SmartCitizen kit

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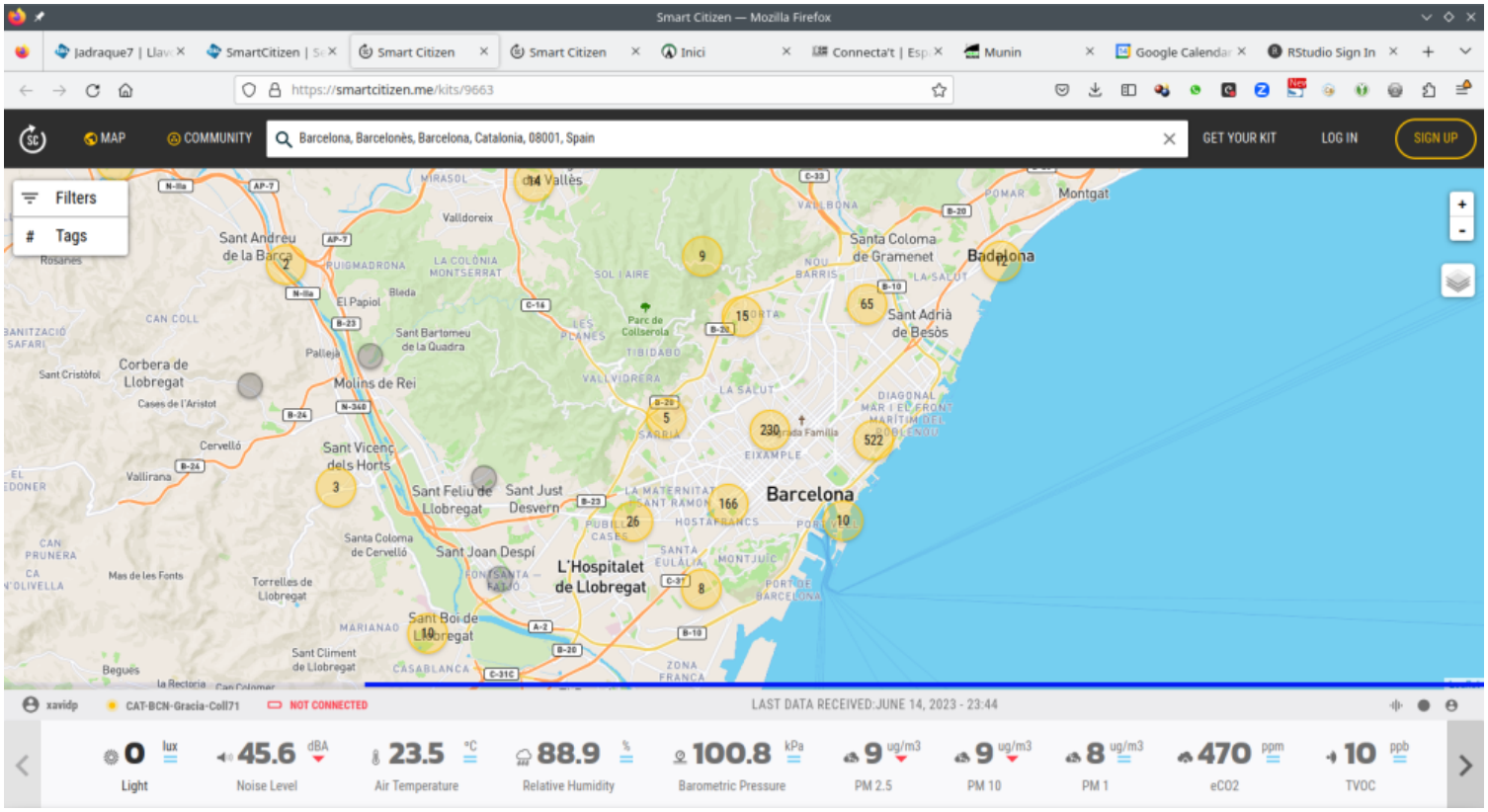
Intro

Docs:
Info: http://start.smartcitizen.me[1]
Setup Wizard: http://start.smartcitizen.me[2]
Forum: https://forum.smartcitizen.me[3]

