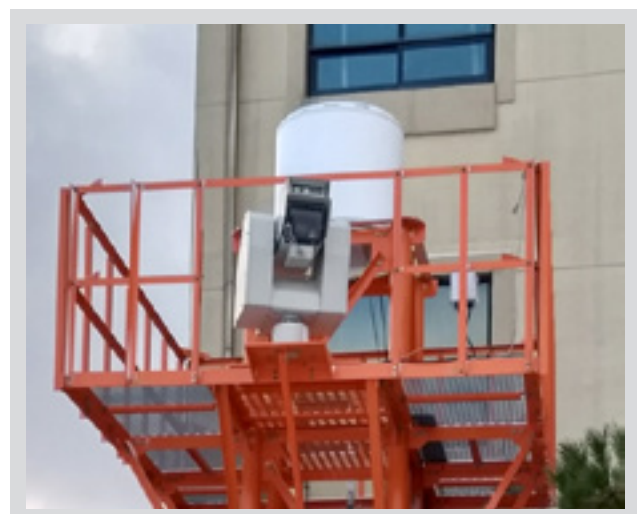


Millimetre-Wave Radar for Runway Foreign Object Detection

Foreign Object Debris (FOD) on runways and taxiways costs airlines and air forces £millions each year in damage caused to aircraft. The most notorious incident of this was the Paris Concorde accident in 2000. Threats from FOD can consist of very small items where early detection is paramount, particularly on runways during take-off and landing in order that risk to passenger safety is mitigated.



Stationary FOD sensor developed for Incheon Airport, Korea.

Our revolutionary Millimetre-Wave Radar

Plextek has designed, developed and deployed a solution that provides an effective platform for countering this threat. We believe the Plextek solution is market-leading due to its capability to detect very small foreign objects at a range of +400m with very low false alarm rates.

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.

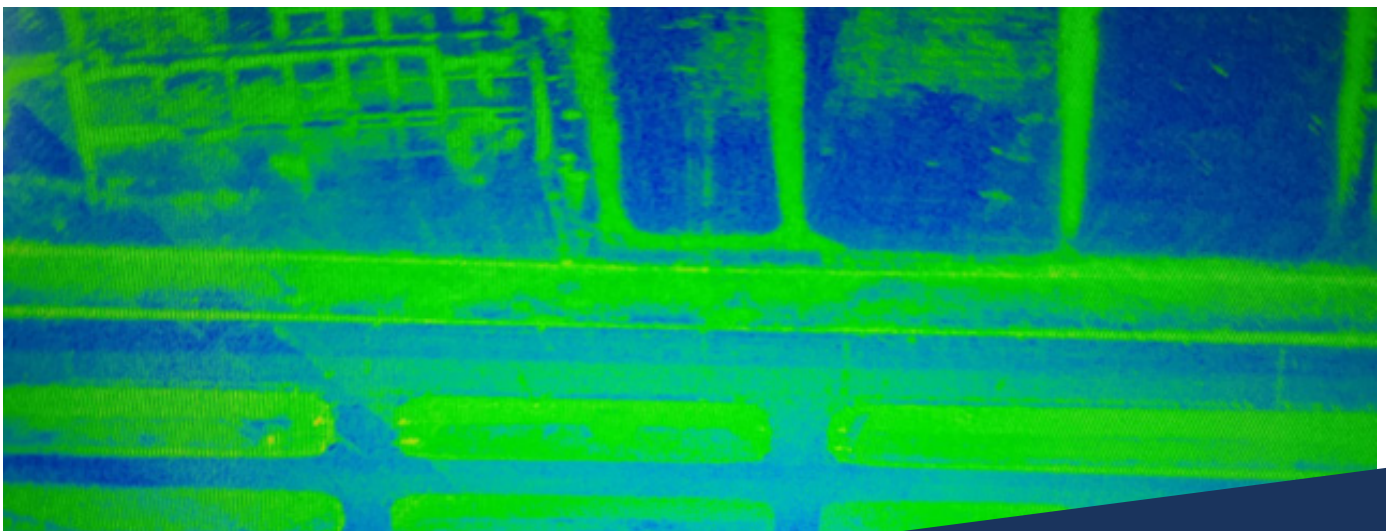
The technology was inherently designed to be low size, weight and power to reduce deployment cost and time to market, and delivered maximum performance with 100% target illumination even at the point of early stage development.

