GT.3 and GT.4 – Development and integration of electronic systems for AQM

Jesús Lozano Rogado

Outline

- Objectives and participants
- Control architecture and specifications
- Development of prototypes
- Conclusions

Participants

- GT.3




- GT.4

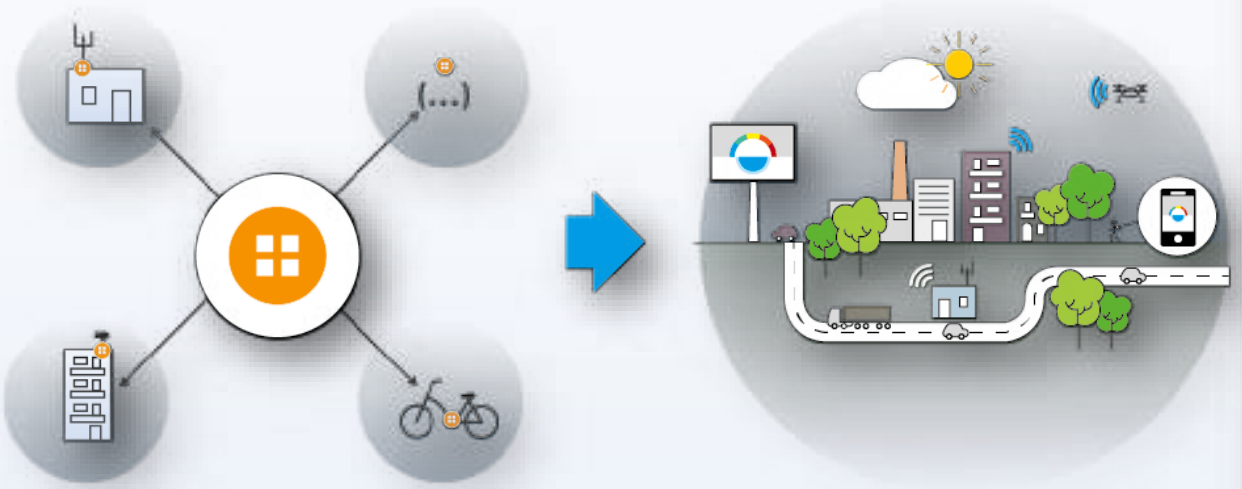




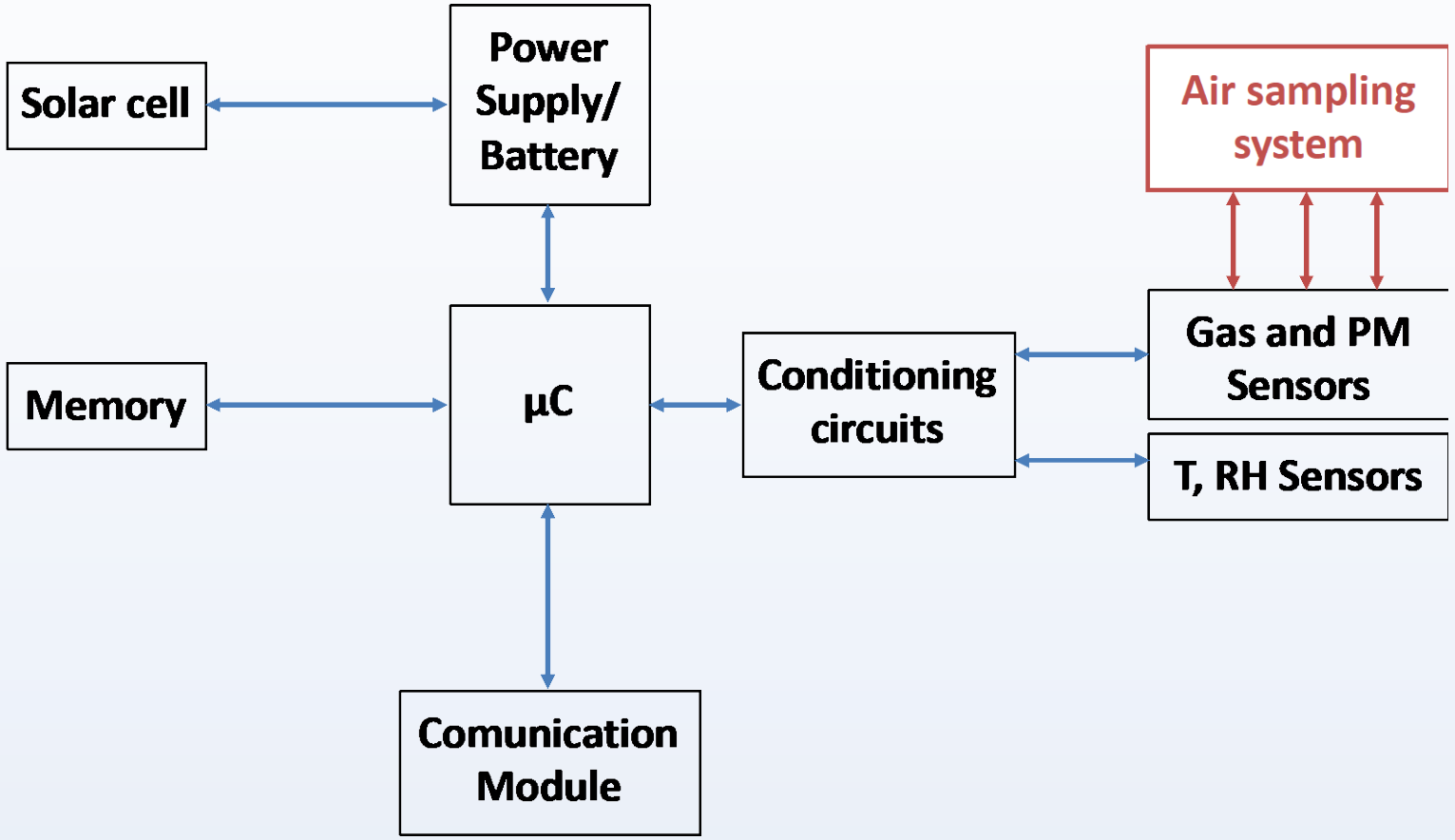




Objectives



Control architecture

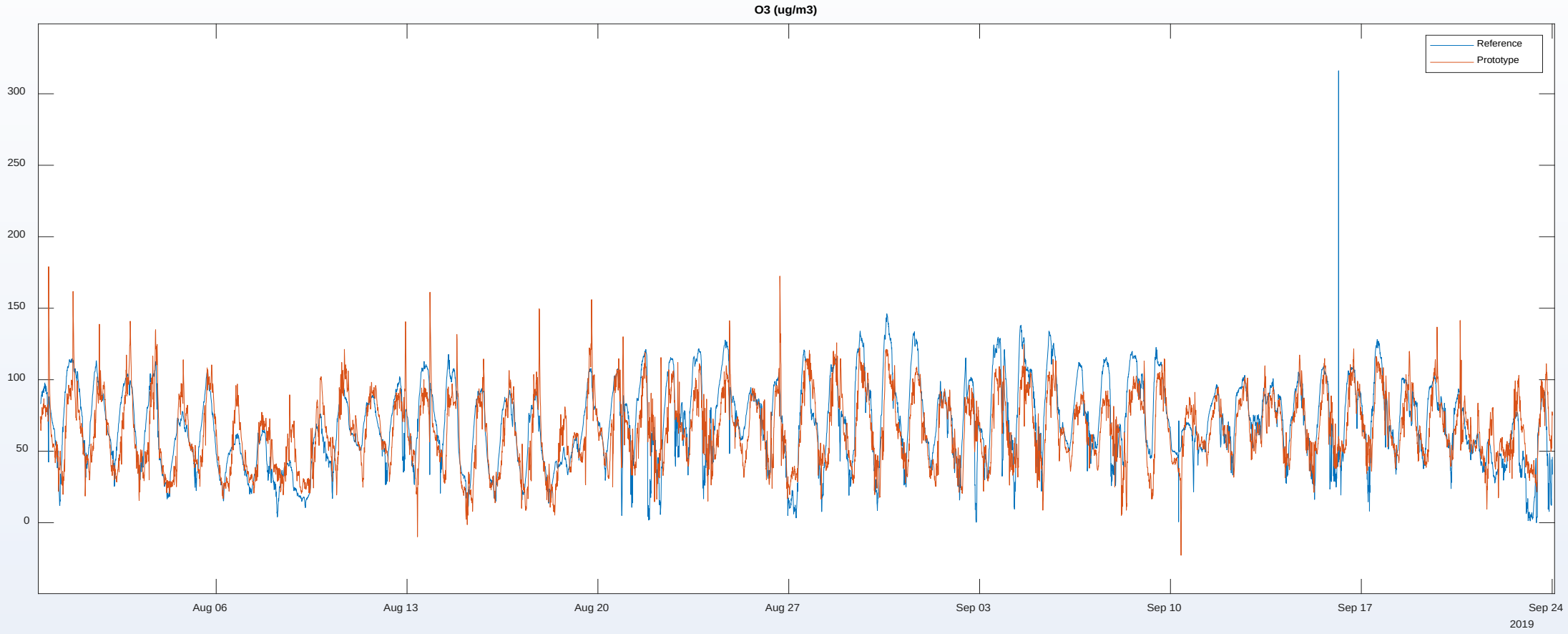


Especifications of electronic systems and definition of prototypes:

