



ELAC 
SONAR

A COHORT PLC COMPANY

HUNTER 2.0

HULL MOUNTED SONAR

HUNTER 2.0 is a hull mounted sonar carrying out anti-submarine warfare (ASW) in active and passive modes in shallow and deep waters for panoramic detection of submarines and other objects.

elac-sonar.de

Sphere 

SUCCESSFUL OPERATIONS DUE TO PERFECT TRACKING AND CLASSIFICATION OF TARGETS

HUNTER 2.0 is a hull mounted sonar providing active and passive surveillance, analysis and classification capabilities. The system features a forward looking mine avoidance mode as well.

To ensure the active detection of targets, HUNTER 2.0 features Doppler Detection and coherent FM processing. Doppler detection allows the operator to filter stationary echo information and display only moving targets. Due to the high Doppler resolution of HUNTER 2.0, even slow moving submarines or AUVs can be detected. FM pulses are processed coherently by the system, providing the very high distance resolution required for the classification of targets and the detection of mines in mine avoidance mode. A confidence filter cleans up the display, removes echo information from surface reflections and reduces the probability of false alarms. Targets are automatically detected and tracked by the system, although the operator is able to set up targets manually.

The passive mode of HUNTER 2.0 includes LOFAR, broadband and DEMON processing. The system automatically identifies fast moving objects as torpe-

does and delivers a torpedo warning. The tuneable audio channel supports the operator in the classification of underwater targets and noise sources. Significant traits of detected signals can be compared to classification database entries.

HUNTER 2.0 is the most cost effective and best performing solution for new and modernisation programmes for destroyers, frigates, corvettes or offshore patrol vessels (OPV). Various transducer configurations are available with operating frequencies ranging from 4 kHz to 30 kHz. The optional intercept array allows the detection of active transmissions up to a frequency of 100 kHz.

The open-architecture-based middleware of HUNTER 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

- ✔ localisation of underwater contacts for ensuring underwater situational awareness
- ✔ localisation of mines for mine avoidance
- ✔ detection of AUVs and midget submarines
- ✔ sonar pulse intercept detection / torpedo warning
- ✔ full passive sonar suite with broadband, LOFAR and DEMON processing included
- ✔ automatic target detection, tracking and forwarding to combat management system (CMS) and fire control equipment
- ✔ classification of underwater targets by various HMI sub windows and tuneable audio channel
- ✔ available as a standalone or fully integrated version by consequential use of open architecture middleware based on OpenDDS
- ✔ onboard simulator, raw data recording and reprocessing for training or post mission analysis to keep operators trained in ASW scenarios
- ✔ 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

- ✔ simultaneous search, track and classification
- ✔ simultaneously active and passive
- ✔ CW Doppler and coherent FM processing
- ✔ torpedo warning
- ✔ fully electrical roll and pitch stabilisation / compensation

