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# Preliminary Design Review

## C755 Special Computer Engineering

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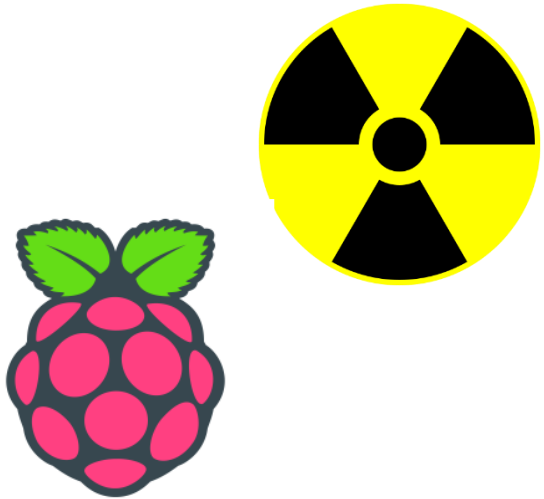
Hochschule für Technik und Wirtschaft Berlin
University of Applied Sciences

# Content

- 1. Introduction
- 2. Functional Description
- 3. Physical Description
- 4. Description of Interfaces

# Introduction

- **Mission Raspberry**
  - Prüfung der Einsatzfähigkeit Raspberry PI 3
  - Strahlenverträglichkeit der CPU im Erdorbit
  - Setzen von Bits in Registern
  - Strahlung messen
  - Prüfen der Register



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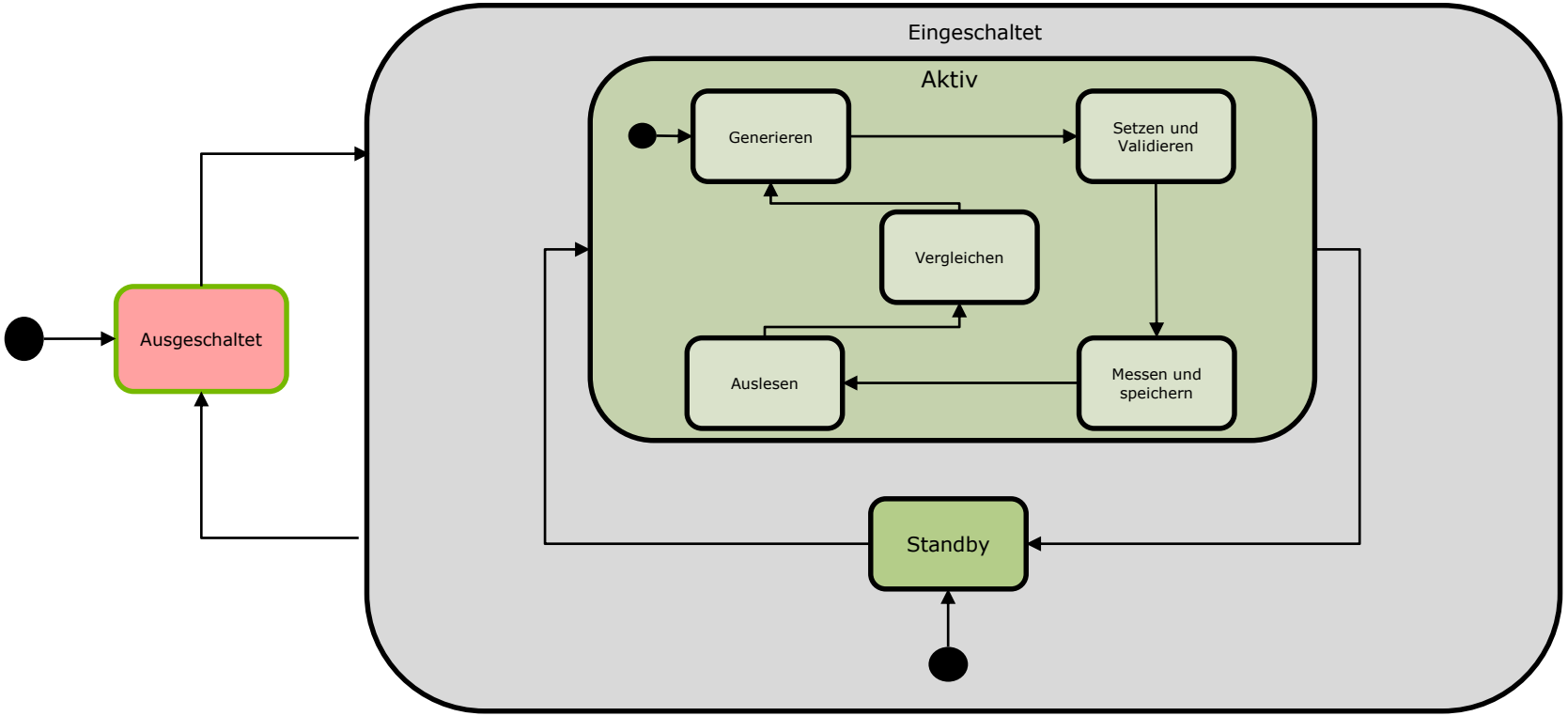

