BLUE PUCK BATTERY LIFE CYCLE CURVES

BLE PUCK format - Battery life cycle

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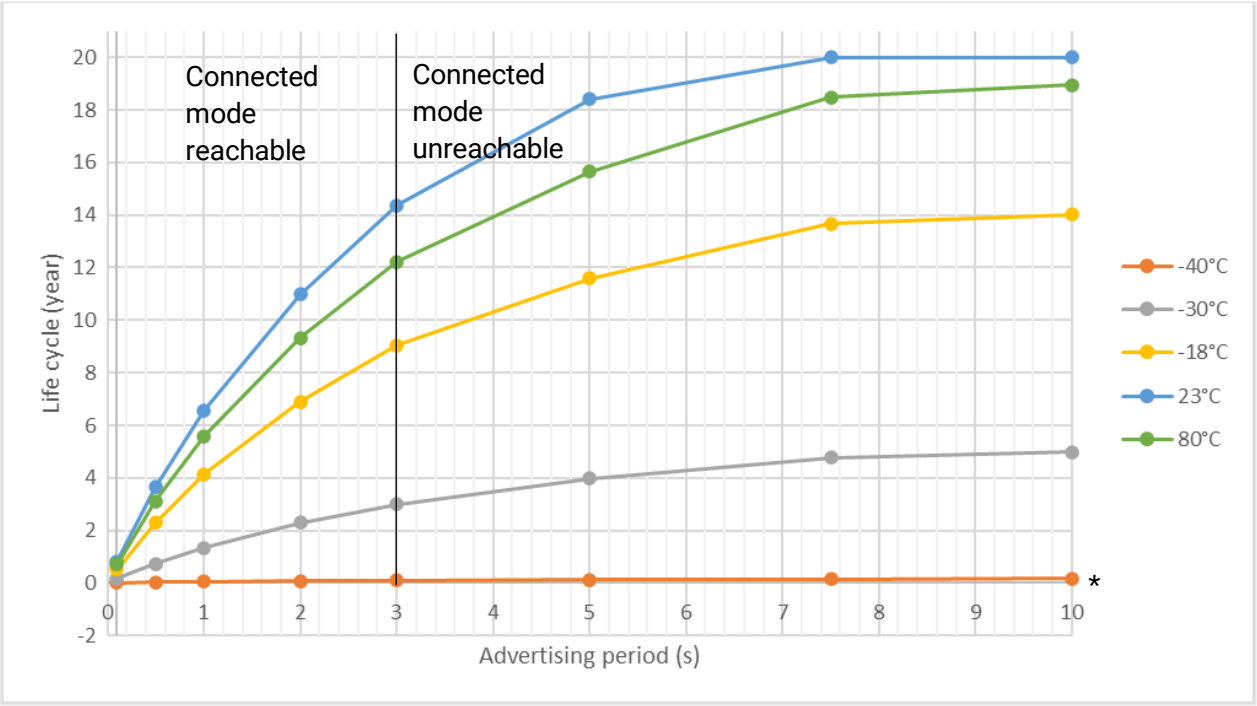
1. ESTIMATED LIFE CYCLE HYPOTHESIS

The autonomy measurements in this document were carried out with the following input parameters:

- ***Products*** : Blue PUCK family : ID / T EN12830 / RHT / MAG / MOV / ANG / DI / BUZZ / T-Probe / PIR
- ***Firmware Version***: v3.x.x
- ***Periodic transmission*** : from 0,1 seconds to 10 seconds
- ***Transmission power*** : 0 dBm & + 4dBm
- ***MAG & MOV format*** : Average of 1 event detect each 30 minutes.
- ***DI format*** : Average of 1 event detect each 30 seconds.
- ***BUZZ format*** : Average of buzzer use once a week, with a duration of 30 seconds.
- ***T EN12830 & T PROBE format*** : Download of 4000 values once a day. One recorded value each 20 sec.
- ***Self discharge*** : A 10% battery capacity discount is applied in the autonomy calculation. The battery's self-discharge and the intrinsic lifespan of its chemical content, limit its use to 20 years, including in storage..

