



KEY FACTS

Acronym: IMOCO4.E

Full name: Intelligent Motion Control under Industry4.E

Coordinating institution: Sioux Technologies B.V.

Project coordinator: Arend-Jan Beltman

GA No.: 101007311 - H2020-ECSEL-2020-2-RIA

Start date: 1st September 2021

Duration: 36 months

Consortium: 46 Partners from 13 countries

This issue provides a grasp of the main project developments during *September 2023 - November 2023*. It also provides facts on the results achieved, as well as links to the latest dissemination activities.

The IMOCO4.E consortium made significant progress during the reference period, showcasing promising results at the three-day M24 hybrid meeting in Brno (September 5-7th, 2023). Beyond presenting technical advancements in Pilots, Demonstrators, and Use Cases, partners dived into the implementation and progress of technical videos. The 2nd IMOCO4.E review meeting provided a platform for further engagement, featuring WP presentations alongside video and live demonstrations. Additionally, video presentations and posters offered detailed progress reports, developments, and results for each IMOCO4.E Building Block.

IMOCO4.E Highlights

WHAT HAS BEEN DONE?

WP3

WP3 partners have advanced the development of perception and instrumentation solutions, including sensors, data processing platforms, AI modules, and servo drives. Concurrently, as validation activities progress in a parallel

work package, these developments are being refined based on test results from the entire solution or its individual components. Notably, some developments were showcased live to the project's reviewers and other partners during the review and consortium meeting in Eindhoven. This meeting also marked the premiere of building block videos, with WP3 videos for BB1, BB2, BB3, and BB7 being finalized and displayed.

Currently, the solutions are nearing completion, with their readiness being quite high. These advancements will be comprehensively documented in the final deliverable of WP3, which is scheduled for completion in the upcoming period. This deliverable, intended for public release, will include detailed descriptions of all solutions developed within the work package.

ToC

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What has been done

WP4 is performing its last steps. After covering the development stage of the solutions of the Building Blocks directly connected to the WP (BB4, 5 and 10), involved partners are working in their implementation and validation results. BB4 provides solutions dealing with Artificial Vision and Artificial Intelligence workload control platforms, developed in Task 4.6, enhancing applications like a multi-rate sensor fusion for high-precision positioning systems being successfully implemented in IMOC04.E Pilot 2. In BB5, a very wide range of control algorithms have been made available, covering decentralized approaches (Task 4.3), as well as MIMO and data-based strategies (Task 4.4). The application of these solutions have shown improvements in industrial robot (Use Case 2) accuracy or lift (Use Case 1) comfort, for example. Finally, BB10 deals with path planning, route optimization, and decision making (collision avoidance) solutions of mobile robots, developed within Task 4.5. Developed technologies are being implemented in three different applications to improve performance and safety in robotic boom applications (Pilot 5) through collision free path planning and visual servoing, enhance safe movements of healthcare robotics (Pilot 4) using non-linear Model predictive Control, and optimize autonomous intra-logistic transportation using multiple AGVs (Demo 3) combining radar based path planning and decision making with fleet level coordination. Partners are currently focused in reporting and documentation activities, and collaborating with use case owners for the final implementation and verification stages within WP6 and WP7.

WP4

WP5

The beginning of this three-month period was about the preparation for the review meeting in Eindhoven. WP5 has prepared three videos and posters representing the results provided in building blocks BB6, BB8, and BB9 and the overall WP5 presentation. Remarkable results from WP5 were demonstrated as already integrated pieces of pilots, use cases, and demos in accompanying videos and during the tour in Nexperia. After the review, partners returned to work to finalize their results and started preparing the deliverable D5.8, which should conclude this work package.

During the recent project period, WP6 has been leading the development of the IMOC04.E framework for exploitation. This involves primarily employing methodologies and toolchains to carefully select and customize building blocks for future applications. We've fostered close collaboration with WP3, WP4, and WP5 to ensure the effective management of the content in our final project deliverables. Additionally, we are currently progressing through the final stages of verification and validation procedures, applied to each software/hardware component and cluster. Furthermore, under the umbrella of WP6, we are finalizing research work on four project use cases. WP6 also continuously monitors critical technological project risks to ensure smooth progress and success.

