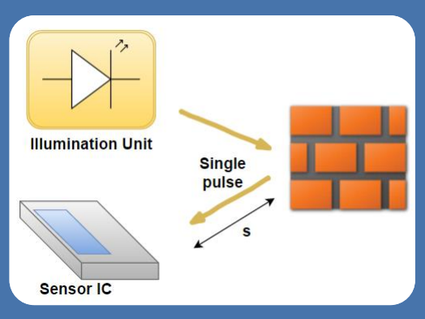
Masterproef industriële ingenieurswetenschappen 2015-2016

Real-time optical range sensing application development

Tom Nulens

master IW elektronica-ICT

Introduction



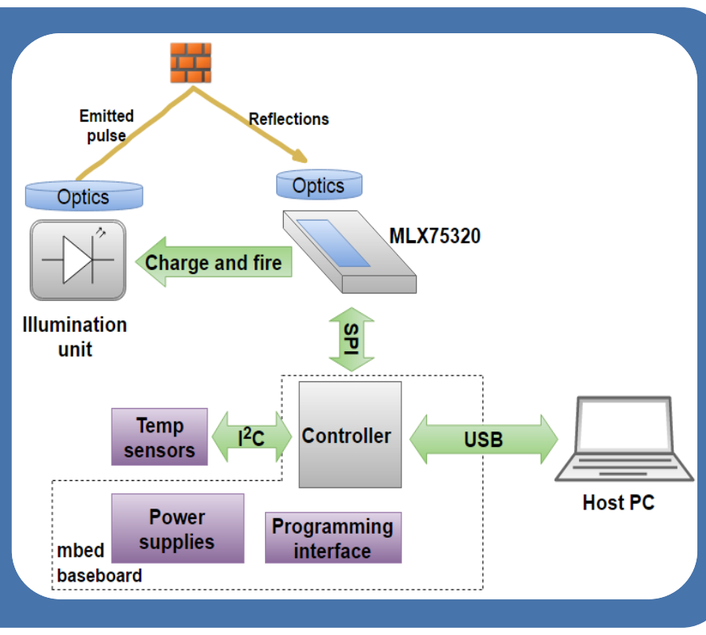
- Evaluation kit and application development for new LIDAR sensor IC
- 16 channel distance measurement without moving parts

Distance measuring principle:

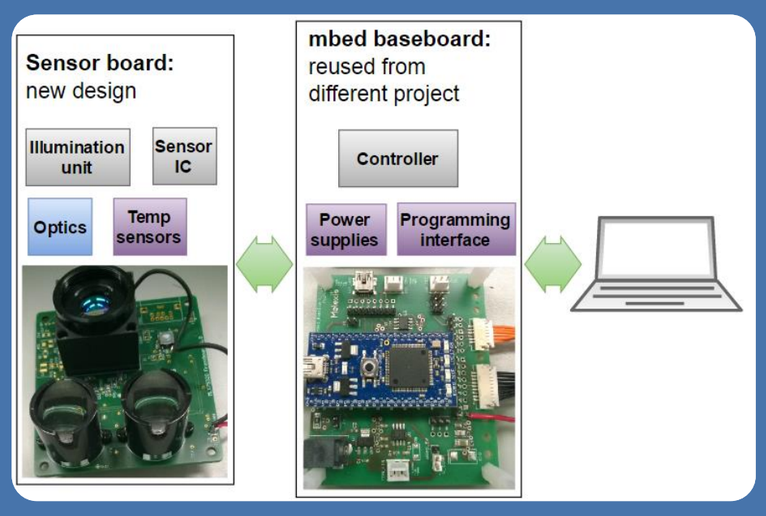
$$distance = \frac{speed\ of\ light\ \cdot time}{2}$$

Concept

1. Host ➔ controller
2. Controller ➔ sensor IC
3. Sensor IC: measure
4. Sensor IC ➔ controller
5. Controller ➔ host
6. Host: display distance

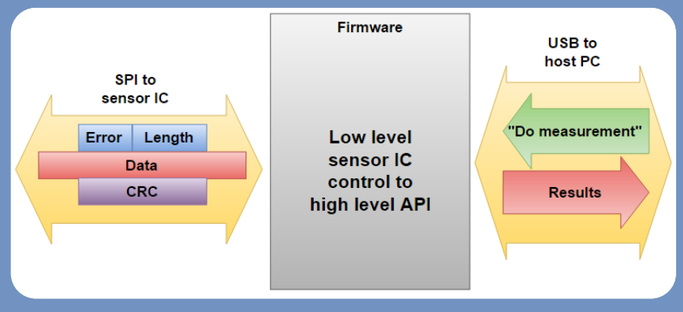


Hardware

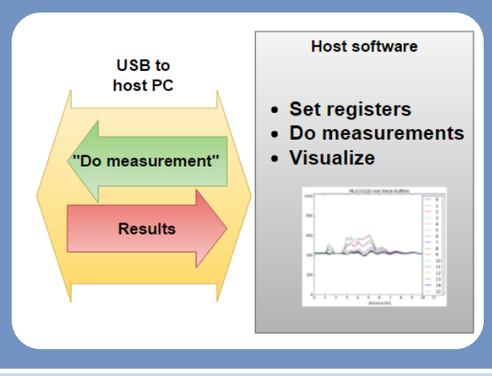


Software

- Microcontroller software

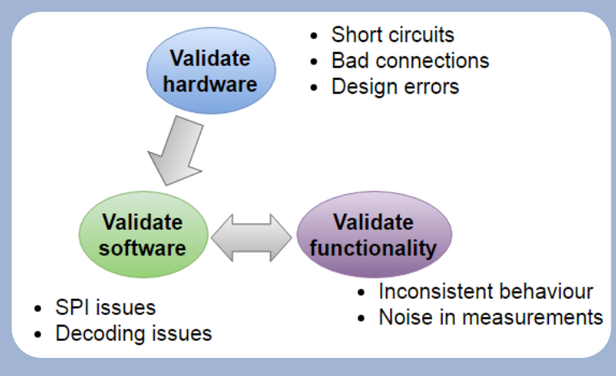


- Host software



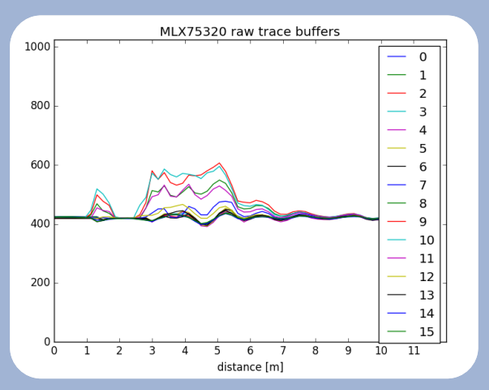
Validation

- Flow of validation:
  - Validate hardware
  - Back and forth between software and functionality validation



Results

- First iteration evaluation kit hardware
- Lessons learned
- Low level SPI to High level USB API in microcontroller
- Host application software to plot measurements in graph



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