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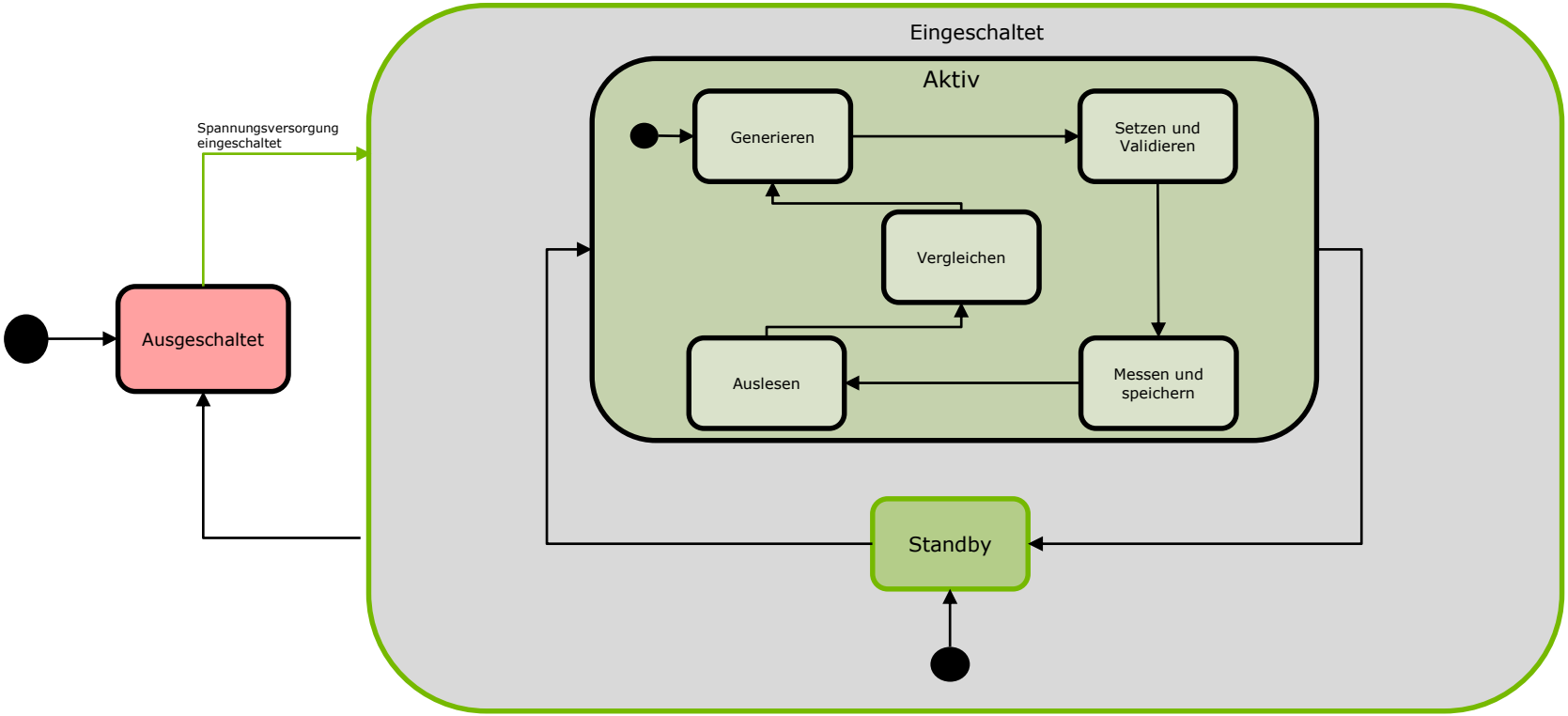

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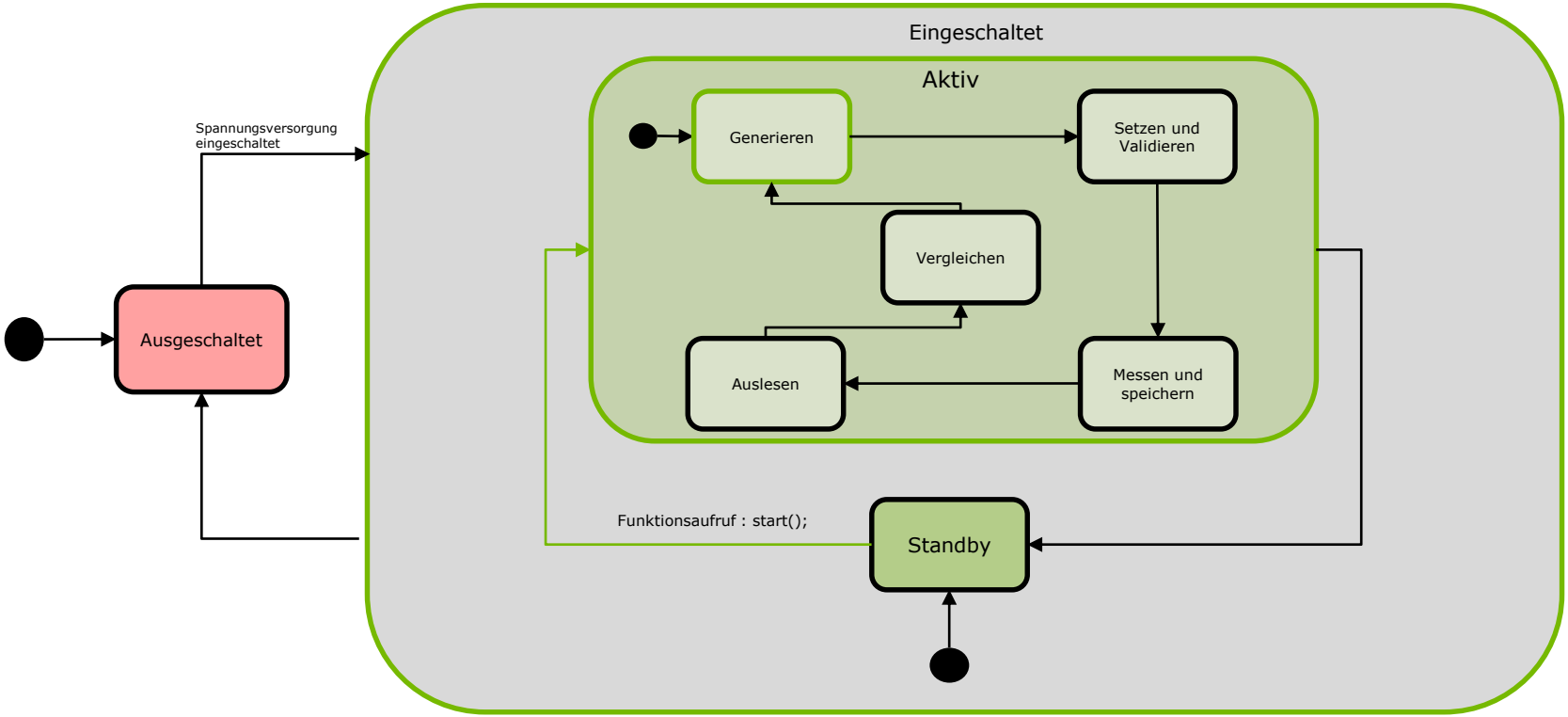

