

# How the TC-Log memory works

A thermocouple sensor is made by a cold spot and a hot spot. The hot spot is the one sensing temperature on the tip of the cable, cold spot is usually a sensor placed internally, in the box of the device, that is usually but not always coldest than the hotspot (that is why is called cold spot). The thermocouple sensor works calculating the difference between the resistance read in the two spots.

TC-Log uses 1 cold spot every 2 sensors. Each sensor has a position from 1 to 8 and the cold spot are placed in this way: for position 1 and 2 there is cold spot 1; for position 3 and 4 there is cold spot 2; for position 5 and 6 there is cold spot 3; for position 7 and 8 there is cold spot 4. This means a total of 12 reading points

Sensor Cold spot	
1	1
2	
3	2
4	
5	3
6	
7	4
8	

Logger has a certain amount of memory which is divided according to the number of the sensors you are using. Consider that the values of the cold spots are saved also so, even if you don't see them and they use less memory than an acquisition from the thermocouples, the logger will save data, and so will use memory, for the cold spots too.

If you use just one thermocouple, no matter in which position, you can record up to 104.855 acquisitions.

## **1 Sensor Only on Position 1 > 104.855 Acquisitions Total**

If you put another thermocouple on a position using the same cold spot, for example you put thermocouples on positions 1 and 2 you will save data from thermocouple 1, thermocouple 2 and their cold spot, because they share the same one. It is 65,534 for each thermocouple

## **2 Sensors Only on Positions 1 and 2 > 65.534 Acquisitions per Sensor (sharing Cold Spot 1)**

And so on.

If you place two thermocouples on two positions not sharing the same cold spot, you will need to record data from two cold spots, so the total is divided by four. You always read only two thermocouples as the example above but since you have placed the sensors on two position that do not share the same cold spot (for example position 1 and position 3), you add an extra sensor (the cold spot for position 3). So, each sensor

1/2



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will record up to 52.427 acquisitions.

## 2 Sensors Only on Positions 1 and 3 > 52.427 Acquisitions per Sensor (recording data from Cold Spot 1 and from Cold Spot 2)

If you use 8 thermocouples it means you are recording data from 8 sensors + 4 cold spots (1 cold spot every two sensors). So you have a total of 12 spots to record and this means 16383 acquisitions per sensor.

There are many possibilities according to where you place the sensors. It is recommended to connect the sensors in sequence (position 1, 2, 3...) and not jump from one to the other, to avoid using memory for cold spots. The software will tell you number of acquisitions and maximum duration of the mission according to acquisition step and which sensors are connected.

Number of active channels	Position of the channels *	Number of acquisitions
1	everywhere	104855
2	adjacent	65534
2	2 not adjacent	52427
3	2 adjacent + 1 more	40329
3	3 not adjacent	34951
4	2 adjacent + 2 adjacent	32767
4	2 adjacent + 2 not adjacent	29126
4	4 not adjacent	26213
5	2 adjacent + 2 adjacent + 1 not adjacent	24965
5	2 adjacent + 3 not adjacent	22794
6	2 adjacent + 2 adjacent + 2 adjacent	21844
6	2 adjacent + 2 adjacent + 2 not adjacent	20164
7	2 adjacent + 2 adjacent + 2 adjacent + 1 not adjacent	18078
8	2 adjacent + 2 adjacent + 2 adjacent + 2 adjacent	16383

\* Adjacent position indicates 2 thermocouples that occupy the channels on the same raw (1-2) (3-4) (5-6) (7-8).



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