ISUS 100 Integrated Sensor Underwater System

Innovative and Sea Proven Technology from the Market Leader

ISUS 100
Combat System
for Submarines

... a sound decision

ATLAS ELEKTRONIK

ISUS 100 Combat System for Submarines –
A Considerable Step Forward in Evolution

Continual improvement in a combat system solution is essential in ensuring that your submarines can dominate an operational theatre. ISUS 100 represents a significant step forward in the capability evolution of this ATLAS combat system product. ISUS 100 builds on the expertise and sea proven capabilities traditionally offered by ATLAS, whilst featuring innovative, new technologies to address the challenges of tomorrow.

1

2

3

4

5

1 CONCISE REAL-TIME TACTICAL PICTURE TO SUPPORT EFFECTIVE COMMAND DECISIONS

A high level of situational awareness within the operational environment of a submarine is necessary to ensure that command decisions are as informed and as effective as possible. ISUS 100 exploits data derived from multiple high resolution acoustic and non-acoustic sensors to build a clear, unambiguous, real time tactical picture of the operational arena. New generation long range acoustic sensors extend the spatial envelope and resolution of the Commander's situational awareness. The analysis and fusion of information derived from multiple sensors improves the accuracy, reliability of and confidence in the information within the tactical picture.

2 SUPERIOR SONAR SENSOR PERFORMANCE FOR COMPLEX LITTORAL WATERS

Improved detection ranges and target bearing accuracy in complex littoral environments are achieved with the new generation of high resolution acoustic sensors within ISUS 100. It can be configured for your specific operational needs and can include the following sensors:

- large acoustic aperture long-range sonar sensors such as our Expanded Flank Array (EFAS) and reelable thin line Extended Towed Array Sonar (ETAS);
- intercept and ranging sonars for rapid detection and classification of off-platform sonars and transients, such as IDRS and CIA arrays;
- high performance medium frequency sonar with near 360° coverage – Enhanced Cylindrical Array Sonar (ECAS) with vertical beam steering capability;
- navigation aid sonars for operations in the littoral such as the Forward Look Active Sonar (FLAS) with sea bottom mapping, mine and collision avoidance capabilities.

4 MINIMUM OPERATOR WORKLOAD AND MAXIMUM PERFORMANCE

ISUS 100 enables you to harness the full potential of modern high performance sensors to maximise your warfighting capability with fewer operators and less operator training.

Modern high resolution sensors and their associated processing generate large amounts of information that, unless managed, will easily overwhelm a team of combat system operators. ISUS 100 applies intelligent management of the information flow within the combat system and automation of tasks traditionally undertaken by an operator to ensure that operators' workload remains at levels that enable them to optimize their contribution to a submarine's warfighting capability. Heavy operator workload is also alleviated through the application of novel algorithms for the extraction of features with low signal to noise, rules based expert systems for target classification and the use of innovative displays which have been tested with submariners.

5 YOUR INDIVIDUALLY CUSTOMISED OPEN ARCHITECTURE SYSTEM

A COTS PC based modular open system architecture enables your ISUS 100 to:

- be configured to meet your specific operational and platform requirements;
- have third party components and algorithms included within;
- be cost effectively upgraded through life to extend capability to meet new requirements;
- exploit the significant advances in COTS hardware to maximize processing performance whilst minimizing power consumption;
- minimize through life costs and ensure cost effective capability upgrades and obsolescence management.

ATLAS ELEKTRONIK

3 FULL SENSOR TO SHOOTER CAPABILITY

A full sensor to shooter capability ensures the effective integration of all aspects of the combat system. ISUS 100 provides you with the entire functional chain from high performance acoustic and non-acoustic sensors through to sophisticated weapons and effectors, enabling rapid and effective prosecution of a target from first detection through to threat neutralisation. An overall system approach ensures efficient and cost effective integration and information flow throughout the system. ISUS 100 includes:

- high performance acoustic sonar and non-acoustic sensors (such as attack periscope, optronic masts, ESM radar/ communication systems, Tactical Data Link);
- comprehensive command and control capabilities;
- sophisticated analysis and sonar performance tools to support threat assessments and tactical planning;
- weapons and their control (torpedoes, missiles and countermeasures).

... a sound decision

ISUS 100 –
The Contents

ISUS 100
Combat System
for Submarines

ISUS 100 Combat System for Submarines –
1 Concise Real-Time Tactical Picture to Support Effective Command Decisions

ISUS 100 provides you real-time, reliable, and relevant far range information for effective command decisions.

Effective command decisions require the provision of a concise tactical picture: clear, unambiguous, and in real-time.

The multistage track management of ISUS 100 exploits fused data from all acoustical and non-acoustical sensors and tactical data links. From the outcome, the comprehensive tactical picture is compiled.

The display philosophy of ISUS 100 enables data from multiple sources to be managed in data layers so that all relevant information can be displayed on a single screen in an uncluttered manner.

The rule-based mechanisms of ISUS 100 allow for rapid and comprehensive contact classification. Every identified contact property (acoustical, optical, electromagnetic) may be utilised. A preliminary classification for every contact is automatically executed in order to provide an initial indication of threat potential to command.

ISUS 100 offers primary (online) and secondary (offline) analysis modes for extracting characteristic features from acoustical contacts.

The information provided by the tactical picture is a sound basis for the commanding officer to decide on manoeuvres or potential weapon engagement.

ISUS 100 Combat System for Submarines –
2 Superior Sonar Sensor Performance for Complex Littoral Waters

ISUS 100 brings you the new generation of sonar sensors for operation within complex littoral waters: Enhanced performance flank and towed arrays optimised for application as classification sensors in the low and ultra low frequency range, active and passive measures of self protection, and navigation aid sonars.

Shallow water, heavy shipping, and particularly silent targets are challenges the crew and the equipment of a modern submarine are confronted with on their missions.

In addition, outstanding detection performance against surface contacts in combination with excellent target separation is fundamental for a successful completion of a submarine's mission.

Expanded Flank Array Sonar (EFAS)
The demands of operating in shallow water depth, compiling high resolution tactical pictures of complex situations, and detecting and tracking silent and long range targets require a new hull mounted sonar sensor with unprecedented performance: EFAS.

