LCC Studio

User Manual

2025.10

V1.9.1

Contents

I. Lixel CyberColor Studio Software Description

LixelCyberColor Studio employs a photorealistic 3D rendering method based on 3D Gaussian Splatting (3DGS) technology. LCC models offer superior visual quality with efficient processing, proving to be a popular choice by professionals over mesh and photogrammetry methods.

Key Advantages

1. **SLAM-based collection**: Efficiently captures large spaces through mobile scanning
2. **Integrated LiDAR data**: Produces more accurate structures, enabling measurement and spatial applications
3. **Rapid processing**: Converts 5-minute scans in 100-150 minutes (1:20-30 ratio)
4. **Compact data**: Files are 80% smaller than comparable formats
5. **Extensibility**: Supports measurement, annotation, editing and further development

Lixel CyberColor Studio (hereinafter referred to as LCC Studio) is a PC-based tool for generating and working with photorealistic 3D models

LCC processes LiDAR and visual data from Lixel scanners into high-quality 3D models in either .ply or proprietary .lcc formats. Models can be viewed locally or shared online via web links for collaborative exploration.

Core Features:

- **Generate**: Import Lixel raw data to automatically create 3D models in .lcc , .ply, .usdz or 3D Tiles format
- **View:** Experience models through local viewing and first-person navigation
- **Publish**: Share LCC results via web-viewable links with one-click publishing
- **Export**: Export in standard .ply or 3D Tiles format , proprietary .lcc or .usdz format

Tools:

- **Measurement & Annotation**: Measure distances and areas, add and view annotations
- **Model Post-Processing:** Provides post-processing tools for operations such as model cropping and color grading.
- **Asset Overlay**: Import external 3D assets (.fbx, .glb, .obj) to enhance scenes

- **Collision**: Generate models with physical collision for immersive navigation
- **Spatial Flythroughs**: Capture viewpoint paths as videos for presentations and reports

Advanced Capabilities

- **Map Fusion**: Seamlessly combine multiple scans through automatic overlap detection for large-scale scene reconstruction
- **Aerial-Ground Map Fusion**: Merge drone imagery with ground scanning data for seamless integration of aerial and ground perspectives
- **HD Enhancement**: Import high-resolution DSLR or smartphone images to improve detail and texture quality in key areas
- **Spatial Recognition**: Automatically extract spatial structures from indoor scans to create structured floor plans for analysis and BIM (Feature currently only available when used with the LCC for BIM plugin)
- **Aerial Reconstruction:** Enables 3DGS reconstruction of ultra-large-scale scenes using only drone-captured aerial imagery, eliminating the need for any ground-based data acquisition equipment.

II. Version and Copyright Notice

1. Version Description

Software Version: Lixel CyberColor Studio V1.9.1

Release Date: October 29, 2025

This manual covers LCC Studio V1.9.1. Operations may differ in other versions.

Notes:

2. V1.9.1 Key Updates:

Studio

1. **3D Tiles Export**: Export models as 3D Tiles format.

2. **Custom Cover Images**: Set thumbnails for your captures at any reconstruction stage.
3. **Enhanced Aerial Fusion**: Aerial-Ground Map Fusion and Aerial Reconstruction now support up to 10,000 drone images.
4. **Improved Sharing**: One-click copy of share links and access passwords.
5. **Bug Fixes**: Resolved known issues, improved stability and user experience.

Editor

1. **Color Grading Optimization**: Improved range parameters (lower/upper limits), fixed extreme value issues causing over-dark/over-bright/gray problems.
2. **Annotation Optimization**: Enhanced annotation interaction logic.
3. **Bug Fixes**: Resolved known issues, improved stability.

Viewer

1. **Annotation List Toggle**: Show/hide individual annotation entries.
2. **Homepage Navigation**: Menu bar supports jumping to homepage.
3. **Bug Fixes**: Resolved known issues, improved stability.

III. Software Installation and Registration

1. Installation package download

Download the software through the official website: https://xgrids.com/download

For LCC Studio V1.9.1 access, contact your sales manager with registered account information to activate your license.

2. System Requirements

2.1 Operating System Support

Windows 10/11 Professional or Home

Hardware Requirements

Basic Configuration:

- **CPU**: Intel i7 8700K or above / AMD R7 1700X or above. A mainstream product after 2017 is recommended.

- **GPU**:
  - Server: V100 (16GB), **A10 (24GB), A100 (48GB)**
  - Desktop: RTX 2080Ti (11GB), RTX 3060 (12GB), RTX 4080 (16GB), **RTX 3090 (24GB), RTX 4090 (24GB)**
  - Laptop: RTX 3080Ti (16GB), RTX 4080Ti (16GB)

Recommended Configuration:

- **CPU**: Intel i7 8700K
- **GPU**: RTX 3070 and above
- **Memory**: 64GB

2.2 Performance Impact Analysis

GPU Performance vs Processing Efficiency:

Example: RTX 4090D vs RTX 3060

- **High-end GPUs (e.g., RTX 4090D)**: Faster processing, especially for high-resolution and large-scale point cloud data with maintained efficiency under large data volumes.
- **Mid-range GPUs (e.g., RTX 3060)**: Suitable for standard-sized point cloud data with stable but lower processing efficiency for large datasets.

2.3 Memory vs Data Processing Capabilities

Example: 64GB vs 128GB

- **64GB Memory:**
  - Stable processing up to 30 minutes of scanning data.
  - Processing more than 50% above this limit (e.g., over 45 minutes of data) may lead to processing failure.
- **128GB Memory**:
  - Stable processing of up to 60 minutes of scanning data.
  - Processing more than 50% above this limit (e.g., over 90 minutes of data) may increase the risk of reconstruction failure.

2.4 Hardware Requirements for Map Fusion & Aerial-Ground Map Fusion

Map Fusion and Aerial-Ground Map Fusion require robust hardware to handle automated multi-map alignment and intensive processing. For optimal performance:

Recommended Configuration:

- **Processor:** AMD Ryzen 9 9950X or an equivalent 16-core processor and above.
- **Memory:** 64GB DDR5 (96GB or 128GB recommended for larger datasets).
- **GPU:** NVIDIA RTX 3090 (RTX 4090 or 4090D recommended for optimal performance).

Notes:

- Verify sufficient system resources before starting fusion tasks to prevent processing interruptions or failures.
- For large models (total length ≥150 minutes) requiring high-quality reconstruction, 96GB to 128GB memory is recommended. If memory is insufficient, opt for **Standard Quality** processing to ensure a smoother process.
- Processing time estimate: Approximately 20 minutes of processing time per 1 minute of scan data when using Medium Quality settings.

Please configure your system according to these recommendations to ensure efficient operation of the **Map Fusion and Aerial-Ground Map Fusion feature.

3. Installation

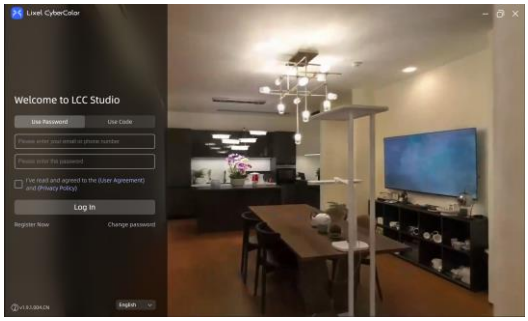
LCC Studio 1.9.1 is distributed as a **fully offline ISO installer.**

Note: Unlike the previous web-based .exe, the new ISO contains all modules and dependencies, enabling a complete, network-independent installation and eliminating failures caused by unstable or unavailable internet connections.

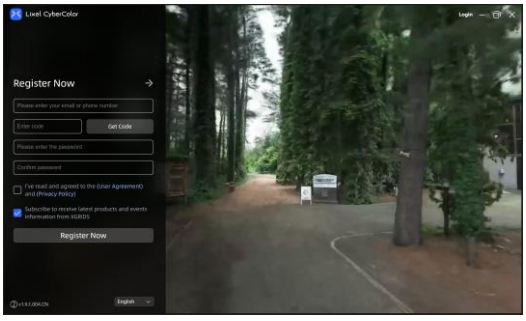
4. Registration

Upon launching the software, you'll see the login screen. Click [Register] to access the registration page.

On the registration page, fill out your information and click [Register] to complete registration and log in.



Login

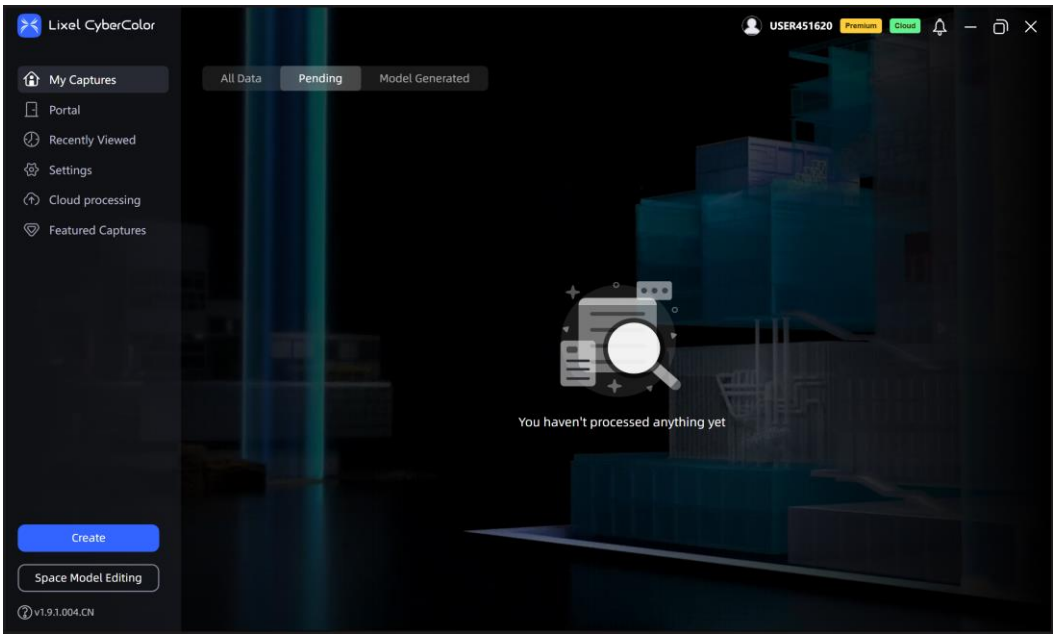


registration

Subscribe to XGRIDS product and event updates: Check the subscription box during registration to receive product and event news via email. Unsubscribe anytime through links in any email.

5. Login

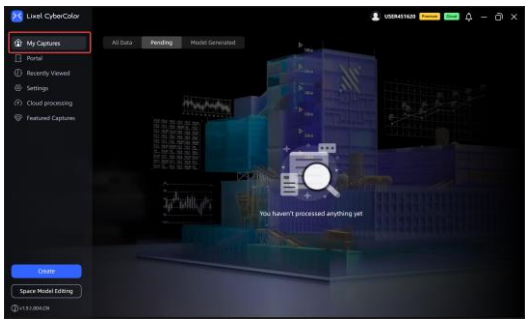
LCC Studio offers two login methods: password or verification code. Once authenticated, you'll access the main interface with your project workspace.



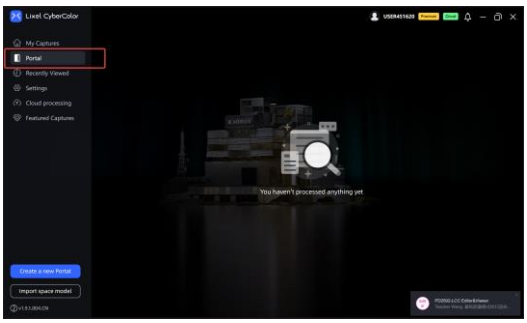
Login

IV. Introduction to software interface

1. Model generation and management



My Captures



Portal

1.1 Scene types

LCC Studio organizes content into three categories:: "My Captures", "Portal", and

"Featured Captures".

- **My Captures**
  - Contains all LCC model data created and uploaded.
  - View, edit, and manage projects here.
- **Portal**
  - Create integrated portal projects via "**Create a new Portal**" for managing multiple LCC models
  - Import .lct format jump scene files for viewing and editing portal projects

Note: Only portal editing functions available in this interface to maintain focus

- **Featured Captures**
  - View featured use cases selected by the LCC team.
  - Platform for showcasing excellent works and gaining inspiration.
  - Online viewing or local pre-caching for offline browsing are both supported.

1.2 LCC data Management

LCC Studio contains three types of data:

- **All data**
  - Contains all valid data categories and all project status categories, including data under reconstruction, to be exported or published, and paused.
- **To be reconstructed**
  - Includes data that has failed local reconstruction, data that needs to be reconstructed, data that is being reconstructed, and data that has been paused for reconstruction.
- **Generated**
  - Contains all models that are successfully reconstructed.

Note: Clicking any scene in the [Generated] list enters editor mode by default; use [View] function for view-only mode.

- **Recently visited**
  - Records all browsed models, distinguishing between .lcc and .ply formats.

1.3 Model generation and editing

- **Editor:** Import and edit exported .lcc and .ply files
- **Create**: Start processing new LCC models.

1.4 Project settings

Click "..." in upper right corner for project-specific operations in My Captures.

- **Processing:** pause, delete, error log upload
- **Generated:** publish, export, report, open file location, error log upload, delete
- **Published:** publish, publish management, export, report, open file location, error log upload, delete

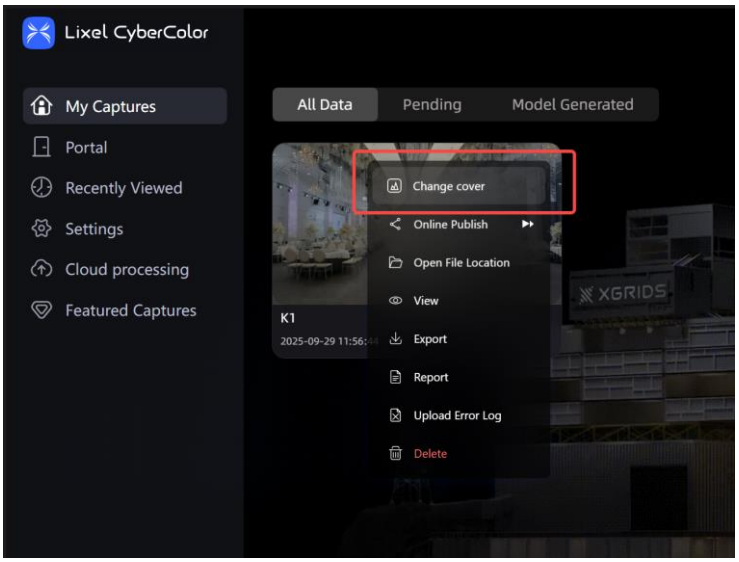
Detailed Function Descriptions

1. **Change Cover Image**

Customize scene card cover images at any reconstruction stage.

