Development of Front-end Electronics and Readout for LHCb TORCH*

Physics’ Electronics and Mechanical Groups have designed the electronics and supporting mechanics and manufactured them in house. The Electronics Group developed tools and procedures to assemble custom ASICs.

The Electronics Group has developed a Gigabit-Ethernet-based readout and control system for the TORCH front-end. We have also developed firmware to integrate data with the TimePix Telescope for use in testbeams, as well as for lab tests.

Performance: measured 40ps time resolution under lab testing conditions.

A testbeam has been performed with the above system in Oct. 2012.

A preliminary analysis shows the coincident with TimePix telescope hits.

*TORCH is a time-of-flight detector concept using Cherenkov light to provide charged particle identification up to 10 GeV/c in LHCb. It is funded by ERC for prototype development between 2012 – 2015. It is a collaboration between the Universities of Bristol and Oxford and CERN.