Extended Towed Array Sonar (ETAS)
The reduction of self noise influences from the towing platform make the new extended thin line towed array exceptional as a classification sensor in the ultra low frequency range and in the ultra long target range.

Enhanced Cylindrical Array Sonar (ECAS)
Vertical beam steering for the cylindrical array sonar offers a significant increase in performance to the sonar system in the mid frequency range.

Multi Purpose Active Sonar (FLAS)
Mine and obstacle avoidance, forward looking, bottom mapping and surfacing safety are crucial factors for successfully and safely operating submarines in complex littoral waters.

ISUS 100 Combat System for Submarines –
3 Full Sensor to Shooter Capability

We can integrate any kind of effector into ISUS 100. In particular, with the heavyweight torpedo family SeaHake mod 4, we are the sole company in the world able to deliver the complete functional chain from sensor to shooter from one single source.

Particularly due to the high degree of integration depth of various sensors, effectors, and functionalities ISUS 100 is an outstanding product in the world of submarine combat systems.

Using mainly COTS components, we are able to offer this high integration depth at a competitive price. Due to factors such as cost-savings, operability, and through-life support, the idea of integrated systems is essential for military applications.

More than twenty five years ago we brought the idea of system integration into the combat system world for the first time, when we started to develop ISUS strictly following the sensor to shooter philosophy.

The current technology of ISUS 100 is the result of a continued development process. A multiplicity of improvements was attained in customer projects. Evaluation of operator feedback and strategic R&D effort result in further improvements to design and system handling.

The name of ATLAS ELEKTRONIK stands for state-of-the art systems using tomorrow's technology today. The high degree of acceptance of ISUS by the navies of the world proves that we have the right philosophy.

We keep the complete sensor to shooter capability at hand.

ISUS 100 Combat System for Submarines –
4 Minimum Operator Workload and Maximum Performance

ISUS 100 minimises your operator workload whilst maximising your performance.

ISUS 100 gives the answers desired for a long time to one of today's most challenging questions: the manning concept. Crews of shrinking size have to cope with ever increasing numbers of contacts.

Automation of Routine Work
ISUS 100 counterbalances these extremes by providing automation of routine work in target tracking, analysis, and classification.

The level of automation can be tailored according to the level of experience of the operator. This also means minimised specialist training requirements.

State of the Art User Interface
ISUS 100 is an extremely user friendly system employing the latest user interface technology (e.g. full touch support).

We are breaking new ground by providing mobile devices and large screen displays in addition to traditional operator consoles.

All these devices are optimised for operation in submarine environmental conditions.

ISUS 100 Combat System for Submarines –
5 Your Individually Customised Open
Architecture System

Modular Open Architecture Systems ensure that adaptation of ISUS 100 to individual customer requirements is always a cost-effective and low-risk solution.

It was a major design goal for ISUS 100 to implement modular open system architecture in accordance with international standards.

To suit all customer specific requirements, the modularity of ISUS 100 ensures easy tailoring to any desired equipment configuration.

Open and modular architecture ensures easy integration of 3rd party applications (equipment and software) and has a great potential for involving your local industry.

Open system architecture in combination with modular design of ISUS 100 comprises future growth potential. Moreover, it creates a high degree of flexibility to incorporate new technologies and system updates economically: Rapid exploitation of latest technology through the use of COTS based architectures: improvements in hardware technology can be rapidly exploited to improve processing performance and power consumption.

The number of consoles for a system is virtually unlimited and may depend upon the customer specific configuration. Open architecture assures flexibility and improves dependability.

Intelligent power management and the use of low power equipment increases mission endurance.

This ensures that ISUS 100 is always at the vanguard of technology trends and will at all times be a state-of-the-art system upon delivery.

**high availability – easy maintenance –
full lifecycle logistics support**
We are able to provide long term ILS support for every delivered system. A highly sophisticated obsolescence management scheme has been introduced especially for supporting systems which contain a multitude of COTS components.

3rd party
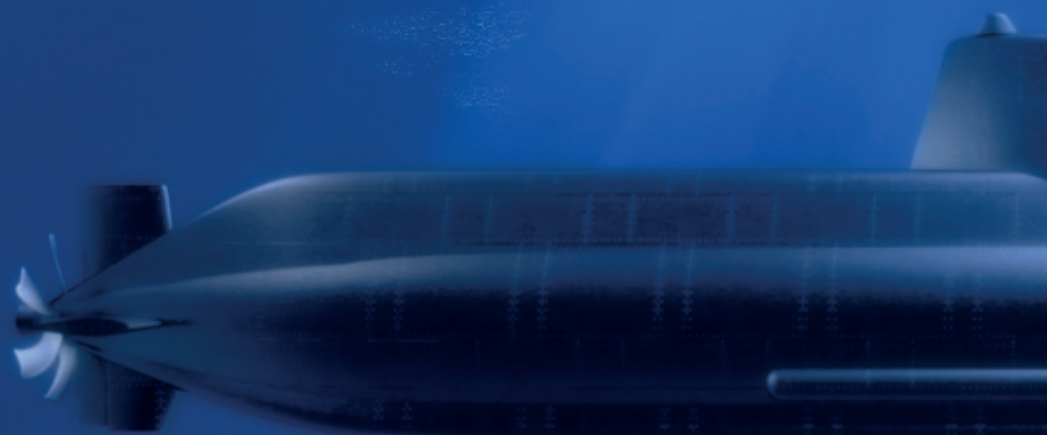Applications

ISUS 100
Components

The ISUS 100 Capability

SURVEILLANCE

Patrolling littoral waters bounded by hostile coasts and harbours over long periods of time.

RECONNAISSANCE

Gathering information from acoustic, electromagnetic, and optronic sensors without being discovered. Participation in net centric operations making use of covert information networks.

