

RUTTER

ICE NAVIGATOR™

DETECTION AND

NAVIGATION SYSTEM



PROVIDING TRUSTED ICE NAVIGATION AND MANAGEMENT INFORMATION



A KEY PART OF ICE MANAGEMENT PLANNING

The Arctic and Antarctic environments present unique challenges with harsh environments, remoteness, and prolonged periods of low light. The *sigma S6 Ice Navigator™* Ice Detection and Navigation system enables ships operating in ice to differentiate between open water, ice pans, leads in ice fields and the thicker ice ridges that impact operations in ice zones. The *sigma S6* system's ability to reliably detect bergy bits and growlers that can significantly damage a vessel or platform makes it possible to offset additional capital and operating costs brought on by the logistics of operating in such a remote environment. The improvements in situational awareness provided by Ice Navigator™ occur across a wide range of sea states, weather, and dim light conditions, making the tactical information it provides essential for real time route planning and decision making in ice operations.

THE CHOSEN SOLUTION FOR ICE-CLASS FLEETS AND ARCTIC DRILLING OPERATIONS

The *sigma S6 Ice Navigator™* system was specifically developed for ice detection in the ice-threatened oilfields of Eastern Canada. Rutter's Ice Navigator™ installation base now includes many of the world's ice breaker fleets as well as tankers, bulk carriers, research vessels, oil rigs and coast guard vessels from countries operating in Arctic and subarctic regions.

Ice Navigator™ systems have also been selected by oil and gas companies as part of their ice defence and ice management solutions on platforms, drill ships and specialty support vessels.

SIGNIFICANT PERFORMANCE IMPROVEMENTS

"We have the Rutter sigma S6 Ice Navigator™ interfaced to one of our navigation laboratory radars. This enables us to improve the students understanding of the excellent detection performance and significance of the Rutter sigma S6 Ice Navigator™ compared to a conventional marine radar.

I am also impressed by the performance of the Rutter sigma S6 Ice Navigator™ that I experienced as an Ice Advisor during the drilling operation in the Kara Sea in 2014."

Norvald Kjerstad, Professor, Nautical Science,
Faculty of Maritime Technology and Operations,
Norwegian University of Science and Technology (NTNU)

NEW ADVANCED ICE ANALYSIS

Understanding the make-up of an ice floe is essential in safe, efficient navigation. *sigma S6 Ice Navigator™* now features state of the art processing providing real-time information on your surroundings with automatic identification and tracking of ice ridges, icebergs embedded in pack ice, and open water leads.

NEW SIGMA S6 CONNECT

A new web-enabled interface allows external systems such as Google Earth Pro and GIS platforms to interface with the *sigma S6 Ice Navigator™* to display radar imaging, ice target information and ice outlines.

NEW COASTLINE MASK

A new Coastline Mask feature provides automatic masking of land areas based on a global coastline database, preventing land areas from being detected as ice targets and simplifying system operation when working near land.

KEY ICE NAVIGATION AND DETECTION FEATURES

Individual ice radar requirements can vary from real time navigational support to the detection and tracking of ice approaching fixed platforms and the establishment of a central ice management hub for Arctic operations. Ongoing ice research partnerships ensure that our features remain current and that we continue to innovate and deliver lasting value. All of our ice navigation systems provide the uncompromised imaging needed to detect hazards, react early and continue to operate safely and efficiently in and around sea ice.

FIG:3 – With *sigma* S6 technology it is possible to see the shadows of higher relief icebergs frozen in the pack ice.

FIG:2 – For operations such as offshore drilling or seismic data acquisition, knowing where the ice front is, and the nature of it, is critical.



FIG:1 – Ice Navigator™ clearly differentiates between open water, ice pans, leads in the ice field and the thicker ice ridges.

