

# MR Editor

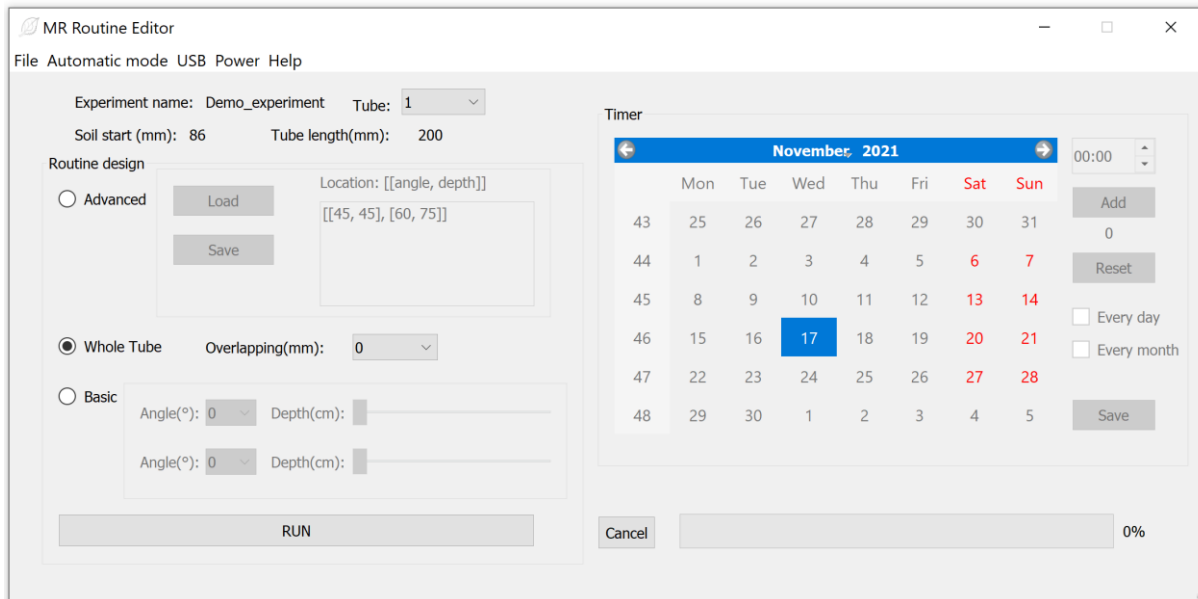
## Table of Contents

Introduction.....	2
Photos / image data .....	2
File tab .....	3
Open .....	3
New .....	4
Quit.....	5
Routines.....	5
Whole Tube .....	6
Basic.....	6
Advanced .....	7
Run and Cancel buttons .....	8
Automatic mode.....	9
Add and Reset .....	9
Every day and every month.....	10
Save .....	12
USB tab .....	12
Power tab .....	13
Help tab .....	13
Updates from the last version .....	14
Angles option for Whole Tube Routine.....	14
LED tab.....	15



## Introduction

MR Editor is the application that allows to control the automatic MiniRhizotron (MR) device. It is possible to design experiments, program and run routines directly or by scheduling them. It also allows to eject the USB driver which stores the images in the *Imagedir* directory. Finally, the MR device can be switched off from the MR editor.



## Photos / image data

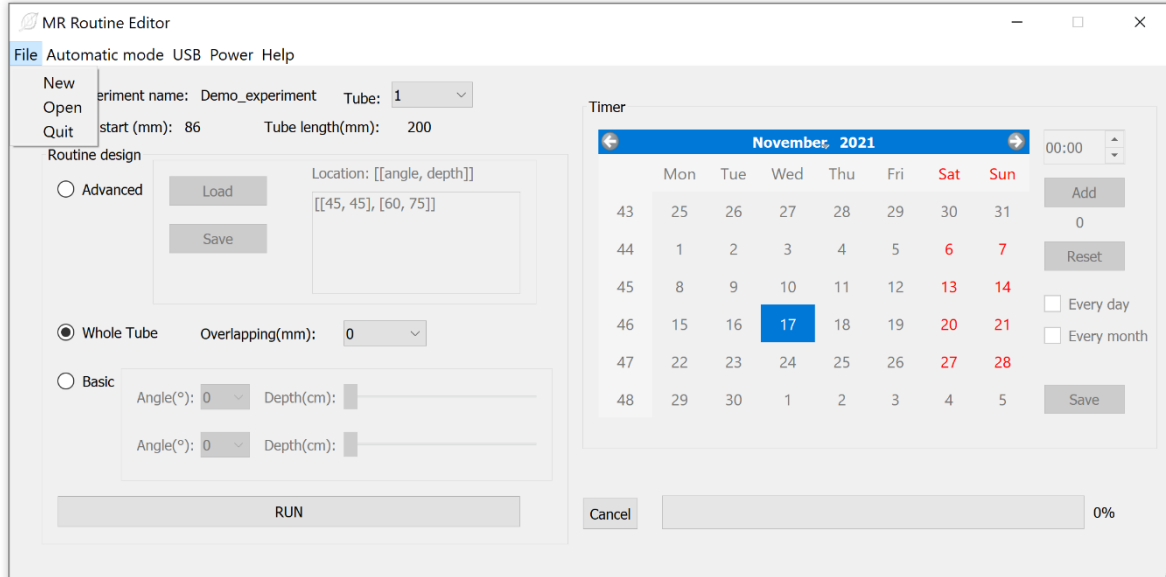
Every different time and session creates its own directory where the photos are stored. However, all directories appear in *Imagedir* directory on the USB stick memory.

