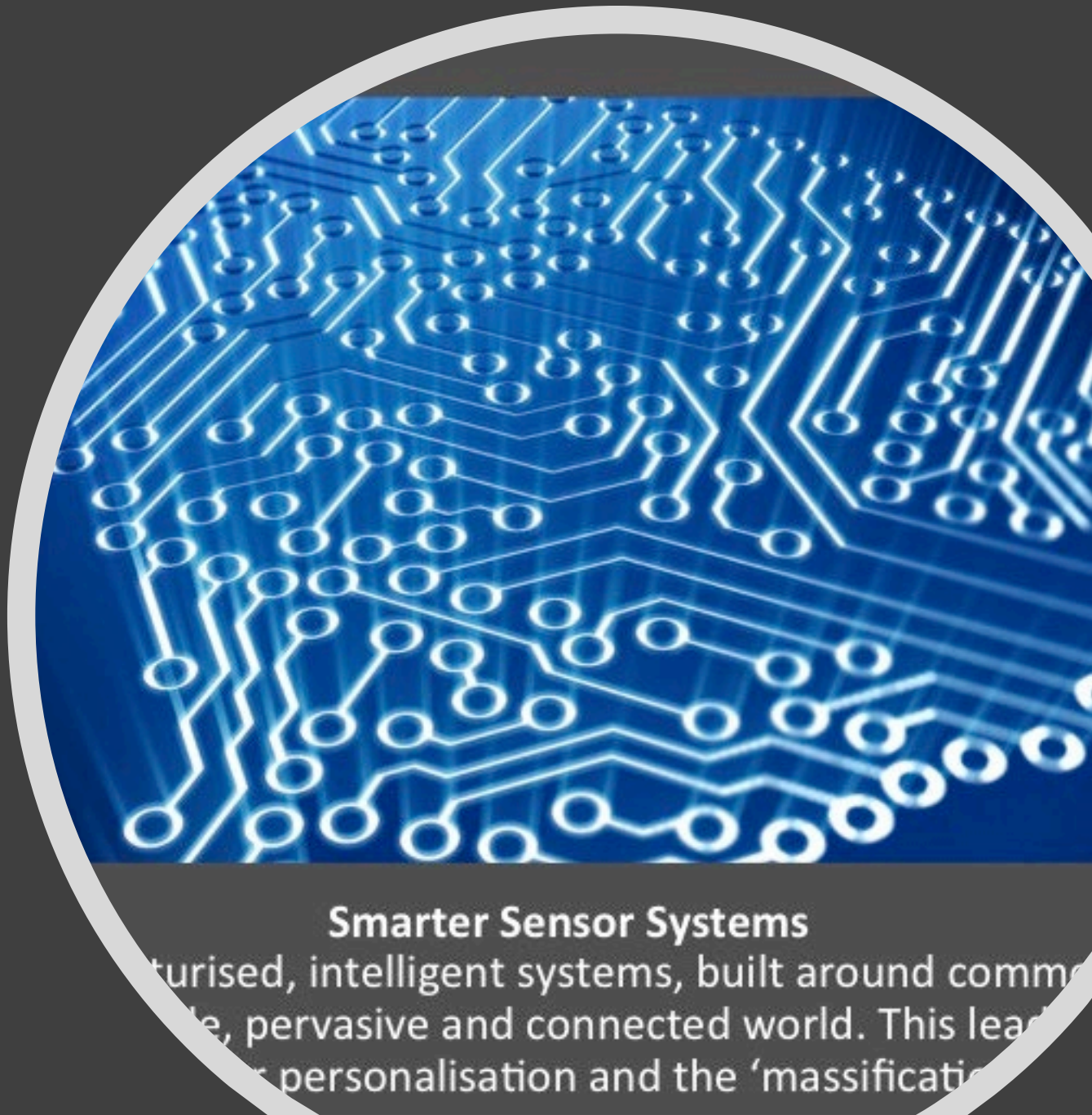
Vincent Claes

IoT Pilootproject

RTC Limburg
Hogeschool PXL



Deelnemers

School	Leerkracht	Aantal lln	Klas
Provil Lommel	Frank Meyers	9	5 Industriële ICT
TI Sparrendal	Chris Vandekragt	4	6 Industriële wetenschappen
campus Hast	Tim Stevens	8	5 Industriële wetenschappen

