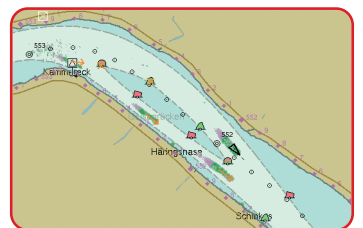
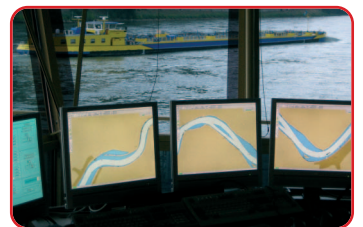


inVTS_{box}

Self-contained Vessel Traffic Surveillance System





Concept of **inVTSbox**

The traffic in ports and on inland waterways in most parts of the world is increasing, accompanied by an increase of ship size. This development leads to higher demands on the infrastructure, wherever ships operate: waterways, locks and harbours. inVTSbox provides various system solutions that perfectly cope with these tasks.

Locks and bascule bridges can be operated more efficiently if the upcoming traffic situation is known precisely, especially when the lock or the bridge is managed from remote.

In harbours, a detailed picture of the traffic can be provided to the authorities for traffic coordination. For security reasons, however, specific areas of a harbour need to be observed in order to signal unauthorized access or dangerous situations to the control centre. **inVTSbox** is a modern, highly computerized monitoring and surveillance system that enables the operators to fulfil these requirements.

Travelling a river with bigger ships might require additional traffic coordination around curves or narrow stretches.

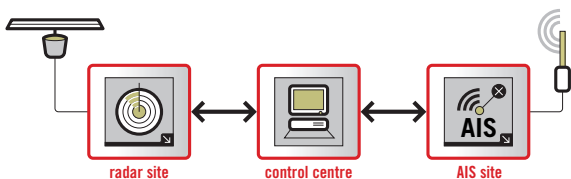
For these purposes, **inVTSbox** is already installed in various applications throughout Europe.

new generation

inVTSbox

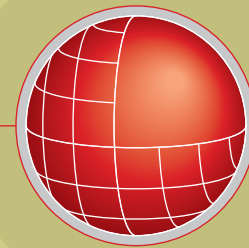


Ship in entrance lock of Kiel-canal



inVTSbox is a self-contained, comprehensive VTS system for waterways and harbours. All necessary functions are combined in one system:

- Radar data acquisition, processing and transmission
- AIS data processing and display
- Target tracking
- Visualization of all data on a chart display
- Powerful, reactive and configurable user interface
- Recording & Replay
- Extra surveillance of specific areas
- Monitoring of traffic and automatic alarm generation



Basic functions page 4/5

- Radar
- AIS processing and display

References page 5/6

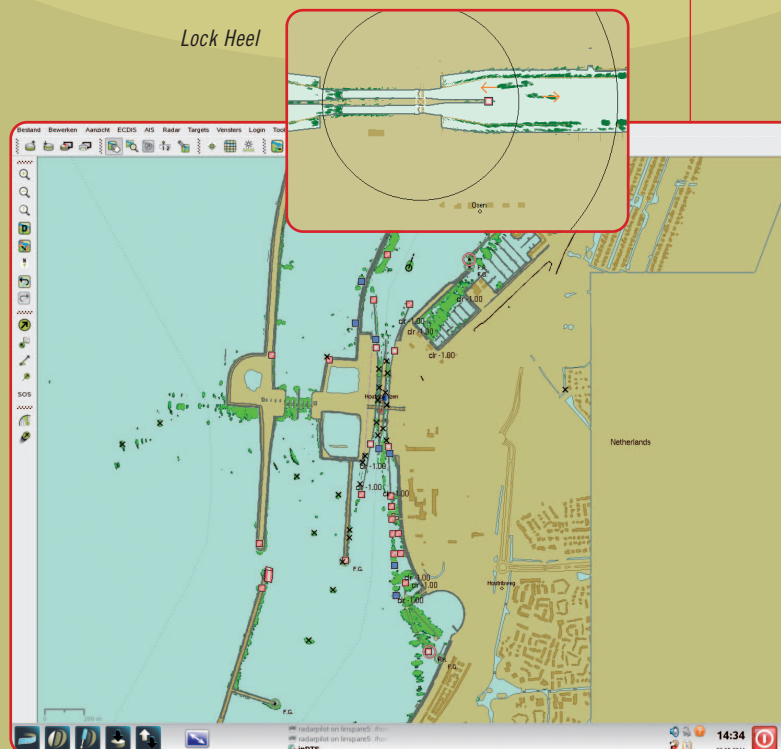
- Central monitoring of locks and bridges
- Offshore monitoring of wind parks
- Traffic surveillance and control on waterways

