

## FEATURES

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# Image-Based Auto-Trigger

## IMAGE-BASED AUTO-TRIGGER APPLICATIONS:

Applications that benefit most from include:

- Lightning Studies
- Animal studies
- Ballistics
- Troubleshooting high-speed machinery
- Microscopy
- Any environment where the event of interest creates a change in the live image in a predictable way. And, where false or missed triggers can be tolerated.

### INTRODUCTION:

Image-Based Auto-Trigger is an innovative feature that allows the user to trigger the camera from the motion detected in the live image. The camera may also provide an external trigger signal based on the Image-Based Auto-Trigger to be used for synchronizing multiple Phantom cameras.

The Image-Based Auto Trigger feature may be available via an on-camera user interface, Phantom application software, or 3rd party software using camera control protocols.

### GENERAL OPERATION:

The Image-Based Auto-Trigger feature allows selected Phantom camera models to trigger themselves when the image changes in a selectable region of the frame. For v-Series implementation, there is also a mode which allows this feature to generate a hardware trigger signal for multi-camera installations.

A few user definable parameters allow the auto-trigger behavior to be adjusted to operating conditions, filtering out unintended triggers due to vibration, changes in illumination, slow-moving shadows, etc.

The Auto-Trigger operation begins by the user selecting a rectangular area within the image, similar to the region used for auto-exposure, the Auto-Trigger region.

As each frame is captured, the image in the Auto-Trigger region is compared to an earlier copy of the same region that has been stored in a dedicated memory. After the comparison is made, the image in memory is updated to the current image, to be used in the future.

The result of the comparison determines if a trigger is generated. A pixel being compared is considered "active" if its level has changed, (brightened or darkened), by more than a preset threshold. The number of active pixels for a given frame is counted, and if it exceeds a set number, a trigger is generated. The required number of active pixels is specified as a percentage of the area of the Auto-Trigger region.

When an Auto-Trigger condition is detected, the Auto-Trigger signal of the camera is pulled low. The Auto-Trigger signal is available on the capture connector.

### HOW TO SPECIFY THE IMAGE-BASED AUTO-TRIGGER SETTINGS:

The following procedure describes the steps necessary to utilize the Image-Based Auto-Trigger feature:

1. Start the PCC (Phantom Camera Control) application.

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2. From the Manager Control Panel select the Phantom camera to be defined by moving the mouse over the desired available Phantom camera you wish to control, then double-click the left mouse key.
3. Click the Live Control Panel Tab.
4. Under the Cine Settings Selector define the Resolution, Sample Rate, Exposure Time, then perform a CSR (Current Session Reference).

**NOTE:** The EDR, (Extreme Dynamic Range™), and Auto Exposure parameters should never be enabled while performing CSR, (Current Session Reference), or Black Reference calibration adjustment.

5. Click on the Image-Based Auto-Trigger Selector and define the Image-Based Auto-Trigger parameters:
  - a. Enable, (check), Image-Based Auto-Trigger.
  - b. If external control of the auto-trigger is desired, for instance, it is required that the auto-trigger feature is disabled for some known transient event, and the auto-trigger signal from the camera is to be routed through some external device and back into the trigger input of the camera, enable, (check), the Only Output Signal (don't trigger this camera) option.
  - c. Define the following Sensitivity parameters, including:
    - 1) Threshold  
The Threshold specifies the amount a pixel value must change in order to be counted as an active pixel for auto-trigger purposes. A value of 100 would require a change of approximately half of the full swing of the camera. A typical threshold setting would be 10.
      - a) Click the up/down arrows to the right of the Threshold entry window to specify the Threshold value, alternatively
      - b) Slide the Threshold slider to the right to increase the Threshold, or to the left to reduce the Threshold.
    - 2) Area %  
The Area % specifies the percentage of the auto-trigger region that must be active in order for an auto-trigger event to be generated. A typical percentage value is 10.
      - a) Click the up/down arrows to the right of the Area % entry window to specify the Area % value, or
      - b) Slide the Area % slider to the right to increase the Area %, or to the left to reduce the Area %.
    - 3) Check Interval (ms)  
The Check Interval (ms) parameter specifies the speed between updates the auto-trigger region is checked.

- a) Click the up/down arrows to the right of the Check Interval (ms) entry window to specify the Check Interval (ms) value, alternatively
  - b) Slide the Check Interval (ms) slider to the right to increase the Check Interval (ms), or to the left to reduce the Check Interval (ms).
- d. Define the Image-Based Auto-Trigger Area by:
- 1) Dragging a box around the Image-Based Auto-Trigger Area.
    - a) Place the cursor over the image, to the upper left-hand corner or the Area, in the selected Phantom camera's Preview Panel.
    - b) Hold down the left mouse key, then
    - c) Drag the cursor to the lower right-hand corner of the Area, in the selected Phantom camera's Preview Panel, then
    - d) Release the mouse key.
    - e) Select the Auto Trigger option when the pop-up dialogue window displays.
  - 2) Alternatively, manually enter the XY coordinates of the Top, Left, Right, and Bottom pixels to define the Area.
    - a) Place the cursor over the image, to the upper left-hand corner or the area of interest, in the selected Phantom camera's Preview Panel, and note the XY: values in the Preview Panel Status Bar.
    - b) Enter the X value in the Area Left entry window, then
    - c) Enter the Y value in the Area Top entry window.
    - d) Move the cursor to the lower right-hand corner of the area of interest, in the selected Phantom camera's Preview Panel, and note the XY: value in the Preview Panel Status Bar.
    - e) Enter the X value in the Area Right entry window, then
    - f) Enter the Y value in the Area Bottom entry window.
  - 3) Or click on the Full button to select the entire image area.

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#### IMPORTANT OPERATION NOTES:

The Image-Based Auto-Trigger feature should never be enabled while performing CSR, (Current Session Reference), or Black Reference calibration adjustment.

#### Focused

Since 1950, Vision Research has been shooting, designing, and manufacturing high-speed cameras. Our single focus is to invent, build, and support the most advanced cameras possible.



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#### WARNING:

The Image-Based Auto-Trigger feature should never be used in applications where missed or false triggers cannot be tolerated or where a false trigger could cause harm to people or property.

The hardware signaling available in some Image-Based Auto-Trigger modes should be used only to synchronize multiple Phantom cameras together and should never be used to trigger or control any other external device or event.

CONSEQUENCES RESULTING FROM SYSTEM FAILURE, FALSE TRIGGERING OR MISUSE OF THIS FEATURE ARE THE SOLE RESPONSIBILITY OF THE USER.