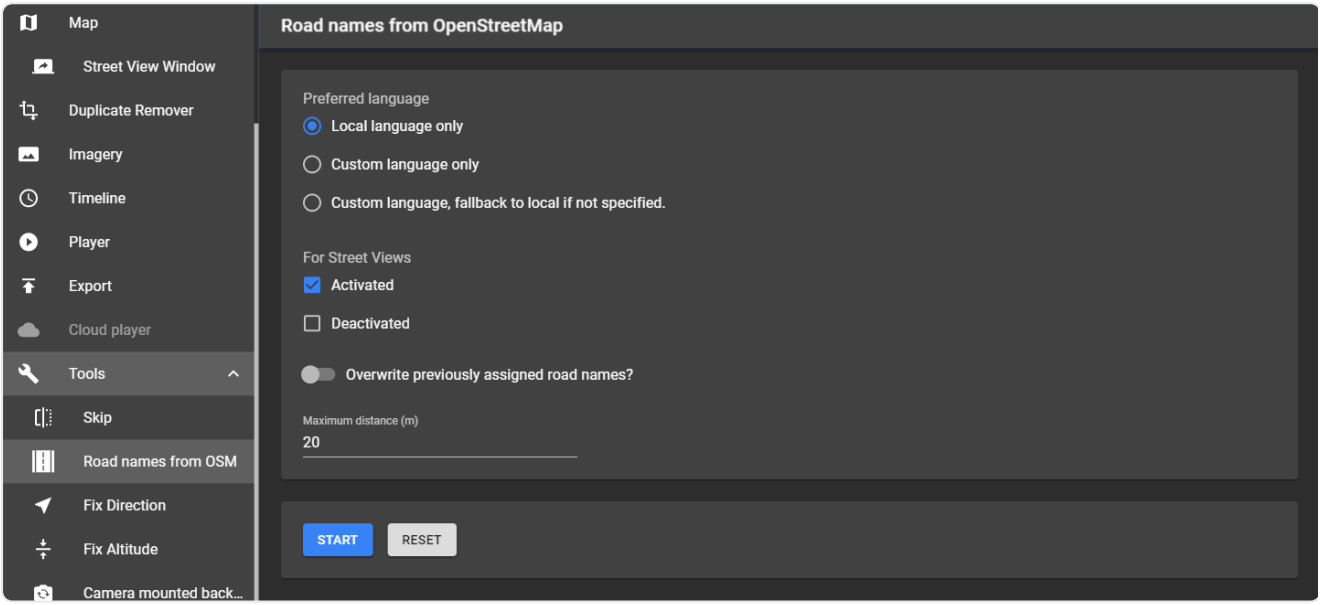


Tools → Skip: Tours list with recording modes

Start applies it; try a few values. **Reset** activates all Street Views deactivated by Skip **and** the Duplicate Remover.

16.2 Road names from OSM

Tools → Road names from OSM gives every Street View the name of the nearest road in OpenStreetMap. Road names can be shown in the player as hotspot labels and selected on the Map.



Tools → Road names from OSM

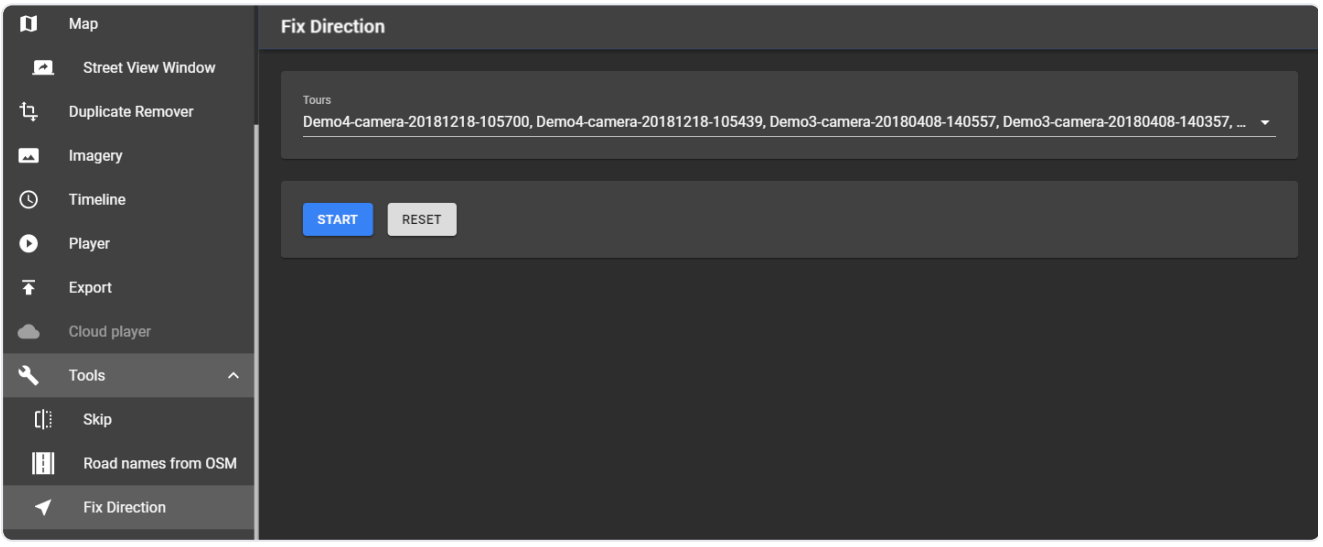
Setting	What it does
Preferred language	**Local language only** (OSM "name"), **Custom language only** ("name:xx"), or **Custom language, fallback to local if not specified**. **Custom language** is the two-letter code, for example `en`.
For Street Views	**Activated** and/or **Deactivated** Street Views.

Setting	What it does
Overwrite previously assigned road names?	Off: Street Views that already have a road name are skipped.
Maximum distance (m)	Roads farther away are ignored.

Needs an internet connection. **Reset** removes all road names, also those entered by hand on the Map.

16.3 Fix Direction

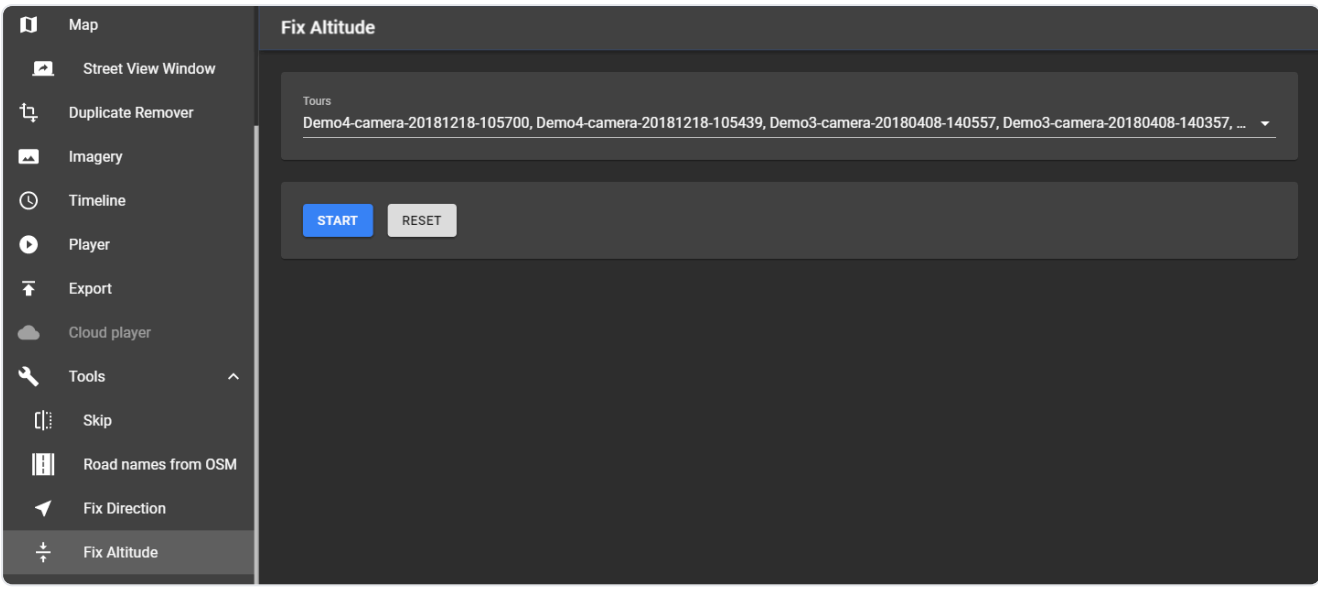
Tools → Fix Direction calculates the driving direction of each Street View from the positions of its neighbours. Use it when the recorded directions of most Street Views are wrong. Select the **Tours**, click **Start**. **Reset** restores the recorded directions.



