

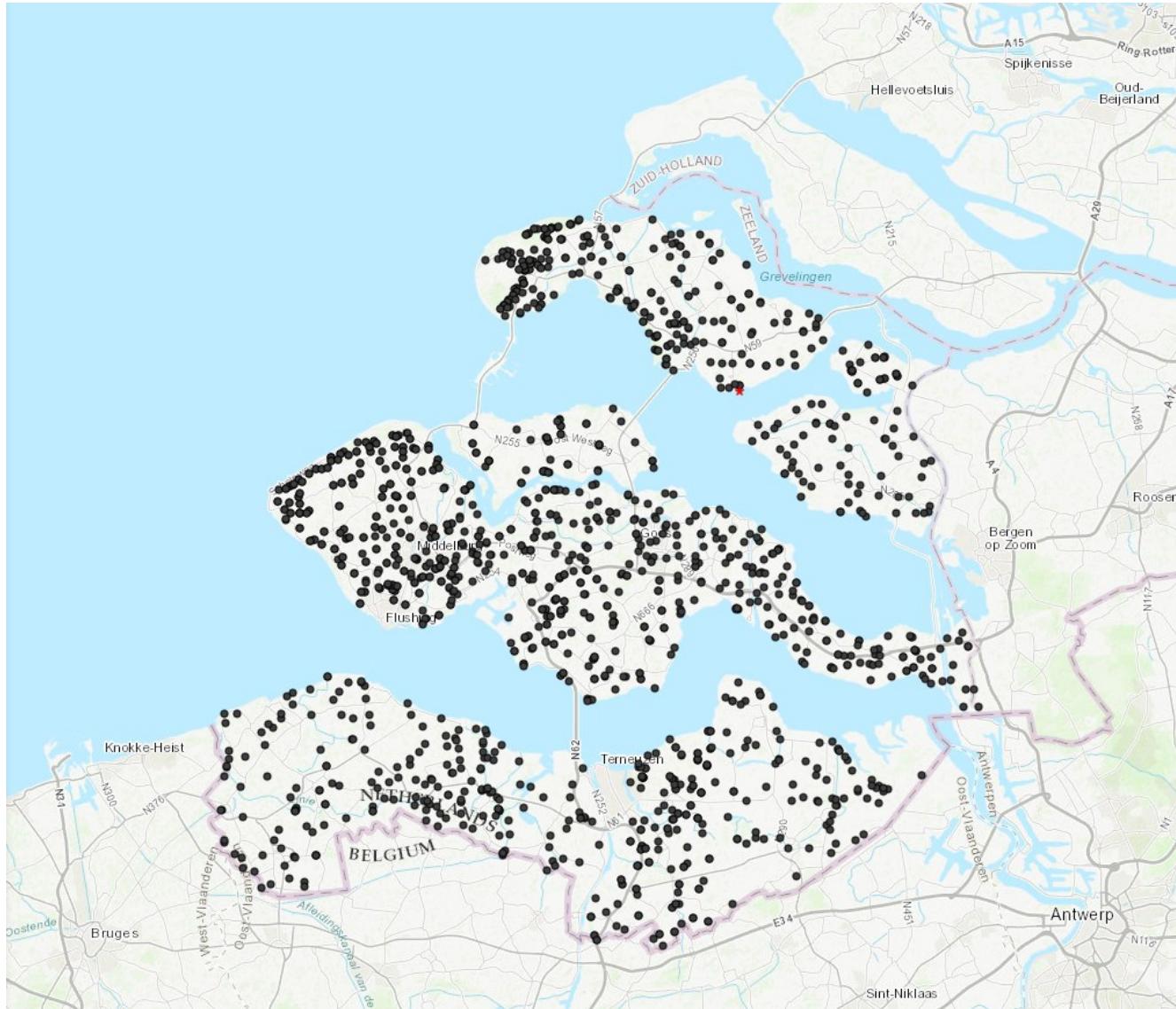
# Multiflexmeter

opensource hardware



Waterschap **Scheldestromen**

Jos Goossen



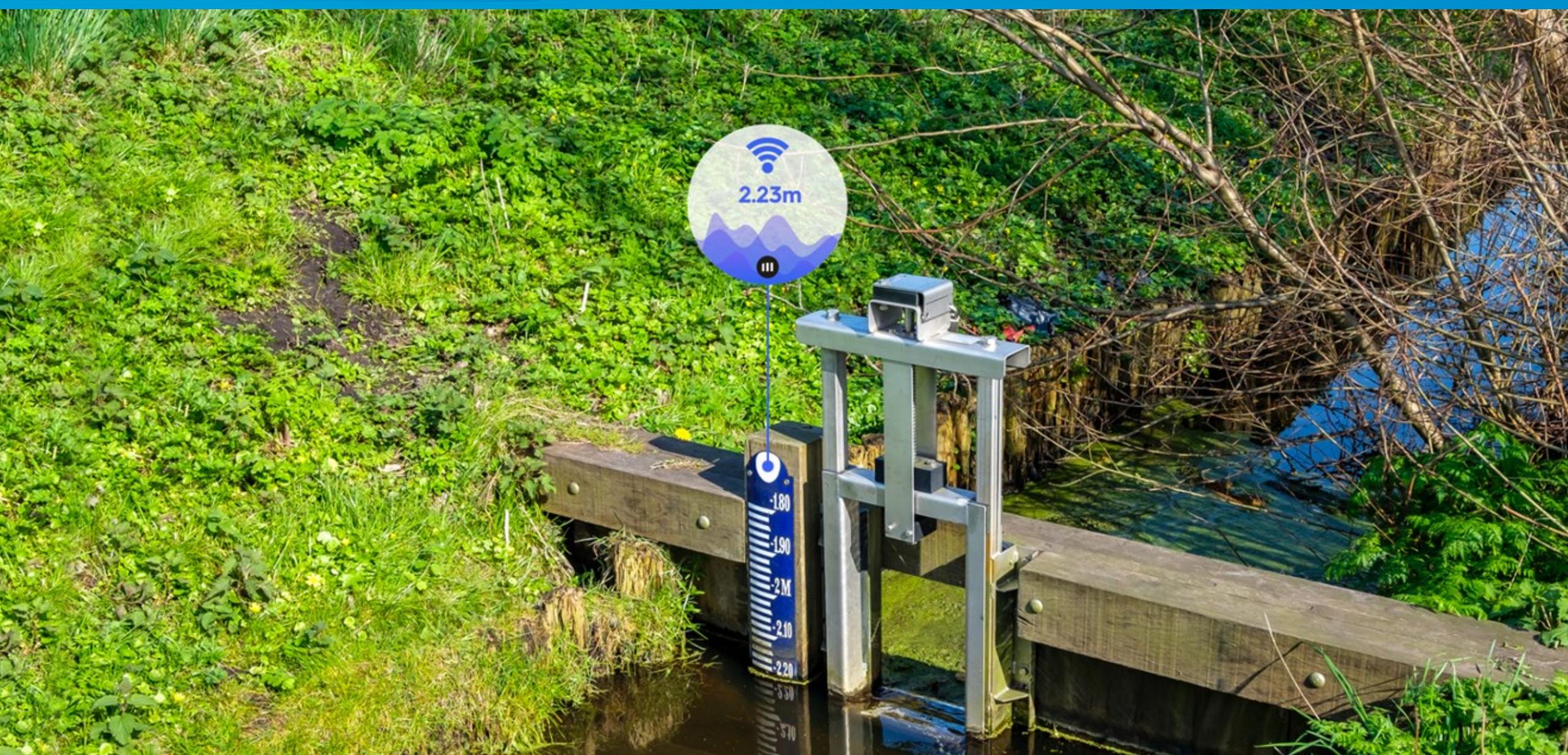
1300 peilschalen

1 getal/maand



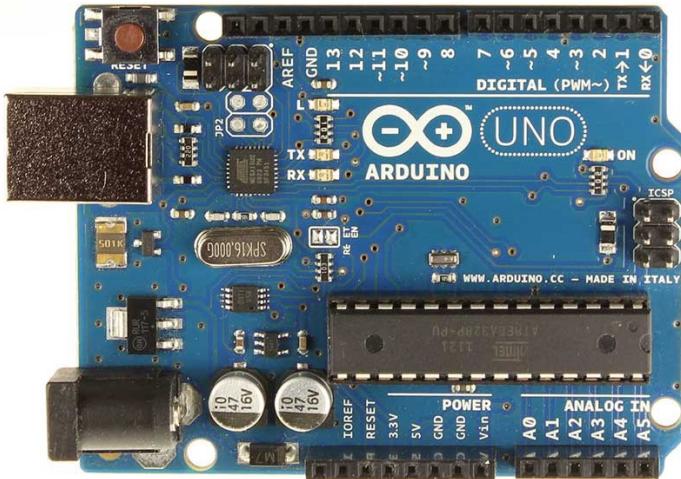
**multiflexmeter**

drijfveer: online waterpeil monitoren



# multiflexmeter

## Het idee



+



