

LOLLY SOFTWARE

HANDBOOK



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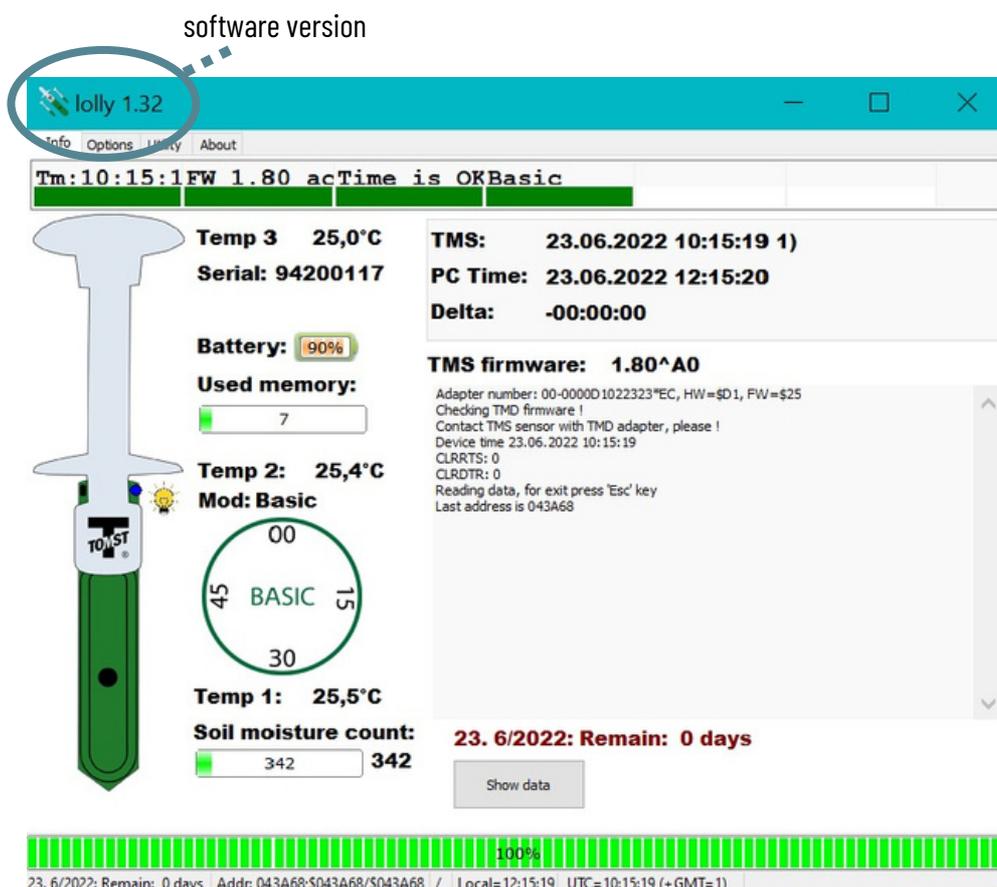
Installation

1. Connect the TMD adapter via the USB port of your computer.
2. Download the Lolly Software and the program will automatically guide you through the installation.
3. Attach the sensor to the adapter. At that point, the basic information about the current condition and settings of the sensor will be displayed in the "Info" window.

The current version can be found at:

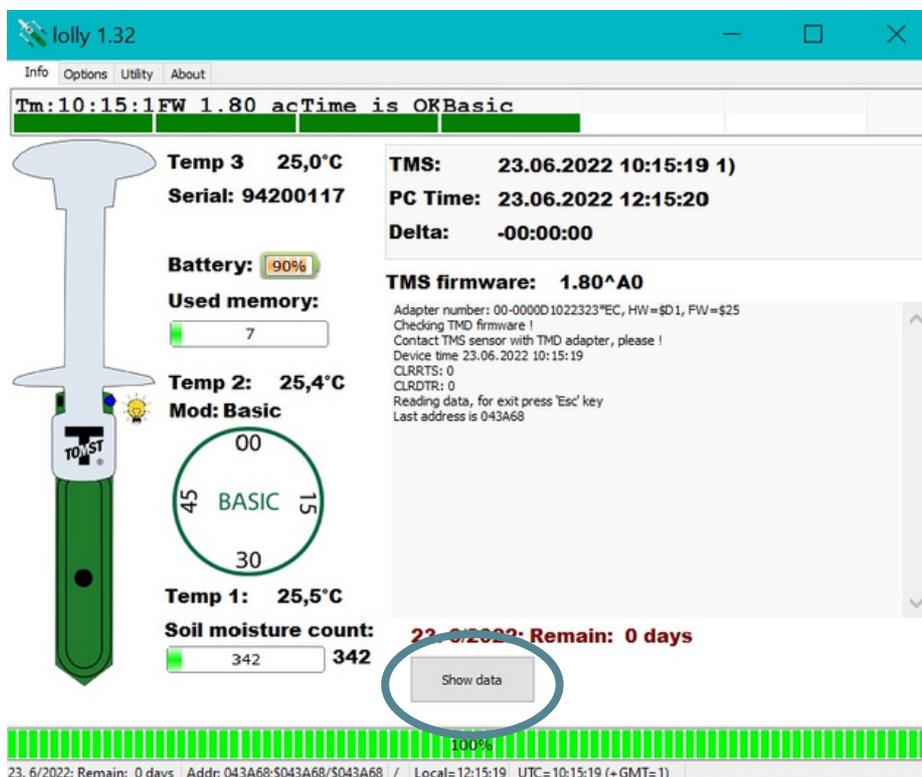
<http://tomst.com/web/en/systems/tms/software/>