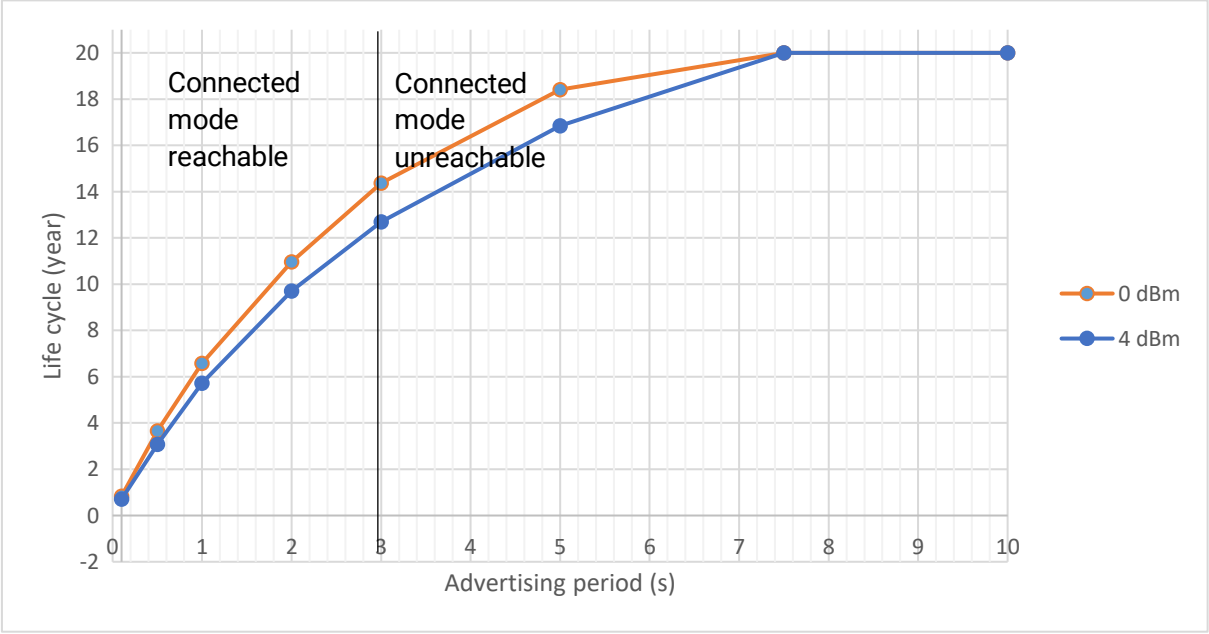
2. BLUE PUCK ID AUTONOMY VS TRANSMISSION PERIOD & TEMPERATURE



* Autonomy at permanent -40°C temperature : 0.09 year at 3s ; 0.16 year at 10s

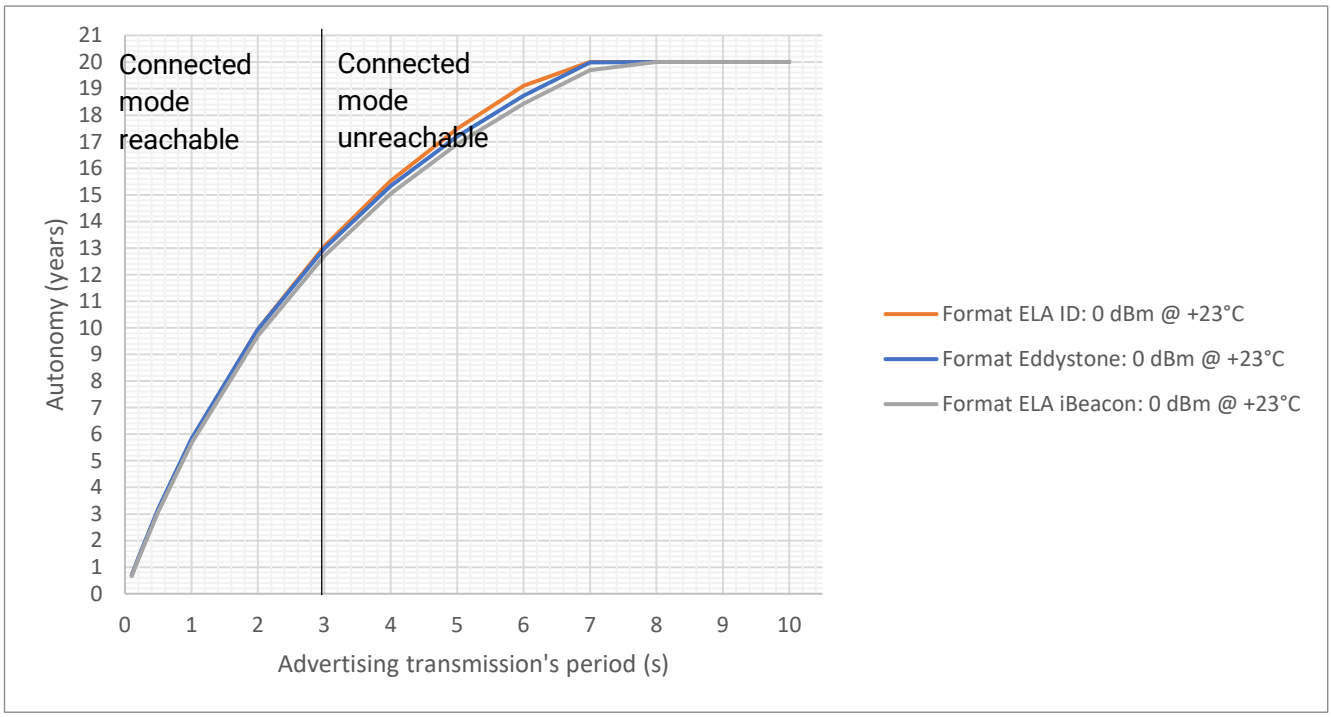
3. BLUE PUCK FAMILY, IMPACT OF THE POWER TRANSMISSION

Reference: Blue PUCK ID at 23°C and 0dB (see reference curve in part 2)



