

SEADRONIX

AI-based navigation and port operation system
for a safer and a smarter maritime industry



SEADRONIX Corp.

SEADRONIX

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ABOUT US

SEADRONIX has developed the state-of-the-art AI technology specialized in maritime environments. With AI-based Berthing Monitoring System(AVISS) and Around View Monitoring System(AVM), SEADRONIX provides safe berthing process at ports and smart navigation assistance in ocean.



SEADRONIX's solution provides technological competitiveness of port in terms of operation and management, ensuring smart and safe port environment.

VISION

The ultimate goal of SEADRONIX is to establish 'Port-to-Port AI platform'. We are moving forward to accomplish the most advanced technologies in maritime industry, smart port operation system as well as self-autonomous navigation system for ship.



AI-BASED BERTHING MONITORING SYSTEM (AVISS)

AVISS monitors a ship berthing at dock providing situational information, result from processing of artificial neural net embedded.

AVISS supports real-time cooperation among stakeholders: port operators, pilots, etc.



MODULE

01



Real-time berthing monitoring

Supported by maritime environment recognition AI technology

02



Easy access

Access to AVISS service regardless of users' locations, enabled by wireless network and cloud server

03



Stand-alone type

Embedded processor optimized for acquiring maritime data and AI analysis

04



Simplicity in installation

Installation on the existing facilities is possible

AVISS Sensor Module Specification

- Size : 300×270×160mm(W×D×H)
- Weight : 8kg
- Waterproof/Dustproof : IP67
- Operating temp. : -20℃~60℃
- Input power : DC 19V
- Power Consumption : 120W
- Processor : Embedded Processor

AVISS Composition



Sensor Module



Cloud Server



Web-based Service

Sensor module analyzes data and transmits to cloud server in order to provide real-time service for users.

AVISS SERVICE



AVISS Mobile

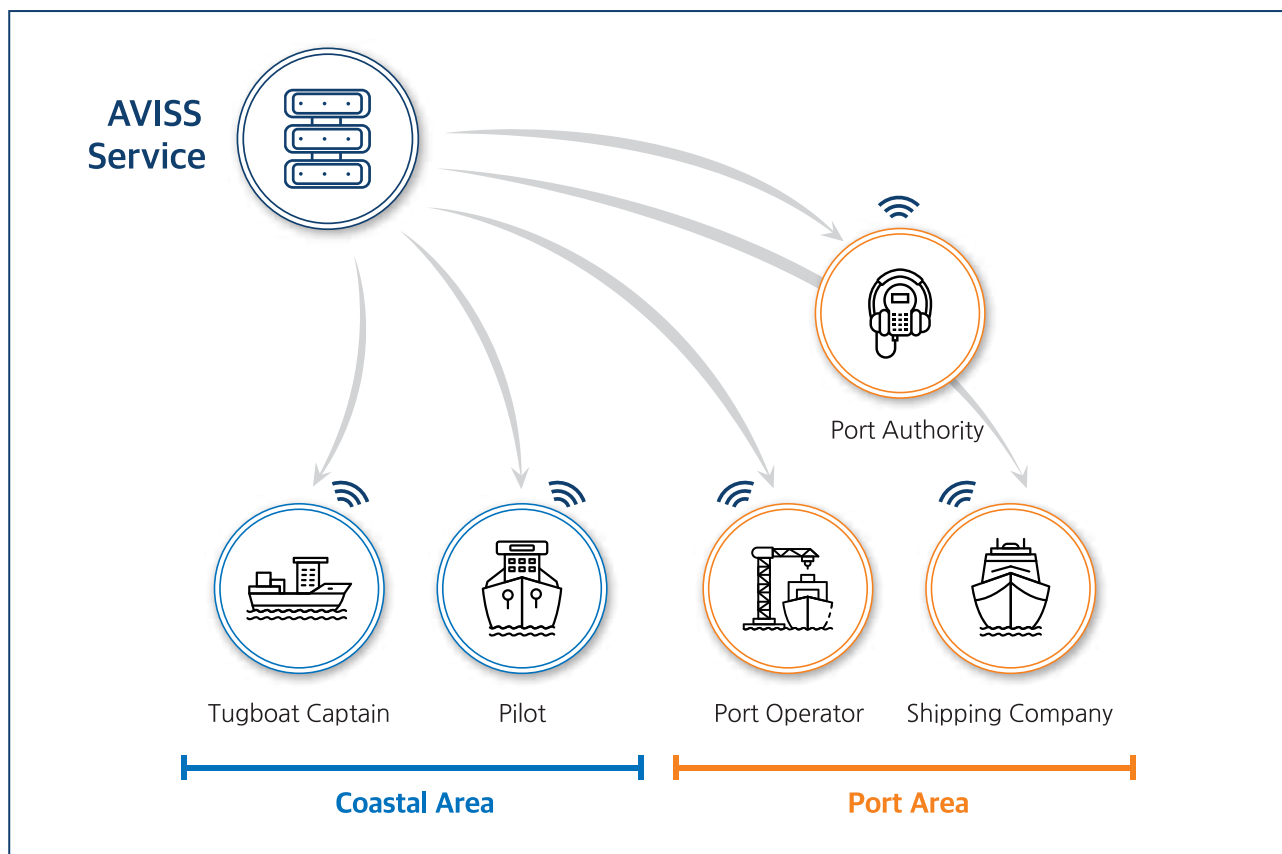
Pilots and tugboat captains can monitor real-time information on their mobile devices during berthing.

