MANUAL

TOOL MASTER Quadra

EyeRay®

en

www.evoset.com

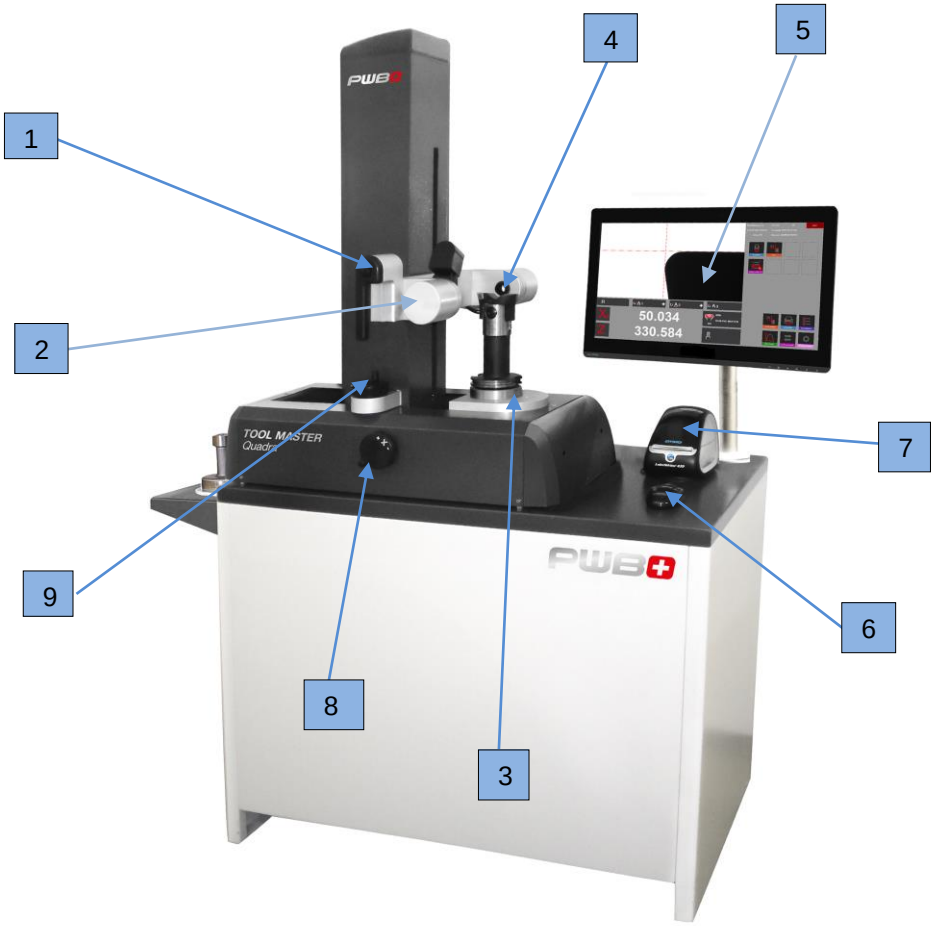
Steg, March 2022

Valid from software version: V.3.6.9.0

Contents

1 Instrument description

1.1 Front view



1. Handle to unlock/lock and move both axis
2. Camera
3. Tool spindle
4. Illumination
5. HP PC
6. Mouse
7. Brother QL-800 Printer
8. Fine adjustment wheel X-axis
9. Fine adjustment wheel Z-axis

2 Instrument installation

2.1 Packing list

Unit

Under body

HP PC

Brother QL-800 Printer

Mouse

ATTENTION : If the instrument has been stored at a temperature below 5 °C, wait for a few hours before unpacking to prevent the instrument parts from condensation. Condensation can affect sensitive parts of the instrument. Keep the original packaging

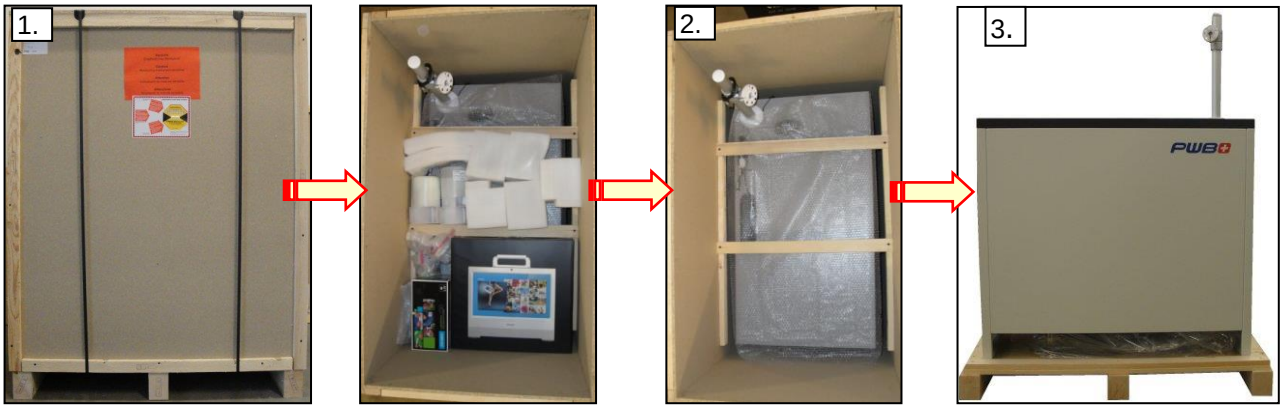
2.2 Unpacking and build-up Z=400

Please note: 2 persons required!!

The unit is delivered in a wooden box. The under-body of the TM Quadra serves as part of the packaging. The Tool Master is fixed on the base of the pallet.
Accessories and also the PC will be located on top of the under-body.

1.) Remove the cover of the wooden box and take the accessories and the PC out of the box.
2.) Disassemble the two wooden strips that secure the under-body

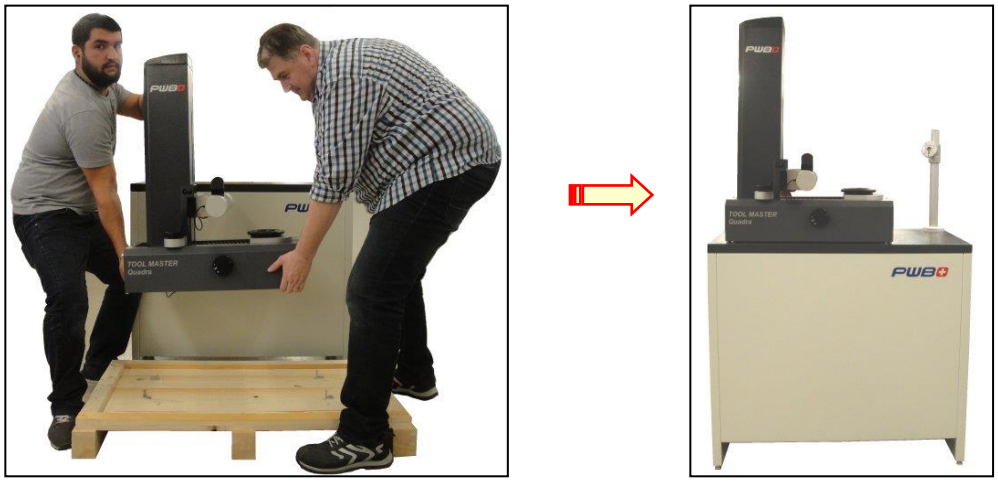
3.) Remove the side walls of the wooden box.



4.) Uplift the under-body (2 persons) and place it on the floor beside the box.

The unit is fixed by 4 screws and aluminium transport angles on the bottom plate.

5.) Remove the aluminium angles and place the unit by 2 persons on the under-body.

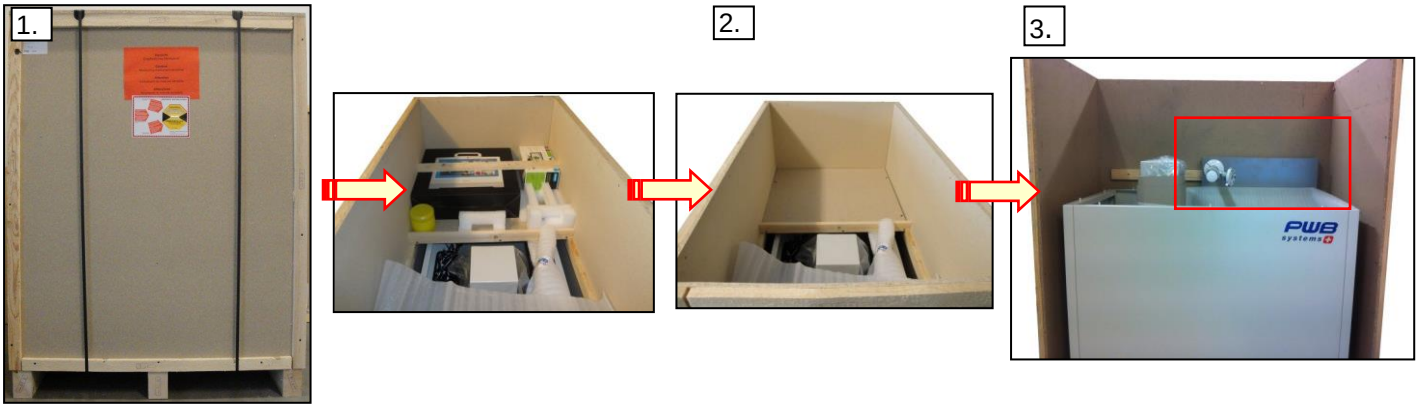


2.3 Unpacking and build-up Z=600

Please note: 2 persons required!!

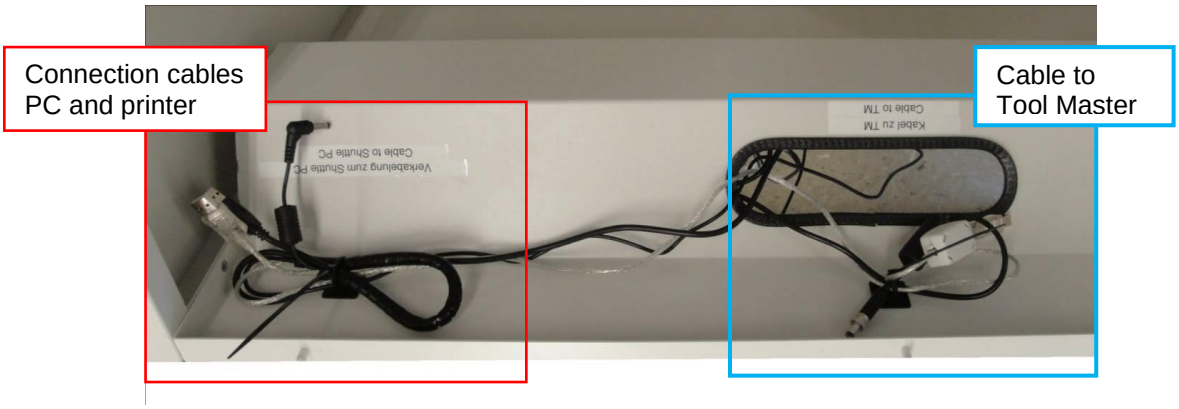
The unit comes delivered in a wooden box.
The under-body of the TM Quadra serves as part of the packaging, and the Tool Master is fixed on the base of the pallet.
Accessories and also the PC will be located on top of the under-body.
The cover of the under body is located beside the under- body.

1.) Remove the cover of the wooden box and take the accessories and the PC out of the box.
2.) Disassemble the two wooden strips and the wooden plate
3.) Remove the cover of the under- body

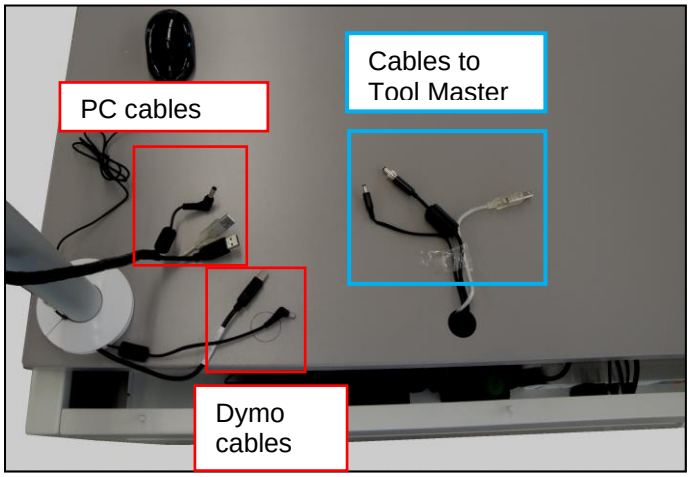


4.) Remove the sidewalls of the wooden box.
5.) Uplift carefully the under-body (2 persons) and place it on the floor beside the box.

The unit is fixed by 4 screws and aluminium transport angles on the bottom plate.
All connection cables are stowed in the under body and labelled.



6.) Place the cover on the under- body and guide the cables through as shown below

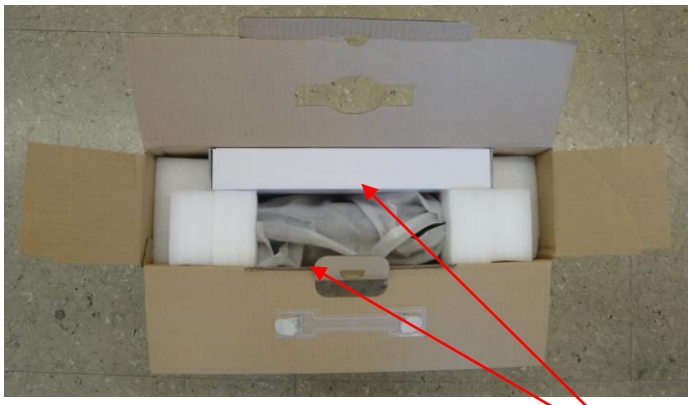


7.) Remove the aluminium angles and place the unit by 2 persons on the under-body.

For all types of units:

<u>All accessories as air supply unit/ mouse pad etc. are to find in the boxes of the PC and the Dymo label writer</u>

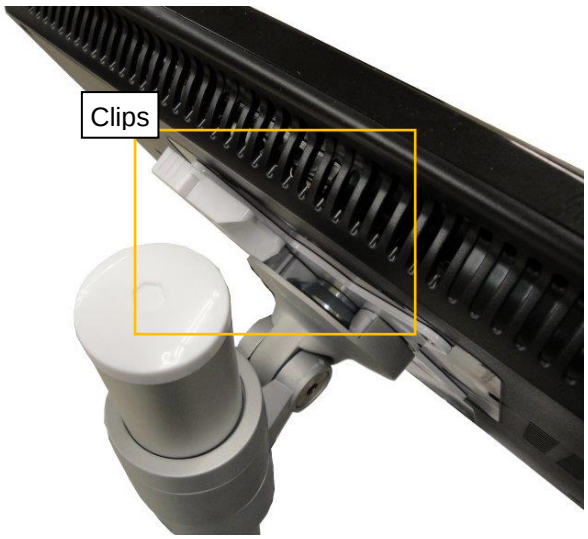
Cardboard box PC, top view



Dymo printer in cardboard box, top view

Accessories

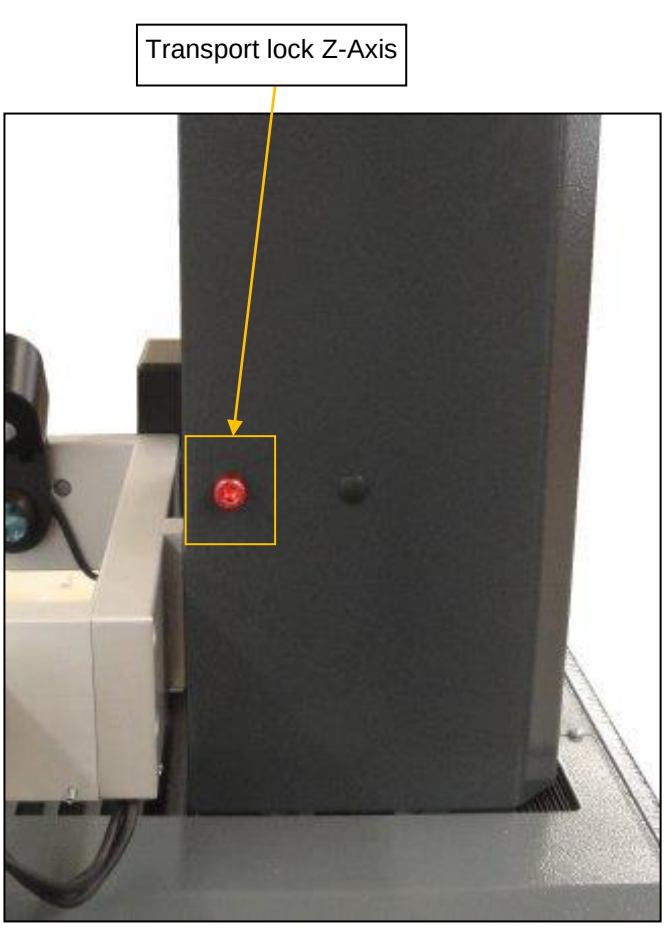
11.) Mount and fix the PC on the holder as shown on below images.

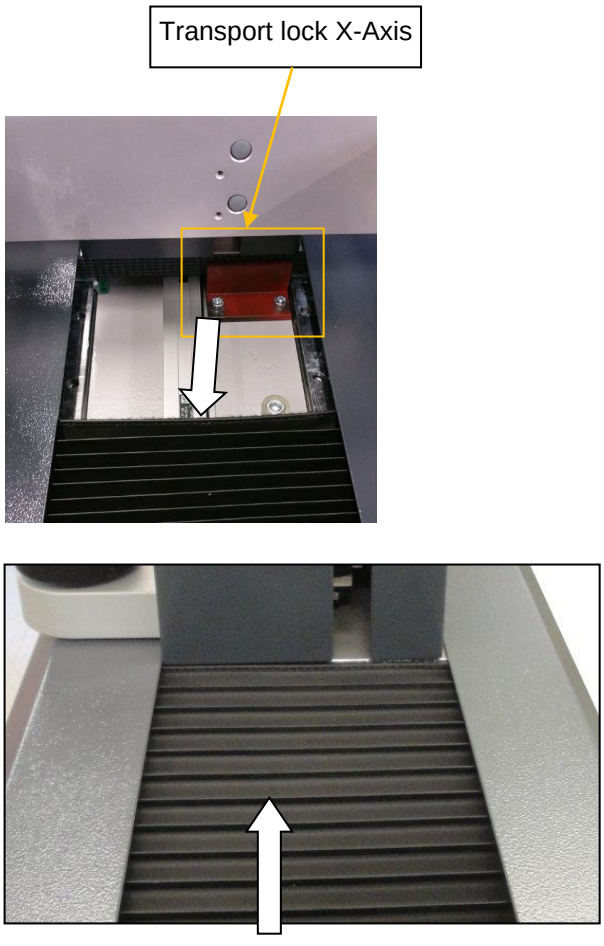


12.) Assemble the air supply unit at the backside of the unit connect it to compressed air supply (5-6 bar, oil and water free air).

13.) Remove the transport security screw of the Z axis: The screw is located at the backside of the column

The X axis is secured by a steel angle, located on the base plate => Release the bellows and move it back. Unscrew the fixing screws of the angle and remove it. Place the bellows back in its intent position.





2.4 Connections

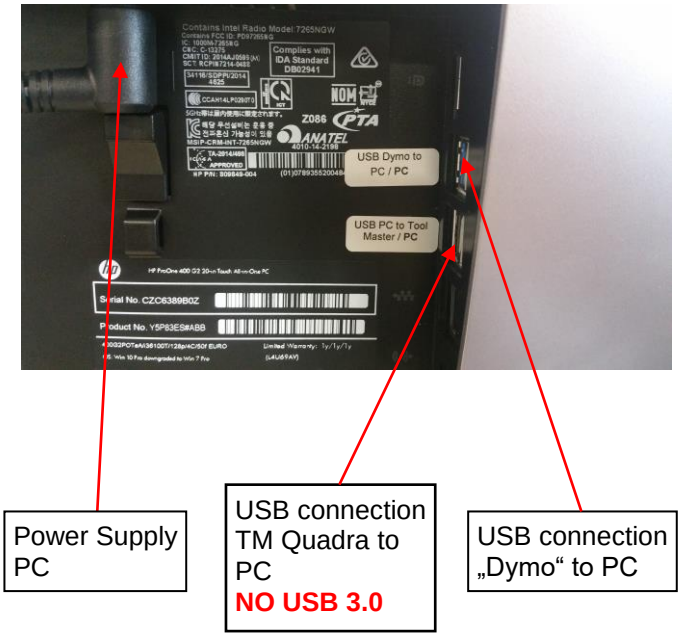
The power supply units for the PC, the TM Quadra and also the Dymo printer are already fixed at the backside of the under body.

The connection of the devices to the multi point connector is already performed.

1.) The cables are all described => Please connect them to the unit, the PC and also the Dymo Printer.

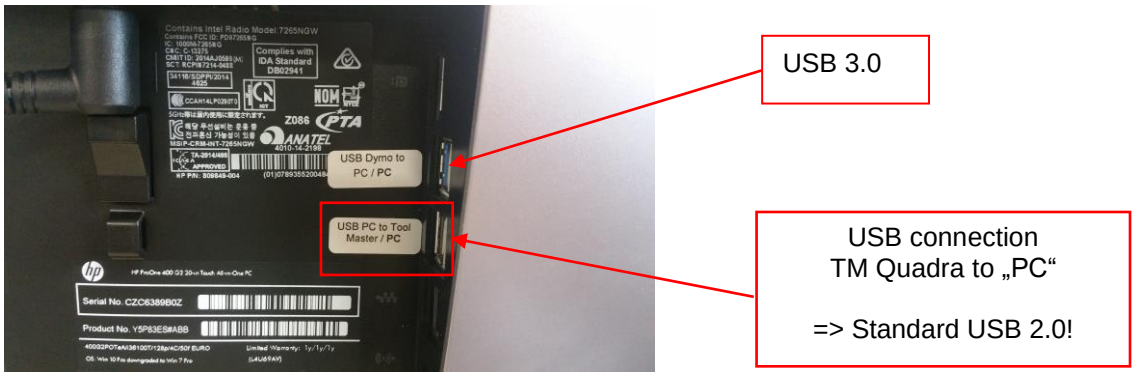
2.) Connect also the TM Quadra with the PC by USB connection cable.

3.) Perform the connection of the Dymo printer by USB cable to the PC



PLEASE NOTE:

Make sure to connect the USB connection “Tool Master- PC” to a standard USB 2.0 connection as shown in the picture below. **Do not connect it to a USB 3.0 connector**.



4.) Connect the multi point connector to the main power supply

Multi point connector

Please find in the cardboard box of the PC a Country-specific plug for the main connection of the multi point connector

Country-specific adaptors

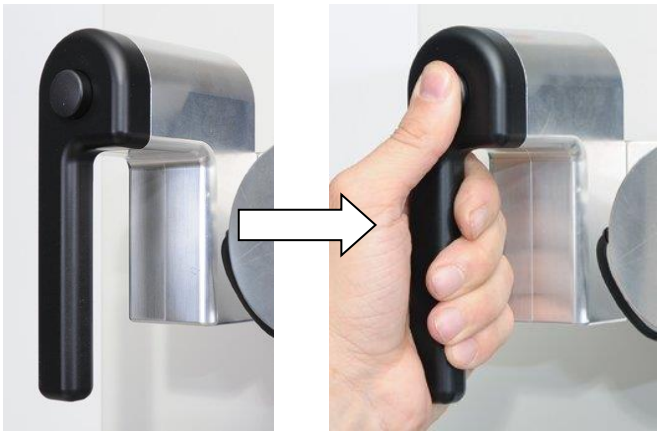
3 Operating the unit

3.1 Axis movement

As soon as the compressed air (5-6 bar) is connected to the unit will both axes be locked.

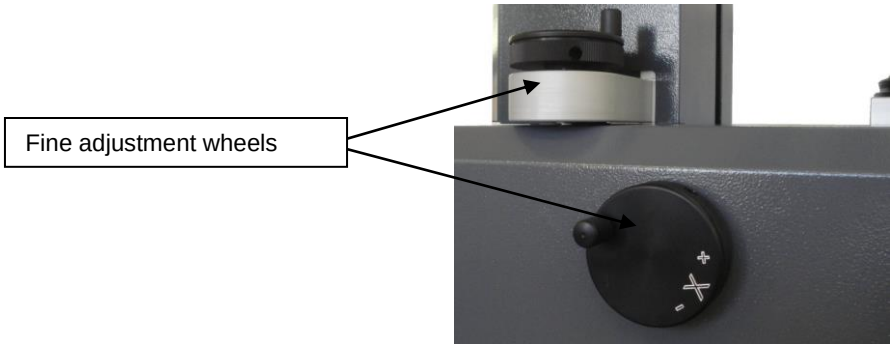
<u>Fast movement:</u>

Push the button on the black handgrip
to release the axis clamping, and move
the carriage/camera to the desired position.



<u>Fine adjustment:</u>

Release the button of the hand grip and use the fine adjustment wheels “X” and “Z” to move the axes micron-wise.



3.2 Spindle types

The TM Quadra is available with 2 spindle types.

Needle bearing (standard)
Available sizes: ISO40 and ISO50

Spindle KV (optional)
Available size: ISO50

3.2.1 Spindle “Needle Bearing”

- Little wear out/ avoid damages of the tool cone
- Better centre alignment in comparison to full surface contact
- Oil and dirt remain in clearance gaps avoiding mismeasurement
- Easy to clean/ no maintenance costs
- Stable run out

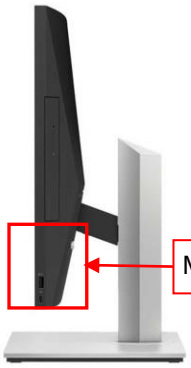
3.2.2 “Spindle KV”

The spindle functions of the “Spindle KV” can be controlled through the EyeRay® software.

- High precision preloaded parts
- Rotations clamping/ vacuum pull in and air bearing functions
- Please see chapter **5.1 Operating spindle KV** for further advises

3.3 Switch-on the unit and the PC

Main switch unit



4 Imaging system Eye Ray ®

4.1 Log-In screen

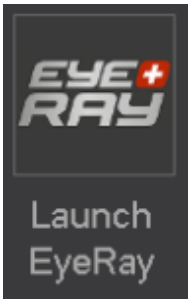
Note: Please make sure, that there is no USB stick or other device connected to the HP PC, while the unit starts up. The unit will not start up correctly.

Start screen:

Icons:

Shut down PC

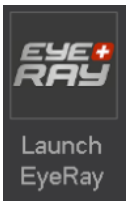
PC restart



Start EyeRay® software

4.2 Start Eye Ray® and Log-In

Click on the icon “Launch Eye Ray”



The Software starts and the Log In selection opens:

Click on the arrow beside the User Input field. A list of the defined user will be shown.

Selection:

User ID	Administrator
Password	admin
User ID	PWB
Password	pwb
User ID:	**Support (Only for online support purposes)**
Password:	**----**

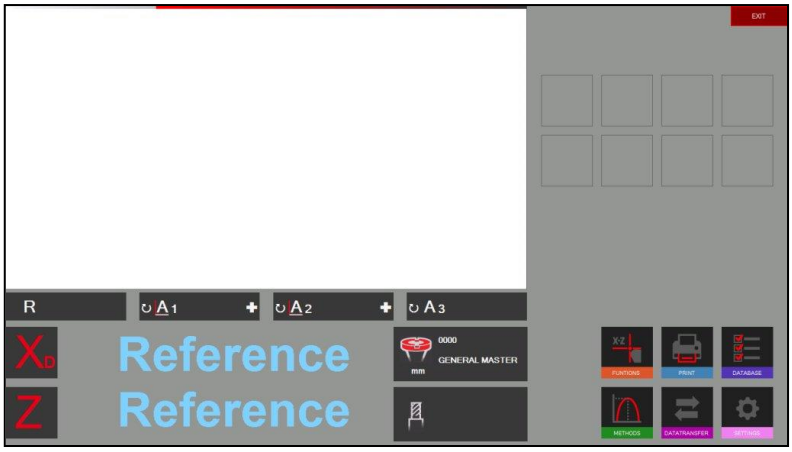
Confirm with:

4.2.1 Only units with linear scales: cross reference marks

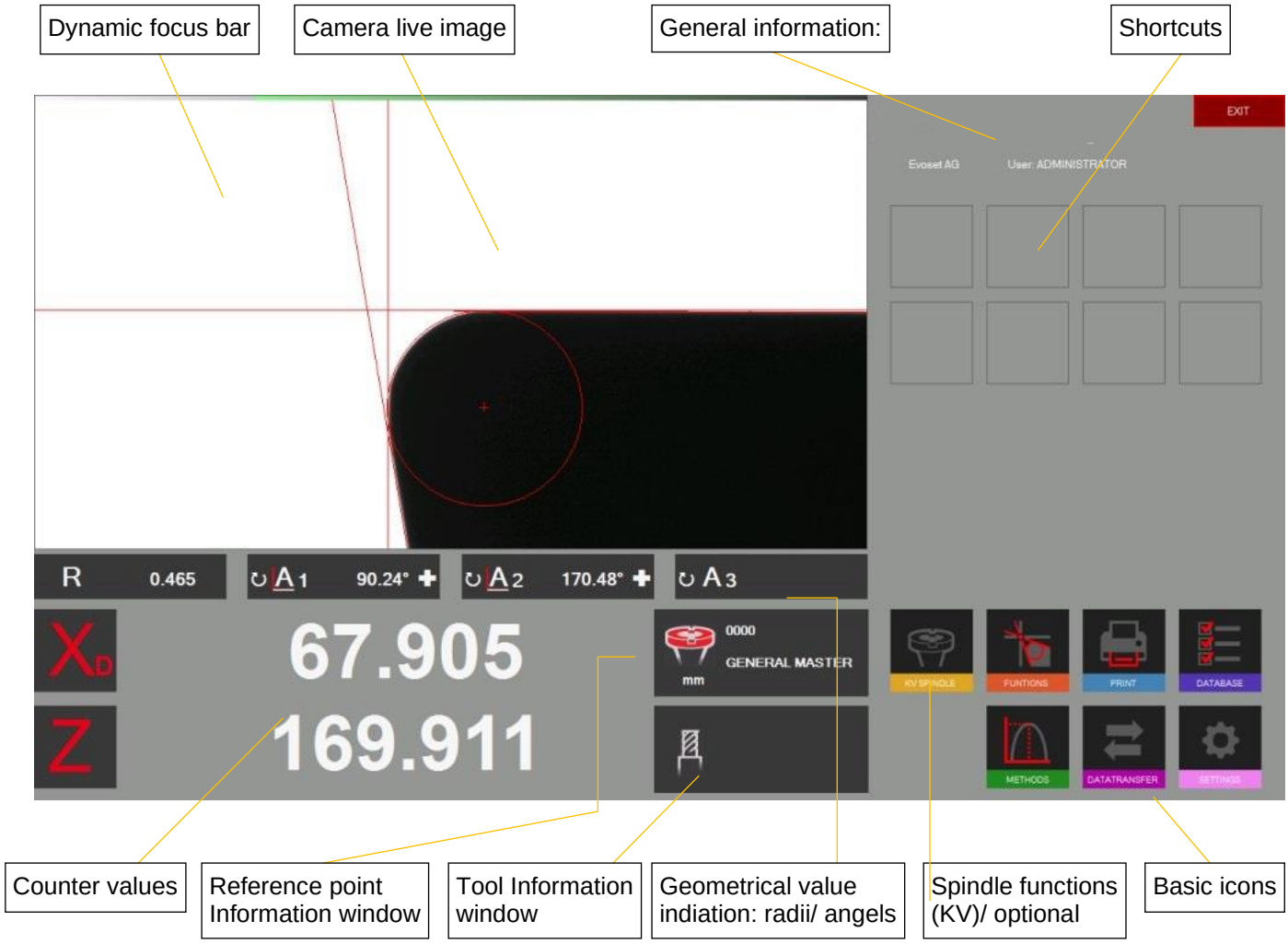
The software opens and shows on both axes „Reference“.