4. BLUE PUCK FAMILY: IMPACT OF THE FRAME FORMAT

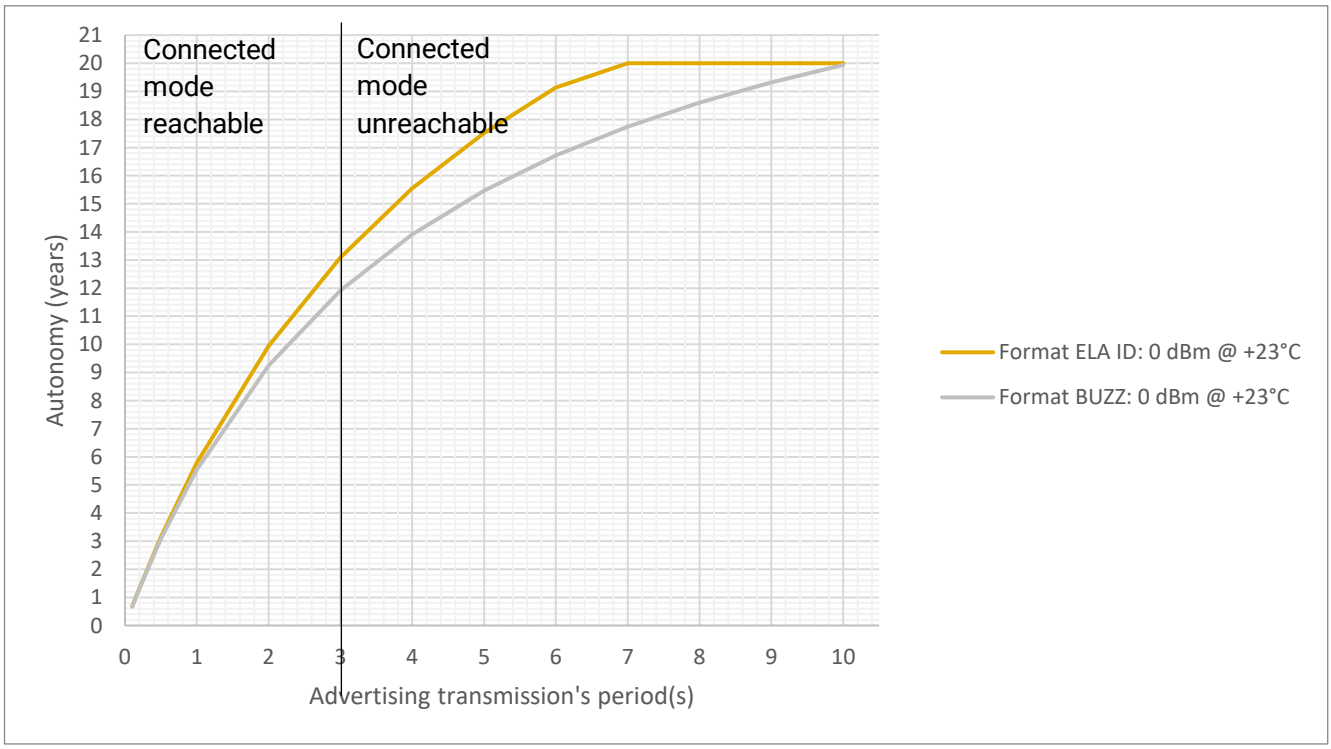
Reference: Blue PUCK ID at 23°C and 0dB



5. BLUE PUCK BUZZ: IMPACT