AVISS Admin

Port operators, shipping companies, and cargo workers can monitor multiple berths in real time with integrated management features.



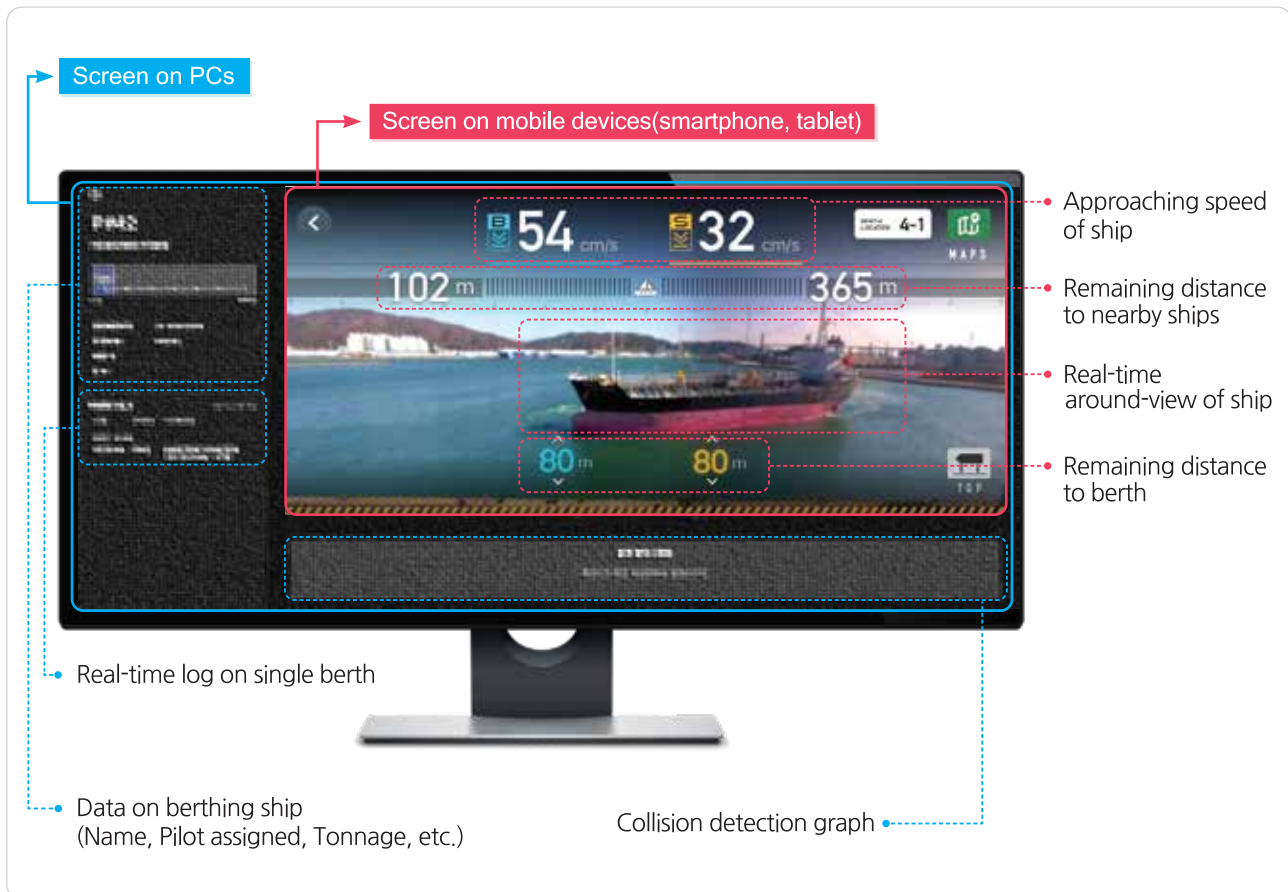
SERVICE USERS



FEATURES OF AVISS

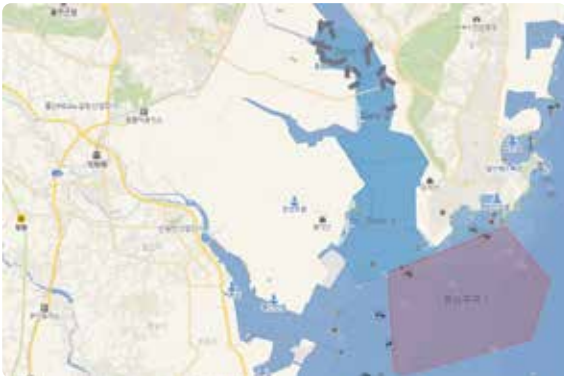
By sharing information with AVISS berthing and port operation can be innovated. Current process that depends on pilots' naked eyes is limited in acquiring situational information whereas AVISS provides berthing information to multiple interest parties all at once.

Single Berth Monitoring



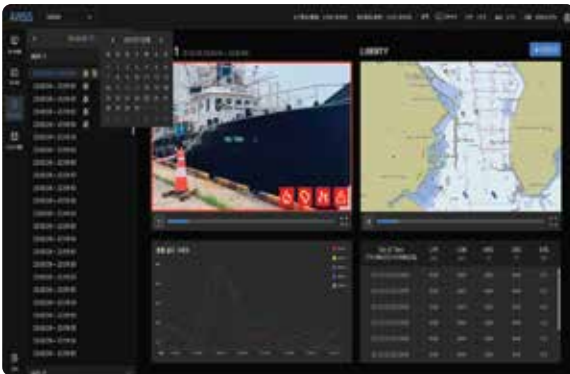
Multiple Berths Monitoring

- Live video streaming on multiple berths
- Berthing schedule and pilot information
- Real-time event log on each berth
- Weather Information



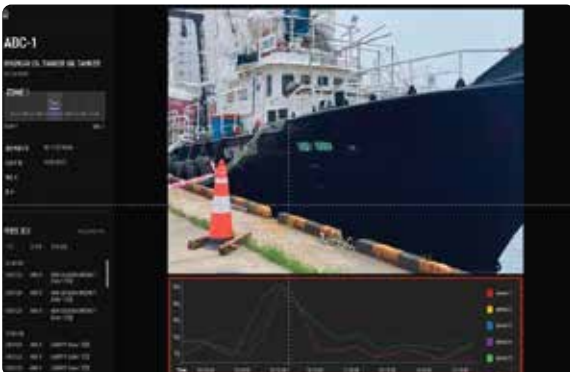
Ship Route Tracking

- Alert the location as a ship enters designated zones
- Accumulated route information of assigned ships indicated on a map(ECDIS)



Berthing History Management

- Data(approaching speed of a ship, remaining distance, around-view, route, etc.) saved for 24/7
- Browsing the data history



Collision Alarm

- Collision detecting graph
(Extra installation required for collision detection sensor)
- Alert message shown as collision occurs