Features:

1. SITUATIONAL AWARENESS
2. LOW SWAP
3. HIGH ACCURACY
4. VERY SMALL OBJECT DETECTION

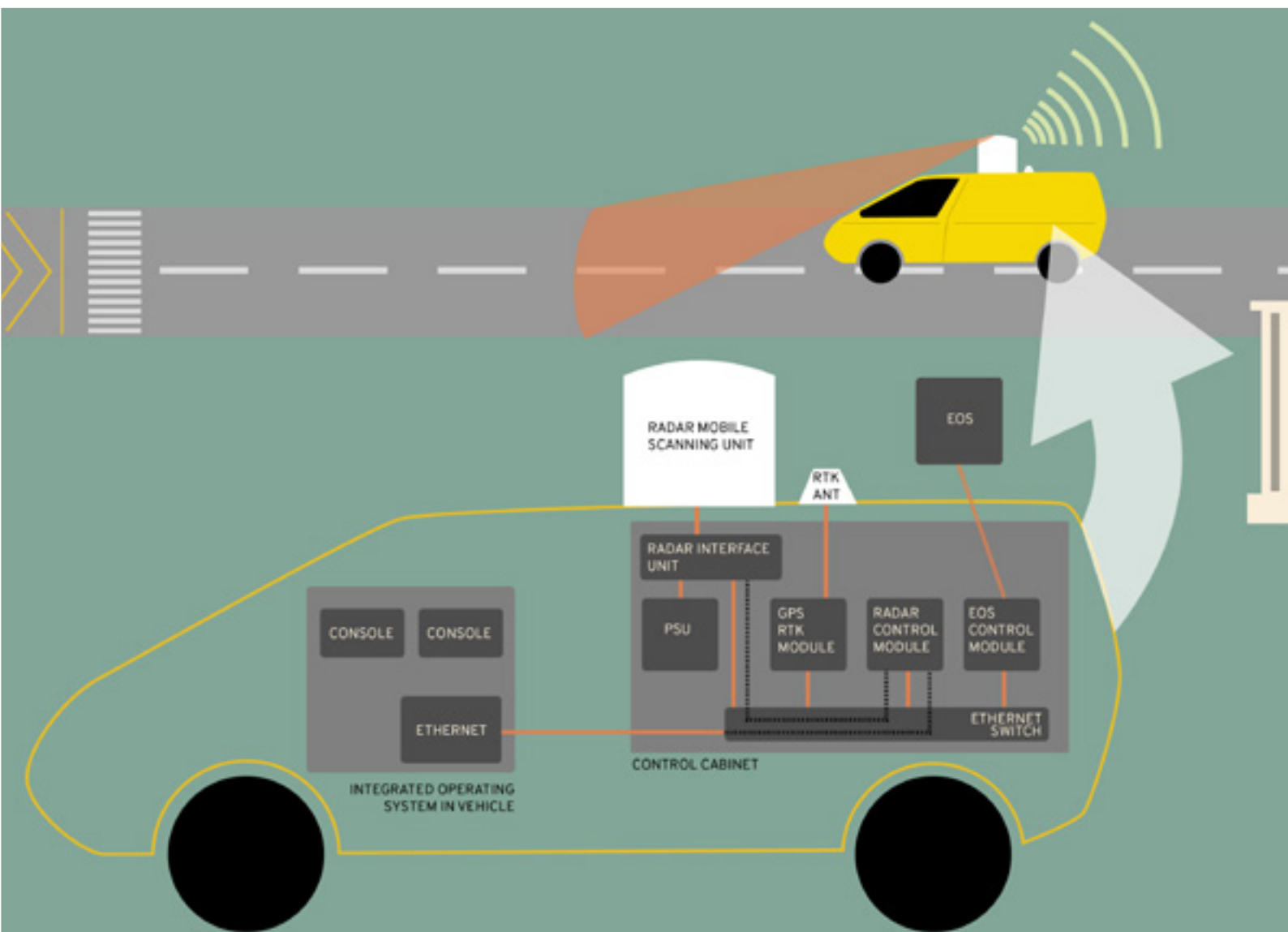
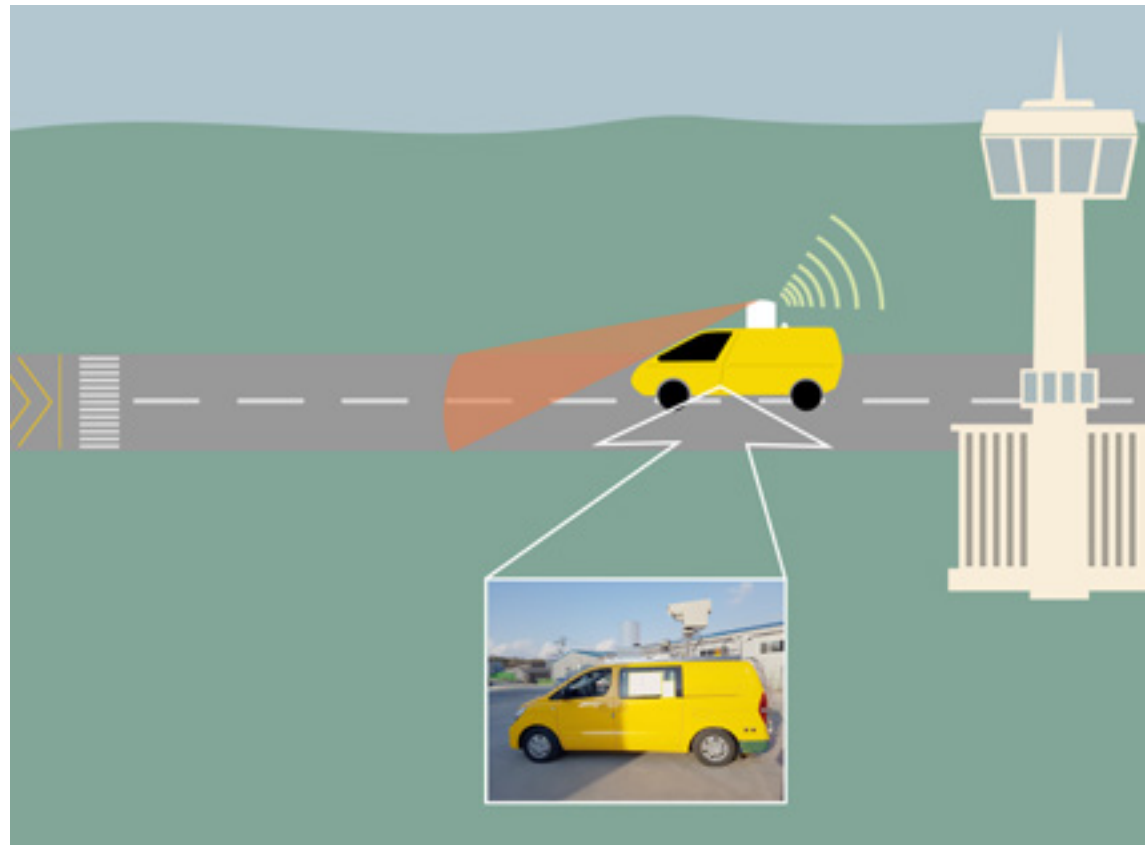
Benefits:

