

DUSTDUINO+ WORKSHOP

ROBERT KIEBOOM



SENSE THE CITY - 7 DECEMBER 2015

MAKING

ZELF MAKEN VAN FYSIEKE OBJECTEN; VAN GEBRUIKSOBJECTEN..

GAAT HAND IN HAND MET DE DIGITALE REVOLUTIE

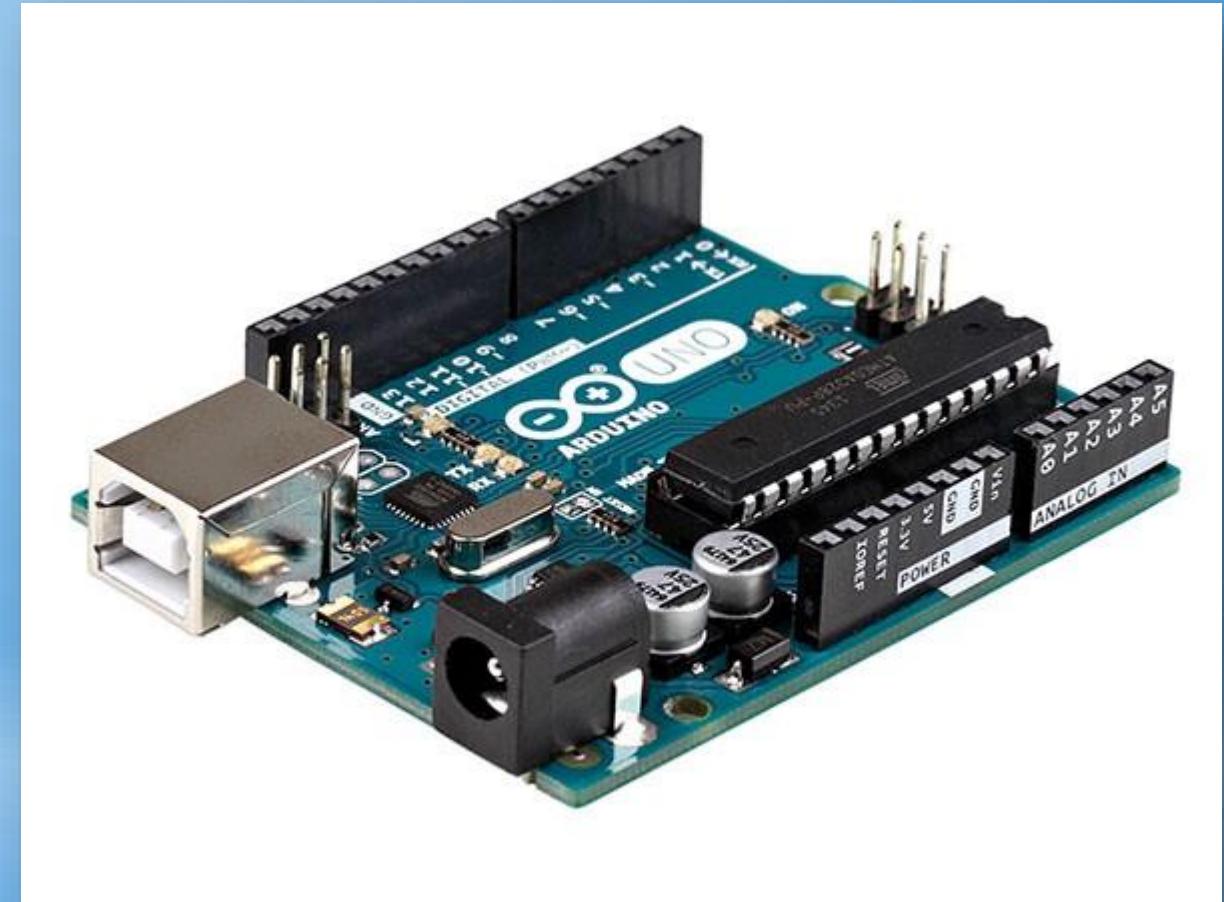
- DE REVOLUTIE VAN BITS
- DE REVOLUTIE VAN ATOMEN

WE MAKEN VANDAAG EEN FIJNSTOF SENSOR MET
OPEN SOURCE HARDWARE EN SOFTWARE...

ARDUINO

ARDUINO UNO

- 2 KB RAM
- 32 KB FLASH
- 8 BIT PROCESSOR
- ECOSYSTEEM
- DIGITALE I/O
- ANALOGE INPUTS



ARDUINO

ITALIË, IVREA 2005

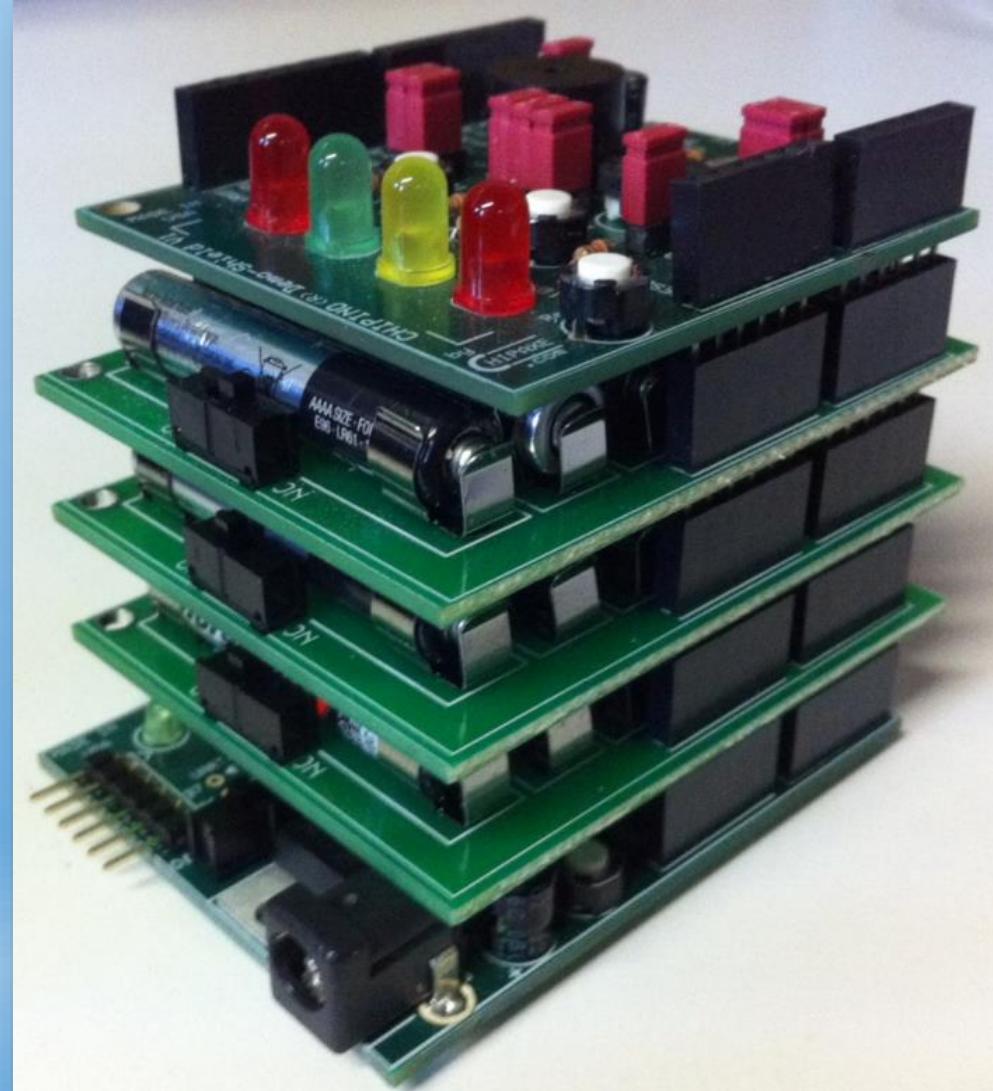
- MASSIMO BANZI
- INTERACTION DESIGN INSTITUTE
- GOEDKOOP, EENVOUDIG
- BEDOELD VOOR BEGINNERS,
MAKERS, STUDENTEN, ...
- ARDUINO: BAR IN IVREA



SHIELDS

- EXTRA ELECTRONICA
- MODULES
- PLUGGEN OP DE ARDUINO
- WIFI, SD KAART, DISPLAY, ...

WIJ GEBRUIKEN HET WIFI SHIELD
VAN ADAFRUIT.



