

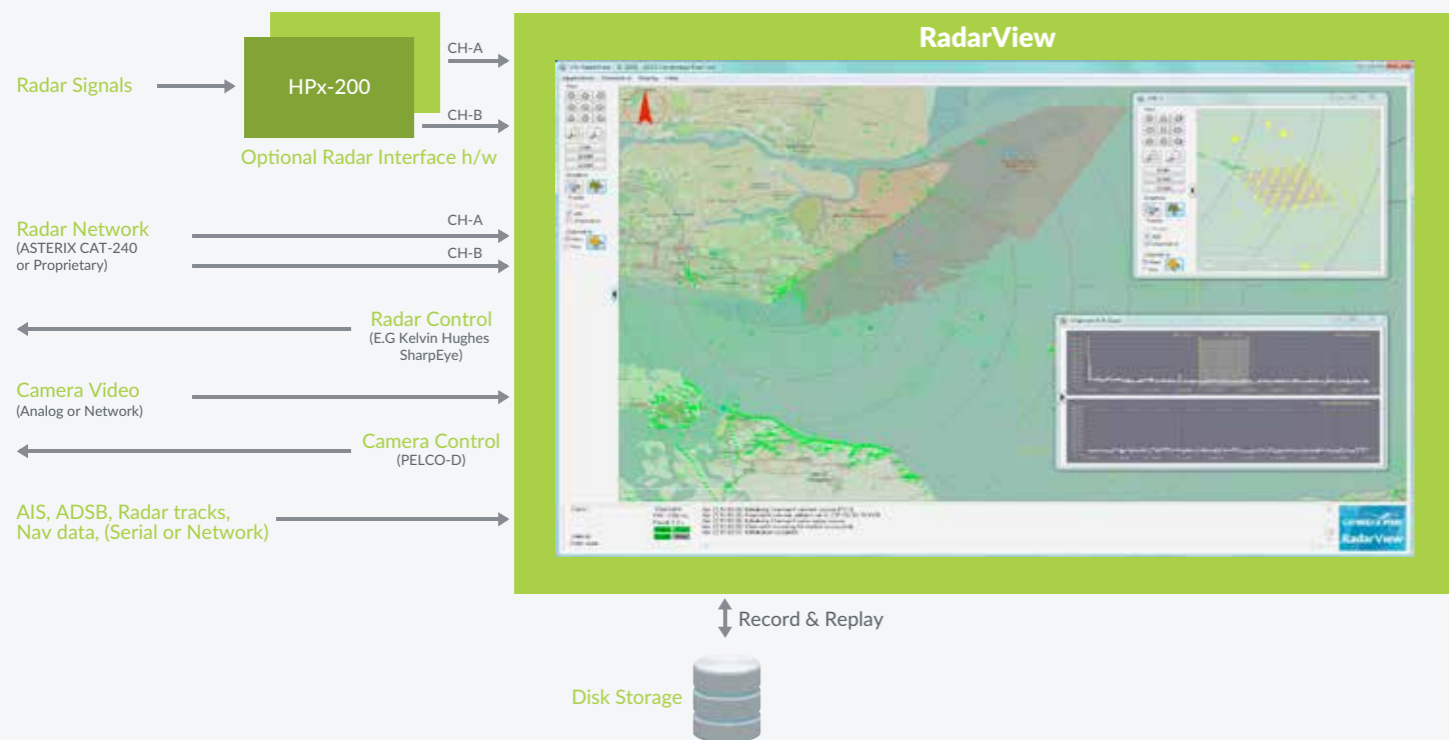
# RadarView

Primary Radar Visualisation  
Software for Windows



# RadarView

RadarView is Cambridge Pixel's Windows-based software application for the visualization of primary radar and camera video. With radar video received from a remote server (SPx Server), a direct network interface from the radar, or a local radar capture card (HPx-200 series), RadarView provides a ready-to-run display application. It supports multiple channels, multiple windows and multiple display presentations for primary radar video in addition to related data (AIS, ADSB tracks etc). Zooming and panning the picture is as easy as dragging the mouse, with the radar picture being updated in realtime to give a highly interactive display.



## Intuitive Display Navigation

Click the mouse in one of RadarView's windows and simply drag the pointer to move the view position. The radar picture is updated in real-time as the mouse moves. Simply use the mouse's scroll wheel to zoom in or out.

