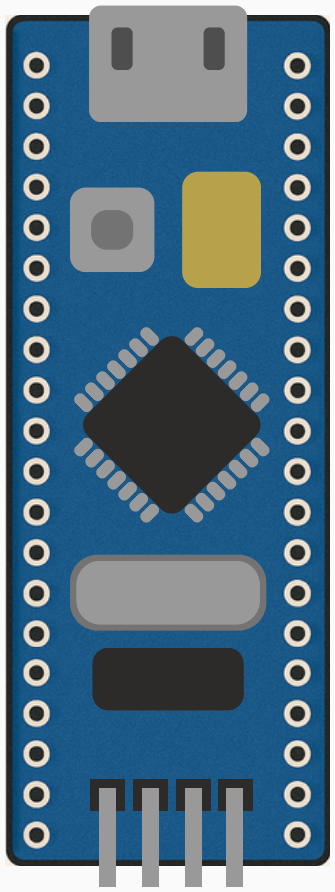
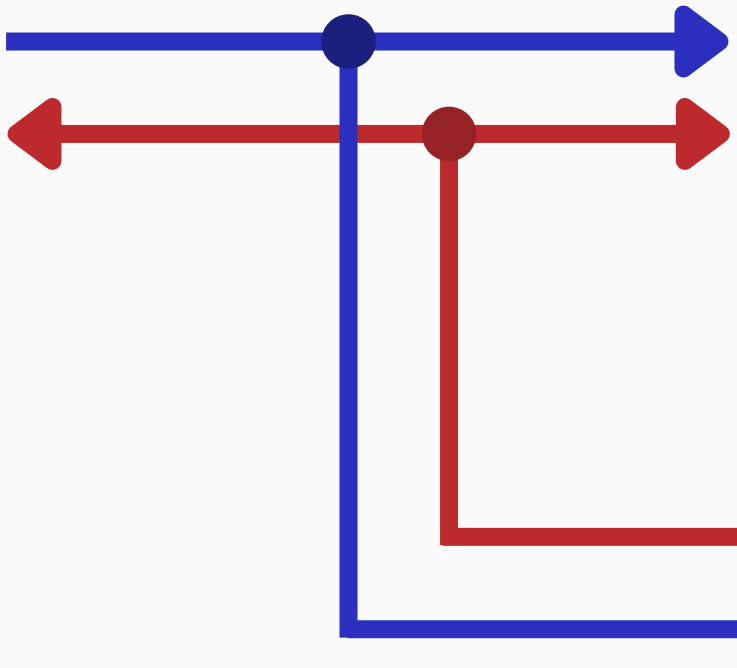
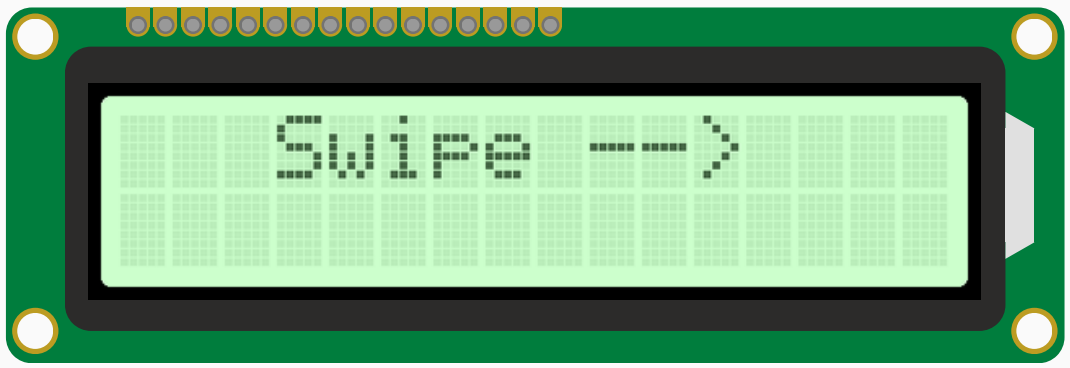
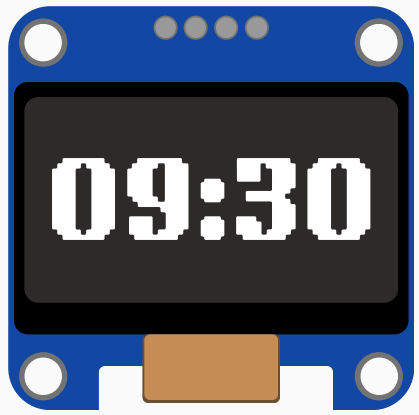
I2C BASICS EXPLAINED









