Seek Simple Viewer

User Manual

The Seek Simple Viewer is an application written by Seek Thermal using the Seek Thermal SDKs with OpenGL primitives. Seek Simple Viewer is a more robust example of what is capable using the Seek Thermal SDKs. In addition, the Seek Simple Viewer can be used to quickly image, test, and adjust a Seek Thermal OEM Camera Starter-Kit.

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Download & Install the Seek Simple Viewer

1) Open any web browser and type https://developer.thermal.com/ and in the middle of the page you will see the Seek Thermal Simple Viewer download icon.

Note: If there is not already a Seek's Developers Portal account in place, a new account will need to be registered.

2) Download the *SeekSimpleViewer_x64.msi* installer if you are using a Windows 64-bit OS or if using a Linux AMD 64-bit OS download the *SeekSimpleViewer_amd64.deb* installer.

3) Double click on the installer to install the Simple Viewer.

4) Open the Seek Simple Viewer application and plug in your Seek Thermal OEM Camera.

5 Main Areas of the Simple Viewer

The Seek Simple Viewer can be summarized into five main areas or twelve different sections and subsections. Here is a description of the five main areas and their locations:

1 – The "Version" section contains the Seek Simple Viewer Application version number and SDK version number.

2 – The "Cameras" section is where the Seek camera sensors will be discovered if they are plugged into the PC's USB ports and the drivers have been installed properly. Select a camera from the drop down and hit the **Start** button in the Camera Control section to connect to, query, control, and image the camera.

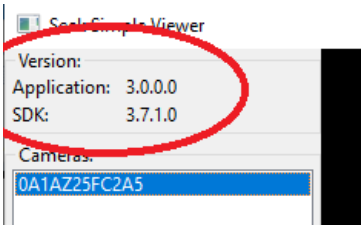
3 – In this section of the Simple Viewer the camera image is displayed in the color palette and AGC mode and parameters that are configurable by the user.

4 – This displays the Scene Minimum, Scene Maximum, and Invisible Center Spot temperatures calculated from the Seek SDK that are currently in the scene. To change the unit of temperature, simply expand and select an option from the "Temperature Units" dropdown section.

5 – Here the camera's Image Settings can be selected or adjusted through the SDK. There are controls such as AGC Mode, Color Palette, HistEQ Gain and Trim controls, as well as some basic filters. These settings can be used to optimize or adjust the image of your Seek Thermal Camera depending on your application.

Version

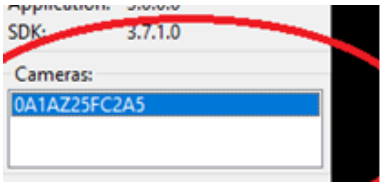
This section shows both the Seek Simple Viewer application version and more importantly the Seek SDK version.



Note: The SDK version is important to note when developing. Trying to use earlier SDK versions than what are listed in the Simple Viewer application itself may cause some discrepancies in camera performance.

Cameras

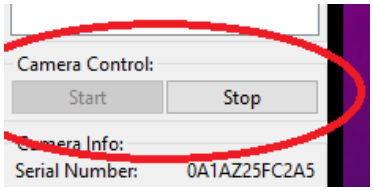
This is a list of the available and recognized Seek Thermal devices by Serial Number. Select a camera from the list, which will be highlighted in blue once selected, and press Start in the Camera Control section to connect and image the Seek Thermal device.



Camera Control

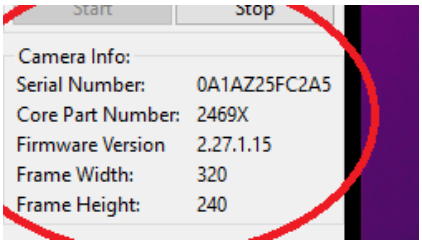
Once a camera is selected it can be connected for control, data acquisition, and imaging in the Simple Viewer.

- Press the **Start** button to connect to the selected camera and start imaging.
- Press the **Stop** button to disconnect and stop imaging from the connected camera.



