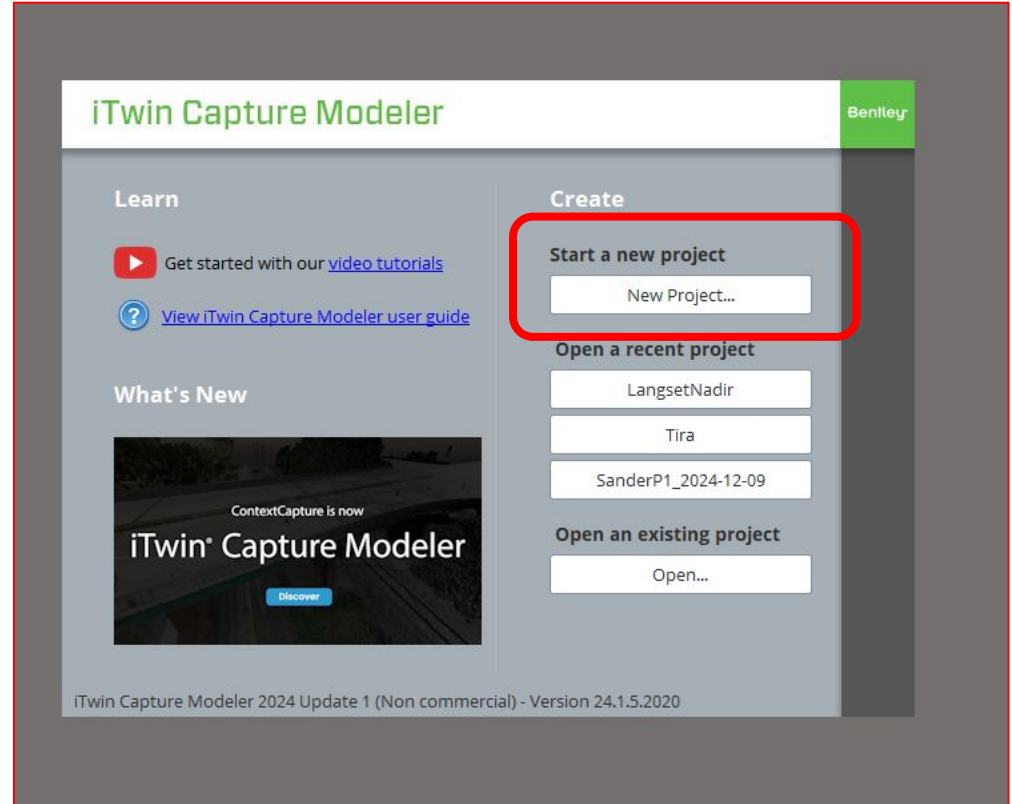
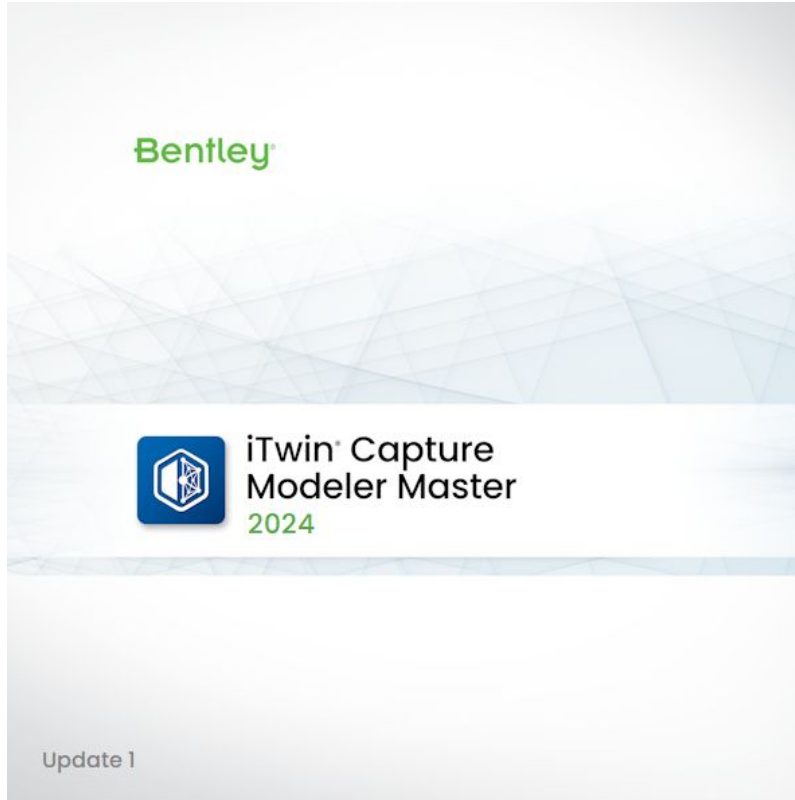