The software is constantly being altered and improved. Therefore, please make sure to update the program before reading out your data.

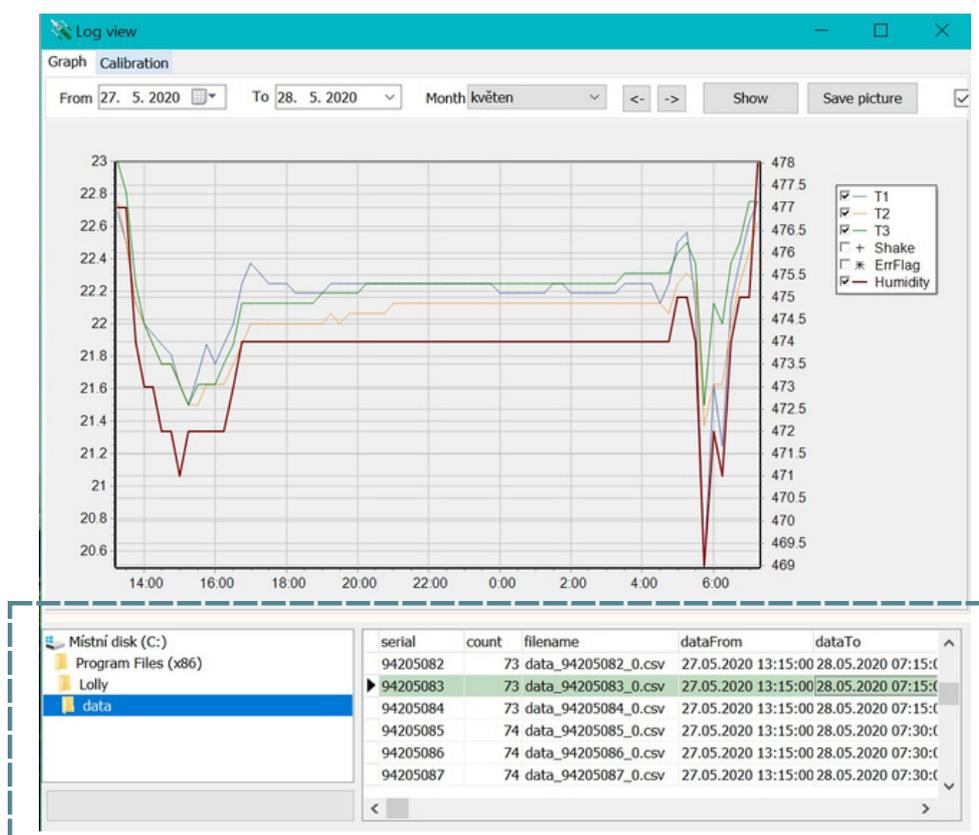


Show data

If you wish to browse through data that has already been downloaded to your computer, select *Show data*.

