

# DISSEMINATION PLAN

MORAL  
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## Abstract

This document presents the dissemination plan of the MORAL project. It should serve as a guideline to the project partners for organization and implementation of dissemination activities, presentations of the project on conferences, seminars, symposia, industrial fairs and events. Publication plan is also given. Strategy for the use of contemporary presentation methods (e.g., social networks, websites) as well as communication methods is also presented.

<sup>1</sup> Dissemination level: **PU** = Public; **PP** = Restricted to other programme participants (including the Commission Services); **RE** = Restricted to a group specified by the consortium (including the Commission Services); **CO** = Confidential, only for members of the consortium (including the Commission Services).

<sup>2</sup> Nature of deliverable: **R** = Report; **P** = Prototype; **D** = Demonstrator; **O** = Other

## Document Authors

ENTITY	CONTRIBUTORS
IHP	Simevski, Aleksandar

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Dissemination Plan  
MORAL



## Executive Summary

This document gives an overview of the most relevant aspects of the dissemination activities, methods and plans of the MORAL project. The objectives are the following.

- Dissemination of information about the MORAL project to a wide range of relevant stakeholders and to the public
- Development of a website that provides open access to the results achieved within the project
- Organisation of a workshop targeting interaction with end-users, academia and industry.
- Publications of achievements and lessons learnt through conferences, international press and peer-reviewed journals (at least two publications per project year, and at least two open access publications via the green way).
- Exploitation of the project results

# 1 Introduction

The dissemination plan presented in this document is a significant asset for the collaborative processes of the partners within the project duration. The goal is to provide dissemination of project results by the industry, the end-user communities, the research communities, as well as other interested audience and parties. The partners of the MORAL project are presented in Table 2.

Participants	Participant Organization Name	Acronym	Country
1 (Coordinator)	IHP GmbH	IHP	Germany
2	RedCat Devices SRL	RCD	Italy
3	SYSGO GmbH	SYSGO	Germany
4	Thales Alenia Space España SA	TAS-E	Spain
5	AbsInt Angewandte Informatik GmbH	ABSINT	Germany

**Table 2: MORAL Project Partners**

The two main objectives of the MORAL project are the following.

- To develop a completely European, International Traffic in Arms Regulations (ITAR) free, high performance, 32-bit microcontroller for space applications. The processor core is based on a novel PEAKTOP architecture, including novel, European instruction set. Besides the processor, the required ITAR-free middleware, Real-Time Separation Kernel (RTSK) and software toolchain will also be available. Achievement of Technology Readiness Level (TRL) 6 is planned.
- To establish a new European company held by the two core partners involved in this project, which will target the European market, but also Russia, India, China and Latin America. This new company, as the last stage of the evolution of the project, will sell the microcontroller chip and its accompanying software, and give support to the market. It will be focused to produce a microcontroller that can bootstrap the European market for space applications. In particular, it targets the fast growing small satellite market.

Recently, low-cost small satellites came in the focus. Space agencies have demonstrated their potential for scientific research and practical applications in the fields of Earth Observation, Science Mission, Human Spaceflight, Space Transportation, Telecommunications, Navigation, Space Security, Robotic Exploration, Unmanned Aircraft Systems (UAS), Defense Applications, etc. The availability of low-cost small satellites is an important issue for various scientific and commercial projects. The recognized potential how they could revolutionize space science, experimentation and operational use, empowers small satellites to be part of a strong business future in space applications. In such a scenario with exponential growth, we can observe that today's small satellites are mainly powered by traditional electronics, increasing new capabilities, but reducing the reliability of such systems compared to traditional missions.

As said, the MORAL project is set to overcome the lack of export-free, rad-hard microcontroller for space applications with unrestricted European access at reduced costs, in order to make a strong impact on the capabilities and reliability in space, focused mainly on small satellites. Moreover, this work further applies to aerospace, e.g., Unmanned Aircraft Systems (UAS), and earth application requirements with high dependability level, in a growing and demanding market. Predictions for 2025-2030 indicate that small satellites will generate a huge market where the proposed microcontroller is intended to apply for a privileged position bringing high system interconnection capabilities and radiation hardness for the emerging requirements of future satellite technologies.



## 2 Dissemination Plan

The dissemination plan is constructed for two major groups:

- industry
- research community

The project gives significant importance to knowledge dissemination activities in order to gain international visibility for networking with similar initiatives and offer the research results for wider exploitation. The benefits and outcomes of the project are presented in Table 3.