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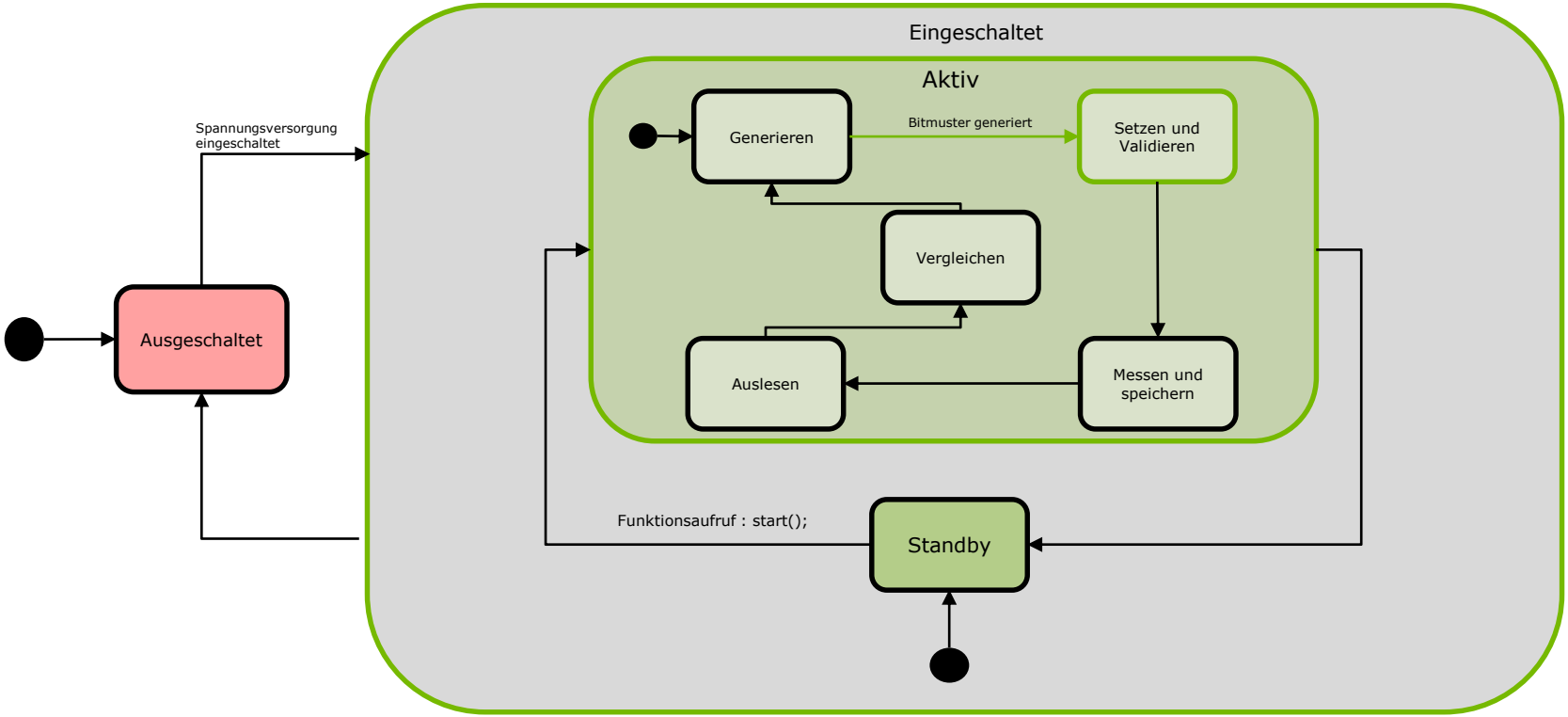