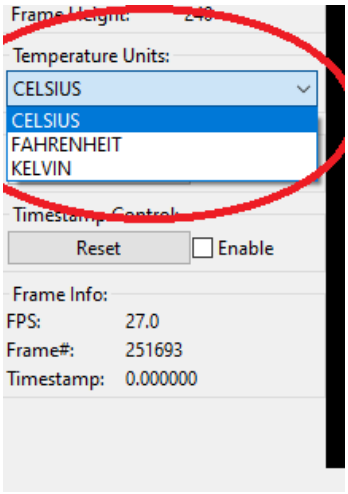
Camera Info

This contains general information about the camera like firmware version, serial number and more. This information becomes available once the camera has been connected to and started.



Temperature Units

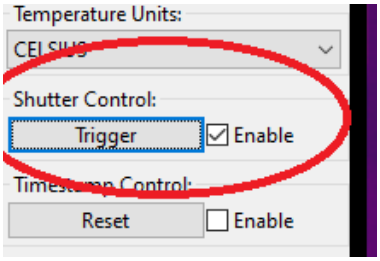
Select from 3 different temperature units. Seek SDK Min, Max, and Spot values are displayed in the bottom center of the application in the corresponding units selected.



Shutter Control

The Seek SDK allows for automatic shutter control.

- The **Enable** checkbox will enable or disable the Automatic Shutter.
- Press the **Trigger** button to trigger a shutter event at any time.



Note: It is highly recommended that the Automatic Shutter be Enabled at all times. This will correct any drift in gain the pixels may experience.

Timestamp Control & Frame Info

The Seek SDKs offer a Digital Time stamp with various controls along with frame information like system frames per second and the frame number.

- Enable or disable via the **Enable** checkbox.
- Reset the timestamp by selecting the **Reset** button**.**

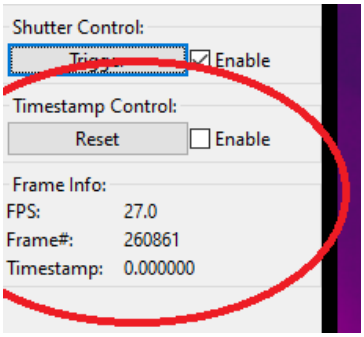
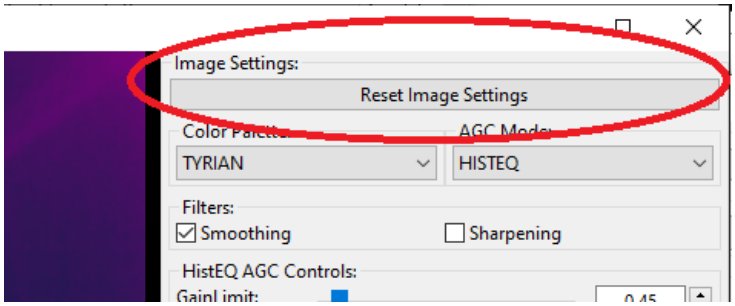


Image Settings

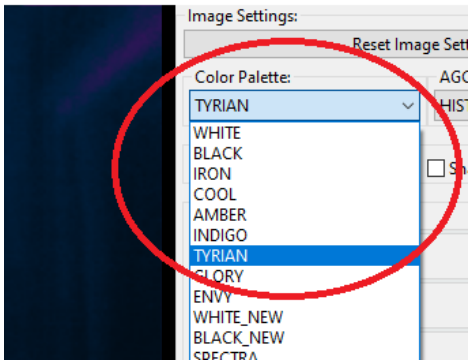
The latest version of the Seek Simple Viewer, v3.0.0.0 or later, offers more examples of imagery settings readily available in the SDK. SDK features to control or tune Seek's Automatic Gain Control or AGC algorithms have always been available in the Seek SDK; however, this version of the Simple Viewer highlights these features making it easier for developers to utilize the tool to optimize the core for a given application, housing, use case or more. For more detailed descriptions please see the Seek SDK User Manuals and examples. At any point in time, you can hit the Reset Image Settings button to return the camera to its default SDK settings.

