



# REAL HOLO

## D6.4

### Intermediate dissemination report

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Abstract	This deliverable contains a report on the REALHOLO dissemination and communication activities, including the project's visual identity as well as communication and dissemination materials, which are used and which are planned to be used within the project.
Keywords	Dissemination, communication, infrastructure, website, homepage, internal communication



## **Editor**

Marion Habernig (TEC)

## **Contributors** (ordered according to beneficiary numbers)

All partners

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## Executive Summary

This Deliverable aims to provide a clear update on the initial communication and dissemination plan, of the REALHOLO project. Dissemination and communication activities that took place in the first twelve months of the project are explained and further plans are summarized. Updates on the dissemination report will be provided in D6.6 “Updated dissemination report”, due in M30 and D6.8 “Final dissemination report”, due in M48 of the project.

In Chapter 1 and Chapter 2 of this deliverable, at first the dissemination and communication plan is summarized and further planned dissemination activities are given. A detailed communication report is also provided and dissemination and communication targets are defined in detail.

Chapter 3 provides information on the different dissemination and communication tools that are used in the REALHOLO project. Different tools, such as scientific publications, presentations, dissemination material, the project website and social media are explained in detail.

Finally, Chapter 4 explains how the REALHOLO project plans to manage dissemination and communication activities.

The established environment enables state-of-the art, efficient and user-friendly collaboration and dissemination of information and provides the ideal administrative basis for the project work. The REALHOLO communication and dissemination plan provides an essential benefit for all project partners and all stakeholders are able to access all project relevant information and documents.

# Table of Content

<b>Chapter 1</b>	<b>Introduction .....</b>	<b>1</b>
<b>Chapter 2</b>	<b>Dissemination and communication plan.....</b>	<b>2</b>
2.1	Dissemination plans .....	2
2.2	Communication plans.....	4
2.3	Dissemination and communication targets.....	7
<b>Chapter 3</b>	<b>Dissemination and Communication tools and channels .....</b>	<b>8</b>
3.1	Existing dissemination material .....	8
3.2	Past scientific publications .....	11
3.3	Past and planned presentations, conferences and events.....	12
3.4	Project website.....	14
3.4.1	Events .....	14
3.4.2	Blog & News.....	14
3.4.3	Results & Downloads.....	14
3.4.4	Partners.....	14
3.5	Social media .....	14
<b>Chapter 4</b>	<b>Management of dissemination and communication .....</b>	<b>15</b>
<b>Chapter 5</b>	<b>Summary and Conclusion .....</b>	<b>16</b>

## List of Figures

Figure 1: Dissemination & Communication phases ..... 1

## List of Tables

Table 1: Dissemination plans ..... 4  
Table 2: Communication plans..... 6  
Table 3: Dissemination material ..... 10  
Table 4: Past conferences, events and meetings ..... 12  
Table 5: Planned conferences, events and meetings ..... 13

## Chapter 1 Introduction

This deliverable provides an overview of the REALHOLO communication and dissemination plan as well as a first report on communication and dissemination activities, which includes communication and dissemination material that are created and used within the project. As thoroughly described in our professional communication kits – V1 (D6.9), our dissemination activities are clustered into three main phases, illustrated in Figure 1.

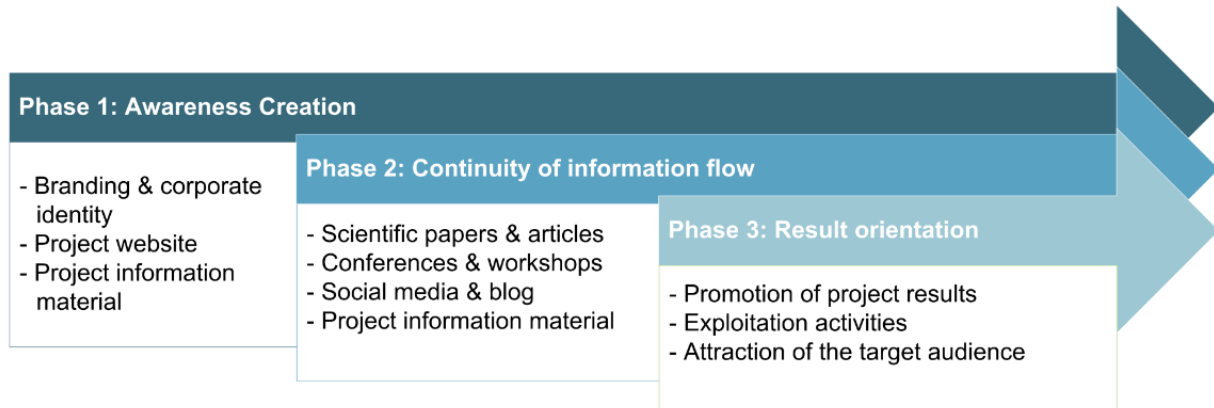


Figure 1: Dissemination & Communication phases

The awareness creation phase took place during the first months of the project, in which the REALHOLO consortium consolidated its branding and corporate identity. During this time, it also established project information material, as well as several communication tools, such as document templates and manuals; a shared platform through which all partners can exchange information; and a project website, on which the latest news and status of the project are made available to the public.