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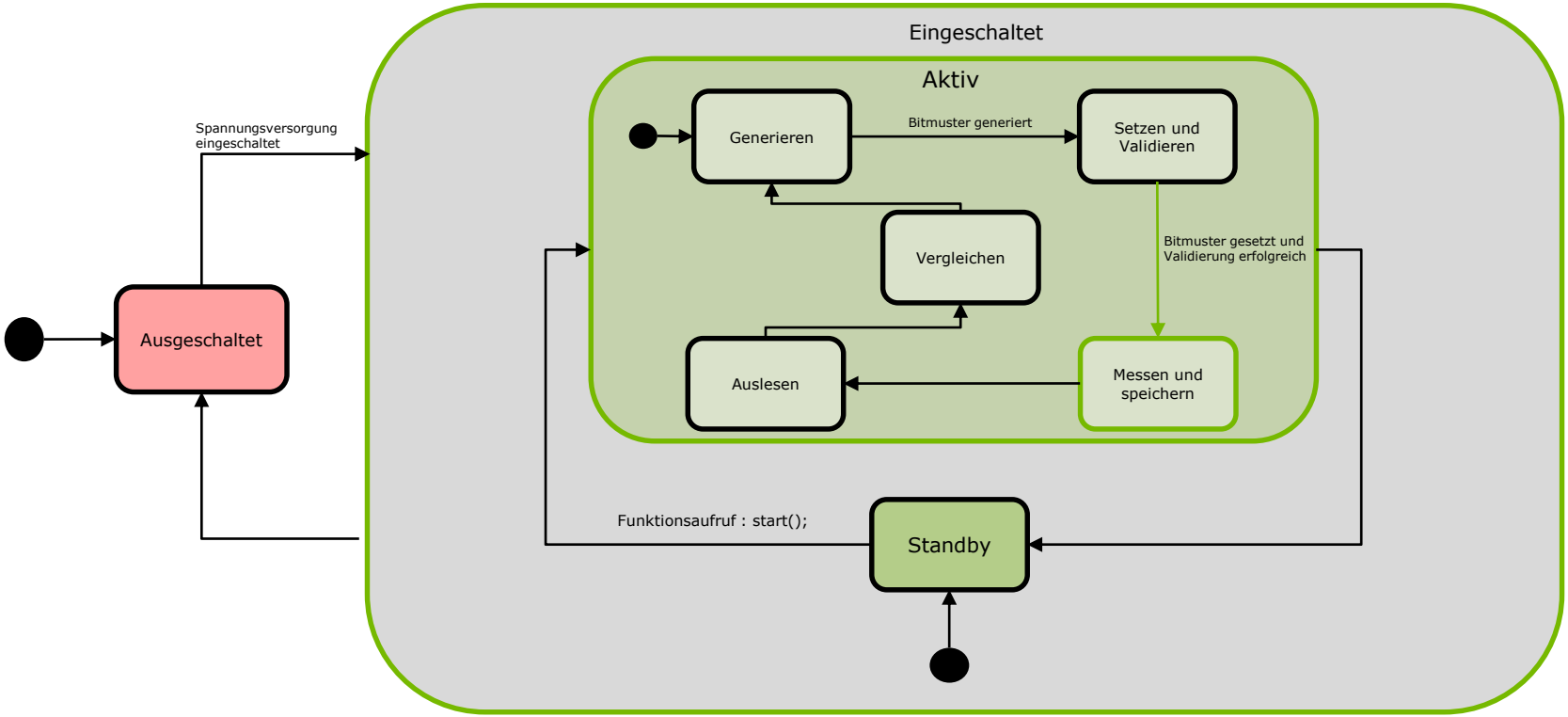

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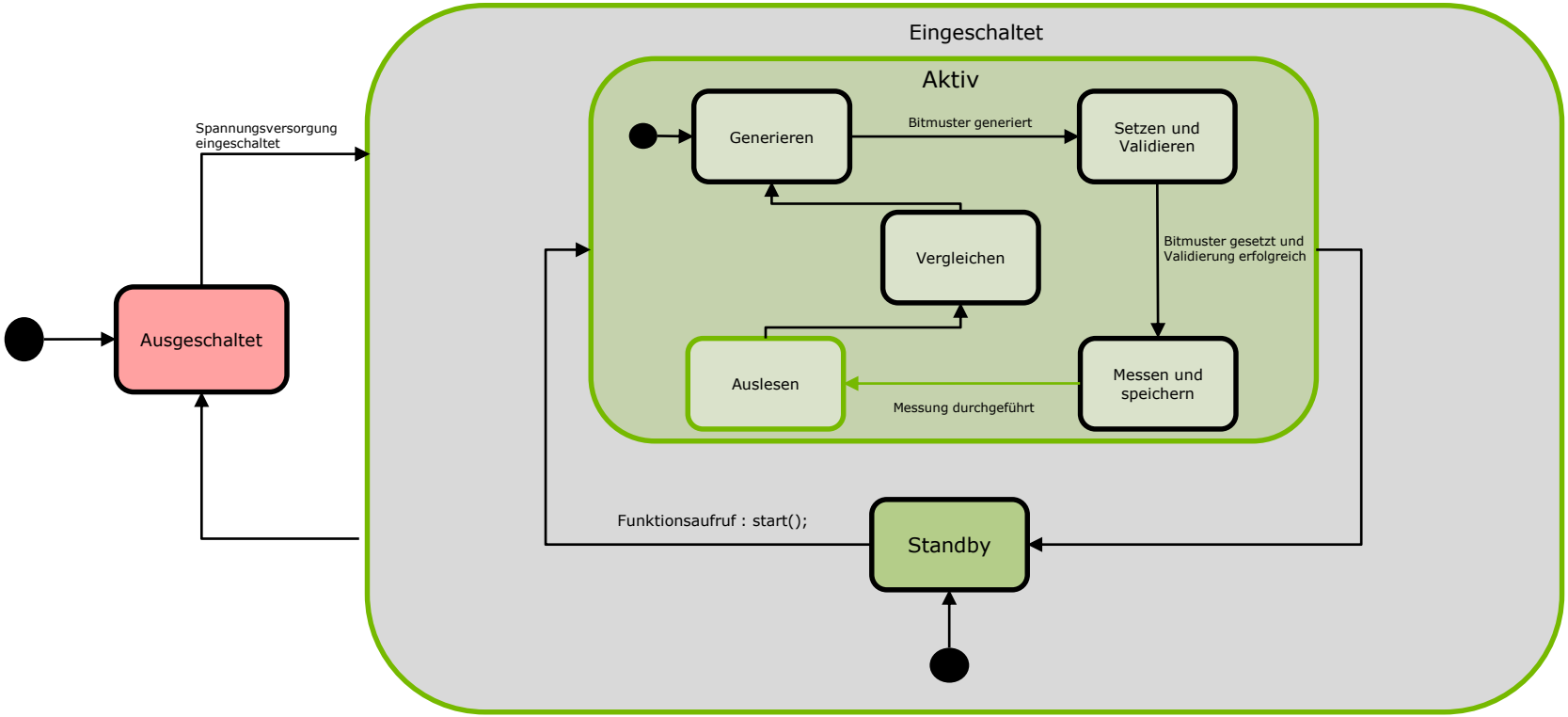