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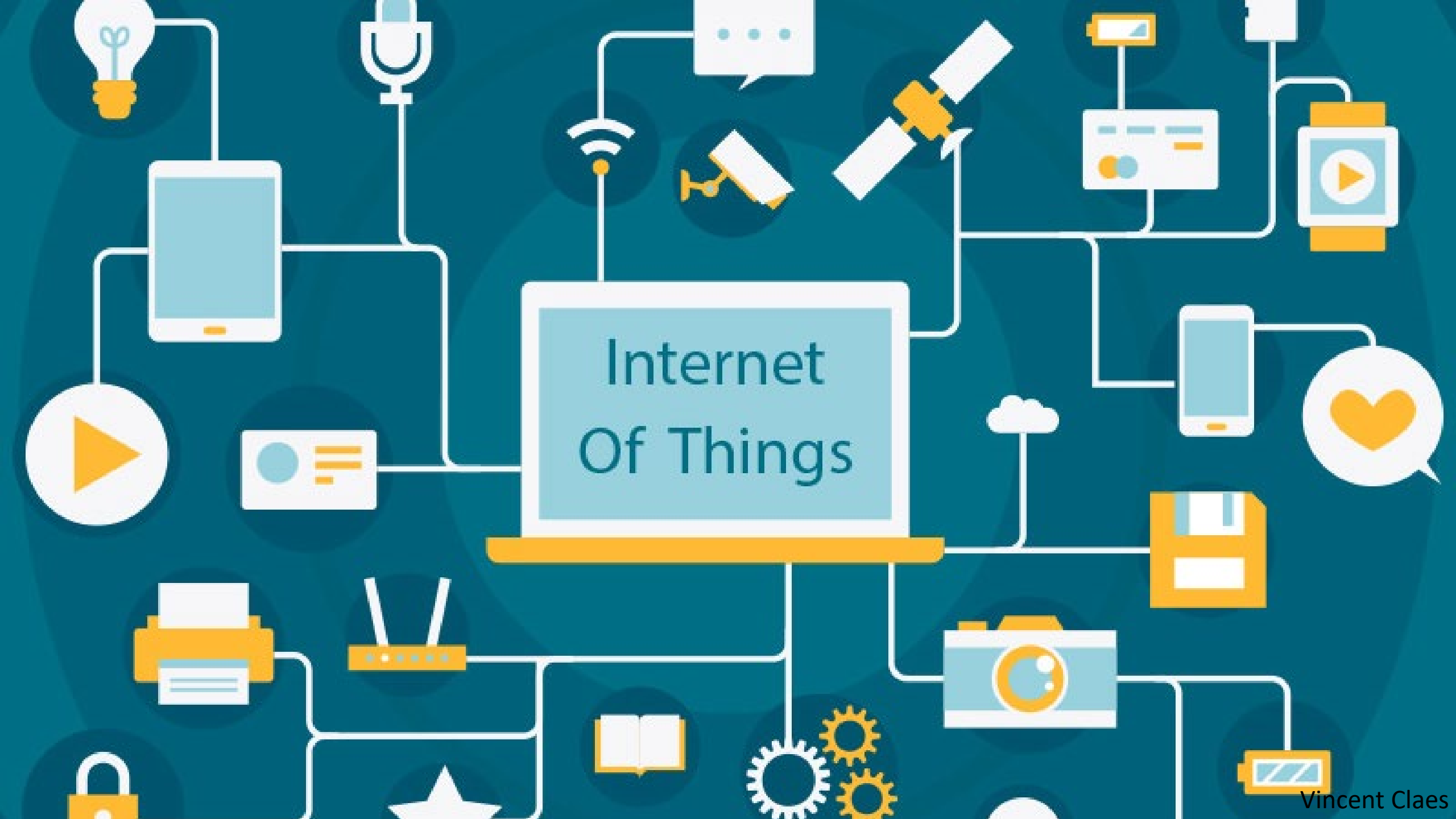

