

# **Minikins RTHi/QTHi**

Battery replacement

*EMS Brno, April 2020*

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# Notice:

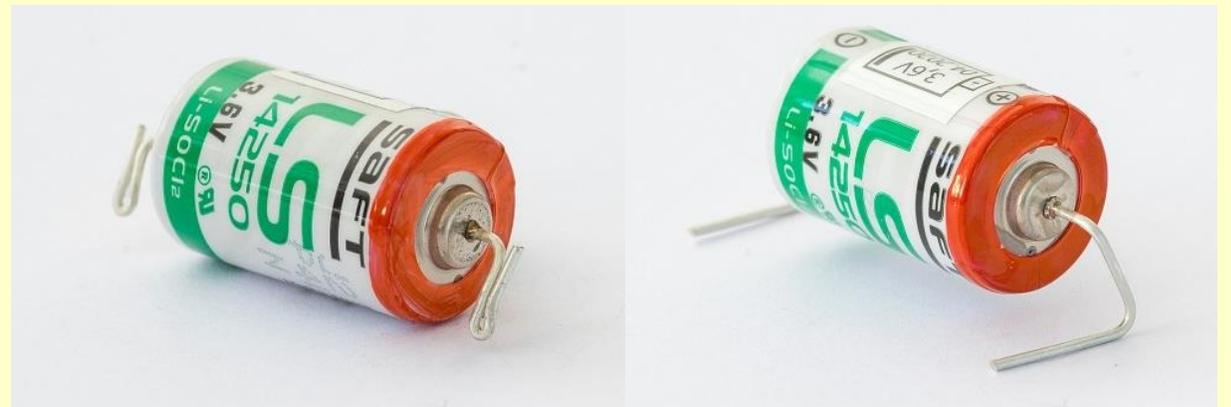
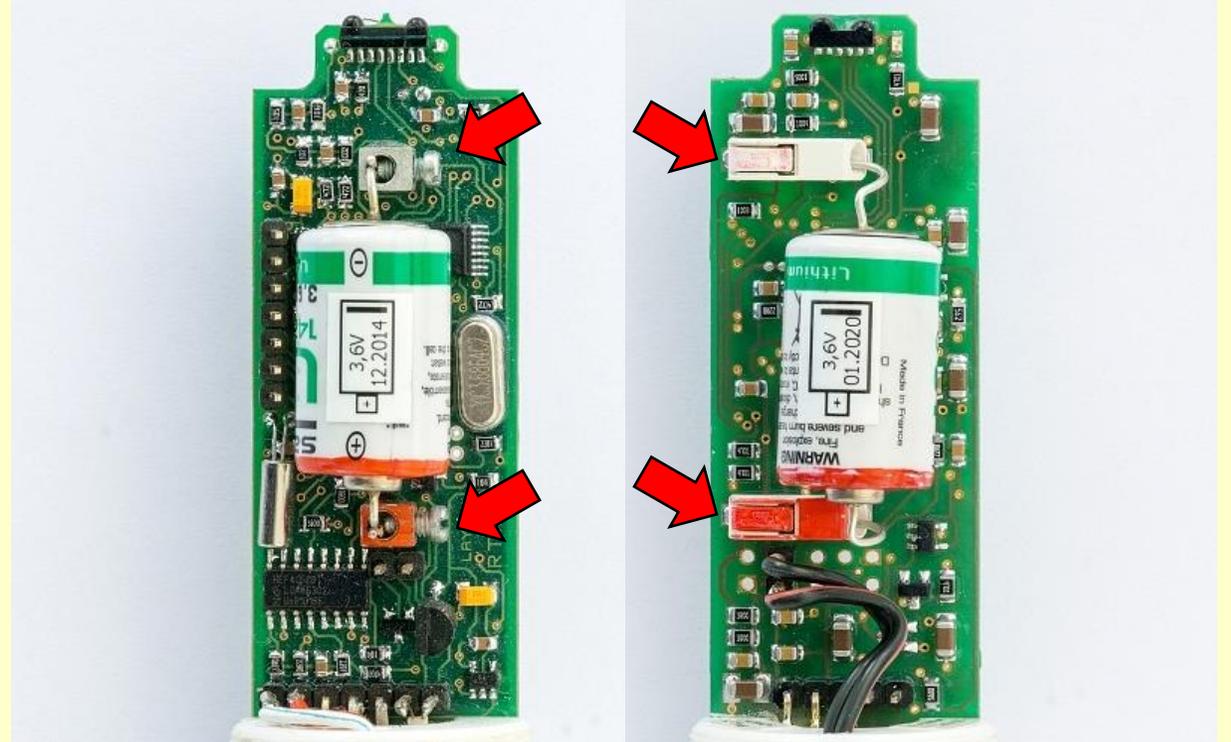
Please note that there are two models with different battery terminals:

- Minikin with screw terminals
- Minikin with screwless terminals - Wago (serial number starts with "A")

Both models use LS 14250 CN battery, single cell, 3.6 V, 1/2AA, Lithium Thionyl Chloride, 900 mAh with axial wires.

The main difference between those models is in the wire adjustment of batteries – see pictures.

When asking manufacturer for new batteries, please specify the model (incl. prefix of serial number) and we will adjust battery terminals accordingly.



