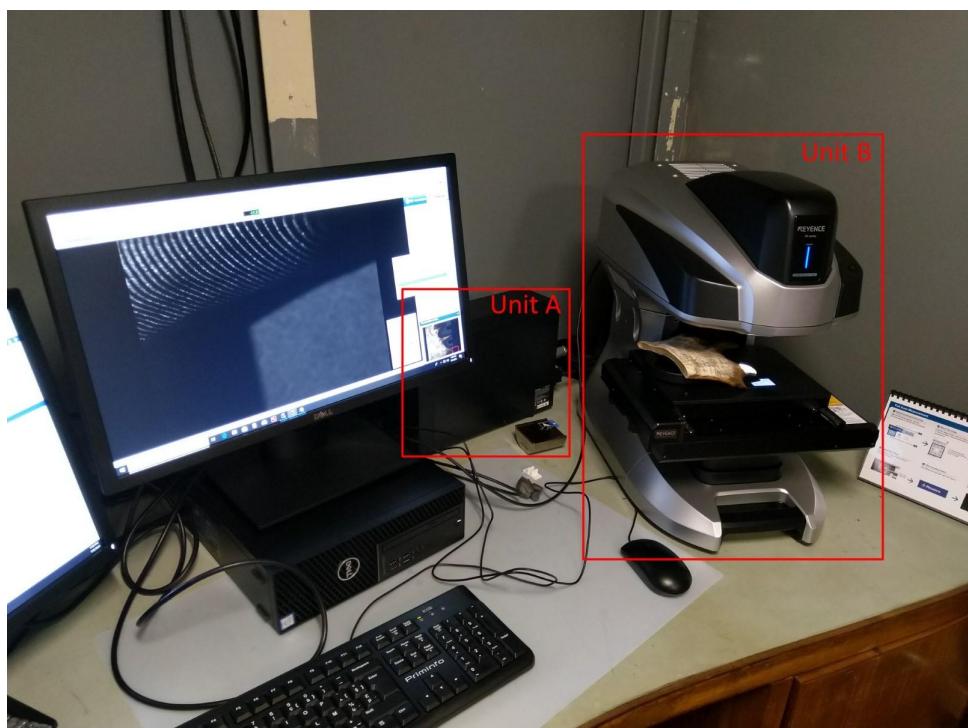


MS57 Training guide: Structured light scanning: Keyence VR-5200 (RBINS)

