Furuno Network Radar Interfacing and Applications

Summary

Cambridge Pixel supports interfacing to Furuno radars using a network interface. This is supported from V1.82 onwards of SPx Server and enables receipt of radar video from DRS4D-NXT, DRS6A-NXT and FAR-15x3, 15x8, 2xx7, 2xx8 and 3000 series Furuno radars.

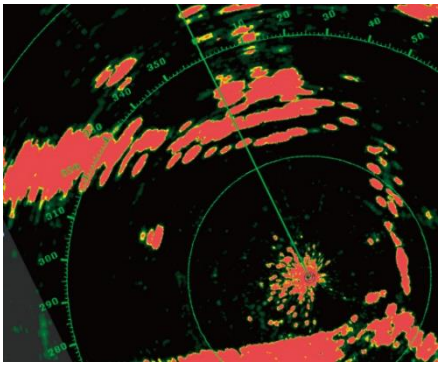
SPx Server can receive the Furuno network video and extract tracks which can then be delivered in standard ASTERIX format to a fusion or display application.

Introduction

Furuno's NXT radars are solid-state radars utilising Doppler technology to provide high-quality, high-resolution radar video for maritime applications. The DRS4D-NXT, for example, is a 60cm dome suitable for small boat applications. It has a single Ethernet connection for control and data, using a proprietary network protocol for communications with a host computer.



Note that other Furuno radars may be supported with a signal interface using the slave display interface on the radar and a Cambridge Pixel HPx card to capture and digitise the radar. Refer to Application Note "Furuno Radar Interfacing" for more details.



Furuno Network Interface

Furuno network radars normally operate either on the 172.31 network or the 192.168.31 network. This implies that the host computer running SPx Server or the user's SPX-based application should have its network interface configured so that its address is either on the 172.31 class B subnet (with a subnet mask of 255.255.0.0) or on the 192.168.31 class C subnet (with a subnet mask of 255.255.255.0). If this requirement is incompatible with other networking requirements for the computer and installation, a second network interface to support connection solely to the Furuno radar may be necessary.

SPx Server Support for Furuno

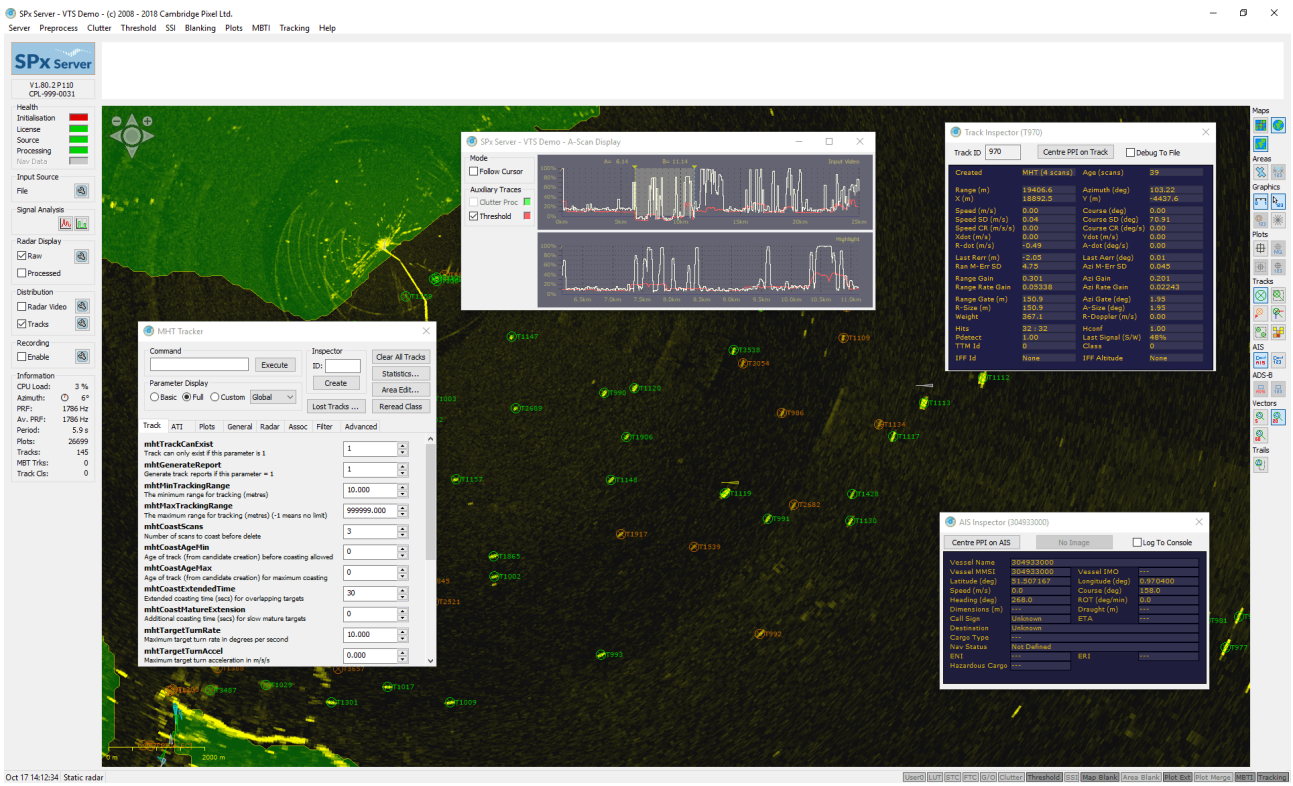
SPx Server supports basic control of the Furuno radars and receipt of radar video for onward distribution (for example in ASTERIX CAT-240 format) or target tracking.