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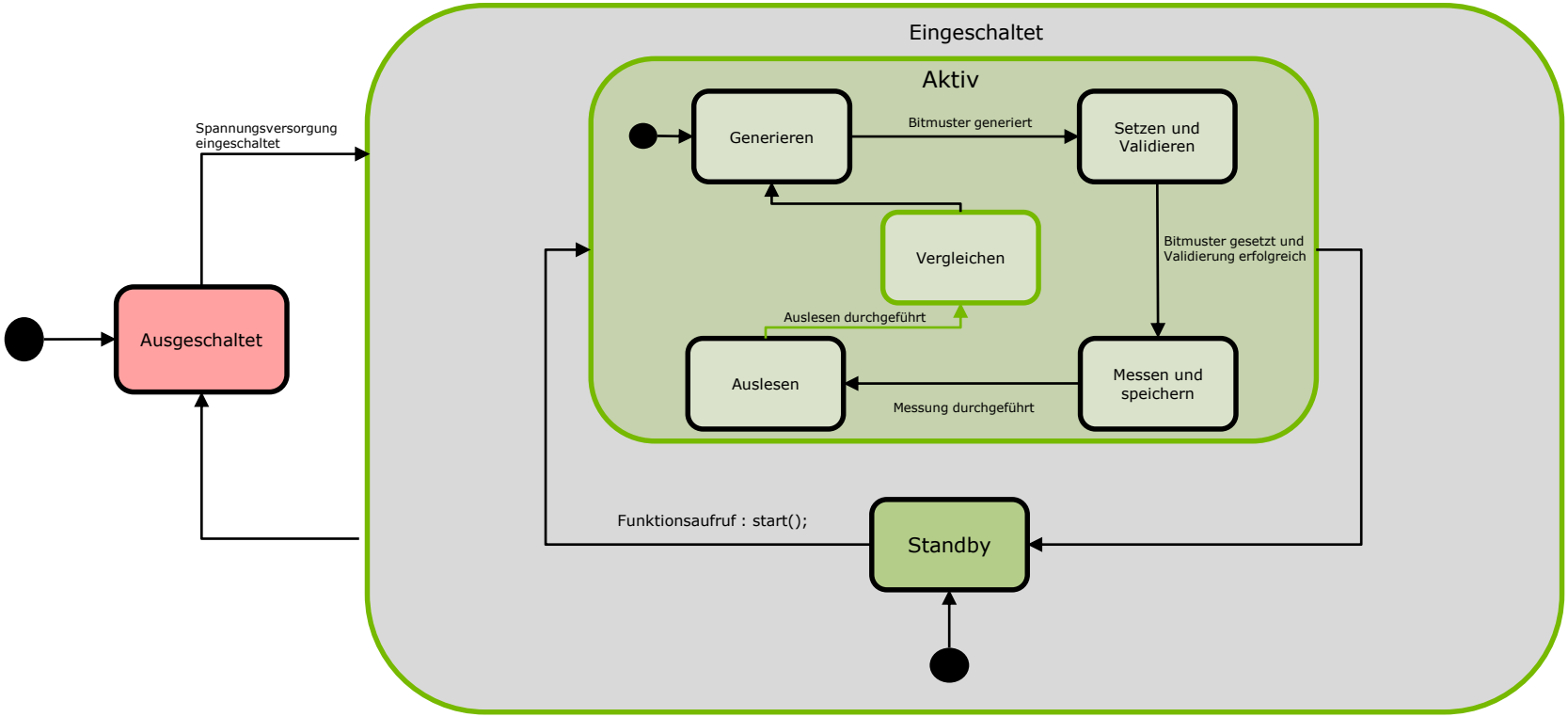

