

Environmental and Climate Data Station - Hardware

Project status: June 2026 (Project start: SEP. 2025)

A separate Raspberry Pi Pico 2W is used for **each** sensor.

Each Pico has an OLED display SSD1306.

OLED connector (for all modules):

SDA -> GP14 / PIN19

SCL -> GP15 / PIN20

1. Fine dust measurement

Sensor: **SDS011**

Connection via UART0

SDS011 TX -> GP1 / PIN2

SDS011 RX -> GP0 / PIN1

Status: OK with Wi-Fi Folder: Fine dust

2. CO measurement

Sensor: **MH-Z19C**

Connection via UART0

MH-Z19C TX -> GP1 / PIN2

MH-Z19C RX -> GP0 / PIN1

Status: OK with WLAN Folder: CO2+

3. Radioactivity

Version 1: with temperature/humidity measurement

Radioactivity Sensor: **RadiationD-V1.1 (CAJOE)**

Direct connection to GP17 / PIN22 + 10k pullup led to problems.

Solved with additional 74ALS00: Circuit: (deprecated, for reference only, see version 2)

74ALS00 Pin 1 -> LED D23

74ALS00 Pin 2 -> +5V

74ALS00 Pin 3 -> GP16

Additional sensor: **BMP280** , Air pressure (+ temperature)

Connection: SDA -> GP0 / PIN1 / SCL -> GP1 / PIN2

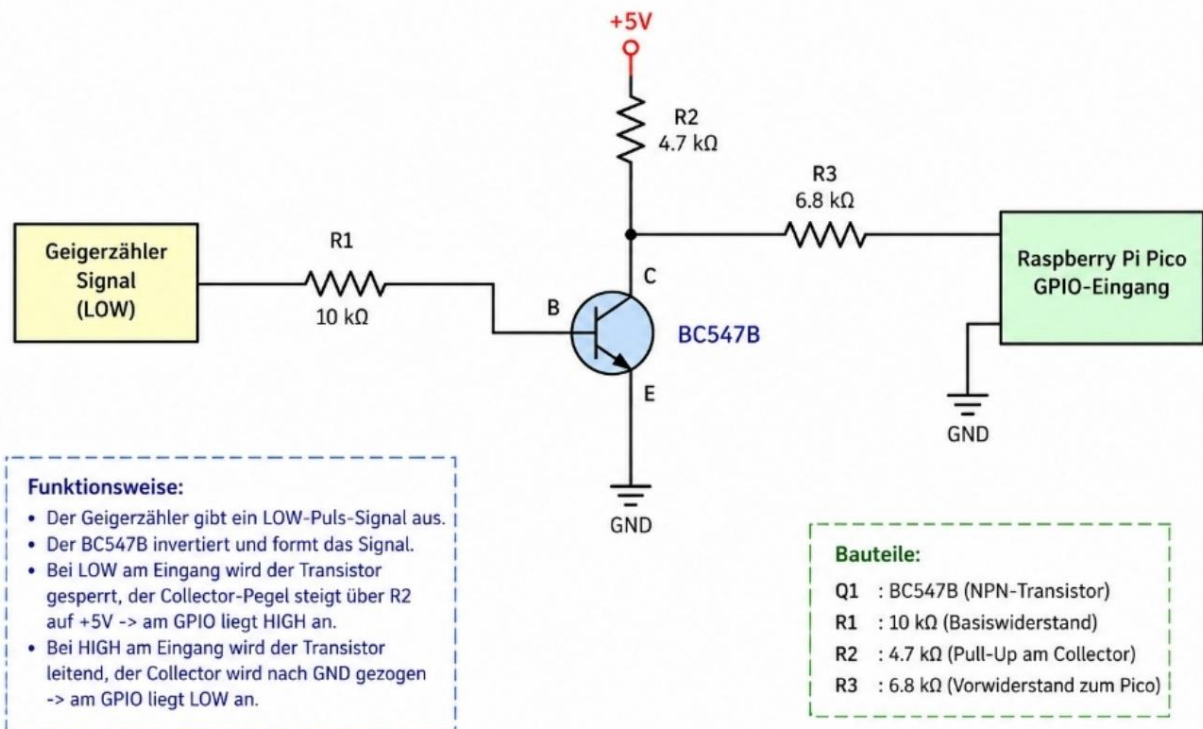
Software in folder: Version-4/Geiger/

Version 2:

The level adjustment was significantly simplified using an NPN transistor **BC547B** as follows :

Geigerzähler mit BC547B an Raspberry Pi Pico anschließen

NPN-Transistor als Pegelanpassung und Signalformer



Pico Input: GP17, software remains unchanged as in **version 1**

New: Radiation station with additional sensor **LTR390UV**

Connection: SDA -> GP0 / PIN1 / SCL -> GP1 / PIN2

Software examples in the Extensions/UV+GAS folder

Radiation station software in the Geiger-UV folder

4. Air pressure/temperature/humidity - measurement with sensor **BME 680**

For Station 2 only

SDA -> GP1 / PIN1

SCL -> GP2 / PIN2

Status: OK with Wi-Fi

5. Wind/water/air pressure with **WS3 Weather module 3**

Required: suitable weather station kit, e.g., DFRobot [model](#)

https://www.dfrobot.com/product-1308.html?gad_source=1&gad_campaignid=22392107167&gclid=EAlalQobChMIqICqhIn-kAMVJqX9BR149ATiEAAYASAAEgJ81_D_BwE

Connection via UART0

WS3- TX -> GP1 / PIN2

WS3-RX -> GP0 / PIN1

Status: OK with WLAN, = Version V4.1 with debug option and formatted output

6. Data transfer via **WLAN**

Notice

This project was created in collaboration with ChatGPT (GPT-5, OpenAI).

The complete technical discussion, code examples and circuit instructions were developed in a private chat history starting in November 2025.

Project reference: **PDP11GY-ENV-PICO-2025**

The complete chat history can be provided upon request.

Contact: **info@pdp11gy.com**