ENGAGEMENT

Deploying missiles, heavyweight torpedoes and unmanned underwater vehicles unanticipated by the enemy.
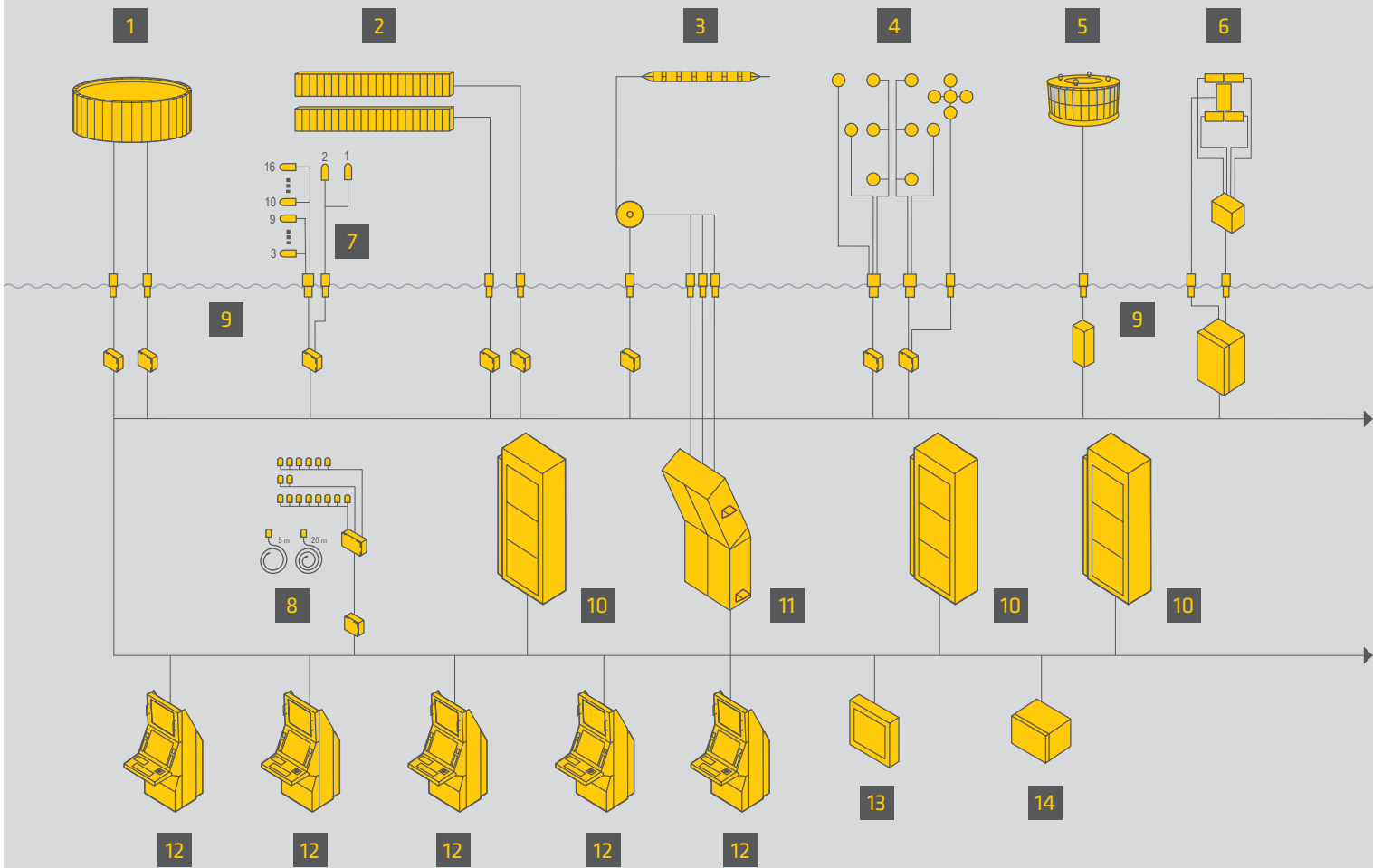
SELF PROTECTION

Self protection utilising forward looking active sonar. Integrated torpedo counter measure systems with soft-kill and hard-kill effectors for self defence.

The ISUS 100 Sonars

ATLAS Delivery

1 | Cylindrical Hydrophone Array
2 | Expanded Flank Array
3 | Towed Array with Handling System
4 | Intercept Detection and Ranging Array
5 | Cylindrical Transducer Array
6 | Forward Looking Tx/Rx Array
7 | ONA Hydrophones

8 | ONA Accelerometers
9 | Pressure Hull Glands
10 | Electronics Cabinets
11 | Winch Control
12 | Multi Function Common Consoles
13 | Electronic Graphics Recorder
14 | Sonar Raw Data Recorder

The ISUS 100 Functionality and Modular Architecture

The Integrated Sensor Underwater System ISUS 100 provides the complete functional chain from sensor to shooter control. Sonar allows for panoramic detection, analysis, and classification of surface vessels, submarines, torpedoes, and other contacts. Electromagnetic and optical sensors plus tactical data links deliver additional contact information. Contacts from any acoustic and non acoustic sensors are managed by command & control and are compiled into a comprehensive tactical picture. Particular control functions enable the operation of long range, wire guided torpedoes and missiles. Various support functions complete the picture and open and modular system architecture guarantees maximum usability, availability, and flexibility.
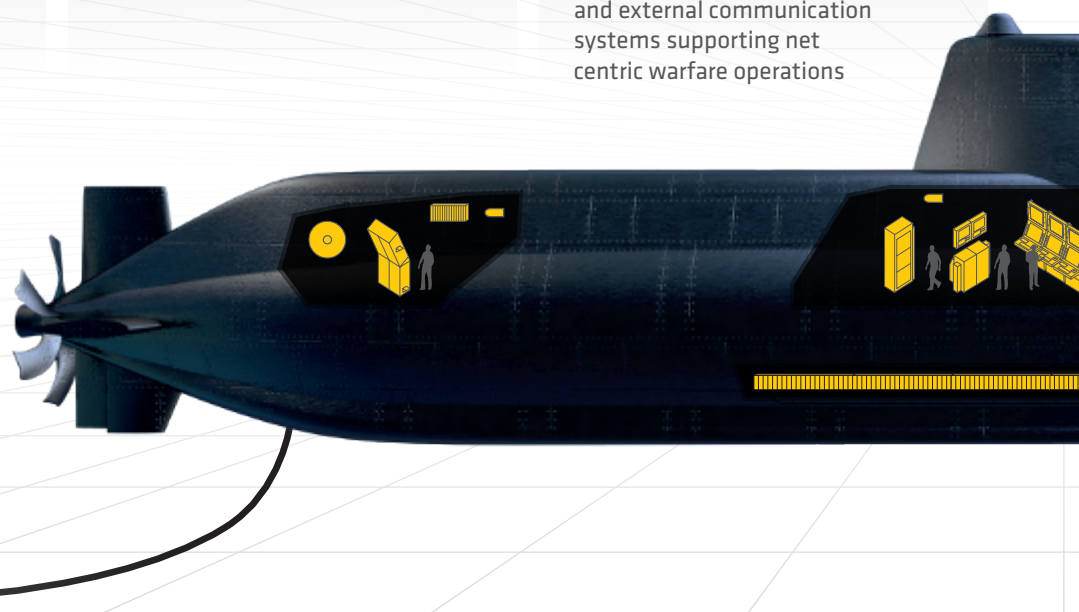
SONAR

