

## What are examples of when ASCENT+ could help SMEs, from a technical point a view?

Below are a few examples but, of course, we cannot be exhaustive as each project has its specificities;

You sell electronic systems, electronic cards or components and you receive recurrent customer complaints due to some component failures. You've tried everything to understand the origin of the issues: misuse, overload, ESD, but you still cannot figure it out: **you should contact ASCENT+ and access to the largest European experts' community to solve your issue!**

You are an innovative SME or a startup with on-going or planned development of a novel device or optoelectronic component, but:

- One of the process steps has a low yield and you cannot figure out why, so you live with it, although it affects your profitability: **you should contact the ASCENT+ team!**

- One of the materials you use is rare, expensive, or not optimized for your application and you would like to try another material, but you cannot make this switch in an industrial foundry until you can prove the new material can do the job and not jeopardize some other aspect of the performance in your device: **you should contact the ASCENT+ team and access to the largest set of pre-industrial tools available for your demo!**

- You need to start working on your next generation device and you would like to explore how advanced simulation can help you reduce the number of iterations in your prototyping plan: **you should contact the ASCENT+ team!**

- You are looking for very specific equipment or a technique to process or characterize your device: **you should contact ASCENT+, as there is a big chance we have it somewhere within our distributed infrastructure.**

- You noticed some peculiar behaviour when testing your device and although this is not a deal-breaker for you: **you would like to understand the physical origin of this behavior you should contact the ASCENT+ team.**



### For further information contact

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<https://www.ascent.network>



**ascent+**  
European Nanoelectronics Access

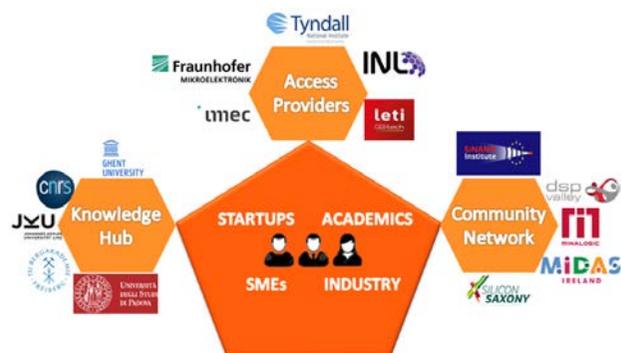


opens the doors  
to the world's most  
advanced  
nanoelectronics  
infrastructures in Europe



## WHY ASCENT+ FOR SMES

The ASCENT+ network reflects very advanced research, led by World leading Research and Technology Organizations (IMEC, LETI, Fraunhofer, INL, Tyndall) and highly ranked universities (Univ. Ghent, JKU Linz, CNRS, Univ Padova, Univ. Freiberg). The programme aim is to open this network to you, FREE-OF-CHARGE, to use the institutions' infrastructure and technical expertise. Now, with ASCENT+, it is your opportunity as an SME, to benefit from the programme and leverage the strength of our European microelectronics infrastructure and scientific community!



If you (SME) have never worked with one of our Research and Technology Organisations (RTOs), you might wonder:

**How could this engagement benefit your company?**

The purpose of this booklet is to illustrate what you can expect from the ASCENT+ team and how you can use our advanced set of competences in nanoelectronics, as a competitive advantage for your business.



## Why should you contact the ASCENT+ Team?

### If you have never worked with RTOs before:

In many Markets, innovation is key to differentiate your product or service offer, and grow your business. Innovation clusters like DSP Valley, Midas Ireland, Minalogic, and Silicon Saxony, see that some startups and SMEs are adept at leveraging academic and RTO support to stay ahead of their competitors. However, this is usually a small subset of our members and Ascent+ is an opportunity to bring the opportunity to more companies. In a way, jumping head-first into collaboration with leading edge experts and infrastructure to back you up, especially if you have not done it before, can be intimidating. Ascent+ is an opportunity to have a “test drive” with an RTO. Learning how you can work with experts, and get the most out of it, requires some practice. Ascent+ will give you this opportunity, at a small scale initially and in a safe environment, through their enrollment and project management process.

