

Start measuring

English | Guide | 1.11.1026.2

1. Start the program and open an image

For the Extended Windows Version 1.11.1026.2, extract the complete program ZIP, or open the self-extracting EXE, choose a folder and click Entpacken. Start Trinos-Sporenmesser-1.11.1026.2.exe and keep the Sprachen folder beside it. Choose **Open image**. The program works locally and leaves the original photo unchanged. This guide covers the extended version; the fixed Simple Windows Version 1.3.1026 does not support language packs.

2. Calibrate using a scale bar

Choose **Calibrate μm** . Drag from one end of the scale bar to the other and release. Enter its known length, for example 10 for 10 μm , then click **Apply**. The scale is shown at the top. Existing spore measurements are converted too. Without calibration, values are in pixels (px). You can also load a saved reference (page 2).

3. Measure a spore in two steps

Length: drag from the centre of one spore end to the other and release. **Width:** move sideways to the spore edge and click. The rotated rectangle stays visible; continue immediately with the next spore.

4. Edit or delete

Rectangles can be edited in both modes. **Edit** prevents dragging on empty image space from creating a new measurement. **+ Measure spore** enables this again. Select a rectangle or table row. Side handles change length/width; the green point rotates it; drag inside to move it. Numeric length, width and angle fields on the right can also be edited; press Enter. **Delete / Del** removes the selection; deleted numbers are reused. **Ctrl+Z** undoes a change.

5. Zoom and move the image

Use the mouse wheel to zoom. The top scrollbar moves left/right; the right scrollbar moves up/down. Alternatively hold Space and drag, or hold the middle mouse button. **Fit image** shows the whole image. View changes do not alter measurements. **L** = length, **W** = width, **Q** = length/width. Calibrated L/W use μm ; Q has no unit.

References and image series

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6. Save and reuse a reference

Calibrate an image and choose **Save reference**. This saves a .sporen-referenz.json file and enables **For new images**. Open further photos with **Open image** or **Add image**: photos of identical dimensions receive the scale, even without a visible bar. After restarting the program, use **Load reference** once, before or after opening a photo. Save separate references for different objectives or acquisition settings.

When is a reference valid?

Magnification, camera/acquisition settings and image scaling must match. Identical pixel dimensions alone do not prove an identical scale. Different image dimensions prevent automatic application. Deliberate application with Load reference requires checking the scale.

7. Collect measurements from several photos

Open the first photo and measure suitable spores. **Add image** adds more photos; **Open image** also preserves previous measurements. Several photos can be selected together. Switch via the image selector at the top. Clicking a table row opens its photo and selects the spore. Table, statistics and TXT/CSV exports cover the whole series. Each photo keeps its own scale, zoom and visible area.

8. Save the whole series or start anew

Save measurements stores all photos, rectangles and scales in a .sporen.json file. **Open measurements** restores it; no separate reference file is required. Every save creates or updates NAME-vorläufige-messwerte.txt beside the project, headed **Preliminary measurements**. Separately exported TXT/CSV files remain unchanged. If units are mixed, this preliminary TXT lists images separately; calibrate all measured images before calculating combined statistics. **New series** starts a new collection and asks to save pending changes.

Units and numbering

When some measured photos use μm and others px, statistics identify missing calibrations. Complete them before a combined export. Spore numbers are unique within the series. Undo applies to the current photo. **Remove** next to calibration resets that photo to pixels and disables automatic reference reuse. Saved projects keep their own scales.

Save and understand results

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Choose the right file

Save measurements: editable .sporen.json with all photos, rectangles and scales. **Save image copy:** JPG or PNG of the current photo at original resolution. **Export measurements:** TXT or CSV selected in the file-type field, including L, W, Q, estimated volume, minimum, maximum and mean. **Save reference:** a separate .sporen-referenz.json scale file. An image copy or TXT/CSV cannot replace an editable project. **Numbers** toggles labels beside rectangles, also in image copies; the table stays available.

Blue statistics and the TXT summary

Values are ordered **lower limit - mean - upper limit**. In **Options**, choose **Mean confidence limits** or **Population limits (95%)**. Screen and TXT use the selected type, named in the heading; on-screen means are bold. Limits require at least five spores across the series; fewer yield means and a note. TXT ends with a copyable summary. Example with fictitious values:

Spores: 17.90-18.90-19.80 x 13.30-14.20-15.00 µm

Q: 1.25-1.30-1.40

Extra information in CSV

CSV includes lower/upper mean confidence limits and approximate population limits for L, W, Q and volume, calculation notes and the photo assignment. With fewer than five measurements, limits show n.a. Mean confidence limits describe uncertainty in the estimated mean; population limits approximately describe the spread of individual spores according to Gerd Fischer's workbook. They are not an exact 95/95 tolerance interval. Min/max are the smallest/largest measured values.

