

MEASURING TOOLS

CL-Profiler Operating Instructions

Safety Instructions

This device is safe and complies with the current regulations. If, however the device is used for purposes other than those intended or operated by unskilled personnel, risk of serious/life threatening injury may occur!

The below instructions must be strictly followed:

1. Read the enclosed documentation before using the device for the first time. All safety regulations included in the enclosed manual must be complied with.
2. This device may only be operated by specially trained personnel. The customer must ensure that unauthorised personnel do not approach the machine on which the device is being used.
3. This device may only be used for the intended purposes.
4. The customer is not allowed to make any modifications on the device unless prior written approval given by Mersen France Amiens.
5. The device must not be used in case of deterioration or in case of lack of maintenance. Mersen France Amiens may not be held responsible of any damage and/or injury if the customer does not fully comply with these safety instructions.

CL-Profiler operating instructions

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I) Introduction

CL-Profiler is an instrument that must be used in combination with a PC, laptop or mini-PC. The instrument records movements of a probe as a function of time. CL-Profiler is usable for different profile applications but is specially developed for commutators and slip rings profiling.

II) Computer Installation

1) Computer requirements

- Computer with Windows 2000, XP, VISTA or Windows 7.
- Minimum 100MB free disk space.
- Minimum 512MB RAM memory.
- One or two free USB ports. We strongly recommend not to use a USB hub, since it will decrease the sensor performance (add noise).

2) Software installation

Only connect the device to the USB port AFTER software installation. The reason is that the USB driver must be installed first.

Run the setup file which is provided on CD or downloaded it on www.cl-profiler.com (see downloads). After installing, the computer must be restarted.

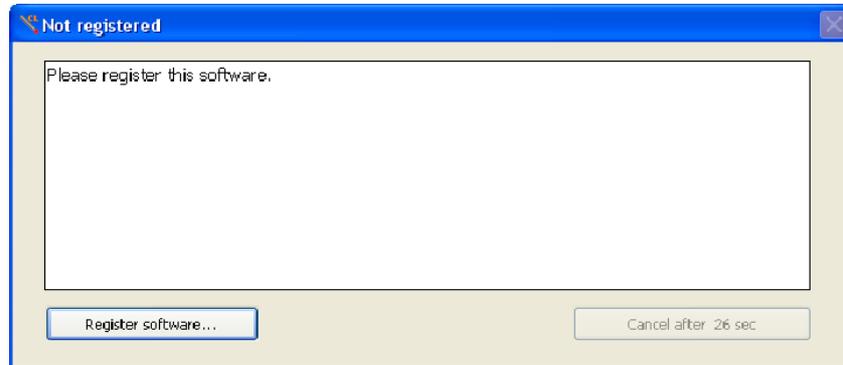
The device is ready to be used.

For users with administrator limitations;

- the USB plug of CL-Profiler must now be connected to the USB port of the PC to activate the USB driver.
- Let Windows search for a driver.
- CL-profiler is now ready to be used.
- The file "CL-profiler" on C drive should not be limited.

III) Registration

To start the CL-Profiler software, click on the Windows start menu, go to "programs" and select "CL-Profiler". You can also use a shortcut on the desktop. If the software is unregistered a pop-up will appear for registration:



For registration, one needs to have access to the internet to obtain an installation code, this can be done on any computer. If you are unable to register at this time, you can click on the button "cancel after xx sec" at the moment that it changes to "Register later".

To obtain an installation code, click on the button "Register software" and go to: <http://www.cl-profiler.com/registration.aspx>
Enter all your information on the web page. The registration site will send the installation code to your e-mail address.