At the end of its first period, the project has now transitioned into the second phase of our communication and dissemination plan. During this phase, the project pursues to promote its results and further raise awareness among the industry and scientific community. Social media also plays an important role during this phase, increasing the interest of multiple audiences and allowing a more interactive communication with them.

As part of the activities planned for this phase, the project has already started to give presentations at different relevant conferences; and scientific publications are being written and submitted to conferences too, as a result of the work done in the project. The contributions to academic and industry/standardization bodies facilitate lively discussions, as well as new insights and feedback on the project's progress, which contributes to the project's success and possibly also follow-up research activities.

## Chapter 2 Dissemination and communication plan

The following chapter states the initial dissemination plan according to the DoA, lists the actual dissemination activities in form of a report and finally states some updates on the initial plan.

### 2.1 Dissemination plans

In the following table the different dissemination activities that have been planned in the DoA can be observed. Dissemination activities are considered key enablers for the success of the REALHOLO project. The goal of dissemination is to make many stakeholders (phase modulation, real-time holography, virtual-/augmented-/mixed-reality) aware of the REALHOLO approach and results. Wherever possible, research results will be used for the creation and support of REALHOLO outcome (e.g. demonstrators for MMA and HUD) and will substantially contribute to the benefit of the targeted constituents (Broad Public Society & Media (A), Policy Makers (B), Industry (C) and Research Community (D)). In the table below, the green tick marks represent activities that are completed/ongoing. The completed and ongoing dissemination activities will be discussed in more detail in the next chapter.

Type of activity – Type of audience – Timeframe	Expected impact / KPI	Means to measure KPI / channels	Main partners involved
<b>Phase 1: Awareness creation</b>			
<b>Project website</b> - Policy Makers (B), Industry (C), Research Community (D) - 2 <sup>nd</sup> month of project  ✓	Interested stakeholders worldwide informed about the project and its results, by publishing news such as conference visits, publications & deliverables, involved partners, links, etc.). <i>KPI: According to experience we plan to reach at least 5,000 people per year.</i>	Website statistics	TEC
<b>Announcement letter</b> - Policy Makers (B), Industry (C), Research Community (D) - Beginning of project  ✓	Inform potential stakeholders about project start. <i>KPI: We plan to reach minimum 5,000 people via press releases in public and social media, on project website and on partners' websites.</i>	Website and social media statistics	TEC, SeeReal, IPMS, Sencio, X-FAB
<b>Phase 2: Continuity of information flow</b>			
<b>Newsletter, Press releases</b> - Industry (C), Research Community (D) - Throughout the project  ✓  (to be continued)	Increased awareness on technological and scientific progress; distribution via public and social media and project website. <i>KPI: We plan to reach at least 1,000 people with each newsletter. At least 1 newsletter every 6 months. Press releases after milestones are reached.</i>	Newsletter mailing list, website and social media statistics	TEC
<b>Participation in conferences or trade fairs</b> – Policy Makers (B), Industry (C), Research Community (D) - Throughout the project	Interest of stakeholders attracted, comparison with international research and with competitors from the market, potential for international cooperation identified. <b>Events:</b> • MEMS & Imaging Sensors	Feedback from participating partners	SeeReal, IPMS, Sencio, Valeo, nSilitation, OmniChip X-FAB,

