



# All-in-One Compact Telemetry and Communication Device

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## Introduction

- ❖ The aim of this project is to design a telemetry system.
- ❖ In this telemetry system, a Bluetooth hardware and a Wi-Fi module will be used to provide communication.
- ❖ A mobile software will be used to monitor and send data remotely to mobile devices and cloud system.
- ❖ It is aimed to use many different sensors in the project.
- ❖ It is aimed to create new solutions on smart home technologies and IoT based new engineering and technology areas.
- ❖ This project is just like a Swiss army knife for portable IoT solutions.

## Specifications and Design Requirements

- ❖ The project design includes processing 13 different data from 11 different sensors,
- ❖ Provides Bluetooth and Wi-Fi connectivity options,
- ❖ It has a strong case to protect the body of the device from impacts,
- ❖ It has a microcontroller that can control all the components on the system and has a low power mode,
- ❖ All parts of the device should be as modular as possible, stable, price-performance product and long-lasting components.
- ❖ Specifications of our solution are all the features that we mentioned above and also the power management system may be redesigned as battery working which makes possible being portable.

## Solution Methodology

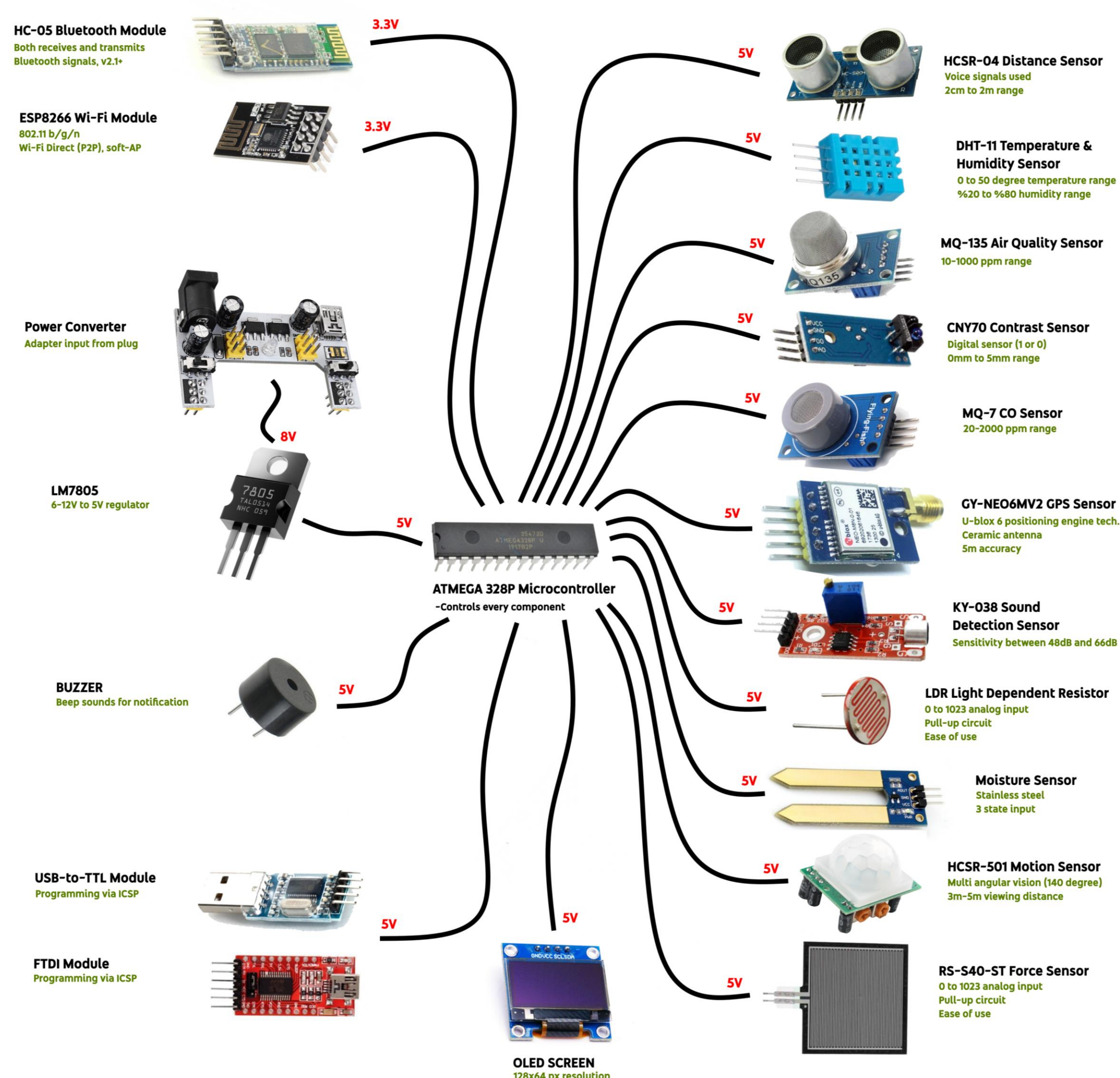


Figure: An Overall Description of the Project Components.