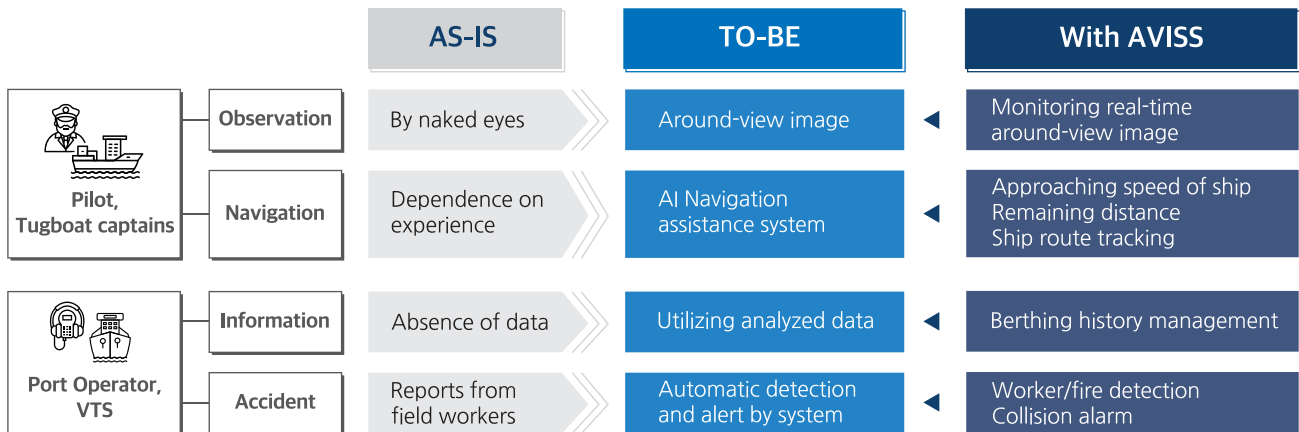


Worker/fire detection

- Alert sent as fire is detected at berth
- Detecting workers in operation on a ship berthed

BENEFITS WITH AVISS

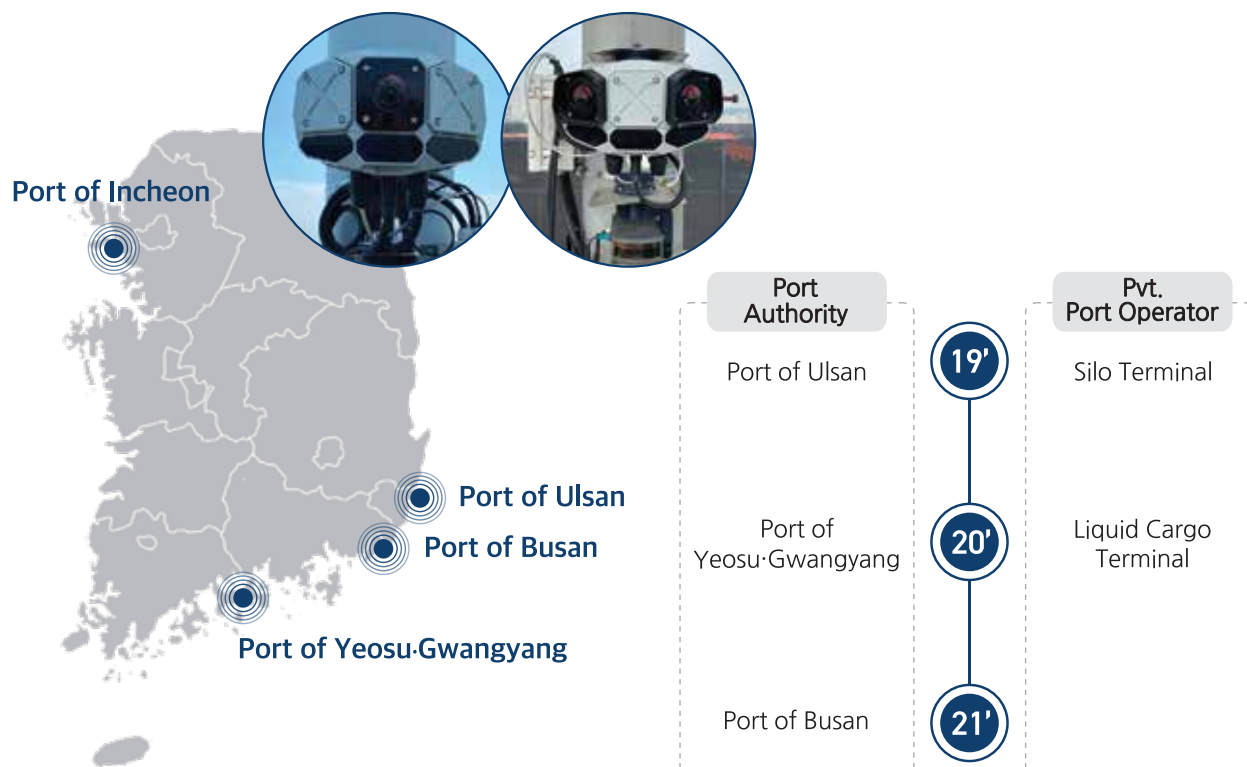
AVISS solves the existing pain points brought out by limited information, resources, and inefficiency in the process for various stakeholder groups in port ecosystem.



