GUIDE | TAGARNO IMAGE ANALYSIS / SPECK COUNTER

VERSION: 1.7 | FIRMWARE 5.10 | 2020.05.25
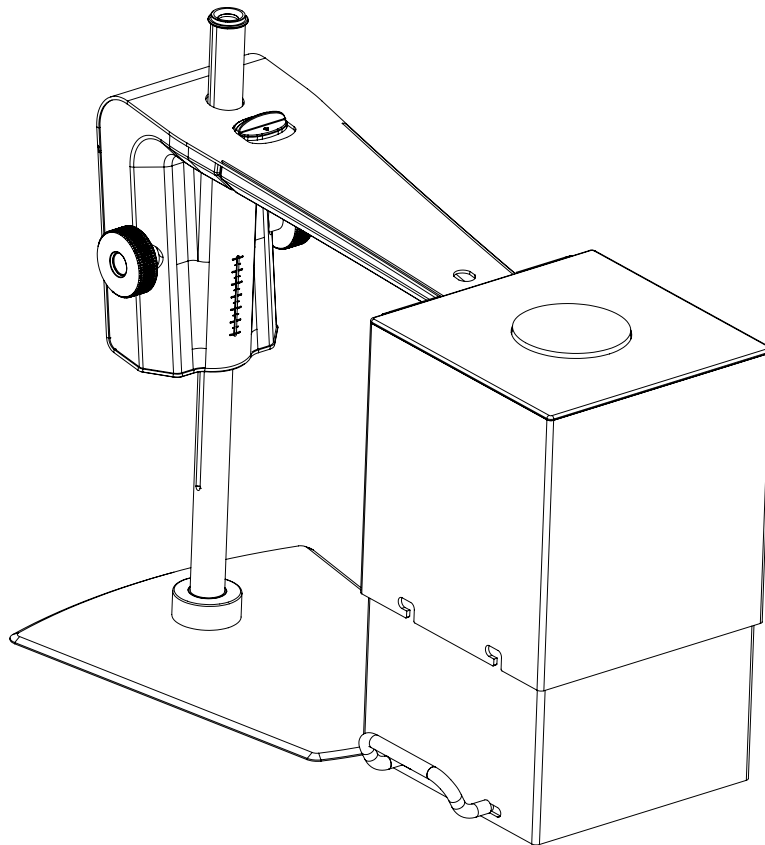
CONTENT

The Speck Counter enables you to objectively locate, separate and count unwanted subjects/specks in a sample.
Read more about Speck Counter here: www.tagarno.com/speck-counter-app

TAGARNO

1. ASSEMBLING

To get the best results, we recommend using this application with the TAGARNO FHD Trend. This allows you to attach the accessories and rightfully adjust the settings.

Equipment needed:
Ring light white
Basic or Advanced control box (external lighting)
Optical diffusor filter
Fresnel lens
Light eliminator
White balance calibration card
TAGARNO Color calibration card
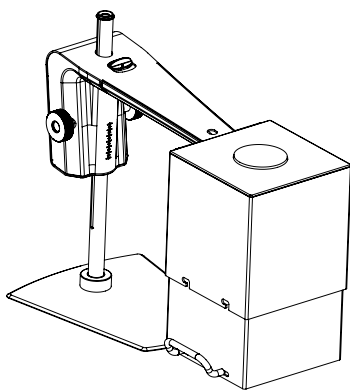
This enables the app to run objective and reproducable analyses.

The microscope light settings are automatically set to auto exposure.

Step 1
Combine Ring light white from TAGARNO with an Optical diffusor filter and a Fresnel lens mounted on top of each other, using two small screws to combine the three parts.

Ring light white ⟶

Fresnel lens ⟶

Optical diffusor filter ⟶
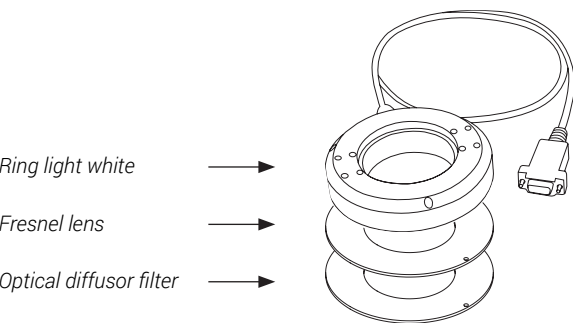
Step 2
The ring light with filter and lens must then be mounted on the microscope as described in the TAGARNO Ring light white user guide.

Step 3
Adjust the light settings on the ring light to intensity 100% using the the preferred control box.

Step 4
Once the sample has been leveled out so that the content of the sample is alligned parellel to the lens surface, place it on a flat surface.