Image Requirements:

- Format: JPEG / JPG / PNG only
- Size: ≤ 5 MB



Change cover image

2. **Publish**

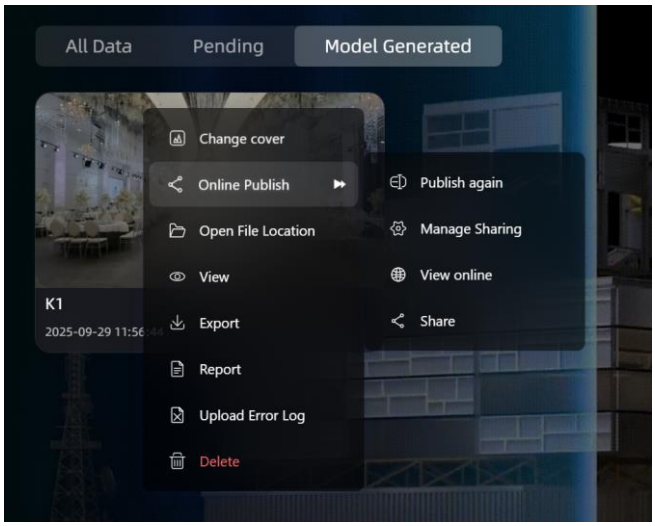
Share generated models with controlled access:

- **Unprotected sharing**: Public access with link only
- **Protected sharing**: Password-protected access with custom or auto-generated passwords
- **Third-party**: If necessary, you may choose to share with third-party companies involved in the collaboration
- **Model description**: Optional descriptive text for context
- **Link generation for sharing**: Automatic online link creation with copy functionality

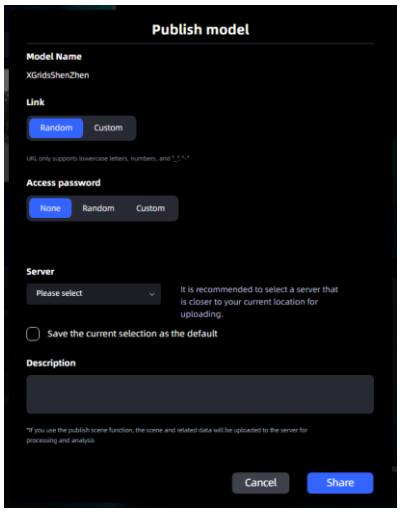
3. **Cloud Sharing Management**

The Manage Sharing button takes users to a cloud dashboard where they can:

- **View published links and details**
  - Access all links, model status information, and descriptions
- **Edit link settings:**
  - **URL parameters** - Modify the model link's URL suffix
  - **Sharing permissions** - Toggle between password-protected or public access
  - **Access password** - Set or change the model's password
  - **Edit description** - Update information to provide visitors with clearer context
- **Manage publication status**:
  - Control link availability by toggling "Publish" or "Unpublish" - enabling users to temporarily disable access when needed or restore access when ready

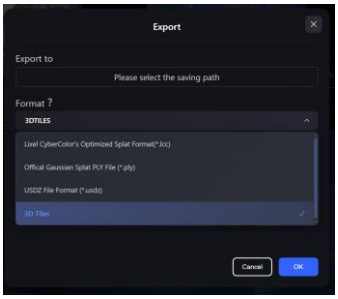


Online Publish



Publish Model

4. **Export**



Export

Export models in multiple formats:

- **.PLY Format:**
  - Standard 3DGS format for open source viewers
  - Compatible with UE/Unity 3D Gaussian plugins
  - Variable precision export options
- **.LCC Format:**
  - Proprietary compressed format (70-90% size reduction)
  - Enhanced storage, viewing, and application efficiency
  - Compatible with XGRIDS LCC Unity/Unreal Engine developer toolkits

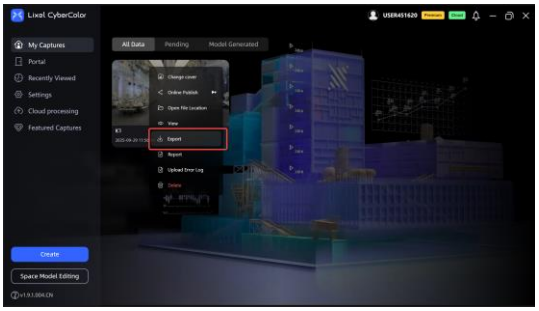
Mesh Export: Optional triangular mesh files (.obj, .ply) without textures

- **.usdz Format:**
  - USDZ is a lightweight, cross-platform 3D format that preserves Gaussian-ellipsoid data (RGB, etc.) for consistent visuals—export in one click with zero configuration.
  - Files open natively in the USD ecosystem within NVIDIA Omniverse.
  - Compared with legacy formats, USDZ stores, previews, and deploys faster, accelerating integration of LCC Studio models across any pipeline.
- **3D Tiles Format**
  - **3D Tiles** is a tiled 3D data format for WebGIS and digital twin applications.
  - Exported data conforms to **OGC 3D Tiles 1.1 standard**, directly loadable in **Cesium 131**.
  - Enables one-click export of LCC Studio reconstruction results for web display.

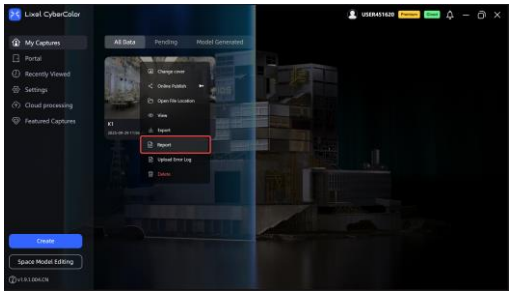
Note: Currently supports Gaussian models with up to 4 million Gaussian points only.

Click "OK" to complete the export.

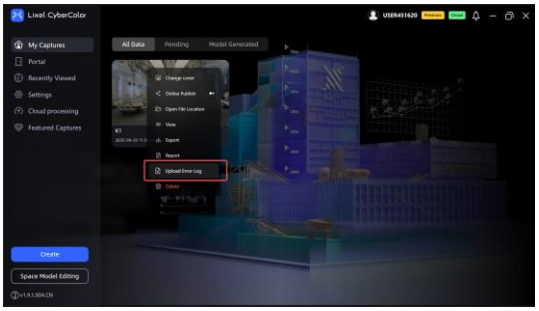
Publish



Export



Report



Upload Error Log

5. **Report**

View detailed data reports for locally generated models with comprehensive model information.

6. **Error log upload**

Upload diagnostic logs to LCC team for problem analysis. Include relevant duration logs with key information before/after issues for accurate diagnosis.

2. Help and version information

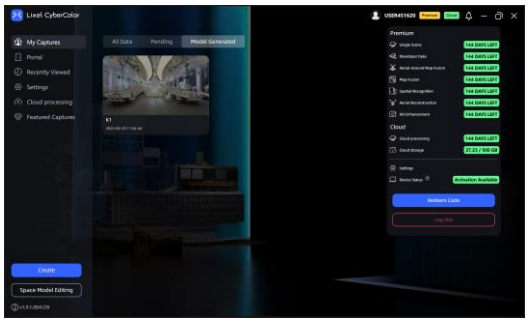
- **User Manual** : Users can directly jump to the current version of the user operation manual by clicking the "Help" button. Detailed operation guides and FAQs are provided here so that users can quickly master the use of the software.
- **Software version information** : In the lower left corner of the interface, we display the current LCC Studio software version information. This helps users understand the software version they are using and provides accurate version reference when technical support is needed.

3. Announcements

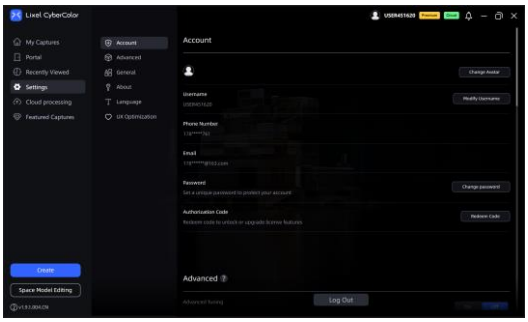
- **Important notes and system guides**: Find the latest software updates, feature changes, and guides to common user questions.

4. Account Information Display

Your account avatar appears in the top-right corner. Hover over your nickname to open the Permission Card, or access full Account Settings through the card or side menu.



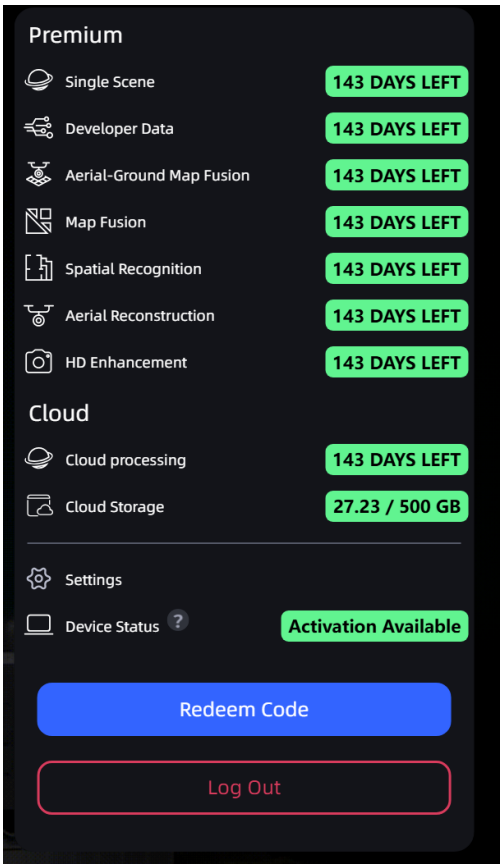
account avatar



Settings

a. **Permission Card**

- Displays your current LCC license tier and lists all active features and their expiry dates.



Permission Card

b. **Settings**

i. **Account**

- **Change Username**: Update display name

- **Bindings**: View/edit linked phone or email
- **Password**: Change password anytime
- **Authorization Code**: Redeem codes to unlock or upgrade features

ii. **Advanced:** Professional functions with detailed parameters and descriptions. Click to view details.

iii. **General**

- **Project Path:** set where LCC stores all reconstruction data. Choose a location on an SSD for best performance and keep it separate from the installation folder.

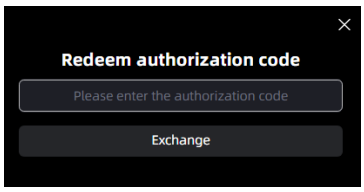
iv. **About:** Version info, downloads, tutorials, and direct feedback to the LCC team.

v. **Language:** Switch between Chinese / English / Japanese**.**

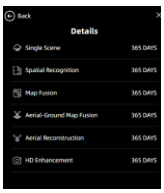
c. **Redeem an Authorization Code**

- **Entry points: Settings → Account → Authorization Code → "Redeem", or click "Redeem" on the Permission Card. Steps:**

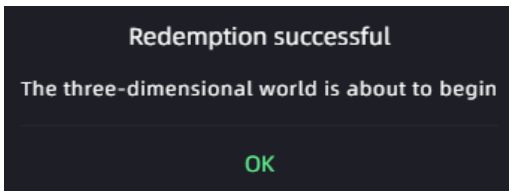
1. Click "Redeem License Code".
2. Paste the code and press "Redeem".
3. Review the license details; click "View Benefits" to confirm features and duration.
4. Confirm to apply. The Permission Card updates automatically.
5. If redemption fails, an error dialog explains why.



Redeem Authorization Code



Authorization Details



Successful

Tips:

- Language change: after switching the language, close and reopen the current workspace for the new setting to take effect.
- Before your first reconstruction, set the Project Path to an SSD folder outside the installation directory for maximum speed.

V. Detailed function descriptions

1. Data Acquisition

Before using LCC Studio, conduct comprehensive scanning with Lixel series scanners following strict acquisition guidelines for optimal results.

Required Resources:

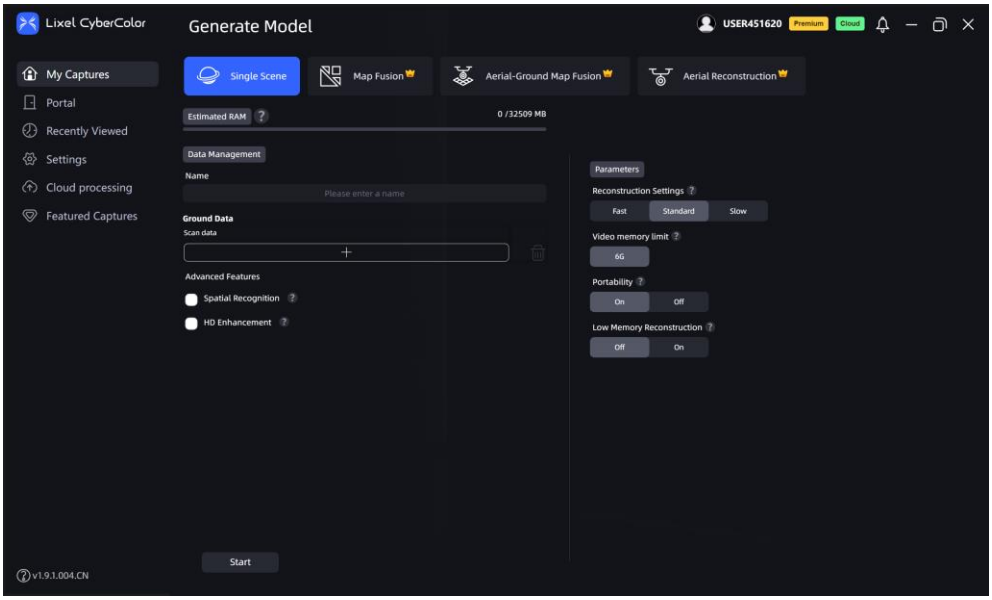
- LCC Scanning Guide v3.0
    - This guide details the preparation, scanning methods, and comprehensive recommendations for capturing high-quality data for Map Fusion and Aerial-Ground Map Fusion.
    - https://d1hl53kddblsn9.cloudfront.net/lcc/doc/help/LCC+Scanning+Guideline+v3.0.pdf
- LCC Quick Start: https://www.youtube.com/watch?v=VVUPbxSz5l4&t=84s

Support for LCC splats with Absolute Coordinate Information

LCC files from RTK-equipped devices support absolute coordinate information with default support for CSCS2000 and WGS84 coordinate systems. Apply to geospatial platforms (e.g., Cesium) for 3D visualization.

2. Model generation

Click "Create" to access the "Generate Model" interface. Choose from **Single Scene Reconstruction**, **Map Fusion Reconstructio**n (multi-scene automatic stitching), **Aerial-Ground Map Fusion or Aerial Reconstruction.**



Create

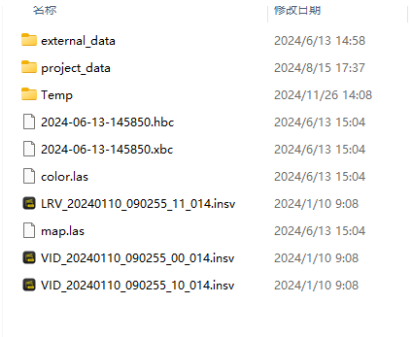
2.1 Single Scene

In LCC Studio, the process of creating a single scene is divided into two steps:

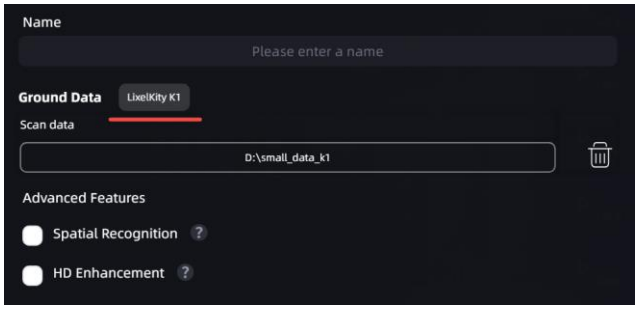
2.1.1 Upload scanning data

1. **Scanning data:**

Upload Lixel scanner data files (displays corresponding device type)



Scanner data



Display device type

2. **Fill in the project name and set the parameters** .
    a. **Name**: Name your LCC scene
    b. **Quality**:
        - Choose between fast, standard, or slow processing
        - Slower processing increases VRAM usage but produces higher quality models with better signal-to-noise ratio
    c. **VRAM Limit**:
        - Select based on your GPU's capacity
        - Higher limits generate more points but increase processing time
        - Balance generation efficiency with model quality when setting the VRAM limit
    d. **Portability**:
        - Enables compatibility with most devices including mobile
        - When enabled: Reduces file size and improves performance across devices
        - When disabled: Preserves more realistic lighting effects but may reduce performance
    e. **Low-Memory Reconstruction**
        - When system RAM is limited, enable Low-Memory Mode to off-load intermediate data to disk instead of keeping it resident in memory. This

reduces peak RAM usage, improves stability, and prevents out-of-memory failures.

Note: This option is only available in Single-Scene reconstruction mode and may increase processing time.

f. **Debug Options:**

Advanced configuration parameters for optimization, diagnostics, and specific scenario requirements:

- **Start-to-end loop closure**

Enhances SLAM mapping constraints for improved accuracy when scan trajectory formxs a closed loop. Select this option if the scan started and ended at the same spot.

- **PPR (Point cloud Participation Rate)**:
  - High PPR enhances detail but may cause edge bleeding in outdoor scenes
  - Use Normal for indoor, Low for outdoor environments
  - Lower PPR if sky bleeds into trees/buildings at model edges
  - **Note**: Bleeding is usually caused by limited scanning angles; capture from multiple heights/angles for best results

Before lowering (normal)

After lowering (low)

- **RTK Data: Controls RTK data usage during reconstruction:**
  - **Auto:** Prioritizes RTK data but disables automatically if anomalies detected, ensuring stable results.
  - **Disabled:** Ignores RTK data completely. Results lack absolute coordinates and cannot be used for Map Fusion, but avoids RTK-related issues.
- **Special SLAM Mode: Select a SLAM Mode for special scenarios:**
  - **None:** Maximizes mapping accuracy for stable devices and clear environments. May fail if scan contains intense motion or sensor interference.

- **Robust Mode:** Maintains stable operation in most scenarios, balancing accuracy and success rate. Recommended for most users.
- **Narrow Scene:** For tunnels, mine shafts, long corridors. May cause failure in regular scenarios.

g. **Advanced Features**

- HD Enhancement: Improve detail in key areas (landmarks and statues, equipment rooms, decorative elements) by incorporating additional high-resolution photos with smartphones or DSLRs. These images combine with original scan data to enhance texture quality and detail rendering.
- Spatial Recognition: For indoor environments, automatically identifies walls, doors, windows and other structural elements, organizing them into a clear floor plan.
  - Useful for space analysis, renovation planning, or BIM modeling.
  - This feature needs to be used with the LCC for BIM plug-in.

