



COMPANY PROFILE

# Robin Radar Systems

**robin**  
radar systems

# 30 Years of Scientific Research



## A YOUNG COMPANY WITH A RICH HISTORY

Robin Radar Systems was founded in 2010, but its history goes back well into the 1980s, when ROBIN started as a project within the renowned Dutch Institute for Applied Scientific Research (TNO).

## RADAR OBSERVATION OF BIRD INTENSITY

The project name was an acronym for Radar Observation of Bird Intensity. Its goal was to prevent collisions between birds and aircraft from the Royal Netherlands Air Force. In conjunction with the FlySafe initiative of the European Space Agency (ESA), advanced software algorithms were developed to process raw radar images from air defence radars to visualise bird intensity.

In 2010, high-tech pioneer and current Robin CEO, Siete Hamminga, spun out the technology to make it commercially available, transforming Robin into the global company we are today.

## YOU'RE WELCOME

But don't just take it from us, come and see for yourself. We would be more than happy to welcome you in our inspiring headquarters in The Hague, the Netherlands.



# From Birds to Drones to Wind Farms

## SPECIALISTS IN SMALL OBJECT TRACKING

As a specialist in small objects which traditional radar can't see, Robin is in a unique position, to detect, track and classify not only birds but also drones.

## NUMBER ONE IN DRONE DETECTION

In 2014 the Dutch government challenged industry leaders to come up with solutions against small drones. Thirty-eight companies responded. Robin Radar became number 1 and developed a purpose-built drone detection radar, first operational in 2015 at the G7 Summit in Berlin. Since then Robin has protected dignitaries at several G7 and G20 Summits, critical infrastructure and events against rogue drones. Currently, with ELVIRA® and IRIS®, we offer some of the best performing counter-drone radars in the world, in addition to our 3D Fixed, 3D Flex, and MAX® systems, primarily used for bird detection.

## BIRDS & BATS FOR WIND & ENVIRONMENTAL

Besides Civil and Military Aviation and Drone Detection, Robin Radar is also active in the Wind & Energy sector, where we protect birds by providing precise, scientific data on bird activity both pre- and post- construction of wind farms and turning off turbines during mass migration events.

# Company Structure



## INDEPENDANT WITH STRONG BACKING

Robin Radar Systems is an independent company with strong financial backing from investors such as the Dutch Mainport Innovation Fund (consisting of, a.o. KLM Royal Dutch Airlines, Delft University of Technology and Schiphol Airport), Inkef Capital (ABP pension fund) and Rabobank.

## FAST-GROWING & AWARD-WINNING

As one of the fastest growing high-tech companies in the Netherlands, we received multiple Deloitte Technology Fast 50 awards. We also set-up a joint venture in China, Sinorobin. In 2021, Robin acquired Scarecrow Group, adding world-class logging software and nature-inspired bird dispersal products to its portfolio. The heart of Robin Radar Systems is and will always be formed by its R&D department. Robin operates an in-house production facility and provides dedicated account management, project management, a Product Expert Centre and operational service and support for customers around the globe.

## LEADING THE WAY

Our experienced Management Team is leading the way for a staff of 70+ people, mainly working from The Netherlands.

# Company Values



## WE MAKE HARD WORK FUN

At Robin, we care about how we achieve our goals. We want to be an example company, an inspiration to others, balancing technology leadership with providing a Great Place to Work® as well as being profitable. So yes, our employees enjoy working for us. We want this, not just because life is short, but because it creates successful companies and is essential in attracting the best talent.

## TRANSPARANCY, TRUST, RESPONSIBILITY

At Robin, we make hard work fun. We believe in responsibility and self-managing professionals. We have as few rules as possible (although we are ISO 9001 and ISO 27001 certified), and we trust each other, completely. That's why our core values - transparency, trust and responsibility - resonate in everything we do.



# Global Customer Base



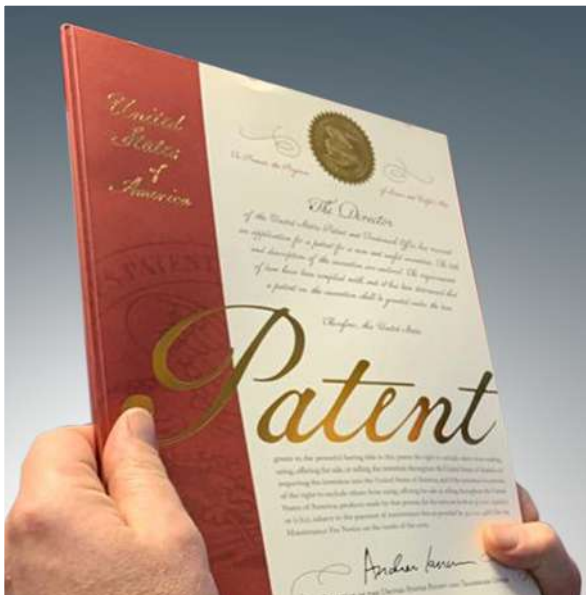
## KEY CUSTOMERS

The Royal Netherlands Air Force was our first customer back in the eighties, and remains one of our key customers today as we protect all its air bases from both birds and drones.

On the Civil Aviation side customers include Amsterdam Schiphol, Eindhoven and Rotterdam-The Hague Airport (Netherlands), Hatay Airport (Turkey), London Heathrow (UK), Berlin Brandenburg and Frankfurt Airport (Germany), Copenhagen Kastrup Airport (Denmark) and Dalian International Airport (China). At Robin, we are pleased to achieve leadership in our global niche markets. By focusing on customer success, we turn customers into lifelong ambassadors.

## KEY PARTNERS

Partnerships have also been established with a.o., the British Royal Air Force, defence & security integrators such as Aselsan (Turkey), Diehl Defence (Germany), Elettronica Group (Italy), ESG (Germany), Saab (Sweden), Operational Solutions (UK), TRD (Singapore) and Boeing and Moog (USA), on- and offshore wind farm projects such as Gemini (Netherlands), Kavarna (Bulgaria) and Tahkoluoto (Finland) and energy suppliers, research agencies, government institutions and event organisers all around the world.