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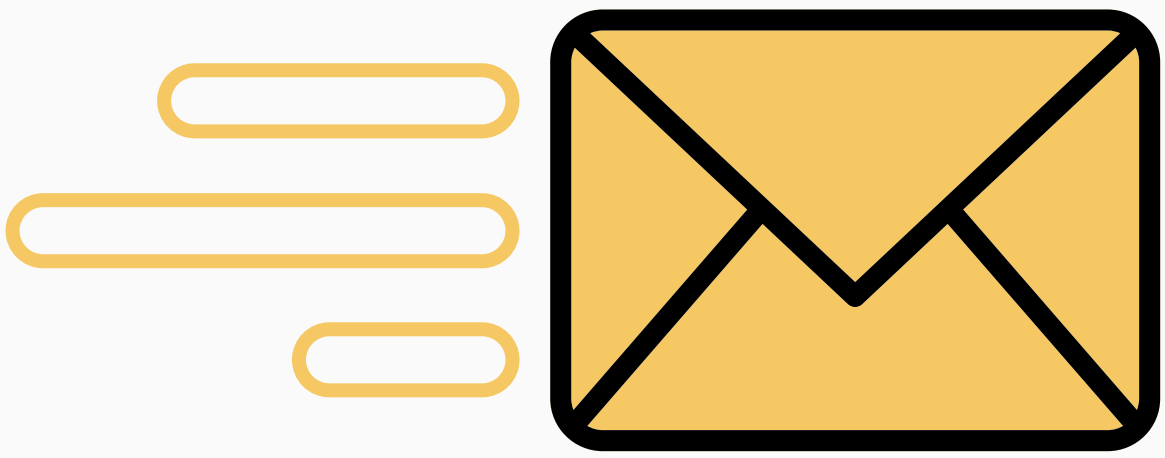
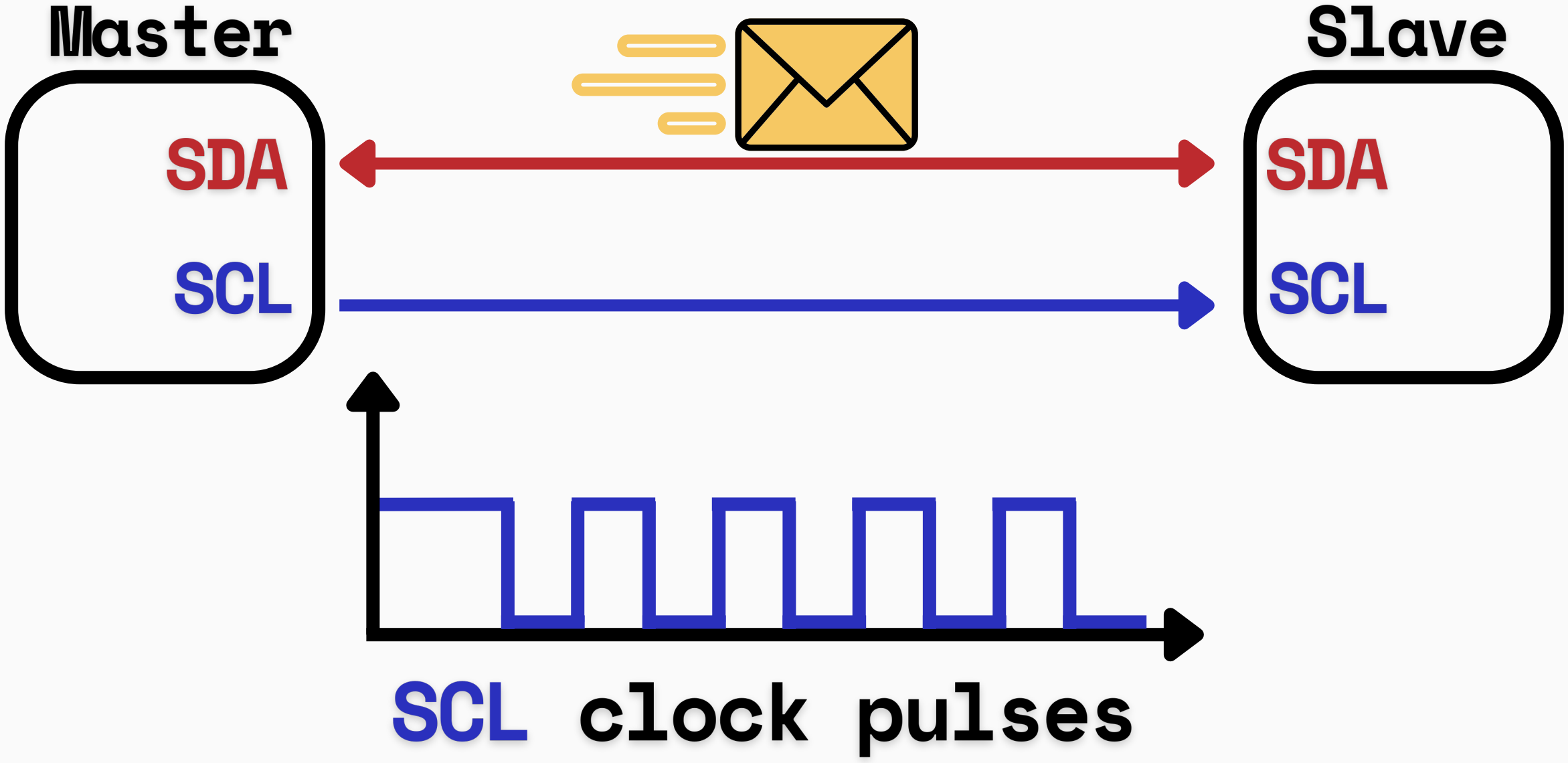
1) What is I²C?

