



CAD MIRRORS

Motivation

In all use cases, the CAD overlay must be positioned according to the camera image. Not only horizontal and vertical displacements (translations) and rotations (rotations) occur. Sometimes the image has to be mirrored.

Possible reflections

The position of the mirror determines the reflection.

This simple statement can be mathematically traced back to three operations:

- Move
- Rotate
- Mirror

All possible orientations of the image can be represented by combining these three operations.

Previous options (as of 01 April 2023)

In Metric, for the alignment of a CAD overlay as of 01.04.2023, the following operations are required

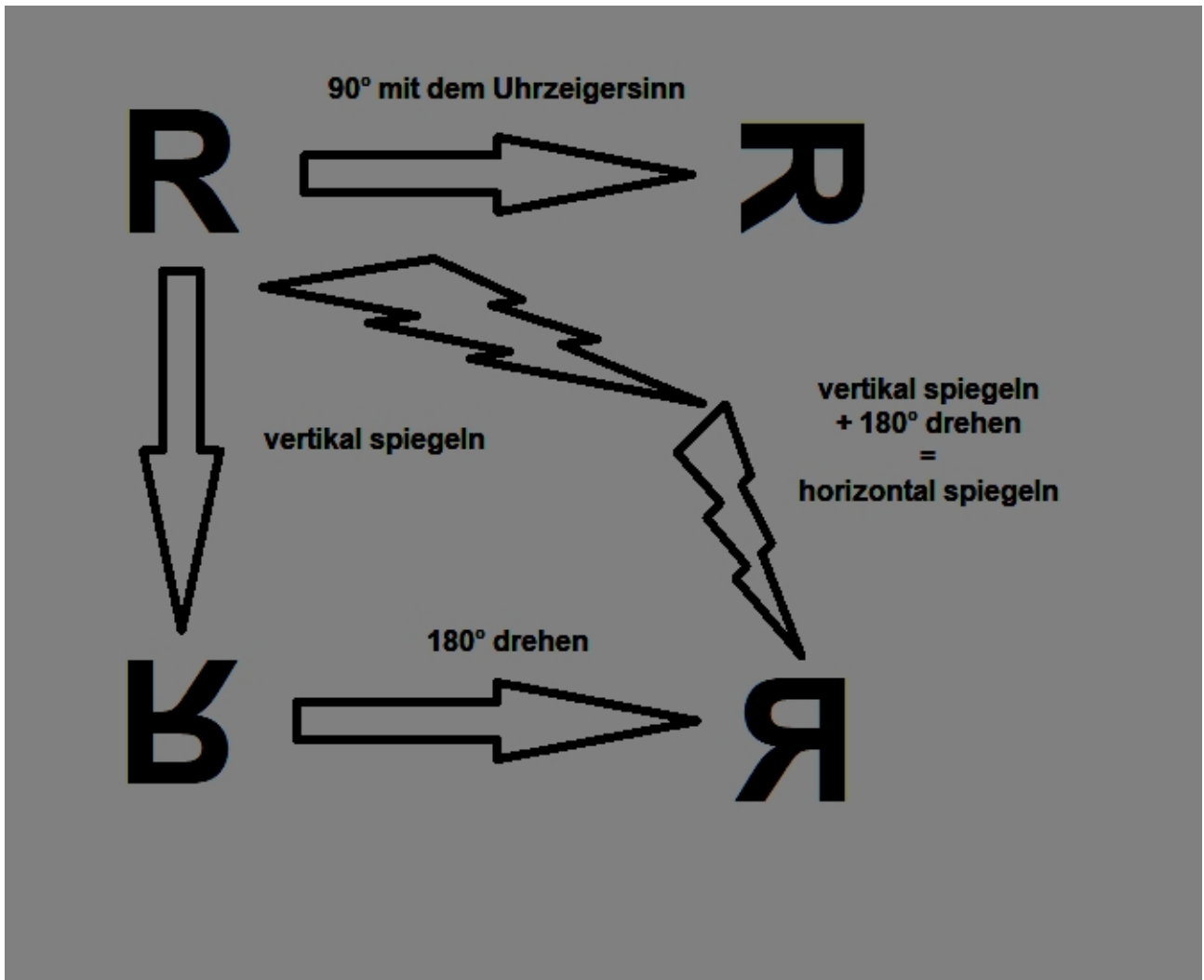
- Move
- Turnin

g realized.

