



## AT A GLANCE

Fraunhofer HHI's Single Photon Detection Module is an efficient, compact, and cost-effective solution specifically engineered for precise single photons detection in the optical C-band and O-band. It is designed to support advanced quantum communication technologies with state-of-the-art detection efficiency and low dark count rates.

### Specifications

- Compact footprint and competitive cost-efficiency
- Available as single-detector stand-alone module or OEM module with up to four synchronized detectors
- Single photon detection sensitivity covering the optical C-band and O-band
- State-of-the-art detection efficiency, dark count rates and timing jitter
- Continuous free-running mode operation.
- Variable deadtime to optimize performance
- Fiber-coupled input
- Highly software configurable

### Technical Background

As quantum technologies advance, the need for accurate single photon detection becomes critical across various applications, from secure communications to quantum computing. Fraunhofer HHI's module addresses these needs by providing a reliable and versatile detection system, essential for modern quantum systems.

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## Reference

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Funded with in the German BMBF  
QuNET-Initiative



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## Applications

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- Quantum Key Distribution (QKD)
- Quantum communication and computing systems
- Quantum sensing applications
- High Dynamic Range (HDR) time of flight measurement (OTDR, LIDAR)
- Fluorescence lifetime measurements
- Singlet oxygen measurement
- FLIM, FRET
- IC inspection

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## Benefits

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- Enhanced sensitivity for detecting single photons
- Versatile integration across various quantum technologies
- Optimized for low-noise and high-precision applications
- Robust performance over a wide range of conditions
- Supports the latest quantum-enhanced applications and communication protocols

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## Description

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The Single Photon Detection Module by Fraunhofer HHI is engineered for high precision in detecting individual photons, crucial for quantum communication and computing applications. With its compact and cost-efficient design, the module provides exceptional detection sensitivity in the optical C-band and O-band. It operates in a free-running mode, ensuring continuous, reliable performance. The module's flexible configuration options allow for integration as a single-detector or as a multi-detector OEM module, supporting diverse system requirements. Its fiber-coupled input ensures easy integration with existing optical systems, making it an ideal choice for cutting-edge quantum technology applications.



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