WP6

WP7

A high light for WP7 was the review meeting at Eindhoven in November. All the pilots and demonstrators showed the status. Many partners had made a video about the work done and their intermediate results and conclusions. These videos were shown during the review meeting. Before the review meeting the applicable due deliverables were made, reviewed and submitted. For every pilot and demonstrator there was a report requested wherein the status was described. Submission of these deliverables was done 2 weeks before the review meeting. After the review meeting, the partners continued working together and the first discussions were there about the final deliverables, due at the end of the project.

Dissemination & Communication

IMOC04.E values the importance of networking, exchanging ideas and knowledge with other similar EU projects. The consortium has managed to generate discussions with H2020 TIBCO, METIS, MADEin4, REBECCA and EdgeAI aiming at the co-organization of special sessions as well as boosting joint dissemination activities.

Liaison activities are in progress

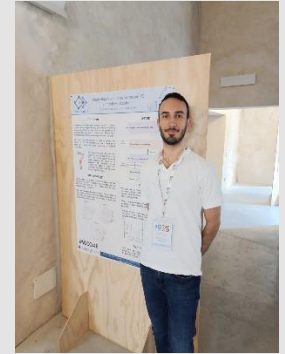
During the past 3 months and in the context of WP8 activities, IMOC04.E participated in the several events, such as:



IMOC04.E project attended SEMICON Taiwan during September 6th – 8th 2023. (Representative partners: SEMI).
More details [here](#)



IMOC04.E project participated to the ETFA 2023 conference in Sinaia, Romania during September 12th – 15th 2023. (Representative partners: ITEC, TU/e, UWB, Siemens, WEG, UNISS, Tekniker).
More details [here](#)



IMOC04.E project at CPS summer school (Representative partners: UGR, UNISS).
More details [here](#)

IMOC04.E project participated to the MEMS & Imaging Sensors Summit 2023 on 21st of August in Grenoble, France. (Representative partners: SEMI).
More details [here](#)



IMOC04.E partner, INL, attended EUROSENSORS Conference in Lecce, Italy during September 10th – 13th 2023. (Representative partners: INL).
More details [here](#)



IMOC04.E partners participated in the DSPE 2023 Conference on precision mechatronics during September 26th – 27th 2023. (Representative partners: Sioux, TU/e).
More details [here](#)

IMOC04.E project participated to the EQTC 2023 event during October 16th– 20th 2023 in Hanover, Germany. (Representative partners: Safran).
More details [here](#)



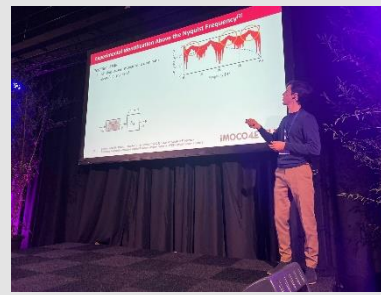
IMOC04.E partners attended EEAI 2023 conference during October 17th – 19th 2023. (Representative partners: ITML, GNT).
More details [here](#)





IMOC04.E project at the EU Digital Future Forum webinar on 6th of November 2023. (Representative partners: SEMI, DTT, TU/e). More details [here](#)

IMOC04.E project attended SEMICON Europa 2023 in Munich during November 14th -17th 2023. (Representative partners: SEMI, DTT). More details [here](#)



IMOC04.E project attended Chips for Europe event during November 30th - December 1st, 2023. (Representative partners: Sioux, UWB, ITML, ITEC, EDI, DTT, Spinverse). More details [here](#)

IMOC04.E project at the Analog Devices European Technical Conference (ADI ETC '23) (Representative partners: ADI). More details [here](#)



IMOC04.E partner, TU/e, participated in the Precision Fair 2023 in Den Bosch, the Netherlands during November 15th -16th 2023. (Representative partners: TU/e). More details [here](#)