Move both axes using the Black Hand grip until both axes crossed the reference mark.

As soon as the reference marks are crossed will the counter displays start counting.



4.3 Screen representation EyeRay®

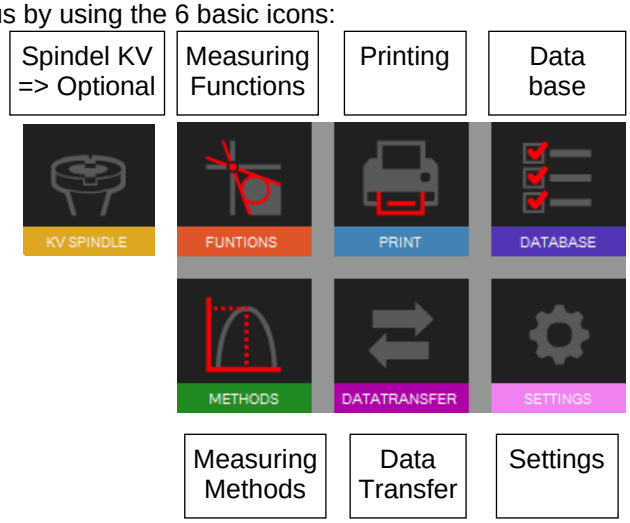


Eye Ray® => Easy to use:

Operate the software just by 6 Basic icons

4.4 Menu structure

Enter all the sub menus by using the 6 basic icons:

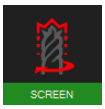


Meas. method

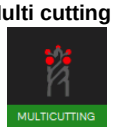
Maximum

Pre-set

Screen



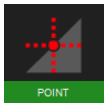
Multi cutting



Front light

Fixed axis

Centre point



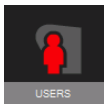
Theoretical Angle/ Radius

Point measurement

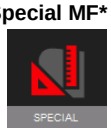
Meas. function

Additional MF

User/ Tailor MF



Special MF*



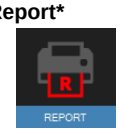
***= Optional**

Printing

Label Format 1

Label Format 2*

Report*



***= Optional**

Basic settings

Illumination

Align camera

Pixel size

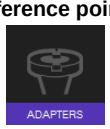
Parallelism corr.

Abs. zero point

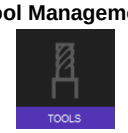
Parameter

Database

Reference point



Tool Management



Backup restore

***= Optional**

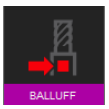
Data transfer

Tool list manager

Open PDF

Send file*

Write to chip*

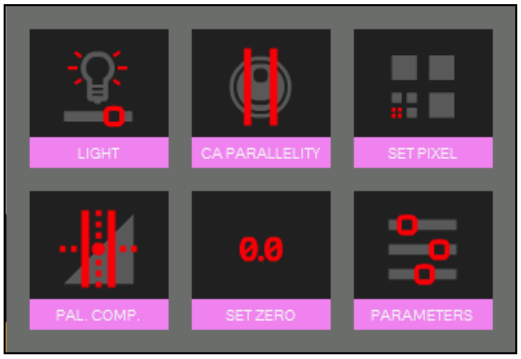


***= Optional**

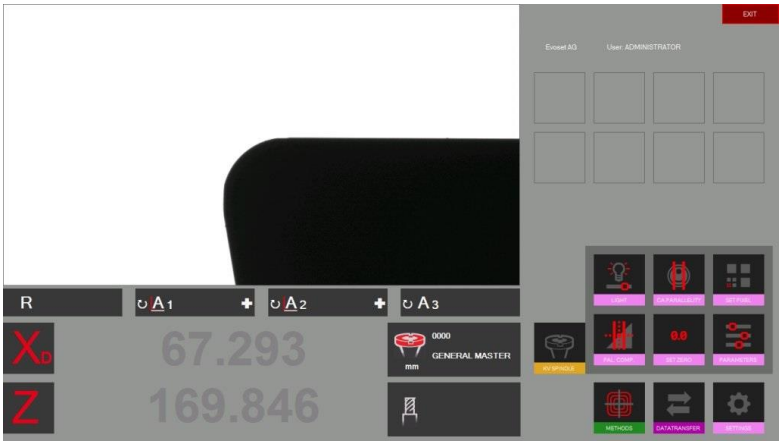
4.5 Basic settings

Click on this icon to open the menu with the 5 basic settings

Illumination	Align camera	Pixel size



Parallelism compensation	Absolute zero point	Parameter



4.5.1 illumination

Open the basic settings with the icon 

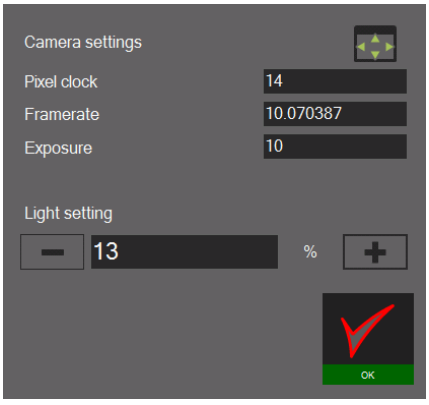
Use this icon to check and adjust the intensity of the illumination

The horizontal lines show the intensity of the light at the top, in the centre and at the bottom of the live image.
The vertical lines show the intensity of the light Rightward, in the centre and leftward of the live image

All the horizontal lines have to be within the tolerance.

All the vertical lines have also to be within the tolerance.

To improve light intensity:
- Clean the camera lens
- Clean the illumination lens



If there is still not enough light intensity, use the “+” icon to increase the light until the lines are within the tolerance fields.

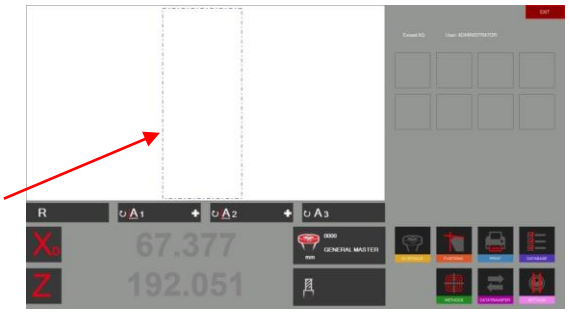
Confirm with 

Check the illumination from time to time => At least once in the week or more when the light around the unit is changing a lot.

4.5.2 Align camera

Put in the master mandrill or a tool which's contour is parallel to the vertical camera axis.

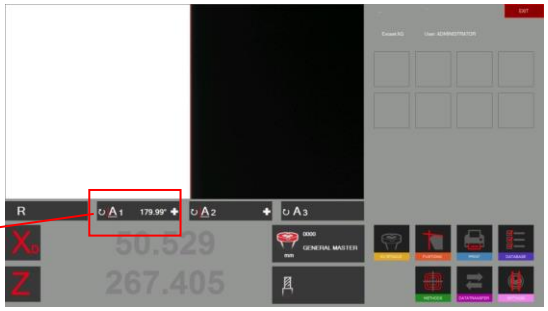
Click on this icon to set the camera.
Move the vertical contour of the master to the ROI/ Region of interest (Rectangle in dashed lines)



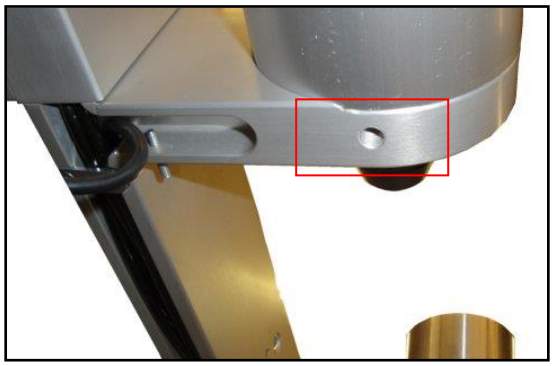
The angle indicator "A1" shows the difference from the vertical contour of the mandrill to the vertical axis of the camera.

The value has to be less than ±0.02°.

⇨ Permissible values: 179.98° - 0.02°



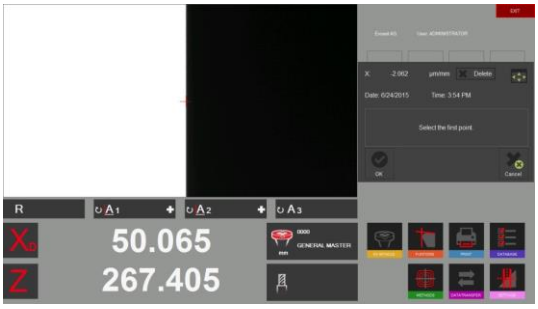
If the deviation is bigger than ±0.02°, loosen the fixing screw at the aluminium holder of the camera.
Turn the camera a little until you reach the maximum permitted value and tighten the camera again.



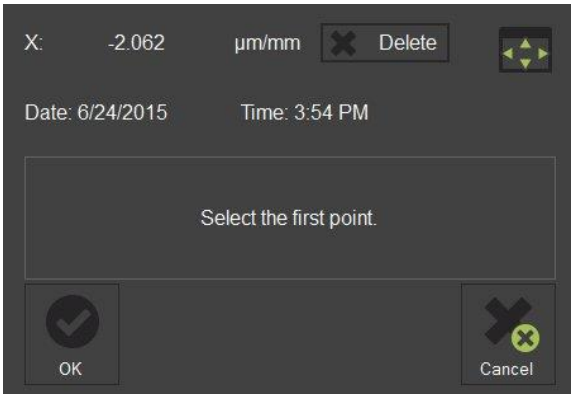
4.5.3 Parallelism correction

This function is used to adjust parallelism errors between the column and the axis of the tool pot.

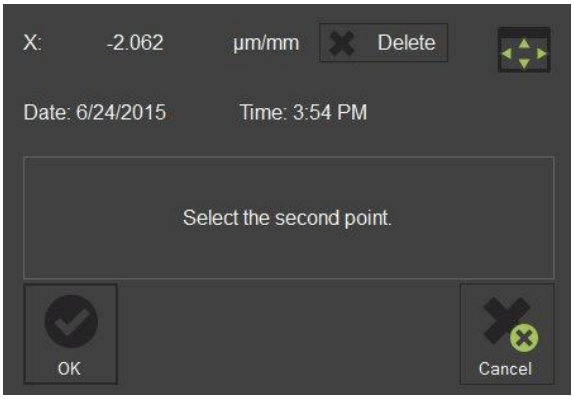
Open the operation with this icon and put in the master mandrill



The software advises to measure the first point at the bottom of the master mandrill.
Move the camera down and confirm the measurement.



Move the camera up and measure a second point on the upper end of the master mandrill.

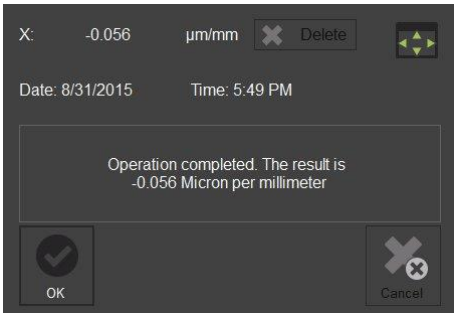


Confirm with 

The result appears in the window as shown rightward.

-0.056 Micron/ mm means a correction of 0.016mm on a height of 300 mm.

This error will now be corrected all the time by the software.



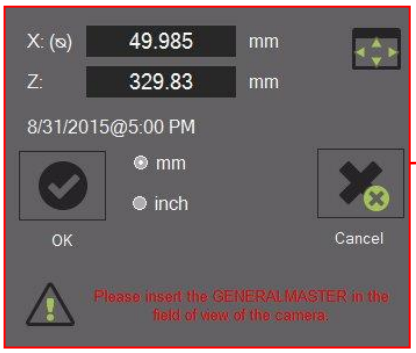
As soon as you finished the procedure of the parallelism correction, will the system advise you to calibrate the instrument.
This has to be done, because of the new recorded parallelism error factor.

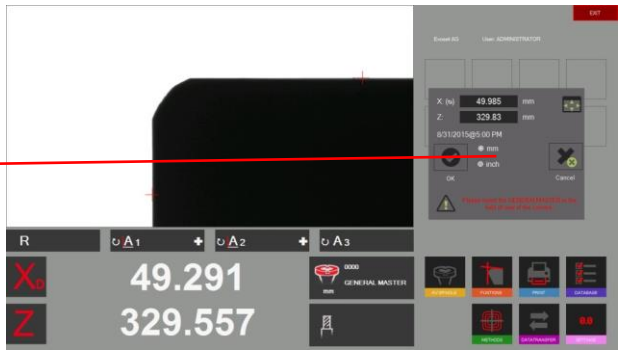
Please see chapter “4.5.4 Set the absolute zero point” for further advise.

4.5.4 Absolute zero point

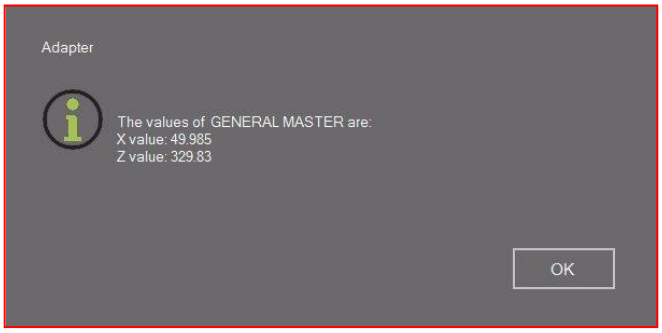
Put in the master mandrill

The icon leftwards starts the procedure.



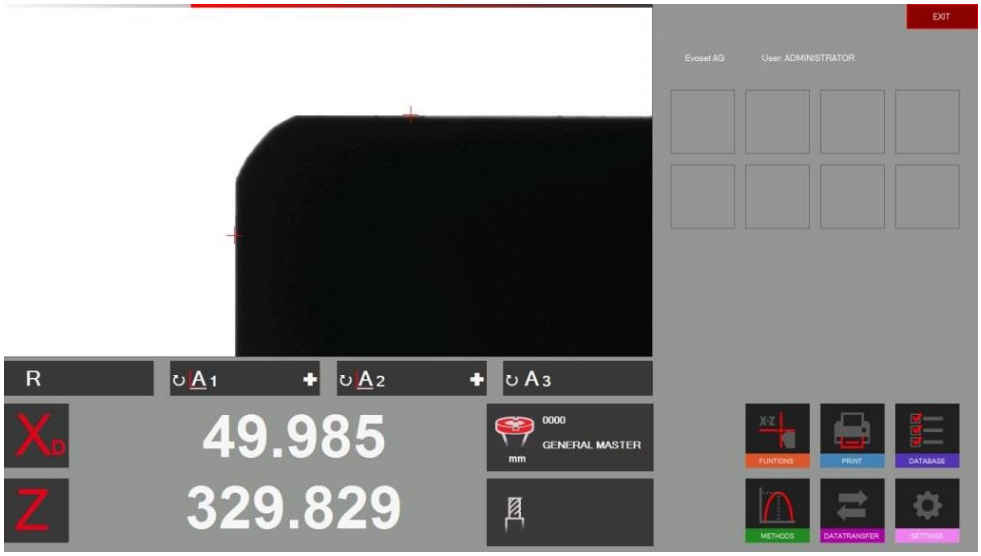


It appears a window that shows the nominal values of the master mandrill (engraved on the mandrill). If the values aren't the same as marked on the mandrill can it be changed in this window. Also can the unit be defined (metric/ inches).



Check that the values on the reference control window are the nominal values.
Master mandrill: Compare the values with the engraved values on the master mandrill.

Confirm with "ok" to set the absolute zero point.
The unit is now calibrated and ready to measure.



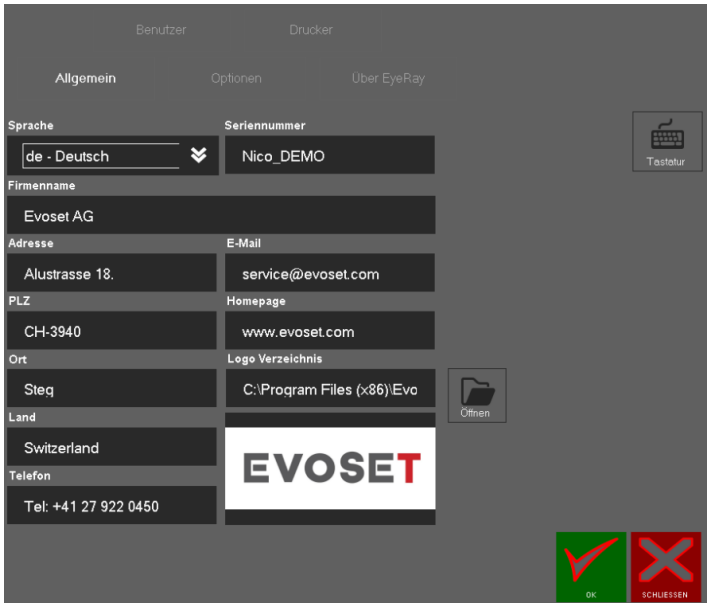
4.5.5 Parameter

Open the parameters by clicking on the icon leftward

Changes are only possible if logged in as Administrator!

Index „General“:

- To change the company name, Language settings, Logo etc.

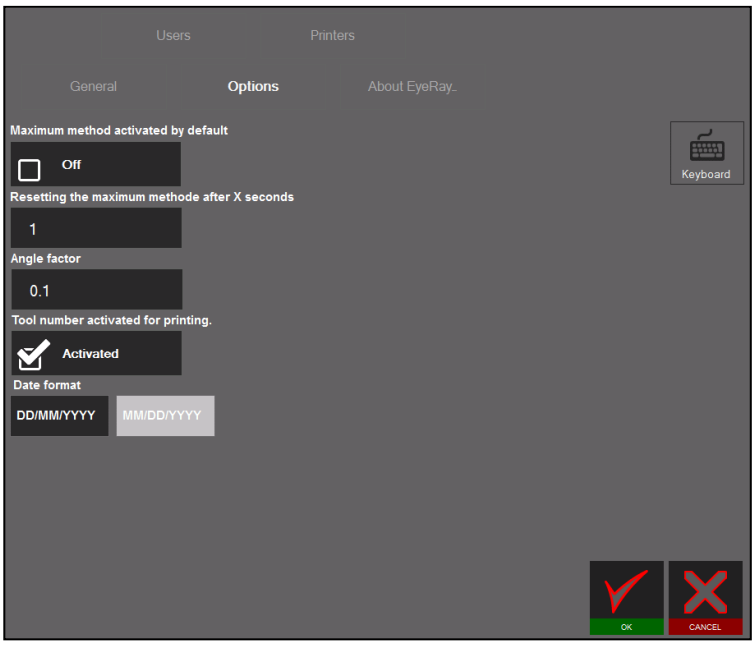


Chapter “Options”:

- Change reset factor of the maximum method/ angle factor etc.

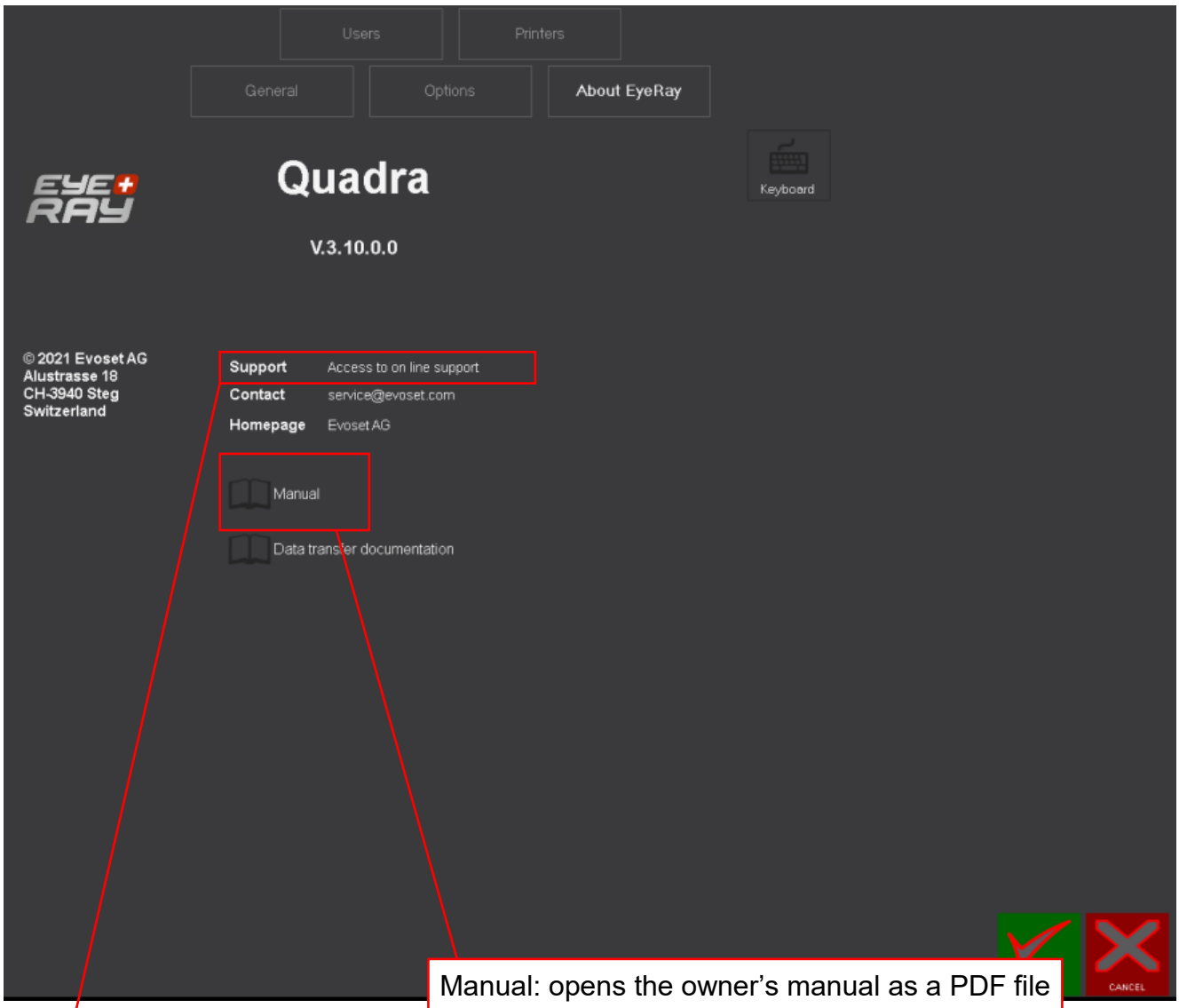
- Define a default MF
  => This MF will be set as default after homing the unit etc.

- Date Format



Index „About EyeRay“

- To open the user’s manual, connection to online support, contact info.

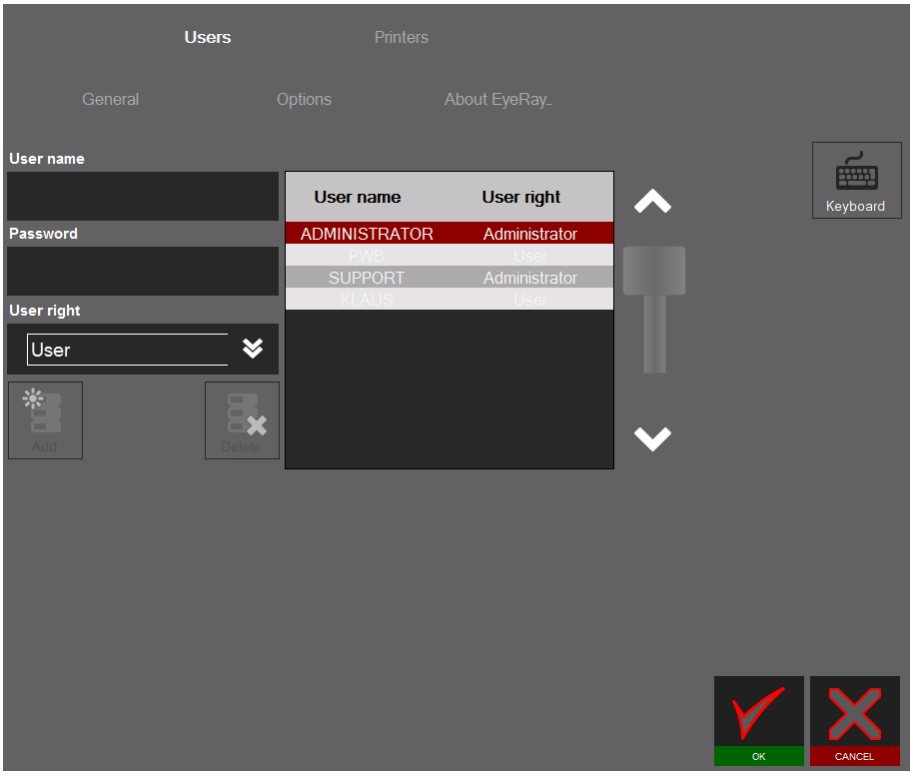


„Support“:
- Internet connection required !
- Opens automatically a website to enter a 6 digit code for the online support.

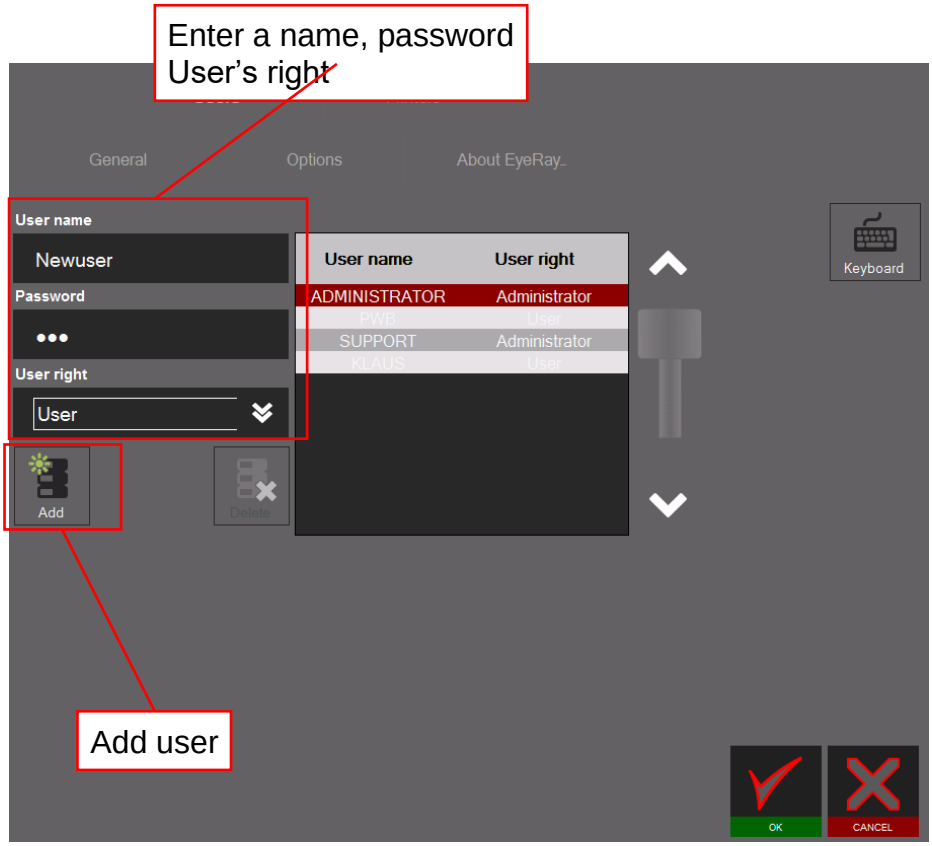
⇨ Please call +41 922 04 50 to get the code.

Index “Users”

-Administrate users/ definition of user rights

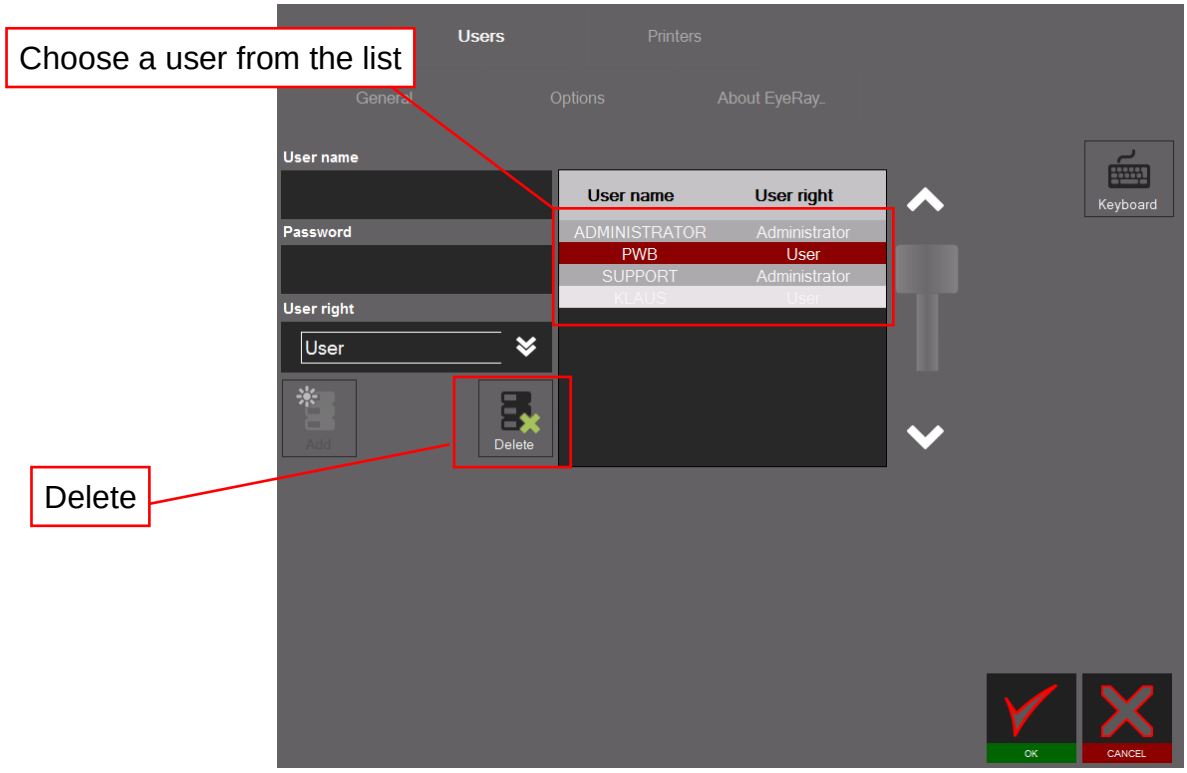


Add a user:

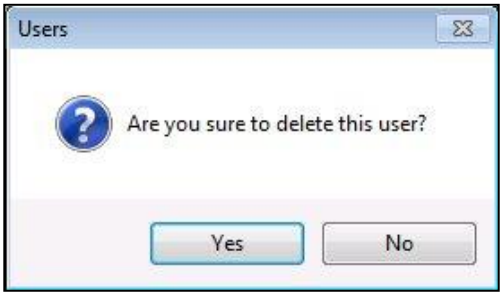


The user “Support” cannot be modified

Delete a user:

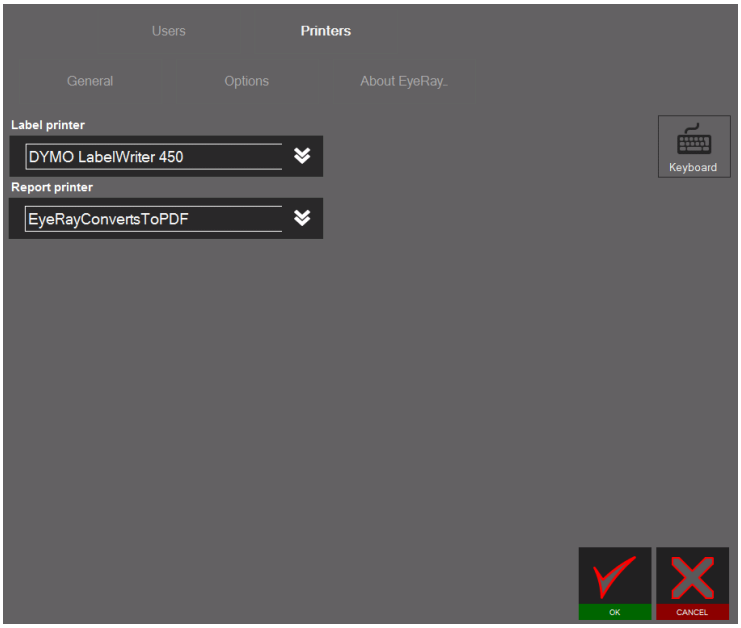


Confirm the appearing message to Delete the user.