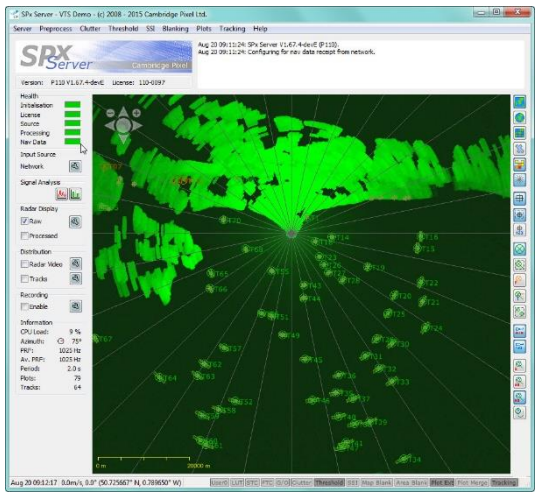
Furuno Network to ASTERIX CAT-240 Conversion

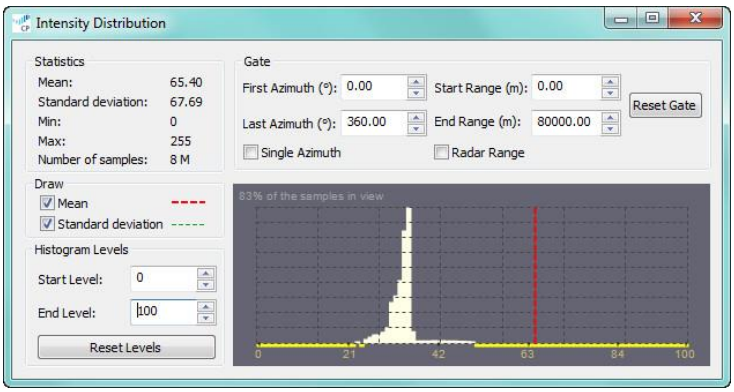
SPx Server may be configured to receive radar video from the Furuno radar and then redistribute the video in standard ASTERIX CAT-240 format. The network parameters for the ASTERIX distribution are fully configurable, allowing the server to distribute as unicast or multicast messages.