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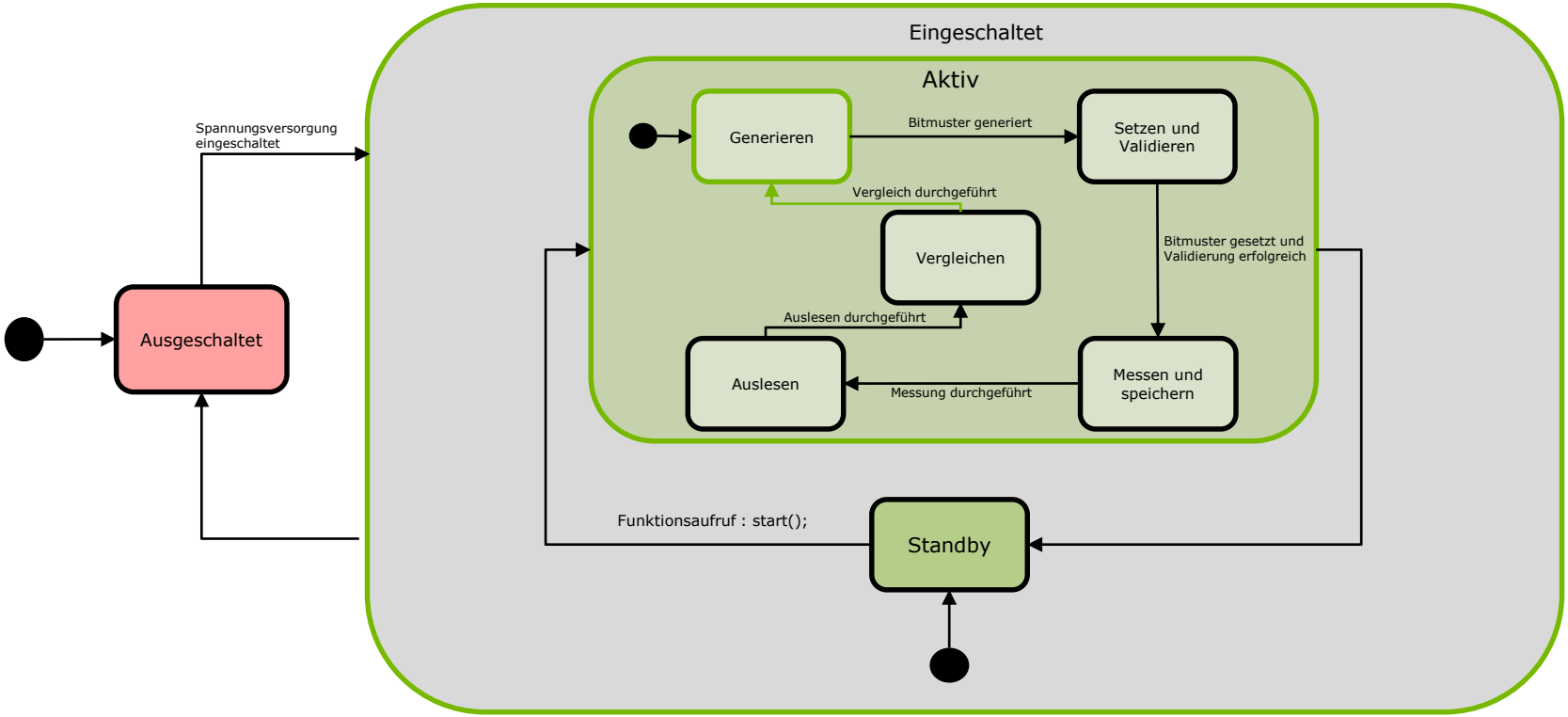

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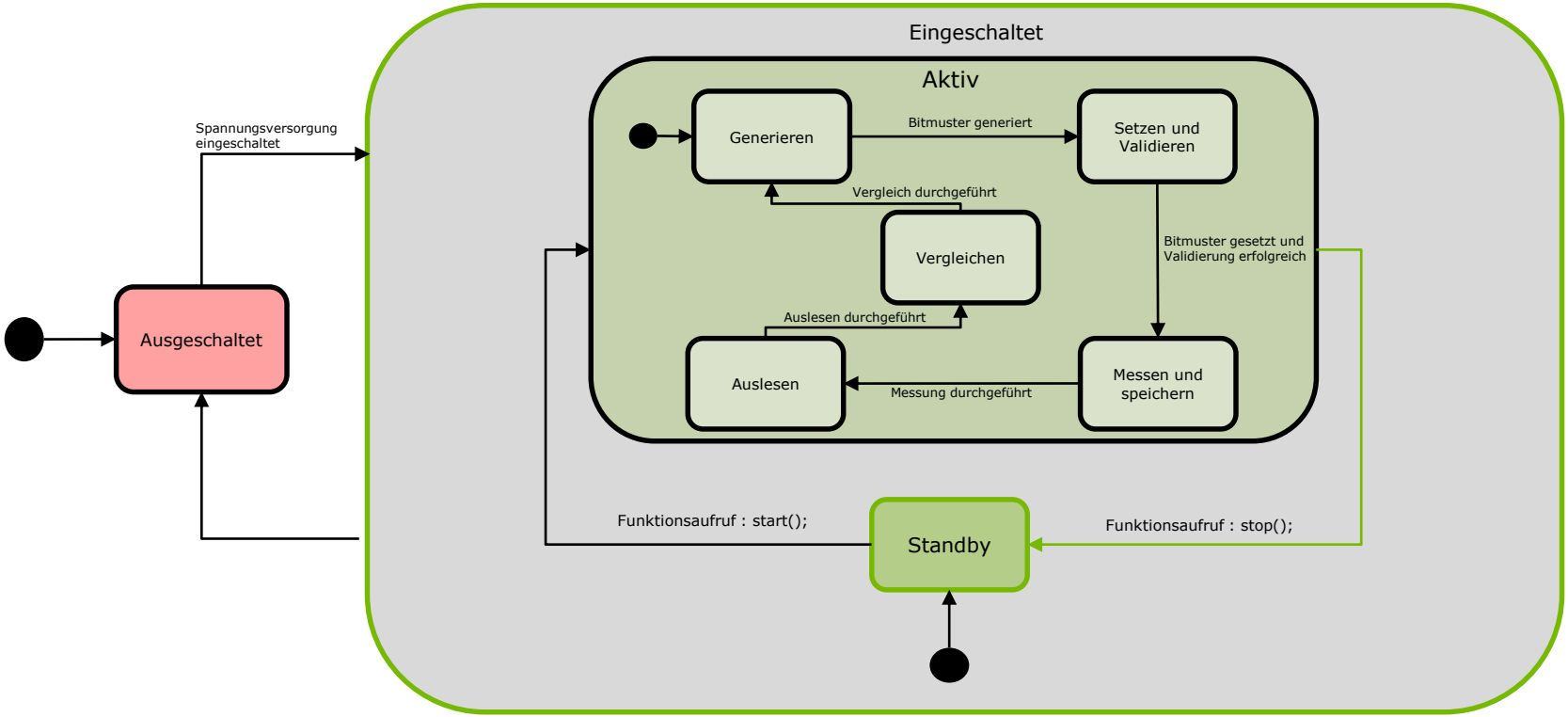

