C-BridgeSim

Seamless augment your Skills & Capabilities

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C-BridgeSim is our leading solution for Ship Bridge operators' training developed according to STCW and certified by RINA.

As spin off Company from a top level Research Institution, the University of Calabria, we are able to think differently providing both disruptive and incremental innovation and that's the spirit of our Ship Bridge Simulator.
Our mission is to invest in values and create innovation side by side with our customers.

> **"Seamless Augment your Skills and Capabilities trough the integration of innovative methodologies and cutting edge technologies based on the latest advances in Modeling & Simulation"**

Contents

Seamless Augment Trainees Skills & Capabilities

An advanced training experience based on STCW requirements

Our Ship Bridge Simulator is certified by RINA as compliant with the requirements of the current Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) in terms of navigation training, on-board guarding, radar with ARPA functions, ECDIS and radio communications.

C-BridgeSim is characterized by a modular and flexible architecture in terms of future expansions (e.g. addition of new student stations, addition of new training scenarios, etc.).

The Instructor's workstation has been designed to offer a wide range of functionalities and to create different exercises and training scenarios gathering data from continous expanding geographic and ships databases.

The Ship Bridge Simulator is equipped with all the instrumentations that trainee can usually found on board real ship to provide an effective and realistic training.

Equipment, consoles and workstations are installed, mounted and arranged in a ship-like manner.

The system is characterized by a modular and flexible architecture in terms of future expansions allowing an easy integration of new students' stations and new training scenarios.

Simulating Complex Scenarios

Complex Environments like in the real world

Full Picture and beyond

✓ Use the simulator to undertake intelligent evaluations.

✓ Take an overview of the current situation, considering the present condition and the risk correlated.

✓ Estimate the potential risk related to the evolution of situation.

✓ Operate easily and in a coordinate way with other people involved in the simulation through cooperative training.

✓ Define the action to undertake considering also the procedural aspects in a dynamic scenario evolution.

✓ Feel the sensation to be physically, visually and emotionally immersed in the training scenario thanks to realistic virtual environments, procedures, interactions and high quality audio.
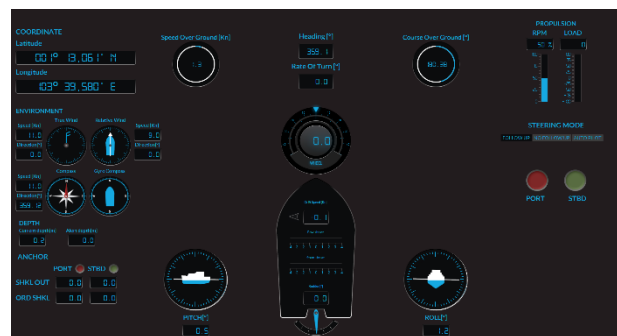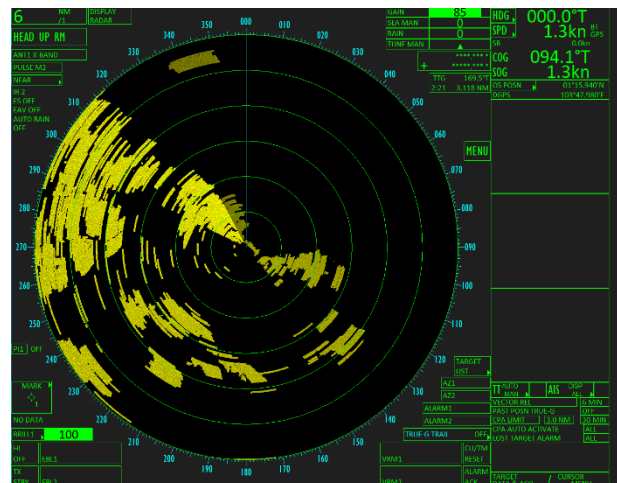
Advanced Scenarios Generation

✓ Experience real scenarios thanks to the use of Virtual Environments and also thanks to the use of Immersive Technologies (e.g. Head Mounted Displays).