Horizontal or vertical mirroring did not exist before.

Expansion stages

As shown above, any alignment can be achieved by adding a single reflection. See the following examples.



New functions

In principle, it is sufficient to implement a new "Mirror" function to be able to display all possibilities.

From the user's point of view, it may seem desirable to provide frequent functions as separate setting options, e.g.

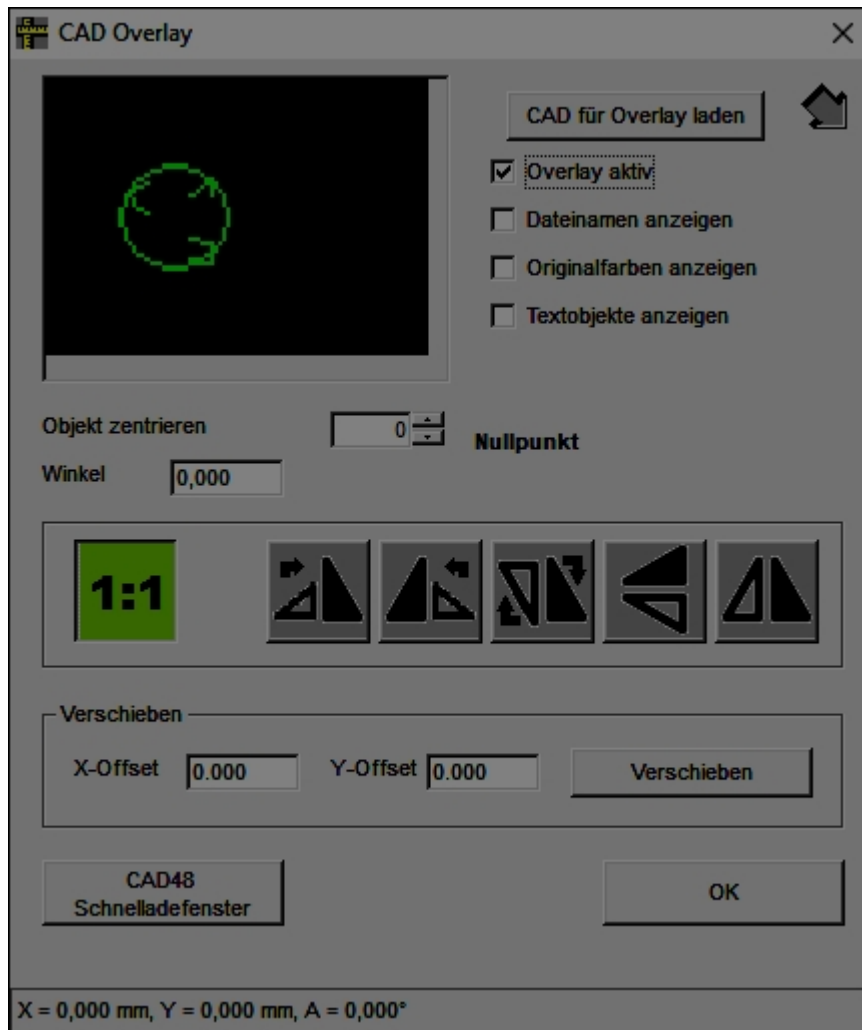
- Horizontal mirroring
- Vertical mirroring
- Rotate 90° (clockwise and counterclockwise)
- Rotate 180
- ...

Addendum June 16, 2023: These options now form the basic framework.



Implementation

In the stand-alone window "CAD Overlay" a new frame with checkboxes has been added, which provides for possible rotations and mirroring (see the following image).