## AliExpress

A screenshot of an AliExpress product page for an HC-SR04 Ultrasonic Wave Detector Ranging Module. The page includes the ArCek logo, a "FACTORY OUTLET AD" badge, a "HOT SALE" badge, a price of €1, and a delivery offer of 12-day delivery on €10. The product image shows a blue module with two cylindrical ultrasonic sensors attached.

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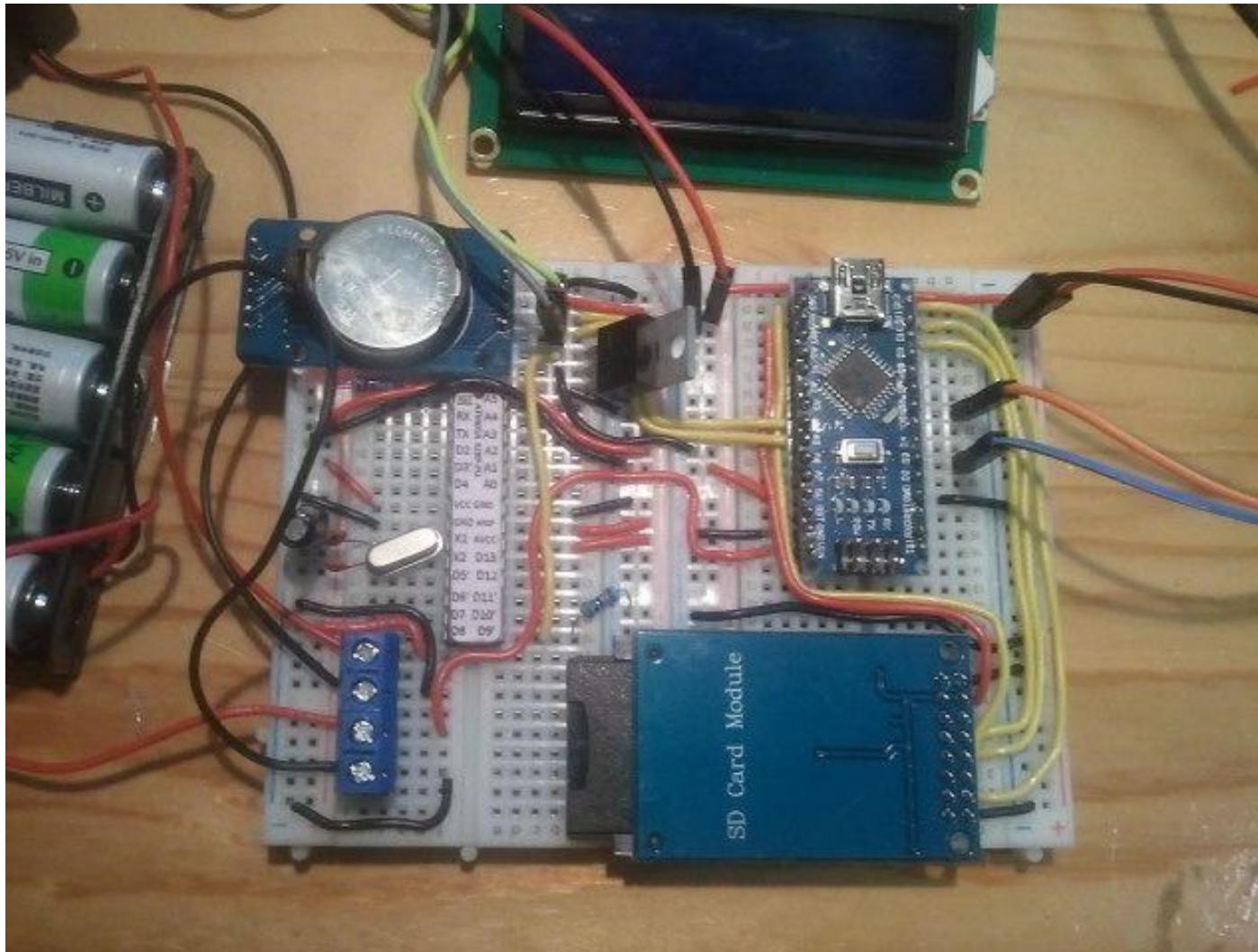


