

Distributed Energy Resources Management

Pedro Faria

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Advanced Innovation and Development**

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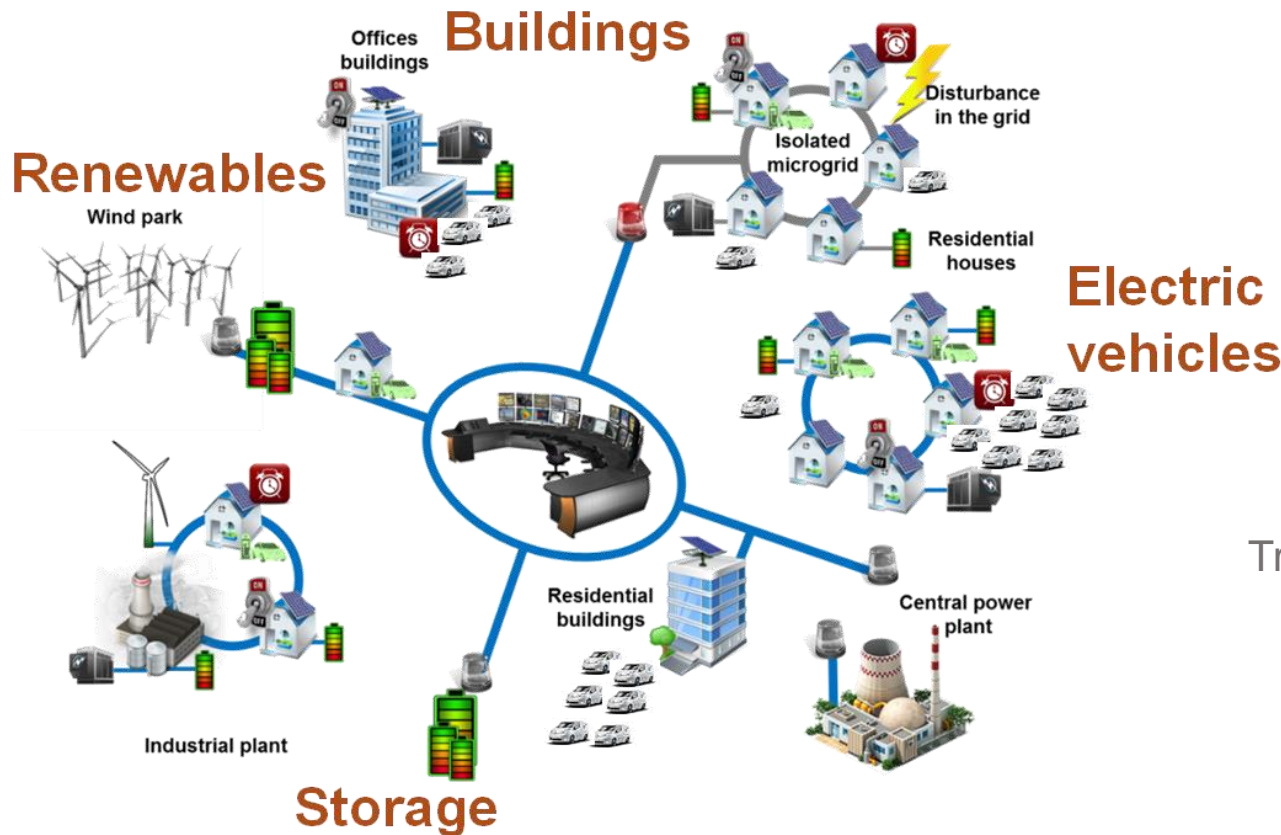
**ENCONTRO
COM A CIÊNCIA
E TECNOLOGIA
EM PORTUGAL**
2-4
JULHO
Centro de
Congressos
de Lisboa
encontrociencia.pt
[#ciencia2018PT](https://twitter.com/ciencia2018PT)

14h00 Sala B - Energias Renováveis e Acessíveis - ODS.7
Energias Renováveis e Acessíveis

Smart grids & microgrids

Real-time multi-agent based platform

Living demo building



Energy transactions

Transactive energy
Transactions among neighbors

Service provision

Business Models

Contracts
Demand response
Tariffs

Electricity market simulation

DREAM-GO



DREAM-GO – Enabling Demand Response for short and real-time Efficient And Market Based smart Grid Operation - An intelligent and real-time simulation approach