Type of activity – Type of audience – Timeframe	Expected impact / KPI	Means to measure KPI / channels	Main partners involved
<p style="text-align: center;">✓</p> <p style="text-align: center;">(to be continued)</p>	<p>Summit/ Semi</p> <ul style="list-style-type: none"> <li>• Sensor and Test Fair</li> <li>• SPIE Photonics Europe</li> <li>• SPIE Photonics West</li> <li>• OSA Digital Holography and 3D Imaging Congress</li> </ul> <p><i>KPI: Persons reached and met during events (depending on size of event).</i></p>		
<p><b>Publication of scientific papers in high impact factor journals</b> – Industry (C), Research Community (D) – Throughout the project</p> <p style="text-align: center;">✓</p> <p style="text-align: center;">(to be continued)</p>	<p>Project results disseminated and made accessible for others.</p> <p><b>Conferences:</b></p> <ul style="list-style-type: none"> <li>• SPIE Photonics Europe</li> <li>• SPIE Photonics West</li> <li>• OSA Digital Holography and 3D Imaging Congress</li> <li>• Industrial Partner Day</li> </ul> <p><b>Journals:</b></p> <ul style="list-style-type: none"> <li>• JM3</li> </ul> <p><i>KPI: We plan to publish at least 5-10 scientific papers</i></p>	<p>Download statistics of repository (e.g. Zenodo)</p>	<p>SeeReal, IPMS, X-FAB</p>
<p><b>Social media</b> – Policy Makers (B), Industry (C), Research Community (D) - Throughout the project</p> <p style="text-align: center;">✓</p> <p style="text-align: center;">(to be continued)</p>	<p>Stakeholders updated on the technical and scientific progress (e.g. on LinkedIn) by sharing e.g. public deliverables, publications or other project-relevant content.</p> <p><i>KPI: We plan to reach minimum 500 views of each posting.</i></p>	<p>Social media statistics</p> <p><i>IPMS:</i></p> <p><i>LinkedIn: ~ 1.600 follower</i></p> <p><i>Twitter: ~ 1.400 follower</i></p> <p><i>Website: ~ 3.000 visitors per month</i></p>	<p>SeeReal, IPMS, Sencio, Valeo, nSilitation, OmniChip X-FAB</p>
<p><b>Reports and deliverables</b> – Policy Makers (B) – Throughout the project</p> <p style="text-align: center;">✓</p> <p style="text-align: center;">(to be continued)</p>	<p>Reports and deliverables sent to the EC and to national and international policy makers to inform about project results. <i>KPI: N/A</i></p>	<p>Number of reports and deliverables delivered</p>	<p>TEC, IPMS, SeeReal</p>
<p><b>Related projects</b> – Industry (C), Research Community (D) - Throughout the project</p>	<p>Feedback on project objectives and results received from research projects from the same field via e-mails, face-to-face meetings or other means.</p> <p><i>KPI: N/A</i></p>	<p>Number of collaboration activities carried out</p>	<p>TEC, SeeReal, IPMS,</p>
<p><b>Presentation of project milestones at internal and external events</b> – Industry (C), Research Community (D) - Throughout the project</p>	<p>Project milestones presented at internal and external events of the project partner.</p> <p><i>KPI: Persons reached and met during events (depending on size of event).</i></p>	<p>Feedback from participating internal and external partners</p>	<p>SeeReal, IPMS, Sencio, Valeo, nSilitation, OmniChip X-FAB,</p>
<b>Phase 3: Result orientation</b>			
<p><b>Co-organisation of workshop on Key</b></p>	<p>Students/scientists/people from industry taught about</p>	<p>Number of participants</p>	<p>IPMS</p>



Type of activity – Type of audience - Timeframe	Expected impact / KPI	Means to measure KPI / channels	Main partners involved
<b>advantages of MMA compared to prior art modulators</b> – Industry (C), Research Community (D) – Towards project end	tools/methodology developed within the project. <i>KPI: We plan to have minimum 50-60 participants.</i>	50-60	
<b>Final project workshop</b> - Industry (C), Research Community (D) – Towards project end	An overview of the project results given and future work discussed. Speakers working on related topics invited. <i>KPI: We plan to have at least 50-60 participants.</i>	Actual number of participants	TEC, SeeReal, Valeo, IPMS
<b>Information campaigns on project results</b> - Policy Makers (B), Industry (C), Research Community (D) - Towards project end	Information about the project results for industrial applications, information platform, information campaigns internal and external events, networks, publications (Whitepaper, Presentations);  Information about the project results for biophotonic research community, targeted information on networks, on conferences, publication of project results in scientific media, on the project website <i>KPI: We plan to reach at least 5,000 people via press releases in public and social media, on project website and on partners' websites.</i>	Website and social media statistics, press review  Use of project results for industrial applications, improvement of competitiveness of European industry  Use of project results for photonic research, strengthening Europe as research centre	TEC, SeeReal, IPMS, Sencio, Valeo, nSilitation, OmniChip X-FAB,
<b>Presentation of project results at events</b> - Policy Makers (B), Industry (C), Research Community (D) - Towards project end	Project results will be presented at internal and external events of the project partner. <i>KPI: Persons reached and met during events (depending on size of event).</i>	Feedback from participating internal and external	SeeReal, IPMS, Sencio, Valeo, nSilitation, OmniChip X-FAB

Table 1: Dissemination plans

## 2.2 Communication plans

In the following table the different communication activities that have been planned in the DoA can be observed. We outlined a comprehensive communication plan with clear objectives that are adapted to different target audiences, especially the broad public society & media (A) and to policy makers (B). Similarly to the process of dissemination and exploitation, also communication will be clustered into three main phases: awareness creation, continuity of information flow, and result orientation. In addition to the planned dissemination activities, the REALHOLO consortium aims at spreading the word about its objectives and novelty improvements in high-resolution, high-speed

MEMS MMA. It also aims to promote the results beyond the own community, communicating the research in a way that is understood also by non-specialists and showing visibility of EU funding. The information flow will be kept alive through flexible, but targeted application of communication measures. In the table below, the green tick marks represent activities that are completed/ongoing. The completed and ongoing communication activities will be discussed in more detail in the next chapter.

