

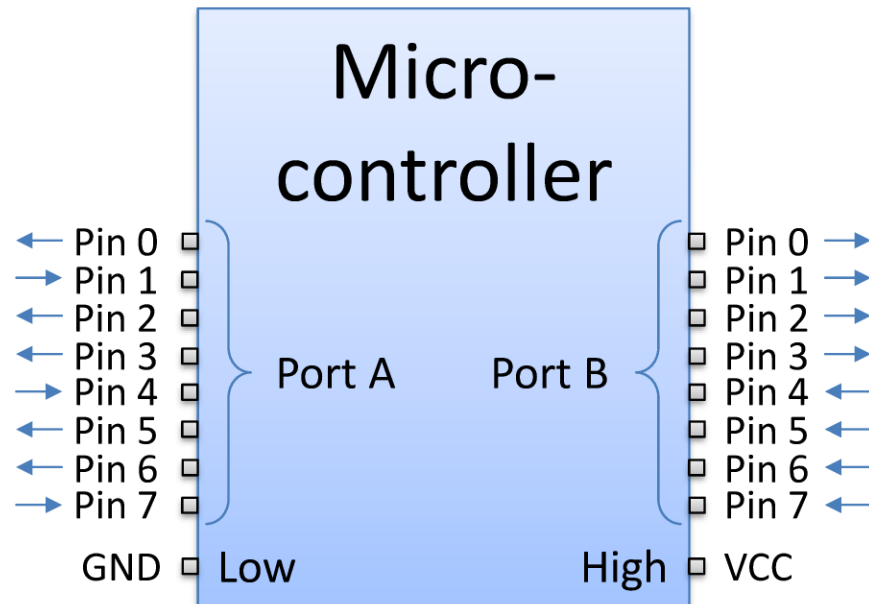
Digital Ports

Embedded Software

Wolfgang Neff

Digital Ports (1)

- Basics
 - Direction of pins
 - Input
 - Output
 - State of pins
 - 1: High (VCC)
 - 0: Low (GND)
 - Group of pins
 - Ports



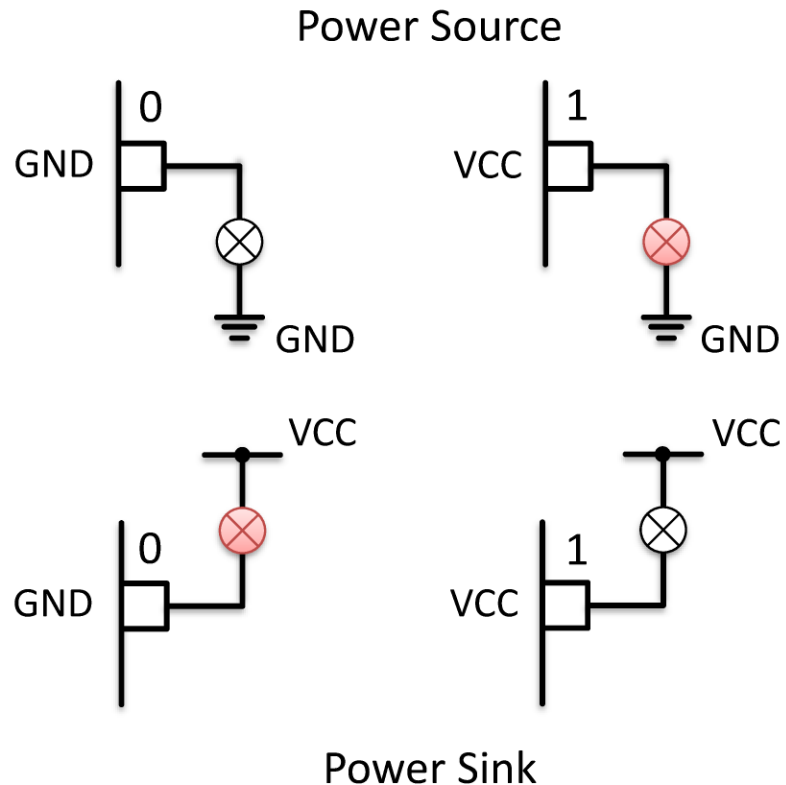
Digital Ports (2)

