Safety, Security & Surveillance Solutions

Sensor Interfacing, Processing & Operator Displays

No Target Selected

CAMBRIDGE PIXEL
AN EMPLOYEE-OWNED COMPANY
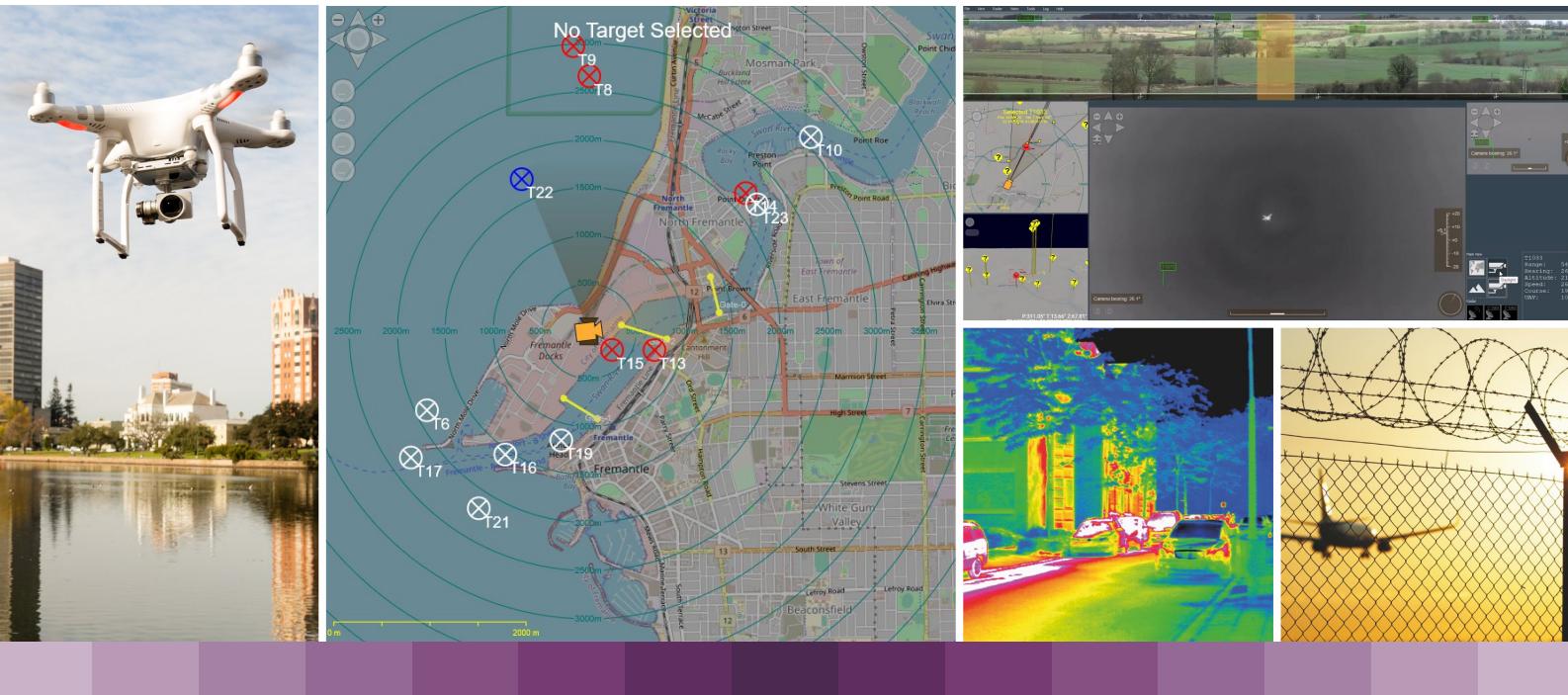
Trusted Solutions for the Safety, Security & Surveillance Market

Cambridge Pixel provides a wide range of sensor interfacing, processing and operator display solutions for the safety, security and surveillance market. Its products are typically used by security systems integrators and surveillance solution providers and have been deployed by customers in more than 50 countries.

Products include:

- PCIe, XMC & VME sensor acquisition & signal simulation hardware
- Customisable Command & Control (C2) operator display applications
- Operator display source-code application frameworks
- Off-the-shelf radar & camera sensor processing server modules
- Software development libraries/toolkits for C++ & .NET developers

In addition to user interface design and implementation, Cambridge Pixel's areas of expertise include:

- Radar interfacing
- 2D & 3D radar target tracking
- Alarm processing
- EO/IR camera control
- 2D & 3D visualisation software

Cambridge Pixel's off-the-shelf products are sensor-agnostic and have been implemented in mission-critical applications with companies such as BAE Systems, Blighter, Hanwha Systems, Hensoldt UK, L3Harris, Lockheed Martin, Navtech Radar, Peraton, Raytheon Technologies, Saab Sensis, SeaOwl and Thales.

