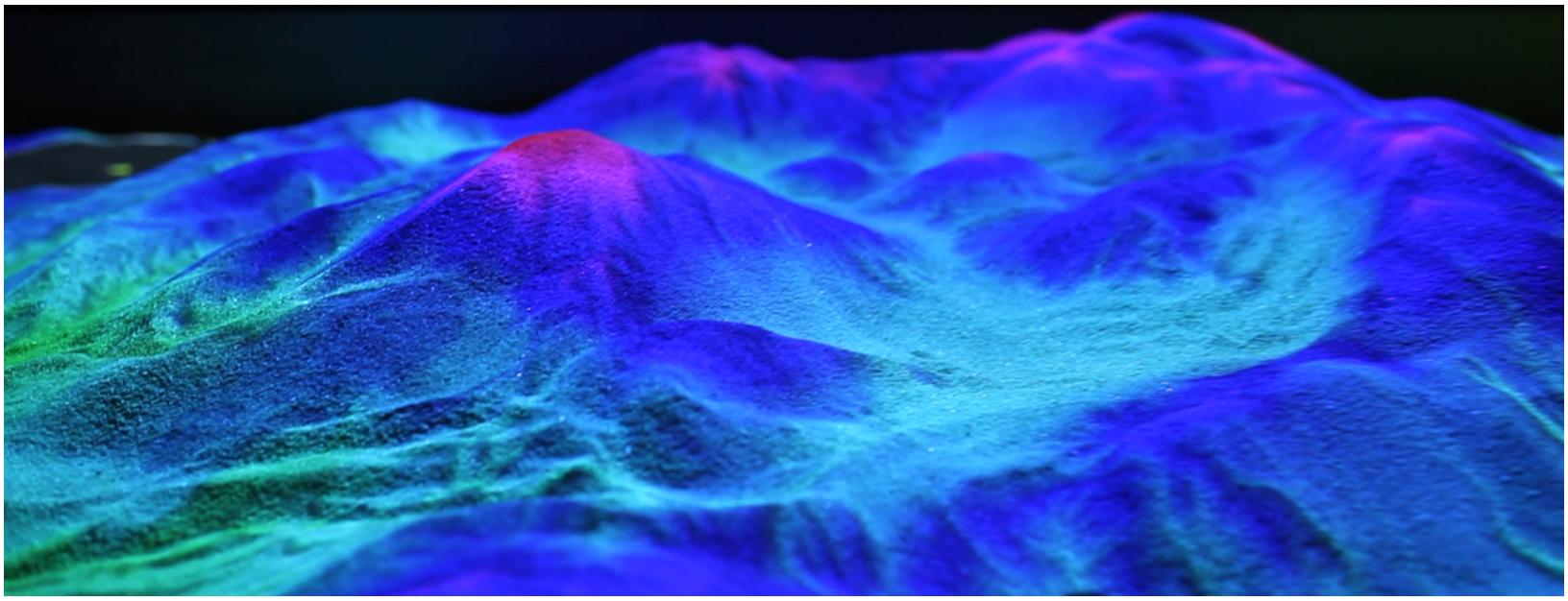
simtable

AnyHazard Manual



The 5-minute quick setup video is at

https://simtable.com/support



Simtable™ and AnyHazard™ User Manual

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    b. Power Up Sequence
    c. Startup
    d. Quitting and Reloading Software
    e. Camera Calibration
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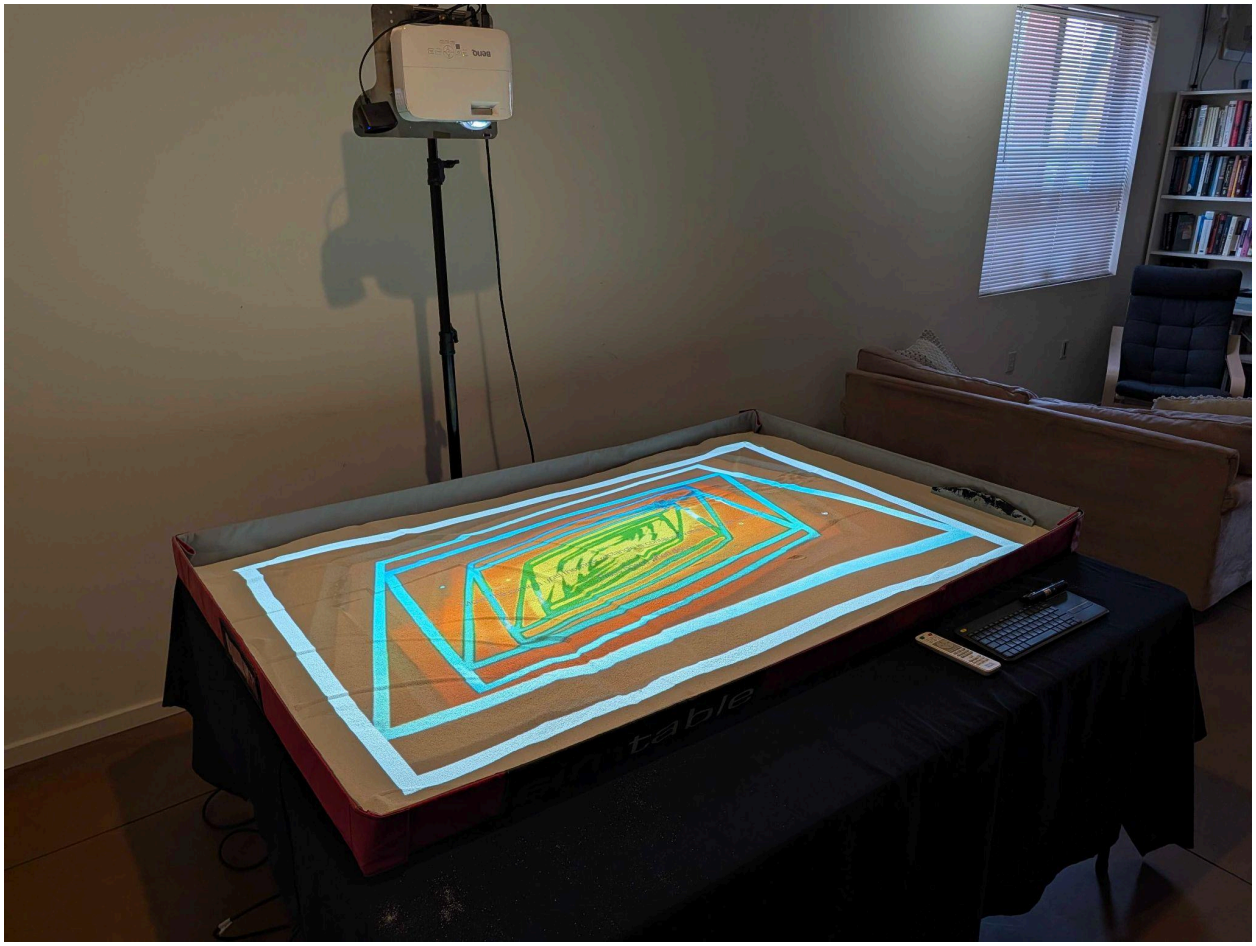
2. **AnyHazard™ User Interface (v2.22.0)**
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1. Simtable™ Table Setup

1.a Table Location Determination

Ideally a location near a power outlet, out of direct sunlight[1] and in a space with dimmable lights should be chosen to set up the Simtable. Typical low-light office conditions are sufficient. If possible, set up under a canopy, closing any blinds or drapes in the room. If the building or room does not have Wi-Fi available, the ethernet port on the back of the Mac Mini can be used. Our standard sand table measures 45 by 72 inches. Once a surface has been chosen to place the table, evenly distribute the sand onto the sand table, smoothing it out.

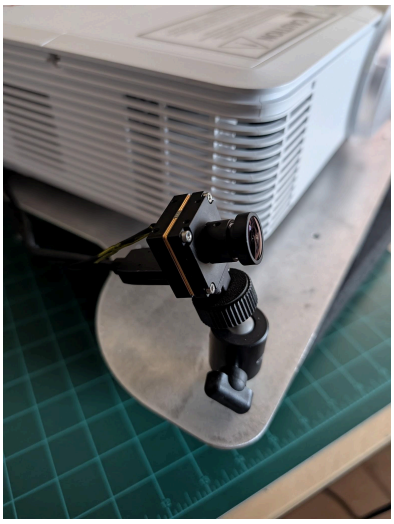


[1] Technically, the area where the table is set up should be 400 lux or less. Free light meter apps for both iOS and Android devices can be downloaded. If you need to set up in a place with bright overhead lights, a 10x10 canopy (available at Walmart and other stores) can be used.