Naming of the photos, example:

**GO\_T001\_L023\_02.08.2021\_223015\_002\_A160.jpg**

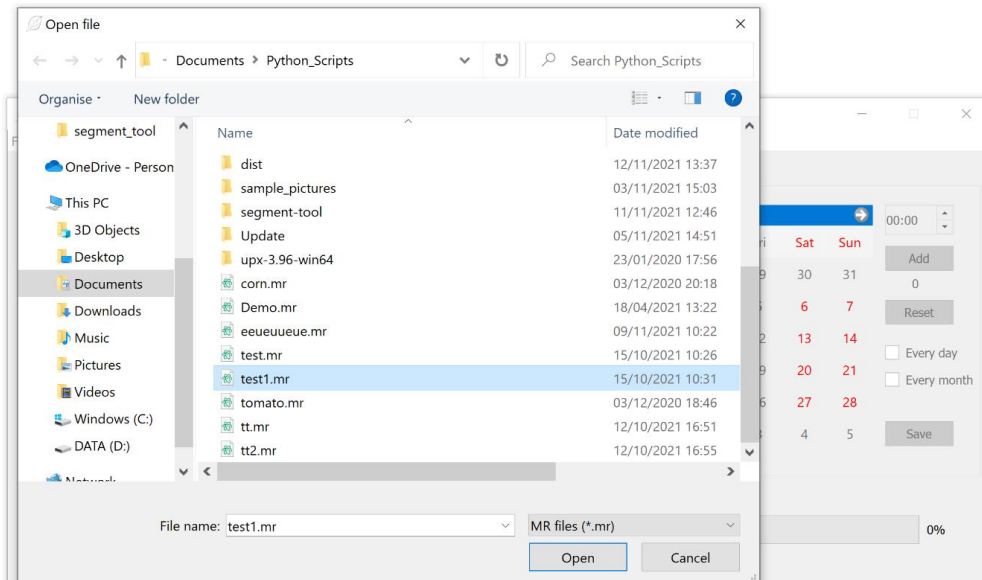
*Experimentname\_Tube\_Location\_Date\_Time\_Session\_Angle.jpg*

## File tab



## Open

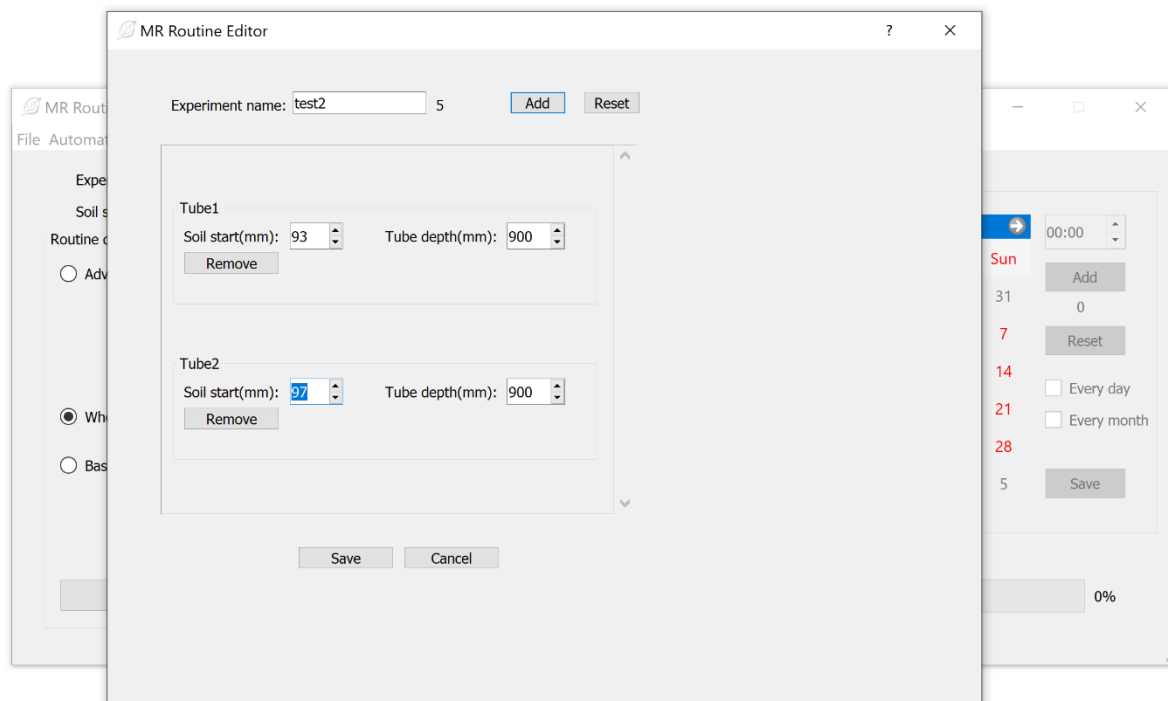
It opens saved experiments, which can be loaded on the Editor. Select the directory *MR Editor* where the experiments are stored and press open to load the experiment. The experiments are stored in *.mr* format.



