connected data logger

Data access has never been easier

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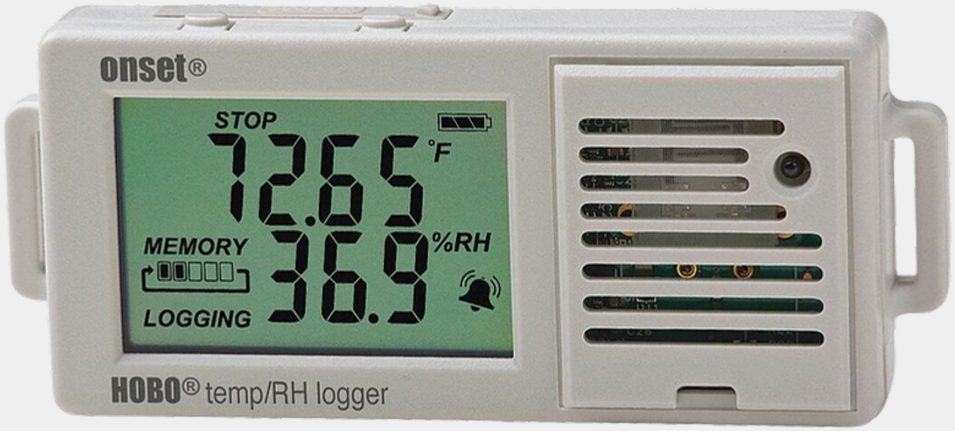
As a French student in my 4th year of engineering school, I mainly study embedded systems. I'm also treasurer of my school's robotics club.

I'm doing my 3-year apprenticeship at exail Aerospace as an embedded software engineer.

In order to get my diploma, I have to do a 3-month internship abroad. To do this, I applied to the MITACS program, which sent me to do my internship with Michael Beck.

Present situation



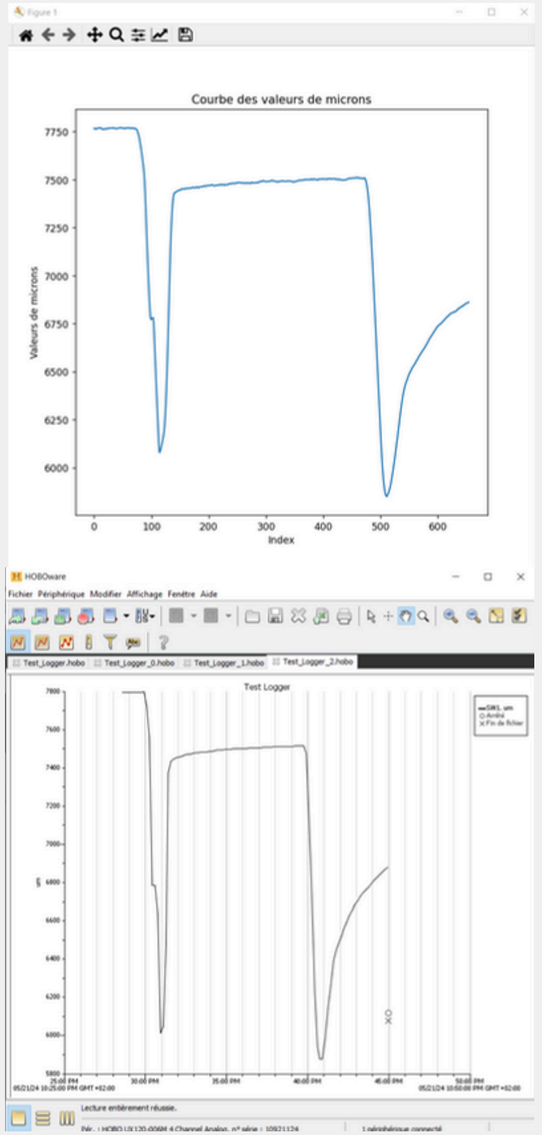
01 Dr. Jay Maillet is currently measuring the influence of the environment on Canadian trees.

02 To do this, he needs to install his sensors and the device that will record the measurements in the field. He must therefore make two expeditions lasting several days a year to collect the data.

03 The main problem is that he can't analyze the results live, which isn't practical for his work.

Our solution

We decided to reproduce the proprietary module used to communicate with it remotely.