1. INCREASED PASSENGER SAFETY
2. GREATLY REDUCED COSTS
3. ENHANCED OPERATIONAL EFFICIENCIES
4. GREATER SECURITY

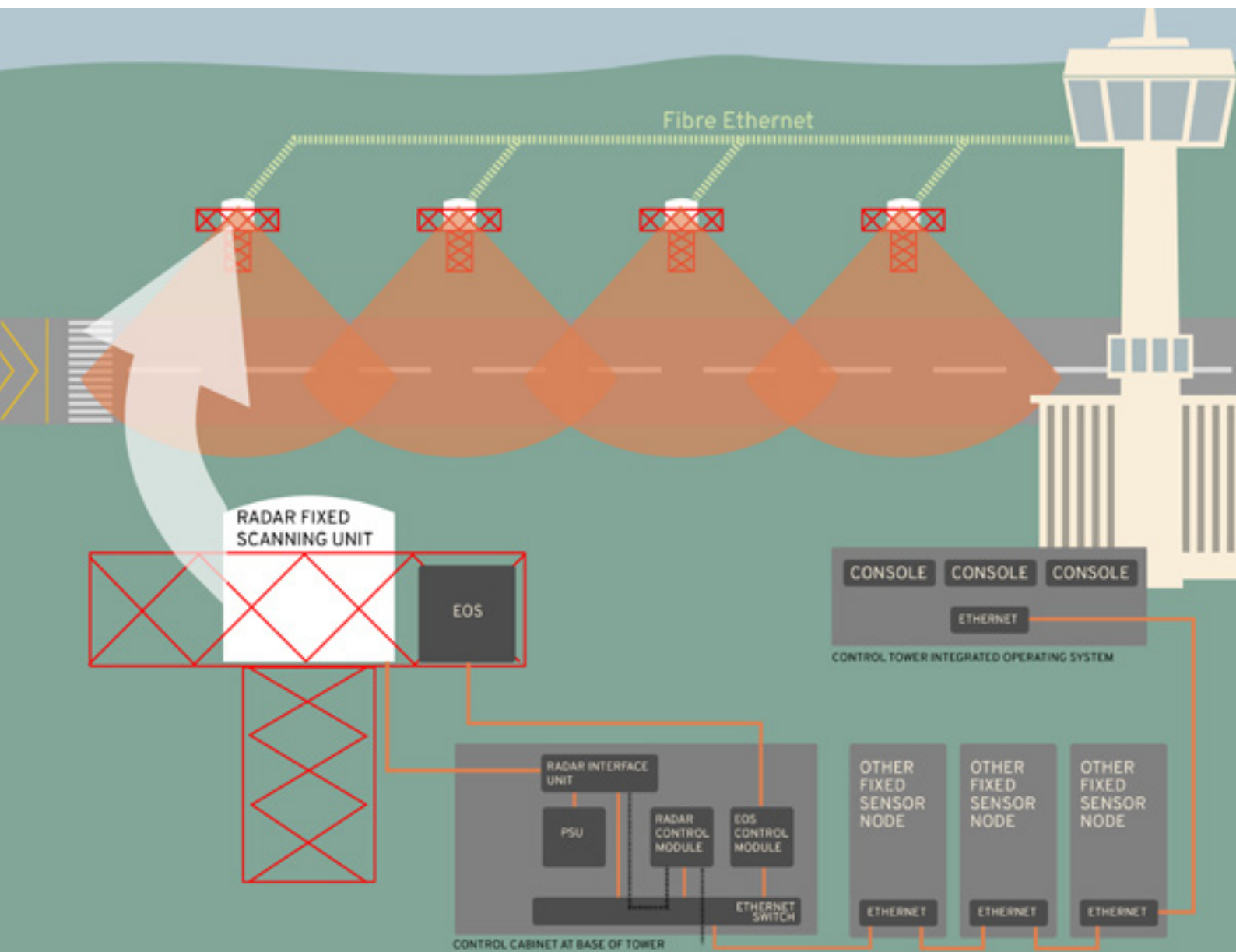
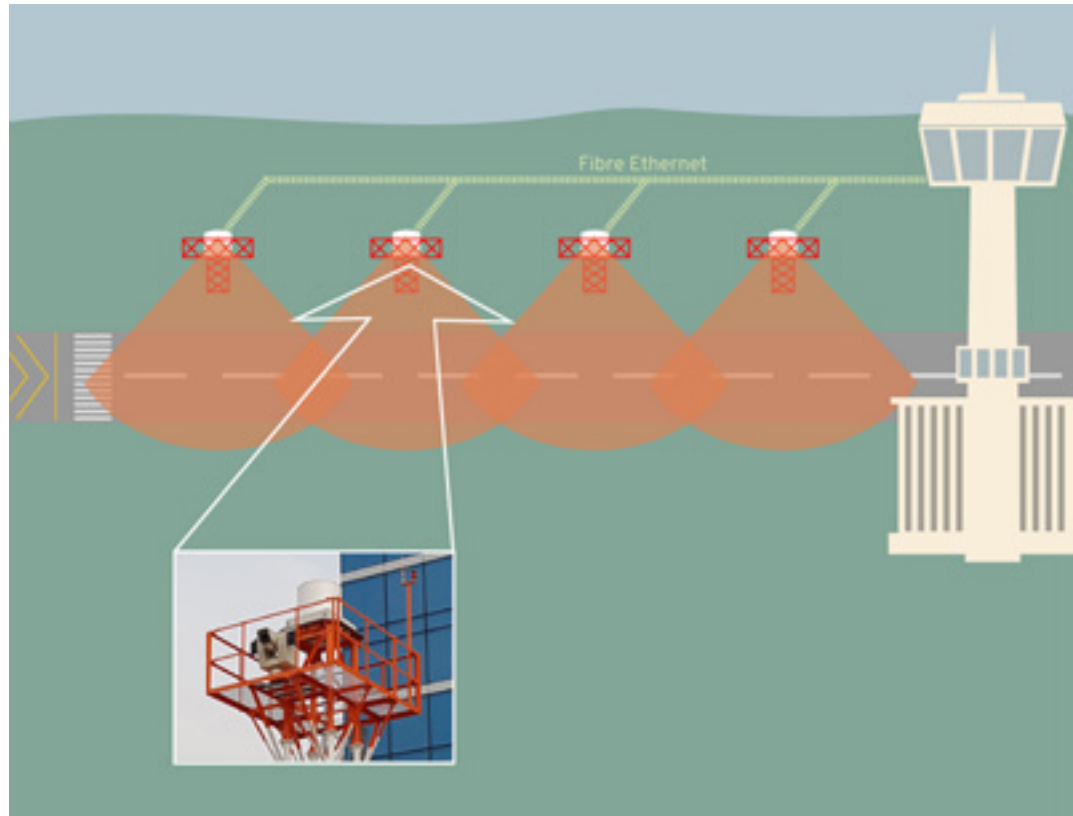