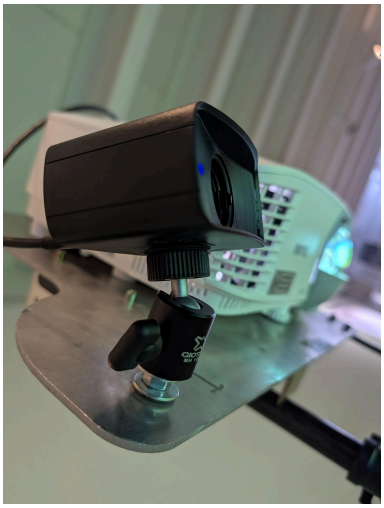
1.b Power Up Sequence

Attach the Simtable head unit onto the stand. Before the projector is turned on or the Simtable head unit is raised, proceed through the following checklist:

Simtable Generation 1 and 2: The back side of the camera has two cable connections to the projector.

Generation 1 Camera	Generation 2 Camera Style 1	Generation 2 Camera Style 2
		

1. Check the VGA and trigger cable connections. Look to see that the VGA end of the trigger cable is in the VGA OUT port on the projector.
2. Check the VGA connection from the computer to the projector and USB camera connection, make sure the VGA Connection from the computer is connected to VGA 1.
3. Check to see that the small white connector is in the camera and seated and positioned correctly (not bent).
4. Check to see that the USB cable is connected to the computer and to the camera.

Generation 3 Camera


Simtable Generation 3: The back side of the camera has one cable connection to the projector.

1. Check the connection between the HDMI cable on the computer and projector.
2. Check the connection between the USB-C cable on the camera and the computer.

Remove the projector's lens cover and power it on. Once you see a blank image projected onto the table from the projector, power on the computer, and raise the head unit. Enlarge the projected image to completely fill the sand table. When you see the Simtable loading screen, adjust the projector focus to ensure a sharp image.

1.c Camera Alignment

When AnyHazard™ first starts it will show a camera alignment screen if it detects a camera. The goal of this screen is to help the operator achieve good camera alignment and focus. If the white square is completely contained inside of the camera view and the lines are not blurry then this step can be skipped by clicking the space bar.

The camera adjustment screw is located between the metal plate and the camera. A half counterclockwise turn will loosen the camera and allow it to pivot freely, then it can be aligned. This task can be tricky for a new operator. The goal is to position the camera so that all of the white box is visible to the camera and focused so that the lines are crisp. When it is done properly, it should look like the photo below.



Next, focus the camera by turning the lens. It is possible to unscrew it too far, but it will not cause permanent damage. A meticulous operator may clean the lens at this point.

When everything is ready, press the spacebar and AnyHazard™ will continue with its calibration procedure.

1.d Quitting and Reloading Software

Before breaking down an operational unit, it is best practice to shut down the computer and projector. To quit, press the “Windows” key or command key (⌘) and ‘q’. From there, you can shut down the computer, or connect the Wi-Fi, update the software, etc. If you want to reload the Simtable software, press the “Windows” key or command key (⌘) and ‘r’.

1.e Camera Calibration and Hotkeys

If after shaping the sand you still see blank spots, or if the table or stand are bumped, the following tools can be used to check the camera alignment, see any blank spots and calibrate the camera if needed. These **hotkeys** will only work if the **Laser is ON**. Check the upper left corner to see that the laser status is “ON”.

Alignment (‘a’ key)— This will show the camera alignment screen which is helpful to see the camera image and the current alignment. If the camera alignment looks good, and the image is in focus and visible, press the spacebar to exit. If you made some adjustments and pressed the spacebar to exit, press ‘c’ to re-calibrate the camera.

Blank Spots (‘b’ key)— This will show the blank spots on the table. When this is active, you will see a gray square overlay on the screen representing the blank spots in the system. The software will interpolate over them. If there are large areas that are grayed out, then the camera alignment screen should be checked. If it looks good, press the ‘b’ key again to turn off the blind spots overlay.

Calibrate the Camera (‘c’ key)—This will calibrate the camera. If you changed anything on the alignment screen, changed the light level in the room, or are having issues after sculpting the sand, use this key. After you have recalibrated the camera, use the ‘b’ hotkey to see the blank spots on the table to ensure proper coverage.

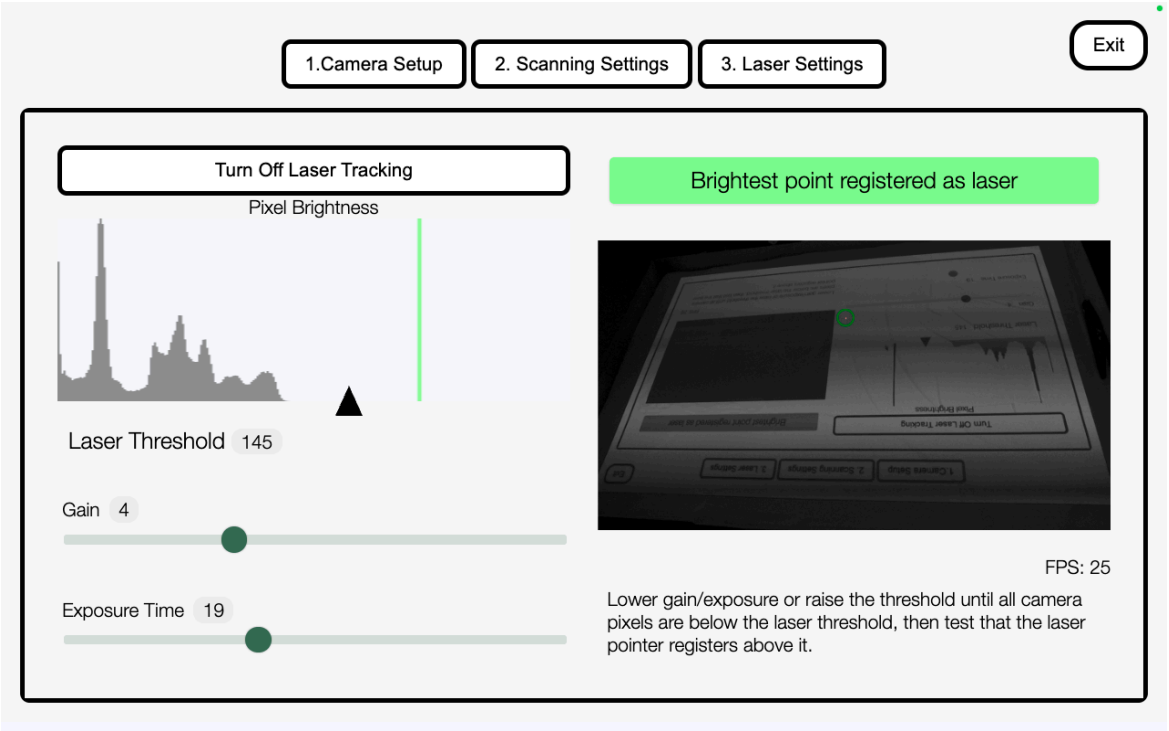
AnySurface Calibrator (‘L’ key)— This component has three tabs for managing the camera/projector pairing and laser interactions. You can open it by pressing the “L” key or clicking the Laser Status indicator in the top left corner of the AnyHazard main interface. Navigate between the three tabs by selecting the buttons on the top part of the interface.

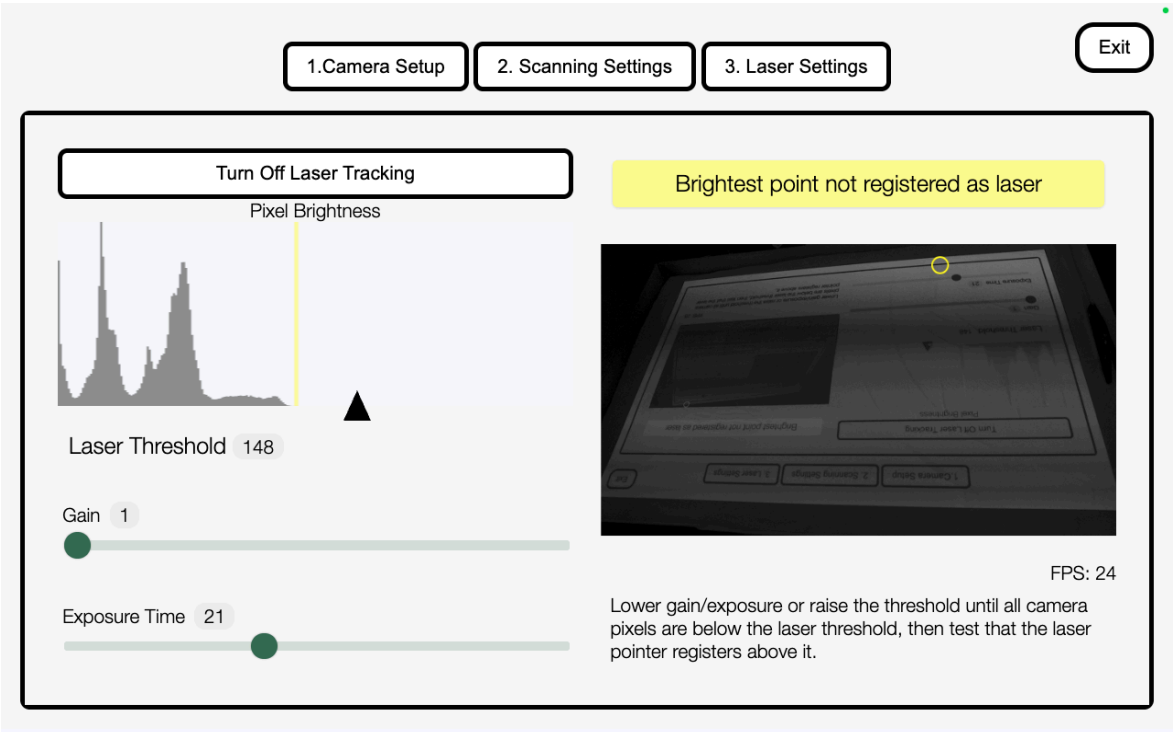
NOTE: This component **cannot** be operated with a laser pointer.