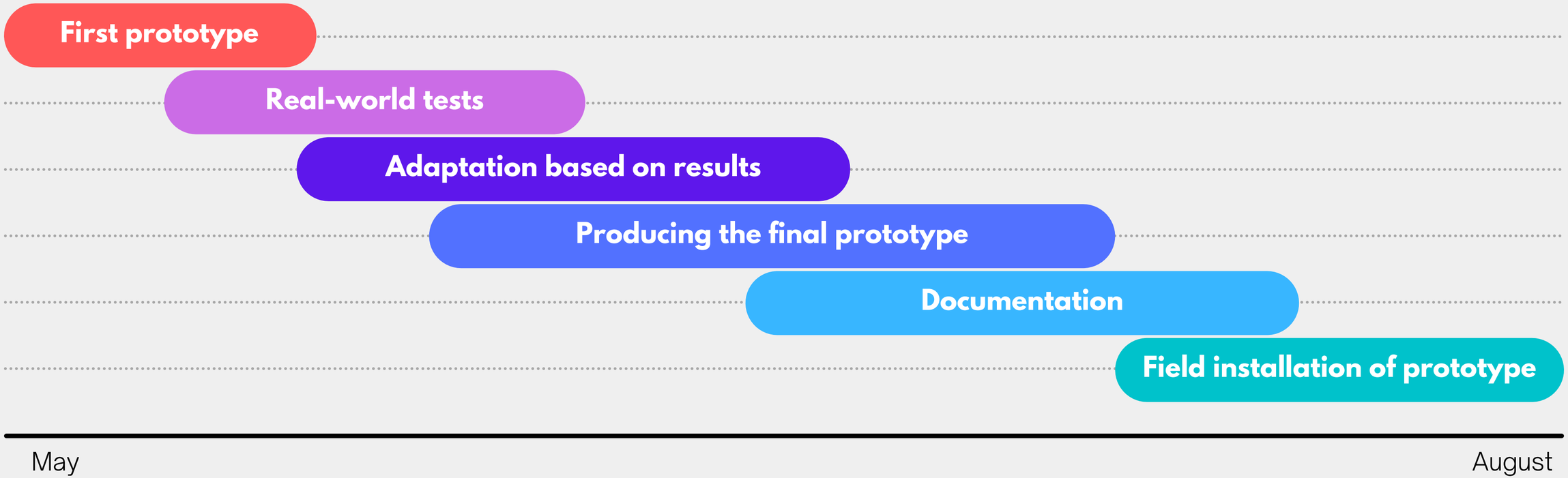
01 For this we have chosen a radio protocol (Lora) that can communicate up to 20 km away.

02 The manufactured module has reached the same level of precision as the proprietary module

03 However, many tests remain to be carried out (autonomy, cold resistance...).

Provisional schedule

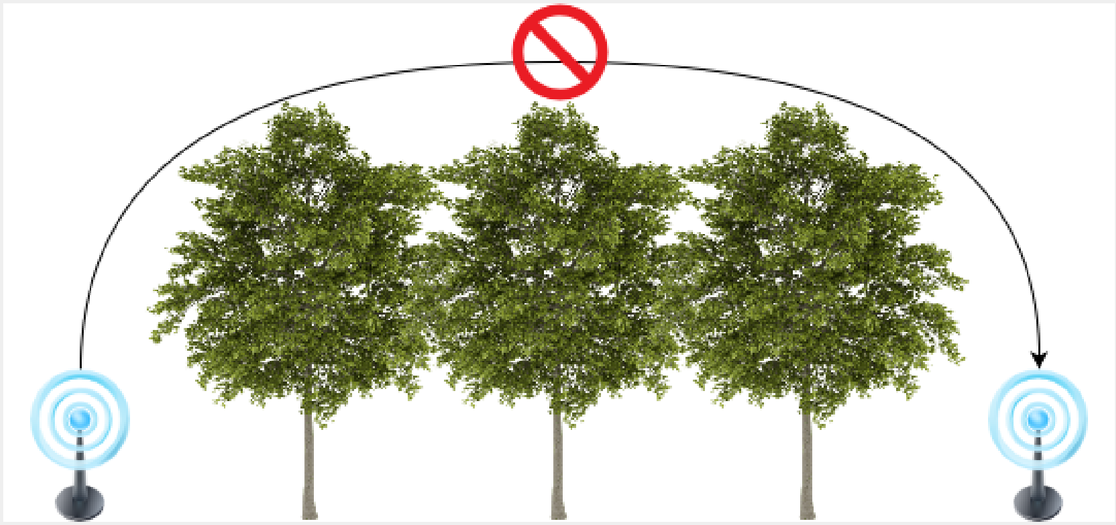
Expected delivery of each feature.



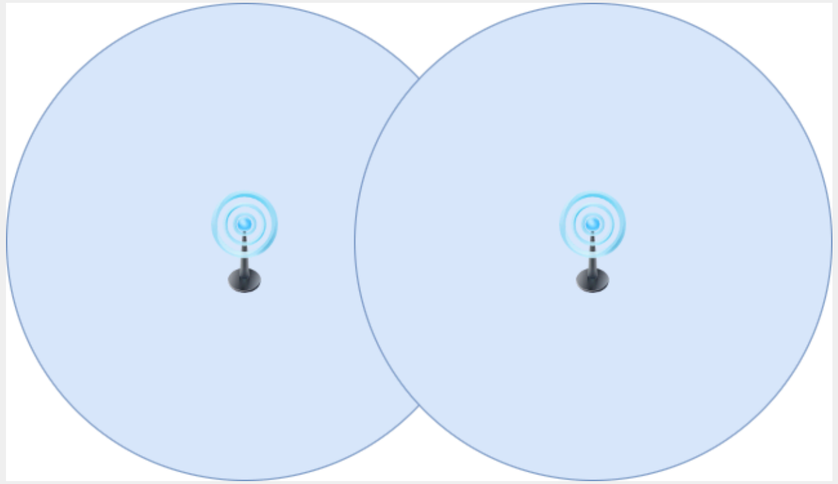
NOTE: Subject to revision.