<u>Index “Printers”</u>

- Selection of the installed printers



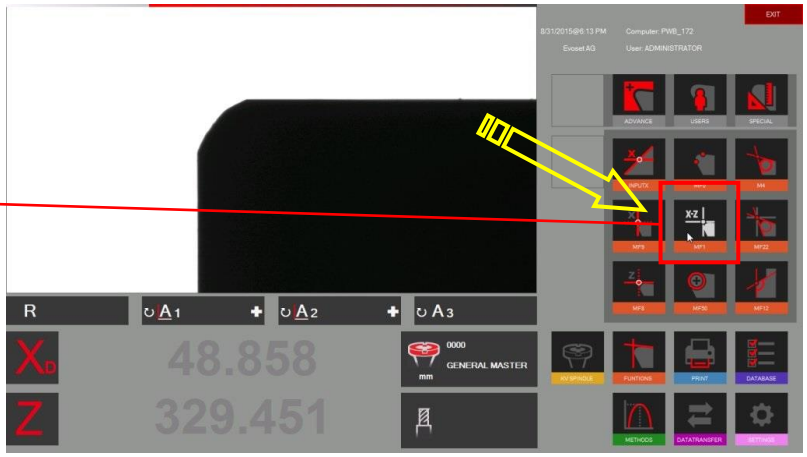
4.6 Shortcuts

Shortcuts can be created for often used functions or methods to open them timesaving.
Max. 8 shortcuts can be created.
Are all shortcuts fields taken, can an existing one be overwritten by a new shortcut.

4.6.1 Create shortcuts

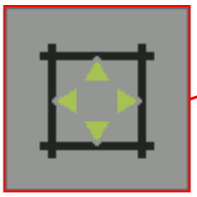
Click and hold the left mouse button in the **lower area** of the icon, which you want to add to the shortcuts.

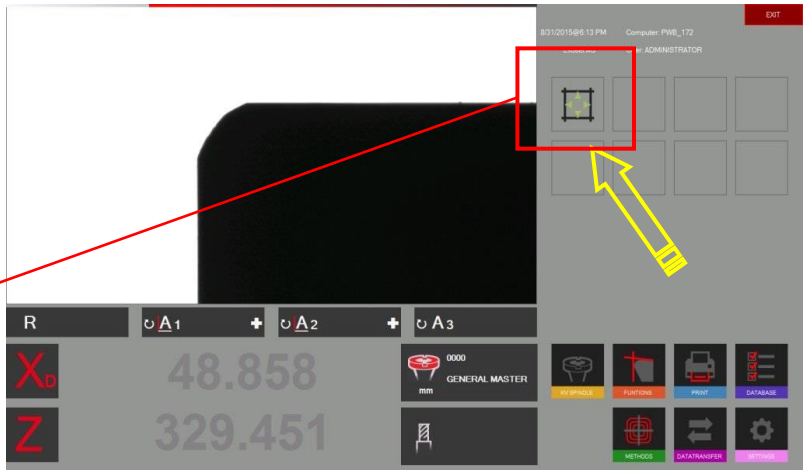
Example: Measuring function MF1



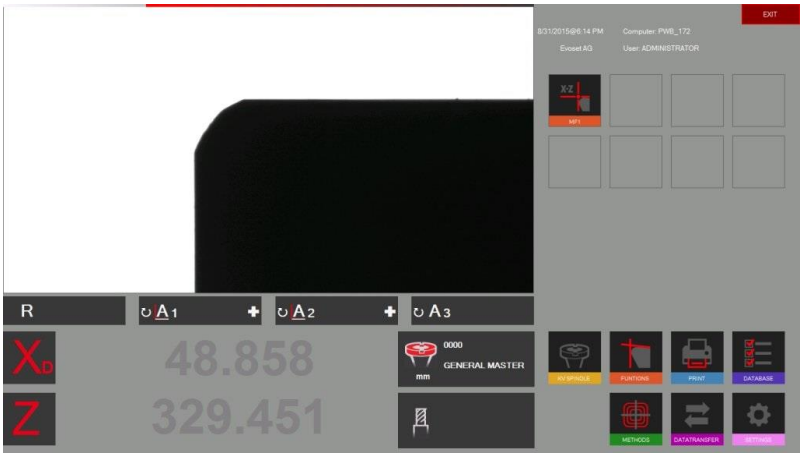
Move the icon upwards to a Shortcut filed by using the left mouse button.

If the field is already used as a Shortcut will it be overwritten by the new one.



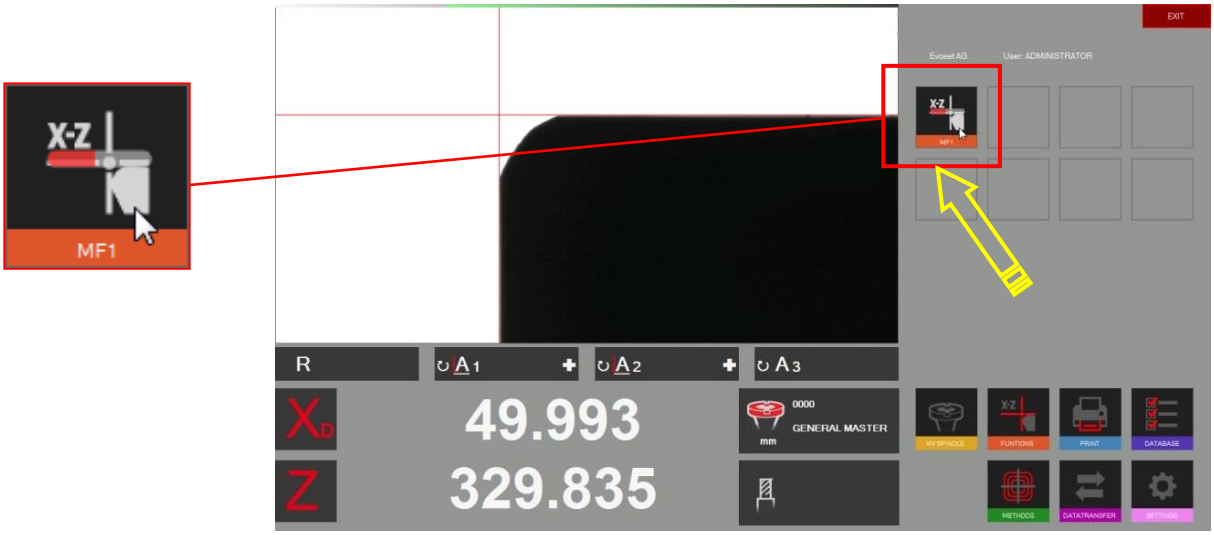


The function is now to find in the shortcuts area

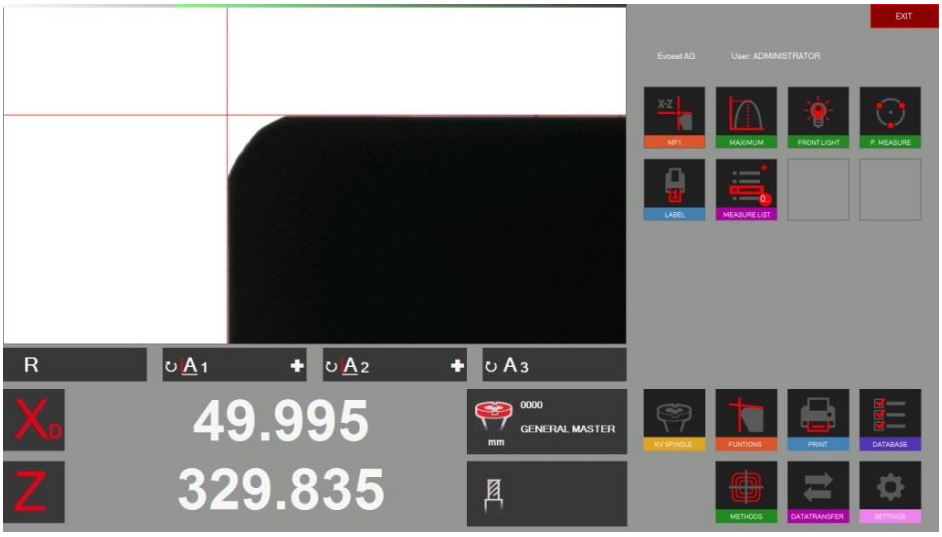


4.6.2 Delete shortcuts

Click and hold the left mouse button on the shortcut.



Please find hereunder an example of different shortcuts (Measuring functions and methods).



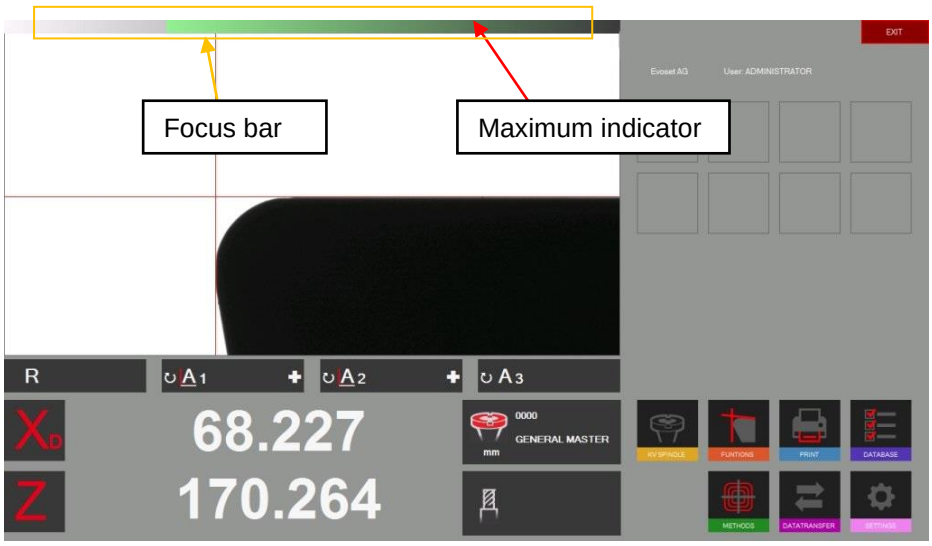
Maximum 8 shortcuts can be created.

4.7 Measuring

4.7.1 Focus bar/ indicator

Description:

The focus bar/ indicator and the maximum indicator help to turn the tool to its maximum deviation and to set the maximum camera focus.



It is located on the upper area of the screen.
If you turn the tool slowly in the camera area you will see that the right part (maximum indicator) of the focus bar move to the left until you reach the maximum and come back when you turn the tool further.

Turn a tool slowly to see how the “Focus Bar” operates.

How to use the “Focus Bar”:

Put in a tool and move it to the camera live image.

Turn the tool => the “maximum indicator” is **BLACK** and moves to the left

Turn the tool further until the “maximum indicator” moves back to the right and turns to **RED**.
=> Means the maximum focus became crossed.

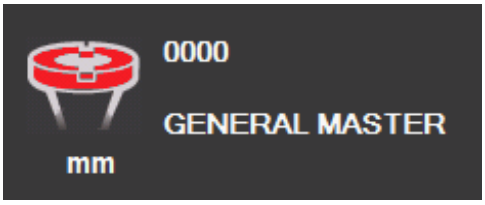
Turn the tool slowly to the opposite direction until the “Maximum indicator” turns to **GREEN** colour.

When the focus is set will the bar automatically be minimised. If the tool is turned again will the bar be shown in its original size to make the use more comfortable.

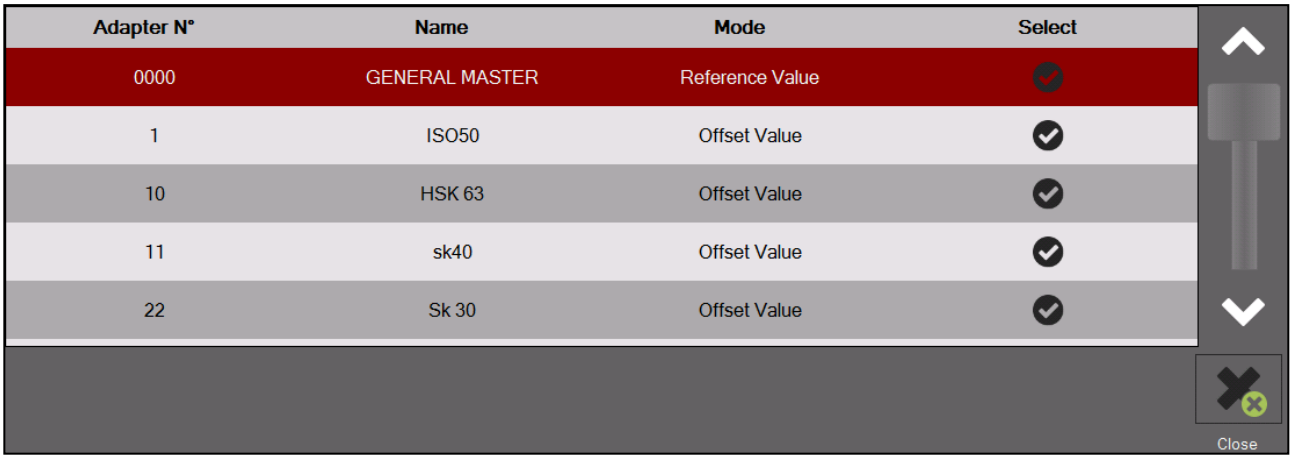
4.7.2 Choose a reference point

Put in a tool.

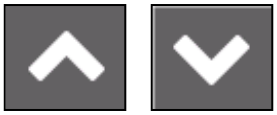
Before measuring a tool is the right “Reference point” to choose

Click on the reference point icon 

It appears a list with all defined reference points



Description of the icons:



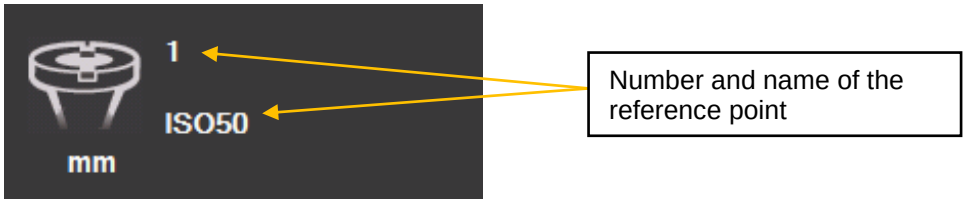
Scroll the list

Close list without selection

Choose a reference point by DoubleClick on it.

The chosen reference point will be shown in the Reference point window

Example:



Two different kind of reference points/adaptors can be stored:
- Adaptors with reference values
- Offset adaptors

Adaptor with reference value:

This kind of reference point is used to calibrate the unit.
Examples: Master mandrill/ “Master tools” with known dimensions/ calibration tools

Mostly is there one adaptor with reference values stored, used to calibrate the unit
=> General master/ Master mandrill.

Offset adaptor/ adaptor with offset value:

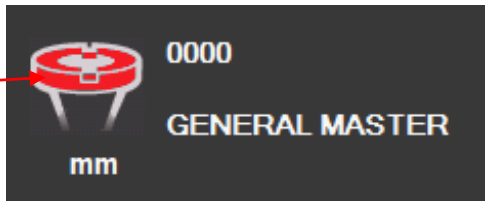
This kind of reference point is used to measure tools with other types of tool holders than the basic spindle.
Examples. PWB Adaptors like ISO/ HSK/ Capto etc.

Mostly is the offset value used in the Z axis. The diameter axis is usually equal to the centre of the tool pot => No offset necessary (Exception: for example turning tools)

Indication of an adaptor with reference values/absolute reference point:

The red highlighted adaptor symbol shows that this adaptor is an „Absolute reference point“

Red highlighted => Adaptor with absolute reference values.

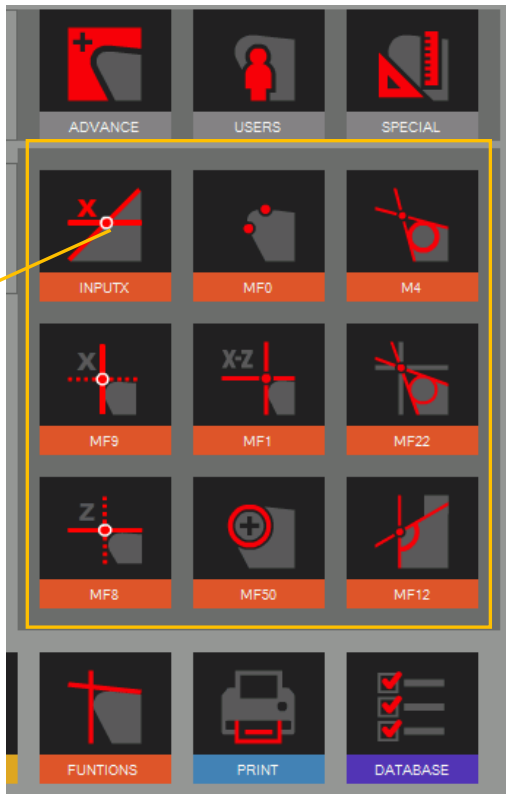


Please note: The unit has to be calibrated with the assigned calibration tool when selecting an adaptor with reference values!!

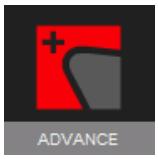
4.7.3 Select a measuring function (MF)

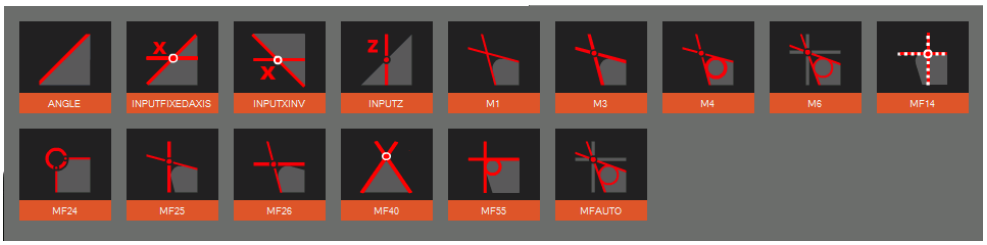
Icon to open the basic measuring functions.

Most measuring tasks can be complied with the basic measuring functions.

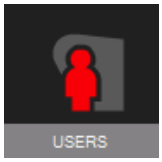


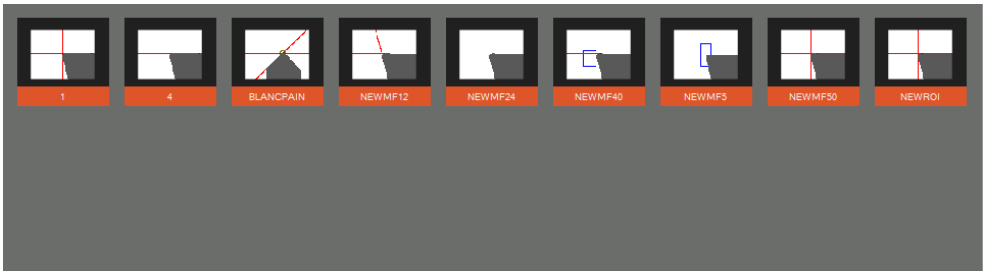
Opens the additional Measuring functions





Shows user defined/ tailor made measuring functions





Special measuring functions (on request)

Evoset/ PWB item number: P270590.
See Chapter „5.8/ Customized measuring function“

4.7.4 Description of the measuring functions

Generally:
The measuring function defines the way how the imaging system analyses the cutting edge

4.7.4.1 Basic measuring functions

MF1

This function measures the highest point on the tool contour in the horizontal direction (X) and the highest point in the vertical direction (Z): so-called point measurement.

MF8

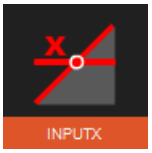
This function measures only the highest point on the tool contour in the vertical direction (Z), means only the length of the tool.

MF9

Measures only the highest point on the tool contour in the horizontal direction (X), means only the diameter respectively the radius of the tool.

M4

This function places both measuring lines L1 and L2 on the tool contour and measures the angles of both lines and also the including angle: so-called line measurement. Furthermore it measures the radius of the tool cutting edge.



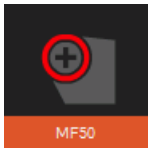
Input X and Input X inversed (Additional function)

Measures the height of a contour, by default diameter value.
Indicates also the angle of the cutting edge.

MF0

Function to check the master mandrill by single measuring points in each axis.

MF50



This function measures the radius of a tool cutting edge and shows at the same time the center point of this radius.

MF22

This function places both measuring lines L1 and L2 on the tool contour and measures the angles of both lines and also the including angle.
At the same time it measures the radius of the tool cutting edge and also the highest point in the horizontal direction (X) and the highest point in the vertical direction (Z).
(MF22 = combination of M4 and MF1)

MF12

This function places both measuring lines L1 and L2 on the tool contour and measures the angles of booth lines and also the including angle. Furthermore it measures the radius of the tool cutting edge.
Difference between MF12 and M4:

The function **MF12** is also used to create user based functions/tailor functions by changing the size and the position of the measuring areas for both lines and the radius.
=> see chapter „4.7.4.3 / Tailor made measuring functions“

4.7.4.2 Additional/ extended measuring functions

Angle

Line measuring: places the measuring line L1 along the contour of the cutting edge and indicates the angle of it.

Input X Invers

Measures the height of a contour by default diameter value.
Indicates also the angle of the cutting edge. Tool shape:

Input Z

Measures the diameter of a contour by default height value.

M1

This function places both measuring lines L1 and L2 on the tool contour and measures the angles of the lines.

M3

Places both measuring lines L1 and L2 on the tool contour
and measures the angles of both lines, and also the including angle:
So-called line measurement. Furthermore it indicates the theoretical intersection point in “X” and “Z”

MF14

In the centre point method is just one pixel along the vertical middle line of the camera view active. The measuring point follows the cutting edge.
Application: To measure the axial run out of a disc or a circular saw blade.

MF24

Measures the radius and the center point on a tool with invert radius shape.

MF25

This function places one measuring line along the tool contour (Z value/ line measurement) and picks up on the X axis the highest point (point measure).
The indicated result is the intersection point in “X” and “Z” of the two lines.

MF26

This function places one measuring line along the tool contour (X value/ line measurement) and picks up on the Z axis the highest point (point measure).
The indicated result is the intersection point in “X” and “Z” of the two lines.

MF40

Line measuring: places the lines L1 and L2 along the tool contour.
Indicates the angles of both lines and the included angel.
Also will the intersection point of the lines be indicated („X“ and „Z“).
(countersink/ centre drills)

MF55

Measures the highest point in horizontal (X) and vertical (Z) direction (PX/PZ).
Also will the radius of the cutting edge be indicated.

4.7.4.3 Used defined/ Tailor made measuring functions

The EyeRay® gives you the opportunity to create user-defined (Tailor made) measuring functions.

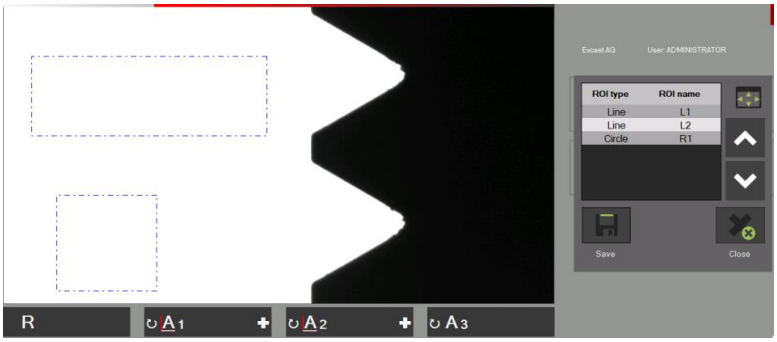
Due to the innovative and flexible EyeRay® is the operator able to modify/change an existing measuring function and store it as his own “user- created” function.

Mostly is the function MF12 be used to create tailor made functions:

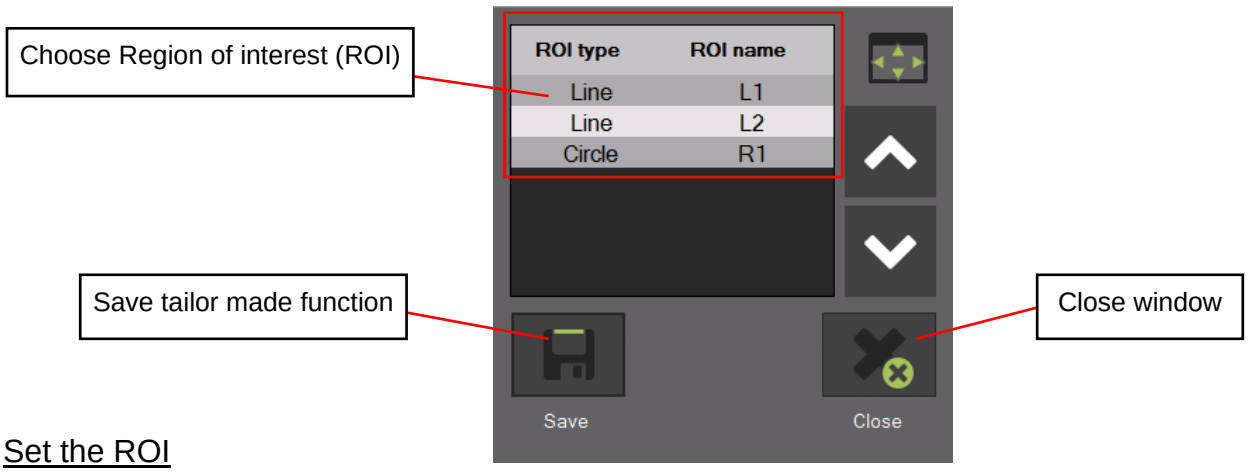
MF12

Choose MF12 and click with the mouse in the live image area of the camera.

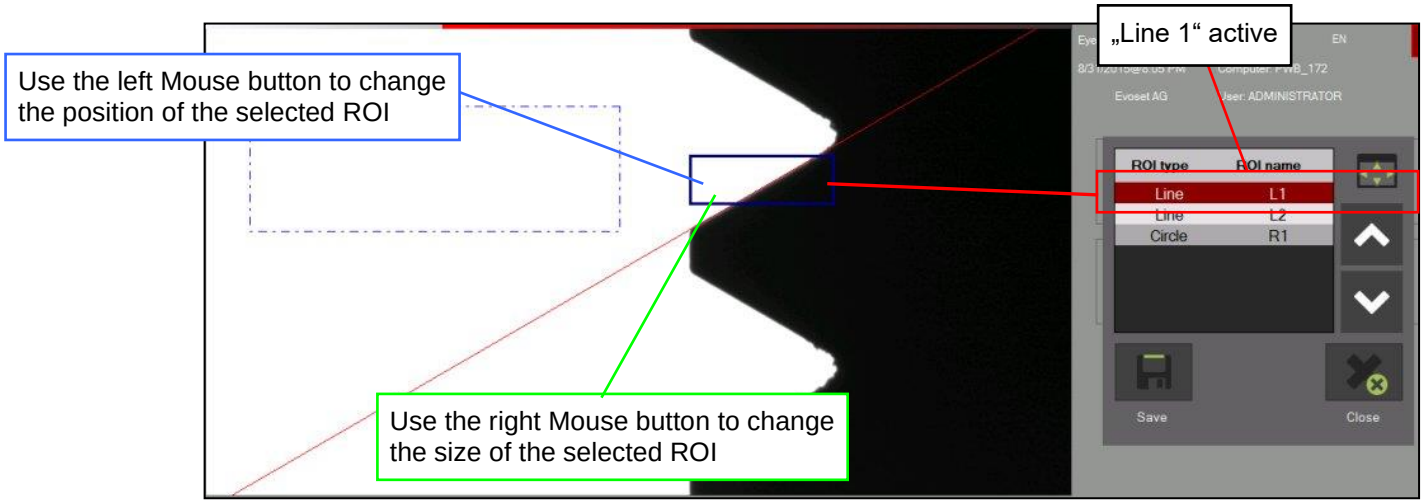
Two blue rectangles (Regions of interest/ ROI) will appear in the live image, and a control window opens.



