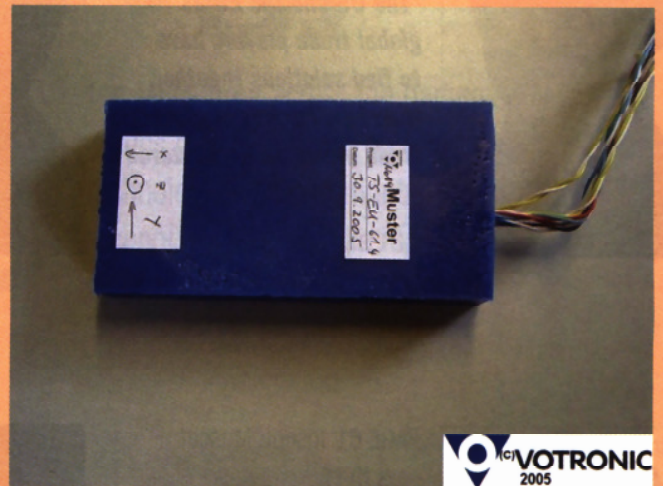


## Reliable Eyes for Air Traffic Controllers at Airports



### Introduction

Traffic volumes at European airports continue to increase, doubling every 12 years. However, the size of airports cannot be increased at the same rate and new airports will not be developed in time to meet this challenge. Therefore, airports are increasingly recognized as important constraints on aviation capacity. These constraints are particularly acute under adverse weather conditions, which dictate less efficient ground movement procedures to maintain safety and can result in delays that propagate through the regional air traffic system and beyond. Technologies that allow Air Traffic Controllers to determine the exact position of each aircraft within the runway and taxiway system at all times, even under reduced visibility conditions, can significantly contribute to avoiding these bottlenecks.

### Approach

ISMAEL ([www.ismael-project.net](http://www.ismael-project.net)), a European R&D project funded within the 6th Framework Programme of the EC, targets these issues using an innovative system based on magnetic sensing technology. ISMAEL's basic principle is detection of small changes of the earth's magnetic field resulting from its interaction with ferro-magnetic objects, such as aircraft components or vehicle engines. The earth's field acts as a biasing magnet, result-

ing in a magnetic signature (fingerprint) from these ferromagnetic objects. This property can be used to provide reliable position, velocity and direction information unaffected by weather conditions, shadowing or reflection effects. ISMAEL does not rely on secondary transponders or other on-board equipment.

### Application

ISMAEL can support air traffic controllers in carrying out airport surveillance. The most well-established technique for airport surveillance is the surface movement radar, which may be augmented by multi-lateration or secondary radar systems. However, these systems feature some weak points resulting from shadowing/reflection effects and the dependence on equipment fitted to the vehicles. In addition, equipping small and medium-sized airports with radar or multi-lateration is often too expensive, requiring these airports to reduce or stop operation under reduced visibility conditions. ISMAEL may serve as "gap filler" for areas where existing surveillance techniques are not effective, or as a low-cost alternative to radar or multi-lateration at smaller airports. The solution is also very appropriate for the prevention of runway incursions. Using appropriately located magnetic sensors, each runway access point can be monitored for intruding vehicles. Finally, ISMAEL also offers

an easy way to provide reliable gate occupancy information.

### ISMAEL at IST 2006

ISMAEL will be presented at IST 2006 in Stand 4G within the Health, Safety & Security zone. Visitors will be able to learn more about the system and the results of the ongoing prototype tests at Thessaloniki and Frankfurt airports. To depict the operational set-up of these trials a model of Frankfurt airport with ISMAEL sensors will be presented to demonstrate the functioning of the system. ISMAEL is also co-initiator of the Airport Safety Cluster (<http://www.airport-safety-cluster.com>). A networking session focusing on airport safety will take place during the IST 2006 in Room 217 from 16:00-17:30 on November 22, at which the cluster and its objectives will be presented briefly.

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