Tools → Fix Direction

16.4 Fix Altitude

Tools → Fix Altitude replaces the recorded heights with heights from a terrain model (NASA SRTM, about 90 m grid). Use it when the recorded heights are wrong. Select the **Tours**, click **Start**. **Reset** restores the recorded heights.

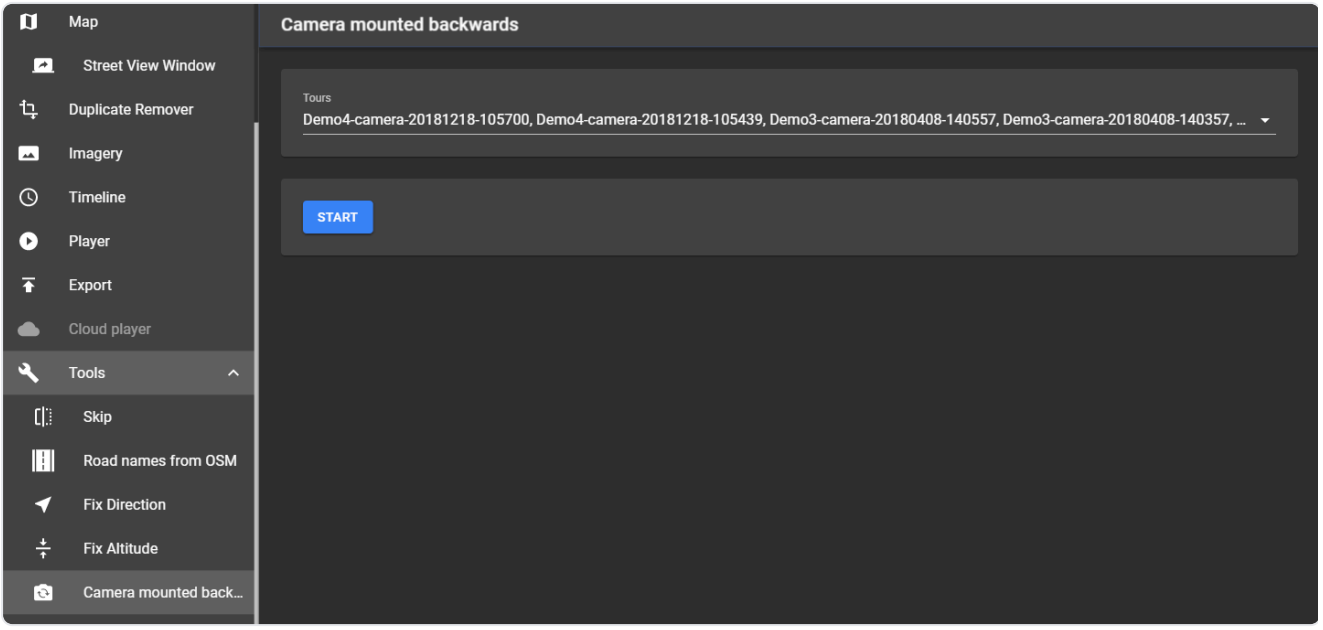


Tools → Fix Altitude

Needs an internet connection: Creator downloads the terrain data for the project area once (about 3 MB per 1° × 1° area). The area covers all Street Views, active and deactivated; move Street Views with wrong positions closer first.

16.5 Camera mounted backwards

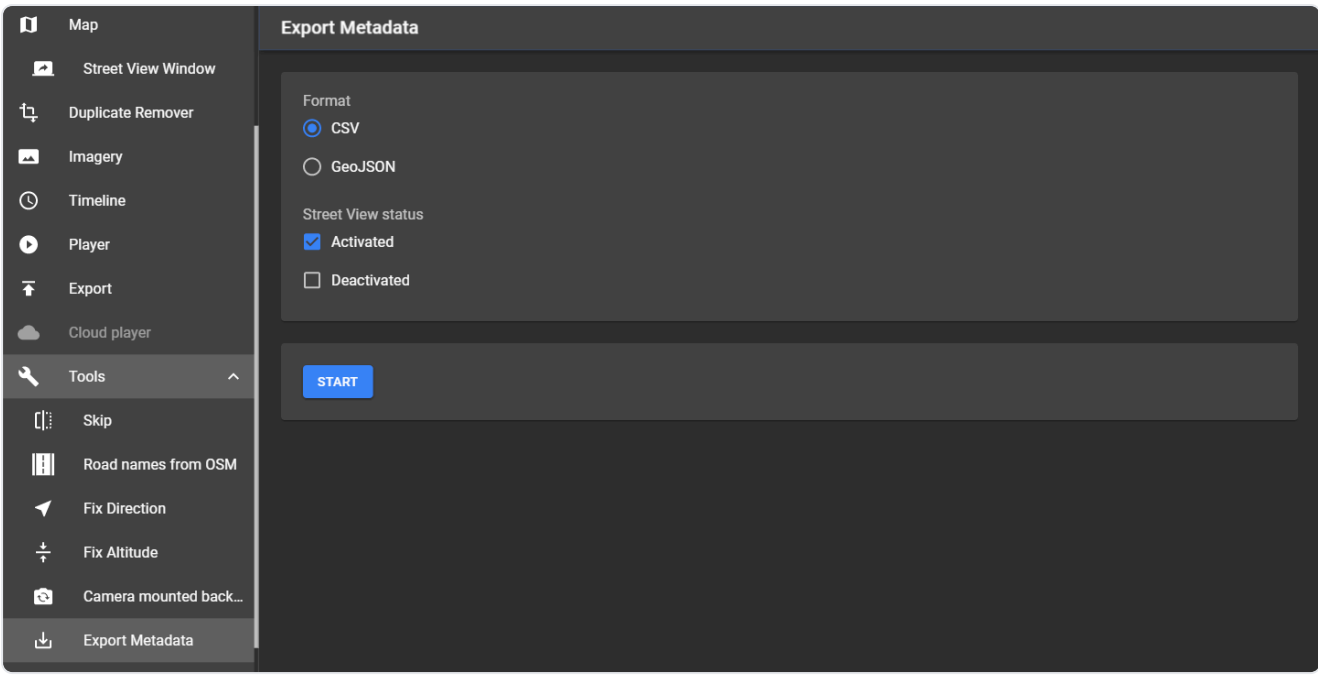
Tools → Camera mounted backwards turns all Street Views of the selected tours by 180°, for recordings made with the camera accidentally mounted backwards. Click **Start** again to undo. Only for recordings of the Applied Streetview camera.



Tools → Camera mounted backwards

16.6 Export Metadata

Tools → Export Metadata saves the data of the Street Views (ID, position, altitude, direction, date, road, POI ...) as a file, for example for a GIS or another program.