1.f Advanced Camera Calibration

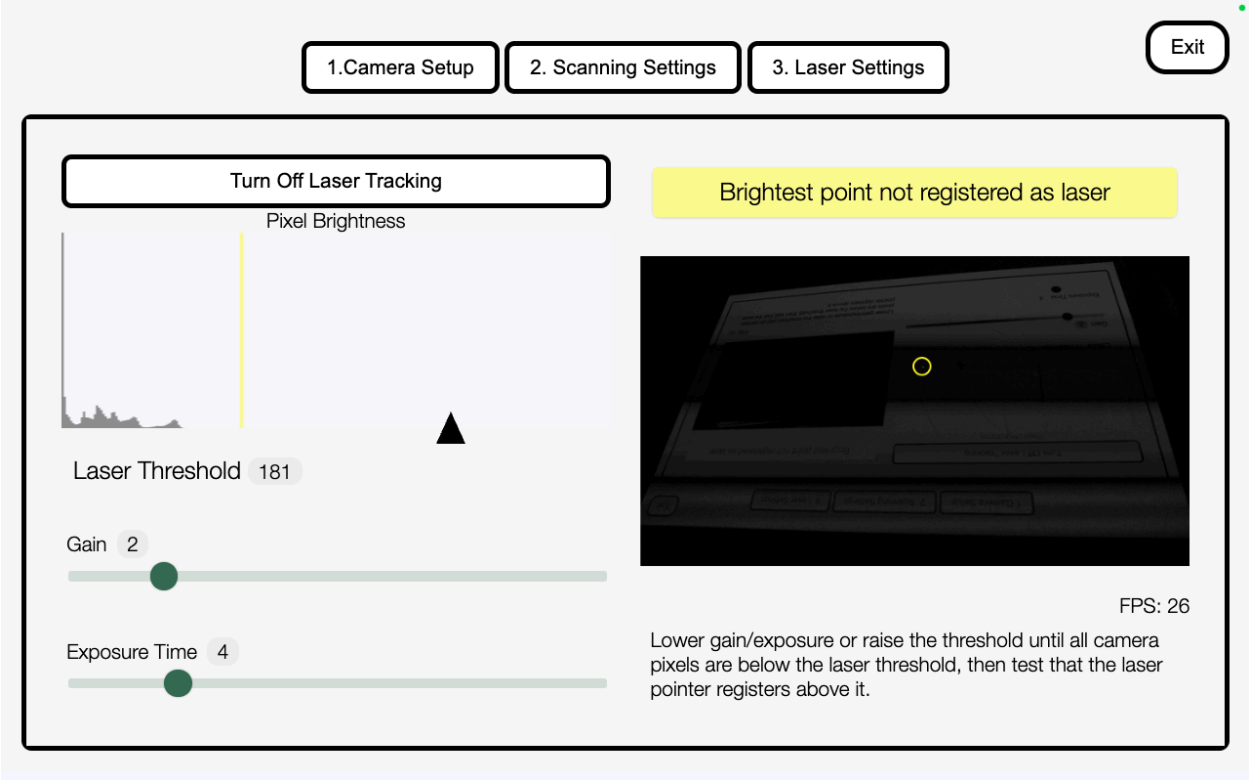
This component has three tabs for managing the camera/projector pairing and laser interactions. You can open it by pressing the “L” key or clicking the Laser Status indicator in the top left corner of the AnyHazard main interface. Navigate between the three tabs by selecting the buttons close to the top of the interface. Below are detailed instructions for how to use each tab of the AnySurface Calibrator. NOTE: This component **cannot** be operated with a laser pointer.

Laser Settings Tab - This interface will help you choose the correct settings for optimal laser tracking. Adjust the gain and exposure time so the line showing the laser point is yellow when there is no laser pointer. Adjust the laser threshold by moving the black carrot beneath the histogram up or down then do a laser event to see if the software detects the laser. It is recommended to keep the exposure time above 10 with the Elgato MK.2 Camera. You should only see the laser indication as green when there is a laser event happening on the table. If you are seeing confirmation of a laser event when there is none, you need to turn down the gain and exposure time then increase the laser threshold. If you are doing a laser pointer event and the table is not detecting a laser event, you need to turn up the gain and exposure and turn down the laser threshold. The tables ship with optimal settings for dimly lit indoor space. The best settings for laser tracking are found by tweaking all three settings (gain, exposure time and laser threshold) incrementally until you consistently only get laser events when there is a laser on the table. You can exit this calibrator by pressing ‘L’, ‘esc’ or the “Exit” button. You can also turn off/on laser tracking in this tab.

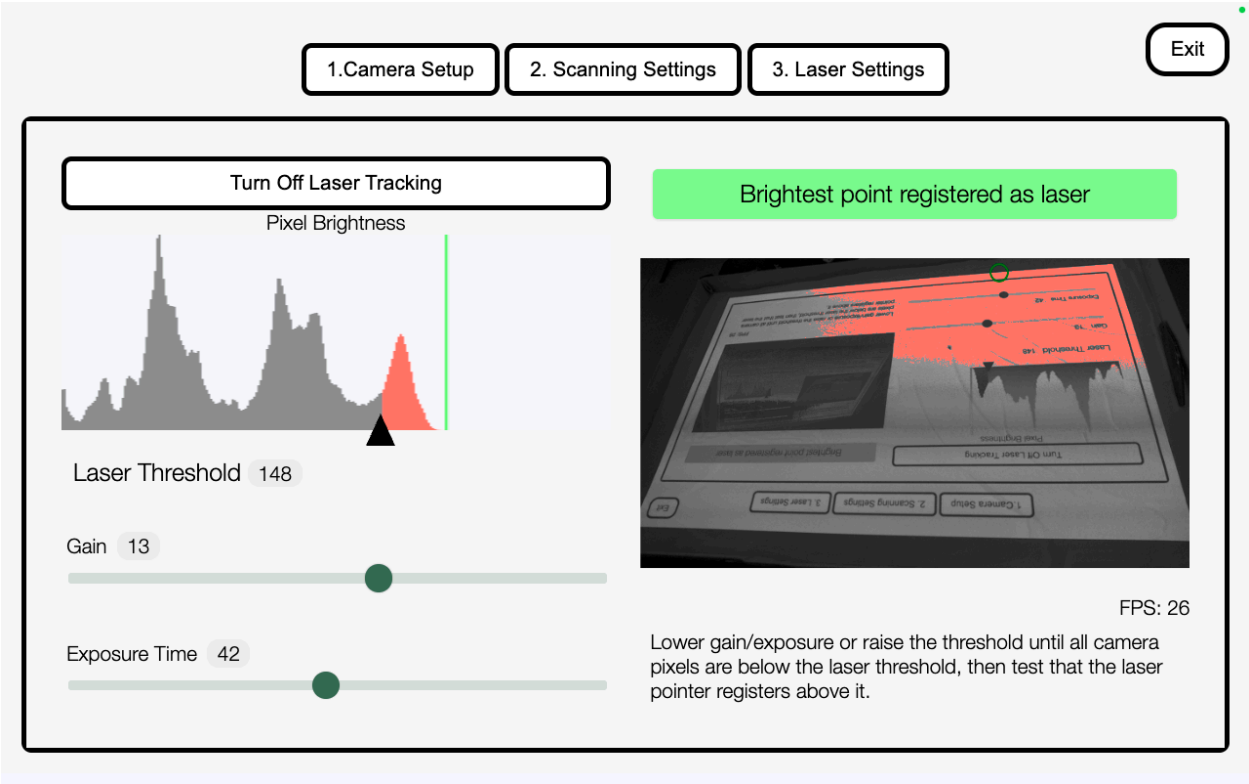




Good Laser Calibration - The two images above show how the laser calibrator looks during a good calibration. Pixel Brightness histogram shows only pixels below the laser threshold carrot except the green brightest point line when a laser is pointed at the table. With no laser, all pixels are below the laser threshold carrot on the histogram.



