

# Analysis Report



## Data

**Test name:**

2019-10\_EXT\_iScape\_22\_citizen\_kits

**Number of devices tested:**

22

**Test date:**

2019-10-07

**Test author(s):**

Óscar González - Victor Barberán

---

## Disclaimer

The methods used in this analysis are subject to the low amount of devices tested, and in general, a *common sense* approach is applied. This means that the plots indicate only trends and highlight some (but not all) potential faulty devices. Conclusions are derived by analysing the data further and testing the devices for longer periods if needed. Please, also note that statistical significance cannot be inferred from these amounts of devices, so some assumptions for normality have to be accepted. Comments and further discussion are always welcome.

Finally, the individual sensors components integrated in the Smart Citizen hardware have their own accuracies and dispersions, for which Smart Citizen cannot assume any liability other than trying to work with the most appropriate selection. The tests we perform are aimed to determine and assume any failures in the sensors and their integration within the Smart Citizen hardware. For more information, please check the [official documentation](#) and the datasheets of each of the sensors.

## Warnings

No warning for this test

---

## Conclusions

In general, devices show normal behaviour. Some comments are addressed below:

- PM sensors for devices 10215, 10224 and 10204 are not marked as anomalies by the plots, but they are replaced by other sensors. A longer validation is carried out after 10/Oct 10am. See Further tests section for more details
- One device (10222) is marked as having erroneous humidity, but it is not discarded due to the magnitude of the *anomaly*
- The data gaps between 10-12am of 10/10 are due to the setup of the tests for further checks of the PM sensors