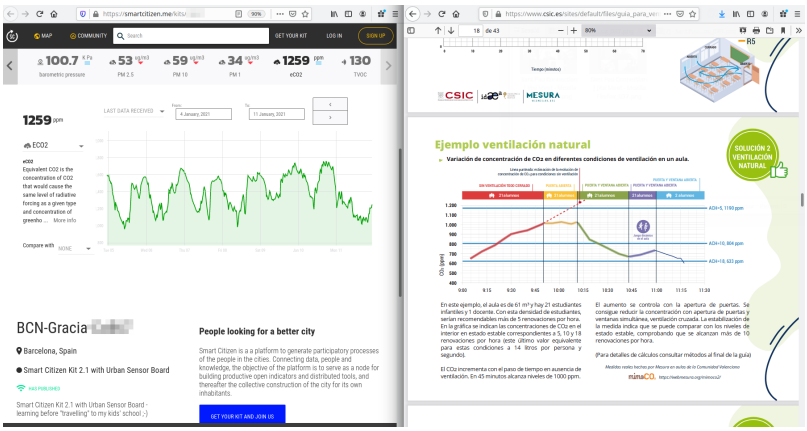
Scientific Paper:

Guillem Camprodon, Óscar González, Víctor Barberán, Máximo Pérez, Viktor Smári, Miguel Ángel de Heras, Alejandro Bizzotto,
Smart Citizen Kit and Station: An open environmental monitoring system for citizen participation and scientific experimentation.
HardwareX, Volume 6, 2019, e00070, ISSN 2468-0672,
https://doi.org/10.1016/j.ohx.2019.e00070[4]
(https://www.sciencedirect.com/science/article/pii/S2468067219300203[5])



Exemple

Interessant veure la lectura del CO2 d'una habitació petita amb finestra tancada (safareig de la cuina on hi ha la caldera de gas per escalfar els radiadors de la calefacció de casa), i les recomanacons que fa el govern espanyol respecte els tipus de ventilació de les aules de les escoles i els efectes esperats en la concentració de CO2 en una aula tipus.



PDF de la dreta de la imatge; https://www.csic.es/sites/default/files/guia_para_ventilacion_en_aulas_csic-mesura.pdf[6]

Config

Veure:
~~https://docs.smartcitizen.me/Guides/getting%20started/Using%20the%20Shell/~~
https://docs.smartcitizen.me/guides/getting-started/using-the-shell/[7]

Battery calculator

~~https://docs.smartcitizen.me/Smart%20Citizen%20Kit/#battery-calculator~~
https://docs.smartcitizen.me/hardware/kit/features/#battery-duration[8]

Version

```
SCK> version
Hardware Version: 2.1
SAM Hardware ID: xxxxxx
SAM version: 0.9.8-6402376-master
SAM build date: 2024-06-04T19:42:33Z
ESP MAC address: xxxxxx
ESP version: 0.9.8-6402376-master
ESP build date: 2024-06-04T18:03:38Z
SCK>
```

SCK OCCS

Listing sensors

By typing in sensor, a list of enabled and supported sensors is displayed:

```
SCK> sensor

Disabled
----------
Ext Temperature
Ext Humidity
Ext SHT35 Temperature
Ext SHT35 Humidity
Battery voltage
Noise dBC
```

```
Noise dBZ
Noise FFT
MPL Altitude
MPL internal temperature
GPS Fix Quality
GPS Latitude
GPS Longitude
GPS Altitude
GPS Speed
GPS Horizontal Dilution of Position
GPS Tracked Satellites
ADS1x15 ADC 0x48 Ch0
ADS1x15 ADC 0x48 Ch1
ADS1x15 ADC 0x48 Ch2
ADS1x15 ADC 0x48 Ch3
ADS1x15 ADC 0x49 Ch0
ADS1x15 ADC 0x49 Ch1
ADS1x15 ADC 0x49 Ch2
ADS1x15 ADC 0x49 Ch3
ADS1x15 ADC 0x4A Ch0
ADS1x15 ADC 0x4A Ch1
ADS1x15 ADC 0x4A Ch2
ADS1x15 ADC 0x4A Ch3
ADS1x15 ADC 0x4B Ch0
ADS1x15 ADC 0x4B Ch1
ADS1x15 ADC 0x4B Ch2
ADS1x15 ADC 0x4B Ch3
SFA30 Temperature
SFA30 Humidity
SFA30 Formaldehyde
Ext PM_A 1.0
Ext PM_A 2.5
Ext PM_A 10.0
Ext PN_A 0.3
Ext PN_A 0.5
Ext PN_A 1.0
Ext PN_A 2.5
Ext PN_A 5.0
Ext PN_A 10.0
Ext PM_B 1.0
Ext PM_B 2.5
Ext PM_B 10.0
Ext PN_B 0.3
Ext PN_B 0.5
Ext PN_B 1.0
Ext PN_B 2.5
Ext PN_B 5.0
Ext PN_B 10.0
```

```
Enabled
----------
Temperature -> every 1 int (60 sec)
Humidity -> every 1 int (60 sec)
Battery -> every 1 int (60 sec)
SD card -> every 1 int (60 sec)
WiFi RSSI -> every 3 int (180 sec)
Light -> every 1 int (60 sec)
Noise dBA -> every 1 int (60 sec)
MPL Barometric pressure -> every 1 int (60 sec)
CCS811 VOC Gas -> every 1 int (60 sec)
CCS811 eCO2 Gas -> every 1 int (60 sec)
SCD30 CO2 -> every 1 int (60 sec)
SCD30 Temperature -> every 1 int (60 sec)
SCD30 Humidity -> every 1 int (60 sec)
PMS PM 1.0 -> every 5 int (300 sec)
PMS PM 2.5 -> every 5 int (300 sec)
PMS PM 10.0 -> every 5 int (300 sec)
PMS PN 0.3 -> every 5 int (300 sec)
PMS PN 0.5 -> every 5 int (300 sec)
PMS PN 1.0 -> every 5 int (300 sec)
PMS PN 2.5 -> every 5 int (300 sec)
PMS PN 5.0 -> every 5 int (300 sec)
PMS PN 10.0 -> every 5 int (300 sec)
SCK >
```