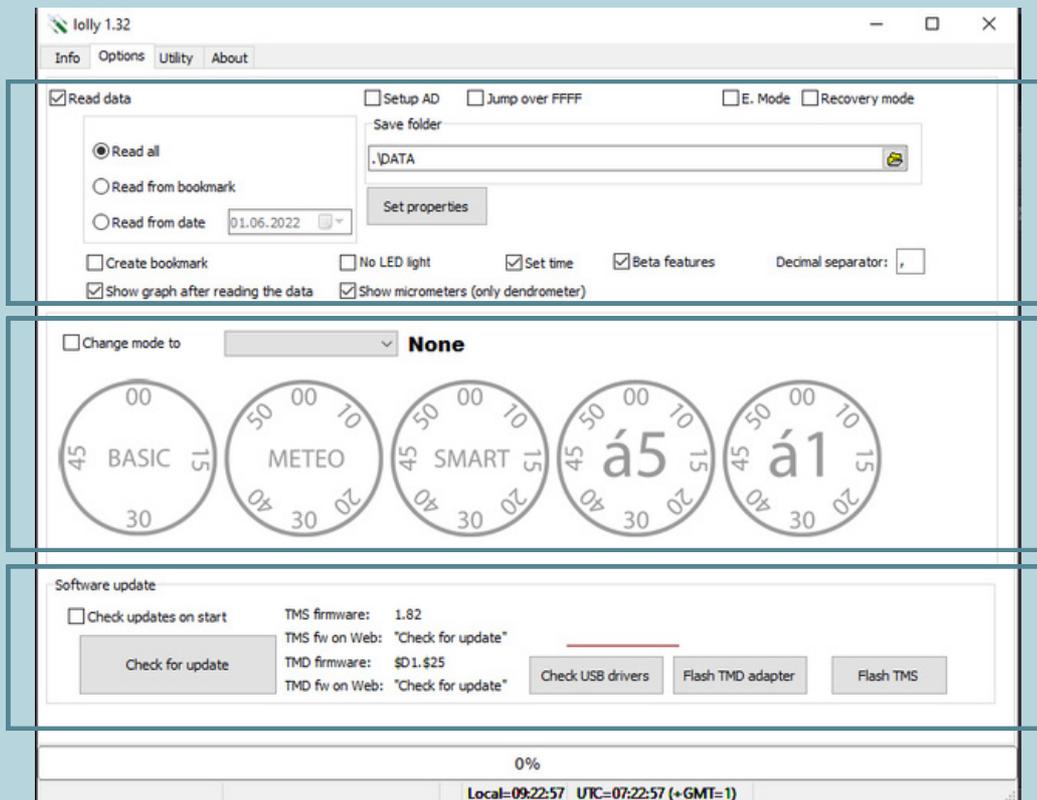


You can then choose the folder and file you wish to display.



OPTIONS

In the second window *Options* you can manage the settings of both the software and the device.



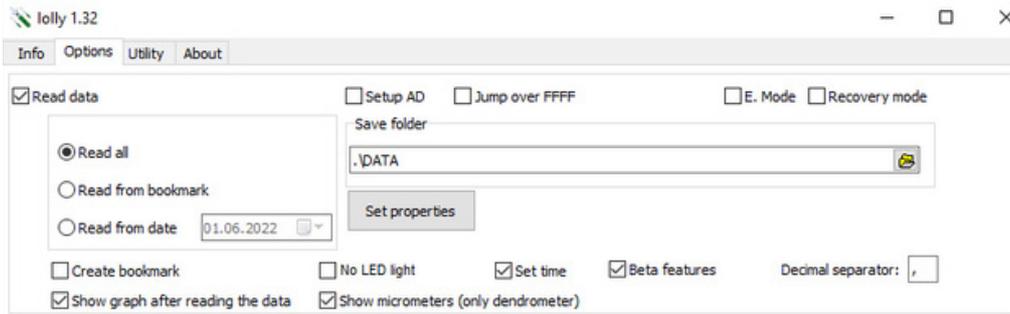
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Section 1



Read data

By ticking this box, you can choose to automatically begin downloading data after attaching the device to the TMD adapter.

Setup AD

Dendrometers ONLY. See relevant section (pg. 14).

Jump over FFFF

E.mode

Recovery mode

These can be used when issues with data downloading occur. They usually result in longer downloading times though so for the most part, these should be left un-ticked.

Read all

select to read out all the data

Read from bookmark

select to read from bookmark (see *Create bookmark* below)

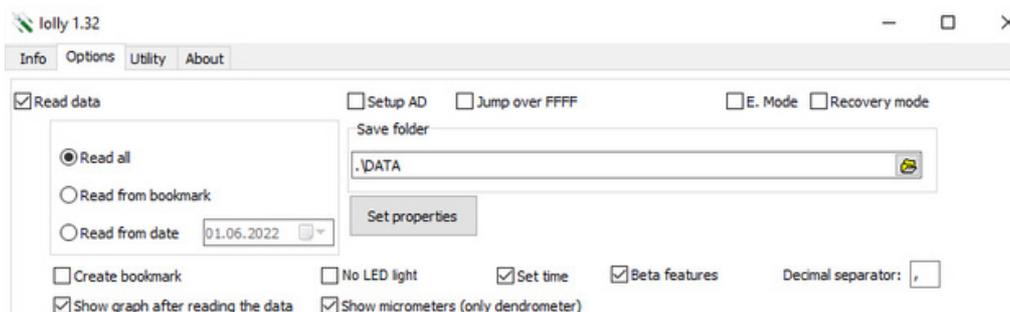
Read from date

select to read out data only from a specific date

Save folder

Here you can specify the folder where the data will be saved. The default setting is C:\Program Files(x86)\Lolly\DATA





Create bookmark

If you only wish to download data from a certain period, you can utilize the bookmark function. This will save you time and can therefore be useful in the field since downloading all the data can take up to several minutes.