### Ultrasoon sensor

Parkeersensor = goedkoop massaproduct

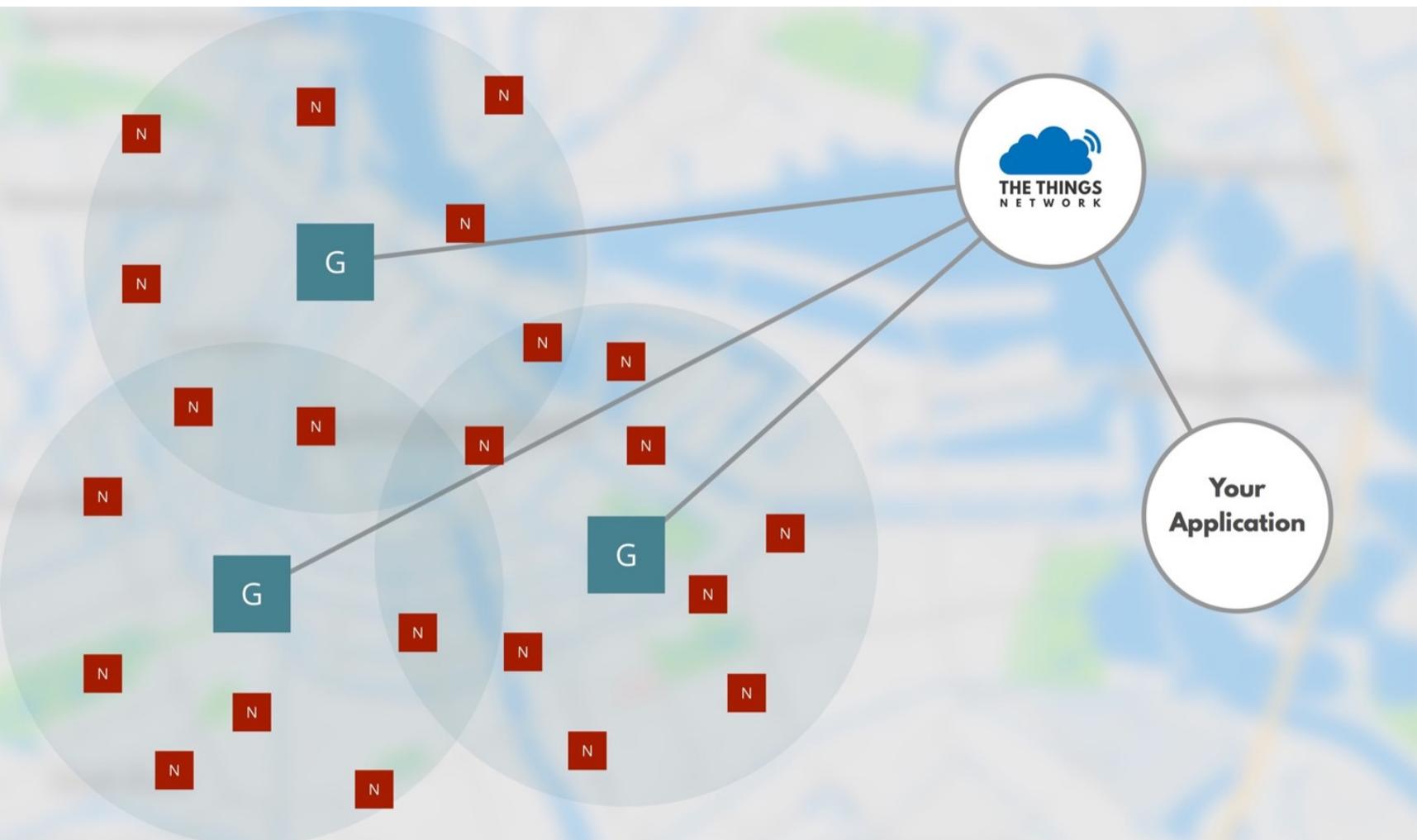


- Contactloos
- Robuust
- Energiezuinig



## Datalogger met SD-card

- Meetnauwkeurigheid 1 cm
- Bereik 2-400 cm
- Time stamp via Real Time Clock



### LoRa

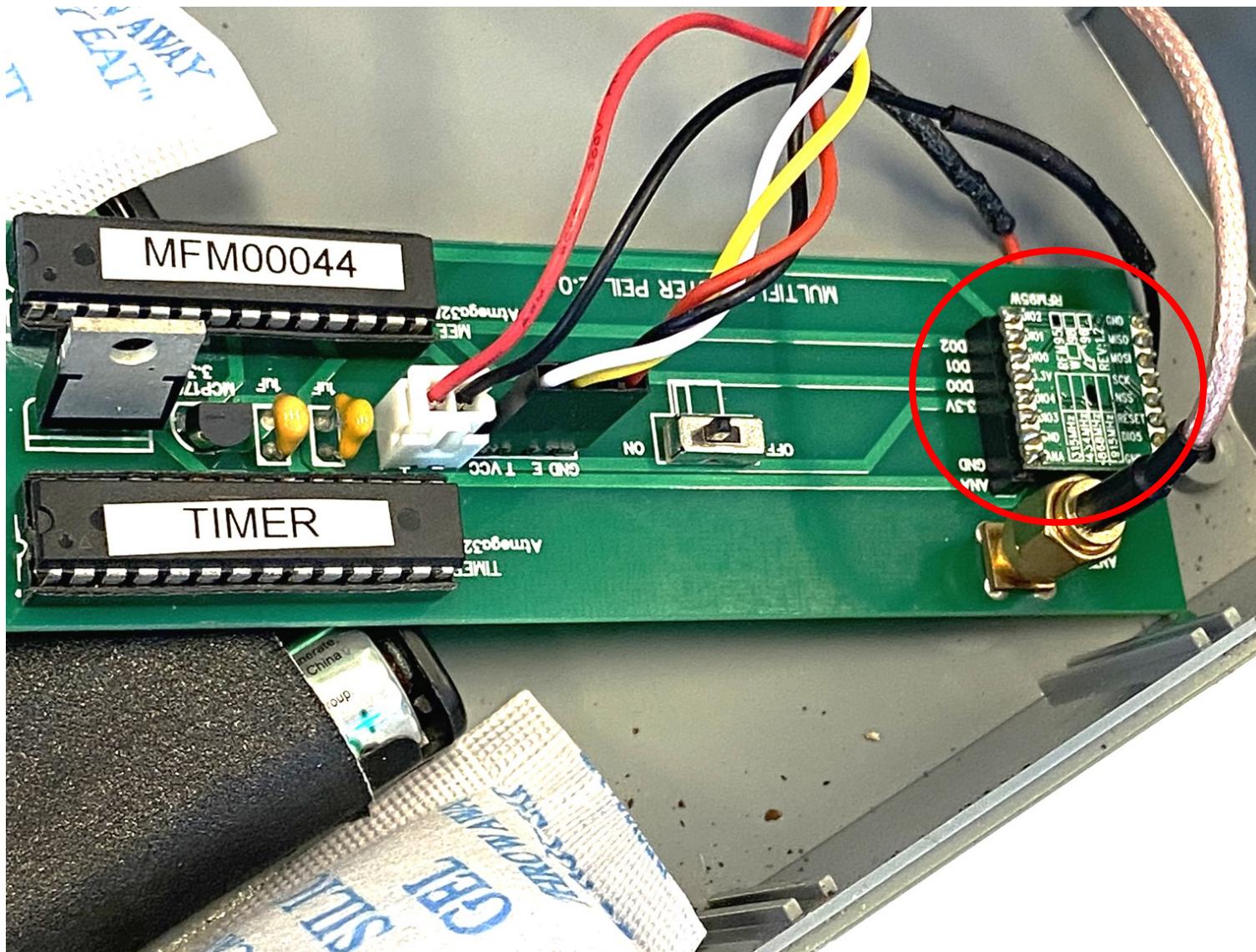
- bereik 2,5 - 15 km
- alleen kleine berichtjes
- zuinig
- veilig

### The Things Network

- open community netwerk
- anno 2015
- al >20.000 gateways
- Zeeland 35 gateways

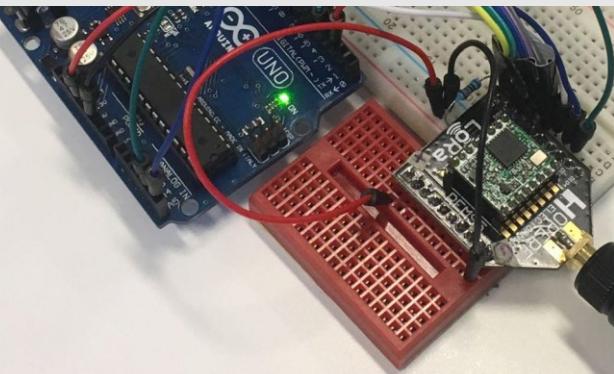
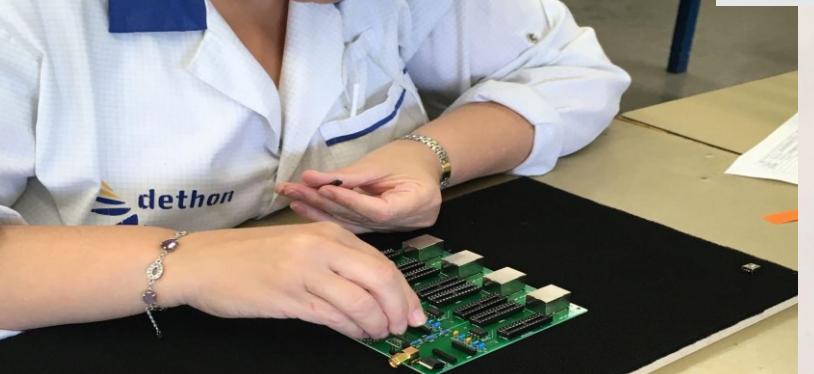
**multiflexmeter**