# Technology Leadership

## PATENTED

Robin Radar Systems is the front runner in the field of radar detection, tracking, and classification of small airborne targets. Many of our technologies are patented. And although we're proud of our leading position, we don't take it for granted.

## INNOVATIVE

Listed in the top three most innovative Dutch companies, we continue to research, develop, manufacture, and above all, innovate. Every day. Because preventing birds striking aircraft is an on-going challenge, and so is protecting airports against drone intrusions as well as mitigating the environmental impact of wind farms. But mostly because only by being truly innovative we can deliver a continuous flow of cutting-edge new capabilities to customers.

## SATISFIED CUSTOMERS

Robin's fast-growing customer portfolio and high year-on-year customer satisfaction score (NPS: 70% of our customers give a 9 or 10 out of 10) are proof of our sustainable added value.



# Our Markets

**robin**  
radar systems

## CIVIL AVIATION

Bird Hazard Management at Airports. You know there's a risk - but how can you measure it accurately? Bird radar gives you the facts. Bird hazard management and preventing birds striking aircraft is an on-going challenge. Our bird radar, dispersal and logging solutions provide all you need to comply with safety regulations and best practices and avoid expensive claims. On top of that, drones are now a common security and safety hazard, causing severe disruption. We have drone monitoring solutions to fit every airport, large or small.

## SCARECROW - A ROBIN COMPANY

Since 2021 we also offer logging software and nature-inspired bird dispersal systems for bird control teams at airports, through the acquisition of Scarecrow Group in the UK.

## OUR HOLISTIC APPROACH TO BIRD HAZARD MANAGEMENT

For effective Bird Hazard Management you need monitoring, deterrence, logging, and reporting tools. Now offering all tools, we aim to integrate these even more intimately in the near future.

## MILITARY AVIATION

Military aircraft are often even more sensitive to bird or drone strikes given they fly fast, low, and often with just a single engine. We offer both bird and drone detection to airbases and air stations, along with our deterrence and logging tools.

## WIND FARMS

It's mandatory to assess the environmental impact on birds for new wind farms. Our bird radars provide the perfect tool for supporting Environmental Impact Assessments (EIA) and also for operational wind farms; individual wind turbine curtailment based on real-time monitoring of birds at your wind farm. For the optimal balance between ecology and wind energy yield.

## DEFENCE & SECURITY

Our largest market; we supply easy-to-use and integrate drone radars to end-users and system integrators for military air defence, police, security, VIP protection, prisons, airports and airbases, sporting events, and critical infrastructure sites like oil and gas refineries and pipelines.



A photograph of a Wizz Air aircraft on a runway. The aircraft is white with purple and pink accents, including the 'WIZZ' logo and 'wizzair.com' on the fuselage. It is positioned on a grassy field with a runway in the background. Several birds are visible in flight around the aircraft. The sky is overcast.

## OUR MARKETS

# Civil Aviation

### BIRD HAZARD MANAGEMENT

At airports, avoiding collisions between birds and planes is a big issue, most pertinent during take-off and landing. Although the airlines suffer the damage, it is the airport's responsibility to have the bird hazard management policies in place to mitigate the risk of bird strikes. Not doing this properly may result in airports becoming liable for damages. The risk is mitigated by active policies to make airports unattractive for birds ('habitat management') combined with Bird Control Units on airside.

### COMPLETE SITUATIONAL AWARENESS OF BIRDS

We developed bird radar systems to monitor and store bird movements around the clock up to 10 kilometres all around. The information is dispatched in real-time onto tablets in Bird Control Vehicles, as well as logged for analysis afterwards.

### BIRD DISPERSAL & LOGGING SOFTWARE

Since 2021 we also offer logging software and nature-inspired bird dispersal systems for bird control teams at airports, through the acquisition of Scarecrow Group in the UK.

## NATURE-INSPIRED

Since 1984, Scarecrow has been providing the most sophisticated bird dispersal systems throughout the world. It's nature-inspired systems supply the most advanced and reliable solutions for bird control problems of all types, in any sector.

## HIGHLY EFFECTIVE BIO-ACOUSTIC DISPERSAL

Scarecrow's bird management products use bio-acoustic technology, which is the evolutionary communication method used by birds to warn of immediate danger, for their safe and humane management.

## INTEGRATE WITH RADAR FOR ULTIMATE SOLUTION

Combined with the products and services of Robin Radar Systems, customers can ensure a thorough grasp on bird activity on and around their airport at all times. It enables the analysis of long-term effects of dispersal, and provides the chance to optimise policies to be as effective as possible with hard data driving decision making.

## BROAD MARKET APPLICATION

- The leading solution for airport bird control for bird strike avoidance
- Agricultural and farming bird management solutions to reduce crop damage caused by birds
- Bird control for risk management on oil and gas platforms
- Reliable bird dispersal for marinas and recreational facilities
- Humane bird control for any type of building

## OUR MARKETS

**scarecrow**   
a **robin** company

## OUR MARKETS

# Our Holistic Approach to Bird Hazard Management



## MONITORING



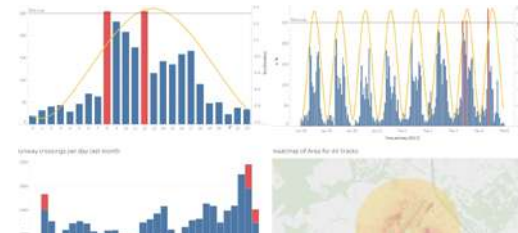
## DETERRENCE



## LOGGING



## REPORTING



### **MILITARY AIRCRAFT ARE PARTICULARLY VULNERABLE**

Fighter jets fly fast, low and typically have just a single engine. This makes them vulnerable for collisions with birds, costing lives and money.

