



ELAC 
SONAR

A COHORT PLC COMPANY

SCOUT 2.0

MINE AVOIDANCE SONAR FOR SUBMARINES

SCOUT 2.0 is the most flexible solution for obstacle and mine detection on board of a submarine. The split transmitter and receiver arrays allow integration in virtually any bow design. The outstanding performance against moored mines and MLOs makes SCOUT 2.0 the first choice.



elac-sonar.de

Sphere 

MORE FLEXIBILITY – SAFER OPERATIONS

SCOUT 2.0 makes submarine operations in dangerous areas safer. This forward looking Mine and Obstacle Avoidance Sonar (MOAS) offers high-performance detection of mines and objects in the water column, below the surface and on the seafloor with sufficient range to avoid hazardous outcomes. Numerous navies currently operate the system in different configurations.

Flexibility is the key

SCOUT 2.0 is operated on newly built submarines as well as on modernised ones. The modular design of components allows a flexible integration of the transmitter and receiver array as well as the inboard electronics. Control and display may be integrated in a dedicated console or multi-function control consoles already on board. In addition to Mine Like Object (MLO) detection, SCOUT 2.0 offers features such as bottom mapping for forward looking terrain charting and an optional surfacing mode to avoid collision with silent objects. ELAC SONAR's experience in designing and producing highly specialised transducers is a valuable asset in the process of integrating the arrays into the submarine's bow. The arrays can be adapted according to the available space between the torpedo tubes and other sensors in order to guarantee the best possible fit. Like all naval systems offered by ELAC SONAR, SCOUT 2.0 has been designed, built and certified in accordance with military standards, ensuring the highest possible availability and reliability of the system.

Conformal array design for a perfect fit

The transmitter and receiver arrays are the core components of SCOUT 2.0. Their shape may be adapted to the position in the bow, resulting in the maximum performance and minimum flow noise. The arrays are designed to withstand extreme shock loads without any shock mounts. The advantage is a perfect integration without the necessity for acoustic windows. The transmitting, receiving and processing units are two separate electronic boxes that may be installed in the electronics room. These units include all electronics for the system's operation. Special attention has been paid to limit the size of the two cabinets. This eases the integration on board of existing submarines. Fast maintenance and repair is supported by easy access to the PCBs inside the cabinets and a clear, well-structured layout.

The open-architecture-based middleware of SCOUT 2.0 reduces the burden on the customer to integrate additional functionalities. These can be developed by the customer themselves or it might be a 3rd party functionality from another supplier.

Main benefits

- ✓ 3D detection of MLOs in the water column, on the surface and on the sea floor
- ✓ forward looking bottom mapping, including the functionality to generate persistent maps that can be exchanged between submarines
- ✓ surface mapping mode to safeguard surfacing operations
- ✓ automatic target detection, tracking and forwarding to combat management system (CMS)
- ✓ raw data recording and reprocessing for training or post mission analysis
- ✓ available as a standalone or fully integrated version by consequential use of open architecture middleware based on OpenDDS
- ✓ sonar performance prediction of the day for accurate situational awareness
- ✓ performance monitoring and fault localisation (PMFL) down to LRU level
- ✓ suited for new built programs and refits

Key features

- ✓ detection range up to 5000 yards
- ✓ coherent FM processing and a high bandwidth for outstanding shallow water performance
- ✓ due to the high dynamics range, analogue gain control is no longer needed.
- ✓ qualified in accordance with MIL-STD and German Navy standards
- ✓ open-architecture-based middleware (OpenDDS)