Beneficiary	Benefit
Satellite developers, IP vendors	Hardware/Software development framework for small satellites
End-users, IP vendors	Microcontroller IP and chip evaluated for ESCC requirements
Software developers	Mature software development framework for the MORAL system
End-users, system designers	ASIC with improved performance/reliability and lower costs
Consortium, new start-up	New research competence and business models

**Table 3: Project benefits**

### 2.1 Industry

The main objective of the industrial dissemination activities in the project will be to articulate the project's key achievements and main messages, with an aim to create a strong awareness of the MORAL project at the European level. This will be achieved by working closely with a wide range of end-users with whom the consortium partners have established contacts. The most important target group for achieving the exploitation of MORAL results is the end-user segment, i.e., aerospace companies developing low cost satellites. This includes integrator companies (e.g., TAS-E which is also a project partner) and national and international space agencies (ESA, DLR, CNES, ASI, etc.).

The methods to address the effective dissemination will include the involvement in relevant fairs, exhibitions and symposia including for example RADECS, DASIA, AMICSA, DLR Bauteile Konferenz, etc. Moreover, the tight contact with national and international agencies is very important and it can be performed by the project partners not only in Europe but also worldwide. To enable successful industry dissemination in the conservative space market, we will rely on the network of local representatives, which already exist at the partner side and will be made to disposal also to the new start-up company. This will make also the immense difference especially for the developing countries. Among other outcomes, this will facilitate the adoption of the project's results by a large community of potential users of the technology.

Brochures and website content will be created to provide information on the project. In particular, a workshop for potential research and industry stakeholders and users will be organized and carried out at the conclusion of the project.

All consortium partners will take a part in the dissemination activities. Furthermore, as some of the consortium organizations are partners in other projects which are administered by the European Commission Units, this will facilitate a joint strategy with other research organizations to be established. Such collaboration will be used to exploit the MORAL achievements to further develop and define objectives for future research initiatives.

### 2.2 Research community

The cheapest and the most efficient way of public dissemination is through electronic channels. For public dissemination we are planning to create an attractive and informative website, also for people outside the academic research community by addressing more general topics of

embedded systems design. Furthermore, press releases for other types of media will be also issued.

For the research community, publications in international, peer-reviewed journals serve as one of the main dissemination channels. All partners agree on an active policy for publishing scientific results at national and international conferences, workshop and journals. For this purpose the partners will exchange all necessary information about conferences and workshops, e.g., deadlines and call for papers, in order to foster disseminations via publications. Moreover, access to scientific results will be granted via the web page of the project. Open access publications via the green way are also targeted. For the researchers active in the MORAL related field, relevant and most-cited journals are the IEEE Transactions on:

- Aerospace and Electronic Systems
- Circuits and Systems
- VLSI
- Reliability

Dissemination of project activities and research results will also be conducted through major conferences like

- Radiation Effects on Components and Systems (RADECS)
- NASA/ESA Conference on Adaptive Hardware and Systems (AHS)
- IEEE Symposium on Design and Diagnostics of Electronic Systems (DDECS)
- IEEE International Integrated Reliability Workshop (IIRW)
- Defect and Fault Tolerance in VLSI and Nanotechnology Systems (DFT).

The project has a separate work package to address dissemination and exploitation issues to the highest standards to ensure the sustainability of deployment actions. In summary, exploitation and dissemination (WP10) will be conducted throughout the project by:

- spreading the awareness on MORAL initiative in the respective circles, will comprise representatives of end-user institutions
- Organization of a workshop
- Release of constantly updated project website, LinkedIn page, and project flyer. Website will include specific information on the objectives and mission of MORAL, research that is being done, analyses, reports, contact information, information addressing end-user needs etc.
- Related articles and press releases in national and international media (such as EE Times).
- Publications in internationally peer-reviewed journals and conference proceedings. The goal is to publish at least 6 scientific papers (from which at least two will be open access), as well as several industry papers during the project period. Publications not protected by copyright laws will be disseminated by the project website.
- Participation in related scientific and business conferences, exhibitions and trade shows.
- Workshops of end-users on major thematic conventions.
- Direct presentations to semiconductor manufacturing and systems design companies.
- Existing contacts of project consortium members. Already existing channels are the most effective way to disseminate new knowledge and also reach new and larger audience as a consortium.
- Co-operation and knowledge sharing with other similar projects.
- Engagements of students and developers (via lectures at the University of Potsdam and the Brandenburg University of Technology – Cottbus-Senftenberg, which are partner Universities of IHP, summer schools (annual summer school of microelectronics in IHP), etc. Parts of the project tasks are performed by PhD students that are supervised by

highly motivated professors and engineers with extensive experience and proven didactic skills. Moreover, master and bachelor students will be indirectly involved in sub-tasks, e.g., via master theses and internship.

