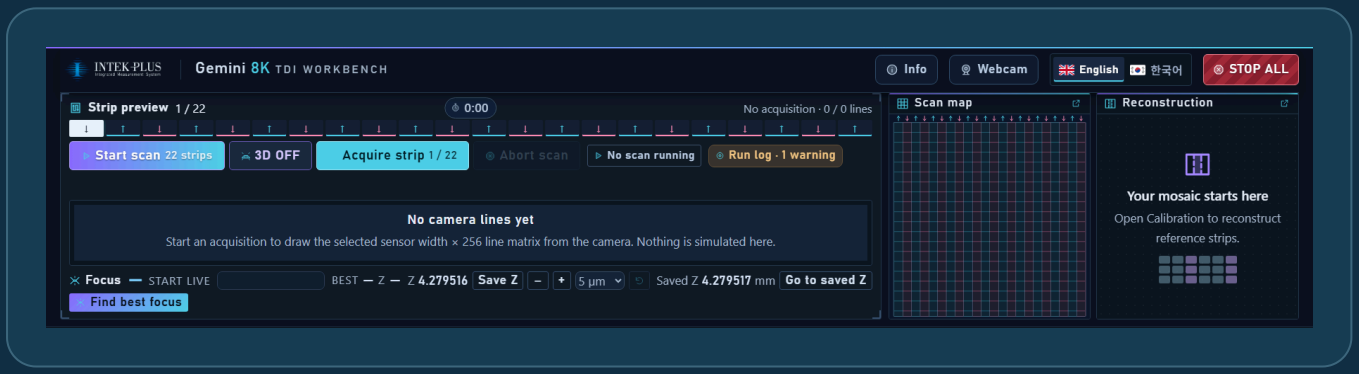
THE SOFTWARE, SCREEN BY SCREEN

TDI Workbench Operator manual

Find the button.
Perform the task.
Check the result.



English edition · 13 OCT 2026
GUI f018225 · 37 screen and workflow chapters
206 control entries · linked button index

CONTENTS

Where do you want to go?

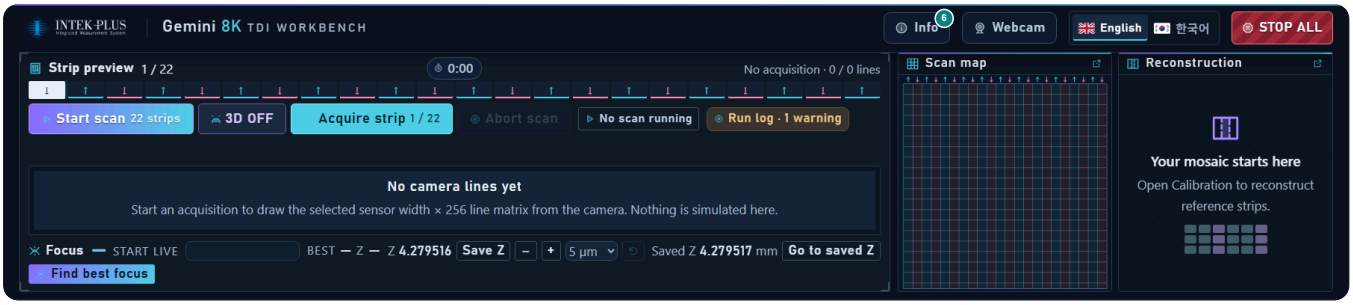
Click a chapter. Each chapter gives its exact GUI location, controls, actions and expected results. The button index is at the end.

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01 / SCREEN & TASK

The main window

> Open TDI Workbench



Actual GUI capture. Numbered markers match controls below; some controls require scrolling or another state.

1 Strip preview

Shows the live or acquired strip. Open its viewer to inspect pixels or use Tools. The small preview uses width fitting.

2 Scan map

Shows strip positions and scan coverage. Its enlarge button opens the map in a separate window.

3 Reconstruction

Shows the combined strips. Click the picture or enlarge icon to open the stitched-image viewer.

4 Camera / Stage / Illumination

The illustrated cards are controls: click camera parts, stage jog arrows, or a light head. Detailed settings are in the five tabs on the right.

5 English / 한국어

Changes interface language. This guide retains English control names beside Korean names so either interface can be followed.

6 Info / Webcam

Info opens the in-app help. Webcam opens a separate camera-view window; Connect webcam asks the browser for access.

DO THIS

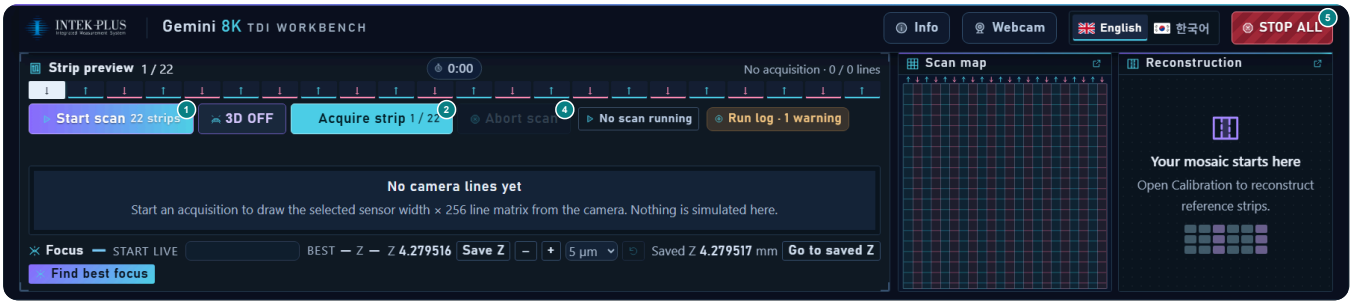
1. Locate the three image areas, then the Camera, Stage and Illumination cards.
2. Use the right-side tabs for settings; scroll inside that panel for lower controls.

> Screenshots show this application, not a generic instrument. Read the control reference below each picture; displayed values are examples from the documentation session.

02 / SCREEN & TASK

Run and stop controls

> Main window → scan controls



Actual GUI capture. Numbered markers match controls below; some controls require scrolling or another state.

1 Start scan

Starts the applied scan plan. The scan-status window opens automatically. A disabled button means a prerequisite or another operation is blocking the run.

2 Acquire strip

Acquires one selected planned strip. Select its strip button first; this is different from starting the whole scan.

3 Strip 1, Strip 2, …

Selects the strip to inspect or acquire. Completed strips expose their image actions.

4 Abort scan

Requests cancellation of the current scan. Wait for the stopped/aborted state and inspect which passes were saved.

5 STOP ALL

Requests the application's stop sequence for active work. Use the physical machine emergency stop when an immediate hardware safety stop is required.

6 Stop camera / Stop stage

Stops the named device operation. These are distinct from closing a viewer or the scan-status window.

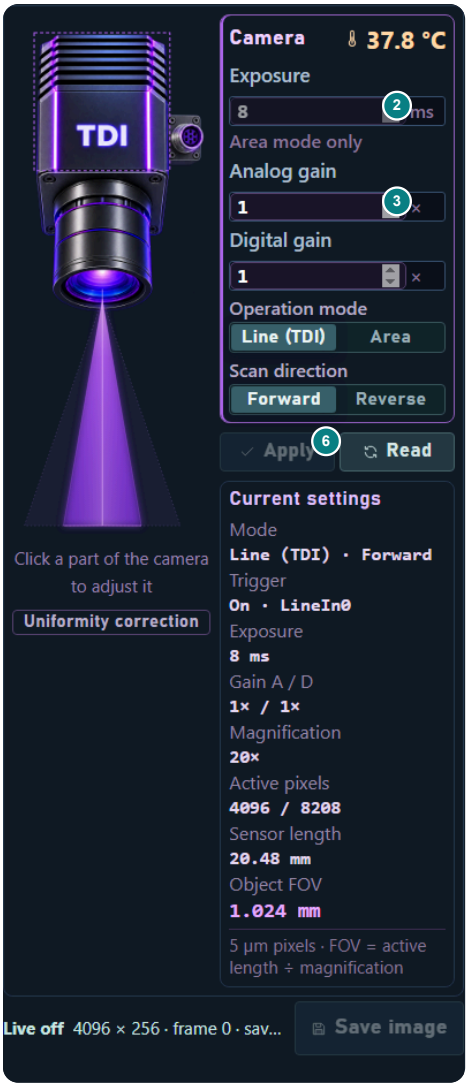
DO THIS

1. Before Start scan, confirm the save folder, placed scan area, focus, lighting and timing mode.
2. After acquisition completes, wait for Reconstruction ready before judging the final seams.

03 / SCREEN & TASK

Camera card: image controls

Camera illustration → camera body



Actual GUI capture. Numbered markers match controls below; some controls require scrolling or another state.

1 Start Live

Applies the pending camera/optics settings and starts the live Area preview. Use it for focus and image adjustment.

2 Exposure

Enter the exposure in the displayed unit. This field is for Area mode; TDI timing uses the line rate.

3 Analog gain / Digital gain

Enter a supported value, then Apply. Analog gain follows device-supported increments. Inspect the image for saturation after changing either gain.

4 TDI / Area

Chooses the pending operation mode. Area produces a two-dimensional live field; TDI is used for line-scan acquisition. Apply commits the selection.

5 Forward / Reverse

Chooses the camera scan direction. The scan sequence sets the direction for each pass; a manual choice is not proof of the next pass direction.

6 Apply / Read

Apply writes edited values; Read refreshes device readback. Check the returned values. Busy or unsupported controls are disabled.