Estimated volume and calculations

Volume assumes an ellipsoid of revolution: $V = (\pi / 6) \times L \times W^2$, depth = width. Units are µm³ when calibrated, otherwise px³. Mean Q and mean volume are averages of individual spore values. Mean confidence limits use $\text{mean} \pm t \times s / \sqrt{n}$; population limits use $\text{mean} \pm t \times s$, assuming a normal distribution. t is Student's t critical value, s the sample standard deviation, n the number of measurements. Calculations use unrounded values; limits round outwards.

Options and quick help

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9. Set number formatting

Open **Options** at the top right. The preview shows your choice. **Apply** stores it permanently; **Cancel** discards changes. Choose comma (1,23) or point (1.23). Choose 0, 1 or 2 decimal places independently for length/width, Q and volume. Internally, values remain unrounded. Export tables omit unnecessary trailing zeros; no thousands separator is used. CSV columns use semicolons.

Move measurement labels

Show measurements on image displays length and width outside rectangles, also in JPG/PNG. Drag a label with the left mouse button to move it; measurements stay the same. Ctrl+Z undoes movement. Save measurements preserves positions; JPG/PNG includes them. This works in both modes. Numbers is independent.

Keyboard shortcuts

N / V: Measure spore / Edit.

Del / Esc: delete selection / cancel the current operation.

Ctrl+Z / Ctrl+Y: undo / redo.

Ctrl+S / Ctrl+Shift+S: save project / save as.

Shift + drag: create a measurement over an existing rectangle.

10. Version and contact

About next to Help shows the version and Mario Tripodi's contact details. Clicking the email address opens your email application: mario.tripodi1974@gmail.com. Trinos Sporenmesser was developed by Mario Tripodi with assistance from artificial intelligence (AI).

Measure distances with lines

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11. Start a line measurement

Open a photo, calibrate in μm if needed and choose **Measure line**. Drag from the start point to the end point and release. The line stays visible. Without calibration, units are px. Use it for basidia lengths or widths, visible ornaments or other distances. Hold Shift while dragging to measure over an existing object.

12. Edit and delete a line

Select the line or its table row. Drag either endpoint to correct the start/end; the length updates. Drag the middle to move the whole line. Zoom in before handling very short lines. **Del** deletes, **Ctrl+Z** undoes and **Esc** cancels an unfinished measurement. **+ Measure spore** returns to rectangle measurement.

13. Separate numbers and statistics

Choose **Spores** or **Lines** above the table on the right. Lines have their own Ln1, Ln2 etc. numbering, independent of spores; deleted numbers are reused. Lines have length only, no width, Q or volume. From five lines, the selected 95% limits are calculated. Spore statistics remain separate.

Keep different distances separate

All lines in one series feed a single line analysis. Use separate series for basidia lengths and widths to avoid mixing means. Only the straight distance in the image plane is measured; a three-dimensional height is not reconstructed.

14. Save and export

Save measurements stores spores and lines with images and scales. Use a compatible current version for files containing lines; older projects remain readable. TXT/CSV have a separate Lines section. JPG/PNG includes lines and enabled number/measurement labels. Labels can be moved; number formatting follows the length/width options.

Languages and language ZIPs

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15. Choose a language

The extended Windows version supports Deutsch, English, Nederlands and Italiano. English and Dutch are included in the current Windows program bundles; Italian can be added separately. Open **Options** → **Language** → **English** → **Apply** (in German: Optionen → Sprache → English → Übernehmen). The interface changes immediately and the choice persists after restarting. An open measurement series remains intact.

16. Extract the language ZIP

Download the desired language ZIP from the homepage. It contains a matching PDF guide and a Sprachen folder with the .trinos-language.json file. Extract the ZIP, then copy that language file into **Sprachen** beside the program EXE. Keep its filename. Copying is sufficient; no separate installation is needed. Close and reopen Options if it was already open. Valid packs appear automatically in Language. Choose the language and click Apply. The Deutsch ZIP contains the German guide and instructions; German is built into the program and needs no language file.

Folder layout

Trinos-Sporenmesser-1.11.1026.2.exe

Sprachen/English.trinos-language.json

Sprachen/Nederlands.trinos-language.json

Sprachen/Italiano.trinos-language.json

Keep Sprachen with the EXE when sharing the program. Automatic recognition requires version 1.11.1026.1 or later; 1.9.1026.1 supports English only. Simple Windows Version 1.3.1026 supports no language packs.

17. Alternative installation

In Options choose **Install language pack...** and select the JSON file. It is copied into your user settings folder. Select the language and Apply. Invalid/incomplete files are not offered as languages. Use complete packs compatible with the program version.

18. What is translated?

Interface, help, messages and headings/explanations in new TXT/CSV exports, including preliminary TXT. Previously exported files are not changed. Decimal separator and precision remain independent of language. Measurement values, references and project files do not change when switching. Standard Windows dialog buttons may follow the Windows language. This guide applies to the Extended Windows Version.