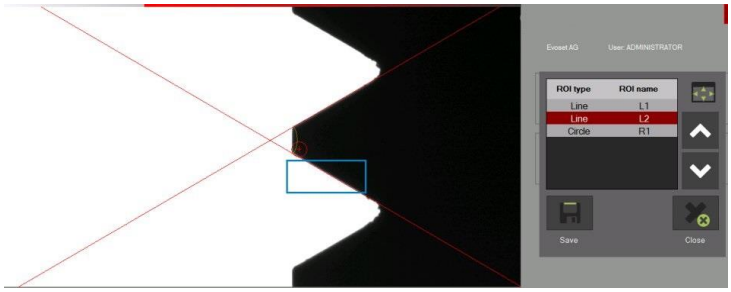
Functions of the control window:



Set the ROI

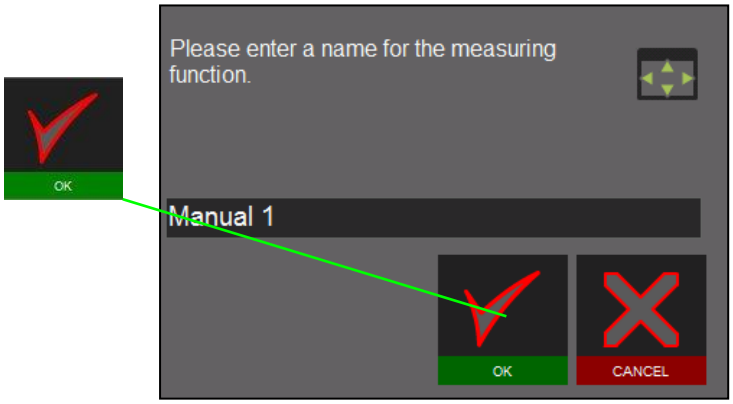


Position both lines and the radius (if desired) at its position:



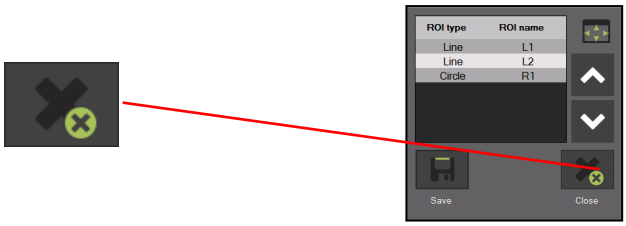
Save the tailor made function:

Click o this icon to save the function.

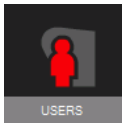


- Enter a name and confirm with

- Close the control window with

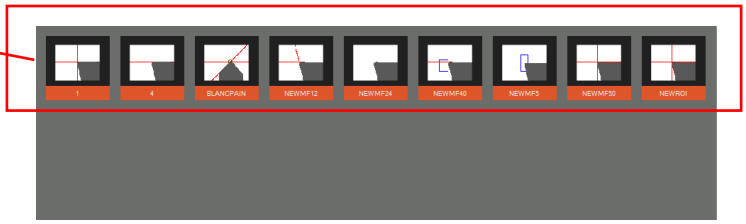


Select a tailor made function



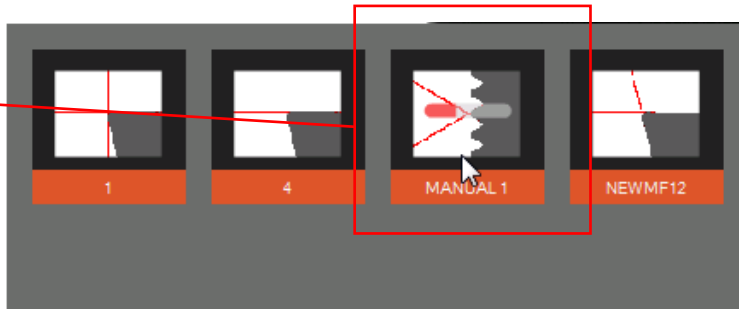
Click on this icon to show all tailor made measuring functions

Click on the icon of the desired function:



Delete a function:

Click and hold the left mouse button on the icon for a few seconds.

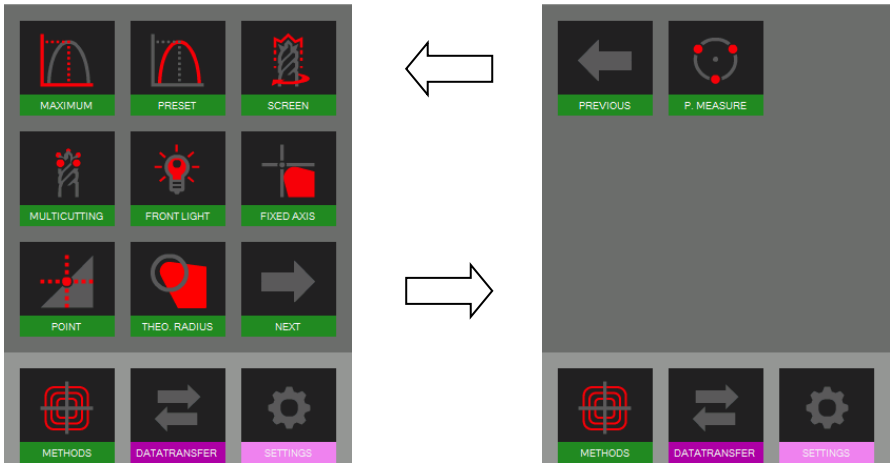


4.7.5 Select a measuring method

With the measuring method defines the user, based on which operation mode he wants to proceed to measure the tool.

The measuring methods are listed on two pages. Browse the pages by using the arrow icon.

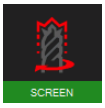
Icon measuring methods.



Symbols/ Methods:

Maximum method

Preset method

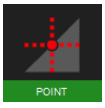


Screen method

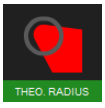
Multi cutting method

Front light method

Fixed axis method



Centre point method

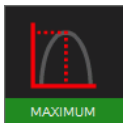


Theoretical angle/ radius

Point measuring

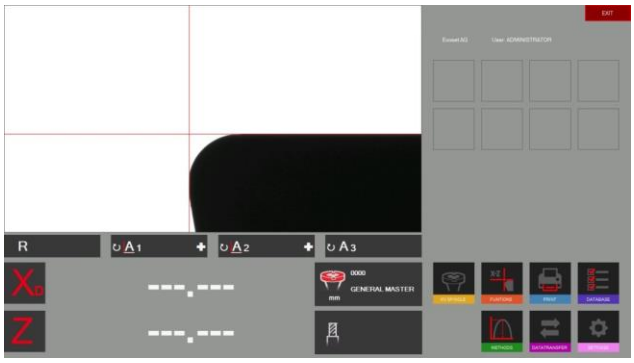
4.7.6 Description of the measuring methods

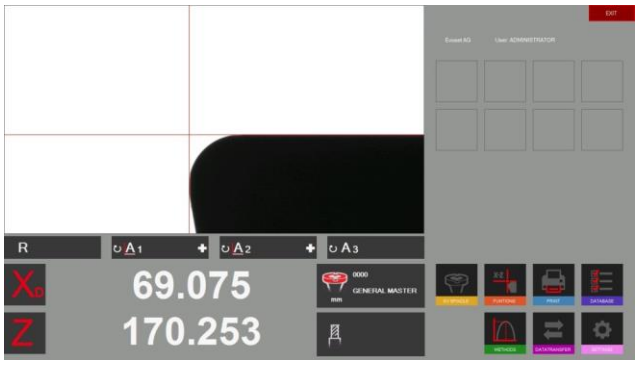
4.7.6.1 Maximum method

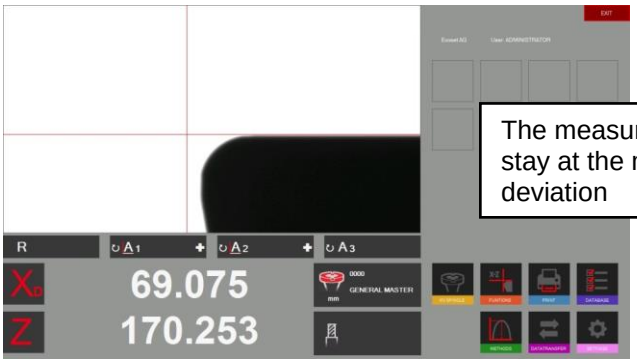


Use the Maximum Hold function to measure the **maximum X and Z values** without using the focus bar=> rotate the tool and the display will show the maximum values

Turn the tool slowly in the vision area of the camera. The software automatically picks up the highest point and places the measuring line on this position. The indicated values are the maximum values of the tool.





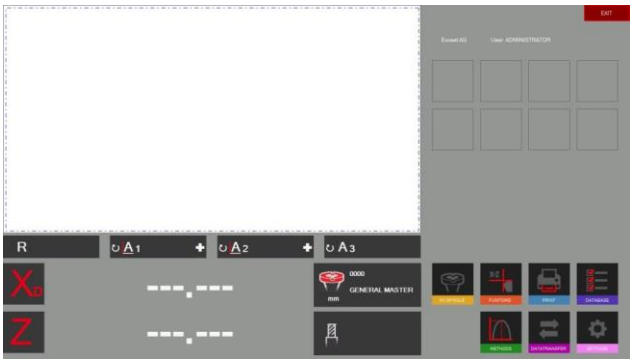


The measuring lines will stay at the maximum deviation

If the tool is turned out of the camera field, will the system execute a reset according the timer settings in the parameters (Chapter 4.5.5/ Parameter/ Index Options).

The counters in “X“ and “Z” are showing dot lines.

The system is ready to measure the next tool



4.7.6.2 Preset mode

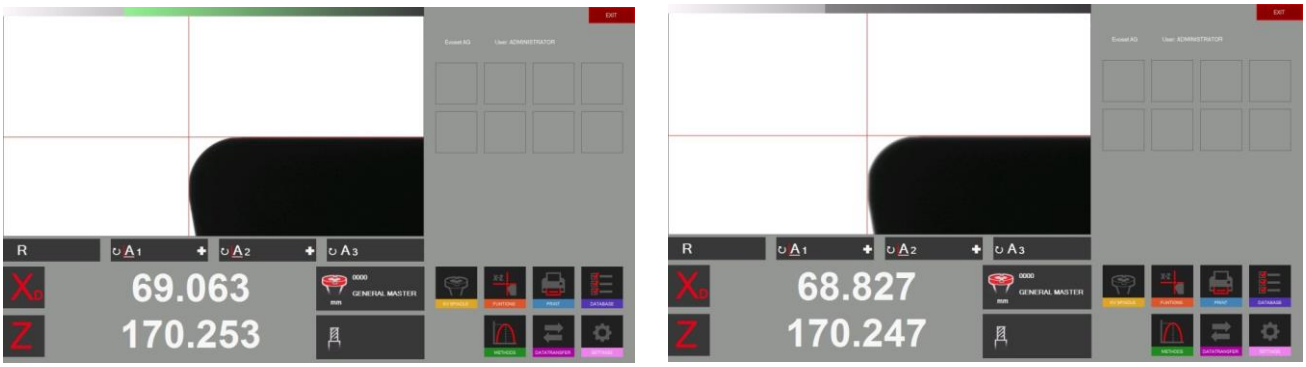
Activate the “Preset” method with the icon on the left.

When to use the preset function: To set a tool like a boring head to a specific Ø or length.

Difference to the “Maximum Method”: The measuring lines are always following the cutting edge.

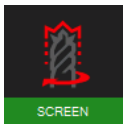
Put the tool in and set the maximum focus with the help of the focus indicator in the upper area of the live image.

When turning the tool in the spindle, are the measuring lines following the cutting edge in both directions.



The measuring lines always follow the cutting edge

4.7.6.3 Screen method



When to use the Screen Function:

If tools with a spiral, like a drill or a ball noised tool, or tools where the shape of the tool is located on more than one cutting edge are to measure, can the Screen Function be very helpful.

A form tool cannot always be measured by searching the highest point.
An image of the complete tool is needed. The “screen method” fulfils exactly this need.

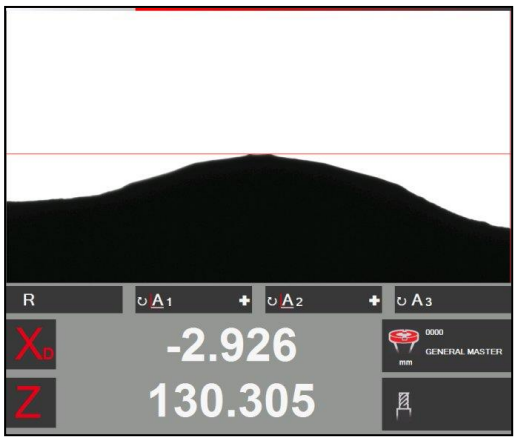
Turn the tool slowly one turn in front of the camera view.

The result that you see in the live image area is the contour that the tool will leave in the working piece.

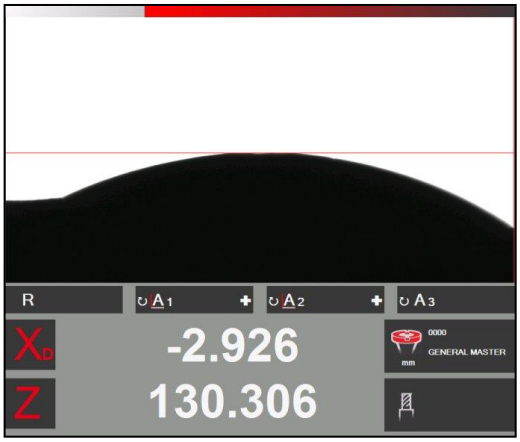
Now can the contour be measured by choosing a measuring function.

Example Ball nose cutter:

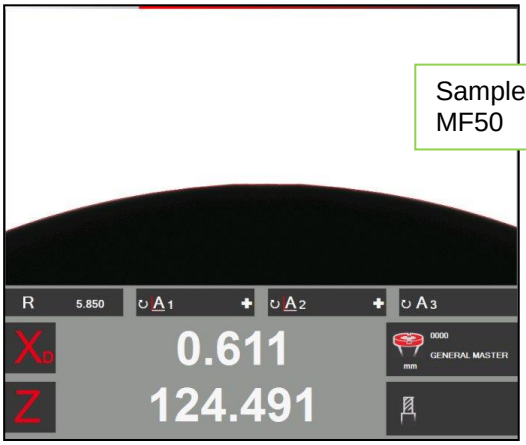
1.



2.

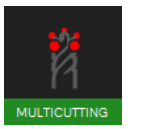


3.

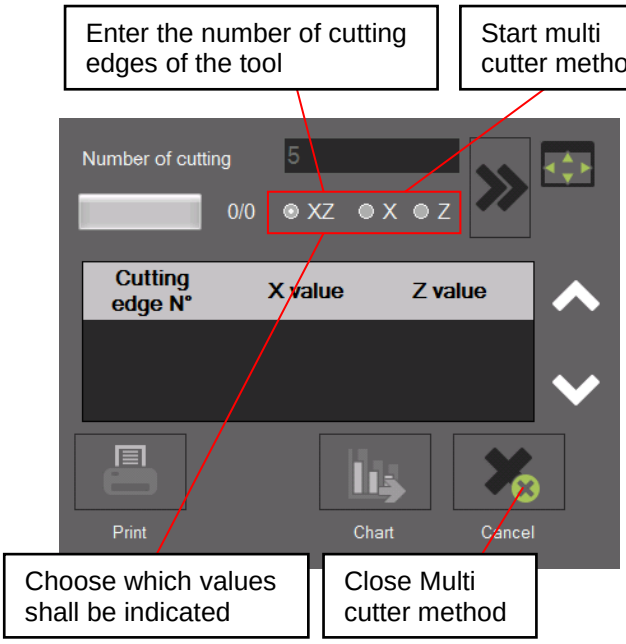


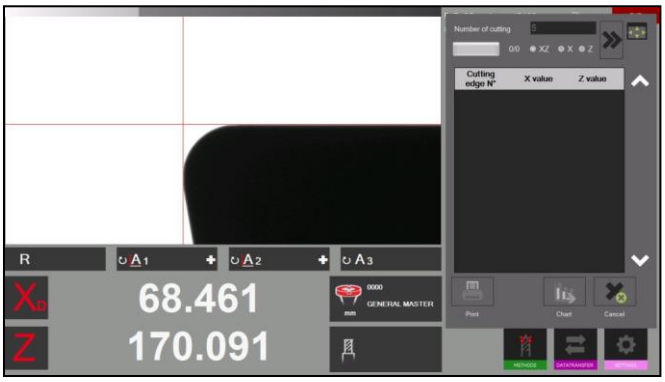
Sample: Measured with MF50

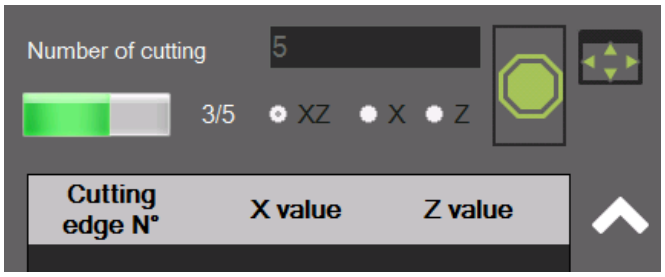
4.7.6.4 Multi cutter method



Measuring a tool with more than one cutting edge and to compare the single edges with each other can be done with the multi cutter method.





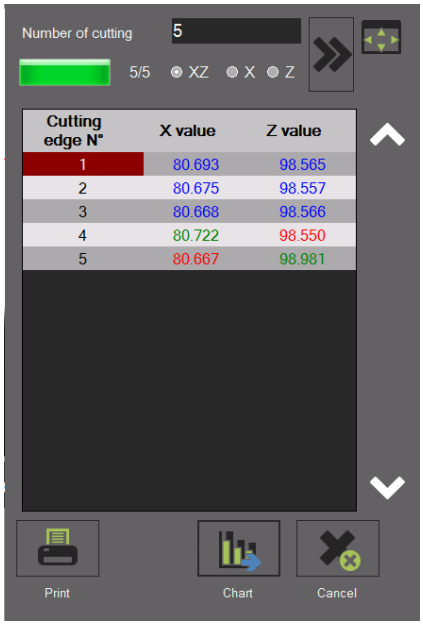


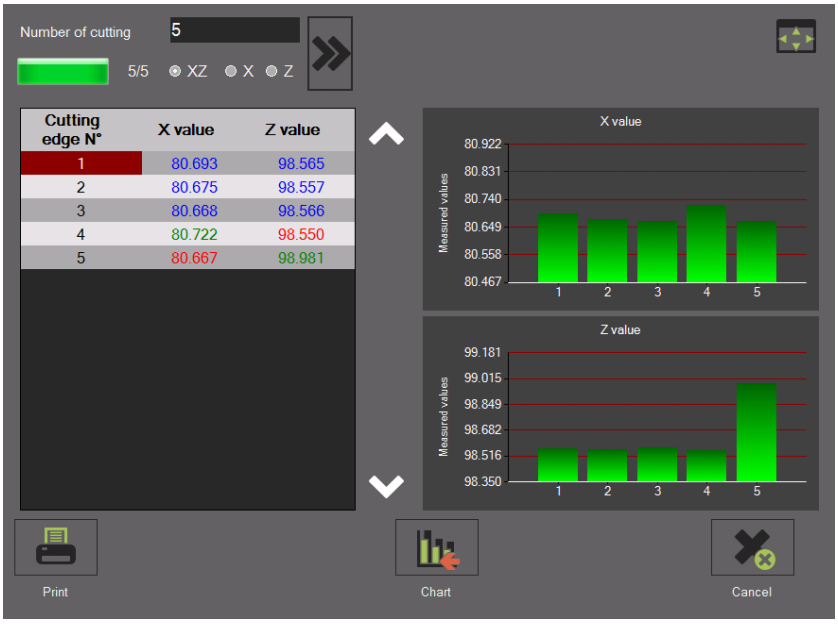
Start the procedure with:

Turn now the tool slowly until every cutting edge became measured. You will see the process indicated in the status bar.
Please note: The first cutting edge initialises the mode, after that starts the procedure.

If all the cutting edges are measured shows the software a graphic with the result.
The result can also be shown in form of a chart.

The biggest value is shown in **"green"**, and the smallest in **"red"** colour.



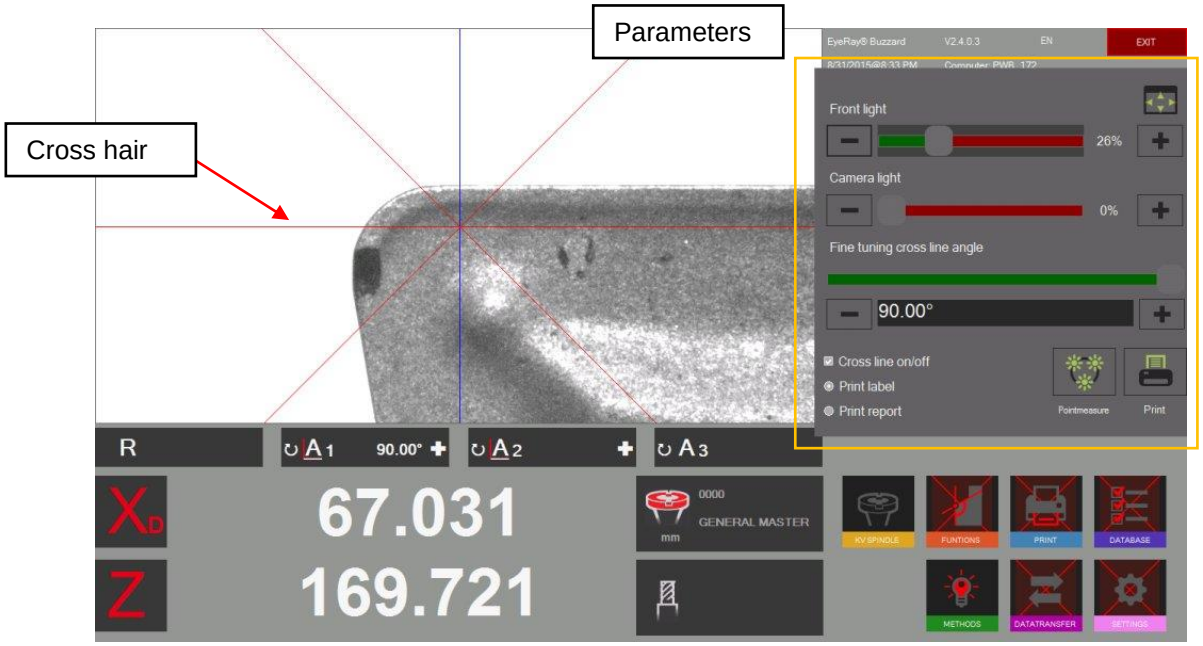


4.7.6.5 Front light/ Tool inspection method

The Front light method is used, for example, for cutting edge inspections (Check of the surface/ check for damages).

Activate the “Front light/ tool inspection method” with this icon.

It pops up a window showing the parameters of the front light.



Click with the left mouse button on the cross hair to change its position. This way can breakages or distances be measured on the cutting edge. Distances/Radii and angels can also be measured by „Point measuring method“. See chapter **„4.7.6.9/ Point measuring”**

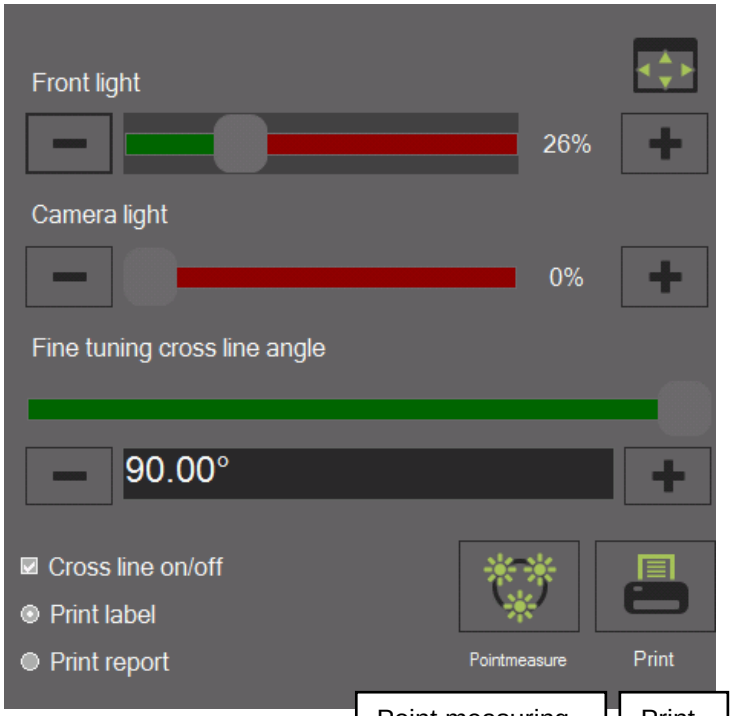
Brightness/ power of the front light

Brightness/ power of the back light

Turning of the reticule by using the adjustment bar/ fine adjustment through “+”, ”-“ button or entering the value by numbers.

Reticule on/ off

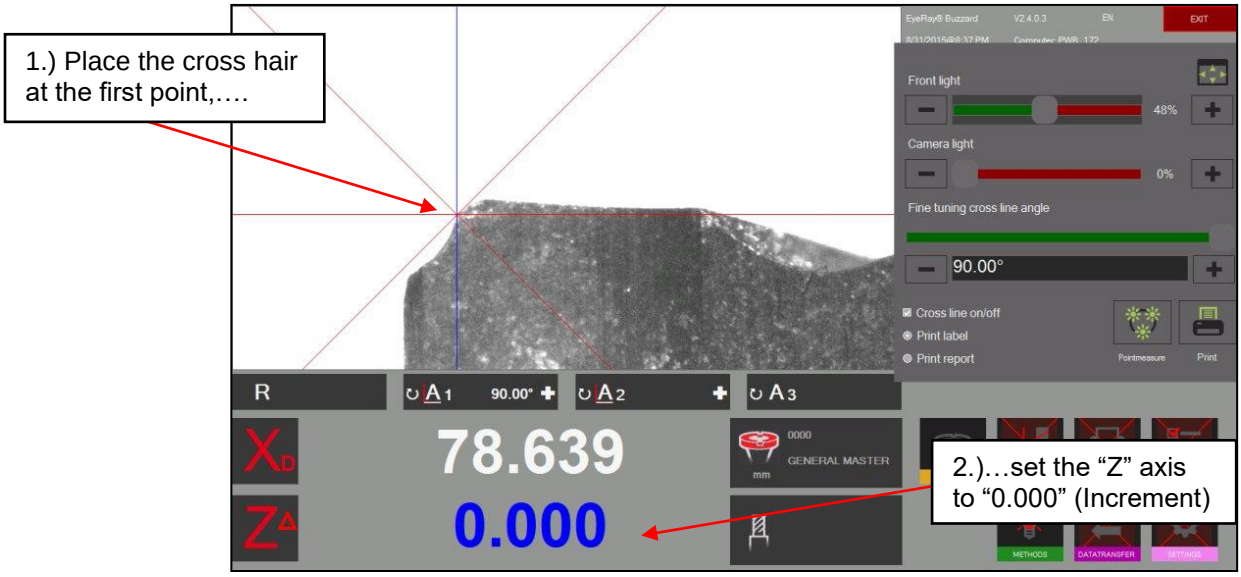
Selection print report/ label

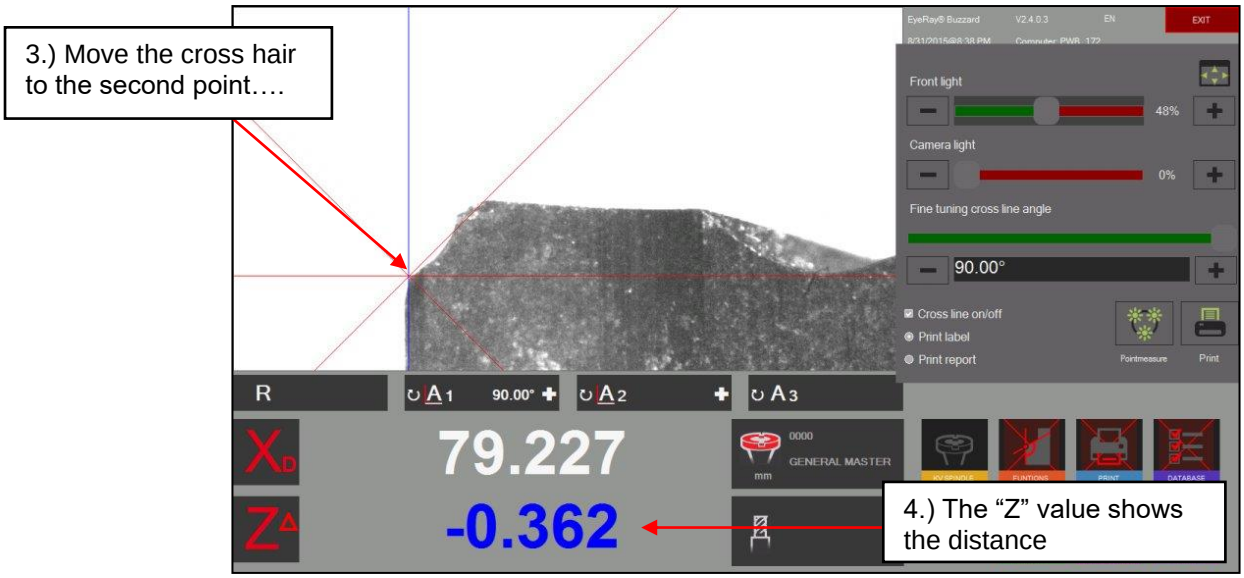


Point measuring

Print

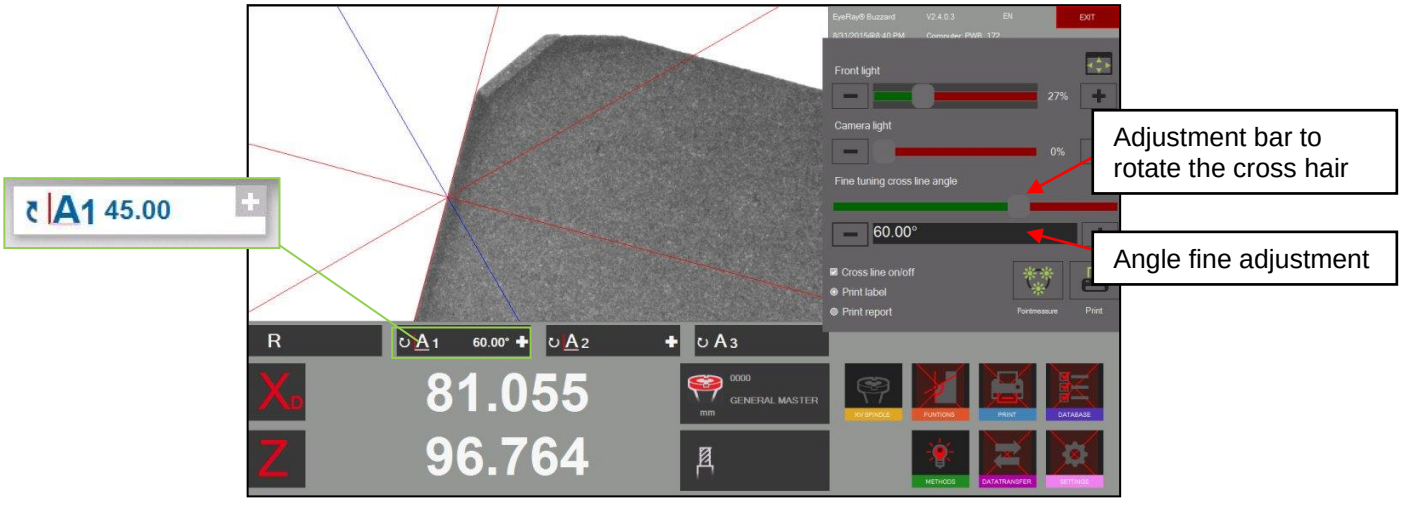
Example: Measure of damage in Z direction with the cross hair:





Measure of an angle with the cross hair:

Use the adjustment bar in the control box or the “+” and “-“ buttons to adjust the angle of the cross hair and to measure an angle on the cutting edge

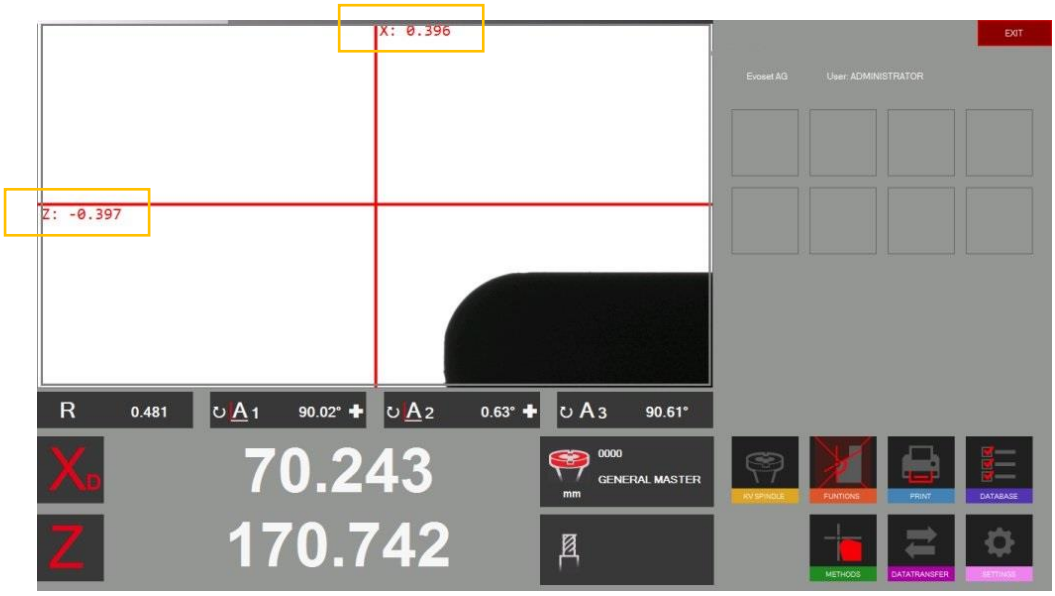


4.7.6.6 Fixed Axes

To measure the length and the diameter with fixed axis (“projector mode”)

Click on this icon to open the “Fixed Axes” method

The fix reticule appears, indicating also the distance between the cutting edge and the reticule. It is shown in red colour.



