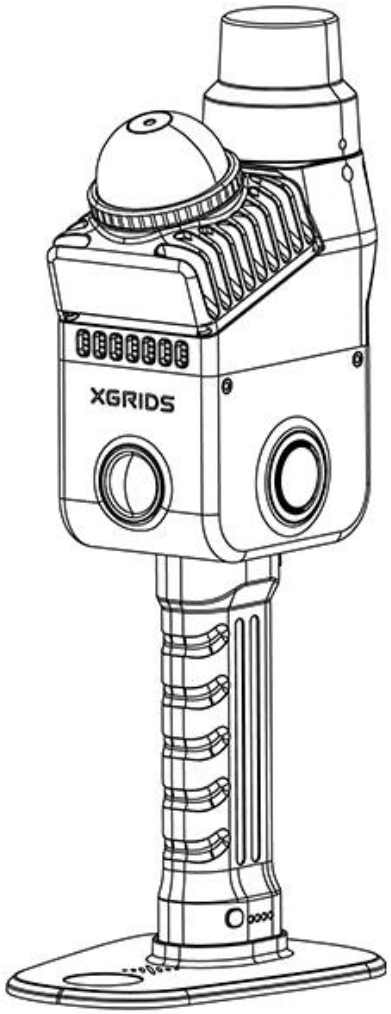
Lixel K2 Capture Guide

Version	Changes	Date
1.0	1.Initial release	5/6/2026



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1.Startup

1.1Preparation

(1) **Sensor check.** Inspect the LiDAR head and camera lenses for dirt or fogging. Clean with a lens cloth if needed. Fogging is common when moving between hot and cold environments — check carefully in those conditions. Never cover or block the sensors during a scan; this causes reconstruction failures or distorted output.

(2) **Battery check.** Press the power button briefly. The status LEDs indicate remaining charge:

LEDs	Battery
None	0-9%
1 bar	10-25%
2 bar	26-50%
3 bar	51-75%
4 bar	76-100%

(3) **Connect LixelGO.** Download and install LixelGO and grant the requested system permissions. When connecting to your K2, confirm the device serial number and connect via **Quick Connect mode**. Use LixelGO during capture for the full scanning experience.

1.2 Initialization

(1) Press and hold the device power button located under the TYPE-C port on the device.
(2) Wait for the device to switch from a flashing blue light to a solid green light.
(3) Place the K2 flat on the ground and keep it still. You can steady it gently with your hand.
(4) Point it away from crowds, traffic, and other high-motion areas.

(5) Tap **Start** in LixelGO, or double-click the device button.
(6) When point cloud appears in the app, leave the device static for at least 10 more seconds.
(7) Wait for the **Initialization successful** prompt.

Do not move the K2 during initialization. Moving early causes a tilted reconstruction or a complete failure.

Where to initialize: Choose feature-rich locations such as a furnished room or an outdoor area with trees and buildings. Avoid open fields, large glass facades, and busy environments with heavy foot or vehicle traffic.

1.3 Picking up the device

(1) Lift the K2 slowly and smoothly.

(2) Avoid sudden movements.

(3) Begin walking your scan route once the device is in your hand.

2. During the scan

2.1 Avoid these movements

The following will degrade point cloud quality and may cause data layering or drift:

Movement	Effect
Sharp, fast body turns	Data confusion and layering
Sudden starts and stops	Loss of positional accuracy
Whipping or shaking the device	Data confusion and layering

Walking faster than 1 m/s	Sparse point cloud
Pushing the K2 quickly into a tight enclosed space (<0.5 m, e.g. small rooms, cabinets, closets)	LiDAR degradation; whole-dataset drift

2.2 Operate this way

(1) Keep your movement slow and steady.

(2) Walking pace: **≤ 1.0 m/s** (a slow walk).

(3) HD mode: **≤ 0.5 m/s.**

(4) Maintain a distance of **≥ 0.5m** from the object being collected.