Step 5
Place Light eliminator over the camera head as displayed below and close the Light elimator by pulling the backwall all the way up. Do not forget to tighten the screws to prevent the backwall from falling back down. Using the Light eliminator will eliminate any external light and prevent it from interfering with the analysis result.
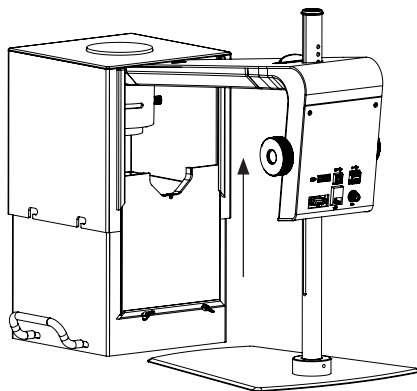
Step 6
Perform a white balance calibration (see Toolbar section, pt 4).

2. TOOLBAR
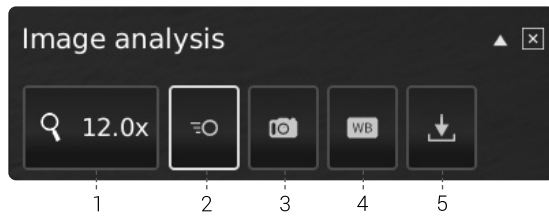
1. Magnification level
Use a keyboard or the control box to choose magnification level.

2. Live view
Use this button to toggle between live and still image mode. In Live mode the live camera image is active. In Still image mode the latest snapshot will be shown.

3. Snapshot
Use this button to take a snapshot of the live image. The snapshot will not be saved automatically.

4. White balance calibration (WBC)
Perform an automatic white balance adjustment in order to get colors displayed correctly on screen. There must be a white object present in the camera field of view when the white balance is being adjusted. A white balance calibration is made each time the camera is turned on to adjust to the given light conditions. A white balance calibration must also be made every time the light conditions change.

NB! We recommend using the white balance calibration card offered by TAGARNO when running WBCs. When doing so, remember to store the card in its protection sleeve once the calibration has been performed. This will prolong the life expectancy of the White balance calibration card.

5. Save Image
This button provides the possibility to save the current view with circle markers. When activated, the information panel will also appear from the saved image (see pt. 14).

When saving an image an information window will appear for a few seconds showing the file name and storage location.

The image will be saved on the inserted USB memory stick. If a USB memory stick is not attached, the image is saved internally on the microscope, provided the share file mode is turned on in General settings.

3. OPERATION

OPERATION (1/2)

Main speck detector	-15	--- 6
Speck minimum size	46px² (0.121mm²)	--- 7
Lightness filter	11	--- 8
Color tone filter	131	--- 9
☑ Measure color	Color calibration	--- 10 --- 11 --- 12
☰ Auto adjust	Run analysis	--- 13
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▼ Template A ★		--- 15
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Speck count result: --- 17

	Count	(≈100cm²)
Type I (light)	1	(15)
Type II (dark)	5	(75)
Total	6	(90)

L*a*b* color	L*	88.9
	a*	1.7
	b*	5.2

Area: 6.7cm² (3.4x1.9)   ---- 18
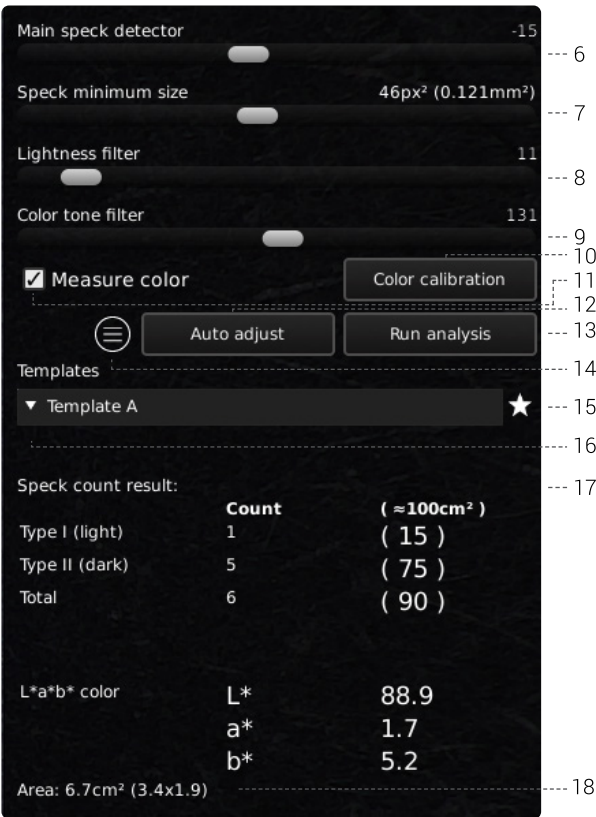
Choose values
Choose a value by sliding the bar or type in the number field by using a connected keyboard.

6. Main speck detector
This slider adjusts the main threshold between the background color and irregularities.

- Start by adjusting the three other sliders to point 0 (Speck minimum size, Lightness filter and color tone filter = 0)
- Then adjust the main speck detector to a desired level around 0
- Choose Run analysis

The application will now identify all irregularities in the image, measured against the background color of the sample inspected.