Once you receive the installation code by e-mail, click on the button "Register software...", a new window will appear:

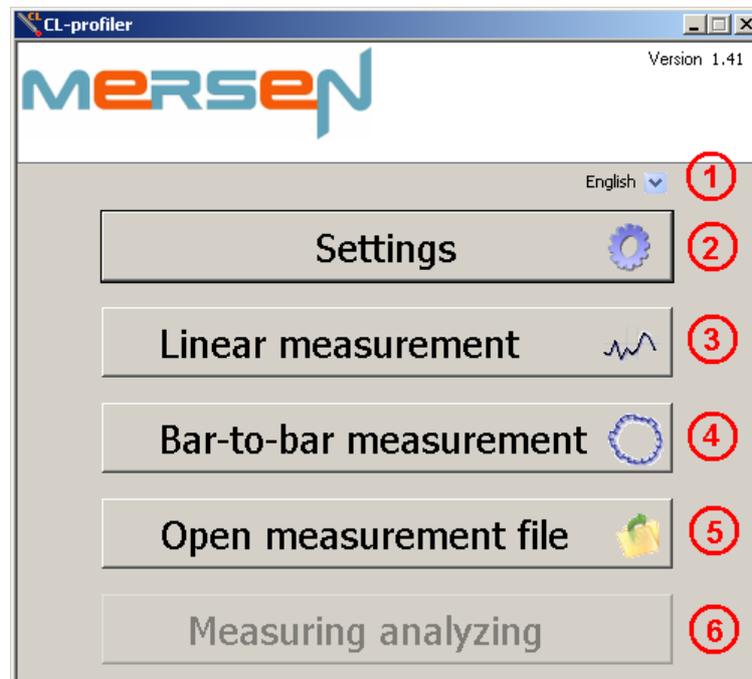
Enter all your personal information, exact the same as on the web page, and make sure the CL-Profiler is connected to the computer. Now click on "Register".

*Note: the registration is based on your personal information and the CL-Profiler serial number.
When connecting a different CL-Profiler, registration must be done again.*

IV) Software use

To start the CL-Profiler software, click on the Windows start menu, go to "Programs" and select "CL- Profiler". If installed, You can also use the shortcut on the desktop.

The main screen looks as follows:



1) Language selection

First select your language via menu (1). If your language is not listed, contact Mersen France Amiens to check if it can be made available.

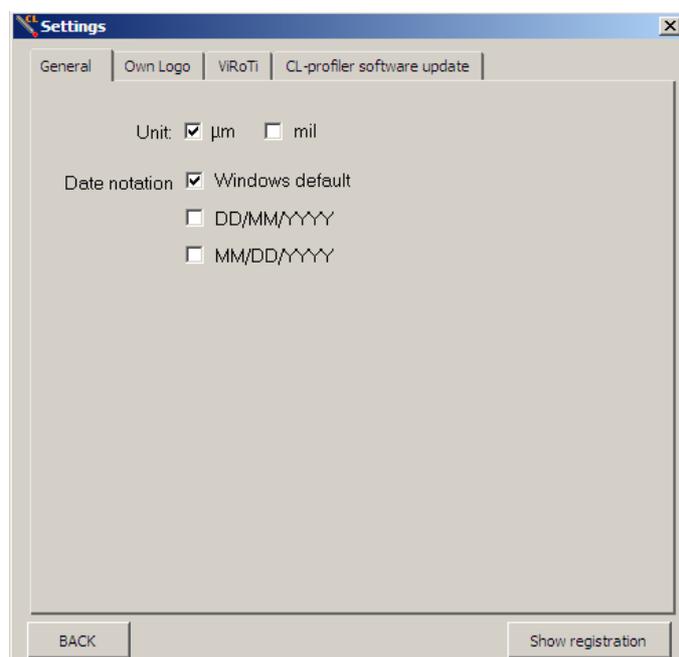
2) Settings

Click on button (2) to open the settings screen, a new window pops up:

a - General

Adjust the various settings to your preferences. Click on the "BACK" button to close the window.

Click on "Show registration" to confirm who's name the software is registered to.



b - Own logo

Click the tab: 'Own Logo'.