AN UNBELIEVABLE TECHNOLOGICAL ADVANTAGE FOR EVERY SONAR

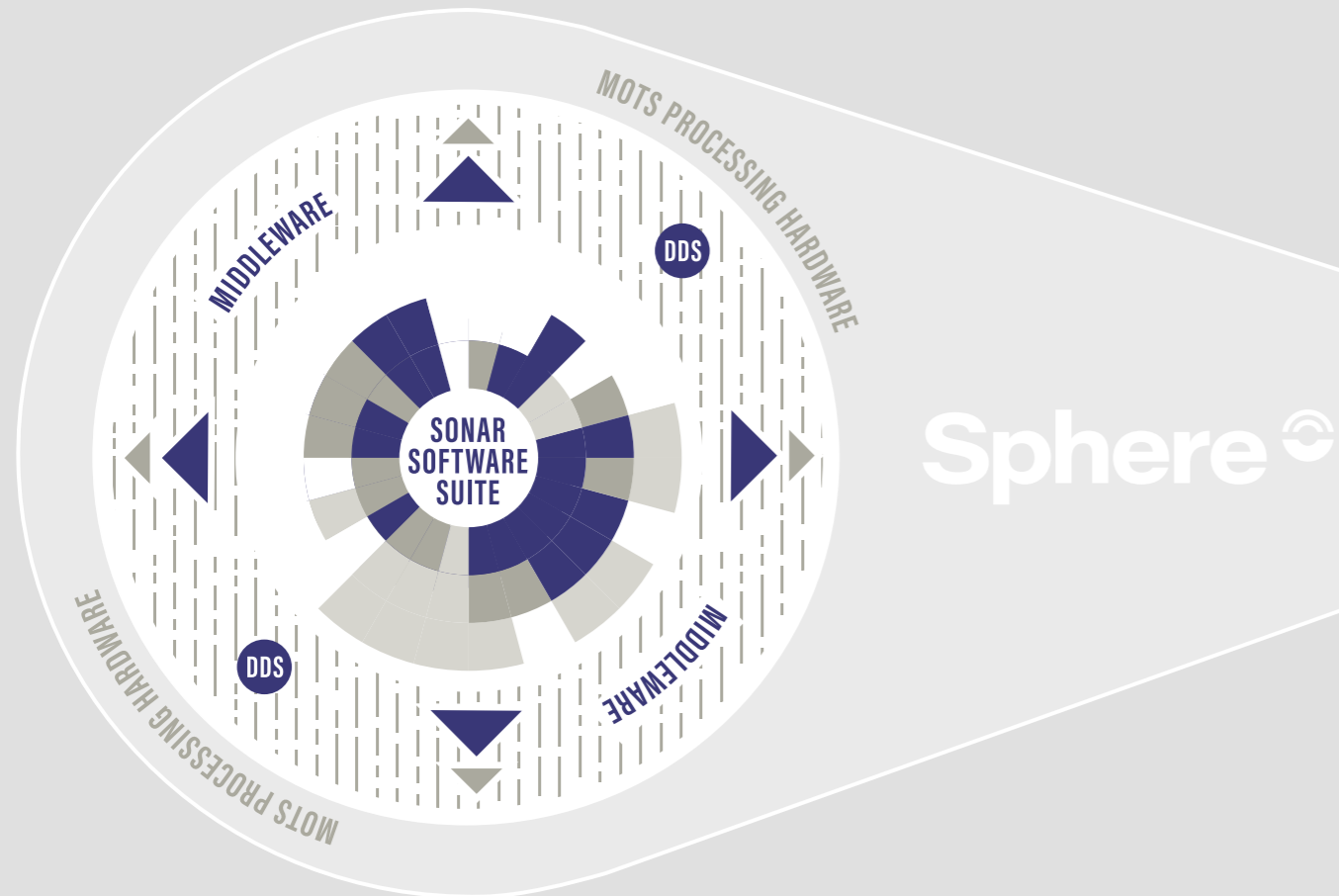
Sphere 

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 HUNTER 2.0 to a whole new level. The data centric approach of Sphere® technology inside HUNTER 2.0 decentralises huge parts of the system and makes it incredibly flexible for customers.