We have a very close working relationship. It's never felt like a usual us-and-them contracting arrangement. It's a very constructive relationship.

Chief Technical Authority, CMS Combat Management System, BAE Systems

For new programmes, we wanted to work with a long term partner that is able to provide us with a cost-effective, flexible solution as well as the expertise, support and training required to enhance our naval combat management system.

Naval Systems R&D Centre Leader, Hanwha (formerly Samsung Thales Corporation)

Commitment to Quality

Cambridge Pixel solutions are developed and maintained to meet demanding standards, under an audited Quality Management System (BSI ISO 9001:2015). All products are designed, developed and made in the UK, ensuring high standards and supply-chain security.

Cambridge Pixel is a member of ADS, the UK trade association advancing leadership in aerospace, defence, security and space. The company is also JOSCAR registered and has satisfied all the requirements to become fully registered on the JOSCAR supplier accreditation register.

Cambridge Pixel was founded in 2007 by Dr David Johnson and its export success led to the company winning the 2015 Queen's Award for Enterprise in International Trade. As an employee-owned company, its highly experienced staff are deeply invested in Cambridge Pixel's success, ensuring that it continues to deliver exceptional products and services.
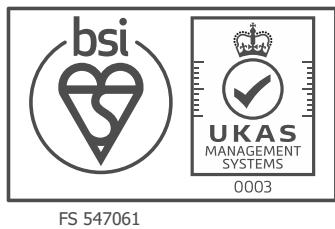
Supported Applications

Cambridge Pixel's flexible software solutions allow a broad range of safety, security and surveillance applications to be supported, including systems for:

- Coastal and land border security
- Critical National Infrastructure (CNI) protection of:
  - Airports
  - Harbours & seaports
  - Nuclear power sites
- Monitoring of offshore wind farms
- Control of counter-drone/C-UAS platforms
- Onshore & offshore installation security for oil & gas facilities
- Infringement monitoring of firing range danger areas

Operator Displays & Processing Modules

VSD Operator Display Application

VSD is a complete end-user display application for Windows that interfaces radars, cameras, Radio Direction Finders (RDF) and other sensors and effectors. The user interface layout and appearance of VSD is highly configurable and has been designed to support touchscreen operation. Where required, VSD allows specialised configurations to be white-labelled and rebranded by third parties.

VSD is sensor-independent and runs on a standard Windows PC or laptop. It integrates and displays data from multiple radars and up to 16 daylight or thermal cameras. VSD can also incorporate functionality such as automatic slew-to-cue, radar tracking, track fusion as well as support for ship (AIS) and aircraft (ADS-B) transponders.

VSD integrates with the latest C-UAS video tracking and classification modules from Vision4ce, OpenWorks and Vizgard. Support is included for control of effectors such as laser dazzlers and Long-Range Acoustic Devices (LRAD), as well as support for specialist RF inhibitors/jammers.

Interfacing and control of the latest 3D AESA radars from Blighter, DRS RADA, Echodyne and FLIR is built-in to VSD.

RadarWatch Operator Display Application

Cambridge Pixel's RadarWatch is a flexible situational awareness display for maritime security applications, coastal surveillance and simple vessel traffic monitoring. It provides an integrated presentation of radar video, tracks, camera data, AIS, mapping and alarm processing, offering a powerful, flexible and cost-effective maritime information system.

RadarWatch works with a wide range of coastal radar sensors and cameras, allowing system integrators to specify the right sensor for each application.