3. Scene-specific techniques

3.1 Text, signage, and textured walls

(1) For door numbers, signs, posters, wall art, and similar details:

1) Point the front camera at the target.
2) Sweep in a **U-shaped path**, moving up and down across the surface.
3) Hold the device **0.5–1 m** from the target.
4) Walking pace ≤ 1.0 m/s (HD mode ≤ 0.5 m/s).



3.2 Ground features

(1) For ground markings, road lines, manhole covers, and similar features:

1) Tilt the device down at less than 15°.

2) Use HD mode.

3) Move slowly.



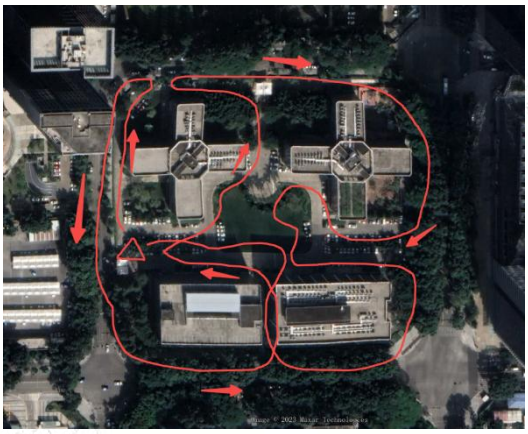
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3.3 Outdoor scenes

(1) **Applies to parks, campuses, streets, building clusters, and roads.**

(2) **Route planning.** A well-planned route significantly improves point cloud quality. Looped routes let the system re-observe areas it has already scanned, accumulating overlapping features that suppress drift and improve accuracy.

1) Recommended: Loop or serpentine routes



2) Avoid: One-way straight lines



Handling traffic and crowds:

1) Don't aim the LiDAR directly at people or vehicles.

2) If one side of the route is busy, rotate the LiDAR toward the quieter side.

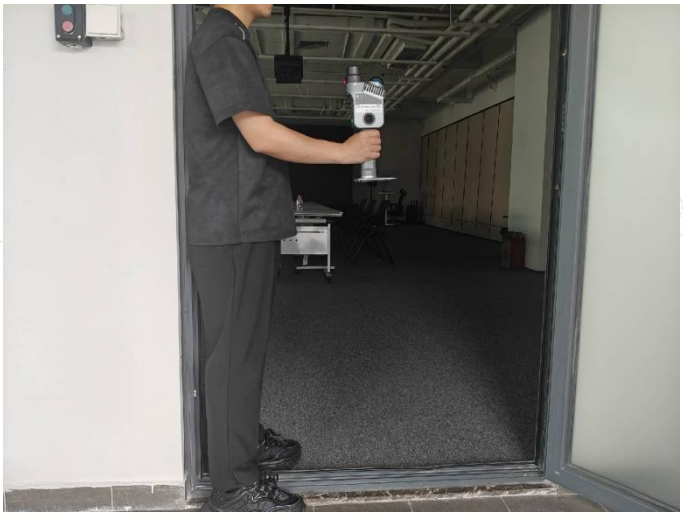
3) Keep moving objects out of the field of view as much as you can.

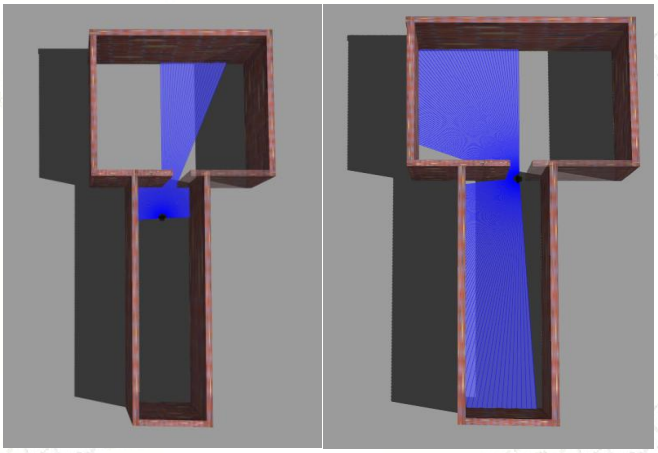
3.4 Indoor multi-room scans

(1) Before you start

Open every door you plan to scan through.