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1

Connect to the network

Orange IoT connectivity

2

Collect your data

From your Orange NB-IoT Rapid Development Kit

3

Visualise your data

Orange Maker
Powered by AllThingsTalk

4

Use your data

Experiments

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Pilootproject

- De deelnemers komen in aanraking met de belangrijkste topics van ***Internet-of-Things*** systemen zoals:
  - *Sensoren*
  - *Sensor Netwerken (Low Power)*
  - *[Sensor] Gegevens [Data] visualiseren*
  - *Programmeren*

Rapid Prototyping Hardware

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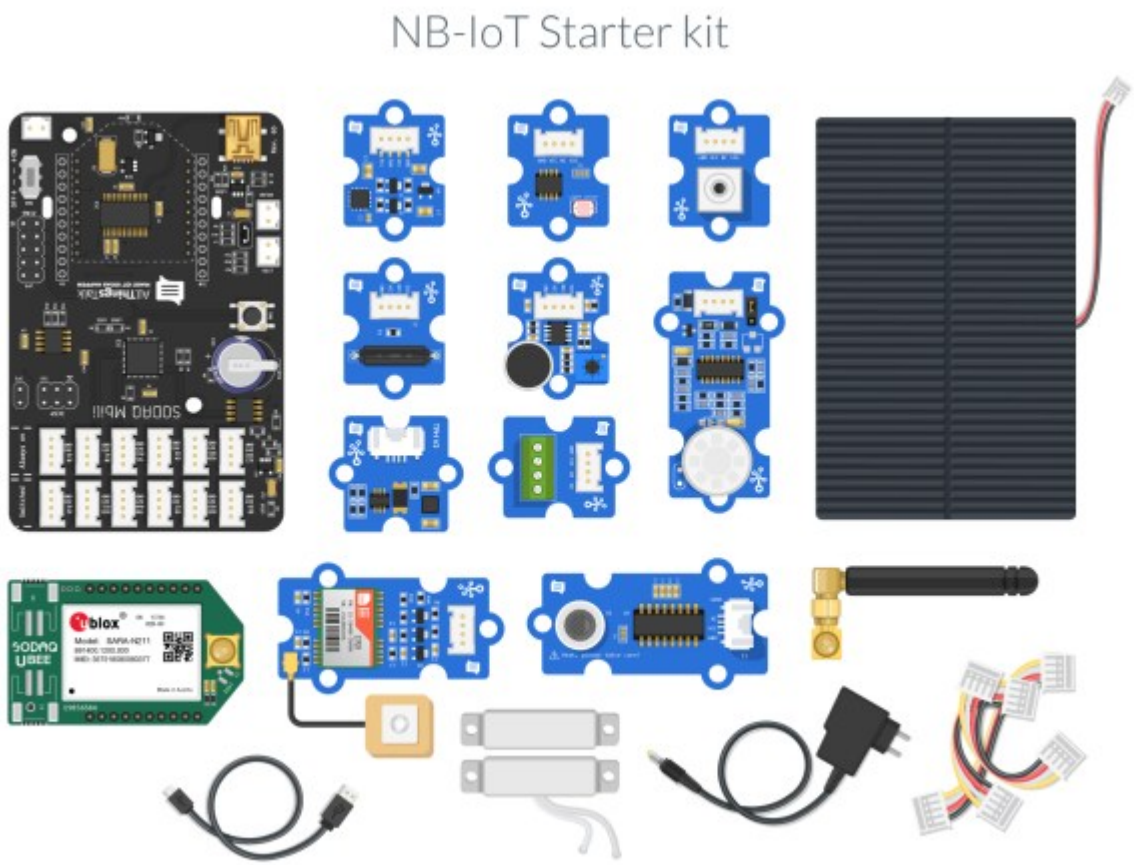
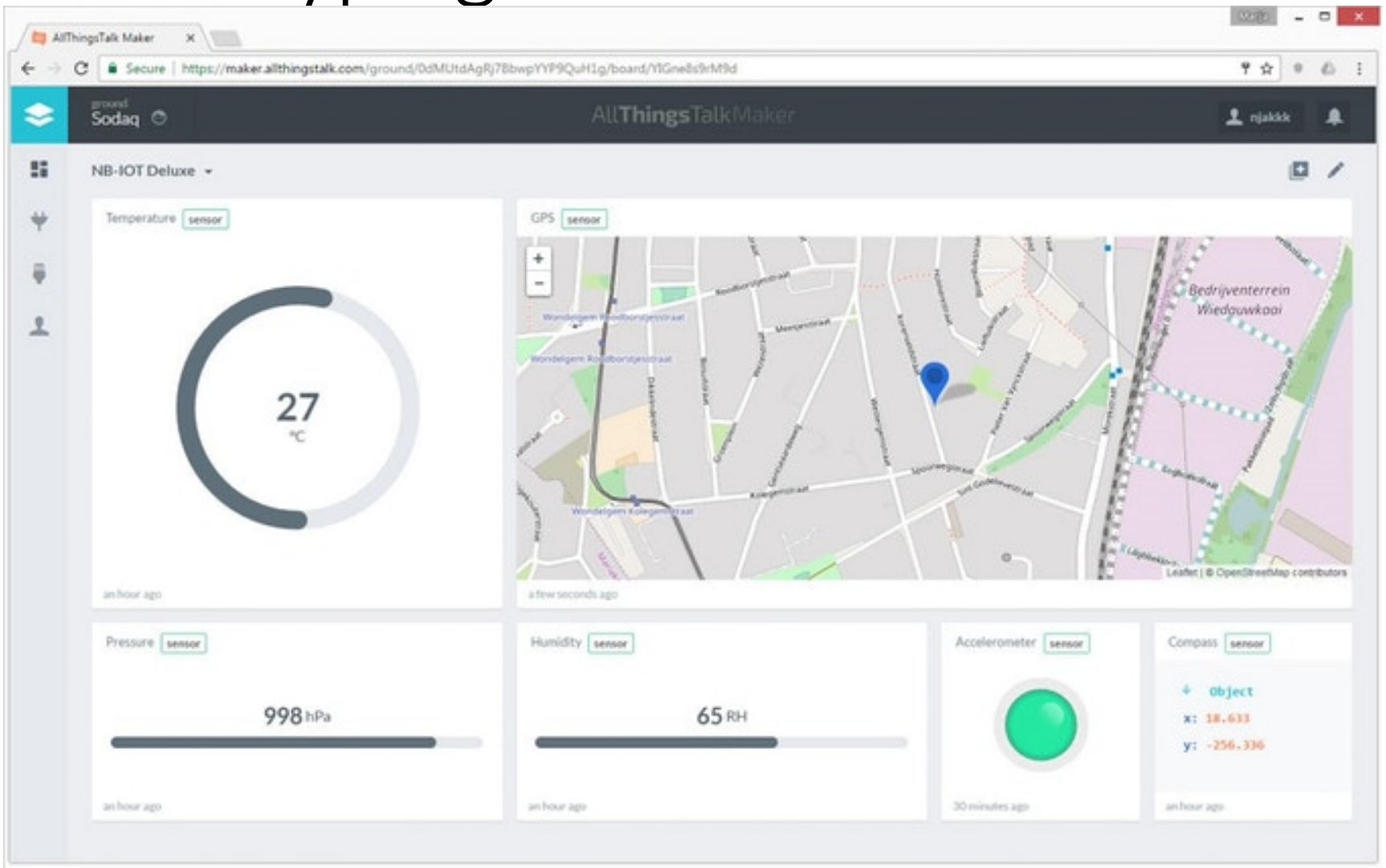
Sensoren



