HÜBNER and ZEISS present holographic displays in Las Vegas

Innovative Window Technology at Consumer Electronics Show

Las Vegas (December 17, 2024). Despite the prevalence of mobile phone apps, passengers continue to prioritize real-time information displayed on public transportation for their convenience. At the Consumer Electronics Show (CES) in Las Vegas from January 7 to 10, 2025, the HÜBNER Group and ZEISS will present how holographic display technology can enhance passenger comfort and convenience.

Experience it live: Passenger information conveniently displayed

This innovative technology for window systems for trains and buses will be showcased at the ZEISS stand (LVCC, North Hall 10149) in Las Vegas. HÜBNER experts will be on hand to demonstrate to customers and other interested parties how passengers can receive information comfortably and directly in their field of vision with holographic optical elements.

"We are delighted to have the opportunity to present our innovative technology for window systems in public transportation in collaboration with our esteemed partner ZEISS at CES 2025, one of the most significant trade shows in North America," states **Ingolf Cedra, Managing Director of the HÜBNER Group**. *"Our aim is to encourage greater interest in the use of public transportation. We are confident that innovations such as holographic display technology for window systems will enhance comfort, the travel experience, and customer satisfaction."*

Despite cell phone apps, display media in buses and trains in demand

Providing passenger information is a crucial aspect of ensuring customer satisfaction in the public transportation sector. This is validated by a study conducted by the Technical University of Darmstadt and DB Regio AG, which examined the needs and information behavior of passengers in regional rail passenger transport. The study revealed that over 30% of respondents indicated that they primarily obtained information during their journey from media sources on the train. Almost 60 percent of respondents indicated support for providing additional information regarding disruptions via collective media on the train.

A study conducted by the Fraunhofer Institute for Experimental Software Engineering (IESE) reached comparable findings. Despite the availability of digital applications on cell phones, the majority of passengers anticipate real-time information within the vehicle regarding the route, position, and connection options.

Holography offers advantages for transportation operators

"Holographic display technology for window systems provides transit operators with significant advantages over conventional technologies such as OLED systems, enabling them to better serve passenger needs," explains **Ingolf Cedra**. *"Holographic displays can be retrofitted at any time, require less energy, and take up less space in the vehicle because no elaborate, space-consuming technology is needed. Furthermore, they offer high image resolution and brightness."*

The technology for holographic applications is integrated directly into the window systems, offering users a flexible and straightforward way to project content. Information regarding the next few stops can be displayed with the same ease as information about the nearest shops or tourist attractions along the route. Holographic displays are temperature-resistant and significantly more robust than traditional displays. The direct integration of the projection surfaces into the window panes provides enhanced protection against vandalism.

Long-term cooperation

"Thanks to our long-term collaboration with the HÜBNER Group in various areas, we have created a valuable win-win situation for both partners in terms of technology and applications," states **Dr. Viktor Schütz, Head of Partnership Management at ZEISS Microoptics.** *"Our multifunctional smart glass technology is ideally suited for use as an interaction and information surface in combination with the large transparent window areas in vehicles. By embedding our holographic technology, we can offer passengers in public transportation a completely new travel experience that has not existed in this form before, with virtually unlimited application possibilities."*

Photonics expertise for public transportation

The HÜBNER Group is leveraging the expertise of its youngest business unit, Photonics, in a novel way: by applying holographic displays in window systems to its core business area of public transportation. In a related development, ZEISS is utilizing tunable lasers from HÜBNER Photonics for the manufacture of holographic optical elements. The holographic optical elements are subsequently incorporated into HÜBNER window systems.

For more information on the Multifunctional Smart Glass technology from ZEISS, please refer to: https://www.zeiss.de/oem-solutions/produkte-loesungen/multifunktionales-smartes-glas/automotive.html

The study, entitled "What Passengers Want to Know – Insights from Two Customer Surveys on Collective Passenger Information in Regional Rail Transportation," is available in German at the following link: https://www.verkehr.tu-darmstadt.de/media/verkehr/fgvv/veroeffentlichungen_2/20210830_DNV_2021_7-8_Tu-Darmstadt_liz.pdf

The study, entitled “Mobility Transition 2030: The Public Transportation System of the Future is Flexible and Digitally Networked,” is available via the following link: https://www.iese.fraunhofer.de/en/media/press/pm-2022-02-23-mobilitaetswende2030.html

HÜBNER Group

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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, holography 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 approximately 30 locations around the world.

www.hubner-group.com

About ZEISS

ZEISS is an internationally leading technology enterprise operating in the fields of optics and optoelectronics. In the previous fiscal year, the ZEISS Group generated annual revenue around 11 billion euros in its four segments Semiconductor Manufacturing Technology, Industrial Quality & Research, Medical Technology and Consumer Markets (30 September 2024).
For its customers, ZEISS develops, produces and distributes highly innovative solutions for industrial metrology and quality assurance, microscopy solutions for the life sciences and materials research, and medical technology solutions for diagnostics and treatment in ophthalmology and microsurgery. The name ZEISS is also synonymous with the world's leading lithography optics, which are used by the chip industry to manufacture semiconductor components. There is global demand for trendsetting ZEISS brand products such as eyeglass lenses, camera lenses and binoculars.
With a portfolio aligned with future growth areas like digitalization, healthcare and Smart Production and a strong brand, ZEISS is shaping the future of technology and constantly advancing the world of optics and related fields with its solutions. The company's significant, sustainable investments in research and development lay the foundation for the success and continued expansion of ZEISS' technology and market leadership. ZEISS invests 15 percent of its revenue in research and development – this high level of expenditure has a long tradition at ZEISS and is also an investment in the future.
With over 46,000 employees, ZEISS is active globally in around 50 countries with more than 60 sales and service locations, around 40 research and development facilities, and 35 production facilities worldwide (30 September 2024). Founded in 1846 in Jena, the company is headquartered in Oberkochen, Germany. The Carl Zeiss Foundation, one of the largest foundations in Germany committed to the promotion of science, is the sole owner of the holding company, Carl Zeiss AG.
Further information at
www.zeiss.com

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