- complete range of frequencies from ultra low to high
- digital array technology for outstanding low electrical self noise characteristics
- automatic detection and tracking of sonar contacts
- analysis tools for noise, pulses, and transients
- interactive classification tools for noise and pulses
- own noise monitoring functions
- navigation and self protection aids

NON ACOUSTIC SENSORS

- high integration depth enables the control and operation of various sensors, such as:
  - attack periscope
  - optronics mast
  - ESM radar
  - ESM Comms
  - Tactical Data Link
  - navigation radar

COMMAND & CONTROL

- System Track/Target Management
- Target Motion Analysis (TMA) based on multi-sensor data processing
- display of tactical situation
- automatic threat and combatability analysis
- integrated navigation, including Electronic Sea Chart integration into tactical displays
- integrated interfaces to internal and external communication systems supporting net centric warfare operations

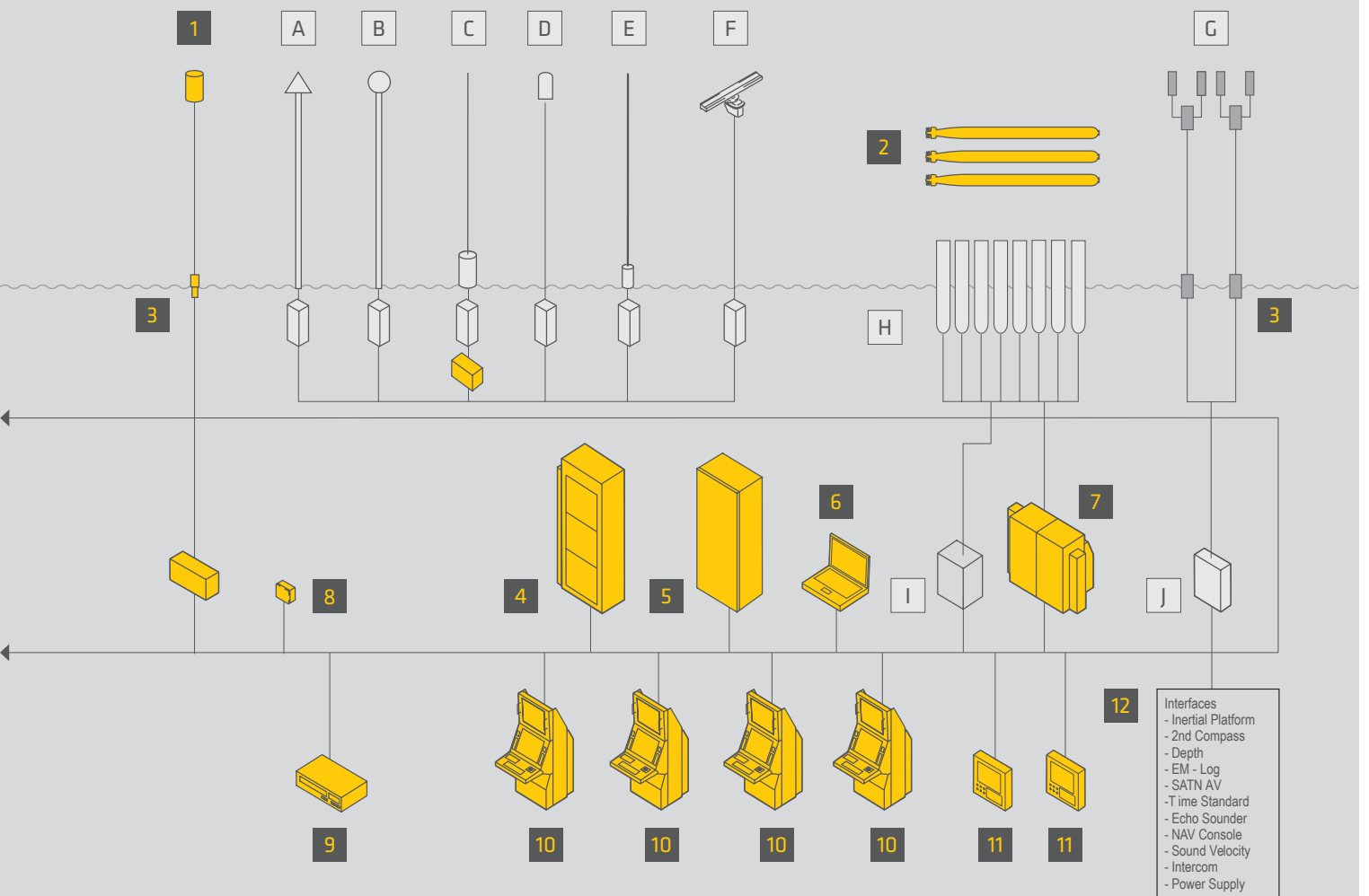| WEAPON CONTROL	SUPPORT FUNCTIONS	SYSTEM ARCHITECTURE
- monitoring of system and weapon status - individual attack planning solutions simultaneously at each console - pre-setting and launching of weapons - simultaneous wire guidance of torpedoes - missile firing - mine laying support - release of torpedo alarm and control of Torpedo Counter Measures (TCM)	- Data Recording System (DRS) - printing of sonar sensor data on Graphic Recorder - digital multi-channel sonar raw data recording - integrated onboard simulation and training - built-in test and fault diagnostics for both hard- and software failures - Sonar Performance Information Range and Integration Tool (SPIRIT)	- common infrastructure and software throughout the whole system - redundant design of all mission-critical functions - true Multifunction Common Consoles (MFCC) with two high resolution flat screen displays - Open System allowing for easy integration of 3rd party applications - use of COTS components wherever possible

