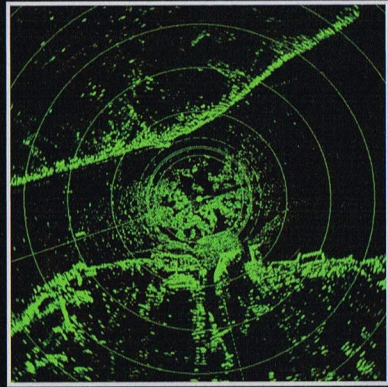


Sigma S6 image as seen by vessel navigating through ice on the St. Lawrence River



Conventional radar image of the same route on the St. Lawrence River

SIGMA S6 – TECHNICAL SPECIFICATIONS

System Configuration

- Marine certified 19" 3U rack / bulkhead mount computer
4 x RS-422, 2 x RS-232, 4 x USB, 1 x LAN, 60 GB HD,
115-230 VAC, 50-60Hz
- Marine certified 19" or 23" TFT display, keyboard /
trackball
- Sigma RSi Interface Card
- Sigma S6 SeaScan Radar Server Processing Module
- Sigma S6 SeaTrack Target Tracker
- Sigma S6 SeaView Radar Display and Remote Display Client

Recommended Source Radar Requirements for optimum performance against small targets:

- X-Band, 25 kW with 3000 Hz Pulse Repetition Frequency
- 1° Antenna Beam Width, >40 RPM Antenna Rotation Speed

Radar Interface

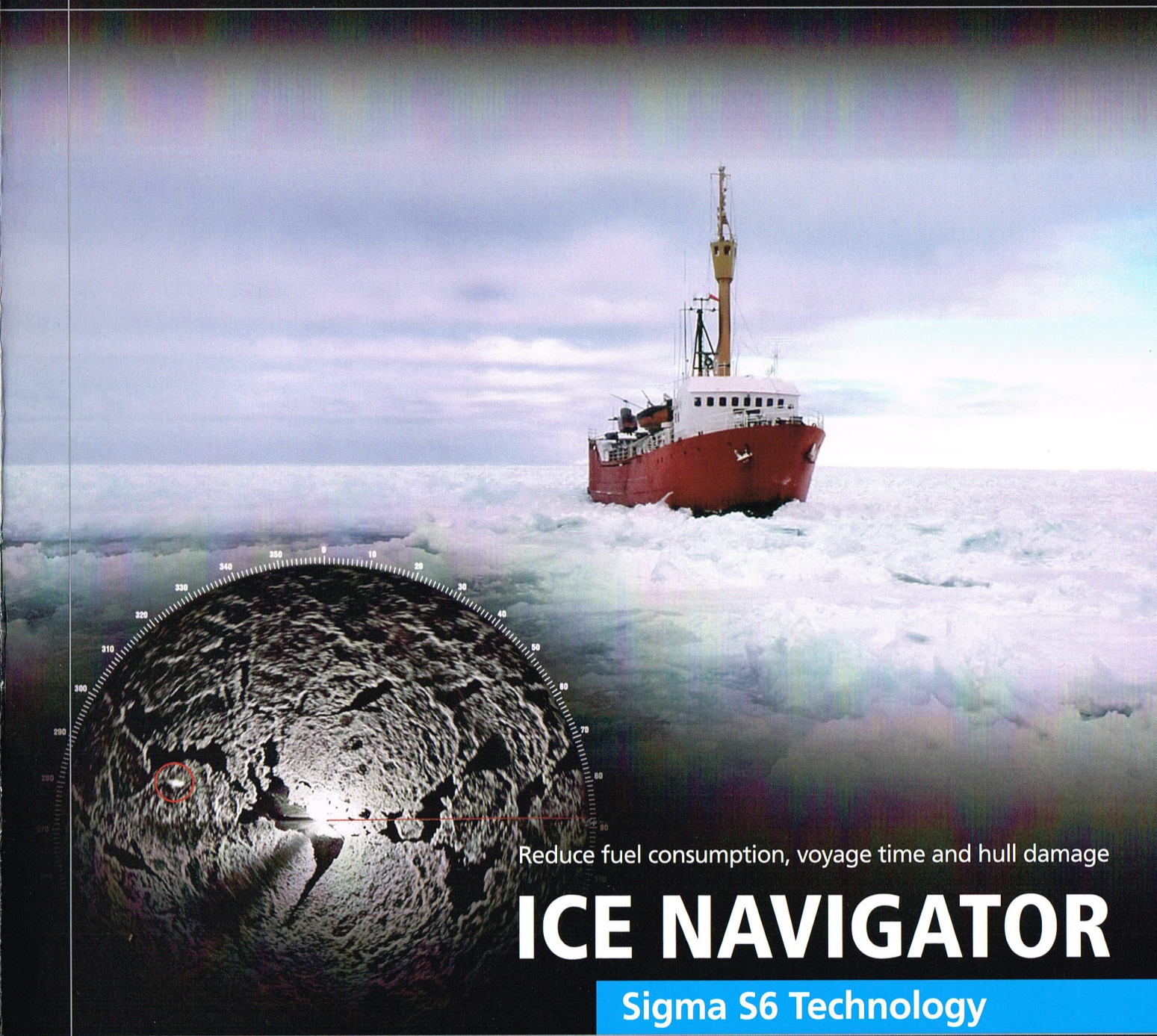
- Raw Video
- Trigger
- Heading (ARP)
- Antenna Rotation (ACP)
- CVD interface can be supplied for composite radar video and other unique radar types