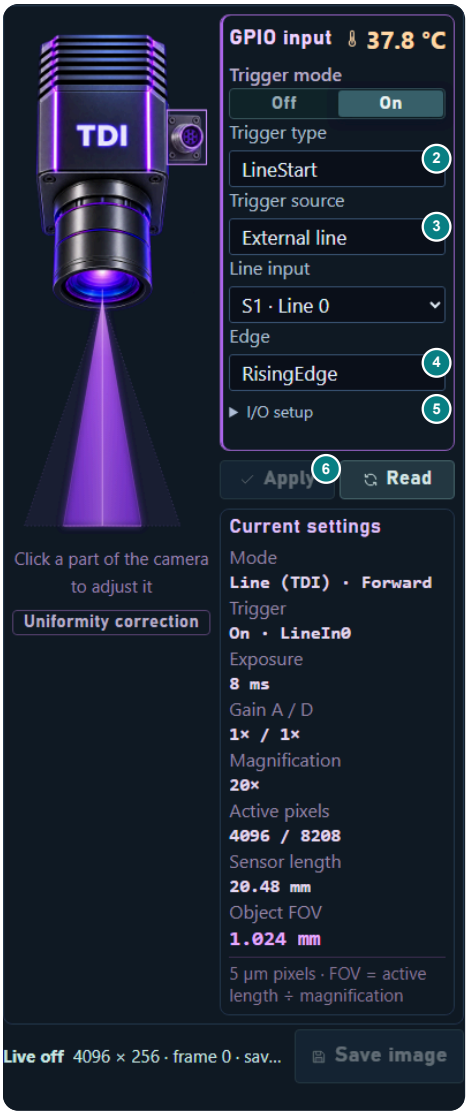
DO THIS

1. Click the camera body, change one parameter, then Apply.
2. Read back the value, start Live and inspect the preview. Stop camera ends Live.

04 / SCREEN & TASK

Camera card: trigger routing

Camera illustration → GPIO input



Actual GUI capture. Numbered markers match controls below; some controls require scrolling or another state.

1 Trigger mode

On requests external triggering for the selected trigger type; Off selects camera timing. Scan timing is confirmed again during each scan.

2 Trigger type

LineStart is line triggering; FrameStart is frame triggering. Select the intended node before editing its source and edge.

3 Trigger source / Line input

Select the wired input. Socket1Line0 and Socket2LineIn0 refer to different camera sockets, not interchangeable names.

4 Edge

Select RisingEdge, FallingEdge or AnyEdge to match the signal. AnyEdge counts both transitions and is not a default substitute for a rising-edge pulse.

5 I/O setup

Expand to select I/O line and Electrical mode, plus Frame input and Direction input. Socket 1 is configurable; Socket 2 inputs are fixed.

6 Apply / Read

Apply the line selection, then Read its electrical mode. Recheck after changes; a field selection alone does not confirm accepted hardware configuration.

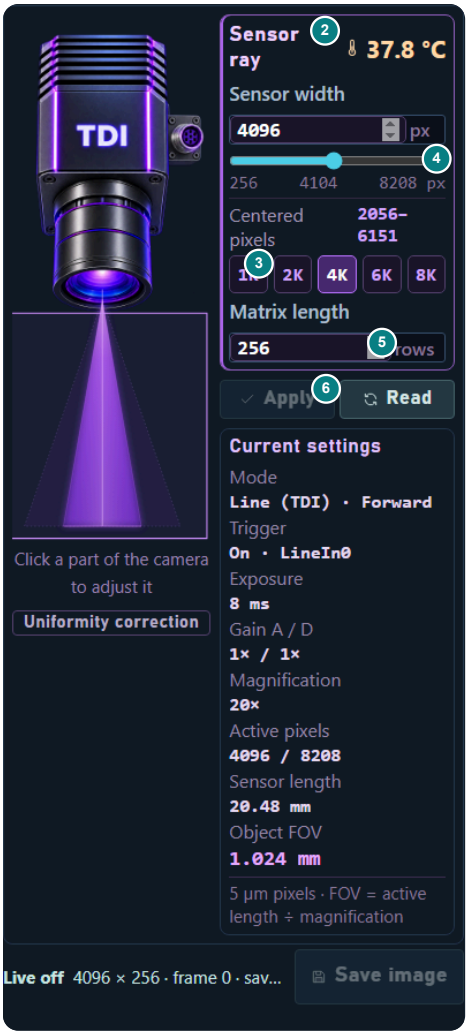
DO THIS

1. For a scan, use Stage → Trigger setting to set spacing, pulse width and camera input.
2. At scan start, verify "Camera readback confirmed · Line trigger ON" in Scan status.

05 / SCREEN & TASK

Camera card: lens and sensor

Camera illustration → Lens or Sensor ray



Actual GUI capture. Numbered markers match controls below; some controls require scrolling or another state.

1 Lens

Click the lens drawing to edit magnification and inspect lens-correction status. The nominal scale changes the scan plan.

2 Sensor ray

Click the fan-shaped area below the lens to open active-width and live-row controls.

3 1K / 2K / 4K / 6K / 8K

Selects a centred sensor crop: 1024, 2048, 4096, 6144 or 8192 pixels. 8K is not the full 8208-pixel sensor.

4 Active sensor width

The slider/manual field adjusts the centred crop. The displayed first–last columns show which sensor columns are used.

5 Matrix length

Controls the Area live preview length, up to 256 rows. It does not set the full scan strip length.

6 Apply / Object FOV

Apply replans edited optical geometry. Check Object FOV and active pixels before scanning; nominal magnification is not a measured calibration.

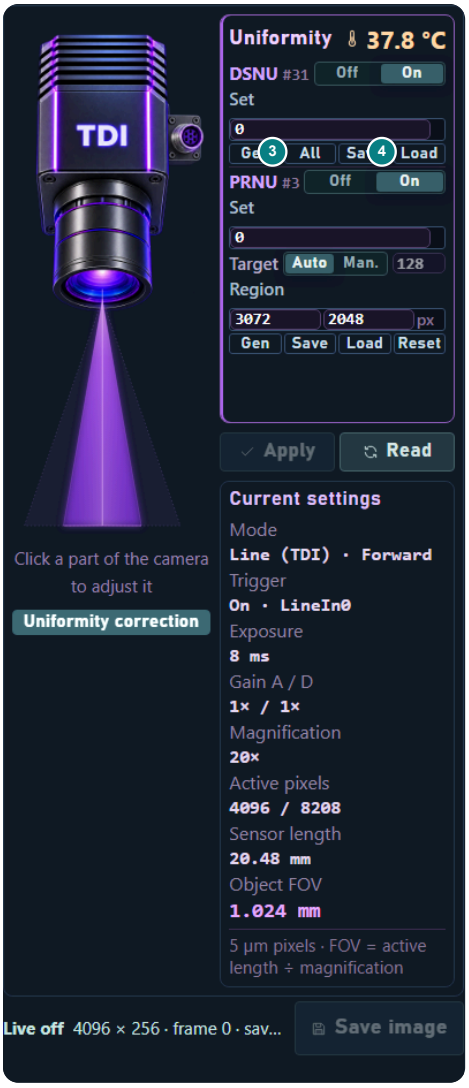
DO THIS

1. Select a width, enter the objective magnification, then Apply.
2. Check the Scan settings strip count, sampling and lines per strip.

06 / SCREEN & TASK

DSNU and PRNU controls

Camera card → Uniformity correction



Actual GUI capture. Numbered markers match controls below; some controls require scrolling or another state.

1 DSNU / PRNU Mode Off–On

Switches use of the selected correction. These controls write directly; do not wait for the Camera card's Apply button.

2 Set

Chooses the correction set supported by the device. Numeric edits commit on Enter or when focus leaves the field.

3 Gen / All (DSNU)

Gen generates for current settings with Live running. DSNU needs darkness; PRNU needs uniform light after DSNU. DSNU All generates all gains at current depth and saves, after confirmation.

4 Save / Load / Reset

Use the available module actions for persistent storage, retrieval or reset. Generating alone does not preserve a correction through camera power-off.

5 PRNU Target Auto / Man.

Chooses automatic target or the entered target level. Use a uniform field near half saturation and avoid clipping.

6 PRNU Region

Sets the reference region's X offset and width in pixels. The operation counter beside DSNU/PRNU reports device operations.

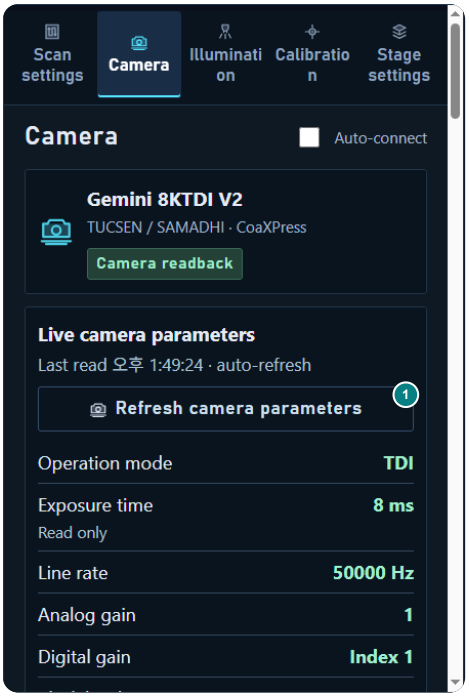
DO THIS

1. Start Live with the sensor dark. Select DSNU set, Gen, enable and Save.
2. Present a uniform illuminated field. Select PRNU set and target, Gen, enable and Save; inspect the image.

07 / SCREEN & TASK

Camera settings and recipes

Right panel → Camera



Actual GUI capture. Numbered markers match controls below; some controls require scrolling or another state.

1 Refresh camera parameters

Reads current settings and device capabilities. Readback can pause while acquisition owns the camera.

2 Signal & exposure

Edits exposure, gain and black-level fields offered by the camera. Follow the units and supported increments shown.

3 TDI & synchronization

Contains mode, direction, line rate, TDI stages and trigger settings, including the input-filter setting when supported.

4 Image format / Device health

Pixel format affects recorded counts; orientation/test-pattern fields affect the image. Temperature is read-only.

5 Validate recipe

Checks the entered recipe. A valid recipe is not yet applied to the camera.

6 Apply to camera / Export

Apply writes entered values and reports acceptance/refusal. Export downloads camera-recipe.json with its applied/offline status.

DO THIS

1. Refresh, edit the intended fields, Validate recipe, then Apply to camera.
2. Inspect the returned values before exporting the recipe.