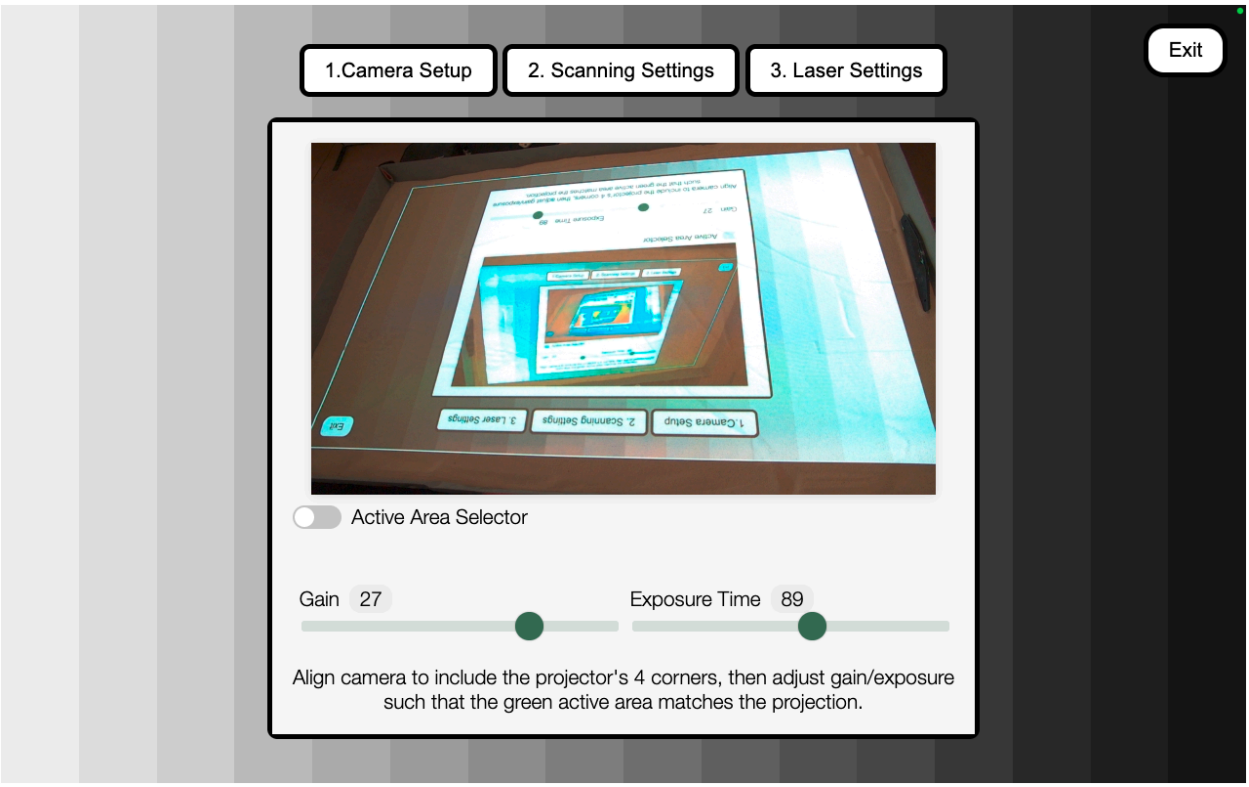
Bad Laser Calibration 1 - Gain and exposure are too low while the laser threshold is too high to detect a laser event. Even when the laser is on and pointing at the table, the brightest point is not detected as a laser.



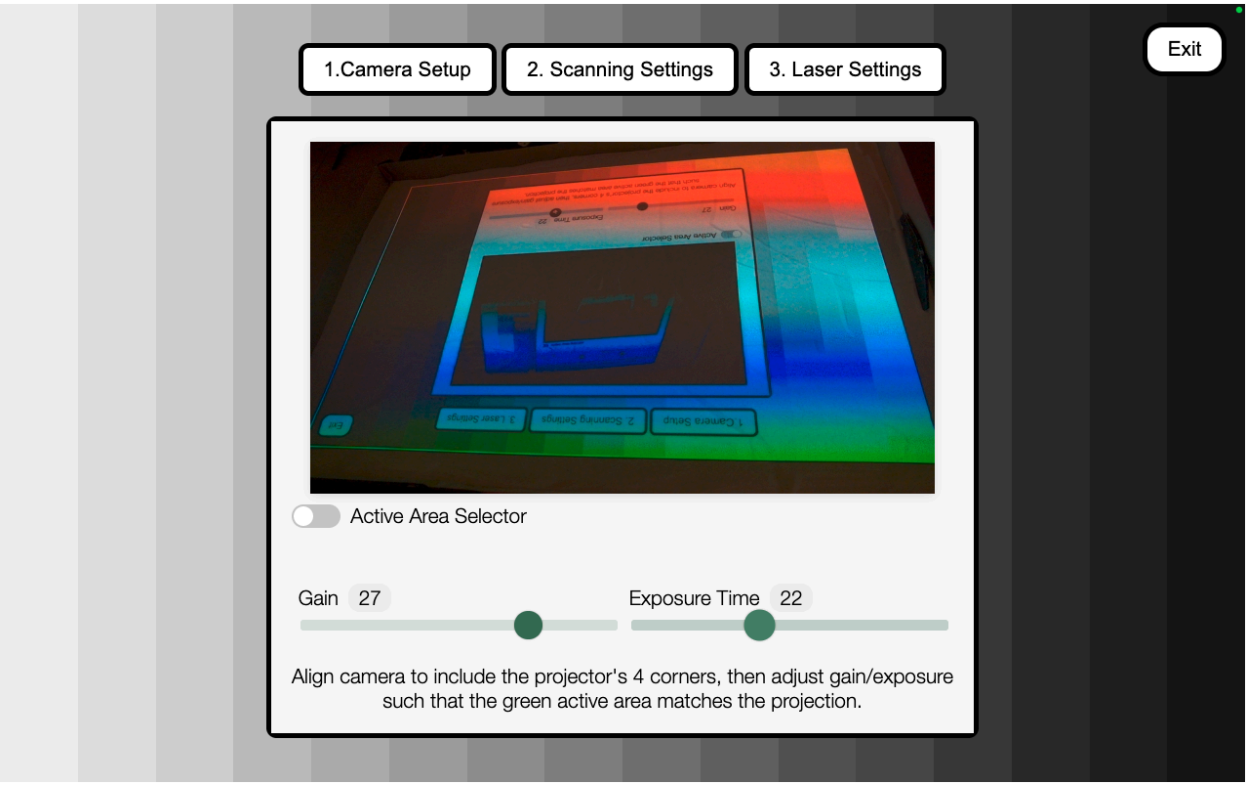
Bad Laser Calibration 2 - The gain and exposure are too high with the laser threshold too low. The pixels above the laser threshold are colored in red on the camera stream and the histogram. A brightest point is being registered even though there is no laser. For the laser pointer to work properly, there can only be one point in the camera stream that registers above the laser threshold.

Scanning Settings Tab - There are two modes in this tab. Scanning Settings helps calibrate the camera for optimal grey code scanning. The work flows below help you find the optimal settings for the camera to distinguish between black and white. After going through one of the two workflows below, press the **'c'** key to rescan the table. This should result in a better correspondence between the camera and projector. Press the **'b'** key to check for blank spots after redoing the scan.

Scanning Settings Mode 1 - Default mode with white to black gradient bars visible. Adjust the gain and exposure up or down until the entire gradient from white to black in the projection is visible in the camera image. You do this by comparing the color of the bar projected on the table to the color of the bar in the camera image.