### **COMPLETE SITUATIONAL AWARENESS OF BIRDS**

This risk is mitigated by active policies to make airfields unattractive for birds ('habitat management') combined with Bird Control Units on airside. We developed bird radar systems to monitor and store bird movements around the clock up to 10km all around. The information is dispatched in real-time onto tablets in Bird Control Vehicles, displayed in the Air Traffic Control tower, as well as logged for analysis afterwards.

### **ANALYSE TRENDS FOR HABITAT MANAGEMENT**

This significantly enhances the Bird Controller's awareness and provides management information about trends, new hotspots and the overall effectiveness of bird control activities, in terms of objective KPIs.

### **BIRD DISPERSAL & LOGGING SOFTWARE**

Since 2021 Robin offers logging software and nature-inspired bird dispersal systems for bird control teams at airports, through the acquisition of Scarecrow Group.

**OUR MARKETS**

## **Military Aviation**



The background of the entire page is a photograph of an offshore wind farm. Several large white wind turbines with three blades each are visible, spaced out across a dark, choppy sea. The sky is a mix of soft orange, pink, and blue, indicating a sunset or sunrise. The turbines are silhouetted against the horizon. A semi-transparent white box is overlaid on the left side of the image, containing the text 'OUR MARKETS' and 'Wind Farms'.

## OUR MARKETS

# Wind Farms

### INCREASING ECO-AWARENESS. AND REGULATIONS

In most countries, it's against the law to kill birds. If a wind farm is planned, it is mandatory to assess environmental impact. The large ambitions for wind farms combined with increasing ecological awareness result in scarcity of suitable locations.

### BIRD RADAR: THE MOST EFFECTIVE TOOL FOR ENVIRONMENTAL IMPACT ASSESSMENT ON BIRDS

Ecological Consultancies use trailer-based versions of our bird radar systems for collecting data to be used in these environmental impact assessments (EIAs). Often this results in a permit to build a wind farm under the pre-condition that a bird radar becomes a permanent part of the wind farm itself.

### WIND TURBINE CURTAILMENT FOR OPTIMAL BALANCE OF ECOLOGY AND ENERGY YIELD DURING OPERATIONS

In a growing amount of cases a 'start-stop-mechanism' is even required to mitigate mortality by automatically shutting down turbines in case of massive migration through the park. In the latter scenario, the energy company is our client.

## MEETING THE GROWING DEMAND FOR COUNTER-DRONE

Small Unmanned Aerial Systems (UAS), or 'drones', result in a new demand for drone detection and intervention methods. In 2015 we won a contract from the Dutch Ministry of Justice to develop a drone detection radar. Its proof of concept was already put into action that same year to protect world leaders during the G7 Summit in the south of Germany. We launched ELVIRA® commercially in 2016.

## FULL 3D MIL-STD DRONE RADAR IRIS®

In 2020 we added a second drone radar to our portfolio with the launch of our MIL-STD certified drone radar, IRIS®.

## DRONE RADAR ON-THE-MOVE

IRIS® is a full 3D radar with leading classification range capabilities that can be used on vehicles on-the-move (OTM) in convoy and mobile VIP protection scenarios.

## EASY TO INTEGRATE WITH COMPLETE SYSTEMS

Nowadays more than half of our revenue comes from selling purpose-built drone detection radars. We often sell to system integrators that combine our radars with other sensors and provide total solutions to end customers in the defence and security markets.

## OUR MARKETS

# Defence & Security



# Our Hardware

**robin**  
radar systems

## MAX®

MAX® is our flagship bird radar. It has the fastest rotation speed in the market, resulting in track updates every second. This allows uniquely detailed 3D visualisation of bird flight paths, including their size, speed and direction. With MAX®, you can track all birds, all around your airspace, in real-time and 24/7, day or night.

## IRIS®

IRIS® is our full 3D, MIL-STD drone radar and is built explicitly for drone detection and tracking. With 360-degrees azimuth coverage and a huge elevation coverage of 60-degrees, IRIS® provides you with early warning of approaching drones in all directions, giving you precious time to react. With deep learning classification and an extended range coverage up to 10km, it's simply the best radar in it's class.

## ELVIRA®

Our original and ground-breaking drone radar. For affordable, 360-degrees azimuth coverage, the same micro-doppler and deep learning classification as IRIS®, but with 2D tracking and a 5km instrumented range, look no further.

## B.I.R.D. TAB™

B.I.R.D. Tab™ can be installed in any airport vehicle, and consists of a tablet computer, a GPS satellite navigation unit, a pair of loudspeakers, a processor and a touchscreen control interface for operation. Disperse birds with ease by broadcasting natural bird distress calls. Includes a touch screen data logging process in line with ICAO recommended best practices, and a separate reporting and analysis software.

## PREMIER 2020

When you just need a nature inspired bio-acoustic deterrent system for dispersing birds but don't need the logging software, Premier 2020 is the system for you. Easily upgradeable to B.I.R.D. Tab™ later if needed.





## OUR HARDWARE

# MAX<sup>®</sup>

### A WORLD FIRST: FULL 3D AVIAN RADAR

Our flagship bird detection radar. It's taken more than four years, millions of Euros, and thousands of coffees. The result is mind-blowing. We quite simply had no other choice, but to call it MAX<sup>®</sup>.

### UNPRECEDENTED TRACKING

MAX<sup>®</sup> has the fastest rotation speed in the market, resulting in track updates every second. This allows uniquely detailed 3D visualisation of bird flight paths, including exports to Google Earth.

### HEIGHT INFO FOR ALL BIRD TRACKS

MAX<sup>®</sup> is a single sensor system, providing full 3D information of all birds in the nearby environment. Height information is provided for all bird tracks, and there's practically no cone of silence above the radar. Our newest bird detection radar offers true full 3D coverage, meaning you get height data for ALL bird tracks, all around the radar, all of the time.

### PURPOSE BUILT TO DETECT BIRDS

MAX<sup>®</sup> has been built to monitor birds from the start. The antennas are designed explicitly with avian targets in mind. It finally brings phased array radar technology into the hands of bird control units and ornithologists. Bird move-ments are displayed in real-time on a computer or mobile device (both iOS and Android).