✓ React to stochastically generated contingencies and failures (e.g. engines failures, fires, explosions, etc.).

✓ Consider constraints and boundary conditions (resources availability, weather conditions, etc.).

✓ Learn how to perform specific operations and procedures and manage correctly available resources, equipment and tools.
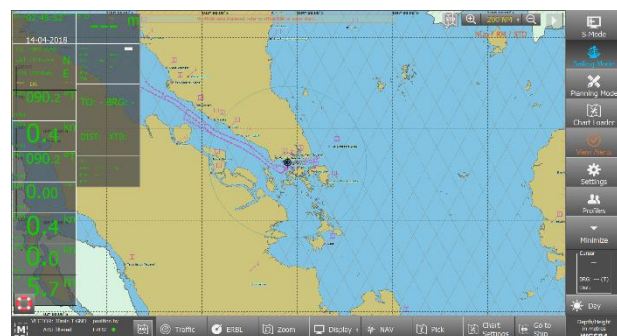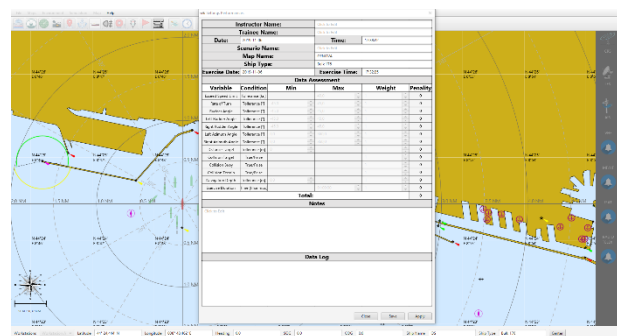
Multiple Geographic Areas and Ships

A full database of exercise areas and ships types

Multiple Training Exercise Areas

The Ship Bridge Simulator is equipped with a full database of geographic areas including both major international ports and a number of rivers for inland navigation. Each training area recreates exactly the real geographic area and is aligned in terms of buoys, lights, harbours and any other real object, data and information.

The Instructor can easily create multiple exercises (even for multiple workstations at the same time), customizing each available instrumentation and tool. The simulation also recreates floating objects and water level according to tidal effect.
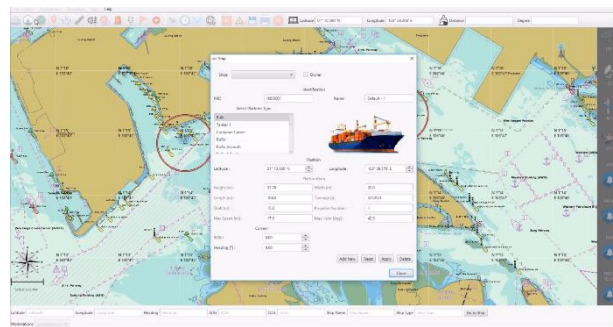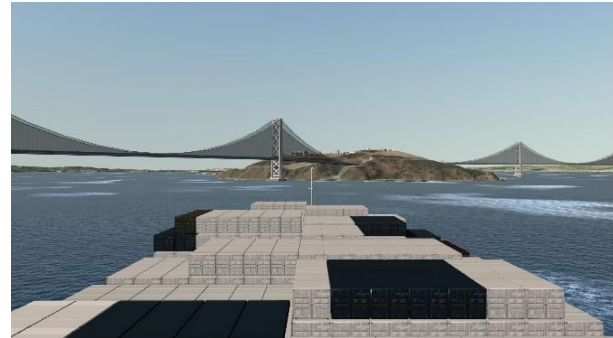
Multiple Ships Types