AN UNBELIEVABLE TECHNOLOGICAL ADVANTAGE FOR EVERY SONAR

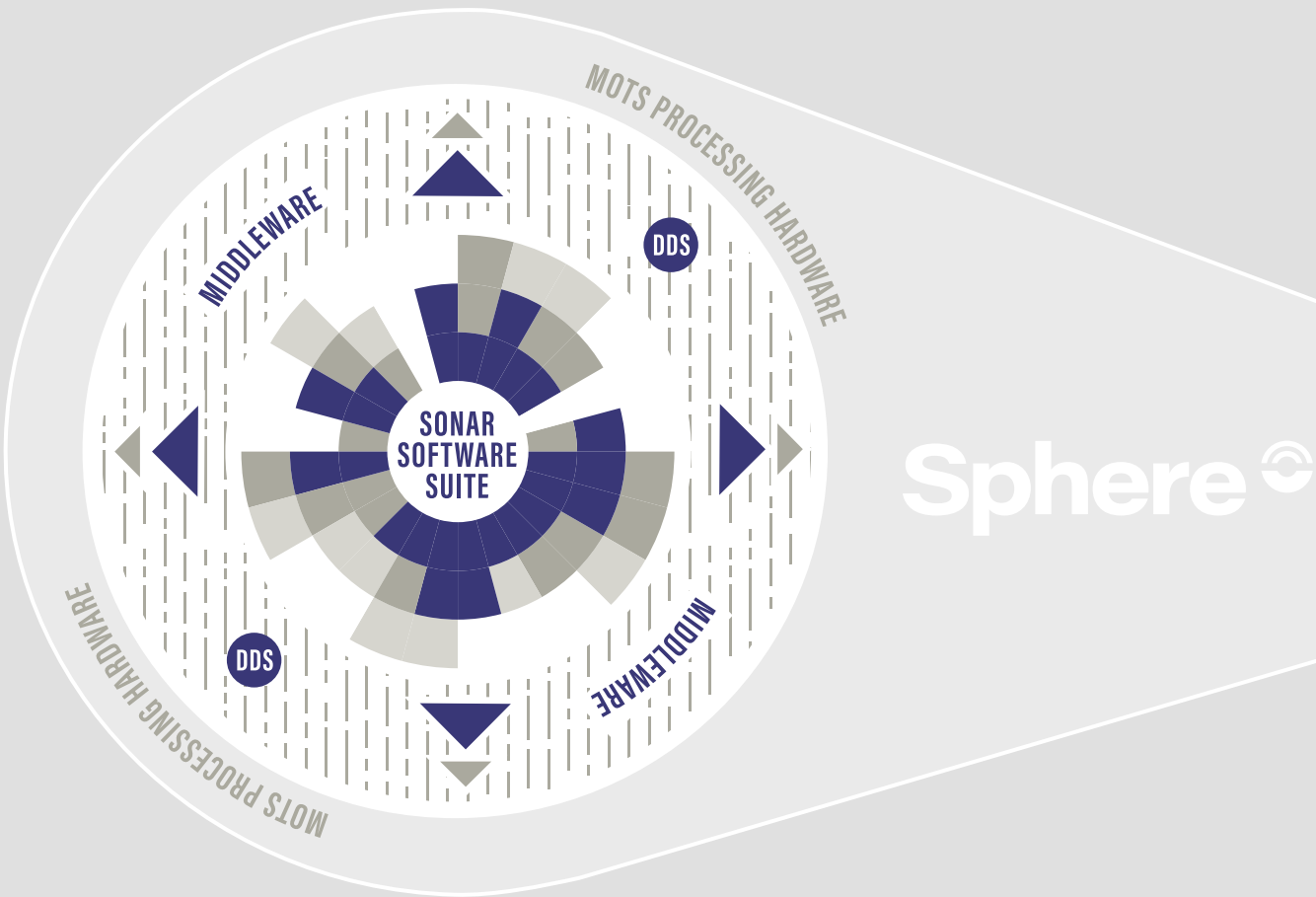


Sphere® by ELAC SONAR is the answer to all requirements in surveillance, mine & collision avoidance, underwater communication and measurement. We no longer think sonar technology in products but in holistic solutions, completely driven by customers' needs. We focus on simplicity, scalability and interoperability. Sphere® integrates formerly separated sonar systems into one versatile unitary system.

Learn more about Sphere® technology at elac-sonar.de.

SPHERE® – UNIMAGINABLE DIMENSIONS OF APPLICATION FLEXIBILITY

Due to its revolutionary architecture, Sphere® by ELAC SONAR enhances classical sonar systems like SCOUT 2.0 to a whole new level. The data centric approach of Sphere® technology inside SCOUT 2.0 decentralises huge parts of the system and makes it incredibly flexible for customers.



OpenDDS Middleware
The data centric system model uses OpenDDS as middleware. All applications running within Sphere® publish data to the ship's network or subscribe to data from the ship's network. The data distribution is completely handled by the OpenDDS middleware.



Open Architecture Sonar Sphere®
Due to the data centric system model, new applications can easily be added by the customer or 3rd parties. The new apps can subscribe to data at any stage of the signal processing.