To create a bookmark, tick "Read data", "Read all", and "Create bookmark". If you already have a bookmark created and wish to create another one, tick "Read from bookmark" and "Create bookmark".

No LED light

Tick to disable the LED light. This can be used to make the device less noticeable but for the most part, we would advise against it.

Set time

Tick to allow for time synchronization with your PC.

Decimal separator

Here you can set the decimal separator for your data. Please make sure it aligns with the separator used by the program of choice for data analysis.

Show graph after reading data

Tick to see graph after reading data.

Show micrometres

Dendrometers ONLY. See relevant section (pg. 14).

Section 2: modes



Here you can select the intensity of measurements.
There are five possible options to choose from the drop bar:

Basic Mode

Measurements occur every 15 minutes.

Meteo Mode

Measurements occur every 10 minutes.

Smart Mode

Measurements occur 8 times per hour during the 10th, 15th, 20th, 30th, 40th, 45th, 50th and 60th minute.

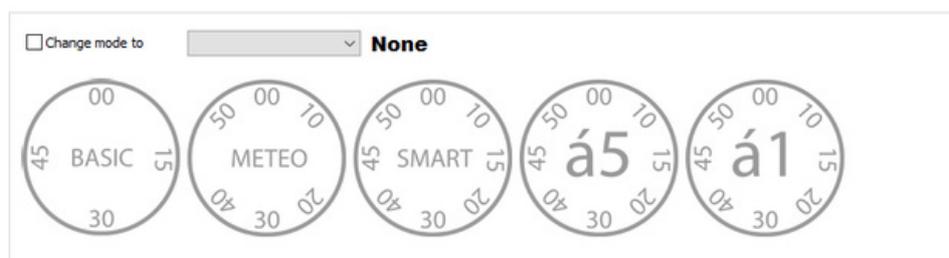
Intensive Mode

Measurements occur every 5 minutes.

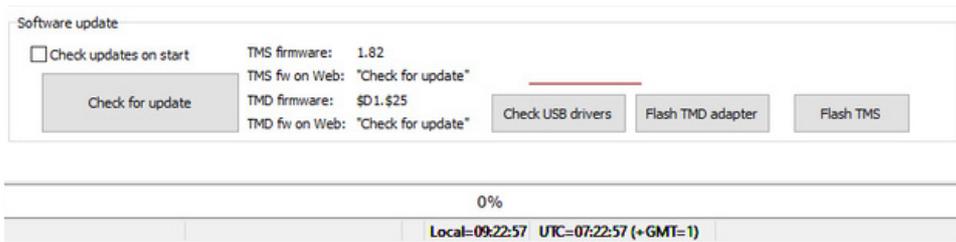
Experiment Mode

The sensor measures every minute. However, this is ONLY recommended for short-term intensive experiments.

If you only need to change the mode without having the data read out, do not leave "Read data" ticked off and instead tick off "Change mode to". Then select the required mode from the dropdown menu. After that, you just have to attach the sensor to the USB adapter and wait for the change to occur in the window "Info".



Section 3



Check for update

In this section, you can update the software using the *Check for update* button. Updating the software does require an internet connection so please make sure to do this before heading out into the field.

It is recommended to tick off "Check updates on start"- the automatic control of new updates of the Lolly software. The newest firmware will also be downloaded and this will enable you to update specific sensors whilst downloading data.

Check USB drivers

Flash TMD adapter

Flash TMS

These can be used in case of issues with data downloading.

If your TMD adapter is not working properly, select *Check USB drivers* and then *Flash TMD adapter*.

If the issues persist, please contact us at tomst@tomst.com.





DATA

To download data, attach your device to the TMD adapter, making sure it is plugged in. Once the download is complete, the data will be displayed in a new window on a graph and will also be saved to the dedicated folder in csv text format. You can open csv files in standard applications such as but not limited to Microsoft Office, LibreOffice etc.

Three files will be generated: data, command, and binary. Only the data file is relevant for you and this is where you will find the collected measurements.

Data format

Each measurement has its own separate row and has the following format.

```
0;2022.10.31 11:45;0;21.5625;22.0625;23.125;148;202;0
```

Individual values are separated by a semicolon and are ordered as follows:

index number of the measurement, date and time in UTC, time zone, T1, T2, T3, soil moisture count, shake, errFlag

Time & time zones

All measurements run in UTC. Following the date and time, a *time zone* parameter indicates the local time difference. It shows the number of extra quarter hours e.g. *time zone* 4 means UTC +4 quarter hours = UTC +1 hour.