# Related tools and accessories:



Minikin sensor  
RTHi / QTHI



Wrench tool



Tweezers



Dessicant bag



IrDA/USB cable



Battery for screw  
terminals



Screwdriver



Battery for screwless  
terminals (Wago)



Single  
squeezer for Wago

# Sensor removal

Remove the sensor (datalogger) body from the radiation shield. For long life maximal reflection are the plates made from aluminium coated by baked varnish. These plates need relatively gentle handling.

- Unscrew three nuts on the top of the radiation shield and remove the uppermost plate with the sensor



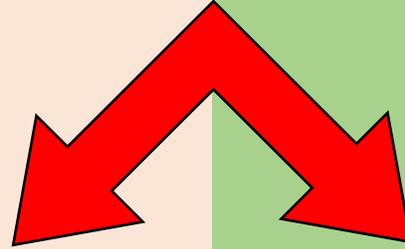
# Electronics removal

Note the **warranty seal** and **never** hold the sensor by the upper plate when screwing off the stainless case of the sensor. For this purpose, the manufacturer supplies each customer with a special tool (wrench).

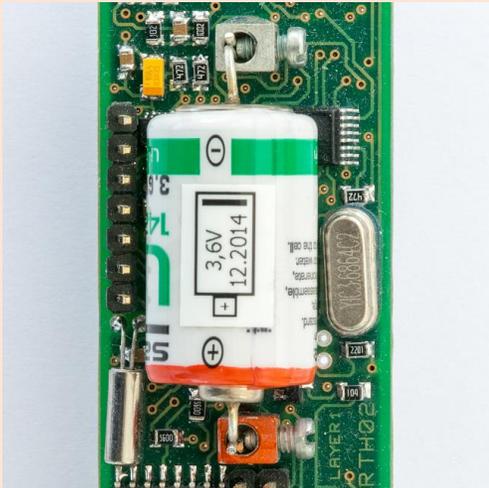
Screw out the stainless case. Use the tool as a counterbalance. Do not hold the aluminum plate during screwing out. Gently pull out the stainless case.



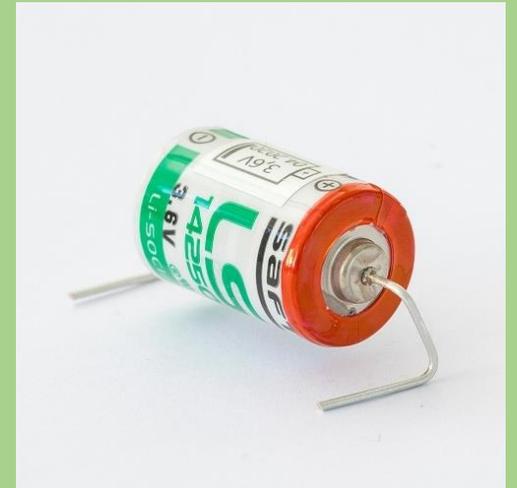
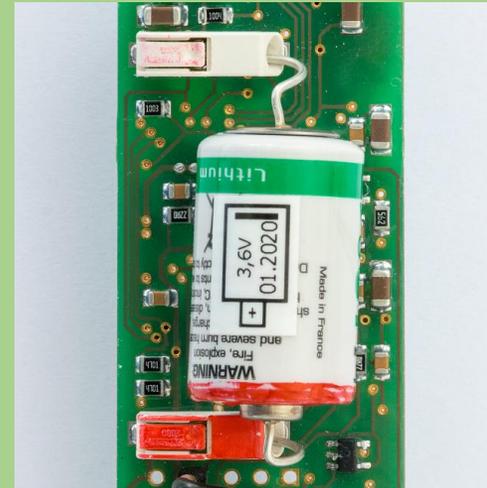
# Battery replacement procedure