DUSTDUINO

- ARDUINO MET FIJNSTOF SENSOR
- MATT SCHROYER, 2013

- MEET PM2.5 EN PM10
- ONGEVEER 100 DOLLAR
- VOLLEDIG OPEN SOURCE
- DEELT DE METINGEN VIA WIFI OP XIVELY



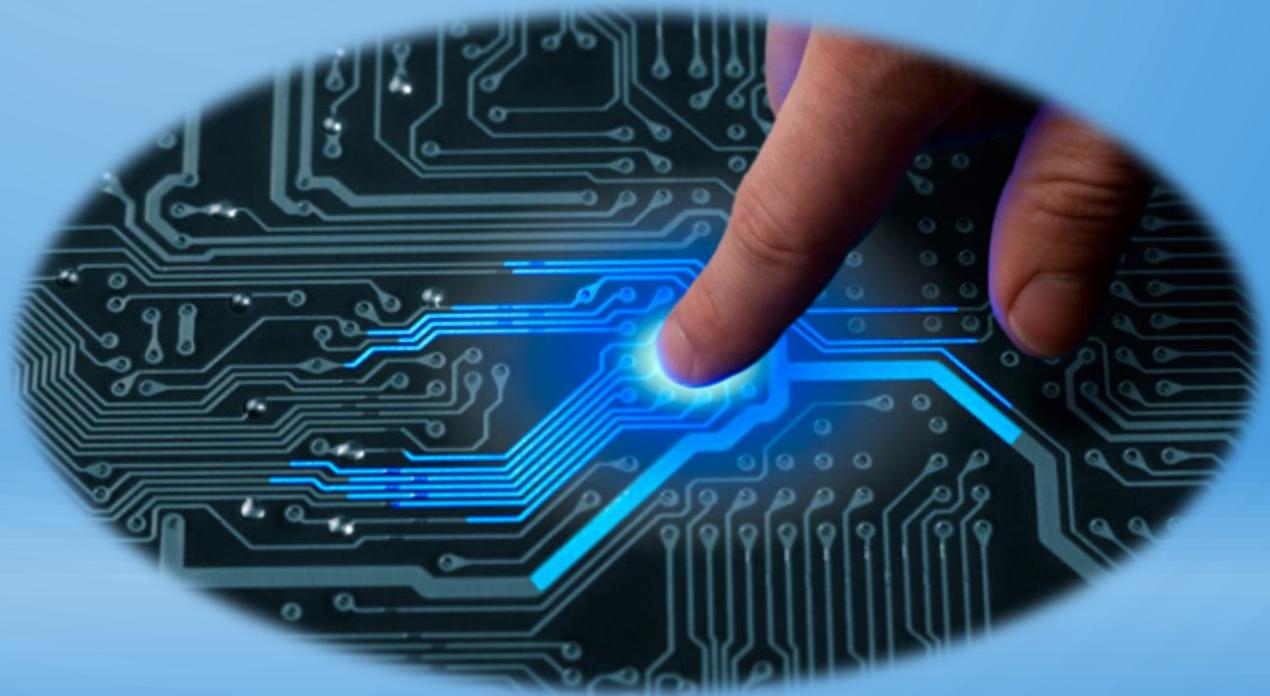
DUSTDUINO+

- ONDERDELEN IETS AANGEPAST
- STATUS LED
- VOCHTIGHEID
- TEMPERATUUR
- OPEN DATA (GEONOVUM FI-WARE/IOT SERVER)
- OPEN HARDWARE (ARDUINO, ADAFRUIT)
- OPEN SOURCE (BRONCODE STAAT OP GITHUB)

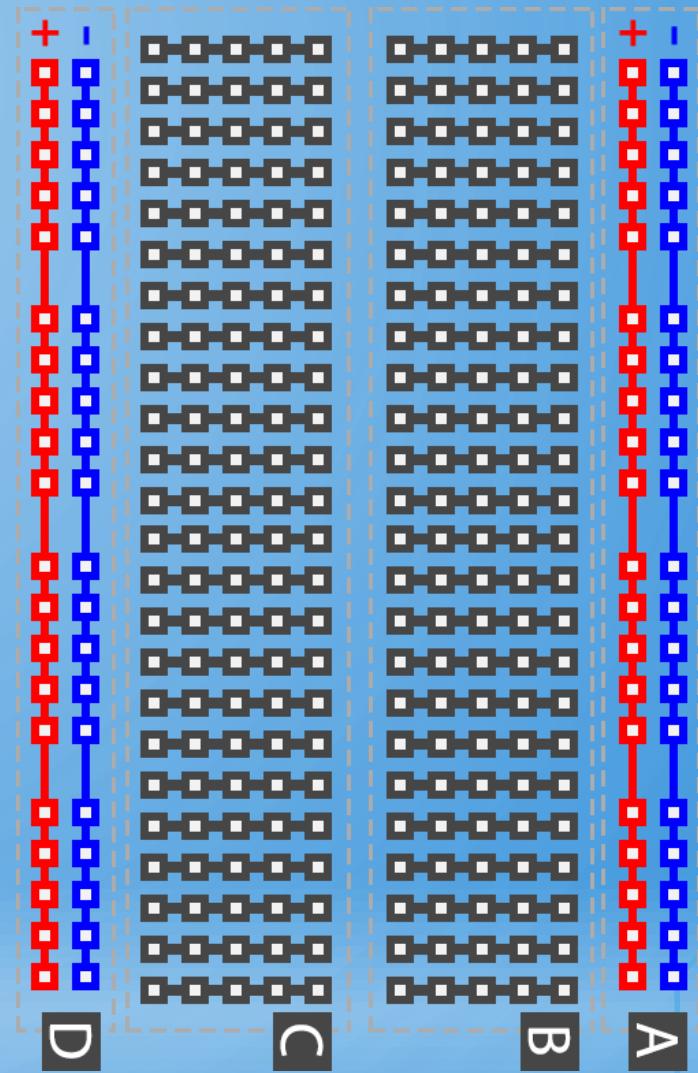
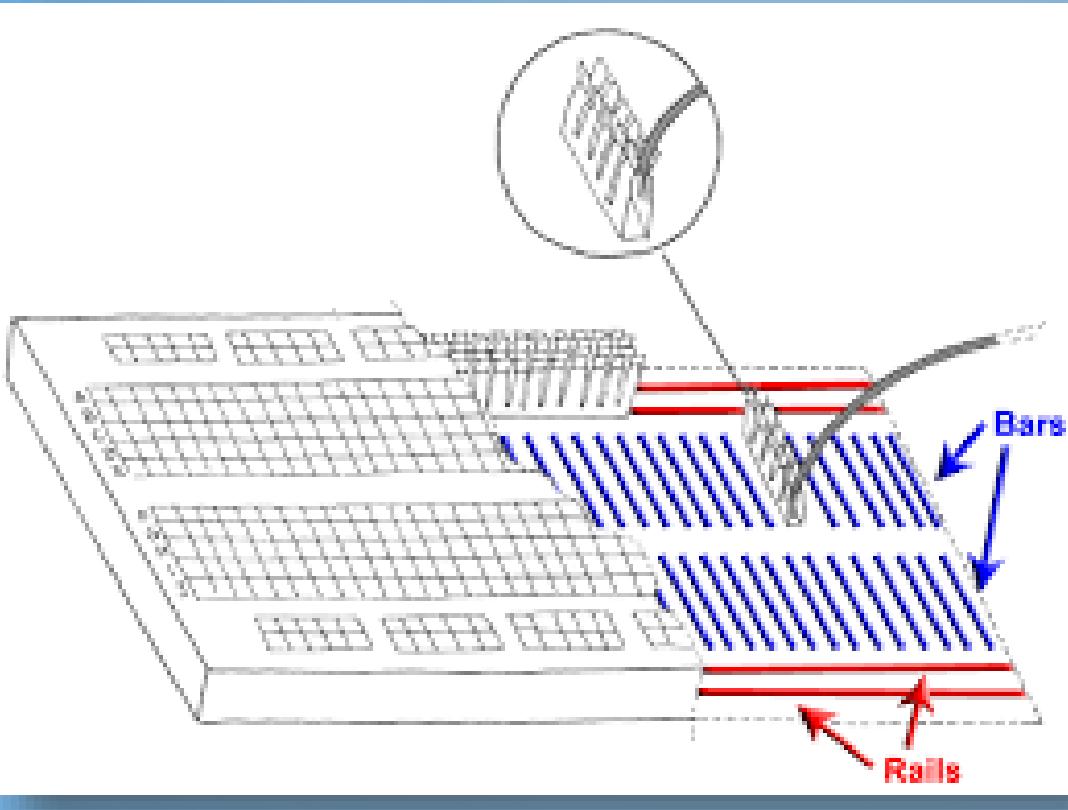
GAAN WE VANDAAG MAKEN!