1) **Technique 1: Pass through doorways sideways**





Walking face-first through a doorway breaks the shared field of view between the rooms on either side, leading to misaligned point clouds.

a. Stand sideways at the doorway.

b. Pause briefly so both rooms are captured at the same time.

c. Walk through slowly.

If you reach a closed door:

a. Turn slowly before reaching the door.

b. Position the K2 with its back to the door.

c. Open the door behind you.

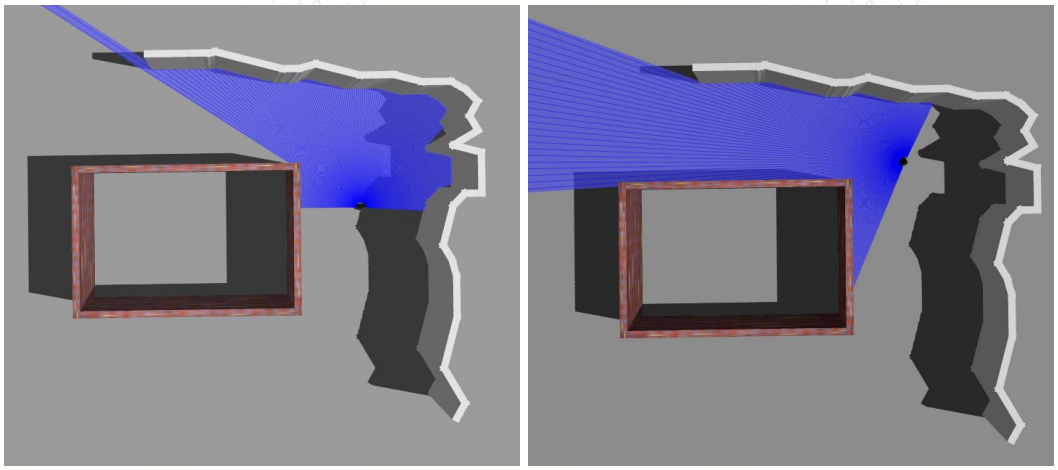
d. Walk through backward.

2) **Technique 2: Corners — angle into the turn**

A sharp 90° turn loses reference features at the corner. Instead:

a. Angle your body slightly into the turn.

b. Make sure the LiDAR captures both walls of the corner at the same time.



3) **Technique 3: Tight spaces — enter and exit backward**

A. **Entering:**

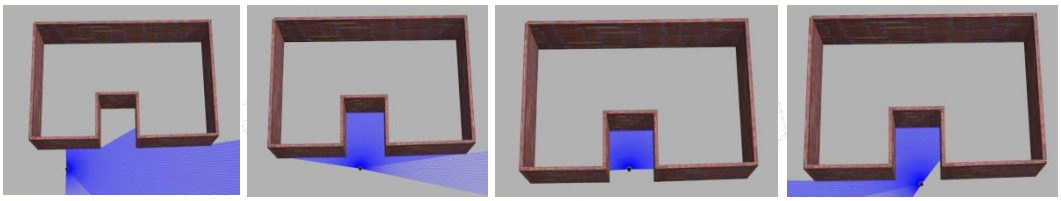
a. Step in backward or sideways, slowly.

b. Before you enter, hold the K2 so it captures the space first — let the device pick up features from the entrance.

B. **Exiting:**

a. Don't turn around inside. Step out backward or sideways.

b. Keep the device aimed at structurally distinct features.



4) **Technique 4: Ceiling and floor fill-in**

Use this when ceiling or floor coverage is sparse in tight areas.

a. Finish your main scan first.
b. Hold the device still.
c. Tilt slowly to 30–60° toward the ceiling or floor.
d. Hold each tilt for no more than 30 seconds.