### SIMPLE TO INSTALL AND USE

MAX<sup>®</sup> has minimal infrastructure requirements. The computer servers can be placed in already existing server rooms, meaning no shelter or housing is required at the radar location itself. All MAX<sup>®</sup> needs is standard power and ethernet.

### USER FRIENDLY SOFTWARE

Developing new hardware isn't the only thing we've done. Because our customers often need to convert bird data into reports and KPIs, we've produced an entirely new tool, just for you. Now you can make easy to understand, and appealing graphics, in a user-friendly software environment. Just select the variables and time period you want, and the tool will immediately generate impressive graphical representations.

### DRONE CLASSIFICATION MODULE (DCM)

The Drone Classification Module (DCM) is an optional upgrade for MAX<sup>®</sup> radars that can provide additional drone radar functionality to our bird radar, MAX<sup>®</sup>. Although originally designed as a bird radar only, due to our work in deep learning on our drone radars, we've been able to bring this functionality to MAX<sup>®</sup>. This is great news if you use, or are planning to use, MAX<sup>®</sup> at an airport or airbase, as the Drone Classification Module provides an even more affordable and efficient way to add drone detection and tracking to your safety management system.

## FULL 360° DOME-LIKE COVERAGE

IRIS® combines smart software with affordable radar, and is built explicitly for drone detection and tracking. With 360° azimuth coverage, and a huge elevation coverage of 60°, IRIS® provides you with early warning of approaching drones, in all directions, giving you precious time to react. And the high elevation coverage means you don't have to worry about drones coming in over the top of your radar.

## DRONE TRACKING IN FULL 3D

Height information is particularly important for cueing cameras and other sensors and weapon systems. That's why IRIS® tracks drones in full 3D, providing accurate height information for quick and smooth detection and mitigation of rogue drones. When the stakes are high, every second counts. You need pinpoint accuracy and direct tracking for quick interventions.

## SMALLER, LIGHTER, MORE POWERFUL

Size does matter. Today's drone threat calls for small and lightweight drone radars AND excellent detection range and coverage. Most radars do one or the other. With IRIS®, we refused to make that compromise. A small and lightweight form factor, MIL-STD certified, with best in class detection range and full coverage; you can take IRIS® with you, and easily deploy and redeploy as you need.

## 4D RADAR-ON-THE-MOVE (OTM)

Need to protect your convoy on-the-move? For VIP protection, law enforcement and military convoys? Of course you do. That's why we've added 4D radar-on-the-move (OTM) capabilities to our flagship IRIS® drone detection radar.

## MICRO-DOPPLER CLASSIFICATION

IRIS's micro-Doppler capability provides the necessary confirmation that a target has rotor blades. It's also what allows IRIS® to detect hovering drones, and to distinguish drones from other moving objects, like birds, avoiding false alarms.

## DEEP LEARNING: EVEN LONGER RANGE

Our recent software upgrade with deep learning algorithms has improved our classification range by up to double.

## MULTIPLE TARGETS & DRONE SWARMS

Drones can be pre-programmed for autonomous flight without an operator and can approach in swarms. Any drone detection system needs to be capable of detecting multiple targets simultaneously. IRIS® can detect and track hundreds of drones at the same time.



OUR HARDWARE

**IRIS®**



## OUR HARDWARE

# ELVIRA®

## PURPOSE BUILT TO DETECT DRONES

ELVIRA® combines smart software with affordable radar, and is built explicitly for drone detection and tracking. For early warning of incoming drones, you need radar. Simply put, no other sensor technology has a wider coverage area than radar. With 360° coverage, ELVIRA® provides you with early warning of approaching drones, in all directions, giving you precious time to react. The ability to detect drones in the distance is not enough though. Drone detection systems need to work in low visibility conditions, and in urban environments full of obstacles, moving objects, and a just about infinite amount of wireless radio devices.

## MULTI-TARGETS AND DRONE SWARMS

Drones can be pre-programmed for autonomous flight with no operator and can approach in swarms. Any drone detection system should, therefore, be capable of detecting multiple targets simultaneously. And they should not rely on the drone and controller radio signals, which are only present when the drone is actively controlled.

## DRONES NOT BIRDS

Last but not least, any drone detector needs to distinguish drones from other moving objects, like birds, to avoid false alarms. ELVIRA® is our purpose-built drone detection radar, specifically designed to meet all of these challenges.

## EASY INTEGRATION

You can integrate ELVIRA's tracks and alarms as a layer in your own existing, or 3rd party, security systems and Command and Control (C2) systems. A simple XML broadcast-based interface as well as ASTERIX and SAPIENT protocols are included with ELVIRA® as standard.

## CAMERA INTEGRATION

Users typically require a visual picture of the target to take further action. Integrators can equip ELVIRA® with a high-resolution pan-tilt-zoom (PTZ) camera for visual confirmation of the target. When a drone is detected, the camera zooms into its direction for a controller to acquire an image and report details.

## MICRO-DOPPLER CLASSIFICATION

The radar's micro-Doppler capability provides the necessary confirmation that a target has mechanical propulsion.

## DEEP LEARNING: EVEN LONGER RANGE

Our recent software upgrade with deep learning algorithms has improved our classification range by up to double.

## INDUSTRY STANDARD

The industry standard for bird strike avoidance; Scarecrow's flagship airside product is the Scarecrow B.I.R.D. Tab™. This is two systems in one, in that it provides not only a bird dispersal method as a vehicle-mounted system solution, but also provides Data Logging/Analysis/Reporting Software for helping airports to make and take informed choices on action to mitigate future bird strike risk – whether by deploying resources in a more informed way at key times, or taking steps to reduce the bird numbers seen in the first instance.

## INSTALLED IN ANY AIRPORT VEHICLE

B.I.R.D. Tab™ can be installed in any airport vehicle, and consists of a tablet computer, a GPS satellite navigation unit, a pair of loudspeakers, a processor and a touchscreen control interface for the operation, which includes bird dispersal via the broadcast of digitally cleansed natural bird distress calls – the calls are available from within the extensive Scarecrow library, and the system is built to the bespoke needs of each individual airport.