Requirements for Advanced Features:

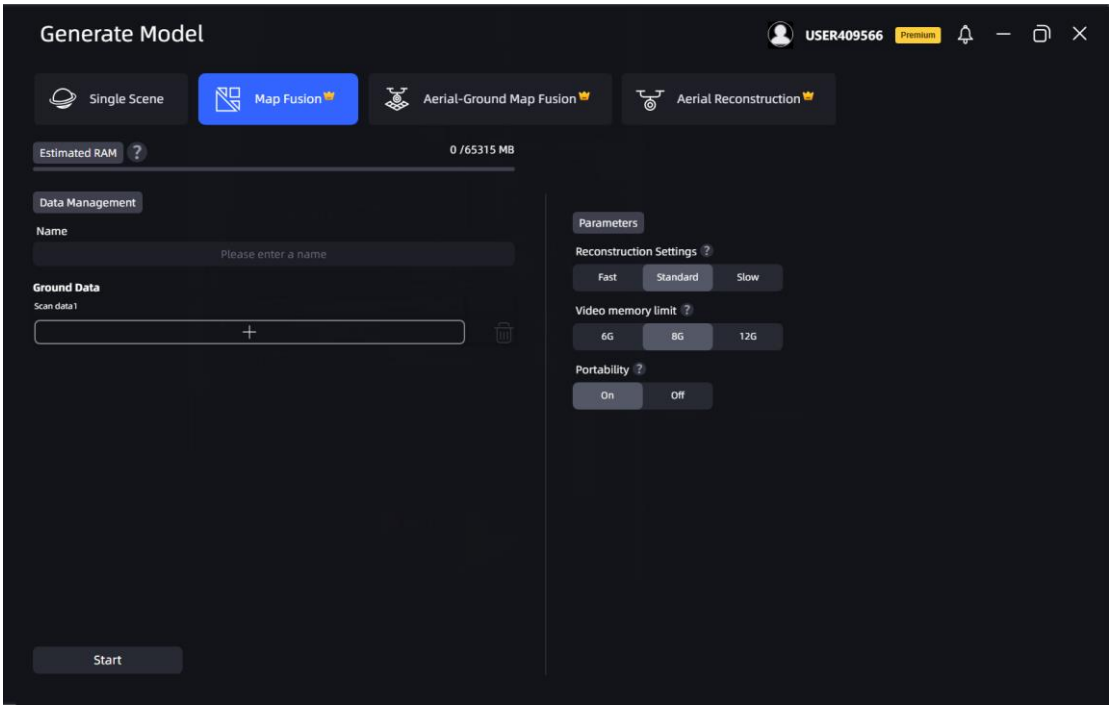
1. **Hardware**: Graphics cards with >8GB VRAM required
2. **HD enhancement guidelines**:
   - Use the same device for all supplementary photos
   - Keep photo count between 20-500
   - Supported formats: JPG, PNG, JPEG

2.2 Map Fusion

Combine multiple scan segments into a complete 3D scene through automated preprocessing, calibration, and matching.

2.2.1 Process

1. **Batch upload multiple datasets**
   - Upload multiple data files from the **same device type**
   - For **Lixel L2 pro devices with panoramic cameras:** upload matching panoramic videos
   - For **K1/L2Pro devices**: panoramic video option will be grayed out, proceed directly to adding next dataset
   - LCC supports fusion of **up to 10 data segments**
2. **Configure scene parameters (same as single scene process)**



Map Fusion

2.3 Aerial-Ground Map Fusion

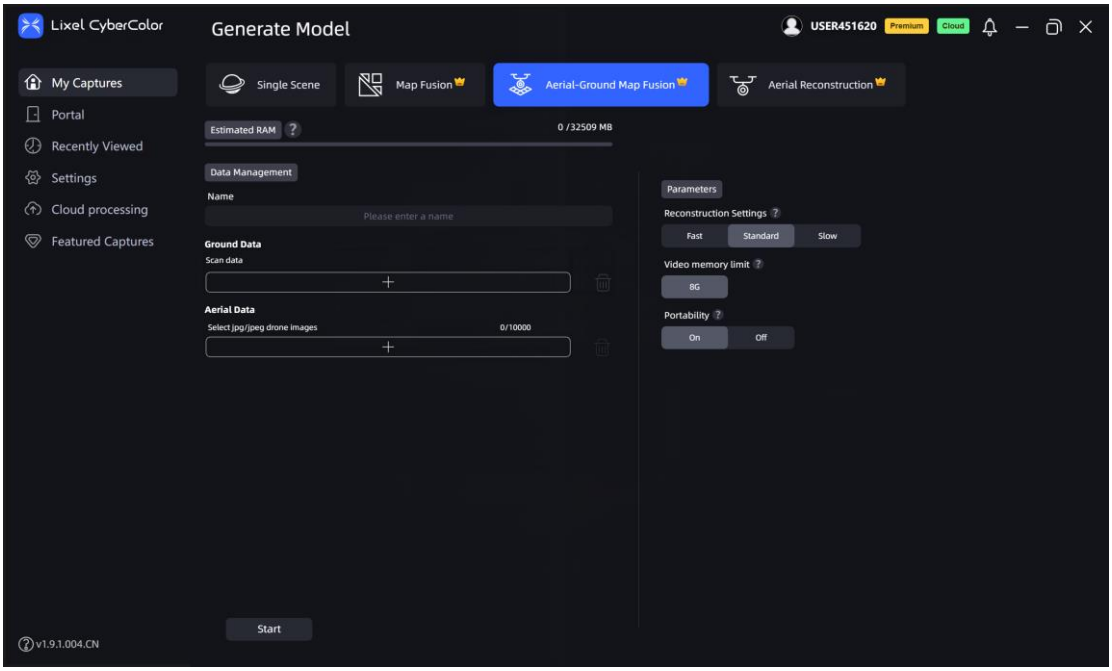
This feature combines aerial drone imagery with ground scans to create complete 3D models of large-scale environments. By merging both perspectives, models capture both architectural overviews and precise ground details, ideal for comprehensive documentation of campuses, building complexes, construction sites, and heritage locations.

2.3.1 Process

1. **Upload ground data from Lixel devices and aerial drone imagery**

- Upload ground data files from your Lixel device
    - For **Lixel L2 devices with panoramic cameras:** upload matching panoramic videos
    - For **K1/L2Pro devices**: panoramic video option will be grayed out, proceed directly to adding next dataset
- Upload drone data
    - Requires **100-10000 drone images**
    - **JPG/JPEG** formats only
    - Image resolution must be 1024×768 or higher, consistent across all images

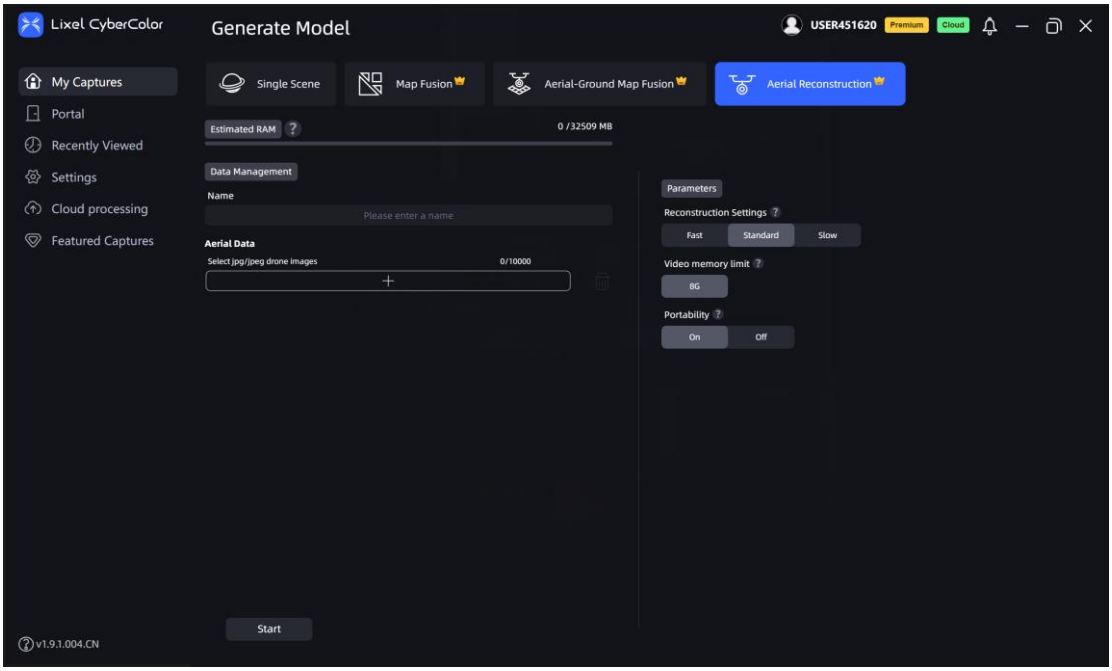
2. **Configure scene parameters (same as single scene process)**



Aerial-Ground Map Fusion

2.4 **Aerial Reconstruction**

Generate 3D Gaussian-Splatting (3DGS) models of city-scale scenes using only drone imagery—no ground-based equipment required.



Aerial Reconstruction

2.4.1 Workflow

1. **Upload Aerial Data**
    - Select Aerial as the capture type and upload drone imagery (JPG/JPEG only).
    - The interface automatically detects and displays the corresponding device profile.
2. **Scene Setup**
    - Enter a scene name and configure parameters (same steps as Single-Scene).

Data Requirements

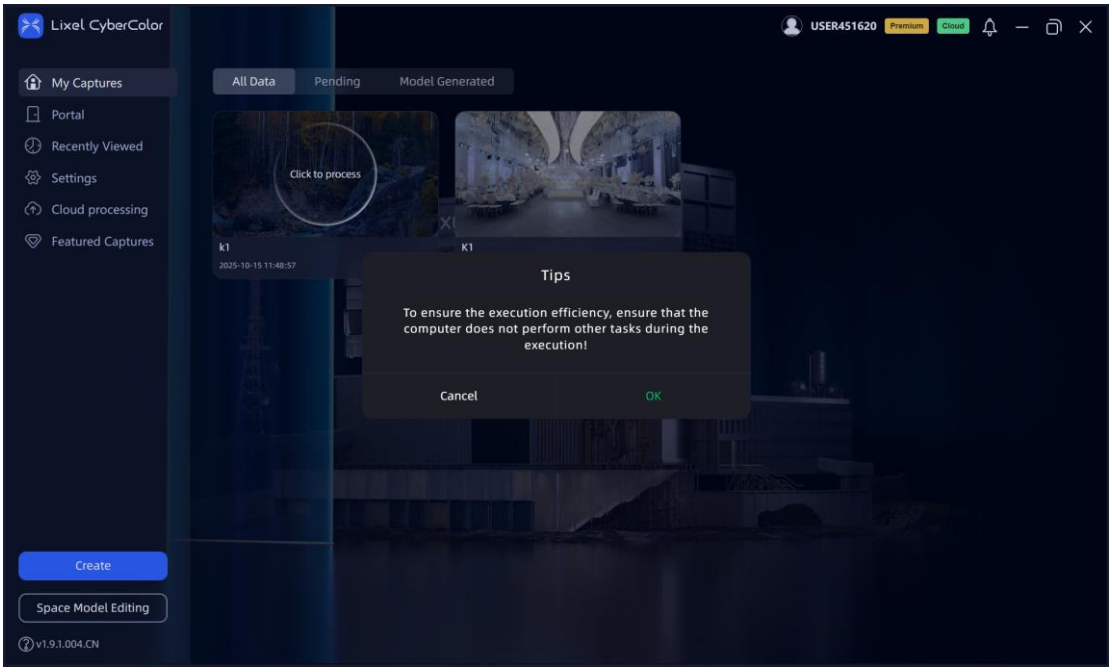
a. Format: JPG or JPEG

b. Quantity: 100–5,000 images

c. Resolution: ≥ 1024 × 768 pixels, identical for all images

3. Start processing

After project creation, click [Start] to load data. Once loaded, access My Generate List page, click [Start Reconstruction] for specific projects, then [OK] to begin automatic model generation.



Start processing

Critical Notes:

- Ensure all pending data uploaded before queuing reconstruction
- Avoid other VRAM-consuming tasks during processing

- Don't close LCC Studio during reconstruction, doing so causes interruption
- Reserve disk space ≥2× collected project data size to prevent reconstruction failure or interruptions due to insufficient disk space.
- Closing LCC Studio during model generation interrupts the process. When you re-open LCC Studio, interrupted projects show failure status; click "Continue" or "Restart" to re-queue

4. LCC Scene Viewing (Viewer)

4.1 Accessing the Viewer (via Studio)

Open the Viewer from **LCC Studio** to browse reconstructed models and perform basic operations such as measurements.

4.1.1 Workflow

1. **Access from *My Captures* or *Recently Viewed***
    a. Navigate to ***My Captures*** or ***Recently Viewed***, and locate the desired scene.
    b. Hover over the scene card.
    c. Click the **View** icon.

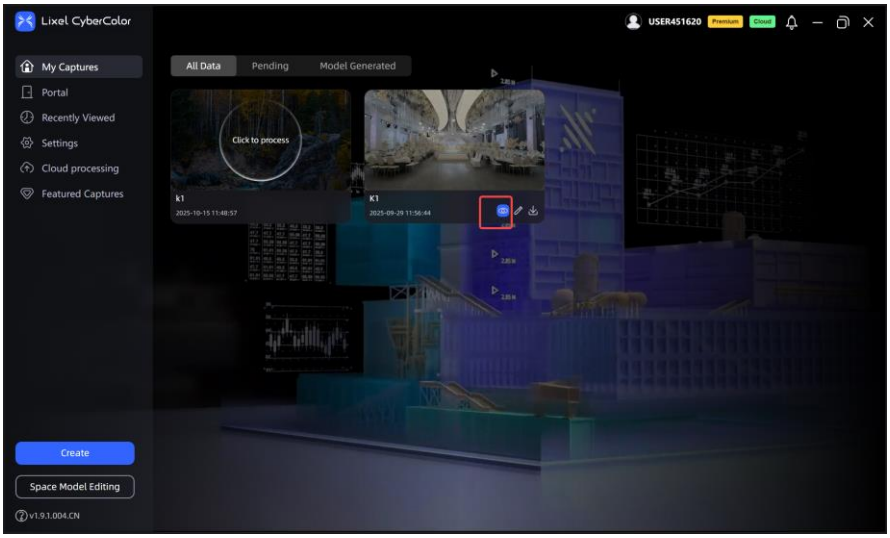


Figure Caption

2. **Access from *Featured Captures***
    a. Navigate to ***Featured Captures,*** and locate the desired scene.
    b. Hover over the scene card.
    c. Click **View** in the action bar.

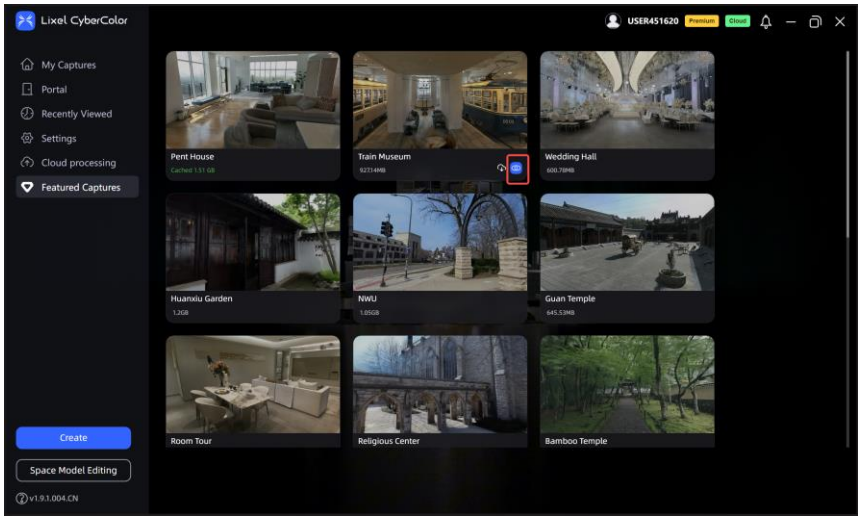


Figure Caption

4.1.2 Performance Notes

- Cached scenes load from local data for faster performance
- Uncached scenes load online by default

4.2 Viewer Homepage

The homepage allows file opening via drag-and-drop or file selection.

4.2.1 Workflow

1. **File Selection**
    a. Click the **Select File** button. Windows File Explorer will open.
    b. Open the **.lcc** file.
    c. The Viewer will automatically load and display the file.

Figure Caption

2. **Drag-and-Drop**
    a. Drag .lcc files directly into the homepage.
    b. Release the left mouse button, and the Viewer will automatically open the file.

    Note: Currently, only **.lcc** files are supported for drag-and-drop.

4.2.2 Recent History

Recent History stores all recently viewed models for easy access.

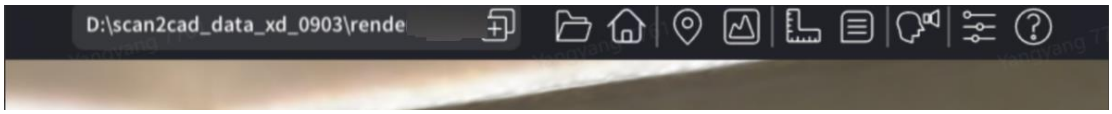
1. Stores up to 24 scenes in reverse chronological order
2. **Important Notes**:
    a. Files with changed paths (e.g., deleted or moved) cannot reopen.
    b. Uninstalling LCC Studio permanently clears all **Recent History**.