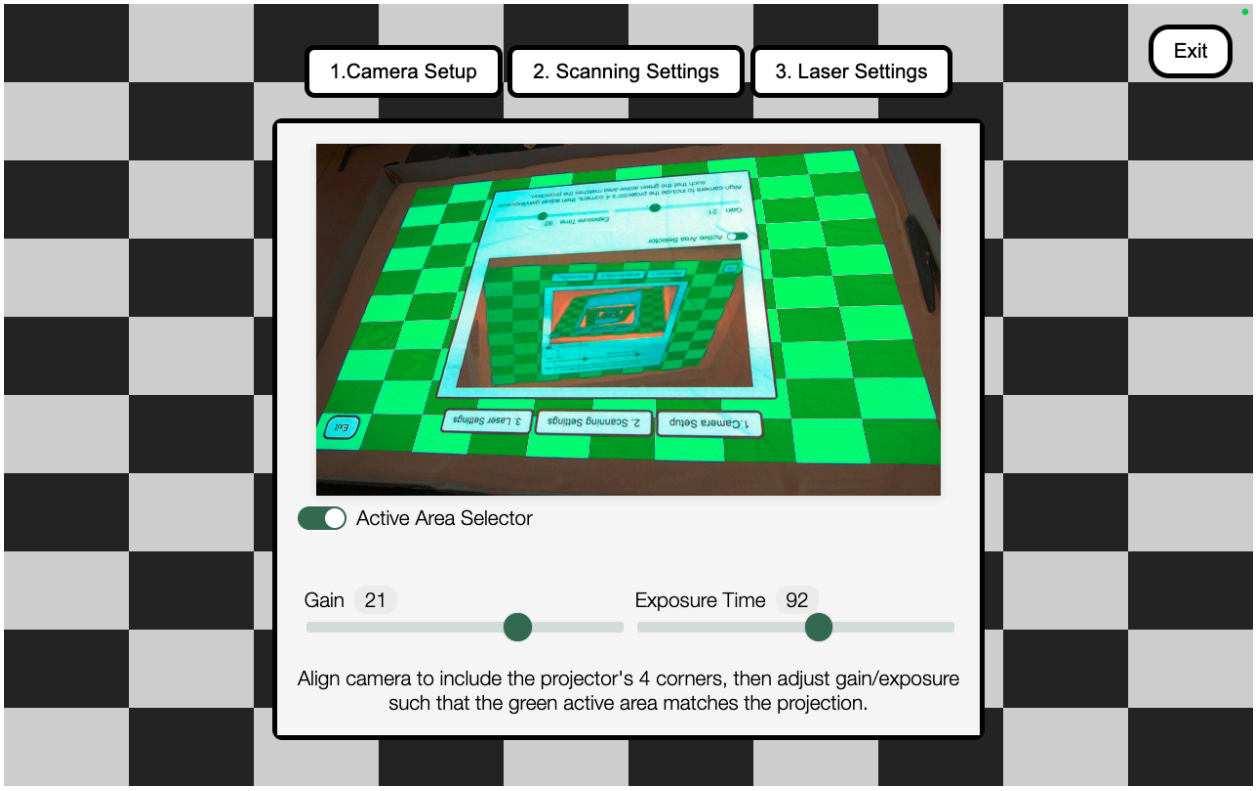


Scanning Settings Mode 1 Good Calibration - All gradients of grey projected onto the table are visible in the camera stream.

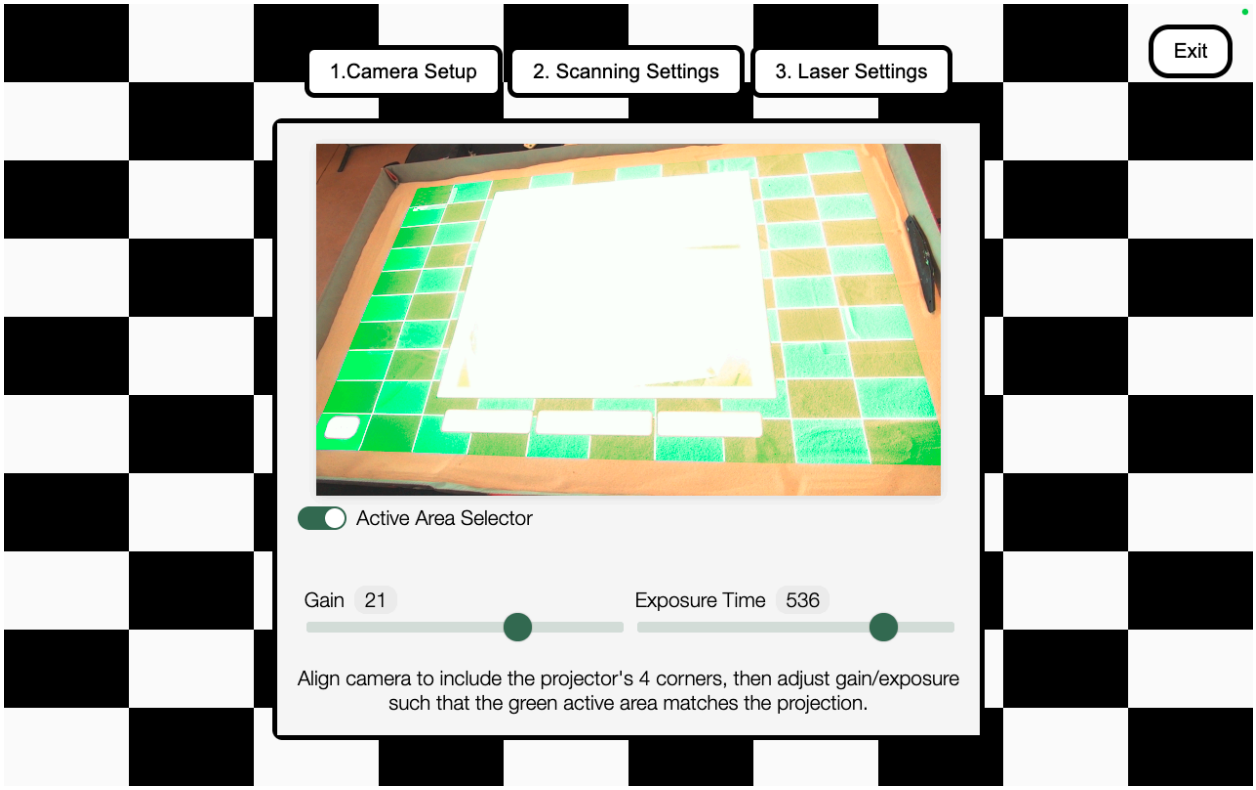


Scanning Settings Mode 1 Bad Calibration - Camera stream is showing rainbow colors, black and white bars are not visible in the projection. Exposure time and gain are too low.

Scanning Settings Mode 2 - Turn on Active Area Selector mode with the toggle button below the camera stream. This will cause a black and white checkerboard to alternate between frames. Anywhere the projection is changing will turn green - this is the area of the projection visible in the camera stream. Adjust the gain and exposure until the green area matches the projection.

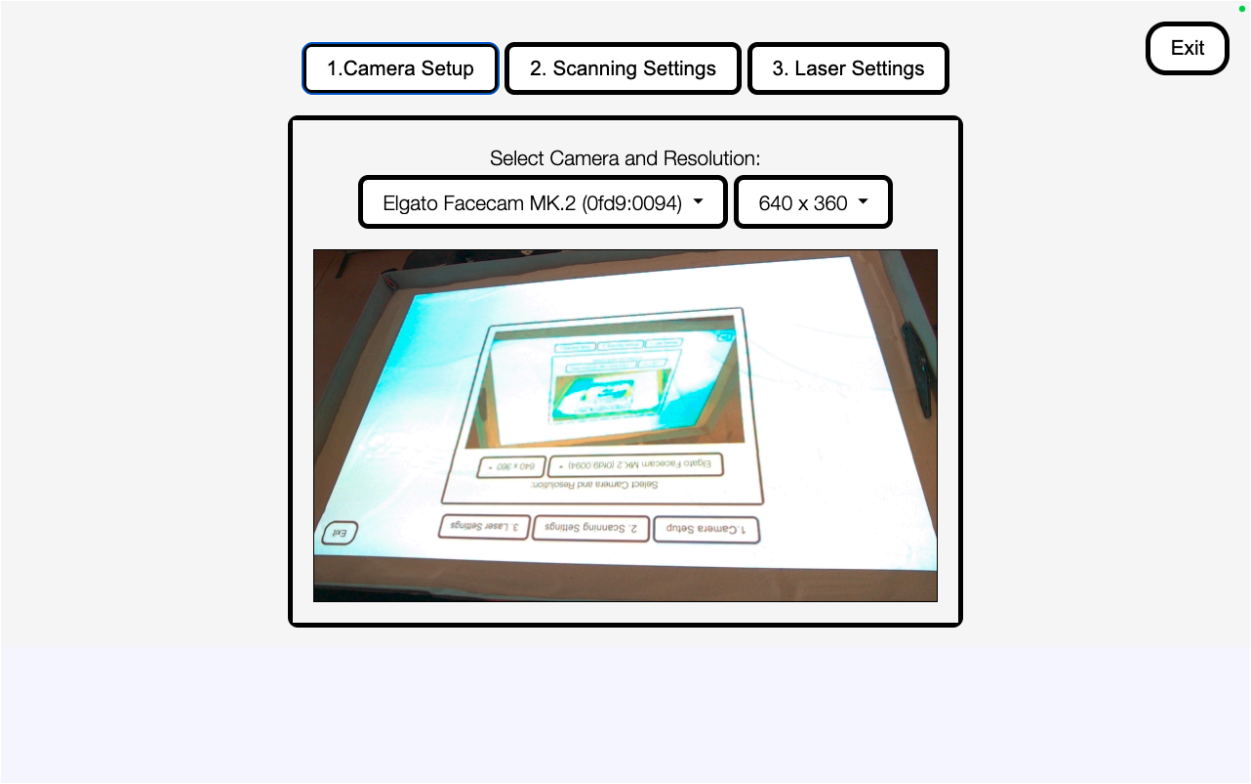


Scanning Settings Mode 2 Good Calibration -The projection is lined up in the camera image.The checkerboard which is switching between white and black boxes appears green where the camera detects a change in color between frames in the camera stream.