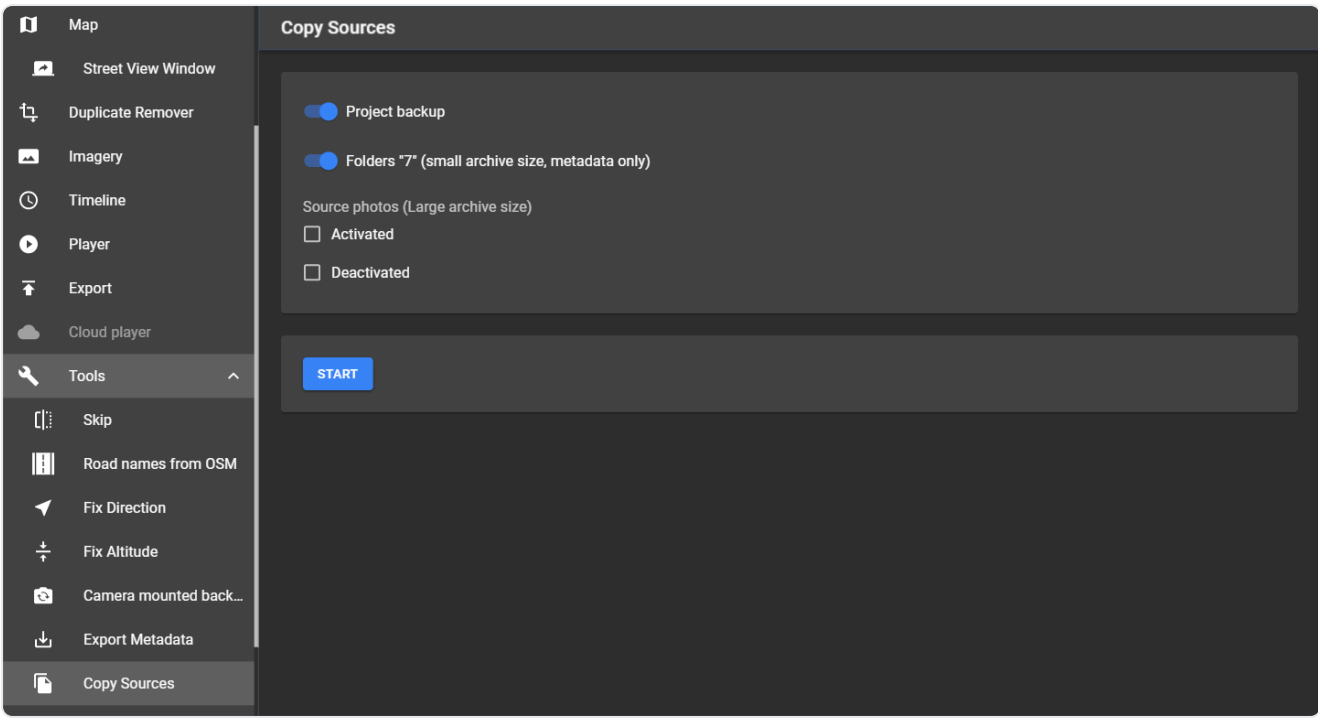
Tools → Export Metadata

Setting	What it does
Format	**CSV** (comma-separated, text in double quotes) or **GeoJSON**.
Street View status	**Activated** and/or **Deactivated** Street Views.

Start asks for the file name (default: The backup folder). **Open output file** opens it.

16.7 Copy Sources

Tools → Copy Sources packs parts of the project into a zip archive, for example to send it to support or to copy only some of the data.



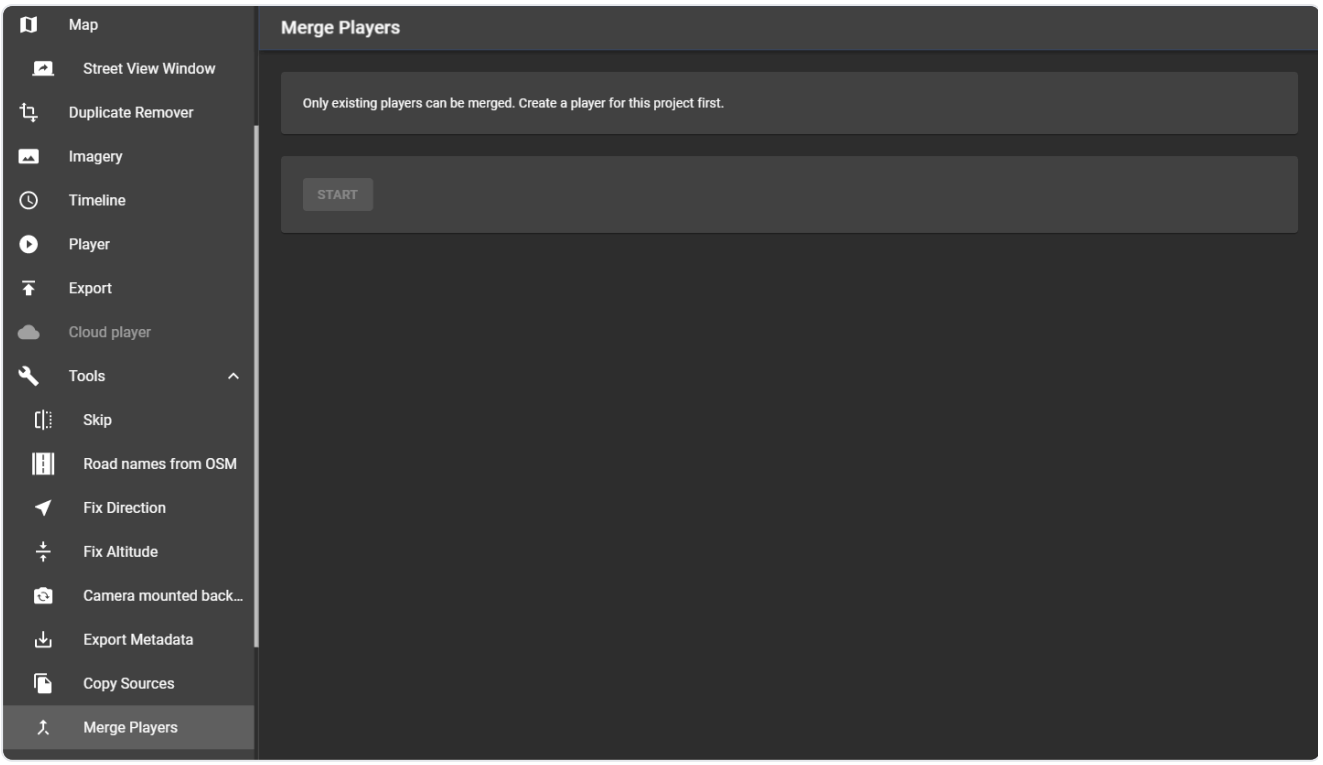
Tools → Copy Sources

Option	What is added
Project backup	The Creator project backup.
Folders "7" (small archive size, metadata only)	The position and log data of all tours, no photos.
Source photos (Large archive size)	The photos of the **Activated** and/or **Deactivated** Street Views.

Start creates the archive; **Open output folder** opens its folder.

16.8 Merge Players

Tools → **Merge Players** combines the players of several projects into one player, for example the city projects of a whole country.