1. Start the scanner	1
2. Scanning	3
3. Credits	7

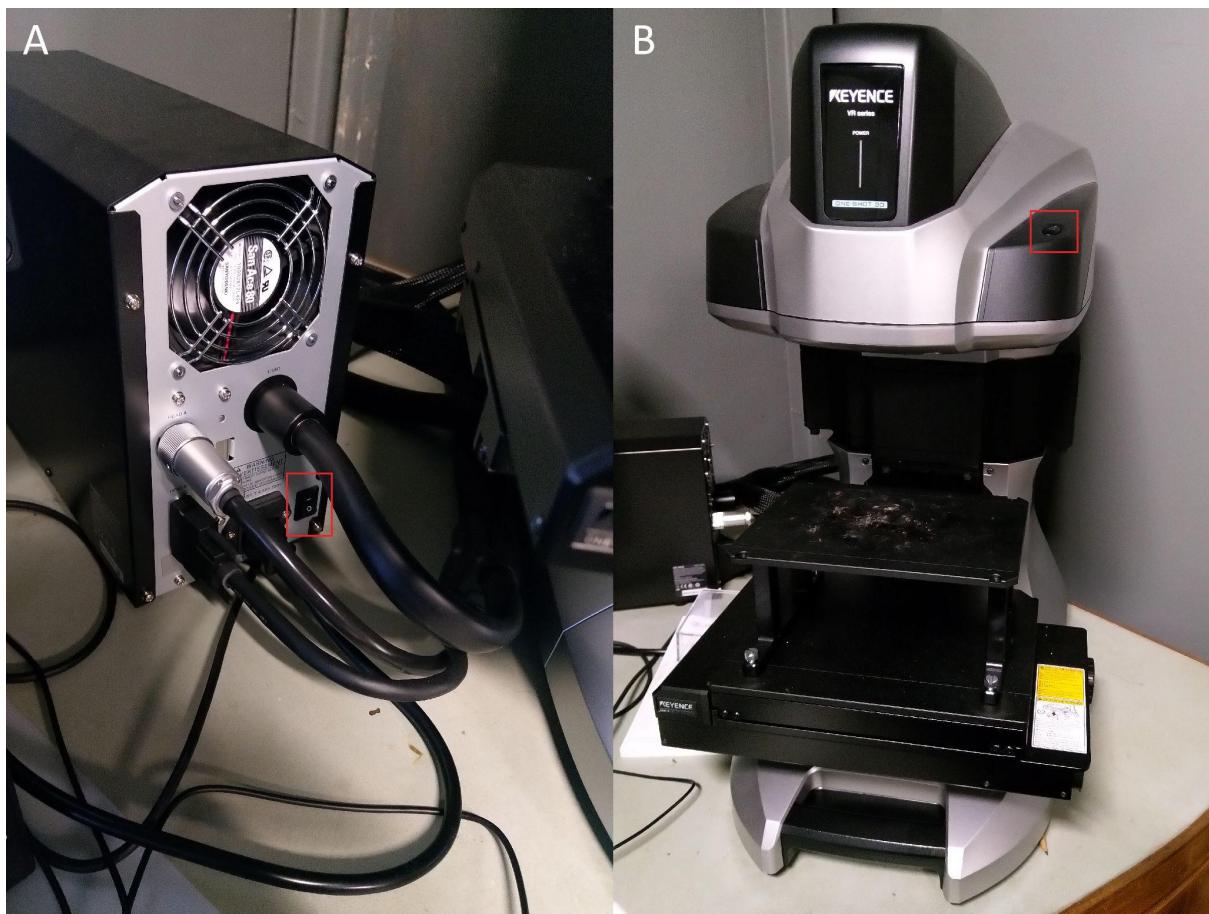
1. Start the scanner

- Connect all the cables and start the computer.
- The Keyence VR-5200 is composed of 2 units: Unit A which is a sort of box, and unit B which is the acquisition apparatus. Generally, when we talk about the Keyence VR-5200 it will be unit B.



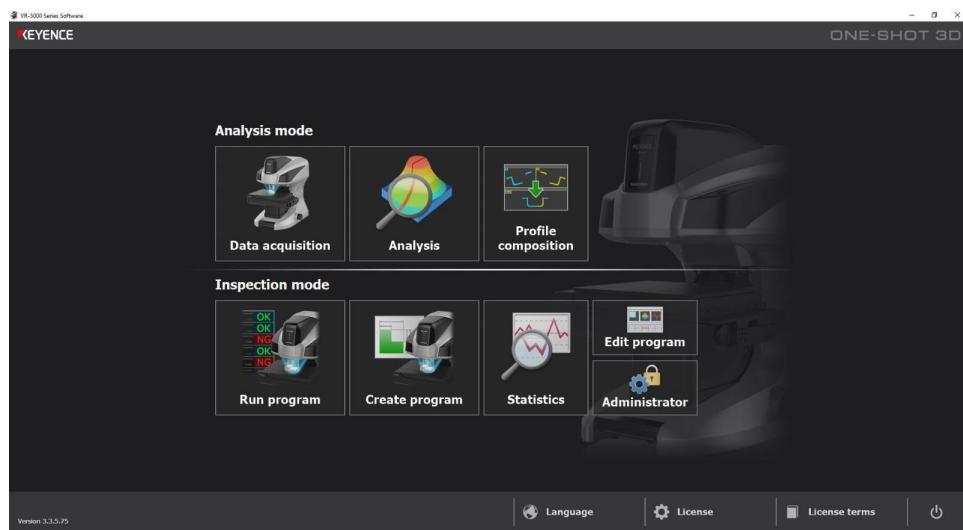
Keyence VR-5200

1. Turn on the Keyence VR-5200. For this there are 2 switches. The first one is situated on unit A (see picture A) and the second one in front of unit B (see picture B).