4.3 Viewer Tool Bar

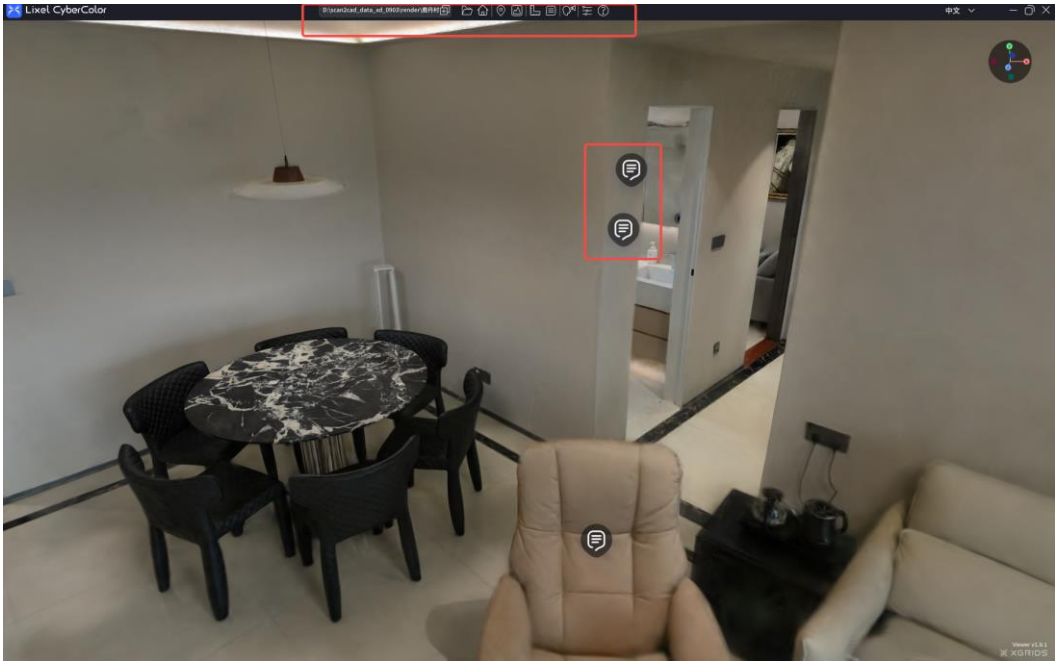
Explore scenes, view annotations, and measure distances or areas in the Viewer.

Viewer toolbar contains:

- **Open Folder**: Import other LCC models
- **Homepage**: Return to Viewer homepage
- **Relocate**: Reset camera to origin point
- **Point Cloud Toggle**: Switch between model and point cloud view
- **Measurement**: Measure coordinates, distances, and areas
- **Annotations**: View scene annotations
- **Mode Switch**: Toggle between Flythrough, Pivot, and Avatar modes
- **Settings**: Configure collision, trajectory, environment, rendering, and measurement units
- **Help**: Access operation guides for each mode



Viewer tool panel



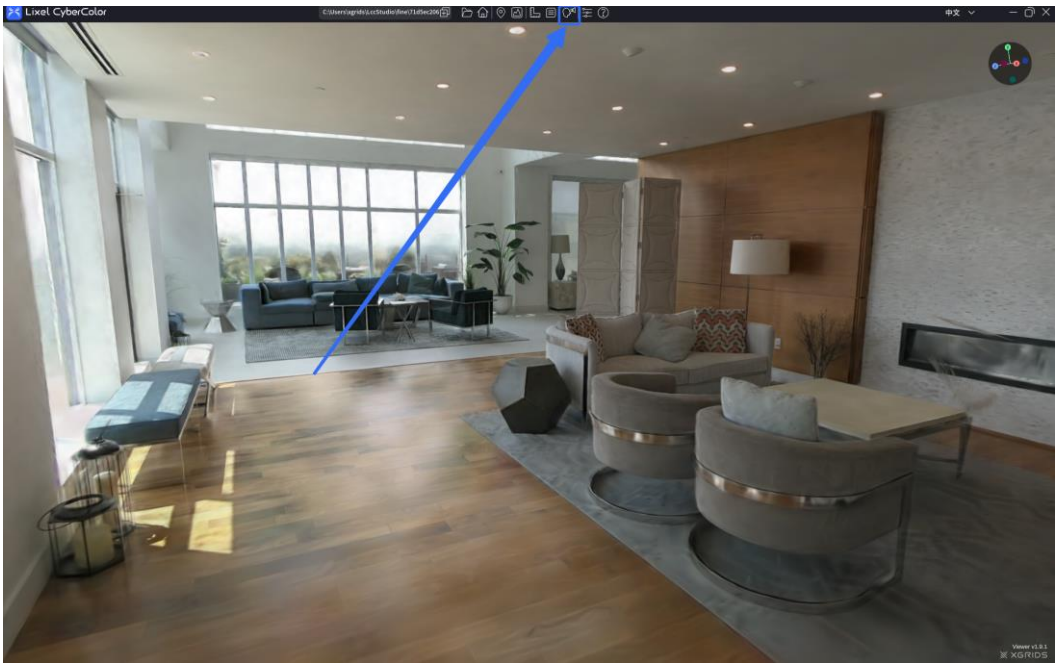
Viewer interface

4.4 Navigation Modes and Basic Operations

In an **LCC Scene**, three modes provide different perspectives and controls: **Flythrough Mode**, **Pivot Mode**, and **Avatar Mode**.

4.4.1 Flythrough Mode

First-person navigation simulating immersive spatial exploration. Camera follows mouse and keyboard input, ideal for indoor browsing and detailed area inspection.

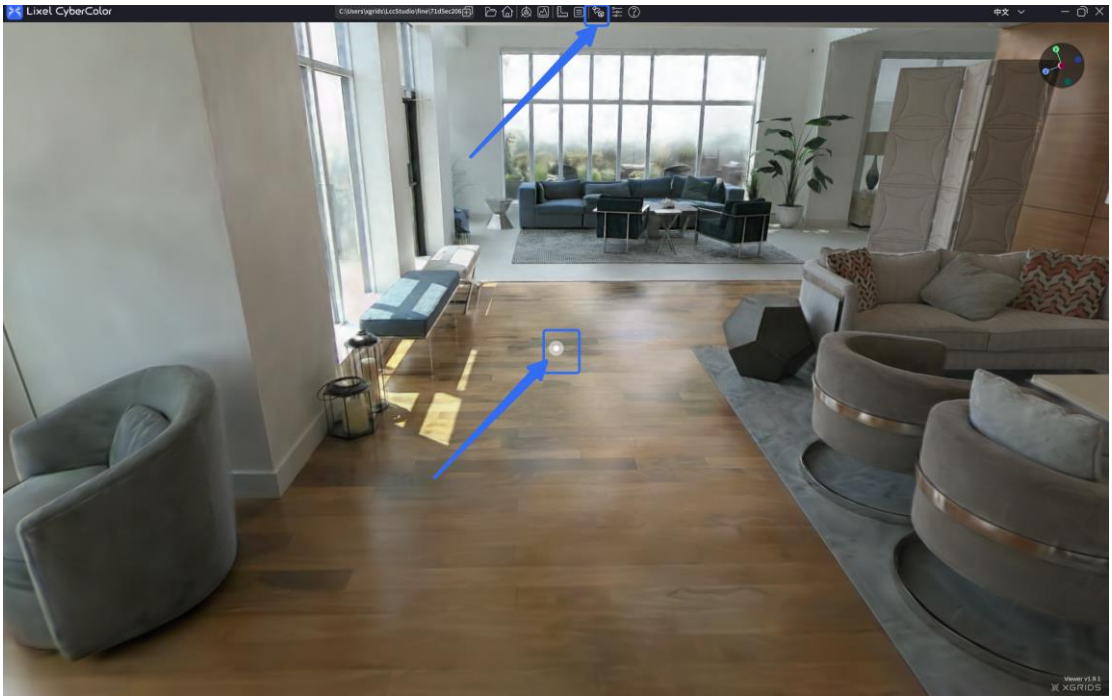


Flythrough Mode

Controls

Command	Function
W / A / S / D / Q / E	Move forward / left / backward / right / down / up
Shift	Accelerate movement
Mouse scroll	Adjust movement speed
Left-click drag	Rotate view
Right-click drag	Pan view

4.4.2 Pivot Mode



Pivot Mode

Camera rotates around a fixed point for global model inspection.

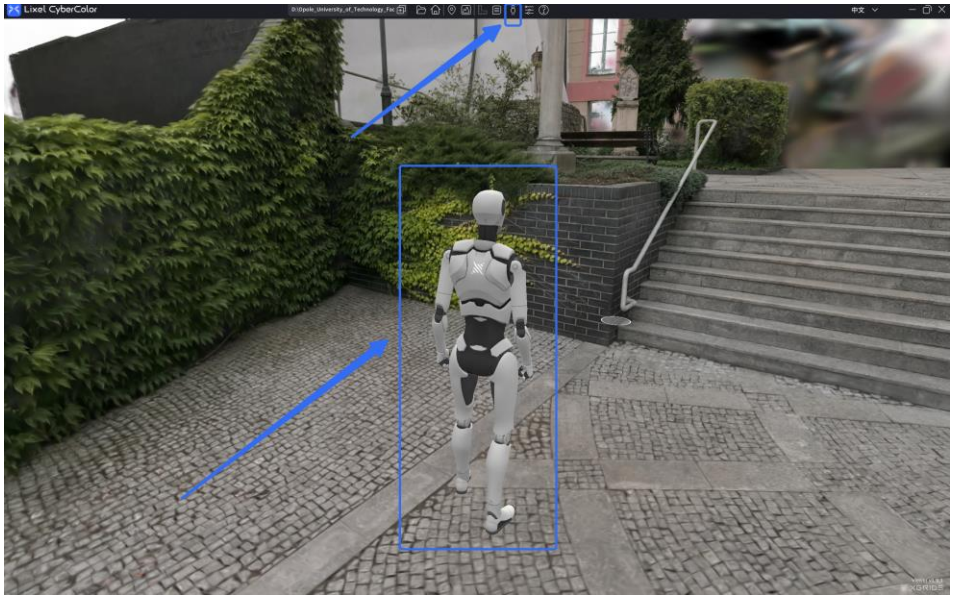
- When panning the camera, the pivot point also shifts.
- If switching from Flythrough Mode to Pivot Mode, use **Relocate** to realign to the center when the pivot becomes offset.

Controls

Command	Function
Mouse scroll	Zoom in/out
Left-click drag	Rotate around pivot point
Right-click drag	Pan view
Double-click	Quickly switch pivot center

4.4.3 Avatar Mode

Navigate the scene as a virtual character. An operation guide displays on first use. Supports immersive flythrough only—measurement and annotation unavailable in this mode.



Avatar Mode

First-person experience ideal for immersive indoor browsing. Camera follows mouse and keyboard input.

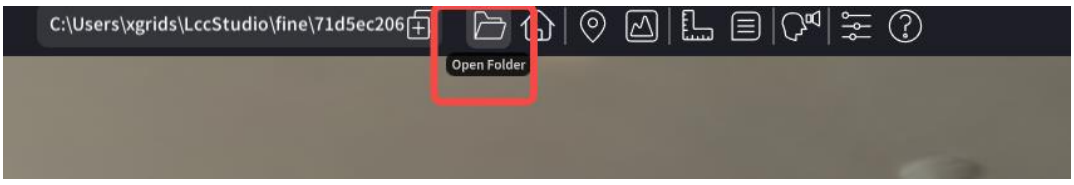
Controls

Command	Function
W / A / S / D	Move forward / left / backward / right
Spacebar	Jump
Shift	Accelerate movement
Left-click target location	Navigate to target (auto-walk)
Left-click drag	Rotate view

4.5 Importing Other Models

Click the **Folder** button to open and view additional models:

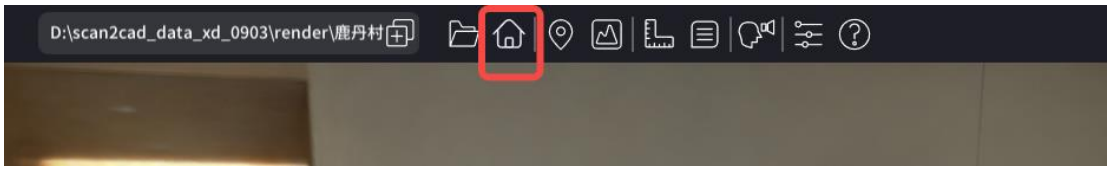
1. Import other locally stored **LCC model files**.
2. Import **.ply model files** for flythroughs or viewing.



Open Folder

4.6 Return to Homepage

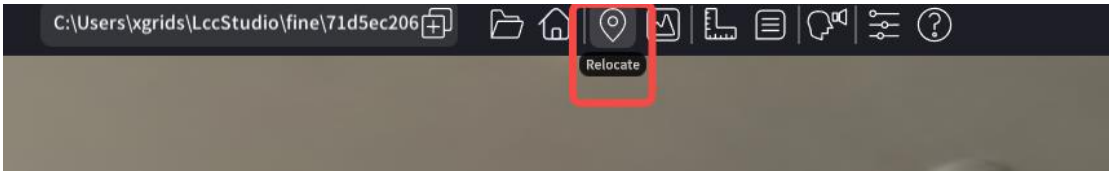
Click [Home] icon to return to the Viewer homepage.



Home

4.7 Relocate

The **Origin Point** refers to the initial location of the scanner during model capture. Reset camera to the scanner's original capture position with **Relocate**.



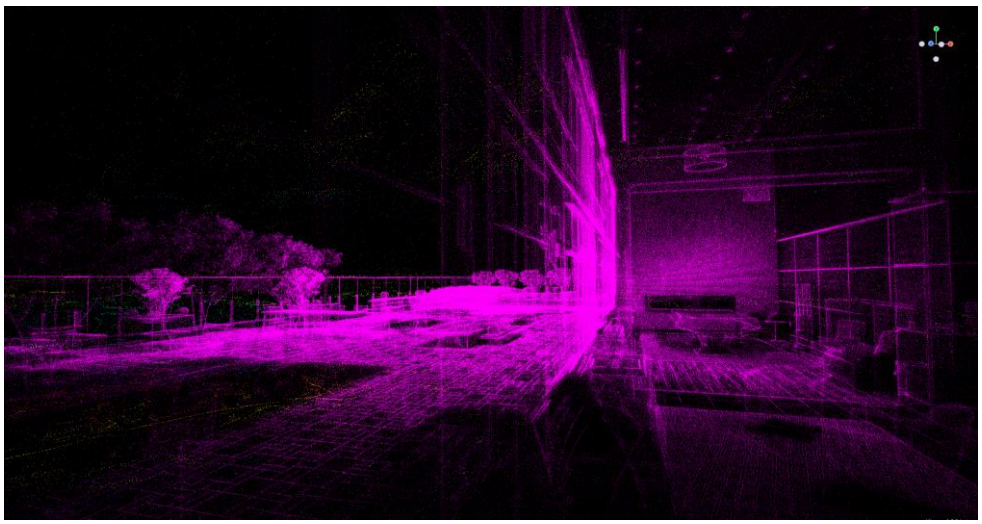
Relocate

4.8 Switch to Point Cloud View

In an **LCC Scene**, switch to **Point Cloud View** to inspect scene structure, data density, or scanning accuracy.

1. Display model as dense points without textures. Ideal for structural inspection and data verification.

2. After switching, you can still navigate freely in **Flythrough Mode**, **Pivot Mode**, or **Avatar Mode**



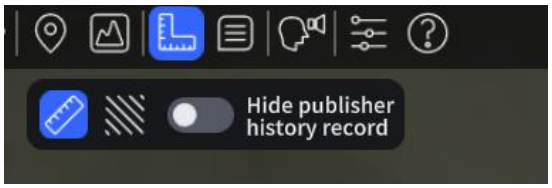
Point Cloud View

4.9 Measurement

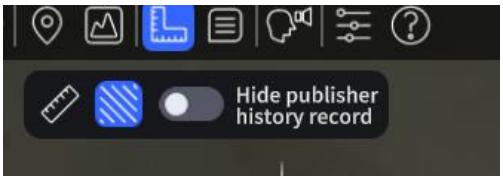
Perform **temporary measurements** or view **publisher-saved measurement data**.

4.9.1 Workflow

1. **Activate Measurement Mode**
    a. Click **Measurement** to activate.
2. **Select Measurement Type**
    a. Choose **Distance Measurement** or **Area Measurement**.
3. **Distance Measurement**
    a. A magnifier icon indicates the tool is active.
    b. Select start/end points for results in meters.
4. **Area Measurement**
    a. A magnifier icon indicates the tool is active.
    b. Select a minimum of three coplanar points to calculate area.
    c. Click **Complete Measurement** for results in **square meters**.