Press the **Reset Image Settings** button to restore the default SDK settings for the Seek device.



Color Palette

Seek Thermal offers a variety of color palettes to choose through its SDK along with the ability for a user to create custom palettes. Some of Seek's more popular palettes are: TYRIAN_NEW, WHITE_NEW, BLACK_NEW, and IRON_NEW. Color Palettes are integrally tied to the AGC mode and parameter settings. Changing settings in one palette may have a vastly different effect in another palette.



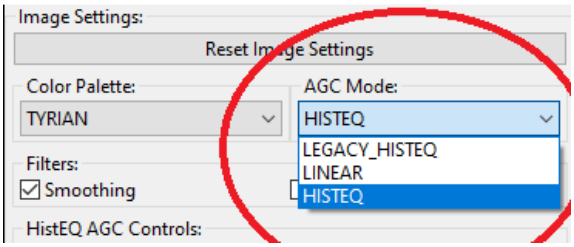
AGC Mode

Seek Thermal offers 3 different automatic gain control (AGC) algorithms to be used to image the camera data.

LEGACY_HISTEQ is a legacy fixed histogram based AGC algorithm.

LINEAR is a linearly based AGC algorithm mode where the user can run in automatic limit mode or with fixed upper and/or lower limits, see the Linear AGC Controls section for more details.

HISTEQ is the default and Seek's latest histogram based AGC algorithm with various controls and parameters to adjust how the algorithm performs, see the HISTEQ AGC Controls section for more details.



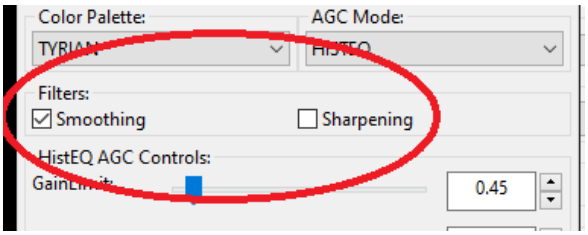
Filters: Smoothing & Sharpening

Seek Thermal offers the control of a few various filters that can be enabled and disabled.

The **Smoothing** checkbox enables and disables the smoothing feature, giving the image smooth edges and helps with scene movement.

Note: Seek highly recommends the smoothing algorithm be enabled at all times.

The **Sharpening** checkbox enables and disables the sharpening feature, giving the image more crisp and pixelated edges.