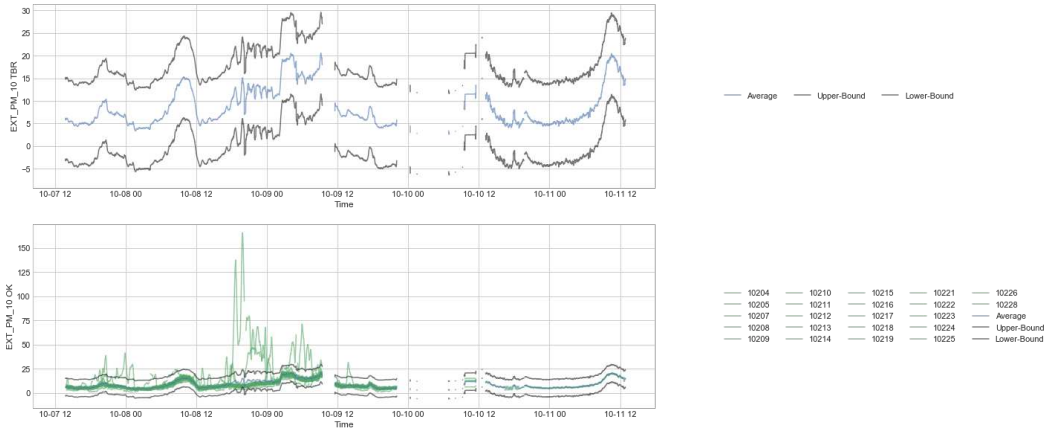
## Time Series Plots

Min Date available: None

Max Date available: None

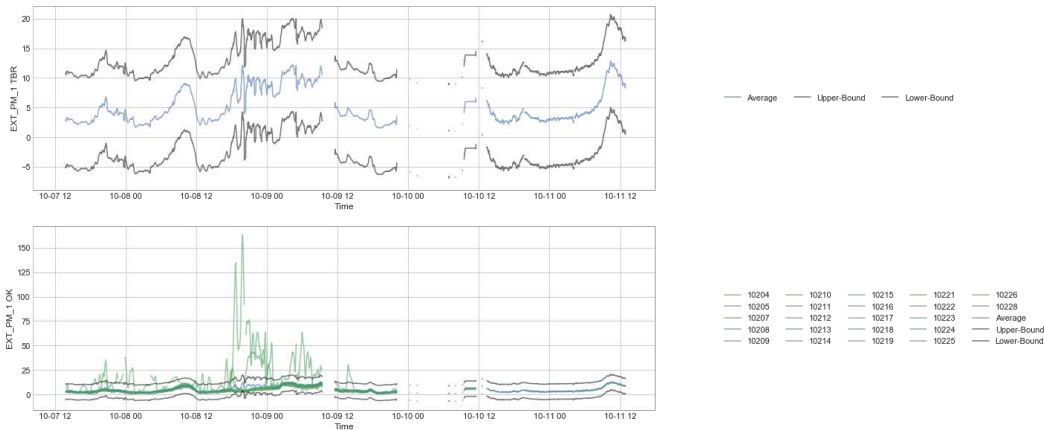
**(1/10) - EXT\_PM\_10**

Using limit for sigma confidence: 3



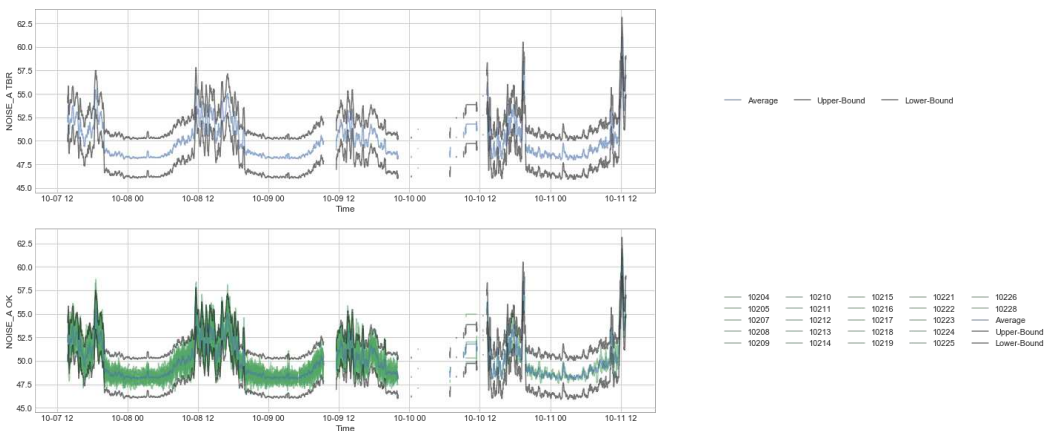
(2/10) - EXT\_PM\_1

Using limit for sigma confidence: 3



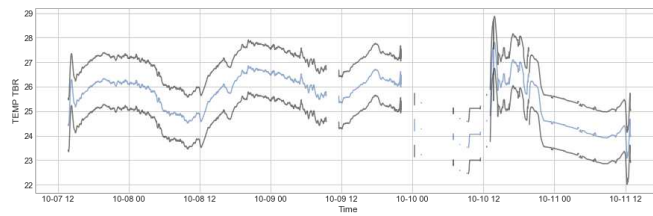
(3/10) - NOISE\_A

Using limit for sigma confidence: 3

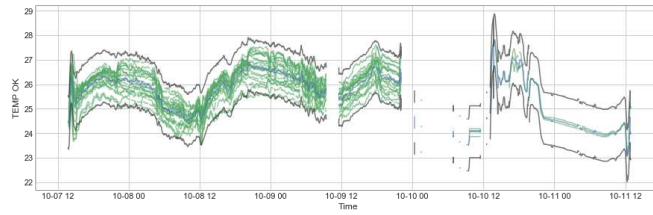


(4/10) - TEMP

Using limit for sigma confidence: 3



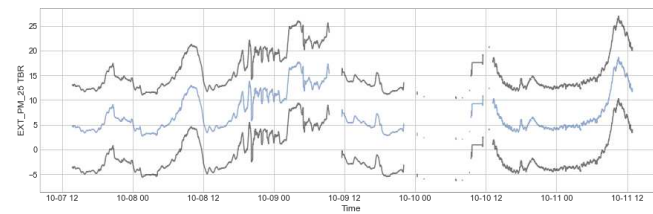
— Average — Upper-Bound — Lower-Bound



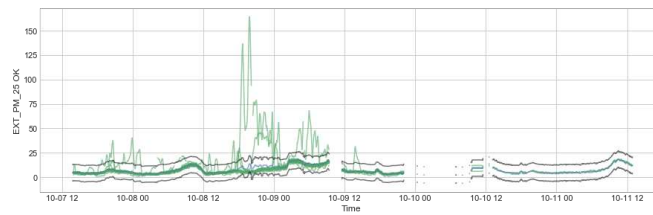
— 10204 — 10210 — 10215 — 10221 — 10226  
 — 10205 — 10211 — 10216 — 10222 — 10228  
 — 10207 — 10212 — 10217 — 10223 — Average  
 — 10208 — 10213 — 10218 — 10224 — Upper-Bound  
 — 10209 — 10214 — 10219 — 10225 — Lower-Bound