Put the tool in and set the maximum focus with the help of the focus indicator.

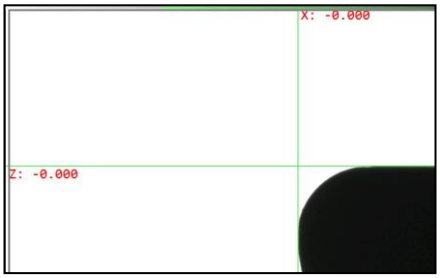
Move the cutting edge with the fine adjustment to the reticule.

If the tool gets closer to the line, will it change its colour to **Brown** (Thick line).

If the tool is only a few microns away from the line, will the colour change to **Orange** (Thin line)

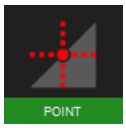
When the line becomes **Green** is the tool touching the reticule (Indicators show 0.000mm).

Did you pass the measuring point will the line become orange again.

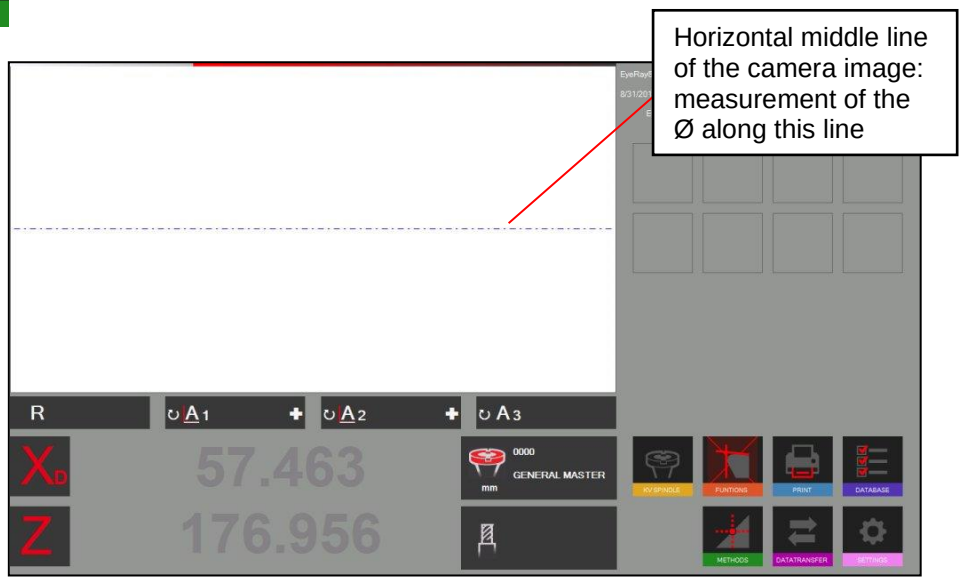


4.7.6.7 Centre point method

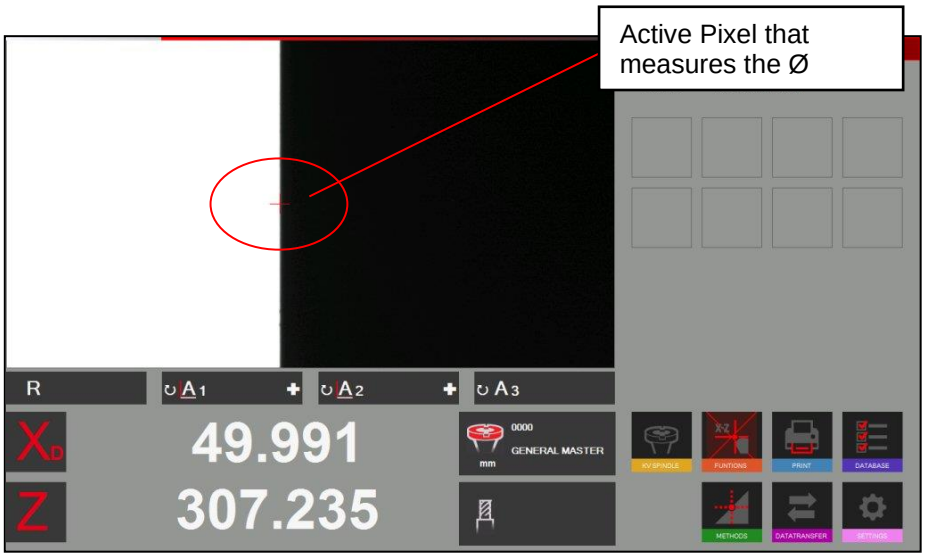
In the centre point method is just one pixel along the horizontal middle line of the camera view active.
Applications: to check the run out or the Ø of a cylindrical piece, check the parallelism of the mandrill to the column of the presetter



Click on this icon to open the centre point method



Put in a cylindrical tool (Master mandrill):



The software indicates the diameter and on the Z axis the absolute height (Fixed axis).

When you move the tool to the left or the right will the point follow along the horizontal middle line.

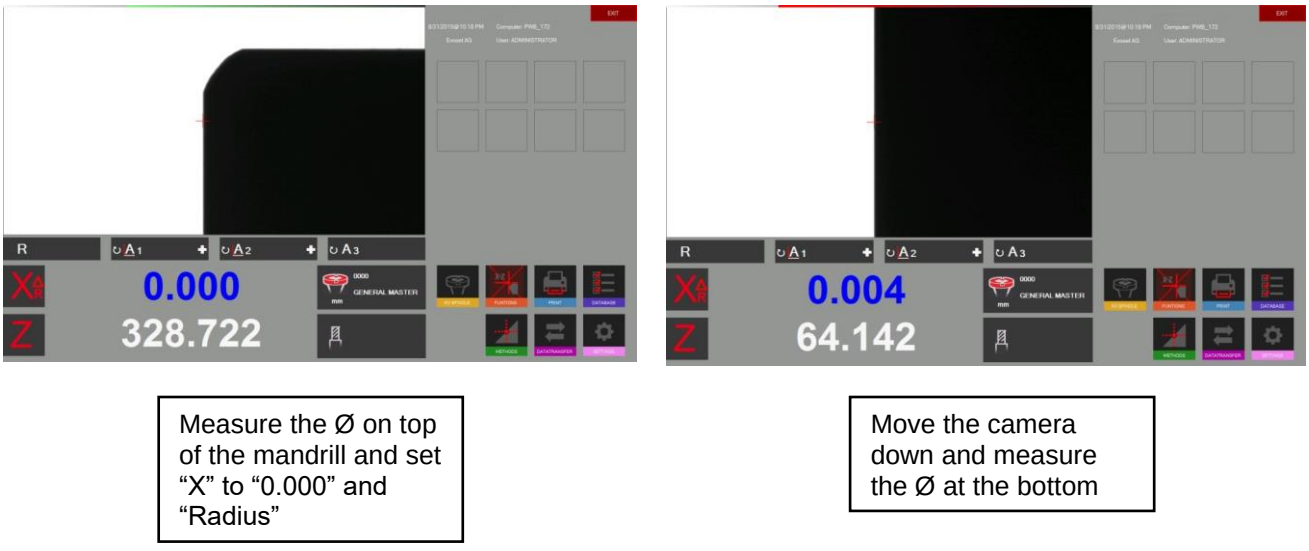
Examples:

Run out measuring using the centre point method

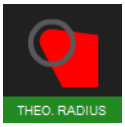
Place a cylindrical shaft or the master mandrill in the tool pot and measure the diameter with the centre point method.
Set the “X” axis to zero and to Radius mode.
Turn the tool => The X axis shows the deviation.

Check parallelism from the mandrill to the column

Measure the diameter with the centre point method in the upper area of the mandrill. Set the X axis to “0.000” and to “Radius mode”.
Move the camera down along the mandrill. The X axis counter indicates the difference.



4.7.6.8 Theoretical angle/ radius



Use this icon to open the method „theoretical angle/ radius“.

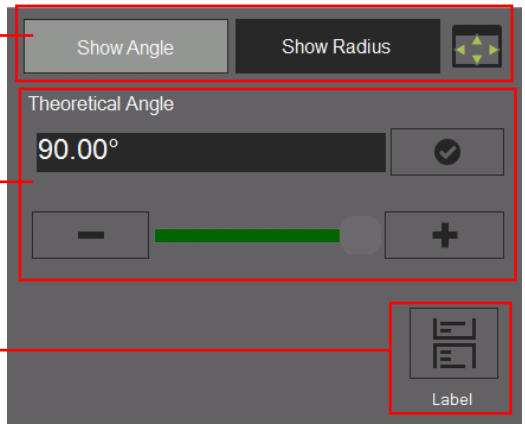
This method is used to draw an angle or radius by deaulft values.

It appears a setting window:

Selection: Set angle or radius

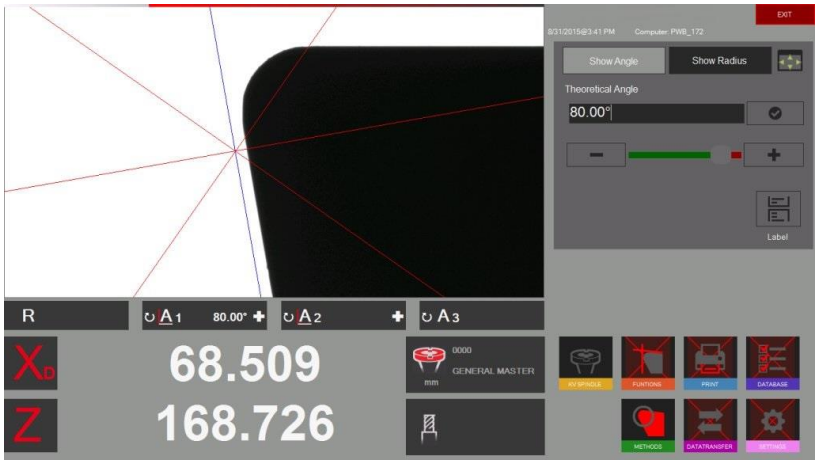
Angle: Setting of the value by adjustment bar or typing in the value/ Fine adjustment by „+“ and „-„

Print label



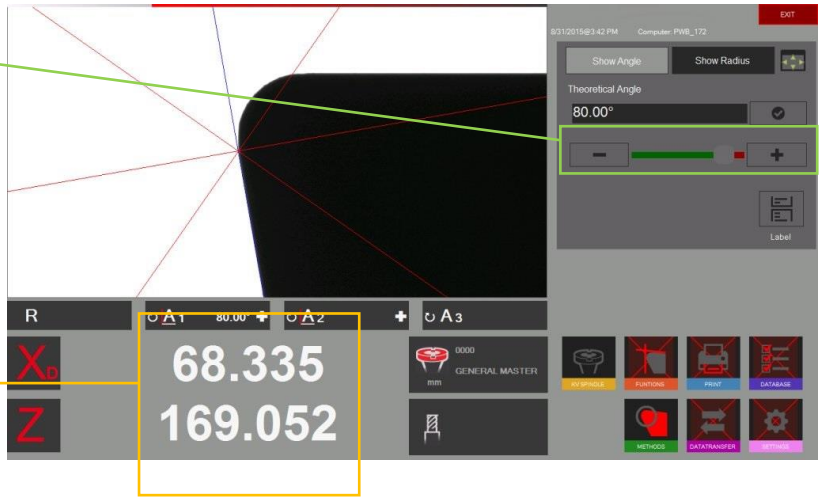
<u>Using the method „theoretical angle“:</u>

Move the reticule by using the mouse to the cutting edge…..



..and set the angle along the cutting edge by using the adjustment bar and the fine adjustment.

Counters „X“ and „Z” are showing the centre position of the reticule.
„A1“ shows the set angle.



Method „Theoretical radius“:

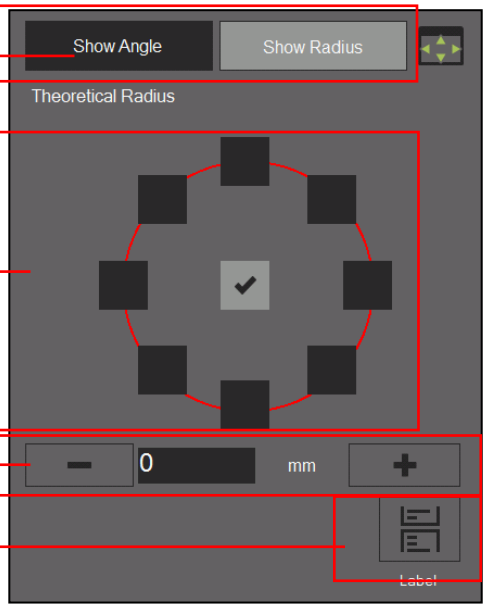
Choose „Radius“ in the setting window::

Choose „Show radius“

When drawing a big radius (bigger than 6mm), with centre in the middle of the camera view, will the circle line not be visible anymore in the active camera view.
This chart is provided to catch the circle line in the middle, to make it visible again (samples below).

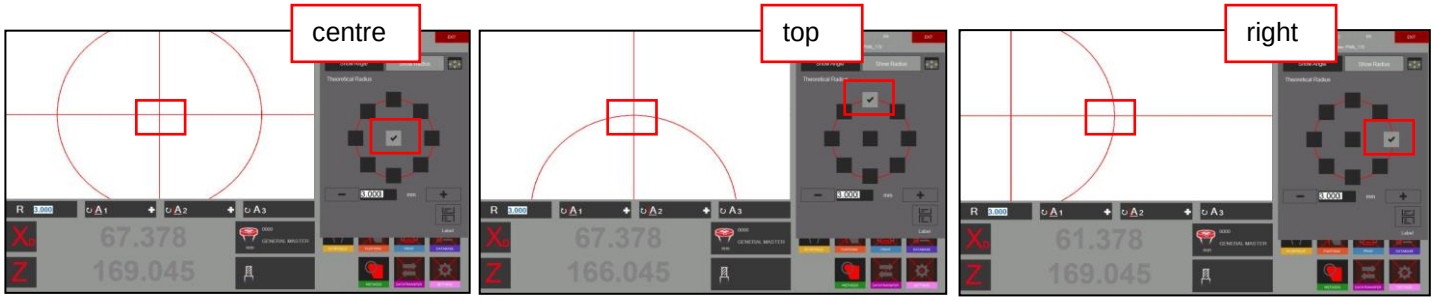
Set value by typing in or using the fine adjustment „+“ and „-„

Print label



Samples with different circle line settings along the above chart:

Circle => r=3mm



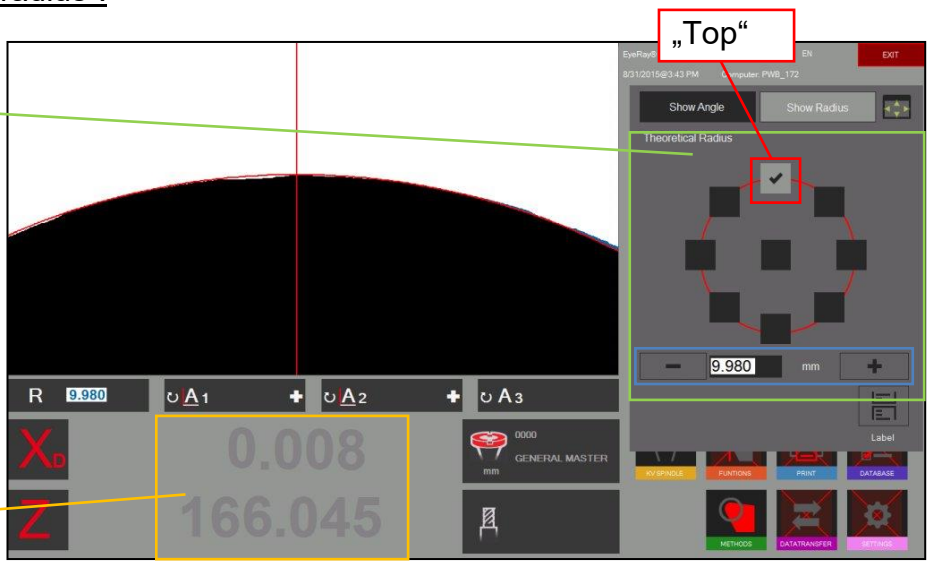
Using the method „Theoretical radius“:

Draw a circle (type it in) and catch the circle line along the chart as desired (Sample: “top”)

Move the circle line to the cutting edge and …

… set the radius using the fine adjustment

The counters „X“ and „Z“ are showing the position of the centre point.
„R“ shows the set radius.



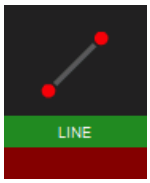
4.7.6.9 Point measuring

The point measuring method allows setting measuring points by mouse click directly in the live image of the camera.

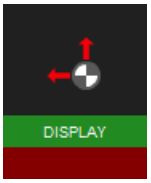
Opens point measuring

It appears a selection window

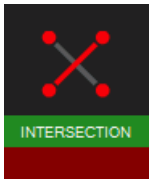
Symbols:



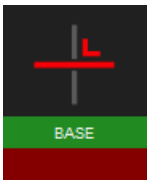
Point to point line



Show/ hide graphic information



Angle between 2 lines, defined by 4 points



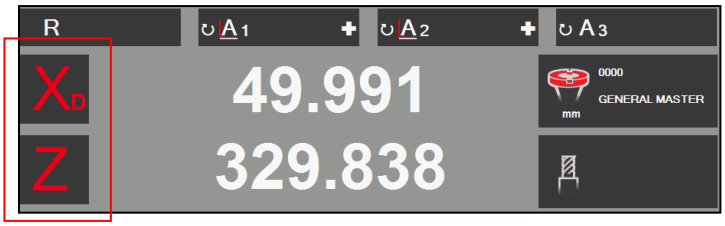
Change basis of angle calculation

Circle measuring (defined by 3 points)

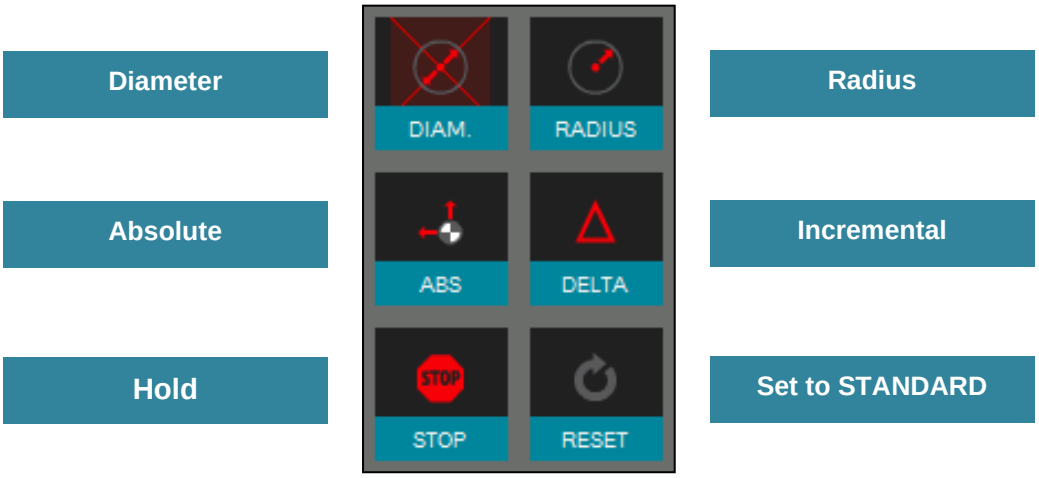
Change angle direction

4.7.7 Select axis measuring mode/ counter display

The measuring result is indicated under the camera image in the measuring result area.



Click on the “X” or “Z” sign to open the shortcut menu of the different axis display modes.

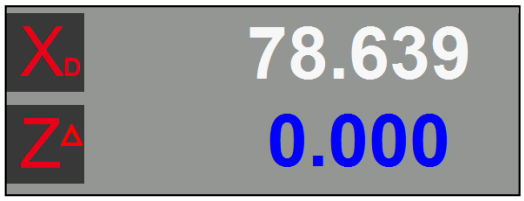


The button “Set to standard” will show the value as defined in the active “reference point”.

In the incremental mode will the chosen axis set to “0.000” and the colour changes to blue. Also will the mode be indicated by a small icon beside the axis name.

X mode “absolute”

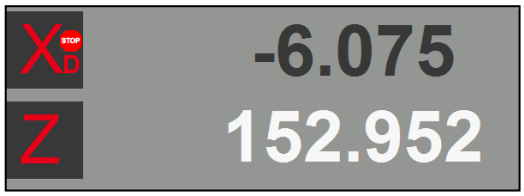
Z mode “incremental”



In the “Hold” mode will the value of the chosen axis be frozen and the colour changes to black. Also will the mode be indicated by a small icon beside the axis name.

X mode “Hold”

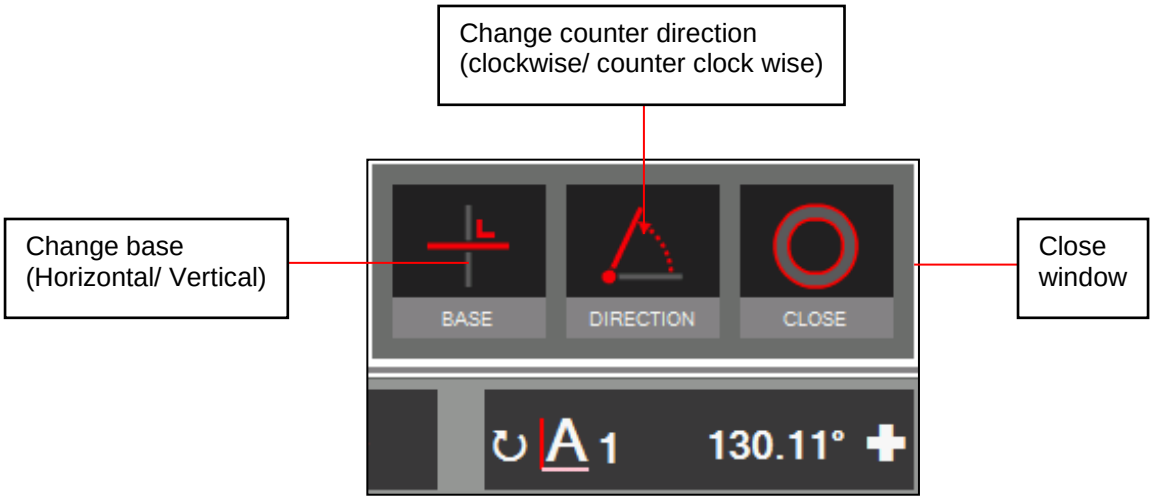
Z mode “absolute”



The measured angles and radii will be indicated above the counter values and are described below:

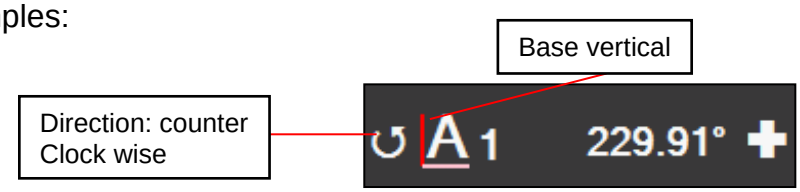
Measured radius | Angle “A1” | Angle “A2” | Included Angle “A3”

Click on the “+” sign to open a window, where the base of the angle calculation and the Direction of the angle measurement can be changed

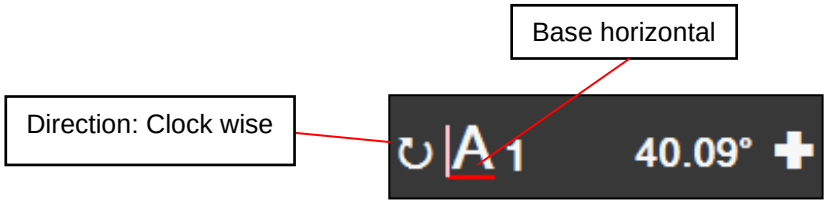


Examples:

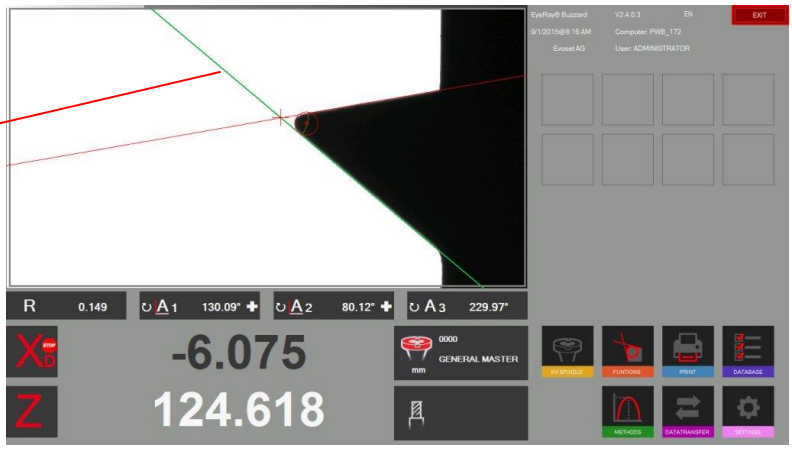
1)



2)



If you click on the character A1 or A2 the corresponding line on the live image will be shown in green colour for a few seconds



4.8 Printing measured values

Click on this icon to show the installed printing options

4.8.1 Print label / standard

To print out a single label.

4.8.2 Customized label EyeRay®/ Optional

A second label format can be customized regarding customers specifications. On request.

Evoset/ PWB item number: P270540
See chapter 5.3 „ Customized label EyeRay® “

4.8.3 Printing report EyeRay®/ Optional

Coming soon: Report printing according customers specifications.

Evoset/ PWB item number: P270550
See chapter 5.2 „ Printing report EyeRay® “

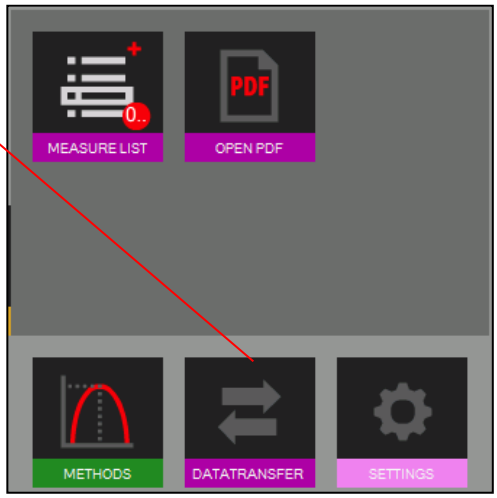
4.9 Data Transfer

4.9.1 Tool list

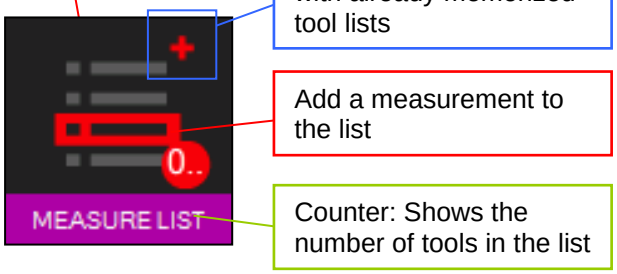
Example:

This feature allows generating and saving a tool list for every piece you produce.

The tool list management is to find in the Menu “Data transfer”

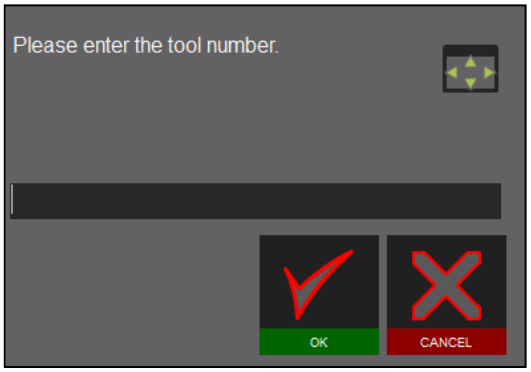


The icon of the tool list management is Multi functional:



Click the red frame in the tool list icon to add your measurement to the tool list

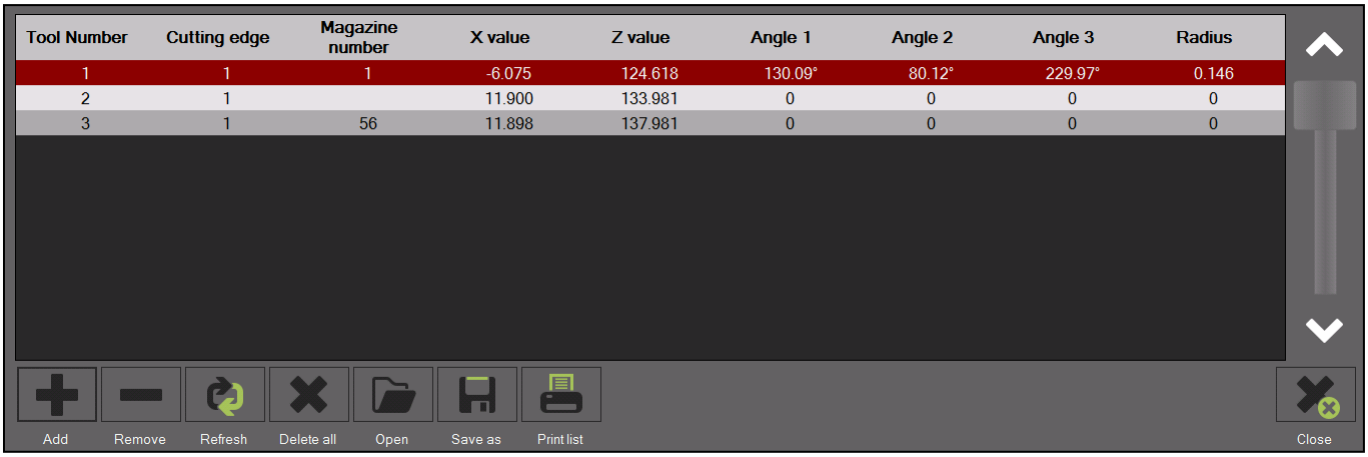
Input fields for the tool number and the magazine number will open.
Please note: No entry needed.



