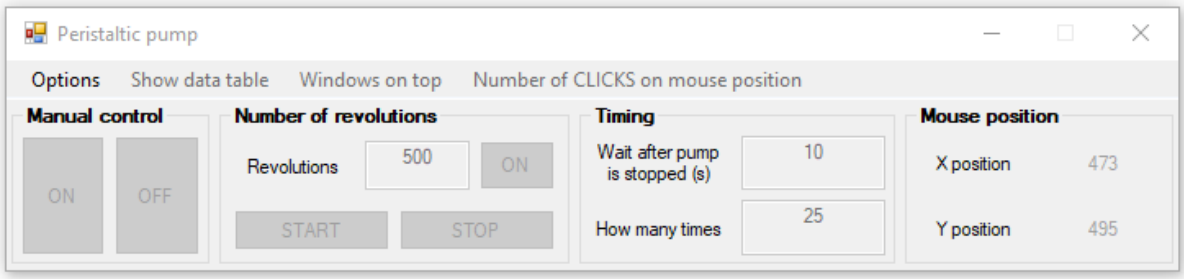
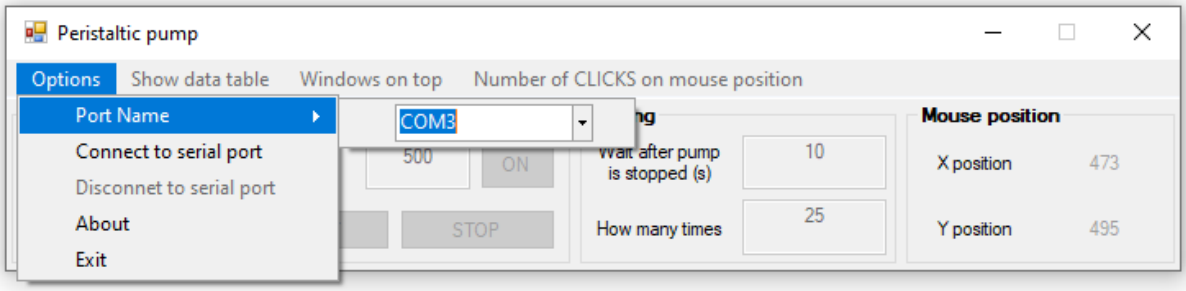
Instruction Manual

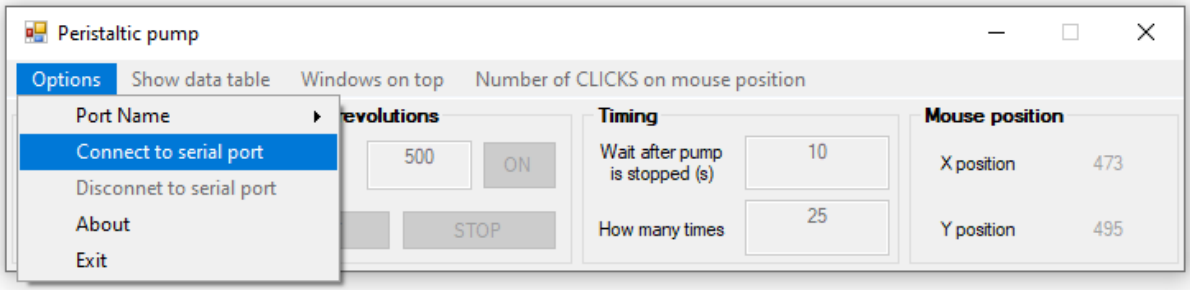
(1) After starting the application, the main working window will be displayed. The only menu item button that can be clicked on is **Options**.