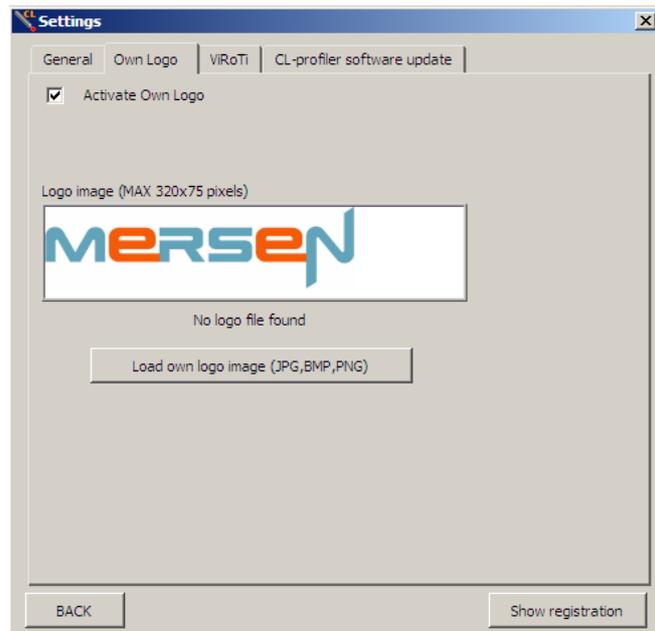
In here you have the possibility to personalize the software with your own logo.

This logo appears on the main menu and the reports.

Wink the box 'Activate Own Logo'

You can load your logo by clicking the 'Load own logo image (JPG,BMP,PNG)- button' and browsing for your image.

Make sure the image of your logo does not exceed the measurements: 320x75 pixels, in order to get a complete view of your image.

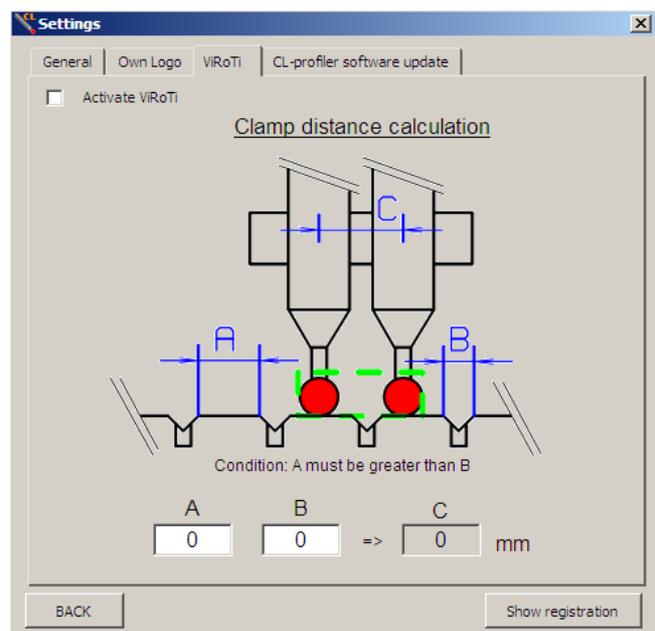


c - ViRoTi

ViRoTi stands for **V**irtual **R**oller **T**ip and is used to profile grooved slip rings and commutators. (Please check Chapter 7 on p.12 for more info)

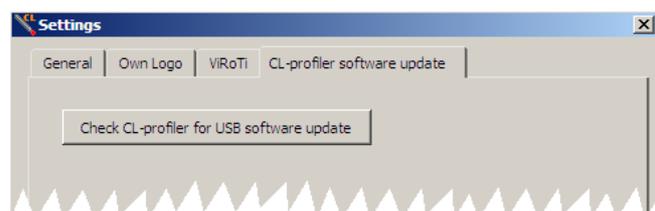
To use the ViRoTi tool, wink 'Activate ViRoTi'.

In field A (the measure part) & B (the wide of the groove including the chamfer) you can fill in the distances to let the software calculate the necessary distance for your clamp (C).



d - CL-profiler software update

To update the software of your probe(s), click the 'Check CL-profiler for USB software update'. If necessary the probe will then automatically update.



