The same manual applies for Linux, Windows and Mac users. Depending of your setup, you will need to run the python code directly, or you can use the lazy compiled version for windows. Once opened the program, you will see the following screen:

ThermoLogger v1.1 USB Communication	– 🗆 X
∠ Con	nect! Info
ThermoCouple 1           Status:         0           Internal T         0.0 [ºC]           External T         0.0 [ºC]           Plot Internal T1         Plot External T1	ThermoCouple 2           Status:         0           Internal T         0.0 [%C]           External T         0.0 [%C]           Plot Internal T2         Plot External T2
Sampling rate	Graph Timeline Complete Record Data Mark
Packages: 0 Sampling: 0.005 // SN: 0 SR: 1 SG	Record Data Mark

Figure 1: ThermoLogger v1.1 software main windows.

In the upper part of the windows, you will see a blank combobox under "USB Communication". Now you can connect the board to the USB of your computer. No extra drivers are needed. Then the COMPORT will should appear as shown in next picture:

ThermoLogger v1.1	2 <b>-</b>	×
USB Communication		
COM3 V Con	inect! Info	
ThermoCouple 1           Status:         0           Internal T         0.0 [ºC]           External T         0.0 [ºC]	ThermoCouple 2           Status:         0           Internal T         0.0 [2           External T         0.0 [2	
Plot Internal T1 Plot External T1	Plot Internal T2 Plot External T2	
Sampling rate	Graph Timeline	
150ms 🗸	Complete	~
	Record Data Ma	irk
Packages: 0 Sampling: 0.00s // SN: 0 SR: 1 SG	C: 0	

Figure 2: A board is detected at COM3.

Once you clicked "Connect!", all the options will enable for you to use:

ThermoLogger v1.1 USB Communication			-2	
СОМЗ 🗸	Disc	onnect!	Info	
External T	29.68 [ºC] 27.75 [ºC]	ThermoCouple 2 Status: Internal T External T	Working ;	1 29.12 [°C] 30.5 [°C]
Plot Internal T1 Plot External T1		Plot Internal T2		2
Sampling rate 150ms	3	Graph Timeline Complete		4
Packages: 42 Sampling: 0.16s //	SN: 0 SR: 1	5 sc: 0	Record Data	Mark

Figure 3: Sections of the software.

- The values from the thermocouple and the status of each one. It can detect any short between wires, to ground, or if the thermocouple is disconnected. The "internal T" is the temperature of the ADC over the board, so it is not relevant for measurements.
- 2. You can tick or untick those boxes to add the curve to the graph:

DSB Communication  COMS  COMS  Communication  COMS  Communication			🐔 Figure 1	- 0 ×
COM3 Disconnecti Info ThermoCouple 1 Status: Working Internal T 29.43 [*c] Deternal T 29.45 [*c] 29.45 [*c] 29.45 [*c] 29.45 [*c] 29.45 [*c] 29.45 [*c] 29.45 [*c] 29.45 [*c] 29.45 [*c] 20.45 [*c]	ThermoLogger v1.1	— — ×	<b>☆ &lt; → ⊕ Q ⊉ ⊠</b>	
Cons     Outcometo     Internal T       ChemoCouple 1     Status:     Working       Internal T     Status:     Working       Internal T     29.43 [*c]     External T1       29.43 [*c]     External T       External T     Det Internal T2       Pot Internal T1     Pot External T2       Pot External T1     Pot External T2       Orapite     Orapite       State:     Record Data	USB Communication			
hemsCouple 1 Tatus: Working Internal T 29.43 [sc] External T 29.43 [sc] 20.75 [sc] 20.75 [sc] 40- 40- 20- 40- 20- 40- 20- 40- 20- 40- 20- 40- 20- 40- 20- 40- 20- 40- 20- 40- 20- 40- 20- 40- 20- 40- 20- 40- 20- 40- 20- 40- 20- 40- 40- 20- 40- 40- 40- 40- 40- 40- 40- 4	COM3 V Dis	iconnect! Info	100 Temperature	e Plot
Status:     Working     Status:     Working     Internal T1       Internal T     Internal T     Internal T2       External T1     Internal T2     30.43 [sc]       Pot Internal T1     Pot Internal T2       Pot Internal T1     Pot Internal T2       Pot Internal T1     Pot Internal T2       Status:     Complete       Record Data     Mark	ThermoCounie 1	ThermoCounte 2		
Internal T  29.43 [#C]  External T  29.43 [#C]  External T  29.43 [#C]  External T  29.43 [#C]  External T  20.75 [#C]  Plot Internal T2  Plot Internal T2  Plot External T2		A CALIFORNIA CONTRACTOR OF A CALIFORNIA CONTRACTOR OF A CALIFORNIA CONTRACTOR OF A CALIFORNIA CONTRACTOR OF A C		
External T			80 -	
31.62       [sc]       27.75       [sc]       60         Plot Internal T1       Plot External T2       40         Stapping rate       Graph Timeline       40         S00ms       Complete       20         Record Data       Mark         ackages:       664 Sampling:       0.50s // SN: 0 SR: 2 SC: 2	29.43 [°C]	30.43 [°C]		
Pick Internal T1     Pick Internal T2     Pick Internal T2       Store Sternal T1     Pick External T2       Store Sternal T1     Pick External T2       Graph Timeline     Complete       Record Data     Mark       ackages: 664 Sampling: 0.50s // 5N: 0 SR: 2 SC: 2	External T	External T		
Pot External T1     Pot External T2       Sampling rate     Graph Timeline       S00mo     Complete       Record Data     Mark       ackages: 664 Sampling: 0.50s // 5N: 0 SR: 2 SC: 2	31.62 [ºC]	27.75 [°C]	60 -	
Sampling rate Graph Timeline Complete Record Data All All All All All All All All All All	Plot Internal T1	Plot Internal T2		
Soloms Complete Compl	Plot External T1	Plot External T2		
Record Data         Mark           ackages: 664 Sampling: 0.50s // 5N: 0 SR: 2 SC: 2         20 -	Sampling rate	Graph Timeline	40 -	
Record Data Mark ackages: 664 Sampling: 0.50s // SN: 0 SR: 2 SC: 2	500ms ~	Complete		
ackages: 664 Sampling: 0.50s // SN: 0 SR: 2 SC: 2			20 -	
		Record Data Mark	1	
	Packages: 664 Sampling: 0.50s // SN: 0 SR:	2 SC: 2		
		273/12		3° 0 <sup>№</sup> 0 <sup>∞</sup> 0 <sup>∞</sup>
a shi			19 <sup>1,7</sup>	19" 19" 19"

Figure 4: The graph window will pop-up as soon as any box is ticked

You can change the plot in real time. In addition, you can modify the view, Y and X axis, colors and curves colors in the graph windows. Furthermore, you can export the graph as picture or vector using the options of the same windows.

3. You can select the sampling rate, but it has a trick: Only 150ms or 250ms are functional. Any value above this values will sample every 250ms and make an average data until the sampling rate required is achieved, acting as a Low Pass Filter.

		🚯 Figure 1	- 🗆 X
ThermoLogger v1.1	- 🗆 🗙	⋇ < → ⊕ Q 幸 ∠ 🖹	
USB Communication			
COM3 V Dis	connect! Info	100 Temperature Plot	— Internal T2
ThermoCouple 1 Status: Working Internal T	ThermoCouple 2 Status: Working Internal T	80 -	External T1 Internal T1 External T1 External T2
29.37 [°C]	Internal 1 29.93] [°C] External T		
31.62 [ºC]	27.75 [ºC]	60 -	
Plot Internal T1	Plot Internal T2		
Plot External T1	Plot External T2		
Sampling rate	Graph Timeline	40 -	
500ms ~	Complete ~		
150ms A 250ms 5 500ms 15 15 55	Stop Recording Data Mark	20 -	
5s 510s 1 min 2 min 3 min	2 SC: 2		<u> </u>
3 min 5 min V	THE M	81911 81918 81919 81919 81912 81912 81912 81912 8191	* 81915 81910

Figure 5: Sampling rate selection.