Data Input Interfaces (NMEA RS-422)

- GPS for Position and Time
- Gyro Compass w/10 Hz update rate
- AIS
- Anemometer
- Depth Sounder

Data Output Interface (NMEA RS-422)

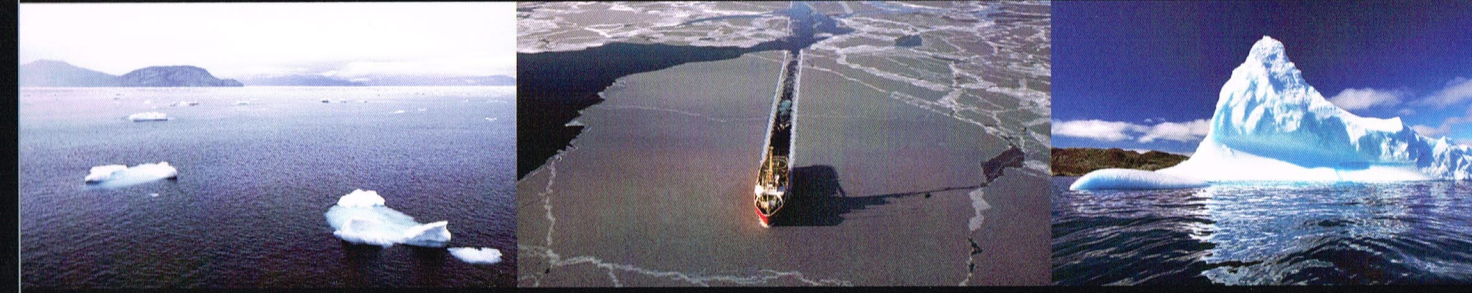
- TTM (Tracked Target Message), or
- RSD (Radar System Data / cursor), as selected by operator