The Ship Bridge Simulator is also equipped with a full database in terms of ships types such as containerships, tanker, bulk carrier, ro-ro, passengers, etc. Ships are also available in different displacement, length, draught and with a number of propulsion types: traditional engine, fixed pitch propeller and controllable pitch propeller, single/double propeller, azimuthal thrusters, etc.
The ships motion at sea is done by using an internally developed physics engine where 6 DOF equations based on validated hydrodynamic modeling are implemented. The ship models (both own ships and targets) are available in a permanently expanding library.
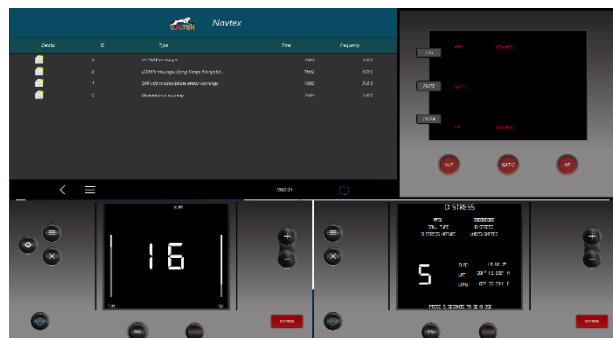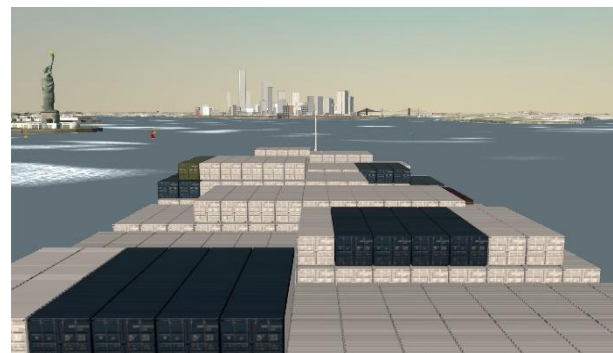
Where Research & Development make the Difference

Strong cooperation with worldwide Universities

The C-BridgeSim has been developed in cooperation with University of Calabria (**where CAL-TEK is a spin off Company**) and in cooperation with other worldwide Universities.

With more than 200 scientific articles published on International Journals and International Conferences, our company brings the results of Research & Development activities within the Ship Bridge Simulator providing our Customers with innovative solutions. Our company continuously works to advance the State of the Art in the training domain by integrating, as part of the Ship Bridge Simulator, new enabling methodologies and technologies such as **Virtual Immersive Reality, Augmented/Mixed Reality, Artificial Intelligence** and many others.

