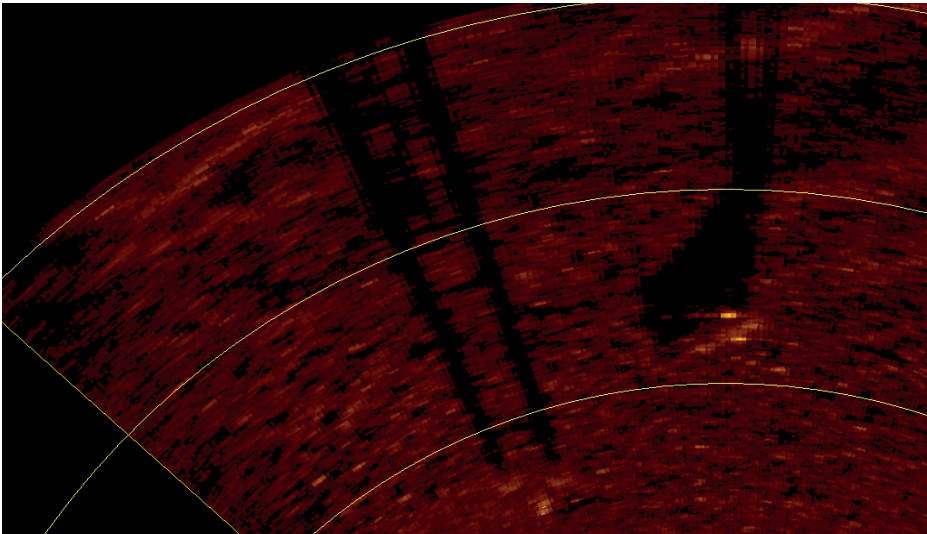


SAR EXPRESS



KONGSBERG

LOW-COST SEARCH & RECOVERY SCANNING SONAR SYSTEM



Mannequin test target at 900 kHz



Complete SAR Express System

- › Low-cost system for limited budgets
- › Saves time
- › Increases diver safety by allowing operator to identify potential hazards and direct the diver in real-time

- › Provides digital records of search and findings
- › Unprecedented image clarity from a domed sonar
- › Operates in zero visibility from 1 - 250 M (3 - 820') range

Kongsberg Mesotech Ltd. has developed SAR Express, a low-cost search and recovery scanning sonar system for dive teams with limited budgets. The SAR Express is centered on Mesotech's Clariscan® domed sonar, which combines the Company's wide-bandwidth composite transducer with a patented acoustic lens that provides unprecedented image clarity.

Mesotech's underwater search and recovery systems are widely used by first responders and law enforcement agencies searching for victims of drowning, evidence, downed aircraft and submerged vehicles. It saves time, increases diver safety and provides records of the search and findings.

SAR Express components:

- Clariscan Sonar Head (300-1200 kHz)
- Deployment tripod
- 225' of Kevlar® strengthened deployment cable
- Low voltage 'Splash-proof' Interface Unit
- MS1000 Express Software
- Remote Keypad
- Shipping cases (3)

A Windows PC computer is required and generally customer supplied but can be purchased from Mesotech.

The Remote Keypad is a rugged USB plug and play device that simplifies usage by enabling the sonar operator to initiate key system functions in the MS1000 software program without the need to use a conventional keyboard or mouse. A two-button thumb joystick simulates mouse/pointer control and the rubber buttons are softly backlit for use in unlit or darkened environments.

The MS1000 Express software provides basic functions for the system operation - refer to functionality table on the reverse side for complete details.

The 'Splash-proof' Interface Unit provides 28 volts DC and telemetry to the sonar head and is used for operation of Mesotech-supplied Kevlar cable up to 152 M (500') in length.

“Sending a police officer underwater in zero visibility without scanning sonar is like sending an officer on patrol without a bulletproof vest.”

