Blemish Correction Procedure

Blemish Correction:

CMOS image sensors might contain some blemished pixels. These include both black (dark) pixels and white (bright) pixels. Black pixel blemishes remain black regardless of the light level, and white pixel blemishes are always white even in dark conditions.

In accordance with JAI quality standards, blemishes are controlled and corrected at the factory prior to shipment. However, some blemishes may occur after products are shipped out. These blemishes can be caused by ambient temperature, actual usage of the camera (increasing sensitivity, long exposure time), or even cosmic ray damage.

To address this, most JAI cameras include a blemish correction function. The blemished pixels are identified and stored in a portion of camera memory called the "Coordinate List", and can then be complemented by using adjacent pixels. The blemish correction function is accessed in the JAI Control Tool in "Section I – JAI Custom Control Blemish."

- ***Coordinate List of blemish pixels:***
  The coordinate list of blemish pixels consists of both a factory list and a user list. At the time of factory shipment, all blemished pixels which have been identified are stored in the factory list and the user list is empty. Newly-found blemished pixels can be stored into the user list after shipment. The maximum number of blemished pixels that can be stored depends on the camera model. Go Series cameras, for example, have maximums of either 256 or 512 pixels, depending on the model. Spark Series SP-20000 cameras support up to 1,000 pixels in their coordinate lists. For a camera with a maximum of 256 pixels, the Blemish Detect Position Index ranges from 0 – 255.

- ***How to store blemished pixels into the user list:***
  The methods for storing blemished pixels into the user list are as follows:

  1 Automatic detection method:
  With the lens cap attached, click "JAI Custom Control Blemish" -> "Blemish Detect" -> "Push to Execute Command". Then, blemished pixels are detected automatically, stored into the user list in ascending order starting from Index 0, and "Blemish Compensation Number" which describes the number of blemished pixels increases automatically.

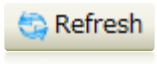
  2 Manual registration method:
  Even after the above "Automatic detection method", if some blemished pixels remain visible in the image, the blemished pixels can be stored into the user list manually. In the user list, coordinates

of blemished pixels are registered. The actual procedure is described in the following example (see text and figures below). This example assumes that the "Blemish Compensation Number" is 40, meaning that Indexes 0-39 are already filled.

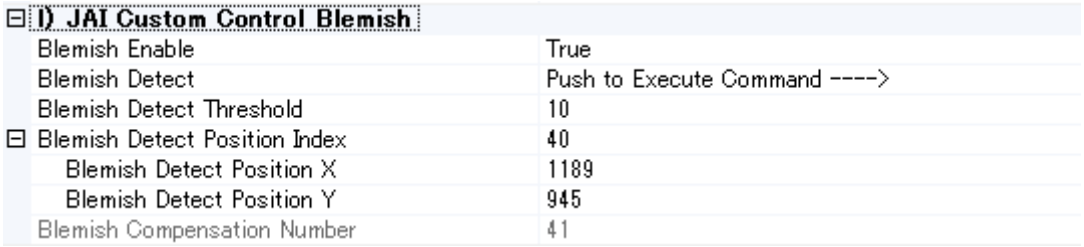
A) First, enter "40" into the Index field and confirm that both Position X and Position Y show the value of 0 (meaning the index is unused).

B) Enter the coordinates of the blemished pixel into Position X and Position Y (see figure below).

Click the "Refresh" button and confirm that "Blemish Compensation Number" changes to 41.



Note: Indices should be used consecutively. If a new blemished pixel is registered into an index whose preceding index is unused, it will not be stored correctly.

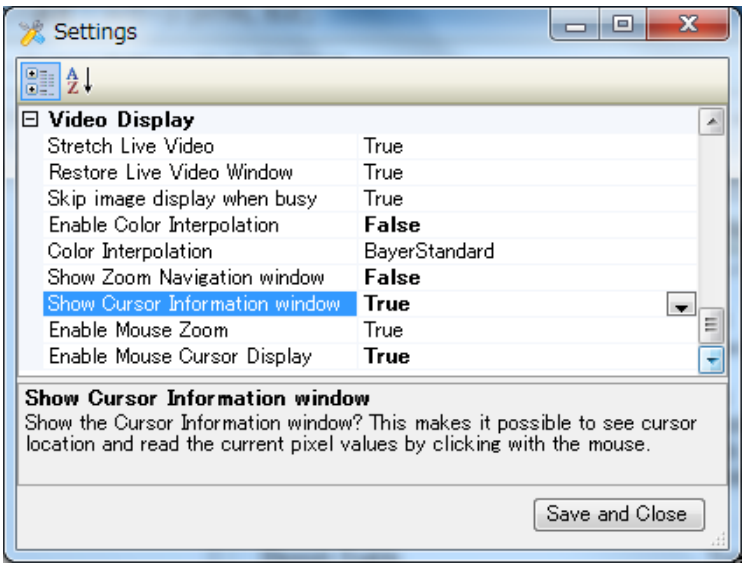


- ***Tool to identify coordinates in an image:***

To identify the coordinates of a visible blemish in the "capture window" (display window of a camera-captured image), do the following:

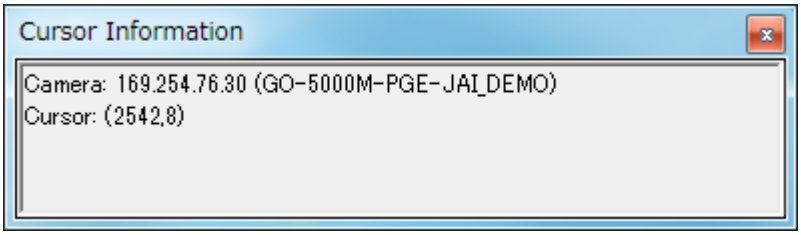
Click the "Change Settings" button in the top-right area of the JAI Control Tool.

Select "True" in "Show Cursor Information window".



Click “Save and Close” to save the setting.

After closing the capture window, click “Start Acquisition” again. You will then see the usual capture window and a second window called “Cursor Information” as shown below. The “Cursor Information” window displays the coordinates of mouse pointer as “Cursor.”



You can now move the mouse pointer to point at the visible blemish and read the value in the cursor information window. The first number is the X Position and the second number is the Y Position.

Enter this information using the Manual Registration method described previously, and the newly identified blemish will be added to the Coordinate List for automatic correction.