TRACTIAN

# Hardware R&D - Challenge

*Welcome to the fastest growing industrial startup in Latin America and thank you for your interest in joining us.*

This is a challenge we from the Hardware Team developed in order to understand better your skills and your role with us.

Your goal here is to develop a **full wireless communication system**. We want to evaluate your abilities to project, design the PCB and program everything from scratch. The main objective is to send a 500 kB file from a 100 m open-air gap, using at least one battery powered device.

The challenge is divided into three major tasks:

**1 - Sketch it up!**
Grab a pen and some paper and start drawing. Choose the transmitter and other relevant electronics and gather them in a schematic. We recommend using KiCAD, but feel free to use your favorite one.

**2 - It's layout time**
Place the components you chose in a PCB using CAD software. Remember to rely on some layout guidelines. Again, we recommend KiCAD for this. Oh, we would love to see the board in 3D!

**3 - Write some code!**
What are the most important functions your firmware relies on? How is the microcontroller routine? We strongly recommend you to follow the famous Arduino prototype, with Setup() and Loop() functions.

**Take a deep breath!** We know it's a lot to process, but don't worry! You can spend more time on one task or the other, depending on how much experience you have in each one. The whole project will be evaluated as one, but we prefer you to dive deeper in one of them than keep everything too obvious.

We have numbered a few key points for you to keep an eye on:

- Market availability: do your components still get manufactured nowadays or have they become legacy in the 80's?
- Power consumption: do not draw your sword to kill a fly. Watch those extra milliamps!
- Design is not only about the looks: anticipate the case. Are there any external components, like antennas? If so, do they fit in the available space?
- User experience: does the user need to solve a Rubik's cube in order to use your system? Keep it simple, keep it elegant.

**Make it public.** Use GitHub for that. Remember to document everything you think is relevant in the Readme page. Why you chose the components you did, why you did (or did not) add something in the firmware, and so on. You can even propose some case designs or production methods. Own it. Every detail counts.

Do not hesitate to contact us shall any question emerge! When you are ready, just send us the link and that's it! Go grab some coffee and we will be in touch.

***Go for it!***