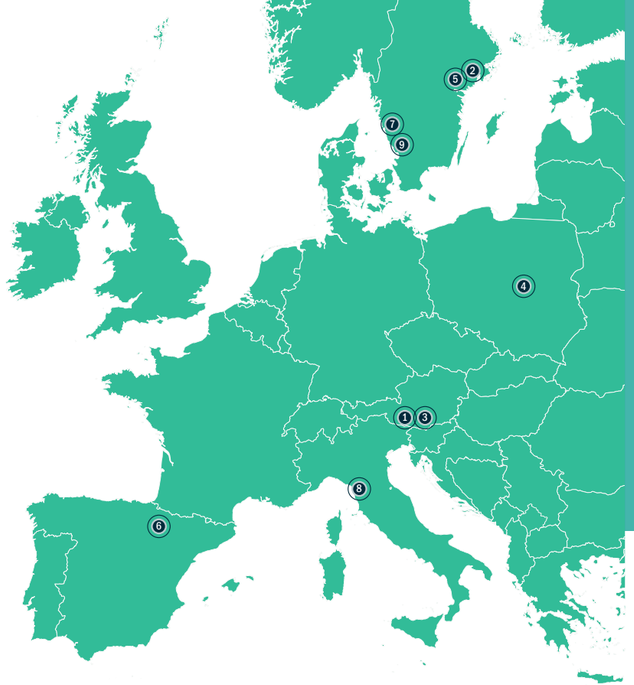
Partners



1 TECHNIKON
Technikon Forschungs- und Planungsgesellschaft mbH
Austria [Villach]

2 KTH VETENSKAP OCH KONST
KTH Royal Institute of Technology
Sweden [Stockholm]

3 infineon
Infineon Technologies Austria AG
Austria [Villach]

4 VIGO PHOTONICS
VIGO Photonics S.A.
Poland [Warsaw]

5 veoneer
Veoneer Sweden AB
Sweden [Stockholm]

6 ANTERAL
Anteral SL
Spain [Pamplona]

7 CHALMERS UNIVERSITY OF TECHNOLOGY
Chalmers University of Technology
Sweden [Gothenburg]

8 ERICSSON
ERICSSON Telecomunicazioni SPA
Italy [Pisa]

9 ERICSSON
ERICSSON AB
Sweden [Gothenburg]

Facts

Budget

€ 3.9 Million
100% EU-funded

Consortium

9 Partners
5 countries

Duration

39 Months
01/2019 - 03/2022

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Car2TERA

Eyes and Ears for the Car of the Future

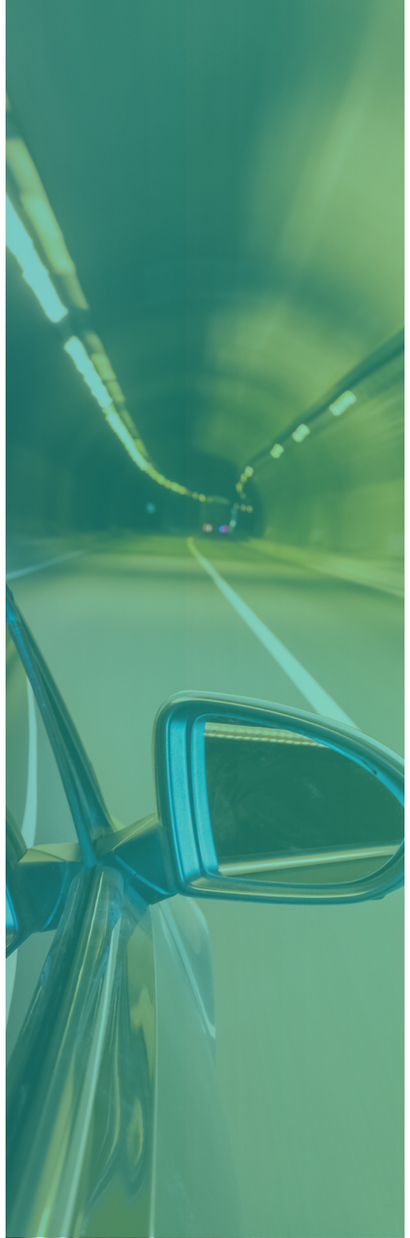
Terahertz sensors and networks for next generation smart automotive electronic systems

The Car2TERA project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 824962.

Car2TERA

About

Occupant safety and the increasing appeal of autonomous automobiles are the driving forces behind the growing need for smart electronic systems in modern cars.
The Car2TERA project will focus on two areas of research and development: in-cabin radar and onboard data communications. The project will exploit the benefits of sub-terahertz (150-330 GHz) communication.
Car2TERA project partners will build a prototype radar for testing. Additionally, the Car2TERA partners will develop nascent methods of data communication using plastic fibre. These communications will be necessary in the near future to facilitate 5G and the IoT.
These short-distance, high data-rate technologies will be demonstrated by project end to illustrate their capabilities. Car2TERA will implement Technology Readiness Level 4 in both demonstrators.



Vision

When it comes to the engineering and manufacturing of car radars, Europe has more than 79% of the current market share. Furthermore, European semiconductor manufacturers hold a 90% market share on SiGe car radar chipsets.
Car2TERA will fortify European influence in the global smart electronic sensor systems market by exploiting frequency spectrum for new and emerging applications. The proposed short-range, sub-THz frequency radar technology will facilitate applications such as in-cabin sensing and improvements in outdoor sensing including road condition monitoring.
These developments will aid assisted and automated driving while ensuring road safety.

Motivation

Advanced sensor systems and sensor fusion are the key components in the safe progression from Advanced Driver Assistance Systems (ADAS) to fully automated vehicles.
Radar is a key sensing technology for advanced driver assistance systems and automated vehicles due to its strong detection capability, long range, and resilience to drastic environmental conditions such as inclement weather and lighting extremes.
Currently, automotive radar sensors operate in the 24 GHz and 77 GHz bands in FMCW mode, and cannot meet the complex challenges for safe driving of automated vehicles and mobile robots.
The sub-THz frequency spectrum (150 - 330 GHz) is perfectly suited for this kind of radar communication, however, the micro devices that transmit, receive and network at that range are still being developed.

Mission & Objectives

1) Develop emerging sub-THz (150-330 GHz) smart electronic systems based on the latest semiconductor, microsystem and nanoelectronics technologies

2) Implement TRL-4 (Technology Readiness Level) demonstrators in two high potential application scenarios:

a) a new class of compact, high-resolution, electronic-beam-steering short-range car radar sensors, with the primary application being in-cabin passenger monitoring for individually and real-time adjusted crash mitigation measures

b) Short range, high data-rate THz-over-plastic wired links for telecommunication radio-access networks facilitating the mobile data growth demanded by 5G and beyond

New technologies used

- **Polymer Microwave Fibre (PMF)**
- **600-GHz-fmax SiGe MMICs**
- **Silicon micromachining for system integration, packaging and phased-array antenna front-end**
- **Integrated MEMS reconfigurability**
- **Large-bandwidth, high-linearity graphene MMICs**
- **Advanced signal processing: OFDM radar signals and AI sensor fusion**