WORKSHOP

WE GAAN BEGINNEN



BREADBOARD

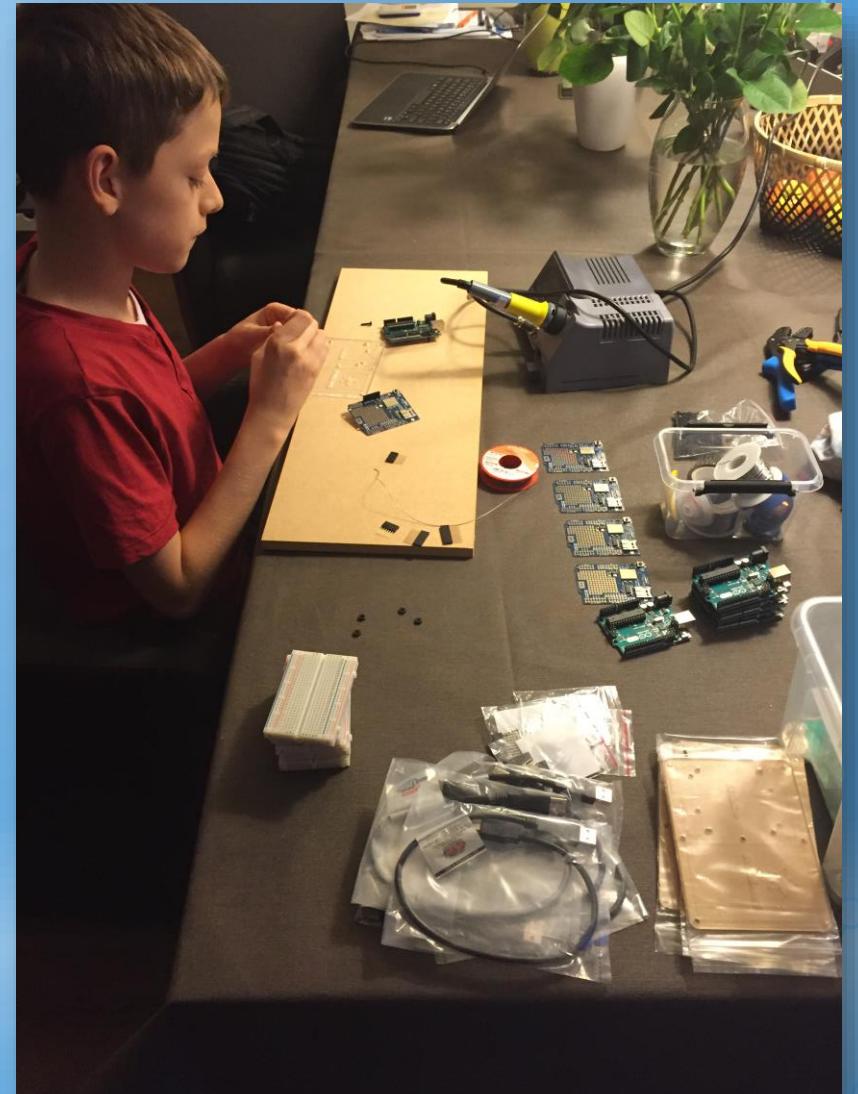


VOORBEREIDING

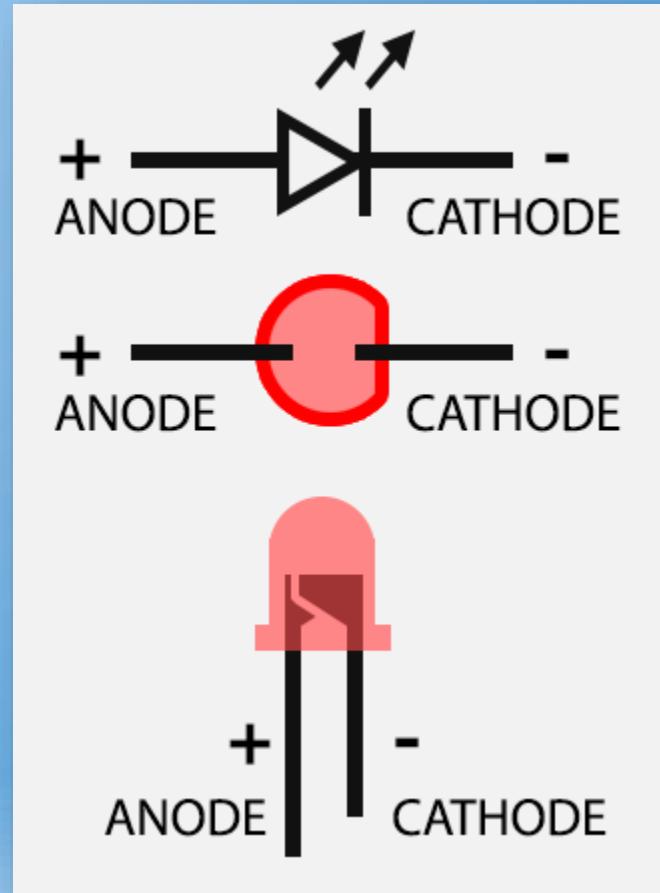
IS AL GEBEURD...

- SHIELD IS GESOLDEERD
- PLAATJE ERONDER
- PINNEN AAN DUST SENSOR GEKNOPEN

BEDANKT TIM!

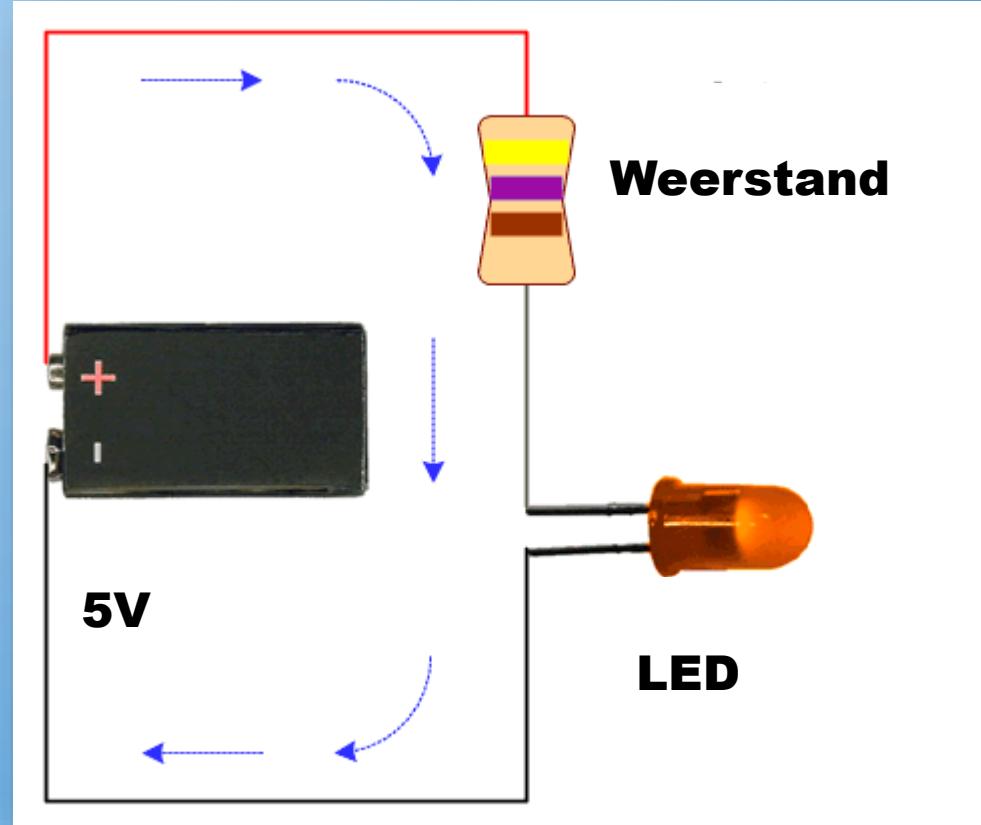


STAP 1 - LED



WEERSTAND

- BEGRENST DE STROOM
DOOR DE LED...