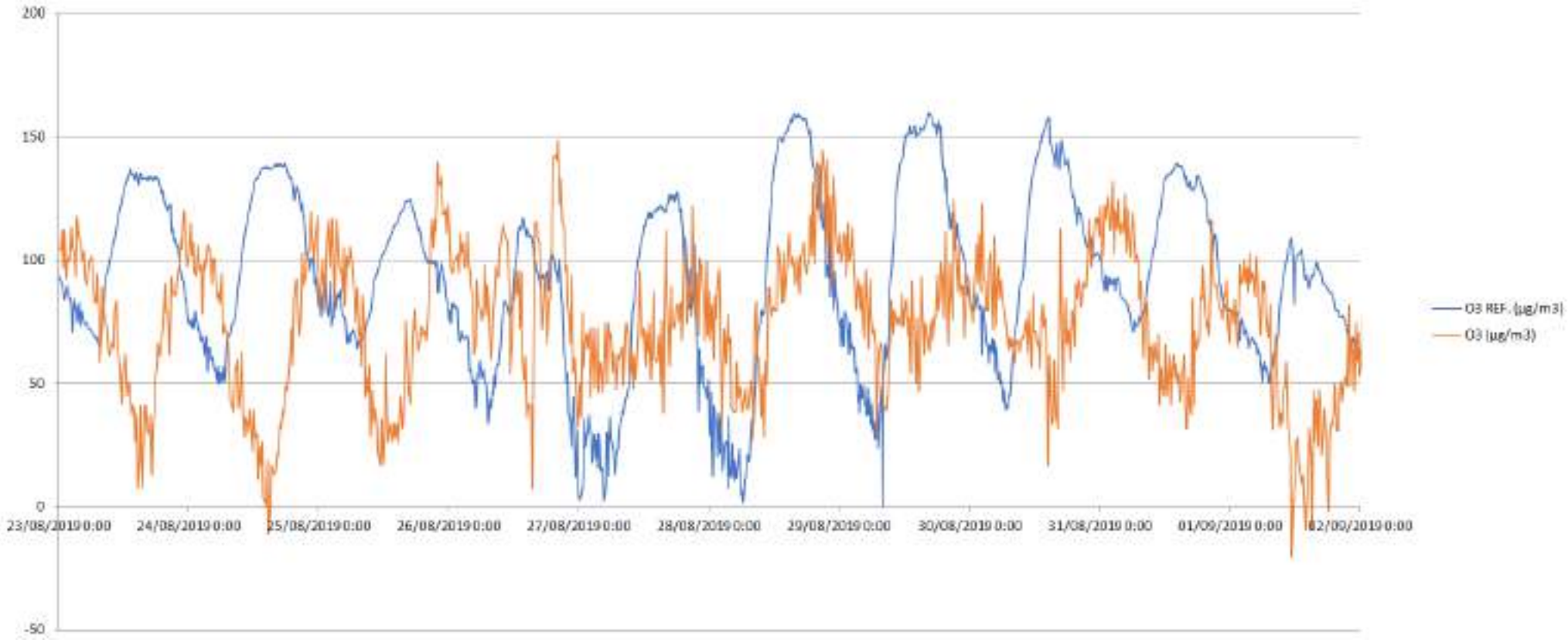
- Fixed and Mobile unit: Suction pump or fan / AC powered / Alphasense EC (4) +PM+RT+RH / Ethernet
- Drones: Static sampling / Battery powered / Alphasense EC (2) +PM+RT+RH / 3G
- Cargo bikes: Suction pump or fan / Battery or solar powered / Alphasense EC (4) +PM+RT+RH / 3G
- Citizen / personal system: Static sampling / Battery powered / I2C sensors (Bosch/Sensirion) / Bluetooth
- MOX sensors: Suction pump / AC powered / comercial + CSIC + CNRS sensors / Ethernet