Shake

A default value of 202 (TMS), 204 (Thermologgers), 206 (Dendrometers). This parameter was developed for a previous generation of sensors and is no longer relevant.

errFlag

Should be 0. If =1 the device couldn't convert time from PCF chip.

To change the decimal separator see pg. 6

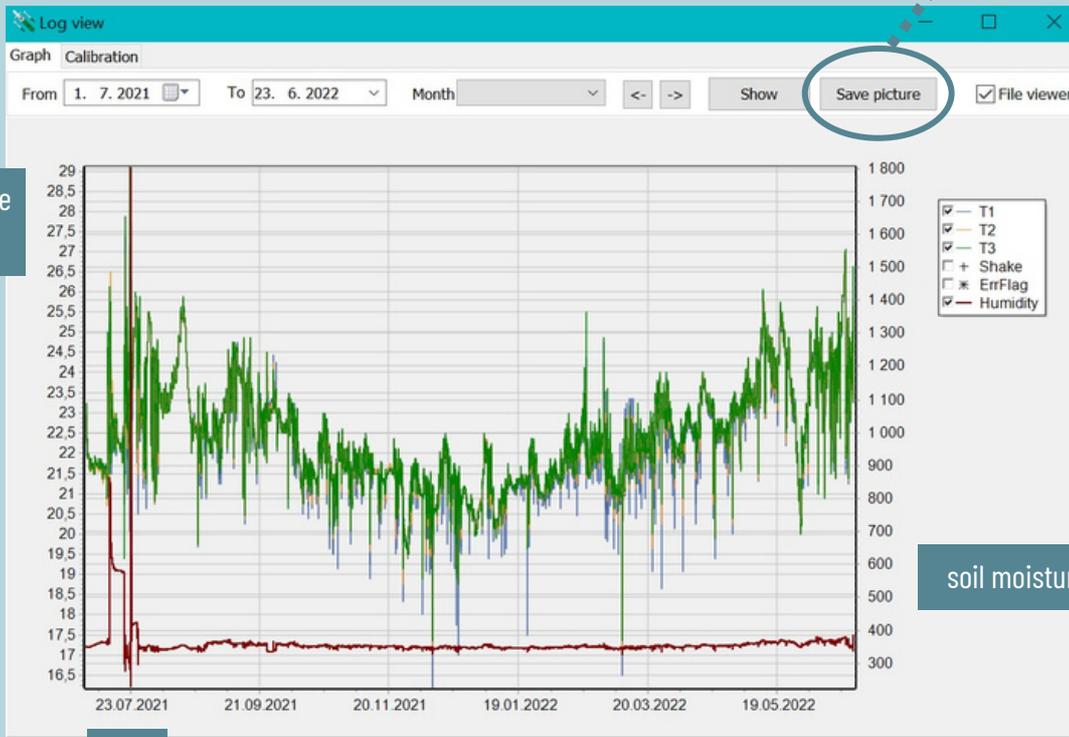


Graph

sample data

allows you to download the graph as an image

air temperature
(°C)



soil moisture

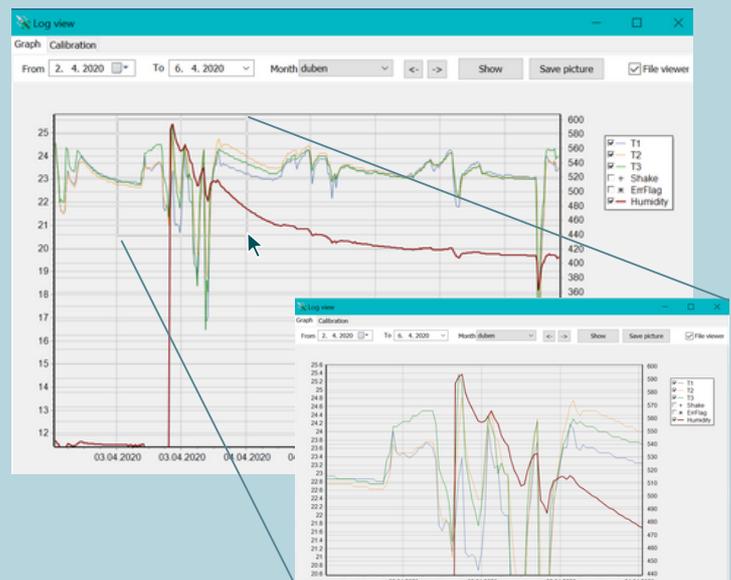
date

WWW.TOMST.COM

Zoom in & out

To zoom in, create a window of the section you want to enlarge with your cursor, from the top left to the bottom right corner. See image on the right for reference.

To zoom out, reverse the process by dragging the cursor from the bottom right to the top left corner.