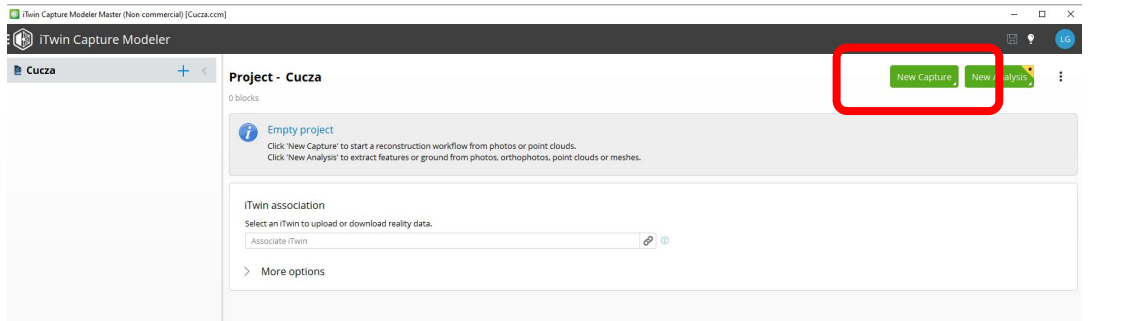
# Processing photogrammetric data

Using iTwinn Capture Modeler  
Non geotagged data, with GCPs over Cucza abbey

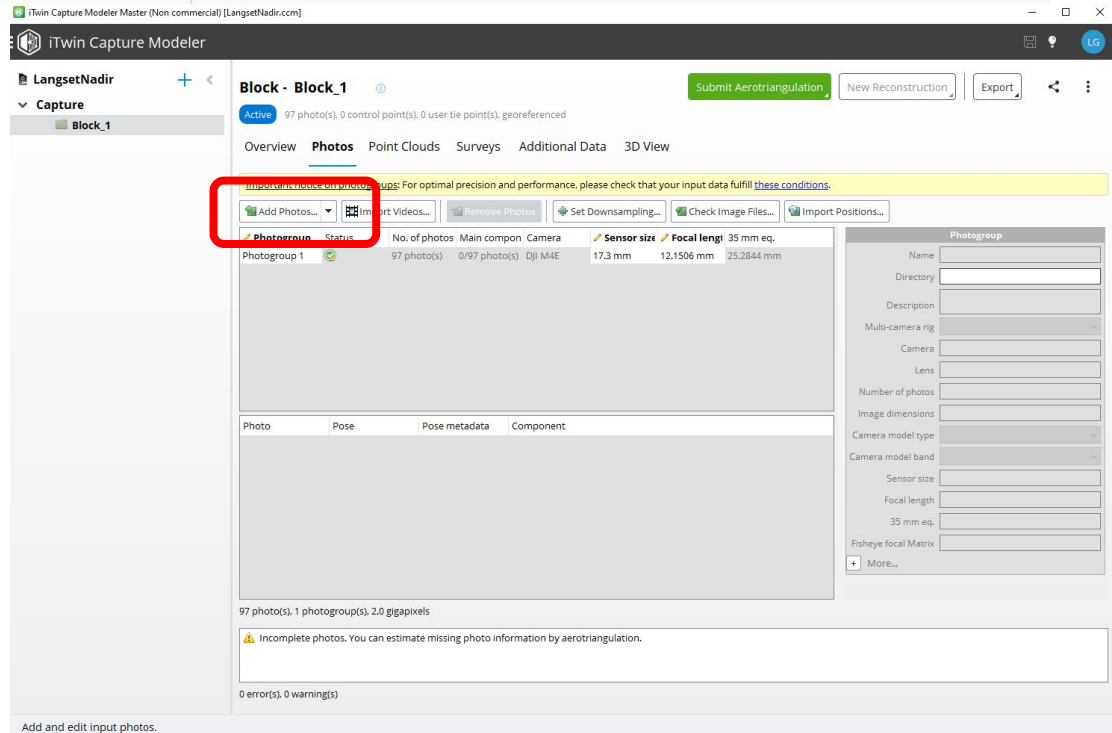
# Open iTwin Capture Modeler Master, start new project