• Output Pins

– Power sources

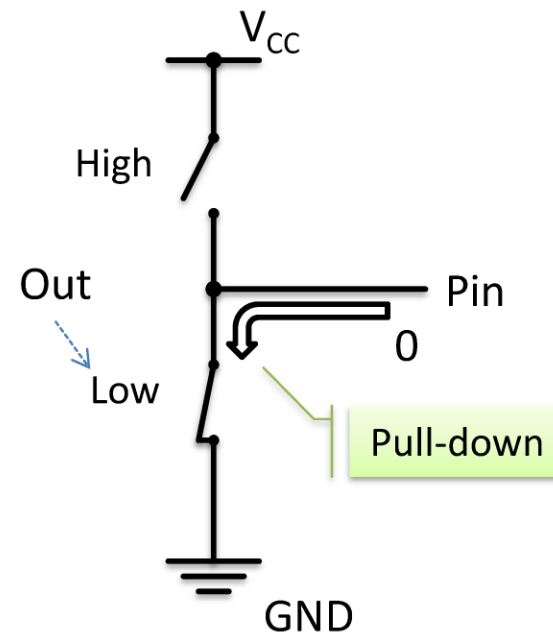
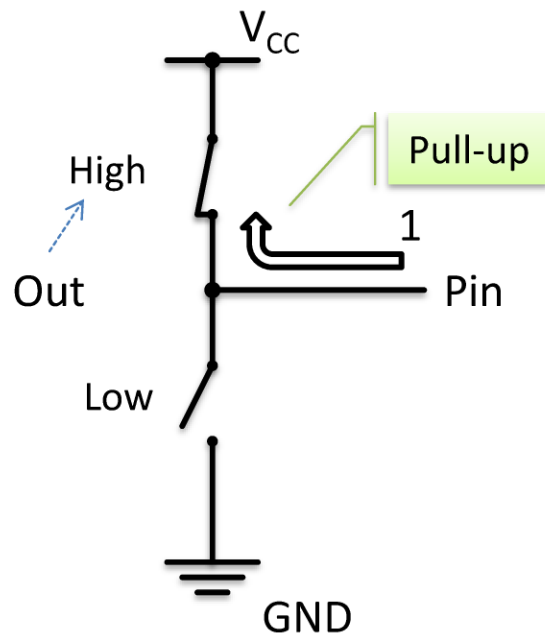
- High
 - Positive pole
 - Source