Type of activity – Type of audience - Timeframe	Expected impact / KPI	Means to measure KPI / channels	Main partners involved
<b>Phase 1: Awareness creation</b>			
<b>Press release -</b> Broad Public Society & Media (A) - Within first 2 weeks of project ✓	Public informed about the project start. <i>KPI: We plan to reach at least 5,000 people via press releases in public and social media, on project website and on partners' websites.</i>	Website and social media statistics	TEC, SeeReal, OmniChip, IPMS, Sencio, Valeo, nSilitation X-FAB
<b>Project branding -</b> Broad Public Society & Media (A) 2 <sup>nd</sup> month of project ✓	Interested people worldwide informed about the project and its impact on Europe (e.g. via blog). <i>KPI: N/A</i>	Website statistics	TEC, SeeReal, IPMS
<b>Project website -</b> Broad Public Society & Media (A) - 2 <sup>nd</sup> month of project ✓	Interested people and patients worldwide informed about the project and its impact on Europe (e.g. via blog). <i>KPI: We plan to reach at least 5,000 people per year.</i>	Website statistics	TEC
<b>Leaflet -</b> Broad Public Society & Media (A), Policy Makers (B) - 2 <sup>nd</sup> month of project ✓	Increased awareness on project targets, opportunities and partners. Distribution via e-mail, social media, project website or at events. <i>KPI: We plan to print minimum 1,000 copies.</i>	Website and social media statistics, amount of copies printed and distributed	TEC, SeeReal, OmniChip, IPMS, Sencio, Valeo, nSilitation X-FAB
<b>Animated Video, Real Video -</b> Broad Public Society & Media (A), Policy Makers (B) - Within first 12 months of the project ✓	Public, patients and policy makers aware of main objectives of the project. <i>KPI: We plan to reach minimum 1,000 hits for each video via video platforms, project website and social media channels.</i>	Video platform statistics, website statistics, social media statistics <i>IPMS: (~ followers)</i> <i>LinkedIn: ~ 1600</i> <i>Twitter: ~ 1400</i> <i>Website: ~ 3000 visitors per month</i>	TEC, IPMS
<b>Phase 2: Continuity of information flow</b>			
<b>Social media -</b> Broad Public Society & Media (A), Policy Makers (B) - Throughout the project	Public, patients and policy makers informed about project activities and results relevant for the European society through postings (e.g. on Twitter) about project partners and	Social media statistics	TEC, SeeReal, OmniChip, IPMS, Sencio, Valeo,

Type of activity – Type of audience - Timeframe	Expected impact / KPI	Means to measure KPI / channels	Main partners involved
✓ (to be continued)	meetings, important milestones, links to related topics etc. <i>KPI: We plan to reach at least 500 impressions for each posting.</i>		nSilitation X-FAB
<b>Video interviews</b> - Broad Public Society & Media (A), Policy Makers (B) - <i>Throughout the project</i>	Public and policy makers informed about project activities and results relevant for the European society through an interview series with project partners telling about their role in the project, the expected outputs etc. <i>KPI: We plan to record 2-4 video interviews and publish them on video platforms, project website and social media channels with at least 1,000 hits each.</i>	Video platform statistics, website statistics, social media statistics	TEC, IPMS
<b>Podcast</b> - Broad Public Society & Media (A), Policy Makers (B) - Within first 12 months of the project ✓ (to be continued)	Public, patients and policy makers informed about project activities and results relevant for the European society through a podcast. <i>KPI: We plan to publish 2 podcast episodes per year on audio platforms, project website and social media channels with at least 1,000 hits each.</i>	Podcast platform statistics, website statistics, social media statistics	TEC
<b>Targeted e-mails or face to face meetings</b> – Policy Makers (B) – Throughout the project ✓ (to be continued)	Input provided for discussions and recommendations exchanged among the EU-involved countries, exchange recommendations. <i>KPI: N/A</i>	Actual number of policy makers reached via e-mail or face to face	TEC, SeeReal, OmniChip, IPMS, Sencio, Valeo, nSilitation X-FAB
<b>Phase 3: Result orientation</b>			
<b>Final press release</b> – Broad Public Society & Media (A), Policy Makers (B) – Last month of the project	Overview of the project results and their impact on European society. <i>KPI: We plan to reach at least 10,000 people via public and social media, project website and partners' websites.</i>	Website and social media statistics IPMS: (~ followers) LinkedIn: ~ 1.600 Twitter: ~ 1.400 Website: ~ 3.000 visitors per month	TEC, IPMS
<b>Available networks</b> for further actions	SPIE - international society for optics and photonics Silicon Saxony - Hightech network VDE - Association of Electrical Engineering OptoNet - Competence network optical technologies <i>KPI: we reach minimum 10,000 people via those additional networks</i>	Presentation and communication of further content possible	IPMS