- **uBlox SaraN211 module**
- **Antenna**
- **1.5W Solar panel**
- **Lithium Polymer Battery 1200mAh**
- Grove – Button
- Grove – **Light sensor**
- Grove – PIR motion sensor
- Grove – **Temperature – pressure – humidity sensor**
- Grove – 3-Axis Digital Accelerometer
- Grove – Sound/Loudness Sensor
- Grove – **GPS module**
- Grove – Air quality sensor (Indoor)
- Grove – Tilt switch
- Grove – Magnetic door switch & screw connector

Rapid Prototyping Software



- https://maker.allthingstalk.com

Case Study: Luchtkwaliteit

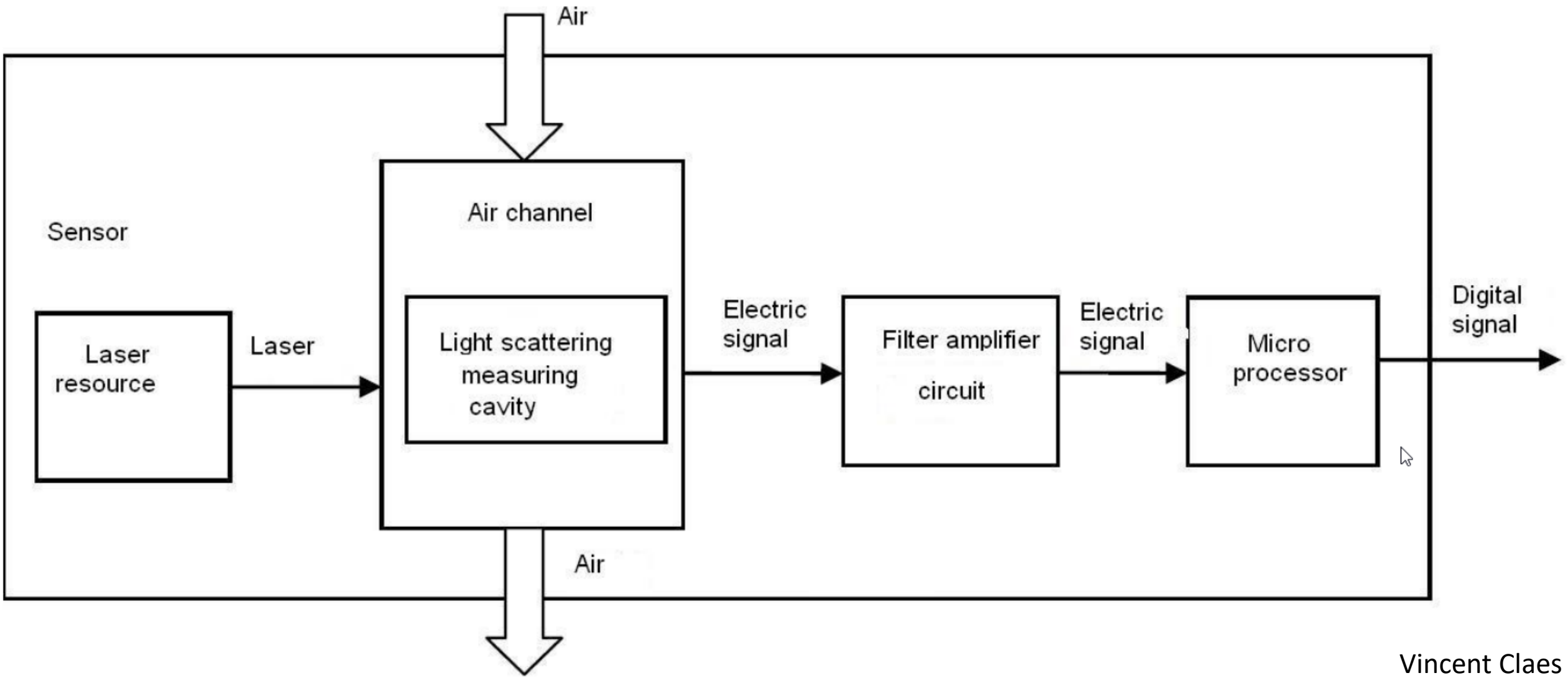
- PM3015 laser particle sensor module
- Deeltjes van 0,3µm ~10µm
- Output van sensor: PM1.0, PM2.5 en PM10 in µg/m³
- Industrial Grade

