

Smartglasses Light Drive

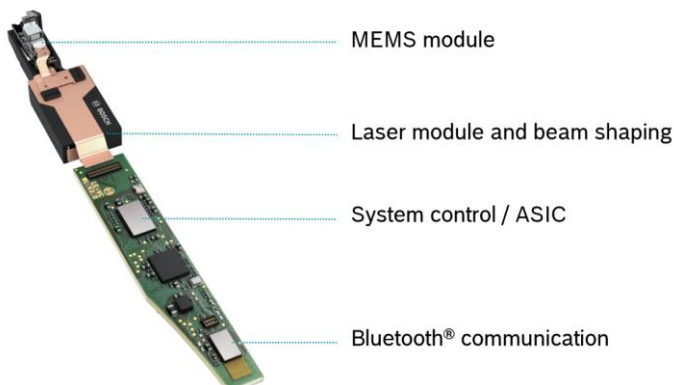
Your single-source, all-in-one, all-day solution

GENERAL DESCRIPTION

The Bosch Smartglasses Light Drive provides a complete, ready-to-use solution for smaller, lighter, more stylish smartglasses. The solution is also compatible with curved and corrective lenses – a significant market considering that worldwide six out of ten people use corrective lenses every day¹. This all-in-one smartglasses system delivers a highly intuitive user experience as a convenient display extension, providing an alternative to smartphone or smartwatch screen checking.

Bosch Sensortec’s solution is a turnkey light drive system for smartglasses, ready for integration. The light drive is composed of a technology stack of optical, computing, and sensor components. Bosch has core competencies in the subsystems of this technology stack. The optical systems include microelectromechanical system (MEMS) mirrors with ASIC controller that precisely direct a low-power beam of light to the user’s eye. This beam of light travels from the light drive, through the pathway of scanning micro-mirrors, across a finely tuned transparent holographic element (HOE) embedded in the glasses lens, finally painting real-time imagery directly onto the user’s retina. The visualized content is invisible to the outside world, entirely private to the user.

Sensing solutions developed by Bosch provide developers with the tools to connect the user with the world. Orientation, barometric pressure, and absolute heading sensors form the basis for environmental awareness in smartglasses. Wireless communications, e.g., low energy Bluetooth®, complete this energetically efficient system for a comfortable all-day sensing and display solution built into glasses.



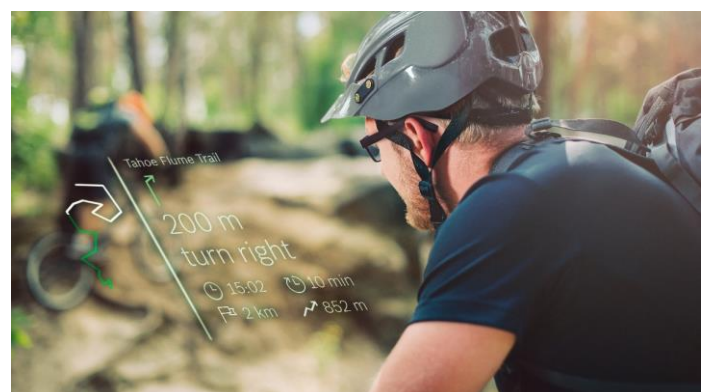
Picture source: Bosch Sensortec



Picture source: Bosch Sensortec

CLEAR BENEFITS

- ▶ Visually transparent: first all-day visual comfort for prescription glasses wearers – 6 in 10 people globally¹.
- ▶ Small size and low weight, for easy integration: < 10 grams, 30% less depth than other options.
- ▶ Compatible with the curved lenses of prescription glasses.
- ▶ Maximum privacy: no externally visible imagery and camera.
- ▶ Delivers high quality, bright images, even in direct sunlight.
- ▶ Turnkey light drive display solution, for rapid integration.
- ▶ Produced as a sole source end-to-end solution, in-house by Bosch Sensortec.



