Product Overview

Marine Traffic Surveillance and Management
M-NAV Solutions is a Marine Aids to Navigation (AtoN) specialist, delivering solutions and services to the maritime sector. M-NAV is an Industrial Member of the International Association of Lighthouse Authorities (IALA).

We offer a range of marine traffic surveillance and management solutions, from Vessel Traffic Management Systems (VTMS) for the support of Port Vessel Traffic Services (VTS), to solutions for coastal monitoring and surveillance. We work closely with our partner, Vissim AS of Norway, to deliver the most modern, reliable and tailorable solutions on the market.

Vissim AS is an Industrial Member of the International Association of Lighthouse Authorities (IALA) and a global leader in the development and delivery of some of the world’s largest and most complex vessel traffic management and maritime monitoring, surveillance and management systems.
Overview of Marine Traffic Surveillance and Management Solutions

At M-NAV Solutions, we recognise the need that many coastal States have for the surveillance and management of vessel traffic within their Ports and coastal waters.

We also understand that the design of these types of systems are dependent on many local variables. These may include the complexity of vessel traffic, monitoring and reporting requirements, but also local capacity, geographical restrictions and the extent of available communication networks.

In most cases, one particular system will not meet all local requirements or comprehensively address local issues. We ensure that when addressing a customer’s needs, all factors are taken into consideration and carried through into the design phase.

In cooperation with our technology and integration partner, VISSIM AS, we offer a comprehensive range of different tailorable solutions, utilising modern reliable hardware, state-of-the-art software, and a professional and controlled design, assembly and installation process.

An Overview of Solutions

- Fully tailorable Vessel Traffic Management Systems (VTMS) for Vessel Traffic Services (VTS), either as single site or multi-site/multi-port solutions. Our VTMS solutions are hardware-independent with the most appropriate sensors chosen to suit location and coverage requirements.
- Compact, low-powered AIS monitoring units for coastal surveillance on remote sites with integration into a number of different communication networks, allowing for transmission of data from even the most remote sites.
- Complex coastal monitoring and surveillance systems enable surveillance and management of vessel traffic via a range of sensors - AIS, VHF, CCTV, Radar and weather stations. These solutions are customised to customer requirements and can be designed to run reliably and autonomously on very remote sites.
- Surveillance or Control centres that allow for the collection, integration, and central display of data using modern, state-of-the-art software with various options for remote control and support of sites. The use of a number of different communication networks enable monitoring of even the most remote sites.
- Our VTS and coastal surveillance solutions are designed according to client requirements, through identification of potential sites and a study of local environmental conditions, professional coverage modelling, and a review of the most appropriate means of data transmission.
- M-NAV Solutions are remote-site specialists and we understand that environmental conditions play an integral part in the cost and reliability of any monitoring and surveillance site or network. We choose equipment that is designed to work in the prevailing conditions and we can design remote sites to operate autonomously with a high level of availability, integrating remote system control and monitoring, powered by 100% renewable power sources.
- Our solutions comply with all the relevant IALA Standards, Recommendations and Guidelines.
M-NAV Solutions offers a number of solutions for coastal monitoring and surveillance utilising the Automatic Identification System (AIS) tracking system technology. These systems are designed to monitor and track vessel traffic via the unique AIS signature from vessels and can include standalone coastal stations or a series of sites to form a wider network.

The core elements of these systems are a range of robust, low-power remote-site enclosures that house the AIS equipment and power supplies.

These enclosures are lightweight and durable, designed for ease of installation in very remote locations and ensure reliable operations in even the harshest environmental conditions.

Equipment is selected for low power consumption which allows for the integration of solar power and internal battery banks, eliminating the need for backup power. Depending on the equipment utilised, our remote AIS enclosures can offer up to 15 days of autonomy, allowing for ongoing, uninterrupted operations on remote and difficult to access sites.

Our remote AIS enclosures can be designed with AIS receivers only, allowing for a small, compact unit that can be installed in strategic locations, such as telecommunication sites or existing AtoN stations.

When transmission of AIS data is required, or extra networking capabilities are needed, the remote AIS enclosures can be installed with an AIS Base Station, providing additional flexibility and the ability to expand networks and include the monitoring of AtoN.

As with all our marine traffic surveillance solutions, we can design and install surveillance centres that allow for collection, integration, and display of data from the AIS network and additional capabilities as required by the client. To support network operations, we offer multiple methods of data transmission, allowing for collection of AIS data from even the most remote sites.