ATTENTION: do not disconnect the probe during updating, this could cause irreversible damage to the software remaining in a limbo state.

3) Linear measurement

Click on button (3) to open the linear measurement screen:



a - Slider

On the left side, the slider (1) indicates the current location of the sensor, in the centre or at the end of the range. The scale will become narrower when the middle point (zero) is approached. It is better to move the sensor close to the zero point since the sensor has lower noise around it.

b - Y-scale

There are several settings for setting the Y-scale (2). Select "Zero Startpoint" or "Sensor position" (is absolute value). "Zero Startpoint" will use the start point as zero value when recording starts. When recording stops, the y-scale will be adjusted so that the zero point is middle between maximum and minimum.

Auto scale will make the scale of the graph (16) fit to the running measurement. If auto scale is disabled, one can select the range of the Y-scale by means of the menu "Y-range".

c - Recording

The recording time (3) determines how long the signal will be recorded. A running measurement can always be interrupted with the "STOP" button (4).

To start or stop recording, click on the "START" or "STOP" buttons (4). When recording is busy, a red blinking indicator is shown on the bottom right hand side of the screen.

d - Save data

When a measurement is finished, it can be saved with the "Save" button (5). A new window will pop-up which allows you to enter some additional information about the measurement (machine name...). Also note that the scale information is saved together with the data. If one zooms in to a part of the graph (see further), that scale position is also saved.

e - Printing

For the linear measurement there are two reports available, the "Linear graph" (6) and the "Radial graph" (7). These reports can be printed or saved as JPEG files so that they can be included in your own reports. Make sure a printer is installed before attempting to print.

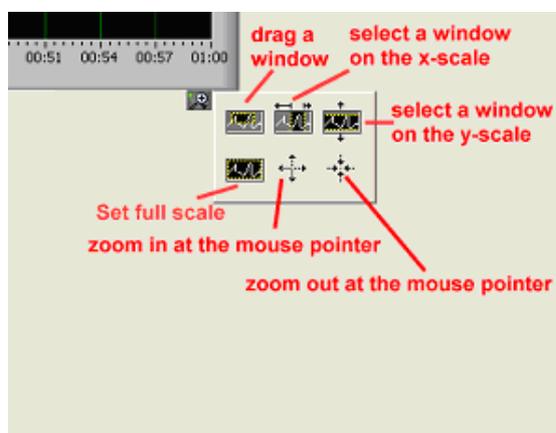
Measurements can also be transferred to a different computer with a USB stick.

Before printing, one can add additional information that belong to this measurement by clicking on "Insert report text" (8). This is the same text as in the pop-up window when saving the data.

f - Graph

The graph (16) shows the current measurement. It is possible to zoom in, on a part of the graph. This way one can, for example, take only that piece of the X-scale that contains useful data. For example, if two rotations of a device under test are recorded, you can zoom into a part so that you get the data of only 1 rotation. When printing, only the part in which you were interested will be printed.

The ZOOM tools are located above (10). Click on the magnifying glass to see new options appear:

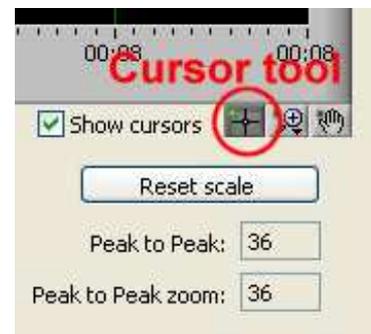


Click on button (17) "Reset scale" to reset the scale like it was before modification.

The peak to peak indicator (11) shows the difference between maximum and minimum of the whole curve. The "peak to peak zoom" indicator (12) shows the difference between maximum and minimum of the zoomed area (in the example it's the same).

g - Cursors

When activating the selection "Show cursors" (9), two cursor lines will appear on the screen: a blue (13) and a yellow (14) horizontal line. They are useful for determining the difference between 2 points. The number (15) at the yellow cursor shows the difference. For moving the cursor lines, first select the cursor tool in the zoom palette, then move the mouse over the blue or yellow cursor and click on to grab it. Then you can drag it up or down.