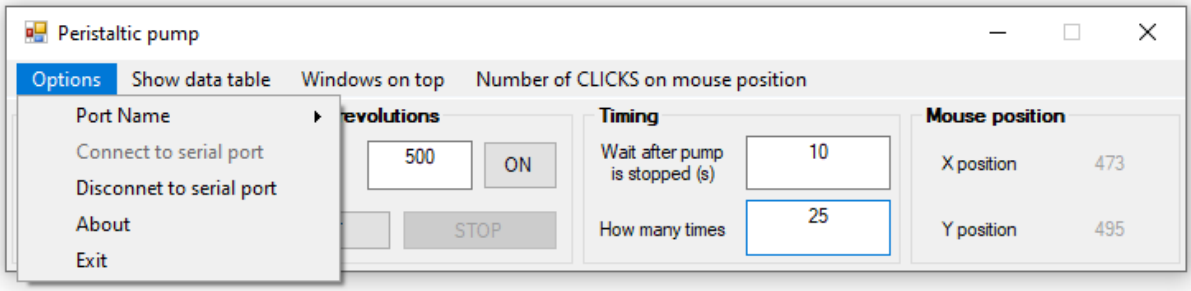


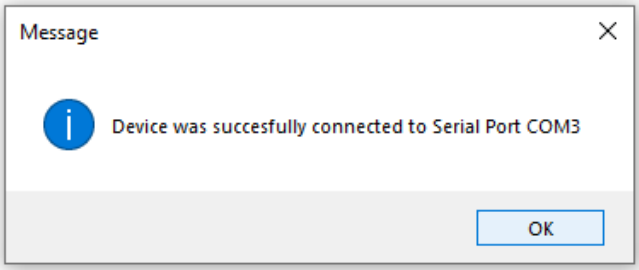
(2) Into the text box, the name of COM port, which is connected with Arduino is pasted, here it is COM3. The unknown COM port name can be found in the Windows Device Manager. The entered value is saved in the memory after the first entry. The same value appears after reopening the application in all data text boxes.



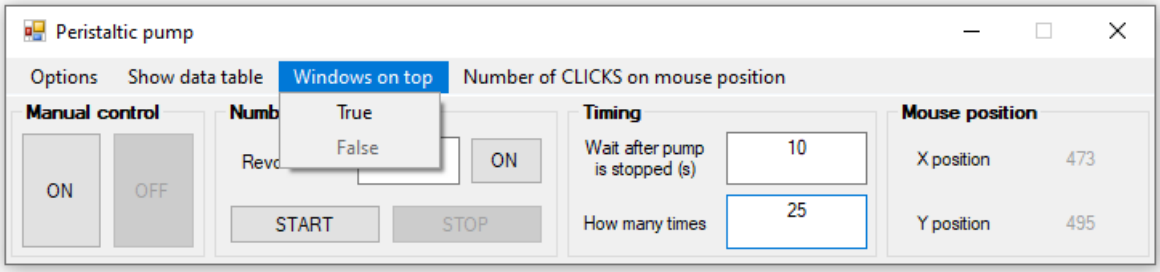
(3) When connected to an existing serial port, the other available buttons and text boxes are activated. The message box informs about the successful connection to the selected serial port.



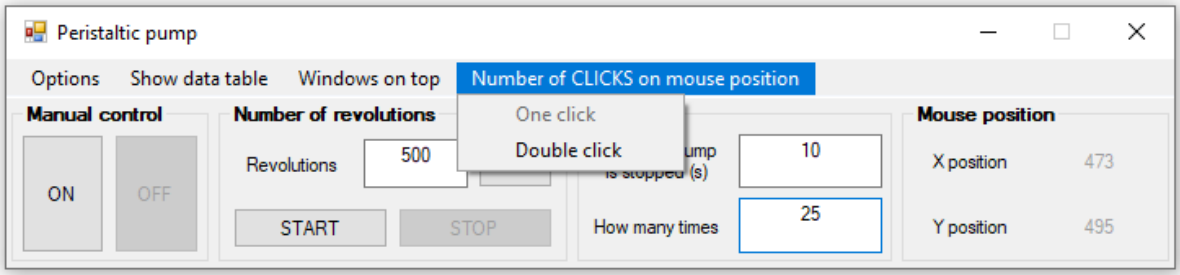




(4) With the menu item, **Windows on top** can be set the forced keep the main working window on top. After the mouse is clicked out of the main window, it will not hide in the background. A false value is set as default.



(5) With the menu item, the **Number of CLICKS on mouse position** can be set how many times will simulate the click on the mouse defined position. One-click is set as default.