Our Publications   Our Conferences   Our Scientific Db

UNIVERSITÀ DELLA CALABRIA

CALTEK
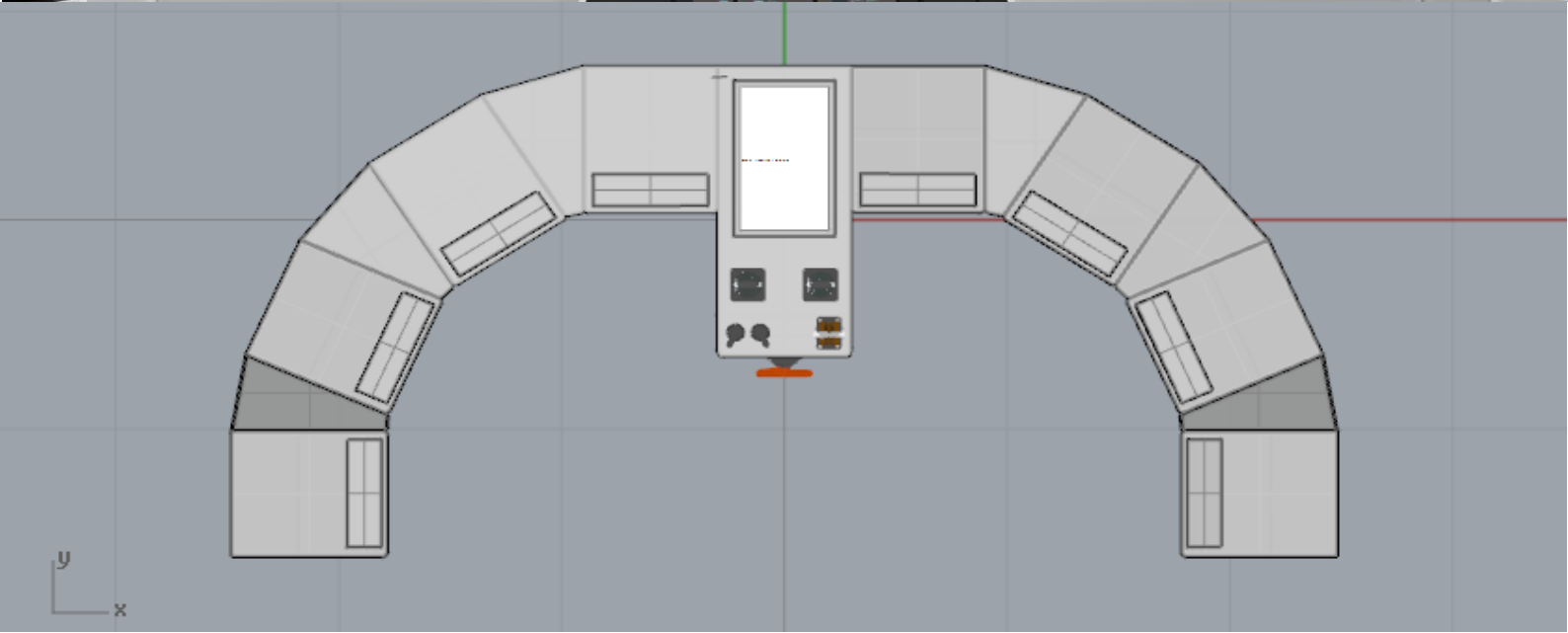
Bringing Reality Into Simulation

Real controls units and validated 6DOF mathematical models

The Steering Console includes control units for different types of ships such as: traiditional main engine, FPP/CPP, tunnel thrusters, azimutal thrusters, etc.
The simulation of own ship and target ships is based on a mathematical model with 6 degrees of freedom.

Control units are provided by KWANT CONTROLS, a specialist supplier of nautical controls since 1937 with more than 60.000 controllers installed.

KWANT CONTROLS
sneek-holland
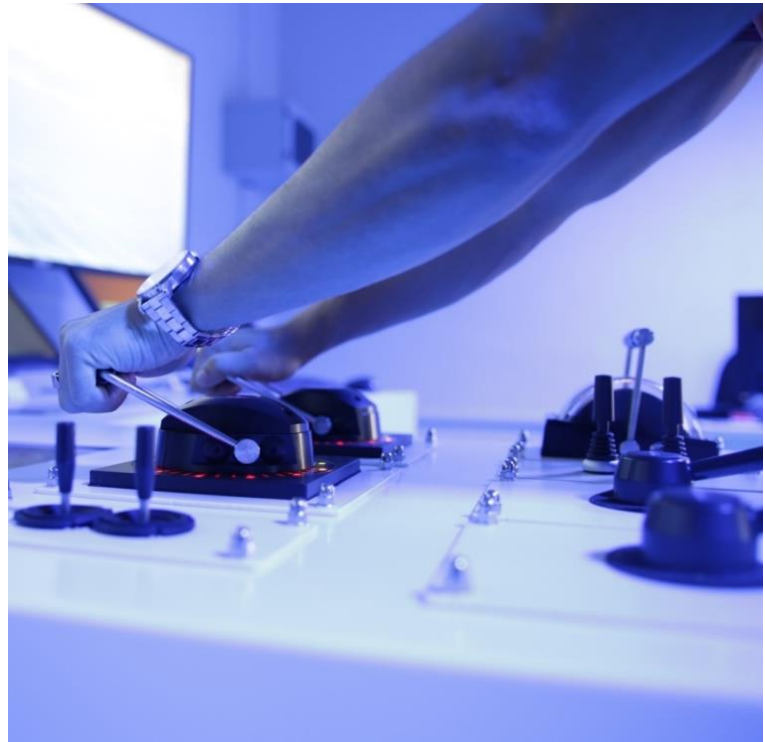
A Visualization System based on Ultra HD resolution