Start a “new capture”



Add photos or a directory of photos



# Information about your photos is missing!

Fill the Sensor size (36mm)  
and Focal length (50mm)

The screenshot shows the 'Block - Block\_1' interface. At the top, there's a status bar indicating '48 photo(s), 0 control point(s), 0 user tie point(s)'. Below this, there are tabs for 'Overview', 'Photos', 'Point Clouds', 'Surveys', 'Additional Data', and '3D View'. The 'Photos' tab is active. A yellow banner displays an 'Important notice on photogroups'. Below the banner, there are buttons for 'Add Photos...', 'Import Videos...', 'Remove Photos', 'Set Downsampling...', 'Check Image Files...', and 'Import Positions...'. A table lists the photogroups, with 'Photogroup 1' selected. To the right of the table, a detailed view of 'Photogroup 1' is shown, enclosed in a red box. This view includes fields for Name, Directory, Description, Multi-camera rig, Camera, Lens, Number of photos, Image dimensions, Camera model type, Camera model band, Sensor size, and Focal length. The 'Sensor size' is set to '36 mm' and the 'Focal length' is set to '50 mm'. Below the table, there's a section for 'Photo', 'Pose', 'Pose metadata', and 'Component' with a list of 48 photos. At the bottom, there's a warning message: 'Incomplete photos. You can estimate missing photo information by aerotriangulation.'

Photogroup	Status	No. of photos	Main compon	Camera	Sensor size	Focal lengt
Photogroup 1		48 photo(s)	0/48 photo(s)		36 mm	50 mm

Photo	Pose	Pose metadata	Component
Abbey-IMG_0173...	Unknown	None	None
Abbey-IMG_0191...	Unknown	None	None
Abbey-IMG_0192...	Unknown	None	None
Abbey-IMG_0193...	Unknown	None	None
Abbey-IMG_0194...	Unknown	None	None
Abbey-IMG_0195...	Unknown	None	None
Abbey-IMG_0196...	Unknown	None	None
Abbey-IMG_0197...	Unknown	None	None
Abbey-IMG_0198...	Unknown	None	None
Abbey-IMG_0204...	Unknown	None	None
Abbey-IMG_0205...	Unknown	None	None
Abbey-IMG_0206...	Unknown	None	None
Abbey-IMG_0207...	Unknown	None	None
Abbey-IMG_0208...	Unknown	None	None
Abbey-IMG_0209...	Unknown	None	None
Abbey-IMG_0210...	Unknown	None	None
Abbey-IMG_0211...	Unknown	None	None

48 photo(s), 1 photogroup(s), 63.4 megapixels

Incomplete photos. You can estimate missing photo information by aerotriangulation.

0 error(s), 0 warning(s)

# Setup parameters (default except circled here), and submit

**Aerotriangulation Definition**

Define parameters and submit aerotriangulation processing.

**Output Block Name**

Positioning/Georef...

Settings

**Output Block Name**

Choose the name and the description of the aerotriangulation output block.

ID: **Block\_2**

Name: Cucza - AT no georef

Description: Result of aerotriangulation of Block\_1 (2025-Feb-21 14:13:40)

< Back Next Submit Cancel

**Aerotriangulation Definition**

Define parameters and submit aerotriangulation processing.

**Positioning/Georeferencing**

Choose how the aerotriangulation should adjust and orient the block.

**Settings**

**Adjustment constraints**

- ☐ Control points
- ☐ Photo positioning metadata
- ☐ Point clouds (scans)

**Final rigid registration**

- ☐ Positioning constraints on user tie points
- ☐ Control points
- ☐ Photo positioning metadata
- ☐ Point clouds (scans)
- ☐ Custom

**Use targets (QR Codes, Apriltags or Chiltags)**

**Automatic vertical**

The block vertical direction is oriented according to input photo orientation. Block scale and heading remain arbitrary.

< Back Next Submit Cancel

**Aerotriangulation Definition**

Define parameters and submit aerotriangulation processing.

**Settings**

Choose aerotriangulation settings.

**Poses and tie points**

☒ Compute ☐ Adjust ☐ Extend ☐ Lock

Computing poses and tiepoints. Parameters: normal keypoints density, default pairs selection mode.

**Optical parameters**

☒ Adjust main parameters ☐ Lock all parameters

Adjusting focal length, principal point, radial distortion and tangential distortion. Keeping aspect ratio and skew unchanged. Pre-calibration stage enabled.

