

SMART
SENSOR
BUSINESS

ACRCalculator

Product Description



CONNECTING AND OPERATING INSTRUCTIONS

Original Instructions

Table of contents

1 General/terms	4
2 Calculate distance	5
3 Calculate field of view	6
4 Settings	7

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1 General/terms

The ACRCalculator tool is used to perform basic calculations for camera applications. This tool is especially designed for the components which are distributed by Leuze electronic Inc.

Distance, field of view, accuracy and intermediate rings can be calculated with this tool.

Distance:

This value indicates the distance between the camera bottom side and the object. For cameras with screw-on C-mount lenses, it is important to observe that the lens can be closer to the object (see Figure 1).

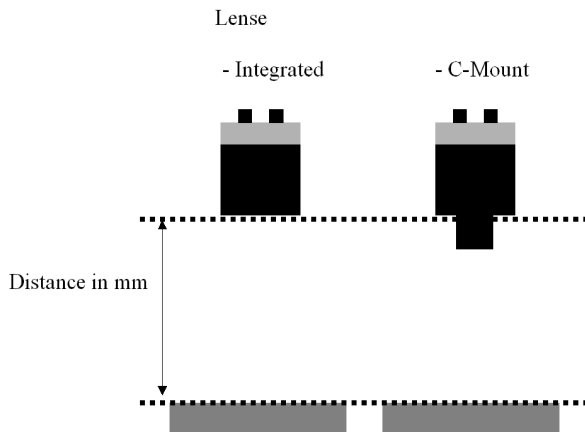


Fig. 1: Working distance

Field of view/object:

The field of view is the area, which is currently inspected by the camera. In order to be able to check an object/feature, it must be located within the field of view.

The aspect ratio of the field of view depends on the geometry of the imaging chip which is built into the camera.

Accuracy/resolution:

The resolution value indicates how many individual pixels make up the field of view. The accuracy of the inspection can vary, depending on the selected resolution and the size of the field of view. A high resolution with a small field of view yields a high accuracy.

Intermediate rings:

Intermediate rings are required for cameras with C-mount lenses in order to be able to focus images in close up range. The necessary intermediate rings are inserted between the lens and the camera.

2 Calculate distance

The screenshot shows the 'Leuze ACRCalculator' window with the 'Calculate distance' tab selected. The interface is divided into several sections:

- Object (A):** Includes input fields for 'Code width' (100.00 mm), 'Code height' (100.00 mm), 'Tolerance width' (37.50 %), and 'Tolerance height' (10.00 %). Below these are 'Field of view width' (137.50 mm) and 'Field of view height' (110.00 mm).
- Resolution (B):** Includes a dropdown for 'Resolution' (SXGA (1280x1024)), a 'zoom' dropdown (zoom 1), and input fields for 'Pixel per mm' (9.309 px) and 'mm per pixel' (0.107 mm). A 'Min. module resolution size' field shows 12.7 mil.
- Lens (C):** Includes radio buttons for 'Integrated' and 'C-Mount', and a 'Focal length' section with radio buttons for 6 mm, 12 mm (selected), 25 mm, 50 mm, 8 mm, 16 mm, 35 mm, and 75 mm.
- Field of View (D):** A central visualization showing a gray rectangle (object) centered within a larger blue rectangle (field of view).
- Working distance (E):** Includes input fields for 'Working distance' (231.75 mm) and 'Extra spacer' (0.0 mm).

Fig. 2: Tab, Calculate distance

- Entry of the object dimensions and the position/motion tolerances.
- Selection of the desired resolution and output accuracy in the fields "pixels per mm" and "mm per pixel".
- Selection of the lens type and focal length.
- Visualization of object size and field of view. In order to receive the best possible resolution, the object should fill the field of view almost completely.
- Result of the distance in mm.

The required minimum intermediate ring dimension is specified for C-mount devices. It should be noted that this value must be added to the standard intermediate ring (the standard intermediate ring is specified in the manual of the respective camera).