- Low
 - Negative pole
 - Sink



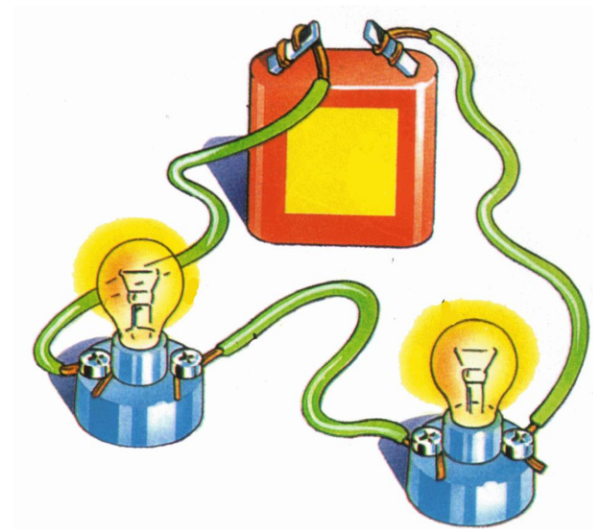
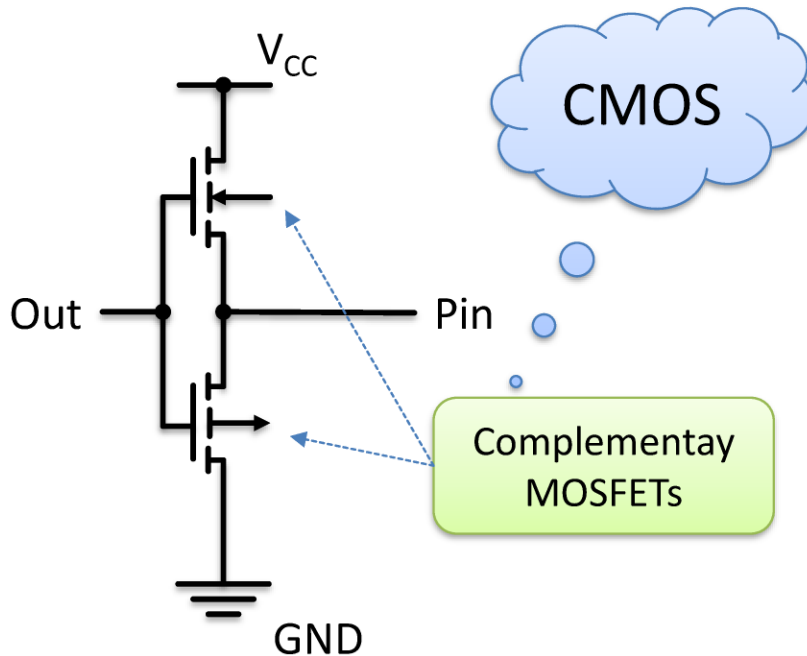
Digital Ports (3)

- Output Pins (continued)
 - Push–pull output



Digital Ports (4)

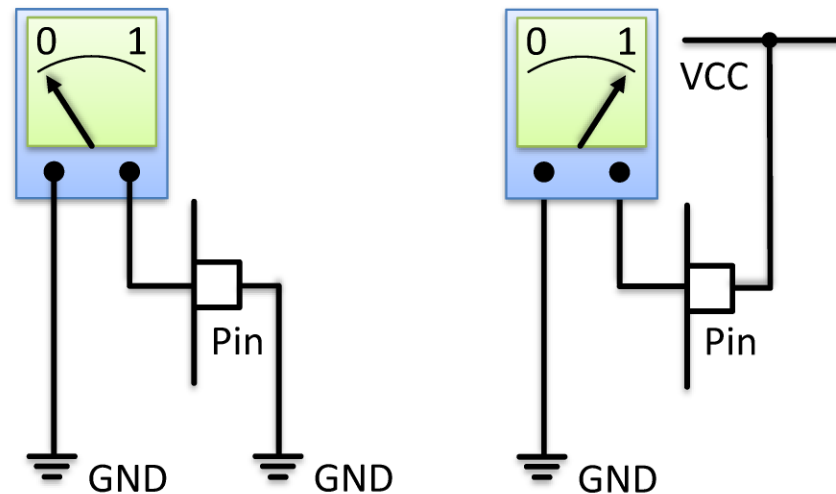
- Output Pins (finished)
 - Technical Implementation



Digital Ports (5)

