



SEA SOFTWARE &
HI-END SOLUTIONS
SURVEILLANCE

iSolutions

for ecological and marine safety

- Vessel Traffic Management Systems
- Oil Spill Monitoring Systems
- Radar Domes
- Parabolic Radar Antennas



Sea Surveillance provides hi-end software solutions for marine and ecological safety. Our products are suitable both for on board and coastal based applications. The main business areas of the company are: offshore, ports and harbors, ecological and meteo surveillance, marine information technology.

Sea Surveillance is a real knowledge-based company, our aim is to provide our clients with innovative, user-friendly, reliable, money saving solutions. All the products have open architecture modular design that ensures great flexibility and ease of further modification.

About company

Our company product range includes:

Integrated solutions:

- Vessel Traffic Management Systems
- Oil Spill Monitoring Systems
- Data Recording Systems

Hardware components:

- Radar Domes
- Parabolic Radar Antennas
- Radars

Hardware components could be sold separately or as a part of integrated solutions.

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1. Technologies

■ iConcept

iConcept is an innovative technology that underlies our software solutions. Its key features are open architecture modular design, centralized component location and wide use of Internet to connect the modules. The products based on iConcept are called **iSolutions**.

General System Configuration



What i stands for

- **Innovative** World's first VTS system using such technologies.
- **Internet-based** Use of modern internet protocol extensions makes possible to locate system components at any place of the world where local or internet connection to the iServer is available.
- **Intelligent** Our systems are configured to insure great flexibility, scalability and accessibility with the highest security.
- **Integrated** Using our API the clients may integrate the sensors they need.
- **Inexpensive** Server-based system structure saves money and time on deployment and maintenance.



iSolutions Components

Components of iSolution can be divided into 3 groups:

- Sources
- Server (iServer)
- Information Surveillance Display (iSurv)

Sources:

- iTracker
- CCTV
- VHF

To enhance the reliability and workability of our systems we use IP devices that have no moving parts (e.g. HDD, fans, etc.) and replace computers by smart devices where it's possible.

iServer — the main component of iConcept

iServer receives data from the sensors, processes it and stores it in the database.

That's why our systems insure all connected clients to see the same picture despite of their location.

We use MS Server 2008 as a core of the iServer and Internet Information Server (IIS) as a gateway to the world.

Electronic charts can also be stored on the iServer and accessed by users from anywhere in the world.

Our database is made on MS SQL Server 2008 that gives us great freedom in storing different types of data and power to process it.

Concentration of data in one place simplifies and makes cheaper update routine of big systems.

iServer can be configured to work in hot standby mode.

All computations including traffic warning calculation is done on the iServer.

iSurv — Information Surveillance Display

iSurv a «shell» of our system that user sees. It receives information from iServer and overlays it on the electronic S57 chart that also can be received from the server. Users logged into the system using their username and password.

iSurv supports up to 10 access levels according to the profile defined on the server.



All components are designed to be able to work in local network or via Internet.

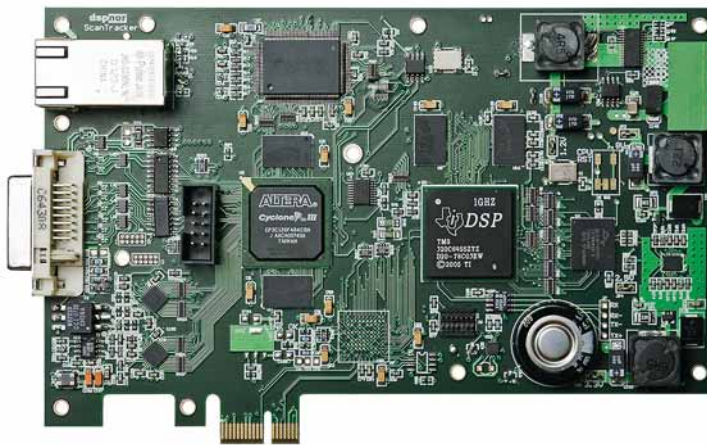
The advantages of using products with iConcept:

