



Plextek in Airports



“I let the contract to Plextek because I had total confidence that they would complete the MMIC design to specification and deliver on time.”

Patrick Beasley, Principal Radar Designer, QinetiQ Airport Radar



Introduction

With product design and manufacture conducted under the strictest confidence, Plextek is the partner who understands your security needs, and can deliver you high quality innovative solutions.

About Plextek

We have a 30 year history of providing engineering solutions to Global organisations. The Plextek Group of companies has supported over a dozen airports over this period. In this brochure, you will find some examples of projects where Plextek has been pushing the boundaries of engineering.

Through extensive research, we understand the key security challenges in aviation and can generate both ideas and solutions through to delivery. This gives you the confidence that a solution is delivered to the assured level of security, performance, resilience and ergonomics that you need.

We are a consultancy that works with clients to achieve results based on their bespoke project requirements and our engineering experience, supported by our library of IP for key technology elements.

Contents

Surveillance Radar for Comprehensive Threat Detection	4
Millimetre-Wave Radar for Foreign Object Detection	5
FOD Case Study: Incheon Airport	6
Hidden Threats Identification	7
Smart Airport Lighting	8
Smart Parking for Airports	9



Surveillance Radar for Comprehensive Threat Detection

There is a continued and increasing threat to airport security from human and vehicle intrusion.

It is necessary to identify moving objects that could be a potential threat to your site.

We recently developed an e-scan ground surveillance radar for Blighter Surveillance Systems. Reporting on highly accurate positional information, our device was able to detect the presence of moving personnel and vehicles at a range of several kilometres.

The technology is capable of simultaneous target detection for both close and long range distances, scanning hill tops and valleys without manually tilting the radar. We also incorporated low radio transmission power to allow for safe human operation.

Significantly improve the security of your airfield or airport with a surveillance radar that can be customised and tailored to your specific needs.



Benefits:

- Person & Vehicle
- Simultaneous Target Detection
- Safe Human
- Operation Reduced Manufacturing Costs

“We needed a highly reliable, maintenance-free system that could provide intensive 24-hour surveillance of key areas of the airport in all weather and light conditions.”

Andy Cowen

BAA's Security Development Manager on behalf of London Heathrow Airport

Millimetre-Wave Radar for Foreign Object Detection

Foreign Object Debris (FOD) found on runways and taxiways costs airlines and air forces millions of pounds each year from the damage that it causes to aircraft.

Benefits:

- Situational Awareness
- Low SWaP
- High Accuracy
- Very Small Object Detection

Our revolutionary Millimetre-Wave Radar is particularly exciting.

We believe it is market-leading due to its capability to detect very small foreign objects from a range of 500m.

Utilised for application on airport runways, it has greatly enhanced situational awareness for detecting foreign objects to a very small size at short range, increasing safety and security.

The technology was inherently designed to be low size, weight and power to reduce deployment cost and time to market, and delivered maximum performance with 100% target illumination even at the point of early stage development.



FOD Case Study: Incheon Airport

In partnership with a Korean Consortium, we developed new radar sensors for an airport which are capable of detecting very small Foreign Objects (FOD).

Radar Sensor Capabilities

- M5 nut & bolt @ 400m (2cm object)
- High- resolution radar (7.5cm range resolution)
- Advanced detection algorithms
- Self-learning of environment
- Geo-masking
- Ethernet - Low data bandwidth (Kb/s)
- Real-time user update (HMI)
- Impressive Imaging capabilities
- All weather operation



Mobile Sensor

- Installation on a moving vehicle
- Checks runway between aircraft take off and landings

For use on lower traffic airfield applications

Stationary Sensor

- Multiple sensors are installed on towers alongside the runway
- Provides continuous FOD detection
- For use in high-traffic airfield applications



Hidden Threats Identification

A limitation of current microwave imaging systems is that they only detect shapes and cannot identify materials. It is, however, possible to perform material identification at these frequencies, in a similar way to optical spectroscopy.

Hidden Materials Identification for enhanced airport security

Existing airport imaging systems are limited to shapes identification, whereas UWB microwave frequencies are adopted for materials identification with spectroscopy. Our customers have enjoyed successful permittivity measurements across diverse materials, with a system that discriminates between threat (explosive) and non-threat materials.

Our system reduces false alarm rates and increases airport efficiencies.

It's fully compliant with current operational processes and operates with current microwave images systems as a total solution.

Benefits:

- Hidden Materials Identification
- Explosive Targets
- Solid & Liquids Identification
- False Alarm Reduction





Smart Airport Lighting

Owing to the rising cost of energy, the monitoring and control of lighting has become increasingly common.

Plextek developed a system for a UK street lighting client that allows lights to be 'trimmed and dimmed'. Connected lights can be turned on and off accurately depending on the day of the year or be dimmed depending on ambient light conditions. The system allows groups of lights to be independently controlled. Applied to airports for example, lights near a runway could be brighter or on for longer to improve safety, whereas lights around car parks can be dimmed according to use. Likewise, lights can be turned on to deter crime or illuminate an incident attended by the emergency services.

Our client for this project is now a UK market leader in street light management with over one million street light units deployed.

Large energy cost savings are already being shown.



Smart Parking for Airports

Finding a parking space quickly and efficiently in a busy airport can be a logistical nightmare. It could cause unnecessary congestion and in a worst case scenario passengers can miss their flights.

Knowing when an on-street parking space is free, then notifying drivers of the available slot, was the challenge that Plextek was set by a client deploying a parking system.

We developed a magnetometer as the primary sensing technique and an optional light sensor combined with algorithm development, threshold manipulation and extensive testing.



Plextek

Exceptional technology
to positively impact the future

Get in touch to find out how Plextek can help you
to deliver your next innovation in technology.

email

hello@plextek.com | +44 (0) 1799 533200 | twitter: @plextek | www.plextek.com
Plextek Services Limited, The Plextek Building, London Road, Great Chesterford, Saffron Walden, CB10 1NY, United Kingdom