## SCREW TERMINALS



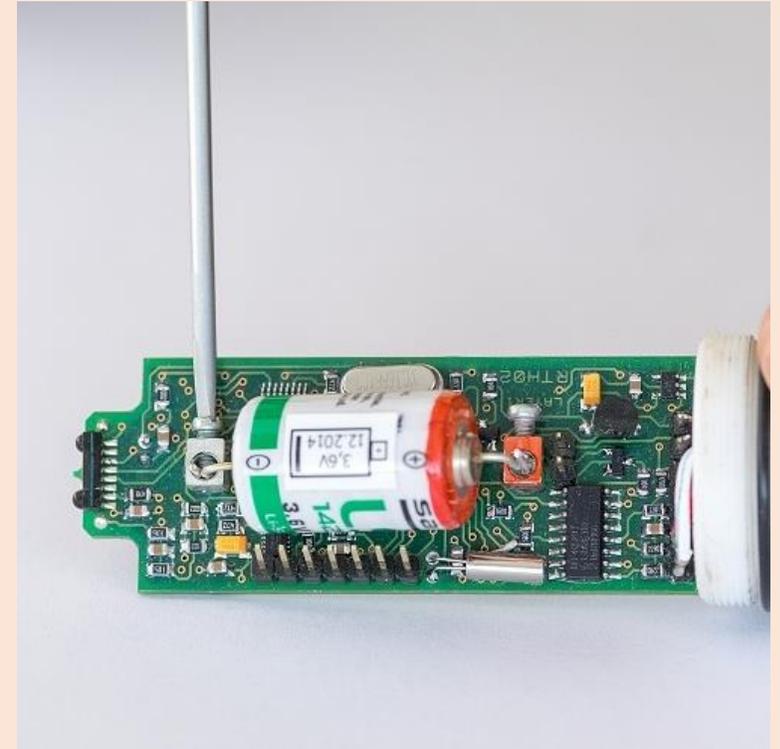
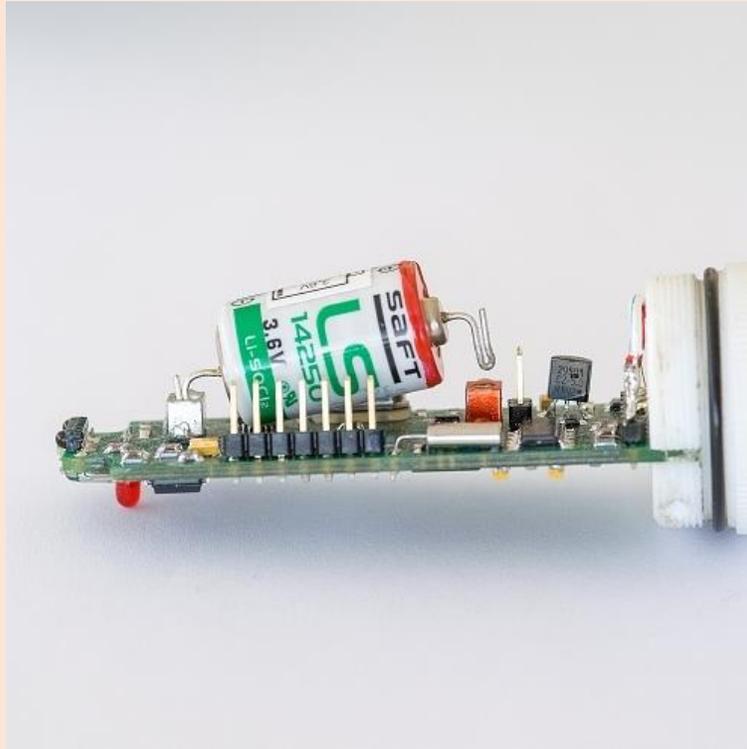
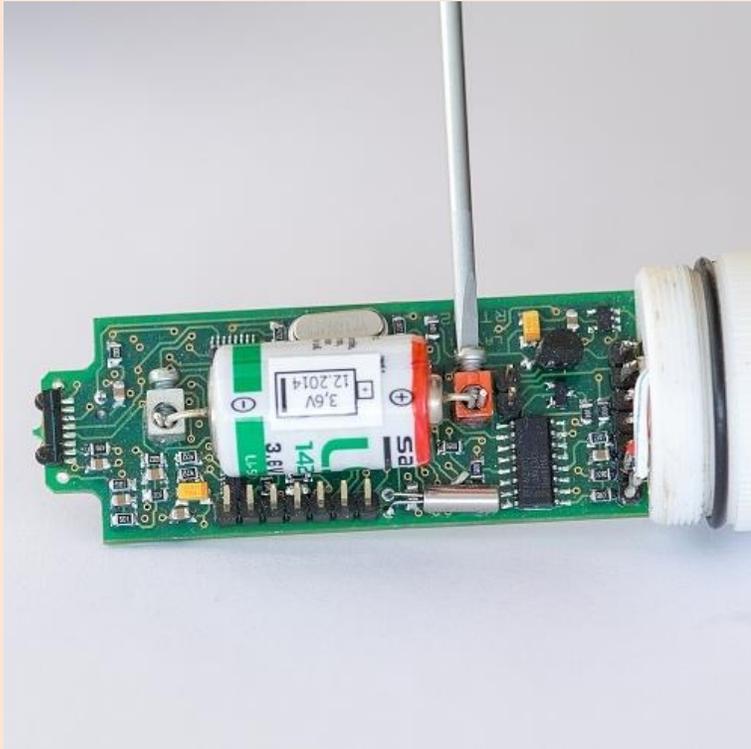
## SCREWLESS TERMINALS