4. Graph timeline: This will help you change the X-axis of the graph manually. You can select from different timelines, but we recommend to leave it as "Complete", so the X-axis will include all the temperature curves.

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ThermoLogger v1.1		- 🗆 🗙	$\Rightarrow \leftrightarrow \Rightarrow \Rightarrow$	Q ≇ 🗹 🖺	
USB Communication					
C0M3 ×	Disconnectl	Info		Temperat	ture Plot
COM5 V	Disconnecti	Ino	100		Internal T2
ThermoCouple 1	ThermoCouple 2				External T1
Status: Working	Status: V	Vorking			Internal T1
Internal T	Internal T		80 -		External T2
29.34 [2	:]	29.87 [°C]			
External T	External T				
31.75 [2	:]	27.5 [ºC]	60 -		
Plot Internal T1	Plot Internal T2				
Plot External T1	Plot External T2				
Sampling rate	Graph Timeline		40 -	1	
500ms	Complete	~			
	5 min 30 min		20 -		
Recording: log 18092023 191839.csv	1 hour		20		
	8 hour 24 hour	-			
Packages: 1.18k Sampling: 0.46s // SN:			1000		
	20200		04	<b>a b b c c</b>	3 8 5 5
			1919:11 1919:18	1818 <sup>1,0</sup> 181 <sup>9,0</sup> 181 <sup>9,1</sup> 181 <sup>9,1</sup>	181917 18191A 181917 181918
		and the second second	\$ \$°.	\$ \$ \$ \$ \$	\$ \$ \$ \$ \$

Figure 6: Graph timeline menu selection.

5. In the fifth selection we have the recording data section. By clicking "record data" we start to record all the data in a .csv file inside "Data" folder:

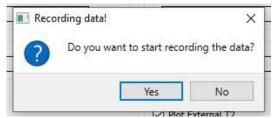


Figure 6: The user is asked to start recording the data.

As soon as we click Yes in the pop-up, a .csv file with the date will be created. The "Mark" button will create a Mark in the file, so you can keep track of the time you change anything during the test. (Example: You can mark whenever you change the temperature of the oven you are measuring, so later on when reviewing the .csv file, you will see the mark). You can make as many mark as you want.

Finally, the bottom bar is for debugging, as it includes the following data:

*Number of packages:* The number of packages received from the board.

*Sampling:* The time (in seconds) of the last data printed in graph and screen. Should coincide with the Sampling Rate selected on the GUI.

SN: Sample Number inside the average loop

SR: Number of samples we are averaging for every printed sampled.

SC: Sampling Choice (Position of the comboBox).

To end, if you click on the "Info" button, you will extract the info of the FW and HW board you have:

🛯 Info window			37—33	U	>
	Thermal D	Data Logger SW V1.1 - 2023	3		
Board Info	1.2b	USB Stack Info	04D8		
HW Version: SW Version:	1.02	Product ID: COM Type:	00AA Disposi <mark>t</mark> ivo ser	ie USB (C	OM3
COM Port:	COM3	Revision:	1.1		
This project is license	ed under Open Source l	licenses. <u>Check GitHub Pag</u>	e for all the files	and new (	updat
	<b>OSHW</b>	ES0000	)34		
This project was dow	alanad by Makina David	-	wises com		
ſ <mark>h</mark> is project was dev	eloped by Making Devic	ces. <u>https://www.makingde</u>	evices.com		

Figure 7: Info window.

For any requested feature or problem with the software or the board, please contact using the form of https://www.makingdevices.com