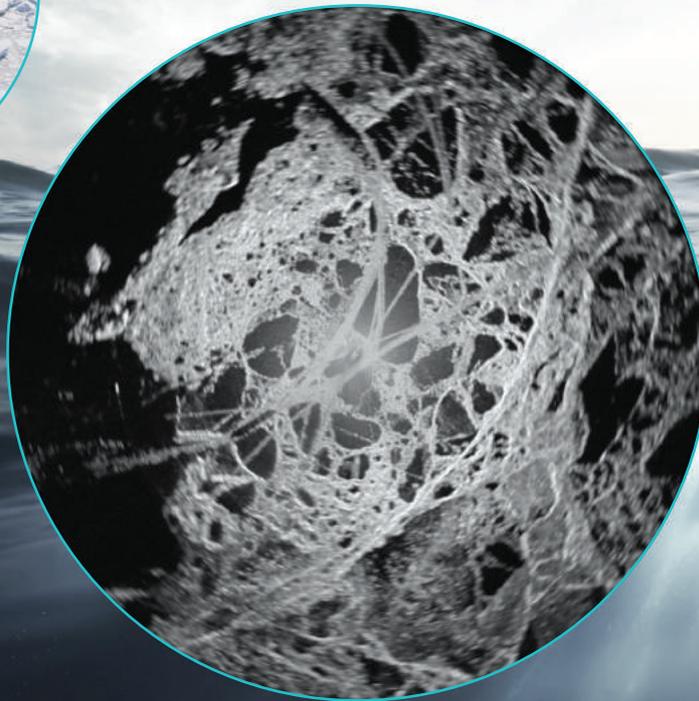


FIG:4 – Comparison of Hazardous Ice Detection Capability

	Size – Height Above Sea Level	Distance Visible Ice Navigator™	Distance Visible X Band Radar-only
Bergy Bit	1 to 5 m	Greater than 4 nmi	1 to 0.5 nmi
Growler	Less than 1 m	Greater than 2 nmi	Less than 0.5 nmi

HIGH DEFINITION ICE IMAGING

High resolution image processing provides high definition ice imaging, leading to superior detection and tracking. The *sigma* S6 user-interface provides adjustments to radar tuning to further customize the on-screen image.

AIS OVERLAY WITH CLASS A AND B TARGETS

Class A and B AIS target overlay options are available with full information, radar tracks and target association display. The addition of Class B targets enables the monitoring of transponders attached to ice threats and the verification of smaller vessels in an operating area.

TRACK MULTIPLE TARGETS

The *sigma* S6 Ice Navigator™ advanced target tracker can monitor and track up to 300 targets simultaneously, ensuring the operator has complete awareness of all activity and targets within range of the radar.

MULTIPLE CLIENT OPTIONS

The *sigma* S6 remote client feature allows numerous remote clients to view the master system. The *sigma* S6 SeaBridge option is a low-bandwidth solution facilitating information sharing between a remote radar location and multiple networked clients viewing the Ice Navigator™ display.

CAMERA INTEGRATION

Integration and control of IR cameras is facilitated through Rutter's SeaView interface. Features include the ability to support multiple cameras, intelligent selection of a best camera for specific targets, and automatic slewing to ice targets entering a guard zone. These features support quick decision making in addressing potential threats and possible interruptions to operations.

Fig:4 Reference – O'Connell, B., "Marine Radar for Improved Ice Detection," Proceedings of the 8th International Conference on Ships and Marine Structures in Ice (ICETECH 2008), Society of Naval Architects and Marine Engineers – Arctic Section, Banff, Alberta, Canada.

PRACTICAL AND VERSATILE SOLUTIONS

Rutter *sigma* S6 technology connects to most commercially available marine radars, enabling customers to extract additional value and effectiveness from their existing assets. Should it be required, Rutter provides the option of supplying a dedicated high performance radar as an input sensor. As with all Rutter *sigma* S6 product lines, Ice Navigator™ can be combined with any of our other systems to meet your needs: Small Target Surveillance, SeaFusion Data Integration, Oil Spill Detection and the WaMoS® II wave and current monitoring systems offered by OceanWaveS GmbH.

RUTTER ICE NAVIGATOR™ ICE DETECTION AND NAVIGATION SYSTEM

Features:

- Ice Detection
- Ridge, Berg, and Lead Detection
- Screen Capture and Video Recording
- Tracking Software (300 Targets)
- Scan Averaging (128 Scans)
- Motion Compensation
- Multiple Remote Clients
- Cursor Serial Port Output (Used for IR Camera Input)
- TTM NMEA Serial Port Outputs (For IR Camera and ECDIS Inputs)
- *sigma* S6 Connect
- Coastline Masking

Options:

- Raw Data Recording
- SeaBridge – Multiple Client – Low Bandwidth Communication Link
- SeaFusion – Multiple Radar – Single Display

Note: Ice Navigator™ accepts standard serial/network inputs from navigational instruments (NMEA 0183) including: AIS, wind anemometer, echo sounder, speed log, GPS, and gyrocompass.

Information about end user training, product support, product combinations, performance modeling, product references and reliability measures can be provided by e-mailing your request to support@rutter.ca

Rutter Inc. is an authorized representative of OceanWaveS GmbH.



RUTTER

Rutter Inc.
30 Hallett Crescent, Suite 102
St. John's, NL
Canada A1B 4C5
Tel: +1 709 576 6666
Fax: +1 709 576 7635
E-Mail: sales@rutter.ca

www.rutter.ca