08 / SCREEN & TASK

Strip preview: every image action

> Main window → Strip preview toolbar

1 Zoom	Opens a saved strip in a zoomable popup. Available once the session has a saved strip source.
2 Full screen / Live full screen	Full screen opens the saved strip along its full length. Live full screen expands the current camera image; the two actions use different sources.
3 Tools	Opens line-profile and LSF tools over this image. The parent preview keeps its view while the tools window is used.
4 Histogram	Toggles the grey-value distribution of the whole image at camera bit depth. Use it to inspect clipping and signal range.
5 1:1 / Calibrate lens	1:1 shows source pixels. Calibrate lens opens the Area lens workflow and requires an Area image.
6 SAVE	In the Area preview, saves the shown frame as full-size, full-depth 16-bit TIFF through the save dialog. It does not save a screenshot.

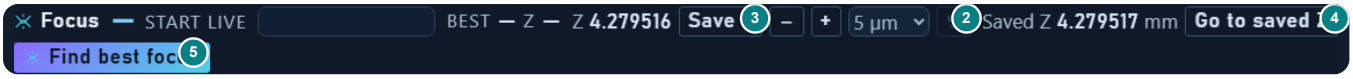
DO THIS

1. Start Live or acquire a strip so the toolbar has an image source.
2. Choose the action matching that source: Area SAVE for the live frame, Zoom for the saved strip.

09 / SCREEN & TASK

Focus: buttons and saved Z

> Below Strip preview → Focus assist



Actual GUI capture. Numbered markers match controls below; some controls require scrolling or another state.

1 Z – / + and step

Moves Z by the selected small step. Watch the image and sharpness trace while keeping lighting and gain steady.

2 Reset the peak

Clears the remembered sharpness peak; it does not move Z. Use after changing sample or illumination.

3 Save Z

Stores the current Z reference. Wait for the saved indication; the saved value is distinct from the highest sharpness seen.

4 Go to saved Z

Commands Z to the saved reference if it lies inside the working bounds. Disabled when no usable reference exists.

5 Find best focus

Turns on selected lighting, starts Area Live and searches Z within its working range, then verifies the chosen focus. This moves the stage.

6 Stop the hunt

Cancels the focus search. Review the final position and status before starting another operation.

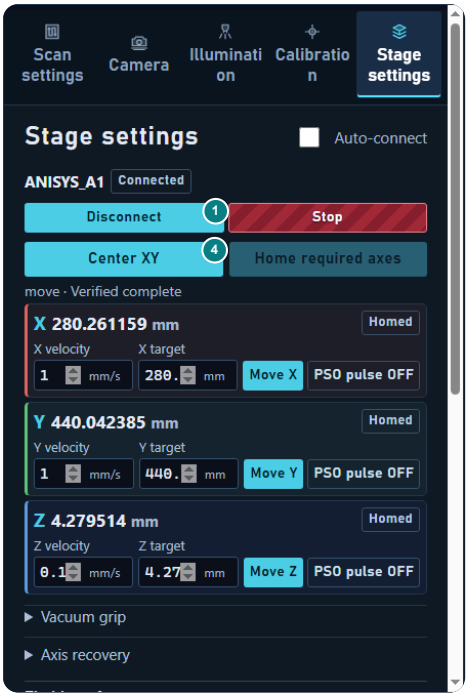
DO THIS

1. Set Search range ±, Coarse step and Frames per position under Stage settings.
2. Run Find best focus, inspect the result, then Save Z if it is the reference you want.

10 / SCREEN & TASK

Stage card and movement

Stage card; right panel → Stage settings



Actual GUI capture. Numbered markers match controls below; some controls require scrolling or another state.

1 Connect / Disconnect

Connects to the configured Automation1 controller. Disconnected setup exposes host and port; 0 uses the default port.

2 Jog by step / Jog by speed

Select the jog behavior in the Stage card, then use X/Y/Z arrows. Confirm the chosen distance or speed before pressing.

3 X/Y/Z target and Move

In Stage settings, enter an absolute target and axis velocity, then Move X, Y or Z. The reported position and Verified complete are the result.

4 Center XY

Moves XY to the configured scan centre when available. It is a motion command, not a way to save the current position.

5 Set Center

Uses the current position to set the scan centre. Check the acquisition-centre/start readouts before scanning.

6 Vacuum Chuck ON/OFF

Controls the configured vacuum chuck through the pneumatics controller. Check connection and reported output state.

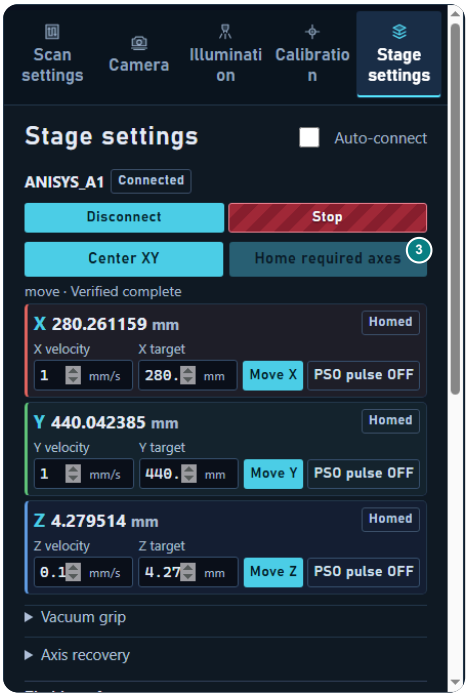
DO THIS

1. Connect and confirm positions, working bounds and homing state.
2. Use a small jog to position the sample; use Stop stage to stop stage motion.

11 / SCREEN & TASK

Bounds, recovery and focus setup

Stage settings → scroll down



Actual GUI capture. Numbered markers match controls below; some controls require scrolling or another state.

1 Working bounds → Apply

Enter each axis minimum/maximum in mm and Apply. Missing bounds lock movement. These app bounds do not replace controller safety limits.

2 Use current position for … work area

Creates the displayed work-area size around the current position. Check that it is physically usable before accepting it.

3 Home required axes

Homes axes that still require homing. Axis recovery also offers Home for an individual axis. These actions move hardware.

4 Axis recovery: Enable / Disable / Reset fault

Expand the section and operate the intended axis. Clear the cause of a fault before resetting it; inspect the returned axis state.

5 Search range ± / Coarse step / Frames per position

Configures the focus search in mm, µm and frames. The search remains constrained by Z working bounds.

6 PSO pulse ON/OFF

Arms/disarms position-spaced output for the chosen axis across its work range. Jogging an armed axis produces pulses; switch it off after a diagnostic.

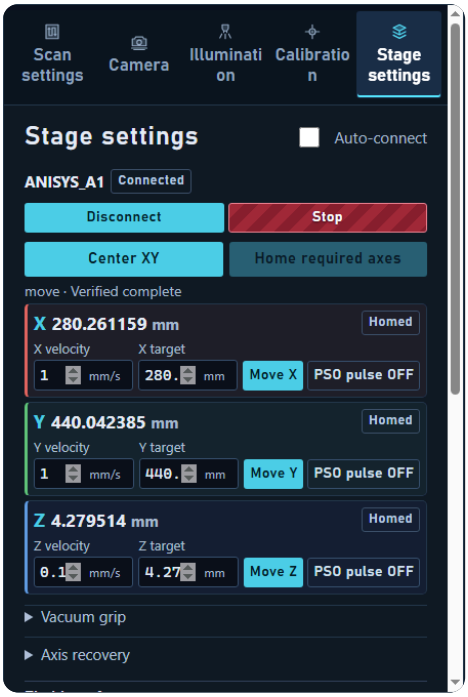
DO THIS

1. Use the reported controller limits where present; do not guess travel from one position reading.
2. A disabled motion control may indicate missing bounds, homing, a fault or another active operation.

12 / SCREEN & TASK

Vacuum valves and alarms

Stage settings → Vacuum grip



Actual GUI capture. Numbered markers match controls below; some controls require scrolling or another state.

1 Chuck of the Vacuum Chuck button

Selects which of the two chucks the main Stage card's Vacuum Chuck button operates. Confirm the physical chuck assignment.

2 Vacuum / Purge valves

Each valve button toggles its output. The host closes a chuck's purge before opening vacuum and vice versa. Purge releases the grip.

3 Main air valves

Controls the separate main air outputs. Check the machine's pneumatic configuration before changing these outputs.

4 ON / OFF / unknown

Shows reported point state. Unknown is not a confirmed OFF and may disable control until the host answers.

5 ALARM / clear

Reports ejector/regulator input alarms. Investigate an alarm rather than repeatedly toggling a valve to hide it.

DO THIS

1. Open Vacuum grip, confirm the host and choose the intended chuck.
2. Operate the required valve, then inspect its state and alarms before stage movement.

13 / SCREEN & TASK

Lighting selection and output

Illumination card



Actual GUI capture. Numbered markers match controls below; some controls require scrolling or another state.

1 CH1–CH4

Selects directional UV heads on the illustration or channel buttons. The four heads are used separately for 3D acquisition.

2 CH5

Selects the central coaxial illumination. Its controller settings are separate from the UV controller.

3 ON

Turns on the selected, connected channels. A selected channel and an emitting channel are different states.

4 OFF

Turns illumination off. Check the reported state before leaving the sample or changing the setup.

5 Channel level controls

Use the per-channel controls for the selected head. For full configuration, open the Illumination settings tab.