- Begin: 01.Feb.2015; Duration: 4 years
- 5 EU partners (2 academic/R&D + 2 companies); 1 US partner
- Coordinator: GECAD



FUSE-IT: Facility Using smart Secured Energy & Information Technology



GREEDI: Plataforma inteligente e segura para Gestão de Recursos Energéticos em Edifícios de grande Dimensão

dominoes

smart distribution grid



DOMINOES - Smart Distribution Grid: A Market Driven Approach for the Next Generation of Advanced Operation Models and Services

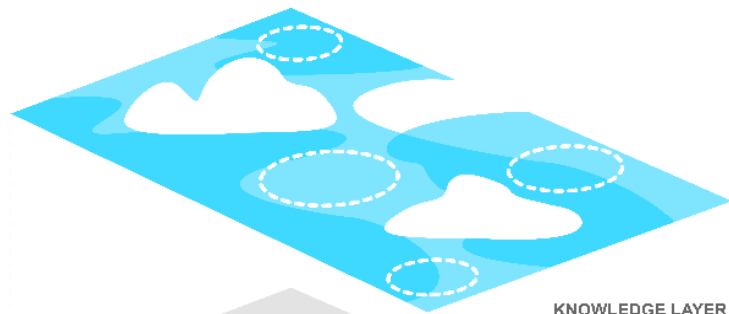
- Begin: Oct.2017; Duration: 42 months
- 8 EU partners (4 academic/R&D + 4 companies)