First prototypes of test campaign of electronic systems

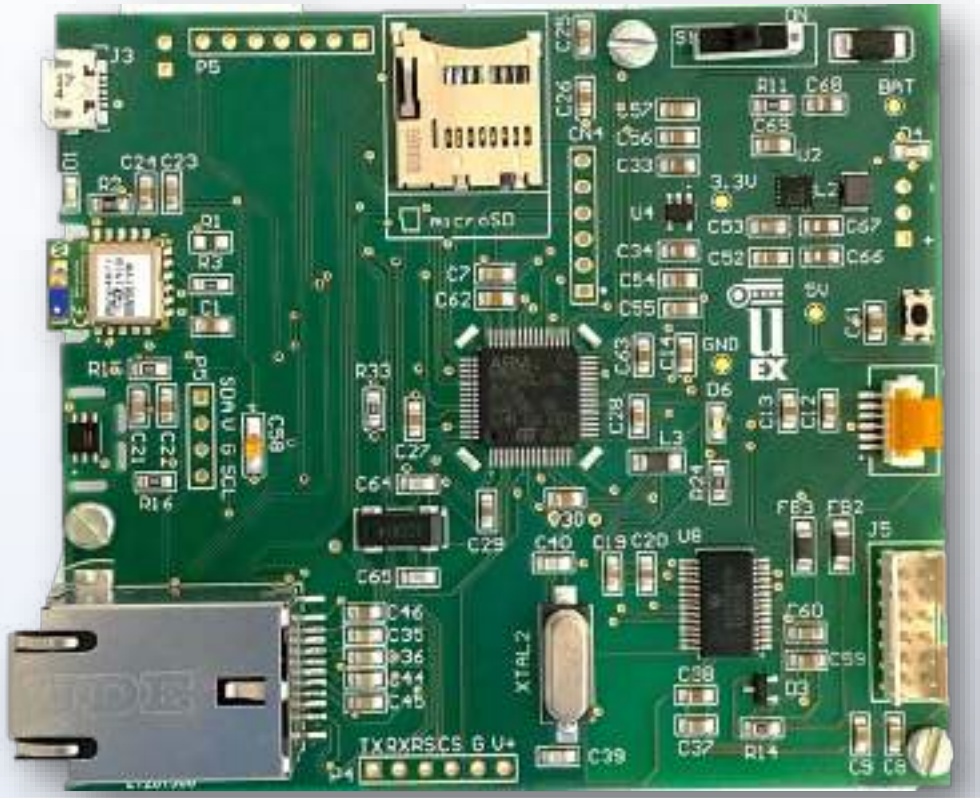
First results

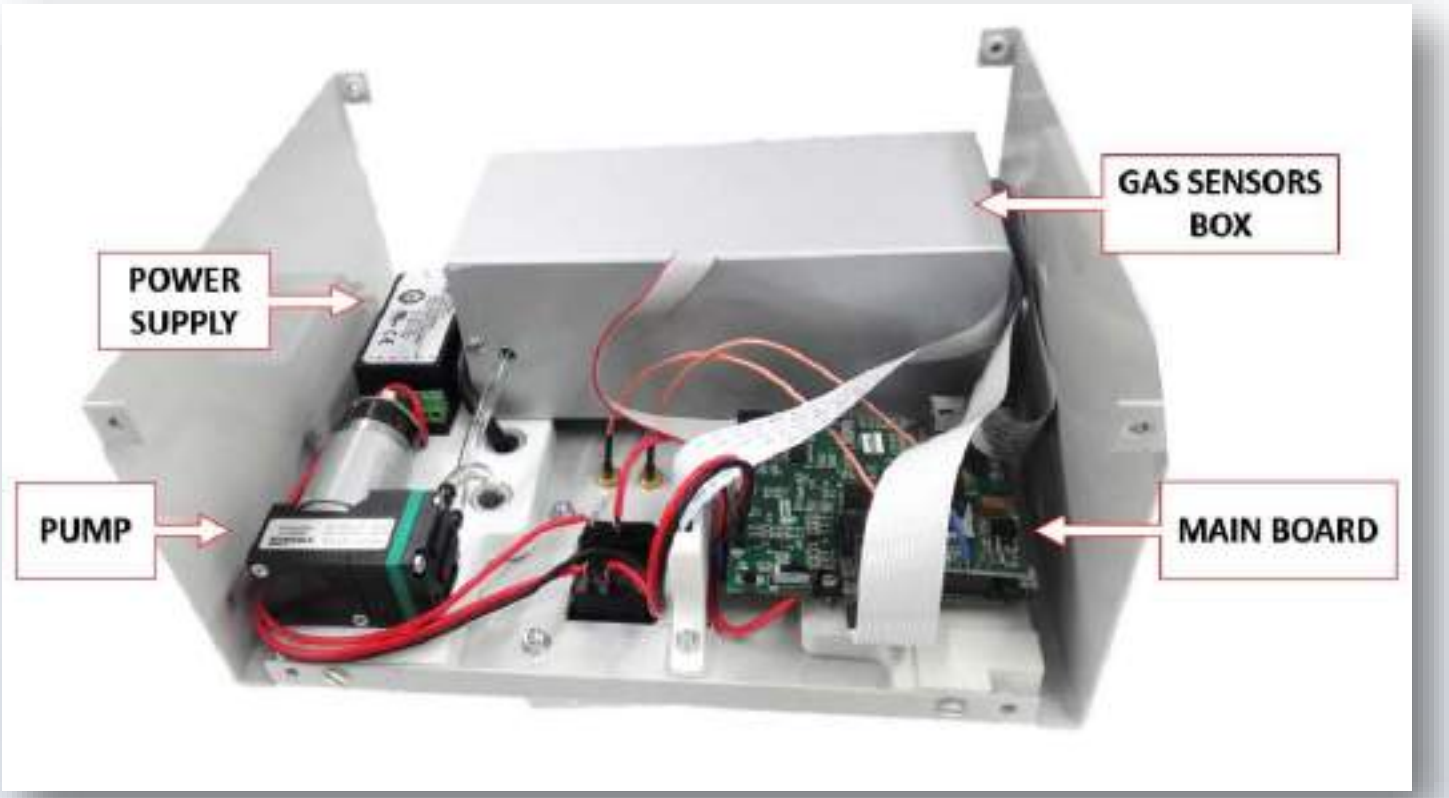


First results



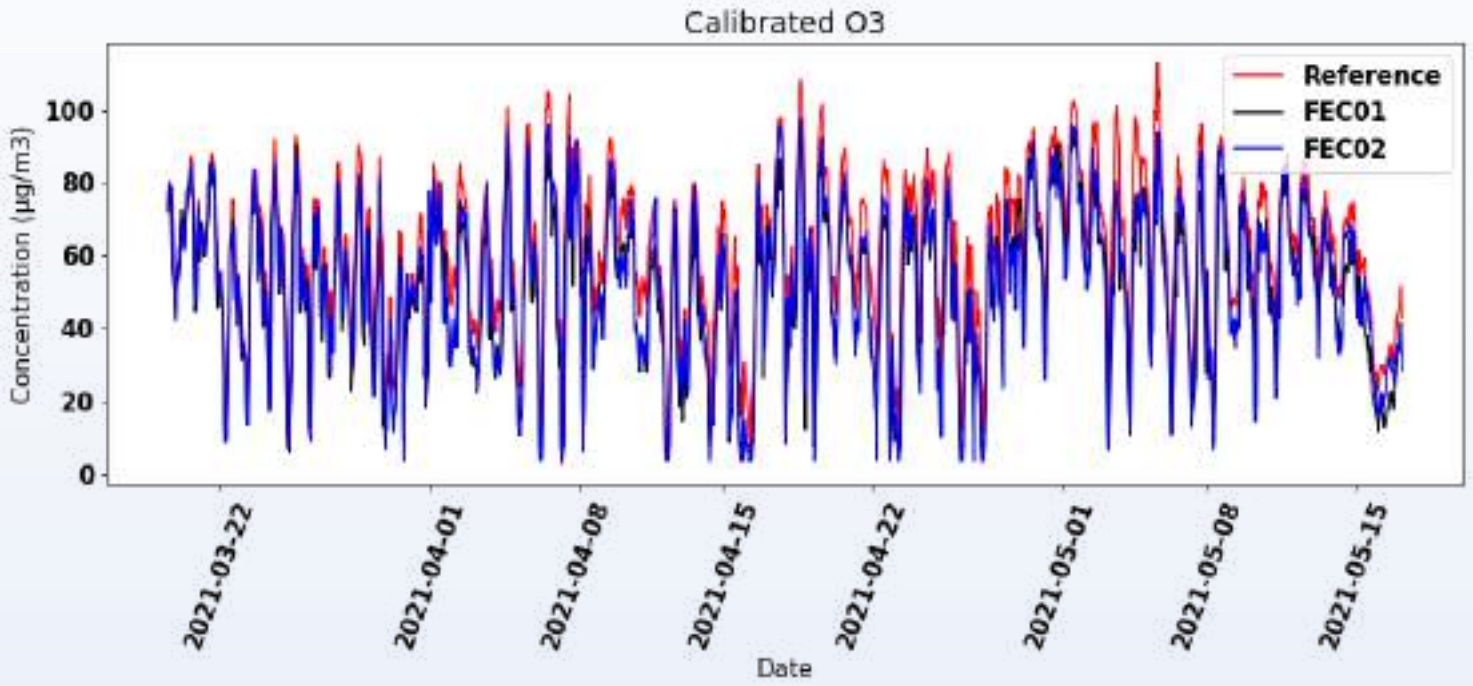
Prototype for stationary and Mobile AQM units

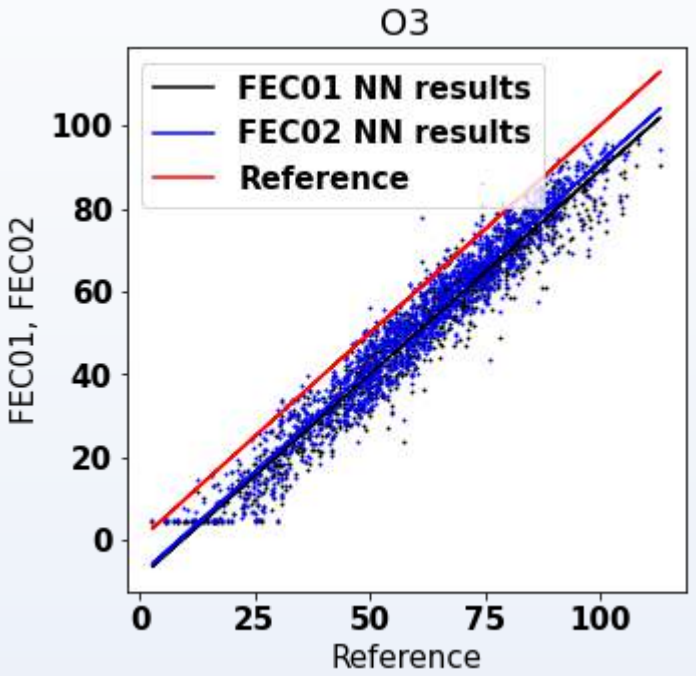




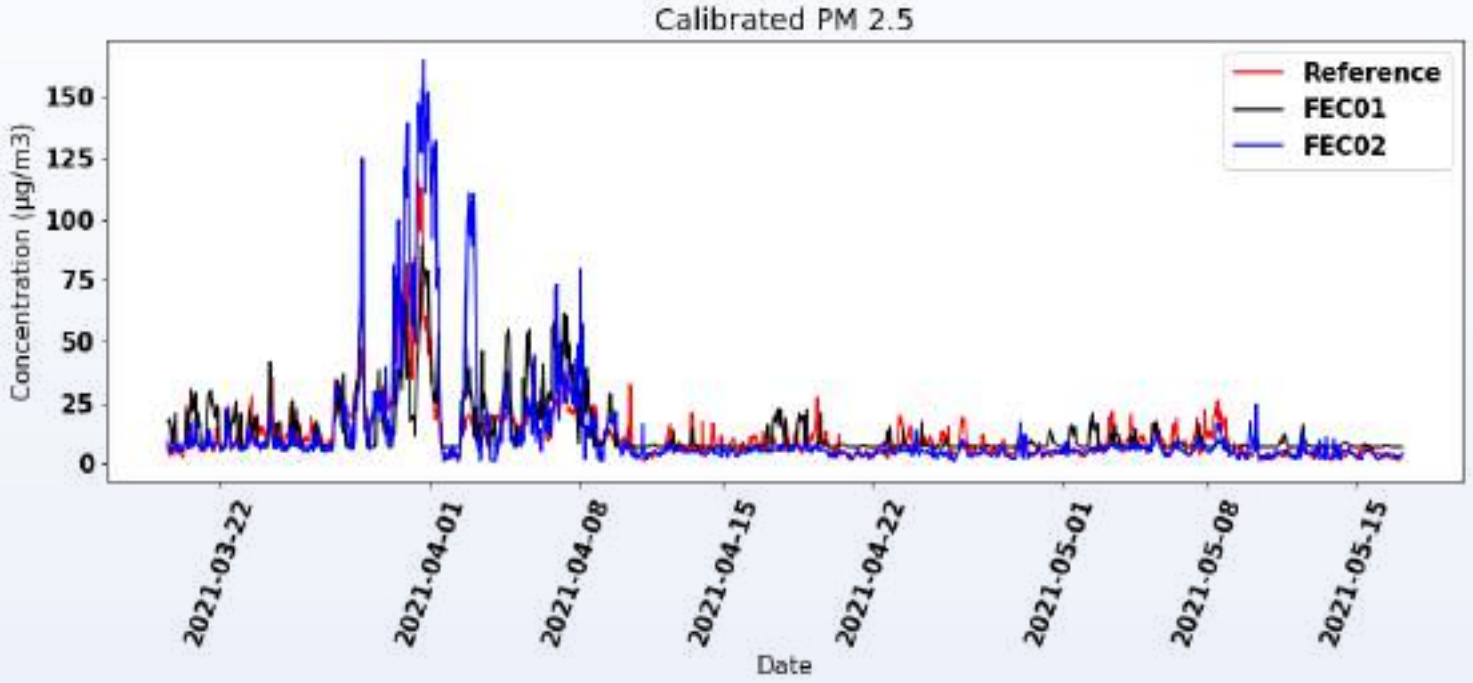
Prototype for stationary and Mobile AQM units

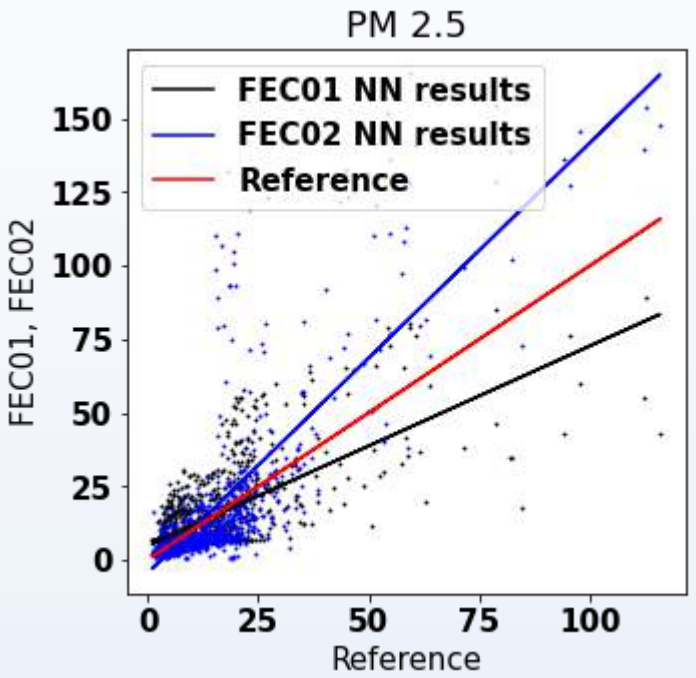
Results of stationary and Mobile AQM units