## (5/10) - EXT\_PM\_25

Using limit for sigma confidence: 3



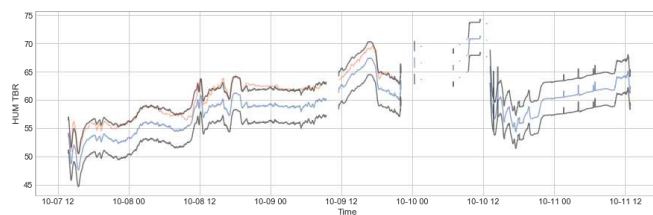
— Average — Upper-Bound — Lower-Bound



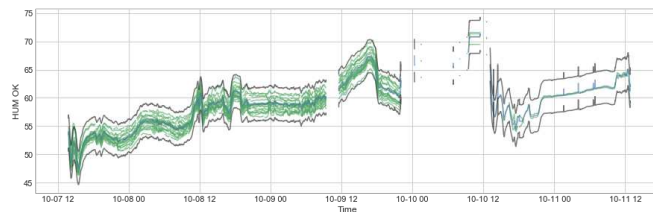
— 10204 — 10210 — 10215 — 10221 — 10226  
 — 10205 — 10211 — 10216 — 10222 — 10228  
 — 10207 — 10212 — 10217 — 10223 — Average  
 — 10208 — 10213 — 10218 — 10224 — Upper-Bound  
 — 10209 — 10214 — 10219 — 10225 — Lower-Bound

## (6/10) - HUM

Using limit for sigma confidence: 3



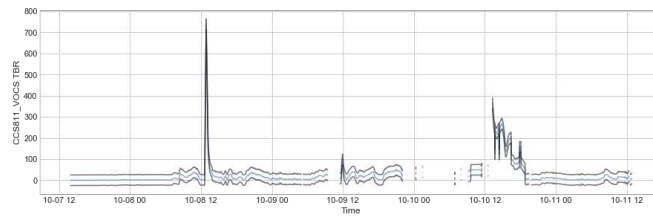
— 10222 — Average — Upper-Bound — Lower-Bound



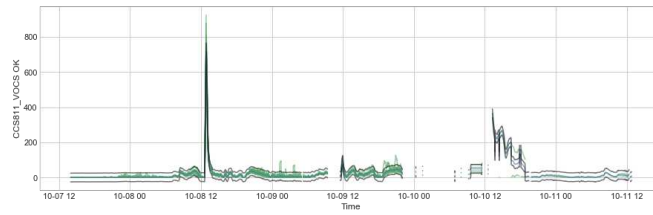
— 10204 — 10210 — 10215 — 10221 — 10228  
 — 10205 — 10211 — 10216 — 10222 — 10228  
 — 10207 — 10212 — 10217 — 10223 — Average  
 — 10208 — 10213 — 10218 — 10224 — Upper-Bound  
 — 10209 — 10214 — 10219 — 10225 — Lower-Bound

## (7/10) - CCS811\_VOCS

Using limit for sigma confidence: 3



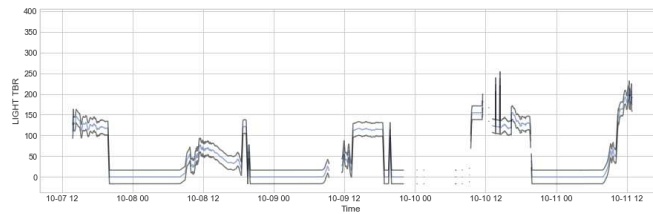
— Average — Upper-Bound — Lower-Bound



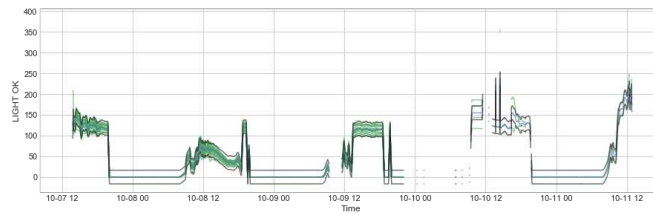
— 10204 — 10210 — 10215 — 10221 — 10226  
 — 10205 — 10211 — 10216 — 10222 — 10228  
 — 10207 — 10212 — 10217 — 10223 — Average  
 — 10208 — 10213 — 10218 — 10224 — Upper-Bound  
 — 10209 — 10214 — 10219 — 10225 — Lower-Bound