Distance measurement



Area measurement

4.9.2 Usage Notes

1. **Temporary Measurements**
    a. Valid only during the current viewing session. Temporary measurement data will be cleared once the measurement tool is closed or the scene is exited, and cannot be permanently saved in the Viewer.
2. **Publisher Measurements**
    a. Measurements created by the scene publisher can be viewed in the Viewer but cannot be edited.
3. **Show/Hide Publisher Records**
    a. **On**: Display the publisher's measurement data.
    b. **Off**: Hide publisher measurement data and show only temporary measurements.
4. **Measurement Unit Settings**

a. Switch between **metric** and **imperial** systems, and select length units (e.g., centimeters, meters, feet)

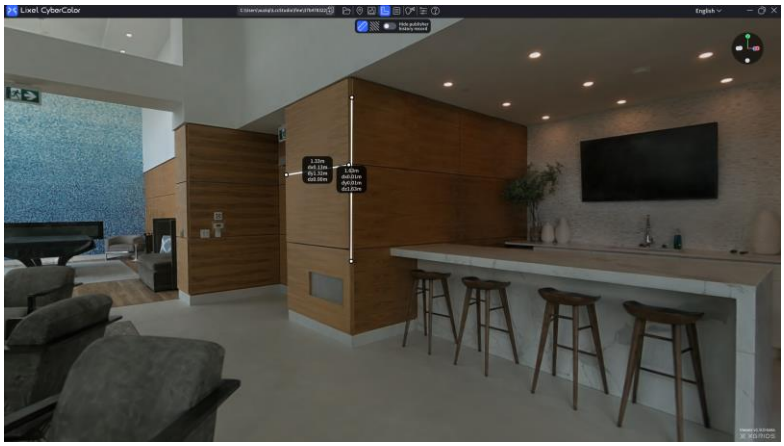
b. Measurement values are updated in real time when the unit system is changed.

c. By default, the Viewer uses the **metric system**.

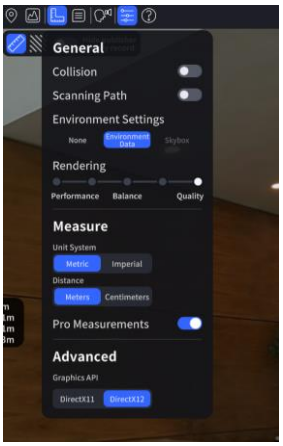
5. **Show Professional Measurement Data**

a. In distance measurement mode, enabling this option will calculate the **offset values (dx, dy, dz)** between two selected points in real time.

b. Often used to check whether a line segment is horizontal or vertical, or to perform precise alignment calibration.



Pro Measurements



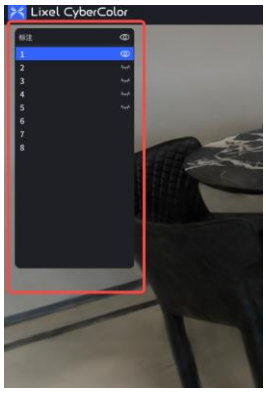
Measurement Setting

4.10 View Notes

View rich content including:

- Photos / Videos / Hyperlinks / Images / Text

Note



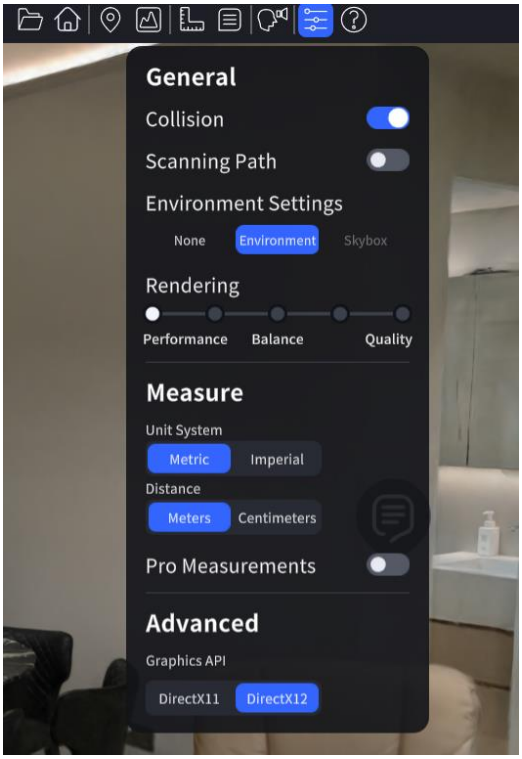
Note

4.10.1 Usage Notes

1. **Enable Notes**
    a. When a scene is loaded, notes will auto-activate when available.
2. **Notes List**
    a. Left panel displays all notes within the scene.
3. **Auto Navigation**
    a. Click a note to navigate to their location.
4. **Show/Hide Notes**
    a. Click the eye icon to toggle all notes.
    b. Hover over individual notes to show/hide specific ones .
5. **Hover Info**
    a. Hover over a note for basic information.
6. **Expand Details**
    a. Click on a note to expand its details, including images, videos, and text descriptions.

4.11 Settings

In the **Viewer**, users can configure various functions to customize scene browsing and analysis.

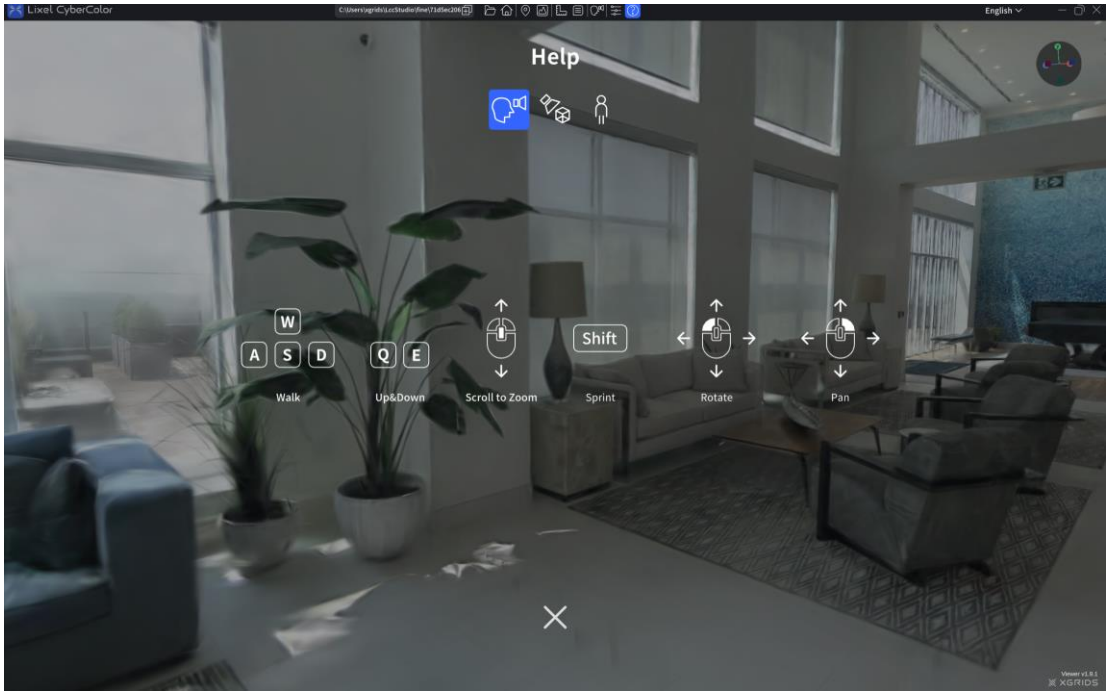


Settings

1. **Collision**
    a. Enable or disable spatial collision detection.
    b. Enabled by default when a scene is opened.
    c. If the collision file is missing, you will be notified when enabling the feature.
2. **Scanning Trajectory**
    a. View scanning device path for recent LCC scenes.
    b. Supported across both Editor and Viewer.
3. **Environment Options**
    a. Control the display of environmental data (skybox / scanning environment data).
    b. Environmental data is not affected by model cropping. When environment data is available, toggled on or off in both Editor and Viewer.
4. **Rendering**
    a. Configure rendering quality:
        i. **Performance Mode**: Optimized for faster rendering speed.
        ii. **Quality Mode**: Higher graphical fidelity, but requires stronger hardware performance.
5. **Measurement Settings**
    a. Configure measurement units.
    b. Switch between **metric** and **imperial** systems, and choose length units (e.g., centimeters, meters, feet).
    c. Measurement values update in real time when units are changed.
    d. Supports displaying **professional measurement data**, showing dx / dy / dz axis offsets for more precise calibration.
6. **Graphics API**
    a. If rendering issues occur (e.g., screen tearing, artifacts, or flickering), switching the graphics API may help improve display performance.

4.12 Help

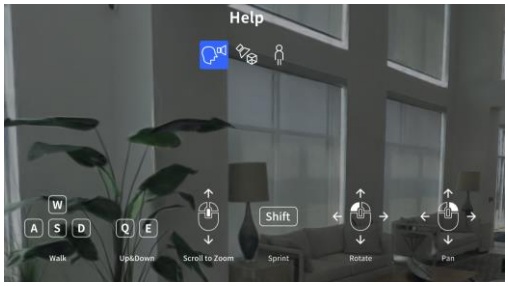
Access function guides by clicking [Help].



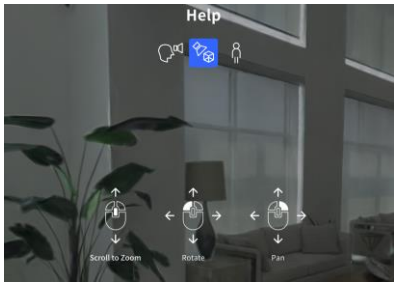
Help

4.12.1 **Workflow**

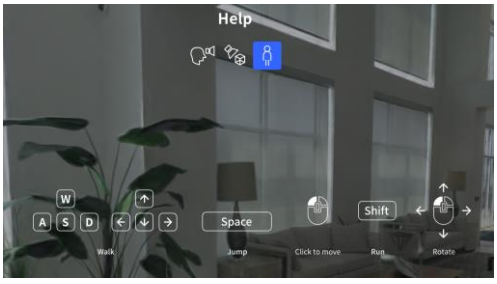
1. Click [Help] to view guide.
2. Click icons to switch between instructions for different modes.



Flythrough mode



Pivot mode



Avatar mode

5. LCC Scene Editing (Editor)

5.1 Interface Overview

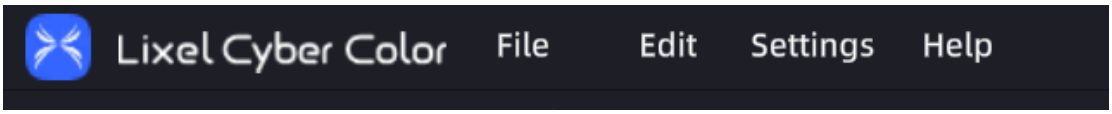
Interface Overview

1. **Main Menu Bar**
    - File management, editing operations, software configuration, and user assistance (**File, Edit, Settings, Help**)
2. **Quick Access Toolbar**
    - Frequently used operations: **Open, Save, Undo, Redo, Move, Rotate, Scale**.
3. **Tools Panel**
    - Editing tools for models and scenes: **Selection, Color Grading, Skybox, Measurement, Notes**.
4. **View Controller**
    - Navigation modes, rendering views, and origin reset. Supports precise 3D control operations.
5. **Assets Panel**
    - Access visual assets in current project (models, notes) with management and editing support.
6. **3D Viewport**
    - Main editing/preview area supporting panoramic browsing, zooming, rotation, and interaction.

7. **Coordinate Axes**
    - Quick X, Y, Z axis orientation and positioning.
8. **Status Bar**
    - Software version, frame rate (FPS), and performance monitoring.
9. **Loading Progress Bar**
    - Model conversion and export progress tracking.
10. **Notification Area**
    - Displays alerts and rules for user actions requiring attention.
11. **Sequence Control Area**
    - **Camera rendering, video export, and keyframe export** for generating videos or screenshots.
12. **File Path Display Bar**
    - Current project file path for quick location confirmation.

5.2 Main Menu Bar

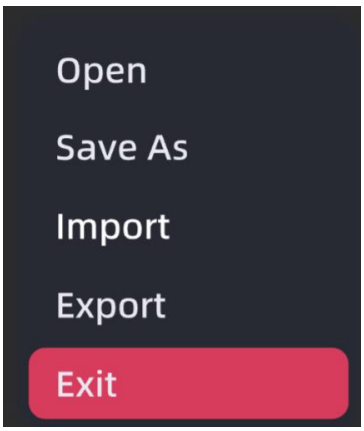
The main menu bar includes common function entries such as **File, Edit, Settings, Help**, used for project file management, editing operations, software configuration, and user support.



Main Menu

5.2.1 File

The **File** menu provides options for opening, saving, importing, exporting project files, as well as exiting the application.



File Operation

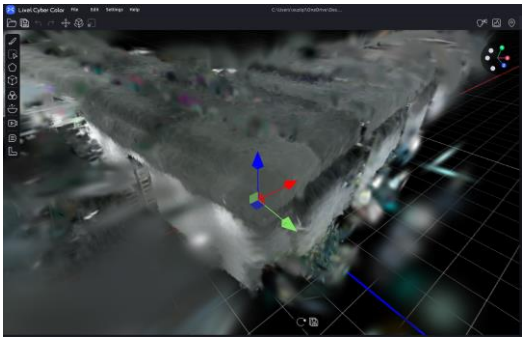
5.2.1.1 **Open**

- Select and load another **LCC model** from the local drive.
- **Note**: Use **Save As** to create a new `.lcc` file before opening another project if you want to preserve current edits (cropping, color grading).

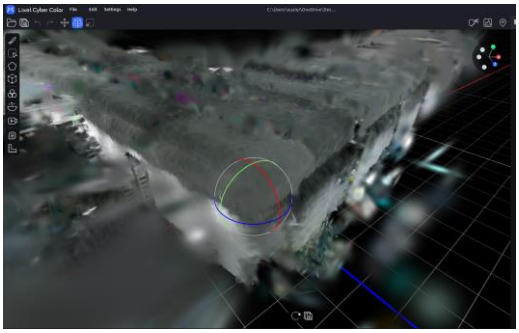
5.2.1.1.1 **Open .ply**

The **Editor** supports opening `.ply` format **3DGS files**. Import `.ply (3DGS)` files with model operation tools (Translate, Rotate, Reset, Save).

1. After importing a PLY file, the model operation tools (Translate, Rotate, Reset, Save) will appear at the bottom of the interface. Re-clicking the tool will exit the corresponding operation mode.
    a. **Translate**: changes model position.
    b. **Rotate**: rotates model's angle.
    c. **Reset**: restores the model to its initial default state, undoing all operations.
    d. **Save**: saves a specific camera view, which will be automatically applied the next time the file is opened.



Translate



Rotate

2. `.ply (3DGS)` files generated in **LCC Studio** will automatically be recognized as LCC format, and all viewing and editing operations will remain consistent with LCC files. However, third-party `.ply` files may require origin point adjustments. These changes generally do not affect file usability.
3. To ensure that older `.ply (3DGS)` files are compatible with the latest version of the LCC software, it is recommended to re-convert these files with the latest version to ensure proper use.
4. When importing `.ply (3DGS)` files, the system will automatically convert them into LCC format for operation, which may affect scene performance and rendering quality.

5.2.1.2 **Save As**

Save the current project as a new file while keeping the original file unchanged. File formats supported:

- **LCC**
- **PLY**

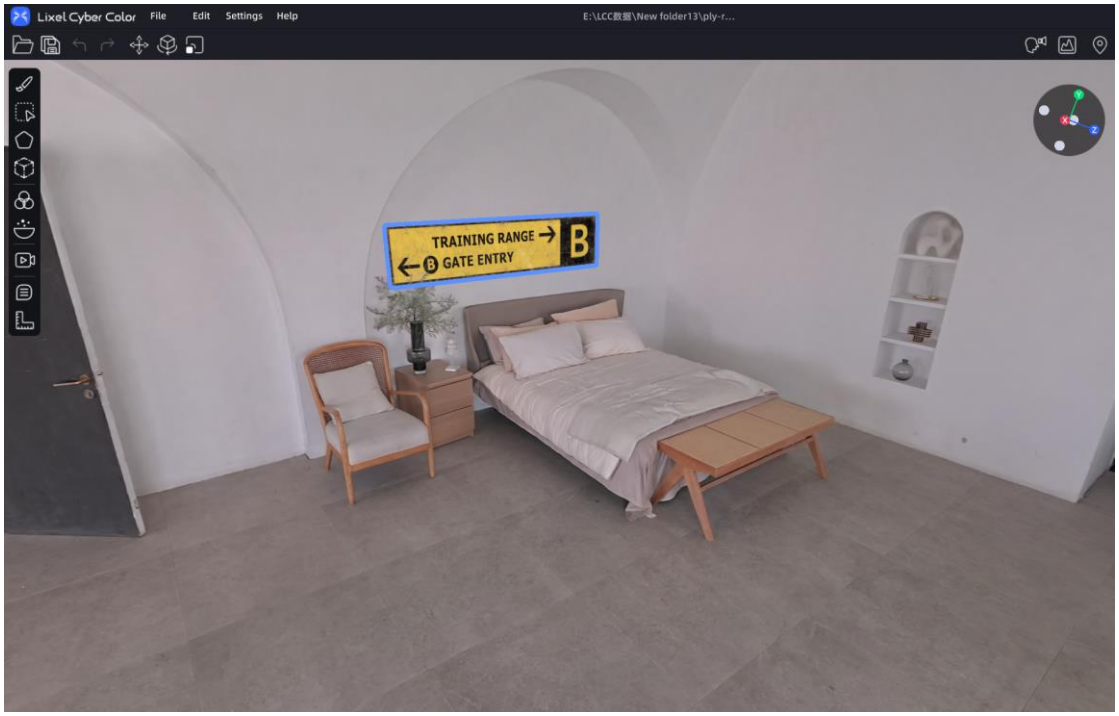
Note: In the Editor, the following saving rules apply to edited scenes:

- **Real-Time Auto-Save**: All edits (such as measurements and notes) except cropping/color grading save automatically.
- **Save As for Cropping and Color Grading**: Cropping and color grading require Save As to preserve changes. This prevents accidental overwriting of the original file. Both `.LCC` and `.PLY` formats are supported.
- **Format Behavior**: `.LCC`saves close the current scene and open the newly saved one. `.PLY`saves standalone files without triggering an automatic scene switch.