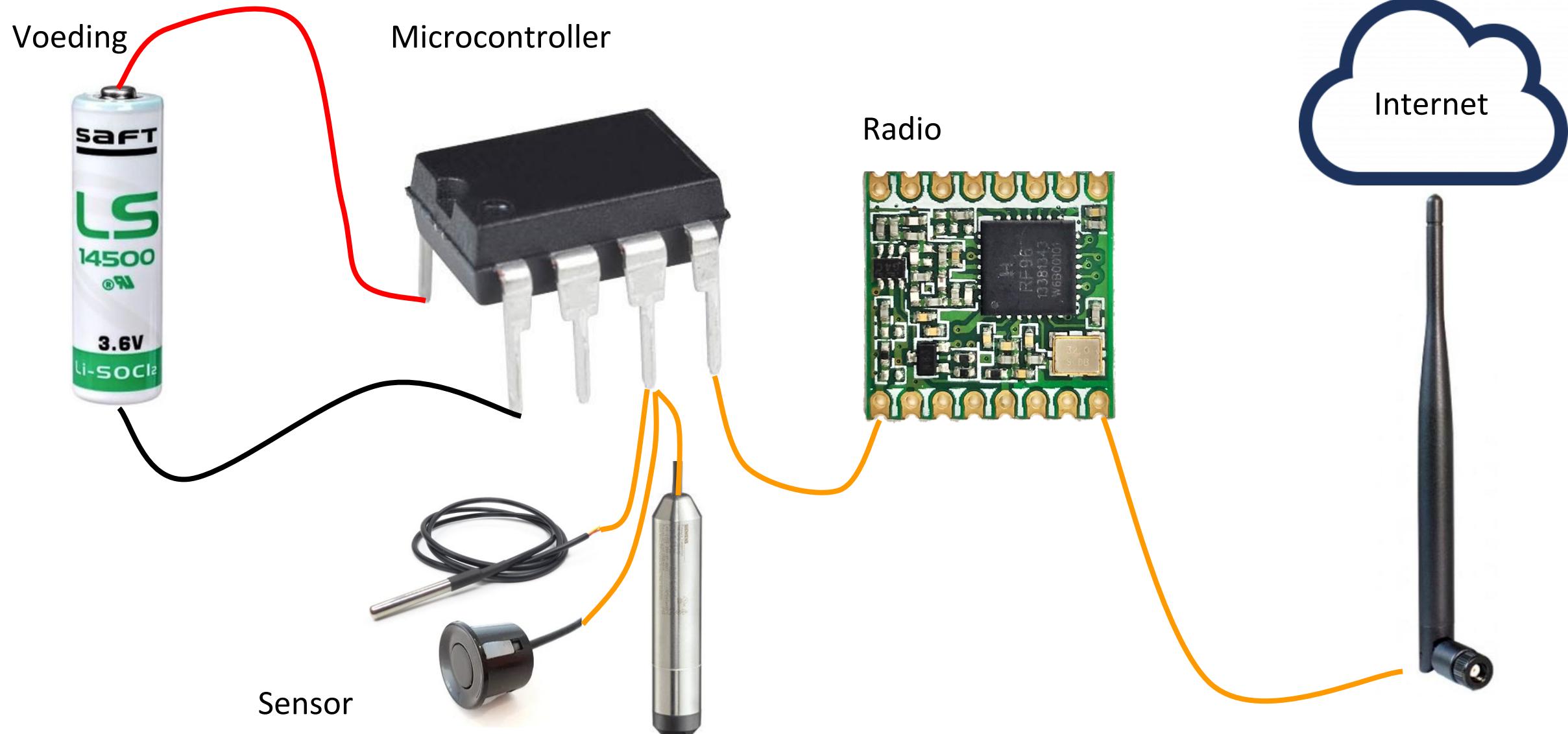
**MFM-versie 2**



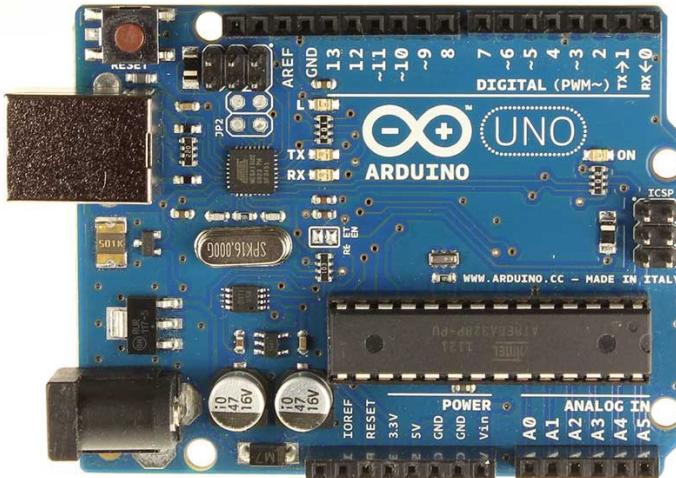
# multiflexmeter

# Innovatief





Multi en flex:



Analoog sensoren via analog/digitaal converter

Digitale sensoren via:

- I2C, serial clock pin (SCL) en serial data pin (SDA)
- One Wire
- UART via RX en TX pinnen
- SPI