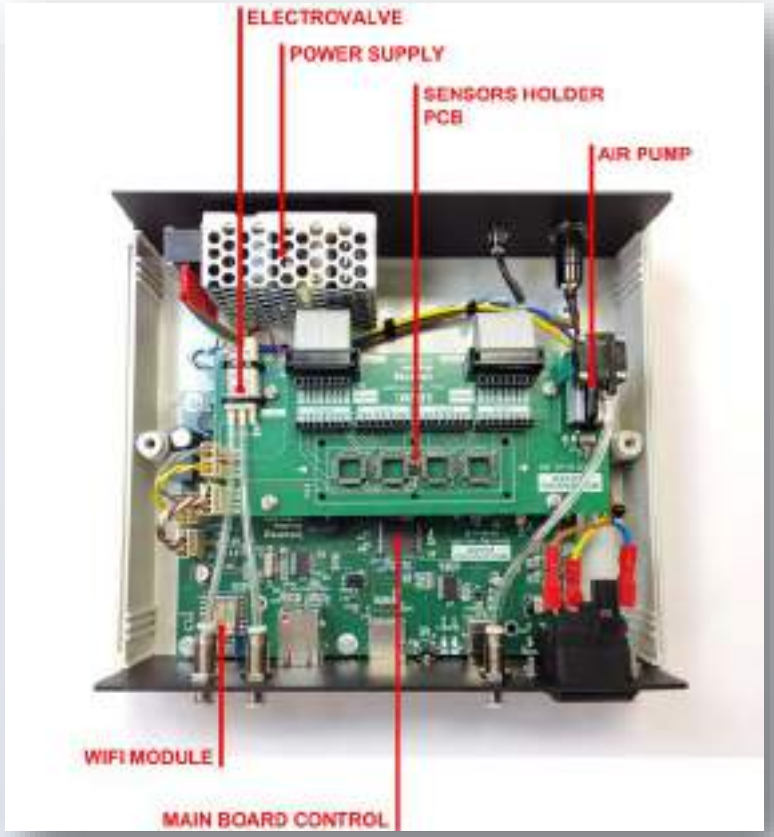


Results of stationary and Mobile AQM units



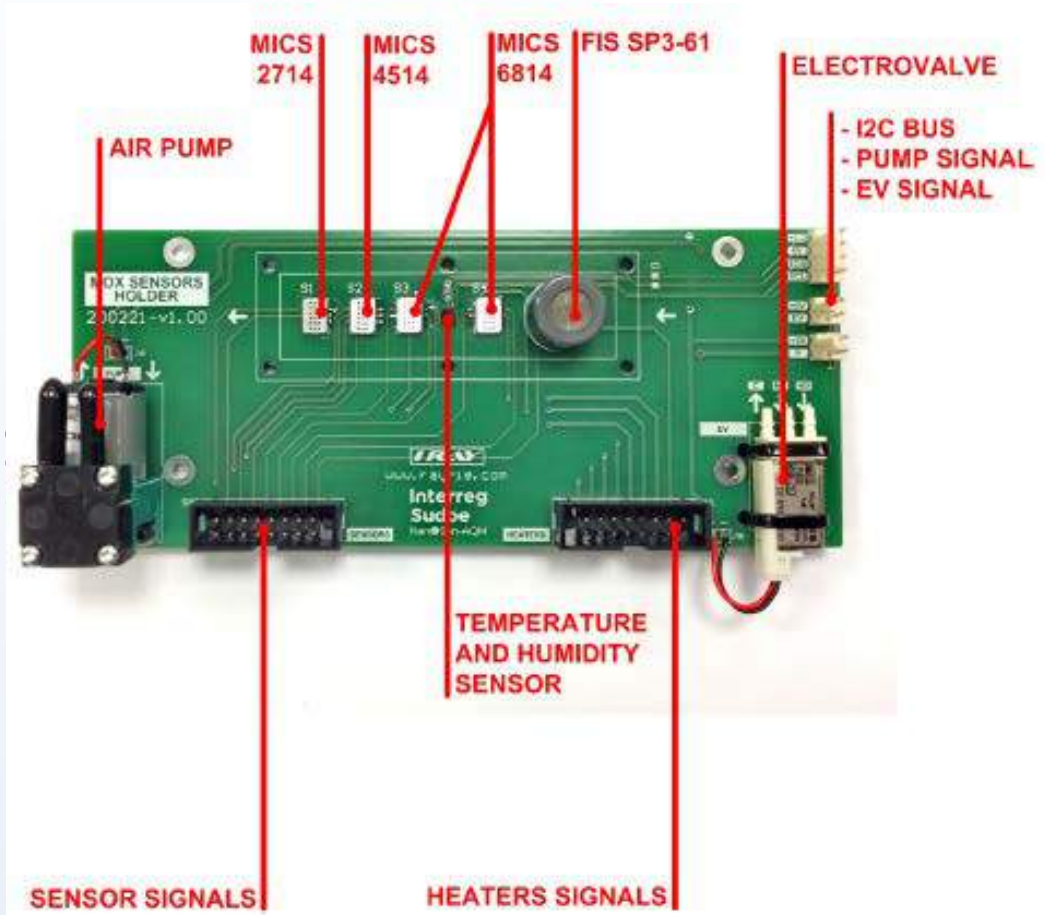


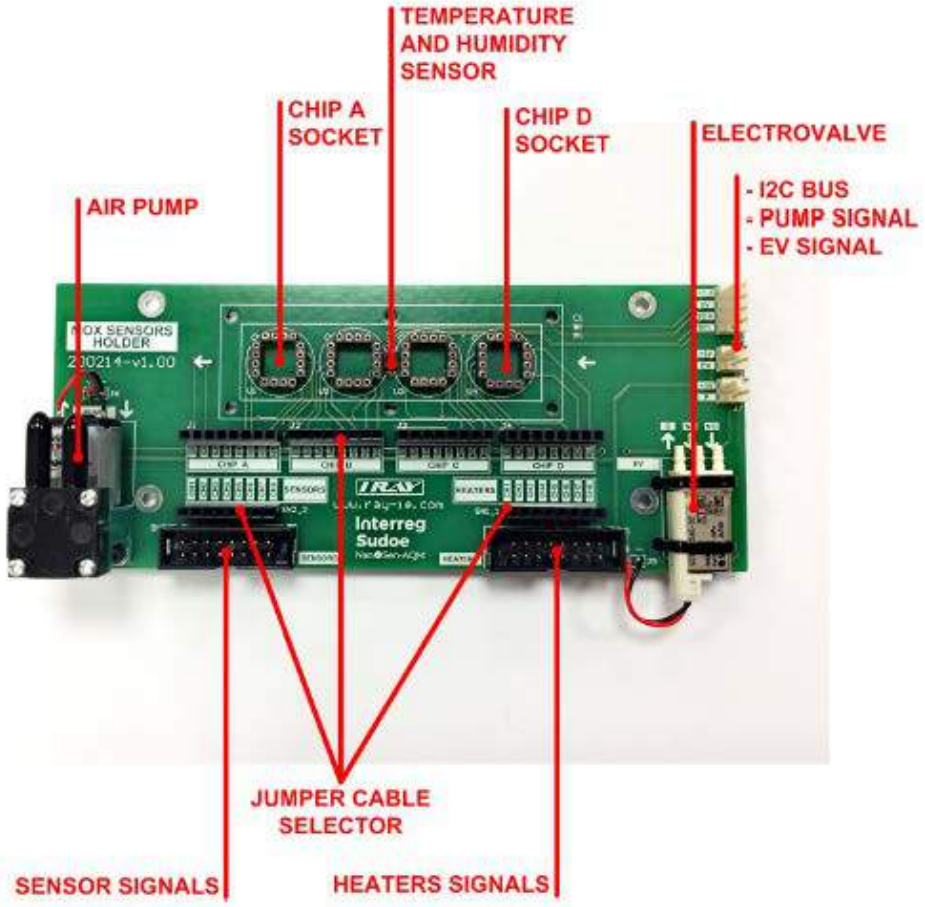
Prototype for stationary and Mobile AQM units (MOX sensors)



Prototype for stationary and Mobile AQM units (MOX sensors)

Commercial sensors





Nanosensors

CNRS (FMXCN) / CSIC (FMXCS)

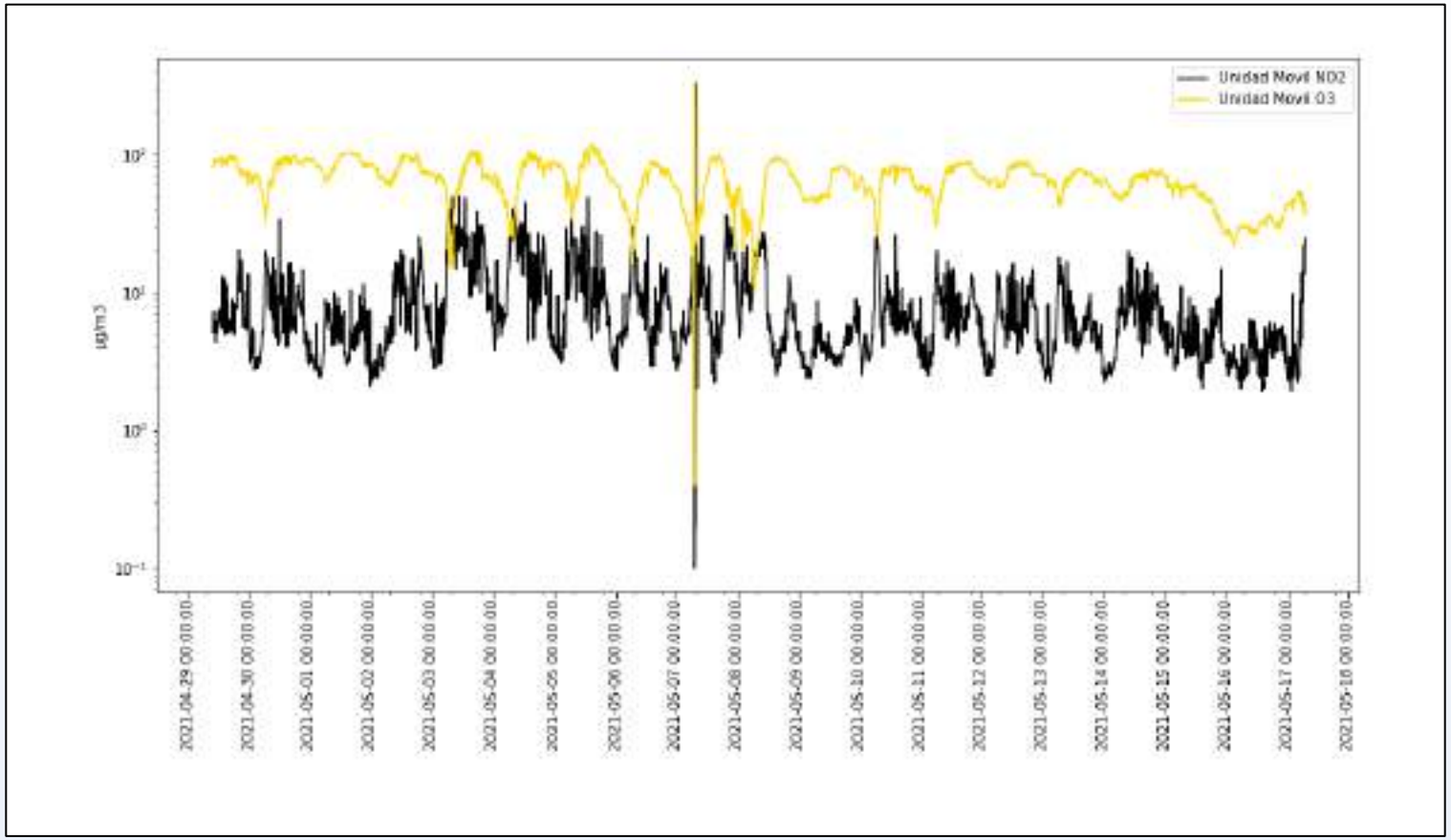
MOX nanosensors

CH	SENSOR	DET. GAS	P_h (mW)
1	MiCS 2714 (OX)	NO2	43
2	MiCS 4514 (OX)	NO2	43
3	MiCS 4514 (RED)	CO	76
4	MiCS 6814 (OX)	NO2	43
5	MiCS 6814 (RED)	CO	76
6	MiCS 6814 (OX)	NO2	43
7	MiCS 6814 (RED)	CO	76
8	FIS SP3-61	O3	400