3 Calculate field of view

The screenshot shows the 'Leuze ACRCalculator' window with the 'Calculate field of view' tab selected. The interface includes a menu bar (Options, Help) and three tabs (Calculate distance, Calculate field of view, Settings). The main content area is divided into several sections:

- Object:** Working distance: 100.00 mm (highlighted by red box A).
- Resolution:** SXGA (1280x1024) (highlighted by red box B), zoom 1, Pixel per mm: 21.428 px, mm per pixel: 0.047 mm, Min. modul solution: 5.5 mil.
- Lens:** Integrated (selected), C-Mount.
- Focal length:** 6 mm, 12 mm (selected), 25 mm, 50 mm, 8 mm, 16 mm, 35 mm, 75 mm (highlighted by red box C).
- Field of view:** Field of view width: 59.74 mm, Field of view height: 47.79 mm (highlighted by red box D).
- Extra spacer:** 0.0 mm.

The Leuze electronic logo is visible in the top right corner of the window.

Fig. 3: Calculate field of view

- A. Entry of the data for the distance.
- B. Selection of the desired resolution and output accuracy in the fields "pixels per mm" and "mm per pixel".
- C. Selection of the lens type and focal length.
- D. Output of the field of view size in width and height.

Please note: With setting "ACR 368i" (in tab Settings) in the window "Resolution" one more result "Min. Module size" is shown.

This shows the minimum size of a 2D Code module (in "mil" = 1/1000 inch = 0,0254 mm).

4 Settings

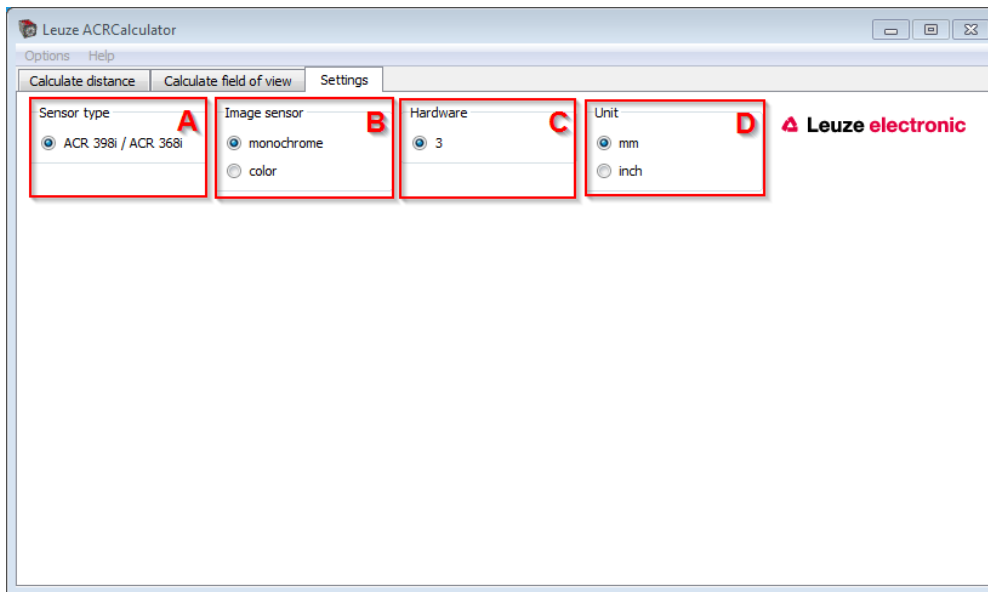


Fig. 4: Tab, Settings

- A. Selection of the sensor type.
- B. Selection monochrome or color chip.
- C. Selection of the hardware platform.
- D. Switching of the measurement units.

Note: In the fields B.-D. inactive selections are not possible because of hardware selection in field A.

Support

For further questions regarding this tool and your application please contact the technical support.

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Please note:

It should be noted that due to deviations of the tolerances the results may vary. A test and a correction of the data cannot be excluded. There is absolutely no liability for the functionality and compatibility of this software. Any warranty is void. The use will occur at your own risk.

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