Andere protocollen via externe modules

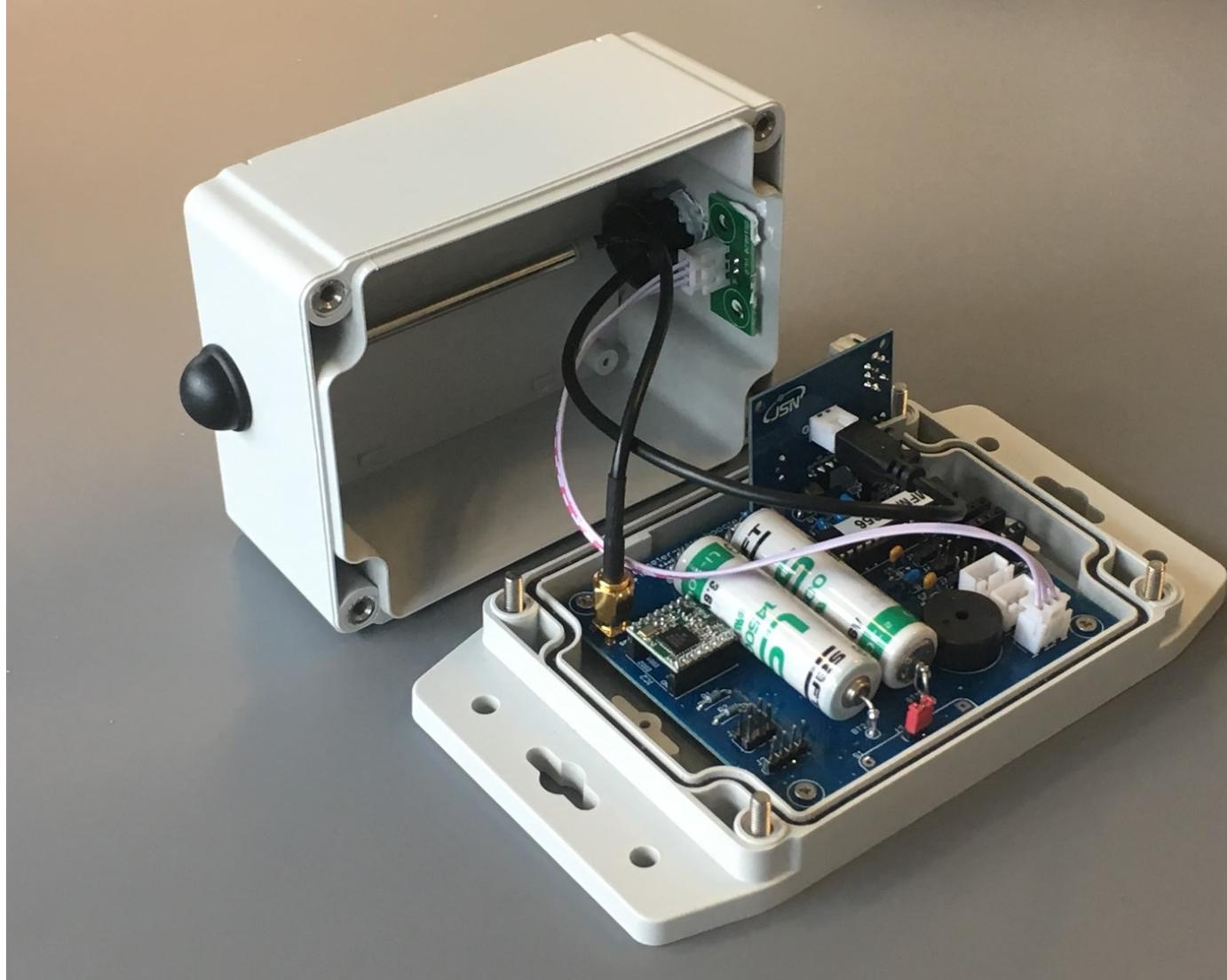
99% van alle sensoren te koppelen

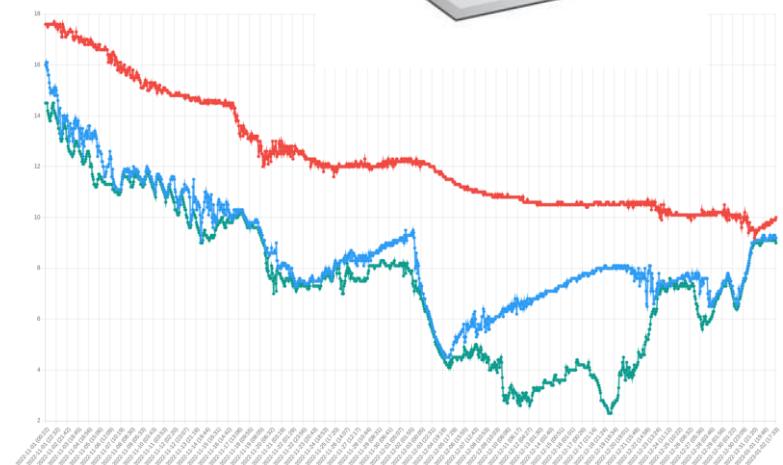
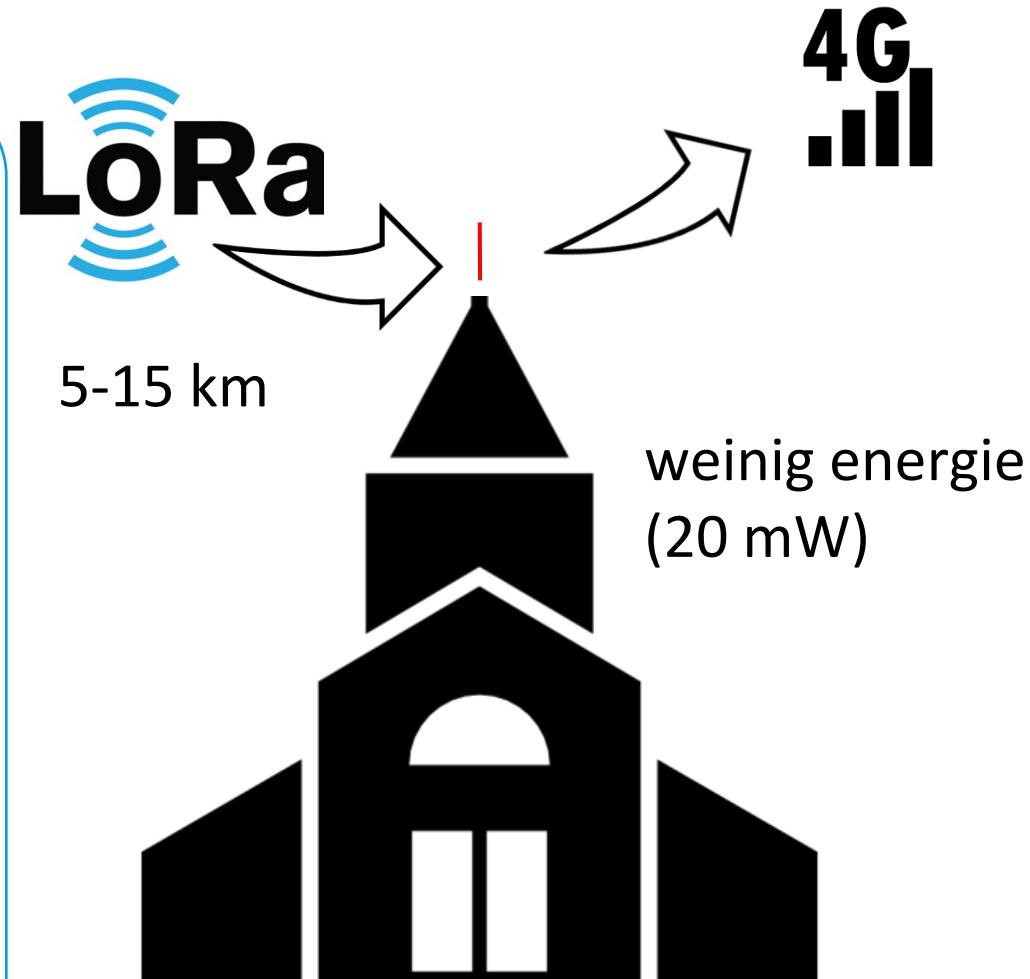
**multiflexmeter**

**MFM-versie 3**



[demo data-ontsluiting via Grafana](#)

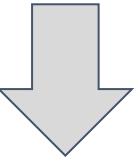




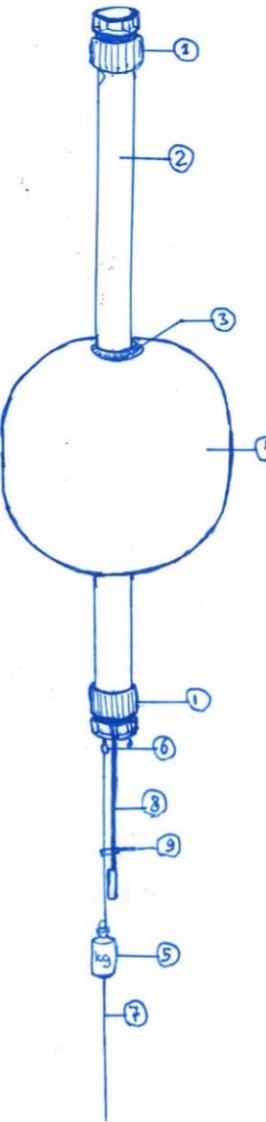


[Hoek, steunpunt Mauritsfort, hoogte 7 m](#)