5.2.1.3 **Import**

Import external assets (such as models, textures, etc.) into the current project. File types supported:

- **GLB**
- **FBX**
- **OBJ**
- **Collision Mesh**



Texture

1. **Texture Display**
    - Texture information will be displayed after import if available.
2. **Model Operations**
    - Single-click a model in the model list to select it for operations such as **Translate, Rotate, and Scale**.
    - Double-click a model in the list to quickly locate it in the scene and display it in an enlarged view.
3. **Display and Deletion**
    - Models can be shown, hidden, or deleted.

Notes and Limitations

1. **Import Time**: The time required to import a model may vary depending on the file size and the performance of the computer hardware.
2. **File Size Limits**:
    a. The maximum size for a single imported file is **100 MB**.
    b. Multiple files can be imported, but the total combined size must not exceed **1 GB**.
3. **Texture Resolution Limit**: The maximum supported resolution for a single texture file is **2048 × 2048**.
4. **Default Length Unit**: Imported models use **meters** as the default length unit.
5. **Performance Constraints**: Large model assets may impact performance, especially when switching between scenes containing such models.
6. **Supported Texture Formats**: Currently, only **.jpg** and **.png** formats are supported.

5.2.1.4 Export

Export the current project or model into a specified format for use in other software or platforms. File types supported for export:

- **LCC**
- **PLY**
- **Collision Mesh**

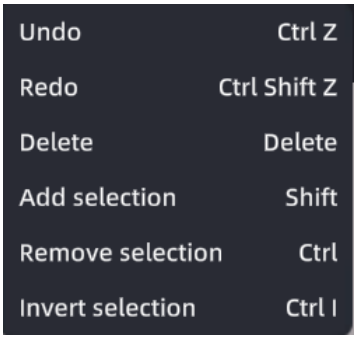
5.2.1.5 Exit

Close the current application.

Note: If you have performed operations such as **clipping** or **color adjustment**, **Save As** a new `.lcc` file to preserve the editing results.

5.2.2 Edit

Edit and select scene content.



Edit Operations

5.2.2.1 Undo

During the editing process, users may make mistakes or wish to repeatedly test and compare different options. To address this, the system provides an **Undo** function, allowing users to roll back the previous action and improve error tolerance and efficiency.

How to Use

- **Undo:** Press `Ctrl + Z` to roll back the most recent action.

Supported Actions for Undo

- Within the Selection Tool:
  - Select Area
  - Add to Selection
  - Subtract from Selection
  - Invert Selection
- Contrast Adjustment
- Saturation Adjustment
- Brightness Adjustment
- Cropping Area

5.2.2.2 Redo

During the undo process, users may make mistakes or wish to repeatedly test and compare different options. To address this, the system provides a **Redo** function, allowing users to restore the previously undone action and improve error tolerance and efficiency.

How to Use

- **Redo:** Press `Ctrl + Shift + Z` to restore the previously undone action.

Supported Actions for Redo

- Within the Selection Tool:
  - Select Area
  - Add to Selection
  - Subtract from Selection
  - Invert Selection
- Contrast Adjustment
- Saturation Adjustment
- Brightness Adjustment
- Cropping Area

Note: The redo operation is only available after an **Undo** has been executed. Once a new operation is performed, the redo stack is cleared immediately.

5.2.2.3 Delete

Delete the selected objects or elements.

The delete function in the Editor is an important tool for cleaning invalid or distracting data from the scene. By using flexible selection methods, users can quickly and precisely select areas or objects to be removed, and then perform cropping operations, thereby improving the clarity and usability of the reconstructed data.

Cropping operations do not directly modify the original data. After completing cropping, users can save the processed results as a new scene to ensure the integrity of the original dataset.

5.2.2.4 Add to Selection

By default, new selections replace previous ones. To add to an existing selection, use **Add to Selection**.

How to use:

- Hold down `Shift`while performing a new selection.
- Objects in the new selection area will be added to the current selection without overwriting it.
- The selection box will appear **green** when adding to a selection.

Origin

Add Selection

Add Selection

Best for:

- Selecting objects from multiple disconnected regions.
- Adding missed items after an initial selection.
- Combining different selection tools to create complex selections.

5.2.2.5 Subtract from Selection

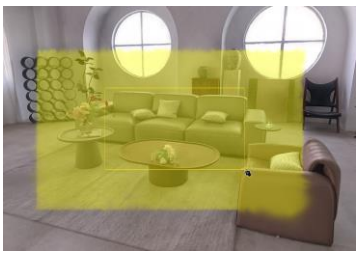
To remove unwanted objects from your current selection, use **Subtract from Selection**.

How to use:

- Hold down`Ctrl`before performing a new selection.
- Objects within the new selection area that were previously selected will be deselected. Unselected objects remain unaffected.
- The selection box will appear **yellow** when subtracting from a selection.

Original Selection

Subtract Selection



Subtract Selection

Best For:

- Refining a broad selection by removing specific areas.
- Working in tandem with adding to selection to create precise, complex selections.
- More flexibly controlling the final cropped area, preventing accidental deletion of desired content.

5.2.2.6 Invert Selection

By default, selection operations target objects within the selection box. However, users often need the opposite—to keep only what's inside the box, or to exclude specific portions while retaining everything else.

LCC Editor supports one-click toggling between "Inside Selection Box" and "Outside Selection Box."

How to use:

- In any selection mode, press `Ctrl + I` to toggle between inside and outside selection.
- The selection will immediately update.

Select Inside

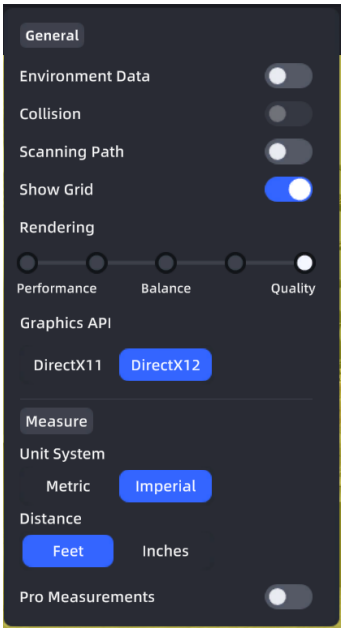
Select Outside

Best for:

- Selecting everything *except* a specific area.
- Quickly excluding large scene portions during cleanup.

5.2.3 Settings

Configure scene options for different editing and analysis needs.



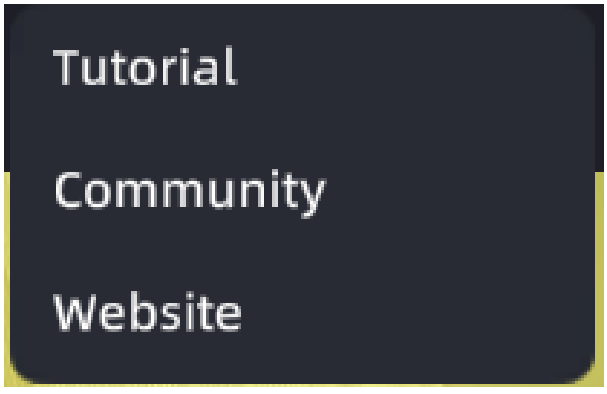
Settings

1. **Environment Data**
    a. Toggle environment data display.
    b. Unaffected by model cropping; available in both Editor and Viewer.
2. **Collision**
    a. Enable/ disable spatial collision. Activated by default in the latest version.
    b. If the collision file is missing, you will receive a prompt when enabling this function.
3. **Scanning Trajectory**
    a. View device trajectory during data capture.
    b. Available in both Editor and Viewer.
4. **Grid Plane**
    a. 2D working plane for precise model control and alignment.
    b. Available in Editor only.

5. **Rendering**
    a. Set rendering mode to Performance Mode (faster) or Quality Mode (higher clarity, requires better hardware).
6. **Graphics API**
    a. Switch API if rendering issues occur (screen corruption, artifacts, flickering).
7. **Measurement Settings**
    a. Configure units (metric/imperial) with real-time updates.
    b. Enable professional mode to display dx/dy/dz axis offsets with more precise measurement operations.

5.2.4 Help

Access support resources, official website, and community.



Help Operations

5.2.4.1 Tutorials

Access the official user manual and data capture guide.

5.2.4.2 Community

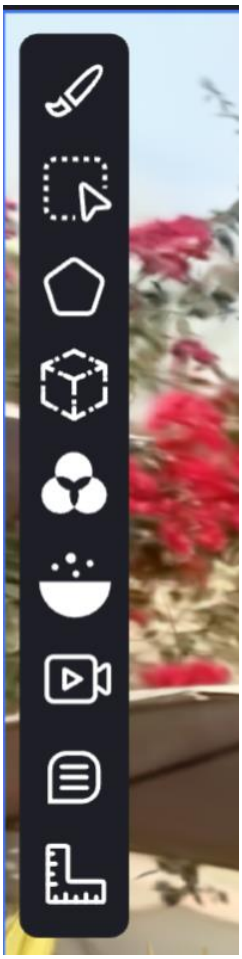
Platform for user exchange and feedback.

5.2.4.3 Official Website

XGRIDS.com - official website for the latest software versions and updates.

5.3 Toolbar

Main editing functions for quick access to common operations.



Toolbar Operation

5.3.1 Selector

The Selector upgrade enables flexible operations on selected areas.

Quick Reference:

- Rectangle ：Fast rough selections via 2D projection
- Polygon : Custom shapes for irregular boundaries

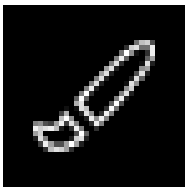
- Brush : Paint precise areas with mouse drag
- Clipping Box : True 3D selection independent of camera angle

Universal Controls:

- `Shift`: Add to selection (green highlight)
- `Ctrl`: Subtract from selection (yellow highlight)
- `Ctrl+I`: Invert selection
- `Alt`: Temporarily unlock camera view
- `Esc`: Cancel current selection
- `Ctrl+Shift+D`: Clear all selections

5.3.1.1 Brush Selection

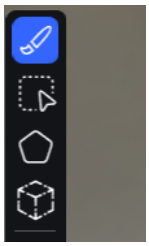
Brush selection offers precise control for complex or localized areas. You drag the mouse to "paint" a selection region, which the system then projects into 3D from your current camera view. All objects within this projected volume are selected.



Brush Selection

How to use:

1. Click the **brush icon**
2. **Hold the left mouse button** and drag to paint your selection area. The brush stroke will be shown in real-time.



Brush Selection

Brush Selection

After Selection

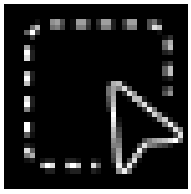
Best for:

- **Complex or irregular local selections:** Ideal for selecting areas with intricate or non-standard shapes, avoiding the excess selection that might occur with rectangle or polygon tools.
- **Detailed adjustments and fine-tuning:** Perfect for making precise additions or

subtractions to an existing selection, allowing you to "paint" corrections onto specific areas.

5.3.1.2 Rectangle Selection

Rectangle selection projects a 2D rectangle from your current camera view into a 3D selection volume. Simply drag to define the area, and all objects within that projected volume are selected.



Rectangle Selection

How to use:

1. Click rectangle icon
2. Hold left mouse, drag rectangle in view.
3. Release to complete selection.

Rectangle selection

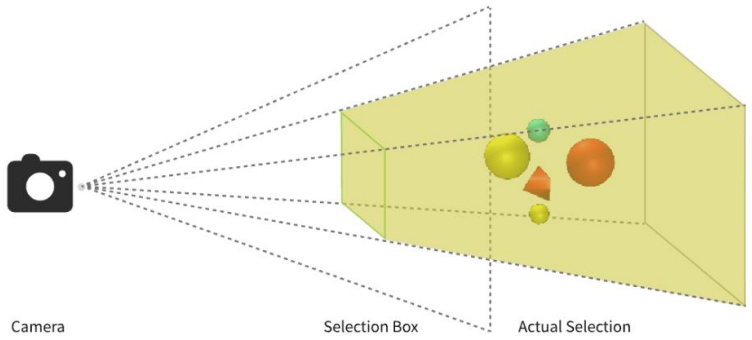
Best For:

- **Quick rough selections:** A great first step before refining with other tools.
- **Cleaning blurry edges:** Easily crop out messy, sparse areas by adjusting your view and boxing them off.

How it Works: Camera Projection

Imagine a **flashlight shining from your camera** through the rectangle you draw on

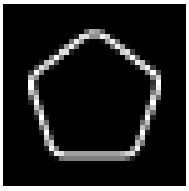
your screen. Everything illuminated by that light beam in 3D space gets selected.



Principle of Camera Projection

5.3.1.3 Polygon Selection

Purpose: High flexibility for irregular or complex boundary regions. Click points to draw any custom closed shape on your screen, and the system projects it into 3D from your camera's view. All objects within that projected volume are selected.



Polygon Selection

How to use:

1. Click polygon icon
2. **Left-click** to place each point of your polygon.
3. **Click the first point again** to close the shape, or **double-click** if you have at least two points.
4. Close to complete selection.

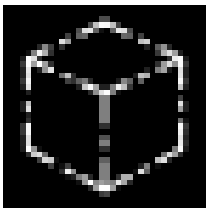
Polygon Selection

Polygon vs. Rectangle Selection

Scenario	Recommended	Description
Quick selection of regular areas	Rectangle Selection	Simple, efficient, smooth operation
Precise selection of complex irregular areas	Polygon Selection	Accurate, flexible, avoids misselection
New users or quick tasks	Rectangle Selection	Easy to learn
High precision or edge control needed	Polygon Selection	Custom-defined detailed selections

5.3.1.4 Clipping Box

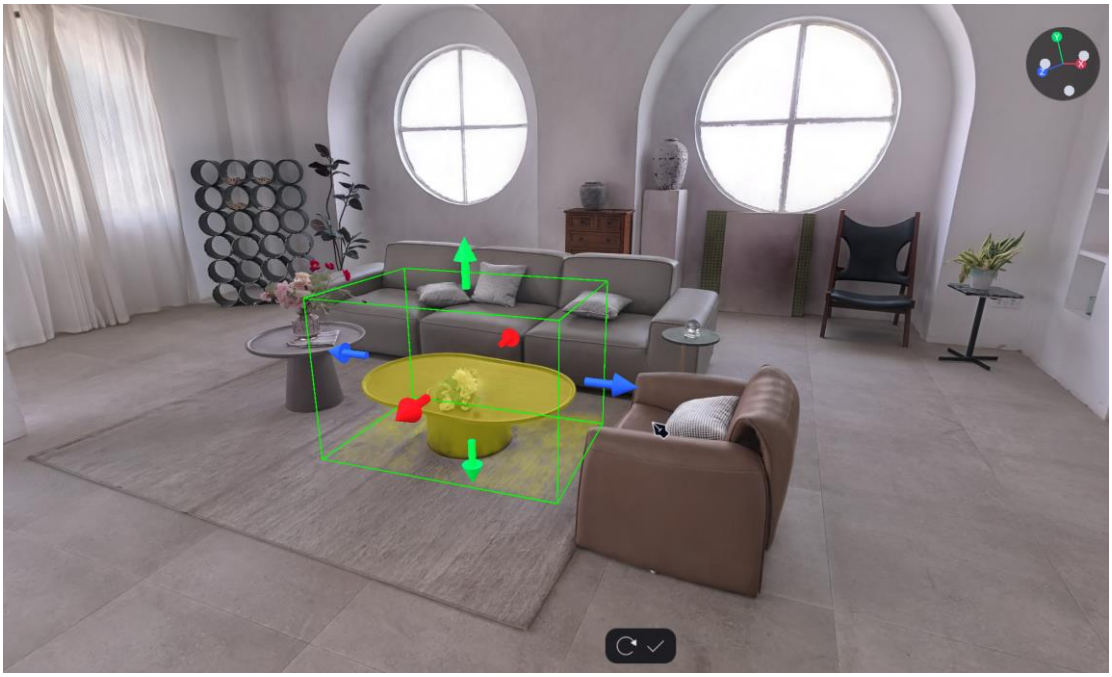
Purpose: The only 3D selection method for defining a precise region in the model regardless of the current camera angle.