Technical Specification

Criteria	Fixed	Mobile
General feature	Ability to detect stone, metal, plastic, rubber, glass and organic matter so that runway and taxiway surfaces can be kept free of FOD objects	
Display arrangements	Operator console displays can be in multiple locations (minimum 04). A customised system will be deployed to enable data and images to be shared between the control tower, ground control and system operators and standby in real time	
Sensor type	Millimeter wave radar integrated with optical day-night IR camera	
Detection Coverage	Range: 400M FOV: 180°	
Number of sensors	As required to meet runway requirements. Typical 4km runway would require 6 sensors	
Location Accuracy	Range: 1 metre	Range: 1 metre
Minimum detection size	-30dBm ² (2.5cm object)	-30dBm ² (2.5cm object)
Detection Probability	>95%	>95%
Detection Time	Within 1 minute	Real time
Detection Range	>400m	100m
Field of View	180 deg	70 deg
Operating conditions	All weather (mist, rain, sunshine, dust, fog, etc), day and night	
Alarm types	Audio and visual	
Video playback	Continuous and event recording	
Operating Frequency	78-81GHz	78-81GHz
Operating Temperature	-32 to 50C	
IP Rating	IP 65	
Brand, model, country of origin	Plextek's FOD radar is design & developed in the United Kingdom	
Assembling/Manufacturing Country and Date	The Plextek FOD radar and other items will be bespoke manufactured to order	
User Airport Name	Incheon Airport, South Korea	
Rejection Capability	Vehicle, Aircraft	
Surveillance	Continuous Operation	
Authorization/Approval	ICAS/FAA	



Fixed Solution



Incheon Case Study

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

- Radar Sensor Capabilities: M5 nut & bolt @ 400m (2.5cm 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)
- All weather operation

STATIONARY SENSOR

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

MOBILE SENSOR

- Installation on a moving vehicle
- Checks runway between aircraft take off and landings
- For use on lower traffic airfield application

Plextek works with its customers to develop customised solutions that efficiently meet the conditions of business critical projects. Our core IP is deployed within our solutions to ensure customers get the best of modern engineering to deliver results.

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