

A new generation of arc detectors for the LHC and Linac4 high power RF system

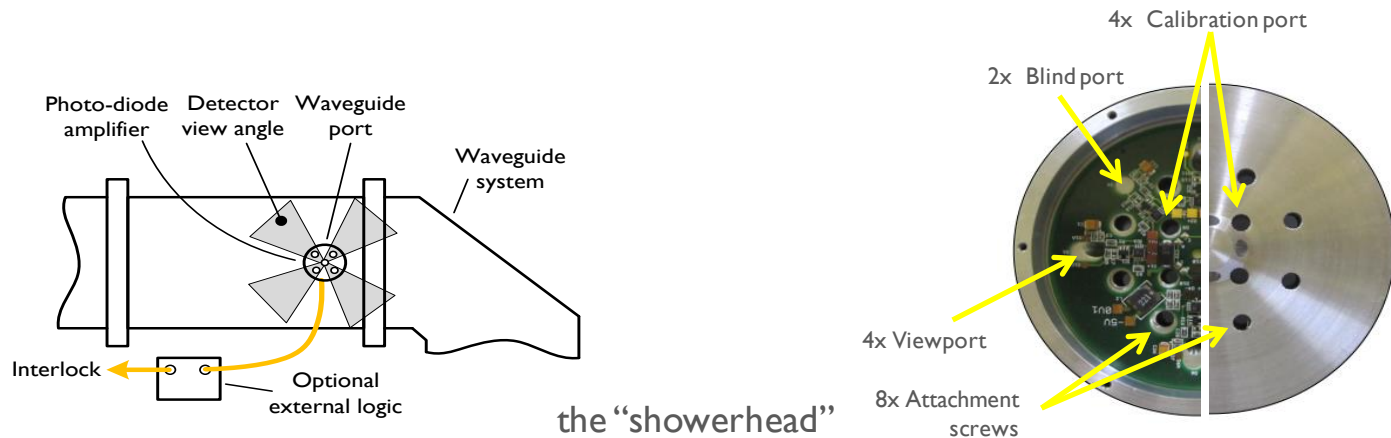
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framework

- The arc detectors are used to detect possible electrical discharges that can occur in high power distribution system
- They provide a fault output signal effecting a shutdown of the RF power system prior to damage very expensive equipment such as klystrons, circulators, high power couplers or even cavities
- LHC experience shows that some of the optical fibers, usually used in arc detectors, suffer from x-ray induced opacity
- The sensors may also exposed to the radiation produced by secondary showers coming from the high intensity beams which, if not treated properly, can cause frequent spurious trips
- The arc detector is a crucial equipment for RF systems. However, as the sales volume is rather small (e.g LHC \approx 120 pc, \approx 1kCHF/pc), the commercial offer is very limited

a top-performing device

- The new LHCAD was designed with a focus on performance and reliability. It introduces redundant detectors for critical environments (e.g. x-ray) and features adjustable detection algorithm based on a voting logic
- It is a fast and reliable low light level detection system ($<10 \mu\text{s}$, $< 10 \text{ Lux}$) which can be used in critical environments (high voltage, high power RF, x-rays)
- It is an easily adaptable, modular, programmable and remote controlled device



status & perspectives

- The new LHCAD has been operating in LHC
 - no false arc trips recorded in 2012
- Final validation proof-of-concept studies of the fibre-less version are still being worked on today
- Series production for Linac4 will soon start
- Frequent requests/interest from other research institutions or industries who would like to use them (ESRF,Thales, IPN, ESS,...)

How to respond to these requests??