- I²C (Inter-Integrated Circuit) is a two-wire, serial communication protocol.
- Developed by Phillips Semiconductors in the early 1980s.
- Supports multi-master and multi-slave configurations.
- Commonly used for short-distance, intra-board communication.



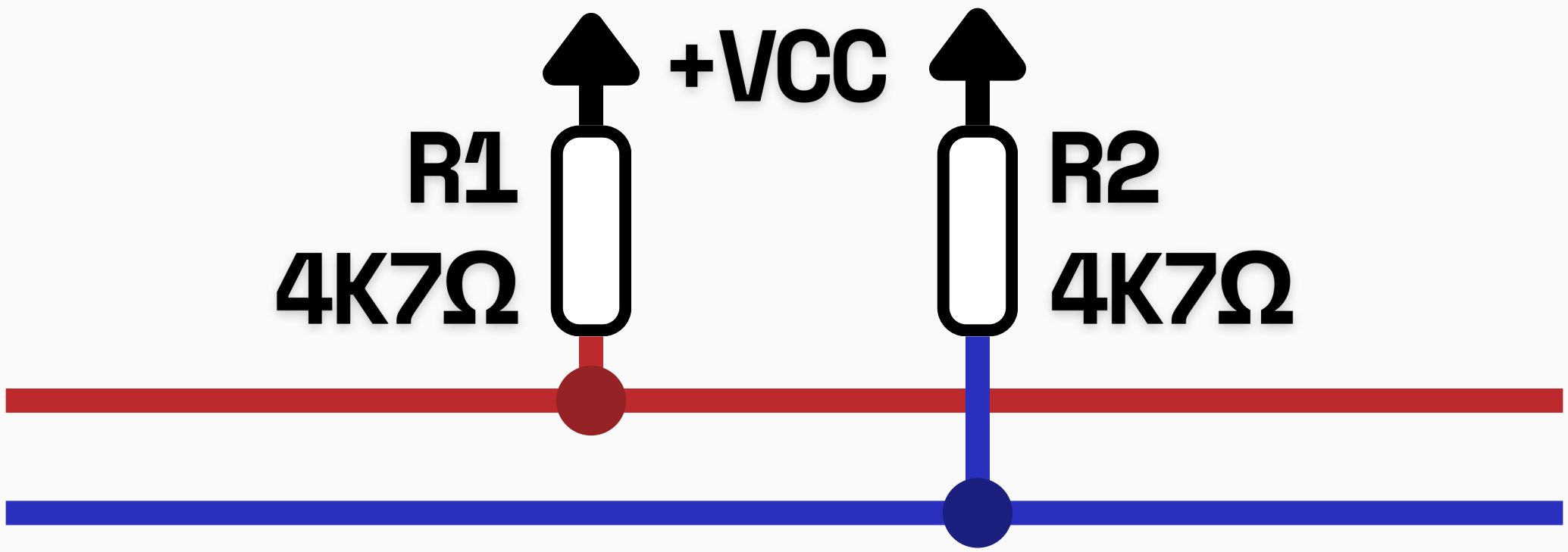
2) I²C Pins and Their Roles

- SDA (Serial Data Line): Carries data bits bidirectionally.
- SCL (Serial Clock Line): Carries clock pulses from master to synchronize data.