*Sgt. Rob Riffle, Dive Team Supervisor
Winnipeg Police Services*

MS1000 SOFTWARE - FEATURE COMPARISON CHART

Features	MS1000 Express	MS1000 Standard
Telemetry Interface		
RS232/RS485	X	X
USB	X	X
Ethernet	X	X
Sonar Head Support		
Single Altimeter	X	X
Single imaging sonar head (excluding high-resolution)	X	X
High-Resolution sonar head		X
Multiple sonar heads, Altimeters support		X
Synchronization of multiple sonar heads		X
Sonar Head Operation Settings		
Gain	X	X
Range	X	X
Scan Sector	X	X
Scan Step Size	X	X
Transmit Power	X	X
Resolution	X	X
Frequency (Fixed and Tuneable)	X	X
Baud rate	X	X
Scan Mode Polar	X	X
Scan Mode Sector	X	X
Scan Mode Side-scan		X
Scan Mode Echo-sounder		X
Manual Pulse Length		X
Bandwidth		X
TVG		X
Peak Detection		X
Compression		X
Target Tracking		X
Profiling and data exporting		X
Sonar Display Settings		
Colour Palette Selection	X	X
Grids, Cursors, and Annotations	X	X
Multilingual User Interface	X	X
Slant Range Correction		X

Features	MS1000 Express	MS1000 Standard
Tools		
Measurement Tools	X	X
Remote Keypad	X	X
Snap shot (BMP, JPG, PNG, TIF)	X	X
True Zoom		X
Event Marker		X
External Sensor Support		
NMEA Standard Sensor (GPS, Compass, MRU, etc.)	X	X
Valeport® MIDAS CTD Sensor		X
Track Plotter Survey features		
Helmsman Display		X
Survey line planning		X
Survey area coverage display		X
Survey map/chart planning		X
GeoTIFF importing		X
Coordinate conversion, projection and Datum shift		X
Sonar location coordinates calibration		X
Event marker recording and replay		X
Maintenance		
Program sonar factory baud rate	X	X
Upgrade sonar firmware	X	X
Factor Reset of Operation and Display Settings	X	X
Data recording and playback	X	X
Error message log window and file	X	X
Multiple user operation		X
Optional Features		
3D Profiling		X

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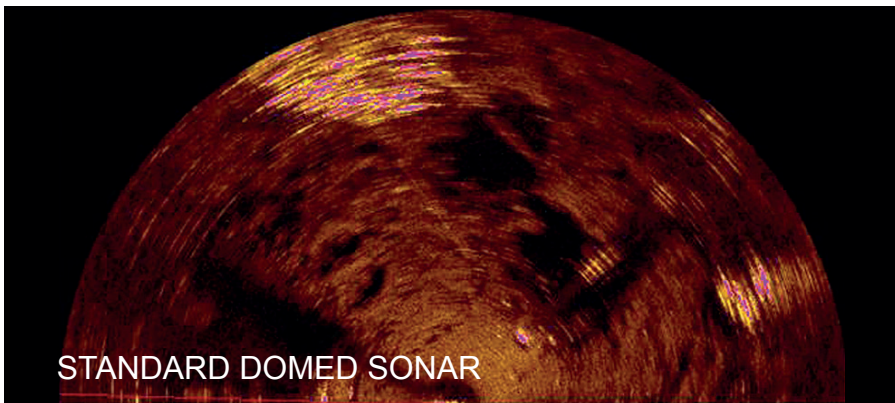
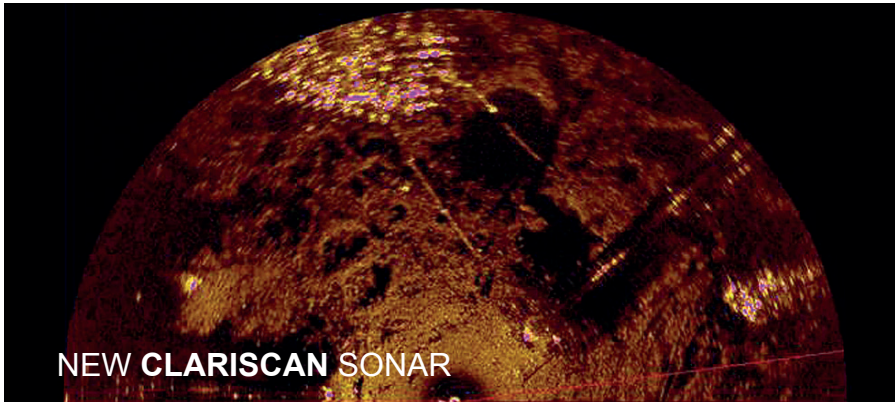
CLARISCAN

P/N 975-21190000



KONGSBERG

HIGH-PERFORMANCE DOMED SCANNING SONAR



- New patented¹ acoustic lens technology
- Improved image resolution and sharpness
- Improved operating range and frequency
- 4000 M operating depth

Mesotech's latest innovation in domed sonar technology combines the Company's wide-bandwidth composite transducer with a patented acoustic lens to provide unprecedented image clarity from a domed sonar head.