Applications

- Outdoor air quality monitoring
- Environmental monitoring

http://cteq.eu/NB-IoT/Cubic_PM3015_DS.pdf

Case Study: Luchtkwaliteit



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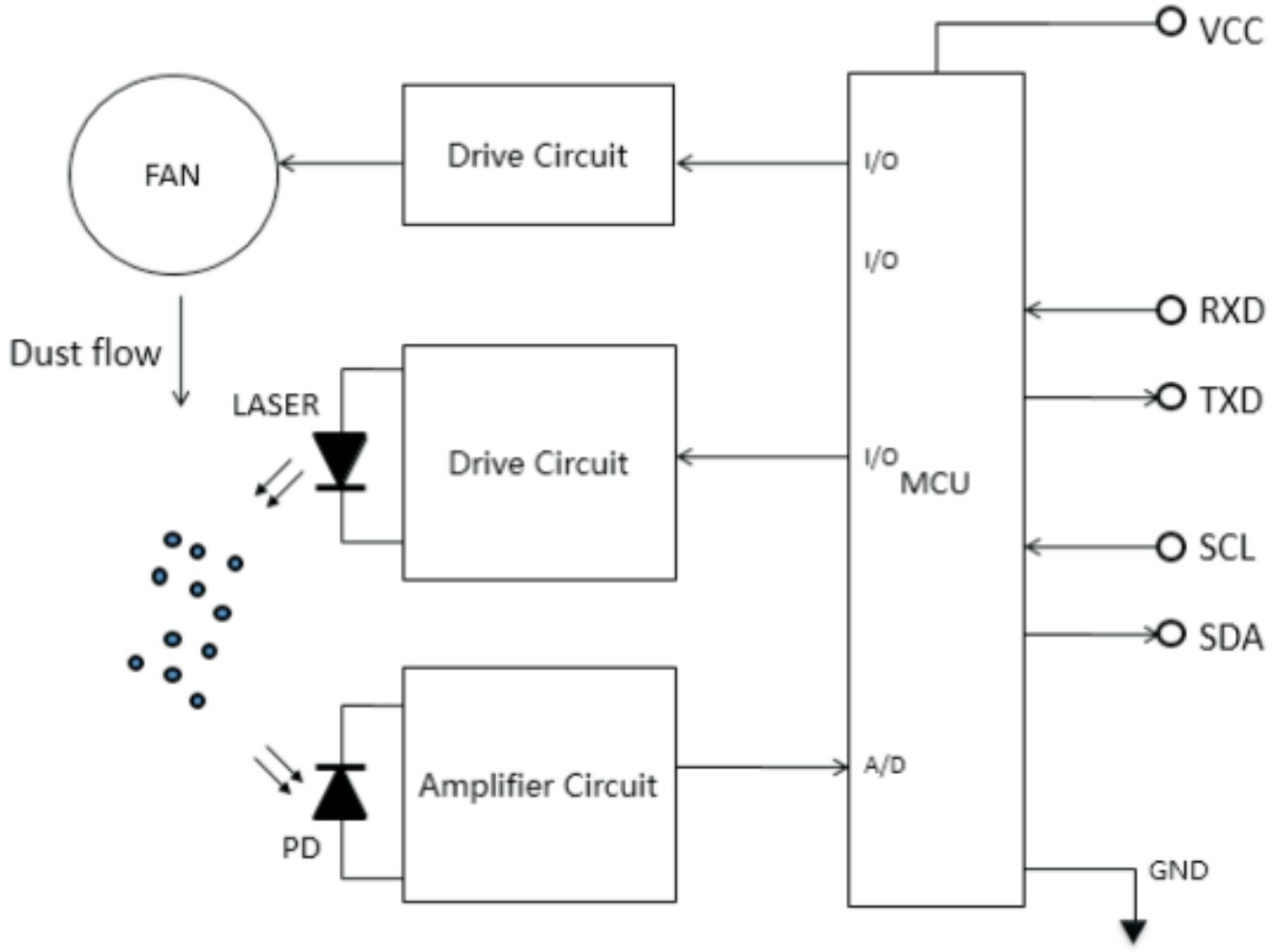
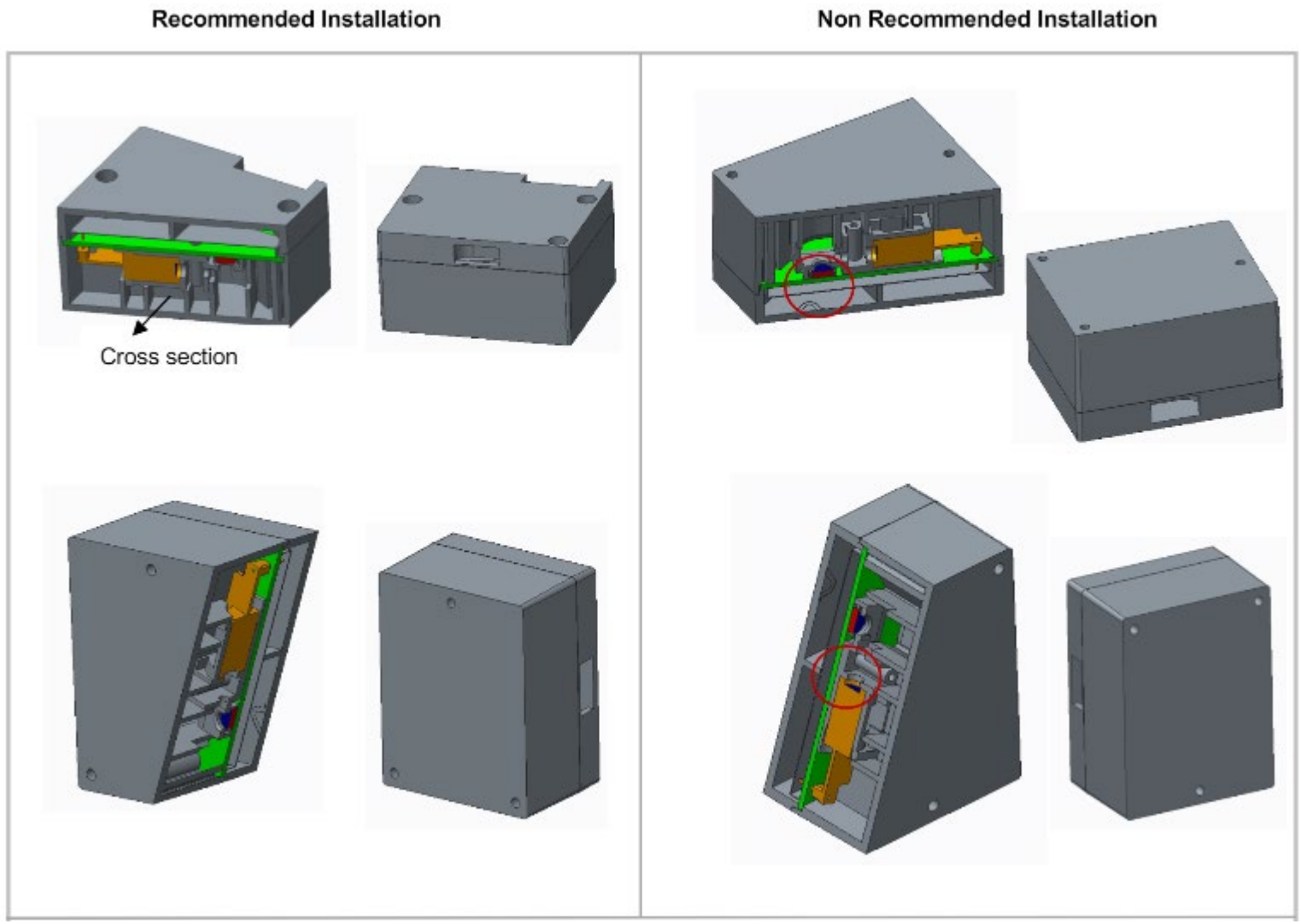
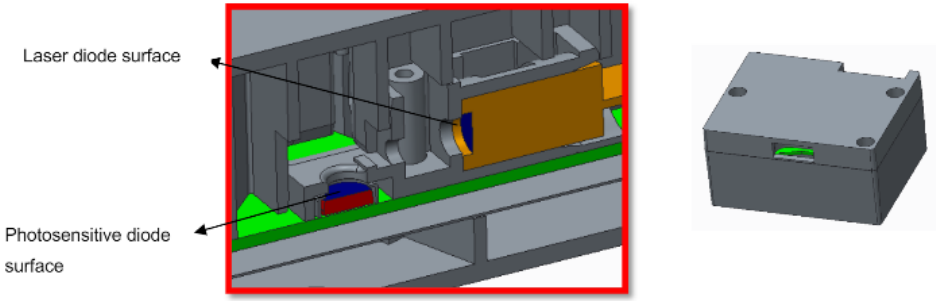
Case Study: Luchtkwaliteit