*For alternate parts of manual, due to terminal type, follow background colour*

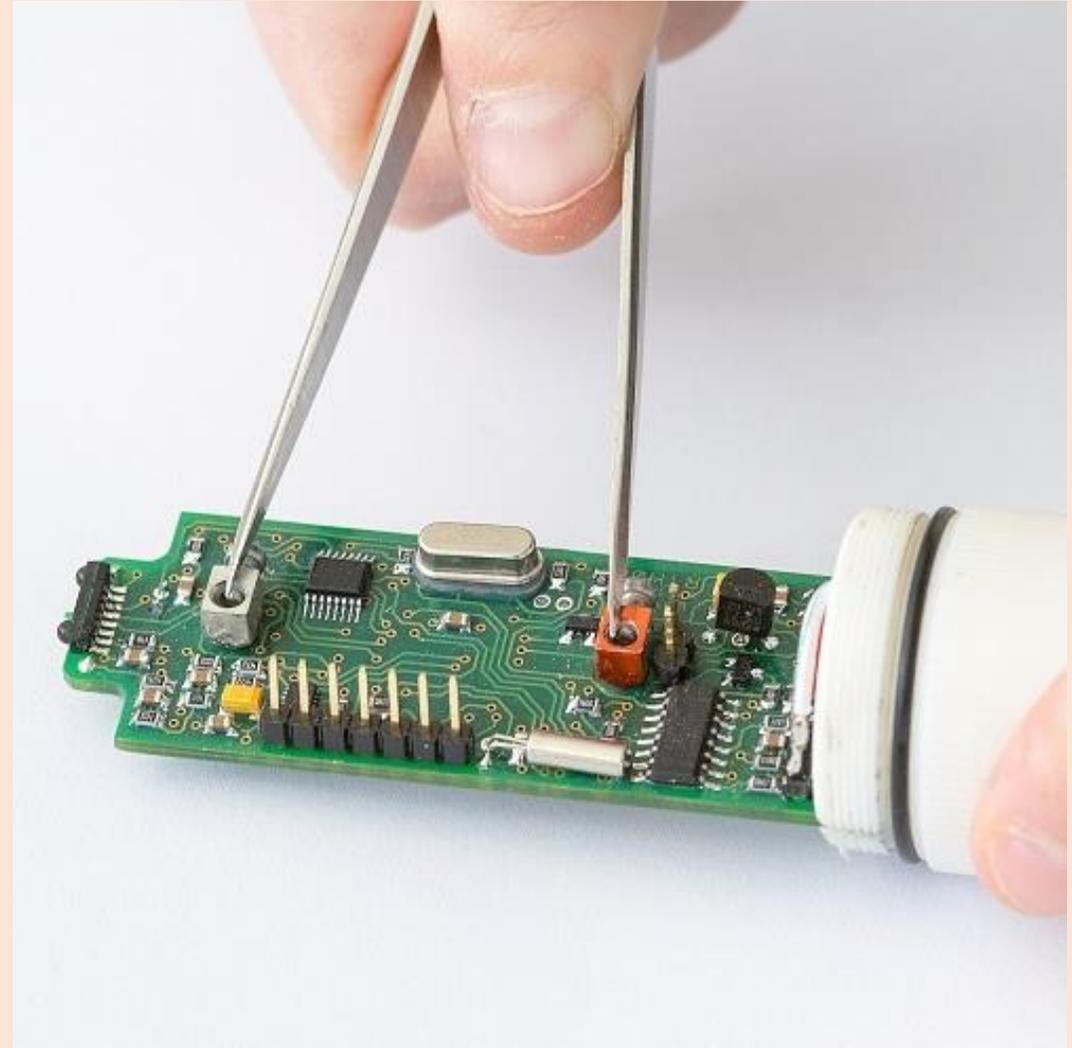
# SCREW TERMINALS - battery removal

- Remember the battery polarity.
- Screw out the positive battery terminal and lift the battery wire.
- Screw out the negative terminal and remove the battery.



