

BLM *Beam Loss Monitor*

Largest dynamic range / lowest cost of any BLM



K. Wittenburg was awarded the Faraday Cup in 2000 for the design of the PIN-photodiode Beam Loss Monitor and its implementation at HERA. Bergoz Instrumentation was granted a license by DESY to use Wittenburg's original development.

This Beam Loss Monitor (BLM) is a new approach to measure and localize beam losses.

Very small size and low unit cost make it possible to monitor all locations where beam loss is predicted.

Vacuum quality around the storage ring can be measured based on BLM count rate.

Two PIN-photodiodes mounted face-to-face detect charged particles. Coincidence counting make it insensitive to synchrotron radiation photons.

Spurious count very low: < 1 count in 10 s

Up to 10 MHz counting: dynamic range > 10⁸

Recovers 100 ns after a hit

Choice of detector solid angle: Large PIN-diodes can be user installed

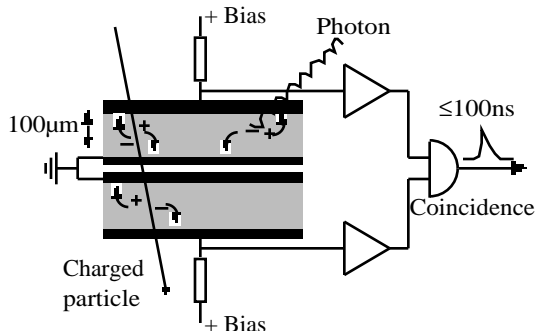
Output is a TTL compatible pulse: easy counting

Tested successfully up to 10⁸ Rads for hardness

Specifications

Single particle detection efficiency	> 30%
PIN-photodiode surface	7.34 mm ²
Spurious count rate	< 0.1 Hz
Maximum count rate	> 10 MHz
Count rate @ 6x10 ⁵ Rad/yr SR photons	≈ 100 Hz
Same with 3 cm lead shielding	≈ 1 Hz
Output	positive TTL 50Ω
Cable driving capability	> 200m RG213
Output female connector	10-pin HE10
Power supply	+ 5V 170 mA - 5V 80 mA + 24V 1 mA
Size	69 x 34 x 18 mm

Operating principle



The charged particle crosses both PIN-diodes, causing a coincidence. Synchrotron radiation photons, if stopped by either PIN-diode, do not cause a coincidence



Ordering code

BLM Beam Loss Monitor

Distributors

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Instrumentation