- Addressing the general public (press, local media, local community, etc.) promoting the results of the project and importance of European research. The regional contacts are based on good contacts of the partners to media, and on well-known events such as the annual "day of open doors" at IHP.

## 2.3 Target groups

Based on Table 3 we have profiled four main target groups:

- Research community, addressing design methods for rad-hard ASICs in space.
- General research community, creating complementarities in embedded applications;
- End-users such as system integrator companies, with the focus on the MORAL project partners (TAS-E), who are the exploitation partner of the project results;
- Enterprises as collaboration/exploitation partners using the results stemming from the project, for example software companies (developing application ecosystem), IP vendors (providing further hardware and software IPs), large semiconductor manufacturing companies.

Each target segment is subject to specific dissemination channel to reach the constituency in the most effective way. Table 4 summarises the target groups and the dissemination channels.

Target groups	Dissemination channels
Research community in closely related fields of MORAL	Thematic conferences and seminars, publications, direct visits and on-place presentations
General research community	Conferences, seminars, press releases, symposia
End-users	Direct contacts, workshops, website, conferences, articles, symposia, direct E-mails
Software companies, IP vendors	Workshops, ESA/DLR annual events, presentations, website, articles in international press, direct E-mails, campaigns
End-users, semiconductor manufacturers	
Standardisation bodies	Workshops, dedicated conferences
Public entities	Dedicated seminars (e.g., Italian Space Agency, DLR, local chambers of commerce such as in Frankfurt, Milano, Brussels)
General public	Websites, articles, local press, newsfeed, project leaflets

**Table 4: Target groups**

Communication measures of various kinds will be applied by the project team for promoting the project and its findings. Dedicated communication tools will include:

1. Creation of advanced, innovative, impactful communication tools and materials
  - MORAL public website: The website will also have a final exploitation forum for the deployment of project results and gathering the potential industrial audience. It will allow access to certain papers, and videos, enabling potential users to explore the MORAL technology/solution features.
  - Flyers, newsletter, brochures and posters available for events and workshops participated by MORAL representatives.
  - A set of public deliverables that could be used as an introduction to MORAL objectives – notably business cases and best practices.
  - Goals and achievements of the project will also be posted on the web site, in plain non-technical language, suitable for the general public. The aim will be to enhance the public's understanding and appreciation of the importance of European research.

## 2. Internet marketing

MORAL will implement a website for interaction with the public. The website design includes mechanisms for interaction with the visitor. This will leverage the end-users contributions which are an important vehicle for successful creation of awareness through word of mouth promotion, user generated reviews, custom FAQs, forums, etc.

## 3. Social-Media campaigns

Targeted to the general (non-specialist) public, journalists and bloggers via Facebook, Twitter, YouTube, etc.

The project communications plan will be measured through quantifiable objectives, performance indicators and impact assessment. Tools will be tailored to the needs of various audiences, including groups beyond the project's own community. Where relevant, e.g., in the area of Subject-area Education, measures will be included for public/societal engagement on issues related to the project. Campaign-based activities, targeted at a broad range of stakeholders and the general public will be considered. Communication campaigns will include, as mentioned: websites, social networks, schools, media organizations, etc.

## **2.4 Dissemination activities**

### **2.4.1 Project website**

IHP will prepare and activate a website of the project. Information about the project's objectives, activities, work progress, consortium partners, accomplishments and prospects results will be published. IHP will update periodically this website using information provided by all partners. IHP will lead this task, while RCD, SYSGO, TAS-E and ABSINT will do support.