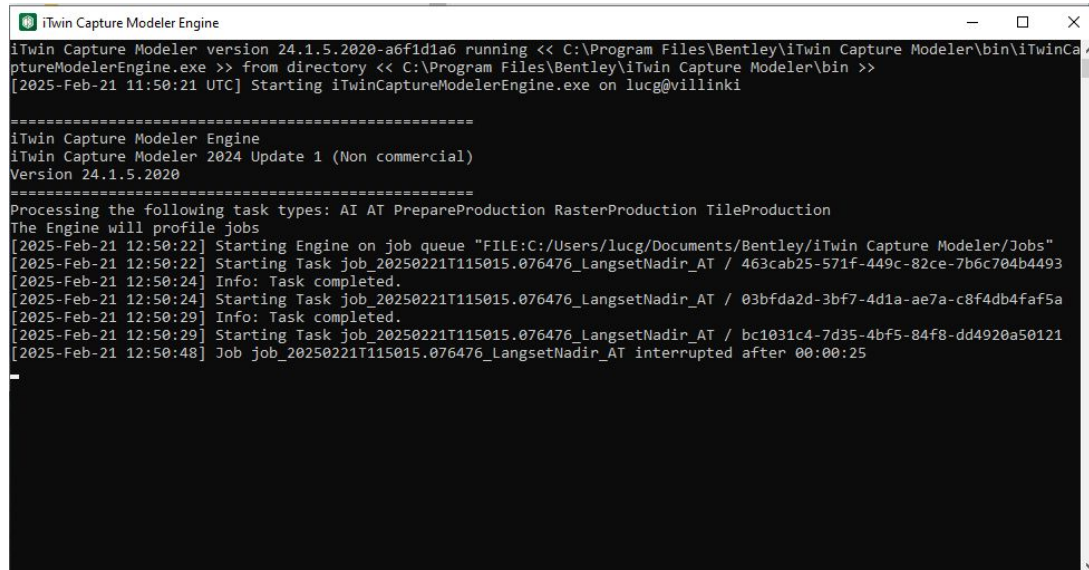
Targets extraction: None

Automatic color correction: Blockwise

Create splats: ☒

< Back Next Submit Cancel

Start iTwin Capture Modeler Engine (that's the actual processing engine, it listens to new “jobs” being added by other iTwin tools)



```
iTwin Capture Modeler Engine
iTwin Capture Modeler version 24.1.5.2020-a6f1d1a6 running << C:\Program Files\Bentley\iTwin Capture Modeler\bin\iTwinCa
ptureModelerEngine.exe >> from directory << C:\Program Files\Bentley\iTwin Capture Modeler\bin >>
[2025-Feb-21 11:50:21 UTC] Starting iTwinCaptureModelerEngine.exe on lucg@villinki

=====
iTwin Capture Modeler Engine
iTwin Capture Modeler 2024 Update 1 (Non commercial)
Version 24.1.5.2020
=====
Processing the following task types: AI AT PrepareProduction RasterProduction TileProduction
The Engine will profile jobs
[2025-Feb-21 12:50:22] Starting Engine on job queue "FILE:C:/Users/lucg/Documents/Bentley/iTwin Capture Modeler/Jobs"
[2025-Feb-21 12:50:22] Starting Task job_20250221T115015.076476_LangsetNadir_AT / 463cab25-571f-449c-82ce-7b6c704b4493
[2025-Feb-21 12:50:24] Info: Task completed.
[2025-Feb-21 12:50:24] Starting Task job_20250221T115015.076476_LangsetNadir_AT / 03bfda2d-3bf7-4d1a-ae7a-c8f4db4faf5a
[2025-Feb-21 12:50:29] Info: Task completed.
[2025-Feb-21 12:50:29] Starting Task job_20250221T115015.076476_LangsetNadir_AT / bc1031c4-7d35-4bf5-84f8-dd4920a50121
[2025-Feb-21 12:50:48] Job job_20250221T115015.076476_LangsetNadir_AT interrupted after 00:00:25
```

Wait (1min or so)





# Go to Survey to add GCPs

Block - Block\_1

Active 48 photo(s), 0 control point(s), 0 user tie point(s)

Submit Aerotriangulation New Reconstruction Export

Overview Photos Point Clouds **Surveys** Additional Data 3D View

Survey Points Constraints

Import surveys from file

Import Surveys

Common Formats

**Custom Text Format (Wizard)**

No points added

Accept position

Export

All Potential Matches In Use

Search

ring constraints.