Immersive Environments, up to 360°

The Visualization System of the C-BridgeSim is composed by LED TV screens, with 4K Ultra HD resolution. The number of TV LED and the degree of real view can be reconfigured according to customers' needs. A Professional sound system based on 5.1 or 7.1 surrounding system provides the trainees with the sensation of experience the real ship bridge sounds.

The exercise areas are based on detailed 3D databases with a high-resolution true-color texturing that are displayed by the visualization system. The simulation also recreates floating objects and water level according to tidal effect. The database includes 3D models of navigation aids, cultural and industrial objects. The visualization system includes an overhead monitors panel display for nautical instruments visualization.
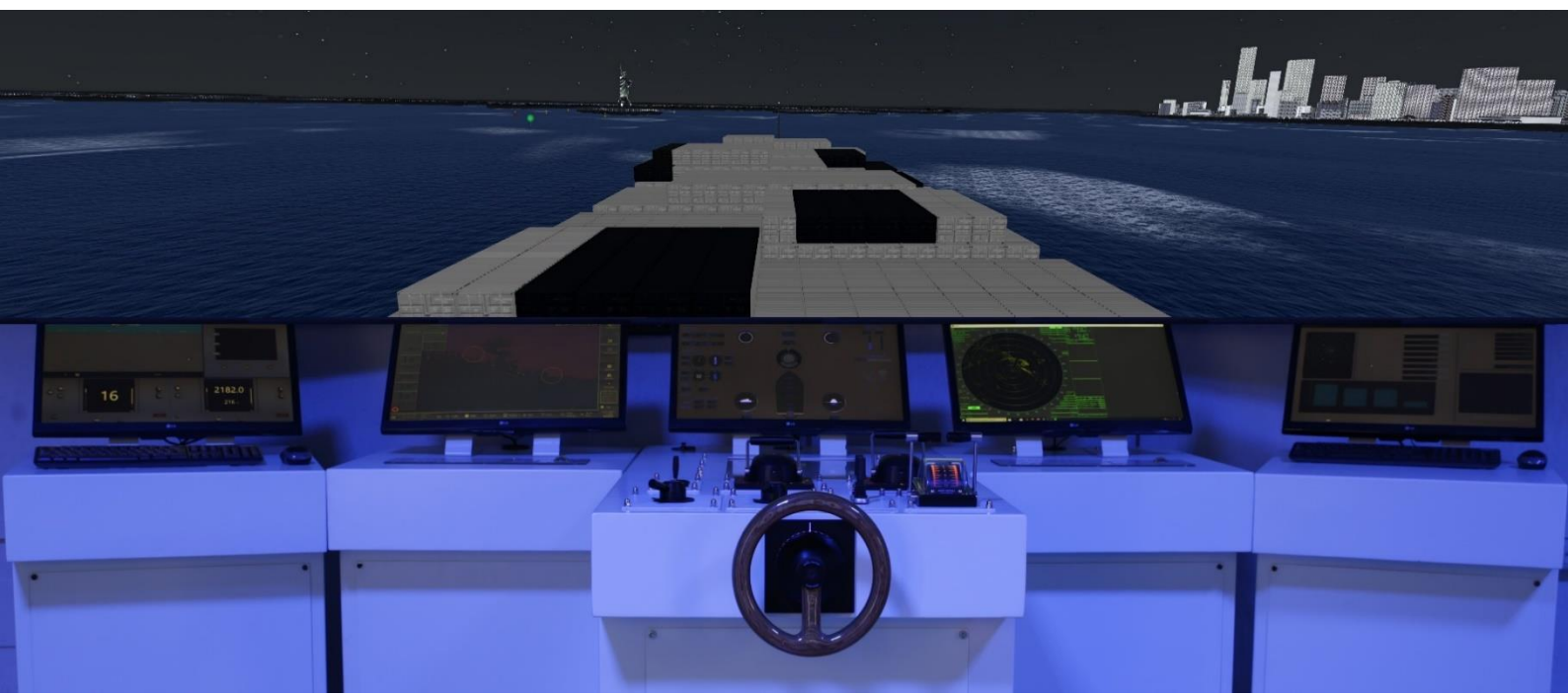
The Radar ARPA
Integrated Team Training and Stand-alone Training