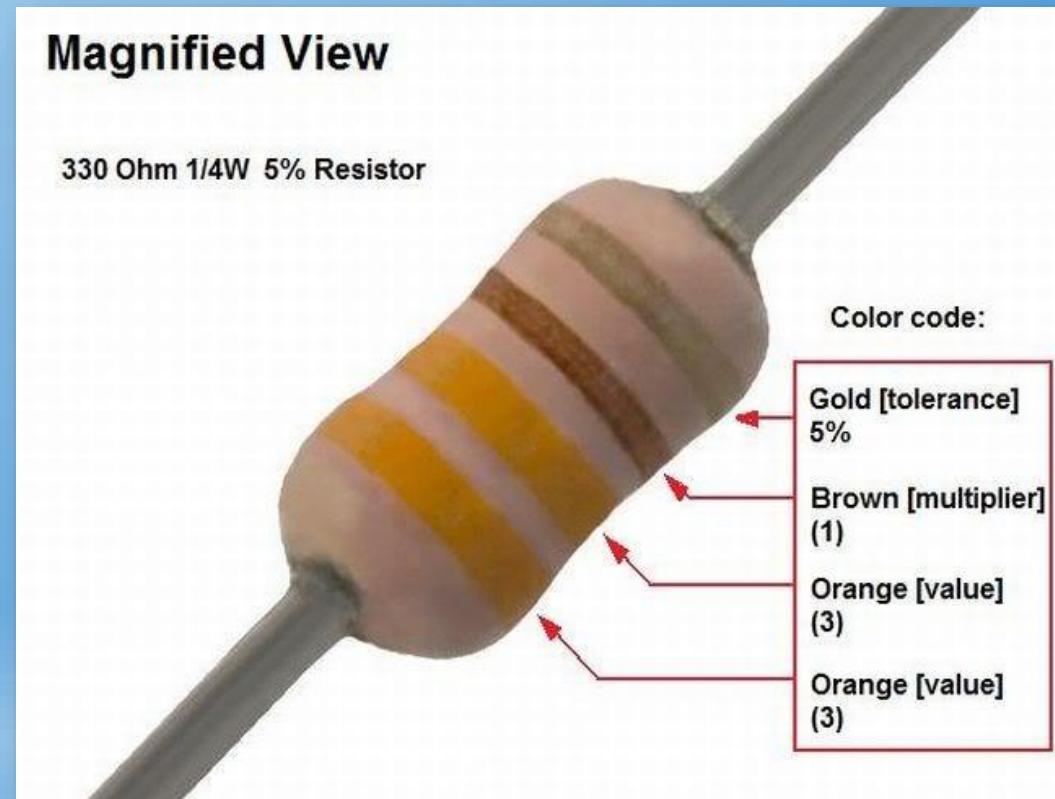
WEERSTAND

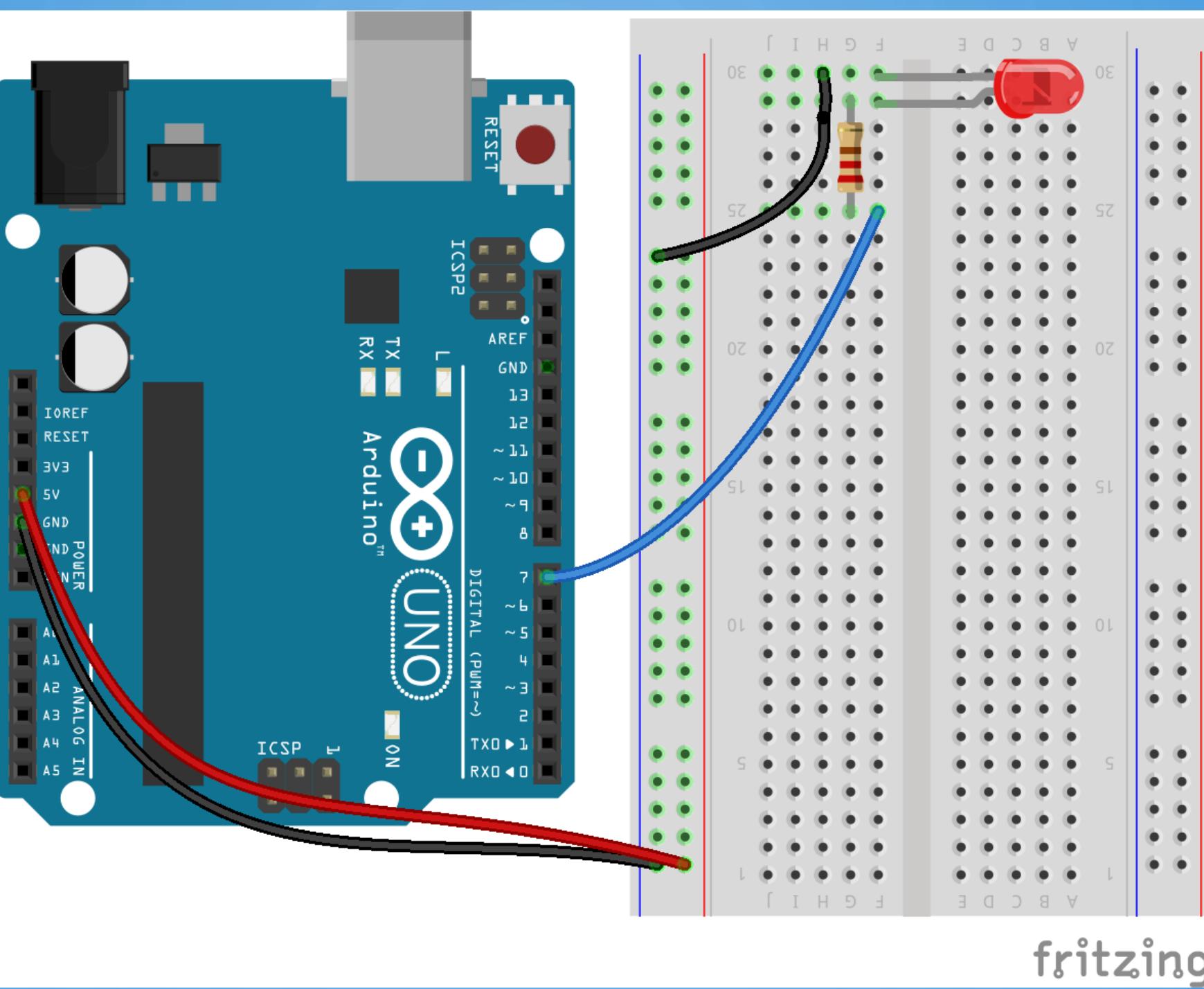
KLEUREN GEVEN DE WAARDE

WIJ GEBRUIKEN 330 OHM

Magnified View

330 Ohm 1/4W 5% Resistor





fritzing

14

ARDUINO IDE

DOWNLOAD DE SOFTWARE VAN ARDUINO.CC

=> ARDUINO IDE 1.6.6.

DOWNLOAD PAGINA OP VOLGENDE SHEET

<https://www.arduino.cc/en/Main/Software>

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DOWNLOAD

ENGLISH

Download the Arduino Software



ARDUINO 1.6.6

The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. It runs on Windows, Mac OS X, and Linux. The environment is written in Java and based on Processing and other open-source software. This software can be used with any Arduino board. Refer to the [Getting Started](#) page for installation instructions.

Windows Installer
Windows ZIP file for non admin install

Mac OS X 10.7 Lion or newer
Linux 32 bits
Linux 64 bits

[Release Notes](#)
[Source Code](#)
[Checksums](#)

ARDUINO SOFTWARE HOURLY BUILDS

LAST UPDATE
4 December 2015 14:22:26 GMT

Download a preview of the incoming release with the most updated features and bugfixes.

[Windows](#)
[Mac OS X \(Mac OSX Lion or later\)](#)
[Linux 32 bit](#), [Linux 64 bit](#)

ARDUINO 1.0.6 / 1.5.x / 1.6.x PREVIOUS RELEASES

Download the [previous version of the current release](#), the classic [Arduino 1.0.x](#), or the [Arduino 1.5.x Beta version](#).

All the [Arduino 00xx versions](#) are also available for download. The Arduino IDE can be used on Windows, Linux (both 32 and 64 bits), and Mac OS X.

[Source Code](#)

HET EERSTE PROGRAMMA

```
// dit gebeurt bij het opstarten
void setup() {
    pinMode(7, OUTPUT);    // maak pin 7 een uitgang
}

// dit wordt steeds weer opnieuw uitgevoerd
void loop() {
    digitalWrite(7, HIGH);   // zet de LED aan
    delay(1000);           // wacht een seconde
    digitalWrite(7, LOW);    // zet de LED uit
    delay(1000);           // wacht een seconde
}
```

RUNNEN

- ZET HET BORD GOED: ARDUINO UNO
- ZET DE COM POORT
- UPLOAD MET CTRL-U / CMD-U

HET LEDJE GAAT NU KNIPPEREN...