IMOC04.E partner, UGR, participated to the European Researchers' Night (Representative partners: UGR). More details [here](#)

Consortium/Review Meetings, Submitted Deliverables & Upcoming Events

During the reference period, the partners intensively disseminated the project results by spreading knowledge and creating good networking opportunities with industrial and scientific peers. The IMOC04.E partners have focused to widen up the network of scientific experts of the project and transferred valuable scientific results by participating in multiple online and physical conferences and workshops. Visibility of the project and transferability of the project outcomes has been promoted through the update of the [promotional material](#) and by regular dissemination to the public through social media channels.

Prerecorded videos
Coming Soon!!

Although the outreach activities continue with weekly posts on social media platforms (LinkedIn and Twitter), the IMOC04.E team plans to increase knowledge and visibility of the project by raising awareness of the benefits of the IMOC04.E platform on specific use cases and demonstrators via prerecorded videos!

IMOC04.E interim (M24) meeting in Brno has been successfully completed!



The three-day IMOC04.E M24 hybrid meeting took place in Brno on September 5-7th, 2023. The meeting slots were dedicated to the IMOC04.E Pilots, Demonstrators and Use cases and the overall scope of this meeting focused on the presentation of the technical progress of these project results. Besides the presentation of the actual achievements, IMOC04.E partners also discussed the implementation and the preparation progress of the IMOC04.E Building Blocks and Use Cases technical videos. The final IMOC04.E technical videos are expected to be ready and published within the following months.

IMOC04.E 2nd Review Meeting has been successfully completed on Nov 9th, 2023



The Review Meeting, hosted by SIOUX and ITEC, took part in Eindhoven and Nijmegen! It started with a short pitch of the IMOC04.E coordinator, Arend-Jan Beltman. Then, the IMOC04.E WP leaders presented extensively the technical progress that has been carried out so far as well as their short-term plans preparing the upcoming work and deliverables.

During the 2nd IMOCO4.E review meeting, along with the WP presentations, many videos and live demonstrations were introduced to the reviewers and the EU project officer. They had the opportunity to observe live demonstrations and videos of the Pilots, Demonstrations, and Use Cases that had been specifically set up for the meeting. They were also briefed on the progress, developments, and results of each IMOCO4.E Building Block through video presentations and posters.

In addition, all participants were given a guided tour of ITEC's premises, where they were able to experience more IMOCO4.E live demonstrations and learn about the project's achievements.

The Review meeting ended up smoothly with positive feedback from the reviewers!



IMOCO4.E Consortium will meet again in M34 Consortium meeting in Athens during 18-19 June 2024.

Submitted Deliverables

- D4.7 - "Report on Appropriate XIL toolchain for optimized design of motion control algorithms"
- D6.4 - "Validation reports (first iteration)"
- D6.5 - "Evaluation and test reports (first iteration)"
- D7.13 - "Demo 1: integration and validation report (initial version)"
- D7.14 - "Demo 2: integration and validation report (initial version)"
- D7.15 - "Demo 3: integration and validation report (initial version)"
- D7.16 - "Demo 4: integration and validation report (initial version)"
- D7.3 - "Pilot 1: integration and validation report (initial version)"
- D7.4 - "Pilot 2: integration and validation report (initial version)"
- D7.5 - "Pilot 3: integration and validation report (initial version)"
- D7.6 - "Pilot 4: integration and validation report (initial version)"
- D7.7 - "Pilot 5: integration and validation report (initial version)"
- D8.2 - "Stakeholders' engagement, exploitation and standardization activities (initial version)"

Upcoming Events

In addition, IMOCO4.E partners plan to participate in:

- MECSPE, 6-8 Mar 2024, Bologna, Italy - [Event Link](#)
- Industry Strategy Symposium, 6-8 Mar 2024, Vienna, Italy - [Event Link](#)
- 3D & Systems Summit, 12-14 June 2024, Dresden, Germany - [Event Link](#)

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