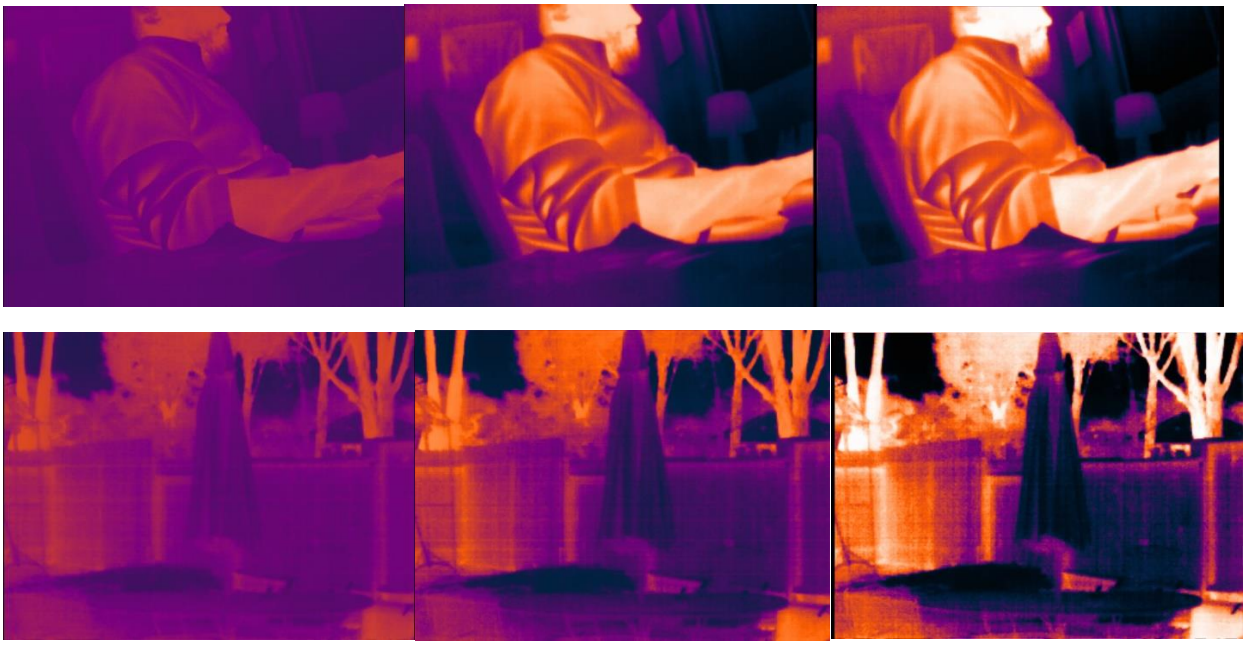


HISTEQ AGC Controls

Seek Thermal offers a variety of parameters that can be controlled through the newer histogram automatic gain control algorithm. Each section corresponds to the SDK call that is used to set the parameter setting. In addition, you can hover over each section in the Simple Viewer to show more information about the SDK call being used. For extensive details please refer to the Seek AGC application note available in the Seek Thermal Developer Portal.

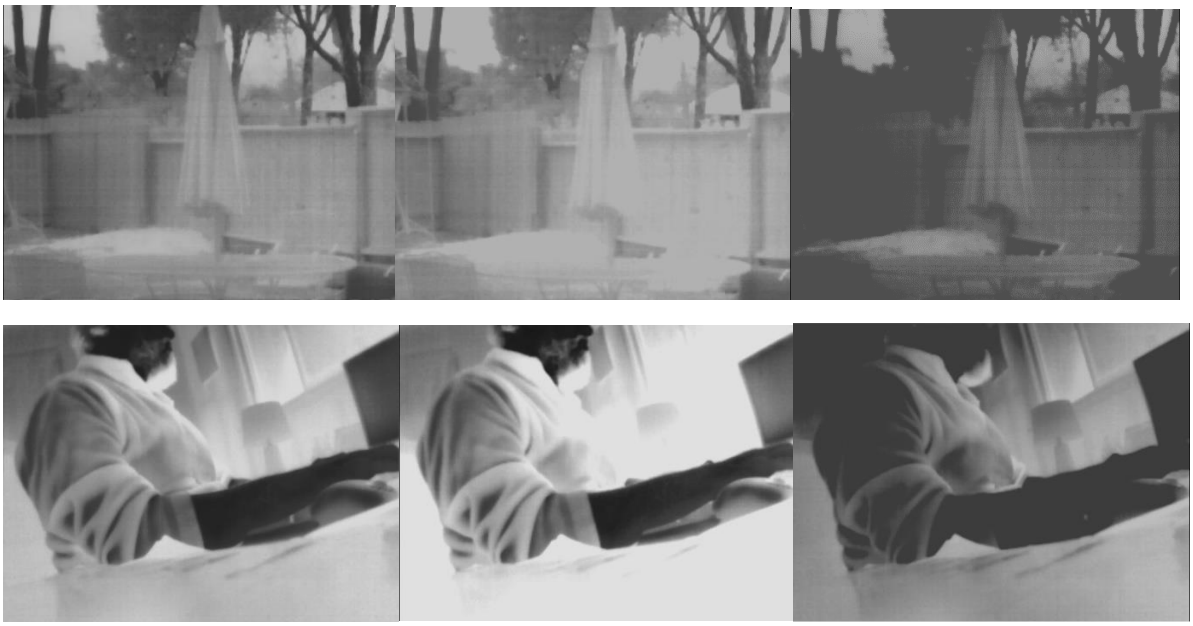
GainLimit (Sensitivity or Contrast)

The GainLimit slider and count field can be adjusted to allow more or less Gain into the algorithm colorization. This is often compared to a thermal contrast or sensitivity parameter. In lower thermal contrast scenes one can ramp up the gain to try to bring out more contrast to the scene. Having higher gain limits can introduce 'noise' in the image and lowering the GainLimit can reduce 'noise'. For detailed technical information please see the Seek AGC application note.