Due to the growing difficulties airports face with birds and the growing requirement for accurate data to be easily logged by the operators, Scarecrow developed the Scarecrow B.I.R.D. Tab™ Software following the success of its predecessor Ultima.

## NEXT GENERATION

B.I.R.D. Tab is the next generation of bird dispersal and data logging using the Panasonic Toughpad tablet PC, which has an integrated camera to enable photographic evidence to be included in reports for improved due diligence.

## FEATURES

- Up to 20 calls as required, programmed from the Scarecrow Bird Distress Call library
- Efficient data collection in line with ICAO recommended best practices
- Ability to define the information collected in line with individual airport requirements
- Detailed regular reporting available at the press of a button
- Easy data analysis for managing areas of concern at airports, to then take steps to mitigate the risk of future bird strikes
- Provide validated due diligence/evidence in the event of litigation by the airlines and/or their insurers, against the cost of repair and inconvenience/loss of aircraft use when bird strikes occur
- Runway Inspection module



## OUR HARDWARE

# B.I.R.D. Tab™



## OUR HARDWARE

# Premier 2020

## NATURE INSPIRED & EFFECTIVE BIRD DISPERSAL

The Premier 2020 is the replacement for the well-established and long standing Digi-Scare and Premier 1500 systems. Scarecrow have now sold approaching 1000 of these various vehicle mounted systems to airports across the world. The broadcast of distress calls, as part of an integrated bird management scheme, has proved effective for bird dispersal from airfields and surrounding areas, and has been the backbone of Airfield Wildlife Management for the past 32 years. It is an essential part of flight safety and must be carried out efficiently to minimise birdstrike risk to aircraft, their passengers and crew.

The Premier 2020, unlike its predecessors, has been designed and built in a modular format to enable an easy 'upgrade' to the fully integrated Scarecrow B.I.R.D. Tab System™ which, in addition to the bird distress calls used for dispersal, incorporates a touch screen data logging process in line with ICAO recommended best practices, and a separate reporting and analysis software.

## EASY UPGRADE OPTION TO B.I.R.D. TAB™

The upgrade is a simple process, and enables the continued use of the Premier 2020 for bird dispersal, so that the investment in the Premier 2020 equipment is safe.

Scarecrow Premier 2020 operates from 12V or 24V DC sources and has been designed to be vehicle installed to provide a complete bioacoustic bird dispersal system when connected to Scarecrow roof mounted loudspeakers. The speakers project a vertical beam of sound reaching into the sky above to ensure distress calls are maintained until the subject birds have dispersed from the immediate area.

## CALLS INCLUDED

- Herring Gull
- Pigeon
- Jay
- Common Gull
- Magpie
- Heron
- Black Headed Gull
- Jackdaw
- Falcon
- Lapwing
- Rook
- Crow
- Novel Sound

Other calls available on request.

# **robin**

## **radar systems**

# Our Software

**robin**  
radar systems

## BIRD VIEWER

Our intuitive Bird Viewer enables you to see exactly what's happening on and around your airport, airbase, or wind farm. Real-time situational awareness, 24 hours a day. Distinguish between small, medium and large birds and flocks, choose different overlays and map types, change orientation, zoom and tilt to view tracks from the perfect angle. You can also easily search and replay activity as it occurs.

## MOBILE VIEWER

Mobile Viewer is designed for day-to-day operations. It empowers users out in the field to access real-time information easily, on tablets that can be installed and used in vehicles. Making flight paths visible, in a similar way to Bird Viewer, Mobile Viewer also uses the tablet's GPS to pinpoint your current location in relation to the activity happening around you. It's the ultimate tool for any Bird Controller in the field.

## DRONE VIEWER

Our map-based Drone Viewer is an intuitive web interface that empowers users with 24/7 visualisation of what's happening in their airspace, early warnings of drone incursions and precious time to assess and react to threats. Easily integrate with other sensor systems and command and control systems.

## REPORT VIEWER

Our Report Viewer software is used for analysing and comparing bird activity over time. This web-based application is designed to quickly & easily create graphs and maps based on various data from one or more defined periods of time. It visualises data on the number of birds as well as bird characteristics (altitude, speed and flight direction), in different time periods (minimum is an hour) and in different areas.

## B.I.R.D. TAB™

Scarecrow B.I.R.D. Tab™ Reporting System is a standalone tablet with preinstalled data logging and analysis software. A highly effective data logging and analysis system that has been designed to provide all of the same functions of Scarecrow B.I.R.D. Tab™, just without the ability to broadcast distress calls to disperse birds.

## O.A.R. OFF AERODROME REPORTING

An effective software system for monitoring and reporting on wildlife activity at 'Off-Aerodrome' sites. Designed in consultation with international airports and the Civil Aviation Authority.





## OUR SOFTWARE

# Bird Viewer

## BETTER SOFTWARE - BETTER BIRD CONTROL

Our intuitive Bird Viewer enables you to see exactly what's happening on and around your airport, airbase, or wind farm. That's right; real-time situational awareness, 24 hours a day. Awesome hardware demands software to match, and that's why we've spared no effort to create Bird Viewer. This software interface is a web-based application, installed on one of the system servers. It runs from your browser on a device which is connected to your radar system. Bird Viewer even works wirelessly, as long as a connection (3G, 4G or 5G) is available.

## DISTINGUISH BIRD SIZE

The differently-coloured tracks distinguish between small, medium and large birds and flocks. A circle at the end of a track, varying in size depending on the size of the bird, indicates each bird's present location. You can add display filters and classifications to show tracks by size, tailored to your unique needs. If you want to, you can even identify vehicle and aircraft movements, displaying them as separate tracks.

## CUSTOMISE YOUR VIEW

You are the master of your own universe. Or, at least your own Bird Viewer. You can choose different overlays and map types, and even navigate on a Google Earth background complete with customised map and site landmarks. Change orientation, zoom and tilt to view tracks from the perfect angle.