4. Using LixelGO to assist your scan

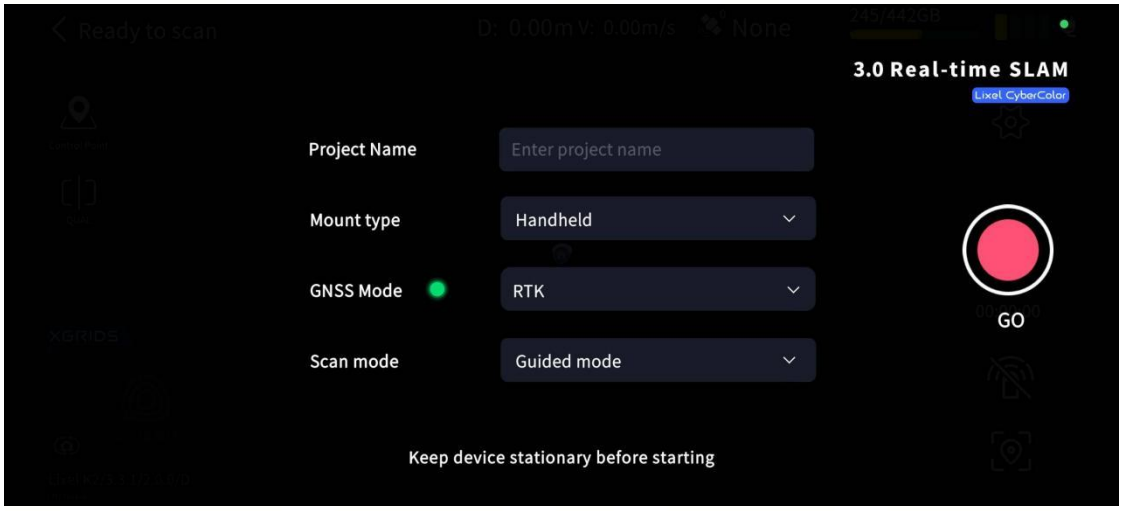
4.1 Real-time coverage check

LixelGO's scan assist system shows live point cloud density as you walk.

(1) Setup:

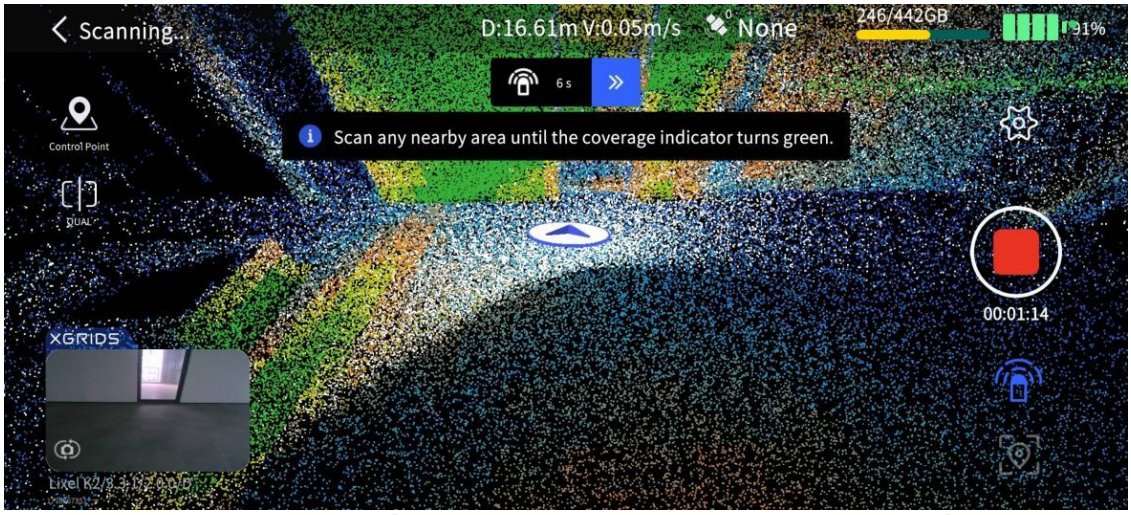
1) Select **Guided mode.**

2) Set render mode to **QUAL.**



3) Watch the coverage indicator on the map:

- **Green:** Density is sufficient
- **Not green:** Sparse coverage — keep scanning this area



(2) What we recommend:

Make a habit of checking LixelGO while you scan. Confirm that every target area has turned green before moving on. This is the simplest way to avoid returning to site for a re-scan.