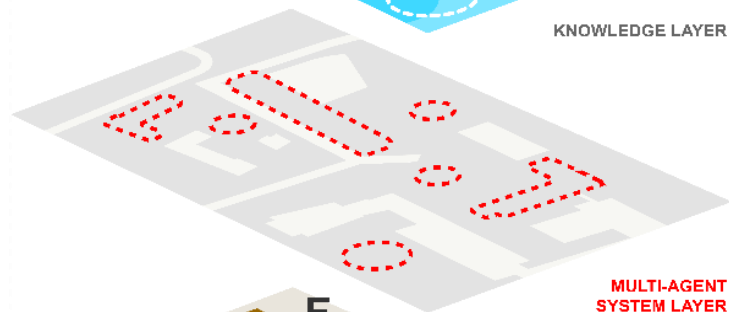
ITEA3



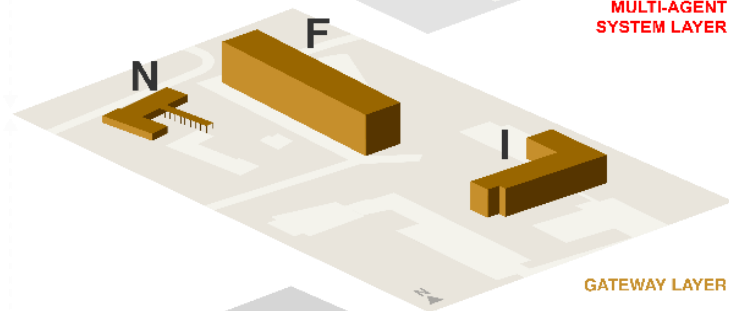
Real-time multi-agent based platform



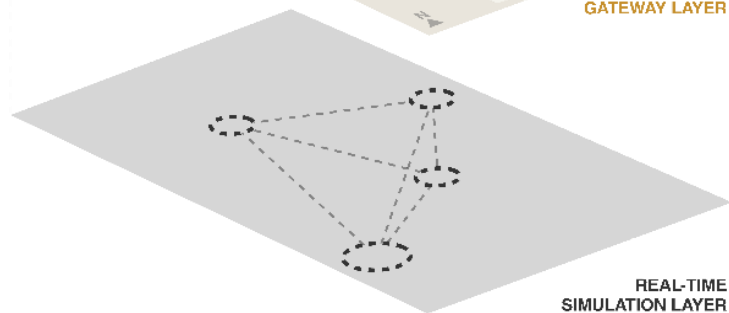
KNOWLEDGE LAYER



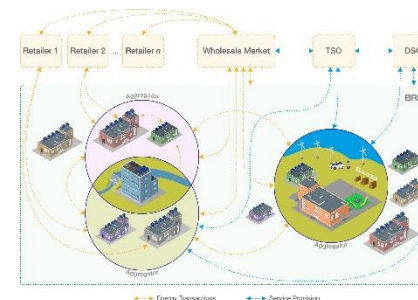
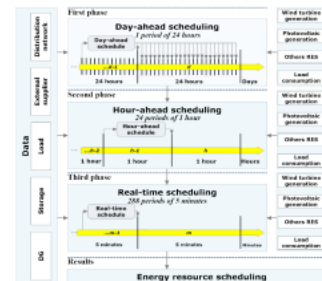
MULTI-AGENT
SYSTEM LAYER