WHEN THE BUZZER IS USED

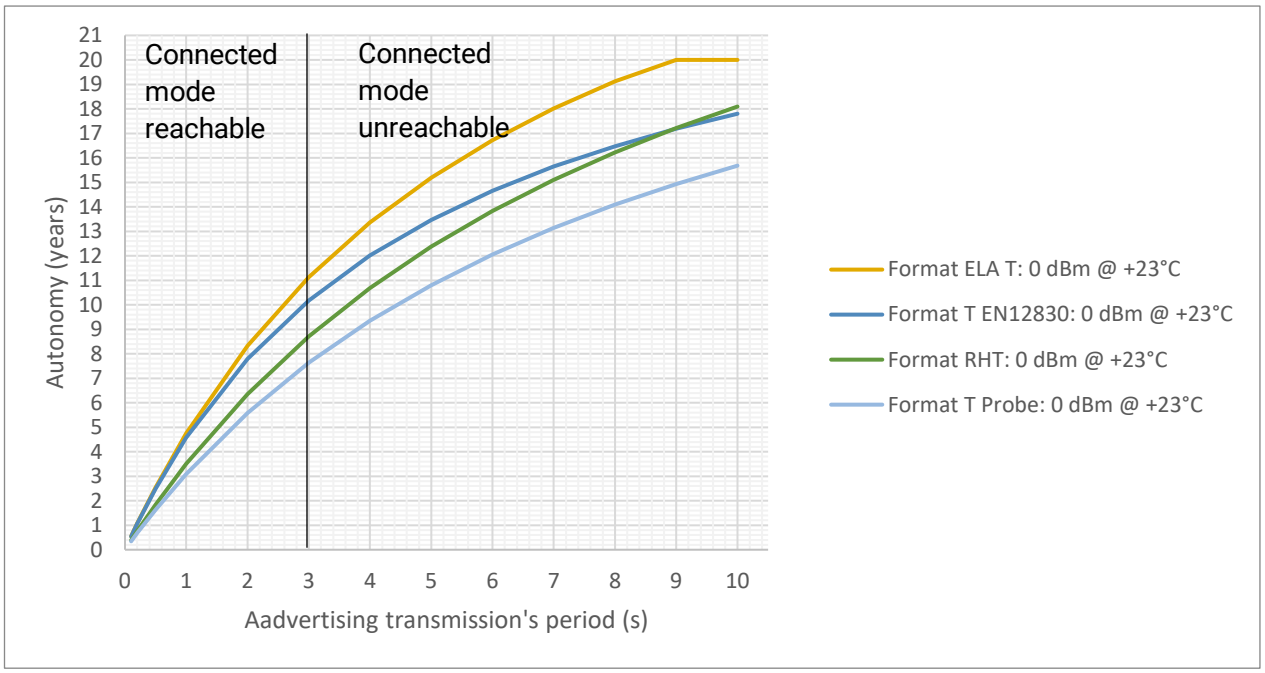
Reference: Blue PUCK ID at 23°C and 0dB, the buzzer is used once a week during 30 seconds.