The RADAR ARPA console is equipped with the Radar Simulator capable to offer the main training functionalities according to the standard STCW.

The radar simulator can also be used to carry-out Radar/ARPA courses in stand-alone mode by using a dedicated software combined with the Instructor workstation.

- Masking of ships and coastlines (shadow effect)
- Warnings and Alarms Acoustic and visual warnings for dangerous targets: Targets in Guard Zone, Target lost
- Manual and automatic target acquisition
- Target tracking
- Collision Alarm (CPA from 0.1 to 9.9 NM, TCPA from 10 to 99 minutes)
- AIS Data Display
- Trial manoeuvres
- Targets past position
- Acquisition zones. AZ1: 0.5 NM width sector, within 3-6 NM, desired bearing; AZ2: 1NM width sector or polygon, desired range and bearing
- Reading target data Distance and route
- Multiple and false echoes generation
- Sea and rain clutter management.
- Parallel index lines

- Range scales from 0.125 NM to 96 NM
- Relative Motion Head-Up
- Relative Motion North-Up
- Relative Motion Course-Up
- True motion
- Coastlines with internal echoes
- Echoes from other ships, (up to 100) depending on their type and appearance
- Echoes of navigation marks (up to 100)
- False echoes
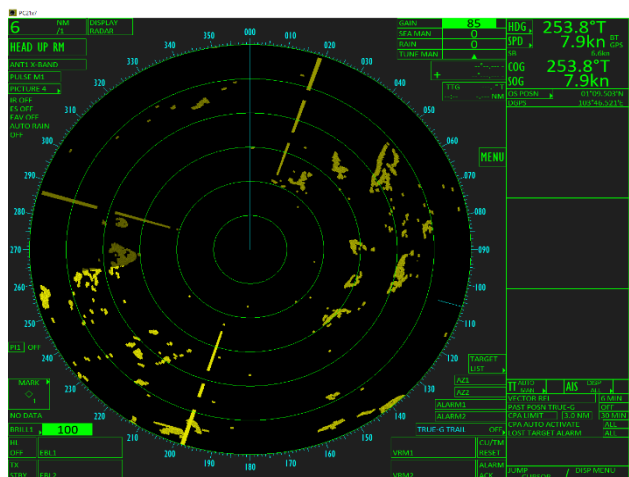
The ECDIS

A Real ECDIS integrated in the Ship Bridge Simulator

The ECDIS console is equipped with the EGLOBE G2 ECDIS system already certified by DNV according to the following standards: Annex A.1, item No. A.1/4.30 and Annex B, Module B in the Directive. IMO Resolutions A.694 (17), MSC.191 (79) & MSC.232 (82).

The ECDIS is fully integrated in the bridge simulator and its functionalities can be controlled through a dedicated user interfaces (also designed for touch screens).