Clipping Box

How to use:

1. Click the cube icon
2. Click three times: first corner → opposite corner (forms rectangle base) → height (Z-axis)
3. Transparent cube appears showing selection range

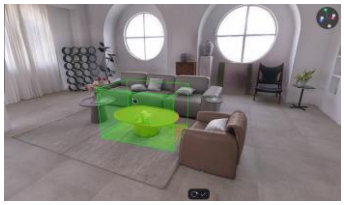


Clipping Box

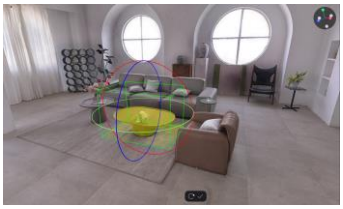
Editing:

Use 3D tools to edit the clipping box:

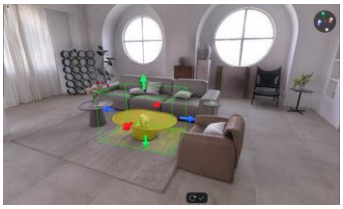
- **Translate (Move):** Drag the cube to reposition it in 3D space.
- **Rotate:** Spin the cube around any of its axes.
- **Scale (Stretch):** Elongate or compress the cube along any of its axes.
- **Reset:** Discard the current clipping box and recreate it from its initial state.
- **Confirm:** Apply the current selection range defined by this cube.



Translate



Rotate



Scale

Best for:

- **Cleaning Scans:** Easily remove unwanted items on floors (e.g., debris) or ceilings (e.g., mis-scanned pipes) by precisely positioning the box.
- **Targeted Cropping:** Quickly isolate specific areas, like a single room or shelf, by encompassing it with the box and then inverting the selection.
- **Layered Structures:** Efficiently select entire structures with distinct levels, such as multi-tier shelving or stairwells, without affecting adjacent layers.
- **Precise Selections:** Offers highly predictable and consistent boundary control, making it perfect for industrial applications demanding exact edges, angles, and dimensions.

5.3.1.5 Tips

1. View Control Tips

When using rectangle, polygon, or paintbrush selection, the view is automatically locked to prevent accidental camera movement that could affect selection accuracy. However, you can temporarily unlock it for better inspection.

View Lock

The camera automatically locks in these selection modes:

- Rectangle selection
- Polygon selection
- Paintbrush selection

While locked, mouse dragging (left/right click) and WASD keys will not move the

camera, preventing accidental view changes during selection.

Temporary Unlock

To temporarily unlock the camera for viewing or adjustment:

- **Hold down `Alt`**
  - `Alt + Left-click drag`: Rotate camera.
  - `Alt + Right-click drag`: Pan view.
  - `Alt + Scroll wheel`: Zoom view.
  - `Alt + W/A/S/D`: Move view forward/backward/left/right.

Release`Alt` to automatically re-lock the view and resume your selection.

2. Cancel Selection

If you're in the middle of drawing a selection (e.g., a polygon not yet closed, or still dragging the paintbrush) and want to stop without affecting existing selections:

How to use:

- **Press `Esc`.**
- **Right-click** the mouse.

3. Clear All Selections

To quickly deselect everything and start fresh:

How to use:

- **Press `Ctrl + Shift + D`**

4. Shortcut Overview

Function	Shortcut	Description
Crop Selection	`Delete`/`Backspace`	Delete currently selected objects
Add to selection	`Shift`	Hold while selecting to **add to existing selection**
Subtract from selection	`Ctrl`	Hold while selecting to **remove from existing selection**
Invert selection	`Ctrl+I`	Toggle selecting inside vs. outside the box

Function	Shortcut	Description
Cancel selection	`Esc`/ Righ-click	Cancel current drawing (doesn't clear existing selection)
Clear all selections	`Ctrl+Shift+D`	Clear all selected objects
Undo	`Ctrl+Z`	Revert last action
Redo	`Ctrl+shift+Z`	Restore an undone action
Unlock view temporarily	`Alt`(hold)	Temporarily unlock camera for navigation
Exit cropping mode	`Esc`	Exit cropping mode (history is cleared)

5.3.2 Color Grading

Adjust brightness, contrast, and saturation with real-time preview. Settings save automatically and sync across platforms (Web Viewer, Viewer).

Color Grading

How to Use

1. Click **Color Grading** in the toolbar.
2. Drag sliders to adjust **brightness**, **contrast**, and **saturation**.
3. Changes display in real time and save automatically. Changes are visible across plaforms.
4. Parameter description and reference examples:

Original

Brightness=1

Brightness=-1

Contrast=1

Contrast=-1

Saturation=1

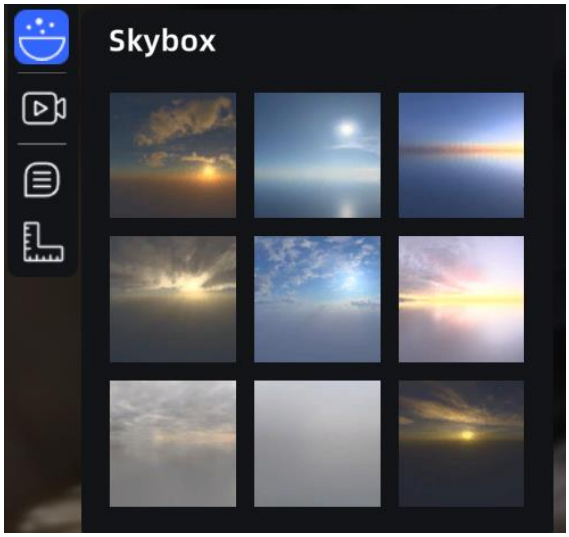
Saturation=-1

5. **Tips**

- Moderate adjustment: excessive brightness or contrast may cause loss of detail.
- Stylized processing: high saturation may work for certain artistic styles, but not all scenes.
- Environmental interaction: grading effects are influenced by scene lighting, skyboxes, and other environmental settings.

5.3.3 Skybox

The **Skybox** enables users to quickly change the background of scenes with preset templates to simulate different times of day and weather conditions, all with matching colors tones and lighting.



Preset Skybox

How to Use

1. Click the **Skybox** button in the toolbar to open the Skybox settings panel.
2. The panel provides multiple preset templates that can be previewed and applied directly.

Note: Skybox cannot be used simultaneously with environmental data. Only one mode can be previewed at a time.

5.3.4 Recording

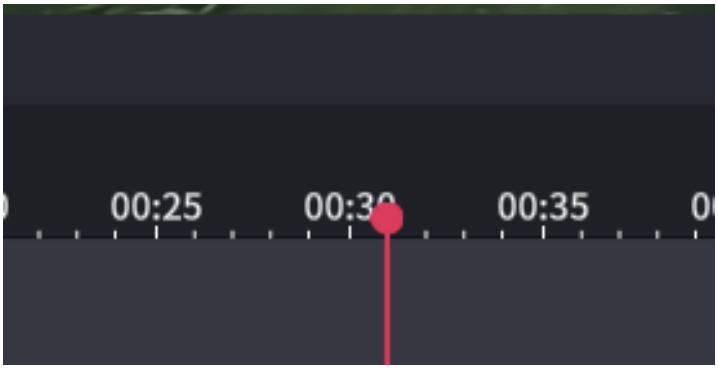
Perform camera flythroughs within a scene and export the process as a video file.

Recording Mode

How to Use

Upon entering camera recording mode, a timeline panel will appear at the bottom of the software. Users can record in **First-Person** mode.

1. **Timeline**: Used to jump to different frames, operate keyframes, and control video animation playback.
2. **Playhead**: The red vertical line shows the current time point and can be dragged along the timeline to quickly locate the view of a selected keyframe.



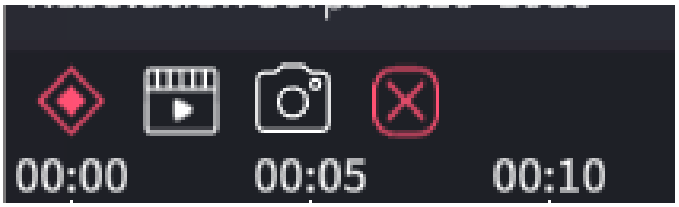
Current Frame

1. **Time Range**: Determines the length of the recorded video. By default, it is set from 0 seconds to 1 minute 55 seconds. You can adjust this setting using the start time/end time inputs in the timeline.

2. **Output Parameters**: The default output video parameters are set to 1 second/30 frames with a resolution of 1920x1080.

3. **Playback Controls**: These buttons control the playback and display the current playback progress.

4. **Operations**:



Sequence Toolbar

   a. **Add Keyframe**: Record current camera position/viewpoint on timeline

   b. **Video Output**: Confirm animation range, choose output path, saves as .MP4

   c. **Screenshot:** Capture current viewpoint as image anytime

   d. **Delete Keyframe**: Remove selected keyframe

Limitations:

   a. Time range limited to set bounds (no playback/rendering outside)

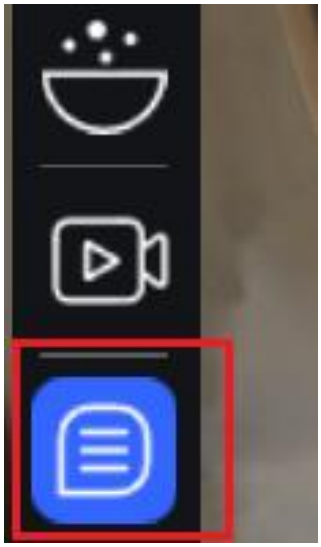
   b. Follow current frame auto-pans when playhead moves out of visible area

   c. Fixed .MP4 output format at 1920×1080 resolution

   d. Auto-save operations in real-time within project file

5.3.5 Notes

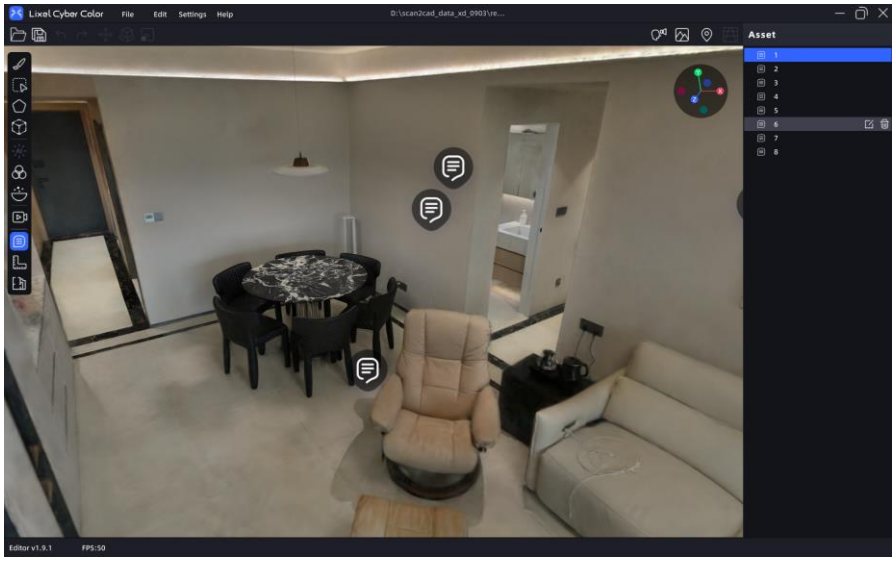
Add rich annotation content including photos, videos, hyperlinks, images, and text.



Note Tools

5.3.5.1 Workflow

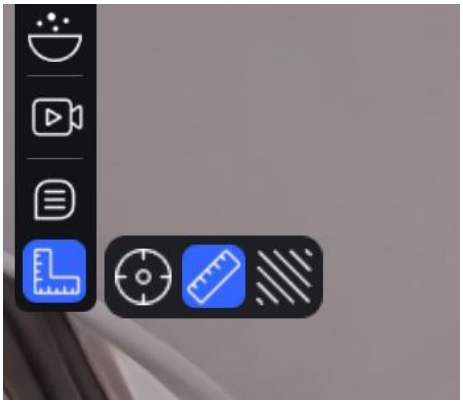
1. **Add Note Point**
    a. Users can place a note point at any position within the model.
2. **Upload Note Content**
    a. Select the content or hyperlink to be uploaded.
3. **Edit Note Content**
    a. Click on a note in the asset list or directly in the scene to edit its content.
4. **Data Management**
    a. **List (Scene) Display**: Notes are displayed in real time in the right-hand list panel or within the scene.
    b. **Delete**: Users can remove notes that are no longer needed from the list.



Note List

5.3.6 Measurement

Obtain coordinate, distance, or area data within the scene with real-time calculations, and unit switching. View professional measurement details for precise analyses.



Measurement

5.3.6.1 Workflow

1. **Activate measurement mode**

- Click the "Measurement" button on the interface to access three types of measurements.

2. **Select measurement type**

- Select "Distance Measurement", "Area Measurement", or "Coordinate Measurement" as needed.

3. **Coordinate Measurement:**

- Click "Coordinates" button (magnifying glass icon appears)
- Select measurement point in scene
- System displays absolute coordinates (accurate to 6 decimal places)

4. **Distance Measurement:**

- Click "Measure" (magnifying glass icon appears)
- Place first measurement point
- Place second measurement point
- System calculates and displays distance in meters

5. **Area Measurement:**

- Click "Measure" (magnifying glass icon appears)
- Place first measurement point
- Define area with additional points (minimum three on same plane)
- Click finish after placing all points

- System calculates and displays enclosed area in square meters

6. **Measurement Data Management:**

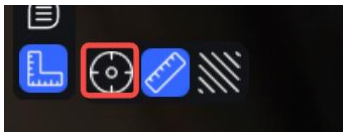
- Save: The data measured during scene editing will be saved in real-time in the lcc file.
- Delete: Remove temporary measurement data from the viewer, but saved data cannot be deleted.

7. **Measurement Unit Settings:**

- Switch between metric/imperial with real-time updates (default: metric)

8. **Pro Measurements:**

- Enable coordinate offsets (dx, dy, dz) between points for horizontal/vertical verification



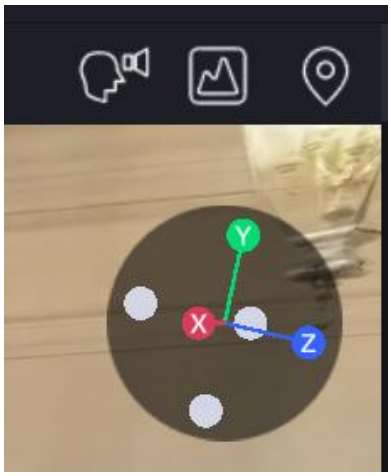
Coordinate Measure

Distance Measure

Area Measure

5.4 View Control

The View Control panel allows users to flexibly adjust how the scene is displayed and observed in the Editor, making it easier to meet different browsing needs and work scenarios.



View Control Area

5.4.1 Mode Switching

Click the **Mode Switch** button to freely switch between **Flythrough Mode**, **Pivot Mode**, and **Avatar Mode**.

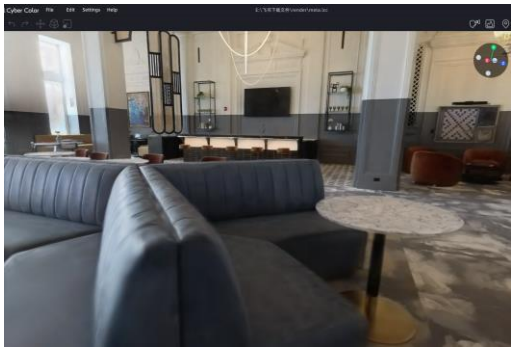
5.4.2 View Switching

In an LCC scene, users can switch the model view to **Point Cloud View** for a more intuitive inspection of scene structure, data density, or scanning accuracy.

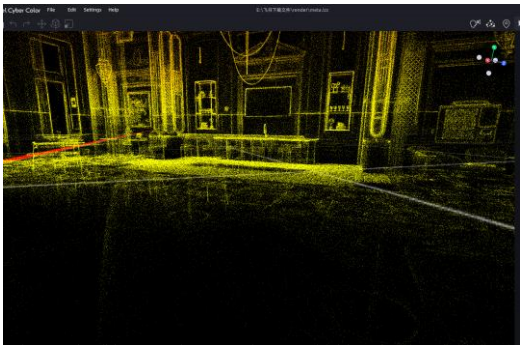
a. Point Cloud View displays the model as a dense point cloud without surface textures.

b. Best suited for data inspection, accuracy comparison, or when only structural information is required.

c. After switching, users can still navigate freely in Flythrough Mode, Pivot Mode, or Avatar Mode.