- Quick to install
- Easy to use
- Cheap to maintain

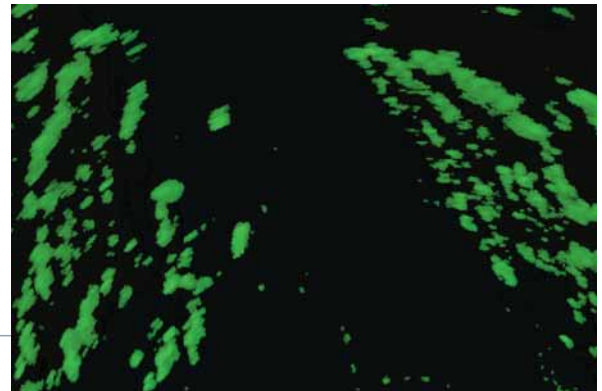
1. Technologies

iTracker

iTracker is a complete single board solution for radar data collecting, processing and distribution. It is the only product on the market that integrates data collection, transceiver control, video processing, target tracking and data distribution. The unit minimizes installation and ownership costs.

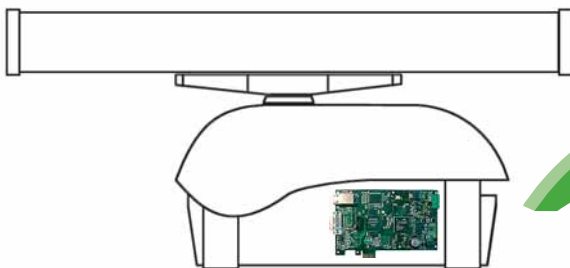


iTracker



Radar video

System Configuration



Radar with Integrated iTracker



Tracked targets,
radar video





iTracker Features

Advanced Video Processing

High speed high resolution video sampling ensures optimal datasets for the tracker. In addition to full resolution sweep correlation and scan integration, an ordered statistics CFAR processor is utilized for optimal processing and clutter removal.

LAN Interface

The Gigabit LAN interface offers a variety of protocols and options. The user may select high resolution streamed data for local display while transmitting readymade images with a selectable resolution over low bandwidth connections. Track data is also transmitted at a user defined rate. The firmware may be upgraded over LAN.

Multiple Hypothesis Tracker

This technology is regarded as the most advanced and reliable tracker technology on the market today. It is typically used in military systems.

Host Radar Remote Control

The iTracker board offers full remote control and adjustment of the connected radar. The monitoring station may trigger on alarm levels or view log data for the transceiver.

Minimize the Cost of Installation and Ownership

When integrating the iTracker together with the masthead transceiver only a network cable is needed in addition to the power cable.

- Automatic track extraction
- Video / tracker masking
- Small target / fast target detection
- High speed RF limiter control output
- Selectable update rates and resolution installation
- Lossless or lossy compression schemes
- Streaming of raw or processed data
- Web-based setup interface
- Optional solid aluminum casing for masthead installation
- Each iTracker board may support several clients depending on the selected configuration

Technical Data

• Radar interfaces	Sperry Marine, Furuno, Raytheon
• Sampling speed	10–120 Mhz
• Sampling resolution	12–16 bits
• Video format	Any polarity, any TVA format
• PRF	10–10000 Hz
• ARP	1–120 RPM
• Azimuth interfaces	Any serial format, synchro on demand
• Sync delay	Adjustable
• Power supplies	5 V, 25 W
• LAN interface	1000/100/10 Mbits

2. Hardware components

■ Radar Domes

The Ex-Radome is a system designed primarily for X-band radar, both with respect to physical dimensions and frequency but may be used for all kinds of surveillance equipment needing an Ex-protected enclosure in potentially explosive atmospheres.

It is constructed to fulfil the European Normative EN 50014 and consists of a dome made from fibreglass composite and a stainless steel/aluminium support structure. It includes a purging and overpressure control system to ensure an Ex-safe environment. It also includes Ex-safe work-light and Ex-safe power outlet, as well as a shutdown-protected electrical distribution cabinet. An internally mounted gas detector is optional.

We also have non-Ex model which could be used as an enclosure for harsh weather conditions (wind, rain, snow, hail, sand, salt spray, UV rays, wide temperature fluctuations) insects and animals.