Support is included for augmented vision, which is the overlay of target information onto live video to aid interpretation of the scene.
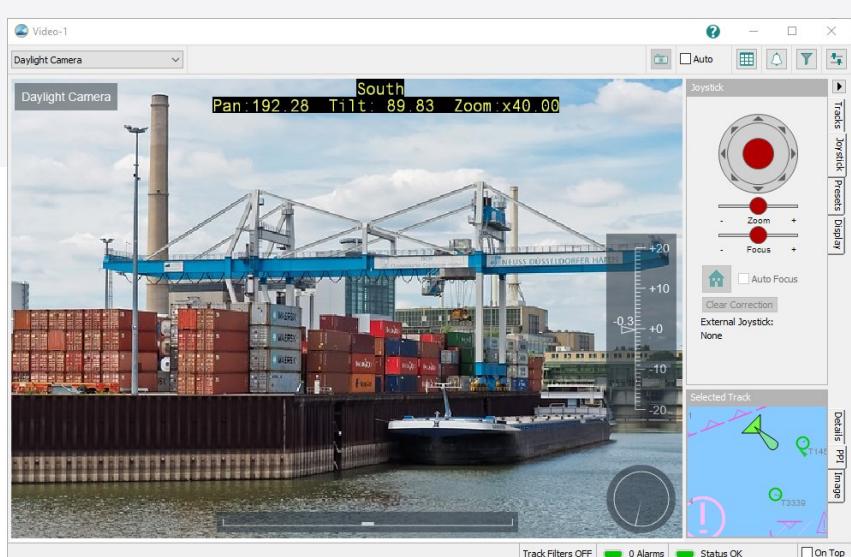
Operator Displays & Processing Modules

Surveillance Display Framework (SDF)

Cambridge Pixel's Surveillance Display Framework (SDF) offers a quick-start route either for the development of next generation C2 user interfaces or for the modernisation of legacy systems. SDF is supplied as a complete development package that includes source code for an off-the-shelf, fully customisable, multi-sensor GUI/Command and Control C2 application.

SDF runs as two full-screen windows, each designed to be displayed on a separate monitor. The main window is a plan position indicator (PPI) radar display consisting of a background map (or chart) overlaid with primary radar video and various sources of tracked target data.

The secondary window is switchable between the display of a detailed track table or a live camera video picture. A variety of example user interface elements are included on the secondary window.
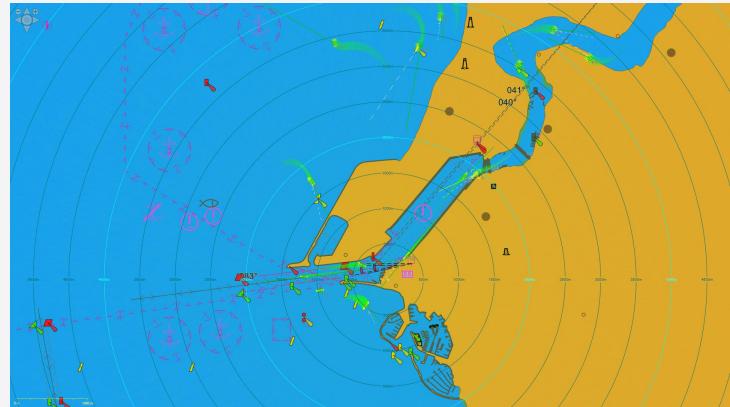
SPx Processing Modules

Cambridge Pixel's operator display applications are commonly paired with its SPx backend server processing modules, of which there are now more than 20 available modules. The most commonly deployed SPx backend software modules include:

- SPx Alarm Server – alarm configuration & trigger monitoring
- SPx Camera Manager – automatic target following & camera prioritisation
- SPx Fusion Server – multi-source/multi-format radar track combiner
- SPx Server – radar video plot extraction, target tracking & distribution
- SPx Track Manager – radar track format conversion, annotation & filtering

