

M3NIR

M E N I R

The development of advanced mid-infrared laser-based multi-sensing systems has started under the M3NIR project.

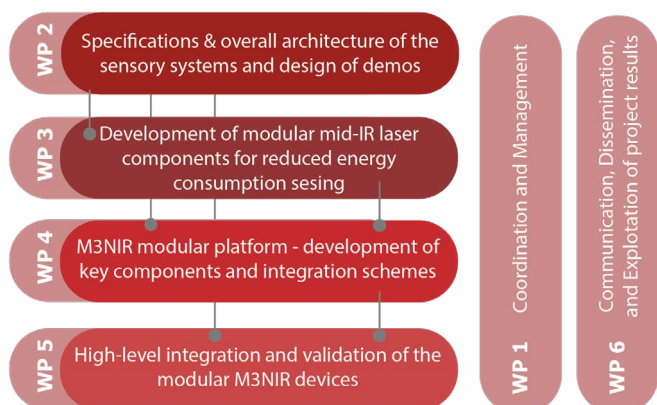
M3NIR (Integrated, Modular, Multisensing, Mid- and Near- IR sensing platform) project with the aim to develop innovative photonics-based sensing approaches has started on 1st of January 2023. The international consortium of 13 partners from all over Europe plans to boost significantly sensing technology in terms of performance, reduction of footprint, energy consumption and costs. The project is being implemented within the framework of the European Union's Horizon Europe research and innovation program¹.

The value chain to be implemented by the M3NIR project includes the optimization of the manufacturing approaches of mid-infrared photonic devices, the development of relevant electronics and the high-level integration of other components like microfluidics for the realization of high-performance sensors for environmental, industrial, and medical applications. With the extra focus towards miniaturized configuration, robustness, maintenance-free operation, low power consumption and cost-effective sensing, M3NIR aims to create a modular, highly adaptable and efficient multi-sensing platform, which will be validated in the domains of environmental monitoring and healthcare. The project will make use of novel schemes for component integration and packaging, enabling both scientific and industrial breakthroughs.

M3NIR project based multi-sensing technological platform will allow measuring a wide range of chemicals, in the liquid and gas phase. It will introduce novel sensor approaches and much wider application for the monitoring of greenhouse gas and other - sulphur oxides (SOx) and nitrogen oxides (NOx), methane (CH₄) and carbon monoxide (CO), carbon dioxide (CO₂), as well as particulate matter (PM) - emissions, detection of phosphates and nitrates in water and breath analysis for health and well-being related applications. The vision for the technology is to fully exploit mid-infrared integrated photonic circuits to achieve a degree of miniaturization and lightweight enabling the incorporation of sensors into a wider range of devices (e.g. drones).

M3NIR project objectives and goals are structured around 6 Work Packages. Project duration is scheduled for 42 months.

While M3NIR aims at developing a core photonics technology, its application and market orientation, the vast experience of partners from Belgium, Austria, Germany, Greece, Spain, Czechia, Cyprus, Lithuania and Switzerland and their expertise in the individual fields will be capitalized. The M3NIR consortium is led by IMEC.



¹Horizon Europe is the EU's Framework Programme for Research and Innovation and a global reference for transforming R&I results into scientific, economic and societal value. You can find more about HE here: [Horizon Europe](https://europea.eu) (europea.eu)

Project partners:

- ✓ INTERUNIVERSITAIR MICRO-ELECTRONICA CENTRUM (IMEC), Belgium,
- ✓ ETHNIKO KAI KAPODISTRIAKO PANEPISTIMIO ATHINON (NKUA), Greece,
- ✓ VLC PHOTONICS SL (VLC), Spain,
- ✓ MICROFLUIDIC CHIPSHOP GMBH (CHIPSH), Germany,
- ✓ TECHNISCHE UNIVERSITAET WIEN (TUW), Austria,
- ✓ ARGOTECH AS (ARGO), Czechia,
- ✓ EULAMBIA ADVANCED TECHNOLOGIES MONOPROSOPI ETAIRIA PERIORISMENIS EFTHINIS (EUL), Greece,
- ✓ UNIVERSITAET ULM (UULM), Germany,
- ✓ S CAN GMBH (S CAN), Austria,
- ✓ ALTUS LSA COMMERCIAL AND MANUFACTURING SA (ALTUS), Greece,
- ✓ UAB METIS BALTIC (METIS), Lithuania,
- ✓ CY.R.I.C CYPRUS RESEARCH AND INNOVATION CENTER LTD (CyRIC), Cyprus,
- ✓ ALPES LASERS SA, Switzerland.

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The project has received funding from the European Union under Grant Agreement No. 1011093008