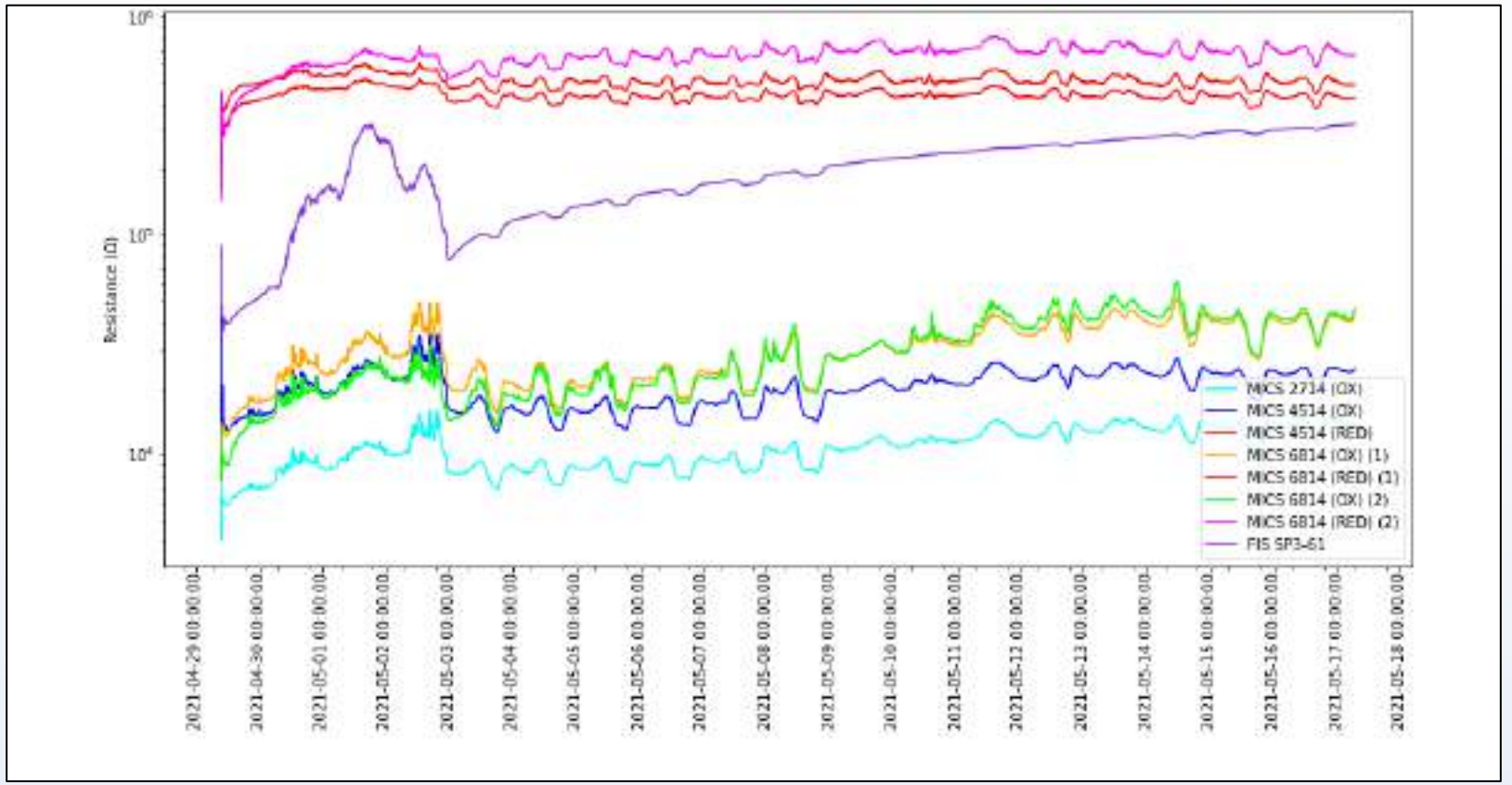
CNRS Sensors	1		2		3		4	
Channel	Ch1	Ch2	Ch3	Ch4	Ch5	Ch6	Ch7	Ch8
Film thickness (nm)	25	25	25	25	50	50	50	50
Temperature	Constant	Pulsed	Constant	Pulsed	Constant	Pulsed	Constant	Pulsed
Power (mW)	20	20-30	25	5-25	25	5-25	25	5-25

CSIC Sensors	1		2		3		4	
Channel	Ch1	Ch2	Ch3	Ch4	Ch5	Ch6	Ch7	Ch8
Sensing material	SnO_2: RGO	SnO_2: RGO	SnO_2:PRG	SnO_2: PRG	SnO_2: GNPL	SnO_2: GNPL	SnO_2:Pt NP	SnO_2:Pt NP
Power (mW)	41	41	14.5	41	14.5	41	14.5	14.5

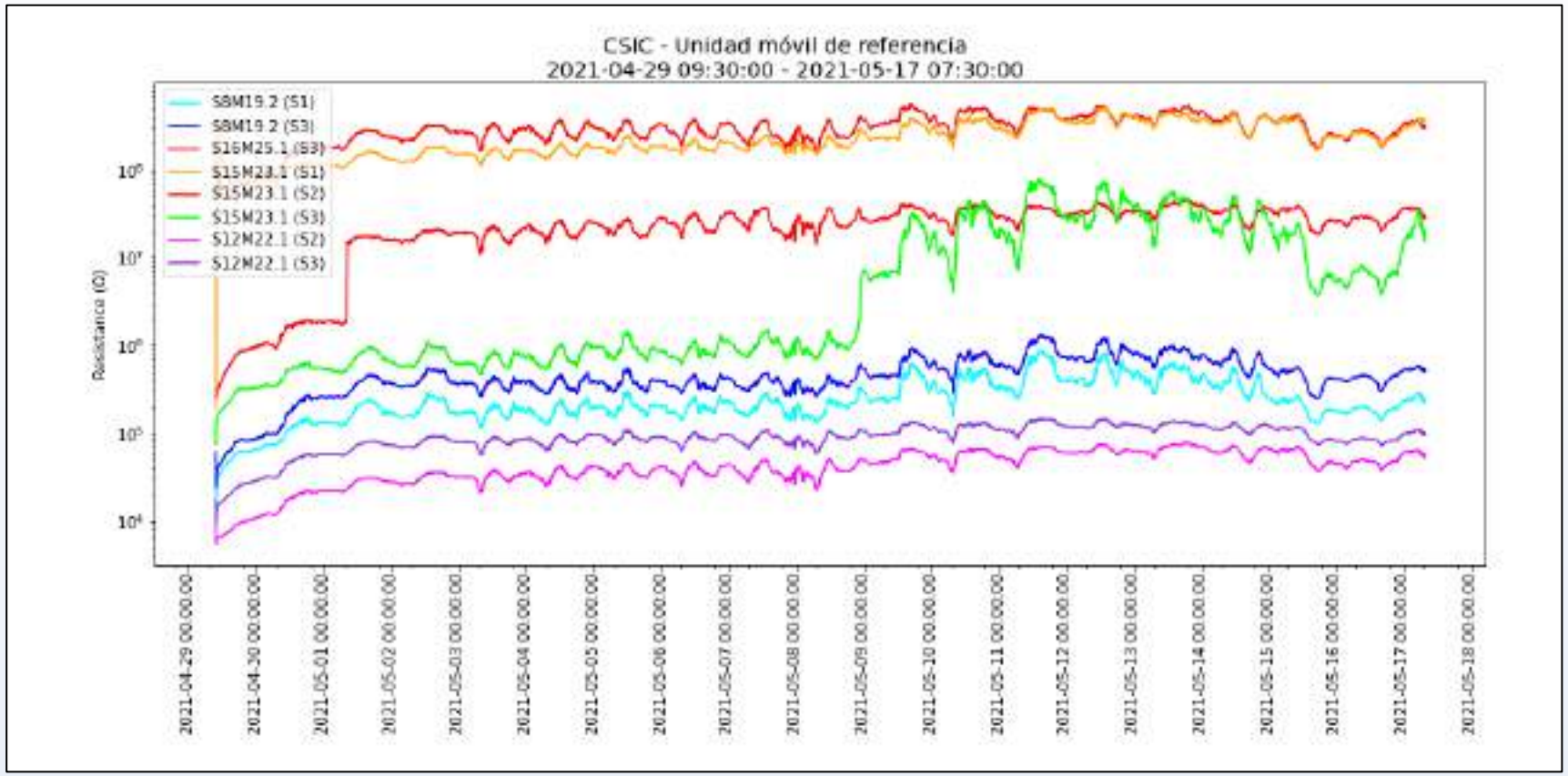
Results with MOX sensors (reference)