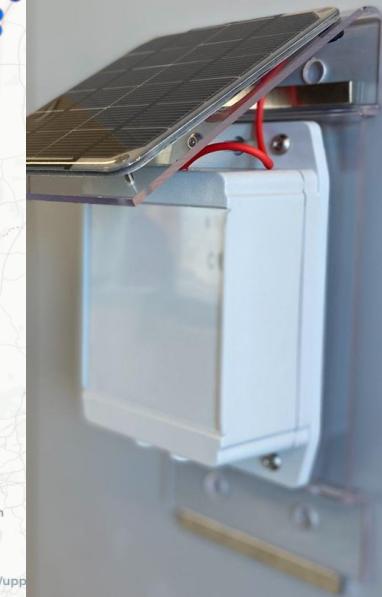
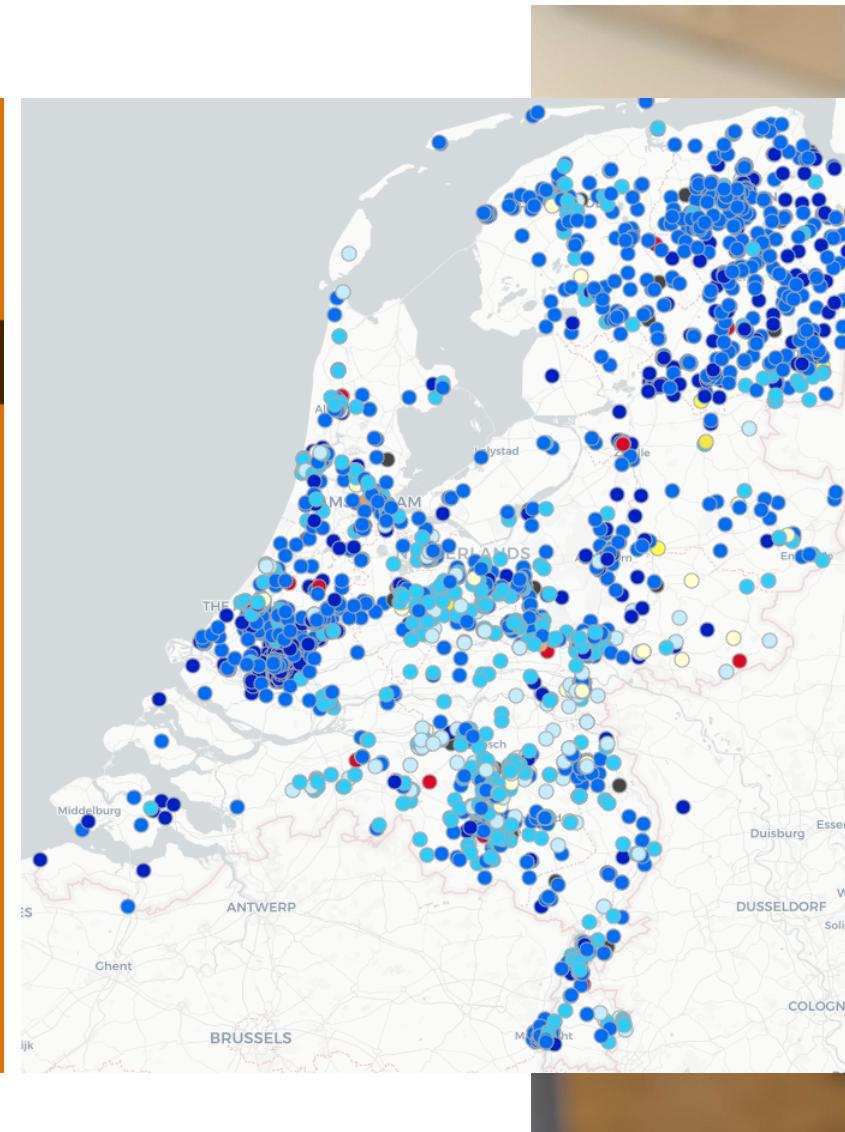
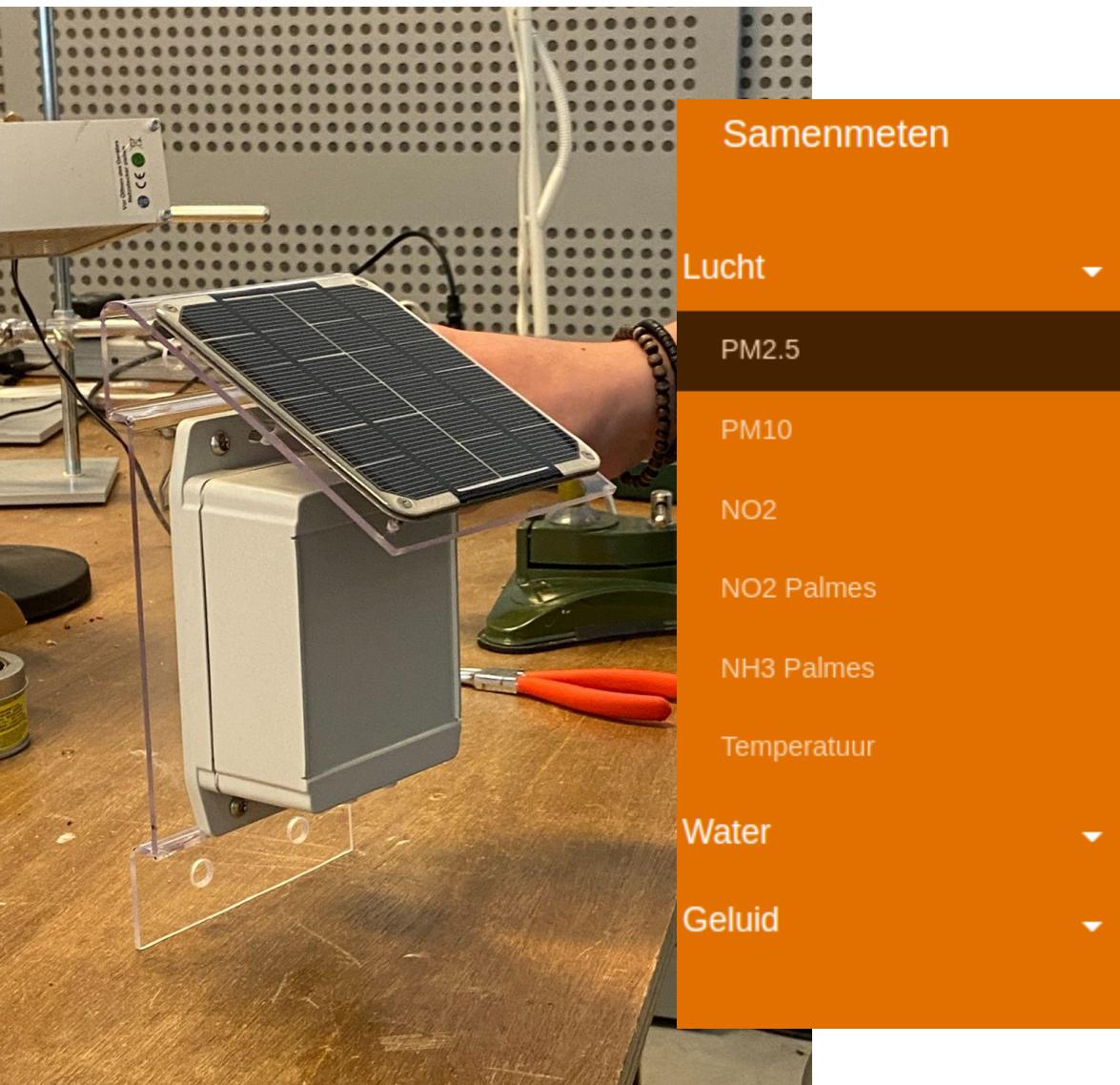
Vak-HAVO Goes ontwerpt drijvende temperatuursensor