General Specification

Parameter	Model	
	10223 EX(p), 10223	10223-6 EX(p), 10223-6
• Antenna Size	7 foot (parabolic)	6 foot (slotted)
• Outer Diameter	2.43 m	2.67 m
• Dome Material	Gas and dust-proof Fibreglass optimizes for 9.4 GHz. The radome is made of one piece without any joints.	
• Support frame material	Aluminium / Stainless steel	
• Wind Tolerance	350 km/hr (225 mph)	
• Additional Equipment for non-Ex(p) models	Air Conditioning Radar Transmission Screen Heater Lightning protection	
• Additional Equipment for Ex(p) models	Remote monitoring system (temperature, humidity, pressure)	



Parabolic Radar Antennas

We have two different configurations of radar antenna — regular and down tilt.

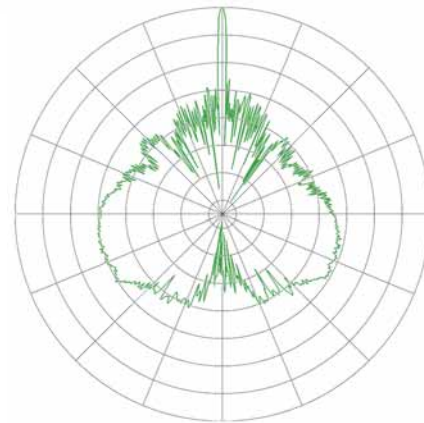
Key features:

- High gain and narrow beam width parabolic X-band 2100 x 360 mm antenna
- Ideal for detection of small targets
- Designed for use inside the radar dome
- Switchable polarization (Circular, Horizontal or Vertical) for any weather conditions



Advantages:

- Radar target tracking — allows to pick reflection from smaller targets on longer distance compare to standard slotted wave guide antenna
- Oil spill detection — gives much cleaner picture of the sea surface
- Minimizes blind area for high installation (for down tilt model)



General Specification

Parameter / Model	Regular	Down Tilt
• Frequency range	9.34 – 9.47 GHz	
• Antenna gain	34.3 dBi	31.8 dBi
• Elevation beam width (-3 dB)	7.0°	9.0°
• Down tilt lobe (-15 dB) ref. main beam		14.0°
• Azimuth beam width (-3 dB)	1.1°	1.1°
• Side lobe level linear polarization level azimuth 4°–10° / >10° / elevation >15°	-28 / -32 / -21 dB	-26 / -28 / -19 dB
• Sidelobe level circular polarization level azimuth 4°–10° / >10° / elevation >15°	-25 / -30 / -26 dB	-22 / -26 / -19 dB
• VSWR	1.3	
• Max. peak power	25 kW (1µS pulse width)	
• Material	Aluminium	
• Height over gear box interface	800 mm	700 mm
• Max swept diameter	2200 mm	
• Interface	Sperry Marine	

3. iSolutions

■ iOSMS — Oil Spill Monitoring System

Oil spill monitoring system with innovative internet-based concept. The main purpose of the system is to detect oil spills and to track them over time.

iOSMS key features are:

- The earliest possible detection of oil spills in a range of up to 4 km
- Ability to detect oil spills under poor weather conditions and during darkness
- Providing an automatic alert if an oil spill presents
- Monitoring of the oil spill including oil drift vector with speed and direction
- Providing information about wave height, direction and speed
- Providing weather information

System benefits:

- The system uses standard coastal or ship radar system
- Ability to use different kinds of sensors and program modules
- Earliest possible and precise detection of oil spill and its cause
- Full set of data for efficient planning of the recovery operations

Oil Spill Detection System & Wave Monitoring System

Oil Spill Detection System (OSD)

The OSD system can be used as a standalone system or as a part of a remote sensor network. The OSD system provides continuous local surveillance. It can be installed on board the moving vessel, on the oil rig

and on shore. The oil spill detection system utilizes advanced image processing algorithms for earliest possible detection of oil spills.