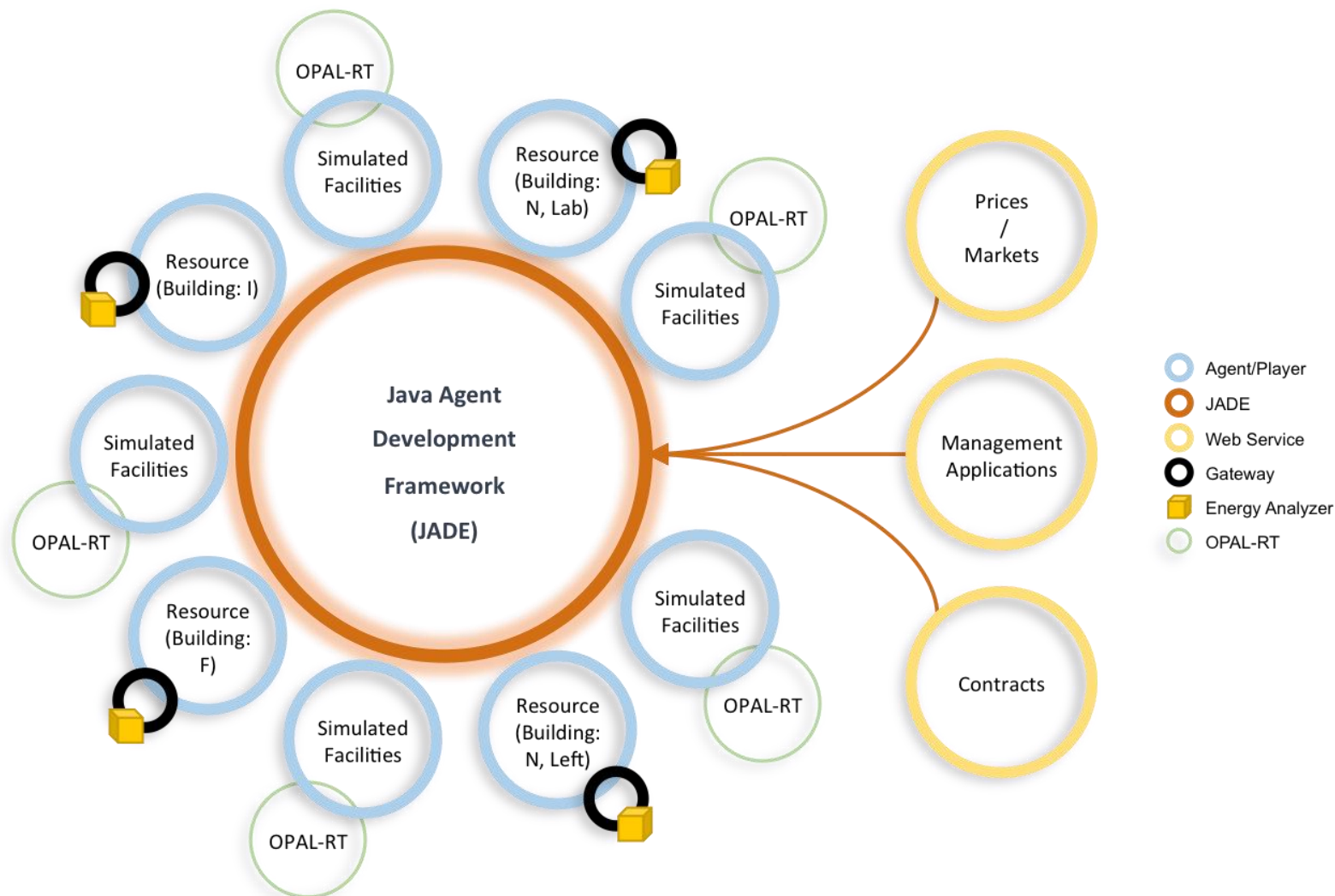
GATEWAY LAYER



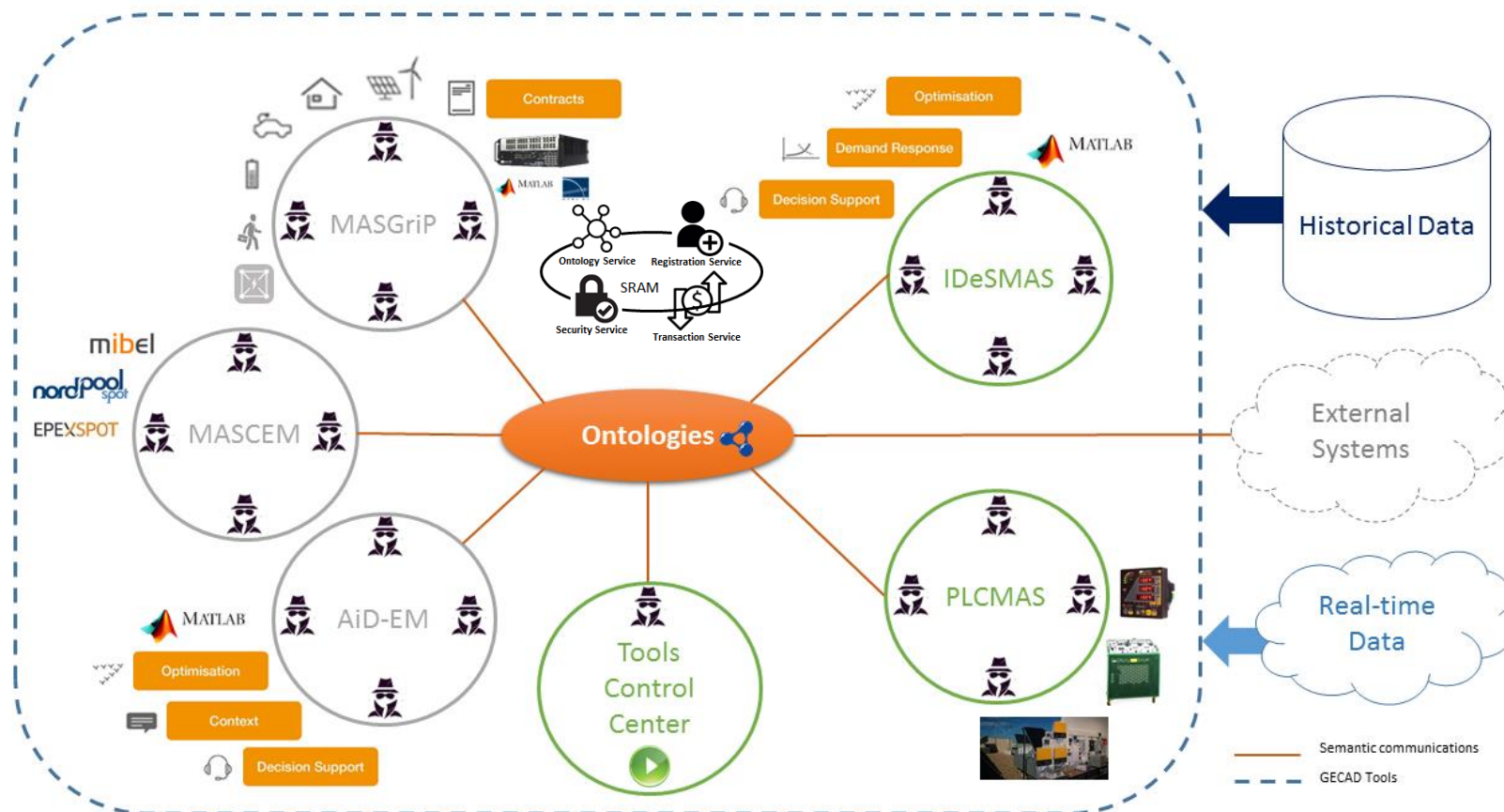
REAL-TIME
SIMULATION LAYER



Real-time multi-agent based platform



Real-time multi-agent based platform



AiD-EM - Adaptive Decision Support for Electricity Markets negotiations
 MASCEM - Multi-Agent Simulator of Competitive Electricity Markets
 MASGrIP - Multi-Agent Smart Grid Platform
 IDeSMAS - Intelligence and Decision Support Multi-Agent System
 PLCMAS - Programmable Logic Control Multi-Agent System

