

Serial Peripheral Interface

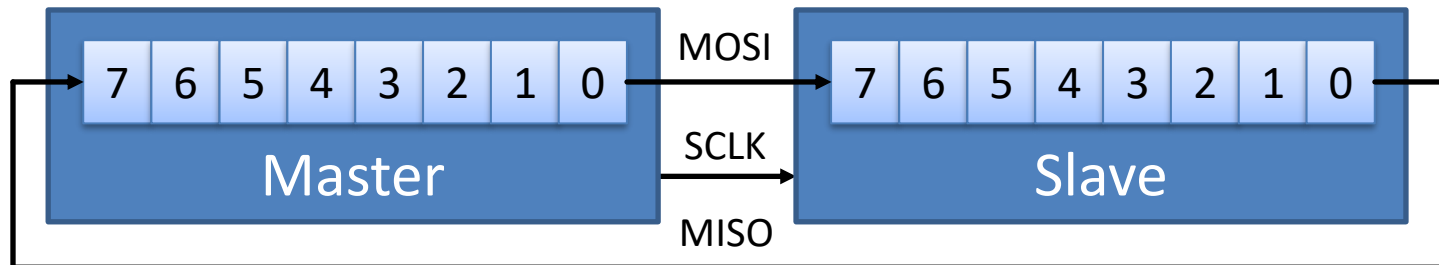
Networks and Embedded Systems

Second Grade Level

Wolfgang Neff

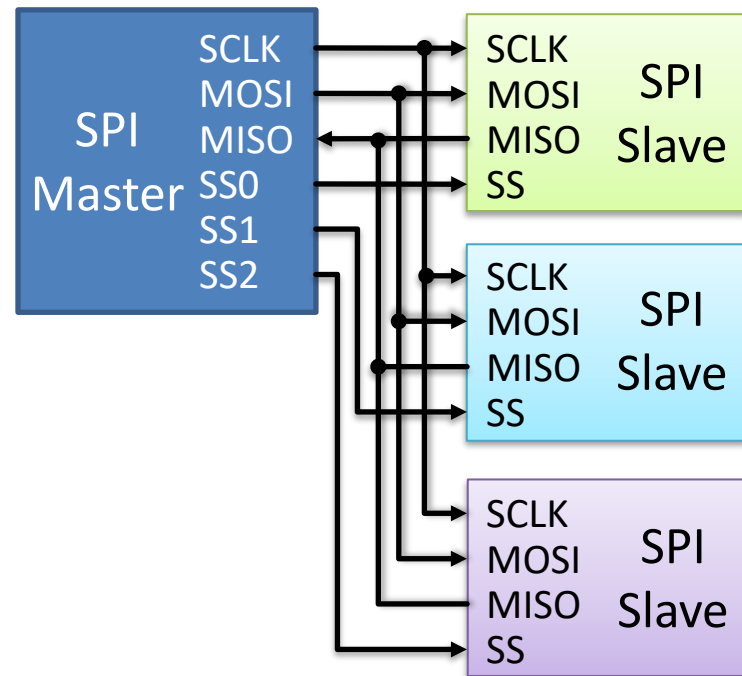
SPI (1)

- Operation
 - Master controls synchronous communication
 - Two shift register form a circular buffer
 - Master shifts data to slave via MOSI
 - Slave shifts data to master via MISO



SPI (2)

- Addressing
 - Point-to-point connection
 - Several slaves possible
 - Slave select
 - Control line
 - Active low
 - Activates slave
 - Just one slave active
 - The other must be inactive



SPI (3)