## New

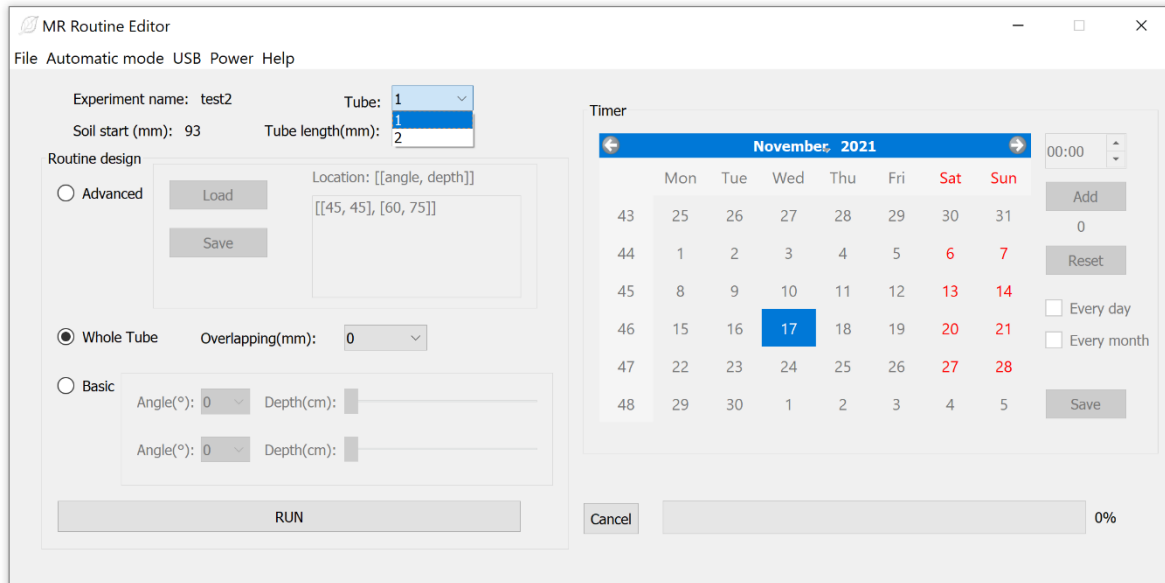
**New** tab allows to create a new experiment, define the name and by pressing add it will add the tubes. Soil start indicates where the camera should start to take photos, by default 90mm. The Tube depth is the maximum depth that you want the camera to go. Each tube usually starts from 90 mm and the maximum length is 900.

**TIP:** set allways the maximum depth for 1m tube. Setting shorter depths can be useful when the roots are only on top part of the soil!



With **Remove** button it is possible to remove the tube and with **Reset**, to remove all the tubes.

After pressing **Save**, it will save the experiment in the *MR Editor* directory and load automatically the experiment in the MR Editor. We saved two tubes, which are available for loading from the MR Editor. It directly reads the name, tube, starting of the soil and the maximum tube length.