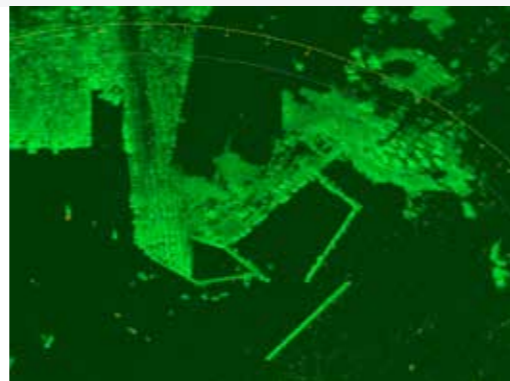
## Display Presentation

The colour of each video can be independently configured and videos can be displayed with or without history fade trails, which are retained as the view changes. Up to 255 scans of history data can be displayed and new data can be displayed in a different colour to history data for clear distinction.

## RadarView Scan Conversion

RadarView uses Cambridge Pixel's high-performance Radar Scan Converter software which supports PPI, B-Scan and A-Scan display presentations and allows multiple videos to appear in a window, and multiple windows to appear on a screen.

The view can be scrolled and zoomed effortlessly, and in real-time, using the mouse to move the radar centre and the scroll wheel to zoom. Different videos can be shown in different colours within the same window - for example, raw and processed video.

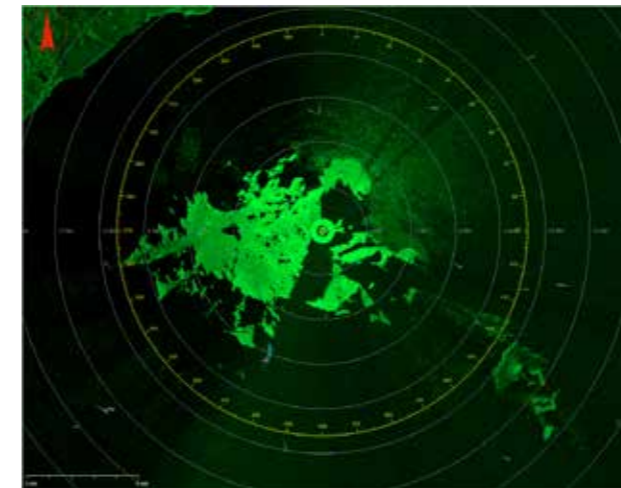


## Display Options

RadarView supports the display of radar video in normal PPI view and, for more specialised requirements, also supports B-Scan and A-Scan views. A-Scan mode is especially useful for radar configuration and set-up.

### PPI Display Mode

The PPI (Plan Position Indicator) view displays the radar as if looking at a plan view of its coverage. It shows a rotating sweep that corresponds to the movement of the antenna.



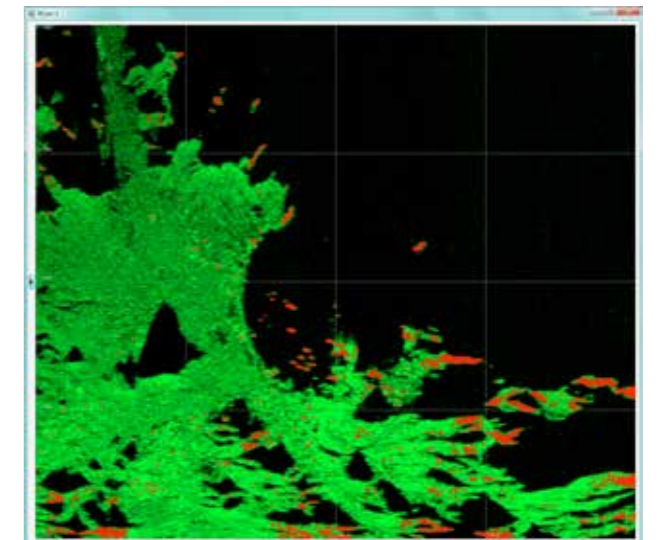
### A-Scan Display Mode

In A-Scan (or A-Scope), the data is displayed as a signal strength or amplitude against time (equivalent to range) for each return. The display is what would be seen if the radar video were displayed on an oscilloscope.



### B-Scan Display Mode

Typically used in fire-control situations, the B-Scan mode shows range against azimuth. As the radar rotates, the display updates across the window, from left to right.



## Video Display

When used with a compatible TV frame grabber card or Cambridge Pixel's SPx AV Server, RadarView supports display of up to 2 real-time video windows. These may be used to display PAL or NTSC TV signals, possibly derived from a camera co-located with the radar to provide visual surveillance of the radar coverage. The camera may be controlled using an on-screen joystick or by associating the camera's position with a radar track (slew-to-cue).



# RadarView Graphics

RadarView displays the following graphical components:

## North Marker

Indicates the direction of North when using a ship heading referenced display mode.