Reduce fuel consumption, voyage time and hull damage

ICE NAVIGATOR

Sigma S6 Technology



Head Office - Canada

63 Thornburn Road
St. John's, NL
Canada A1B 3M2
Tel: + 1 709 576 6666
Fax: + 1 709 576 7635
sales@rutter.ca

Germany

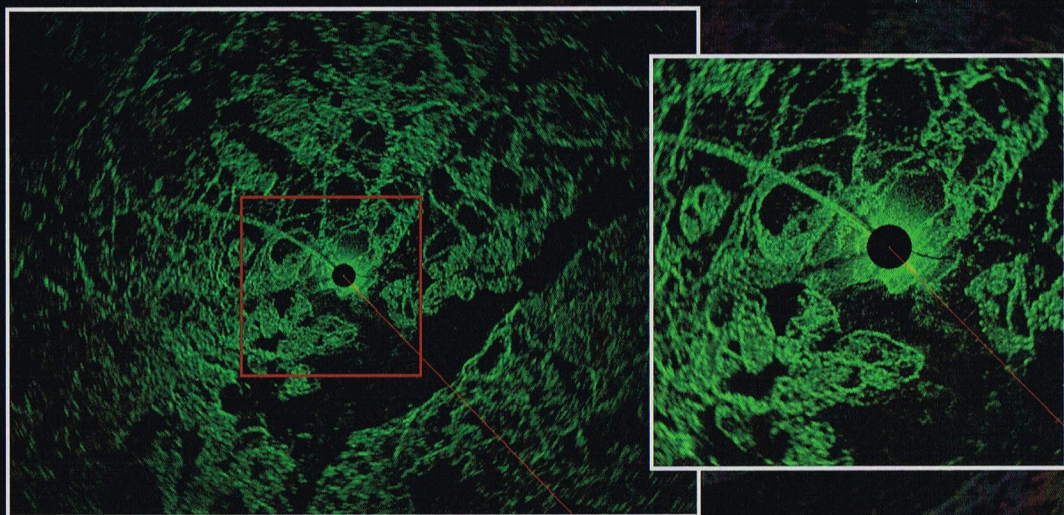
Tel: + 49 421 34 99 538
Fax: + 49 721 151 329 560
germany@rutter.ca

www.rutter.ca



Chart your course safely and responsibly through the world's most dangerous and environmentally sensitive waters





A ship navigates through heavy ice in the Canadian Arctic. The closer range view clearly shows a lead (crack) in the ice.

Sigma S6 Radar Technology

Proven to Enhance Safety While Saving Time and Money

Global warming and resource depletion are opening up new shipping routes and making arctic oil and gas projects more economical. Now more than ever, operators and regulatory agencies are paying close attention to maritime safety in environmentally sensitive regions.

Rutter's Sigma S6 Ice Navigator can interface to a large range of marine radars with suitable performance. The complete Radar-100S6 can be installed to manage daily operations, display ridges in ice fields, detect growlers and bergy bits, or provide immediate notification of an approaching iceberg.

Rutter also provides the ability to fully integrate the Ice Navigator with motion compensated IR Camera and Xenon Search Light, converting a single station into an integrated Multi Station Ice Management System – for vessels and platforms.



- Identify the optimum route through icy waters
- Reduce fuel consumption and voyage time
- Protect your vessel from costly hull damage

Outstanding Small Target Detection and Imaging

The Sigma S6 Ice Navigator's extraordinary small target detection provides the critical information needed to manoeuvre through ice infested waters. With exceptional image clarity the Sigma S6 provides the ability to detect and analyze small subtle features such as ice leads, fissures and bergy bits that might otherwise be missed.

Rutter's Sigma S6 Ice Navigator goes beyond other systems with their current ice radar offerings. In addition to enhanced ice navigational safety, the Sigma S6 also provides the improved ability to detect small targets in rough seas. Its high resolution radar signal processing and 256 shades of colour delivers a distinctive way of presenting conventional radar data, by delivering detailed imaging of the smallest ice features or objects on the sea surface, including oil*.