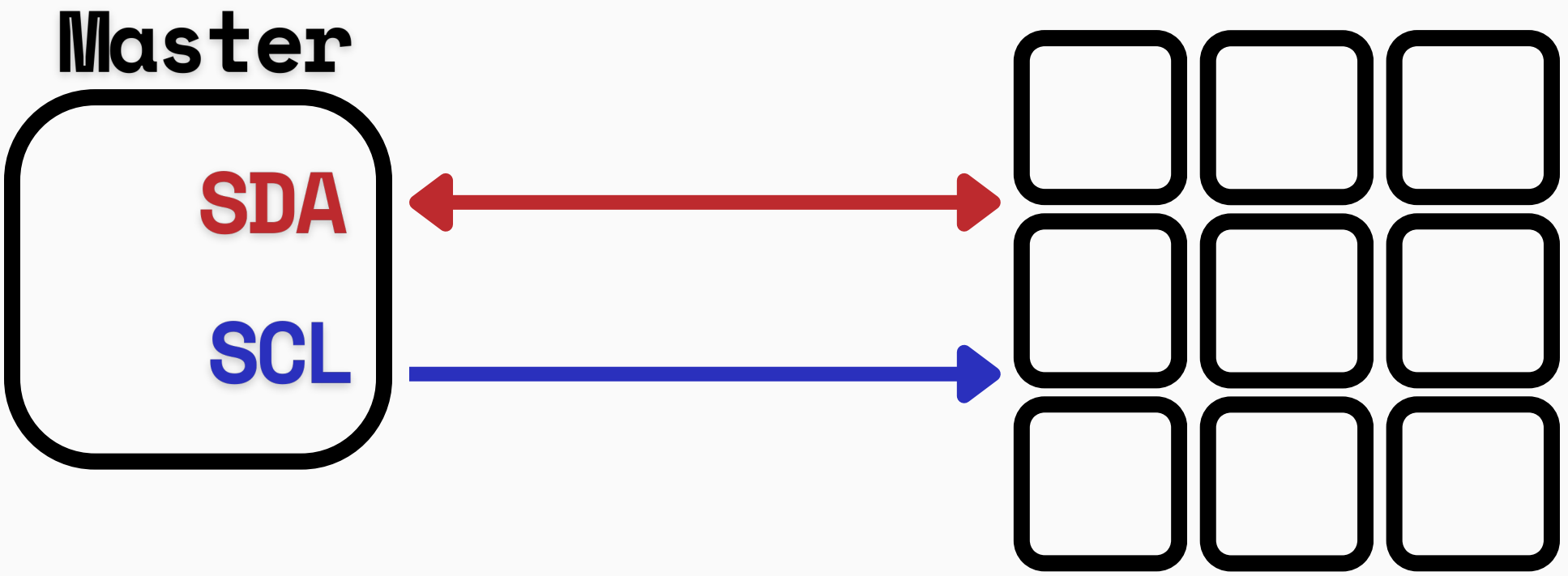
3) Pull-Up Resistors

- Both SDA and SCL are open-drain/open-collector, requiring external pull-ups.
- Typical pull-up values range from 2.2 kΩ to 10 kΩ.
- Choose resistor value based on bus capacitance and desired speed.



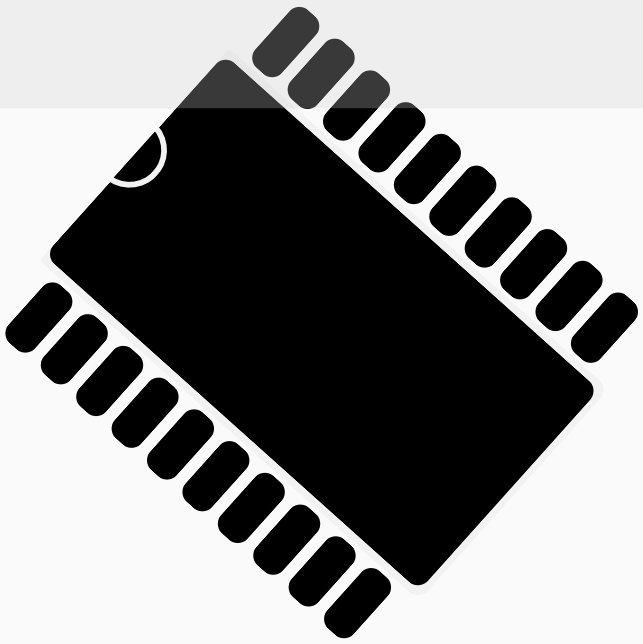
4) How Many Slaves?