The buzzer function is unreachable if the transmission period is higher than 3 seconds.



6. BLUE PUCK T EN12830, T-PROBE, RHT AUTONOMY VS TRANSMISSION PERIOD

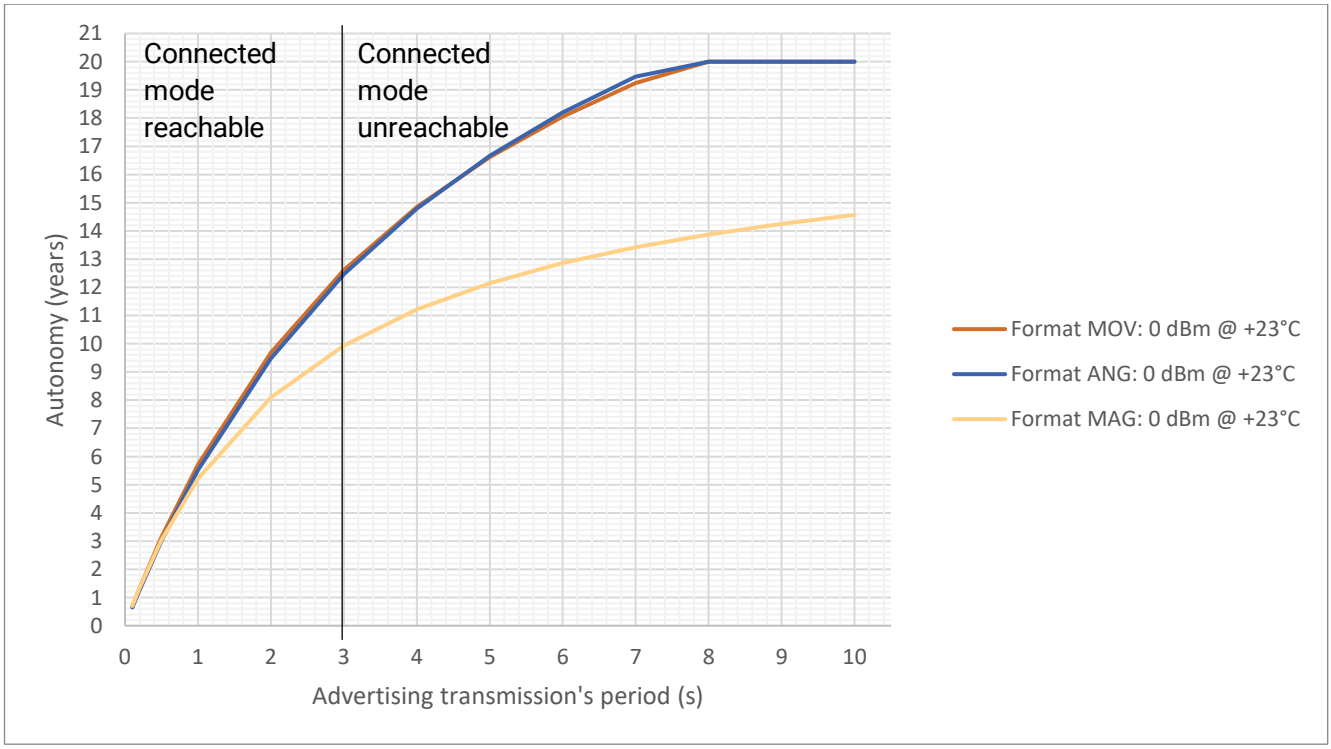
Reference : 0dB and 23°C



Note : In order to evaluate the influence of temperature or power transmission, please refer to part 2 and 3 with Blue PUCK ID reference