The cursors will also be shown on the reports.

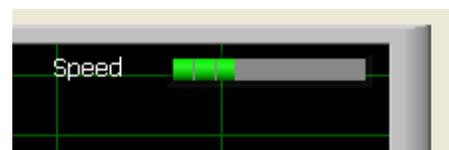
4) Bar to bar measurement

On the main screen click on button (4). A new window appears looking very similar to the previous paragraph **3) Linear measurement**. We will only explain the difference.

Instead of a recording time there is now a setting "number of bars" (1).



While recording, the software tries to detect the bars by the peaks that appear when the sensor jumps down between two successive bars. It is important that the speed of the rotor is not too high, to be able to measure these peaks and bar values correctly. Limit the rotating speed to a maximum of 30 bars per second. An indicator on the top of the graph will show the speed. It is green when the speed is OK, orange when it gets high, and red



when it's too high. If the speed is too high, it will be impossible to save the data because it is not reliable.

During recording, the graph shows the real time sensor value, which also includes the peaks between the bars.

Once recording is finished, the software will try to find the bars and show one value for each bar. The curve is then converted from a flowing line to a step-wise presentation, where each step represents a bar.

In the bar to bar measurement there are also 2 reports available, the Linear and Radial report. The bars can be represented in a circular plot (radial) or in linear fashion.

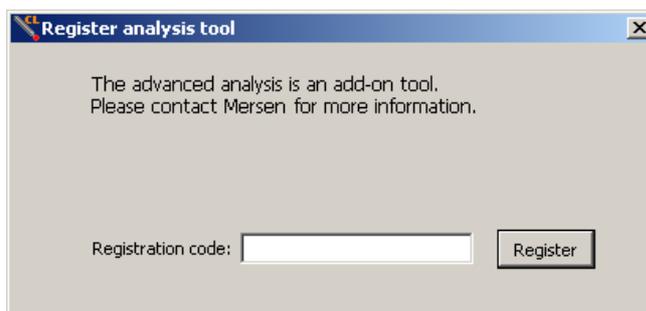
5) Open saved files

On the main screen, click on "Open measurement file" (5) to open data that was previously saved. When the data is shown, it is represented in the graph exactly as it was when it was saved. The whole graph is included in the data, also if one zoomed in, into a smaller part of the graph when it was saved.

The tools and reports are the same as in previous paragraphs.