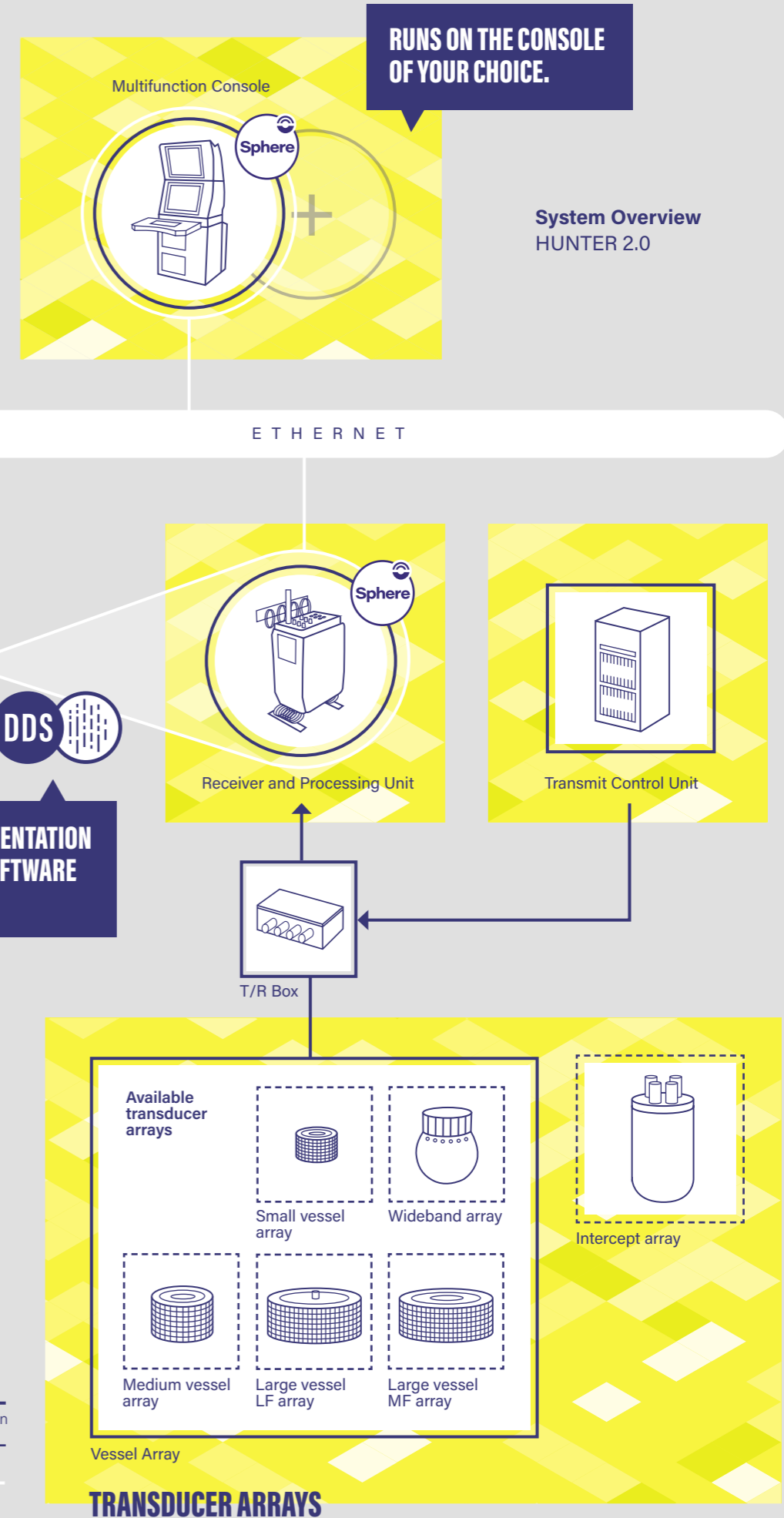


OpenDDS Middleware
The data centric system model uses OpenDDS as middleware. All applications running within Sphere® publish data to the ship's network or subscribe to data from the ship's network. The data distribution is completely handled by the OpenDDS middleware.

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.



Recommended Configuration
Options
Connected by Sphere®

TRANSDUCER ARRAYS

TECHNICAL DATA

Active Mode

Detection range	up to 64 kyds (*)
Transmission sector	360° (ODT mode) 30°, 60°, 120° (SODT, SRDT mode) 120° (forward-looking mine avoidance)
Pulse lengths	between 10 ms and 640 ms (*)
Pulse types	CW, FM
Receiving sector	360° horizontal 16° vertical 48° vertical (MCC mode)
Number of ATT channels	32
Doppler resolution	< 1 kn
own ship Doppler correction	≤ 32 kn

(* depending on system configuration)

Passive Mode

Number of ATT channels	16 broadband tracker 16 narrowband tracker 16 DEMON tracker 16 manual tracker
Receiving sector	360° (ODT)
Bearing time record display	up to 60 min

ATT — Automatic Target Tracking / CW — Continuous Wave / FM — Frequency Modulation / MCC — Maintain Close Contact
ODT — Omni-Directional Transmission / SRDT — Sector Rotating Directional Transmission