## World Coastline Vector Map

A coastline database down to a resolution of 40m is built into RadarView.

## Radar position

A symbol indicating the position of the radar (or radars) centre.

## Heading Marker

On moving platforms displays the heading of the platform.

## Underlay Map

The radar videos are blended with an underlay map, which can be a tiled, raster or user-defined map.

## Tracks

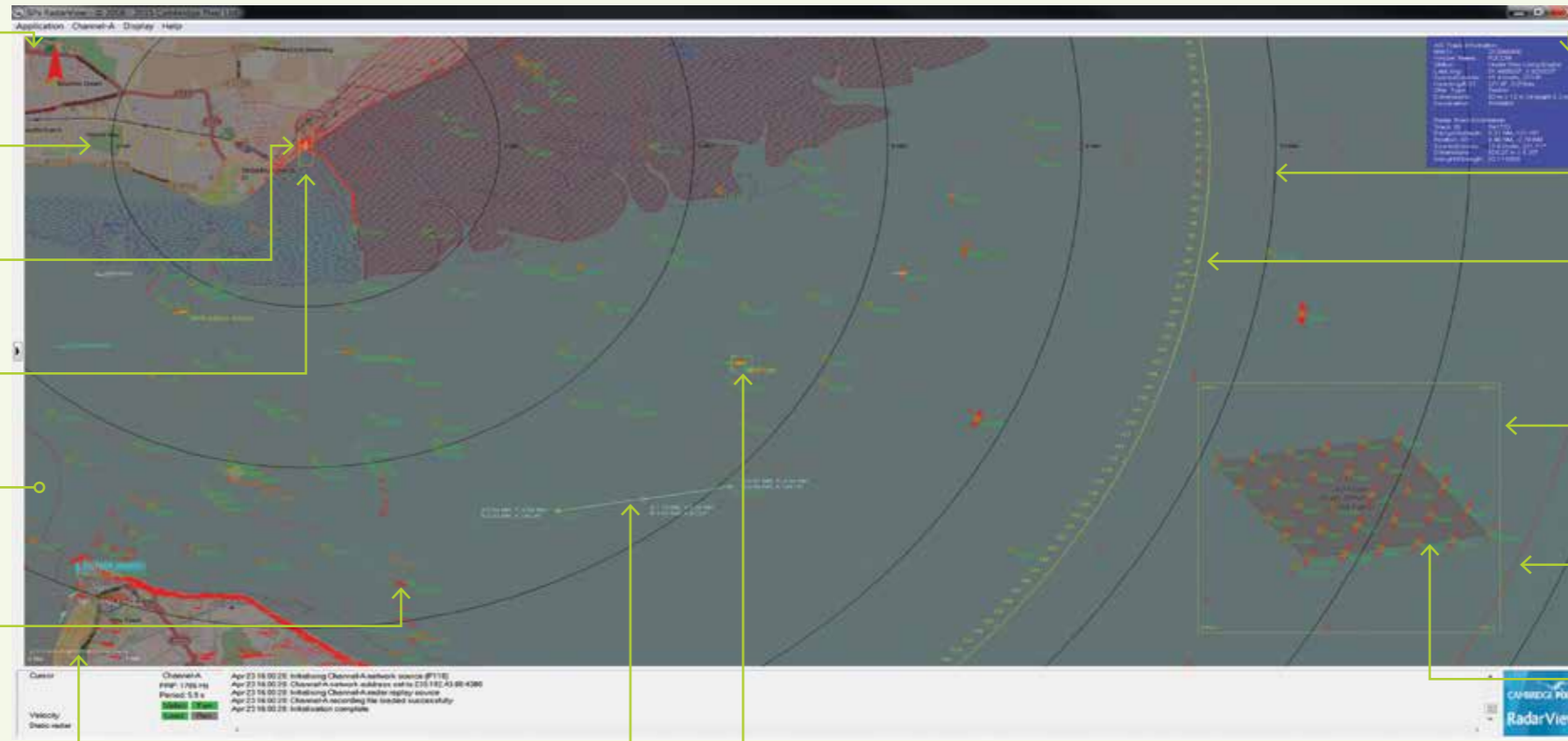
These are tracks derived from a remote radar tracker (ASTERIX CAT-48). They are shown as a track symbol with optional trail history and course vector.

## Range scale

A line that shows the current range scale.

## AIS Tracks

These are secondary tracks received through an AIS antenna or from a remote SPx Server. They are shown as a track symbol with optional trail history and course vector.



## Primary and AIS track information

Detailed information contained within the track messages for primary and AIS tracks may be displayed for user-selected tracks.