The ISUS 100 Sensors and Effectors

ATLAS Delivery

1 | Doppler Log Unit
2 | SeaHake Torpedoes
3 | Pressure Hull Glands
4 | Electronics Cabinet
5 | Server Cabinet
6 | Maintenance Notebook
7 | Weapon Control Unit
8 | Video Distribution Unit
9 | Video Recording Device
10 | Multi Function Common Consoles
11 | Local Firing Panels
12 | Interfaces

Non ATLAS Delivery

A | Attack Periscope
B | Optronics Mast
C | Link
D | ESM Radar
E | ESM Comms
F | Navigation Radar
G | Torpedo Counter Measures
H | Torpedo Tubes
I | Missile Control System
J | TCM Control Unit

Interfaces
- Inertial Platform
- 2nd Compass
- Depth
- EM - Log
- SATN AV
- Time Standard
- Echo Sounder
- NAV Console
- Sound Velocity
- Intercom
- Power Supply

Nothing Will Escape the ISUS 100 Tactical Sonar Sensors

CYLINDRICAL HYDROPHONE ARRAY

FLANK ARRAY

With a breadth of experience which spans more than one hundred years, the performance of ATLAS sonar sensors has been continuously improved and is at an unrivalled level of maturity.

- excellent target detection performance
- excellent target discrimination, exceptionally well maintained during target crossings
- high sophisticated automatic target detection and tracking
- online and offline analysis for noise, pulses, and transients
- interactive acoustical contact classification

Cylindrical Array Sonar

Cylindrical Array Sonar provides a panoramic view of the surrounding contacts and is usually the primary sensor of a submerged submarine.

It is available as CAS with a fixed vertical beam and as ECAS with extended acoustical aperture in height, vertical beam steering and increased acoustical performance.

Both CAS and ECAS are available in optimum cylindrical shape and in customer specific conformal array shapes.
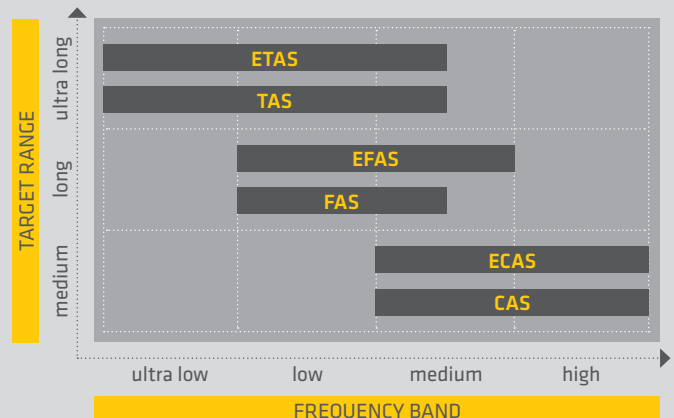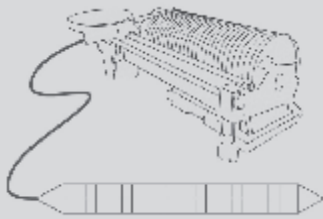
Flank Array Sonar

Flank array sonar is a hull mounted sensor with optimum acoustical decoupling from the platform providing excellent contact classification capabilities.

It is available as FAS as a line array or EFAS as a vertically extended array with an increased frequency range and improved detection performance. Both variants require the same installation foundation. Both arrays support target ranging capability. Optimum addition is the own noise analysis sonar ONA for monitoring own ship radiation.
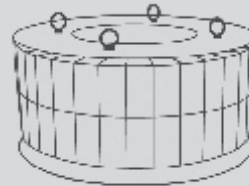
The tactical sonar sensors of ISUS 100 cover the complete frequency band and target range in which contacts are emitting noise.

Towed Array Sonar

Towed array sonar is a deployable sensor with exceptional acoustical decoupling from the platform by a long tow cable and vibration insulation units providing excellent contact classification capabilities even in the ultra low frequency band.

It is available as TAS as a conventional towed array or as ETAS as an extended thin line array with a superior ultra low frequency performance. Both variants are available as clip on solutions and as automatically deployable by remote controlled winch.

A continuous measurement of array shape allows for using data from the towed array even during harsh manoeuvres.

Passive Sonar Functions

Common for all types of arrays is the complete set of sonar functions:

- conventional beamforming
- adaptive beamforming
- broadband waterfall detection and tracking
- DEMON detection and tracking
- LOFAR detection and tracking
- target range estimation (with FAS/EFAS)
- primary and secondary Analysis
- data recording interface for tertiary analysis (SOBIC)
- audio channel

Tracks are instantiated automatically and can be additionally set by the operator. Track data from every sonar sensor is automatically fused by a track management function to provide a single track for each target.

Active Operating Sonar

Active operating sonar provides omni directional and sector transmissions with high source level (adjustable).

Variable pulse types and waveforms can be applied for active transmission, depending on the actual focus of the operation.

The ISUS 100 Intercept Sonar Sensors Never Miss a Single Pulse or Transient

INTERCEPT DETECTION & RANGING ARRAY

CYLINDRICAL INTERCEPT ARRAY

Detection and analysis of hydroacoustic intercept pulses and transient noise are two more key features of effective sonar systems.

The following list shows the multiplicity of available sonar sensors covering the complete frequency band.

Intercept Passive Sonar
With intercept passive sonar any hydroacoustic pulse from sources like helicopters with dipping sonars, pinging frigates, homing torpedoes etc. can be detected and analysed over the complete frequency band.

Intercept Detection and Ranging Sonar
With this sonar sensor, in addition to the target bearing, the target range can be estimated in the high and very high frequency band. This gives a first indication in real-time of the target threat potential to the command.