## Quit

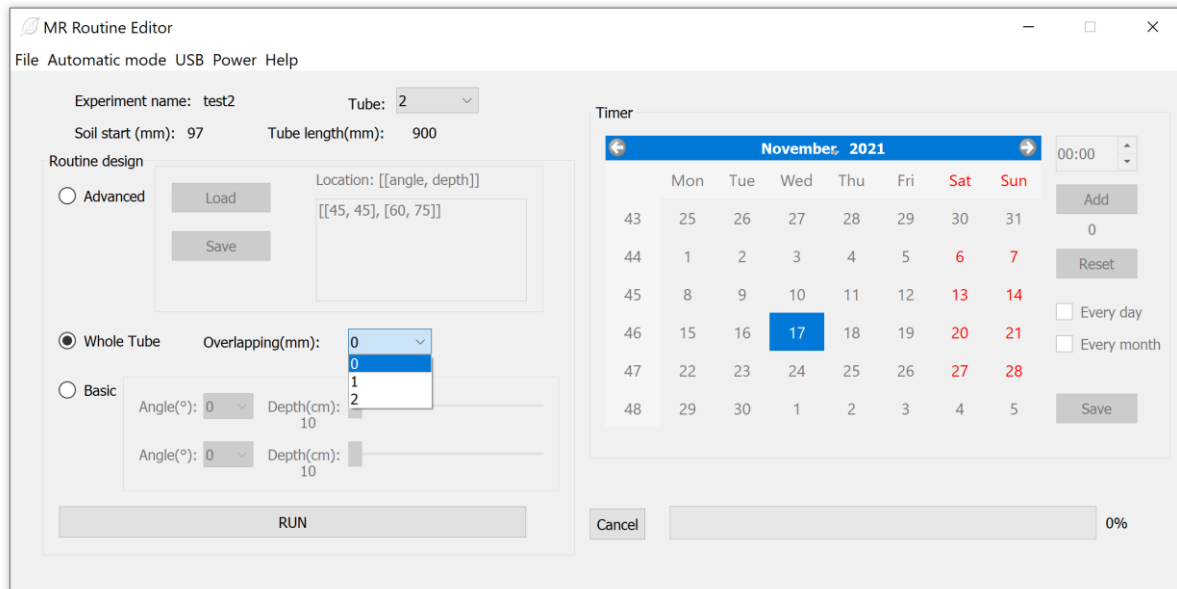
This tab just quit the MR Editor; it has the same function as **X** button on top right corner.

## Routines

There are only three types of routines: whole tube, basic, and advanced. The **Run** button allows to run the selected routines.



## Whole Tube



Takes the pictures from starting soil position down to the maximum depth indicated, and full 360° degrees. However, by default it subtracts 9.5 cm from the maximum depth, to avoid collision with the bottom plug!

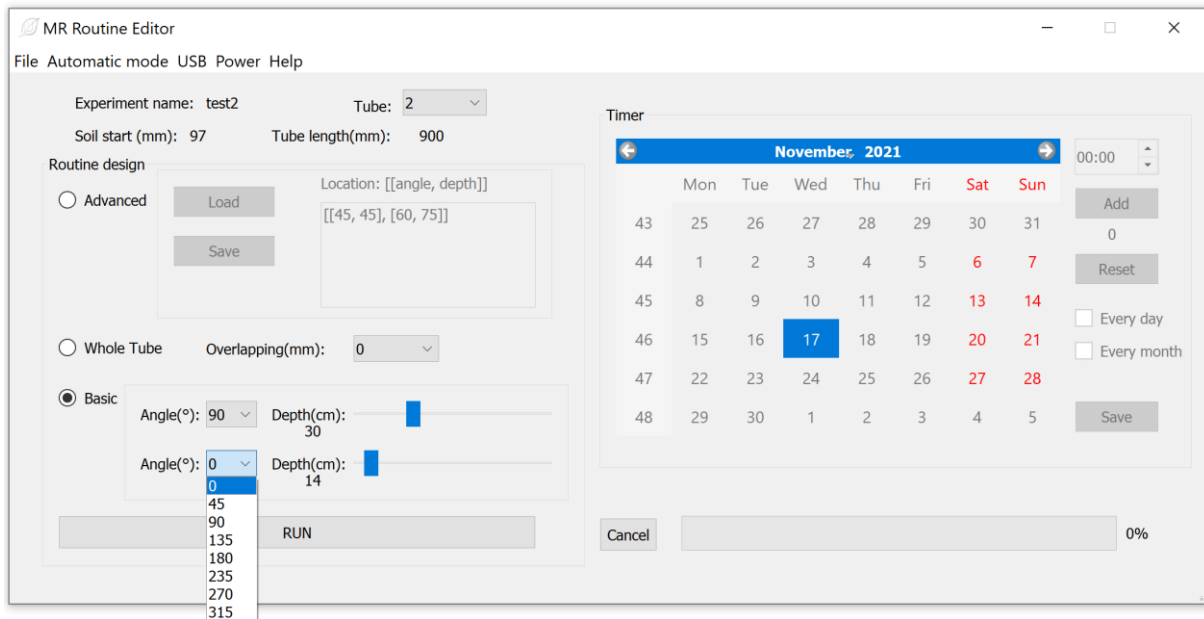
Overlapping or depth-overlapping allows to take images which will share 0, 1 or 2 mm up-down overlapping. However, there is still a small overlap in the centre of the image even with 0 overlap, because the image is convex inside the tube!

A new version has additionally number of angles selection for side-overlapping.

## Basic

Two sides routine allows to program sequential imaging from two sides which can be codified by angle and depth.