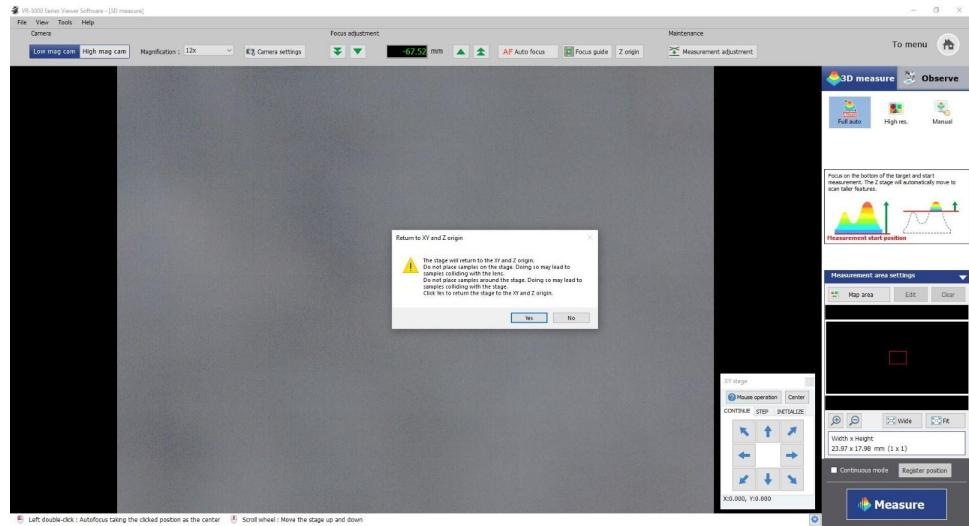
Keyence switches

2. Start VR-5000 series software.



2. Scanning

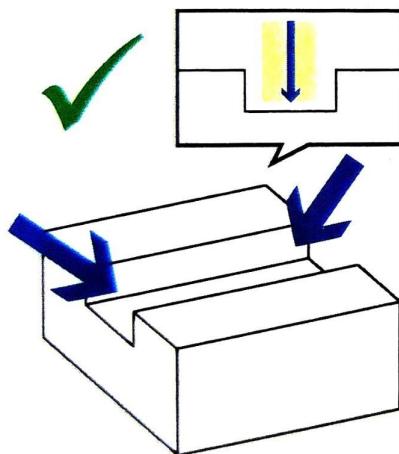
1. Select “**Data Acquisition**”. Another window will open with a pop-up message asking to initialize the stage. Make sure there is nothing on the stage. Press “yes”.



2. Once it's done, you can **place your object on the stage**. Depending on the object you want to measure, use the intermediate stage or not. Also, take into account the geometry and features of your object in regards to the position of the cameras.

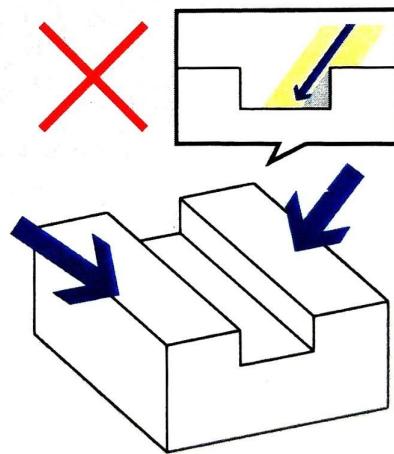
Correct orientation

When a sample has grooves or walls in the area being measured, position the sample so that the measurement lighting does not form shadows.



Orientation that forms shadows

If there are grooves or walls that run perpendicular to the projected light, shadows will form.



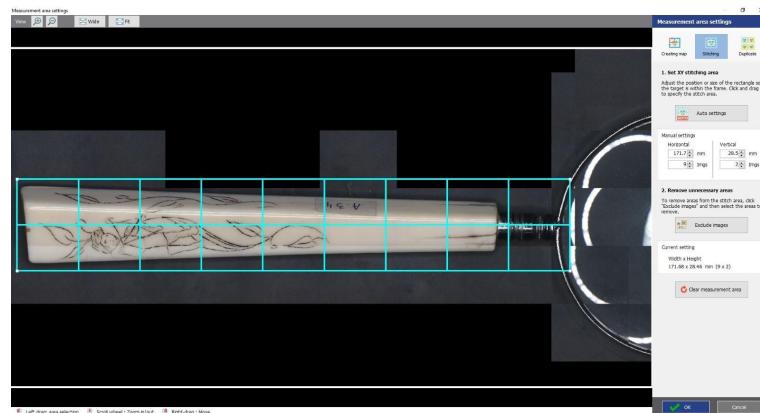
Source: Keyence Easy Operation Guide

3. Focus on the object by double clicking on it, and the machine will make an autofocus on that spot.

4. **Select the magnification you want to use.** The software offers two possibilities: low-magnification and high-magnification. In low-magnification you can choose between x12 and x25 (other magnifications are digital and not optical so we prefer not to use them). In high-magnification you can choose between x40 and x80. The higher the magnification, the more time consuming it is to capture the same area. Time is also proportional to the height of the sample measured. For example, this is the time of capture per magnification for an area of 37,5mm by 28,6mm and 4,3mm height:

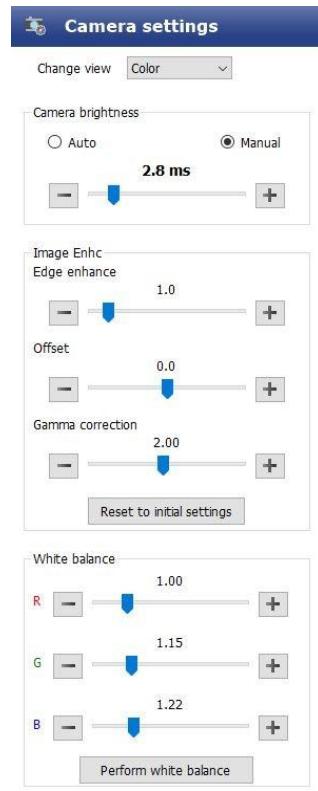
	x12	x25	x40	x80
Time of capture	20sec	60sec	5min	11min
Number of images	4	16	36	156

5. Go to “**Map area**”: the software will automatically map your area, and propose a selected area. If parts are missing go to “creating map” and select with the mouse the tiles you want to scan. Then go to “stitching” and select the area you want to measure. In the purpose of gaining time you can exclude tiles that you don’t want (“Exclude images”).

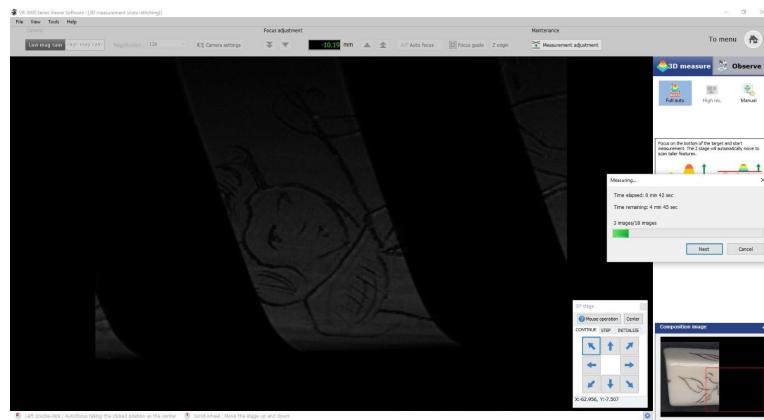


6. When you are satisfied, click “ok”.

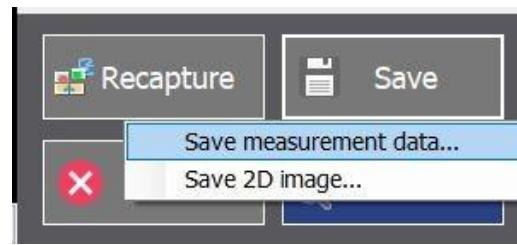
7. You can parameter your white balance and your exposure manually. Move to the part of the object you want to preview to set the exposure. Go to “**Camera settings**”. For exposure select “manual” in “camera brightness”. By default, the exposure will be the one defined automatically for this area, therefore if it’s the lightness area of your object you can leave the default value when you switch from “Auto” to “Manual”. This feature is useful when you have an object with light colour to avoid having an overexposed image. You can use a white balance card or grey card position above your object to define your white balance if necessary.



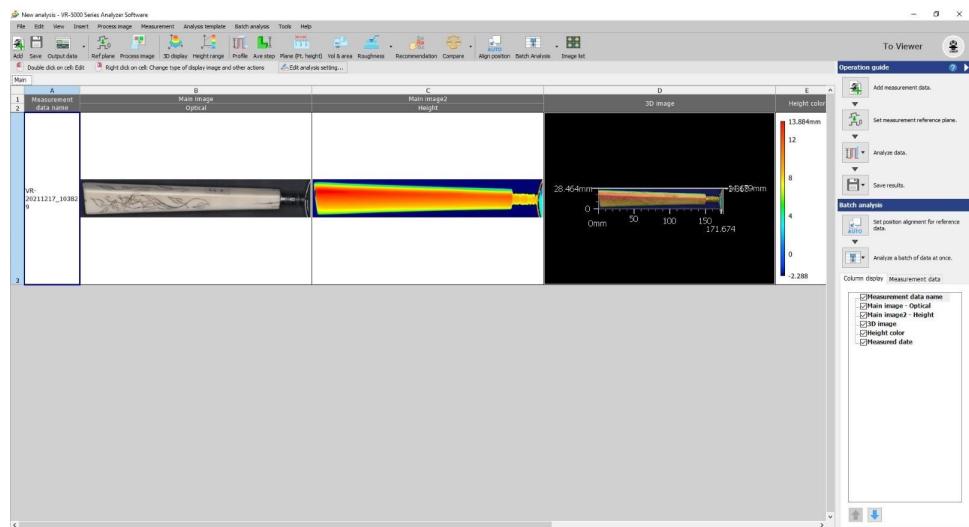
8. Set the **focus on the lowest point** of your object.
9. Start the measurement by clicking on “**Measure**”. The software will start capturing the data tile by tile.