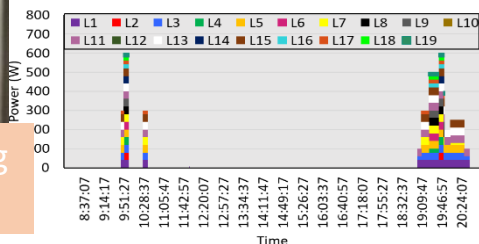
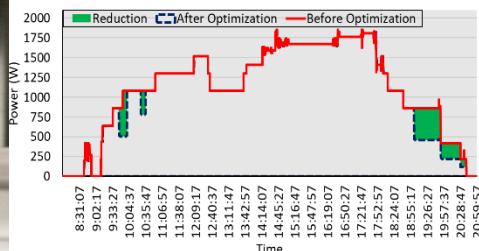
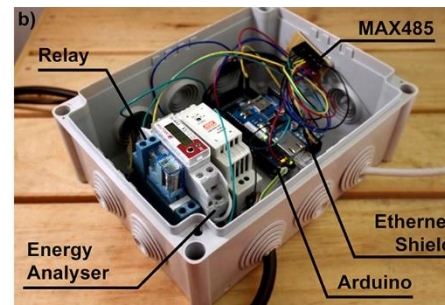
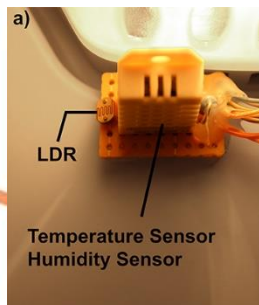
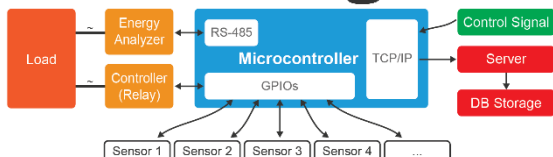
Real-time multi-agent based platform