7. BLUE PUCK MOV & BLUE PUCK MAG AUTONOMY VS TRANSMISSION PERIOD

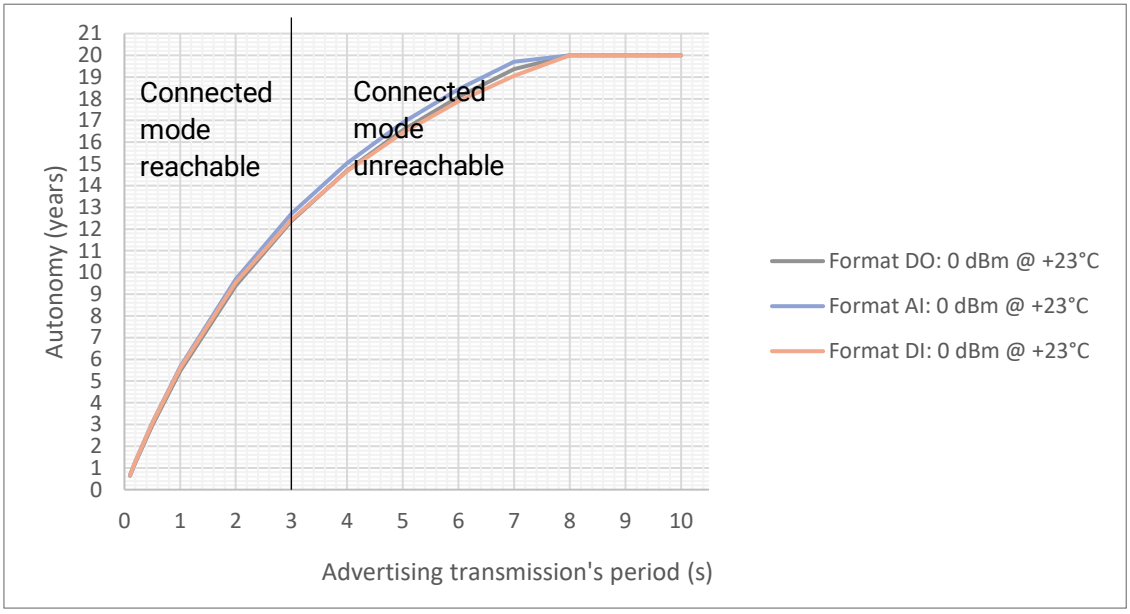
Reference : 0dB and 23°C



Note : In order to evaluate the influence of temperature or power transmission, please refer to part 2 and 3 with Blue PUCK ID reference