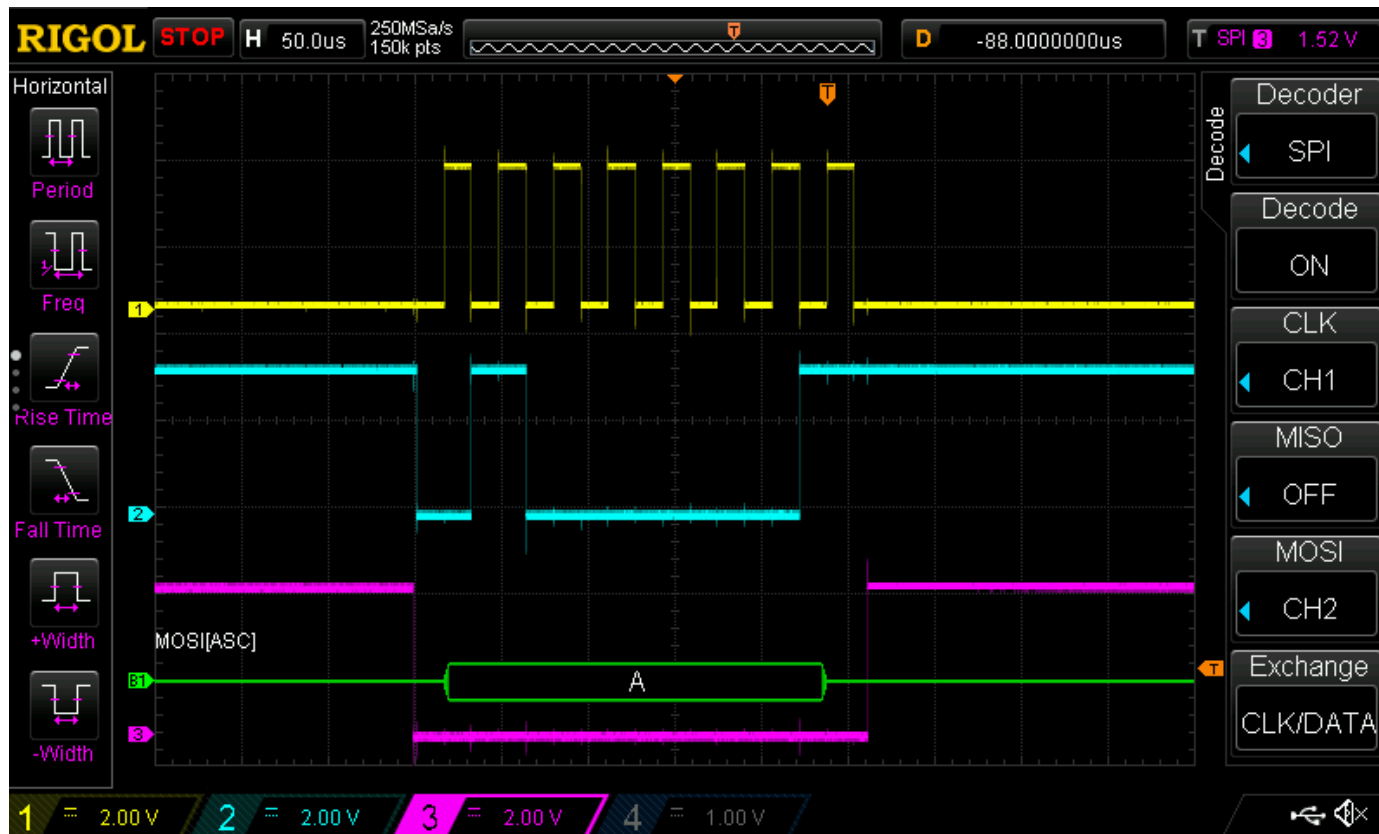
- Three-state logic
 - Third state in addition to *0* and *1*
 - Remove devices from circuit
 - High impedance
 - High resistance → insignificant current

– State table

State	
0	Low
1	High
Z	High impedance

SPI (4)

- Real-Life Example



SPI (5)

- Advantages
 - Simple software implementation
 - Extremely simple hardware interface
 - Full duplex communication
 - High throughput

SPI (6)

- Disadvantages
 - No formal standard available
 - Requires more pins than other protocols
 - Extra lines due to the lack of addressing protocol
 - No error checking by protocol
 - Handles short distances, only