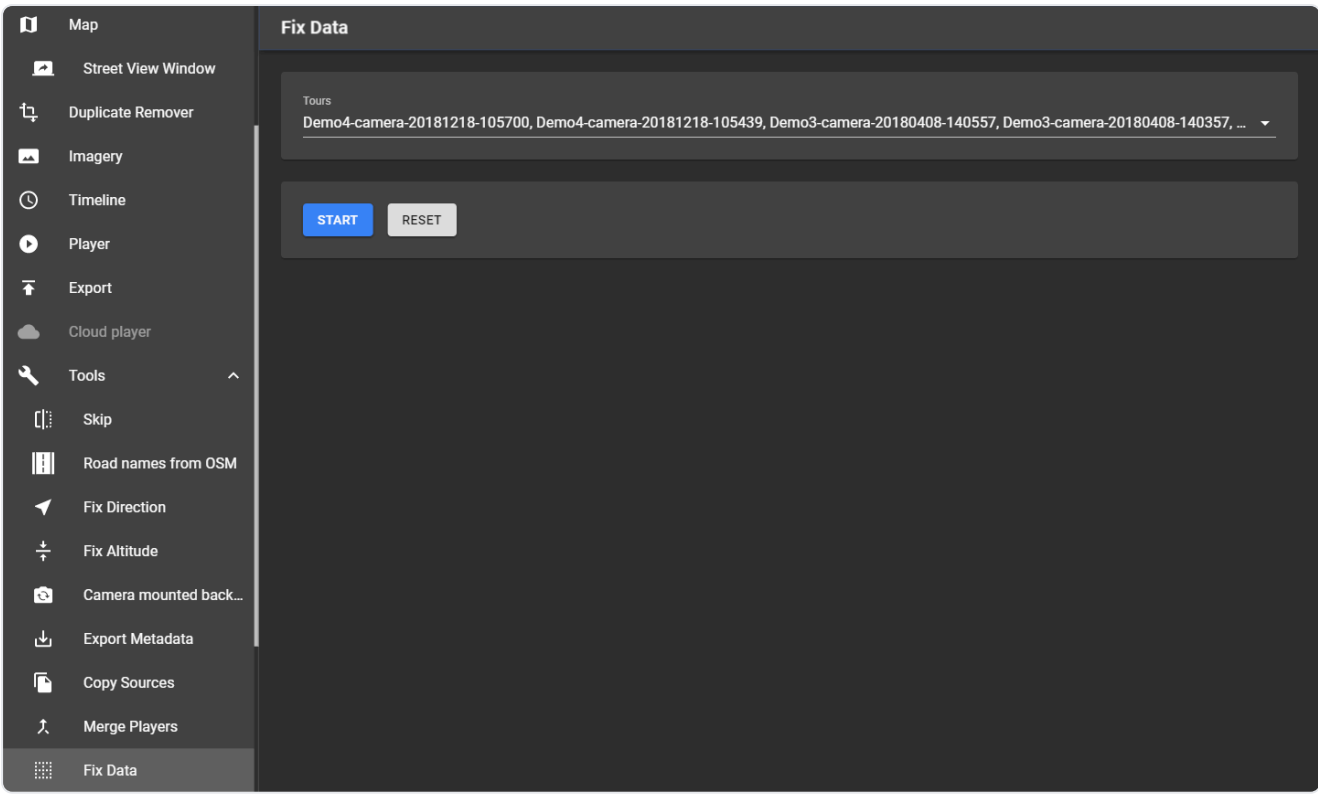


Tools → Merge Players

1. Export a player in every project first. Projects without a player can't be selected.
2. Tick the **Players to merge**.
3. **Copy panoramas-tiles**: Also copies the Street View tiles of all projects into the merged player's folder, so it can be published as one.
4. **Start** creates the merged player in a new folder in the output folder. The projects are not changed. **Open output folder** opens it.

16.9 Fix Data

Tools → **Fix Data** deactivates Street Views whose photos are missing, and writes them to the log. Select the **Tours** and click **Start**. **Reset** activates them again; it also resets the changes of Skip and the Duplicate Remover.

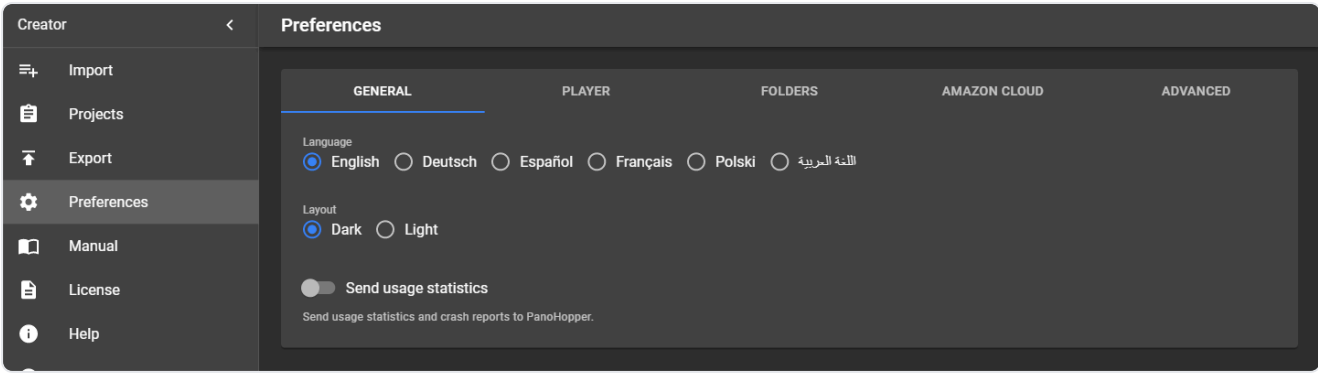


Tools → Fix Data

17 Preferences

Menu → Preferences holds the settings that apply to all projects. Changes are saved at once; there is no Save button. The page has five tabs: **General**, **Player**, **Folders**, **Amazon cloud** and **Advanced**.