- Ship motion data (COG, SOG, HDG, LOG)

- Chart Management
- Chart data display
- Mode and orientation management
- Radar Integration
- Possibility to load multiple types of charts (e.g. S57. S63, etc.)
- Alerts and warnings management
- Antigrounding
- Look ahead settings
- Watch handover checklist
- Customizable data display
- User objects definition
- Report generation
- User Profiles
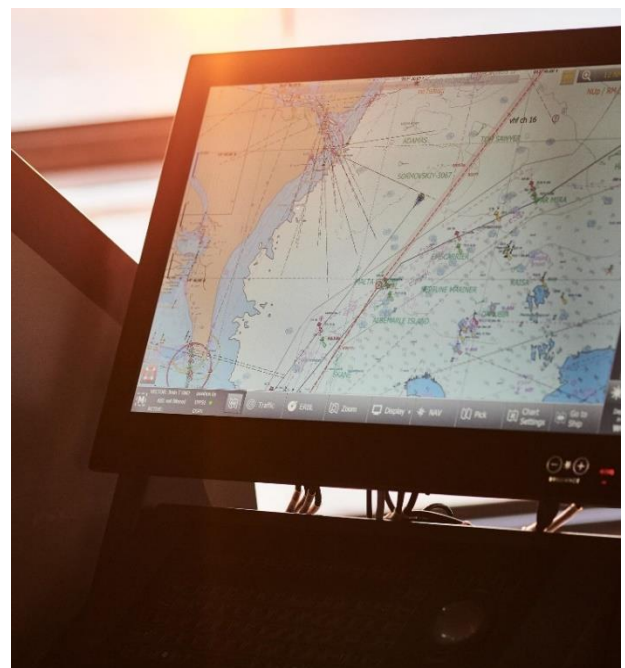
Already developed to work on Touchscreen technology , the EGLOBE G2 ECDIS meets all the IMO digital navigation regulations

>https://www.chartworld.com/web/on-board/ecdis

Full Aid to Navigation

AIS, GPS, Echo-Sounder and SpeedLog

AIS Simulator

The **AIS simulator** is able to manage AIS messages and, in addition, to receive messages from the outside (generated by other ships or by the instructor).

The AIS simulator allows the trainees to indicate the data related to the own ship (destination, type, departure, status, etc.), manage dynamic data, receive and view information relating to target ships.

The AIS is fully integrated with the RADAR and the ECDIS systems .

DGPS Simulator

The **DGPS simulator** includes functionalities such as:
- Map display and geographical coordinates to define the position
- display of connected satellites and data associated with them
- routes registation and WAYPOINTS
- display of data associated with routes and calculation of estimated time of arrival (ETA)
- MOB

ECHOSOUNDER SIMULATION

The **ECHOSOUNDER simulator** has the following functionalities:
- depth display
- display of the ship's speed
- graphic display of depth
- possibility to add markers to the depth graph
- possibility to save a log with received data
- Noise filter
- Manual or automatic range based on the current depth
- Setting and alarm activation on a reference depth
- position of the ship, date & time

SpeedLog

The **SpeedLog** is used to simulate the speed log of the own ship that summarize relevant navigation information, including:
- ✓ Heading
- ✓ Doppler (SOG and COG)
- ✓ Marine currents
- ✓ Wind intensity and direction
- ✓ Rate of Turn
- ✓ GPS (COG and SOG)
- ✓ Depth (including DBK)
- ✓ Drift
- ✓ Voyage Distance
- ✓ Total Distance
- ✓ Speed alarm, etc.

The GMDSS Simulator

Full support to Communications

The C-BridgeSim is equipped with a full communication system to train operators to use correctly different types of instrumentations.

Communications can be directed toward other vessels, coast stations as well as toward the Instructor that can simulate a number of different communication scenarios.

Communications are simulated according to the International Convention for the safety of Life at Sea (SOLAS).

The GMDSS simulator is equipped with different system such as:

- Radiotelephone VHF
- Radiotelephone SSB MF/HF
- INMARSAT Standard C
- NAVTEX (NBDP receiver)
- EPIRB
- SART
- Watch Receiver - 2187.5 kHz and CH 70
- DSC Controller/Receiver VHF - CH70
- DSC Controller/Receiver MF/HF - 2-4-6-8-12-16 MHz
- GPS readout (Lat./Long.)
- Speed-log readout (NM)
- Gyrocompass readout (Deg.)