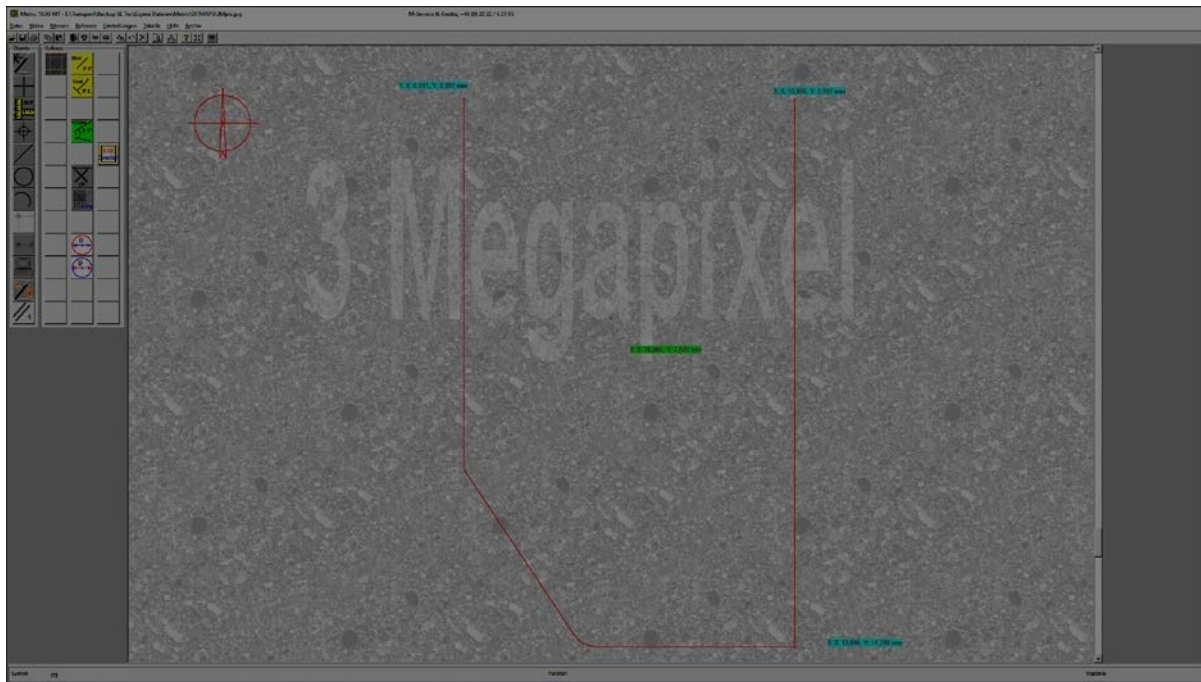
By default, the CAD is loaded with the following values set

- Center object: 0 (original zero point of the DXF)
- Rotation angle: 0.000
- XOffset: 0.000 mm, YOffset: 0.000 mm, i.e. the zero point of the DXF is located in the upper left corner of the image.
- The center of rotation is located in the middle of the screen
- The 1:1 button is active



Selecting a "Rotate" button, one of the first three, sets the rotation angle to 90° clockwise, 90° counterclockwise, or 180°. The fourth selection reflects on a horizontal line, the fifth on a vertical one.

NOTE: Technically, when you switch from mirror to non-mirror, the file is reloaded.



Standard after loading the CAD

The point at the top left has the coordinates (7 / 3), at the bottom right (13.9 / 14.4). The center of the screen is at (10.064 / 7.548), there the center of rotation is set.

Various options

Center object

Without active crosshairs

When the "Center Object" slider is operated, the selected element of the CAD is centered on the center of the screen. At the same time, the center of rotation is placed there.



With the option "0" (zero point) the DXF is aligned at its file-internal zero point in such a way that this is displayed in the upper left corner of the screen. At the same time, the center of rotation is placed there.

With the option "-1" (center) the center of the enclosing, axis-parallel (with orientation 0°) rectangle - the center of the so-called extents of the DXF - is centered on the screen center. At the same time, the center of rotation is placed there.

With the option "-2" (left/bottom), a point resulting from the X-value of the left
The center of rotation is centered on the center of the screen at the "end" of the DXF and at the lowest point of the DXF (0° alignment). At the same time, the center of rotation is placed there.

With active crosshairs

This option applies to simple type crosshairs:

- fixed
- fixed, machine zero
- simply
- simple, rotatable
- simple plus simple rotatable

When the "Center Object" slider is operated, the selected element of the CAD is centered on the crosshair center. At the same time, the center of rotation is placed there.

With the option "0" (zero point) the DXF is aligned at its file-internal zero point in such a way that this is centered on the crosshair center. At the same time, the center of rotation is placed there.

With the option "-1" (center), the center of the enclosing, axis-parallel (with orientation 0°) rectangle - the center of the so-called extents of the DXF - is centered on the crosshair center. At the same time, the center of rotation is placed there.

With the option "-2" (left/bottom), a point resulting from the X-value of the left
The center of the crosshairs is centered on the "end" of the DXF and the lowest point of the DXF (at 0° alignment). At the same time, the center of rotation is placed there.