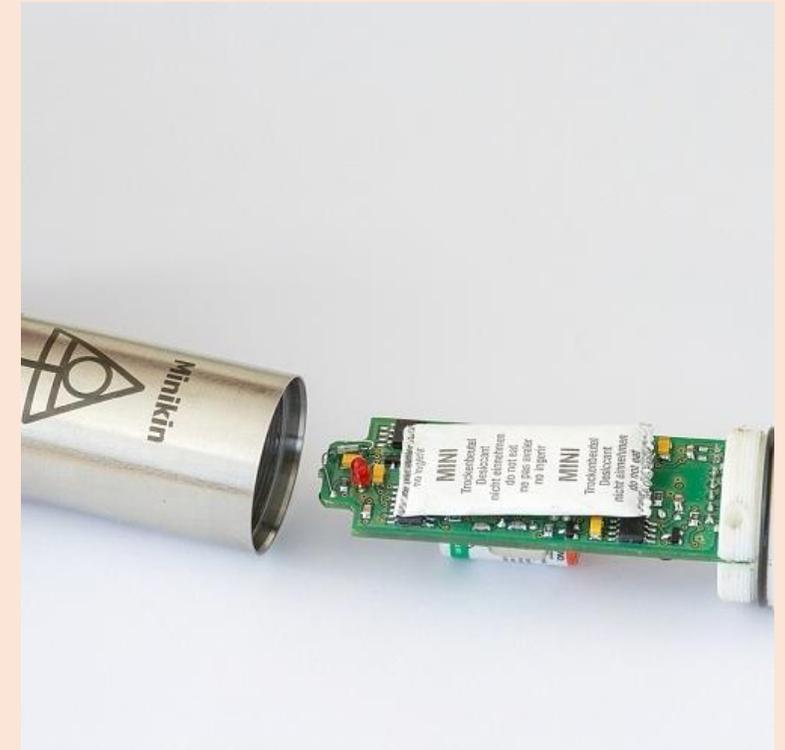
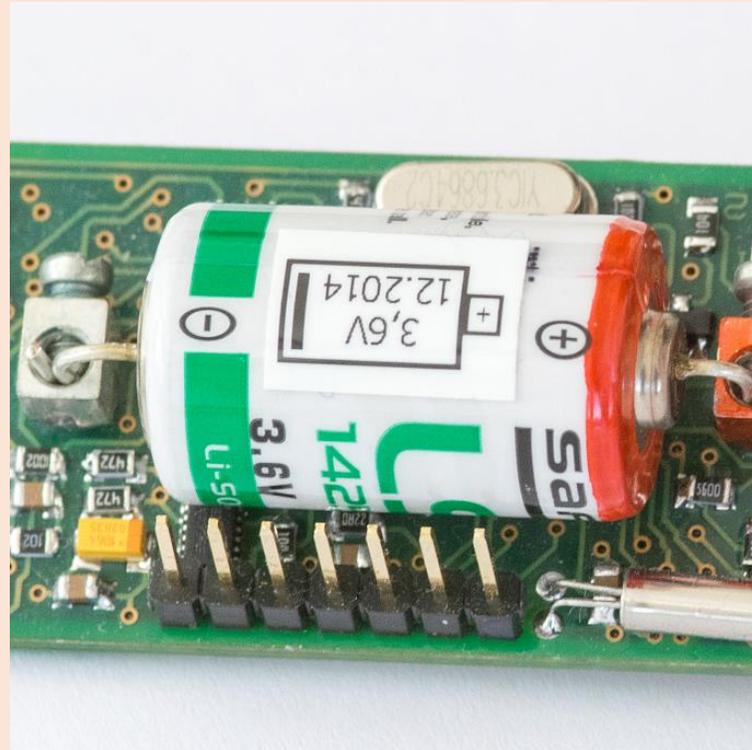
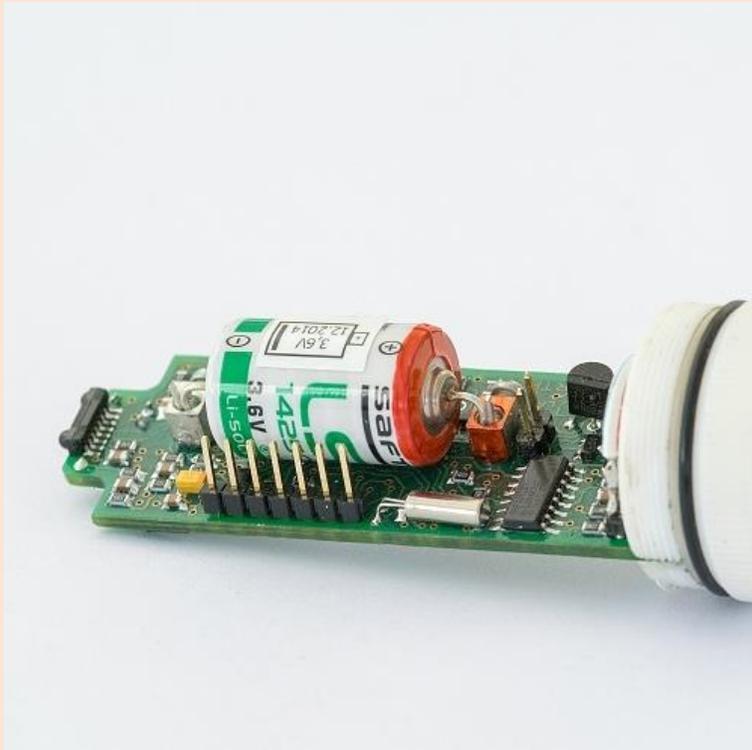
# SCREW TERMINALS - battery reset

- Short circuit the battery terminals. It will reset the battery life counter. Tweezers is the ideal tool for this.
- Note that the battery counter can be reset also from Mini32 (Configuration>More>Batt. reset)