4.2 Stopping the scan

How you stop affects final data quality. Always close the loop:

1) Walk back to your starting point.
2) Stand still at the starting point for 10 seconds, holding the device steady.
3) Stop the scan in LixelGO.

Why this matters. Returning to the starting point lets the system run a final real-time loop closure, locking in additional overlapping feature constraints. The result is reduced layering and noticeably better overall accuracy. Do this on every capture.

5. Control point mode

(1) Placing control points

1) Place the device gently — avoid impact or vibration when it touches the ground.

2) Lift it back up slowly and smoothly.
3) Wait for the **Control point added** confirmation in LixelGO before lifting.
4) Walk a full loop or two around the control point, or stand near it briefly, to capture more complete surrounding coverage.
5) After placing the **last** control point, wait at least **15 seconds** before stopping the recording.

(2) Control point layout

Requirement	Specification
Spacing between adjacent points	**< 50 m**
Distribution	Even across the scan area — no clustering or gaps
Pattern	Triangular or polygonal — never on a single straight line

6. RTK mode

RTK mode requires an outdoor differential signal. It will not work indoors.

(1) Field requirements

Parameter	Specification
Device tilt during normal handhold	**≤ 15°**

Scan area span	**≥ 10 m**
Valid RTK data points	**> 20**
Continuous unfixed distance (for post-processing accuracy)	**< 50 m**
Route for accuracy verification	≥ 100 m, non-linear

(2) Minimum to enable coordinate conversion

The K2 can convert to absolute coordinates (with reduced accuracy) when both of the following are met:

1) Scan area ≥ 10 m
2) Valid RTK points > 20 (verify in LixelStudio)

Below either threshold, conversion will fail.

7. Pre-scan checklist

(1) Before scanning

1) Device placed steady; LiDAR unobstructed
2) **Initialization successful** prompt received
3) All doors opened (multi-room indoor scans)

(2) While scanning

1) No sharp turns, sudden stops, or whipping movements
2) Walking pace ≤ 1.0 m/s
3) Loop or serpentine route outdoors

4) Sideways doorway technique and angled corner technique indoors

5) LixelGO coverage indicator monitored — key areas confirmed green

(3) After scanning

1) Returned to starting point

2) Held still for 10 seconds

3) Recording stopped in LixelGO

8. Troubleshooting

(1) Issue 1: Layered point cloud

1) **Likely causes:**

- Fast turns or shaking during the scan
- Route did not loop back
- Did not return to the starting point and hold for 10 seconds before stopping

2) **Fix:** Follow the operating procedure carefully. Always return to start and hold for 10 seconds before stopping the recording.

(2) Issue 2: Indoor and outdoor point clouds don't align

1) **Likely causes:**

- Walked face-first through a doorway
- Skipped the angled corner technique on turns

2) **Fix:** Re-scan the affected segments using the sideways doorway and angled corner techniques described in §3.4.

(3) Issue 3: Sparse areas in some regions

1) **Likely causes:**

- Walking faster than 1.0 m/s
- Did not check LixelGO coverage; missed areas
- Too far from the scan target (recommended distance: 0.5–1 m)

2) **Fix:** Slow your pace, monitor LixelGO actively, and rescan sparse areas.

(4) Issue 4: RTK accuracy below expectation

1) **Check each item:**

- Scan area ≥ 10 m
- Valid RTK data points > 20
- Continuous unfixed distance < 50 m
- Verification route ≥ 100 m and non-linear

2) **Fix:** If any requirement is unmet, recapture under conditions that meet all RTK requirements.

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