BLINK

KLASSIEKE EERSTE SKETCH MET EEN ARDUINO

WE KUNNEN DE SNELHEID VAN KNIPPEREN EVEN AANPASSEN

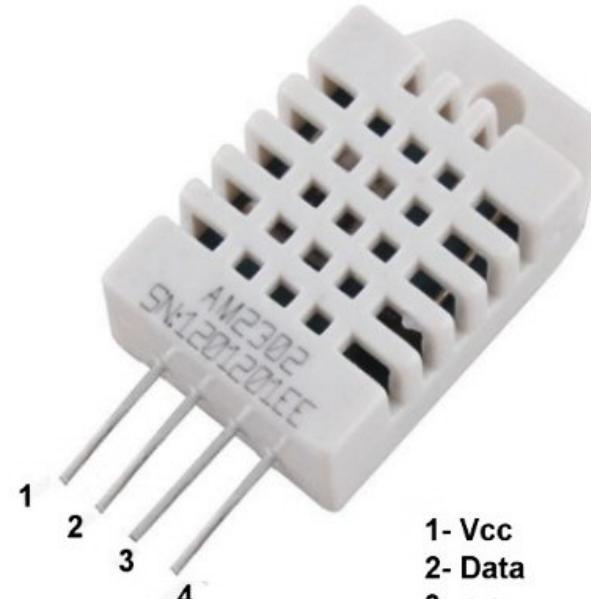
SNEL VERDER MET DE REST...

STAP 2- VOCHT & TEMPERATUUR

DHT22 Temperature-Humidity Sensor

- 3.3 to 6V power and I/O
- 1.5mA max current use during conversion
- 0-100% humidity readings with 2-5% accuracy
- -40 to 80°C temperature readings $\pm 0.5^{\circ}\text{C}$ accuracy
- Up to 0.5 Hz sampling rate (once every 2 seconds)
- 4 pins, 0.1" spacing

- 1) VCC
- 2) DATA (digital I/O)
- 3) Not Connected (N.C)
- 4) GND



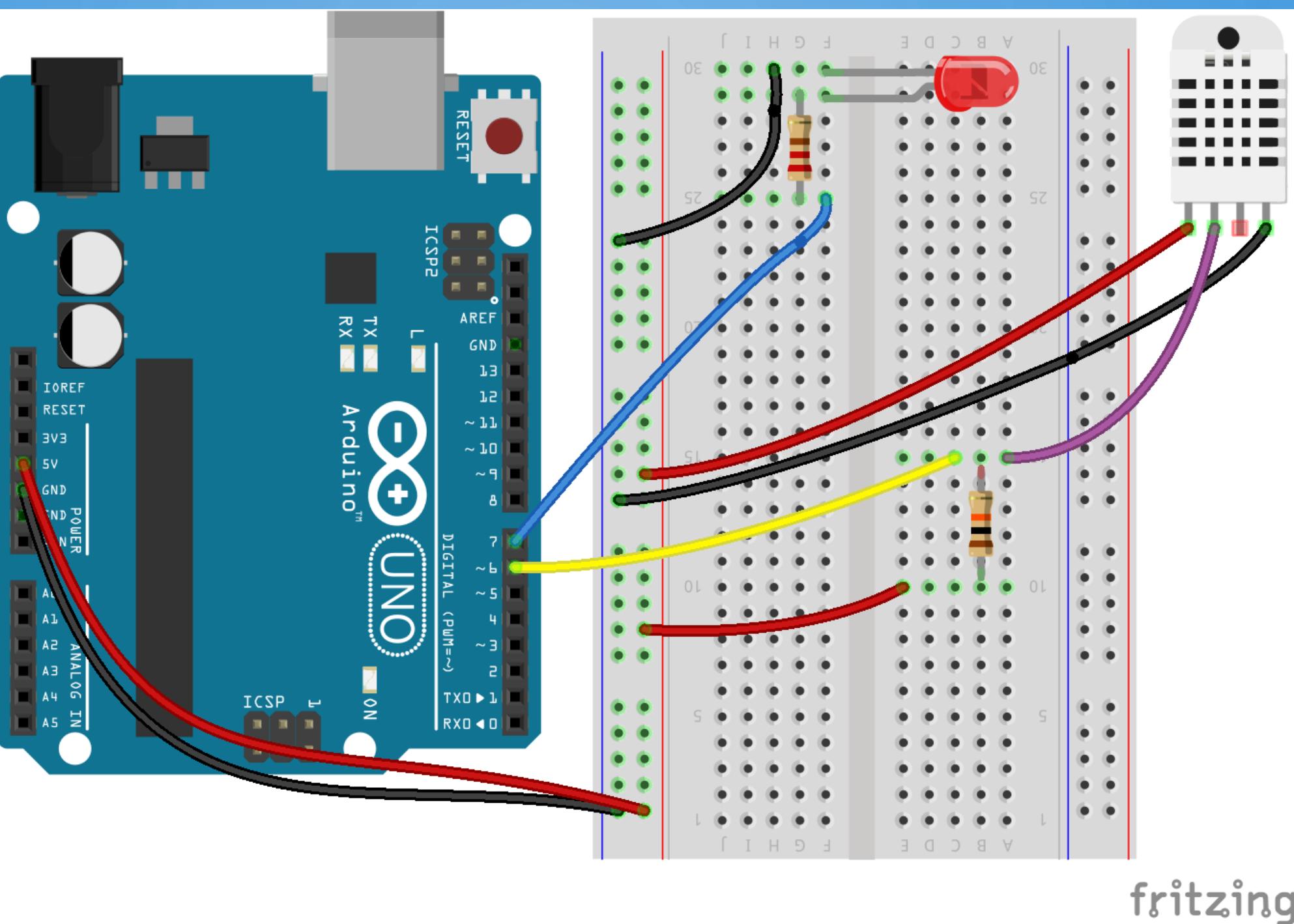
1- Vcc
2- Data
3- n.c.
4- GND

Note: Connect a 4.7K or 10K resistor between VCC and the DATA pin

LET OP!