Problems

Following our first expedition in the forest, we were able to test the operation of our system.



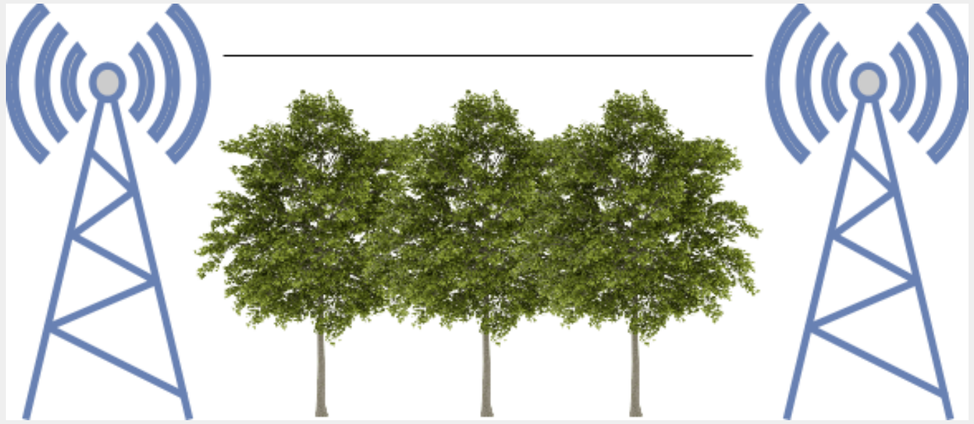
01 Our tests in the forest showed that the Lora signal didn't travel well in the forest, fading after a few hundred meters.



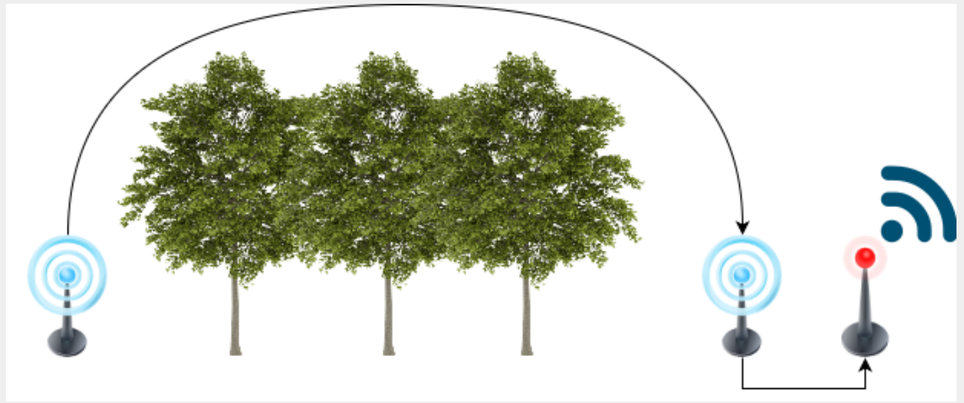
02 The antennas used are omnidirectional, meaning they transmit in all directions with the same power. However, this is not the most suitable method of transmission.

New solutions

To address these issues, we did some research and chose three possible solutions:



01 Place the antennas above the treetops, because trees block the signal, so the antennas should be placed above all obstacles. For signal transmission up to 10km.



02 We can also use cellular data transmission to transmit data over long distances and Lora to communicate sensor nodes with the sending node.

03 The last solution is to use directional antennas, which transmit more power in a given direction.


Search or jump to...
cmd+k
Home › Dashboards › Website performance
Memory / CPU
8 B
6 B
4 B
2 B
0 B
6%
5%
4%
3%
2%
1%
0%
16:50
17:00
17:10
17:20
17:30
17:40
memory
cpu
logins
Last 20 minutes
70
60
50
40
30
20
10
17:30
17:35
17:40
17:45
logins
logins (-1 hour)
Memory
114 B
Google hits
57.1
Support calls
84.9
Sign ups
283
server requests
150
100
50
0
16:50
16:55
17:00
17:05
17:10
17:15
17:20
17:25
17:30
17:35
17:40
17:45
web_server_01
web_server_02
web_server_03
web_server_04
Google hits
0.400
27.7
37.1
66.5
21.2
A-series
B-series
C-series
D-series
E-series
client side full page load
5 s
4 s
3 s
2 s
1 s
0 ms
16:50
16:55
17:00
17:05
17:10
17:15
17:20
17:25
17:30
17:35
17:40
17:45
avg
upper_25 6.81 ms
upper_50 142 ms
upper_75 535 ms
upper_90 1.04 s
upper_95 1.46 s