Functionalities include:

- transmit aid alert ship-coast
- receive aid alert coast-ship
- transmit and receive alert of ship-to-ship aid
- transmit and receive communications for the coordination of the operations search and rescue
- transmit and receive signals for location aims
- transmit and receive information on marine security (MSI)
- transmit and receive general communications destined to networks or radioelectric earth systems
- transmit and receive general bridge-bridge communications

Multiple Configurations for Multiple Needs

From initial training to Full Mission Ship Bridge Simulator

C-BridgeSim is fully scalable, flexible, modular and interoperable to fullfill customer's needs in terms of training capabilities.

Interoperability with already existing solutions is achieved through the standard IEEE 1516 HLA (High Level Architecture) for interoperable and distributed simulation.

C-BridgeSim can be installed on simple desktop PCs for initial training (there are 3 standard desktop configurations) as well as can be provided as a Full Mission Ship Bridge Simulator (with four standard configurations: 3, 5, 7 and 9 consoles). The same modularity apply to ship models, training scenarios, board software and instrumentations.

Even a basic desktop installation can be arranged in a way to provide trainees with the feeling to be onboard the ship thanks to dedicated portable controllers.

The Instructor's Workstation

A wide range of functionalities to recreate real-world training scenarios

The Instructor Workstation has been conceived, designed and implemented to provide a wide range of functionalities and to deeply control training scenarios and trainees' performances over the time.

The own ship as well as the target ships can be opportunely customized; all the onboard instrumentations (Radar, ECDIS, GMDSS, etc.) can be configured to recreate all the situations that the trainee can experience on board real ships. Multiple instances of the Bridge Simulators can be controlled by a single instructor's workstation.

The Instructors' User Interface has been designed according to the most recent User Experience Design (UX) principles in order to stimulate the correct instructor's perceptions and response while using the system.

- Full control of the simulation
- Creation of exercises, exercise editing, running, printing and debriefing;
- Management of pre-existing exercises (save and restore)
- Start-End of the training exercise
- Exercise recording and replay on the instructor map
- Map zoom-in and zoom-out
- High accuracy data presentation on the basis of vector charts
- Print of all the kinematic data of the exercise
- Control of own ships and targets: direct control of steering and propulsion systems, autopilot, mooring, anchors for own ships; control of position, speed, direction for targets;
- Waypoints management
- Management of 100 moving targets of different types
- Radar ARPA settings management
- AIS settings management

- Ships management
- Capability to move the own/target ships during exercise
- Displaying of the actual ship contours;
- Continuous display of the ship motion parameters and environmental conditions: ship course and speed, course over the ground, heading, rate of turn, etc.
- Display of the speed vector
- Display of walls and piers
- Track history and time stamp
- On chart monitoring of own ship and target ships
- Anchors operations management
- Alarms and Failures management
- Lights and Shapes management
- Fogs management
- Flags management
- Mooring operations management
- Tugboats Management
- GMDSS data management for each own ship

After Sale and Life Cycle Support

Just Simulate and don't worry

We are able to provide full support, assistance and maintenance during and after the warranty period with dedicated After Sale Packages and Full Life Cycle Support Packages.

We are able to define an ad-hoc maintenance and assistance program according to your needs: from continuous software updates to insurance for improper use, from extended warranties and continuous personnel training to online/telephone/remote assistance.

After Sale and Life Cycle continuous support

Assistance by telephone and email, online assistance through a dedicated ticket service

Remote intervention and on site service

Continuous training in order to guarantee an efficient use of the Ship Bridge Simulator

SPEED UP YOUR BUSINESS!

We invest in **values**,
we create **innovations**

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