## Range rings

These are rings drawn at configurable ranges.

## Compass ring

An arc that shows the range of azimuths represented by the current view. The display of this compass ring automatically adjusts to the scale and centering of the radar.

## Window Views

The main PPI window shows a dashed box to indicate the view of the pop-up PPI, B-Scan and A-Scan windows.

## Range End

This is a circle drawn at the end of range for the radar.

## Active Areas

This shows areas defined as polygons and used to affect the display of radar video in geographical areas.

## Display ruler

Allowing measurement of range and azimuth between two points.

## Feature Summary

- Radar input from
  - HPx-200 series cards
  - SPx Server
  - ASTERIX CAT-240
  - Network radars
- Multiple (up to 5) independent PPI windows
- Independent view, colour and scale
- Dual input channels
- Static or moving platform
- NMEA navigation input for ship systems
- Underlay map display from tiled map (internet downloaded), user map or raster
- Built-in processing options including
  - Filtering
  - CFAR Thresholding
  - Clutter processing
- Configurable display units (m/km/NM)
- Area-based display using complex polygons
- Built-in world coastline database
- Overlay symbology
- Easy-to-use Windows-based software
- Runs on wide range of hardware
- Optional TV video display
- Pelco-D camera control support
- Slew-to-cue
- Radar Video Analysis
- Radar Control (selected radars)
- Track receipt and display
- AIS target receipt and display
- B-Scan (Azimuth-Range) display
- A-Scan (Oscilloscope) display
- Record and Replay of radar video
- Built-in test pattern generator
- Configuration Wizard
- Magnifier available for PPI and B-scan windows
- Full screen or window mode



## RadarView Operation

RadarView is based on Cambridge Pixel's established SPx radar processing toolkit. This provides a powerful set of processing and display components for capture and presentation of radar video using the capabilities of modern multi-core processors and graphics processor units (GPUs).

RadarView reads a configuration file at start-up. This defines initial values for RadarView's appearance and capabilities. The software provides GUI tools to configure runtime operation and a save facility, allowing the current display settings to be saved to the configuration file. A convenient Wizard is provided, which guides the user through the initial configuration process, making set-up quick and easy.



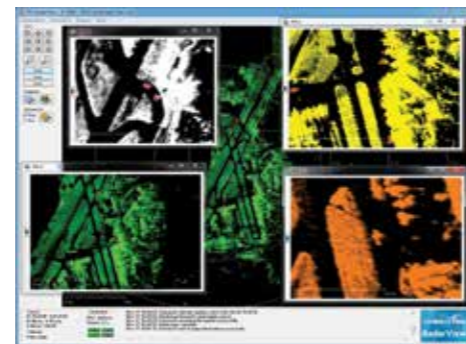
## Radar Acquisition

RadarView works with Cambridge Pixel's HPx range of radar Interface cards and is also capable of receiving network radar video from Cambridge Pixel's SPx Server application or from radars which provide a network video output directly.

Instead of using the HPx radar interface, RadarView can receive network radar video, either provided directly from the radar (in one of a number of proprietary formats) or distributed from Cambridge Pixel's SPx Server across a network. A remote SPx Server could be receiving one or more channels of video and distributing to several RadarView display clients in SPx or ASTERIX CAT-240 format.

## Multiple Scan Conversions

RadarView can be configured for one main PPI and four additional windows, giving up to five windows in total. Each window can contain one or two channels of radar video, where a channel can come from an HPx card, a network source or a recording file. Finally, each channel can be displayed in raw and processed form, where the processed form is derived using RadarView's built-in processing capabilities. So in total RadarView can provide  $5 \times 2 \times 2 = 20$  simultaneous PPI scan conversions.



## HPx Radar Interface Cards

HPx cards are compatible with a wide range of commercial and military radars using video, trigger and ACP/ARP or parallel azimuth signals. HPx cards provide a flexible range of options to support dual analogue and up to 8 digital video inputs. The card is software programmable to allow the analogue and digital video inputs to be mixed to a single intensity level for each sample.

RadarView provides indications of received PRF and provides a visual indication of the presence of video and turning data.