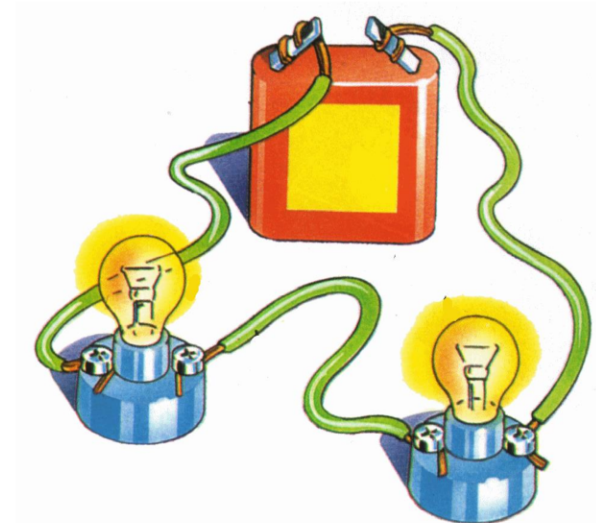
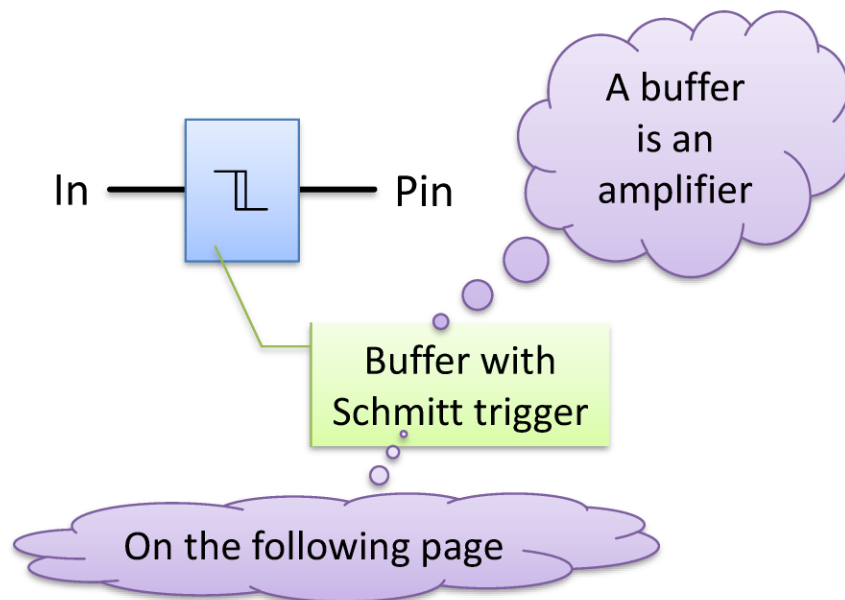
- Input pins
 - Probes
 - Voltmeter
 - GND $\rightarrow$ 0
 - VCC $\rightarrow$ 1
 - No current