Table 2: Communication plans

## 2.3 Dissemination and communication targets

During the proposal phase of REALHOLO, a detailed communication and dissemination plan was already set up, stating different audiences, what the objective of reaching the audience would be and what the impact of reaching them will be.

In order to assess the effect of the dissemination and communication activities on the target audience, a number of Key Performance Indicators (KPI) has been selected, allowing to measure progress towards fixed goals for dissemination activities. These KPIs are repeatedly referenced in the document. The following table collects the selected KPI:

Dissemination activity/ channel	KPI
REALHOLO website	<ul style="list-style-type: none"> <li>• Number of visitors</li> <li>• Average session duration</li> </ul>
Social Media	<ul style="list-style-type: none"> <li>• Number of postings</li> <li>• Number of followers</li> <li>• Number of impressions</li> <li>• Engagement rate</li> </ul>
Scientific peer reviewed publications	<ul style="list-style-type: none"> <li>• Number of publications per year</li> <li>• Number of views and downloads per publication (e.g. on Zenodo)</li> </ul>
Participation in conferences, workshops	<ul style="list-style-type: none"> <li>• Number of events</li> <li>• Number of attendees (e.g. during a REALHOLO presentation or workshop; best estimates of persons who heard about REALHOLO )</li> </ul>
Organization of presentations, workshops	<ul style="list-style-type: none"> <li>• Number of events</li> <li>• Number of attendees</li> </ul>
Videos, podcasts	<ul style="list-style-type: none"> <li>• Number of views/downloads (Vimeo, Omny)</li> <li>• Number of impressions</li> </ul>

Table 1: Key performance indicators for dissemination and communication activities

## Chapter 3 Dissemination and Communication tools and channels

### 3.1 Existing dissemination material

The REALHOLO project already provided a certain number of dissemination materials that is summarized in table underneath. More detailed information can be found in D6.10 “Professional communication kits – Version 2”.

Type of activity	Main Leader	Title	Date	Place	Target audience <sup>1</sup>	TOTAL /KPI	Type and goal of the event / website	Countries addressed
Website	TEC	REALHOLO Project website	1/1/2021	online	a, b, c, d, e	No data available yet	The REALHOLO website is the main dissemination platform of the project and all public project information is available here. The website is a tool to disseminate information on the project and its impact to interested parties worldwide (e.g. news such as conference visits, publications & deliverables, involved partners, links, etc.). According to experience we plan to reach about 10.000 people per year. Official project website: <a href="https://realholo.eu/">https://realholo.eu/</a>	International
Social Media	TEC	REALHOLO Twitter Account	1/1/2021	online	a, b, c, d, e	2898 impressions	Social Media is used to interact with and inform interested parties about latest project outcomes, results, and relevant information. <a href="https://twitter.com/RealholoH">https://twitter.com/RealholoH</a>	International
Social Media	TEC	REALHOLO LinkedIn Account	1/1/2021	online	a, b, c, d, e	4433 impressions	Social Media is used to interact with and inform interested parties about latest project outcomes, results, and relevant information. <a href="https://www.linkedin.com/company/realholo-h2020/">https://www.linkedin.com/company/realholo-h2020/</a>	International

<sup>1</sup> Scientific community (a), Policy Makers (b), General public and civil society (c), Industry, Investors and Customers (d), Media (e)