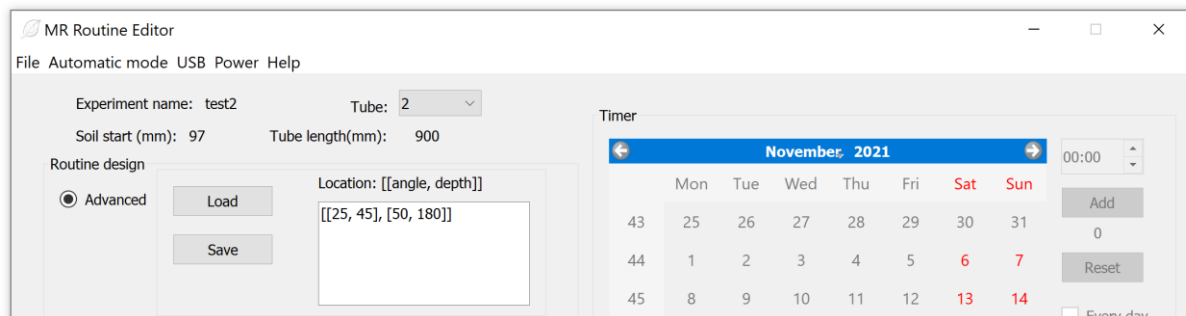




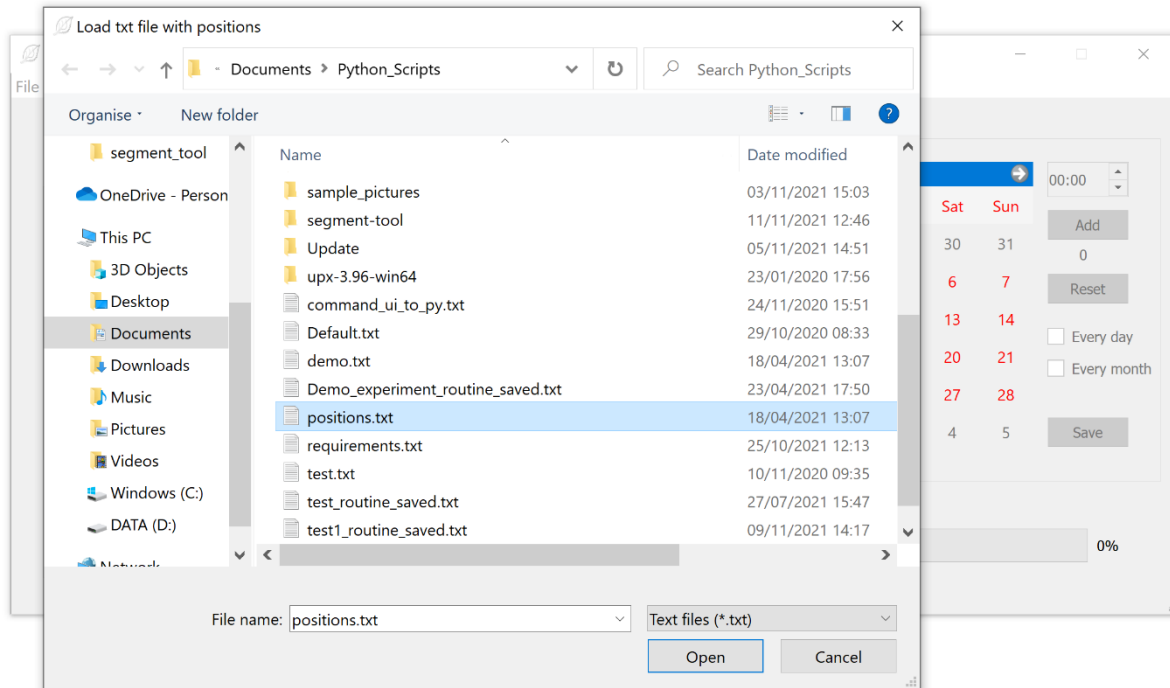
It is possible to select two angles in **degree (°)** units and two depths in **cm** units. Then the camera will take photos on those angles and through selected depths, starting allways from *Soil start*.

### Advanced

A more advanced option for the routine requires to know well which exact position or positions are interesting for taking photos. You can write in the text box the position or positions you want the camera to go. It is mandatory to keep the brackets [ ] and comas. The angle is specified as **degree(°)** and the depth is in **cm**.



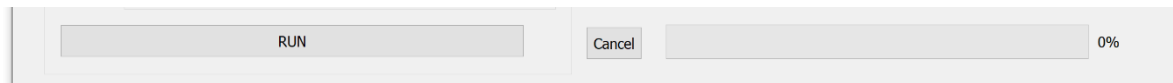
It is also possible to load and save the positions into .txt files, which can be stored anywhere.



In **Advanced** mode there is no automatic protection against collision with the bottom plug; be careful when using this mode, to not go too deep!