Voltage Probe



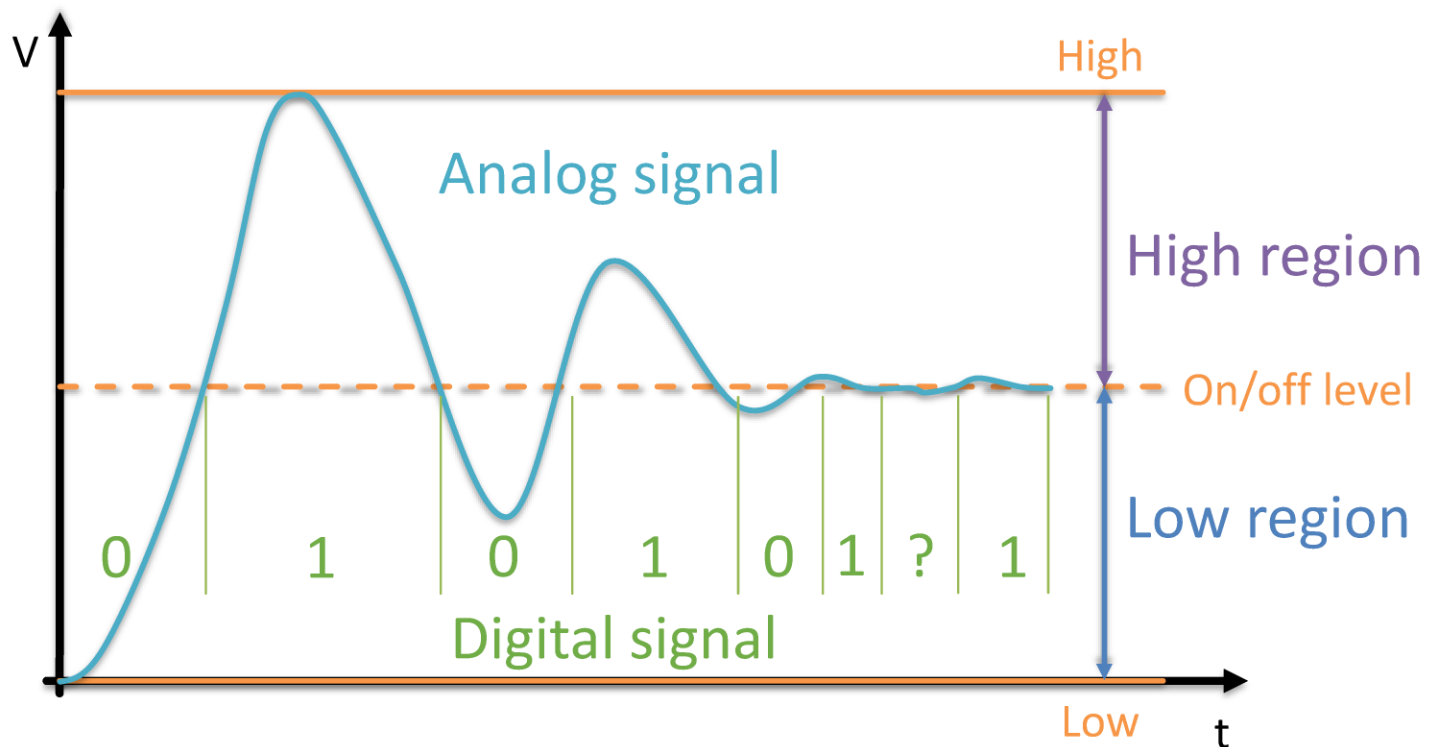
Digital Ports (6)

- Input pins (continued)
 - Technical Implementation



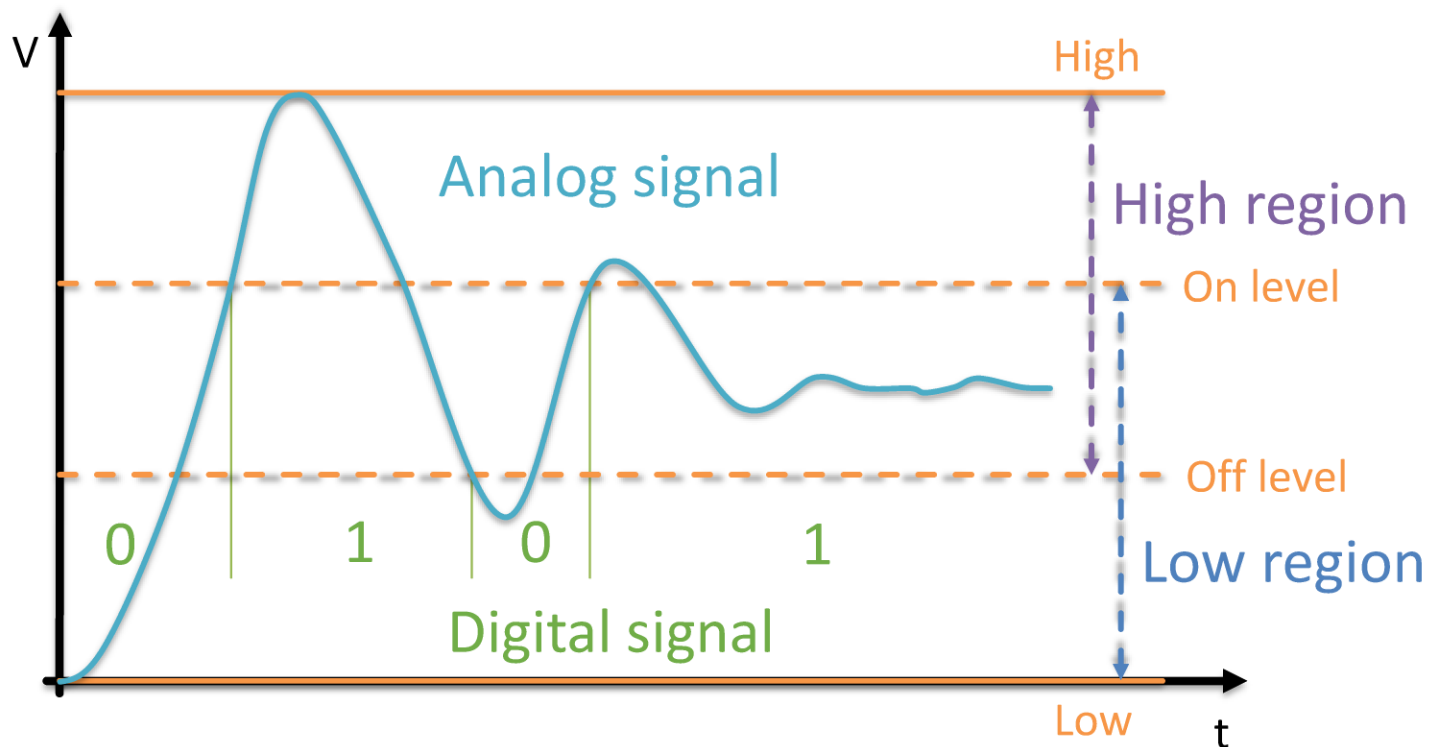
Digital Ports (7)