**Basic Specifications**

- Enclosures designed for use in remote and highly aggressive marine environments.
- Low power consumption.
- Redundant power supplies utilising solar-powered battery banks, designed for maximum autonomy.
- Cooled through an efficient natural air-flow and ventilation design.
- Lightweight, for ease of transport and installation on remote sites.
- A number of options are available for installation and fixicity, regardless of substrate and site conditions.
- Communication from even the most remote sites, including the use of satellite technology.
- Enclosures can be remotely monitored and configured.
- Highest quality equipment and materials used to maximise lifespan and to ensure reliability and availability.
Coastal monitoring and surveillance systems sometimes require more complex data or additional ways of monitoring and tracking vessel traffic. This may necessitate the use of additional sensors such as radar, CCTV, weather monitoring, and VHF communications.

When required in very remote areas, this further adds to the complexity of the design and operation of these sites and the need for autonomous, reliable monitoring stations.

In close cooperation with our technology and integration partner, Vissim AS, we are able to design, supply, and install coastal surveillance stations to meet any requirement.

Coastal surveillance stations can be designed as standalone sites, or as an expanded network located across a number of strategic locations. These stations are a combination of structures, integration of the appropriate sensors, electronics and equipment enclosures, and a power supply.

Structures are chosen based on site conditions to maximise lifespan and reduce through-life costs. Our solutions are hardware-independent and the selection of sensors is based on the data needed, environmental operating conditions and range requirements.

We are able to design and supply power supplies, utilising solar and wind energy to power on-site battery banks which are designed to meet any level of autonomy. Power supplies can be remotely monitored, making these stations self-sufficient and without the added operational and environmental issues associated with traditional power sources that require the storage and replenishment of fuel.

On-site electronics and sensor operating systems are installed in enclosures that are lightweight and durable, designed for ease of installation in very remote locations and operational reliability in even the harshest environmental conditions.

As with all our marine traffic surveillance solutions, we can design and install monitoring centres, allowing for collection, integration, and display of data from the surveillance network and additional capabilities as required by the client. To support network operations, we offer multiple methods of data transmission, allowing for collection of surveillance data from even the most remote sites.
M-NAV Solutions offers fully tailorable Vessel Traffic Management System (VTMS) solutions for the support of Vessel Traffic Services (VTS), either as a single site or multi-site/multi-port system.

Our partner, VISSIM AS, is a VTMS specialist, providing solutions utilised in some of the biggest and most complex VTS installations in the world.

Our VTMS solutions can integrate data from the full range of sensors including radar, AIS, CCTV and drone, VHF, weather stations, metocean sensors, and satellite data. This provides real time detection, tracking, and surveillance of vessel traffic, ensuring a high level of situational awareness and interaction.

The core of the VTMS solution is the Vessel Traffic Management Application software which is suitable for small, medium, and large-scale VTS worldwide. The system architecture is able to support a hierarchy of VTS control centres and multiple sensor sites, operating on a WAN/LAN and can be hosted on the premises, in the cloud, or on a client’s IT infrastructure.

The software application includes a large library of interface protocols for a wide range of hardware manufacturers and models. For radar manufacturers in particular, the application supports solid state and magnetron radars from all the major radar manufacturers. As Vissim is a hardware-independent supplier of surveillance solutions, they have comprehensive experience in developing interfaces to client specific hardware, which also enables integration using existing sensors and infrastructure.

The software application includes a large suite of functions which is configured according to customer needs. Different modules can be integrated at any time, expanding or increasing system capacity. This modular design, including the ability to integrate different hardware, makes our VTMS solutions the most complete VTS support solution on the market today.

Our VTMS solutions are compliant with all IALA Standards and can be customised to take into account any other applicable standards or legislation governing the location in which they will be installed.
One of the key benefits of our VTMS Solution is the modular and flexible nature of the core VISSIM application. Multiple applications are available to build a system that is fully responsive to customer requirements and maximises the level of safety and efficiency.

**Software Modules**

**Vissim VTMS Application** - manages and processes data generated from sensors, further processed in central servers, and intuitively presented in Vissim VTMS GUI on operator stations.

**Vissim Radio Communication** - controls all radios in the system and allows direct calling from VTMS GUI operator stations.

**Vissim CCTV Module** - controls the cameras installed and enables direct control from VTMS GUI including auto-tracking.

**Vissim Port Management Application** - allows automisation of port processes, increases maritime logistics efficiency, record keeping, and collection of port billing data.

**Vissim System Management Module** - enables real time performance monitoring of all components of the system, such as radars, AIS base stations, VHF base stations, and IT equipment.

**Vissim Wave Height Detection** - provides real time sea state information by using effective and highly advanced algorithms analysing radar video.

**Vissim Oil Spill Detection Module** - fully-automated, real time detection software which processes data from raw radar images and provides system-generated oil spill information and alarms.

**Vissim Compliance Module** - a web-based platform that streamlines the management of personnel and vessel certification, providing real time assurance of certificate validity in the context of live operations.

**Vissim Logistics Module** - Vissim Logistics Module supports the planning of manifests and real time personnel transfer operations of the entire life cycle of offshore installation and operation.