Input File

Enter the input text file

File name:

Choose a file to import

Organize New folder

Recordings

SanderNordstue

SettingsPackage

TrygveBaardMe

This PC

GCP.txt

File Format

Define how the input file must be read

Number of lines to ignore at the beginning of the file:

Delimiters

Decimal separator

123.456

[Comma ","]

Combine consecutive delimiters

Preview

File: GCPs.txt

#Name.Long.Lat.Elevation

12060100_172	2.4167787	42.5959513	496.2353
12060100_173	2.4170388	42.5960187	496.2161
12060100_174	2.4169620	42.5950438	499.3241
12060100_176	2.4176673	42.5947423	502.8374
12060100_290	2.4170437	42.5956057	500.7433
12060100_291	2.4176677	42.5951925	500.2973
12060100_293	2.4169898	42.5946510	503.8060
12060100_298	2.4177648	42.5945606	505.8251
12060100_301	2.4169674	42.5952098	499.8477
12060100_302	2.4168569	42.5948630	498.9078

Data:

	Column 1	Column 2	Column 3	Column 4
Row 1	12060100_172	2.4167787	42.5959513	496.2353
Row 2	12060100_173	2.4170388	42.5960187	496.2161
Row 3	12060100_174	2.4169620	42.5950438	499.3241
Row 4	12060100_176	2.4176673	42.5947423	502.8374
Row 5	12060100_290	2.4170437	42.5956057	500.7433

Please ensure that rows contain only valid data, and exclude any column header.



# Fill up all the settings, and import

## Control points import wizard

Import control points from a custom text format made of delimiter-separated-values.

Input File  
File Format  
**Data Properties**  
Fields

**Data Properties**  
Define properties of the imported data

Spatial reference system  
Spatial reference system: Local coordinate system (arbitrary units) ▼

**Default**  
Local coordinate system (arbitrary units)  
Local coordinate system (meters)  
WGS 84

**Recent**  
ETRS89 / UTM zone ...height (EPSG:5941)  
ETRS89 / UTM zone 32N (EPSG:32632)  
ETRS89 / UTM zone 32N (N-E) (EPSG:3044)

**More**  
Spatial reference system database...  
Import reference sys...ion from DGN file...

Input File  
File Format  
Data Properties  
**Fields**

**Fields**  
Specify columns corresponding to the imported data

Select a line for data preview

	Column 1	Column 2	Column 3	Column 4
Row 1	12060100_172	2.4167787	42.5959513	496.2353
Row 2	12060100_173	2.4170388	42.5960187	496.2161
Row 3	12060100_174	2.4169620	42.5950438	499.3241
Row 4	12060100_176	2.4176673	42.5947423	502.8374
Row 5	12060100_290	2.4170437	42.5956057	500.7433
Row 6	12060100_291	2.4176677	42.5951925	500.2973
Row 7	12060100_293	2.4169898	42.5946510	503.8060
Row 8	12060100_298	2.4177648	42.5945606	505.8251
Row 9	12060100_301	2.4169674	42.5952098	499.8477

Fields selection

Column	Role	Preview
Column 1	Name ▼	12060100_172
Column 2	Longitude ▼	2.4167787
Column 3	Latitude ▼	42.5959513
Column 4	Height ▼	496.2353