Oil filled domes were introduced to provide protection and eliminate flooding on the traditional exposed transducer shaft. This solved the flooding issues but introduced beam defocusing in two conditions, warm & shallow and cold & deep. The beam defocusing effect becomes more extreme in warm shallow water as temperature increases and cold deep water as depth increases.

The Company's engineers designed an acoustic lens that maintains beam focus through operational temperature and depth changes, significantly improving sonar performance and resulting in images that are much sharper. The Clariscan acoustic lens behaves like an optical contact lens, correcting refraction caused by oil in the dome.

APPLICATIONS

- Obstacle avoidance
- Pipeline survey
- Target detection
- Underwater construction support

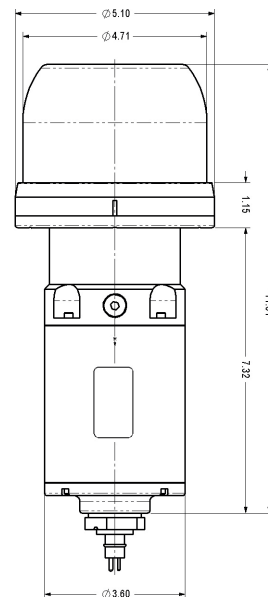
ELECTRICAL SPECIFICATIONS

Tunable in 5 kHz steps from 300-600 kHz ² and 605-1200 kHz in both CW and LFM modes								
Preset Frequencies	330 kHz	450 kHz	600 kHz	675 kHz	800 kHz	900 kHz	1000 kHz	1100 kHz
Beam Width (nom)	2.7° x 26°	2.2° x 19°	1.6° x 16°	1.4° x 36°	1.2° x 31°	1.0° x 25°	0.9° x 22°	0.8° x 20°

Maximum range:	300 m @ 330 kHz, 100 m @ 675 kHz, 50 m 1000 kHz
Minimum range:	0.5 m
Range Resolution:	≥3.75 mm (variable, determined by transmit-pulse width)
Sample Options:	238, 476, 952, 1904 (Low Resolution, High Resolution, Zoom x 2, Zoom x 4)
Sampling Resolution:	0.26 mm (0.5 m range @1904 samples), 21 mm (10 m range @ 476 samples)
Scan Speed:	typical: 3.7 sec/360° @ 5 m and 1.8° step size (@ 460 kbps) nominal: 34 sec/360° @ 100 m and 1.8° step size (@ 460 kbps)
Scan Angle:	360° continuous (user adjustable for limited sector scans)
Step Size:	0.45° - 7.2 (user selectable)
Transmit Pulse Widths:	5 μs to 1000 μs (auto selected for optimized operation)
Receive Bandwidth:	Based on 'Wide' setting: 493 kHz (0.5 m range), 109 kHz (10 m range)
Telemetry:	RS485 or RS232 asynchronous serial data
	Fixed Downlink: 9600 bps to 921 kbps (user selected for compatibility with other serial communication equipment)
	Optimized Downlink: 9600 bps to 921 kbps (auto set to highest rate allowed by the quality of the telemetry link)

PHYSICAL SPECIFICATIONS

Power Requirement:	22-26 VDC@ ≤ 0.8 A
Temperature Range:	-10 to +40°C operating -30 to +40°C storage
Operating depth:	4,000 m
Connector:	RMG-4-BCL
Materials:	Aluminum 6061-T6, 300 Series S.S., Urethane
Finish:	Anodize, Black/Blue MIL-A-8625 type II
Dimensions:	Diameter: 5.1 in / 130 mm Length: 11.5 in / 292 mm (excluding connector)
Weight:	In Air: 9.5 lb / 4.3 kg In Seawater: 4.2 lb / 1.9 kg



¹ US Patent 8,879,360 B2

² Excluding 570-580 kHz, which is blocked from use

975-21197901-1.1

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