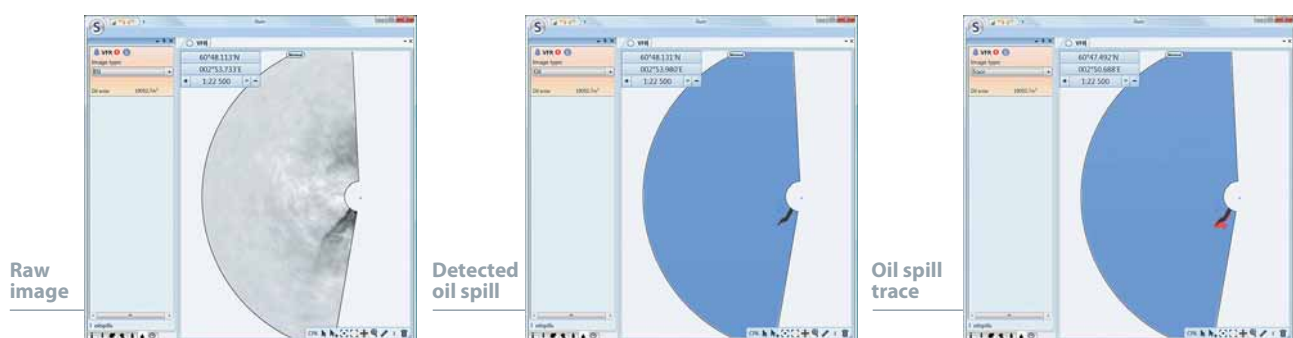
Wave Monitoring System (WAVEX)

The WAVEX provides means for measurement of directional ocean wave spectra and ocean surface currents based on analyzing portions of radar images of the sea surface. Data processing of a time sequence of these

images allows qualitative directional wave spectra as well as spectra scaled in absolute wave height and surface current to be obtained.



OSD & WAVEX uses standard marine X-band radar as a main source for collecting information.





iVTMS — Vessel Traffic Management System

iVTMS is a modern vessel traffic management system that expands usual set of tools and functions. The system is based on iConcept.



This technology ensures high accuracy of received and processed data and simplifies its distribution.

iVTMS gathers the information from all possible kinds of sensors:

- Radar
- AIS
- CCTV
- Weather sensors

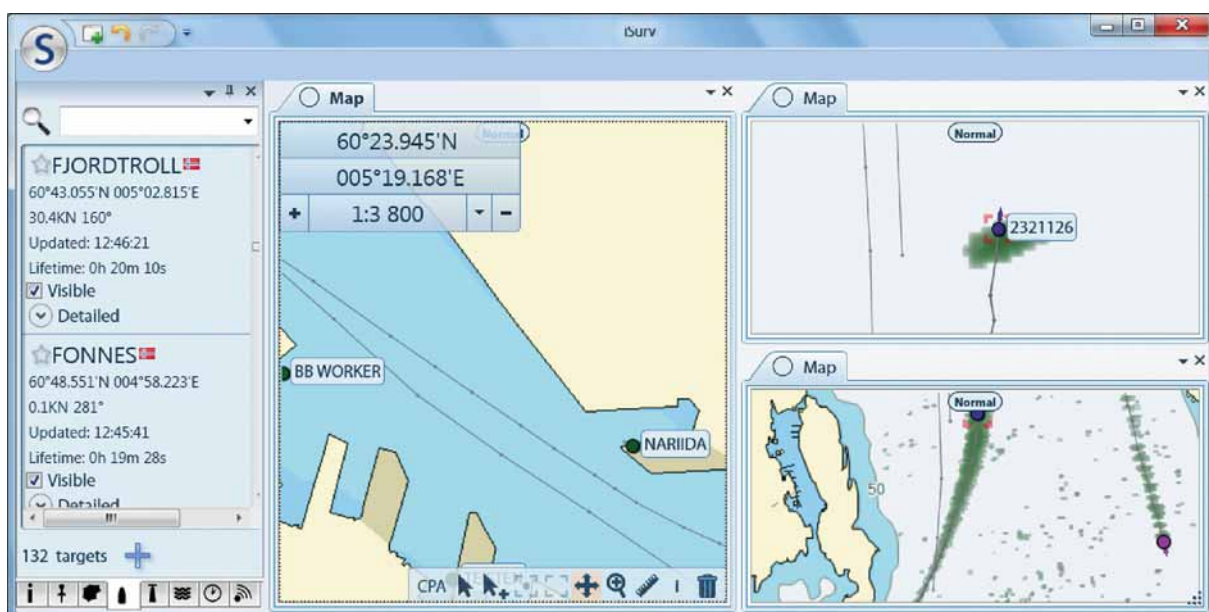
The information is overlaid on the electronic S57 charts.

iVTMS key functions are:

- Vessel traffic monitoring
- Providing an operator with early traffic / collision warnings (audible and visible)
- Providing vessel data
- Distributing data to remote location
- Playback and logging
- Remote control and monitoring of equipment
- Operator training

Standards:

The iVTMS is designed to fulfil IALA recommendations



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