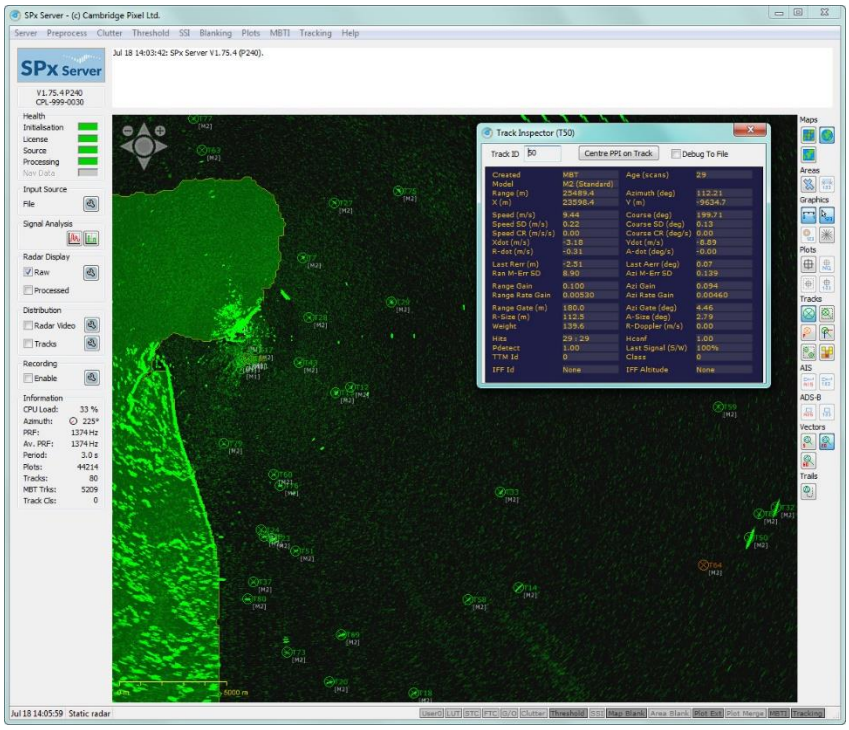
Target Tracking

The normal capabilities of SPx Server are available for processing, plot extraction and target tracking of video from the Furuno. This permits tracks to be automatically extracted from the radar video and subsequently tracked. The tracking process is highly configurable to support a wide range of operational requirements from small target tracking through to large ships and aircraft. A multi-hypothesis tracking engine is used, with the addition of multiple models to permit the same radar input to be analysed for different types of targets with different parameter sets. The tracker can be used from simple ARPA requirements with manual or automatic track initiation, through to the tracking of fast, agile targets.









More information about SPx Server is available on Cambridge Pixel's web site at:

https://www.cambridgepixel.com/products/SPx-Server/

Record and Replay

SPx Server may be used to record and replay Furuno radar video.

(For specialised record and replay requirements, RDR is the preferred product.)

Software Licence

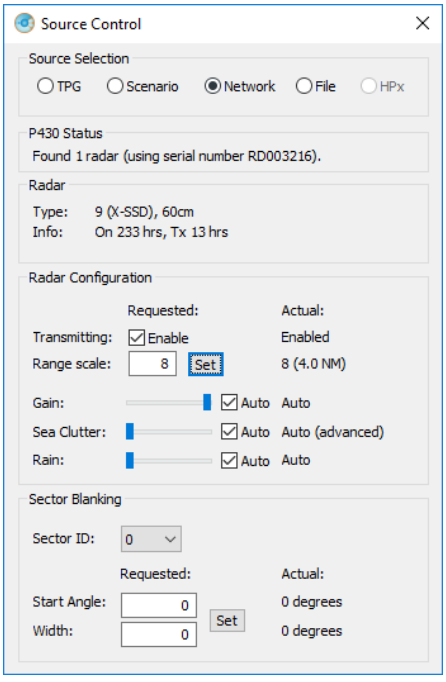
To receive radar video from a networked Furuno radar, a type-specific licence is required from Cambridge Pixel in addition to the normal SPx server licence.