Confirm with:

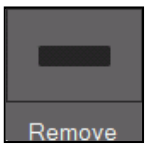
The counter shows always the numbers of tools in the tool list.
Example: The tool list contains 3 tools.

Click on the “+” button of the Tool list icon to show the list.



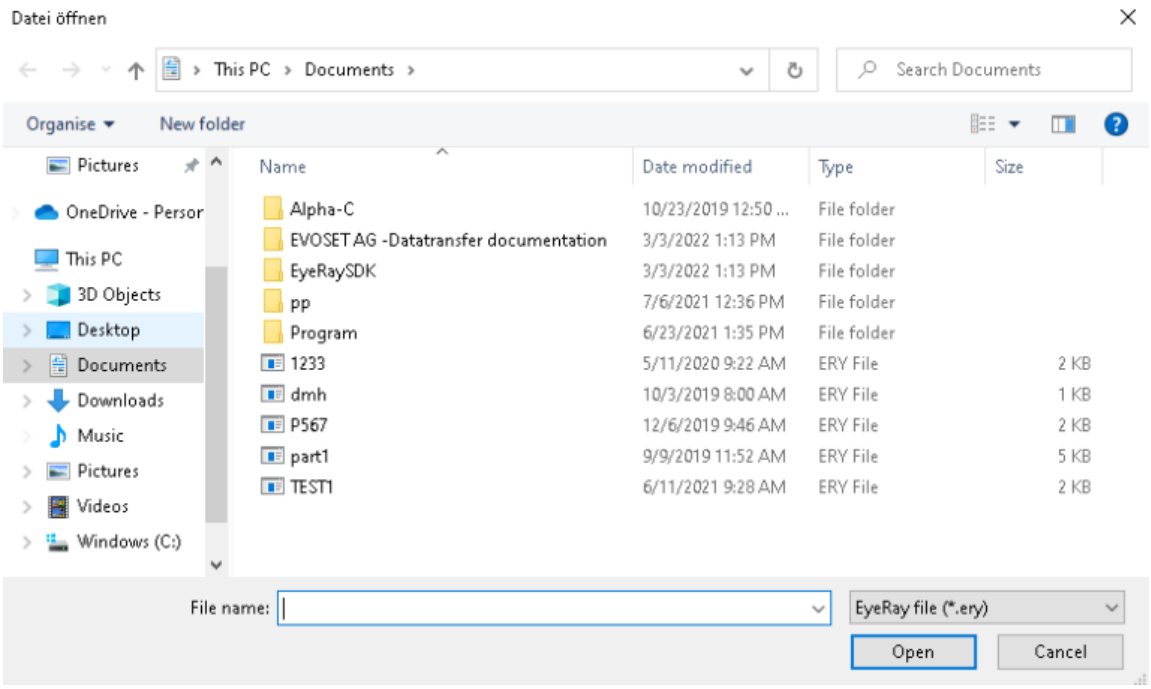
Functions:

Add a new measuring to the list



Delete the highlighted measuring list

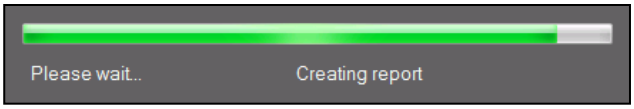
To open the directory of the tool lists



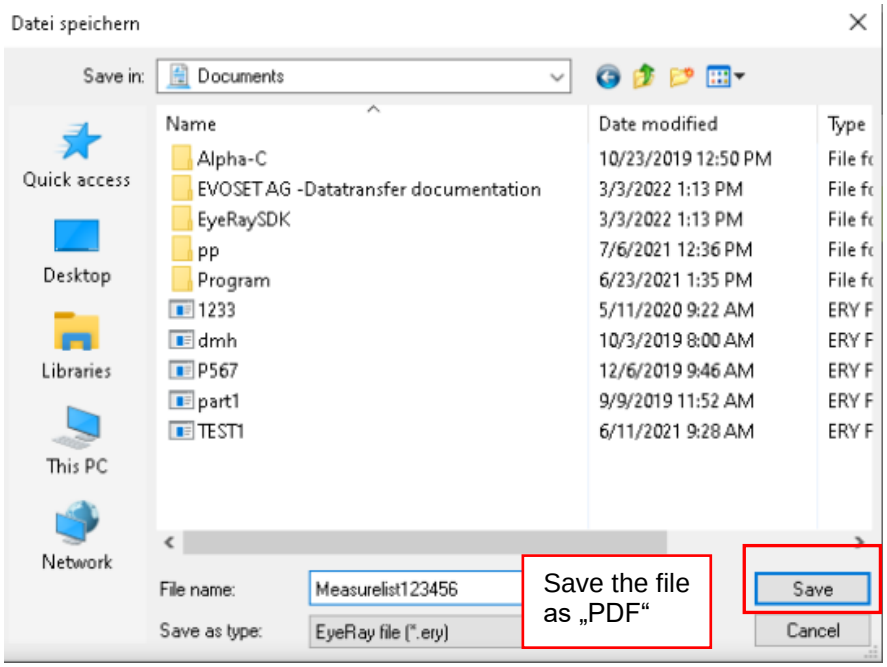
To print out the list on a printer (A4 printer has to be installed and set as report printer in the parameters, otherwise will a PDF file be created by default)

Default (PDF):

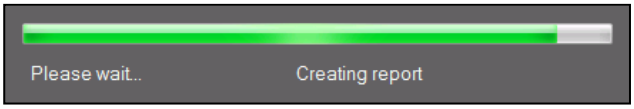
Report creation:



Save:



Report creation:



Opening: after saving will the file automatically be opened:

EVOSET

Evoset AG
Alustrasse 18.

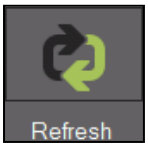
CH-3940 - Steg - Switzerland
Tel: +41 27 922 0450
service@evoset.com
www.evoset.com

Liste der Messungen

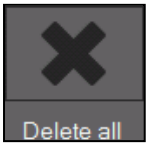
Datum 3/3/2022

Bezugspunktname **0000** **GENERAL MASTER**

Werkzeug Nr.	Werkzeugname	Schneide	Magazin Nr.	X	Z	A1	A2	A3	R
1		1	1	29.991	91.100	0	0	0	0
2		1	2	29.991	91.101	0	0	0	0
3		1	3	29.374	90.887	0	0	0	0

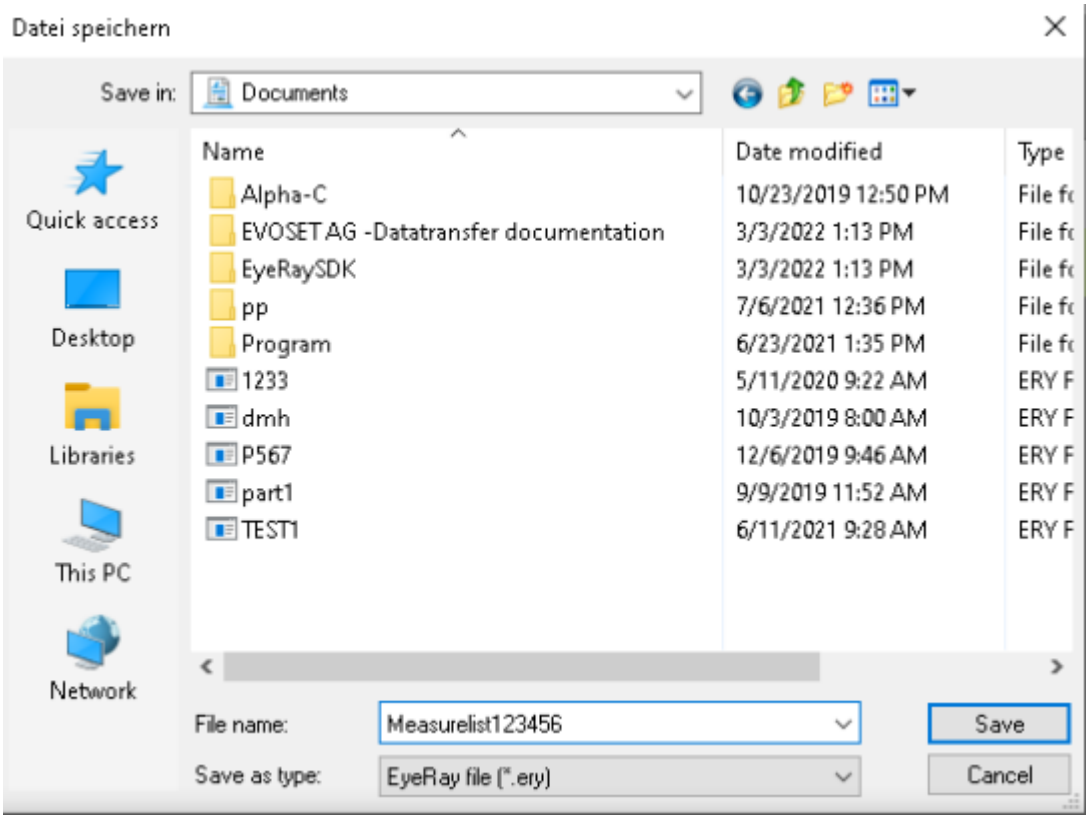


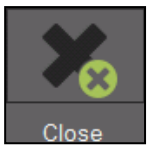
Re-measure the highlighted measuring



Deletes the tool list

To save the tool list



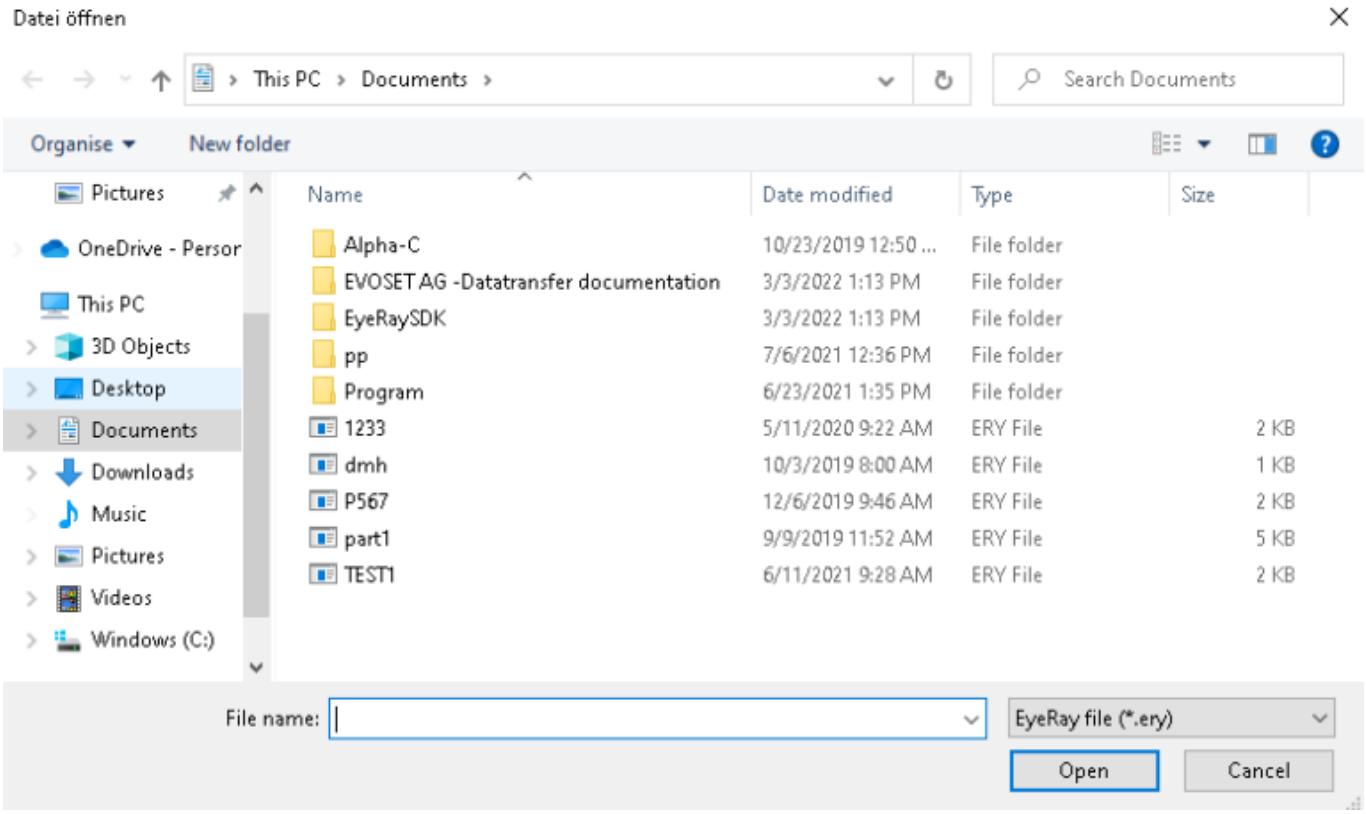


Close tool list

4.9.2 Open PDF file

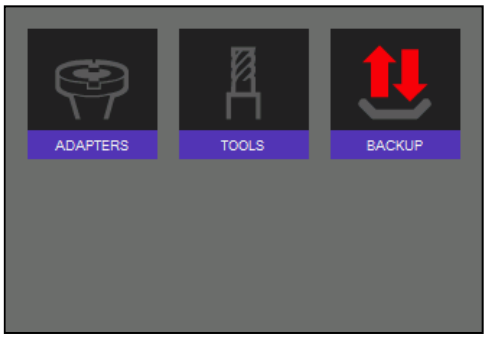
Use this icon to open saved PDF files as measuring lists or reports.

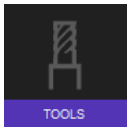
It opens a window, where you can browse the system to open, rename and move PDF files to other directories as a USB stick, or to delete files.



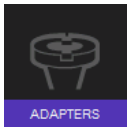
4.10 Data base

This icon opens the data base functions.





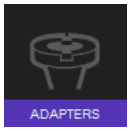
Tool data base



Open reference points data base

Icon to backup or restore

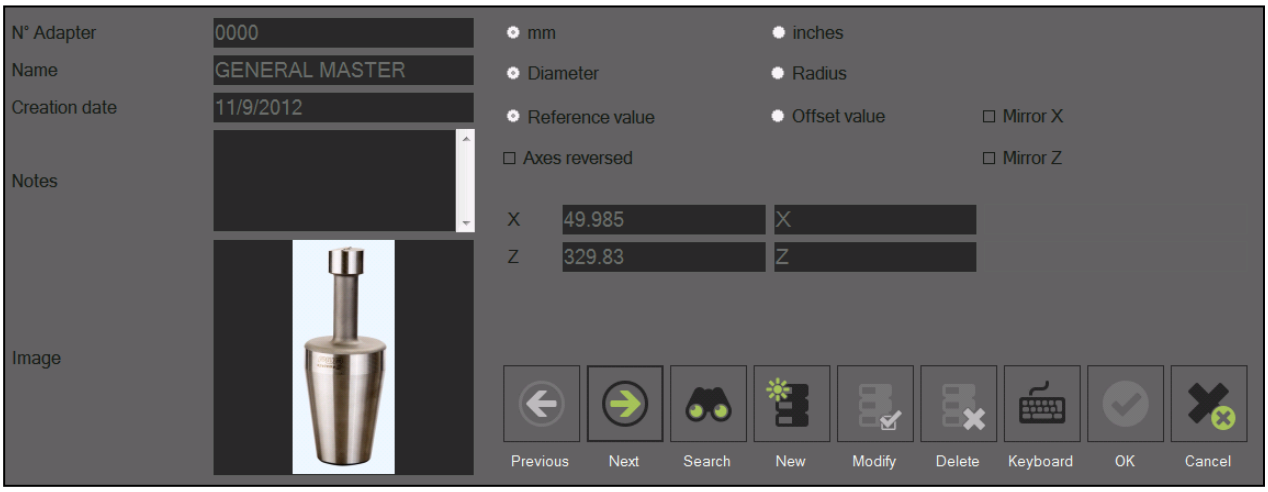
4.10.1 Reference point data base



Icon to open the reference point data base

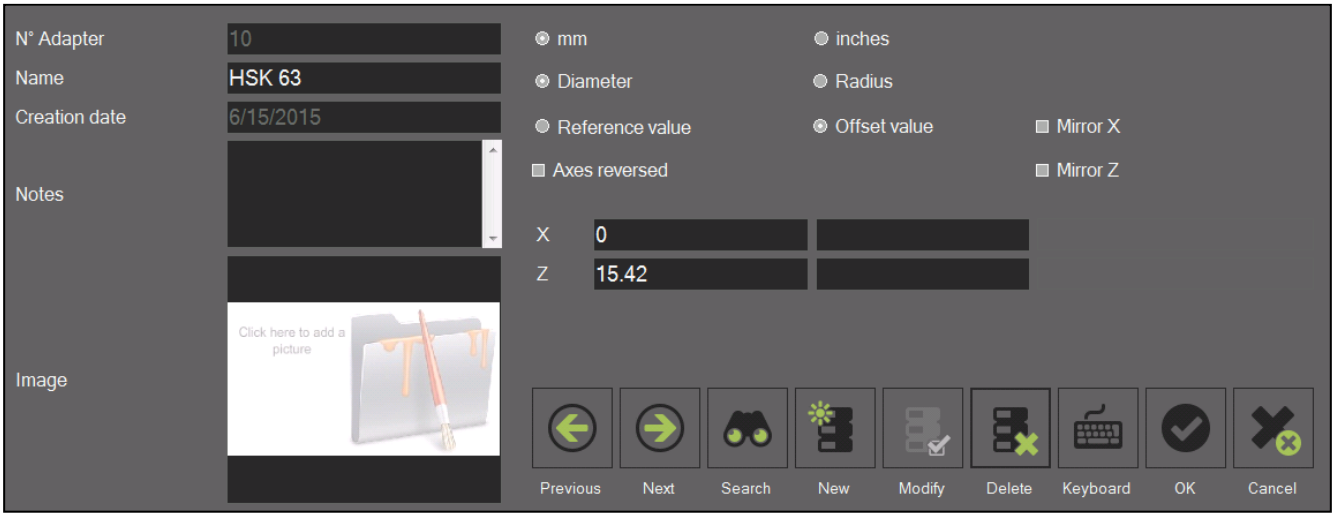
The first adaptor/ reference point is always the “General Master”, used to calibrate the unit. It has always the number “0000” and cannot be deleted

It’s a so called “Absolute Zero Point”, means, that the unit will be calibrated with such a Reference Point.



The reference point “000” cannot be modified.

4.10.1.1 Description of the input fields:



Information:

N° Adapter	Number of the reference point
Name	Description of the reference point (Sample: name of the machine/ Name of the tool holder type)
Creation date	automatically set
Notes	Remarks
Image	Click in this area and browse the computer to add an image to the reference point.

Options:

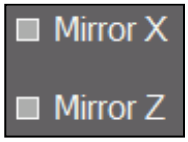
Defines the unit for the reference point

Measuring result in Diameter or in Radius

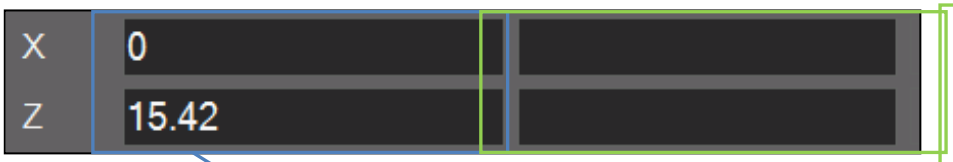
Standard setting: The offset value is the difference between the zero point of the Master mandrill (General Master) and the zero point of the used tool holder system. **Mostly used. So called: offset/relative zero point**!

Different absolute zero points can be assigned beside the “General Master”.
The nominal values have to be entered in the input field for “X” and “Z”.
So called: absolute/ reference zero point

The vertical axis will become the X axis and the horizontal axis will become the Z axis.



Changes the counting direction of the axis



Input field for the „X“ and „Z“ values.
Enter either offset values or reference values depending on the settings made above.

Axis description: to enter an axis name. The axis will be shown as it becomes set here => sample: Change “X” axis description to “A” axis.

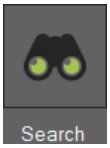
Mostly will here be entered the Z axis offset value (engraved values on the PWB adaptor).

If the reference point has “reversed axes”: Define on which axis the measurement mode R/D should be activated

If the axes are not reversed is the R/D mode on the X-Axis.

Functions:

Browse the data base from a reference point to the next



Search the data abase for a specific reference point

Add a new reference point

Save modifications

Delete reference point

Show “on-Screen-Keyboard”

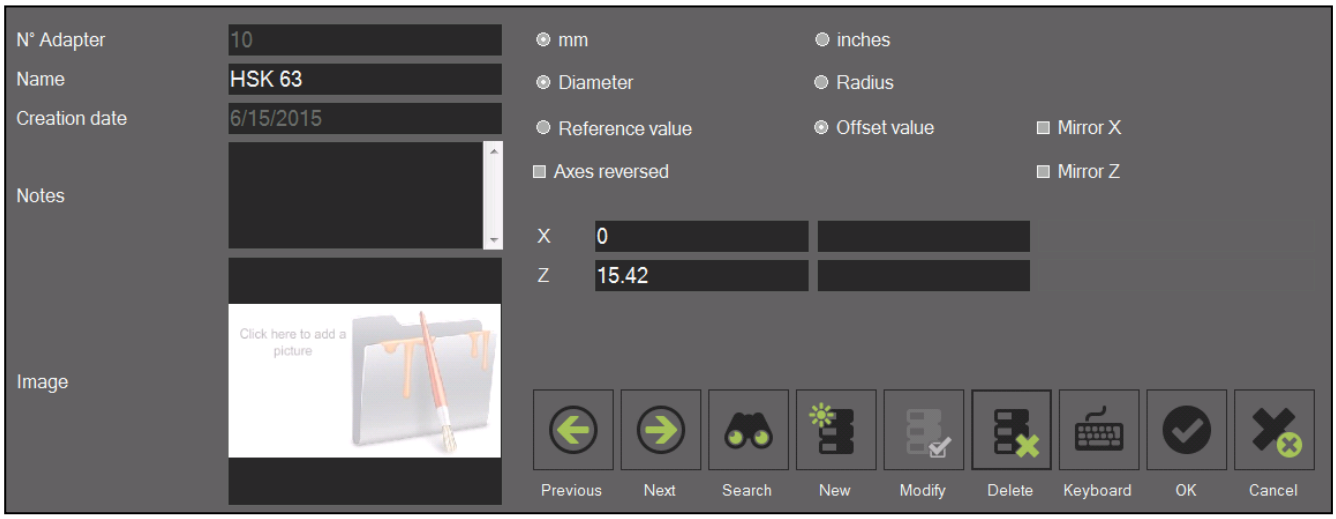
Select adaptor

Close list

4.10.1.2 Samples of reference points:

1.)

Reference point No: 63
Relative reference point for a machine with HSK-A63 tool holder system.
- Offset Values:
  X = 00.00mm
  Z = 15.42mm

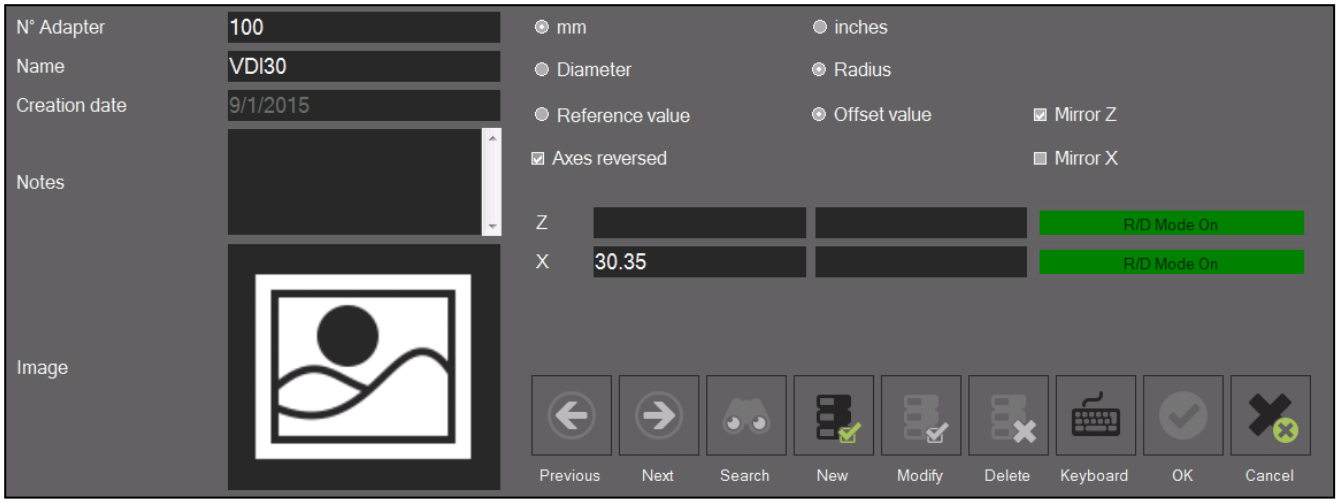


2.)

Reference point No: 400

The image shows a relative reference point for a machine with VDI40 tool holder system.

- Reversed axis
- Changed counting direction in Z-axis.
- R/D mode on X-axis active
- Offset values:
  X= 00.00mm
  Z= 35.55mm



4.10.2 Basic Tool Data base

Opens the basic tool data base

Allows to create and to manage tools with nominal values and tolerances.
Based on the saved information can the tools late be re-measured and a set/actual comparison be done.

4.10.2.1 Description of the input fields

Information:

Tool No.	Number of the tool
Description	Name/ Description oft he tool
Date	Automatically filled in
Adapter	Mandatory field => Assignment to an adaptor
Image	Click in this area and browse the computer to add an image to the reference point.
Notes	Remarks

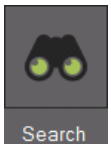
Magazine

Position in Magazine: To enter the position of the tool in the magazine of the machine

Options:

Measuring result in Diameter or in Radius

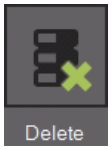
data base tool by tool



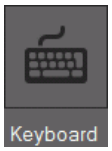
Search the data base for a tool

Add a new tool

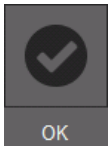
Save modifications



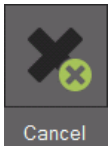
Delete tool



Show “on-Screen-Keyboard”



Select tool



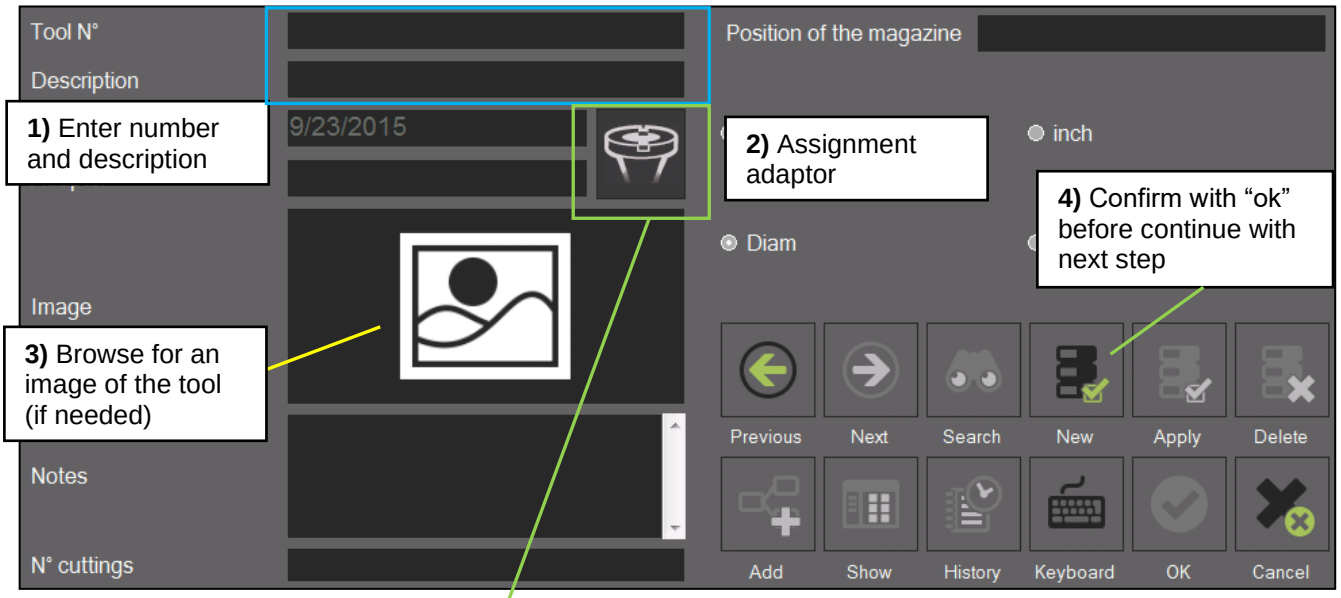
Close list

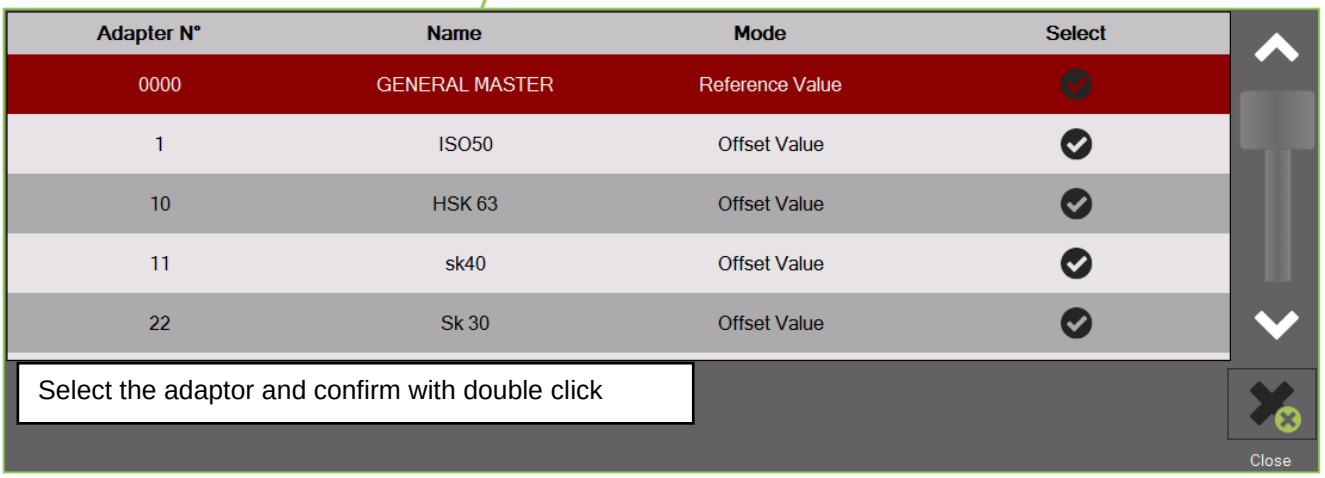
Open mask for nominal values and tolerances