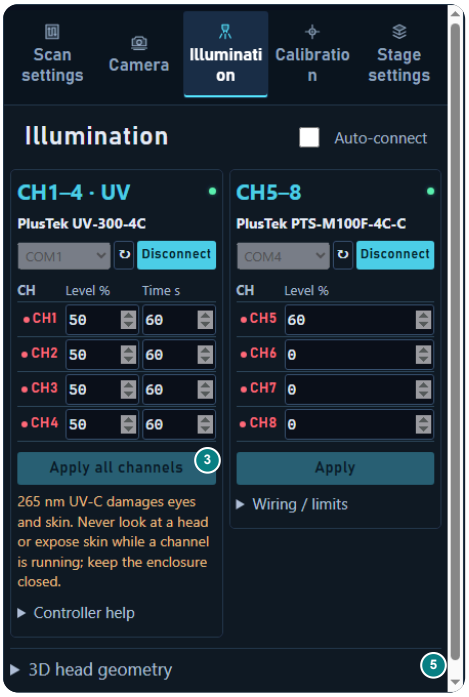
DO THIS

1. Select the intended channel(s), confirm controller connection, then press ON.
2. Inspect Live for saturation. Keep lighting unchanged during a focus or quality comparison.

14 / SCREEN & TASK

Illumination settings

Right panel → Illumination



Actual GUI capture. Numbered markers match controls below; some controls require scrolling or another state.

1 Port / Connect

Select the appropriate serial controller and Connect. The displayed connection state applies to that controller.

2 Level % / Time s

Sets each UV channel's level and on time. Review all channel rows before applying the group.

3 Apply all channels

Writes the channel settings to the controller. Inspect readback and any error before expecting the next run to use them.

4 Switch to remote

Changes a Local controller to serial remote control. Local panel/I/O mode can prevent serial commands from controlling output.

5 3D head geometry

Sets head elevation and each head's azimuth for relief reconstruction. Enter the actual arrangement, not values chosen to make a result look better.

6 Back to the measured layout

Restores the application's reference light geometry. Check it against the current physical head arrangement.

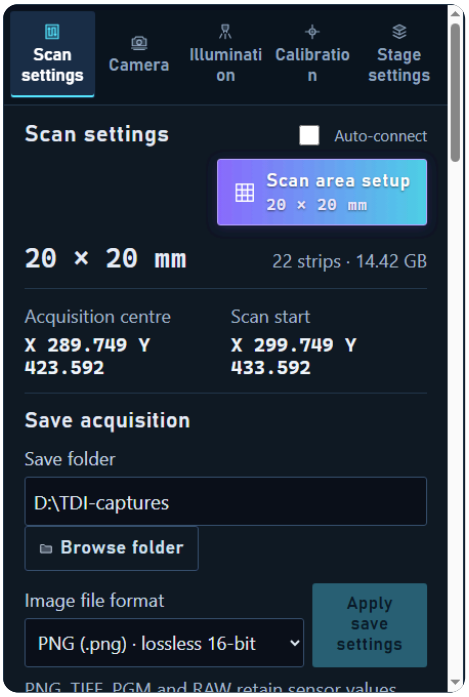
DO THIS

1. Connect the UV and coaxial controllers that you use.
2. Apply channel settings, then return to the card to select channels and switch output.

15 / SCREEN & TASK

Scan dimensions and sampling

Right panel → Scan settings



Actual GUI capture. Numbered markers match controls below; some controls require scrolling or another state.

1 Width / Length

Width is across strips; Length is along the Y traverse. Enter sample coverage in mm.

2 Active pixels / Sensor pixels (manual)

Chooses a centred sensor width. A manual width must be a supported whole-pixel count. Invalid input leaves the applied selection unchanged.

3 Objective magnification

Changes nominal pixel scale and FOV. Enter the effective objective magnification used by your optical setup.

4 Cross-scan FOV

Editing FOV adjusts effective magnification. Changing active width alone preserves the pixel scale.

5 Use nominal 20x optics

Restores the nominal 20× optical calculation. This button does not measure the lens or activate a physical calibration.

6 Calculate scan points

Applies geometry immediately. Edits can also apply after a short delay; wait until the unapplied-changes warning clears.

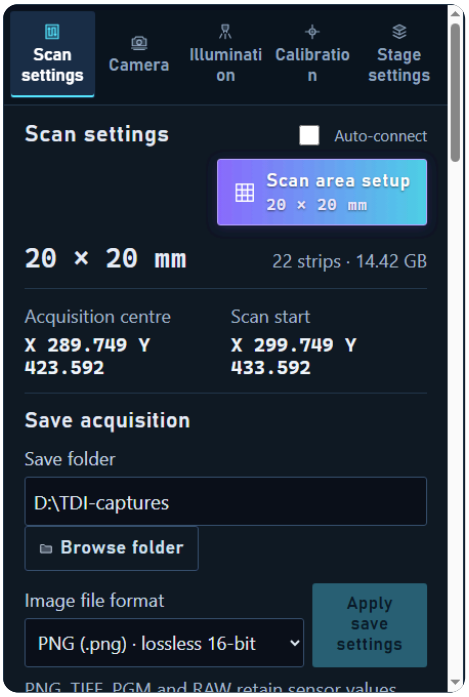
DO THIS

1. Enter dimensions, active width and optics, then Calculate scan points.
2. Check Strips, Sampling and Lines per strip before setting the speed.

16 / SCREEN & TASK

Overlap, speed and plan export

Scan settings → Strip overlap and lower fields



Actual GUI capture. Numbered markers match controls below; some controls require scrolling or another state.

1 % / mm

Changes overlap entry units; the planned physical overlap remains the same.

2 Overlap slider / Minimum overlap

Sets requested overlap from 0–49%. Use enough shared texture for matching; more overlap increases strip count and data.

3 10% / 12.5% / 15% / 20%

One-click overlap presets. Calculate scan points and read Actual overlap rather than assuming the requested value is exact.

4 Scan velocity / Travel speed

Scan velocity controls acquisition traverses; Travel speed controls repositioning. Review run-up space and timing feasibility after changes.

5 Strips / Strip pitch / Lines per strip

These are computed plan results. They tell you expected passes, X spacing and recorded image length.

6 Export all scan points

Downloads scan-plan.json for the applied plan. Disabled while edits are unapplied or computation is busy.

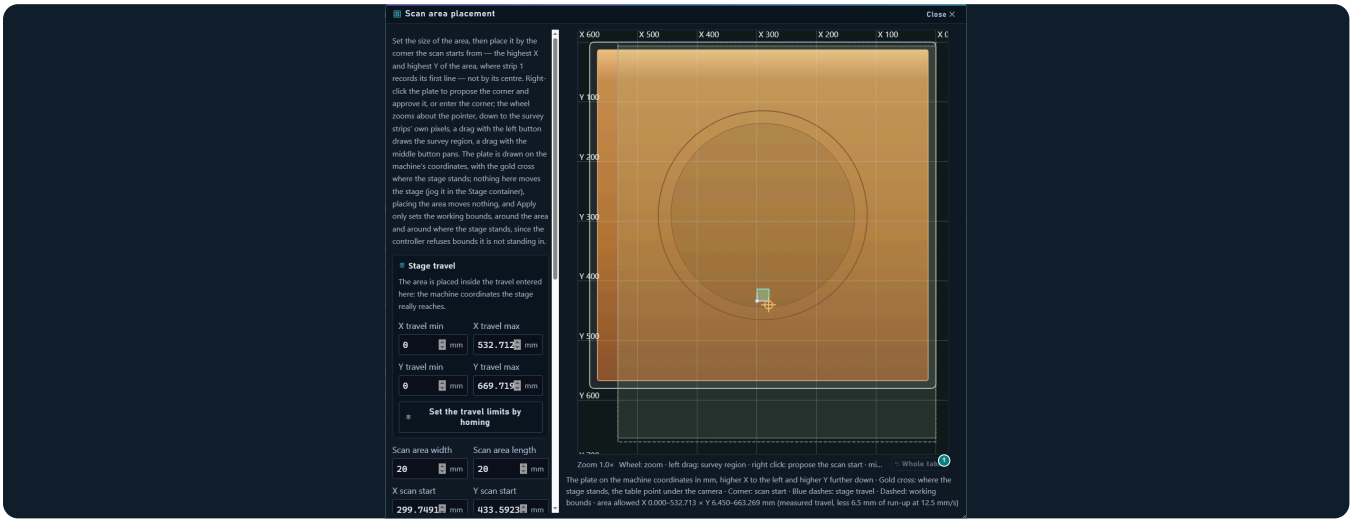
DO THIS

1. Set overlap and speed, apply the plan and review the calculated metrics.
2. Open Scan area setup to place this plan on the stage.

17 / SCREEN & TASK

Place the scan area

Scan settings → Scan area setup



Actual GUI capture. Numbered markers match controls below; some controls require scrolling or another state.

1 Wheel / middle drag / Whole table

Wheel zooms the map; middle drag pans. Whole table restores the full table view. These gestures do not move the stage.

2 Right click → Proposed scan start

Right-click a map position to propose the scan start. The origin remains unchanged until accepted.

3 Set as scan start / Discard

Accepts or discards the proposal. Inspect scan centre, scan start and planned coverage after accepting.

4 Use current position as start

Defines the scan start from the stage's current position. This is a placement choice, not a request to acquire.

5 Apply this area to the stage

Applies the chosen area as the stage work area where permitted. Read any bounds refusal before trying Start scan.

6 Set by homing / Home now

Starts the travel-measurement/homing workflow. This can move the stage across its travel; it is not a map-only action.

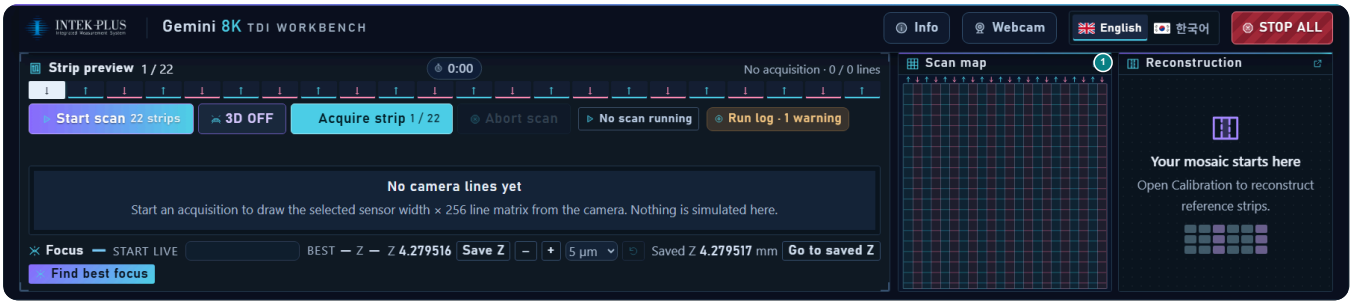
DO THIS

1. Check area allowed, dimensions and run-up clearance on the map.
2. Propose a start, accept it, then check the acquisition-centre/start readouts.

