

TORCH proposed new detector for the LHCb facility at the Large Hadron Collider at CERN

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Photek is proud to have collaborated with CERN providing TORCH, a new detector for the LHCb facility at the large Hadron Collider, one of the four major experiments operating at the site. The TORCH collaboration consisted of CERN and the universities of Oxford and Bristol, along with Photek who were tasked with producing the novel PMT needed for the development. The requirements for the new PMT consisted of three main aims that were not widely available when the project began in 2012: A square format with an 88% packing density in one dimension, an operating lifetime capable of accumulating 5 C/cm² of anode charge without a significant drop in sensitivity, and a multi-anode readout capable of resolving < 100 µm position resolution for single photons in one dimension. It also had to achieve the < 100 ps single photon timing expected of PMTs based on microchannel plates (MCPs). The project was successfully achieved with 10 prototype PMTs being delivered to CERN in the summer of 2017. Photek developed a novel A.C. coupled anode that deliberately shares charge between neighbouring anode pads to interpolate the photon position, this design has since been patented. The PMT design has been adapted to form a more traditional D.C. anode version with a 64 x 64 readout pattern known as the MAPMT253, now commercially available.

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2021 marks the 50th anniversary in CERN'S Intersecting Storage Rings, the first hadron collider ever built

About Photek:

Photek is a specialist manufacturer and global supplier of vacuum based tubes and camera systems for photon detection. Their comprehensive range of products includes Image Intensifiers, Solar Blind Detectors, Photomultipliers, Streak Tubes and a range of associated electronics and Camera Systems. Photek has a unique ability to partner with their customers to design, manufacture and support complete, bespoke solutions for the most demanding photon detection and imaging requirements. They are recognized as a global leader in the design and manufacture of large area image intensifiers, ultra-fast photomultiplier tubes (PMTs), UV detectors and advanced photon counting camera systems. Photek products support specialist applications in; Physics (high energy, particle, nuclear), defense industries (threat warning), physical chemistry, bioluminescence, space science, material and biological inspection.

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