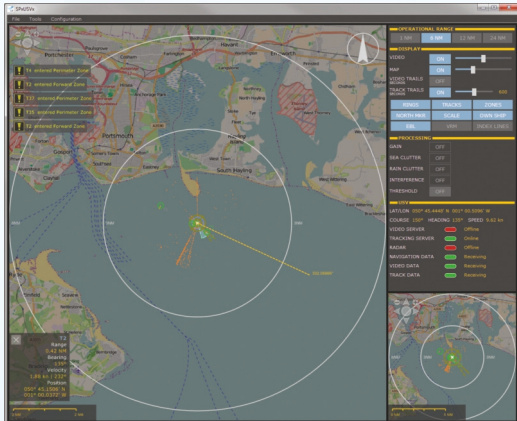# USVx
Unmanned Surface Vehicle Application Software

Features:

- Intuitive user interface controls
- Support for multiple radar channels
- Main and auxiliary PPI windows
- Remote control of radar operating parameters
  - Gain control
  - Clutter and interference processing
- Control of software radar video processing and tracking
- Manual track initiation and deletion
- Display of radar video and track reports
- Accept NMEA-0183 navigational data from vessel
- Optional support for AIS track fusion
- Compression of radar video from vehicle
- Support radar azimuth and positional correction
- Full status information display
- Support for tiled background maps and world vector shoreline map
- Optional support for S57 charts
- Radar video and track trails for historic data
- Perimeter and forward alarm zones
  - Audible and visible alarms
  - Operator acknowledgment
- Synthetics overlay
  - Range rings and range scale
  - North and own ship markers
  - Electronic bearing line
  - Variable range marker
  - Parallel index lines
- Recording and replay of radar video
- Easy configuration via setup wizard
- Runs on standard Windows PC

USVx is a Windows-based client software application that provides control of radar sensors and tracking functions on an unmanned surface vehicle (USV) from a support vessel or coastal facility. The application is designed for use with a wide variety of unmanned applications including minehunting, unmanned reconnaissance and environmental monitoring.

USVx receives and displays radar video, tracks and navigational data from SPx Server software located on the vehicle. It uses a powerful and intuitive graphical user interface designed for use with touchscreens that allows the operator to change range scale, control the operation of the radar and tracker remotely, and monitor alarms and track reports. Optional fusion software allows AIS reports to be combined with radar tracks.

PPI display windows

USVx supports separate main and auxiliary PPI display windows. UI buttons support a set of pre-configured operational ranges for quick selection, while each of the PPI windows can be independently zoomed and panned by the operator.

High-quality maps from public servers can be used as a background to the display windows, with processed radar video superimposed. Track reports received from the server on the USV are shown as symbols overlaid on the display, and information about a selected track is displayed in a tote. USVx supports history trails for radar video and target symbols to visualise longer-term movement of targets.

Network control and data

USVx communicates with tracking and video server software on the USV using a data link typically implemented with microwave or satellite technology. The server is able to compress radar video to a data rate suitable for the bandwidth available on the link. Track reports and navigational data from a GPS and/or compass system are received as UDP packets over the data link. USVx can also control the operation of the radar itself using a network-based protocol, allowing key parameters such as gain, clutter processing and interference rejection to be set by the operator.
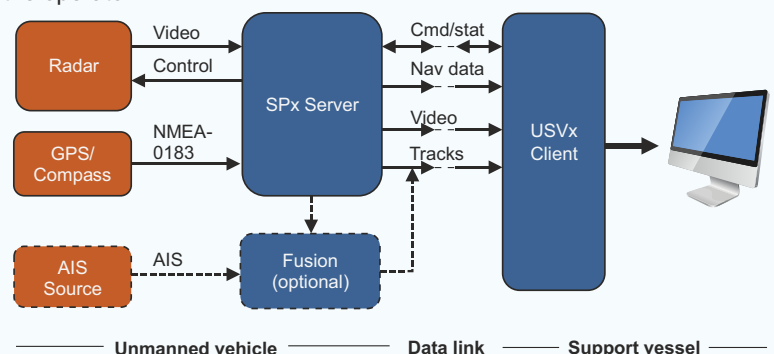
Alarms and alarm zones

USVx supports two alarm zones: a circular Perimeter Zone that is centred on the USV's position and a sector Forward Zone that is aligned to the USV's course. When a track enters either alarm zone, the operator is notified by an on-screen tote and/or an audible alarm. Alarms can be acknowledged and dismissed by the operator at any time.

Synthetics

USVx supports several on-screen synthetics as operator aids, including range rings, range scale, north and own ship markers, electronic bearing line and variable range markers and parallel index lines. Each of these can be separately enabled. ■

Operator Display

Two PPI displays with independent pan and zoom
North up or heading up
Relative motion or true motion
Configurable video and trails colours

Operator Controls

Radar operating range (four configurable buttons)
Video, map and trails enable

Processing Controls

Gain, sea clutter, rain clutter
Interference, thresholding

Position and Status Information

Latitude/longitude
Servers online
Radar online
Navigation data active
Video data active
Track data active

Synthetics overlay

Range rings and range scale
North marker
Own ship marker
Electronic bearing line
Variable range marker
Parallel index lines

Track tote

Track ID, range, bearing, velocity, latitude/longitude

Alarm display

Track ID and zone identification
Operator acknowledge button

Tracker Controls

Sensitivity
Filter gain
Auto-initiation
Maximum coasts
Maximum target speed

Interfaces

Radar video from server (UDP/IP)
Radar tracks from server (UDP/IP)
NMEA-0183 (position, speed, course and heading)
Optional AIS input

Underlay maps and charts

Open Street Map Mapnik
MapQuest
MapQuest Open Aerial
Stamen Terrain (North America only)
World Vector Shoreline
Optional support for S57 charts

Software Licensing

USB dongle. MAC address licence option

Host Computers (server and client)

CPU: Intel i5, 2 GHz or better recommended
RAM: At least 2GB of system RAM
OS: Windows 10