18 / SCREEN & TASK

Scan map: acquire one square

> Scan map → enlarge



Actual GUI capture. Numbered markers match controls below; some controls require scrolling or another state.

1 Enlarge Scan map

Opens the interactive map. The small card is for overview; individual-square acquisition is available in the enlarged map.

2 Forward / Reverse legend

Colours identify stage +Y and −Y passes. Scanned squares are marked separately.

3 Square tooltip

Hover a square to read strip number, square number, X, Y interval and expected lines.

4 Click a square

Moves the stage to that square and scans it under the checked lights. This is an acquisition command, not simply image selection.

5 Reconstruction after a retake

Single-square/strip results are placed at their recorded positions and can replace an earlier local take in the combined view. Review the changed area.

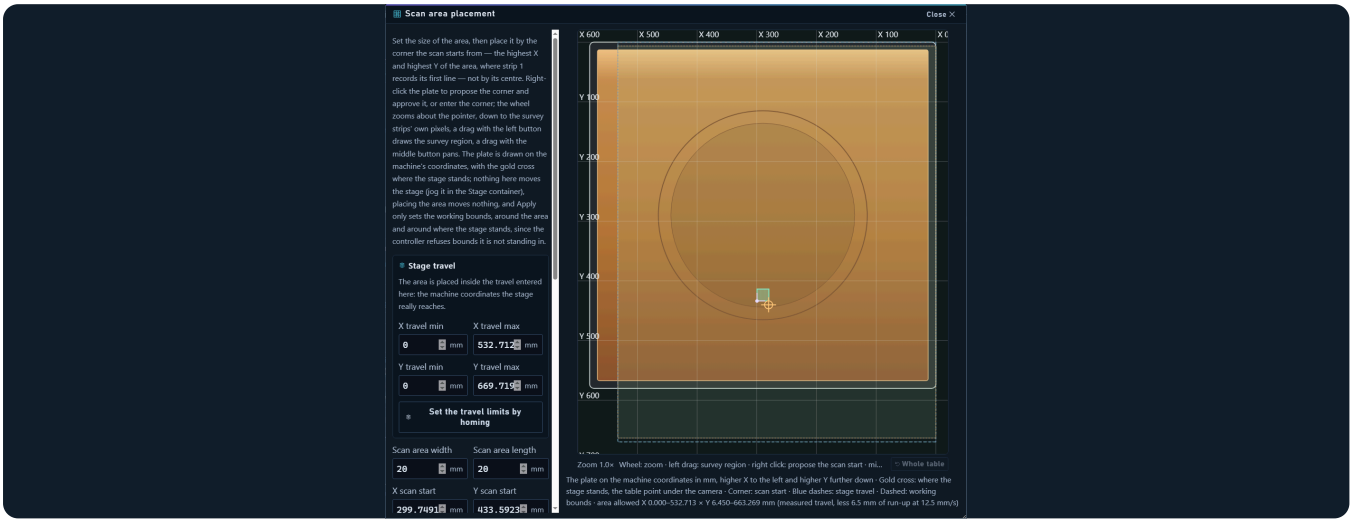
DO THIS

1. Set a valid scan centre and plan, then enlarge Scan map.
2. Inspect the square tooltip and lights before clicking; follow acquisition and processing in Scan status.

19 / SCREEN & TASK

Survey the table before scanning

> Scan area setup → Survey of the table



Actual GUI capture. Numbered markers match controls below; some controls require scrolling or another state.

1 Left drag on the map

Defines the survey region. This is different from right-clicking to propose a scan start.

2 Survey from / to

Sets the survey bounds. Review the strip pitch, estimated strip count and time shown for that region.

3 Survey now

Acquires survey strips with real stage movement. Wait for strips to appear on the map before choosing a detailed scan region.

4 Stop

Stops an active survey/homing operation in this workflow. Check the reported final state.

5 On the map / reading…

Reports survey imagery loaded for viewing. Image-read failure does not imply that the survey file was never acquired.

DO THIS

1. Draw a survey region, review its estimates, then Survey now.
2. Use the resulting sample image to place the final scan; accept the proposed start explicitly.

20 / SCREEN & TASK

Set line triggering

Stage card → Trigger setting



Actual GUI capture. Numbered markers match controls below; some controls require scrolling or another state.

1 PSO output / Scan direction only

Selects the physical output pin and whether pulses are limited to scan direction. Timing mode comes from Camera → GPIO input → Trigger mode after Apply/readback.

2 Trigger spacing

Sets distance per pulse in nm. Match the intended line sampling; a tenfold smaller spacing requests tenfold more triggers.

3 Pulse width

Sets pulse duration in µs. Pulse plus required gap must fit before the next trigger at the chosen speed.

4 Camera input

Chooses the input used by scans. It must match the physical stage-to-camera wiring.

5 Inverter (Socket1)

Configures the Socket 1 inversion option. Use only when the connected signal requires it.

6 Pulse rate while moving

Calculated rate = speed ÷ spacing. Example: 12.5 mm/s and 250 nm give 50 kHz; the interval is 20 µs.

DO THIS

1. Camera → GPIO: set Trigger mode On and Apply for stage-triggered scans, or Off for camera timing. Then set output, input, spacing and pulse width here.
2. At scan start, use camera readback confirmation, not the switch alone, to identify actual line triggering.

Triggered acquisition applies and reads back the camera input filter. The displayed expected rate is a calculation, not an independent pulse count.

21 / SCREEN & TASK

Run the input diagnostic

Trigger setting → Check run



Actual GUI capture. Numbered markers match controls below; some controls require scrolling or another state.

1 Axis / Travel / Speed

Defines the axis and actual motion used for the check. Verify a clear, permitted travel path.

2 Still time

Sets the stationary observation interval used alongside moving measurements.

3 Check all inputs

Tests inputs in sequence with motion and stationary phases. Lights remain off. This is a hardware test, not a simulated graph.

4 Stop

Cancels the diagnostic. Wait for its final status before starting a scan.

5 still / moving / expected

Compares observed camera line rates with the expected rate. The per-input graph shows phases and the verdict explains the result.

6 Final status

The diagnostic returns trigger mode to Off and leaves the chosen camera input selected. Recheck scan trigger settings before acquisition.

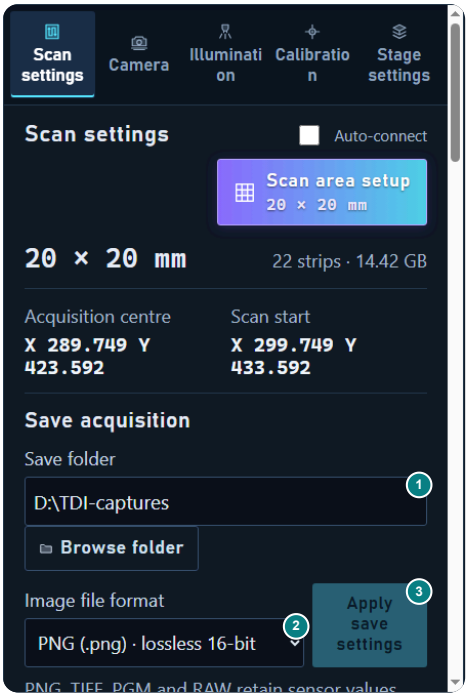
DO THIS

1. Connect the stage, configure a safe check travel and start Check all inputs.
2. Read each verdict and final state; investigate unexpected stationary counts before scanning.

22 / SCREEN & TASK

Save folder and image format

Scan settings → Save acquisition



Actual GUI capture. Numbered markers match controls below; some controls require scrolling or another state.

1 Save folder / Browse folder

Enter or browse to an absolute folder on the acquisition PC. This is the destination for subsequent acquisition files.

2 Image file format

Choose the output format. Read whether it is lossless full-depth, 8-bit display or lossy display before using it for measurement.

3 Apply save settings

Checks and applies the destination/format. Review available space and any refusal. Merely typing a folder is not completion.

4 Save image

Saves the current image through its viewer action. This is separate from choosing where future scans will be written.

5 Reconstruction → SAVE

Saves the selected Original or Processed reconstruction at full output depth as a 16-bit PNG through the save dialog.

6 Scan directory

Retain scan.json, mosaic.json and original strip files together with the output. The stitched PNG alone does not preserve the acquisition metadata.

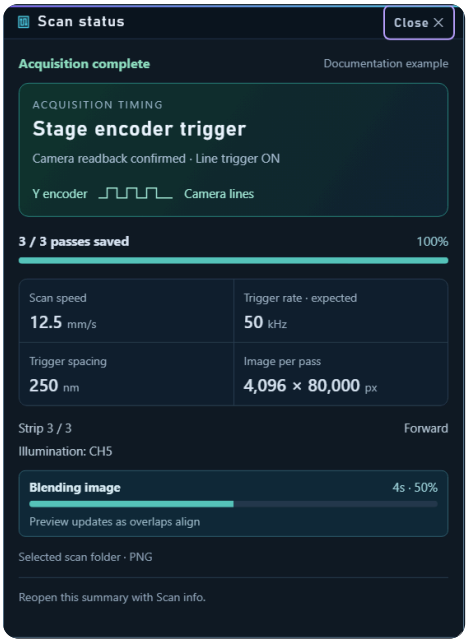
DO THIS

1. Choose folder and format, Apply save settings, then confirm available disk space.
2. After processing, check that the output exists in the scan's reported directory.

23 / SCREEN & TASK

Read the scan-status window

Start scan → automatic popup; Scan info reopens it



Actual Scan status component with example values; no acquisition was performed.