Case Study: Luchtkwaliteit





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Case Study: Luchtkwaliteit

- Connectie Sensor (Hardware en Software)
  - UART interface
  - **3,3V ⇔ 5V**
- Air inlet / outlet
- Behuizing (onze hardware moet herbruikbaar zijn voor volgend jaar, waterdicht, monteerbaar op fiets, …)
- Data Visualisatie

Gebruikt Materiaal

- Stap 1: **Hardware van Orange Maker Kit [SODAQ]**
  - Arduino IDE
  - Gebruik van 3-Axis Digital Accelerometer en GPS module
  - Gebruik van Magnetic door switch en Push button
  - Gebruik van Light, Temperature, Pressure, Humidity, sound level en air quality (indoor) sensoren
  - Experimenteren
- Stap 2: **Software van AllThingstalk (Gegevens visualisatie)**
  - Grafische Webomgeving Allthingstalk gebruiken
  - Data Visualisatie
  - Experimenteren
- Stap 3: **Case Study**
  - Nieuwe Sensor implementeren (aansluiten, gebruik)
  - Behuizing bouwen voor sensorsysteem
  - Data Visualisatie voor Case Study
- Stap 4: **Presentatie en demo van gerealiseerd project**

Planning

- Stap 0: Kick-off moment met Leerkrachten
  - **28 / 01**
- Stap 1: Hardware workshop, Kick-off moment met studenten
  - In Februari => **19/02**
- Stap 2: Gegevens visualisatie
  - In Februari / Maart => **19/02**
- Stap 3: Case Study setup workshop
  - In Maart [TBD]
- Stap 4: Slotmoment
  - [TBD]

Contact gegevens

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