Scanning Settings Mode 2 Bad Calibration - The image is blown out, the differences between frames are not being properly detected with white lines showing up between the black and white boxes.

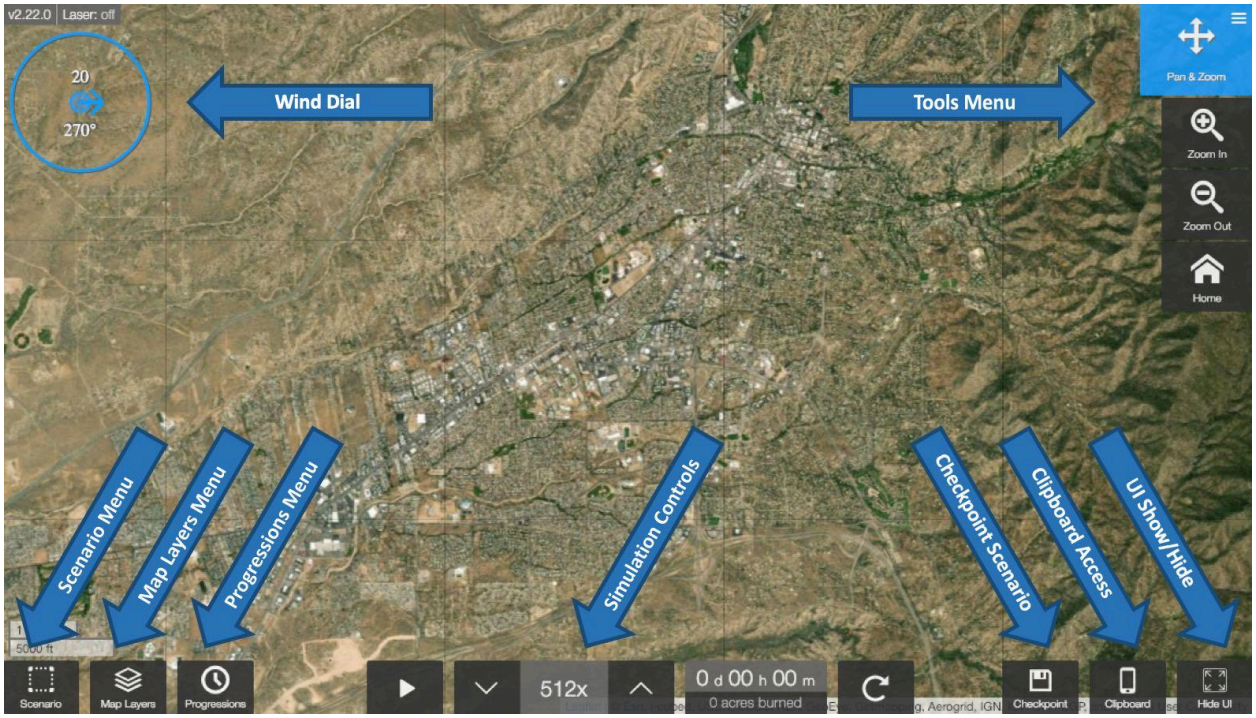
Camera Selector Tab - This tab can help you debug the camera connectivity issues. When you navigate to this tab, you will see the camera stream. If the camera stream is not available, there will be no stream. You can reselect the camera from the drop-down menu. There is also the ability to select a camera resolution on newer Simtable units. This can help with laser tracking performance issues. We have found preferred resolutions for the Elgato MK.2 camera to be “960 x 540” or “640 x 360”. When you change the active camera or camera stream resolution, you will be prompted to go through the camera alignment and grey code scan upon closing the AnySurface Calibrator.



Camera stream should be visible when in this tab.

2. AnyHazard™ User Interface

2.a Main Interface Overview



Laser Status Indicator

This shows the current status and version of the laser server the Simtable is running. Check this indicator when calling support to help our support team know what version Simtable you have.



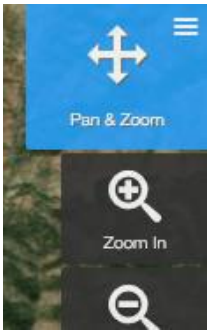
Wind Dial

This controls the wind speed and direction. The direction is shown in **degrees clockwise from the North,** indicating **where the wind is coming from**. The number in the middle displays wind speed in MPH (default is 0, max is 60.) The longer the arrow, the faster the wind speed. To change the wind speed and direction, position the laser or click the mouse inside the circle.



Tools Menu

The tools menu is your main menu for AnyHazard. The **Pan & Zoom** control will be selected by default. To change to a different tool, click or laser onto the top menu item, this will pull up the Main Menu. Select the desired mode by clicking or lasering over the menu item. The selected item will then be highlighted. Tools are discussed individually later in this section.



Scenario Menu

Clicking or lasering the **Scenario** button will pop up a menu of available scenarios. Change the scenario or create a new scenario here.



Map Layers Menu

To view the map layers menu, click or laser over the **Map Layers** button. This menu outlines Base Layers, Overlays, Simulation Layers and personal WMS Layers.



Progressions Menu

Progressions for After Action Reviews are available via the progressions menu. Click or laser the **Progressions** button to view available progressions.



Simulation Controls

This is where the current simulation is controlled and can be reset. Simulations can be played/paused and the speed determined. Simulation statistics, including time and acres burned, are displayed.



Checkpoint Scenario



Use the Scenario **Checkpoint** tool to save a snapshot of the scenario that is checkpointed. This allows the user to restart the scenario from that saved location.

Clipboard Access



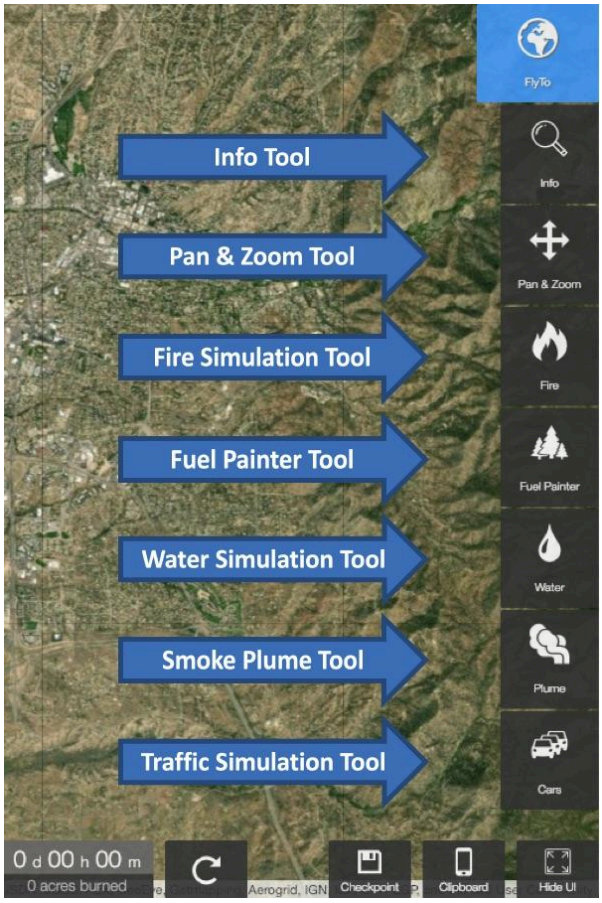
The **Clipboard** button provides access to the Clipboard. Link to Clipboard via a web link or QR code. **Note:** Do NOT click the link when running AnyHazard with the laser, the table will go to Clipboard which is not controllable with the laser pointer.

Show/Hide User Interface (UI)



This button will **Show/Hide** the user interface which includes the simulation status, the wind dial, the menus, and the buttons when selected.

2.b Tools Menu



Info Tool - In the information bar the elevation, fuel, and location data of a point on the map is displayed. To turn on this tool, click or laser the Tools Menu, then the Info button.

Pan & Zoom Tool - Controls the zoom in/out function, pans the map, or moves the map to the default location. Click or laser the Tools Menu, then select the Pan & Zoom button to use. Pan & Zoom does not change the active area.

Fire Simulation Tool - To run a wildfire simulation, open the Tools Menu and click or laser over the Fire button. The simulation uses the Anderson 13 fuel model and is based on a ground spread model.

Fuel Painter Tool - To alter fuel conditions, open the Tool Menu and select the Fuel Painter button. Change fuel type and density to see impacts on fire spread.

