



More convenience for passengers with innovation from HÜBNER and ZEISS

Holographic displays in windows open up new dimensions in public transport

Kassel / Jena, Germany (5 September 2024). The future of attractive public transport – with holography: In cooperation with ZEISS Microoptics, the HÜBNER Group is developing holographic display technology for window systems in trains and buses. These intelligent components offer passengers more comfort and convenience in their daily use of public transport. The HÜBNER Group will be presenting the innovative new technology at the InnoTrans 2024 in Berlin in Hall 1.2, Booth 120.

Holographic displays require less space and energy

*“With holographic optical elements in our window systems, passengers can receive important information directly in their field of vision,” says **Ingolf Cedra, Managing Director of the HÜBNER Group.** “In addition, holography offers significant advantages over conventional technologies such as OLED systems. Holographic displays are more economical, require less energy and also take up less space in public transport vehicles because no elaborate technology is required for the output devices – and all of this with excellent image resolution.”*

*“Transparent surfaces in vehicles are ideal for embedding holographic technology to provide interaction and information-delivery surfaces with a wide range of possible applications. There are basically no limits to what can be done here. Any light-conducting transparent surface – such as windows – can take on the tasks currently performed by displays and input devices – plus many other functions, thanks to our ‘Multifunctional Smart Glass’ technology,” explains **Dr. Viktor Schütz from ZEISS Microoptics.** These additional functions include sensor and detection applications, transparent cameras, projection in different image planes, and filter options, all of which can be integrated into window panes.*

Technology integrated directly into window systems

The technology for holographic applications is integrated directly into the window systems, making it possible to project content simply and flexibly. Information about the upcoming transport stops can be conveniently displayed, as can information about nearby shops or tourist highlights along the route.

The images shown in holographic displays in window systems are characterized by a high degree of transparency of over 90 percent. In contrast to conventional OLED systems, holographic display can show different content



on the same surface depending on the angle of view. In addition, holographic systems are temperature-resistant and significantly more robust. The direct integration of the projection surfaces into windowpanes provides better protection against acts of vandalism.

Photonics expertise for public transportation

The development of holographic displays for vehicle window systems represents the first time that the HÜBNER Group is bringing the expertise of its newest business unit Photonics to its core business area of public transport. As part of the cooperation, ZEISS Microoptics is using tunable lasers from HÜBNER Photonics for the production of the holographic optical elements. These optical elements are then being integrated into the window systems manufactured by HÜBNER.

Window systems with holographic displays at InnoTrans 2024

The HÜBNER Group will be presenting these window systems featuring holographic displays that have been developed in the cooperation with ZEISS Microoptics as a new innovation at InnoTrans 2024 in Berlin, Germany. The company will also be presenting a host of other new developments and innovations at Booth 120 in Hall 1.2, a broad range of offerings that help to make rail transport more sustainable, efficient and reliable. More information about the HÜBNER Group at InnoTrans 2024 is available online at: <https://www.hubner-group.com/innotrans/>

More information about “Multifunctional Smart Glass” technology from ZEISS Microoptics is available at: <https://www.zeiss.de/oem-solutions/produkte-loesungen/multifunktionales-smartes-glas/automotive.html>

Caption: The new holographic display technology makes it possible to show information on nearby tourist attractions or on arrival and departure times in the windows of trains and buses. Photo: ZEISS Microoptics

HÜBNER Group

Mobility. Materials. Photonics. | united by passion.

With its business divisions **Mobility Rail**, **Mobility Road**, **Material Solutions** and **Photonics**, the HÜBNER Group is a global system supplier for the mobility sector, for manufacturing, and for life sciences and research applications. HÜBNER is the worldwide leader in gangway systems for rail vehicles and buses as well as a supplier of chassis technology, cockpit display solutions and door sealing and safety profiles. The company is also an internationally recognized supplier of sophisticated solutions involving elastomers, insulation and composite materials. HÜBNER's business unit for laser technology is developing successfully, featuring applications for cancer diagnostics and spectroscopy, for example.

In 2023, the HÜBNER Group generated sales of approximately €472 million, with approximately 3,500 employees worldwide. In addition to its headquarters in Kassel, Germany, HÜBNER is present with more than 30 locations around the world.

www.hubner-group.com



About ZEISS | ZEISS Microoptics

Seeing beyond | Defining Glass

ZEISS is a leading global technology company in the field of optics and optoelectronics. In its four divisions – Semiconductor Manufacturing Technology, Industrial Quality & Research, Medical Technology and Consumer Markets – the ZEISS Group last year generated annual revenue of €10 billion.

ZEISS employs approximately 43,000 people in nearly 50 countries with approximately 30 production sites, 60 sales and service locations as well as 27 research and development locations (status: 30 September 2023). The company was founded in Jena in 1846 and has its headquarters in Oberkochen, Germany. ZEISS Microoptics is the leading provider of sophisticated micro-optical and holographic optical solutions for a wide range of applications in the automotive, home tech and consumer sectors. The “Multifunctional Smart Glass” technology enables, among other things, large-scale holographic projection systems, highly integrated cameras in transparent media and holographic lighting applications. ZEISS Microoptics is based in Jena and offers the complete value chain from optical design and mastering to holographic replication systems for series production.

www.zeiss.de

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