

## Enhancing radar performance

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Roke Manor Research provides defence and security customers with tailored solutions to improve the technical performance of radar sensors.

Roke is developing sophisticated signal processing techniques and advanced RF circuits to reduce unwanted signal distortion. These improve the detection performance of modern radar systems in highly cluttered environments and jamming scenarios.



Datasheet



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## Dynamic range enhancement

Both military and commercial sensor systems are limited by the performance (or dynamic range) of the hardware used to implement them. Roke's research, for the Electro-Magnetic Remote Sensing (EMRS) Defence Technology Centre (DTC)\*, is developing new methods and techniques that provide users with the ability to:

- Use sensitive Electronic Surveillance Measures (ESM) and radio communications receivers close to transmitters operating in the same bands
- Use radars in jamming, urban and coastal clutter environments without loss of sensitivity.

## Receiver techniques found to improve radar sensor performance include:

- Sophisticated digital linearisation using signal processing techniques
- RF mixer linearisation using frequency retranslation techniques.

## Applications for the researched techniques include:

- Advanced Multi-Function Radar (MFR)
- Phase Array Radar (PAR)
- Electronic Surveillance Measures (ESM)
- Advanced bistatic radar
- Passive and active microwave/millimetre-wave imagers and sensors
- Cellular systems and mobile telephone base stations

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\*The Electro-Magnetic Remote Sensing (EMRS) Defence Technology Centre (DTC) will deploy £30 million of research funding over the six-year period from April 2003 to April 2009. The EMRS DTC is the second DTC to be launched by the UK Ministry of Defence. The DTC is managed by a consortium comprising SELEX Sensors & Airborne Systems Ltd, Thales UK Ltd, Roke Manor Research Ltd and Filtronic Plc.



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## Features & benefits

Roke's receiver linearisation techniques enable a reduction in receiver complexity and power consumption at the receiver design stage. They also have the potential to be retro fitted to existing receivers in order to enhance performance (or dynamic range).

The performance of these techniques is being systematically assessed and analysed during the EMRS DTC research programme. Practical experiments using military radar hardware have already shown the techniques offer valuable improvements. These include:

- Relatively simple, yet efficient and flexible, ways to mitigate many types of distortion in typical receivers
- Improving the performance of systems while reducing system costs and complexity.

## Why Roke?

Roke's specialists work on defence, security and commercial projects spanning across the complete spectrum of radar and microwave imaging and sensing technologies.

We have developed concept demonstrators, custom designs, prototypes and designs for manufacture to meet specific and demanding customer requirements.

For further information on how we can improve your radar and microwave imaging sensor performance call Brett Harker.

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