1 Stage encoder trigger / Camera timing

The prominent timing panel identifies position-triggered or software-gated camera timing. Read it on every run.

2 Camera readback confirmed

Line trigger ON confirms accepted trigger configuration; OFF confirms camera timing. "Waiting" is not confirmation.

3 Passes saved / Scan progress

Tracks acquisition passes already saved. 100% here does not mean the whole reconstructed image has finished saving.

4 Alignment / Blending / Saving

The processing bar and elapsed time describe work after or alongside acquisition. Wait for Reconstruction ready.

5 Alignment incomplete / warnings

A rejected overlap is explicitly reported. Review warnings and the seam; an image file can exist with unverified alignment.

6 Close / Scan info / Abort scan

Close hides this window without stopping acquisition. Scan info reopens it. Abort scan is the action that requests cancellation.

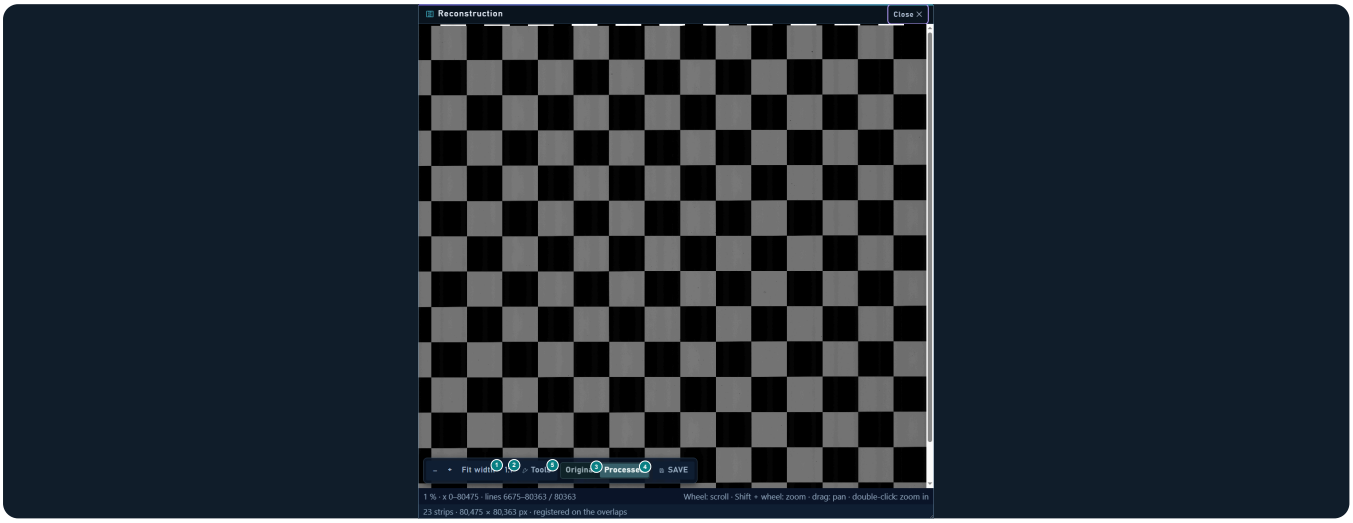
DO THIS

1. Confirm timing and image dimensions immediately after start.
2. Watch processing separately from acquisition; inspect warnings before reviewing the final image.

24 / SCREEN & TASK

Reconstruction viewer controls

> Reconstruction card → enlarge



Existing saved scan shown in actual Mosaic component; no new acquisition.

1 Fit width

Fits the stitched image width to the viewer. A tall image still needs vertical scrolling; use the wheel or scrollbar to inspect its length.

2 − / + / 1:1

Zooms out, in, or to one image pixel per screen pixel. Shift + wheel zooms around the pointer; ordinary wheel scrolls.

3 Original

Shows the stitched image before display corrections: no flat-field, strip-level or lens correction in this view. It is still a stitched view.

4 Processed

Shows the corrected reconstruction. Its completed overview reads the composed output raster; at native detail the service reads source pixels for inspection.

5 SAVE / Tools

SAVE writes the chosen view. Tools opens line-profile and LSF controls over a separate copy of this view.

6 CH buttons / 2D–3D controls

A four-head scan can select an individual head reconstruction or the relief view. Head selection changes the image being inspected.

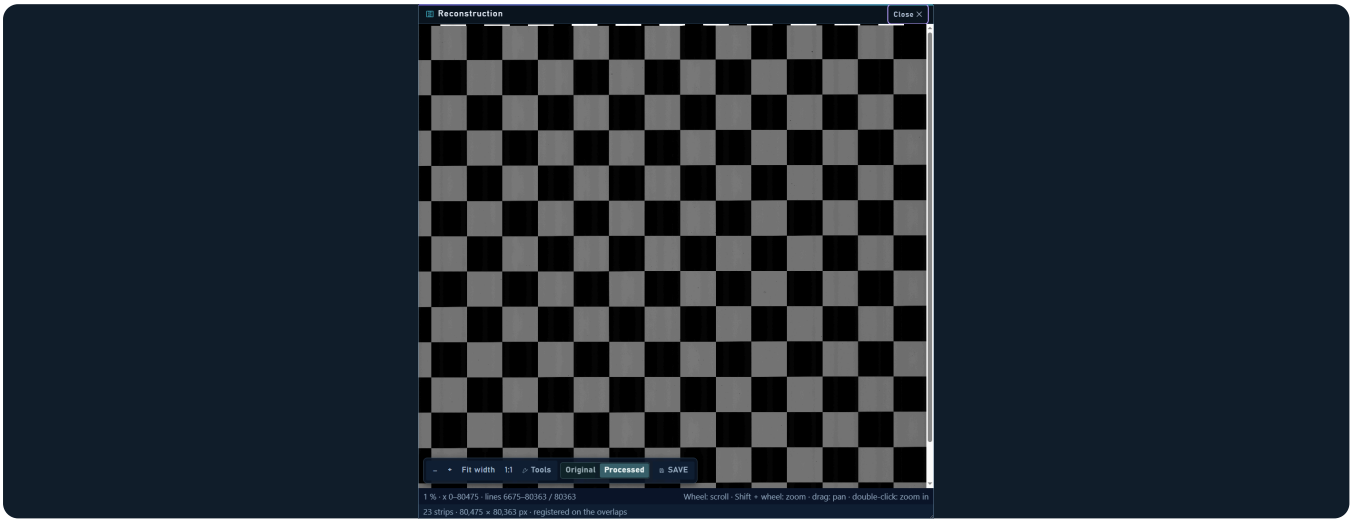
DO THIS

1. Wait for processing to finish, enlarge Reconstruction and select Processed.
2. Inspect each seam at several rows and at 1:1; compare Original when diagnosing correction artifacts.

25 / SCREEN & TASK

Move, resize and inspect images

> Any Strip / Reconstruction / Tools window



Existing saved scan shown in actual Mosaic component; no new acquisition.

1 Title-bar drag

Moves the popup without moving the image inside it. Drag a corner to resize; Tools windows also resize from their edges.

2 Image drag

Pans an image in a normal viewer. In Tools, the active Line or Region mode determines what a drag draws.

3 Wheel / Shift + wheel / double-click

Scroll, zoom around the pointer, and zoom in. Fit width returns from manual zoom to a fitted view.

4 Pixel / line / X / Y readout

Reports the pointed image coordinate, and machine coordinates when placement data exists. Stitched coordinates use nominal scan placement.

5 Close / Escape

Closes the focused viewer. Closing a viewer does not delete saved images or stop a running scan.

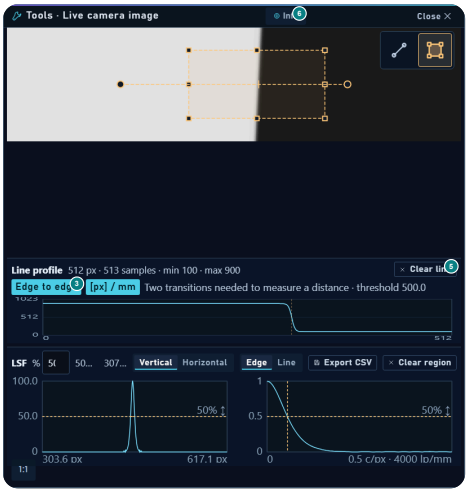
DO THIS

1. Use Fit width to orient yourself, then 1:1 or Shift + wheel for pixel inspection.
2. If no picture appears, read the Run log; repeated resizing is not an acquisition fix.

26 / SCREEN & TASK

Tools: line profile and distance

Image viewer → Tools → Line icon



Actual measurement controls with a synthetic edge example; not a measurement of the sample.

1 Line icon

Selects line drawing. Drag across the image to draw the intensity profile; endpoints remain draggable.

2 Profile plot

Shows grey values along the selected line. The source view and display corrections affect the values being inspected.

3 Edge to edge

Toggles automatic midpoint-transition detection along the drawn line. Detected boundaries and distances between successive edges appear on the image and plot.

4 [px] / mm

Toggles pixel/mm distance when scale is available. Disabled mm conversion means the image lacks usable physical scale.

5 Clear line

Removes the profile line and its values. It leaves the LSF region and source image intact.

6 Info

Opens the tools help over the measurements. Toggle it off to return to the retained line and region.

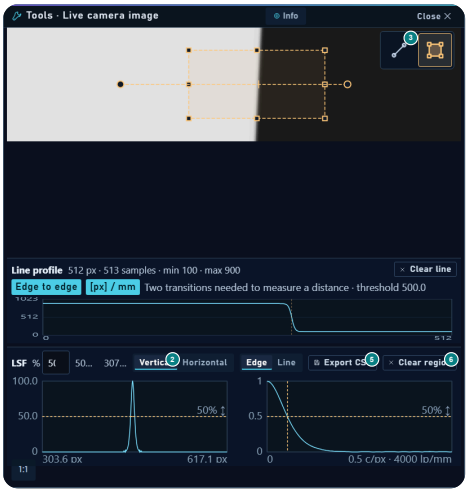
DO THIS

1. Open Tools, select Line and drag across the two features.
2. Enable Edge to edge, inspect the detected transitions, then choose px or mm and record the scale used.