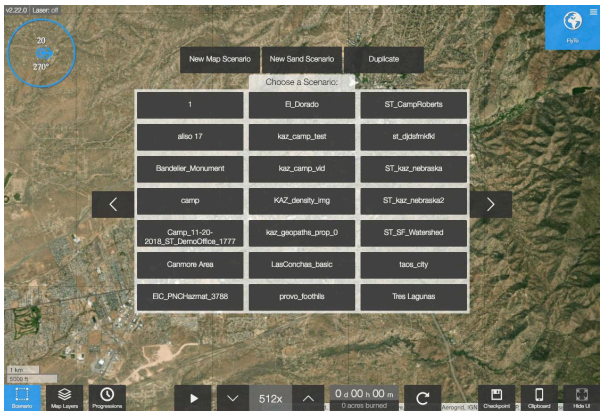
Water Simulation Tool - To start a flood on the current scenario, open the Tools Menu and select the Water button. Use this to run different rain and flooding models.

Smoke Plume Tool - To create a plume model, click or laser the Tool Menu and select the Plume button. Different types of smoke can be modeled using the Plume tool.

Traffic Simulation Tool - This tool lets users add traffic to the map. The traffic control menu will only be selectable when there is a road network. Select the tool and then click or laser over a spot where you want to add cars.

2.c Scenario Menu and Clipboard

Select Scenario - Open the Scenario Menu by clicking or lasering the Scenario button. A menu will pop up with the available scenarios. You can then select/change the scenario or create a new scenario. The current scenario will be highlighted. If you don't see the scenario you want on the current page, click or laser over the left or right-facing arrows. Once you see the scenario you want, click or laser over it.



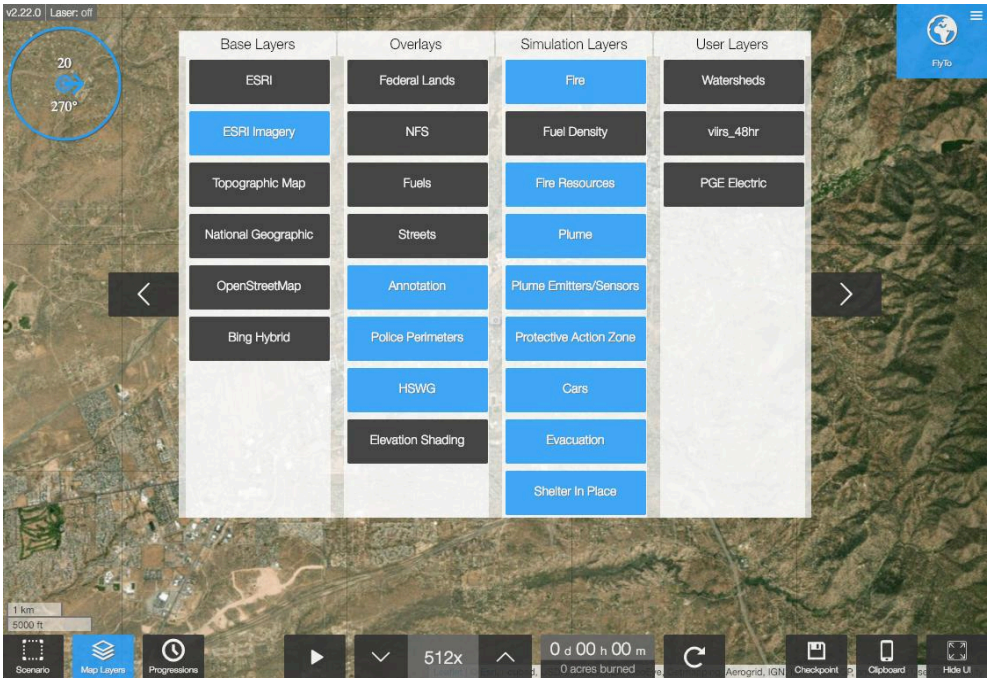
Create Scenario - To create a new map scenario, select **New Map Scenario** from the **Choose a Scenario Menu**. Create a map by zooming and panning to the location you would like for your new scenario. The search box can help you find a location by name. Once you find the area you want, click on the Enter a Scenario Name text box, and give your scenario a name **(required)**. After naming your scenario, click the save button.



Clipboard - To the right of the simulation controls is the Clipboard button, this will open a popup window that will give you a clipboard link for the current scenario. To view the clipboard popup, click or laser over the clipboard button. If your tablet or laptop has a QR code scanner application, scanning the QR code will give you the clipboard link. To close the popup, click or laser over the close button or over the clipboard button.



2.d Map Layers Menu



To open the **Map Layers** menu, click or laser over the Map Layers button. In this menu, there are four columns. The first column is the **Base Layers** list. Only one Base Layer can be on at a time. Default layers for AnyHazard™ include **ESRI**, **ESRI Imagery**, **Topographic Map**, **National Geographic**, **OpenStreetMaps**, and **Bing Hybrid**. The current Base Layer will be highlighted. To change the Base Layer, click or laser over the one you want. If the internet connection is lost, you may see black for the Base Layer.

The second column is the **Overlays** list. These are the overlays that cover the simulation area. If your chosen Base Layer is missing the federal land boundaries, then use the **NFS** and/or **Federal Lands** to see them. The **Streets** layer will be grayed out if there are no roads loaded. If you see this then you will not have the ability to do evacuations or fire engines.

The third column outlines the **Simulation Layers**. The main simulation layers are **Fire**, **Plume** and **Cars**. The Fire Model has one minor layer related to it called Fire Resources. The Plume Model has Plume Emitters/Sensors, and Protective Action Zones. The last two layers on the list are related to the Evacuation Model. If you want to add Evacuation or Shelter in Place area, you will need to use Clipboard.

Lastly, the fourth column shows custom WMS **User Layers** imported from customer GIS servers. Contact us at support@simtable.com to add a layer for your table.

3. AnyHazard™ Simulation Modules

3.a Simulation Controls



Play/Pause Simulation - The white PLAY arrow icon is shown on the left in the image above. This indicates if the simulation is paused or not. Clicking or lasering over the button in this state will play the simulation. If you see the pause bars highlighted in blue, the simulation is running. When you click ‘ignite a fire’, place an ‘emitter’, or place ‘cars,’ the simulation will start.

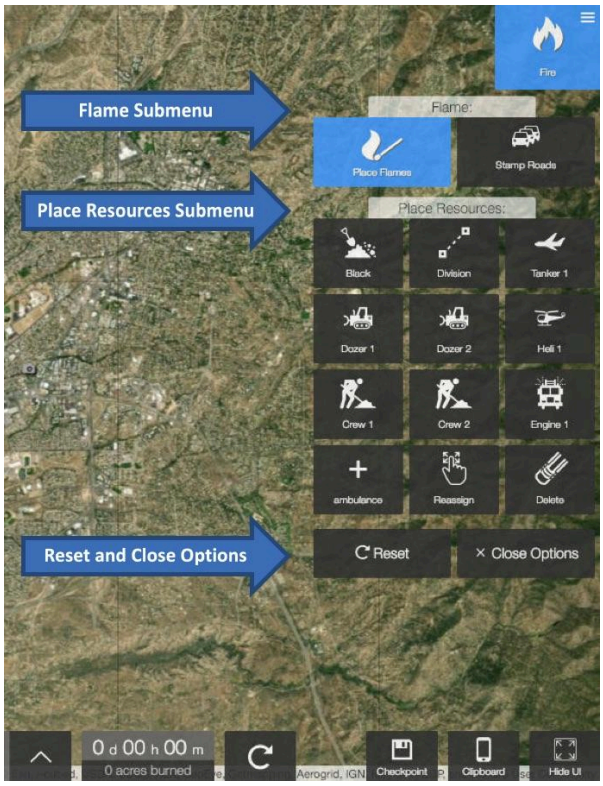
Simulation Speed (Decrease and Increase Speed) - The next items are the simulation speed controls. The slowest time is 1 or real time and the fastest is 65,536 times real time. The Speed multiplier goes up and down by multiples of 2 (i.e. 2, 4, 8, 16,). To turn down the speed, click or laser over the decrease speed button. To turn up the speed, click or laser over the increase speed button. The current speed multiplier is displayed in the middle of the speed controls.

Simulation Status (Time and Acres Burned) - To the right of the simulation speed controls is the status showing the simulation time and acres burned output. The top is the simulation time, and the acres burned on the bottom. The time output is ordered by days, hours, and minutes.

Reset Simulation - This button will reset the current simulation to the beginning or to the most recent checkpoint.

3.b Fire Simulation Menu

Opening up the Fire Simulation Menu displays two available submenus. The top **Flame Submenu** includes the **Place Flame** ignitor tool and the **Stamp Roads** tool. The lower **Place Resources Submenu** contains resource management tools and is followed by the **Reset** and **Close Options** buttons. Upon opening the Fire Simulation Menu, the **Place Flame** ignitor tool will be selected.



To use the ignitor tool, click or laser over the **Place Flame** button. Clicking or lasering over a desired point on the map will start a spot fire in that location. When a spot fire is placed, the simulation will start.

The **Stamp Roads** tool changes the fuel type layer. It causes the simulation to treat major roads as very stable fire lines and minor roads as medium stability fire lines.

The **Close Options** button will hide the submenus. To open up the submenus again, click or laser over the menu or selected tool. The **Reset** button will reset the simulation.