Type of activity	Main Leader	Title	Date	Place	Target audience <sup>1</sup>	TOTAL /KPI	Type and goal of the event / website	Countries addressed
Flyer	TEC	Project Leaflet	1/1/2021	online	a, b, c, d, e	No data available yet	The REALHOLO project leaflet gives an overview of the project and describes mission, motivation and concept of the project, as well as the included work packages. The aim is to raise awareness on project targets, opportunities and partners which can be distributed via e-mail or directly after meetings or conferences. <a href="https://realholo.eu/wp-content/uploads/2021/02/REALHOLO_Leaflet_Web.pdf">https://realholo.eu/wp-content/uploads/2021/02/REALHOLO_Leaflet_Web.pdf</a>	International
Press release	TEC	Announcement Letter	1/1/2021	online	a, b, c, d, e	No data available yet	Project announcement, to inform the public about the project. <a href="https://realholo.eu/wp-content/uploads/2021/01/REALHOLO_Announcement_Letter2.pdf">https://realholo.eu/wp-content/uploads/2021/01/REALHOLO_Announcement_Letter2.pdf</a>	International
Video/ Film	TEC	Project Teaser	1/1/2021	online	a, b, c, d, e	255 impressions	The project teaser provides an overview of the project. <a href="https://realholo.eu/realholo-overview/">https://realholo.eu/realholo-overview/</a>	International
Website	TEC	Blog: Today in talk with Hagen Stolle	8/2/2021	online	a, b, c, d, e	N/A	Introduction to some project partners. <a href="https://realholo.eu/today-in-a-talk-with-hagen-stolle/">https://realholo.eu/today-in-a-talk-with-hagen-stolle/</a>	International
Website	TEC	Blog: Today in talk with the team from Sencio	23/2/2021	online	a, b, c, d, e	N/A	Introduction to some project partners. <a href="https://realholo.eu/today-in-a-talk-with-the-team-from-sencio/">https://realholo.eu/today-in-a-talk-with-the-team-from-sencio/</a>	International
Website	TEC	Blog: Today in talk with Christophe Sabatier	4/3/2021	online	a, b, c, d, e	N/A	Introduction to some project partners. <a href="https://realholo.eu/today-in-a-talk-with-christophe-sabatier/">https://realholo.eu/today-in-a-talk-with-christophe-sabatier/</a>	International
Other	Fraunhofer	Annual Report	2021	online	a, b, c, d, e	N/A	REALHOLO is mentioned in the annual report of Fraunhofer IPMS.	International

Type of activity	Main Leader	Title	Date	Place	Target audience <sup>1</sup>	TOTAL /KPI	Type and goal of the event / website	Countries addressed
							<a href="https://www.ipms.fraunhofer.de/content/dam/ipms/de/documents/2020/Fraunhofer%20IPMS%20-%20Jahresbericht%202020.pdf">https://www.ipms.fraunhofer.de/content/dam/ipms/de/documents/2020/Fraunhofer%20IPMS%20-%20Jahresbericht%202020.pdf</a>	
Website	X-FAB	Link to project on innovation page of X-FAB website	1/9/2021	online	a, b, c, d, e	No data available yet	REALHOLO is linked to the website of X-FAB. <a href="https://www.xfab.com/innovation">https://www.xfab.com/innovation</a>	International
Press release	TEC	Newsletter Issue 01	1/9/2021	online	a, b, c, d, e	No data available yet	The newsletter provides general information of the project, as well as an update of technical results of the first six months and expected challenges. <a href="https://realholo.eu/wp-content/uploads/2021/09/REALHOLO_Newsletter_issue_01.pdf">https://realholo.eu/wp-content/uploads/2021/09/REALHOLO_Newsletter_issue_01.pdf</a>	International
Other	TEC, SeeReal	1st Podcast	20/12/2021	online	a, b, c, d, e	No data available yet	In the 1st podcast partners Hagen Stolle and Johannes Pleikies from SeeReal Technologies speak about the goals and challenges in this H2020 project which aims to bring holography to the forefront by prototyping practical applications.	International

Table 3: Dissemination material

## 3.2 Past scientific publications

During the first period of the project, REALHOLO has submitted 3 papers at conferences:

**Title:** *MEMS Spatial Light Modulators for Real Holographic 3D Displays*

**Conference:** [MicroSystemTechnic Congress 2021](#) (MST21)

**Authors:** Peter Duerr, Andreas Neudert, Christoph Hohle, Hagen Stolle, Johannes Pleikies, Hagen Sahm

**Abstract:** The demand for 3D displays for virtual, augmented and mixed reality is increasing rapidly. While there are a number of such displays already available, there is still a need for improvement of the image quality. The best possible solution is the full reconstruction of a natural light field by real holography for perfectly realistic images. For this, a novel type of piston mode micro mirror spatial light modulator (SLM) is required, with pixels of only a few micrometers pitch precisely addressable to one of many deflection states. Fraunhofer IPMS and SeeReal together with consortium partners started developing such an advanced MEMS (micro electro mechanical system) SLM with unique properties.