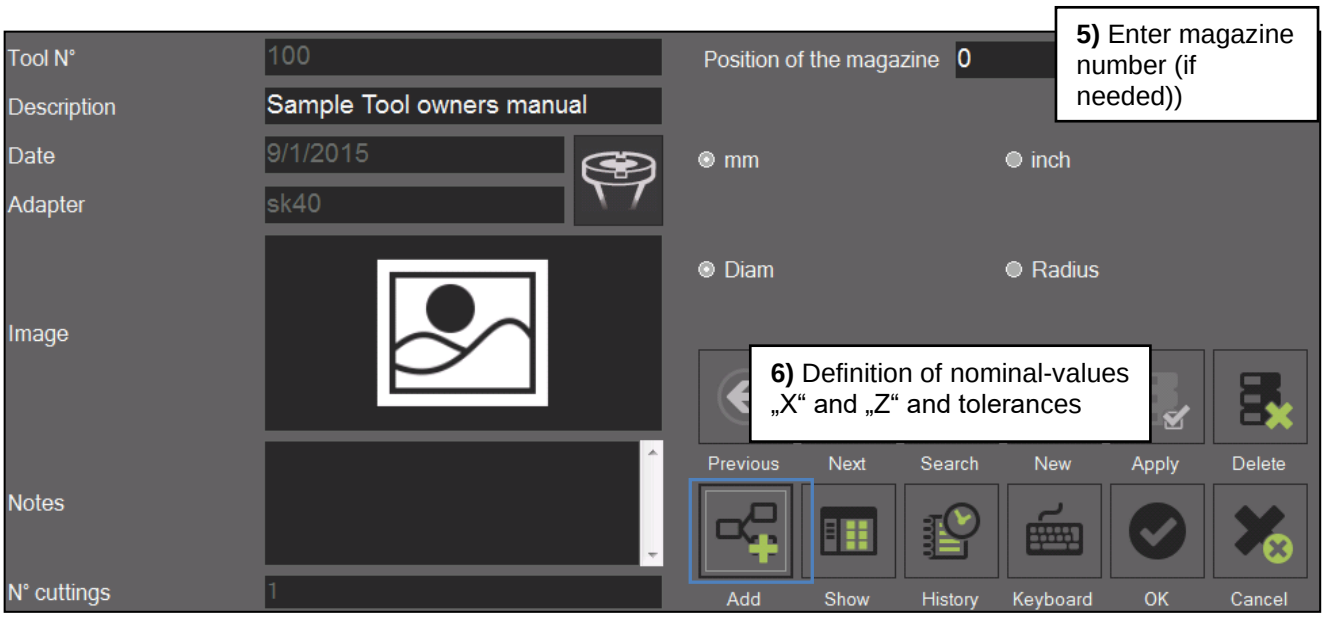
Show values (chart)

4.10.2.2 Generate a tool

To open a mask for a new tool

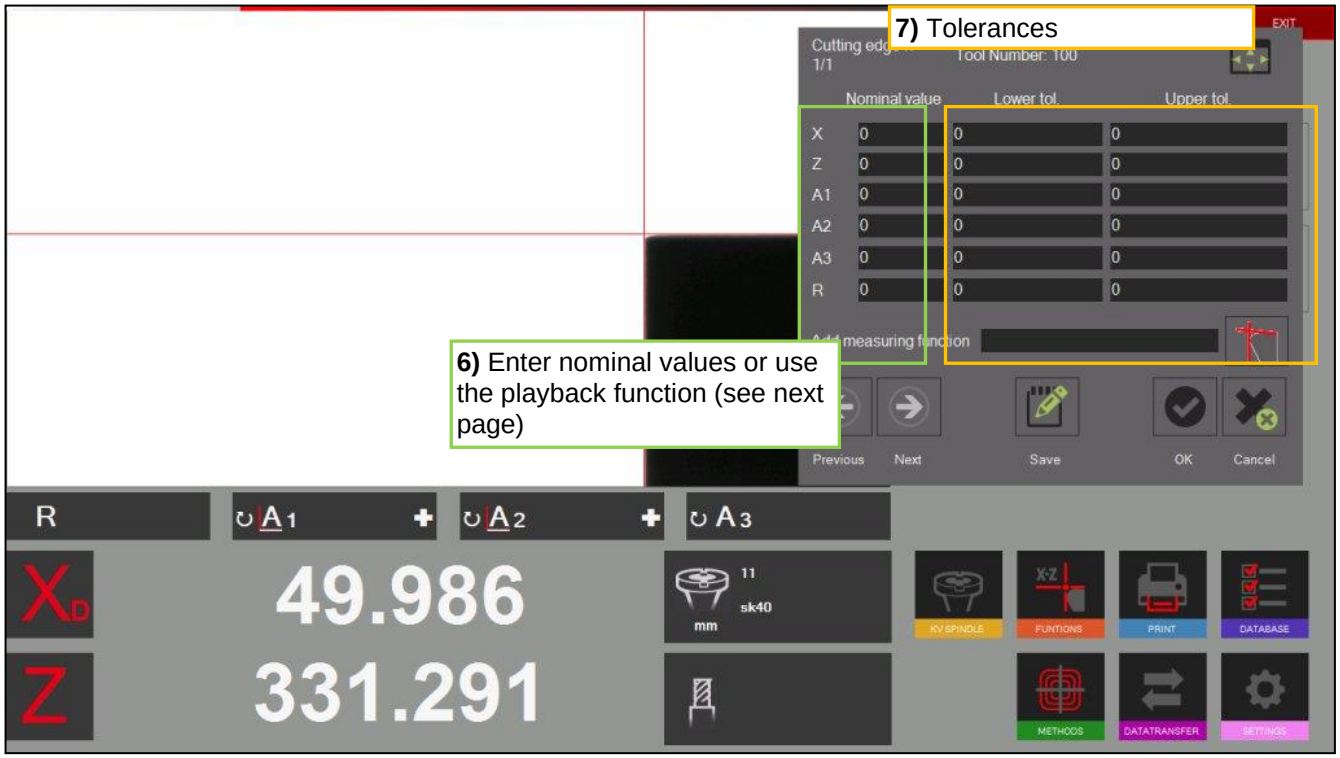






Please see next page for nominal values and tolerance information.

Clicking on this icon opens the input mask for nominal values and tolerances



Functions:

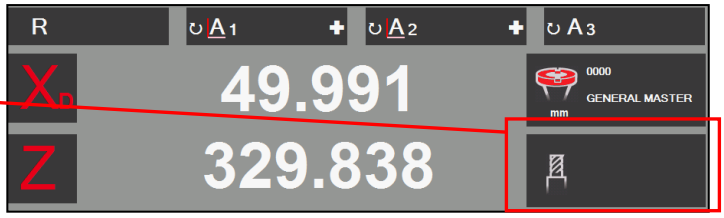
Playback (Import counter values/ see next page)

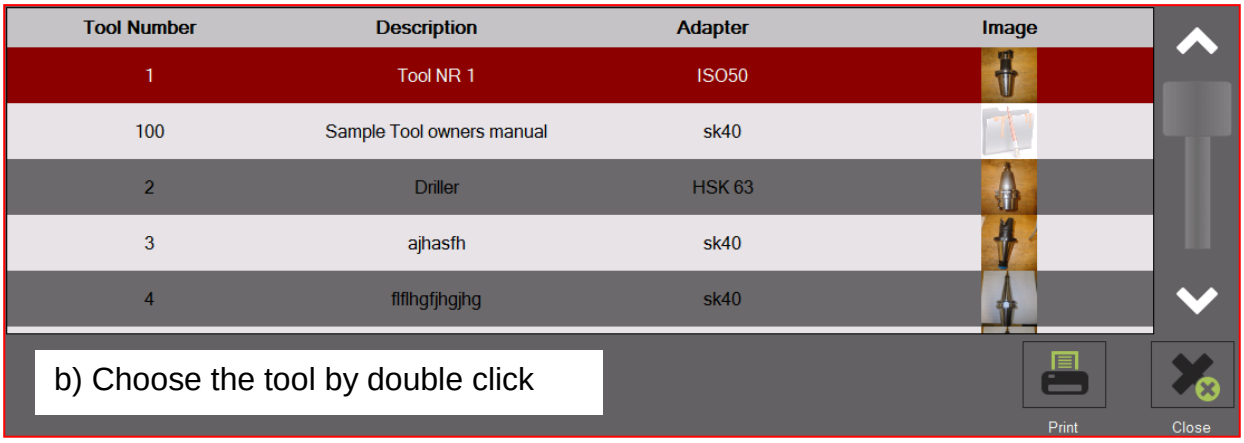
Save and close

Close without saving

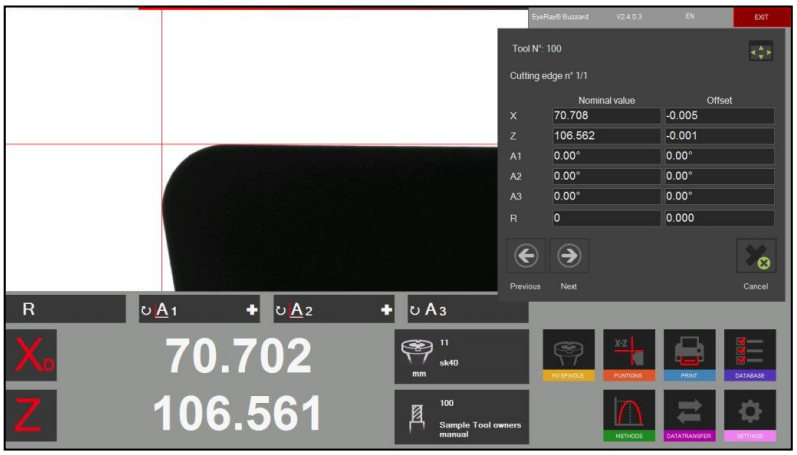
4.10.2.3 Measure a saved tool

a) Open the list of the tools by click on the symbol beside the counter values.

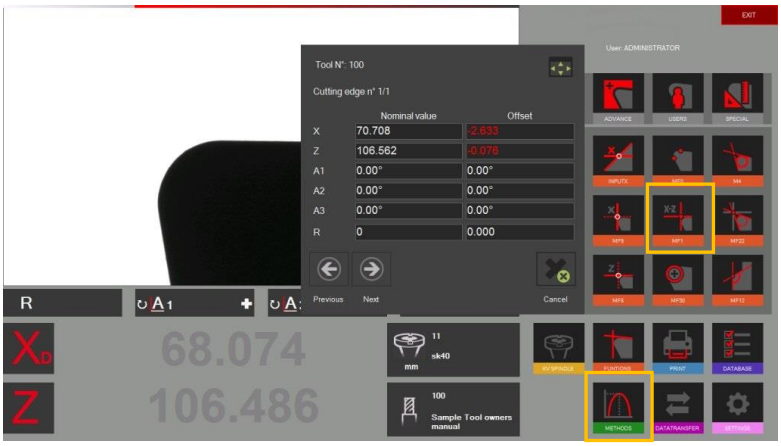




b) It opens the measuring information Window, showing the nominal values and the offset.



c) By clicking on the icon for the measuring functions will the input mask of the nominal values automatically be moved to the left.

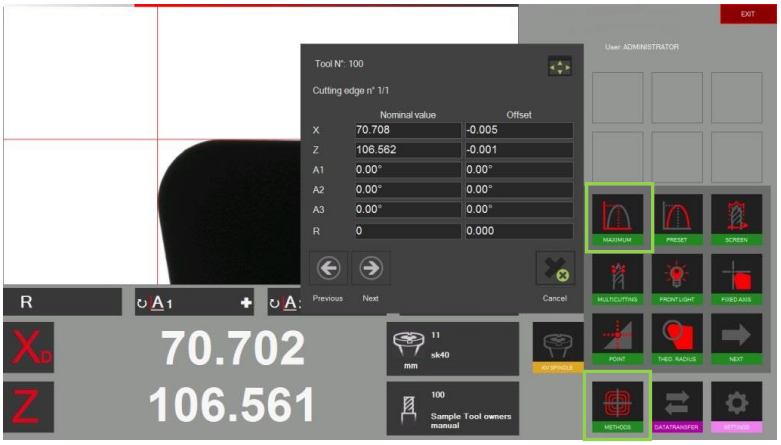


d) The desired measuring function can now be chosen.

Sample: Measuring with MF1(X/Z)

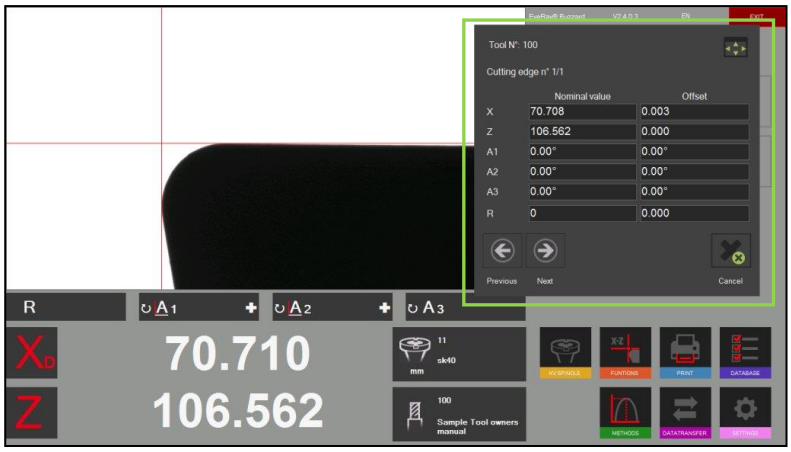
e)) The measuring method can be assigned the same way as described above

Sample: Maximum



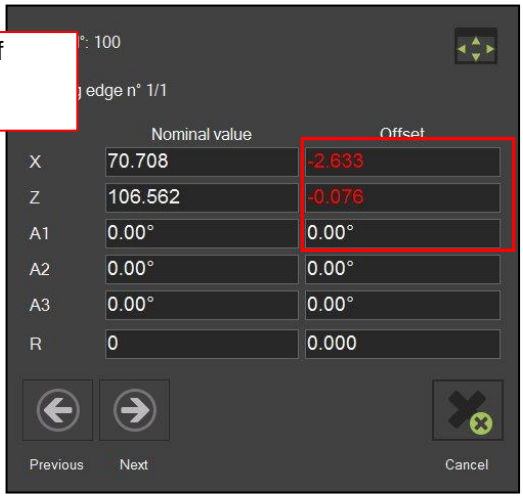
e) After turning the tool over its highest point (Maximum) is the measurement completed.

The offset between the measured values and the nominal values will now be indicated in the measurement info window.



Offset within defined tolerance:
Black

Offset out of tolerance:
Red

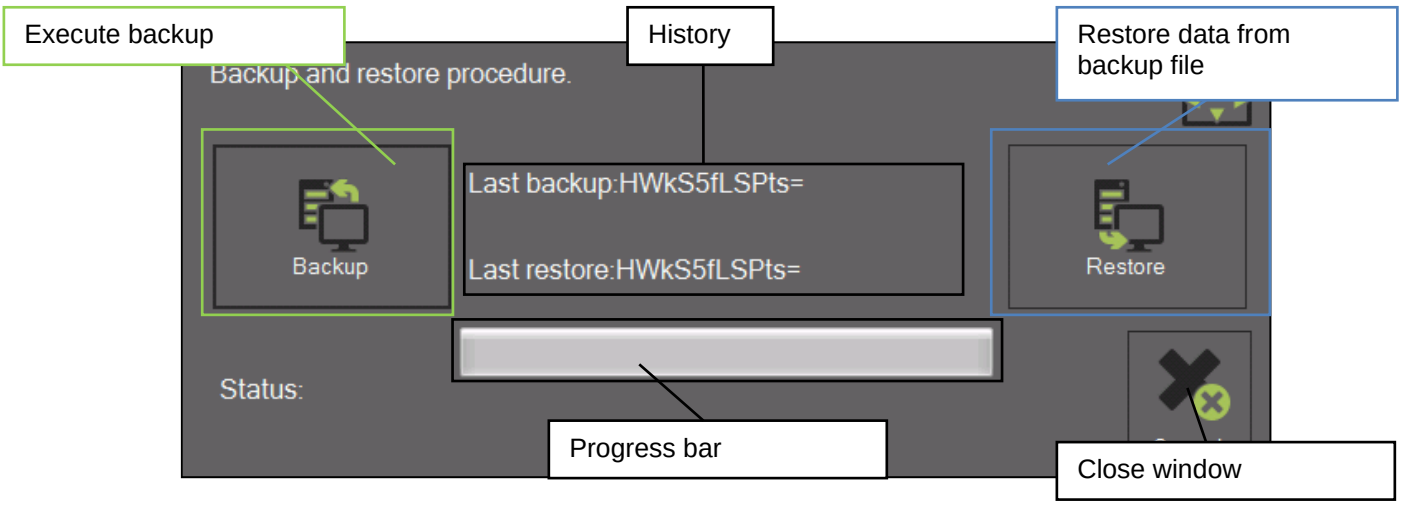


4.10.3 Backup and Restore

The backup procedure saves the data bases of the EyeRay® system.
All adaptors, tools (units with tool data base), corrections and calibration data (pixel size etc) will be saved in a backup file.

This icon opens the backup and restore funtions.

Description of the icons:

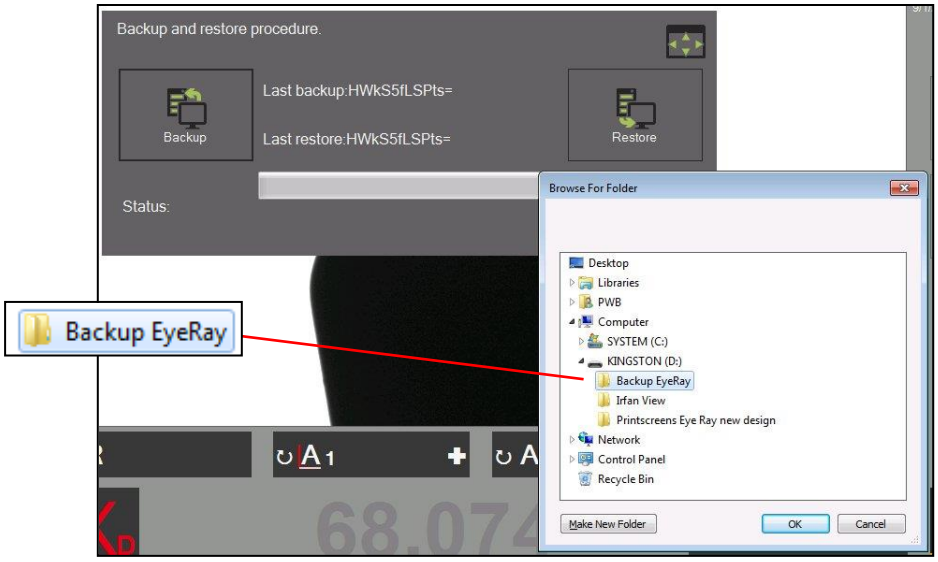


<u>Perform backup:</u>

Start the procedure with the icon rightwards:

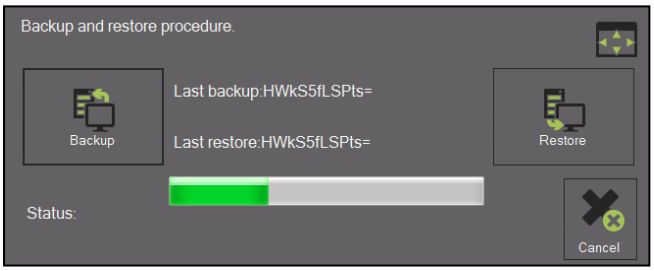
It opens a window, to choose the directory for the backup:

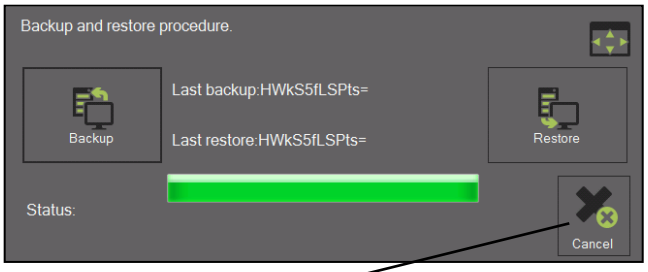
Create a folder, name it “backup EyeRay” and start the procedure with „ok“.



The backup must be done on a USB stick and not on the PC itself!

The bar shows the progress of the backup. This operation may take several minutes.

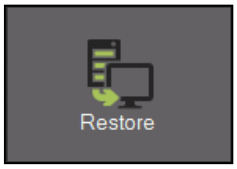




Close the window after finishing the backup procedure.

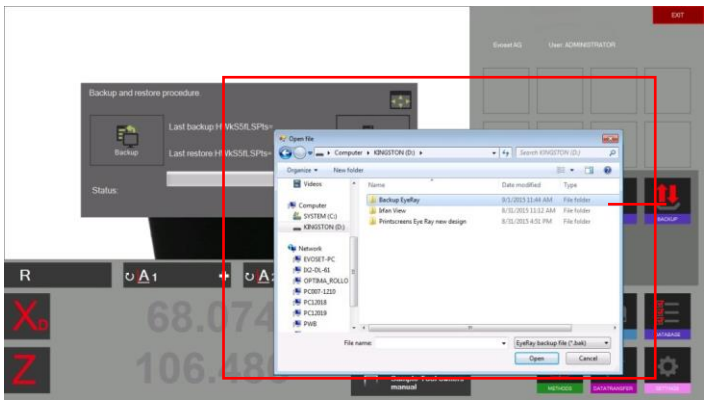
<u>Restore:</u>

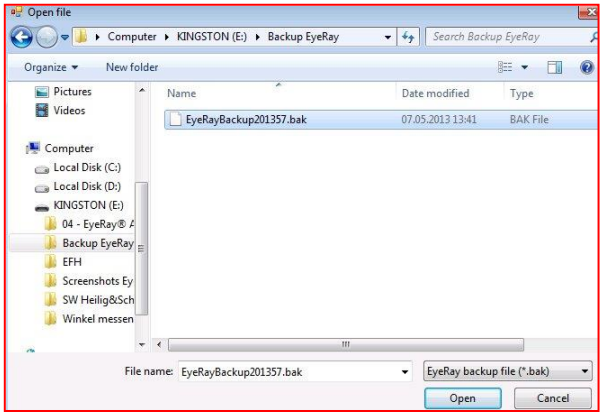
Open the restore procedure with the icon rightwards:



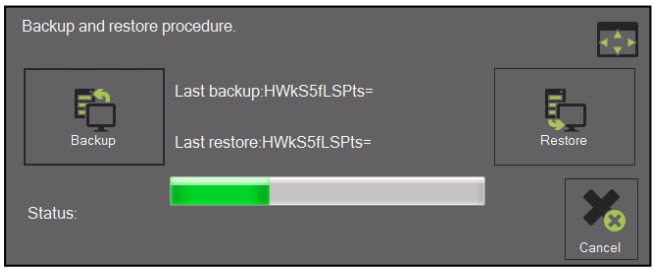
Choose the backup file, which has to be restored .

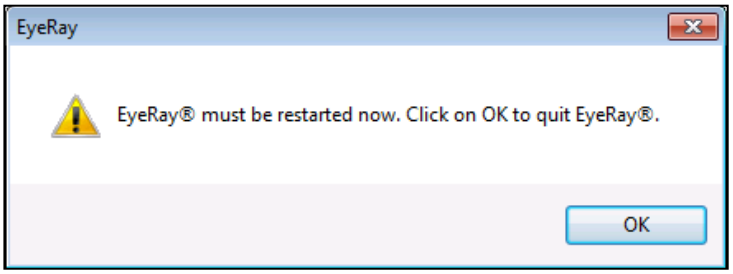
Select the file „EyeRayBackup…….bak“ and start the restore process with „Open“.





The bar shows the progress of the restore procedure. This may take several minutes.





After finishing the restore operation must the software be restarted.

5 Optional functions

5.1 Customized label EyeRay® (SW option)

To print out a customized label.

Item number: P270540 / Customized label EyeRay®

5.2 Data transfer PostPro EyeRay® (SW Option)

Data transfer to a network or machining centre.
Multiple post processors possible.

Item numbers: P270220 / Data transfer license EyeRay®
P270215 / Data transfer PostPro EyeRay® / per control

5.3 Data transfer RFID chip/ EyeRay® (SW option)

Data transfer by data carrier on tool holder (RFID chip).
Multiple post processors possible.

Item number: P270225 (contains Software / Licence and Hardware for the Tool Master)

5.4 Centre height measuring with camera / EyeRay® (option)

Centre height measuring through second camera (horizontal camera).
The camera can be retrofitted and becomes assembled on the lateral plate of the tool master.

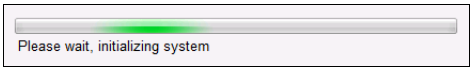
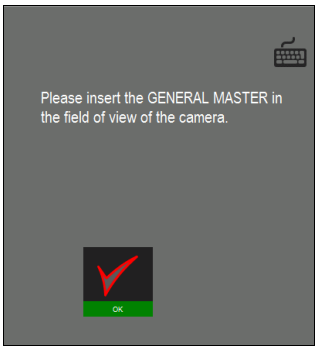
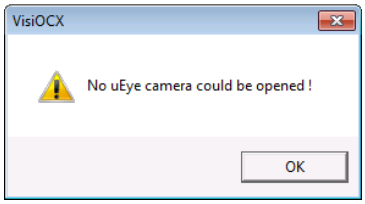
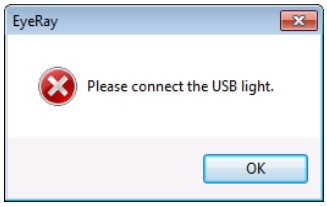
Item number: P270110 / Centre height measuring with camera / EyeRay®

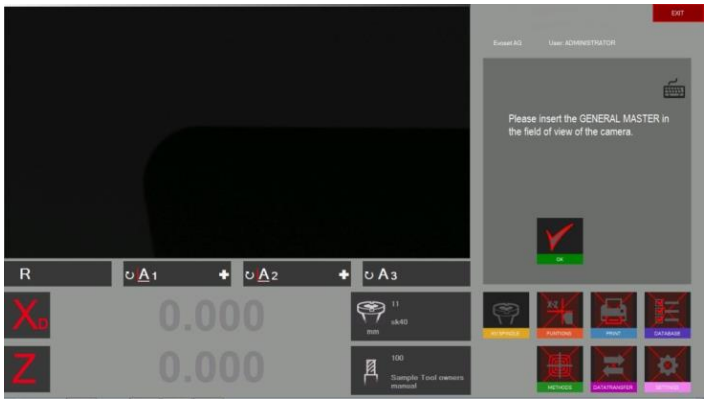
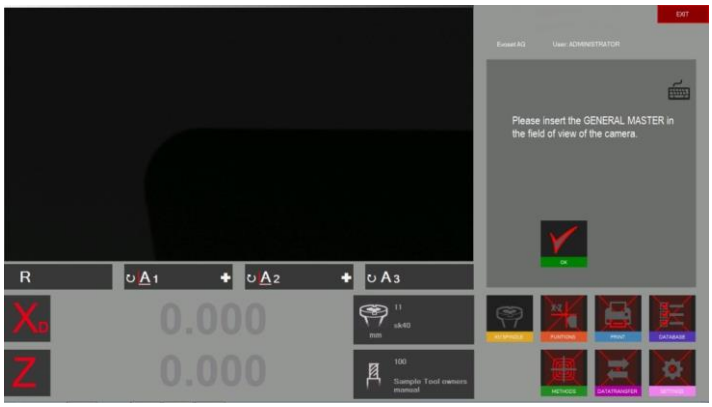
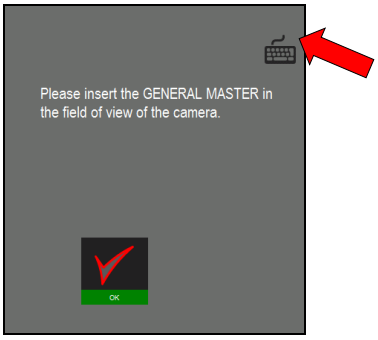
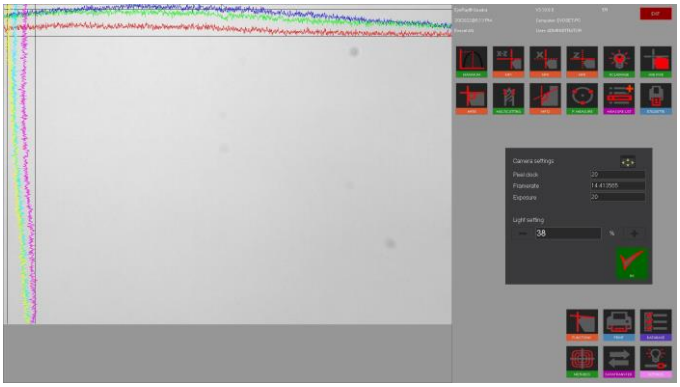
5.5 Customized measuring function (SW option)

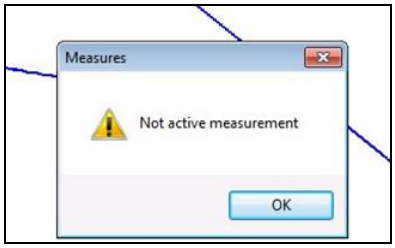
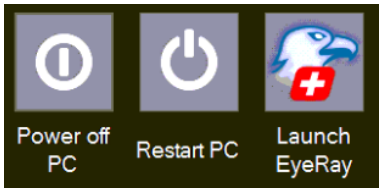
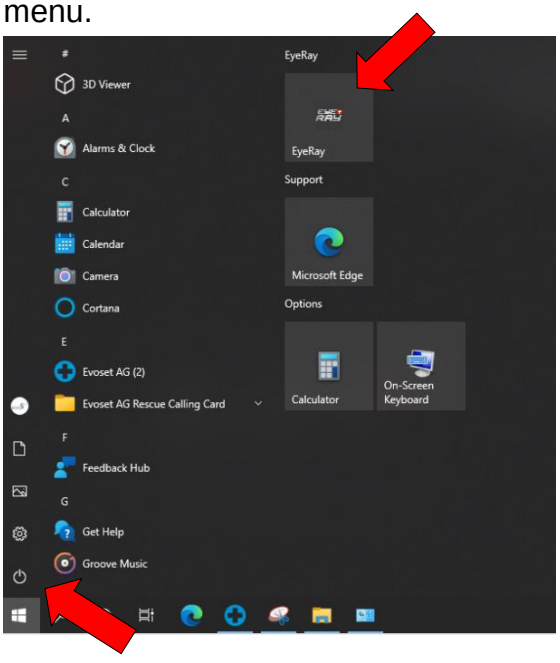
pecifications sheet created special measuring function.