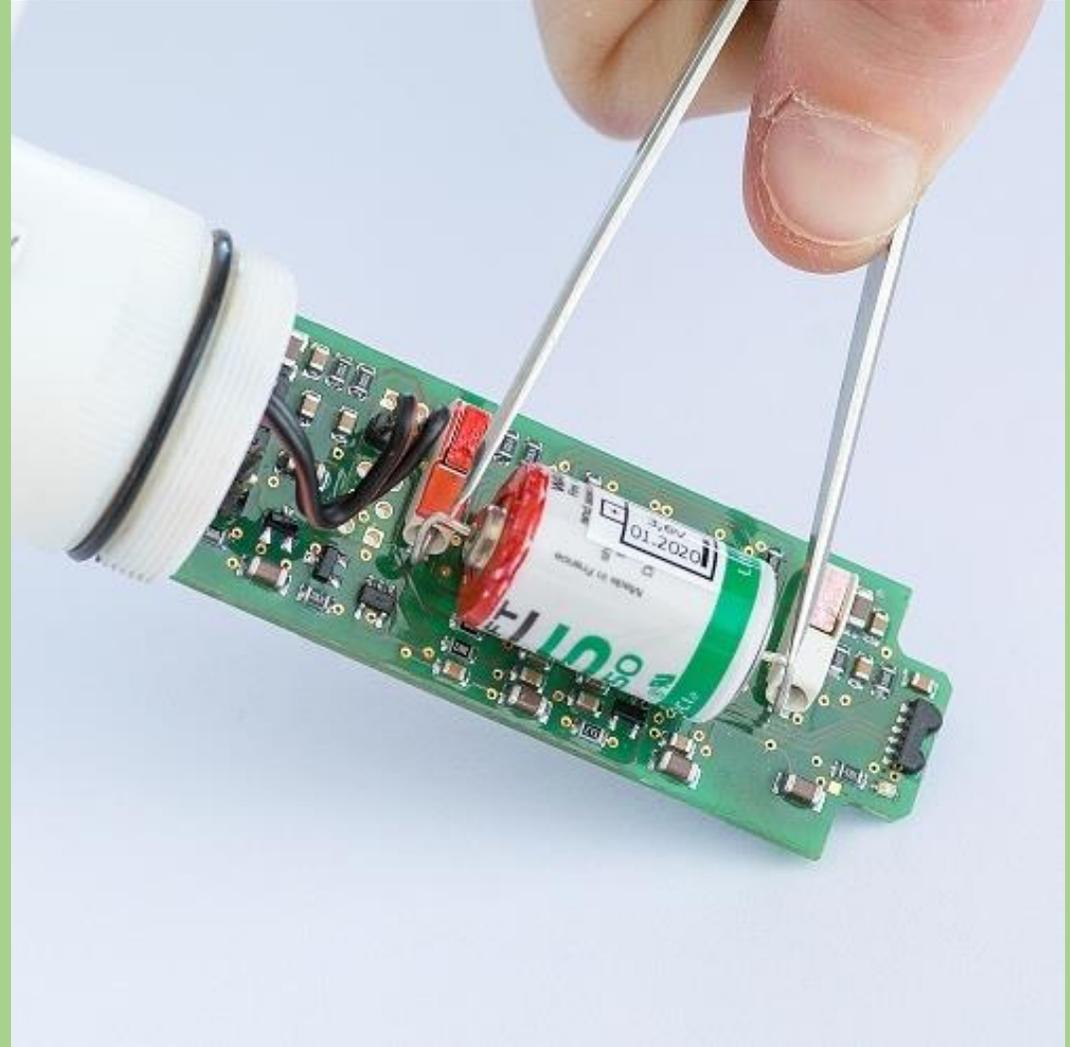
# SCREW TERMINALS - battery inserting

- Insert new battery back to terminals. Consider polarity! Screw it up firmly.
- It is good idea to write down the time stamp of battery replacement.
- Insert new desiccant bag.



# SCREWLESS TERMINALS - battery reset

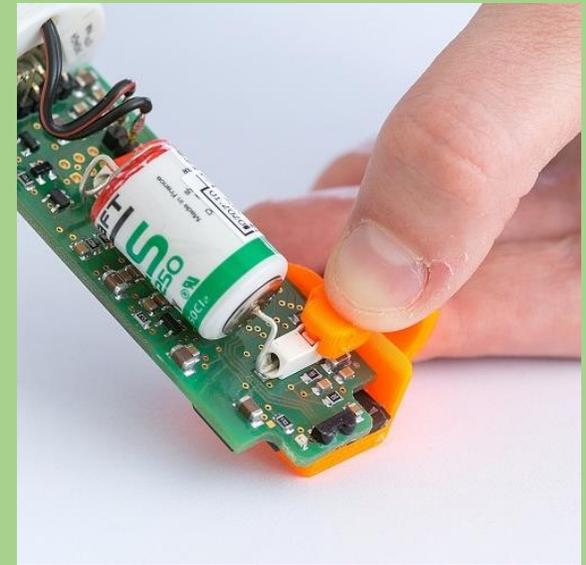
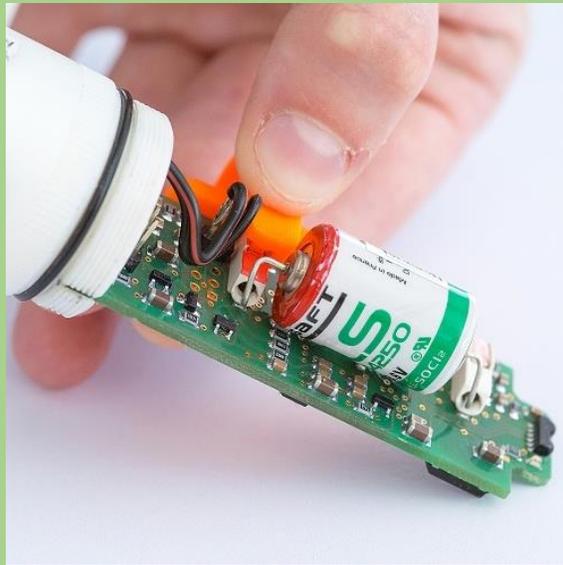
- Short circuit the battery terminals of old battery for few seconds - see picture. This will reset the battery life counter. Tweezers is the ideal tool for this.
- Exceptionally you can reset the counter also by short circuiting of new battery – not more than one second.
- Note that the battery counter can be reset also from Mini32 (Configuration>More>Batt. reset)