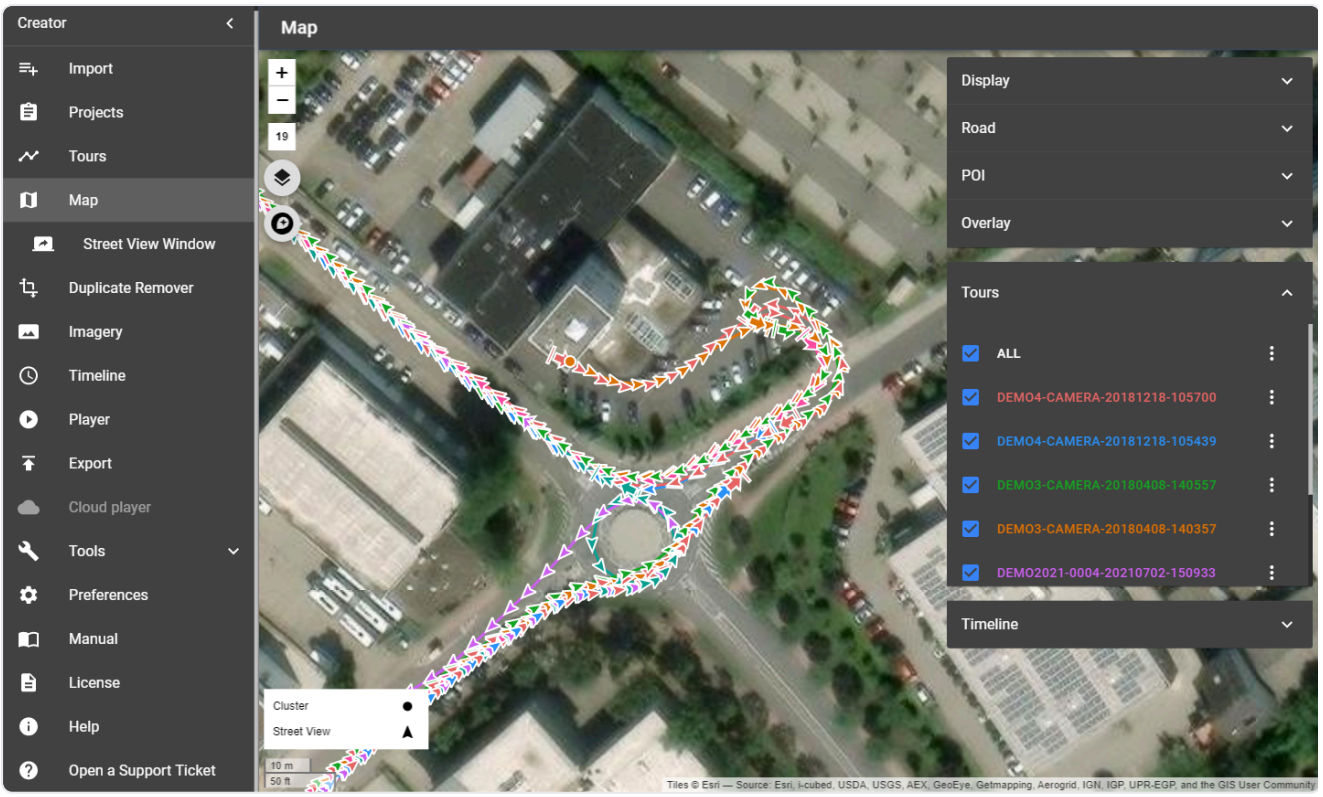
17.1 General



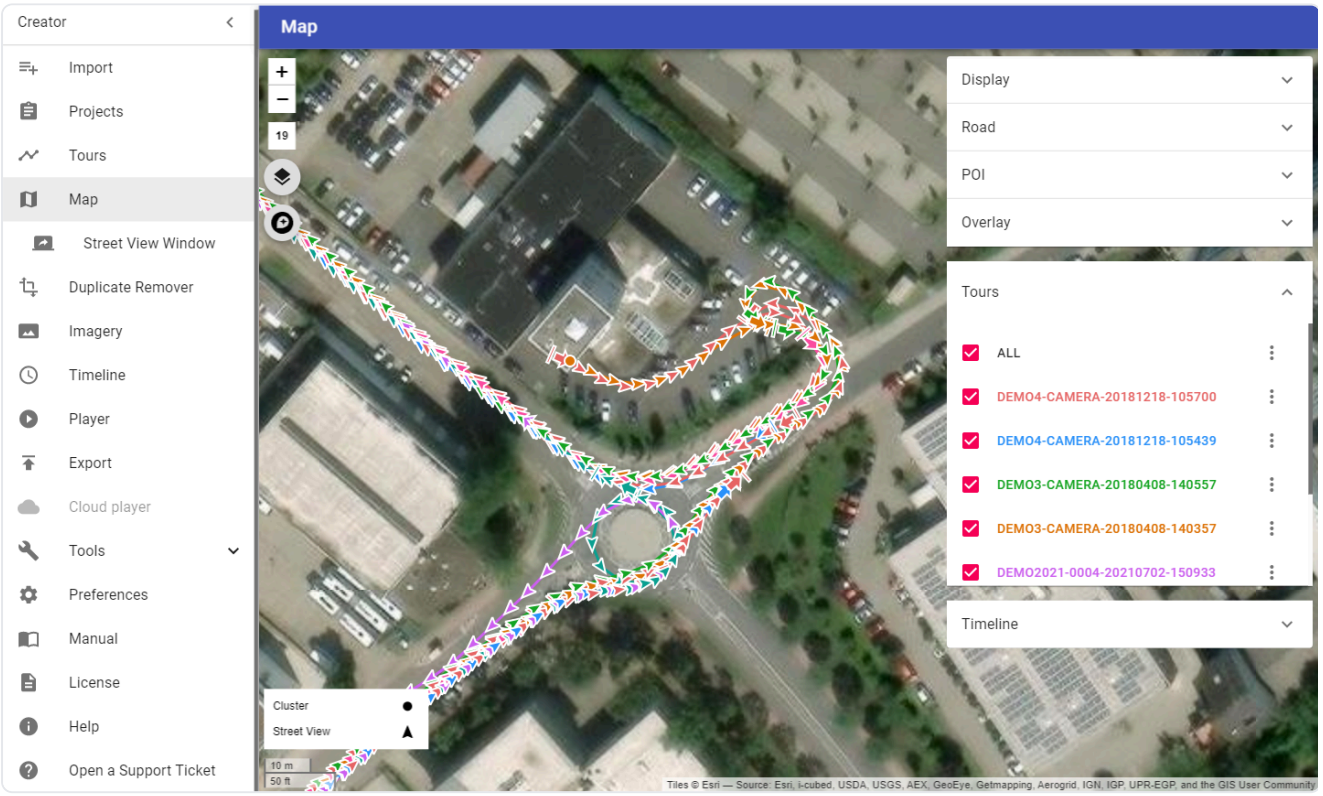
Preferences → General

Setting	What it does
Language	Language of Creator: English, Deutsch, Español, Français, Polski or العربية (Arabic, written right to left). The exported players have their own language settings, see Player → Translations. Changing the language closes the Street View Window.
Layout	Colours of Creator. **Dark** (default): dark, with blue buttons and switches. **Light**: the light look of earlier Creator versions. The change applies immediately and has no effect on projects or exports.
Send usage statistics	Off by default. When on, Creator sends usage statistics and crash reports to PanoHopper once per start, with your panohopper account: how often you use its functions (for example exports, backups, map tools) and the error messages of problems. Folder paths, user and computer names and e-mail addresses are removed from error messages; no texts you typed or project data. Switching it off deletes what was not sent yet.

The same page in both layouts:

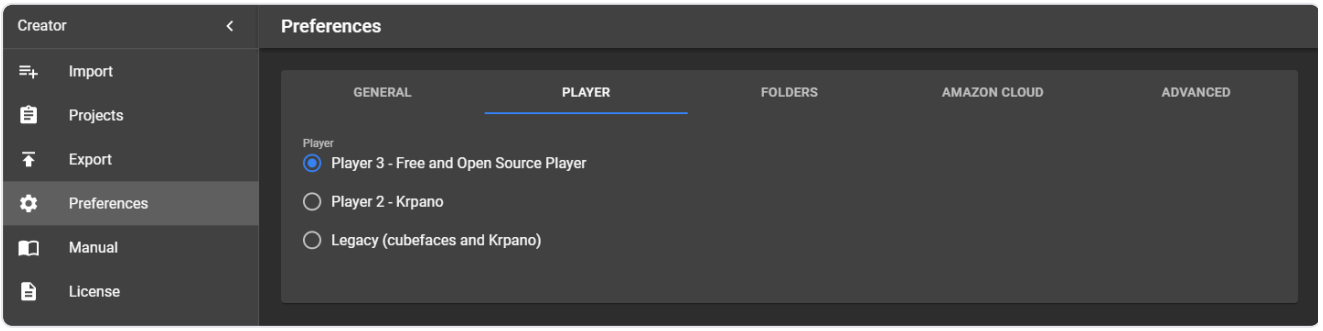


Layout Dark (default)



Layout Light

17.2 Player



Preferences → Player

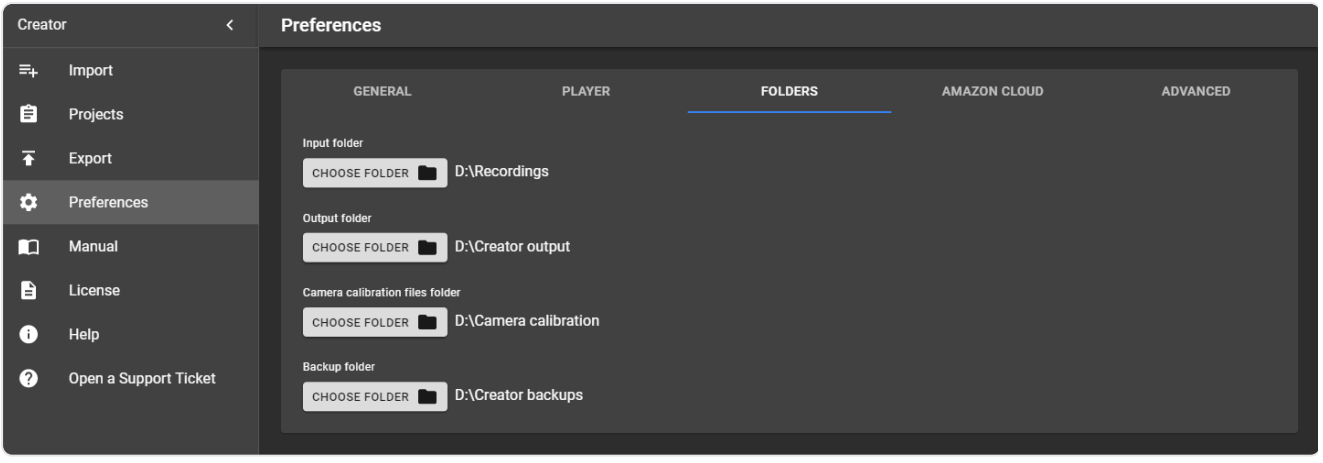
Choose the player that Export creates. The choice applies to all projects and to the next export.

Player	What it is	Player folder	Street View tiles
Player 3 – Free and Open Source Player (default)	Player built from free open-source parts (Photo Sphere Viewer, OpenLayers). No licence costs.	`player3`	`panorama-tiles`
Player 2 – Krpano	Player based on krpano, with hotspots, arrows and click navigation.	`player2`	`panorama-tiles`
Legacy (cubefaces and Krpano)	The player of Creator 8.0.5, for projects that must look as before.	`player2-legacy`	`panorama-tiles-legacy`

The folders are created inside the project's output folder, for example `D:\Creator output\Demo3\player3`. Player 3 and Player 2 use the same Street View tiles, so switching between them does not create the tiles again. Legacy uses its own tile format.

> **Tip:** If you export the same project with several players, Export shows one *View* button per player, for example *View player3* and *View legacy player: Krpano*.

17.3 Folders

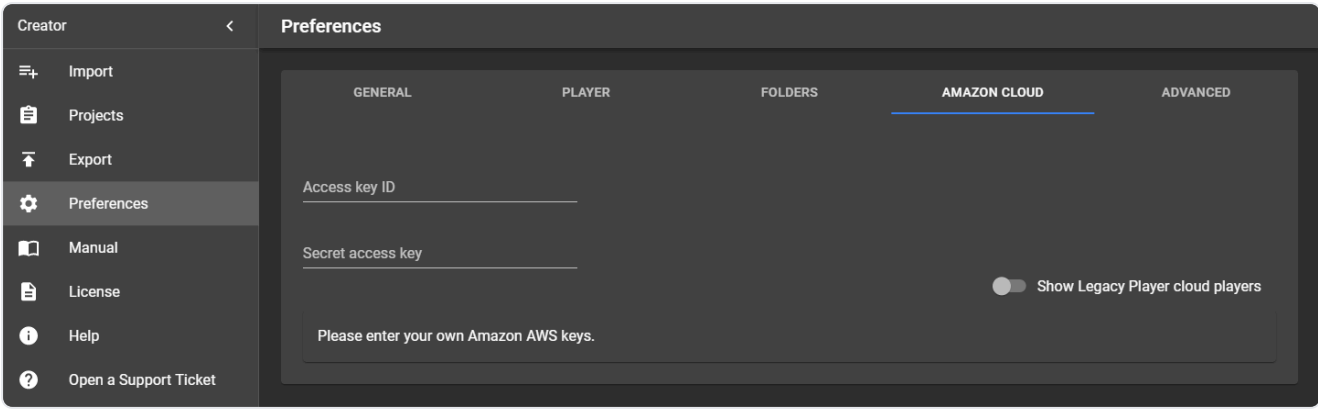


Preferences → Folders

Folder	Used for
Input folder	Where Creator starts looking when you import a new recording.
Output folder	Where Export writes players, Street View tiles and panoramas. Each project gets its own subfolder with the project name. A project can also have its own output folder.
Camera calibration files folder	Holds the camera calibration files (`<camera serial number>.pto`). Creator looks for a tour's calibration file here first, then in the folder that holds the tour folders. Required before Export and Imagery can stitch. See Troubleshooting → Camera calibration files.
Backup folder	Default folder for project and tour backups and for Tools → Copy Sources and Tools → Export Metadata.