- Input pins (continued)
 - Without Schmitt trigger



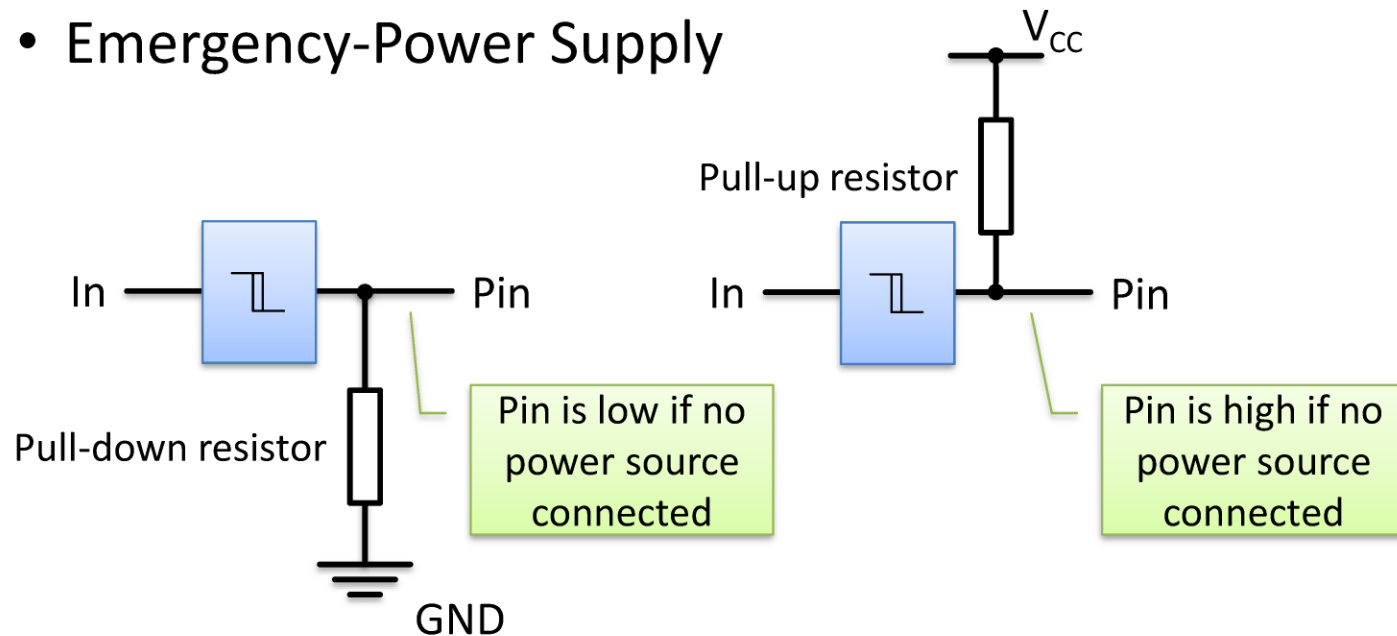
Digital Ports (8)