8. BLUE PUCK DI, AUTONOMY VS TRANSMISSION PERIOD

Reference : 0dB and 23°C



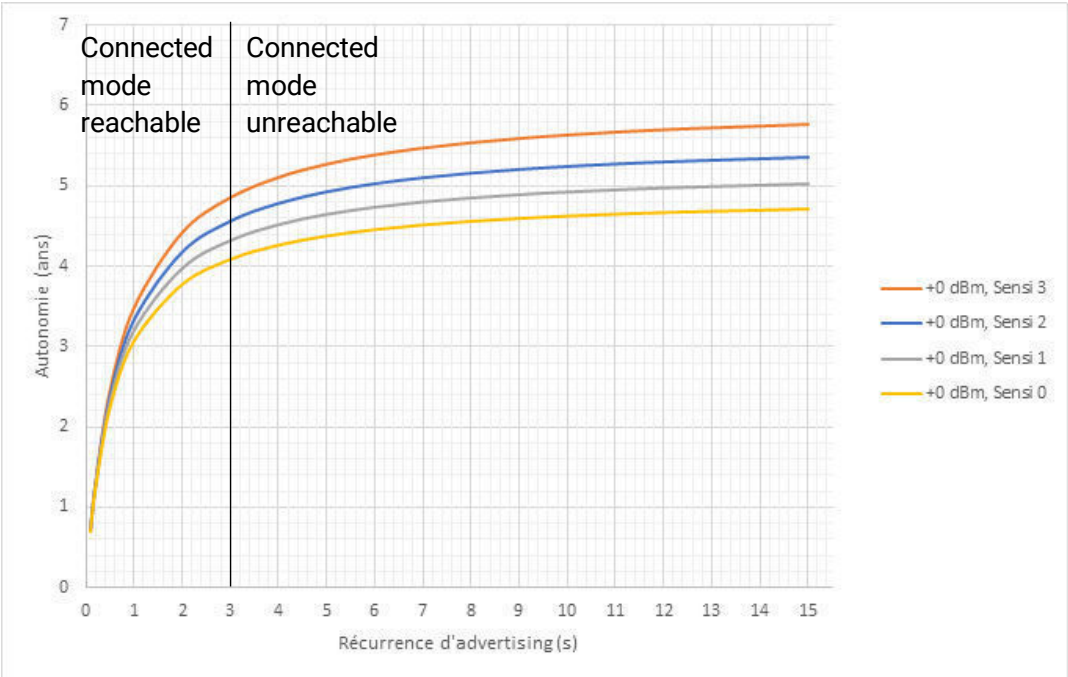
Note : In order to evaluate the influence of temperature or power transmission, please refer to part 2 and 3 with Blue PUCK ID reference

9. BLUE PUCK PIR AUTONOMY VS TRANSMISSION PERIOD AND SENSITIVITY

The sensitivity level of the PIR sensor is defined by 4 maximum detection distance as following :

- Sensi 0: 50cm ;
- Sensi 1: 1m ;
- Sensi 2: 2m ;
- Sensi 3 : 5m

Reference : 0dB and 23°C



Note : In order to evaluate the influence of temperature or power transmission, please refer to part 2 and 3 with Blue PUCK ID reference

10. BLUE PUCK FAMILY : IMPACT OF THE TEMPERATURE AND THE POWER TRANSMISSION

Here is a simple method in order to evaluate the impact of the temperature and the power transmission on the battery life of the Blue PUCK family:

1. Read the autonomy chart at the reference 0dB and 23°C of the product concerned.
2. Read the autonomy chart at the reference product BLUE PUCK ID in the same conditions in part 2.
3. Read the autonomy chart at the reference product BLUE PUCK ID in new conditions in parts 2 and 3.
Note that it could be done in 2 steps.
4. Calculate the battery life reduction of the product concerned.
Note that it could be done in 2 steps.
5. Apply this reduction to the product concerned.

Example : Battery life cycle of the Blue PUCK T PROBE at 3s, 4dB and -30°C :

1. Read the autonomy chart at the references **0dB** and **23°C** of the Blue PUCK T PROBE**: 7.5 y**
2. Read the autonomy chart at the reference product BLUE PUCK ID in the same conditions in part 2**: 14y**
3. Read the autonomy chart at the reference product BLUE PUCK ID in new conditions in parts 2.
Note that in this case it is done in 2 steps :
   - Life duration at 0db, -30°C : **3y**
   - Life duration at 4dB, +23°C : **12.5y**
4. Calculate the battery life reduction of the product concerned.
Note that in this case it is done in 2 steps :
   - Impact of the temperature : 14/3= 4.666. Life cycle at -30°C is divided by **4.666**
   - Impact of the power transmission : 14/12.5 = 1.12. Life cycle at 4dB is divided by **1.12**
5. Apply this % of reduction to the product concerned: 7.5/4.666/1.12 = **1.4y.**

Battery life cycle of the Blue PUCK TPROBE at 3s, 4dB, -30°C is 1.4y