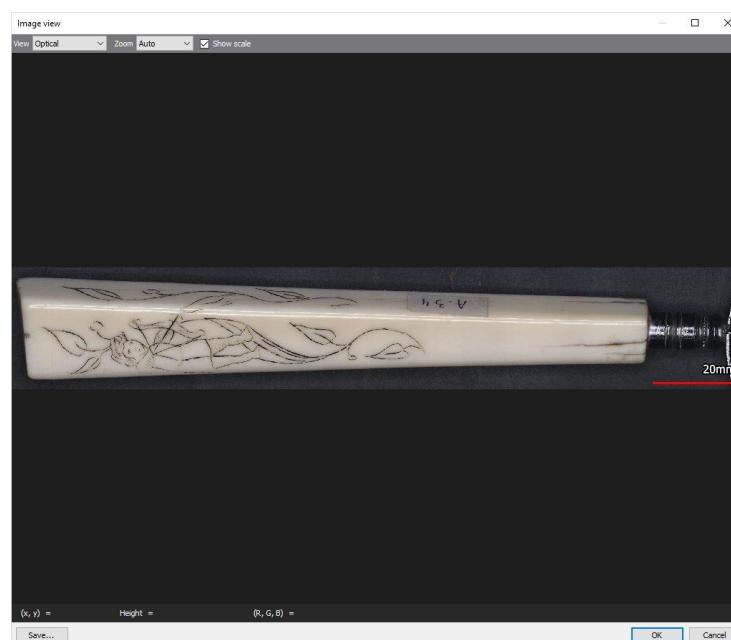
10. Select “Save” and “Save measurement data...”



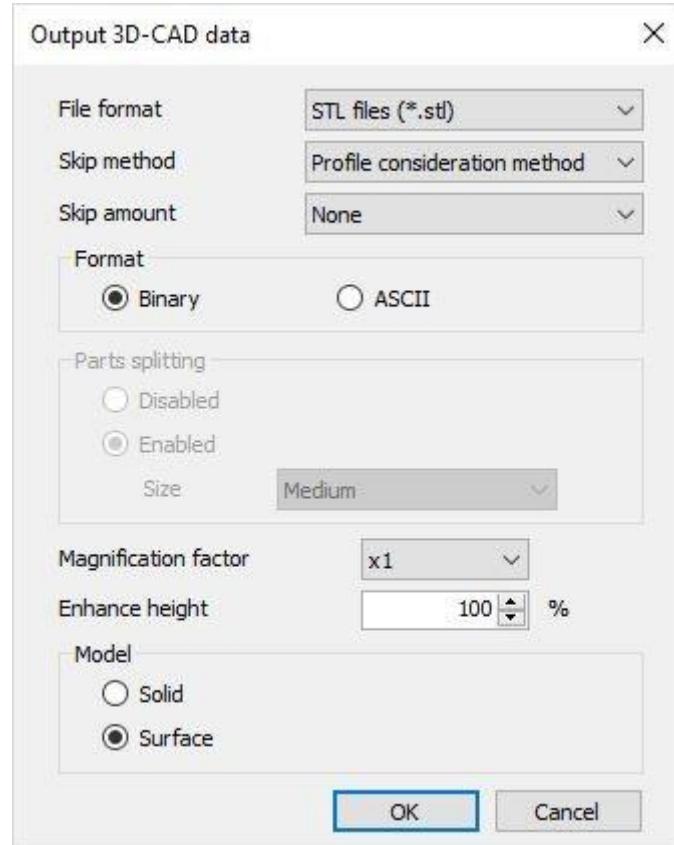
11. Load the data in the “Analysis” software. For doing that, either click directly on “Analyze” or go to the Analysis software and “Add measurement data” (in files or using the icon “add” on the left of the screen”.



12. You can add a scale to the 2D image and save it: double click on the image in the column “Main image Optical”. Activate the “Show scale” and “Save”.



13. Export the 3D data: select the 3D data in the column “3D image”. Then in file, go to “**export**” -> “**output 3D-CAD data**”. Choose .stl, skip amount “none” (the higher the level the more decimated and the less feature you have) and for Model choose between 3D Solid or Surface. With Solid, the missing data will be filled everywhere (if you want to 3D print it is a good option).



3. Credits

- Author: Aurore Mathys
- Date: December 2021
- Version: 1.0
- CC: CC BY