DE KLEUREN VAN DE DRADEN ZIJN BIJ IEDEREEN VERSCHILLEN

LET DUS OP DE PINNEN VAN DE SENSOR
EN DE PINNEN VAN DE ARDUINO



STAP 3 – FIJNSTOF SENSOR

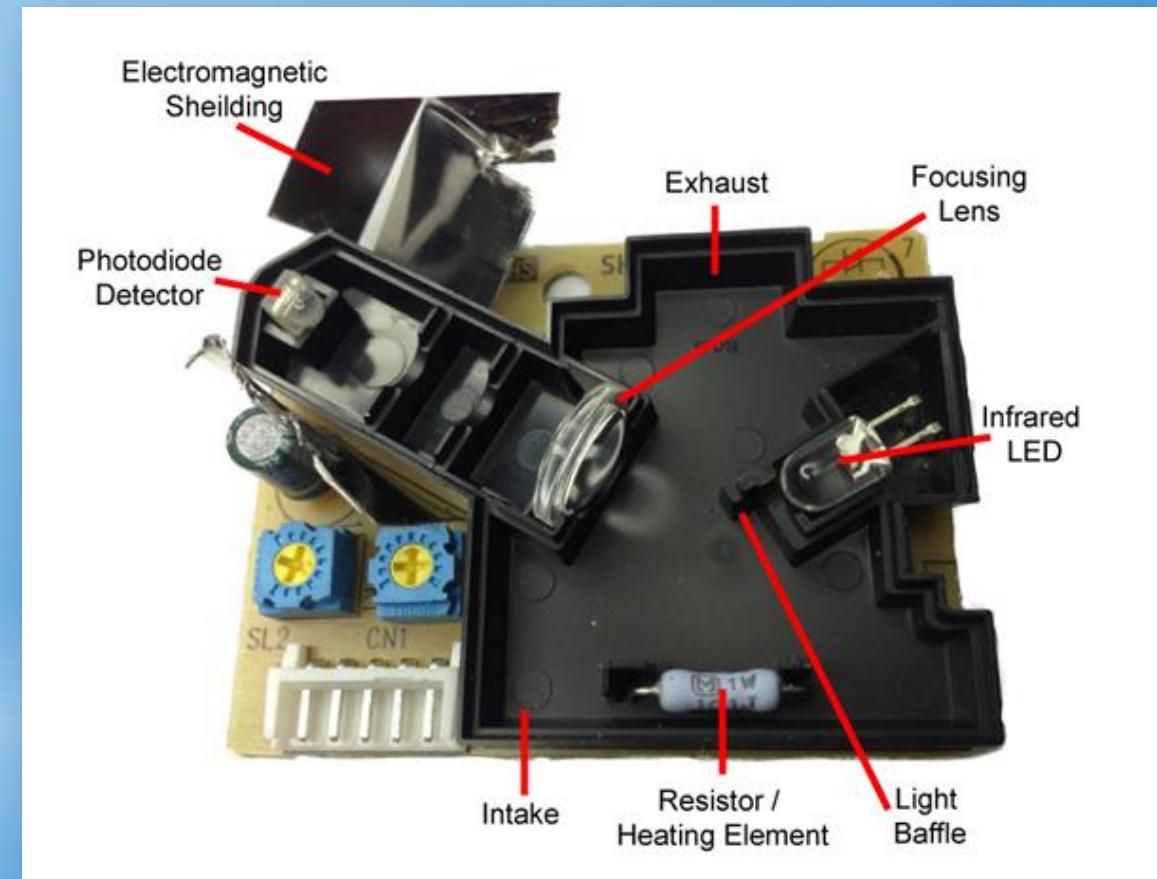
SHINYEI PPD42NS

OPTISCHE SENSOR

VERWARMINGSELEMENT

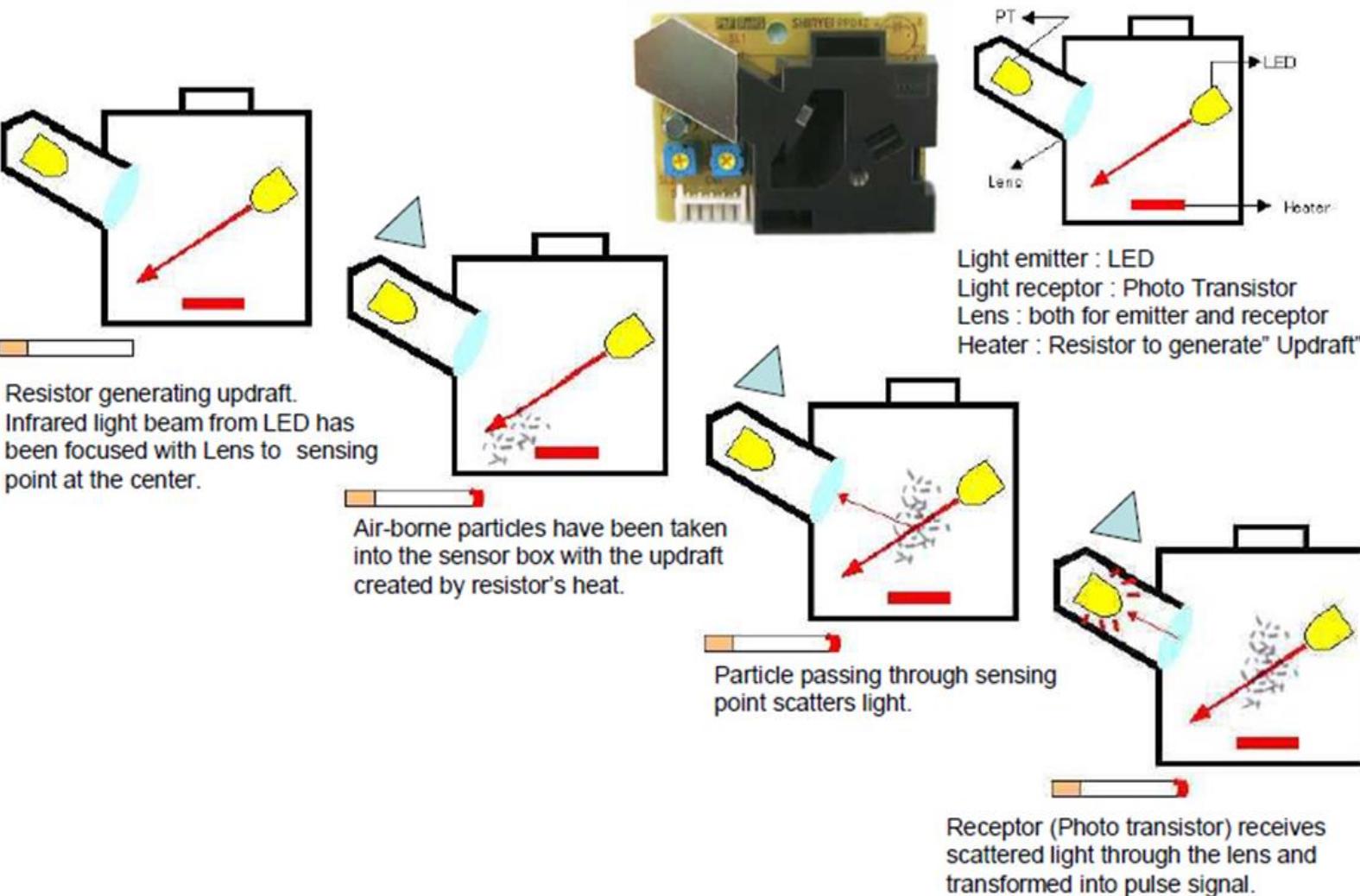
ORIËNTATIE

TWEE MATEN DEELTJES

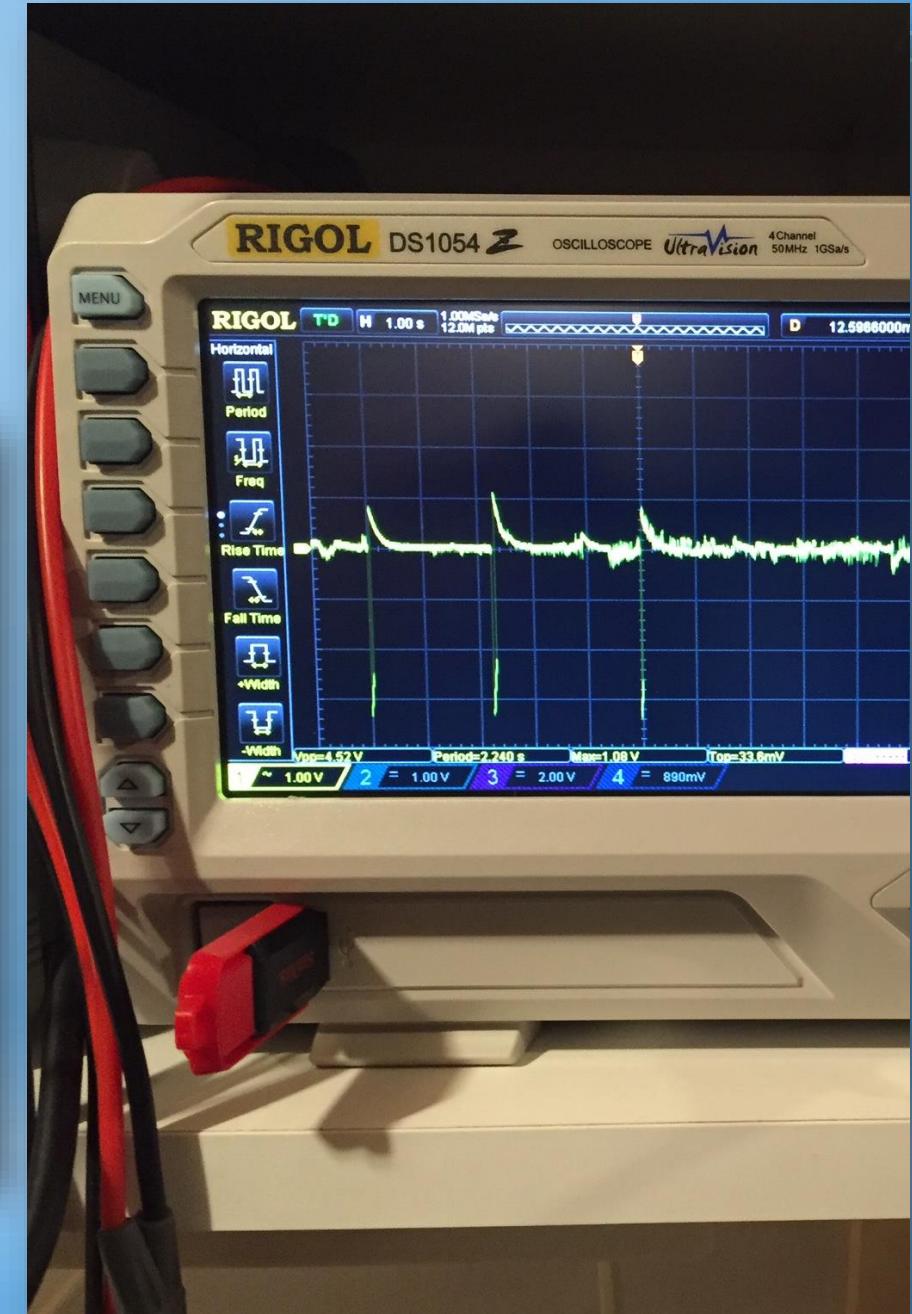
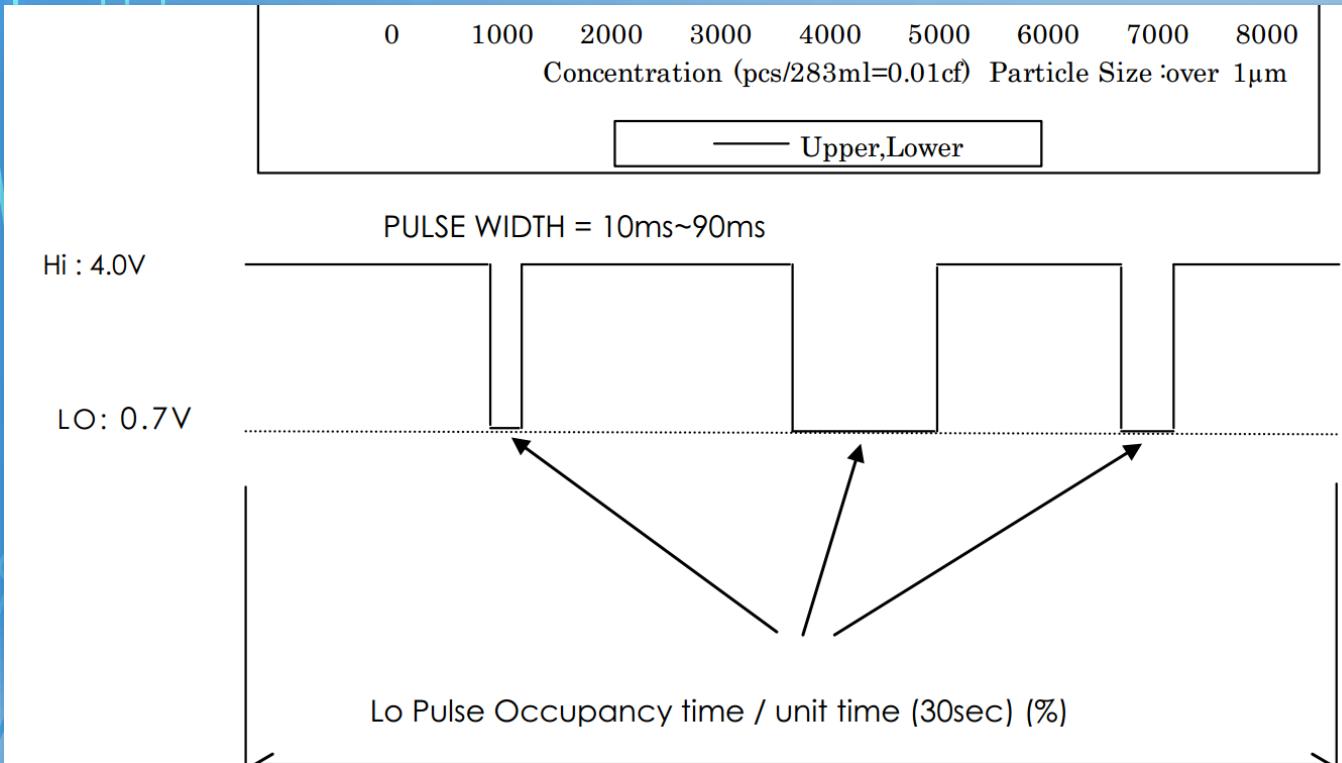