If too many irregularities are being counted/identified, you can adjust the slider to the left, which will then reduce the number of irregularities which is being identified in the image.

7. Speck minimum size
Choose the minimum size of the speck you wish to count.

8. Lightness filter
In order to distinguish between two types of speck, the difference between the two types can be separated based on the lightness they have on a greyscale. The slider position will mark the threshold position between the two types of speck which you want to identify.

When running an analysis, the lighter type of speck will be marked with a red circle and the darker type will be marked with a blue circle.

9. Color tone filter
The color tone filter is similar to the lightness filter, with the only difference that it is setting a threshold on a color scale for the speck observed.

This is a slider which can be used for refining the result you get, after having set the lightness filter.

10. Color calibration
To ensure correct calculation of L*a*b* color values of a sample, a Color calibration must be performed before selecting the Measure color feature (see pt 11).

To start the calibration process, click the Color calibration button. Then, click OK and follow the on-screen instructions while using the provided TAGARNO Color calibration card.

Color calibration
Place the white balance card in the field of view.

Cancel   OK
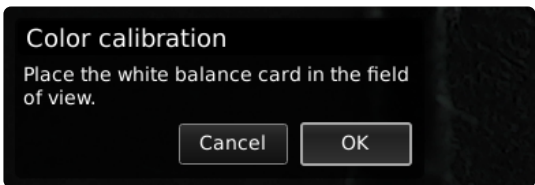
NB! Make sure that the target on the White balance calibration card is not in the highlighted square during the first step of the Color calibration.

11. Measure color
Select the Measure color feature to include L*a*b* color values in the analysis results.

NB! Changing magnification levels after selecting the Measure color feature will automatically uncheck the feature and the box will turn yellow to make you aware of this. Perform a new Color calibration if you want to measure color values at the current magnification level.

12. Auto adjust
When choosing the auto adjust functionality, the application will perform an automatic analysis of the image, suggesting a starting point for the lightness and color tone filters.

13. Run analysis
Choose this option to start running an analysis of the current image and get indications of the actual level of speck in the sample.

The analysis will always be performed using a still image which is automatically captured during the analysis process.

The red circles mark the lighter type of speck while the blue circles mark the darker type.

NB! You will not be able to run the analysis, if the button contains a yellow exclamation point. Perform a white balance calibration before trying again (see pt. 4).

OPERATION (2/2)

14. Information panel
Activate this information panel to view all details of template, filter settings, close up lens, area and the speck count results.

Disable the information panel by pressing the icon again.

Template name : "Template A"

Main speck detector	-15
Speck minimum size	46px² (0.121mm²)
Lightness filter	11
Color tone filter	131
Close-up lens	+4
Area	6.7cm² (3.4x1.9)

Speck count result:

	Count	(≈100cm²)
Type I (light)	1	(15)
Type II (dark)	5	(75)
Total	6	(90)

L*a*b* color		
	L*	88.9
	a*	1.7
	b*	5.2

NB! The L*a*b* color values will not be included in the Information panel if the Measure color feature is not selected. To update the Information panel with the L*a*b* values, go back and select Measure colors, perform a Color calibration and run a new analysis.

15. Save template
- Click once on the star symbol to save a template using the current zoom level and slider positions
- State preferred name and press save

The template is now saved and available for later use.

16. Recall template
Recall a saved template by clicking on the list and choosing the template of your choice.

Delete a template by pressing the X at the right of each saved template.

17. Speck count result
When an analysis has been performed, the results will display at the bottom of the window as visualized below.

	Count	(≈100cm²)
Type I (light)	0	(0)
Type II (dark)	0	(0)
Total	0	(0)

Type I (light) - red marker indicates the lightest type of specks in the sample according to the chosen filter settings.

Type II (dark) - blue marker indicates the darkest type of specks in the sample according to the chosen filter settings.

Total indicates the total number of specks in the sample according to the chosen filter settings.

Count column states the number of respectively light and dark types plus the total number of specks in the sample.

(≈100cm²) shows the light, dark and total number of specks per 100cm² (calculated relative to the sample size). This helps you compare different samples to each other.

L*a*b* color shows the average L*a*b* color values of the sample. Please note that areas at the edges of the field of view are not included in this calculation due to potential lens distortion and thus incorrect results.

NB! The L*a*b* color values will not be included in the Speck count results if the Measure color feature is not selected. To update the Speck count results with the L*a*b* values, go back and select Measure colors, perform a Color calibration and run a new analysis.

18. Area
This area states the actual area and dimensions of the sample which is currently being displayed on screen, based on the magnification level and field of view.

E.g. when the current magnification level is 4.9x, the actual area is 53.4cm2 and the dimensions are (9.7 x 5.5cm). Data will then be displayed as 53.4cm2 (9.7 x 5.5).