Fusion

Optionally, the output of SPx Server may be input to SPx Fusion Server, which combines the track reports with a second source of tracks (overlapping radars) and/or with AIS data.

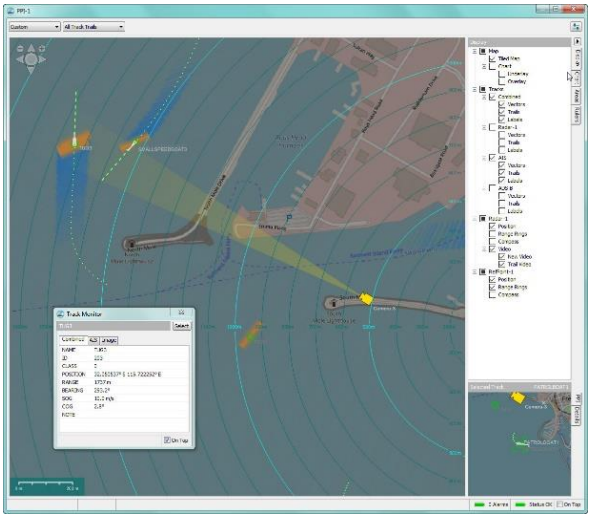
Radar Control

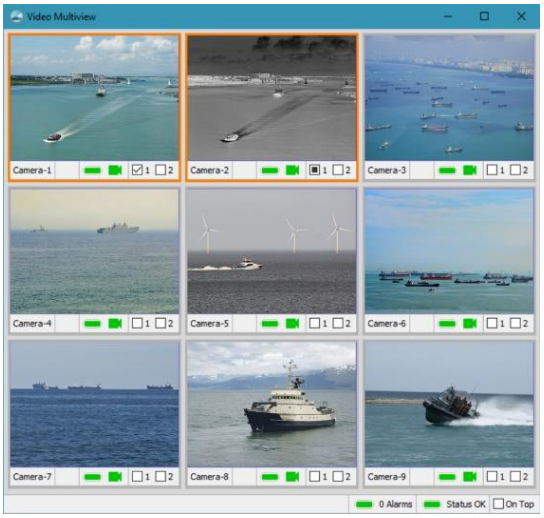
SPx Server exposes a number of radar control parameters for basic configuration of the radar. This includes range scale, clutter control, STC and transmit enable. Other control features provided by the radar may be exposed in due course or for special needs consult Cambridge Pixel.



RadarWatch

RadarWatch is Cambridge Pixel's integrated maritime security application providing a display of radar video, tracks, AIS, charts, camera video, alarms and related data.





Key features of RadarWatch include:

- Display of primary radar video
- Display of tracks
- Display of AIS
- Display of ENC charts
- Camera video display
- Camera control (manual, slew-to-cue)
- Comprehensive alarm specification for events of interest
- Multi-window, multi-screen display
- Record and replay
- Augmented vision (tracks overlaid on camera video)

RadarWatch supports the interfacing and display of multiple radar feeds (from Furuno or other radars) to create a composite picture. Tracks are generated by SPx Server and may be fused with AIS reports prior to input to RadarWatch for display as an overlay to ENCs of other mapping sources. Complex alarm rules may be specified to identify behaviours of interest, for example with targets in specified locations, moving in a specific way or otherwise behaving in an unexpected manner. Alarm outputs may be reported to a user, delivered to an external sub-system, used to control a camera, or used to initiate recording. RadarWatch may be configured with a user-interface will multi-window, multi-screen support, or it may be used as a server application generating alarms when specified events are identified.

Support for Furuno Radars in other Cambridge Pixel Applications

Consult Cambridge Pixel to discuss the options for interfacing Furuno radars to other Cambridge Pixel software applications. In many cases, using SPx Server as the bridge allows any existing Cambridge Pixel product that accepts radar video to be used with a Furuno network radar.

<End of Document>