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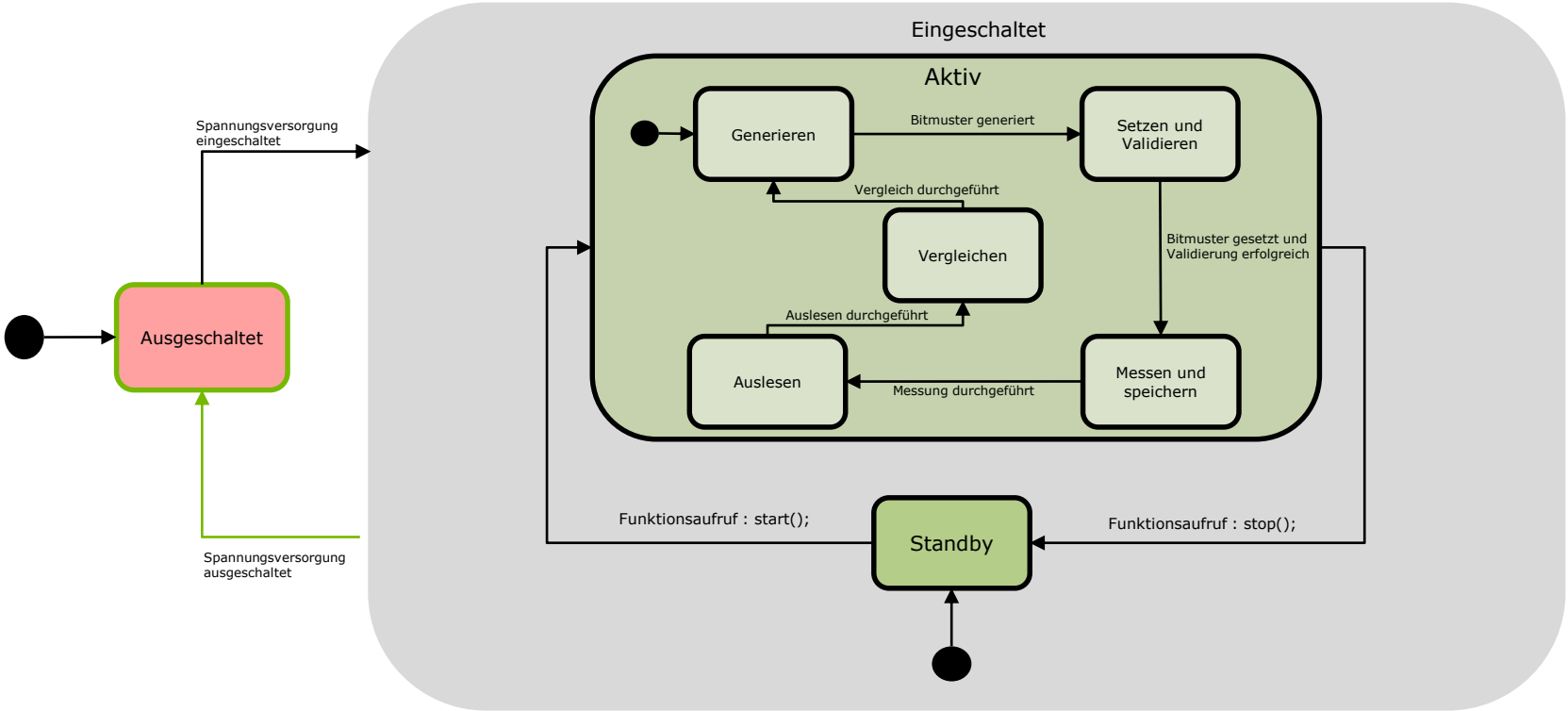