Left Trim (Cold Contrast) & Right Trim (Hot Contrast)

There are two percentage sliders (parameters) that allow you to remove the hottest or coldest objects from a scene. Trimming the top or bottom of the Histogram colorized temperature values from a given scene. These can typically be used to bring in more focus to the background or foreground of a scene. Please see the Seek AGC application note for more informative and detailed explanation.



Alpha Time (Transition Time)

Seek allows its customers to control how rapidly or slowly changes are applied when image settings are changed, the scene temperature changes drastically, or for the histogram algorithm to adjust. You can have no transition time and instant change, or you can allow up a full second for the changes to gradually be applied.

GainLimitFactor (More Sensitivity Control)

Seek Thermal offers a bit more depth on the control of the gain parameter of their Histogram algorithm. Details for this call can be found in the Seek AGC application note.

GainLimitFactorX (Sensitivity Range) & GainLimitFactorY (Sensitivity Depth)

Seek Thermal offers more controls on the gain parameter of their Histogram algorithm. Details for this call can be found in the Seek AGC application note.

Histogram Info

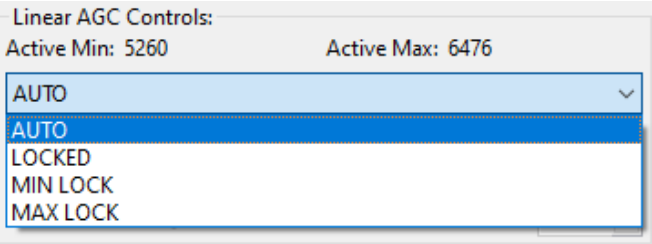
Seek Thermal offers more depth on the control of the gain parameter of our Histogram algorithm. The Histogram Info bin size can be useful when optimizing the algorithm for a given seen. Details for this call can be found in the Seek AGC application note.

Linear AGC Controls

Another popular Automatic Gain Control (AGC) algorithm is called the Linear AGC algorithm. Unlike the HISTEQ or Histogram algorithm that will bring our highs and lows in a scene; the LINEAR AGC mode will essentially make linear mapping of the coldest point in a scene to the warmest. Seek Thermal's LINEAR AGC mode can be run in 4 different ways:

- **AUTO** mode will automatically adjust the linear min and max limits based on the active scene.
- **LOCKED** mode will lock both the linear min and max limits based on count values that are set.