## Run and Cancel buttons

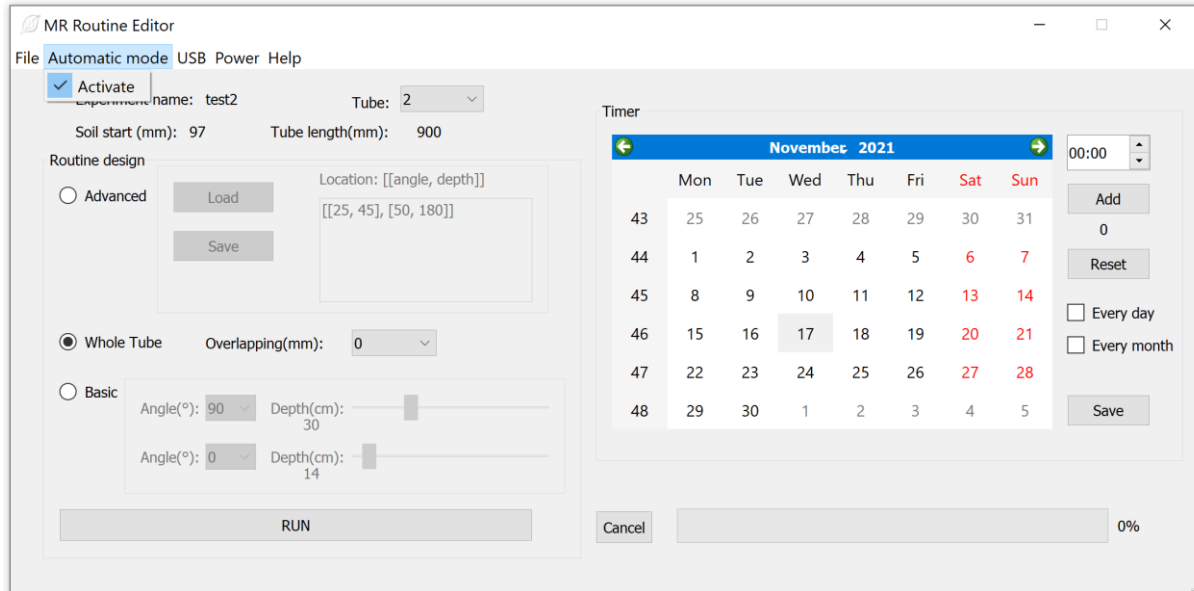
**Run** button runs the routine selected and **Cancel** allows to cancel that running. When running, the progression bar, will be loading and indicating the estimated time and percentage done. The percentage is more accurate than time!



When running the blue light (top LED) will be on, which will indicate the running of the routine. When cancel the red light will be on.



## Automatic mode



Once activated the automatic mode, it will finally be possible to use the **Timer** and schedule your routine, to run it automatically at selected dates.

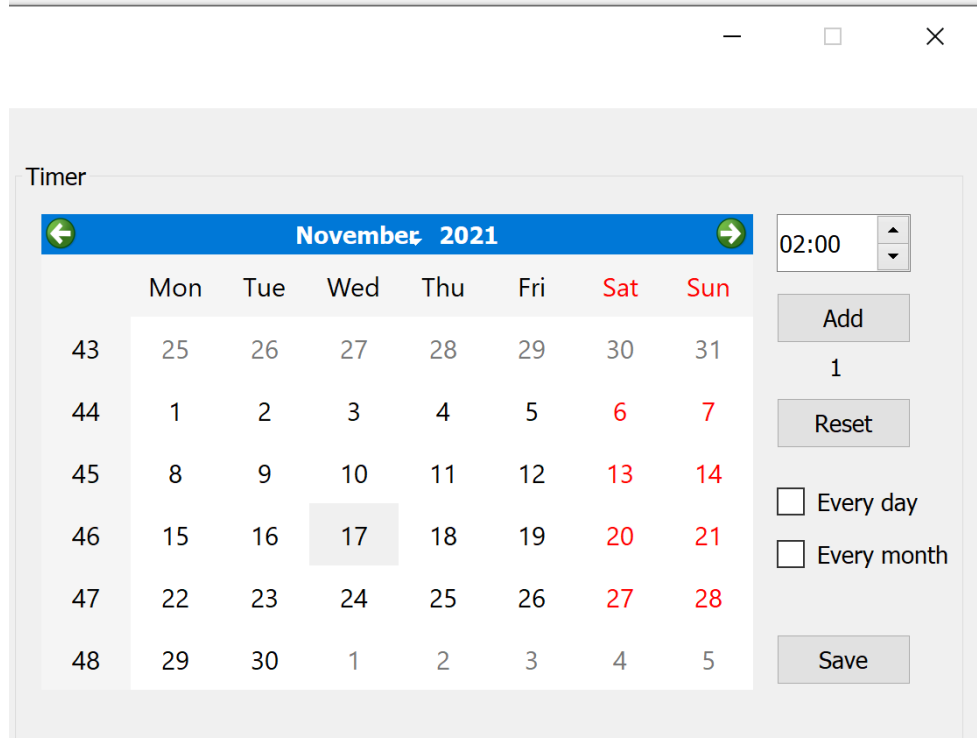
### Add and Reset

By pressing in the calendar, you can choose the dates for your routine, you can combine routines with different dates though.

The time box allows to put an exact time in hour and minutes. The **Add** button allows to add times and dates to the schedule, the number below indicates how many are already stored in the application.



With Reset button it is possible to clean all dates and times stored and begin again.