Track data for intercept pulses is automatically associated to existing tracks from the tactical sonar sensors.

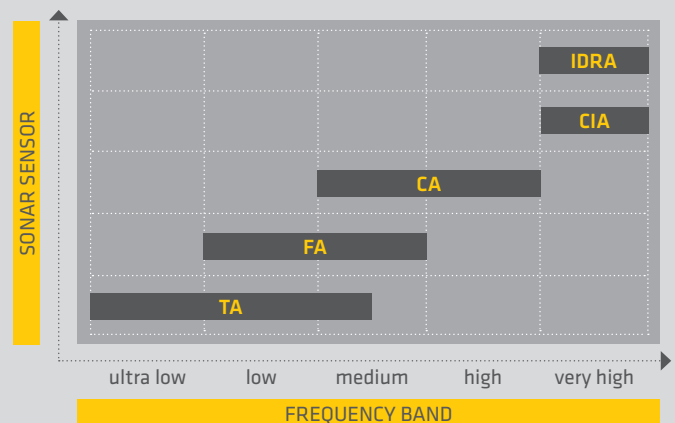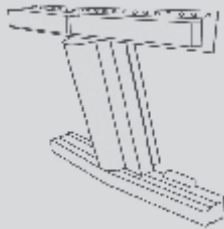### Transient Noise Detection
In the ultra low to medium frequency range detection of transient noise caused by the movement of anchor cables or flaps for example, gives additional information, even if a target is not transmitting any passive noise.

All these sensors feature primary and secondary analysis capability as well as data recording facilities for tertiary analysis.

The ISUS 100 Navigation Aid Sonar Sensors
Will Ensure Your Safe Passage through Any Area

Forward Looking Active Sonar

The forward looking active sonar is a multi purpose sonar and provides the following functions:

- mine and obstacle avoidance
- forward looking
- bottom mapping
- bottom navigation
- surfacing protection

Doppler Log Unit

- speed over ground sensor and navigation aid

ATLAS Sonars

ATLAS offers you a comprehensive portfolio of sonar sensors for the full spectrum of duties and covering the complete frequency band.

Your individual configuration choices compose the perfect sensor suite for your type of submarine and your mission scenarios.

In any case, it will be a low risk solution based on advanced sea proven technology.

Non Acoustic Sensors

OPTICAL SENSORS	ESM	TACTICAL DATA LINK	RADAR	AIS / WAIS
▫ Attack Periscope ▫ Optronics Mast	▫ ESM Radar ▫ ESM Comms	▫ Link 11 ▫ Link 16 ▫ Link 22	▫ Navigation Radar	▫ AIS ▫ WAIS

Non Acoustic Sensors provide an additional range of contact information for ISUS 100,
which is vital for today's submarine operations.

In addition to basic sensor equipment like attack periscopes and navigation radars, the extended range of ISR tasks a submarines performs today requires a larger variety of non acoustic sensors.

Therefore, additional sensors like optronic masts and advanced ESM sensors for radar and communications have been integrated into ISUS 100. These sensors provide an additional range of contact information. This integration has been proven at sea with many navies of the world.

Tactical Data Link enables communication with remote units in network centric warfare scenarios. It provides simultaneous reception, filtering, reformatting and transmission on multiple data link nets.

Command & Control

| Contact Association Display | TMA Display | Non-Acoustic Sensor Displays |

Sensor Segment/ DRS Segment

Track Classification Data

COMMAND & CONTROL

- Combat Information and Analysis
- System Track and Target Management
- Multi-sensor Track Correlation and Fusion
- Target Motion Analysis
- Tactical Situation Display Compilation
- Identification/Classification
- Tactical Support
- Navigation Support / Sea Charts
- Tactical Navigation
- Threat Analysis
- Combatability Analysis

Target Data

Torpedo/ Missile Data

Weapon Control Segment

| Target Summary Display | Tactical Situation Display | Link Data Display |

ISUS 100 Command & Control provides a comprehensive graphical overview of the submarine's tactical situation.

C&C manages all contact and weapon information:
- association of tracks from multiple sensors to system tracks
- target motion analysis (TMA, X-TMA, F-TMA etc.)
- contact classification and identification

C&C compiles the tactical picture displays:
- Geographical Situation Overview
- Tactical Navigation and Navigation Support
- Threat and Combatability Analysis
- Weapon Control

The Electronic Sea Chart System of ISUS 100 applies vector based standard ECDIS S-57/S-63 electronic nautical chart data, which is capable of handling additional military layers.

Route planning is supported by selectable electronic sea charts and radar video overlays and simultaneously takes into account the tactical situation of the surrounding area.

Contact data derived from non-acoustic sensors is seamlessly integrated into the tactical picture.
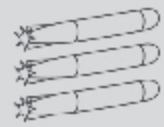
Weapon Control

WEAPON CONTROL UNIT	TORPEDOES	MISSILES	COUNTER MEASURES

We are the sole company of the world being able to deliver the whole functional chain from sensor to shooter derived from a single source. We offer a family of heavyweight torpedoes and, in particular, the latest model Seahake mod4. Beyond our own products, other types of torpedoes as well as missiles can be integrated into ISUS 100.

Weapon control is performed using the operational chain of Multifunction Common Consoles (MFCC) and the Weapon Control Unit (WCU). Each MFCC is capable of controlling weapons.

The display and operation block implemented in the consoles is the user friendly information interface between the ISUS 100 WCU and the operator, presenting a permanent overview of the weapon system status and enabling the operator to take appropriate actions as soon as they become necessary. The output of the interactive operating menus gives the operator further assistance. In addition to requesting and analysing the Torpedo Displays, the operator may use the Tactical Situation Display, the Target Data Display, and the TMA Display to complete his overview.