- ❖ Our solution should be as compact as possible. Due to the high number of components in the circuit, we designed two different PCB boards and assembled the system together.
- ❖ In order to protect our design from external influences, we designed a case using plexiglass material.
- ❖ In our journey from design to a final product, we implemented the embedded system design process step by step.

## Application Areas

- ❖ This device is extremely low cost and versatile compared to its competitors and can be used in numerous areas such as home automation, mining industry, health care, smart farming, security.

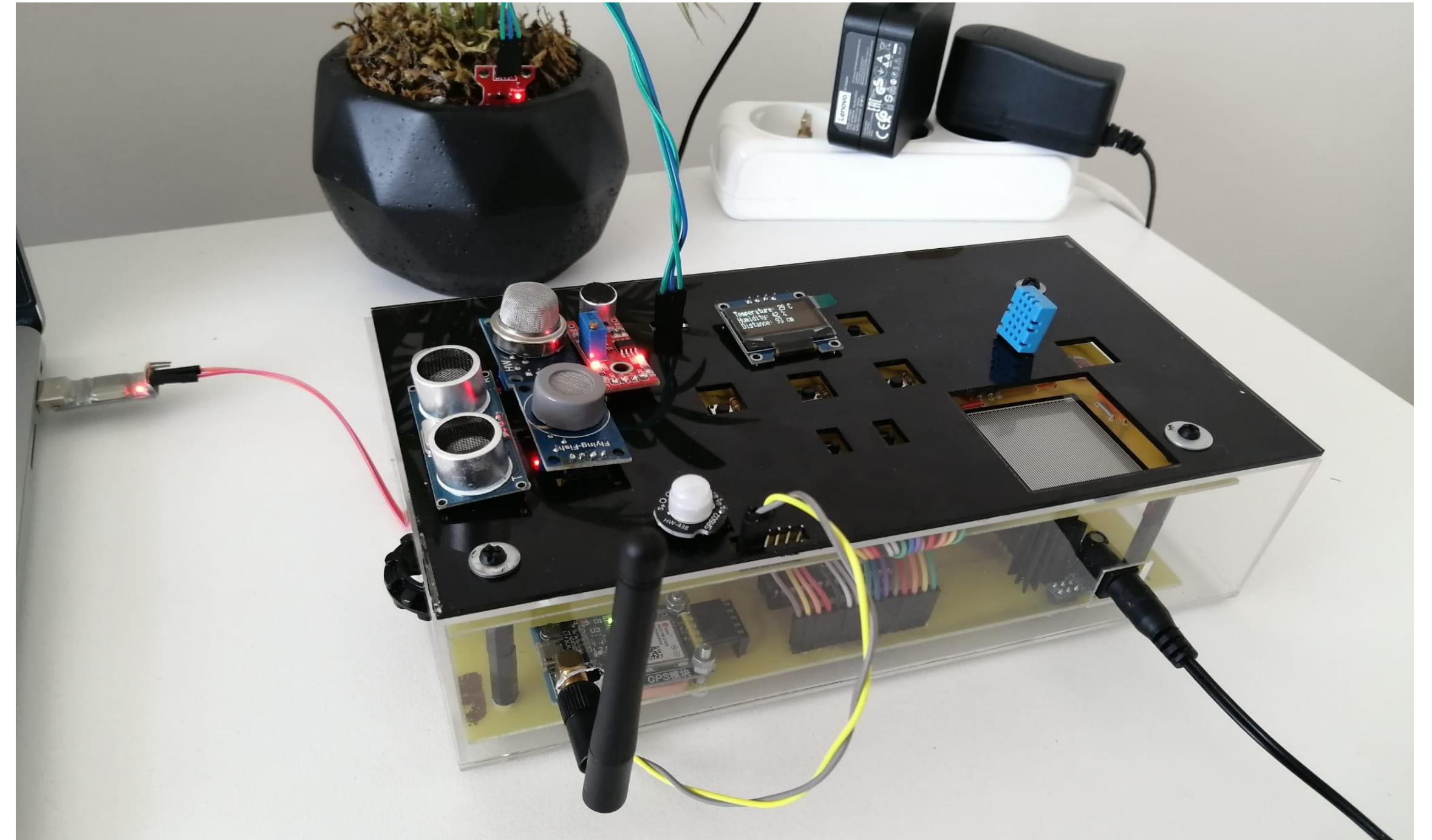


Figure: Example Usage of Project for Smart Farming.