The screenshot shows a software window titled "Timer" with a calendar for November 2021. The calendar has columns for days of the week (Mon to Sun) and rows for dates. The date 17th is highlighted. To the right of the calendar is a configuration panel with a time input field set to "02:00", an "Add" button, a counter showing "1", a "Reset" button, two checkboxes for "Every day" and "Every month", and a "Save" button.

### Every day and every month

You can only choose one either Every day or Every month, which will repeat the same timings the same day of the month, in this case 17, so it each 17<sup>th</sup> of the month it will do those 4 programmed routines. Combination of different dates and times during the month are possible!



Timer

← November 2021 →

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
43	25	26	27	28	29	30	31
44	1	2	3	4	5	6	7
45	8	9	10	11	12	13	14
46	15	16	17	18	19	20	21
47	22	23	24	25	26	27	28
48	29	30	1	2	3	4	5

02:00

Add

4

Reset

Every day

Every month

Save

Timer

← November 2021 →

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
43	25	26	27	28	29	30	31
44	1	2	3	4	5	6	7
45	8	9	10	11	12	13	14
46	15	16	17	18	19	20	21
47	22	23	24	25	26	27	28
48	29	30	1	2	3	4	5

02:00

Add

4

Reset

Every day

Every month

Save



## Save

Saves the routine and scheduled time for it. It will perform the routine automatically when the time is indicating **every year by default**. To schedule a new routine, just program a new one and save it again, the new schedule will overwrite on the old one. So, it is not possible to program two different routines in the same time, because it will overwrite the last saved!

It also creates a text file `..._routine_saved.txt`, where you can check the parameters and the timing that you saved. This file appears in the directory *MR Editor*.

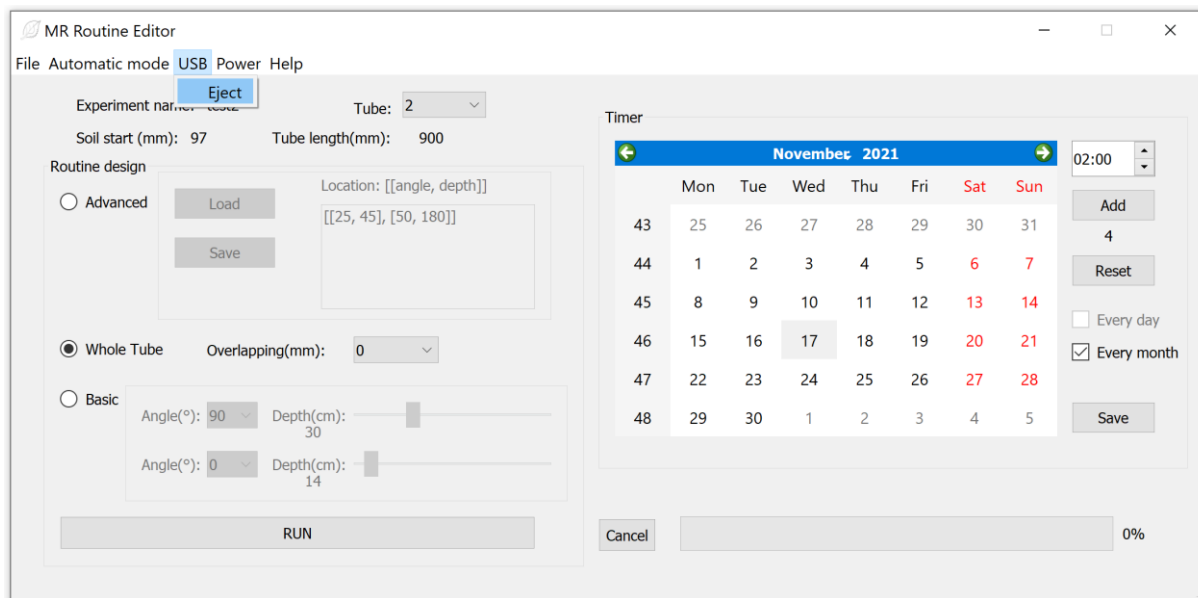
TIP1: in case you forgot the routines and times you programmed you can check `..._routine_saved.txt` file.

TIP2: do not save times/dates/routines one by one, but use **Add** and add all times/dates and routines needed for your project; then **Save** it, once you finished. The programmes are overwritten, new savings remove the old ones, that is why everything should be defined before saving!

## USB tab

This tab allows to eject the USB memory safely from the MiniRhizotron. To correctly eject the USB driver, the camera should not perform any routine, and stay in the initial position, it is indicated by the camera itself by green light on top.