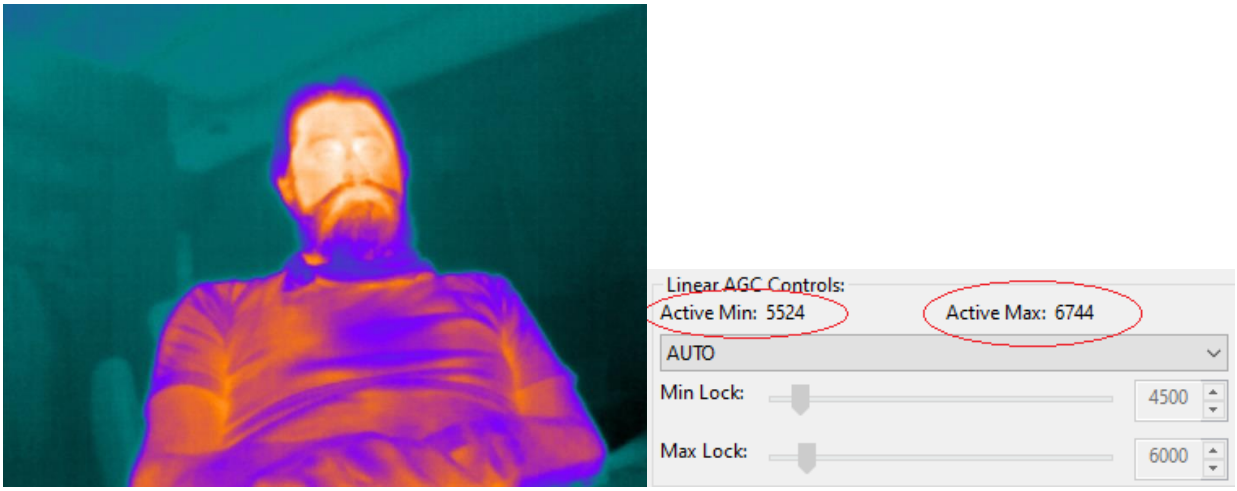
- **MIN LOCK** mode will lock only the linear minimum limit based on the set count value with no limit on the maximum value.
- **MAX LOCK** mode will lock only the linear maximum limit based on the set count value with no limit on the minimum value.



Active Min & Active Max

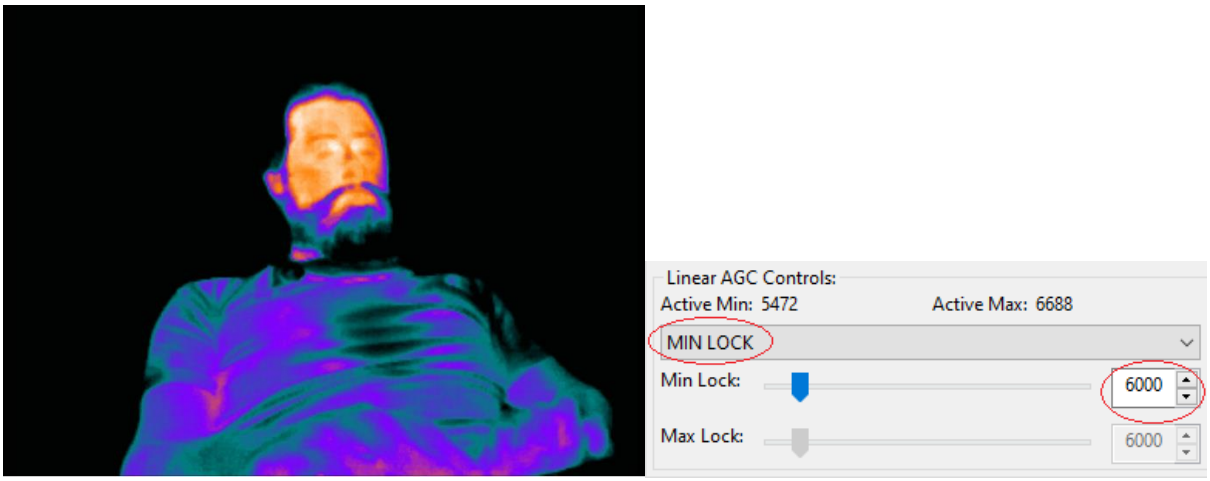
At the top of the Linear AGC Controls there are two SDK calls to read the active minimum and maximum count values of the active scene. These SDK calls can be used to tune your locking minimum and maximum values for the linear AGC algorithm.

Note: Count values correspond to active colorized heat imagery data and not the absolute temperature of the object itself.



Min Lock Slider

The **Min Lock** slider and parameter field allow a user to set the minimum count value of the scene that will be used in making its linear AGC algorithm mapping from low to high. This allows you to easily hide cooler or typically background objects in a scene.



Max Lock Slider

The **Max Lock** slider and parameter field allow a user to set the maximum count value of the scene that will be used in making its linear AGC algorithm mapping from high to low. This allows you to easily bring in cooler or typically background details.