27 / SCREEN & TASK

Tools: LSF and MTF

Image viewer → Tools → Region icon



Actual measurement controls with a synthetic edge example; not a measurement of the sample.

1 Region icon / rectangle handles

Select Region, then drag a rectangle across an isolated edge or thin line. Drag the box/handles to reposition or resize it.

2 Vertical / Horizontal

Choose the target direction. Vertical averages rows to measure across columns; Horizontal averages columns to measure across rows.

3 Edge / Line

Edge differentiates the edge-spread profile into the LSF. Line treats a thin line's background-subtracted profile as the LSF.

4 % field / draggable horizontal level

Drag the horizontal line in either plot or type 1–99%. Both plots use that selected percentage; the LSF width and MTF crossing update.

5 Export CSV

Saves the measured profile, LSF, MTF and selected level through the save dialog. A result is required before export is enabled.

6 Clear region

Removes the rectangle and LSF result. The profile line is a separate selection.

DO THIS

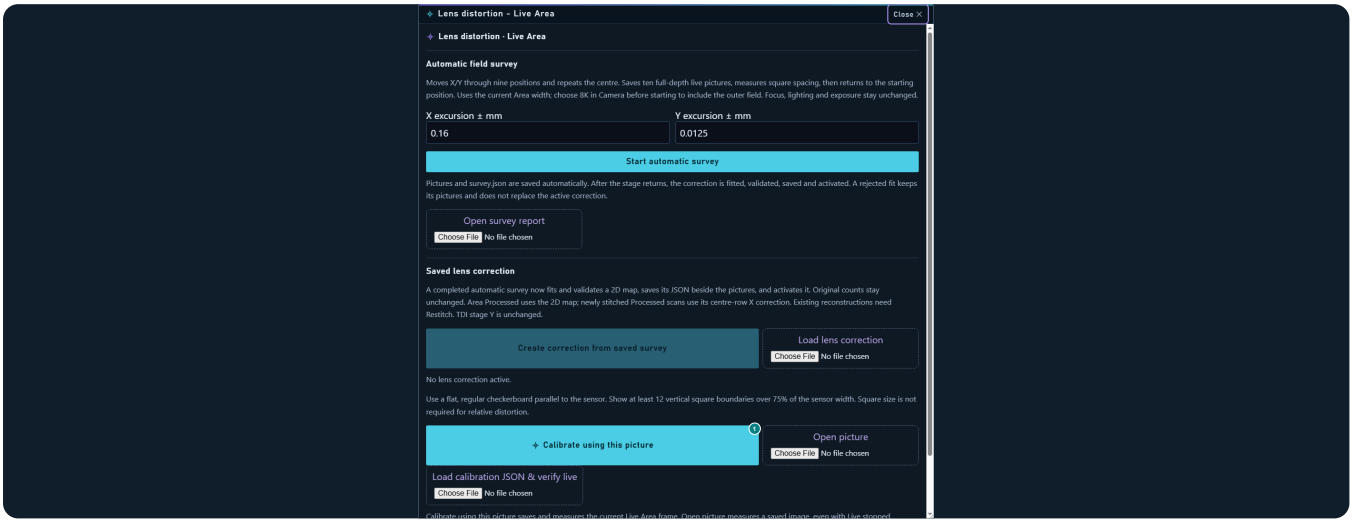
1. Inspect near 1:1, draw a suitable region and choose target/direction.
2. Drag 50% to another level, check the updated width/frequency and Export CSV.

At 50%, the width is FWHM. Other percentages are widths at that selected level, not FWHM. A missing crossing is not a zero-width or zero-frequency result.

28 / SCREEN & TASK

Lens calibration from a picture

Strip preview (Area Live) → Calibrate lens



Actual Area lens dialog; no calibration or survey was run.

1 Calibrate using this picture

Measures relative lens distortion from the current full-depth Area picture. A suitable visible grid/edge pattern is required.

2 Open picture

Uses an existing calibration picture instead of a new live frame. The report records which picture was used.

3 Detected boundaries

Toggles boundary marks on the measured picture. Inspect that the algorithm selected real target features.

4 Verify another live picture

Checks the measured model against a different live frame. Read before/after and held-out residuals.

5 Save calibration / Load calibration JSON & verify live

Saves or loads this Area calibration report for verification. Loading it here does not activate a whole-scan correction.

DO THIS

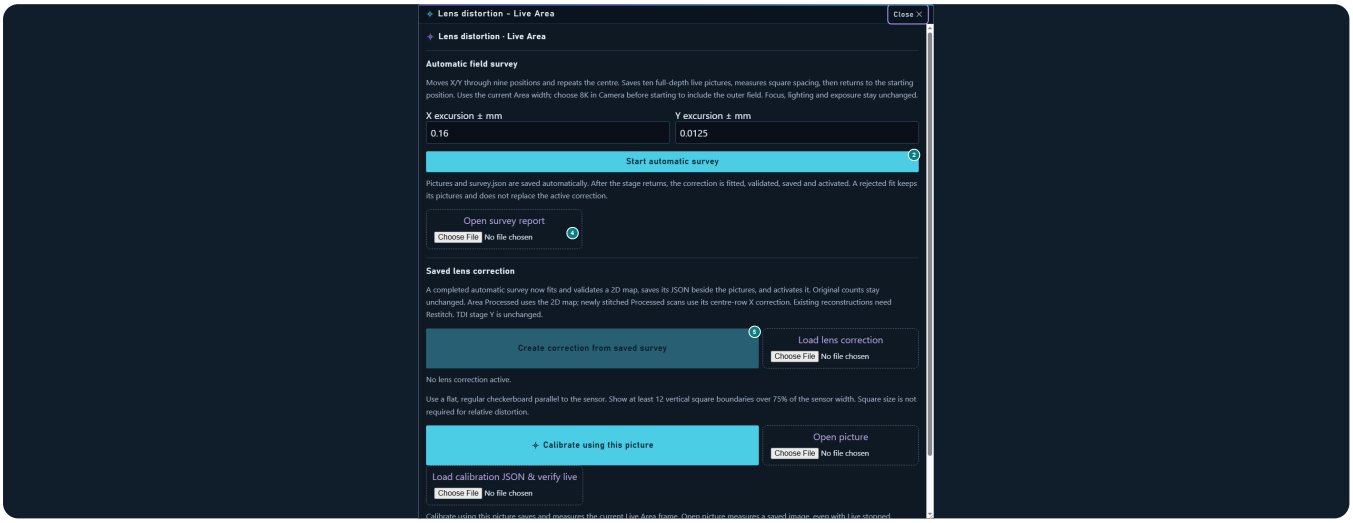
1. Use a focused Area image with useful boundaries and run Calibrate using this picture.
2. Inspect marks, verify another frame and save the report.

The single-picture result is relative X correction. It does not by itself establish physical scale or activate scan correction.

29 / SCREEN & TASK

Automatic lens survey and correction

> Area Live → Calibrate lens → Automatic field survey



Actual Area lens dialog; no calibration or survey was run.

1 X excursion ± / Y excursion ±

Sets the survey displacement around its starting position. Verify work bounds and a suitable Area target.

2 Start automatic survey

Acquires multiple pictures with real stage moves. Progress shows pictures saved and return status.

3 Cancel and return

Cancels the survey and attempts return to the starting position. Check “Starting position restored”; do not assume the return succeeded.

4 Open survey report / Save survey report

Opens the result or saves the survey report for later correction creation. Inspect sampled regions and spacing.

5 Create correction from saved survey

Builds the correction from a saved survey and applies the validity checks. Inspect the resulting active status.

6 Compare Original / Processed / Disable lens correction

Compares images under the active model or turns the model off. Save correction JSON exports it; Save Processed Area TIFF saves the compared image.

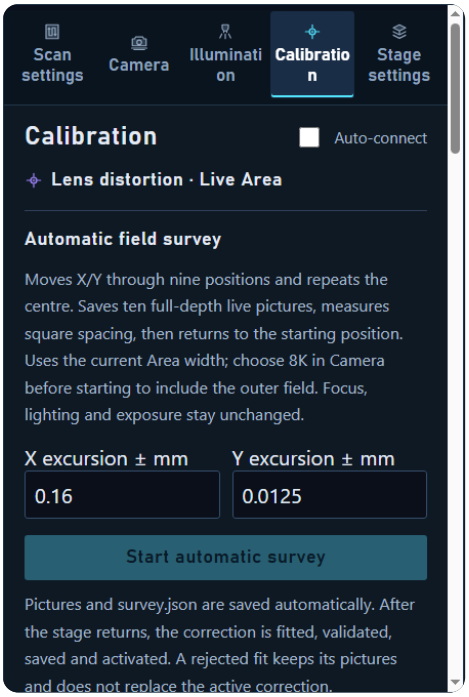
DO THIS

1. Acquire a multi-position survey, inspect the report and verify the stage return.
2. Create the correction, compare images and confirm active status before using it.

30 / SCREEN & TASK

Reference-pattern calibration

Right panel → Calibration



Actual GUI capture. Numbered markers match controls below; some controls require scrolling or another state.

1 Upload reference-pattern DXF

Loads the dot-grid reference in mm; the parser requires $INSUNITS 4. Check pattern identity and pitch.

2 Reference ROI

Sets the reference region used by the calibration. Compatibility and activation are evaluated against the relevant geometry.

3 Import acquired strips

Imports 8-bit binary PGM files, sorted by filename, one per planned strip. Keep order and geometry consistent.

4 Calibrate from imported strips

Runs the measurement on imported strips. Inspect separate optics and stitching verdicts, residuals and confidence.

5 Simulated instrument / Instrument self-test

These generate or use synthetic calibration data for software checks. Their result is not calibration of the connected machine.

6 Save As / Export report

Saves the calibration document or measurement report. Preserve source identity and verdicts with it.