Exceptional Value With Retrofit Options

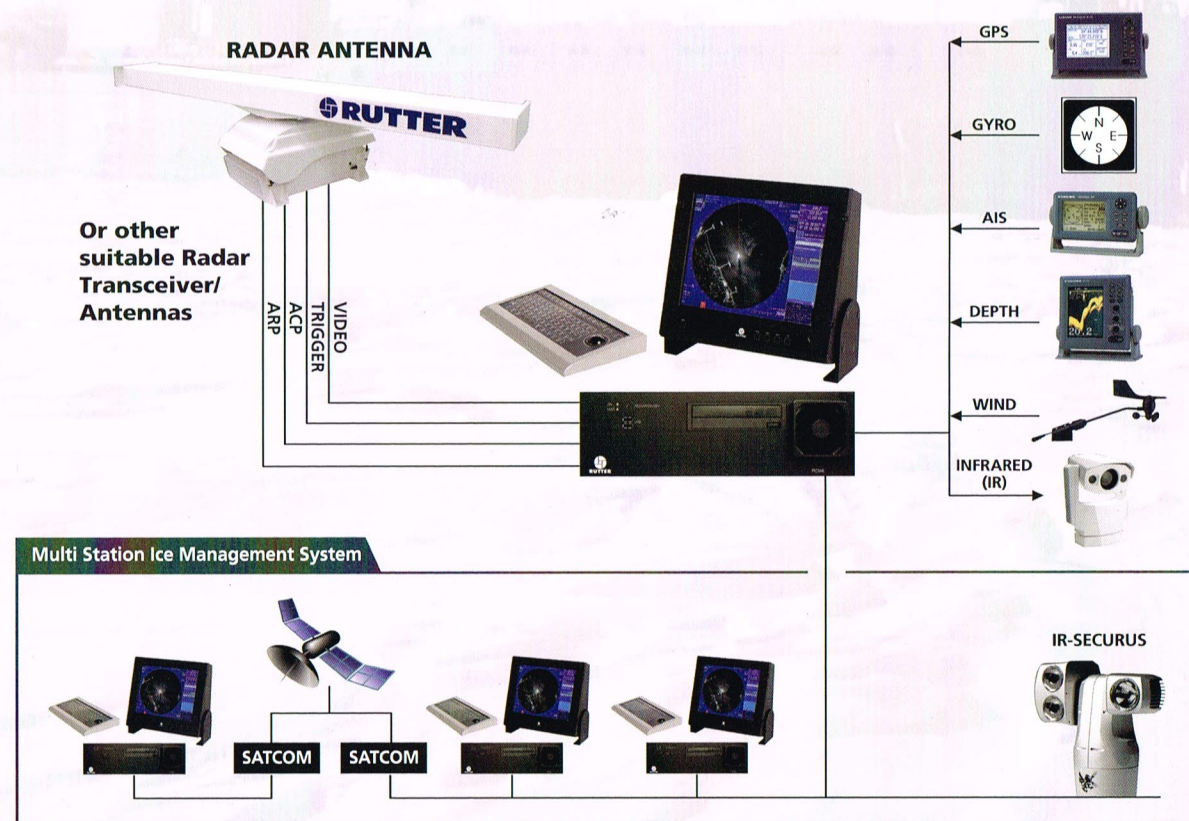
The Sigma S6 Ice Navigator is a result of 20 years of research and development for the purpose of detecting ice, icebergs, sea surface anomalies and/or small targets. The technology

has been refined into the current Sigma S6 radar processor, tracker and recorder. Rutter's Sigma S6 technology has been verified to detect:

- Small ice bergs, "Growlers" (<1m above sea surface) from more than 2Nm, and "Bergy Bits" (<5m) from more than 4 Nm
- Persons in water, buoys from more than 1.5 Nm
- Oil slicks* or other sea surface features from more than 4Nm

The Sigma S6 Ice Navigator offers unique processing capabilities that include:

- High resolution image processing for presenting "photo-like" images
- Pulse-to-Pulse Processor for superior noise reduction and tracking accuracy
- Scan Average Processor capable of correlating radar scans for detecting fast targets, or motion compensated radar scans for enhanced detection of slow moving targets and surface texture discrimination
- Target data output in NMEA/TTM format via LAN or serial interface



Rutter's Sigma S6 Ice Navigator Radar System can be integrated with its Sigma S6 Oil Spill Detection (OSD) and Small Target Systems to provide the complete solution to meet demanding operational requirements.

* While the Sigma S6 Ice Navigator may occasionally be used for imaging oil slicks, it is not an approved Oil Spill Detection system. For the automatic Oil Spill Detection, Outlining and Tracking, Rutter offers the SIGMA S6 Oil Spill Detection System.