UTILIZATION OF AVISS



REFERENCES



FAQs ON AVISS

Is installation construction necessary for extra facilities in order to install AVISS?

No such construction is necessary for AVISS installation. AVISS sensor module(HW) can be easily Installed on the top of existing facilities such as a light tower and a crane at port. However, special adjustment may be needed depending on port environment and circumstance where AVISS is to be installed.

What is the length of a ship AVISS can monitor?

2-300 meters long per 1 sensor module. For a berth over 2-300 meters long, additional sensor modules are to be installed. However, depending on the installation location the coverage is subject to change.

Can AVISS operate in severe weather conditions and dusty environments as well?

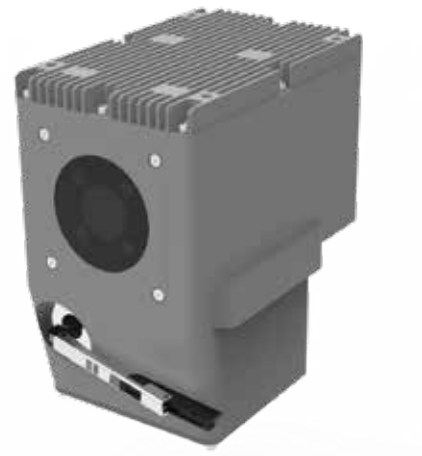
As long as a port is still in operation under such conditions, AVISS can operate. Image enhancement(exposure control, de-fogging), undistortion techniques and sensor fusion technology ensure the consistent quality of AVISS Service. **AVISS sensor module is certified for water/dust proof (IP67).**

Can AVISS provide service in a place where network is weak?

AVISS can operate in moderate network connectivity. Using edge computing technology, only limited essential data is transmitted for AVISS service. However, condition of the service may vary depending on the network quality.

AROUND-VIEW MONITORING SYSTEM (AVM)

AVM provides situational information from multiple sensor modules installed around a ship. It assists smart navigation in a whole other level based on AI technology specialized in ocean object recognition at a close range around a ship.



MODULE

01



Real-time around-view monitoring

Monitoring blind spot and recording navigation information

02



Situational information based on AI

Detecting at a close range of ocean objects: other nearby ships, buoys, etc.

03



Supports Retrofit installation

Minimizing installation range by setting modules at both sides of bridge wing

04



Intelligent wiper equipped

Wiper operates adaptively on weather situation to secure a clear view

AVM Sensor Module Specification

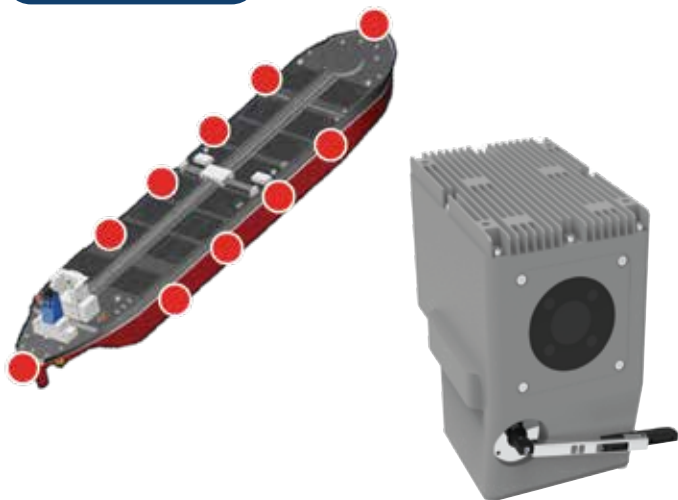
- Size : 160×215×232mm(W×D×H)
- Weight : 6kg
- Waterproof/Dustproof : IP68
- Operating temp. : -20℃~60℃
- Input power : DC 5V / 24V
- Power Consumption : 25W
- Processor : Embedded Processor

AVM Composition



Situational information around a ship is analyzed through each sensor module in order to assist smart navigation.