## Results and Discussion

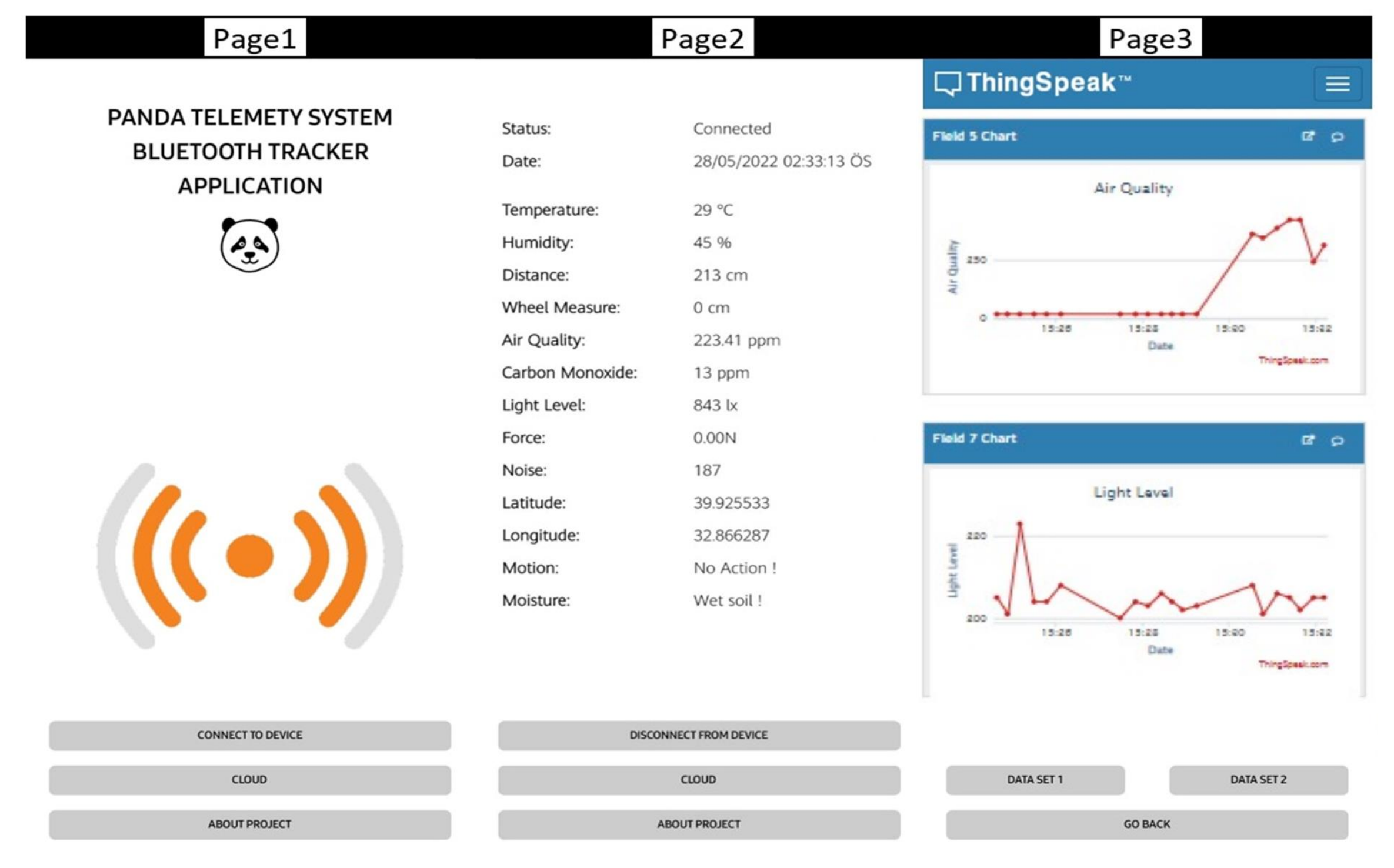


Figure: Panda Telemetry Android Application.

- ❖ Our device can instantly present the sensor data it collects to the user with the OLED on it.
- ❖ A Bluetooth application has been developed within the scope of the project.
- ❖ It can transmit sensor data wirelessly with its Bluetooth application and integrated cloud service.

## References

- ❖ Brian Kopp, "Industrial telemetry", in Telemetry Systems Engineering, pages 493-524, Artech House, 2002
- ❖ Chris Nagy, "Embedded Systems Design", in Architecture: CPU and Memory, pages 12-24, Elsevier Science, 2003.

## Acknowledgements

- ❖ This project was completed within the context of ELE401-401 Graduation Project courses in Hacettepe University, Faculty of Engineering, Department of Electrical and Electronics Engineering.
- ❖ We thank Prof. Dr. Ali Ziya Alkar for his invaluable contributions to our project.