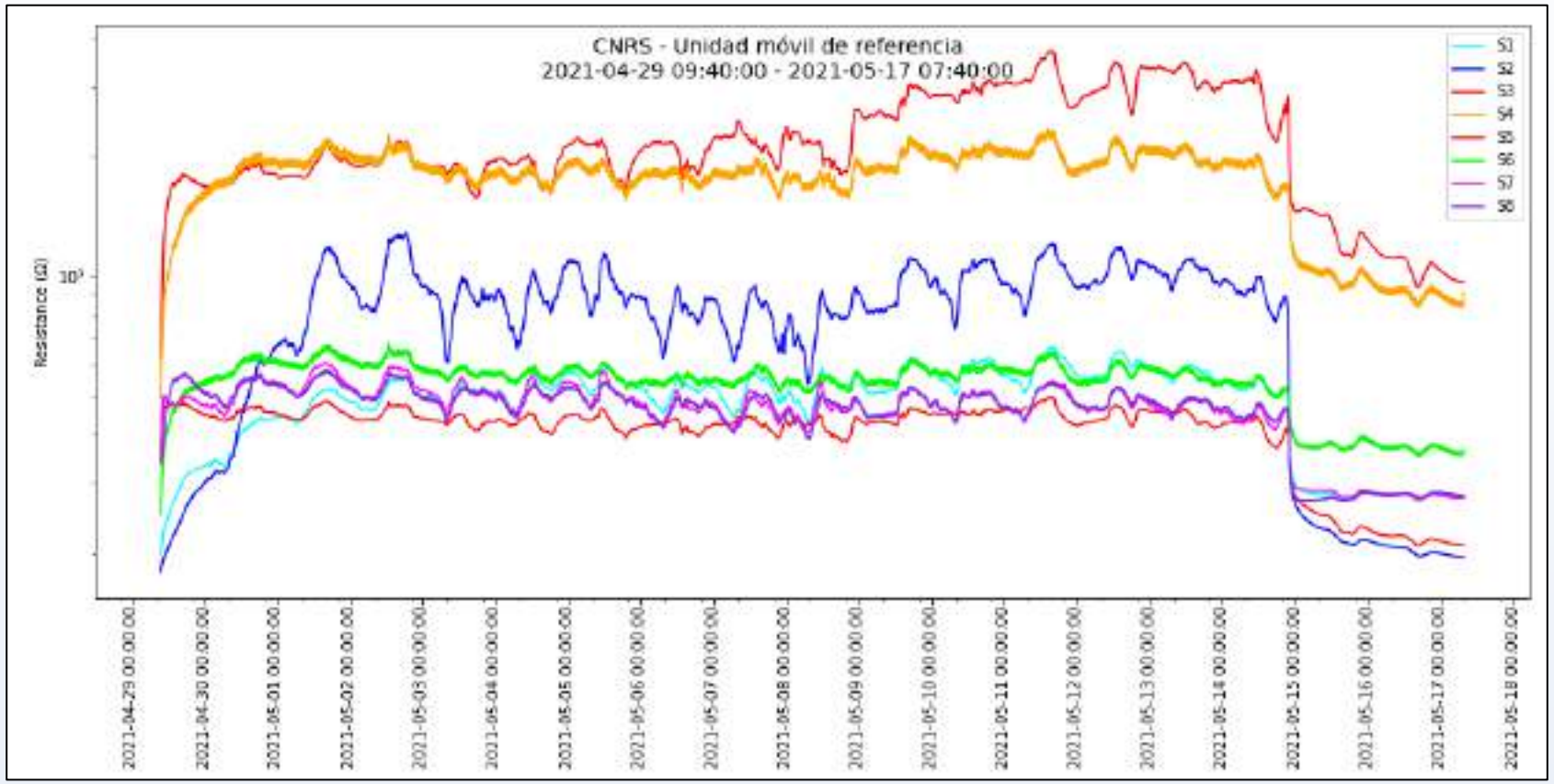
Results with MOX comercial sensors (FMXCO)



Results with MOX nanosensors CSIC (FMXCS)



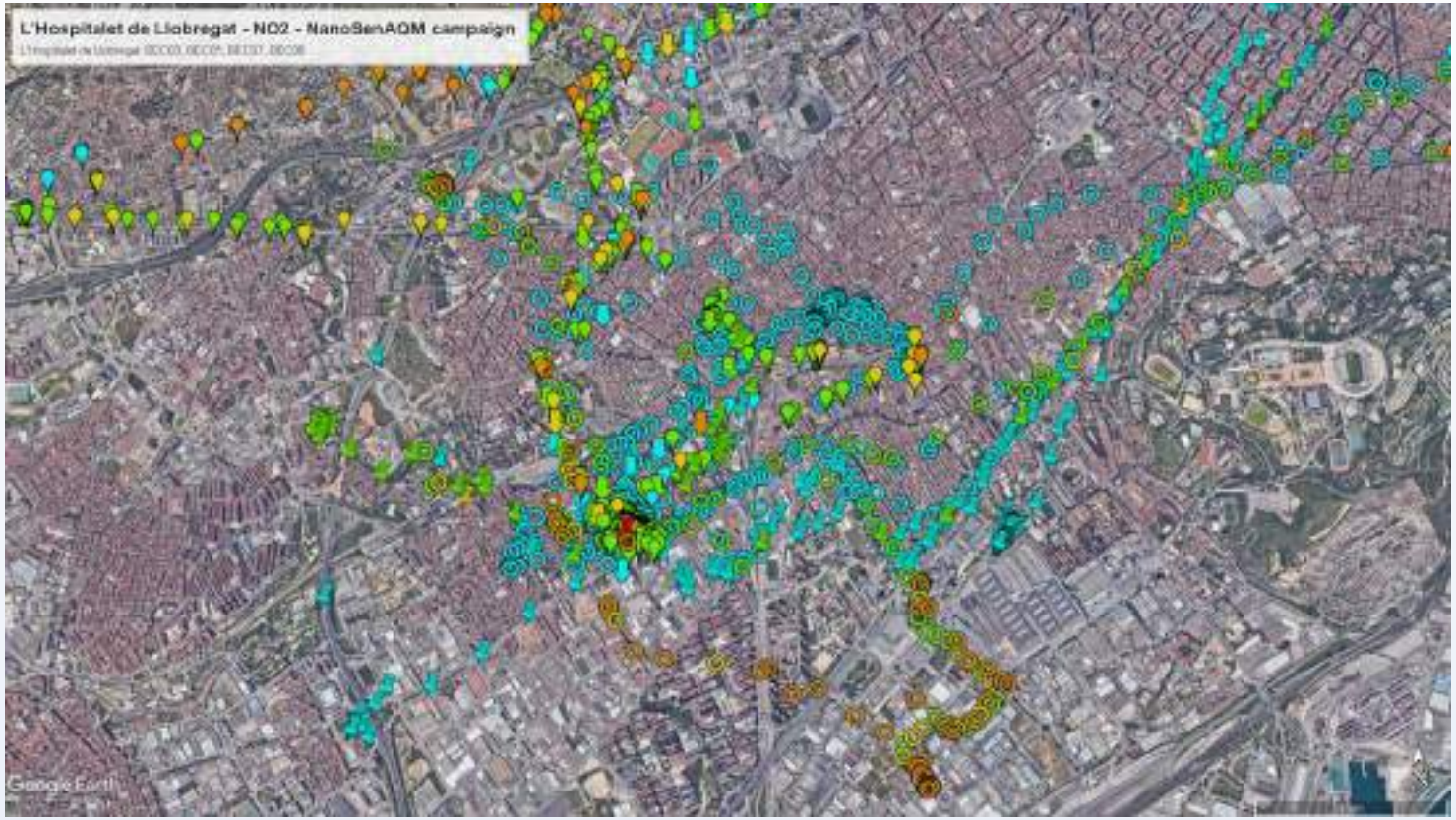
Results with MOX nanosensors CNRS (FMXCN)