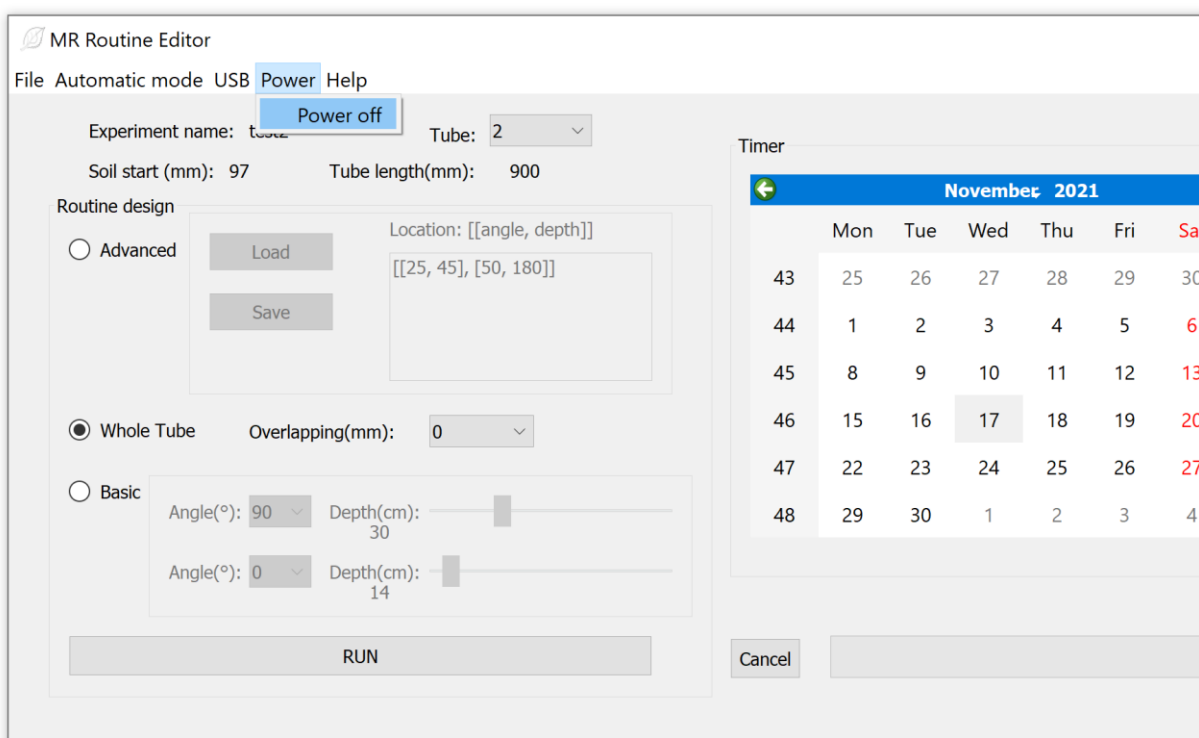
After pressing the tab **Eject**, wait the pop-up window that indicates that it is ejected.



TIP3: It is a good habit to copy the images from the USB driver as soon as you can, and delete the old directories and photos from *Imagedir* directory, but never delete the *Imagedir* itself!

## Power tab

Pressing the **Power off** tab, the MR will take some seconds to switch off, a window with the message will appear to indicate the switching off. But only when the top LED is off, the MR will be completely off. So, wait till LED is off!



The camera cannot be power on from MR Editor, you should use magnet and put it to the sticker, until you see top green light! It takes around one-two minutes to initiate and connect to access point from the MR.

## Help tab

By pressing it, it will show basic help to remind the use of the MR Editor and the signals of the camera and correct interpretation. Additionally, to the commands, there are light indications, on the top of the MR:





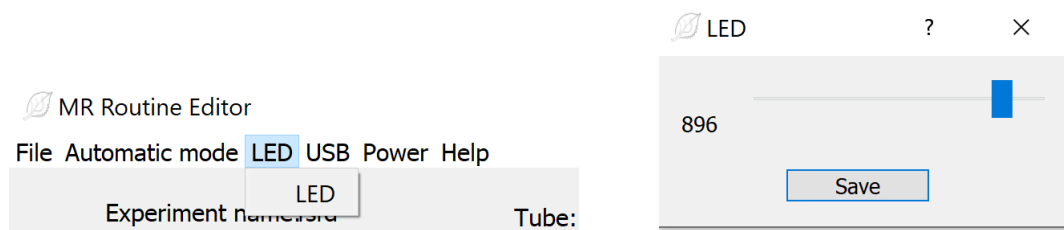
**Vienna Scientific Instruments GmbH**  
Heiligenkreuzer Strasse 466, 2534 Alland, Austria

E-mail: office@vienna-scientific.at  
Office: +43 650 69 74 672



### LED tab

Controls the LED light intensity, for the photo. 100 is the minimum and 1000 is the maximum.



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**Vienna Scientific Instruments GmbH**, CEO Mr. Liaqat Seehra  
Registry/FN: 472331f (Landesgericht Wiener Neustadt)  
VATIN/UID: ATU72346918  
EORI: ATEOS1000083836

Bank: Volksbank Wien AG  
IBAN: AT 77 4300 0423 0001 4000  
BIC: VBOEATWW

