Andreea EL-LEATHEY, Rareș CHIHAIA,
Alexandru CONSTANTIN, Paula ANGHELIȚĂ, Gabriela CÎRCIUMARU
National Institute for R&D in Electrical Engineering ICPE-CA Bucharest, Romania

Digital Twin for PV Power Plants

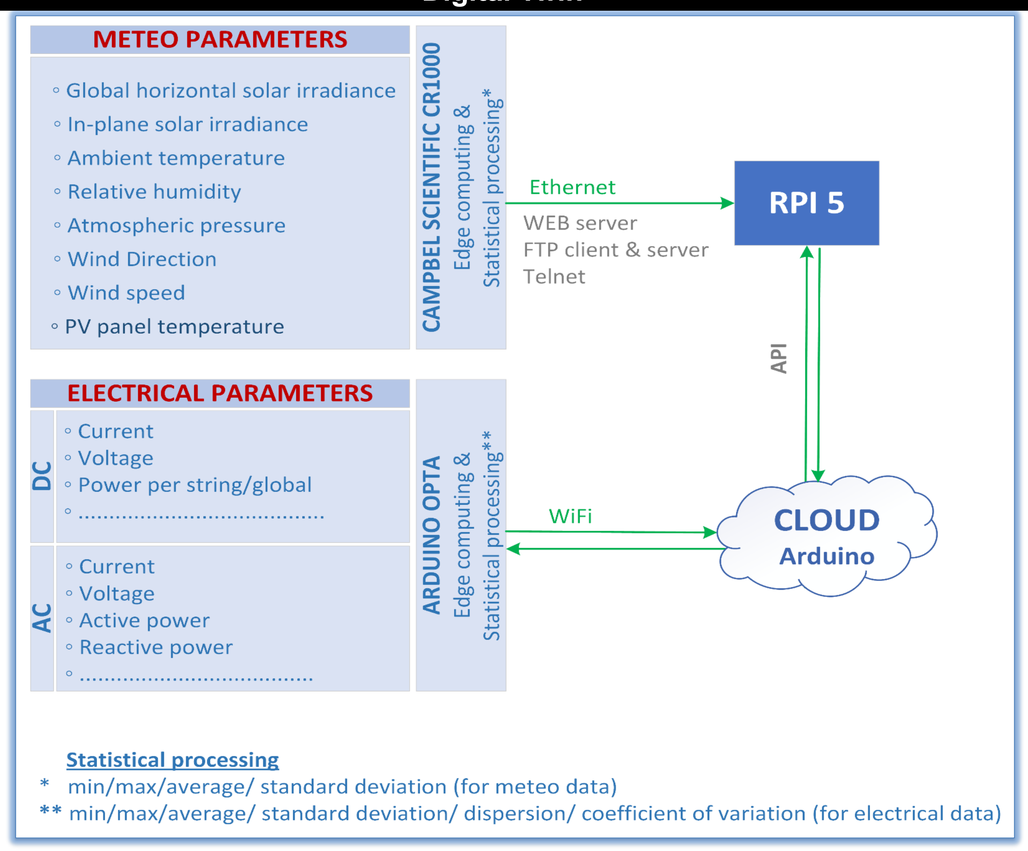
General Information

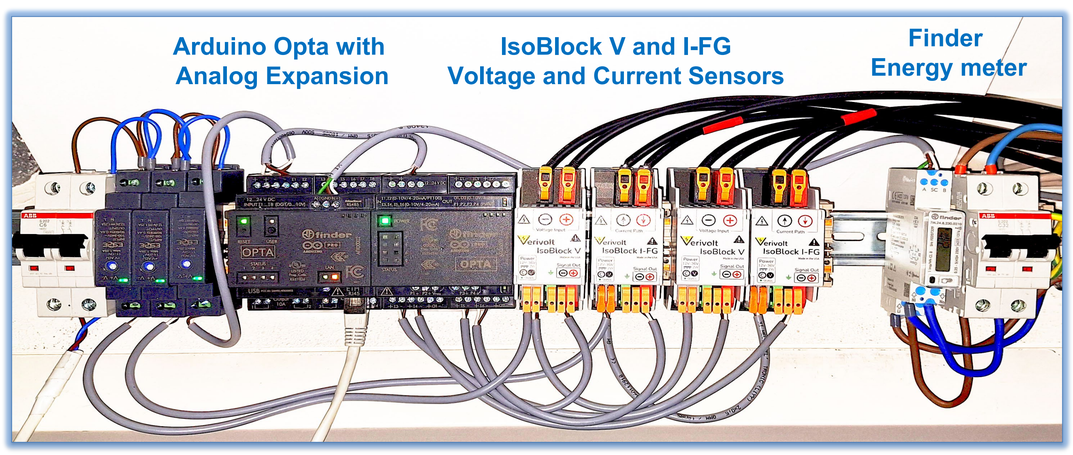
The National Institute for Research and Development in Electrical Engineering, ***ICPE-CA Bucharest***, is developing applied research activities across the entire energy value chain from production up to efficient consumption.
ICPE-CA expertise and infrastructure supports a wide range of RES applications, products, services and technical consultancy regarding:

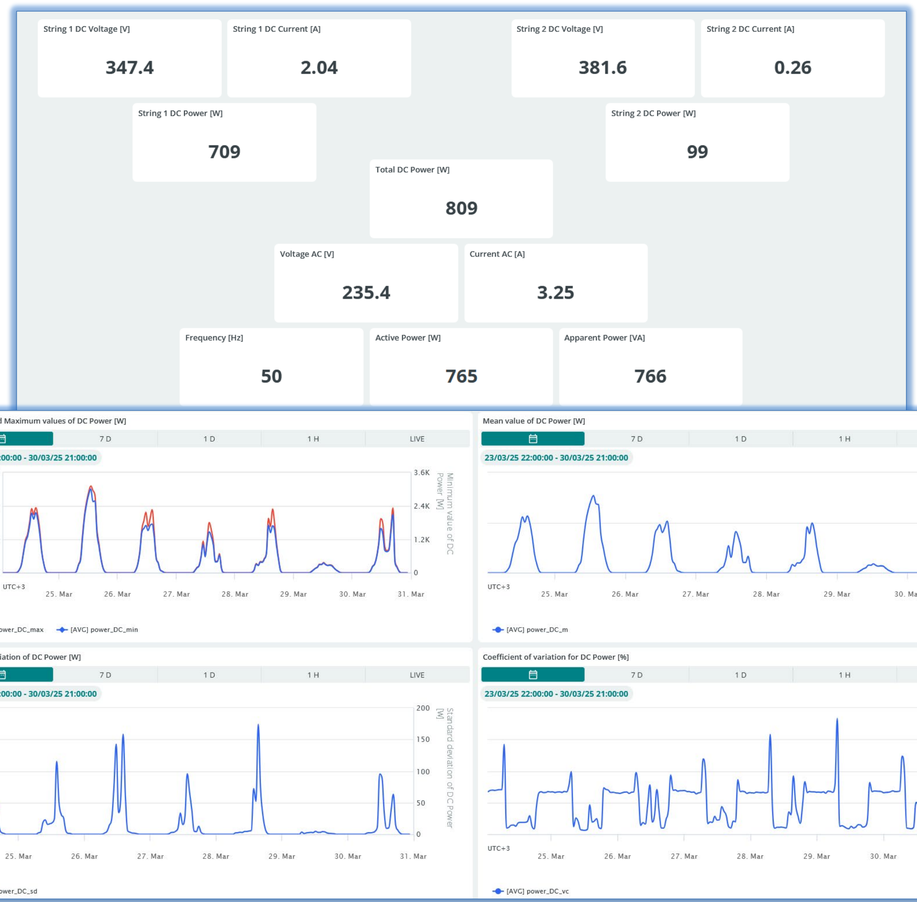
- BIPV,
- Certified PV systems lab & on-site testing,
- Smart Grids,
- Solar, wind & hydropower, biomass & biogas,
- O&M,
- Biodiversity and environment protection.

ICPE-CA has a good expertise in implementing applied R&D and strategy-based projects.