Black Line Tool - Creates a fire break along the line drawn. Click/laser and drag over the simulation area to create black lines.



Division Tool - Draws division lines and breaks. Click/laser and drag over the simulation area to create division lines.



Tanker Tool - Simulates an air tanker drop. The tanker has a maximum length of 1000 meters (~3280 ft.). Click/laser and drag over the simulation area to create tanker lines.



Dozer Tool - Draws a dozer line. Click/laser over the simulation and start drawing your line. **Note:** Dozer Type 1 has a higher production rate than Dozer Type 2. Dozers can not cross big bodies of water or traverse very steep terrain.



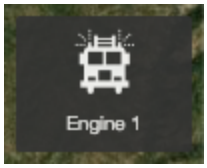
Helicopter Tool - Performs a Helicopter drop. To do a drop, select the tool and then click or laser over a point in the simulation area.



Hand Crew Tool - Puts down Hand Crews that follow along a path until they encounter a burned part of a fire. If the crew reaches the fire, they will start a one foot in the black line.



Engine Tool - To use the Engine tool, a road network needs to be loaded. To deploy, select the tool and then click/laser both the starting point and the endpoints. The engine will take the closest path from point to point.



Ambulance Tool - To deploy an Ambulance, a road network needs to be loaded. To deploy, click/laser both start and endpoints on the simulation. The ambulance will then take the shortest path between the selected points.



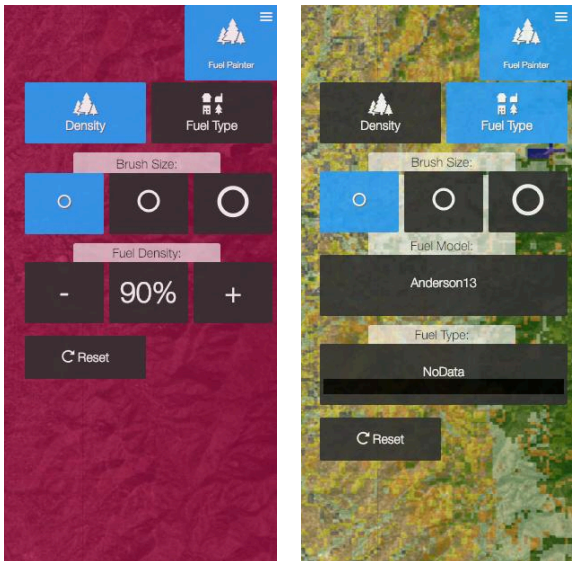
3.c Fuel Painter Menu

To view/alter the fuel model, select **Fuel Painter** from the main menu. There are two main submenus: **Density** and **Fuel Type**.

In the **Density** submenu, you can select a density value from 0% to 100% in 10% intervals, and a brush size to paint on the scenario.

In the **Fuel Type** submenu, you can select the **Fuel Model**, **Fuel Type**, and paintbrush size to alter the simulation fuels.

The **Reset** button at the bottom of the **Fuel Painter** submenu resets the fuel model to the original one loaded in.



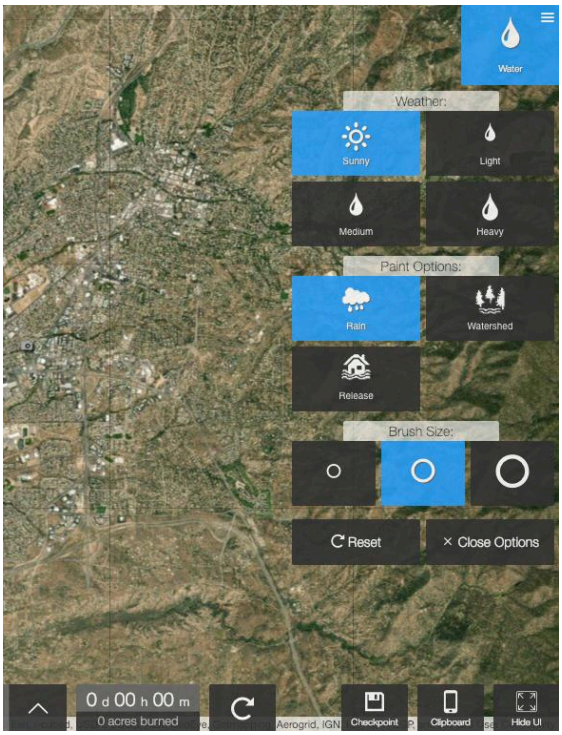
3.d Water Simulation Menu

To add water to the current scenario, select the **Water Tool** from the main menu. In the Water Tool, there are 3 submenus: **Weather**, **Paint Options**, and **Brush Size**.

In the **Weather** submenu, the default weather mode is set to **Sunny**. The three rain modes are **Light**, **Medium**, and **Heavy**. These modes drop water in the area of the scenario. To turn them off, select the **Sunny** or **Reset** button.

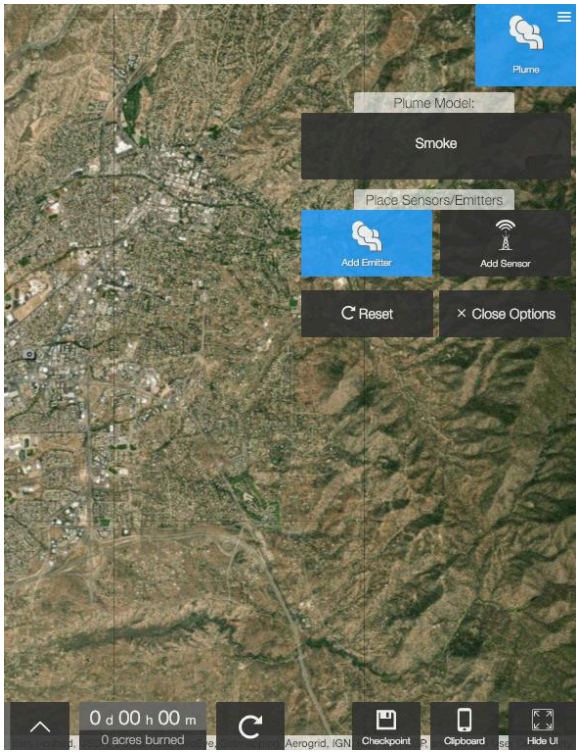
To induce spot flooding in areas of the scenario, select **Rain** in **Paint Options**. Select the brush size and then select a spot in the simulation area.

To view the **Watershed** select from **Paint Options** and click/laser a location in the simulation area. Select **Release** to view a large water release from a clicked/lasered location. **Note:** A simulation speed of approximately 1024x is recommended for optimal visualization. Water does not put out the fire.



3.e Plume Simulation Menu

To run a plume model, click or laser over the **Plume** button from the main menu. There are two submenus: **Plume Model** and **Place Sensors/Emitters**. The initial plume model selected is **Smoke**. Note that the **Clipboard** can be used to select and tune the plume model.

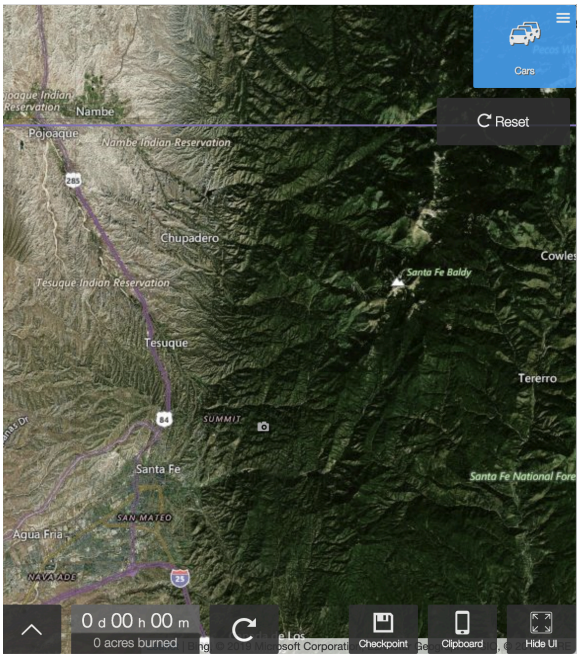


To add a smoke plume, select the type of plume model you would like to simulate in the **Plume Model** submenu. To add an emitter of that type, select **Add Emitter** from the second submenu and select the location where you would like it to be added in the scenario. Similarly, to add a sensor to read a particular type of plume, select **Add Sensor** from the second submenu and click or laser a position in the scenario.

Like with the Water Model, a speedup of the simulation to approximately 1024x is recommended for optimal visualization.

3.f Cars Simulation Menu

AnyHazard™ has the ability to read road data from OpenStreetMap for a simple traffic model.



This mode works like a paintbrush. Either laser or left click and drag the mouse to put cars down. These cars are affected by evacuation and shelter-in-place zones, which can be added through the clipboard.

If the area of interest is too big and roads fail to load, you will see a warning, and some features will not be available.