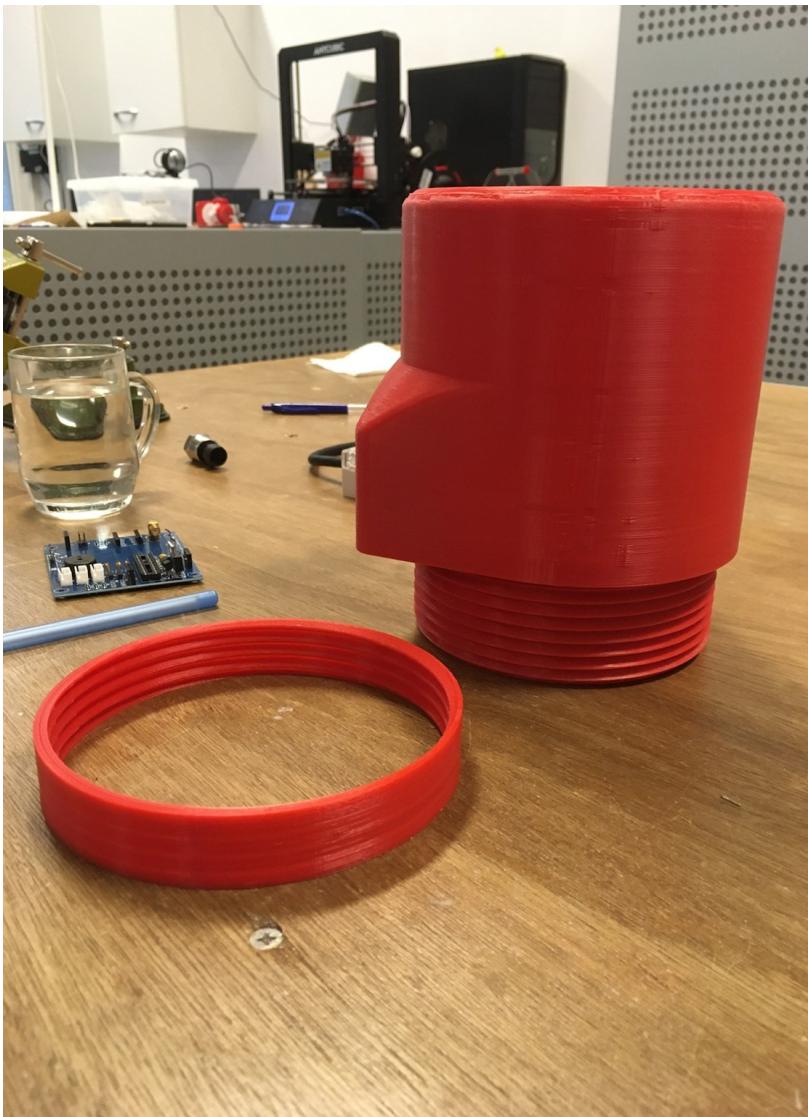


Aquathermie pilot Zierikzee









Druksensor onder water  
Atmosferische sensor in behuizing.

Kunststof deksel (3D-print)

## Grondwaterpeil



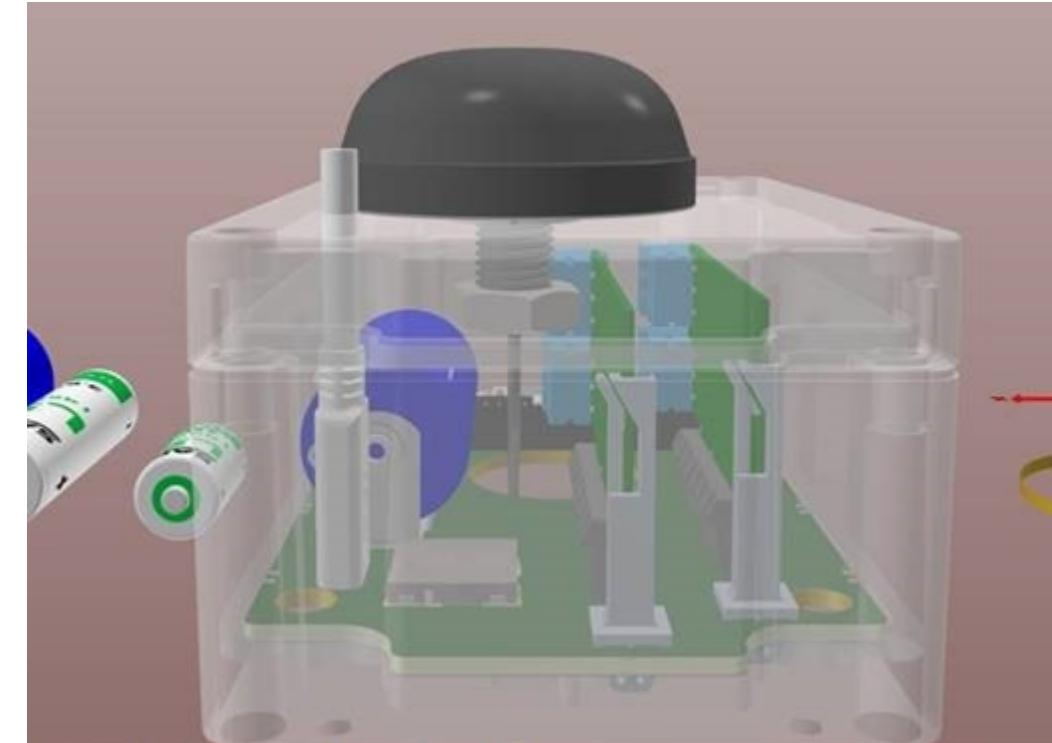
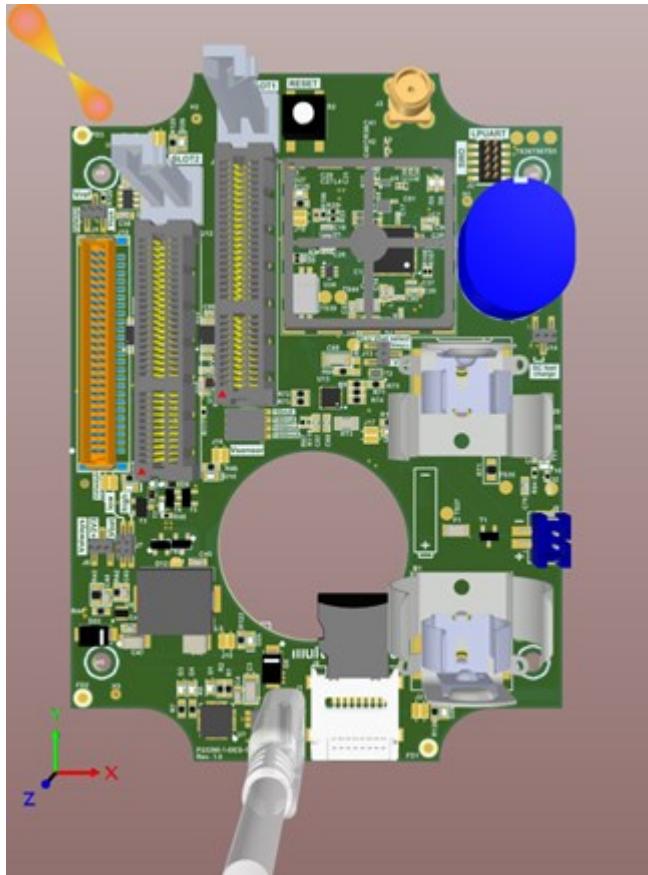
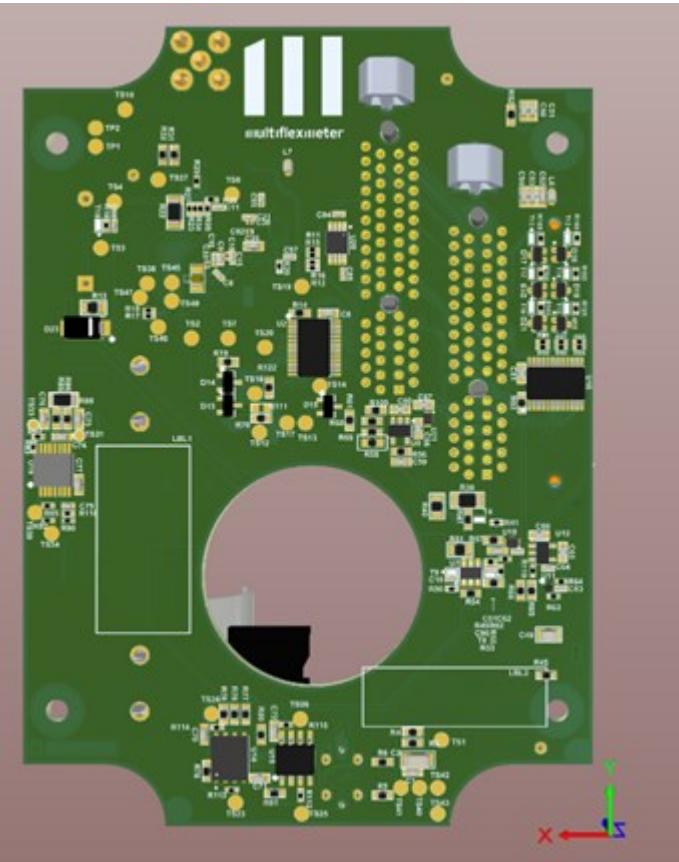
Druksensor onder water