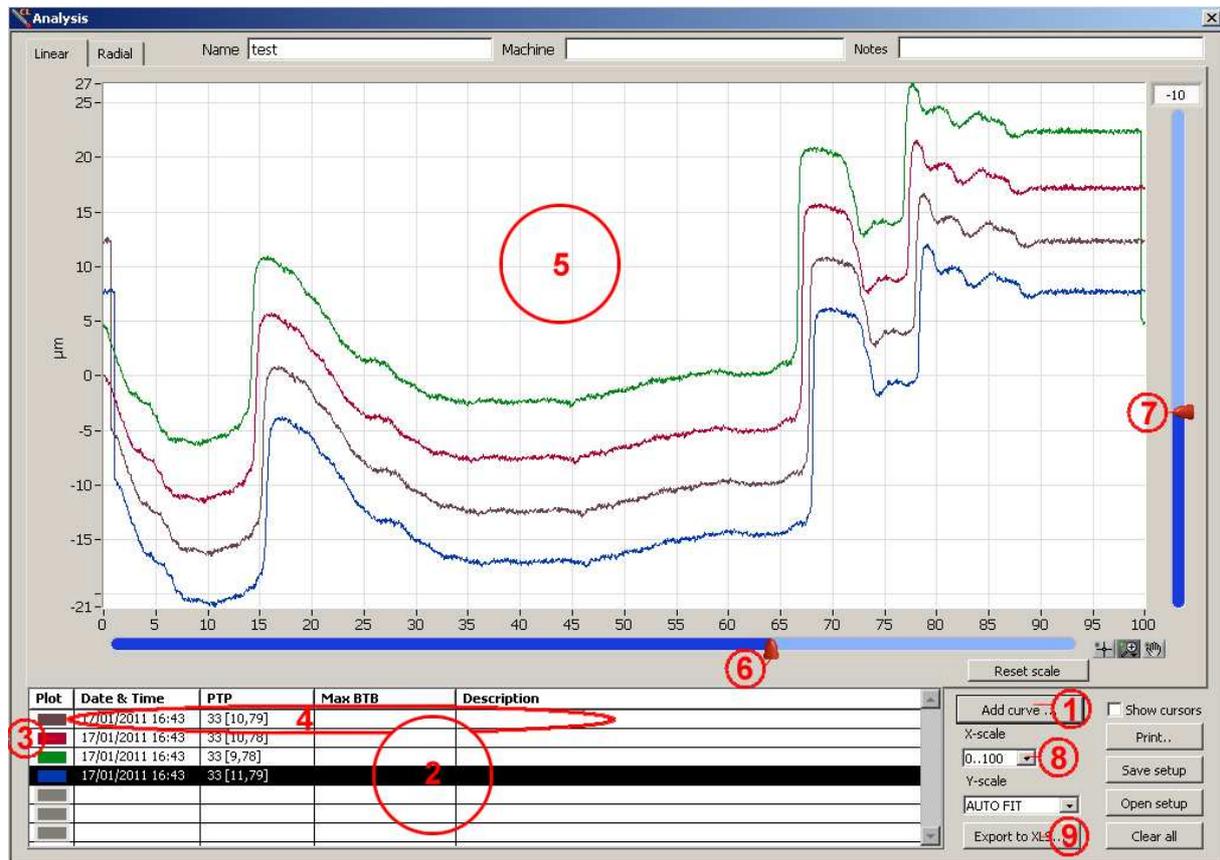
6) Measuring Analysing

Click on button (6) in the main screen to open the additional measuring analysing screen, a new window pops up:



Fill in your 'analysis registration code' and click "Register" to access this additional tool.

This tool contains extra add-on functions for analysing and comparing recorded curves.



a - Add Curves

Press 'Add curve' (1) to add new curves. They will appear in the small window on the left (2). You have the possibility to add up to a maximum of 10 curves.

You can change the color of your curve [click (3)] and change the description or remove the curve by double clicking on the curve's information zone (4).

b - Curve's position

You can change the curve's position in window (5) by selecting the specific curve in window (2) [click to select], and then adjust the sliders (6) and (7). This way we can, for example, compare a previous measurement with a more recent one at the same starting point.

d - X-Scale

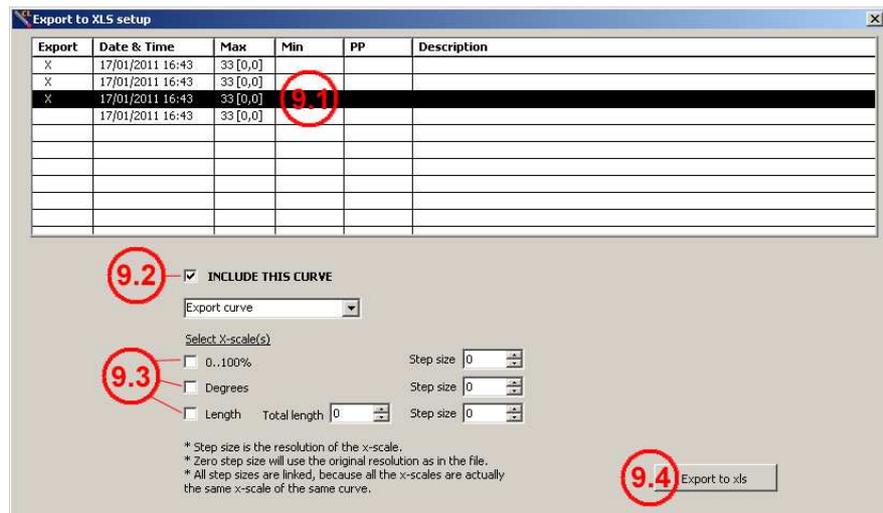
The X-scale (8) can be adjusted to view in percent, bars, length and degrees

e - Export to Excel

Another additional feature in the 'measuring analyzing' function is exporting your measurements to an excel-file. This can be obtained by clicking the 'Export to XLS..' -button (9).