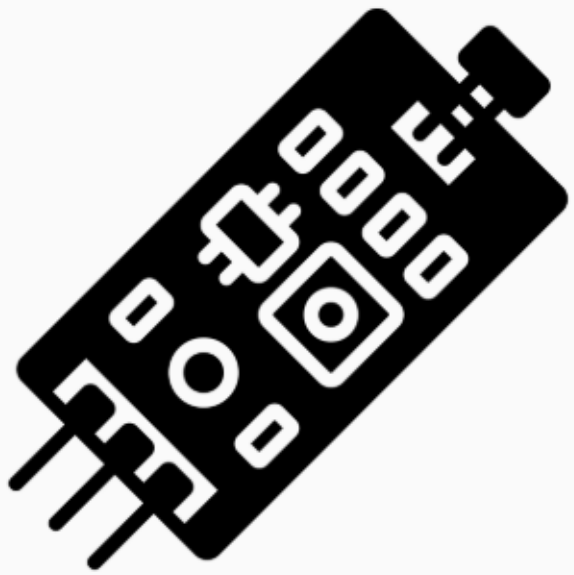
- Theoretically supports up to 127 slave addresses (7-bit addressing).
- 10-bit addressing extends address space further (up to 1023 devices).
- Practical limit depends on bus capacitance and pull-up strength.

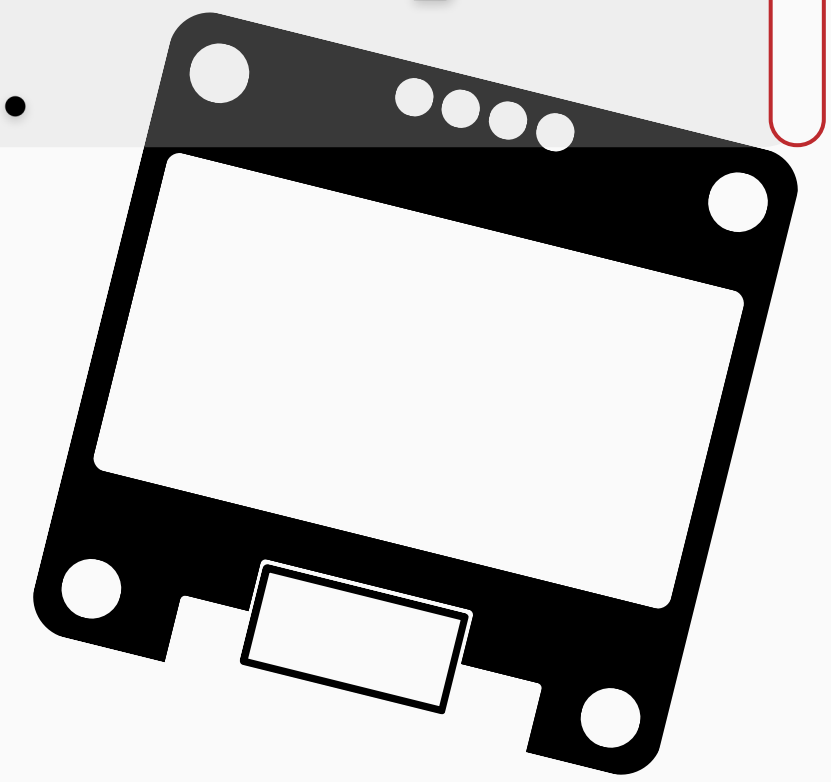


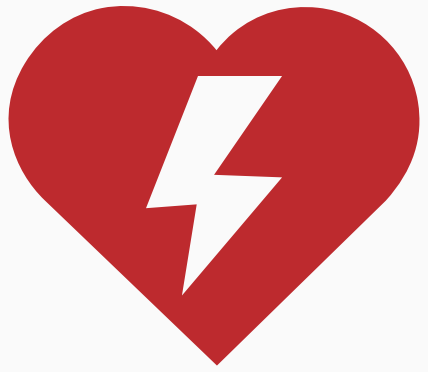
5) Where Is I²C Used?

- Sensor modules (temperature, pressure, accelerometers).
- EEPROM and real-time clock (RTC) chips.
- OLED/LCD displays and audio codecs.
- Power management ICs and system monitors.









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