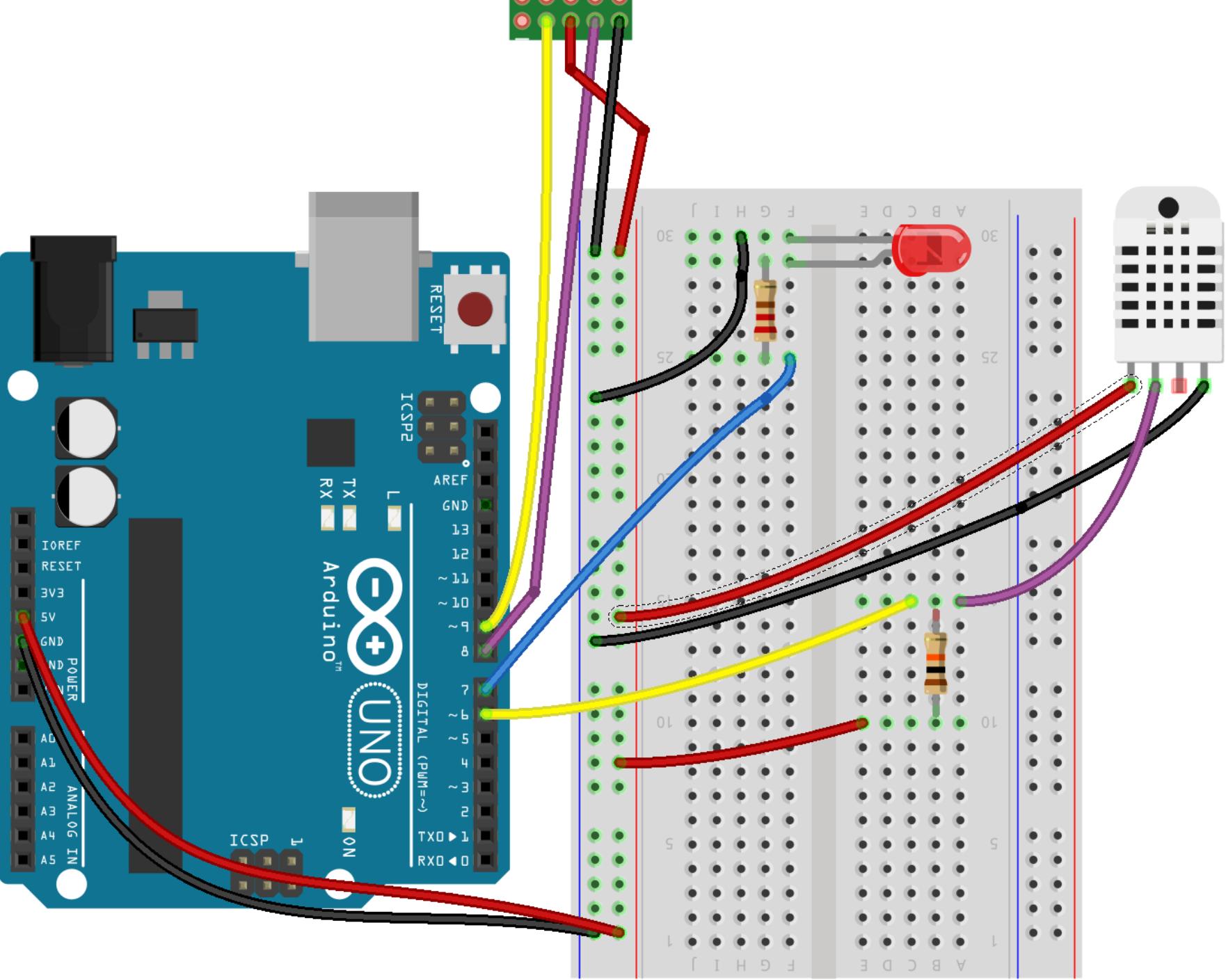
SHINYEI TECHNOLOGY CO., LTD.

HOW PPD42NJ WORKS



PULSEN





DUSTDUINO + SOFTWARE

GA NAAR: [HTTPS://GITHUB.COM/ROBERTKIEBOOM](https://github.com/ROBERTKIEBOOM)

PAGINA TE ZIEN OP VOLGENDE SHEET

Dual Complementary x DuDuome Home Auto x RobertKieboom (Rot x pulsen - Google zoel x Robert

[GitHub, c. \[US\] https://github.com/RobertKieboom](https://github.com/RobertKieboom)

Search GitHub

Pull requests Issues Gist

Contributions Repositories Public activity Edit profile

Popular repositories

DustDuinoPlus
DustDuino+ A dust sensor for Arduino with WIFI, Temperature & humidity 0 ★

SensorNode 0 ★

Contributions

Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov

M W F

Summary of pull requests, issues opened, and commits. [Learn how we count contributions.](#)

Less More

Contributions in the last year 14 total Dec 5, 2014 – Dec 5, 2015

Longest streak 2 days December 2 – December 3

Current streak 0 days Last contributed 4 days ago

Contribution activity Period: 1 week ▾

Dual Complementar x PiDome Home Autor x RobertKieboom/Dus... x pulsen - Google zoel x Robert - x

[GitHub, Inc. \[US\]](https://github.com/RoberKieboom/DustDuinoPlus) https://github.com/RoberKieboom/DustDuinoPlus 🔍 M ⌂ ⌂ ⌂ ⌂

This repository Search Pull requests Issues Gist 🔔 + ⌂ ⌂

RobertKieboom / **DustDuinoPlus** Unwatch 1 ⌂ Star 0 Fork 0

Code Issues 0 Pull requests 0 Wiki Pulse Graphs Settings

DustDuino+ A dust sensor for Arduino with WIFI, Temperature & humidity — Edit

9 commits 2 branches 0 releases 1 contributor

Branch: master New pull request New file Find file HTTPS <https://github.com/RobertKieboom/DustDuinoPlus> Copy Download ZIP