Disabling sensors

To disable one sensor, you can type in part of the sensor name:

```
SCK > sensor Noise -disable
Disabling Noise dBA
Saved configuration on eeprom!!
```

To enable it, if it's present:

```
SCK > sensor Noise -enable
Enabling Noise dBA
Saved configuration on eeprom!!
```

Deshabilitem el sensor de partícules (el que més consumeix, en teoria, segons la documentació i ens

va dir l'Oscar):

Kit sck10_occs

```
SCK > sensor PMS PM 1.0 -disable
Disabling PMS PM 1.0
Disabling PMS PM 2.5
Disabling PMS PM 10.0
ESP finished booting
SCK >
SCK > sensor PMS PN 1.0 -disable
Disabling PMS PN 1.0
Disabling PMS PN 0.5
Disabling PMS PN 2.5
Disabling PMS PN 5.0
Disabling PMS PN 10.0
SCK > ERROR: Access point not found!!
SCK > sensor PMS PN 0.3 -disable
Disabling PMS PN 0.3
Disabling PMS PN 0.5
Disabling PMS PN 1.0
Disabling PMS PN 2.5
Disabling PMS PN 5.0
Disabling PMS PN 10.0
SCK > ERROR: Access point not found!!
```

Change reading frequency

Some limitations apply though:

- The minimum reading and publish interval is 5s
- The maximum reading interval is one hour
- The maximum publish interval is one hour

If we want to set the reading frequency to 1 sensor read every 30 minutes (1800 seconds), we would set:

```
config -readint 1800
```

However, I did it and no change was shown:

```
SCK > config -readint 1800
-- New config --

Mode: sdcard
Publish interval (s): 180
Reading interval (s): 60
Wifi credentials: not configured
Token: not configured
Mac address:  xxxxxxx
Sanity reset (every 24 hours) is: on
SCK > ERROR
```

But changing at the same time the publishing interval and the reading interval did the trick indeed:

```
SCK > config -pubint 1800 -readint 1800
-- New config --

Mode: sdcard
Publish interval (s): 1800
Reading interval (s): 1800
Wifi credentials: not configured
Token: not configured
Mac address:  xxxxx
Sanity reset (every 24 hours) is: on
SCK > ERROR
```

WebApp Lleugera

Es pot consultar les dades d'un sck concret via una webapp feta per un desenvolupador, que va anunciar al forum de SCK:
https://forum.smartcitizen.me/t/smart-citizen-light-webapp/1723[9]

Webapp lleugera:
https://bensventures.github.io/smart-citizen-light/[10]

API documentation

Veure:
https://docs.smartcitizen.me/Guides/[11]

Tokens d'usuari

Anar a:
https://id.smartcitizen.me/users[12]

smartcitizen-R-data a github

https://github.com/fablabbcn/smartcitizen-R-data[13]

Veure primeres proves de codi R (.Rmd) al projecte de temperatura-urbana de l'OCCS i dades del meu SCK:
https://gitlab.com/ajbcn_occs/temperatura-urbana/-/blob/main/SCK.Rmd?ref_type=heads[14]