Click a folder field to choose the folder.

17.4 Amazon cloud



Preferences → Amazon cloud

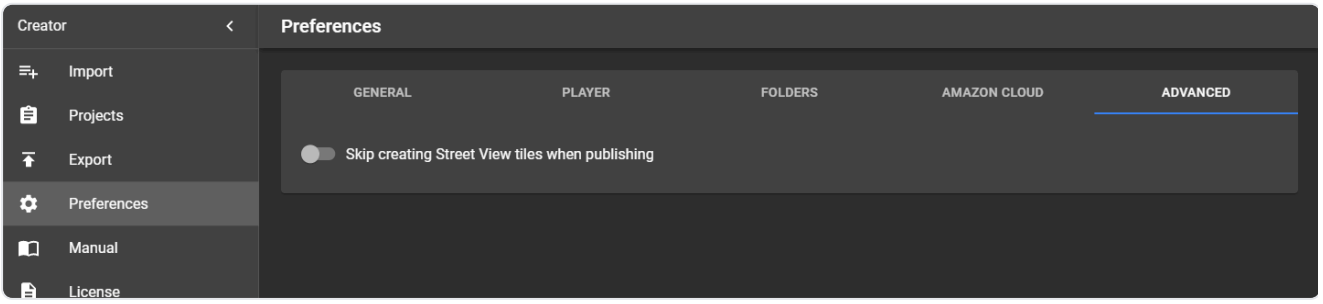
Your Amazon Web Services (AWS) keys for publishing players to the Amazon cloud:

Setting	What it does
Access key ID	Identifies your AWS access key.
Secret access key	The secret part of the key. It is shown as dots.

The same keys can also be entered on the Export page. Without keys, the tab shows *Please enter your own Amazon AWS keys.* With keys, it lists the players already published in your AWS account. Switch on **Show Legacy Player cloud players** to list the cloud players published with the Legacy Player (Player → More → Enable Legacy Player); delete old ones you no longer need, because they cost money in your AWS account. How to create an AWS account and keys is described in Publishing on Amazon Web Services.

> **Note:** Keep the secret access key private. Anyone with both keys can use your AWS account.

17.5 Advanced



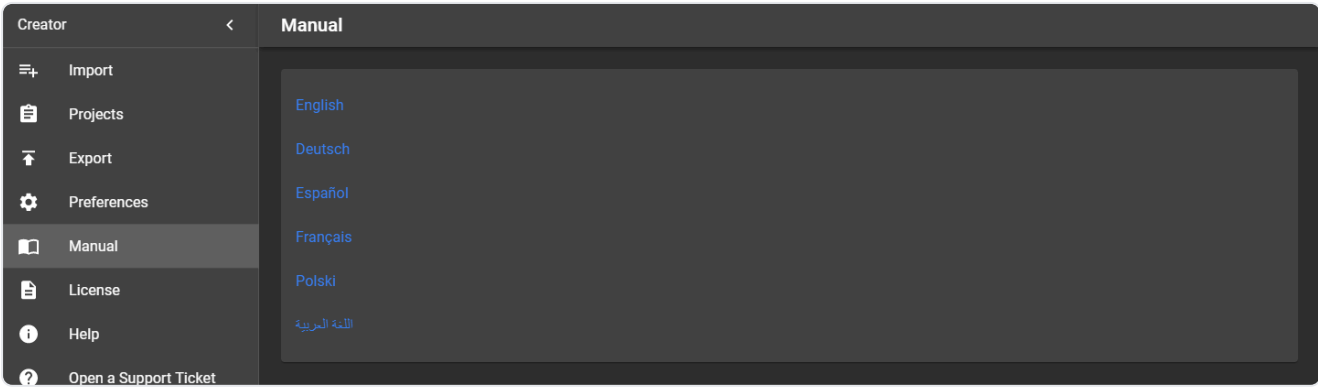
Preferences → Advanced

Setting	What it does
Skip creating Street View tiles when publishing	Off (default): Export creates the Street View tiles that the players need. On: Export creates only the panorama images and skips the tiles. Use it only if you need the panoramas alone, for example for another program. The Windows, Linux, Android and Cloud players need the Street View tiles.

18 Manual, License and Help

18.1 Manual

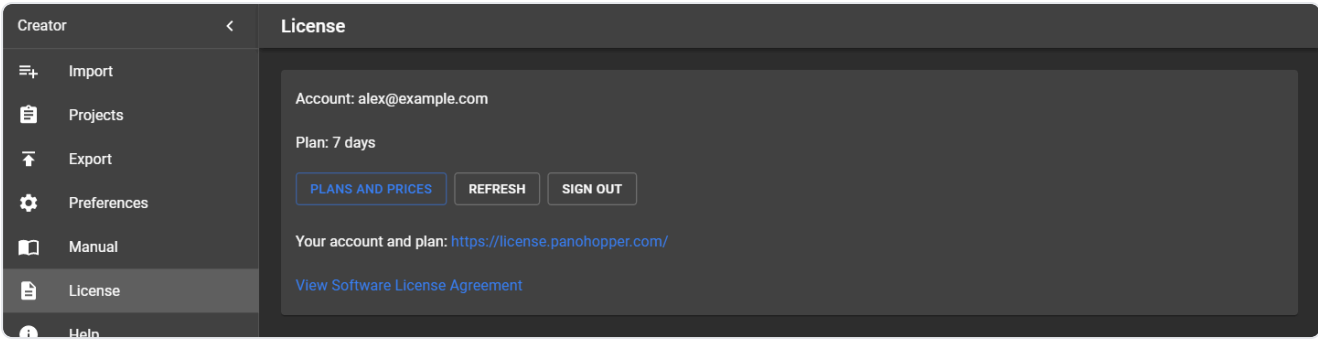
Menu → **Manual** lists the manuals: English, Deutsch, Español, Français, Polski and العربية. Click a language to open the manual (PDF) in your PDF viewer. The translations follow later; until then, every language opens the English manual.



Manual

18.2 License

Creator uses your **panohopper account**. **Menu** → **License** shows your account and your plan. Without a valid licence, Creator opens only this page.



