



Universität  
Bremen

Sustainable  
Communication  
Networks

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# Arduino Lab Exercise

Using the MoleNet Platform to Send Environmental Data  
over WLAN

Internet of Things – SoSe 2025

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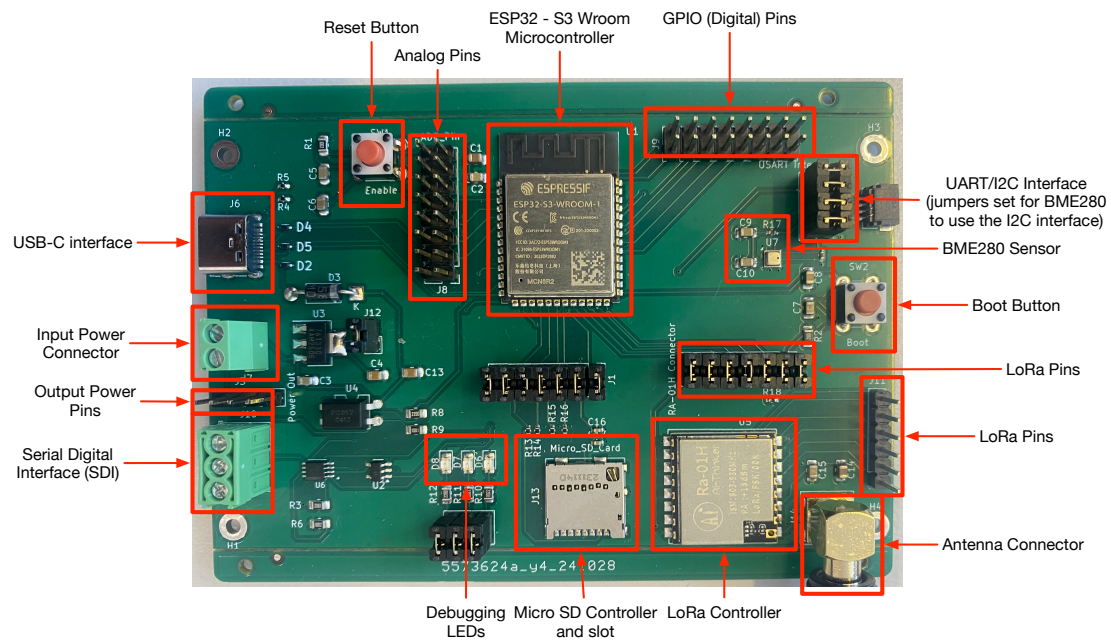
comnets

# Goals of the Lab Exercise

- Setup the built-in sensor of a MoleNet device to collect environmental data (temperature, humidity, pressure, and altitude);
- Establish a link between the MoleNet device and a WLAN Access Point to obtain a DHCP-based IP address;
- Setup a communication path between the MoleNet device and a server residing in the Internet;
- Communicate the collected environmental data at the MoleNet device to the server regularly.

# Primary Hardware Used

→ MoleNet platform based on an ESP32 with built-in sensing and communication capabilities



MoleNet Platform (board, device)

# Summary of Lab Tasks

- **Part 1:** Set up four Arduino programs and observe the output.
- **Part 2:** Combine the functionality of the programs and send environmental data in UDP packets.
- **Part 3:** Modify the program developed in Part 2 to generate the altitude and send data in TCP packets.
- **Part 4:** Submit a four-page report about the work.

# Technical Information to Remember

## → WLAN

- SSID: CN-Students
- Password: CnStudentsWiFiAccess123

## → Server

- Address: 192.168.0.113
- UDP Port: 9980
- TCP Port: 9990

## → Work in groups

- Fill form with your names, matriculation numbers and email addresses

## → Request your data from the supervisors

- Collected UDP and TCP data are sent over your email addresses

# Administrative Information to Remember

## → Duration

- You have time only till 12:45 (server shutdown)
- Try to complete all the in-class parts

## → Show your work to a supervisor

- After completing each part, show it to a supervisor

## → Computer to use

- Use a computer that was verified at the ComNets Lab
- Use your own USB cable

## → Report submission

- Report must be submitted in a week

## → Grading

- Graded only for the parts that you have completed