< Back   Next >   **Import**   Cancel

Check GCPs\_reference.PNG for point location



# Input GCPs position

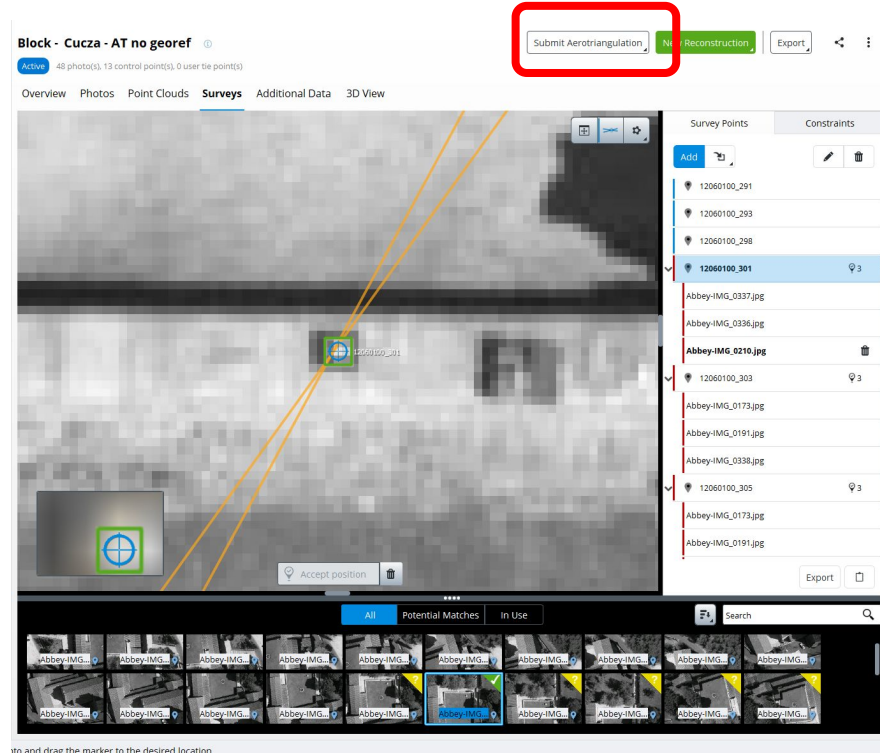
1. Click on **GCP name**
2. Zoom on image to GCP location
3. Make sure your target marker is at the center of the white marker
4. Click **Accept position**



# Repeat the process for several points, on several images



# Submit a new AeroTriangulation



to and drag the marker to the desired location.

# Setup parameters (default except circled here), and submit

Aerotriangulation Definition

Define parameters and submit aerotriangulation processing.

Output Block Name

Positioning/Georef...

Settings

Choose the name and the description of the aerotriangulation output block.

ID: **lock\_3**

Name: Cucza - AT with GCPs

Description: Result of aerotriangulation of Cucza - AT no georef (2025-Feb-21 14:31:24)

< Back Next Submit Cancel

Aerotriangulation Definition

Define parameters and submit aerotriangulation processing.

Output Block Name

Positioning/Georef...

Settings

Choose how the aerotriangulation should adjust and orient the block.

Adjustment constraint

☒ Control points

☐ Photo positioning metadata

Final rigid registration

☐ Positioning constraints on user tie points

☒ Control points

☐ Point clouds (scans)

☐ Custom

Advanced...

☐ Use targets (QR Codes, AprilTags or ChiliTags)

Using selected data for adjustment (1) and for rigid registration (2)

The block is first adjusted to selected data (Adjustment constraints) and then rigidly registered to selected data (Final rigid registration).

< Back Next Submit Cancel

Aerotriangulation Definition

Define parameters and submit aerotriangulation processing.

Output Block Name

Positioning/Georef...

Settings

Choose aerotriangulation settings.

Poses and tie points

☐ Compute ☒ Adjust ☐ Extend ☐ Lock

Advanced...

Computing tiepoints and adjusting poses.

Parameters: normal keypoints density, default pairs selection mode.

Optical parameters

☒ Adjust main parameters ☐ Lock all parameters

Advanced...

Adjusting focal length, principal point, radial distortion and tangential distortion.

Keeping aspect ratio and skew unchanged.

Targets extraction: None

Automatic color correction: Blockwise

Create splats: ☒

< Back Next Submit Cancel




Wait (1min or so)








# Read processing report and have a look at the 3D view

**Block - Cucza - AT with GCPs** 

**Completed** 48 photo(s), 13 control point(s), 0 user tie point(s), georeferenced


[Submit Aerotriangulation](#) [New Reconstruction](#) [Export](#)  

**Overview** Photos Point Clouds Surveys Additional Data 3D View



 **Complete data**  
The block is ready for reconstruction.  
Photos positioning level: **georeferenced**

48 photo(s) in 1 photogroup(s), 63.4 megapixels  
48 photo(s) in the main component  
48 known position(s) and 48 known rotation(s)  
13 control point(s) (13 full point(s), 0 horizontal point(s), 0 vertical point(s)) among which 0 check point(s)  
0 user tie point(s)  
14252 automatic tie point(s). [View](#)  
Resolution ranges from 0.049 meters to 0.054 meters  
Block has blockwise color equalization  
Splits: available. [Recreate](#)