Digital Twin





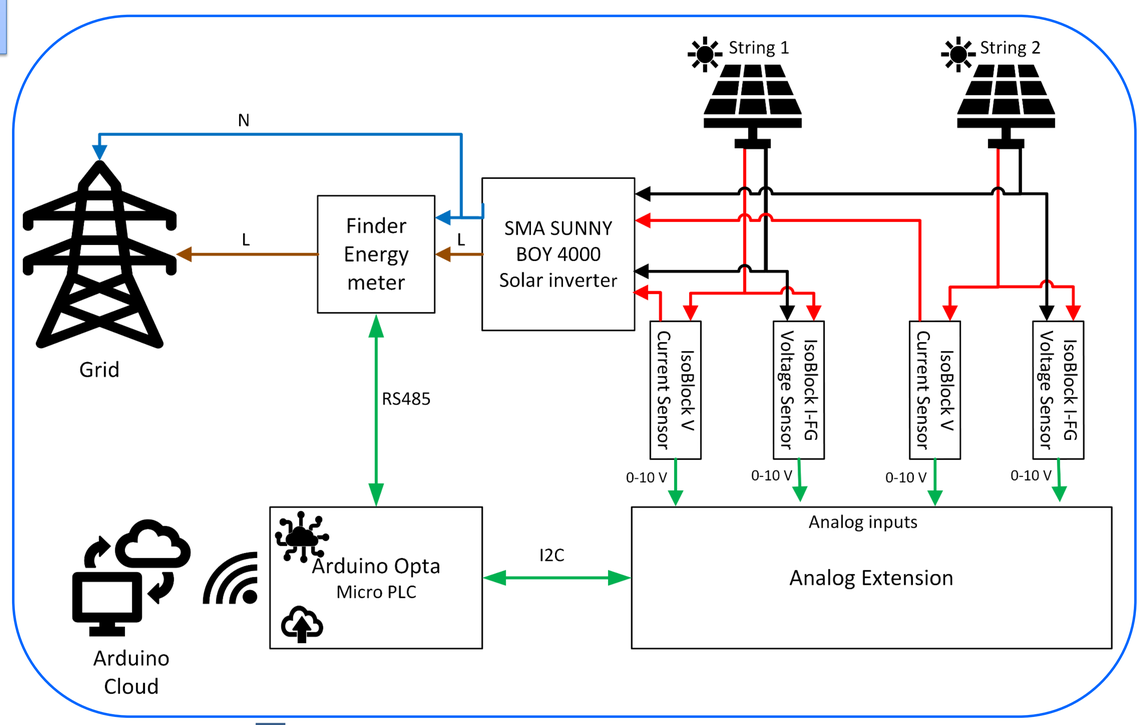


Relevant Data Analytics Indices for DC Power

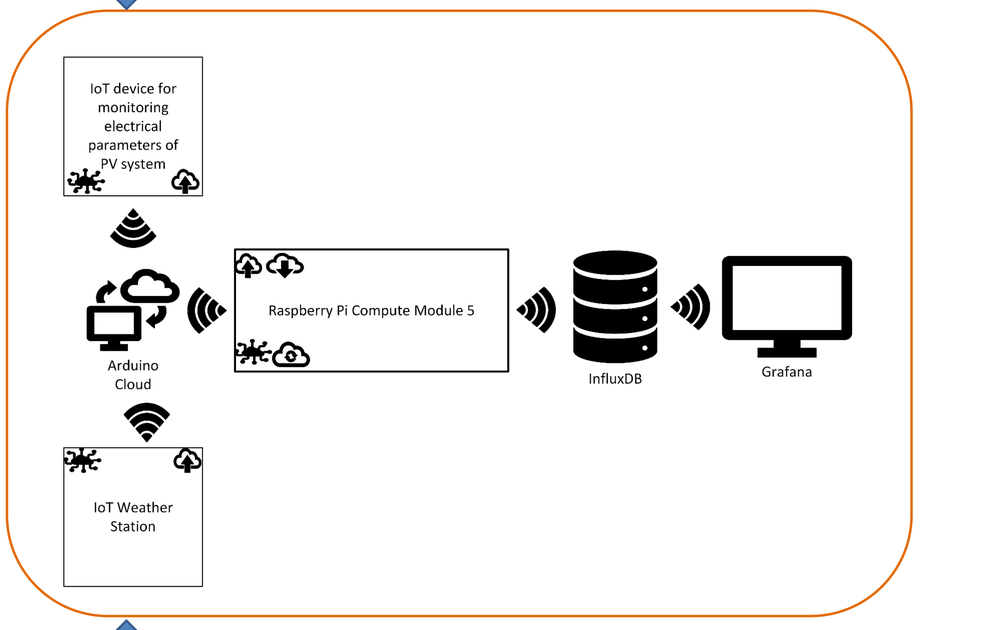
INFUSE Project

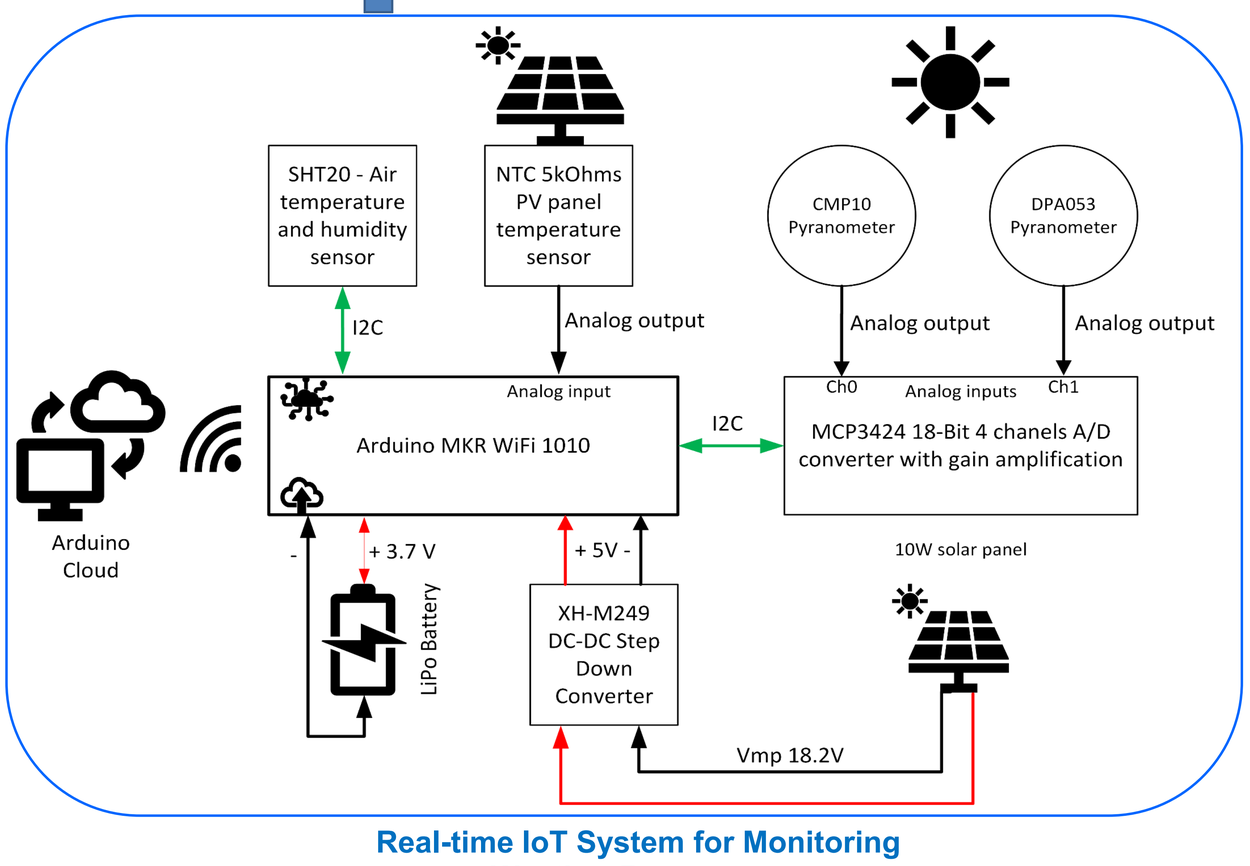
INFUSE overarching goal is achieving **an optimal energy transfer in emerging, inertialess grids, with high share of renewable energy sources.**

In the frame of INFUSE, ICPE-CA has developed the subsystems and the related interface necessary to implement a digital twin for a photovoltaic system. Based on the Arduino Cloud online software platform, the data exchange structure for measurement information was also defined.



Real-time IoT System for Monitoring the PV Electrical Parameters





Real-time IoT System for Monitoring Weather Parameters

Funding: This work was supported by the Ministry of Research, Innovation and Digitization, CCCDI–UEFISCDI, project no. 61/2024 INFUSE (Information Fusion of Multi-Vector Real-Time Data Streams for Energy Management in Emerging Power Grids).