**Title:** *Challenges of monolithic MEMS-on-CMOS integration for spatial light modulators*

**Conference:** [SPIE Opto 2021, MOEMS and Miniaturized Systems XX](#)

**Authors:** Christoph Hohle, Sebastian Döring, Martin Friedrichs, Andreas Gehner, Dirk Rudloff, et al.

**Abstract:** The development of devices that are based on MEMS-on-CMOS technology becomes increasingly time-consuming since System-on-a-Chip (SoC) solutions for highly integrated and miniaturized devices are approaching smaller feature sizes. In order to reduce the development costs and shorten the time-to-market periods, the combination of commercially available CMOS processes from foundries with the subsequent processing in a dedicated MEMS facility is beneficial. This concept offers the possibility to separate the different technological requirements of conventional CMOS manufacturing and MEMS actor processing, which may follow different design rules and process specifications. As a representative of the dedicated MEMS foundries, Fraunhofer IPMS performs surface micromachining on 200 mm wafers for a variety of MEMS devices, in particular for spatial light modulators (SLM). Over the past decade, much experience was gained in development activities for customer specific applications like micro mirror arrays. In this paper, we will discuss essential requirements and upcoming challenges for the monolithic integration of surface micro-machined optical MEMS on foundry-fabricated CMOS backplanes, as conventional (i-Line) lithography is approaching patterning limits. We will present approaches of tuning the planarization of the CMOS chip surface to achieve an excellent mirror array flatness with CMOS compatible inorganic sacrificial layer techniques. Concepts like Mix&Match lithography for achieving high overlay accuracy and the litho stitching technique for the patterning of large chips will be reviewed and a brief outline of our roadmap for the implementation of DUV lithography will be presented.

**Title:** *MEMS Piston Mirror Arrays for Computer Generated Holography*

**Conference:** [SPIE Photonics West 2022](#)

**Authors:** Peter Dürr et al

**Abstract:** Computer generated holography (CGH) offers the best possible solution for very interesting applications like virtual, augmented and mixed reality. To get the images from the computer into the real world spatial light modulators (SLMs) are required that fulfil very demanding specifications. In the European Union funded Project REALHOLO we are currently developing a novel kind of MEMS SLM for CGH applications, which will also be useful in other fields like wavefront shaping or re-programmable diffractive optical elements (DOEs). This paper describes the novel MEMS comb-drive actuator SLM meeting the challenges together with detailed simulations showing the superior performance.



### 3.3 Past and planned presentations, conferences and events

The table below provides an overview on **past conferences and events**.

Type of activity	Main Leader	Title	Date	Place	Target audience <sup>2</sup>	TOTAL /KPI	Type and goal of the event / website	Countries addressed
Participation to Conference <sup>a</sup>	Fraunhofer	MEMS World Summit, Europe	7/9/2021	Munich	a, d	~50	<a href="https://www.memsworldsummit.com/#mws-events-eu">https://www.memsworldsummit.com/#mws-events-eu</a> Presentation given: “Micro Mirror Arrays: Enabling Technology for Holographic Displays”	International
Participation to Conference <sup>a</sup>	Fraunhofer	SPIE Webinar: Spatial Light Modulators – Status and Potential for Holography	7/10/2021	online	a, c, d, e	~60	<a href="https://spie.org/">https://spie.org/</a> Presentation given: “Micro Mirror Arrays (MMA) Targeting Computer Generated Holography”	International
Participation to Conference <sup>a</sup>	Fraunhofer, SeeReal	MikroSystemTechnik Kongress 2021	8/11/2021	Ludwigsburg, Germany	a, b, d, e	~200	<a href="https://www.mikrosystemtechnik-kongress.de/">https://www.mikrosystemtechnik-kongress.de/</a> Paper submitted and presentation given: “MEMS Spatial Light Modulators for Real Holographic 3D Displays”	International

Table 4: Past conferences, events and meetings

<sup>2</sup> Scientific community (a), Policy Makers (b), General public and civil society (c), Industry, Investors and Customers (d), Media (e)

The table below provides an overview on **planned conferences, events and meetings**.

Type of activity	Main Leader	Title	Date	Place	Target audience <sup>3</sup>	Type and goal of the event / website	Countries addressed
Participation to Conference <sup>a</sup>	Fraunhofer	SPIE Photonics West 2022	22-27/1/2022	Ludwigsburg, Germany	a, b, d, e	<a href="https://spie.org/conferences-and-exhibitions/photonics-west?SSO=1">https://spie.org/conferences-and-exhibitions/photonics-west?SSO=1</a> Paper submitted: „MEMS Piston Mirror Arrays for Computer Generated Holography”	International
Participation to Conference <sup>a</sup>	Tbd	Sensor and Test Fair	10/5/2022	Nuremberg, Germany	a, b, d, e	Tbd	International
Participation to Conference <sup>a</sup>	Tbd	MEMS & Imaging Sensors Summit/ Semi	17/5/2022	Grenoble, France	a, b, d, e	Tbd	International
Participation to Conference <sup>a</sup>	Tbd	SPIE Photonics Europe	3/4/2022	Strasbourg, France	a, b, d, e	Tbd	International
Participation to Conference <sup>a</sup>	Fraunhofer, SeeReal	Digital Holography and Three-Dimensional Imaging - OPTICA (formerly OSA)	1-4/8/2022	Cambridge, UK	a, b, d, e	<a href="https://www.optica.org/en-us/meetings/topical_meetings/digital_holography_and_3-d_imaging/">https://www.optica.org/en-us/meetings/topical_meetings/digital_holography_and_3-d_imaging/</a>	International