Parlar amb SCK via shell

Documentació
~~https://docs.smartcitizen.me/Guides/getting%20started/Using%20the%20Shell/~~
https://docs.smartcitizen.me/guides/getting-started/using-the-shell/[15]

Posar la configuració Wifi per consola:
https://docs.smartcitizen.me/guides/getting-started/using-the-shell/#set-the-recording-configuration-config[16]

Videos:
https://www.youtube.com/watch?v=9MQj2Dq4-XI&list=PL33KKs9g8Y1IWsTZZmDc-46yFuuIRZEmi&index=7[17]

Carcasses - Enclosures

Veure dissenys en obert a:
https://enclosures.smartcitizen.me[18]

Guia de solució de problemes amb SCK

Veure:
https://hackmd.io/@z0Fsz2tCQ42I4hpaETyLJQ/Sk0qjmc6s[19]

Recursos SCK en el món de l'educació

Veure:
https://docs.smartcitizen.me/Resources/Education/[20]

Projecte Atenció:

- Projecte Atenció: https://sites.google.com/view/projecteatencio/material-did%C3%A0ctic-19-20/m3-com-%C3%A9s-la-qualitat-de-laire-de-linstitut?authuser=0[21]
- Atenció Project - Citizen Science empowerment for students: https://sites.google.com/view/projecteatencio/inici?authuser=0%20[22]

AulaMar:

- Instrucciones de uso: https://docs.smartcitizen.me/Resources/Education/AulaMar/Instrucciones[23]
- Material Docente - Secuencia didáctica: https://docs.smartcitizen.me/Resources/Education/AulaMar/download/Aulamar_Secuencia_Didactica.pdf[24]

Alternatives Open Source

Alternative device:

- AIRQino Low cost air quality monitor
  https://www.snap4city.org/download/video/tn/ARQuino-CNR.pdf[25]
  Snap4City - https://www.snap4city.org/508[26] - Prof. Paolo Nesi. Consiglio Nazionale delle Ricerche

Alias names of this page:
SmartCitizenKit | Smart Citizen | Smart Citizen Kit | Smart | Qualitat aire | sensors | SCK

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[1] http://start.smartcitizen.me

[2] http://start.smartcitizen.me

[3] https://forum.smartcitizen.me

[4] https://doi.org/10.1016/j.ohx.2019.e00070

[5] https://www.sciencedirect.com/science/article/pii/S2468067219300203

[6] https://www.csic.es/sites/default/files/guia_para_ventilacion_en_aulas_csic-mesura.pdf

[7] https://docs.smartcitizen.me/guides/getting-started/using-the-shell/

[8] https://docs.smartcitizen.me/hardware/kit/features/#battery-duration

[9] https://forum.smartcitizen.me/t/smart-citizen-light-webapp/1723

[10] https://bensventures.github.io/smart-citizen-light/

[11] https://docs.smartcitizen.me/Guides/

[12] https://id.smartcitizen.me/users

[13] https://github.com/fablabbcn/smartcitizen-R-data

[14] https://gitlab.com/ajbcn_occs/temperatura-urbana/-/blob/main/SCK.Rmd?ref_type=heads

[15] https://docs.smartcitizen.me/guides/getting-started/using-the-shell/

[16] https://docs.smartcitizen.me/guides/getting-started/using-the-shell/#set-the-recording-configuration-config

[17] https://www.youtube.com/watch?v=9MQj2Dq4-XI&list=PL33KKs9g8Y1IWsTZZmDc-46yFuuIRZEmi&index=7

[18] https://enclosures.smartcitizen.me

[19] https://hackmd.io/@z0Fsz2tCQ42I4hpaETyLJQ/Sk0qjmc6s

[20] https://docs.smartcitizen.me/Resources/Education/

[21] https://sites.google.com/view/projecteatencio/material-did%C3%A0ctic-19-20/m3-com-%C3%A9s-la-qualitat-de-laire-de-linstitut?authuser=0

[22] https://sites.google.com/view/projecteatencio/inici?authuser=0%20

[23] https://docs.smartcitizen.me/Resources/Education/AulaMar/Instrucciones

[24] https://docs.smartcitizen.me/Resources/Education/AulaMar/download/Aulamar_Secuencia_Didactica.pdf

[25] https://www.snap4city.org/download/video/tn/ARQuino-CNR.pdf

[26] https://www.snap4city.org/508