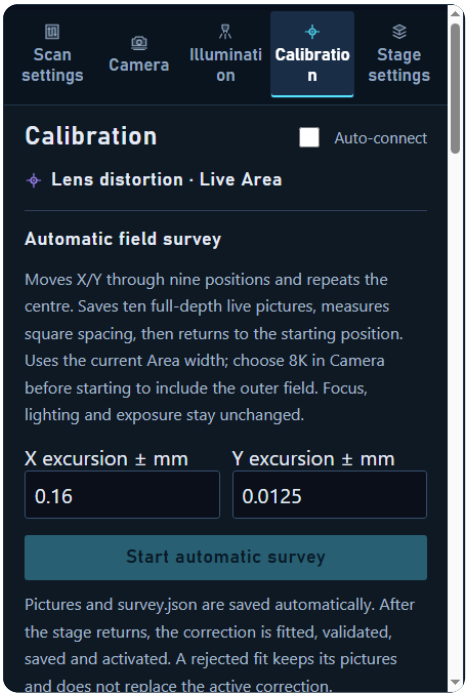
DO THIS

1. Load DXF, set the ROI and import the corresponding strip files.
2. Calibrate, inspect both verdicts and residuals, then save the result.

31 / SCREEN & TASK

Load, activate and verify calibration

Calibration → Load & activate



Actual GUI capture. Numbered markers match controls below; some controls require scrolling or another state.

1 Load calibration

Loads a tdi.calibration/1 JSON file. Read its identity, sensor, requested FOV and correction ABI.

2 Activate for the reference ROI

Requests activation only when the C++ validity/compatibility gate allows it. A loaded document is not automatically active.

3 Refused by the C++ gate

Read the stated reasons. Fix data/geometry incompatibility rather than treating a saved JSON as sufficient evidence.

4 Verify on an independent capture

Runs independent verification for the compatible ROI. Inspect held-out dots, corrected/uncorrected residuals and overlap error.

5 Download run manifest

Exports the verification identity and run record for traceability. Keep it with the calibration file and captures.

DO THIS

1. Load a passing, compatible calibration and activate it for the reference ROI.
2. Verify a separate capture and save its run manifest.

32 / SCREEN & TASK

3D relief: acquisition and viewing

Main window → 3D relief; Reconstruction → 3D

1 **3D relief**	Uses the directional-head acquisition workflow. Each head contributes its own image; confirm connected UV lights and head geometry first.
2 **Picture / Height colours**	Switches surface colouring between the captured picture and a height colour scale. It does not reacquire the sample.
3 **Height exaggeration**	Changes display exaggeration to help see relief. It is not a physical height calibration.
4 **Detail**	Selects reconstruction detail where available. A saved 3D retains the detail used when it was reconstructed.
5 **Reset view**	Returns to the front view after manipulating the 3D scene.
6 **True step height / Calibrate**	Uses an entered known step height to set the relief height scale when a suitable step is detected. Inspect the measured region.

DO THIS

1. Acquire under the four directional heads and wait for reconstruction.
2. Inspect individual head images before trusting the combined relief.

Relief estimates shape from lighting. It is not a directly measured Z map; reflectance, shadows and height calibration affect interpretation.

33 / SCREEN & TASK

3D step height by focus

3D viewer → Step height by focus

1 **Focus here = 0**	Records/focuses the plate reference position for the step-height workflow. Inspect the target point and stage status.
2 **Focus here = top**	Obtains the top-surface focus reference. The difference between the two focus Z positions provides the step-height estimate and calibrates the relief at once.
3 **Stop**	Stops an active focus hunt. Wait for the final status and check the resulting stage position.
4 **positions / measured**	Shows recorded positions and the derived step height. A failed hunt must be resolved before using the value for relief calibration.

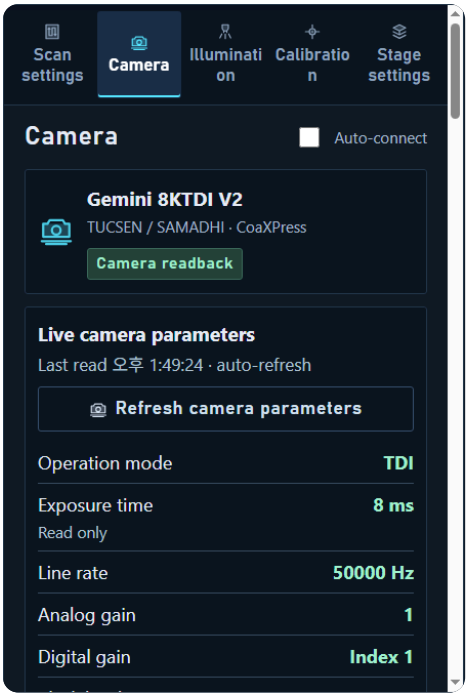
DO THIS

1. Focus the base plate, set the zero reference, then focus the top surface.
2. Review both Z positions and the height before applying it to relief scaling.

34 / SCREEN & TASK

TDI recording: both grabbers

Camera settings → TDI recording



Actual GUI capture. Numbered markers match controls below; some controls require scrolling or another state.

1 Recording length

Sets recording duration in seconds. This recording workflow is separate from a planned multi-strip scan.

2 Record TDI (2 grabbers)

Arms both frame grabbers and records delivered data to disk. Check output location and available space first.

3 Stop recording

Ends recording and lets the write result settle. Read the final completion/failure state.

4 Delivered / Written

Compare received and written line counts for each grabber. The counts describe this recording path, not an independent emitted-trigger count.

5 Dropped / Gaps / Errors

Nonzero values or LINES LOST require investigation. Completion alone is not proof that every expected trigger became one written line.

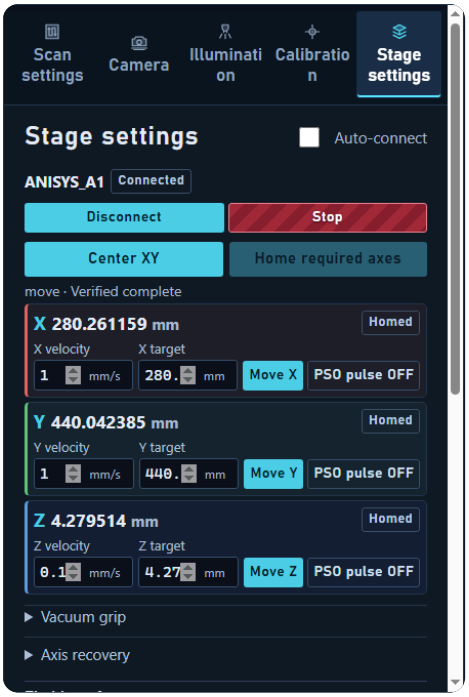
DO THIS

1. Set duration and destination, then Record TDI (2 grabbers).
2. After Stop/completion, review both grabber rows and preserve the recording summary.

35 / SCREEN & TASK

Logs, device status and twin

Run log; Stage settings → collapsed sections



Actual GUI capture. Numbered markers match controls below; some controls require scrolling or another state.

1 Run log

Open it when an operation reports a real error or warning. Keep the first failure text, build identity and scan folder when reporting a problem.

2 Auto-connect

Requests connection to configured camera, stage, light and air/vacuum services on app startup. It does not bypass device errors.

3 Digital twin setup → Show digital twin

Opens the optional diagnostic stage drawing under Stage settings. It is no longer inside the Scan map box.

4 Stage X/Y size / Twin dynamics

Configures the drawing and disconnected simulation. Connected controller limits/speed reports take precedence where available.

5 Synchronization calculator

Expands an offline calculation for speed, acceleration, encoder resolution and recipe limits. Calculate synchronization shows rate, ramp distance and counts/line.

6 Export recipe

Exports the offline stage recipe. It does not configure physical controller safety limits or validate wiring.

DO THIS

1. For a failed action, read the first relevant error before retrying.
2. Use the footer build ID when reporting behavior; reload an idle window after an interface update.

36 / SCREEN & TASK

Walkthrough: a complete scan

Main window → settings → acquisition → inspection

DO THIS

1. Connect the stage and lights. Confirm working bounds, homing, chuck state and a clear sample path.
2. Camera card: choose sensor width and magnification, Apply, then select the intended light channels and ON.
3. Start Live, adjust signal without saturation, Find best focus or jog Z, inspect and Save Z.
4. Scan settings: enter Width, Length and overlap. Calculate scan points and inspect sampling, strip count and line count.
5. Scan area setup: place the area, accept the start and verify bounds/run-up. Set scan and travel speeds.
6. Camera → GPIO: Apply Trigger mode On/Off. Trigger setting: set output, input, spacing and pulse width. Choose save destination/format and Apply.
7. Press Start scan. In Scan status, confirm Line trigger ON or OFF by camera readback. Watch acquisition and processing separately.
8. Wait for Reconstruction ready. Inspect all seams at multiple rows, then save/export measurements and retain original files.

37 / SCREEN & TASK

If a button or result is wrong

> Use the control's state and first error

1 Start scan disabled	Finish/apply the plan, confirm area placement and device readiness, and end conflicting Live/recording work. Read the displayed reason.
2 Preview blank or unstable	Check that the window runs the installed build, then reopen the viewer after the app is idle. Read preview errors in Run log. Do not delete raw strips.
3 Last pass saved but reconstruction pending	Watch Alignment/Blending/Saving. The final step composes the entire mosaic, not just the last strip. Wait for ready or a specific failure.
4 Alignment incomplete	Inspect rejected seams and raw overlap texture. Retain scan.json and source strips; do not describe the file as correctly aligned just because it saved.
5 Pulse too wide / camera refusal	Compare speed, nm spacing, pulse width and gap. Check the selected input and readback; correct sampling as well as timing.
6 No LSF width or mm distance	Choose a suitable region/direction and inspect the plot crossings. For mm, supply a valid physical scale; a missing measurement is not zero.

DO THIS

1. Report the exact button, first error, build ID and scan folder, with the affected view visible.
2. Preserve original images and metadata before any reconstruction repair.

FIND A BUTTON

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FIND A BUTTON

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