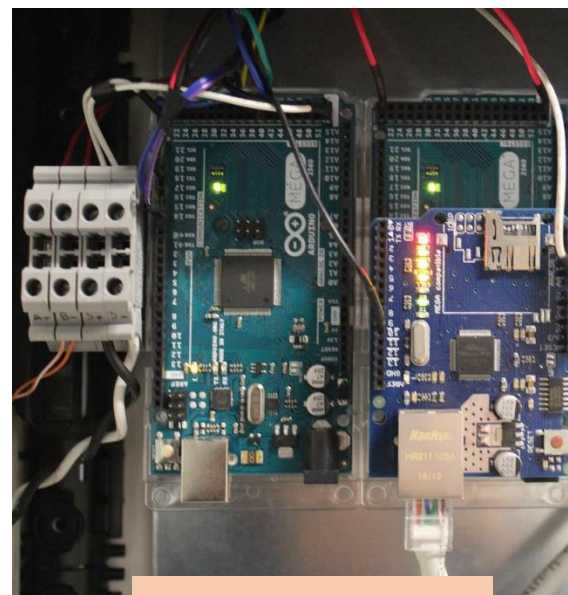
Living demo building

Distributed Intelligence

EnAPlug



Building lighting
optimization

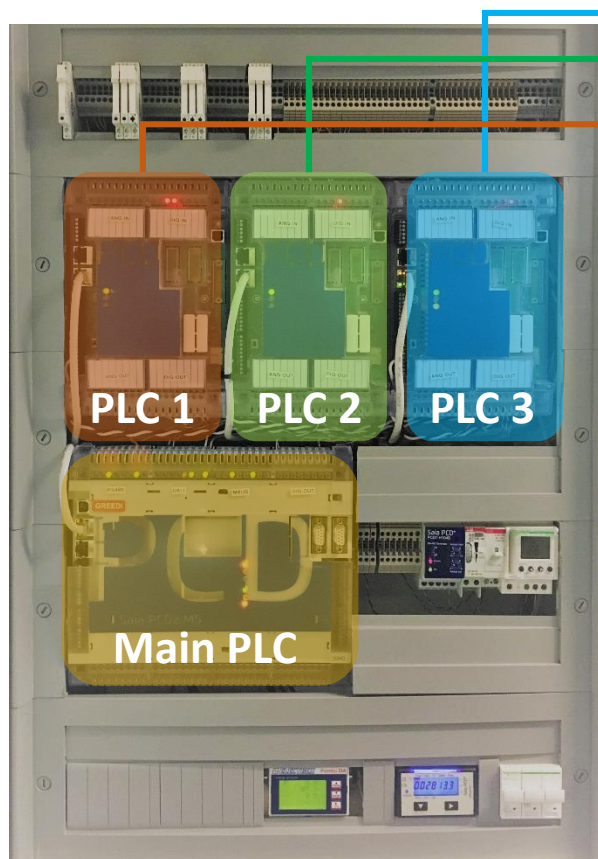


Air conditioning
(Central control)



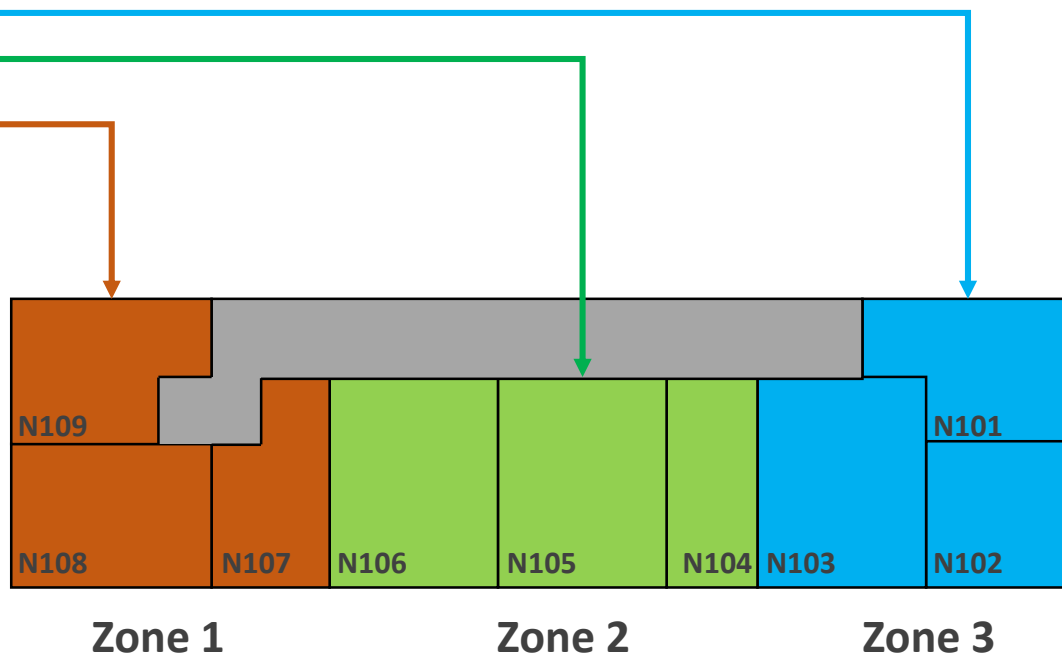
Air conditioning
(single room)

Living demo building



Controller Board of SCADA

(3 Distributed PLCs, and 1 Main PLC)

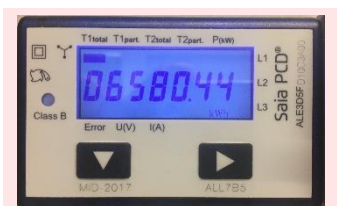


GECAD Building N Plan (West block)