## TRACK SIMULTANEOUSLY

The interface makes it easy to track bird movements happening in real-time, all the time. You can select and zoom in on individual tracks, too (which represent actual bird flight paths). We know what you're thinking: there's a lot of birds in the air, this could get confusing! You're right. That's why you can set up customised zones for critical areas of your site. Think of it as a heatmap to see and be notified of the activity that matters most.

## MEASURE ALTITUDE

Our radars provide you with altitude information of each bird track. Bird Viewer will show you how high the bird or flock is flying. You can even set a filter to monitor specific altitudes, and easily toggle the filter on and off to view all tracks again.

## LOG AND REPLAY

All this data is automatically and continuously logged in a secure database. Via Bird Viewer, you can easily search and replay activity as it occurs. This way, you can watch back and take a closer look to analyse those critical moments.

## AWARENESS & CONTROL - IN THE FIELD

Mobile Viewer is designed for day-to-day operations. It empowers users out in the field to access real-time information easily, on tablets that can be installed and used in vehicles.

Making flight paths visible, in a similar way to Bird Viewer, Mobile Viewer also uses the tablet's GPS to pinpoint your current location in relation to the activity happening around you. It's the ultimate tool for any Bird Controller in the field. Mobile Viewer works wirelessly, as long as a 3G, 4G or 5G connection is available. We provide Mobile Viewer software licenses for a total of five tablets (iOS or Android).

## TRACK FLIGHT PATHS ACCURATELY

Tracking bird movements in real-time has never been easier. You can select and zoom in on individual coloured tracks, which represent actual bird flight paths. The colours distinguish between small, medium and large birds and flocks. A circle at the end of a track, varying in size depending on the size of the bird, indicates each birds' present location. Each track in the viewer also offers altitude information: how high the bird or flock is flying.

## GET AUTOMATIC WARNINGS

Put safety in your control by customising the parameters of alarm zones in critical places. Your teams will be immediately notified of activity in areas of risk, giving precious time to react and manage the threat. Get real-time warnings if, for example, a flock of birds is about to enter a dangerous area. Runway funnel and graph colours will change, indicating when the number of birds is higher than your defined threshold. These zones can be configured with our experts, and are easy to modify based on the new insight you'll certainly gather.

## DISPLAY CRITICAL INSIGHTS

It's important to be where the action is – but we know what you're thinking – how can I possibly deal with all of that information? There's a lot of birds in the air, and surely too many tracks can become confusing! You're right. That's why Mobile Viewer offers activity grids, showing where recent hot spots of bird activity are, for example, during the past 30 minutes. Get important insights into the severity of bird movements to determine where to focus on.

## CUSTOMISABLE CLASSIFICATIONS

See only what you want to see. All classifications are customisable to give you the information you need, from bird sizes to number of birds in flocks. Using Mobile Viewer you can also quickly hide some classifications to make sure you can focus on the right tracks.