### **2.4.2 Strategies**

IHP will lead all the other partners in the dissemination of the project's results by applying different strategies and the media for their respective target audiences:

- communication and promotional materials, in the form of flyers, leaflets, project brochures and other printed materials will be prepared as the project advances, for distribution;
- consortium members will participate and present the project and its result in professional conferences and other meetings;
- participation in media events, press releases and articles prepared for the professional (such as IEEE journals) and general media;
- participation in exhibitions and technical fairs; members of the consortium will participate in various standardization bodies and promote the innovations introduced in MORAL;

These strategies will target a diverse audience comprised of

- device manufacturers;
- design houses, embedded system design developers and IP providers;
- stakeholders in the commercial, finance, manufacturing, trade, labor, and other private entities capable or potentially in the need of applying, promoting the microcontroller;
- public interest groups of users and the general public.

Table 5 gives a list of public deliverables during the course of the project.

No.	Deliverable	Type	Month
D1.2	Data management plan	ORDP	6
D1.3	Project progress report 1	R	14
D1.4	Project progress report 2	R	20
D1.5	Project progress report 3	R	28
D1.6	Final project report	R	40
D2.1	Project feasibility and risk estimation	R	2
D2.2	System specification document	R	6
D7.6	Complete MORAL chip datasheet	R	29
D8.2	Manufactured and assembled PCB	DEM	35
D9.3	Registration number of the start-up	R	28
D9.5	Balance sheet of the 1 <sup>st</sup> year of the start-up	R	40
D10.1	Dissemination plan	R	6
D10.2	Project website	DEC	8
D10.3	Dissemination report 1	R	14
D10.4	Dissemination report 2	R	28
D10.5	Dissemination report 3	R	40

**Table 5: Public deliverables in the project**

The MORAL project can relate to other space-related projects currently in execution by the partners, or already executed. It can use the results of the already finished projects, and can give input to the other projects currently in execution. Table 6 gives an overview of space-related projects executed by the partners.

Acronym	Financed by	Description	Partners
SEPHY	H2020	An Ethernet controller for space applications. Successfully finished project.	IHP, TASE
PISA	EU Eurostars	Power-robust multiprocessor for space applications based on the LEON processor core. Successfully finished.	IHP
Scale4Edge	BMBF	Multiprocessor for space applications based on the RISC-V core. Practically a PISA II project. Ongoing.	IHP
SpaceRegion	EU Intereg	International cooperation between Germany and Poland in the space field. Ongoing.	IHP
SPAD	ILB	Rad-hard Analog-to-Digital Converter (ADC). Ongoing.	IHP
SECHIS	EU Eurostars	Serializer-Deserializer (SERDES) development. Ongoing.	IHP

**Table 6: Space-related projects executed by partners**

Thus, for example, the components developed (Ethernet, ADC, SERDES) can be used in future versions of the MORAL chip, while the PEAKTOP core can be used in building a multiprocessor for space applications based on the experience and results from the previous projects. International dissemination of results can be thus very effective.

### 2.4.3 Outreach, organization of a workshop

SYSGO will contact some relevant stakeholders such as ESA, DAHLIA project with the aims of (1) making MORAL known to them and (2) gather their input for the selection of the 2<sup>nd</sup> hardware platform (i.e., ARM R52 or RISC-V).

During the project course, IHP and RCD will organize a workshop for relevant end-users and stakeholders. This workshop, besides being thematic will also serve as a dissemination channel of project objectives and results.

In this workshop the results of the principles of the system and results of the tests will be presented and discussed. Ideally this will be scheduled to take place in conjunction with a related industry event. A tentative agenda for this workshop shall include the following points:

- Presentation of the MORAL concept
- Demonstration of the Demo Board performance
- Feedback from the users on potential improvements

The type and scope of the disseminated materials in the workshops will include:

- Key achievements will be disseminated as technical convention talks, professional conference presentations and of course scientific peer-review publications including open access publications via the green way (with 6-12 months embargo).
- Key technical findings and recommendations will be made available to business strategy managers via press releases and through the project's website. Press releases, periodically issued by the partners, will be used to draw attention to the project's website. Moreover, those findings will be shared with related companies and publications through partners' direct relationship channels.
- Summary findings and their implications will be posted on the project's website. This will be useful to various end-users and main stakeholders and researchers in the field of processor design for space.

### **3 Summary**

The MORAL project dissemination plan was presented. The target audiences were identified and the appropriate dissemination activities and channels for each target were defined. All dissemination activities are to be reported in three annual reports during the course of the project.