A window pops up "Export to XLS setup" in which you can select the curves you'd like to export to Excel.

Select a curve (9.1) and wink the "Include this Curve"-box (9.2) to export the relevant curve.



"Select X-scale" (9.3), gives you the option to export you're curve(s) in percent and/or degrees and/or length.

Once exported to xls (9.4), you can create an automatic Excel format to calculate the different measurements in your curve(s). This way you can systematically judge your curve(s) state.

f - Other buttons

The remaining buttons have similar function as explained in chapter: **(IV)**

7) ViRoTi tool

ViRoTi stands for **V**irtual **R**oller **T**ip and is used to profile grooved slip rings and grooved commutators.

To use this tool you need:

- two free USB ports on your computer
- two CL-profiler probes or one CL-profiler and one ViRoTi probe.

This function can only work on condition that the measure part "A" is wider than the wide of the groove "B", including the chamfers

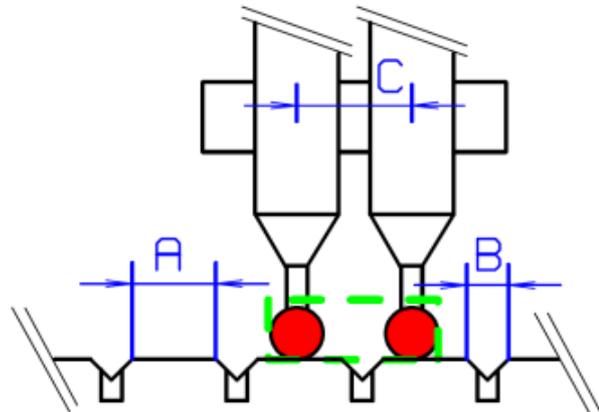
Note: Before using this tool you need to update the probe software. See chapter: **(IV,2) d - CL-profiler software update**

a – How to use

Place the probes radial, with an axial distance "C", on your slip ring or your collector.