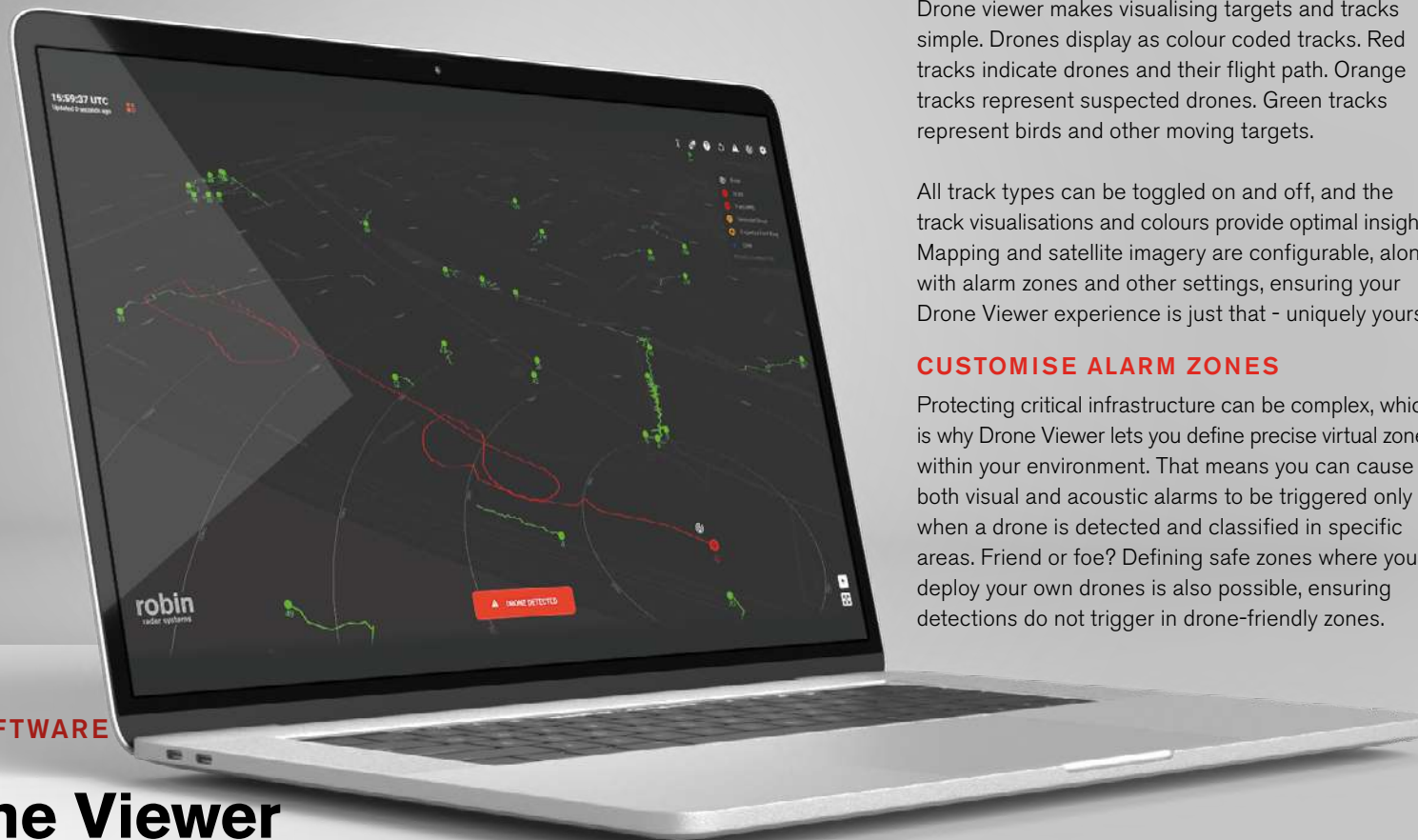


OUR SOFTWARE

# Mobile Viewer

OUR SOFTWARE

# Drone Viewer



## EARLY WARNING = TIME TO REACT

Our map-based Drone Viewer is an intuitive web interface that empowers users with 24/7 visualisation of what's happening in their airspace, early warnings of drone incursions and precious time to assess and react to threats.

Drone viewer makes visualising targets and tracks simple. Drones display as colour coded tracks. Red tracks indicate drones and their flight path. Orange tracks represent suspected drones. Green tracks represent birds and other moving targets.

All track types can be toggled on and off, and the track visualisations and colours provide optimal insight. Mapping and satellite imagery are configurable, along with alarm zones and other settings, ensuring your Drone Viewer experience is just that - uniquely yours.

## CUSTOMISE ALARM ZONES

Protecting critical infrastructure can be complex, which is why Drone Viewer lets you define precise virtual zones within your environment. That means you can cause both visual and acoustic alarms to be triggered only when a drone is detected and classified in specific areas. Friend or foe? Defining safe zones where you deploy your own drones is also possible, ensuring detections do not trigger in drone-friendly zones.

## LIVE STREAM TO YOUR C2 SYSTEMS

With both IRIS® and ELVIRA® you can integrate tracks and alarms as an additional layer in your existing security systems and Command and Control (C2) systems. A simple XML broadcast-based interface as well as ASTERIX and SAPIENT protocols are included as standard.

## INTEGRATE PTZ CAMERAS & OTHER SENSORS

Need multiple systems to play nice with each other? Our software has you covered. ELVIRA® is designed to work with a high-resolution pan-tilt-zoom (PTZ) camera to assist visual confirmation of a detected target. With IRIS®, an external camera can even be cued and slewed right onto the target directly, thanks to its 3D capability and accurate height tracking.

## RECORD ALL DATA

All this data is automatically and continuously logged to a database. Via Drone Viewer, you can easily search and replay activity as it occurs. This way, you can watch back and take a closer look to analyse those critical moments.

## REMOTE DIAGNOSTICS

Performance can be closely monitored remotely. If something isn't going to plan or you have queries that require quick answers, our technical staff can immediately log into the system, perform diagnostics and (in most cases) solve it remotely.

## STRATEGIC OVERVIEW

Our Report Viewer software is used for analysing and comparing bird activity over time. This web-based application is designed to quickly & easily create graphs and maps based on various data from one or more defined periods of time.

It visualises data on the number of birds as well as bird characteristics (altitude, speed and flight direction), in different time periods (minimum is an hour) and in different areas.

## DATA-BASED DECISION MAKING

With the insights provided by Report Viewer, you'll be able to mitigate and prevent high-risk bird activity more accurately and with less effort than before. Anticipate and prepare for bird activity and migration before it happens.

## USER-CENTRIC DASHBOARDS

The Report Viewer consists of different user-configurable dashboard, or views, each with different graphs.

## INTERACTIVE DATA

Report Viewer provides interactive access to all radar data, anytime, anywhere. Historical track data of the radar system is copied as aggregated data to a server. Seamlessly switch between blazing fast extracts and live connections to that data with a single click. Or, get the best of both worlds by scheduling automatic extracts as often as needed.

## KPIS & BUSINESS INTELLIGENCE

Report Viewer is based on a proven data visualisation tool, focusing on business intelligence. It enables you to extend the value of your bird data across your organisation, without being limited to pre-defined questions, wizards, or chart types.

You can create and share data insights with relevant stakeholders within minutes. Select the variables and time period you want, and Report Viewer will immediately transform your data into a comprehensive report with charts and graphs.

## FOR AIRPORTS

At airports individual areas can be set up such as the airport perimeter and runways. This aids in reporting what activity happens where, and exactly where thresholds are exceeded. Finally, factual data to justify new habitat management changes and policy.

## FOR WIND FARMS

At wind farms individual wind turbines or groups of turbines can be set up for optimal shut-down procedures, ensuring only the high-risk turbines are stopped, and for as limited a duration as possible. Optimal energy production with minimal risk to birds - and your permit.



OUR SOFTWARE

# Report Viewer



## INDUSTRY STANDARD

Scarecrow B.I.R.D. Tab™ Reporting System is a highly effective data logging and analysis system that has been designed to provide all of the same functions of Scarecrow B.I.R.D. Tab™, just without the ability to broadcast distress calls to disperse birds.

Scarecrow B.I.R.D. Tab™ Reporting System is easy to use. The tablet can display a database of bird recognition information, including illustrations to aid bird identification. Although the software is not linked to the Scarecrow distress calls there is the ability to log a dispersal and the method used.

Using a rugged tablet touch-screen pc, a GPS receiver and data collection software, Scarecrow B.I.R.D. Tab™ Reporting System creates a complete record of dispersal activity and wildlife observations. The system creates an audit trail featuring date, time, location, operator, species, flock size, attractant, dispersal direction, and method of dispersal utilised.

The Reporting options within the system are many – ranging from a simple high level Threat Report for a management initial overview perspective, drilling down to Reports by individual species, or areas of the airport – whatever the airport management want to look at in detail is available at a touch of a button.

Due to the growing difficulties airports face with birds and the growing requirement for accurate data to be easily logged by the Operators, Scarecrow developed the Scarecrow B.I.R.D. Tab™ Software following the success of its predecessor Ultima.

