



# REAL HOLO

PHASE MODULATING MICRO  
MIRROR ARRAY FOR

**REAL HOLOGRAPHIC  
MR DISPLAYS**



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PHOTONICS

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This project is an initiative of the Photonics Public Private Partnership.



**REAL  
HOLO**

## About

The merging of real and virtual worlds to produce mixed reality (MR) environments is becoming a realistic component of future society. The effective use of MR demands a natural visual experience without physiological side effects for the user. REALHOLO is a project developed to meet these needs by researching advanced micro-mirror-based piston-type spatial light modulator (SLM) modulating the phase of visible light with optical features far superior to any liquid crystal-based alternative. The SLM will facilitate 3D display applications and structured illumination and sensing. REALHOLO will develop dedicated core hardware concepts and modules for integration. The goal is an application-specific demonstration of the MMA in medical application use in real holographic MR head-up display (HUD) to enable future applications like real holographic head-mounted displays (HMD).



## Vision

REALHOLO will pave the way for main stream mixed reality environments by using micro mirror arrays to provide the best possible experience for the user without physiological side effects like eye fatigue, misjudgement, motion sickness and accommodation-vergence conflict, which are known from alternative and intermediate technologies such as stereoscopic 3D. The required natural visual experience can only be achieved with real holographic displays which have been principally demonstrated on the basis of available component technologies -both for

direct view (TFT-LCD) and projection (micro displays). REALHOLO will research and develop a new type of SLM, a micro-electro-mechanical system (MEMS) based reflective micro-display: a micro mirror array (MMA) component with a unique set of properties. The newly developed MEMS technology and MMA will be especially suited for real holographic MR displays but also for many other applications from high value to high volume will also benefit from the fast modulating MMA's for a precise phase modulation with a large number of pixels.



## Motivation

The REALHOLO project will take the next step towards developing commercially available real holographic projection displays usable in a wide range of applications from medical application head-up displays (HUD) to structured illumination and personal head-mounted displays (HMD). The REALHOLO consortium is constructed with the whole value chain represented for subsequent development of market-ready MR displays for the medical industry as well as other holographic and optical

solutions. The consortium enables a revolutionary next generation light modulating device for a variety of new and proprietary applications with unique features in natural 3D imaging, highly efficient structured illumination, irradiation and sensing. REALHOLO will focus on the ethical aspects of research and exploitation as well as dissemination and training activities for the industries and institutions ranging from optical, electronics, medical, agricultural and outer space.



## Mission & Objectives

To be able to develop an application-specific demonstration of the MMA in medical application use in real holographic MR head-up display HUD and the integration of the component in a holographic 2D projection demonstrator, enabling future applications like real holographic

head-mounted displays HMD. The aim is to develop an advanced micro-mirror-based piston type spatial light modulator SLM for real holographic 3D mixed reality MR display applications, structured illumination and sensing. REALHOLO will focus on the following objectives:

**Development of  
a novel MMA-  
based SLM**

**Demo of a  
MR display**

**Demo structured  
illumination  
application**

# Partners

The REALHOLO consortium consists of 7 partners from six different countries. The consortium is a well-balanced group consisting of three industrial partners, four SMEs and one research organization. This constellation enables the project to undertake challenges with a comprehensive talent pool including researchers, developers and users. The consortium brings together the necessary expertise to achieve the project objectives.



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**TECHNIKON**

TECHNIKON FORSCHUNGS-  
UND PLANUNGS-  
GESELLSCHAFT MBH  
Austria [Villach]

②

**Fraunhofer**  
IPMS

FRAUNHOFER GESELLSCHAFT  
ZUR FOERDERUNG DER ANGE-  
WANDTEN FORSCHUNG E.V.  
Germany [Dresden]

③

**nSillion**  
Industrial Research Group

NSILION  
Belgium [Ottignies-Louvain-  
la-Neuve]

④

**OmniChip**

OMNICHIP SPOLKA Z OGRAN-  
ICZONA  
ODPOWIEDZIALNOSCIA  
Warszawa [Poland]

⑤

**xfab**

X-FAB FRANCE  
France [Paris]

⑥

**REAL VIEW** Deep Perception™  
Live Holography

REAL VIEW IMAGING LTD  
Israel [Yokneam]

⑦

**HOLOEYE**

HOLOEYE PHOTONICS AG  
Germany [Berlin]

# Facts



## Budget

**€ 6 Million**  
100% EU-funded



## Consortium

**7 Partners**  
6 countries



## Duration

**60 Months**  
01/2021 - 12/2025

# Contact

## Technical Lead

### Peter Duerr

Fraunhofer IPMS  
Dresden  
Germany

[peter.duerr@ipms.fraunhofer.de](mailto:peter.duerr@ipms.fraunhofer.de)



## Project Coordinator

### Marion Habernig

Technikon Forschungs- und  
Planungsgesellschaft mbH  
Burgplatz 3a  
9500 Villach  
Austria

[coordination@realholo.eu](mailto:coordination@realholo.eu)



Find out more about this Project:  
<https://realholo.eu/>