## (8/10) - LIGHT

Using limit for sigma confidence: 3



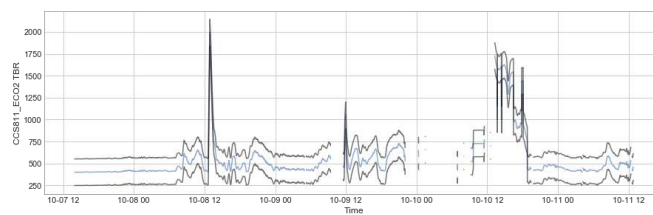
— Average — Upper-Bound — Lower-Bound



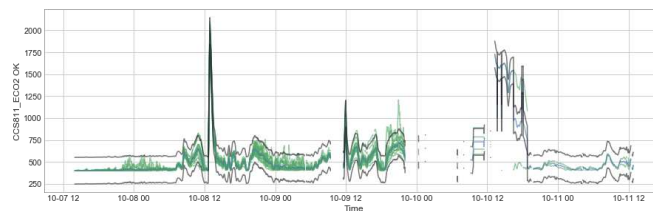
— 10204 — 10210 — 10215 — 10221 — 10226  
 — 10205 — 10211 — 10216 — 10222 — 10228  
 — 10207 — 10212 — 10217 — 10223 — Average  
 — 10208 — 10213 — 10218 — 10224 — Upper-Bound  
 — 10209 — 10214 — 10219 — 10225 — Lower-Bound

## (9/10) - CCS811\_ECO2

Using limit for sigma confidence: 3



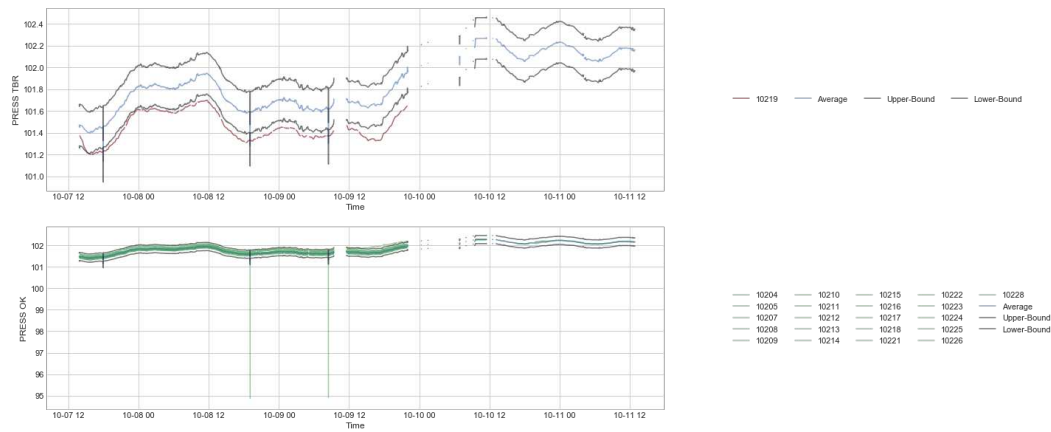
— Average — Upper-Bound — Lower-Bound



— 10204 — 10210 — 10215 — 10221 — 10226  
 — 10205 — 10211 — 10216 — 10222 — 10228  
 — 10207 — 10212 — 10217 — 10223 — Average  
 — 10208 — 10213 — 10218 — 10224 — Upper-Bound  
 — 10209 — 10214 — 10219 — 10225 — Lower-Bound

## (10/10) - PRESS

Using limit for sigma confidence: 3



## Summary

	#_TBR_DEVICES	DISPERSION	#_OK_DEVICES
EXT_PM_10	0	3.00556	22
EXT_PM_1	0	2.61901	22
NOISE_A	0	0.689559	22
TEMP	0	0.352788	22
EXT_PM_25	0	2.77481	22
HUM	1	0.97231	21
CCS811_VOCS	0	8.27892	22
LIGHT	0	5.48881	22
CCS811_ECO2	0	50.485	22
PRESS	1	0.0633983	21
BATT	NaN	NaN	NaN

The three above-mentioned devices are tested for longer to assess normal behaviour with a new PM sensor. A comparison is shown below. Note that the devices are replaced after 10am on 10/10 and no longer anomalous behaviour can be seen:

<Figure size 432x288 with 0 Axes>