### If you already worked with an RTO:

In this case, you should discuss with your R&D Partner if partnering with one of the transnational ASCENT+ partners could help you execute your joint R&D programme or be an opportunity to explore some new design or process. Even though each partner has many capabilities, there might be a unique piece of equipment or a unique competency that your current partner does not have that you could access, free-of-charge, through our transnational access programme.

Regardless of your situation, the ASCENT+ team will ensure that:

- You get the best partners for the work to be done for your company
- You understand RTO's ways of working and constraints
- You preserve your confidentiality and background IP
- You do not pay any fees for initial experimentations



Enrollment in ASCENT+ and project submission is possible through the website <https://www.ascent.network/contact/enquiryform/>

The overall enrollment process



The ASCENT+ team aims to respond quickly to your needs. The overall selection process, from inquiry to selection and “go/no go” should not exceed 4 weeks and you will be assisted all along the process by our management team that will put you in contact with our experts, to help you formulate your needs.



## How is my IP protected when I collaborate with a major Research organization, whose priority is to file patents by the hundreds every year?

The IP relation between the ASCENT+ facility and the User (in this case the SME) is regulated by a Memorandum of Understanding (MoU) or of Agreement (MoA) between the two parties. This has to be sorted after a TA proposal is approved but before the work actually starts.

Typical clause: "Both the ASCENT+ facility and the User shall retain sole ownership of their own background Intellectual Property (IP). Results arising from an ASCENT+ TA project will be the property of the User except in cases where the parties collaborate to jointly develop new IP. In such cases, the new IP will be governed by separate co-ownership agreements.

**Any confidential or proprietary information exchanged between the parties shall be governed by a Non-Disclosure Agreement."**



## Discover how the programme can work through the example of other SME

**TE-OX** aims at manufacturing novel optically-controlled microwave switches and related devices (phase shifters and reflect arrays) by integrating VO<sub>2</sub> thin films in coplanar lines taking benefit of the Metal-Insulator phase transition (MIT).

TE-OX has designed new architectures in order to decrease the switching-time down to the ns and sub-ns scales by triggering the transition respectively by an electrical field or optical absorption. In both cases, one needs to optimize the VO<sub>2</sub> thickness and, consequently, optimize the geometrical parameters of the coplanar lines. Therefore, the main goal of the project was to investigate the switching time of thermally induced VO<sub>2</sub>-based RF switches. The RF-devices fabricated on VO<sub>2</sub> thin films of different thicknesses were measured on VNA up to 40GHz at different temperatures (RT to 80°C and back to 50°C). To further gain insights of the VO<sub>2</sub> transition in these devices, Raman characterisations and SEM observations were performed.

Access provided by ASCENT+: Electrical, physical and optical characterisation (microwave S-parameters measurements up to 40GHz and 80°C, SEM and Raman Spectroscopy) at Tyndall.

This project has demonstrated the high performances (insertion losses <1 dB, isolation > 30 dB) of these Phase-Transition based switches over a 40 GHz bandwidth. Following these results TE-OX is going on with the development of electrically (E-field) and optically controlled Phase-Transition switches in the objective to lower the switching time down to the picosecond level, a breakthrough in signal processing and thus opening a new market in all the fields of communications.

**EOLAS Designs** develops software tools for designing state-of-the-art transistors for memory and logic applications.

EOLAS products aim to bridge the gap between computationally intensive atomistic simulations and circuit-level models. EOLAS develops physics-based simulators to describe the operation of nanoscale devices by employing quantum-mechanical models that enable quantitative prediction of electrical characteristics at a modest computational cost.

ASCENT+ has enabled calibration of our models to experiments by providing temperature-resolved electrical characterisation data for sub-10 nm nanowire transistors. The ASCENT+ programme and the assistance provided by its supportive staff enabled EOLAS to enhance the quality of our products by allowing access to world-class facilities otherwise unavailable for a small enterprise.

**EOLAS DESIGNS**

**EOLAS IS KNOWLEDGE**



**TE-OX**