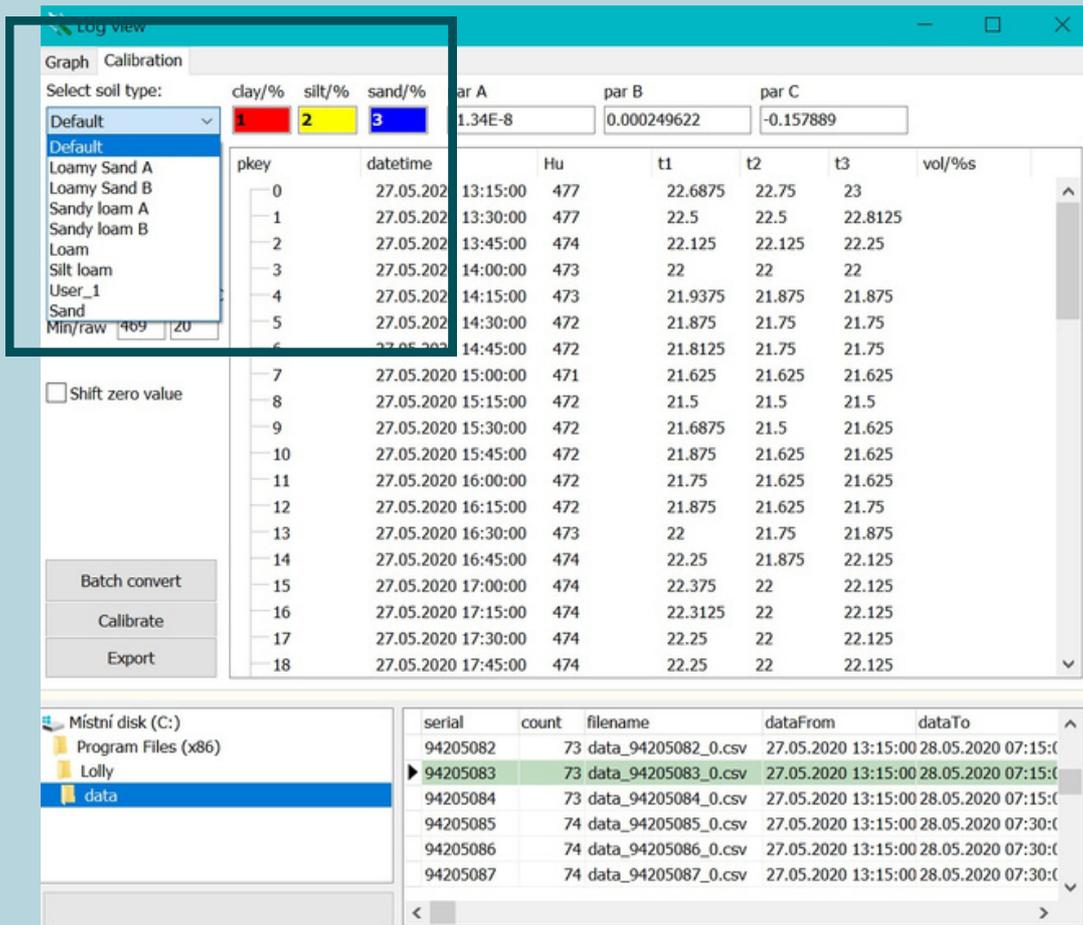
Calibration

sample data

ⓘ **DISCLAIMER:** This function has been adapted from the TMS Calibr tool. If you are looking to obtain more precise values, we would recommend creating your own calibration curve based on a soil sample. For more details, please refer to our [>>Calibration guide<<](#).

Soil type

First, select your soil type from the drop box. We highly recommend you use the Default setting. If none of the soil types listed fit your sample, select the Default setting or the soil type closest to yours.



The screenshot shows the 'Log view' window in the TOMST software. The 'Calibration' tab is active. A dropdown menu for 'Select soil type:' is open, showing 'Default' as the selected option. Below the dropdown, there are three colored buttons: a red button labeled '1', a yellow button labeled '2', and a blue button labeled '3'. To the right of these buttons are input fields for 'par A' (1.34E-8), 'par B' (0.000249622), and 'par C' (-0.157889). Below these fields is a table with columns: pkey, datetime, Hu, t1, t2, t3, and vol/%s. The table contains 19 rows of data. At the bottom of the window, there are buttons for 'Batch convert', 'Calibrate', and 'Export'. Below the main window, a file explorer window is open, showing the 'data' folder selected. The file explorer displays a list of files with columns: serial, count, filename, dataFrom, and dataTo.