B.I.R.D. Tab software is the next generation of bird dispersal and data logging – using the newly launched Panasonic Toughpad tablet PC – it has an integrated camera to enable photographic evidence to be included in reports.

- Efficient data collection in line with ICAO recommendations
- Detailed reporting and easy data analysis for managing the risk at airports to mitigate bird strike
- Provide validated due diligence in the event of litigation by the airlines and/or their insurers for the cost of repair and inconvenience/loss of use when bird strikes occur

## OUR SOFTWARE

# B.I.R.D. Tab™ Reporting Software

## OFF AERODROME REPORTING

O.A.R. is Off Aerodrome Reporting. And it's Off Aerodrome Reporting made incredibly simple and highly effective.

It's clear that there's a need for airport authorities to monitor and record bird activity beyond the aerodrome as effectively as they do within their own grounds.

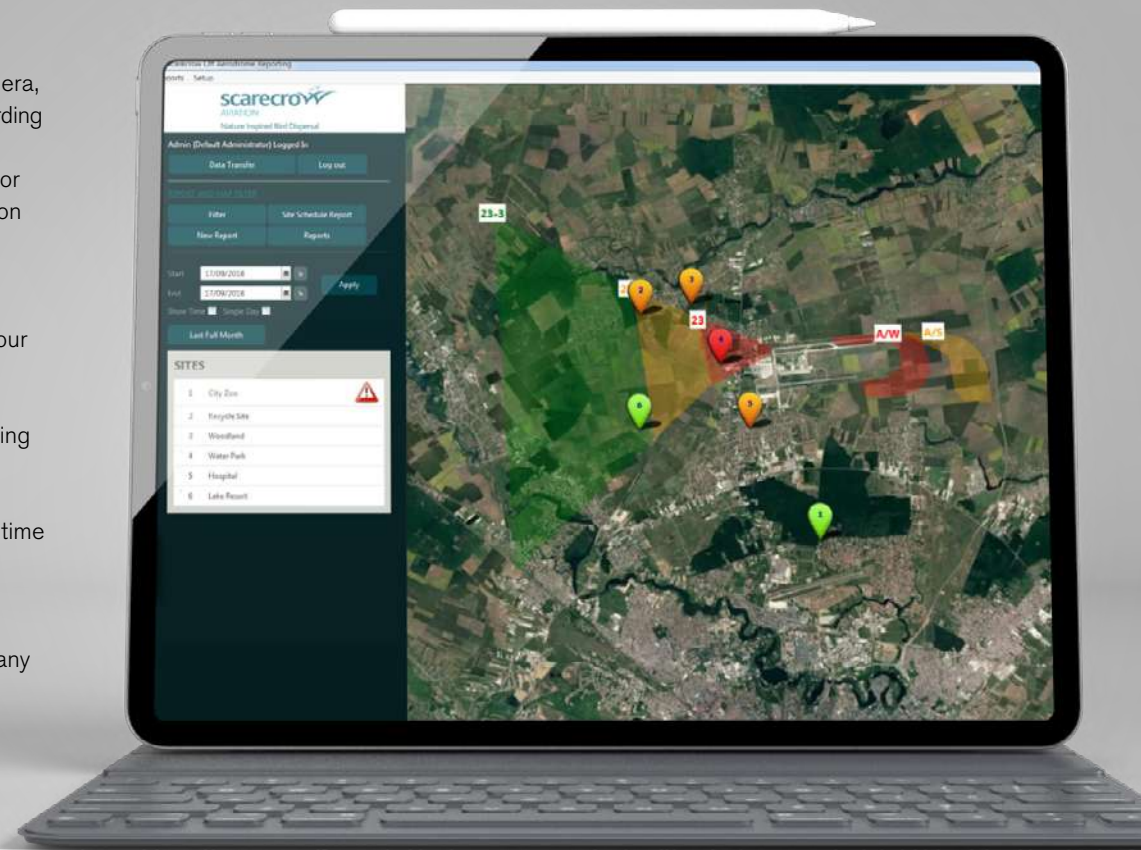
Our team at Scarecrow has been working with major international airports to develop a software system that allows you to do exactly that.

This powerful software tool has been designed in consultation with four international airports and the CAA (UK) to ensure it offers:

- Up to 20 calls as required, programmed from the Scarecrow Bird Distress Call library
- Efficient data collection in line with ICAO recommended best practices
- A cost-effective way for airports to demonstrate due diligence and best practice
- An easy-to-use way to monitor and record off aerodrome bird activity
- A powerful set of tools for analysis and reporting
- Instant integration of off aerodrome insights with recorded bird behaviour within the airport, when used in conjunction with the B.I.R.D. Tab™ system.

Our comprehensive solution provides you with everything you need to monitor, record and analyse off aerodrome sites that may pose a bird strike risk:

- A touch-screen tablet, equipped with GPS and camera, displays pre-configured information for speed of recording
- A powerful set of tools offer instant trend analysis for 'on-the-spot' decisions and detailed data visualisation for reporting
- Integration with the B.I.R.D. TabTM system rapidly reveals correlations between off aerodrome behaviour and behaviour on the airfield itself
- Wireless or flash drive data transfer into the Reporting Analysis Software loaded onto your airport system
- Scheduling and automatic notifications to save you time
- Support is available seven days a week
- The hardware tablet has been field tested for many years as part of our B.I.R.D. TabTM System
- There is no expiry to the software license, and both hardware and software are covered by a 36 month warranty, which can be extended to 72 months for an additional cost either upon purchase or after the initial warranty has expired
- No on-going payments required to provide you with everything you need for best practice off aerodrome reporting



OUR SOFTWARE

# O.A.R Off Aerodrome Reporting

# robin

radar systems

**robin**  
radar systems

**ROBIN RADAR SYSTEMS**

Laan van Waalhaven 355  
2497 GM The Hague  
The Netherlands  
+31 8 8700 8700  
[robinradar.com](http://robinradar.com)

**robin**  
radar systems