**Aerotriangulation**  
[View settings](#) | [View acquisition report](#) | [View quality report](#)

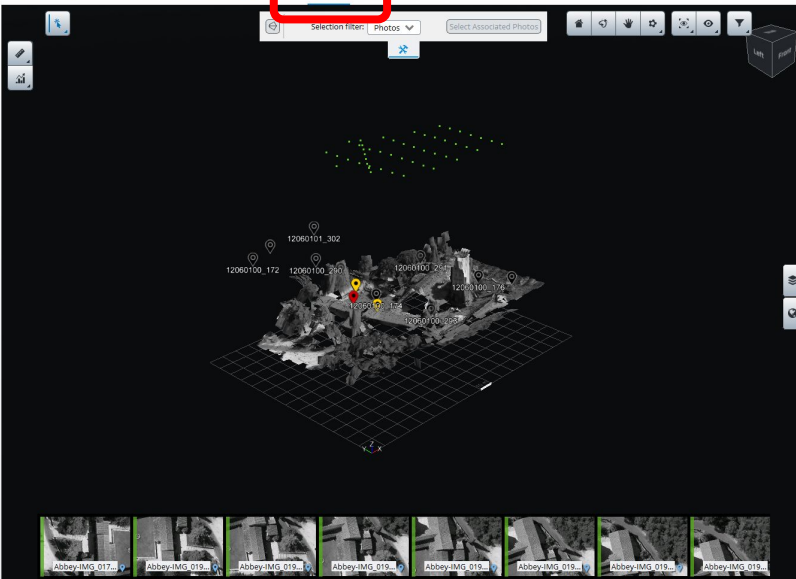
**Block - Cucza - AT with GCPs** 

**Completed** 48 photo(s), 13 control point(s), 0 user tie point(s), georeferenced

[Submit Aerotriangulation](#) [New Reconstruction](#) [Export](#)  

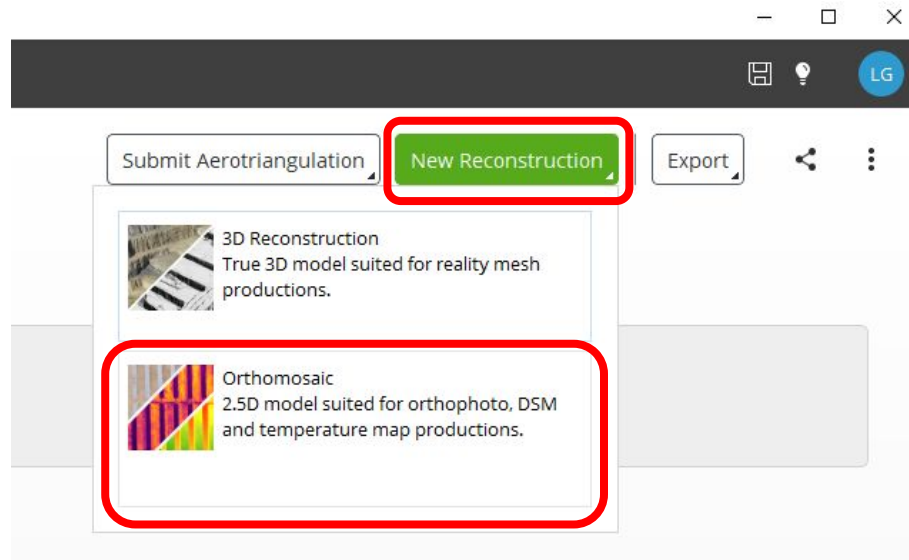
Overview Photos Point Clouds Surveys Additional Data **3D View**

Selection filter: Photos [Select Associated Photos](#)



Abbey-IMG\_017... Abbey-IMG\_019... Abbey-IMG\_019... Abbey-IMG\_019... Abbey-IMG\_019... Abbey-IMG\_019... Abbey-IMG\_019...

# Start a new reconstruction - Orthomosaic




# Choose all the appropriate options - submit the job

Reconstruction - Orthophoto/DSM\_1

Not Started 2.5D, No tiling, extra precision

Overview Spatial Framework Geometry Constraints Reference Model Processing Settings



**Spatial Reference System (SRS)**

RGF93 / Lambert-93 (EPSG:2154)

**Resolution**

0.050000 meters/pixel

**Region of Interest** [Edit]

X (meters):	min	652025.811331	max	652154.606405
Y (meters):	min	6166258.654365	max	6166352.899237
Z (meters):	min	479.999052	max	547.999286

[Hide details](#)

**Tiling**

No Tiling


**Overview**


Dimensions: 128,795 meters x 94,244 meters x 68,000 meters  
Orthomosaic/DSM dimensions: 2576 x 1885 pixels

The tiling contains **1 tile(s)**.  
Expected maximum RAM usage for a job: **6.5 GB**

Submit Production

Submit Production

 Process with iTwin Capture Modeler Engine  
Process the job locally on your own computers.

