

PROJECT

## MULTIECS

### MULTIvariable Environmental Control System

**Funding:** European (Horizon 2020)

**Duration:** Sep 2017 - Jun 2021

**Status:** Complete

**Total project cost:** €490,250

**EU contribution:** €490,250



**Call for proposal:** H2020-CS2-CFP04-2016-02

[CORDIS RCN : 211041](#)

#### Objectives:

The goal of this project is the development of a Multivariable Control System (MCS) by means of extended linearization techniques, based on a control-oriented thermodynamical modelling for the electric air conditioning pack. The focus will be on developing real-time capable low-order models. In a second step, these models will be calibrated using test results from the Topic Manager.

The subsequent MCS design will be performed in the Matlab/Simulink environment, in order to guarantee compatibility with the Topic Manager certification standards and processes. After successful simulation of the MCS implementation in Matlab/Simulink, an experimental validation of the MCS is aimed at the Topic Manager's facilities. The different objectives of the MULTIECS project are itemized as follows:

- Derivation of symbolic control-oriented models for the electrical air-conditioning.
- Efficient parameter identification of the nonlinear dynamic models to be used in the MCS design, aiming for a small number of necessary test cases.
- Development of the multivariable optimal control structure in the Matlab/Simulink taking advantage of the extended linearisation techniques, especially the SDRE design.
- Assessment by simulations and experimental validation of the multivariable control system.

#### Parent Programmes:

[H2020-EU.3.4. - Horizon 2020: Smart, Green and Integrated Transport](#)

**Institute type:** Public institution

**Institute name:** European Commission

**Funding type:** Public (EU)

#### Lead Organisation:

**Universitat Politecnica De Catalunya**

**Address:**

Calle Jordi Girona 31  
8034 Barcelona  
Spain

**Organisation Website:**

<http://www.upc.edu>

**EU Contribution:** €213,125

#### Partner Organisations:

**Universitaet Rostock**

**Address:**

Universitaetsplatz 1  
18051 Rostock  
Germany

**Organisation Website:**

<http://www.uni-rostock.de>

**EU Contribution:** €277,125

**Technologies:**

Unclassified  
Non-technology

**Development phase:** Research/Invention

**STRIA Roadmaps:** Vehicle design and manufacturing

**Transport mode:** Road transport

**Transport sectors:** Passenger transport, Freight transport

**Transport policies:** Other specified

**Geo-spatial type:** Other