

## KLEIN SYSTEM 5000

### HIGH-RESOLUTION, DYNAMICALLY FOCUSED, MULTI-BEAM SIDE SCAN SONAR

The System 5000 is a 5-beam side scan sonar designed for hydrographic, military and commercial applications requiring high-resolution images of the sea floor and bottom obstructions, while operating at tow speeds up to 10 knots and with an overall swath width of 300 meters.

Conventional side scan sonar systems use a single sonar beam per side to generate an image of the seafloor. The physics of this type of sonar results in degradation of image resolution with range poor along track resolution, and requires speeds of 5 knots or less to insure 100 percent bottom coverage.

From a design perspective, these shortcomings can be eliminated by designing a sonar that, through beam steering and focusing techniques, simultaneously generates several adjacent, parallel beams per side. Such a multi-beam design approach permits higher towing speeds with 100 percent bottom coverage, while providing high-resolution imaging to the maximum range of the sonar.

This design approach is principally employed by military side scan sonar systems designed for high speed mine hunting applications. L-3 Klein is the first commercial company to offer a multi-beam side scan sonar using similar design techniques to military sonars, but at a fraction of the cost.

The two main benefits of the high-speed, high-resolution System 5000 series are: higher towing speeds with no loss of bottom coverage, and range independent high-resolution image capability.

Since operation costs are dependent on the amount of at-sea time required to complete a survey, the Klein System 5000 Multi-Beam Side Scan Sonar with survey speeds more than twice that of conventional side scan sonars, minimize at-sea time, thus greatly reducing survey costs.



#### KEY FEATURES

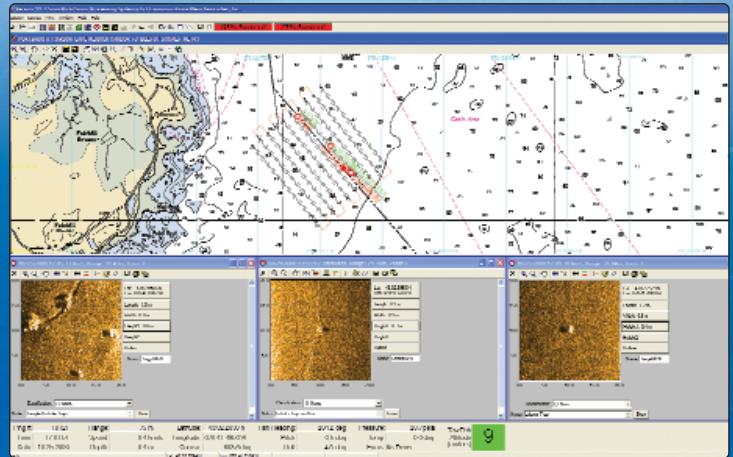
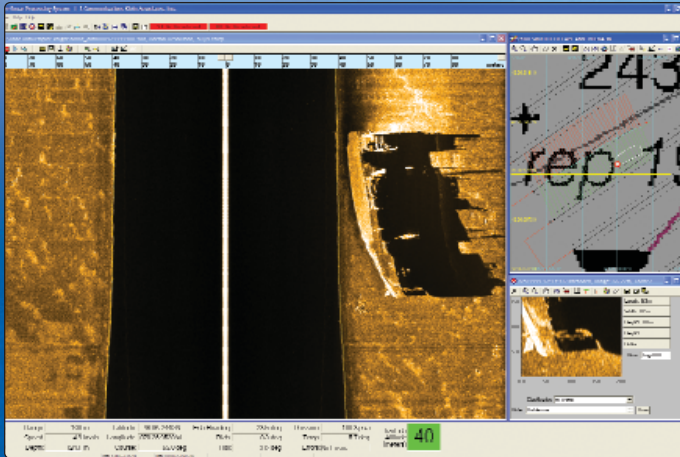
- Multiple simultaneous beams per side each ping
- High tow speed capability
- Dynamic digital auto-focusing
- Very high resolution and 100% coverage
- Sonar connected to PC display on Ethernet LAN

THE DIFFERENCE  
IS IN THE IMAGE



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#### Towfish Specifications

Number of beams	5 port & 5 starboard
Frequency	455 kHz $\pm$ 1%
Range scales	50, 75, 100, 150 m
Pulse length	50 to 200 $\mu$ sec.
High-resolution mode (along track)	10 cm to 38 m
Standard resolution mode (along track)	20 cm to 75 m, thereafter increasing to maximum of 36 cm @ 150 m maximum range
Resolution (across track)	7.5 to 30 cm
Operating speed envelope	2-10 knots @ 150 m sonar range
Sonar digitization	16 bit / channel
Maximum operating range	150 m (300 m Swath)
Array length	120 cm (47.2 in)
Body length	194 cm (76.4 in)
Body diameter	15.2 cm (6 in)
Weight (in air)	70 kg (155 lbs)
Sensors:	
Heading	Standard
Pitch & roll	Standard
Pressure / altimeter	Standard
Depth rating*	200 m standard

#### Options

Yaw rate and high-resolution roll sensors
Responder / transponder
Splash-proof TPU housing
Fiber optic interface

\* For deeper depth rated systems, please contact Klein

#### Transceiver Processor Unit (TPU) Specifications

Width	Standard 19-in rack-mount
Height	13.2 cm (5.2 in)
Depth	54.6 cm (21.5 in)
Weight	12.7 kg (28 lbs)
Input voltage	115/240 VAC, 50/60 Hz
Power	120 W (includes towfish)
Navigation input	NMEA 0183
Data output	100 BaseT Ethernet LAN

#### Tow Cable

Type: steel	Coaxial or fiber-optic double armored
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#### Workstation PC

Workstation PC	
SonarPro® installed	Optional, with SonarPro software installed
Windows OS installed	installed

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**communications**  
Klein Associates, Inc.

**L-3.** Headquartered in New York City, L-3 Communications employs over 64,000 people worldwide and is a prime contractor in aircraft modernization and maintenance, C<sup>3</sup>ISR (Command, Control, Communications, Intelligence, Surveillance and Reconnaissance) systems and government services. L-3 is also a leading provider of high technology products, subsystems and systems.