 Process on the Cloud  
Process the job on the cloud.

## Set options and submit to the iTwin Engine

[illegible]

Wait (a while :| )



# Wait (possibly quite a while :| )

**Production - Cucza - Ortho DSM** ⓘ Cancel 📁 ⋮

Running Orthophoto/DSM production

**Overview** Settings Result

Running...  
The production is running.  
 34%  
0/4 milestone(s) completed.  
Running processing time: **11s**  
[Monitor job queue](#)

Format: Orthophoto/DSM

▼ Job Details

Milestones 4 🔍

Running Tasks 1

villinki  
Orthophoto/DSM processing (Model recor 🔗 9s)



**Production - Cucza - Ortho DSM** ⓘ Submit Update Extract Ground 📁 🔗 ⋮

Completed Orthophoto/DSM production

**Overview** Settings Result

Completed  
The production is completed.  
Processing time: **1min 5s**  
**On a purpose built workstation, expect much longer on the lab computer**

Format: Orthophoto/DSM

▼ Job Details

Milestones 4 🔍

✓ Model reconstruction	21.02.2025 14:43
✓ Parts production	21.02.2025 14:43
✓ Orthophoto/DSM merge	21.02.2025 14:43
✓ Scene files creation	21.02.2025 14:43



# Results

(can be opened in GIS!)

Overview **Settings** Result

Production ID: **Production\_1**

Format: **Orthophoto/DSM**

Destination: **S:/Bentley/Cucza/Productions/Cucza - Ortho DSM**

Spatial Reference System: **RGF93 / Lambert-93 (EPSG:2154)**

Sampling distance: **0.05**

Projection type: **Highest point**

Maximum image part dimension (px): **4096**

Merge output parts: **true**

**Orthophoto**

Enabled: **true**

Format: **TIFF/GeoTIFF**

NoData value: **0 0 0**

NoData transparency: **true**

Color source: **Reference model visible colors**

Image sharpening: **Enabled**

**DSM**

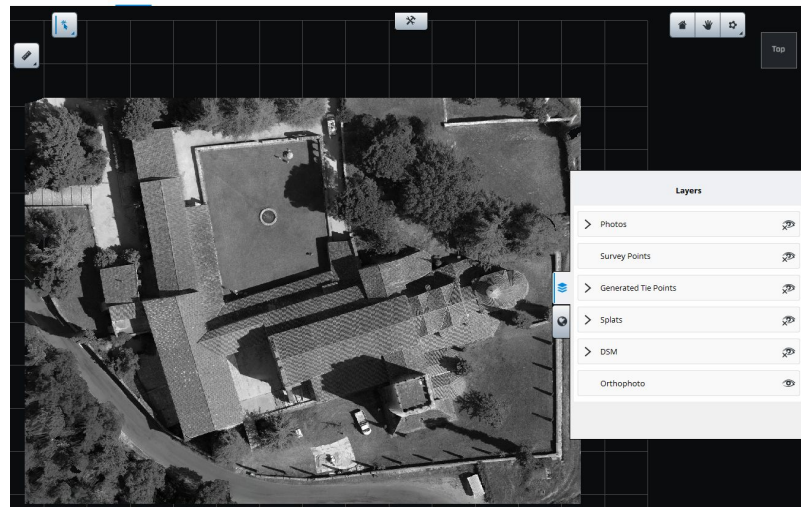
Enabled: **true**

Format: **TIFF/GeoTIFF**

NoData value: **-9999**

Name	Date modified	Type	Size
orthoPhoto	21.02.2025 14:43	File folder	
Cucza - Ortho DSM_DSM_merge.tfw	21.02.2025 14:43	TFW File	1 KB
Cucza - Ortho DSM_DSM_merge.tif	21.02.2025 14:43	TIF File	24 577 KB
Cucza - Ortho DSM_DSM_merge.tif.ovr	21.02.2025 14:43	OVF File	8 196 KB
Cucza - Ortho DSM_ortho_merge.tfw	21.02.2025 14:43	TFW File	1 KB
Cucza - Ortho DSM_ortho_merge.tif	21.02.2025 14:43	TIF File	24 577 KB
Cucza - Ortho DSM_ortho_merge.tif.ovr	21.02.2025 14:43	OVF File	8 199 KB

Overview Settings **Result**



Production - Cucza - Ortho DSM

Completed Orthophoto/DSM production

Overview Settings **Result**