pkey	datetime	Hu	t1	t2	t3	vol/%s
0	27.05.2020 13:15:00	477	22.6875	22.75	23	
1	27.05.2020 13:30:00	477	22.5	22.5	22.8125	
2	27.05.2020 13:45:00	474	22.125	22.125	22.25	
3	27.05.2020 14:00:00	473	22	22	22	
4	27.05.2020 14:15:00	473	21.9375	21.875	21.875	
5	27.05.2020 14:30:00	472	21.875	21.75	21.75	
6	27.05.2020 14:45:00	472	21.8125	21.75	21.75	
7	27.05.2020 15:00:00	471	21.625	21.625	21.625	
8	27.05.2020 15:15:00	472	21.5	21.5	21.5	
9	27.05.2020 15:30:00	472	21.6875	21.5	21.625	
10	27.05.2020 15:45:00	472	21.875	21.625	21.625	
11	27.05.2020 16:00:00	472	21.75	21.625	21.625	
12	27.05.2020 16:15:00	472	21.875	21.625	21.75	
13	27.05.2020 16:30:00	473	22	21.75	21.875	
14	27.05.2020 16:45:00	474	22.25	21.875	22.125	
15	27.05.2020 17:00:00	474	22.375	22	22.125	
16	27.05.2020 17:15:00	474	22.3125	22	22.125	
17	27.05.2020 17:30:00	474	22.25	22	22.125	
18	27.05.2020 17:45:00	474	22.25	22	22.125	

serial	count	filename	dataFrom	dataTo
94205082	73	data_94205082_0.csv	27.05.2020 13:15:00	28.05.2020 07:15:00
94205083	73	data_94205083_0.csv	27.05.2020 13:15:00	28.05.2020 07:15:00
94205084	73	data_94205084_0.csv	27.05.2020 13:15:00	28.05.2020 07:15:00
94205085	74	data_94205085_0.csv	27.05.2020 13:15:00	28.05.2020 07:30:00
94205086	74	data_94205086_0.csv	27.05.2020 13:15:00	28.05.2020 07:30:00
94205087	74	data_94205087_0.csv	27.05.2020 13:15:00	28.05.2020 07:30:00



Calibrate

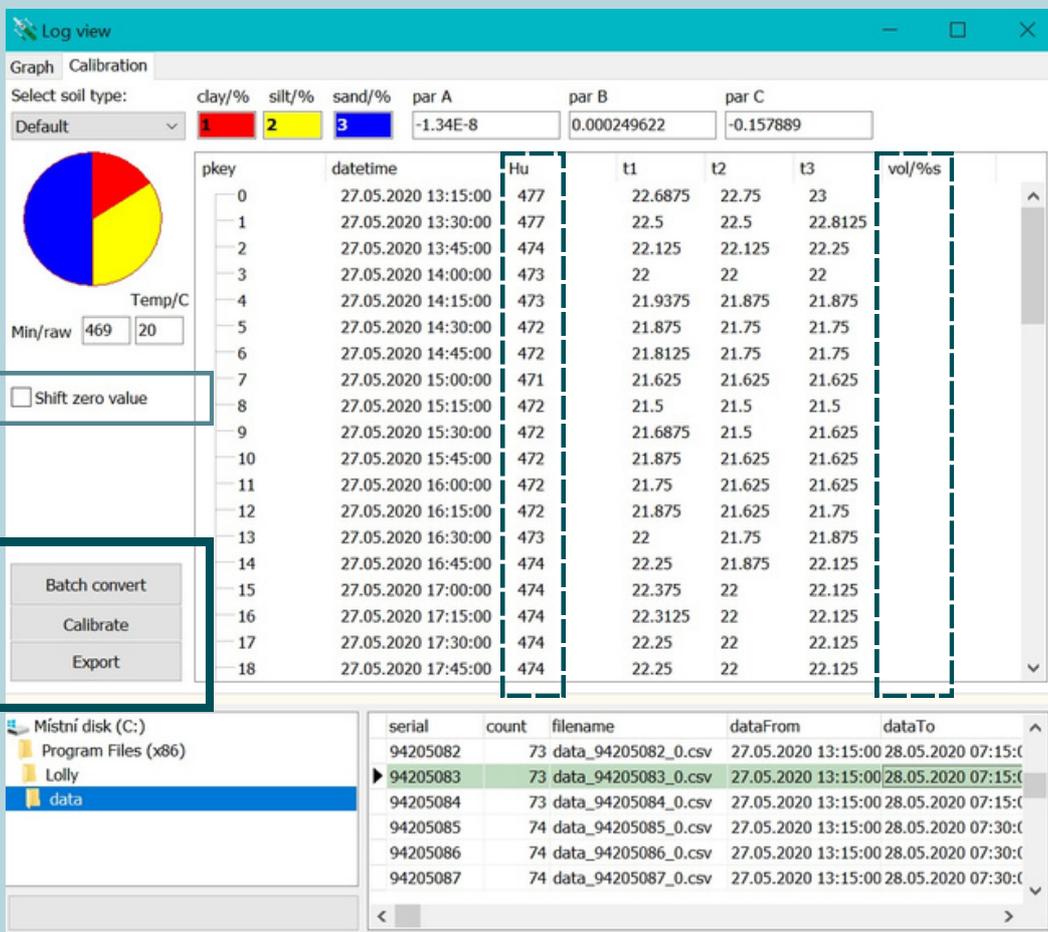
Once you have selected the soil type, click *Calibrate* and the data displayed in column Hu (raw moisture signal ~500-3600) will be converted into volumetric soil moisture (0-100% vol.) in column vol/%s.