In accordance with the operator input, the WCU performs tube/weapon monitoring, weapon activation/power supply, prelaunch check, weapon presetting, and weapon firing. Finally it transmits guidance information to the wire guided weapons.
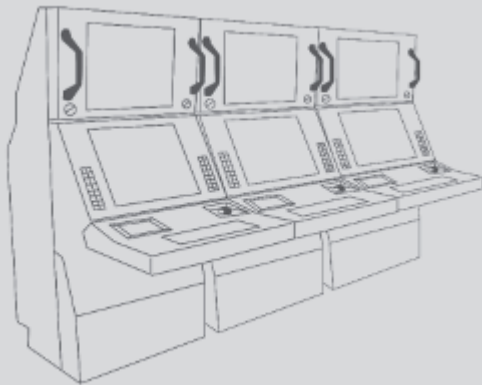
As an ultimate backup mode, launching of torpedoes and missiles in local firing mode can be performed by the WCU without any support from the remaining Combat System. This provides an advantage in case of serious damage during combat. For this reason, two Local Firing Panels are connected to the WCU.

In order to avoid unsafe operation of torpedoes, e.g. inadvertent firing of torpedoes or firing of defective torpedoes, numerous interlock functions are implemented in the WCU both in hardware and in software.

Modern torpedoes such as the SeaHake mod4 provide feedback of high quality sonar data to the onboard system. ISUS 100 makes use of this data by providing the operator with valuable information such as the comparison of torpedo sonar data with on-board sonar data.

System Architecture

ELECTRONICS CABINETS

As a fully integrated system, ISUS 100 provides the ability to completely interchange the tasks of each Multi-Function Common Console (MFCC). This guarantees the full availability of all information for all operations at any time. Even if a single console fails completely, the system capability of ISUS is fully maintained.

The overall ISUS 100 operation capability is maintained even under extreme failure conditions because components are laid out in redundant format:

- Multi Function Common Consoles (MFCC)
- console monitors
- 2 Combat system data busses (one in hot standby)
- 2 TMA processors (one in hot standby)
- 2 weapon signal processing inserts in the Weapon Control Unit (one in hot standby)
- 2 interface units (one in hot standby)
- standard sonar beamformer modules
- standard sonar signal processing modules
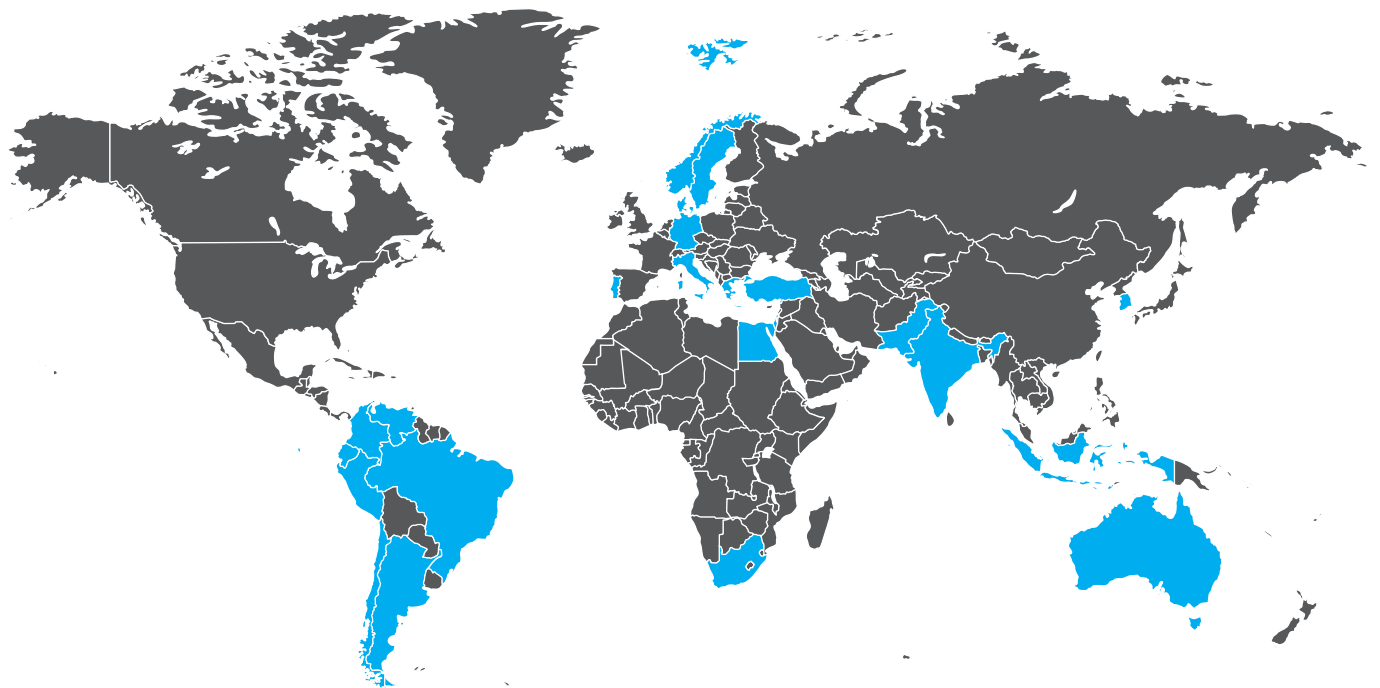- 2 audio processing and distribution systems (one in hot standby)

Furthermore, the Built-In Test System for detection and localisation of defective assemblies guarantees additional security. In case of faults, the Built-In Test System recommends a redundancy switching mode, which is indicated to the operator. After being activated, switch-over to the pre-selected redundancy/ degradation mode takes place.

We exploit standardised programmable processor boards as well as signal processing and display electronics with a high degree of commonality. That way, we assure the high degree of availability of the ISUS 100 equipment and at the same time limit the number of required on-board spare parts.

Support Functions
- Data Recording System
- Graphic Recorder for sonar sensor data
- digital multi-channel sonar raw data recording
- onboard simulation and training with integrated board simulation
- built-in test and fault diagnostics for both hard- and software failures
- Sonar Performance Information Range and Integration Tool (SPIRIT)

References –
Customer Base All Around the World

Egypt	Chile	Greece	Italy	Peru	South Korea
Argentina	Denmark	India	Colombia	Portugal	Turkey
Australia	Germany	Indonesia	Norway	Sweden	Venezuela
Brazil	Ecuador	Israel	Pakistan	South Africa	

The Ability of Each Individual is the Basis of a Strong Performance.