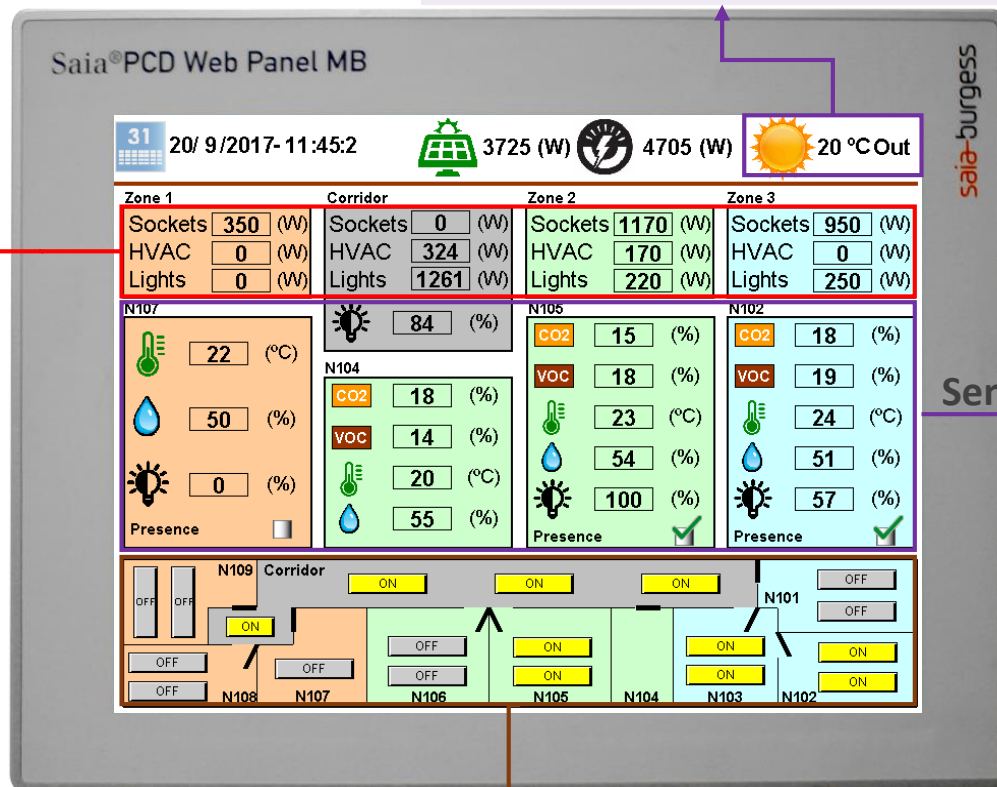
C2C Click to Control



- Temperature Outside
- Light Outside



4 Energy meters



Sensors

- CO2
- VOC
- Temperature
- Humidity
- Light
- Presence

19 DALI controllable lighting spots



Living demo building



No SIM

19:26
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100%

N103 - Office Room

N104 - Server Room

N105 - Office Room

N106 - Office Room

N107 - Office Room

N108 - Office Room

N109 - Office Room

N110 - Kitchen

N111 - Office Room

N112 - Laboratory

N113 - Laboratory

N114 - Laboratory

N115 - Laboratory

N116 - Office Room

Common Areas - Left

Common Areas - Right

Smart Control

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Dali

All lamps (%)

100

Send

Individual Control

Lamp 1 (%)

100

Lamp 2 (%)

100

Lamp 3 (%)

100

Lamp 4 (%)

100

Send

EnAPlug

Control

0 W

43.06 °C

0 var

232.1 V

0 A

192.168.2.199

2018-04-09 19:26:13.283

C2C Click to Control

19:27
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Moodle ISEP-PADs ISEP-Portal GOOGLE Translate Office 365 GECADCloud Dropbox

gem... ac.els-cdn... imdb the l... FCT emite... www.unite... Log in | Tr... Click to...

Login as

Luminosity - Temperature - Total Consumption -

UPDATED

Individual Control

Lamp 1 (%)

12

Lamp 2 (%)

12

Send

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COMPETE

2020

PORTUGAL

2020

EUROPEAN UNION

UNião Europeia

Fundo Europeu de Desenvolvimento Regional

MARIE CURIE

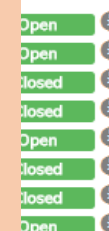
ACTIONS

HORIZON

2020

EUROPEAN UNION

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Thank you!

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