AVM TYPE



SHIPBUILDING

Multiple sensor modules are installed around a ship to monitor the environment

Reference

- Type of Ship : Oil Carrier(VLCC)
- Length : 330m
- 160,000 Gross Tonnages
- # of Sensor Modules : 10

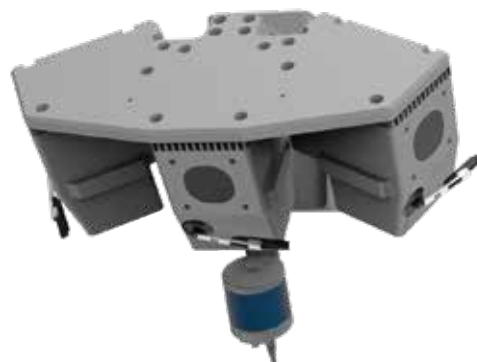


RETROFIT

Retrofit version of sensor modules are installed at both sides of bridge wing (port/starboard), minimizing installation range

Reference

- Type of Ship : Bulk Carrier
- Length : 273m
- 80,000 Gross Tonnages
- # of Sensor Modules : 6



CORE TECHNOLOGY

01 Maritime Objects and Environments Recognition

SEADRONIX has developed artificial neural net, based on massive data set on maritime environment. State-of-the-art AI technology recognizes ocean objects up to the pixel level regardless of the types, and workers in operation on a ship berthed as well. Situational information around a ship can be analyzed as a result of the environment recognition



02 Sensor fusion

Data acquired by sensors--cameras, LiDAR, etc.--is fused altogether to measure situational information around a ship more accurately.



03 Image processing

Image enhancement and undistortion techniques exclusively specialized on maritime environments are applied to AVISS service.

The technology provides one single clear image of the environment around a ship for users to monitor.



▲ Example of Image processing



▲ Example of image stitching

CERTIFICATES AND INTELLECTUAL PROPERTIES



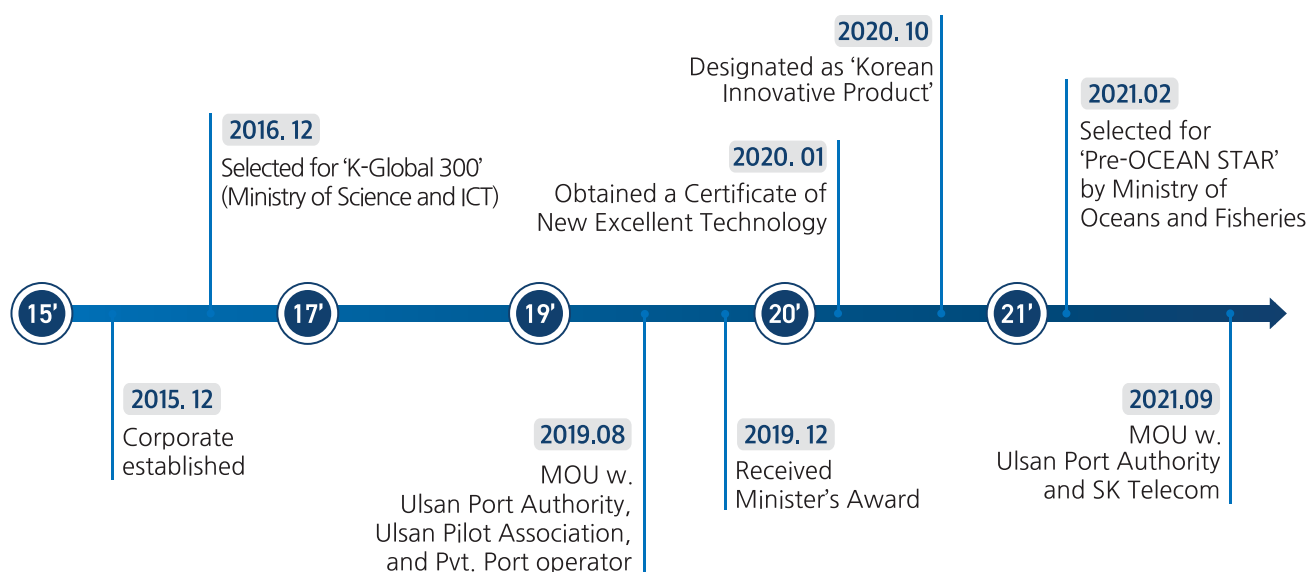
Certificate of Korean Innovative Products
(Exclusive right for gov't office pvt. contract)

Certificate of NeT (New Excellent Technology)

