Pervasive Computing  
Notebook

# Lecture 02:

## SPI-Interface

* Developed by Motorola in 1987
* Uses the „Master-Slave“-System:
  + The master device initiates communication and generates the clock signal, while one or more slave devices respond to the master's commands.
  + Clock Signal: periodic signal generated by the master device that synchronizes the transmission and reception of data between the master and slave devices
* Synchronous Communication
  + Data is transmitted and received based on clock signal -> master and slaves must be synchronized to clock signal
* Multi-Connection on:
  + SLK/CLK: Clock signal, transmitted by the master device.
  + POCI/MISO: Master input – Slave output
  + PICO/MOSI: Master output – Slave input
* Can be “Daisy-chained”
  + Connecting the slaves MOSI to another slaves MISO
* Full duplex (Sending and receiving at the same time)
  + Doubling the data rate, but switching to half duplex, by transmitting both over the MOSI and MISO lines.
* Data Format
  + no specific data format. Format is determined by devices which communicate over the bus
* Speed
  + SPI can operate at high speeds, making it suitable for applications where high data rates are required.

### Examples

* Camera Lenses
* Ethernet, USB and CAN
* Flash Memory
  + SPI's high-speed capability is well-suited for quickly reading from or writing to flash memory.
* Real-Time Clocks
* LCD-Panels
* DACs for audio usage