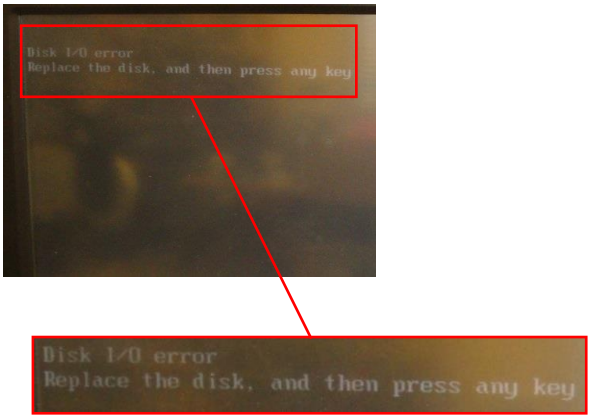
Item number: P270590

6 Troubleshooting

Problem	Troubleshooting
(1) **Error** on X and/or Z axis   Remark: This **Error** could appear when disconnecting a USB flash drive from the PC.	1.) Check the USB connection between the PC and the TOOL MASTER 2a.) Disconnect the USB connection between the PC and the TOOL MASTER and reconnect it after a few seconds. 2b.) This will initialize the system.  2c.) After that you'll have to calibrate the unit. 
(2) Message "No uEye camera could be opened !" during the launch of the EyeRay® software  	1.) Check the USB connection between the PC and the TOOL MASTER 2a.) After the login close the EyeRay® software by clicking the red button (top right)   2b.) Restart the EyeRay® software again
(3) Message "Please connect the USB light" during the launch of the EyeRay® software  	1.) Check the USB connection between the PC and the TOOL MASTER 2.) Check if the main switch at the back side of the TOOL MASTER is **ON**  3a.) After the login close the EyeRay® software by clicking the red button (top right)   3b.) Restart the EyeRay® software again

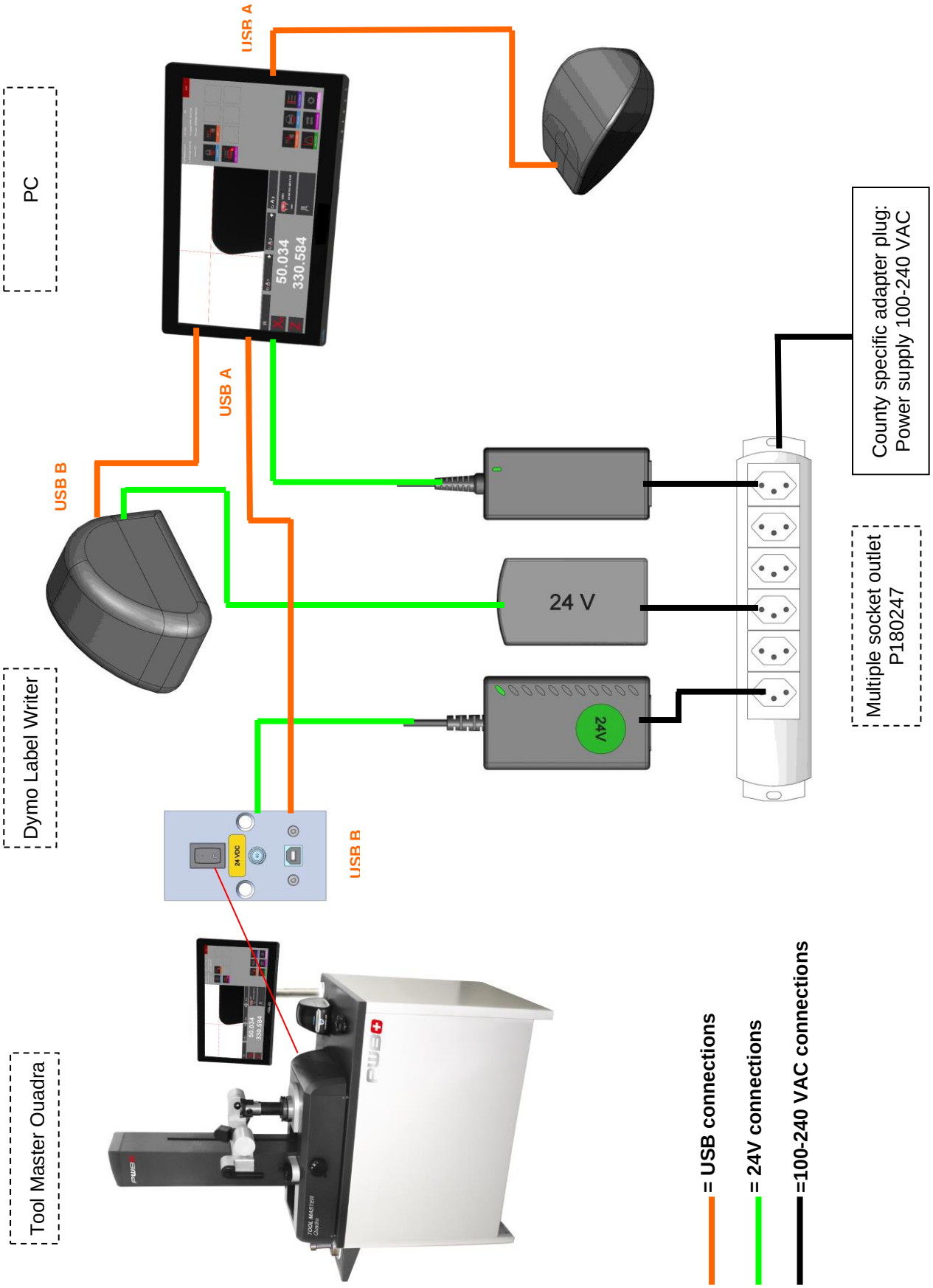
Problem	Troubleshooting
(4a) Blue screen after launching the EyeRay® software 	1.) Check the USB connection between the PC and the TOOL MASTER 2.) Check if the main switch at the back side of the TOOL MASTER is **ON**  3a.) Close the EyeRay® software by clicking the red button (top right)   3b.) Restart the EyeRay® software again
(4b) Still blue screen after launching the EyeRay® software (point **(4a)** already passed) 	1.) Open the "light calibration" by entering **Ctrl** and **L** <u>one after the other</u> If there is no keyboard connected, open the on-screen keyboard by clicking the keyboard button in the blue calibration window  <u>Remark</u>: On the on-screen keyboard you have to click <u>twice</u> on the **Ctrl** button before clicking the **L** button. 2.) Change the "light setting" value until all the lines are inside the two tolerance zones 

Problem	Troubleshooting
(5a) Unit cannot be calibrated. The following message appears: 	Position the mandrill in the view of the camera
(5b) There are no measuring lines to calibrate the unit. Message “Not active measurement” appears. 	1.) Start the light calibration and control the light intensity. follow the point **(4b)** 2.) Now you can calibrate the unit
(6) The EyeRay® “start menu” is <u>not</u> displayed 	Restart the EyeRay® software by clicking the EyeRay® icon in the Windows® start menu.  “Power off” or “Restart” the PC by the Windows® start menu.

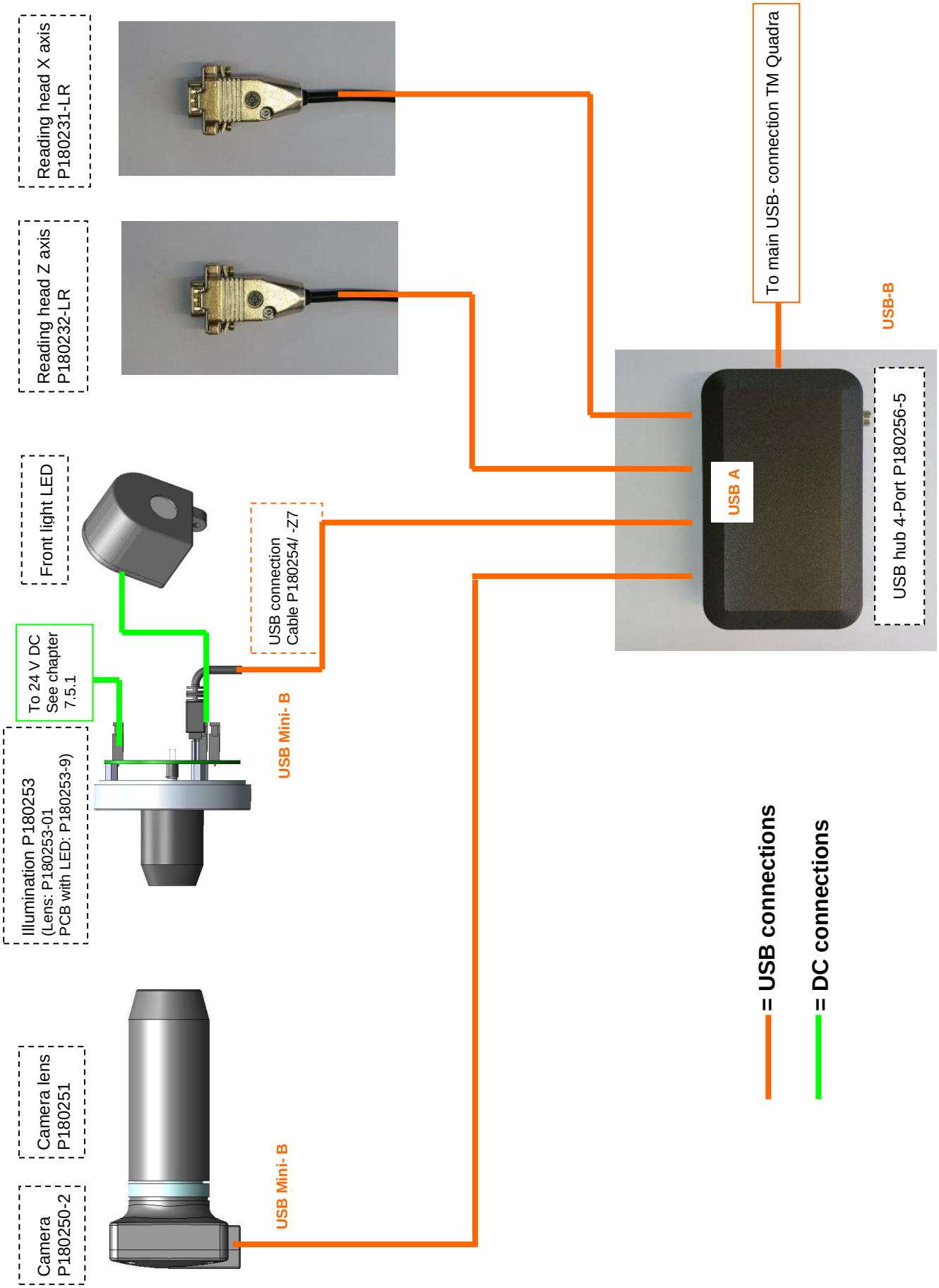
(7) The following message appears when starting the system:  	A USB stick is connected to the All In one PC while starting up. Please remove the USB stick and switch the PC off.

7 Diagrams

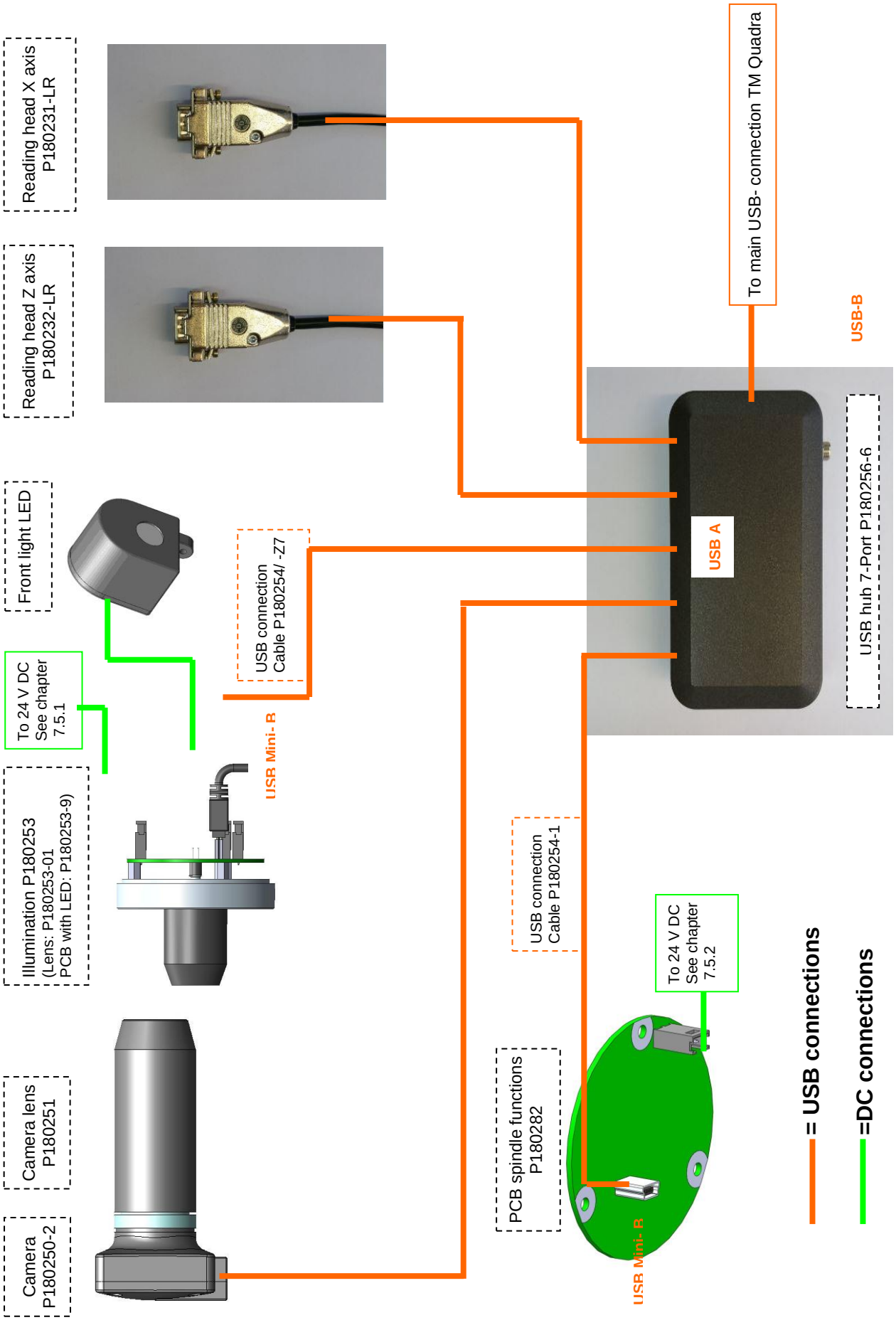
7.1 Overview connections TM Quadra



7.2 Connection USB hub/ Needle bearing

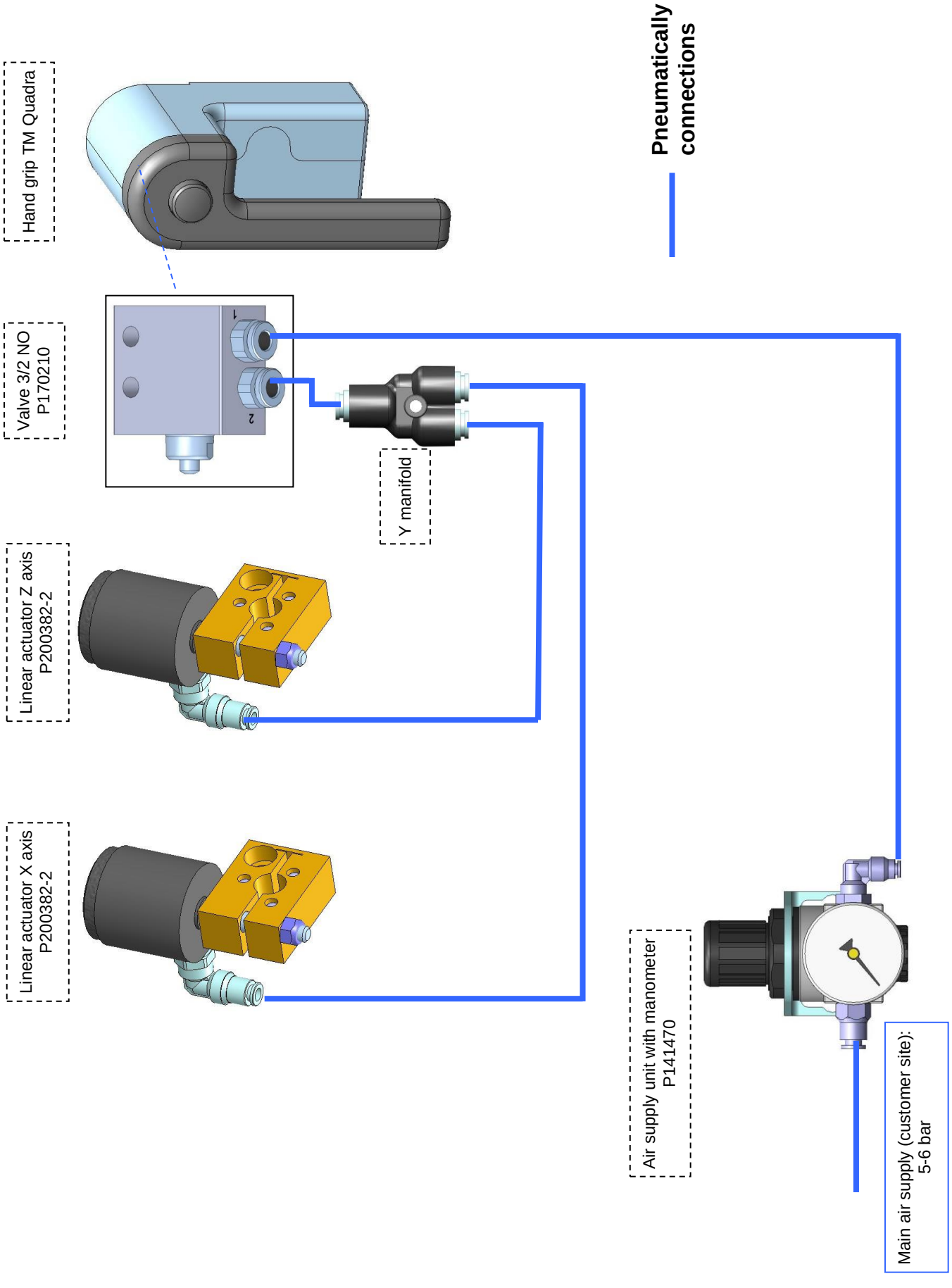


7.3 Connection USB hub/ Spindle KV

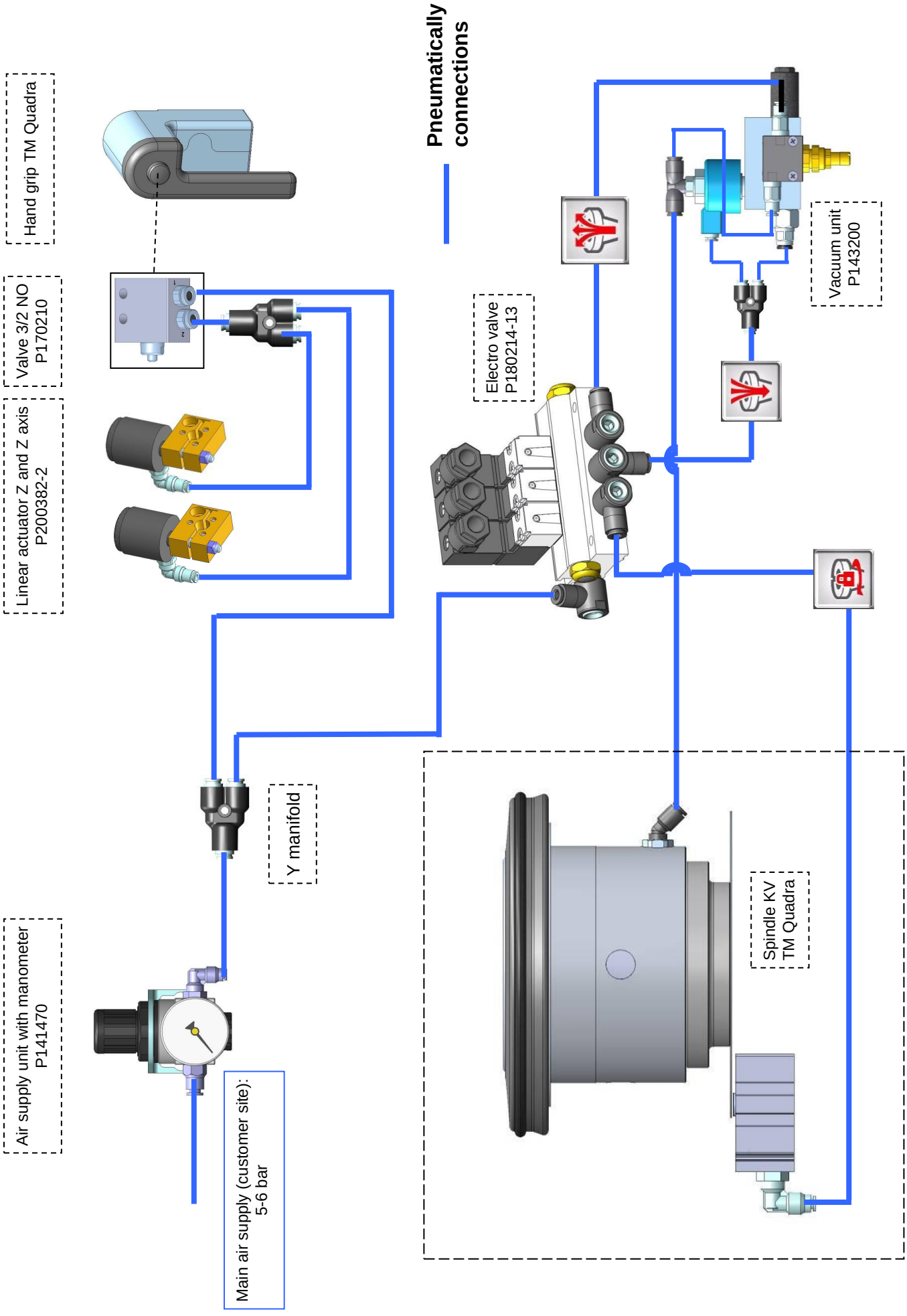


7.4 Pneumatically connections

7.4.1 Tool pot: Needle bearing

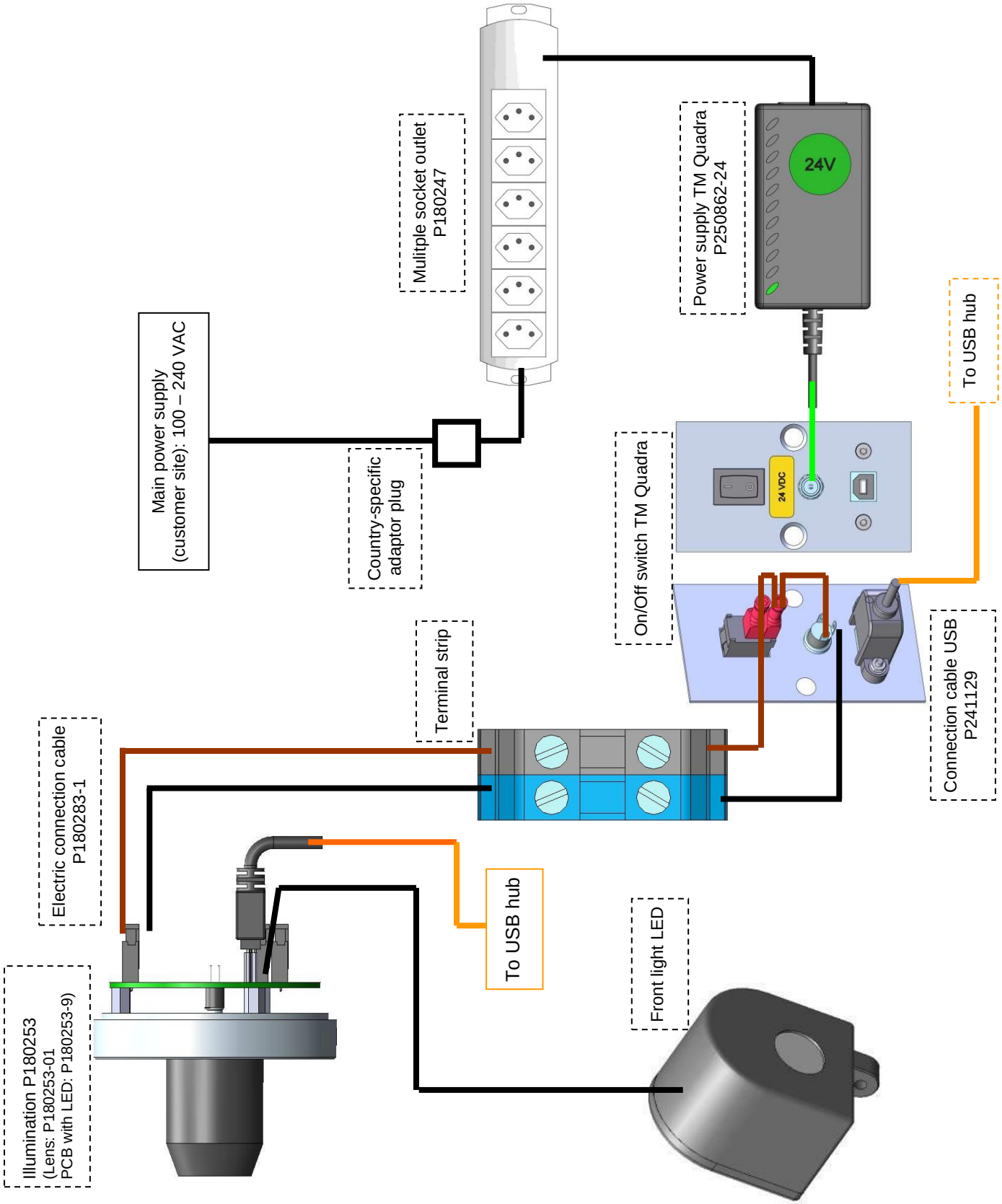


7.4.2 Tool pot: Spindle KV

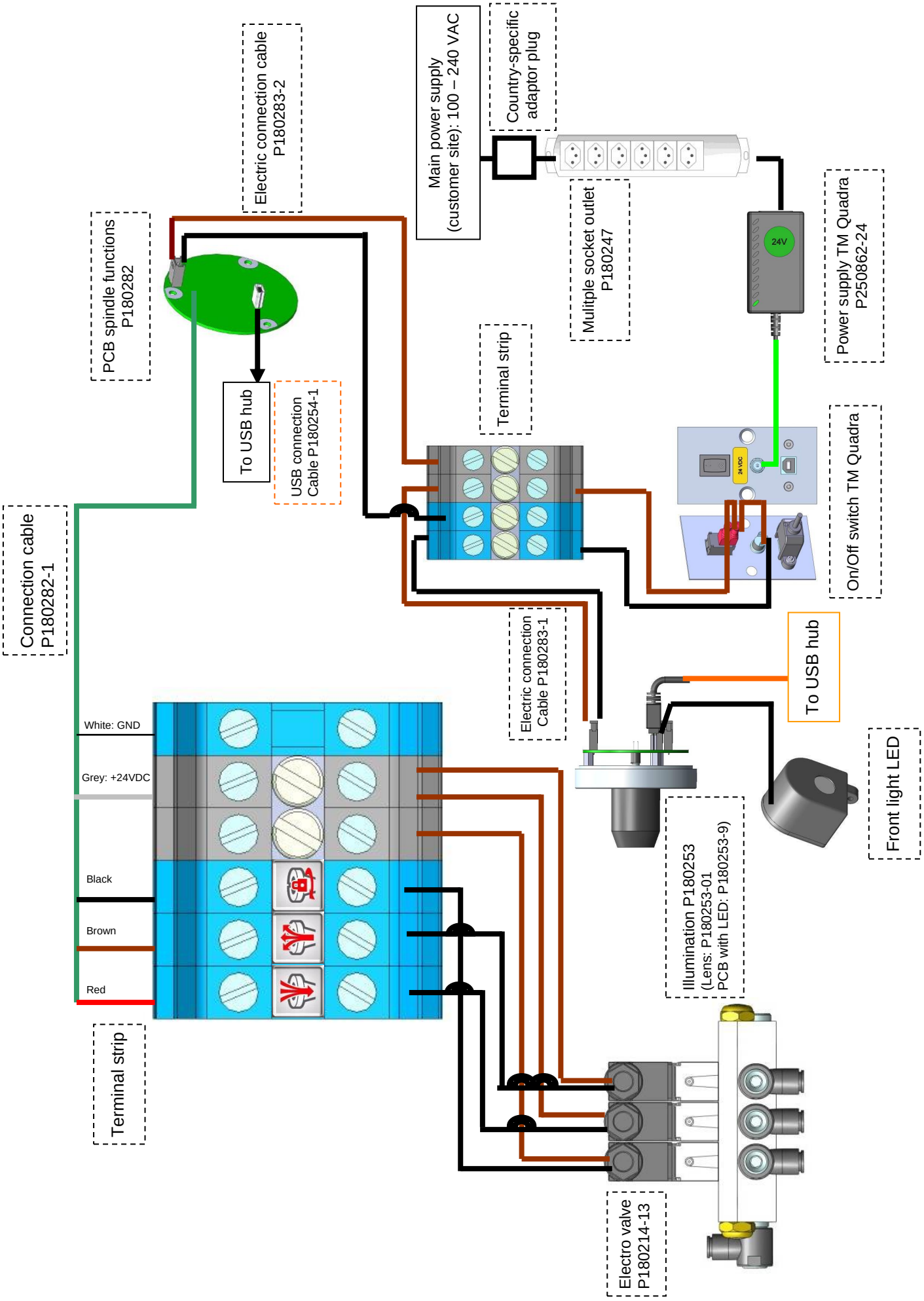


7.5 Electric diagrams

7.5.1 Spindle: Needle bearing



7.5.2 Spindle KV



8 Declaration of conformity

KONFORMITÄTSERKLÄRUNG
DECLARATION OF CONFORMITY
DÉCLARATION DE CONFORMITÉ

CE

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PWB

erklärt, dass das **Werkzeugvoreinstellgerät** :
*declares that the **tool presetter** :*
*déclare que le **banc de préréglage** :*

SERIEN-NR. : ***SERIAL NUMBER :*** ***N° DE SÉRIE :***	
MODELL : ***MODEL :*** ***MODÈLE :***	***TOOL MASTER Quadra***
MARKE : ***BRAND :*** ***MARQUE :***	**PWB**

mit folgenden Richtlinien übereinstimmt :
are in accordance with the following directives :
est conforme aux directives suivantes :

RICHTLINIEN : ***DIRECTIVES :*** ***DIRECTIVES :***	**2006 / 42 / EC** **2004 / 108 / EC** **2006 / 95 / EC**
NORMEN : ***STANDARDS :*** ***NORMES :***	**EN 61326-1:2006**

Evoset AG

Stevan Vukicevic
Technical Director
Steg, 03.02.2022