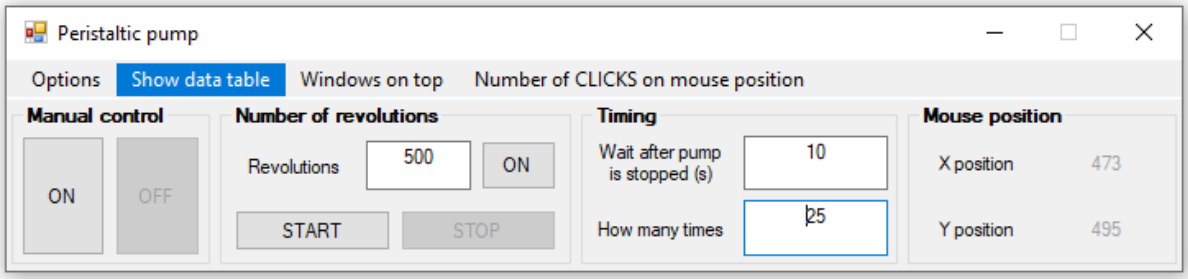
The simulated mouse clicks trigger the individual spectrophotometric measurements. The mouse position (values in the **Mouse position** group box) can be saved/changed with Ctrl+Shift+S shortcuts positioning the mouse arrow wherever on the screen. The mouse position values can be saved/changed only if the main window is activated. The mouse position should be set on the button of spectrometer software that controls the single spectra acquisitions.

(6) With the ON/OFF buttons in the **Manual control** group box, can be arbitrarily turn on and turn off the peristaltic pump. That is usually used to rewash the peristaltic pump tubes.

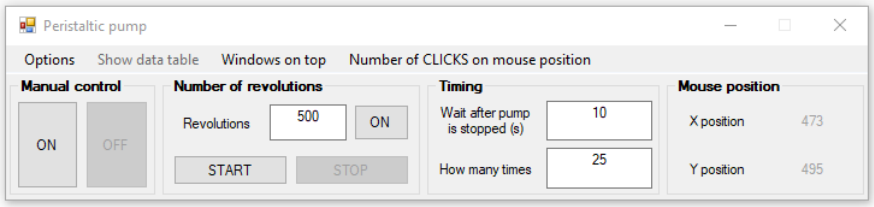
(7) With the ON button in the **Number of revolutions** group box, can be performed a defined number of revolutions of the peristaltic pump. In the text box should not be entered the value lower than 500.

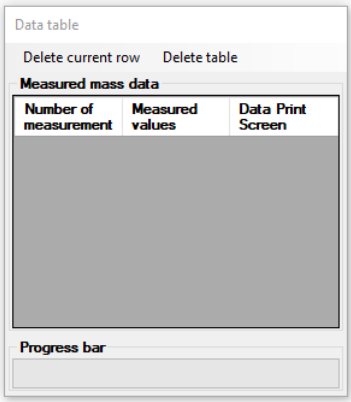
(8) With text boxes in the **Timing** group box, the repetitions and time delay between them can be set up for the automated mode measurements.

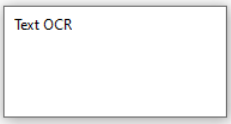
(9) With the START/STOP buttons in the **Number of revolutions** group box, can be arbitrarily turn on and turn off the automated mode of repeated additions of reagents into monitored solution.



That is possible only after the Data table window was opened from the main menu with the button **Show data table**. After the button was pressed, two windows will appear. The smaller window is transparent. Into the bigger one are collected the data from the single pH measurements. The third column contains the print screen under the smaller window, which is analyzed with the Optical Character Recognition package and the found value is showed in the second column in text format. The single rows or the full table content can be deleted with buttons in the bigger window. The content of the table can be copied and saved into an Excel file with Ctrl+A, Ctrl+C, and Ctrl+V shortcuts.







The smaller window should be positioned on the pH value displayed by the pH meter, which is recorded by any kind of USB or web camera like it is showed in video documentation https://github.com/JanToth/Optical-Immersion-Probe-Automation.

(10) If a defined volume of reagent that is added into monitored reaction mixtures is required, the peristaltic pump can be calibrated. The calibration is done by weighing the mass of the distilled water pumped at a various number of revolutions. The calculated

volume of water through water density at defined temperature gives a straight line with R^2 practically equal to 1 like it is showed in the figure below. Here the smallest added volume in one step (500 revolutions) is equal to 40.3 µL.