# Physical Description

- Raspberry PI 3 Model B+
  - CPU : ARMv8 1,2 GHz
  - BCM2837 64 Bit Quad Core
  - 1 GB RAM
  - 41 GPIO-Register

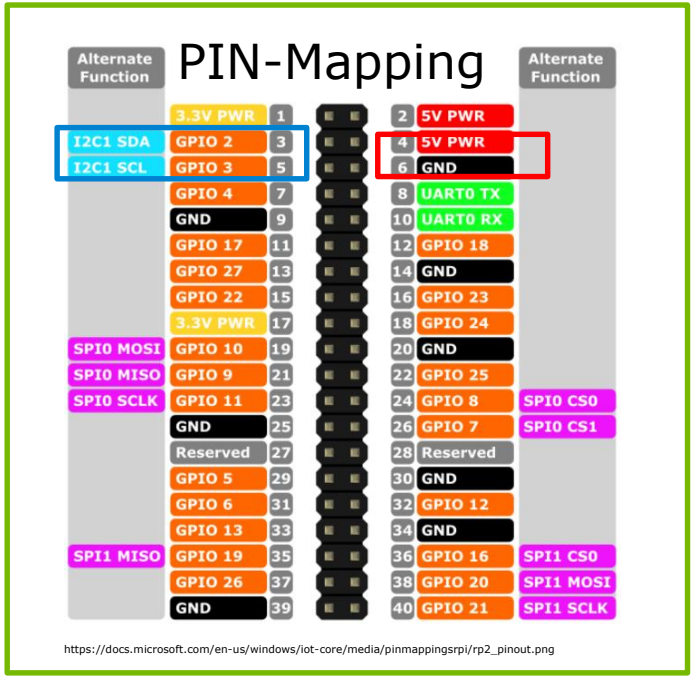
https://pisces.bbystatic.com/image2/BestBuy_US/images/products/6339/6339655_sd.jpg;maxHeight=640;maxWidth=550

## PIN-Mapping

| Alternate Function | | | | | | Alternate Function |
|---|---|---|---|---|---|---|
| | 3.3V PWR | 1 | 2 | 5V PWR | | |
| I2C1 SDA | GPIO 2 | 3 | 4 | 5V PWR | | |
| I2C1 SCL | GPIO 3 | 5 | 6 | GND | | |
| | GPIO 4 | 7 | 8 | UART0 TX | | |
| | GND | 9 | 10 | UART0 RX | | |
| | GPIO 17 | 11 | 12 | GPIO 18 | | |
| | GPIO 27 | 13 | 14 | GND | | |
| | GPIO 22 | 15 | 16 | GPIO 23 | | |
| | 3.3V PWR | 17 | 18 | GPIO 24 | | |
| SPI0 MOSI | GPIO 10 | 19 | 20 | GND | | |
| SPI0 MISO | GPIO 9 | 21 | 22 | GPIO 25 | | |
| SPI0 SCLK | GPIO 11 | 23 | 24 | GPIO 8 | SPI0 CS0 | |
| | GND | 25 | 26 | GPIO 7 | SPI0 CS1 | |
| | Reserved | 27 | 28 | Reserved | | |
| | GPIO 5 | 29 | 30 | GND | | |
| | GPIO 6 | 31 | 32 | GPIO 12 | | |
| | GPIO 13 | 33 | 34 | GND | | |
| SPI1 MISO | GPIO 19 | 35 | 36 | GPIO 16 | SPI1 CS0 | |
| | GPIO 26 | 37 | 38 | GPIO 20 | SPI1 MOSI | |
| | GND | 39 | 40 | GPIO 21 | SPI1 SCLK | |

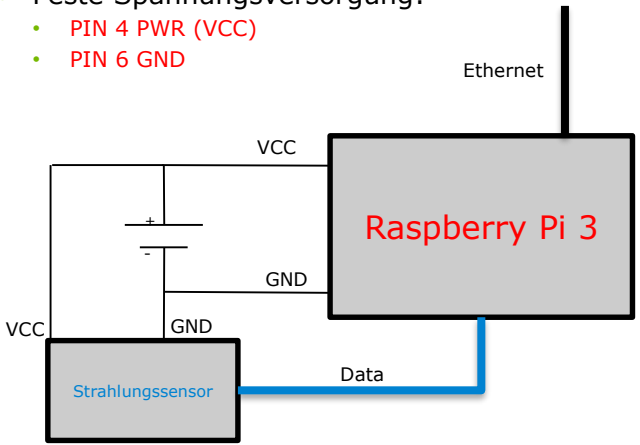
https://docs.microsoft.com/en-us/windows/iot-core/media/pinmappingsrpi/rp2_pinout.png

# Physical Description




https://docs.microsoft.com/en-us/windows/iot-core/media/pinmappingsrpi/rp2_pinout.png

- Feste Spannungsversorgung:
  - PIN 4 PWR (VCC)
  - PIN 6 GND




- Sensoranschluss Strahlung:
  - Datenverbindung via I2C

# Description of Interfaces

- Spannungsversorgung PI 3:
  - nicht über USB
  - 5,5 Volt mit mind. 2.500 mA
- Netzwerkanbindung:
  - Gigabit-Ethernet Port
  - RJ-45 Kabel CAT 7 (Klasse FA) nach IEEE 802.3an
  - SSH – Protokoll
- Strahlungssensor mit Hilfsspannung
  - Verbindungsleitung I2C von Sensor zu System
  - Platzierung nahe dem PI 3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