# SCREWLESS TERMINALS - battery removal

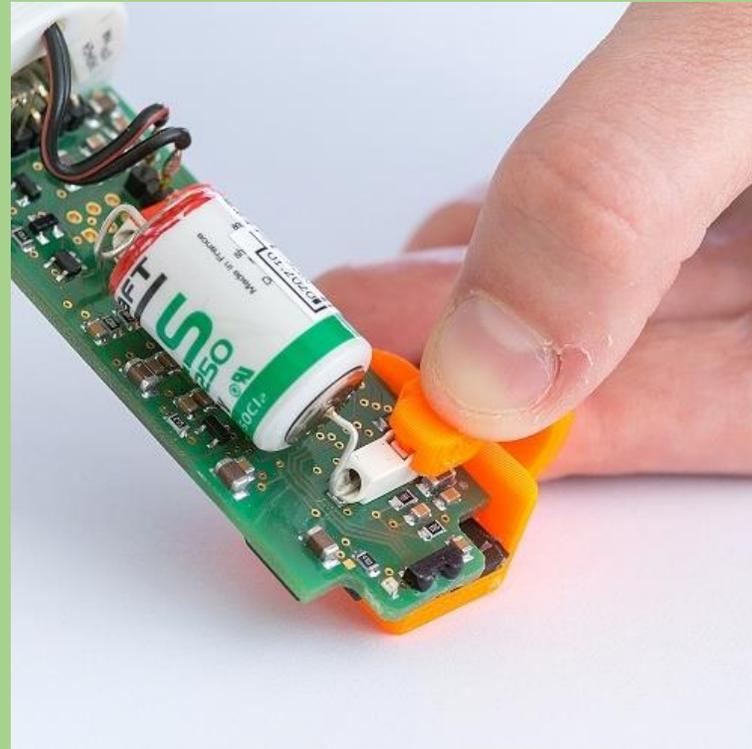
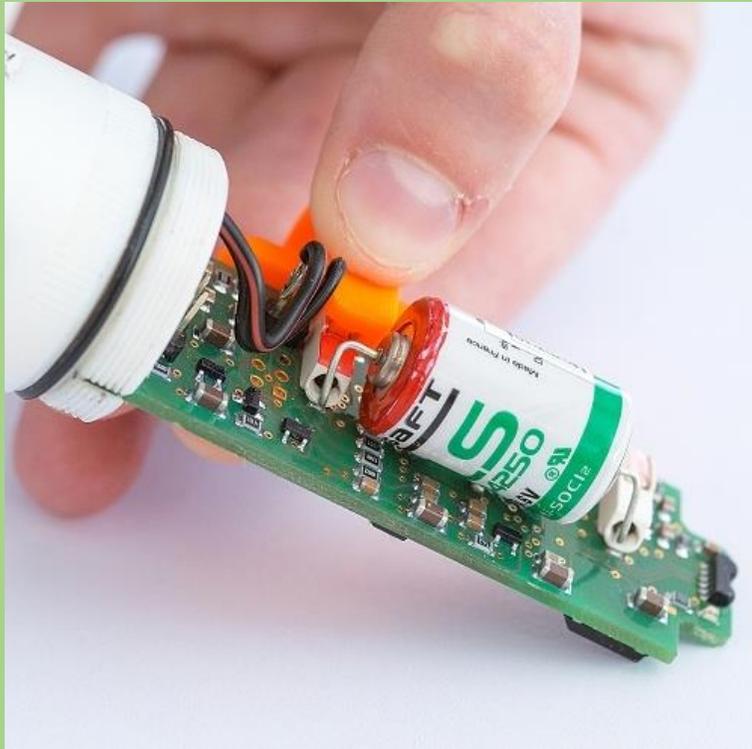
- Remember the battery polarity.
- Use special tool. Insert the tool on the PC board exactly according to pictures.
- Squeeze the tool and remove the battery wire.

Note: The plastic cover of terminals is fragile so they can easy break. Handle with care!



# SCREWLESS TERMINALS - battery inserting

- Use special tool and gently insert the battery terminals
- Notice the polarity – “+” on the battery (in red) and “+” on the PCB.
- It is good idea to write down the time stamp of battery replacement.
- Put new desiccant bag.



# Putting back together

Set the stainless case back over the electronics. Screw it up gently, only by hand. Be careful not to screw "over the thread". For tightening, use the tool the same way as earlier. Loosen up the case for a few degrees after screwing up for later easier release.