Proximity to the markets, knowledge about country-specific framework conditions, tremendous expertise and access to the combined strength of a globally active company make the ATLAS ELEKTRONIK Group a preferred partner for its customers.

The following subsidiaries and shareholdings are coordinated worldwide by the parent ATLAS ELEKTRONIK GmbH in Bremen.

SONARTECH ATLAS is Australia's leading supplier of submarine sonar systems. **Hagenuk Marinekommunikation** supplies turn-key, customised and fully integrated communication systems for submarines, surface combatants and to land-based facilities. **ATLAS Naval Systems MY** supplies command and weapon deployment systems for new patrol boats operated by the Royal Malaysian Navy. The marine specialist **ATLAS ELEKTRONIK UK** provides extensive experience in program guides, design and development, qualification, field tests, supply management and system integration. **ATLAS MARIDAN** is a specialist for developing and integrating autonomous underwater vehicles. **ATLAS ELEKTRONIK Finland** supplies tailored combat and command management systems. **ATLAS North America** is active in the submarine technology and unmanned underwater vehicle sector. The focus of **ATLAS ELEKTRONIK Canada** is on communication systems, sonar solutions and also unmanned underwater vehicles. **ATLAS ELEKTRONIK INDIA** supports the sales activities of the Group in India and **ANEC KOREA** provides technical service support, program management, marketing and sales as well as development and in-service support for existing projects in South Korea. **CYBICOM ATLAS DEFENCE** provides full support for the integrated sensor underwater systems (ISUS) on the new South African submarines. **Signalis** has been established for decades in the market as an industry leader for maritime security solutions.

The ATLAS Group

ATLAS ELEKTRONIK GmbH
Sebaldsbruecker Heerstr. 235
28309 Bremen
GERMANY

Hagenuk
Marinekommunikation GmbH
Hamburger Chaussee 25
24220 Flintbek
GERMANY

ATLAS ELEKTRONIK UK Ltd
Meadows Road
Queensway Meadows Ind Est
Newport | South Wales | NP19 4SS
UNITED KINGDOM

Dorset Green Technology Park
Winfrith Newburgh
Dorchester | DT2 8ZB
UNITED KINGDOM

SONARTECH ATLAS Pty Ltd
Level 2, 6-10 Talavera Rd.
Macquarie Park NSW 2113
AUSTRALIA

ATLAS ELEKTRONIK Finland Oy
Hiomotie 32
00380 Helsinki
FINLAND

ATLAS MARIDAN Aps
Agern Alle 3
2970 Hørsholm
DANMARK

ATLAS Naval Engineering Company Ltd
Room 202, Riverside Bldg.
689-6 Chungbu-Dong
Yangsan-Si, Kyungnam
KOREA

ATLAS North America LLC
208 Golden Oak Court
Suite 415
Virginia Beach, VA 23452
USA

ATLAS ELEKTRONIK Canada Ltd.
Suite 2202D-4464 Markham St.
Victoria BC, V8Z 7X8
CANADA

ATLAS ELEKTRONIK INDIA Private Ltd
Rai House, First Floor
P-23/90, P-Block
Connaugth Place
New Delhi 110 001
INDIA

Signalis Holding GmbH
Hanna-Kunath-Straße 3
28199 Bremen
www.signalis.com
GERMANY

CYBICOM ATLAS DEFENCE Pty Ltd
PO Box 591
Simon's Town 7975
SOUTH AFRICA
www.cadefence.com

... a sound decision

ATLAS ELEKTRONIK
A joint company of ThyssenKrupp and Airbus DS

ATLAS ELEKTRONIK GmbH
Sebaldsbrücker Heerstrasse 235
28309 Bremen | Deutschland
Telefon: +49 421 457-02
Telefax: +49 421 457-3699

www.atlas-elektronik.com

ISUS 100

Combat System
for Submarines

ATLAS ELEKTRONIK
A joint company of ThyssenKrupp and Airbus DS

... a sound decision

The ATLAS Group

ATLAS ELEKTRONIK GmbH
Sebaldsbruecker Heerstr. 235
28309 Bremen
GERMANY

Hagenuk
Marinekommunikation GmbH
Hamburger Chaussee 25
24220 Flintbek
GERMANY

ATLAS ELEKTRONIK UK Ltd
Meadows Road
Queensway Meadows Ind Est
Newport | South Wales | NP19 4SS
UNITED KINGDOM

Dorset Green Technology Park
Winfrith Newburgh
Dorchester | DT2 8ZB
UNITED KINGDOM

SONARTECH ATLAS Pty Ltd
Level 2, 6-10 Talavera Rd.
Macquarie Park NSW 2113
AUSTRALIA

ATLAS ELEKTRONIK Finland Oy
Hiomotie 32
00380 Helsinki
FINLAND

ATLAS MARIDAN Aps
Agern Alle 3
2970 Hørsholm
DANMARK

ATLAS Naval Engineering Company Ltd
Room 202, Riverside Bldg.
689-6 Chungbu-Dong
Yangsan-Si, Kyungnam
KOREA

ATLAS North America LLC
208 Golden Oak Court
Suite 415
Virginia Beach, VA 23452
USA

ATLAS ELEKTRONIK Canada Ltd.
Suite 2202D-4464 Markham St.
Victoria BC, V8Z 7X8
CANADA

ATLAS ELEKTRONIK INDIA Private Ltd
Rai House, First Floor
P-23/90, P-Block
Connaugth Place
New Delhi 110 001
INDIA

Signalis Holding GmbH
Hanna-Kunath-Straße 3
28199 Bremen
www.signalis.com
GERMANY

CYBICOM ATLAS DEFENCE Pty Ltd
PO Box 591
Simon's Town 7975
SOUTH AFRICA
www.cadefence.com

... a sound decision

ATLAS ELEKTRONIK

Contact

ATLAS ELEKTRONIK GmbH
Sebaldsbrücker Heerstrasse 235
28309 Bremen | Deutschland
Telefon: +49 421 457-02
Telefax: +49 421 457-3699

www.atlas-elektronik.com

ISUS 100
Combat System
for Submarines

ATLAS ELEKTRONIK

... a sound decision