License

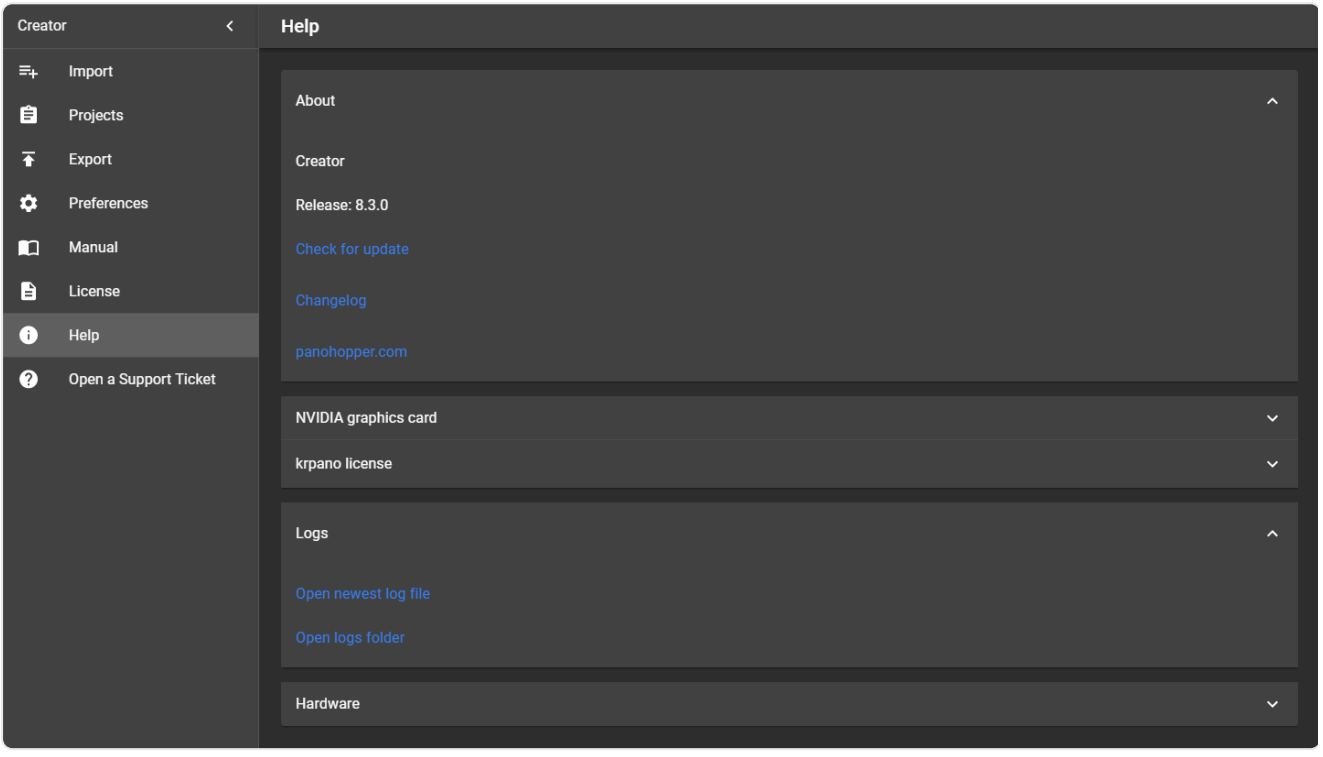
1. Click **Sign in**. Your web browser opens the panohopper sign-in page. Sign in, or create an account. Then return to Creator.
2. A new account gets the **Free Trial**: 10 days, no credit card. The 10 days start the first time you sign in to Creator. The Free Trial is available once per e-mail address and once per PC. During the Free Trial, every panorama gets the fixed watermark "© PanoHopper", and **Imagery** → **Watermark** cannot be switched on. Buying a plan removes it from new exports and unlocks your own watermark.
3. To buy a plan, click **Plans and prices**: Monthly, Annual, 30 days, 1 year or Perpetual. Use the same e-mail address as in Creator. Creator shows the new plan within 10 minutes, or at once when you click **Refresh**.

Field / Button	What it does
Account	The e-mail address of your panohopper account.
Plan	Your plan. On the Free Trial, also the days left.
Use on this PC	One licence runs on one PC. When you sign in to Creator on another PC, the licence moves there. Click this button to move it back to this PC.
Plans and prices	Opens the Creator plans on panohopper.com.
Refresh	Checks your plan now. Creator also checks it every 10 minutes.
Sign out	Signs out on this PC. Your plan stays with your account.
Your account and plan	Opens https://license.panohopper.com/.
View Software License Agreement	The licence agreement of Creator.

Creator works **offline for up to 7 days**. After that, it needs an internet connection once to renew the licence.

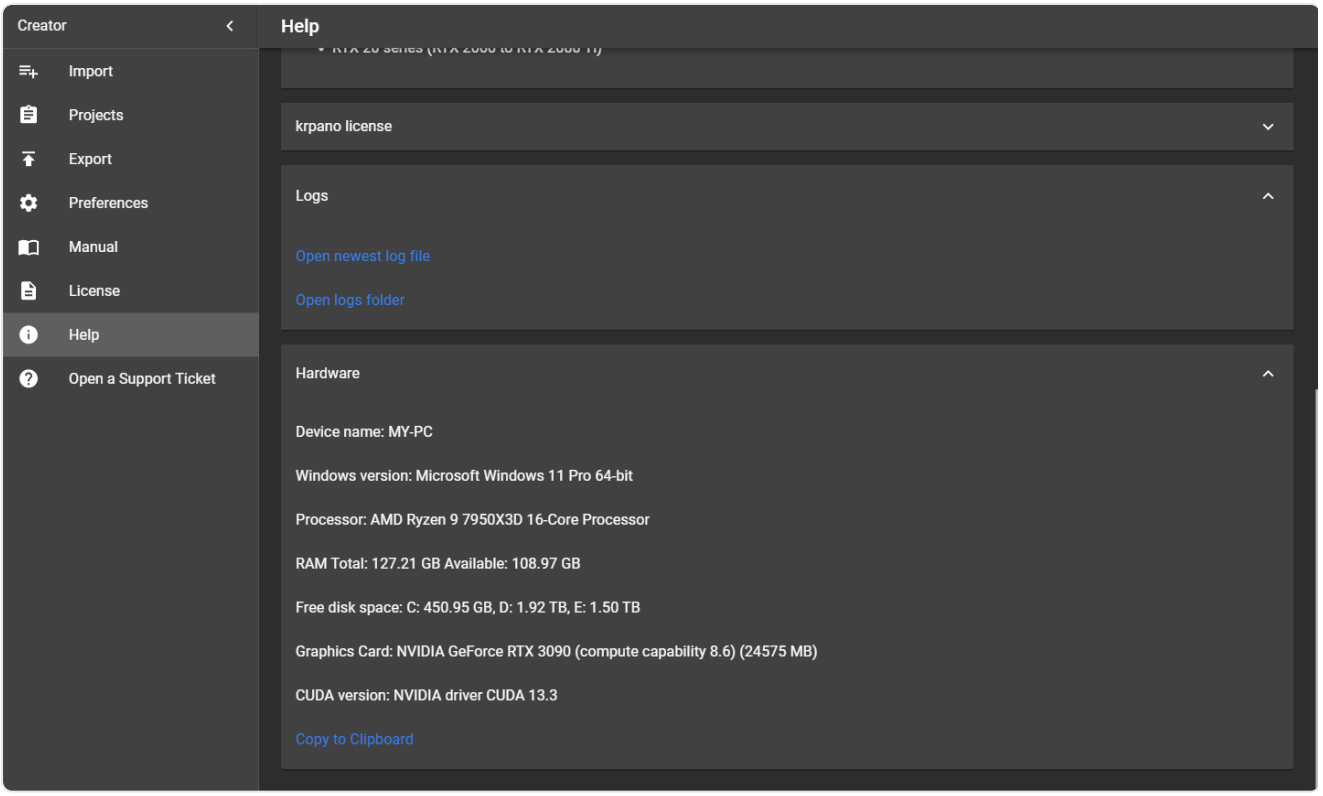
18.3 Help

Menu → Help has these sections:



Help

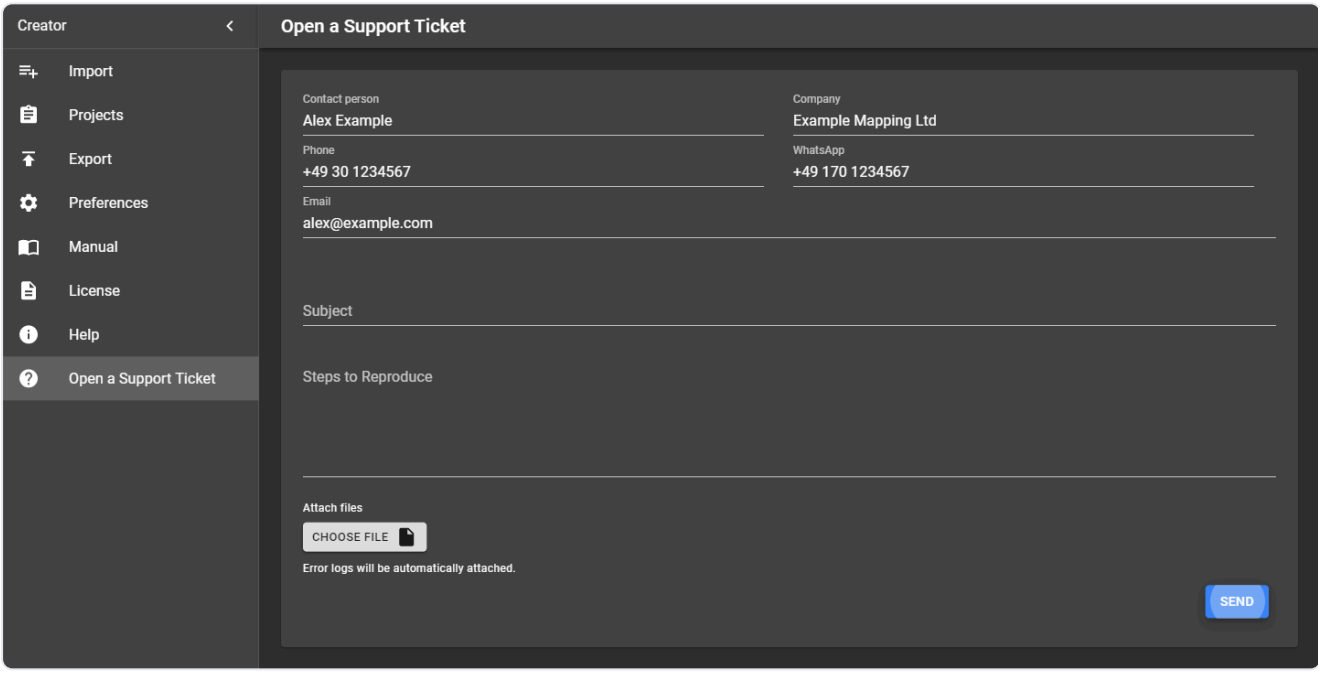
Section	What it shows
About	The installed Creator version, **Check for update**, **Changelog** (what changed in each version) and a link to panohopper.com. Creator also checks for a new version at every start; see Updating to a new version.
NVIDIA graphics card	The graphics card of this PC, the requirements of the stitcher (NVIDIA RTX 20 series or newer, current driver, no CUDA installation) and the list of compatible cards.
krpano license	Player 2 and the Legacy players use krpano. Without a licence they show a small "krpano demo version" mark. Buy a licence at https://krpano.com/buy, click **Add activation key**, paste your key and confirm. Then export the players again. Player 3 doesn't need krpano.
Logs	Opens the newest log file or the folder with all log files. The log lists every step, warning and error, for example missing photos.
Hardware	Data of this PC: Windows version, processor, memory, free disk space, graphics card and driver (CUDA version). **Copy to Clipboard** copies it, for example for a support request.



Help → NVIDIA graphics card and Hardware

19 Open a Support Ticket

Menu → Open a Support Ticket sends a support request with everything the support team needs to help you. Please make sure you use the newest Creator version first; maybe the problem is already solved.



Open a Support Ticket

Field	What to enter
Contact person, **Company**, **Phone**, **WhatsApp**, **Email**	How support can reach you. Creator remembers them for your next request (the first time it takes them from your licence registration). The answer goes to the e-mail address.
Subject	A short title, for example *Export stops at tour 3*.
Steps to Reproduce	What you did, what happened and what you expected.
Attach files	Optional files, for example annotated screenshots, up to 10 MB in total.

Click **Send**. Creator shows *Your Support ticket has been received*. Support answers by e-mail.

19.1 What is sent automatically

- The last three Creator log files.
- PC information: Windows version, processor, memory, disk space, graphics card and driver (as in Help → Hardware).
- Your licence registration data.
- The program name and version, for example *Creator v8.2.0*.

No photos or project data are sent unless you attach them. To send a part of your data, create an archive with Tools → Copy Sources and share it by a link (for example from a cloud drive) in the text.

Support is available in English and German.

20 Troubleshooting

20.1 Missing or damaged photos

Sign: The Export log shows lines like

`Missing or corrupt images in data-set D:\Recordings\Demo3\camera-20180408-140357\2\000000026.jpg`

and Imagery → Leveling and brightness lists missing photos instead of the preview.

Cause: A photo of one of the six lenses is missing, empty or damaged. The folder number (`2` above) is the lens.

What to do:

1. Check the listed files. Copy them again from the original recording if you have it.
2. If the photos are lost, deactivate the affected Street Views: Tools → Fix Data does this for all of them at once.
3. Export again with *Skip existing Street Views*.

20.2 Camera calibration files

Each tour needs the calibration file of the camera that recorded it: `<camera serial number>.pto`, for example `220003131.pto`. The serial number is in the tour's `7\panoramas.csv` and on the Tours page.

Creator looks for the file in this order:

1. the camera calibration files folder,
2. the project folder (the folder that holds the tour folders).

When a `.pto` file is found, Creator creates a `.xml` file next to it once.

Message	What to do
Camera calibration files folder is not set	Set it in Preferences → Folders.
Camera calibration file "…" does not exist for tour "…"	Copy the camera's `.pto` file into the camera calibration files folder.
Camera rig file not found: … (Creator needs the .pto file next to …)	A `.xml` file exists without its `.pto` file. Copy the `.pto` file next to it, or delete the leftover `.xml` file.

20.3 Graphics card not supported

Sign: Imagery and Export report that the stitcher can't run.

What to do: Check Help → NVIDIA graphics card. Creator 8.2.0 needs an NVIDIA RTX 20, 30, 40 or 50 series card with an up-to-date driver. Update the driver from https://www.nvidia.com/drivers. On older cards, use Creator 8.1.0.

20.4 Creator is already open

Only one Creator can run at a time. Starting it again brings the open window to the front.

20.5 Slow processing

- Use SSDs for the input and output folders, ideally on separate drives.
- Exclude the input and output folders from the virus scanner, see Windows settings for speed.
- Use *Skip existing Street Views* when exporting again.
- Thin out dense recordings with Tools → Skip.

20.6 Not enough disk space

Creator checks the free space on its drive at start and every 5 minutes, and warns when less than 1 GB is left. Free up space or move the output folder to another drive.

20.7 Collecting information for support

Use Open a Support Ticket: It sends the logs and PC data automatically.

21 Good housekeeping

21.1 Backups

- Back up often: Projects → Backup all. After a mistake, import the last good backup and continue.
- Turn on *Project backup* in Export, so every export saves the project's state.
- Keep backups in a safe place, ideally also on a disconnected drive.
- Creator backups contain only Creator's data. Back up your recordings and the created files (output folder) separately.

21.2 Data safety

- Creator never changes or deletes your recordings.
- Keep up-to-date backups of the recordings, the Creator backups and the created data.

21.3 Free disk space

Keep enough free space on the drive where Creator is installed and on the output drive. Creator warns when less than 1 GB is free.

22 Player API

You can link and control the players (Player 3, Player 2 and Legacy) from your own systems and web pages.

22.1 Show an asset by its position

Your system can open the player at any position with a web address, without a database. The player opens the nearest Street View and looks at the position. This works with timelines too.

Simplest example:

`https://your-player-address/index.html?v_lat=50.001217&v_lng=8.651100`

Parameter	Meaning
`v_lat`, `v_lng`	Latitude and longitude of the asset (required)
`v_alt`	Altitude of the asset
`v_label`	Text shown for the asset; may contain ` `
`v_timeline`	Name of an existing timeline
`v_layout`	Start layout: `map`, `streetview`, `streetviewBottom` (map top, Street View bottom), `streetviewTop` (Street View top, map bottom), `streetviewOnly`
`v_minimized`	`1`: Small window minimized, `0`: Shown
`v_htmlTitle`	Title of the browser tab

`v_label`, `v_timeline` and `v_htmlTitle` must be URL-encoded (spaces as `%20` and so on), for example with https://www.urlencoder.org/.

22.2 Example pages

Each exported player contains working example pages in its `examples` folder, for example `player3\examples\`:

Example	What it shows
`map.html`	A map of your own (here Leaflet) next to the player: Click the map to open the Street View, move in the player to update the map.
`asset.html`	Open the Street View nearest to an asset by its latitude and longitude.
`timeline.html`	Switch timelines from your page, for "before and after" comparisons.
`screenshot.html`	Take a screenshot of the visible part of the Street View, for reports or a database.
`data.html`	Read the data of the current view: Street View ID, label, timeline, position, direction, zoom, date and time.

Example	What it shows
`external-osm.html`, `external-google.html`	Open another web page (OpenStreetMap, Google Maps) at the current position, with a button you can rename, move and style.

Use them as a starting point for your own integration. The pages talk to the player in an `iframe`, so the player and your page can be on different servers.