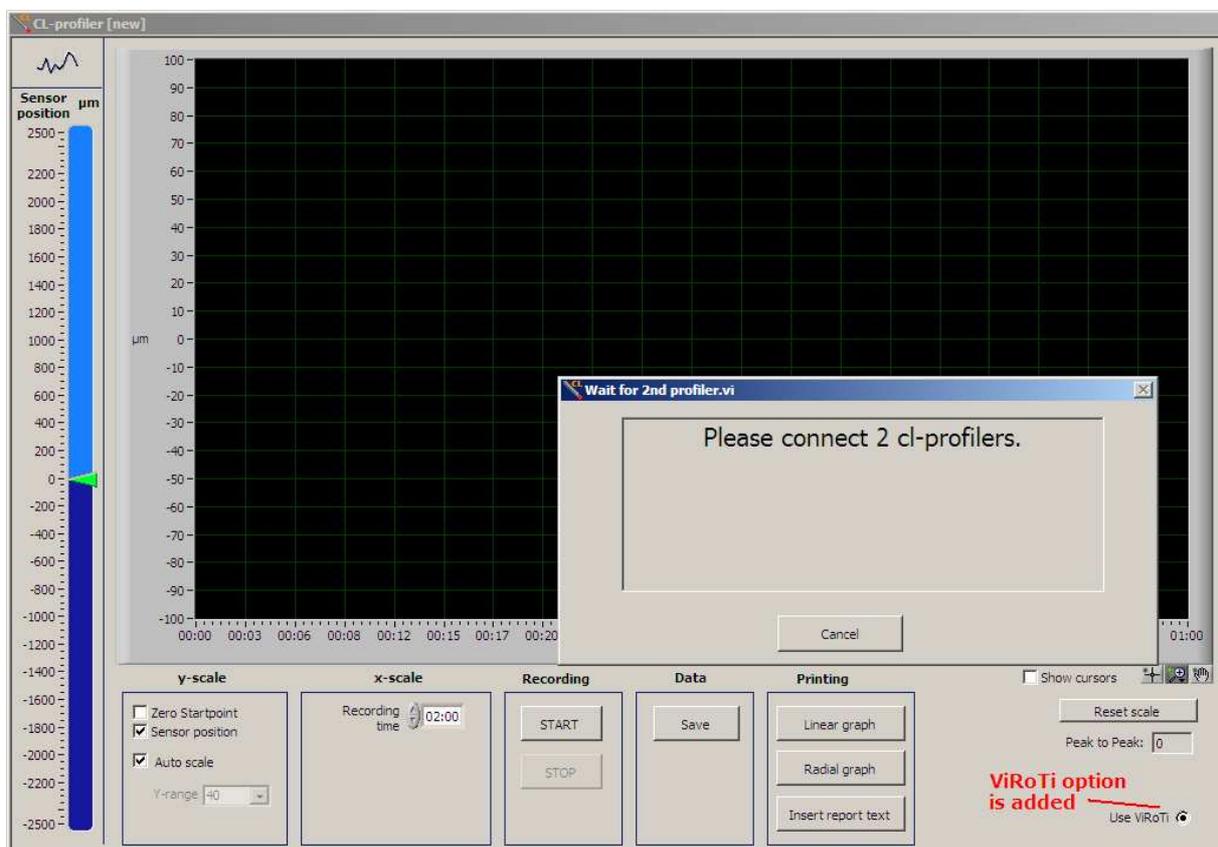
To start the profiling both probes must be located on your measure part of the slip ring or collector, and not in the groove.

Distance "C" depends on the wide of the measure part (A) and the groove (B). The probe distance "C" can be calculated using the ViRoTi calculator in the "Settings menu". See chapter (IV,2) c - ViRoTi



Connect only the registered probe on your PC and start the CL-profiler software.

Activate the ViRoTi tool by winking the box 'Activate ViRoTi' in the "Settings". A ViRoTi activation option will now be added in your measurement window. If you activate the ViRoTi tool in your measure window, the software will ask you to connect the second probe on your PC.



After connecting the second probe on your PC you will see two needles (red and green) in your measure window.

You can adjust the radial position of each probe separately, but it is not necessary that both probes are exact identical. You can simply activate "zero startpoint" before you start the profiling. The software will then place both probes on the same level independent of the physical position of the Ruby tip positions.

Please note for wide grooves or/and mica slots that you use the 8mm ruby tips on both probes.

V) Maintenance

Make sure the cable to the sensor and USB port is not damaged. Clean sensor when necessary.

It is recommended that the sensor is calibrated every two years.

VI) Warranty

The warranty covers construction and material faults of the CL-profiler equipment.

The warranty period is valuable for 1 year starting on the invoice date. Damage due to incorrect or inexpert handling is excluded from the warranty.

The CL-profiler probe must be placed as radial as possible especially on commutators. Angled probe position, can cause to damage.

The ballpoint tip diameter must be:

- for mica slots: approximately 4 times larger then the full width of the mica slot including the chamfers.
- for spiral grooves: approximately 3 times larger then the full width of the groove including the chamfers.

VII) Technical data

- Interface: USB
- Dimensions: 8 mm diameter
- Weight: 0,1 Kg
- Max operating temperature: 40°C
- Max Storage temperature: 50°C
- Measurement range: +/-2,5mm
- Max. variation speed to be measured: 120/40Hz
- Sample rate: 250Hz
- Typical noise level: 0,5 µm
- Accuracy repetitive: +/- 0,25 µm
- Accuracy relative: +/- 1 µm
- Accuracy absolute by 20°C: +/- 2 µm

VIII) Contact information

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