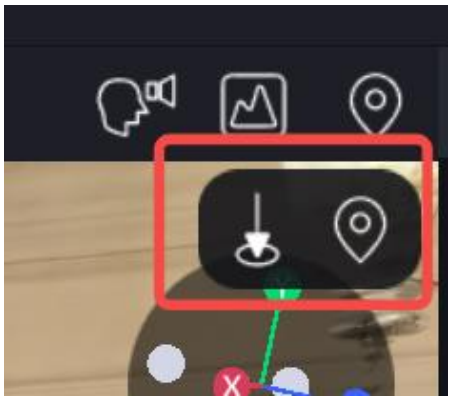
Model View



Point Cloud View

5.4.3 Origin Point

In **First-Person Mode**, users can reset the origin point. Under the **origin Point** function, users can either **Return to origin Point** or **Reset origin Point**.



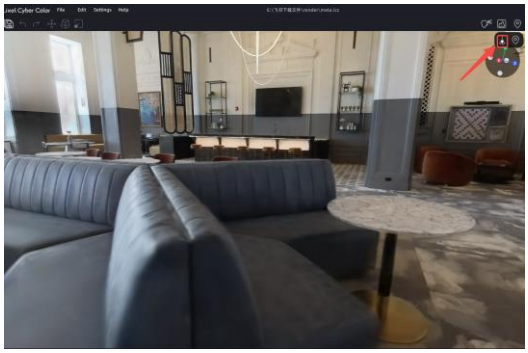
Origin Point

5.4.3.1 Workflow

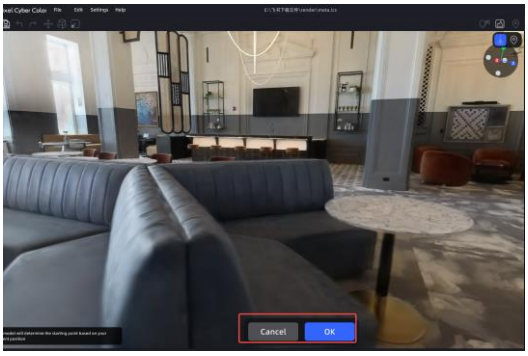
1. **Reset Origin Point**

   a. In First-Person View, users can fly through the scene and set the origin point based on the current position.

b. Once confirmed, the origin point will be reset to the current viewpoint.



Reset Origin Point

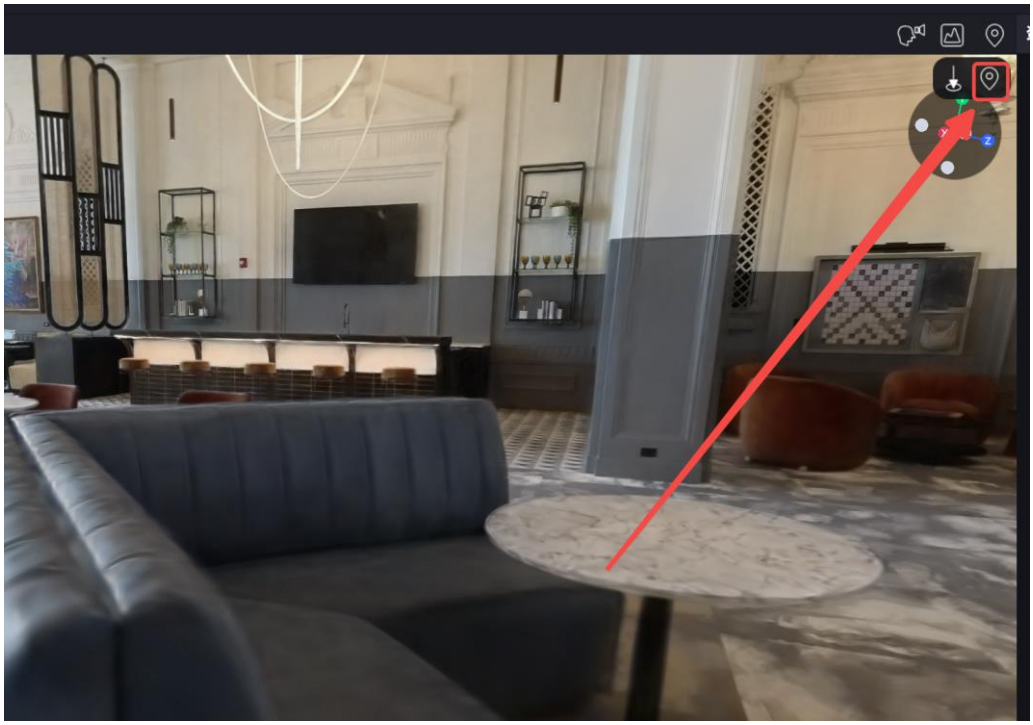


Confirmation

2. **Return to Origin Point**

a. After a origin point has been set, clicking **Return to Origin Point** will automatically move the view back to that location.

b. If no custom origin point has been set, the view will return to the scene's default origin point.

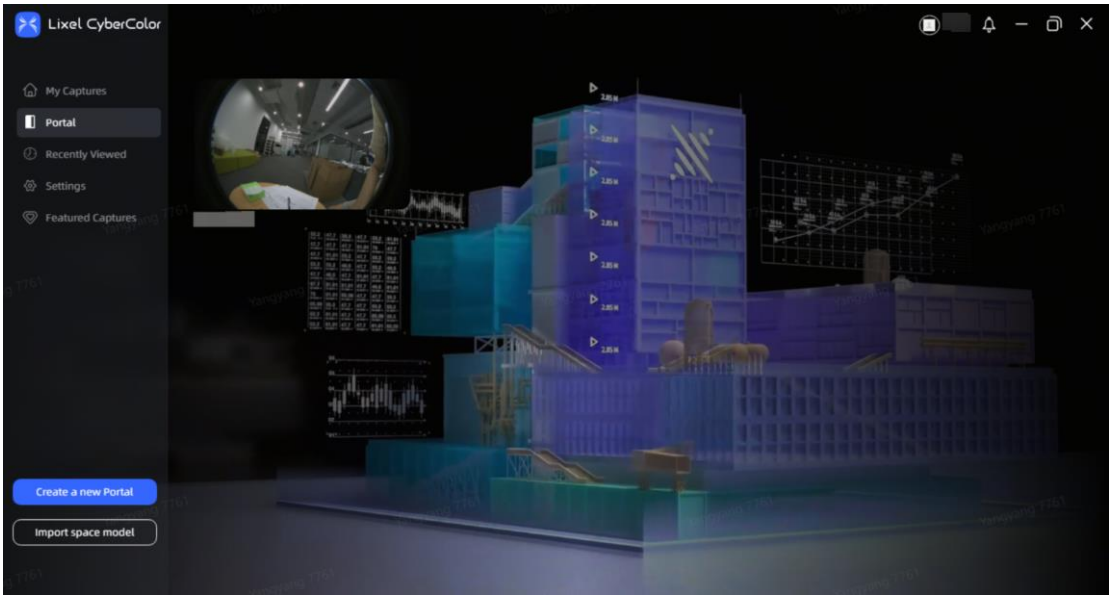


Return

6. Portal

Create multi-scene transitions for LCC models via "Create a new Portal" in the Portal list.

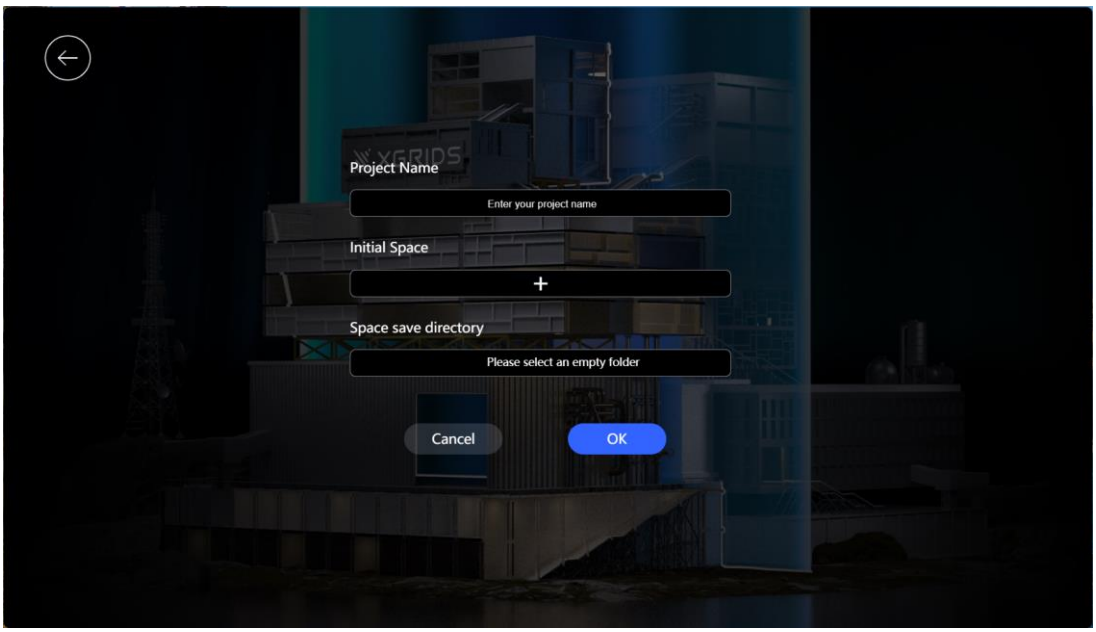
Limit: Maximum 10 LCC scene models per portal project.



LCC Studio

6.1 Create a Portal Project

1. Click "Create a new Portal"
2. **Project Name**: Enter project name
3. **Initial Space**: Configure initial model
4. **Project Directory**: Select storage location for portal files



Create

6.2 Upload Initial Scene

1. In the **Upload Data** dialog, select and upload the **initial LCC scene**.

- Refers to the first fixed main scene, which serves as the starting point for subsequent scene transitions.

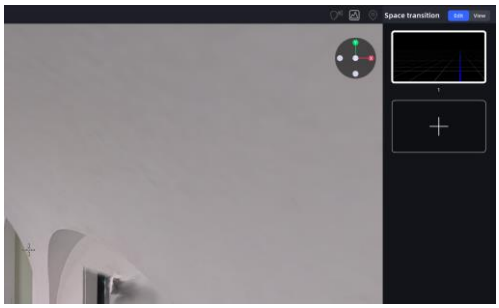
2. The system will automatically generate a **thumbnail** for preview.
3. Click **Confirm** to begin configuring multi-scene spaces within the **Editor**.

Note:

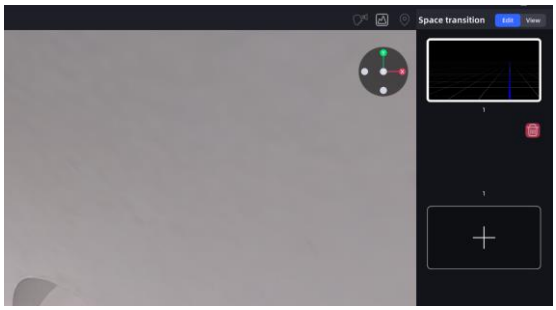
- The first uploaded scene will be set as the **default starting point**.
- Thumbnails for the initial space and any new spaces will prioritize images from the user's folder.
- The system will automatically capture a scene snapshot.
- Blank thumbnail displays if snapshot generation fails.

6.3 Add New Scene

1. **Jump** function activates automatically upon scene entry.
2. The **Scene List** panel will appear at the bottom.
    - Click **Add Space** → **Upload New Space File**.
    - Enter the name of the space and select the corresponding file.
    - Click **Confirm** to add the new space.
3. Now you can view and manage all available jump spaces.
4. Click **Delete** to remove spaces.
    - Deleting a space will also terminate all associated jump connections.



Add Space

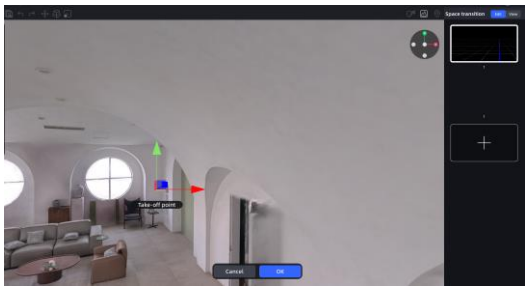


Delete Scene

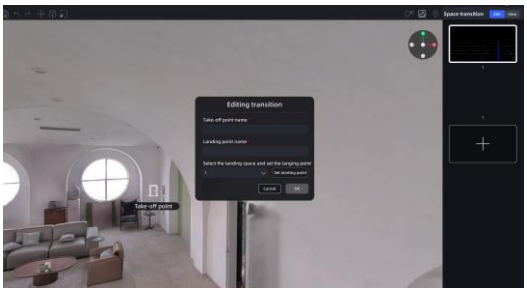
6.4 Configure Jump Points and Landing Points

1. In the initial scene, create a **Jump Point**.
    - Jump Points support **Move** and **Delete** operations.
2. Select the target **Landing Space** from the Scene List.

- Set the **Landing Point** within that space.



Take-off Point

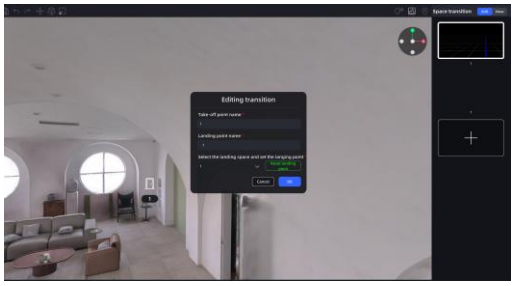


Take-off Point Setting

3. Clicking **Set Landing Point** will immediately switch to the selected landing space.

- After setting the landing position, the system will automatically return to the original space and prompt for a second confirmation in the jump editor.

Landing Point

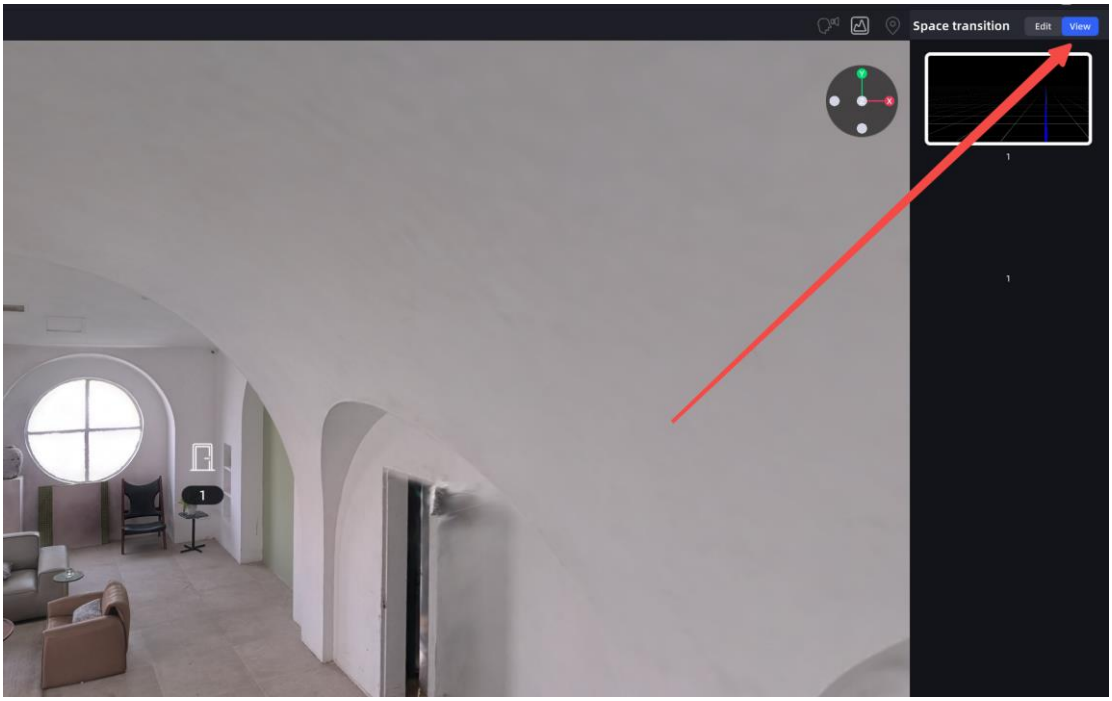


Double Confirmation

Note: Clicking **Reset Landing Point** will re-enter the landing space, allowing the user to redefine the landing position.

6.5 Preview Jump Effects

1. After configuring all jump connections, users can preview the results by selecting **View** from the top menu bar.



Preview

6.6 Notes on Jump Functionality

1. If an error occurs when creating a jump project, follow the error message to identify the issue.
    - This typically indicates that the uploaded file does not meet the requirements (e.g., incorrect format, oversized file, or invalid content). Verify and re-upload.
2. Jump configuration results create a sequence of spaces and jump relations. Currently, **Publishing** is not supported.
3. Only one jump channel is supported between any two spaces.
4. Jump configurations are recorded in real time within the project directory.
    - In the format `transition.lct`
5. In Viewer mode, the jump preview behaves the same as in editing mode.
    - The **Scene List** is activated by default, and clicking the **Jump Function** button will hide the list.