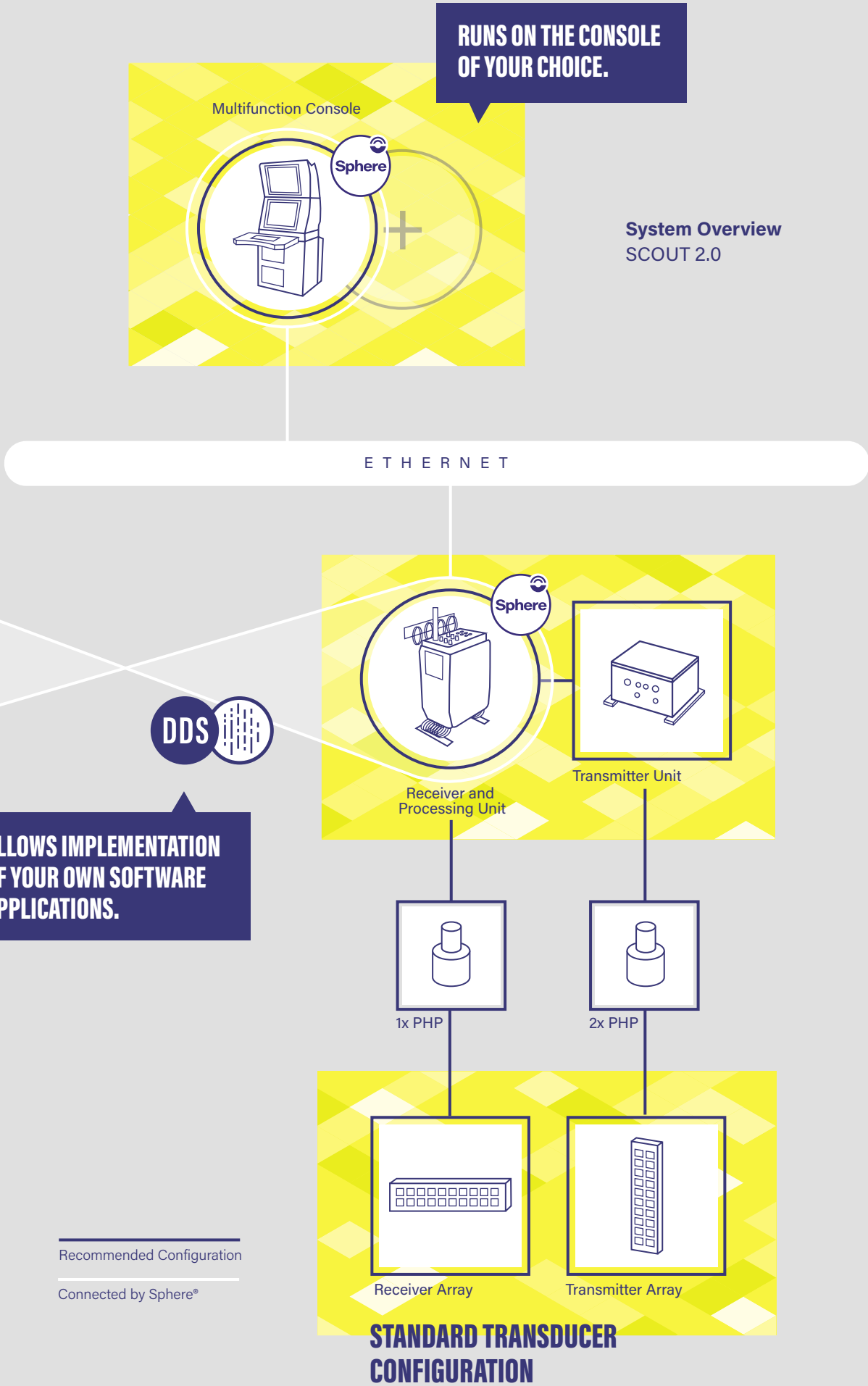


MOTS Processing Hardware
The signal processing of Sphere® is able to run within virtual machines on COTS/MOTS hardware components. Sphere® is independent from the hardware platform. New software applications can be installed anywhere within the ship's network. This also includes customer hardware.



Cyber Security
Open Architecture does not mean your data can be accessed by anyone. Cyber Security is reached by network security, virtualisation and data encryption, not by putting data into boxes.

ALLOWS IMPLEMENTATION OF YOUR OWN SOFTWARE APPLICATIONS.



TECHNICAL DATA

General

Transmission frequency	25 - 35 kHz
Pulse length	1 - 80 ms

Surface Mapping Mode

Max. horizontal coverage	approx. 60°
Max. vertical coverage	approx. 3.5°

Mine and Obstacle Avoidance Mode

Range scales	100 – 8000 yards
Horizontal coverage	90° or 25°
Vertical coverage	24°, 12°, 6°, 3° (user selectable)
Vertical sector is steerable	± 30° (total vertical coverage)
Pulse modulation	CW, FM selectable
Bearing accuracy	approx. 1.5° (Centre Beam)
Range accuracy	≤ 1 % of used range scale

Bottom Mapping Mode

Depth scales	50 - 2000 m
Max. horizontal coverage	approx. 60°
Max. vertical coverage	approx. 3.5°
Depth accuracy @ 1000 m	10 m for center beam

Environmental Qualifications

SCOUT 2.0 is a military system. All components are tested according to military standards. The following table presents a selection. More information on further military qualifications can be obtained from ELAC SONAR.

Typical detection ranges *)

Small Mines (TS = -18dB)	1400 yards
Cylindrical Bottom Mine (TS = -5 dB)	3300 yards
Submarines (TS = +15 dB)	4600 yards

*) isovelocity profile, salinity = 39 ppt, water depth 50 m, bottom type silt (flat), sea state 3, probability of detection >90%, probability of false alarm <0,01%

EMC	acc. to VG 95373 boundary class 3
Temperature	acc. to DEF-STAN 07-55 operation: 7°C to +55°C storage: -35°C to +70°C
Damp heat test	acc. to DEF-STAN 07-55, +55°C, 93% RH (inboard equipment)
Shock test	acc. to BV 0430, issue 3/85
Vibration test	acc. to BV 0440, issue 10/90

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