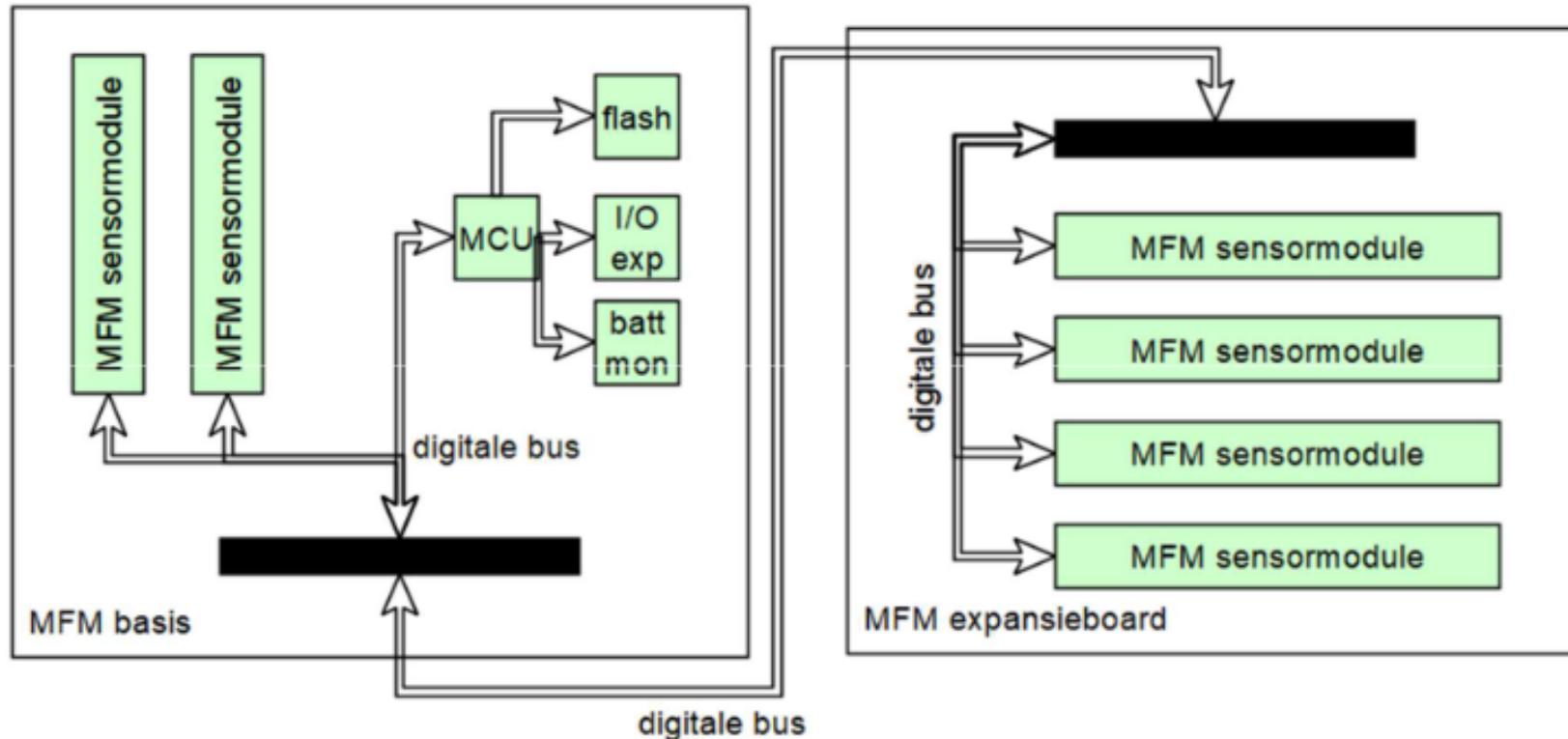
In 2014 uitrol

Aanbesteding door provincie Zeeland.

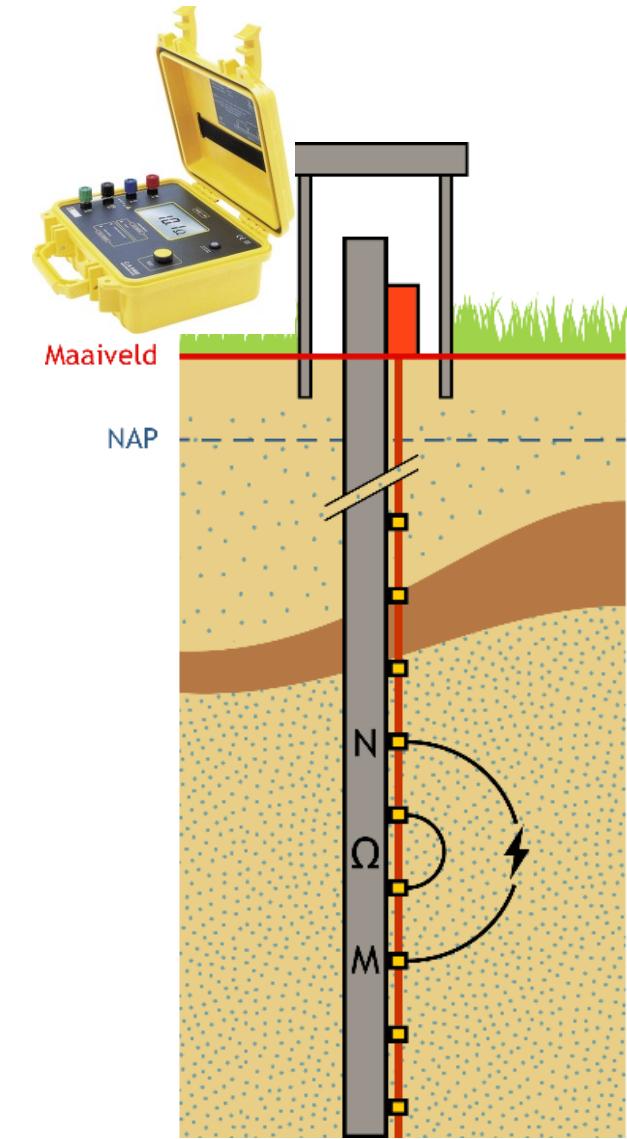
In eerste instantie voor grondwatermeetnet

Chip-tekorten omzeild





- Modulaire opbouw
- Blijft open source
- In 2014 500 grondwater sensormodules
- 10 jaar zonder onderhoud
- externe USB-voeding mogelijk
- Eenvoudig te programmeren
- loggerfunctie voor 10 dagen
- prijsindicatie: < €100/module



€

multiflexmeter