- Input pins (continued)
 - With Schmitt trigger



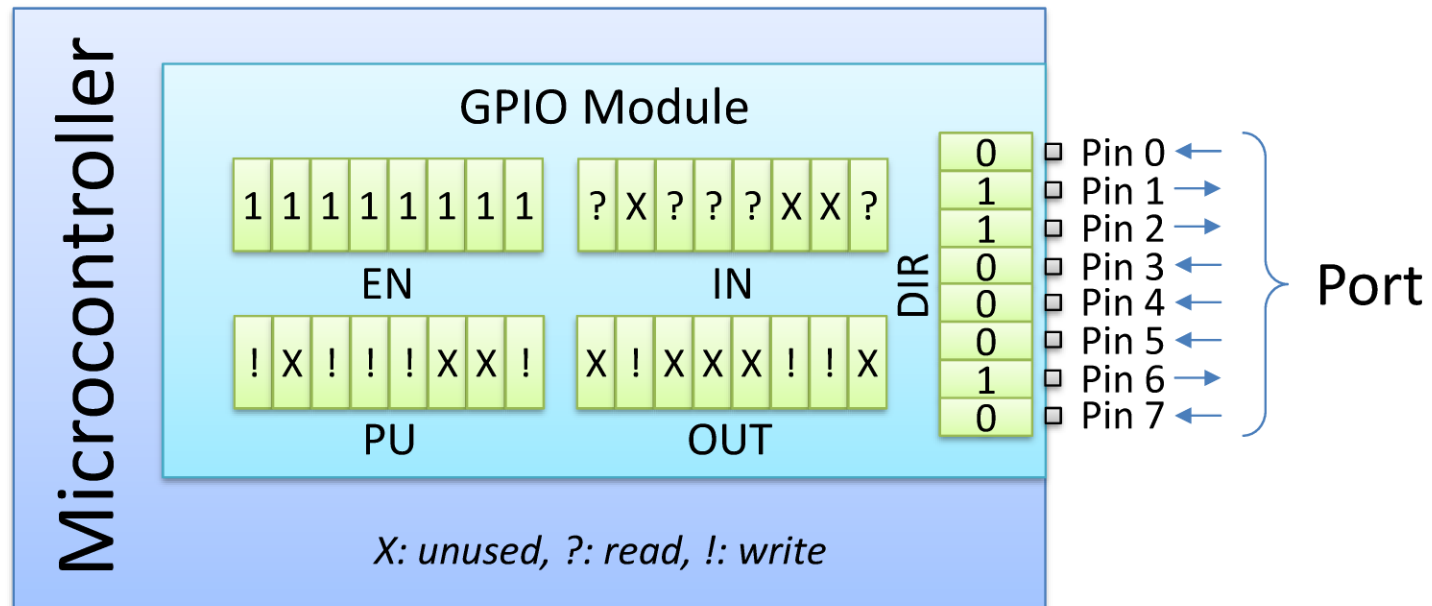
Digital Ports (9)

- Input pins (finished)
 - Pull Configuration
 - Emergency-Power Supply



Digital Ports (10)

- GPIO Module



Digital Ports (11)

- Electrical Characteristics
 - Operating voltage
 - Typ. 3.3 V / 5.0 V
 - Max pin current
 - Typ. 20.0 mA
 - Consult Datasheet