For commercialization, SEADRONIX has obtained Korean government certificates, global ISO's, 11 domestic patents regarding the technology on self-autonomous navigation and smart port, and 1 USA patent* as well.
(Additional patent application filing in progress)

*: Number of patents registered is stated as of 2021

HISTORY

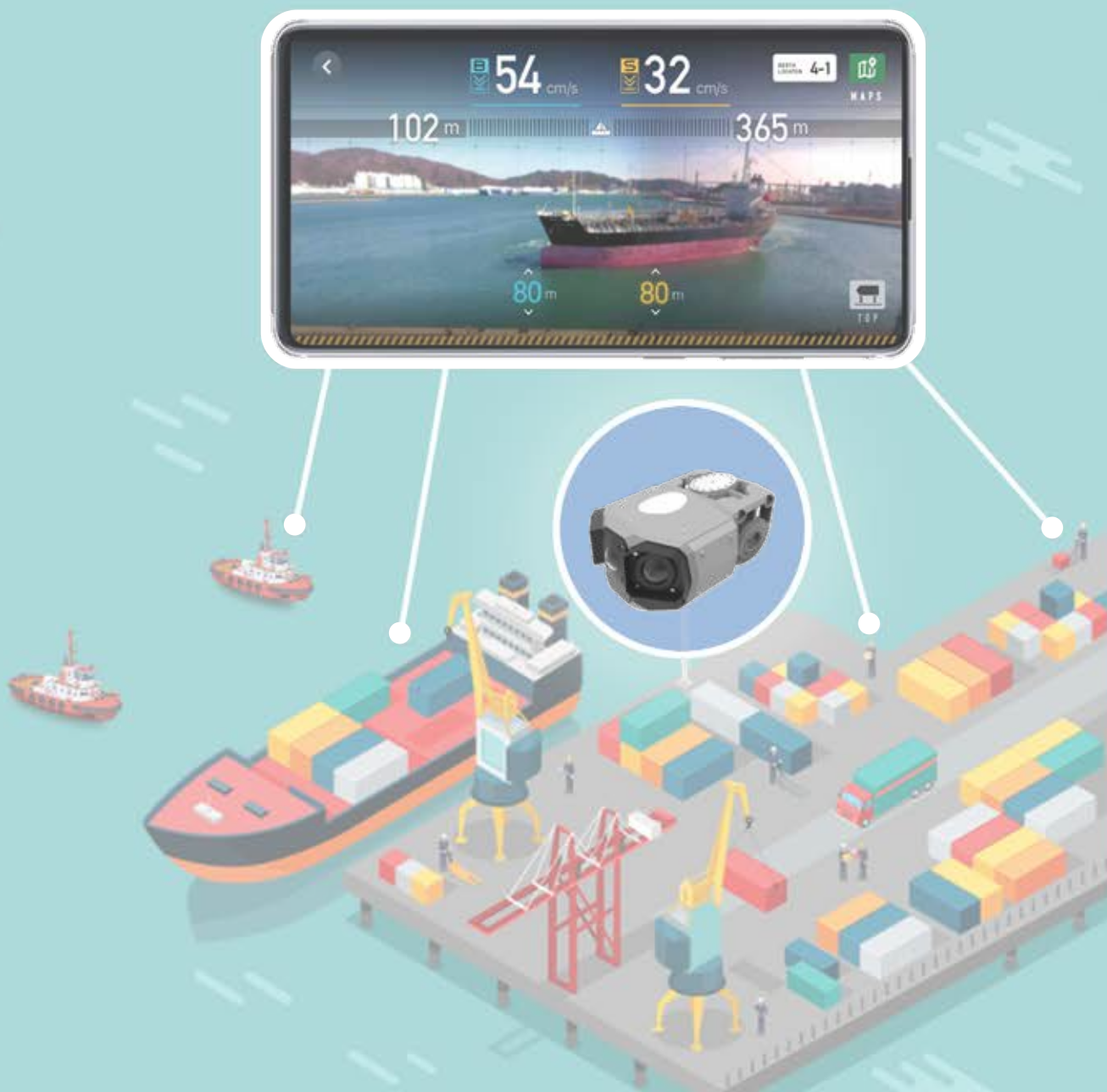


PARTNERS





- AI technology of SEADRONIX can break-through maritime environment, assisting smart port and autonomous navigation.
- AI-based solutions of SEADRONIX will connect every related party in maritime industry within our AI Platform.





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