A typical deployment of SDF and a range of processing modules is shown below:
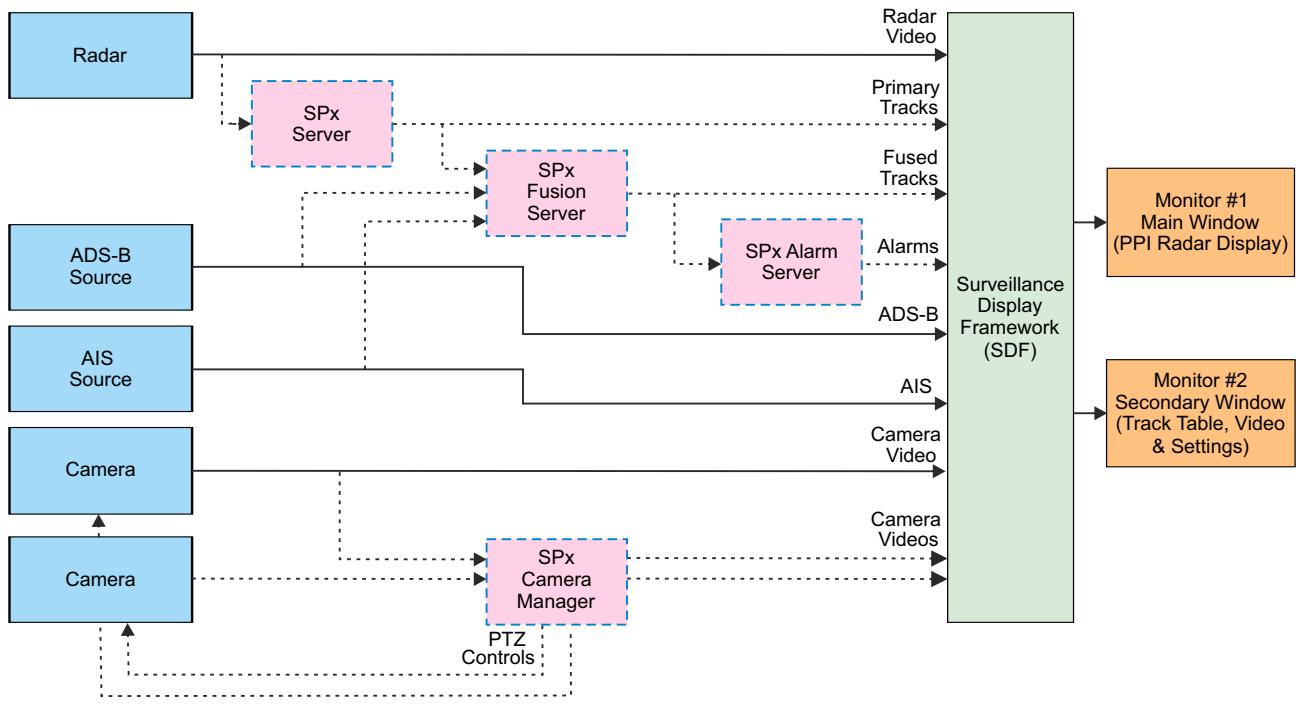
Case Studies

Portable UAS Detection System for Counter Drone Operations

The system uses a specialised configuration of Cambridge Pixel's VSD operator display application. It provides an easy-to-use display of detections from a portable radar and both panoramic and 'area of interest' live feeds from the camera array.

Developed by HBS Consulting, the system innovatively combines an array of super-high resolution cameras and an Echodyne EchoGuard radar. The camera assembly fits directly on the EchoGuard radar such that the two sensor systems have a comparable field of view and sensitivity, dispensing with the need for an expensive and complex PTZ optical subsystem.

Radar tracks are highlighted both on the PPI pane and on the panoramic view. A simple touchscreen control interface is provided, allowing the operator to change range settings and grab screenshots for recording purposes.

It has been a pleasure to collaborate with Cambridge Pixel. I was surprised how quickly and easily they were able to provide a completely tailored solution.

Graham Beall, Managing Director, HBS Consulting

National Land/Coastal Border Surveillance System

In partnership with Defense Integrated Solutions Security Systems, Cambridge Pixel supplied forty VSD systems which integrate multiple sensors (radars and cameras) on a mobile platform. The platforms provide comprehensive and effective monitoring for a national border and maritime security programme in the Middle East.

The VSD system provides the operator with an intuitive full-screen graphical user interface (GUI) that presents multiple sensor windows to permit target tracking and aligning multiple sensors to the target to enhance awareness and quickly discern friendly targets from others.
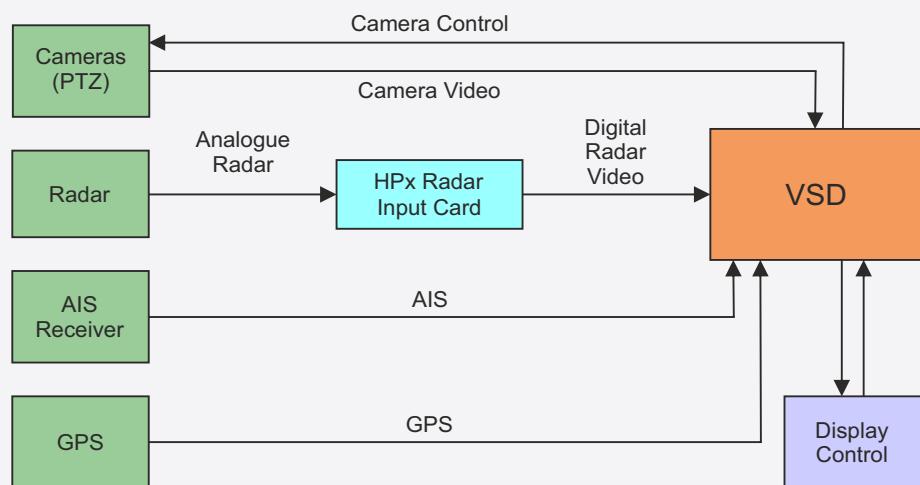
We needed a flexible and intuitive front end to the multi-sensor surveillance system we are supplying to a Middle Eastern customer.

