

Calibration of stereo disparity

The article is intended for operator who is going to use plug-in for quick vertical and horizontal disparities control during the work with the DM in the first time.

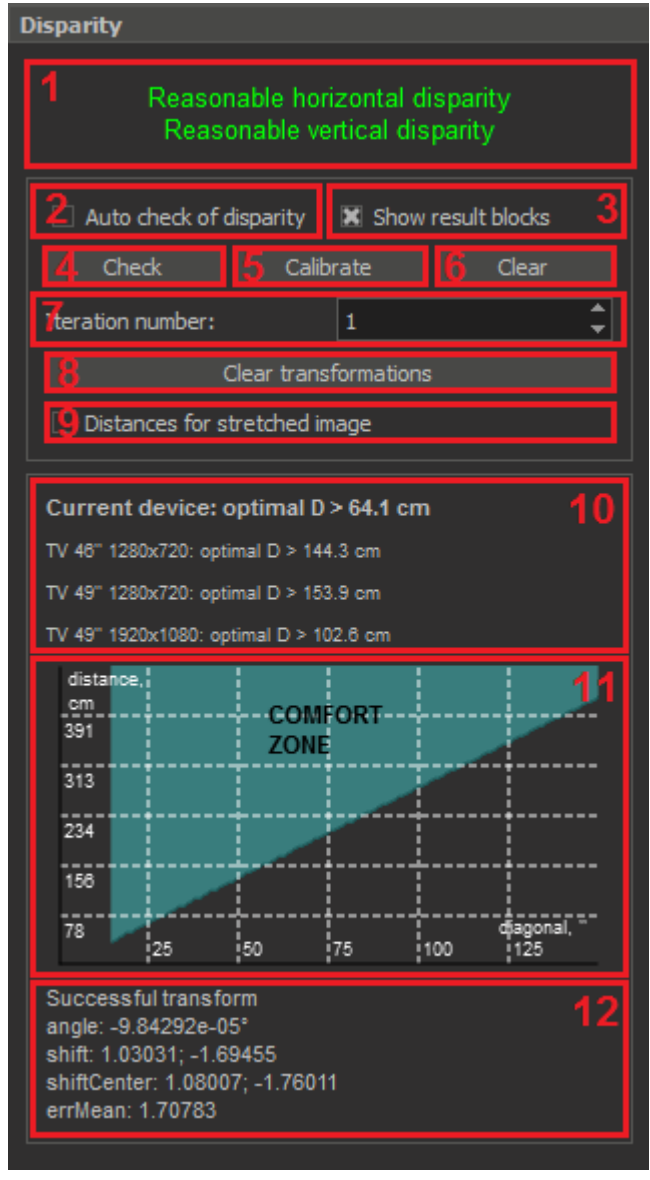
Step-by-step guide

1. Run the program and connect to the microscope. Click on the "Tools" tab at the right program panel and find 'Disparity' plugin:



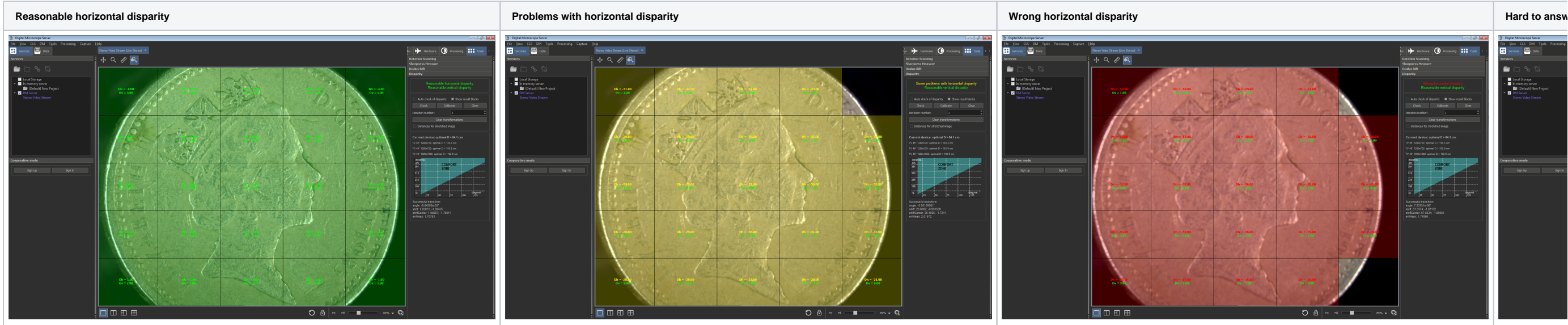
Disparity panel

	Item	Description
	1	The result of the check of horizontal and vertical disparities
	2	Activate/deactivate auto checking disparity mode
	3	Show/hide result blocks
	4	Start checking the state of disparities
	5	Start stereo geometry calibration (for current zoom)
	6	Clear the current disparity measurements
	7	The control for the number of iterations of calibration
	8	Clear the table of transformations, applied to the data
	9	Check it, if you want to see the viewing distance values for the stretched images to fullscreen
	10	The optimal distance to watch the image from different screens
	11	The chart demonstrating the dependency of the distance from the size of the screen



12 The parameters of the calibration

2. Put a flat calibration object in the camera viewport. It should be orthogonal to the optical axis. Fit focus at the object surface.
 3. Set minimum zoom.
- a. Push the "Check" button and check current disparity. Also you can activate auto checking of disparity mode if motors/zoom/focus values are changed by the "Auto check of disparity" checkbox. The plugin will tell you in the [special information area](#), if it's everything ok and recommend to perform calibration if something is wrong with the vertical or horizontal disparity. After checking the application should look like that:



Overlay color demands on disparity:

Color	Disparity	Demands
GREEN	good	disparity <= HorizontalDisparityLowThreshold (for horizontal disparity) / VerticalDisparityLowThreshold (for vertical disparity)
YELLOW		disparity > HorizontalDisparityLowThreshold / VerticalDisparityLowThreshold, and disparity <= HorizontalDisparityHighThreshold / VerticalDisparityHighThreshold
RED	bad, need calibration	disparity > HorizontalDisparityHighThreshold / VerticalDisparityHighThreshold

- b. If you see yellow or red regions push the "[Calibrate](#)" button (the button is unavailable in case of video). After some time you should see that those regions are become green. If they are not, please check the [step 2](#).
- i. You can also set the number of the [iterations of calibration](#). If the number is greater than 1, the calibration will be performed specified times. After each iteration the parameters of the calibration will be recalculated and the new transform will be got and applied.
- c. To show/hide result blocks use the "[Show result blocks](#)" checkbox
4. Change zoom to maximum value.
5. Do steps 3.a - 3.c for this zoom
6. Check the 'Auto check of disparity' checkbox.
7. Zoom out step but step from maximum zoom the minimum, fit focus on the calibration object surface if necessary and wait until the plugin shows you regions with color-coded disparity. Check that most of them should be green at any zoom. If it is not, do steps 3.a - 3c for this zoom.
- To clear colored overlays for disparity push the "[Clear](#)" button.
 - To clear the calibration results push the "[Clear transformations](#)" button.
 - If you want to see the viewing distance values for the stretched images to fullscreen, please use the "Distances for stretched image" checkbox

Configuring of the disparity plugin

You may configure the plugin by the appropriate settings in 'msaconfig.xml':

```
<config>
<id>com.octonus.dm.CVerticalDisparityPlugin/2.0</id>
<values>
  <key name="AutoCheckIntervalMS" value="750" />
  <key name="HorizontalDisparityLowThreshold" value="20" />
  <key name="HorizontalDisparityHighThreshold" value="45" />
  <key name="VerticalDisparityLowThreshold" value="3" />
  <key name="VerticalDisparityHighThreshold" value="8" />
  <key name="CellResolution" value="5" />
  <key name="KeypointRequiredAmount" value="10" />
  <key name="BlockPercentForOKSituation" value="60" />
  <key name="BlockPercentForStateDetection" value="60" />
</values>
</config>
```

The parameters HorizontalDisparityLowThreshold, VerticalDisparityLowThreshold, HorizontalDisparityHighThreshold, and VerticalDisparityHighThreshold are responsible for the decision of the microscope state (if it needs calibration)

If you need additional settings during work, you should add the string:

```
<key name="ShowControls" value="true" />
```

inside your config. To remove the additional controls you should set the key "ShowControls" to "false" or just remove the whole string with this key.