 **RobertKieboom** Update README.md Latest commit 4d82e95 4 days ago

 **libraries** First Commit 4 days ago

 **sketches/UltraLight-scenario** First Commit 4 days ago

 **.gitattributes**  Added .gitattributes & .gitignore files 4 days ago

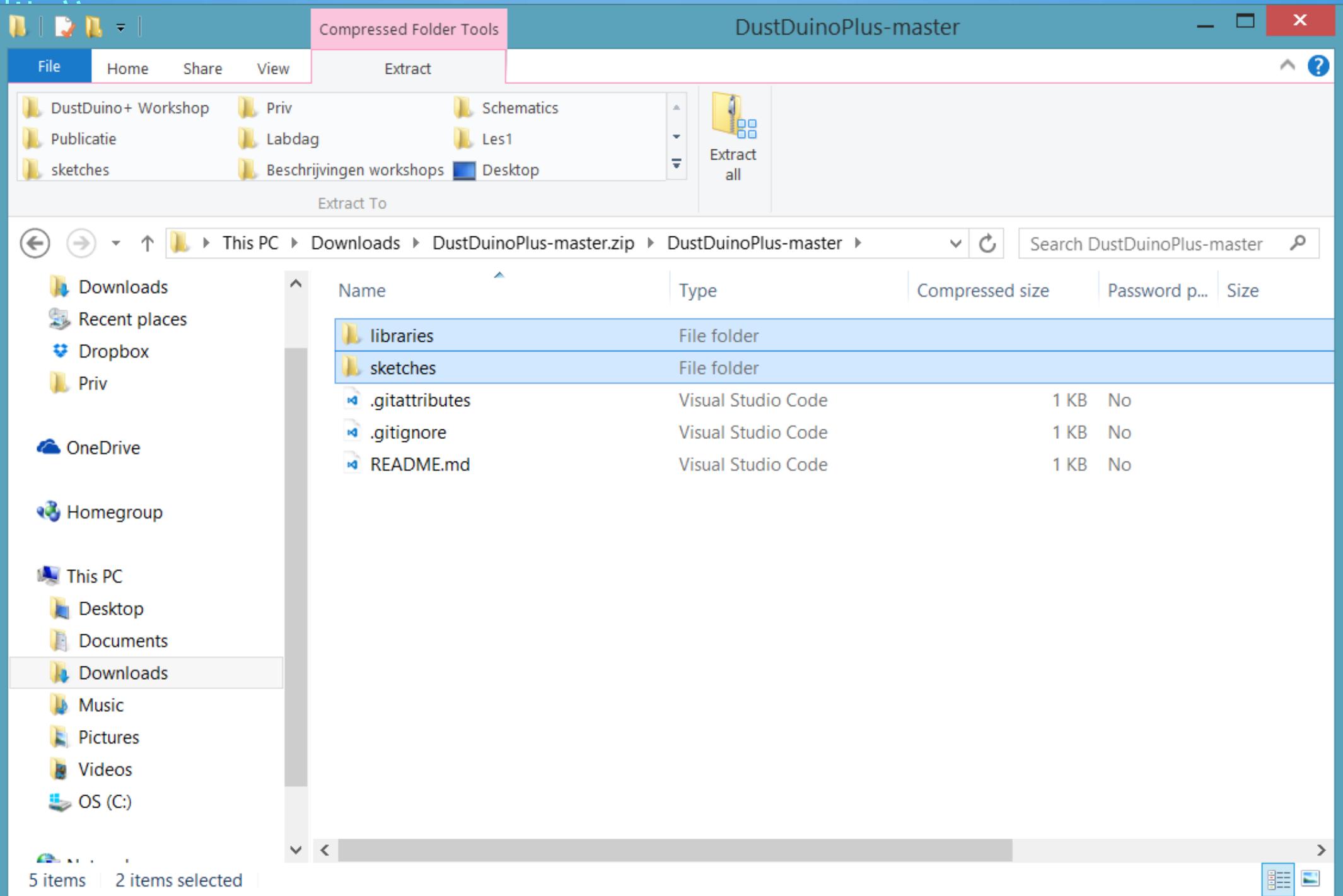
 **.gitignore**  Added .gitattributes & .gitignore files 4 days ago

 **README.md** Update README.md 4 days ago

README.md

DustDuino+

<https://github.com/RoberKieboom/DustDuinoPlus/branches>



DUSTDUINO+ SOFTWARE

- ZET DE “SKETCHES” EN “LIBRARIES” MAPPEN IN DE ARDUINO MAP

DOCUMENTS\ARDUINO\

SKETCHES

LIBRARIES

DUSTDUINO + SOFTWARE

OPEN ULTRALIGHT-SCENARIO.INO

```
#DEFINE WLAN_SSID      "ROCNIJMEGEN-HOTSPOT"  
#DEFINE WLAN_PASS      ""  
#DEFINE DEVICE_NAME    "DUST1" // ZET HIER JE NAAM!  
#DEFINE WLAN_SECURITY  WLAN_SEC_UNSEC  
CONST INT  PORT = 443;
```

- WIJZIG EVT.

```
DEVICE.ADDSTATICATTRIBUTE("POSITION", 52.35, 4.93);
```

RUNNEN

- ZET HET BORD GOED: ARDUINO UNO
- ZET DE COM POORT
- UPLOAD MET CTRL-U / CMD-U
- OPEN DE COM MONITOR

BIJ VERBINDING GAAT HET LEDJE KNIPPEREN (ELKE CA. 3 SECONDEN)

TESTEN

BLAAS OP DE DHT22

LICHT EEN AANSTEKER AAN BIJ DE STOFSENSOR

IOT VIEWER

GA NAAR: [HTTP://SENSORS.GEONOVUM.NL/HERONVIEWER/](http://SENSORS.GEONOVUM.NL/HERONVIEWER/)

JOUW DEVICE MOET NU ZICHTBAAR ZIJN

sensors.geonovum.nl/heronviewer/

SOSPIlot HeronViewer - Version 1.0 - Made with [Heron](#)

Active Layers 1 : 1536001

Layers

- Basis Kaarten
- Sensoren
 - RIVM AQ Stations (WMS)
 - RIVM AQ LML Stations
 - RIVM AQ Stations (WFS)
 - RIVM Zones and Agglomerations (WMS)
 - Smart Emission - Sensors (WMS)
- Chemische Componenten (Current)
 - Carbon monoxide (CO)
 - Ammonia (NH3) - WMS
 - Nitrogen Oxide (NO) - WMS
 - Nitrogen Dioxide (NO2) - WMS
 - Ozone (O3) - WMS
 - Particulate Matter (PM10) - WMS
 - Sulfur Dioxide (SO2) - WMS
- Chemische Componenten (Historie)
- Geonovum Weather
- Fiware
 - Fiware Entities (Geonovum)
- KNMI - Meteorology
- PDOK
- RO Online
- Scratch folder

Zoek adres met PDOK GeoCoder

Slider for Time Series Layers

Date: 2015 12 06 Time: 19:00

Legend

Fiware Entities

Entity

Emission - Sensors

- Active Stations

active Stations

active Stations

Feature Info

RIVM - Active Stations

Result 1 of 1

Name	Value
Id	Dust13Ent
Label	Dust13Ent
Timeinstant	2015-12-06T22:41:07.980846
Humidity	48.90 [Show timeseries]
Pm10	0.32 [Show timeseries]
Temperature	20.90 [Show timeseries]
Pm2_5	-0.00 [Show timeseries]

Data ODbL OpenStreetMap

tom gast,
is de gratis dienst van geonovum
en betaalt 50 km voor de steun
aan de ontwikkeling van deze dienst.

Add Layers from Catalogs

Bookmarks EPSG:28992 | X: 203685.061 Y: 599937.469

heron

Highlight All Match Case 2 of 5 matches

MAKING

GA ZELF DINGEN MAKEN

- GA EENS NAAR EEN MAKERSPACE IN DE BUURT
- MAAK DE JEUGD OM JE HEEN ENTHOUSIAST
- IK BEN BIJVOORBEELD LES GAAN GEVEN
- 3D PRINTING, ARDUINO, LASER SNIJDERS, CNC ROUTERS
- REVOLUTIE VAN ATOMEN, DE LONG TAIL

HET GAAT ONZE MAATSCHAPPIJ FUNDAMENTEEL VERANDEREN

DE KITS

ZIJN GEKOCHT DOOR VIJF MENSEN

- REGISTREER JE DAN EVEN, DAN KUNNEN WE CONTACT HOUDEN
- JE KUNT EEN BEHUIZING MAKEN
- SENSORS TOEVOEGEN
- IK KAN NOG EEN LICHT SENSOR NASTUREN
- CONTRIBUEER AAN GITHUB
- DEEL JE ERVARING!

DUSTDUINO+ WORKSHOP

BEDANKT !!!

ROBERT_KIEBOOM@HOTMAIL.COM



SENSE THE CITY - 7 DECEMBER 2015