Export

Select to generate a file of converted data.

Batch convert

Select to convert all the data files (in csv format) from a folder of your choosing.



pkey	datetime	Hu	t1	t2	t3	vol/%s
0	27.05.2020 13:15:00	477	22.6875	22.75	23	
1	27.05.2020 13:30:00	477	22.5	22.5	22.8125	
2	27.05.2020 13:45:00	474	22.125	22.125	22.25	
3	27.05.2020 14:00:00	473	22	22	22	
4	27.05.2020 14:15:00	473	21.9375	21.875	21.875	
5	27.05.2020 14:30:00	472	21.875	21.75	21.75	
6	27.05.2020 14:45:00	472	21.8125	21.75	21.75	
7	27.05.2020 15:00:00	471	21.625	21.625	21.625	
8	27.05.2020 15:15:00	472	21.5	21.5	21.5	
9	27.05.2020 15:30:00	472	21.6875	21.5	21.625	
10	27.05.2020 15:45:00	472	21.875	21.625	21.625	
11	27.05.2020 16:00:00	472	21.75	21.625	21.625	
12	27.05.2020 16:15:00	472	21.875	21.625	21.75	
13	27.05.2020 16:30:00	473	22	21.75	21.875	
14	27.05.2020 16:45:00	474	22.25	21.875	22.125	
15	27.05.2020 17:00:00	474	22.375	22	22.125	
16	27.05.2020 17:15:00	474	22.3125	22	22.125	
17	27.05.2020 17:30:00	474	22.25	22	22.125	
18	27.05.2020 17:45:00	474	22.25	22	22.125	

serial	count	filename	dataFrom	dataTo
94205082	73	data_94205082_0.csv	27.05.2020 13:15:00	28.05.2020 07:15:00
94205083	73	data_94205083_0.csv	27.05.2020 13:15:00	28.05.2020 07:15:00
94205084	73	data_94205084_0.csv	27.05.2020 13:15:00	28.05.2020 07:15:00
94205085	74	data_94205085_0.csv	27.05.2020 13:15:00	28.05.2020 07:30:00
94205086	74	data_94205086_0.csv	27.05.2020 13:15:00	28.05.2020 07:30:00
94205087	74	data_94205087_0.csv	27.05.2020 13:15:00	28.05.2020 07:30:00

Shift zero value

This function will align the vol/%s values if needed.

For the most part, however, it should be left unticked.

DENDROMETERS

Using the Lolly software to read out Dendrometers is very similar to using it with the TMS devices. However, there are a few differences as described below.

Setup AD

This function will allow you to check the preloading of the Dendrometer spring in real time. This can be useful during installation as it enables you to see the changes immediately.

Show micrometres

Select if you wish to display the values in micrometres. Otherwise, digital numbers will be shown.

The conversion can be summarised as follows:

The full range of digital numbers is from 1 279 up to 34 000. The curve intersects with the y axis at point 1 279; here the measurement is 0 μm . From this we may deduce the proportionality constant: $8\,890 / (34\,000 - 1\,279)$. And finally the formula for converting the digital number to micrometers:

$$\mu\text{m} = (\text{Value} - 12\,79) * \{8\,890 / (34\,000 - 1\,279)\}$$

Keep in mind:

- Only T1 values will be of relevance to you. You can therefore opt to hide T2 and T3 values. The Dendrometer only has one temperature sensor, while TMS devices have 3.



What to do in case of persisting issues

If you are having issues with the Lolly software and with downloading data, there are a few things you can check before contacting us. If you have tried all of the below and the problems persist, please get in touch via email: tomst@tomst.com.

- Check that you have the latest version of the software.
- Check that the cable of your TMD is fully functional.
- Select *Flash TMD*.
- Try downloading the data on a different computer/using a different TMD adapter.
- Make sure you have ticked the required boxes (see *Options* for guidance).

When you get in contact with us, please send the following along with a description of the issue:

- All three generated files (data, command, binary)
- Alternatively, you can also send a screenshot of the error.



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