

# TIMING AND HIGH RATE CAPABLE (THRAC) GAS DETECTOR

## AREA OF EXPERTISE

- Detectors.

## IP STATUS

- Patent filed.

## TECHNOLOGY READINESS LEVEL

- Proof-of-concept.

## CONTACT

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[kt.cern](http://kt.cern)

*This technology merges the state of the art of Micro Pattern Gas Detector (MPGD) and Resistive Plate Chamber (RPC) technologies in to provide a new class of detectors able to provide high rate capability, exceeding  $1\text{MHz}/\text{cm}^2$ , and simultaneously providing sub nanosecond time resolution. Two classes of solutions are found.*

*One exploits new materials and techniques in MPGDs to improve by orders of magnitude the rate capability of RPCs, presently limited to  $O(10)\text{kHz}/\text{cm}^2$  due to bulk resistivity of the “resistive plates”.*

*Another class consists of a very recent micro pattern, the Resistive WELL, where the electrodes for amplification stage are both resistive, thereby determining the full transparency of the produced signals from a series of consecutive amplification stages, yielding a much improved time resolution, which is presently limited to 3-5 ns, thanks to the competing processes on each WELL layer.*

## FEATURES

- Cost-effective and easy to build via standard industrial techniques.
- The use in portable instruments could be limited by the use of gas.

## APPLICATIONS

- Triggering and Tracking Devices.
- Medical Imaging and digital radiography.
- Fast response Beam Monitoring.
- Small Animal PET scanning.
- Plasma Diagnostics.