Picture source: ArturVerkhovetskiy / Depositphotos.com; Bosch Sensortec

Smartglasses Light Drive	
Light source/ colour resolution	RGB lasers, 24 bit full colour
Field of View (FoV)	15°
Resolution	150 line pairs
Frame rate	60 Hz
Optical output power	< 15 µW
Major sensors	BHI260, BMM150, BMP388
Connectivity	BLE
Weight of module	< 10 g
Operating time	14 h with 350 mAh battery
Eye safety	Laser class 1 acc. to DIN-EN 60825-1
Dimensions (L/H/W)	45-75 mm x 5-10 mm x 8 mm (depending on customer integration)

Unless otherwise specified, all values are typical values @ Tc=25 °C.

THREE PRODUCT TIERS FOR MASS PRODUCTION

Tier 1 For fastest time to market, Bosch Sensortec provides a Tier 1 turnkey light drive solution – designed and built in-house to ensure consistent high quality, reliability, and performance, while optimizing response time to changes in market and customer needs. Holographic lens support is included in Tier 1. Picture source: Bosch Sensortec

TARGET APPLICATIONS

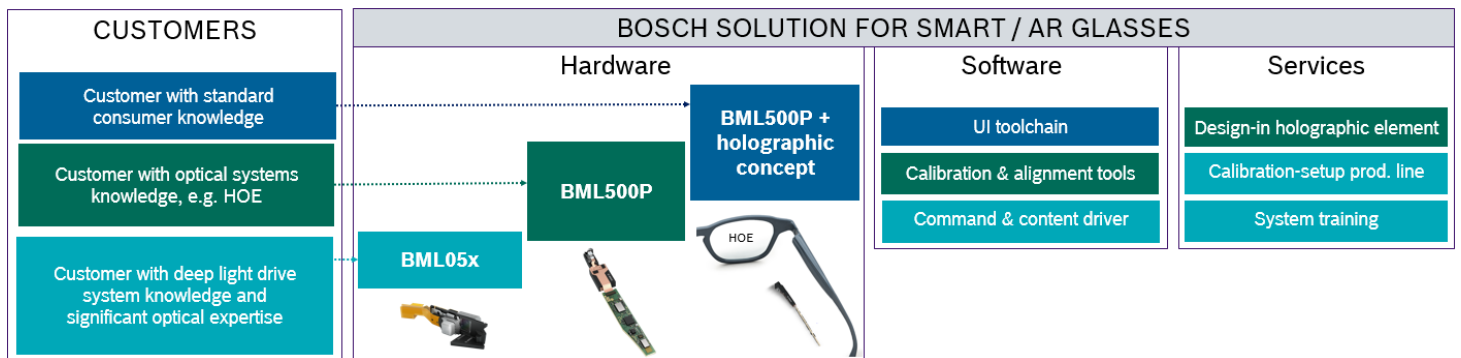
- ▶ **Navigation: Just Drive.** No distraction with transparent, hands free, real-time, heads-up navigation.
- ▶ **Notifications and messaging:** Free your hands and your mind, put down the phone. Stay focused, stay connected.
- ▶ **Notes for life:** Everyday note-based information like to-do and shopping checklists, recipes, or construction manuals are exceptionally convenient for hands-free working.

Tier 2 includes the complete light drive plus PCB as a standalone product, BML500P, which the customer integrates into their frame and holographic solution.

Tier 3 includes the MOEMS scanner (micro-optical MEMS element) as a standalone module. The customer provides all aspects of the PCB plus the holographic solution.

Integration assistance from Bosch is available in the form of software and services for technical integration that complement the ramp-up to mass production.

Bosch Sensortec is one of the world’s leading providers of innovative MEMS sensors and actuator solutions that improve people’s individual lifestyle and well-being.



¹Source: Reference: "How Many People in the World Wear Glasses?". URL: <https://www.reference.com/world-view/many-people-world-wear-glasses-e1268cfa00bdbd41> [05.11.2019].

Jan-Willem Bruggink (2013): "More than 6 in 10 people wear glasses or contact lenses". URL: <https://www.cbs.nl/en-gb/news/2013/38/more-than-6-in-10-people-wear-glasses-or-contact-lenses> [05.11.2019].

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