Kevin Ferguson, General Manager, Defense Integrated Solutions Security Systems, LLC

Offshore Wind Farm Security System

Klein Marine Systems deployed Cambridge Pixel's display software and target tracking technology to protect an offshore wind farm and its associated submarine transmission line off the coast of South Korea.

As part of Klein's HarborGuard maritime security and surveillance solution, Cambridge Pixel's technology integrated radar, camera and AIS sensor data, as well as a Long-Range Acoustic Device (LRAD). The system monitors vessel traffic around the wind farm and along a 10 km submarine transmission line carrying power from an offshore platform transmission station to the onshore distribution facility.

The project used a Simrad Argus X-band radar, a dual thermal/daylight camera from Moog and an AIS receiver that was supported by SPx Server, which generates radar tracks corresponding to vessel movement in the monitored area.

These track reports, along with camera video and AIS reports, are transmitted to the shore-based facility where the RadarWatch presents the combined radar, camera and AIS data in a unified operator-friendly display.

We needed a modern, multi-window display solution that fuses information from radar sensors, transponders and cameras.

Frank Cobis, VP & GM, Klein Marine Systems

Firing Range Danger Area Infringement Safety System

Cambridge Pixel supplied its RadarWatch software and advanced tracking servers to Maritime Information Systems Ltd (Maris) as part of an upgrade to safety systems at UK military firing ranges. The RadarWatch display application and SPx Server tracking software has helped improve safety at the firing range by providing an integrated radar video and AIS track display, as well as advanced alarm capability for targets entering user-defined danger areas.
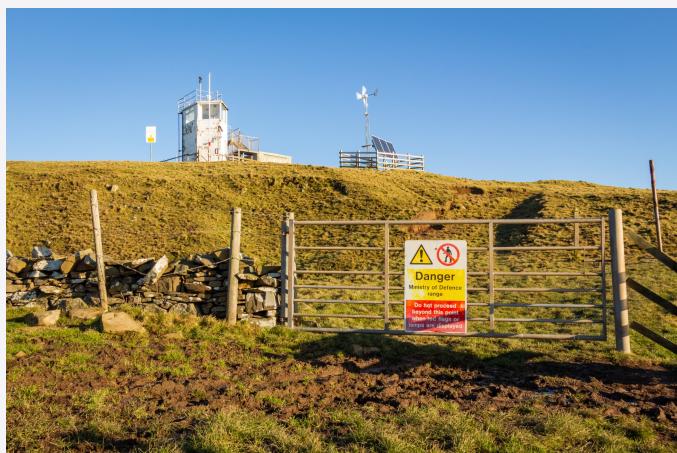
RadarWatch features comprehensive alarm logic allowing alarms to be configured based on areas, target activity, or target behaviour. This alarm logic includes the ability to compare all current targets to user-defined regions and to identify targets impinging on them. Exceptions may be made within a "safe list", allowing identified targets to enter alarm zones without raising an alert.

RadarWatch accepts open data formats such as ASTERIX and NMEA-0183 and works with Cambridge Pixel's own backend server modules too. Augmented vision is also implemented to fuse primary radar tracks with AIS data and then display this as an overlay to camera video.

Cambridge Pixel's display software and its range of flexible backend software modules has allowed us to design and build a complete system upgrade for our customer using commercial sensors.

Nic Baldwin, Technical Manager, Maris

Product Summary

Product	Description
RadarWatch	Flexible end-user display application for maritime security and coastal surveillance with support for radars, cameras, charts and AIS. Includes an augmented vision feature.
RDR Data Recorder	Multi-sensor record and replay application. Supports radar video, tracks, navigation data, ADS-B, AIS, audio, camera video, computer screens and general network data.
SPx Alarm Server	Alarm configuration and trigger monitoring.
SPx Camera Manager	Automatic target following and camera prioritisation.
SPx Fusion Server	Multi-source/multi-format radar track combiner.
SPx Server	Radar processing, plot extraction, target tracking and distribution.
SPx Track Manager	Radar track format conversion, annotation and filtering.
SPx Tracker-3D	Software-based radar tracking supporting 3D and non-rotating electronically scanned radars.
SPx Viewer-3D	3D visualisation software for radar track reports and ADS-B messages.
Surveillance Display Framework	Fully customisable source code framework for a multi-screen end-user display application.
VSD	Highly customisable end-user display application with support for radars, cameras, RDFs, LRADs and RF inhibitors/jammers.

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