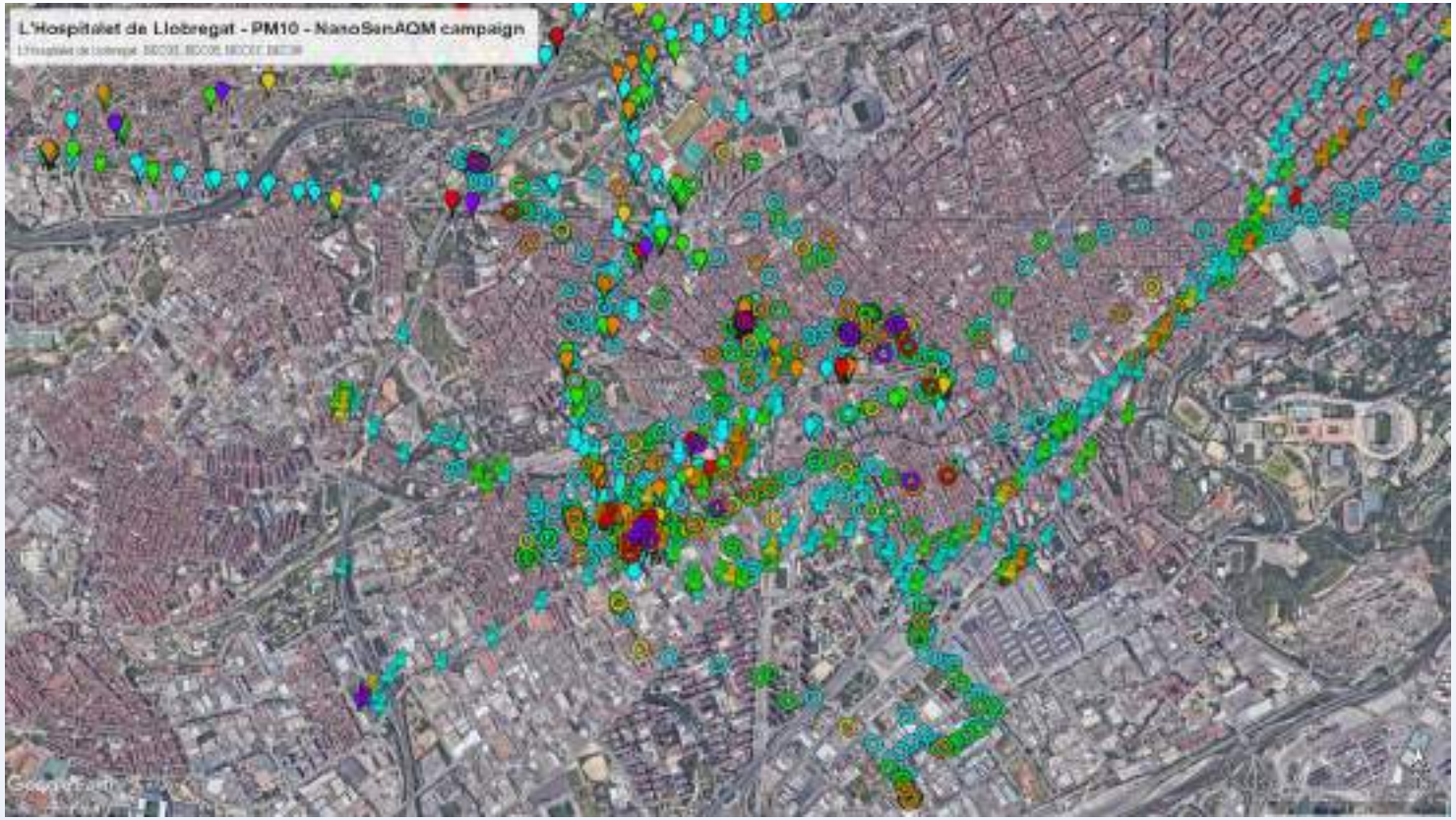
Prototype for bikes

Prototype for bikes

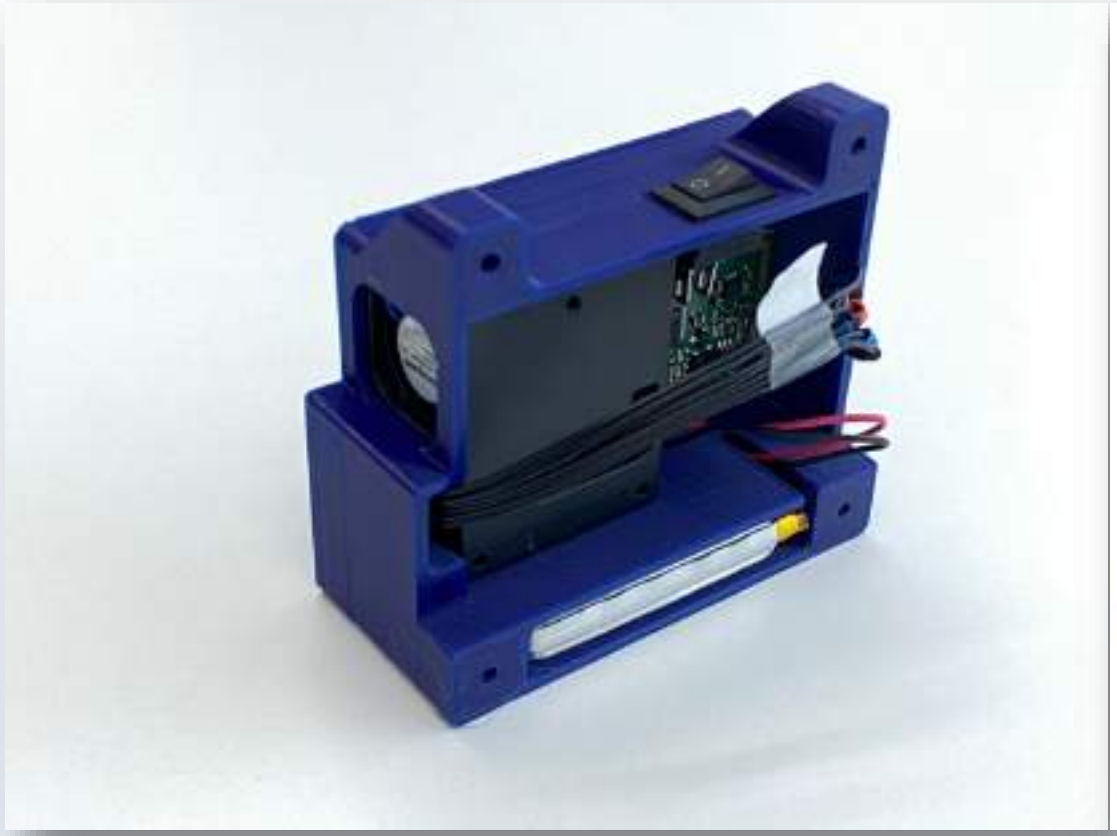
Results with bikes

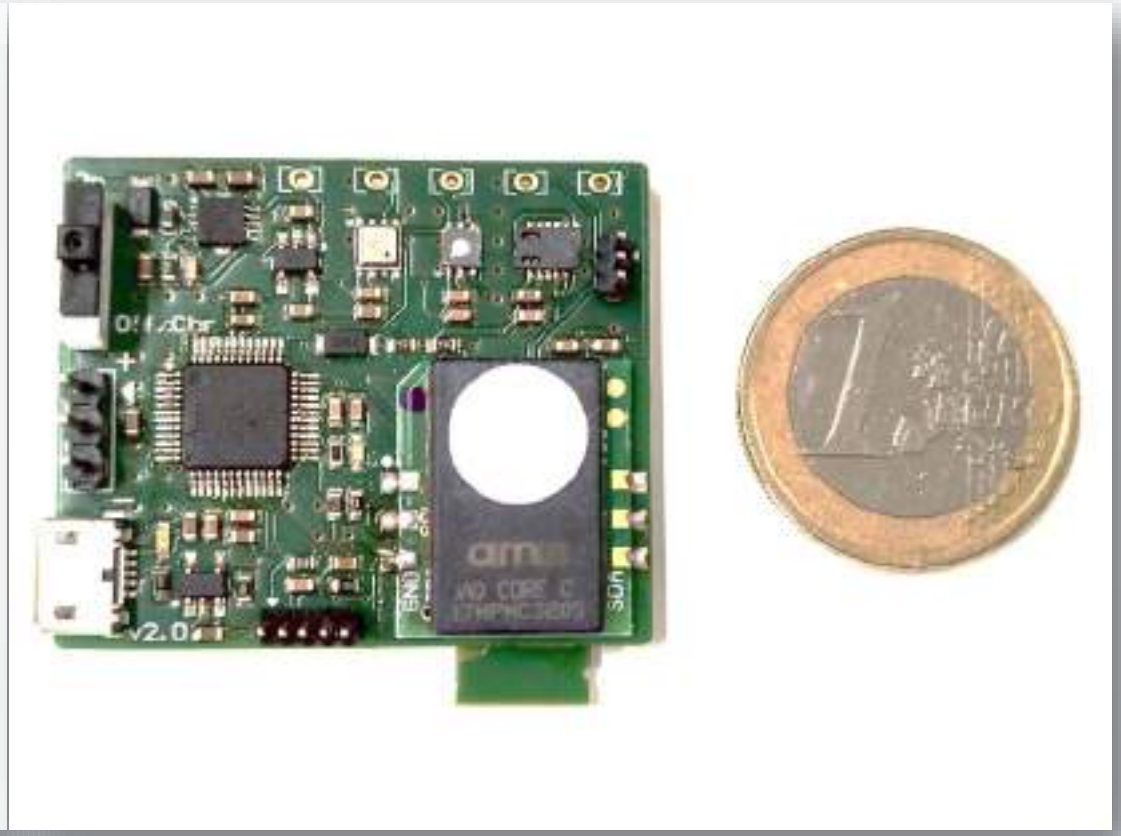


Results with bikes



Prototype for personal AQM devices (citizens)