Table 5: Planned conferences, events and meetings

<sup>3</sup> Scientific community (a), Policy Makers (b), General public and civil society (c), Industry, Investors and Customers (d), Media (e)

## 3.4 Project website

Since its launch at the beginning of the project, the REALHOLO website continues to be one of the main tools of dissemination and communication for the project. It has been so far updated with the most relevant information regarding our results, meetings, as well as past and future events. An overview of the current content is provided in the following subsections. Further information on the website is given in D6.10.

### 3.4.1 Events

**Conferences and Workshops:** Currently there are 5 conferences listed. During the first project year, partners participated in three different conferences, and another 2 are planned for the second project period. The participation of another 3 conferences is still under discussion.

**Meetings:** For now, the following meetings are listed:

- Kick-off meeting, 19-20<sup>th</sup> January 2021
- Technikon's financial webinar, 24<sup>th</sup> March 2021
- Technical Meeting, 15<sup>th</sup> June 2021
- 1<sup>st</sup> Interim Review Meeting, 13<sup>th</sup> July 2021
- Technical, GA and IB Meeting, 15-16<sup>th</sup> December 2021

### 3.4.2 Blog & News

The REALHOLO project teaser, talks with partners, newsletter and some other news (e.g. meetings, conferences...) about the project can be found in the Blog & News section of the website.

### 3.4.3 Results & Downloads

In the results section, public deliverables are uploaded. So far, deliverable D1.3 "Dissemination report on component and system specifications" is available. Other public deliverables will be made available in this section, according to their release schedules. Scientific publications of all partners are also listed. The REALHOLO publications including an abstract and a link to the full articles via the Zenodo platform will follow soon.

### 3.4.4 Partners

In the partners section, all the partners as well as their contact information and geographic locations are listed.

## 3.5 Social media

Making use of the advantages of social media helps spreading project information to a large audience. As a consequence, they are valuable means to disseminate project ideas and results and the plan is to actively use social media as means of communication.

*Twitter* is an online social networking service and micro blogging service that enables its users to send and read text-based messages of up to 280 characters, known as "tweets". The REALHOLO project is available on <https://twitter.com/RealholoH>.

*LinkedIn* is a social networking site for people in professional occupations or simply a social network for business. REALHOLO can be accessed via: <https://www.linkedin.com/company/realholo-h2020/>

Further information on social media activities are given in D6.10.

# Chapter 4 Management of dissemination and communication

Management of dissemination and communication activities are crucial for the project success to the different audience groups.

The dissemination of the REALHOLO project is supplemented with the following activities:

**Project website:** The website is continuously maintained to provide an overview of the project progress. All past and upcoming dissemination activities are found on the website.

**Intra project communications and transfer of knowledge within the consortium** is enabled by the use of Nextcloud (document repository hosted by TEC) and by use of different mailing lists. The publication mailing list being one of them.

In order to keep track of planned and upcoming dissemination activities, a **dissemination activities list** was set up, that is available for partners on Nextcloud. On this list, there is a sheet available with past activities and a second sheet with upcoming activities. Partners are asked to fill in the list on a regular basis. Information provided by partners is then also listed on the project website and social media.

A second list is available for partners, for **scientific publication and research data**. This list allows the consortium to have an overview of publications and relevant underlying research data with open access and is also available on Nextcloud.

Exploitation plans will be discussed in more detail in the Deliverable 6.3 “Intermediate business plan and exploitation report”, which is due in M12 of the project.

## Chapter 5 Summary and Conclusion

This document provides an update on the current status of the REALHOLO communication and dissemination plan outlined in the previous deliverable. Therefore, this report presents a collective overview of the dissemination activities of each partner, which have taken place during the first period of the project.

First, the dissemination and communication plan was discussed in Chapter 2 by dissemination and communicating plans at partner level. Then, the current status of the dissemination and communication tools was described in detail, in Chapter 3.

Finally, Chapter 4 described how dissemination and communication activities are being managed within the REALHOLO project consortium.

This communication and dissemination plan provides an essential benefit for all project partners and the next update on communication and dissemination will be provided in D6.6 “Updated dissemination report”, due in M30 and D6.8 “Final dissemination report”, due in M48 of the project.