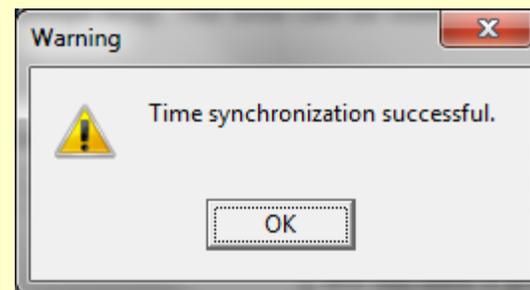
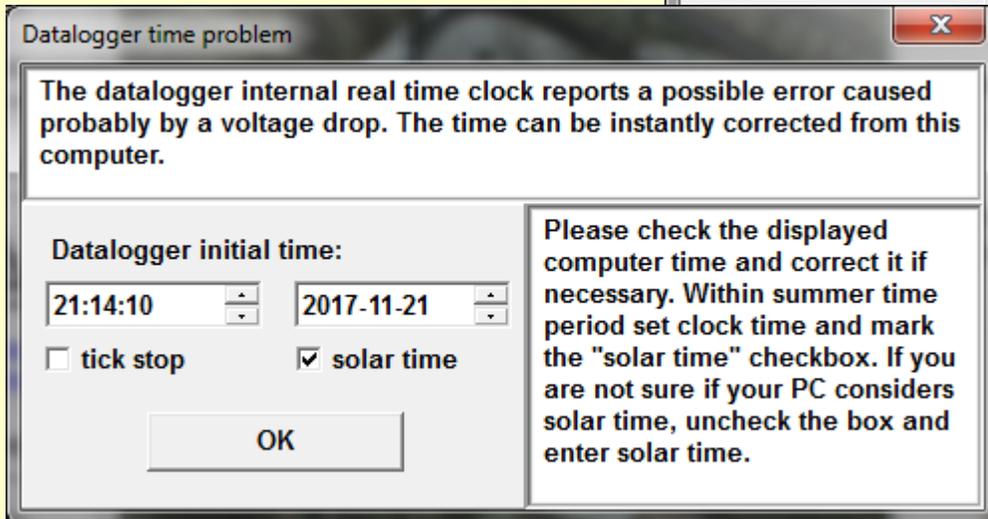
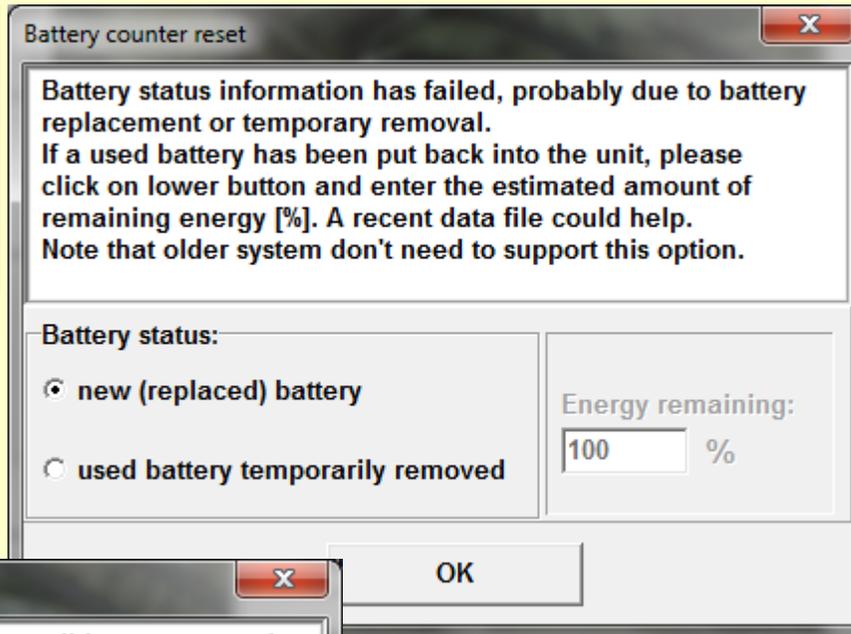
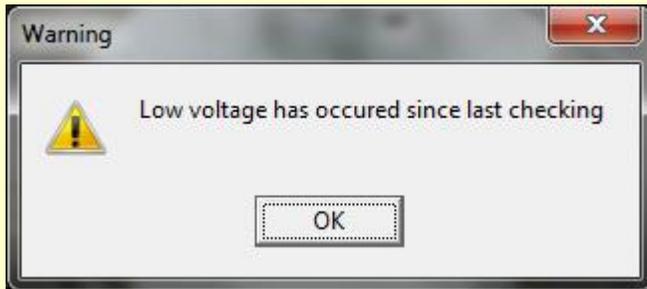
# Final assembling

Put the sensor back to the radiation shield and screw up the nuts.



# Sensor set up

Run Mini32 and go to Configuration. You will pass following windows and messages – just accept them:



# Battery counter

When the battery short circuit has been omitted, you must reset the battery counter manually:  
Configuration > More > Batt. reset.

The screenshot shows the 'Minikin - SETTING UP Mini32 v. 10.2.10.0' window. At the top, there are buttons for 'More >>', 'Get', 'Send', 'Save setup', 'Read setup', 'Capacity info', and 'Close'. Below these are several status and configuration fields:

- PC Time: 08.04.2020 14:52:18  
DL Time: 08.04.2020 13:52:17
- Device type: QTHi  
Device code: 40  
Batt: 3,47 V
- measuring: 4 h  
storing: 4 h
- Battery remains: 95% (approx. 1946 days)  
Memory capacity: 4681 days  
Overwrite ENABLE

Below these fields is a table with the following data:

#	Type	ON/off	Range	Gauge	Description
1.	Voltage	ON	15 mV	PAR [ $\mu\text{mol}/\text{m}^2, \text{sec}$ ]	
2.	Temperature	ON	---	Temperature [ $^{\circ}\text{C}$ ]	
3.	Humidity	ON	---	Air humidity [%]	

# Final check

Go back to Mini32 main screen and press "On-line" button. Check the actual values and all status information. You can also download the data to make sure that nothing happened with memory structure.

The screenshot shows a software window titled "Minikin - DATA HANDLING Mini32 v. 10.2.10.0". The interface includes several buttons: "Actual values" (selected), "Regular reading", "el. values" (with an unchecked checkbox), "PrgmCalc", and "Close". Below these buttons, there are four informational panels:

- PC Time: 08.04.2020 14:54:27  
DL Time: 08.04.2020 13:54:27  
A green "ON" button is located below this panel.
- Device type: QTHi  
Device code: 40  
Batt: 3,47 V
- Periods :  
measuring 4 h / warm-up 0 s  
storing 4 h
- Battery remains: 95% (approx. 1946 days)  
Memory capacity: 4681 days  
Overwrite ENABLE

At the bottom, there is a table with the following data:

#	Type	No. Gauge	Electrical	Physical	Description
1.	Voltage	PAR [ $\mu\text{mol}/\text{m}^2, \text{sec}$ ]	0,0429766	5,80614	
2.	Temperature	Temperature [°C]	1095,11	24,4253	
3.	Humidity	Air humidity [%]	1795,53	29,9134	

**Good luck!**