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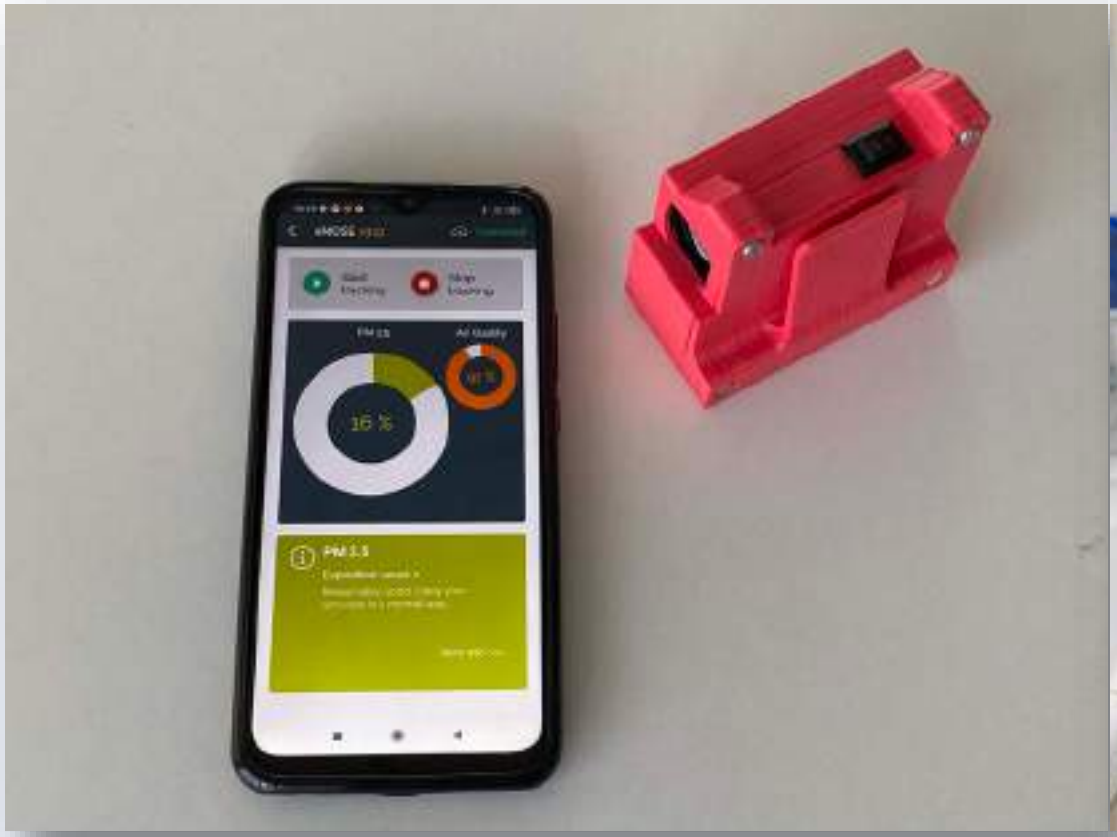
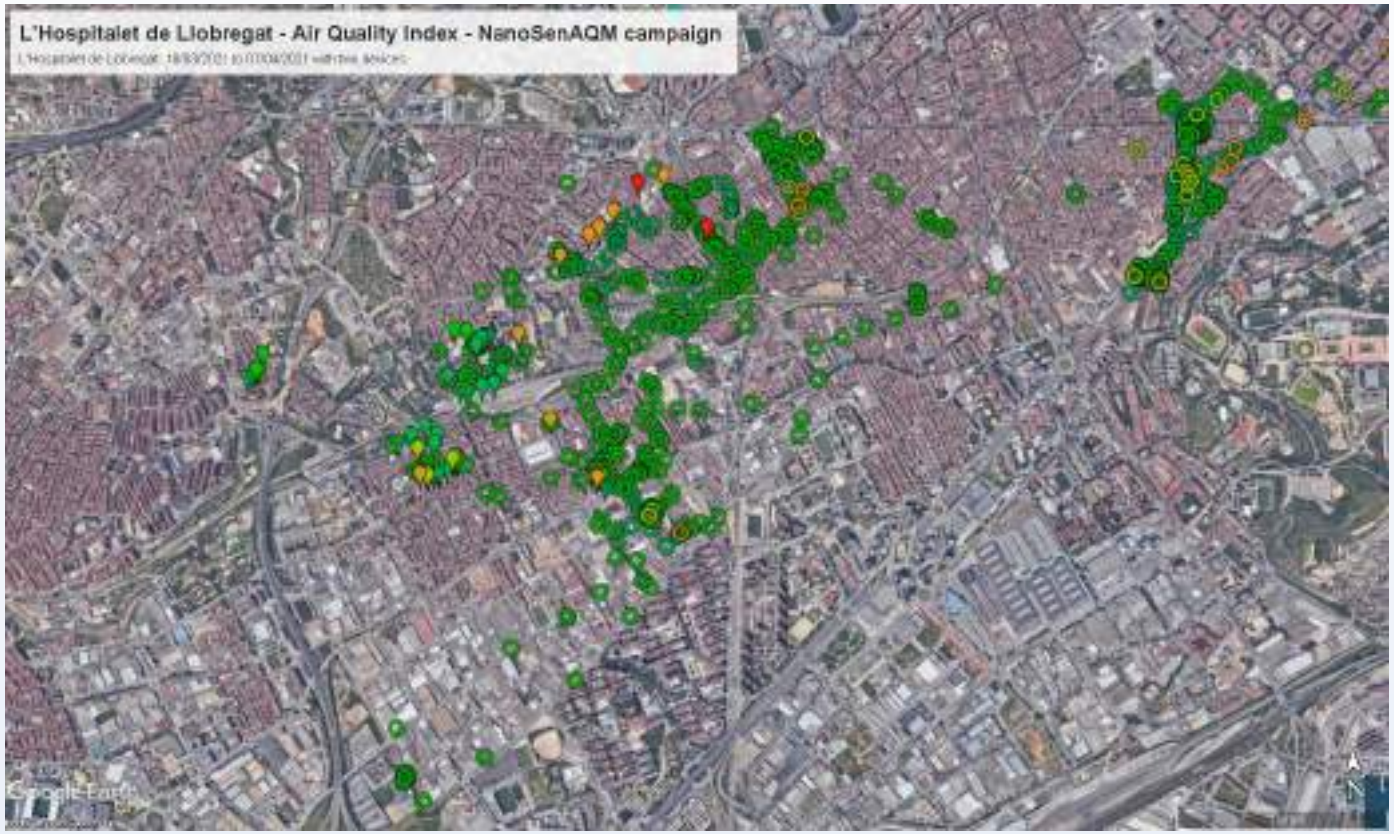
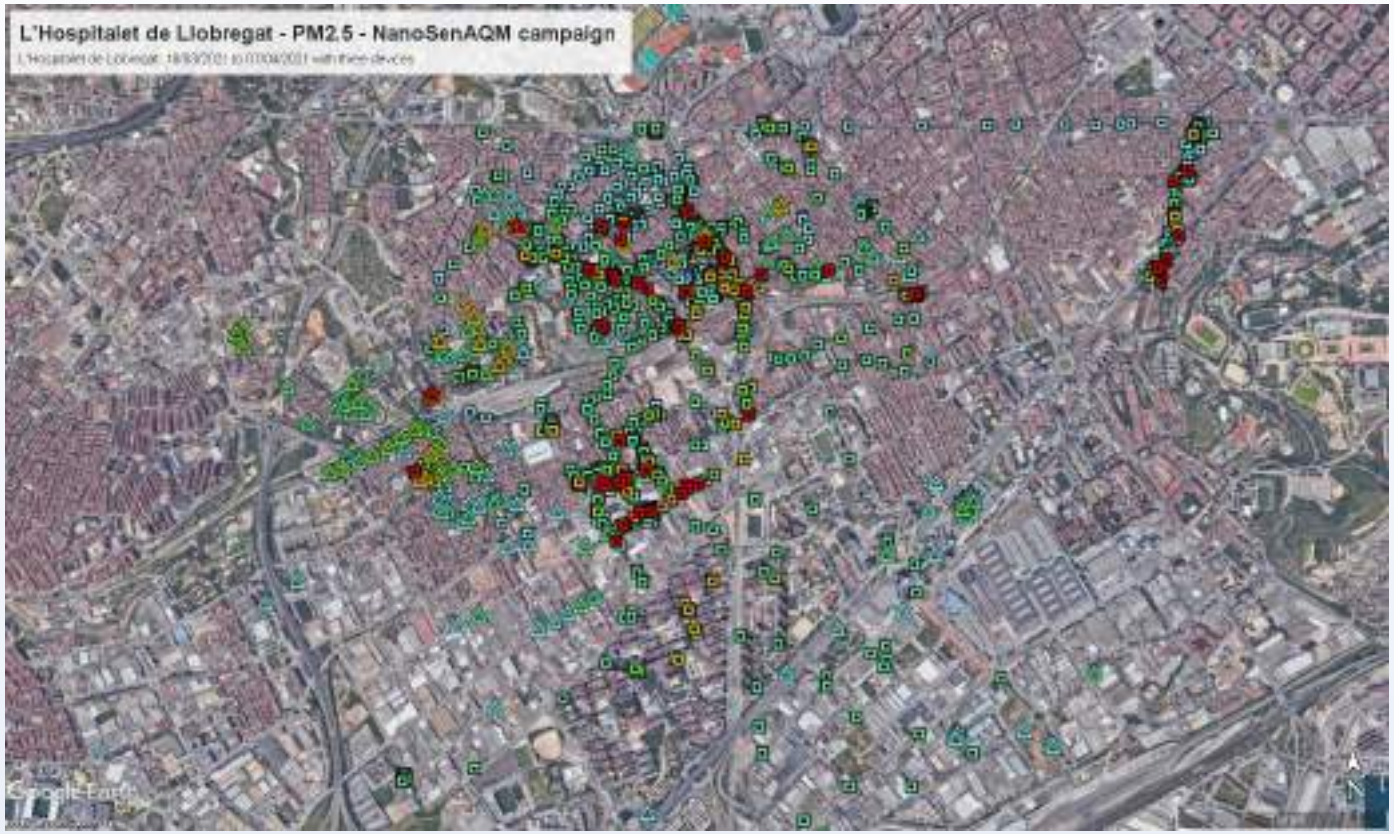


Results with citizens

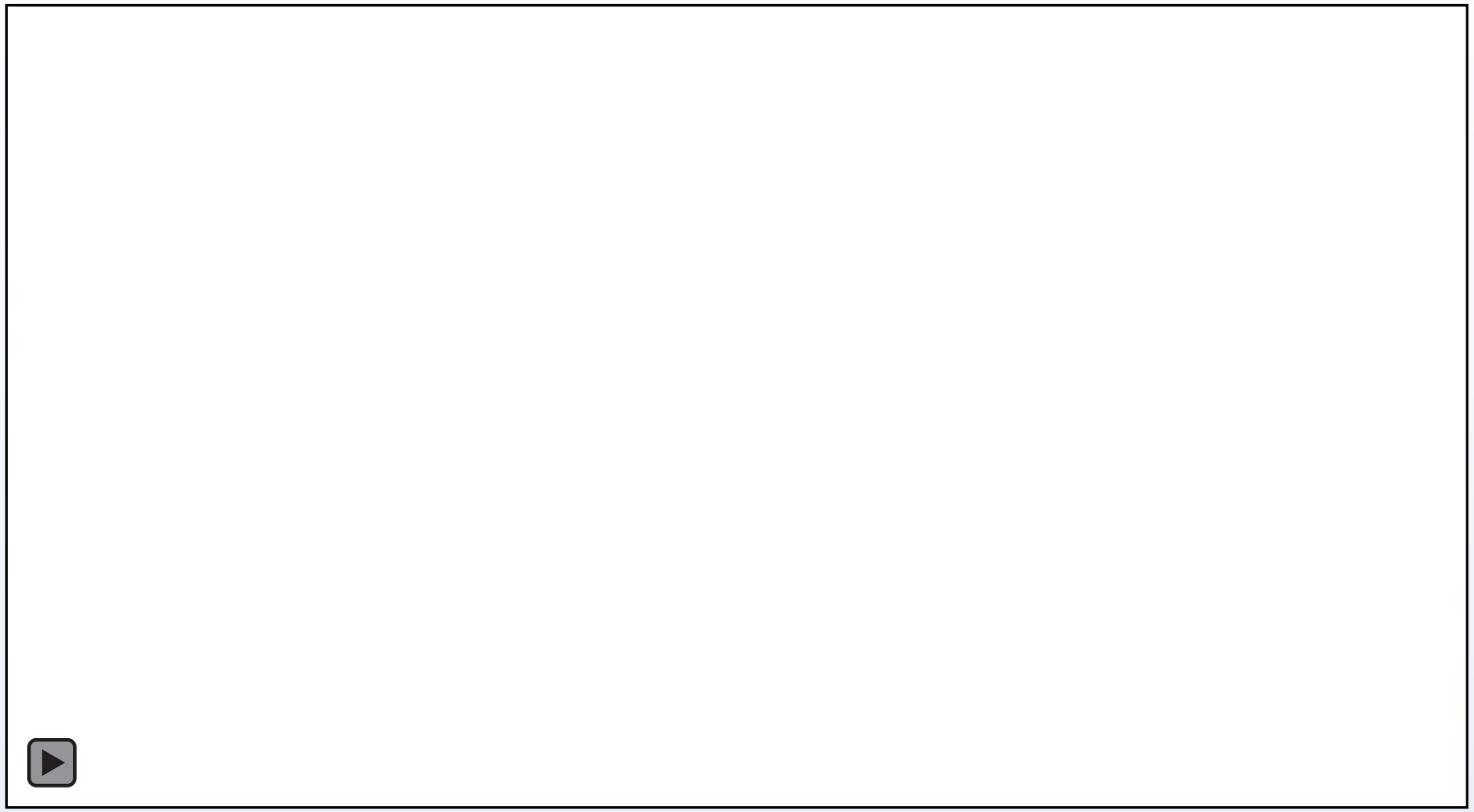


Results with citizens



Electronic System for drones

Results with drones



Results with drones

Conclusions and future works

- Objectives (low cost, size and consumption)
- Specifications
- Development of 5 different prototypes (main product P3.1)
- All of them working for months
- Good results and objectives acomplished
- Aditional data processing

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