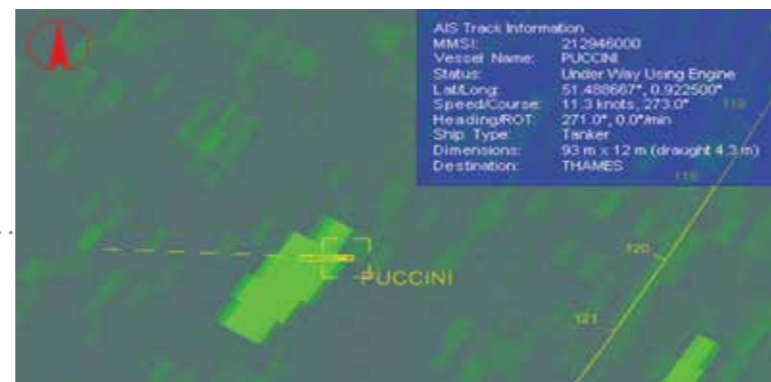
A single RadarView application can work with two HPx cards to support dual channel radar display. The independent radar signals may be presented together in a single window with the same or different radar centres, or in different windows.

## SPx Server

SPx Server may distribute the radar video to any number of RadarView clients connected via Ethernet.

SPx Server may also perform tracking on the primary video and supply track data to RadarView for display.

SPx Server is also capable of distributing AIS tracks to RadarView.



## Radar Processing

RadarView provides radar video processing to support:

- **LUT:** A programmable look-up-table for arbitrarily mapping input values to output values.
- **Interference Suppression**
- **Filtering:** STC and FTC filters are available to help reduce sea clutter and weather effects.
- **Thresholding:** Video may be thresholded using a dynamic CFAR threshold, which is adaptive to the local signal average, or a fixed level threshold.
- **Clutter processing:** A clutter map is calculated based on a long-term average of correlated video. This clutter map may then be combined with the original data to produce the processed video. A simple application of this is to remove static video and display moving targets in the processed channel.
- **Area Blank:** Areas may be defined as complex Cartesian polygons or polar segments. These areas may be used to mask out video or to display it brighter or in a different colour.



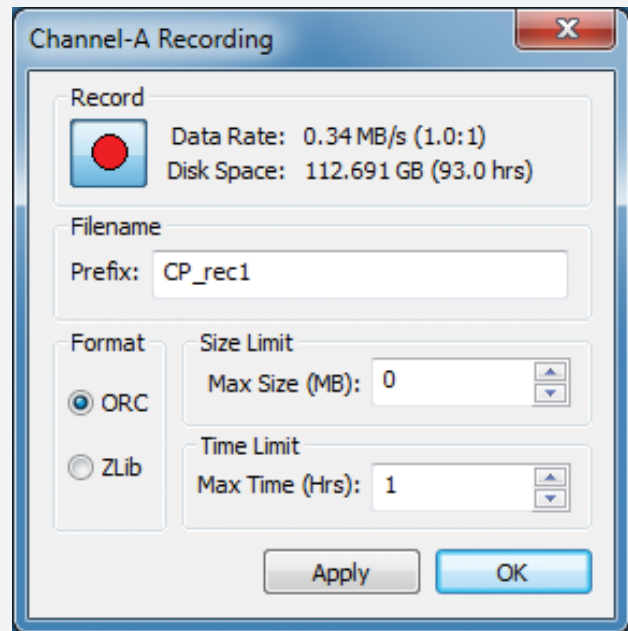
## Camera Control

RadarView supports the widely used Pelco-D PTZ camera control interface. RadarView is able to send pan, tilt and zoom commands over a serial port connection to any camera capable of receiving Pelco-D commands. The Camera can also be controlled by association with a track in slew-to-cue mode.



# Radar Record and Replay

RadarView can be used to record the incoming radar video (plus navigation and AIS data, if present) onto a local hard drive for later viewing. The video is compressed and stored using a lossless coding format based on ZLib or ORC (Cambridge Pixel's Open Radar Coding). The recorded file can be automatically split into manageable portions based on size or time. Recorded data may be copied and moved as normal Windows files, and then replayed into RadarView. Recording and replay may be initiated independently for two channels of video.



## Ordering Information

To interface with radar signals, order the HPx-200 PCI radar interface card (part number 161-100) (or HPX-200e, part number 161-110 for PCIe), which is provided with Windows drivers. Please see Cambridge Pixel's separate data sheet for the cards for full details of the supported radar signals. Alternatively, network video may be served from SPx Server into multiple RadarView clients. Consult Cambridge Pixel for details of SPx Server.

To interface to TV signals, compatible video capture cards are available from Cambridge Pixel or a third party. Alternatively, video may be served over a network from an SPx AV Server into multiple RadarView clients. Consult Cambridge Pixel for details SPx AV and video interface options.

## RadarView Customisation

RadarView is built on top of Cambridge Pixel's flexible SPx Radar Processing software library. The standard software is configurable to accommodate many radar display requirements, with further customisation options available according to customer needs. Consult Cambridge Pixel for details of customisation options, including OEM supply



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