Display options page 7

Maintenance page 8

Extension with web front end inWebDTS page 8

Lock Heel



Houtribsluizen

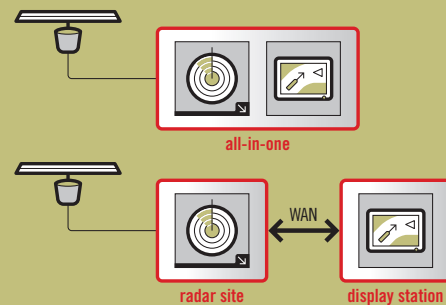
Radar

Radar provides an image of the traffic situation on water ways that is nearly independent from light and weather conditions. It requires no special installations on vessels, thus, all traffic on the waterway, including pleasure boats, is detected by radar.



Setup Options

- Radar acquisition and display on the same computer or on two different computers with data transmission over network.



- Different cost effective radar sensors are available according to user requirements (4 to 25 kW, 6.5 to 12 feet antenna)

Acquisition

- Up to four radar scanners can be integrated
- High resolution image due to max. 100 MHz sampling frequency, resulting in 1.5 m radial sampling interval
- Max. 1500 pixel per radar ray
- Advanced image processing and filtering:
 - Blanking of radar echoes with easily adaptable blanking maps

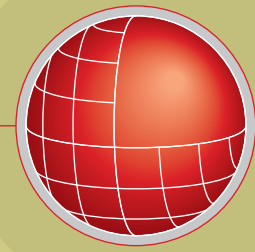
AIS processing and display

For traffic surveillance and monitoring systems the importance of processing AIS information is constantly growing. AIS messages characteristically can be received over a distance of 10 km or even more. Carrying an AIS transponder is mandatory for all seagoing vessels and in some European countries for inland vessels, too. Further carriage obligations are expected to come. Therefore, a great number of inland vessels are also equipped with AIS already.

Vessels equipped with an AIS transponder broadcast their position, velocity, ships name, call sign and several other data in regular intervals on a VHF channel.

inVTSbox provides advanced processing and display capabilities to use AIS for reliable traffic management:

- Full featured AIS base stations as well as cost efficient pure AIS receivers can be connected to **inVTSbox**
- Realtime presentation of AIS targets on (Inland)-ECDIS chart
- Powerful Graphical User Interface for handling AIS information
- Simultaneous supervision of several thousand targets
- Input over serial communication line or Ethernet
- Transmission of AIS data over WAN network connection possible
- Fusion of AIS targets with radar data in local tracking component
- Full compatibility with AIS standard for seagoing vessels as well as with Inland AIS standard



- Scan to scan correlation
- Automatic sensitivity control
- Full remote control of radar sensor possible

Transmission

- Transmission over network connection (TCP/IP)
- Minimum capacity of transmission line 256 kbit/s
- Distance of transmission only limited by WAN facilities
- Adaptive compression for transmission over low capacity line

Display

- Simultaneous presentation of multiple radar videos on one operator station possible
- Colours for radar presentation fully configurable
- Comfortable zooming and panning based on modern OpenGL technology
- Optionally touch screen display

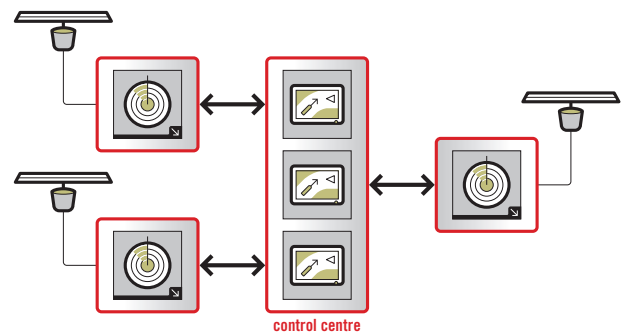
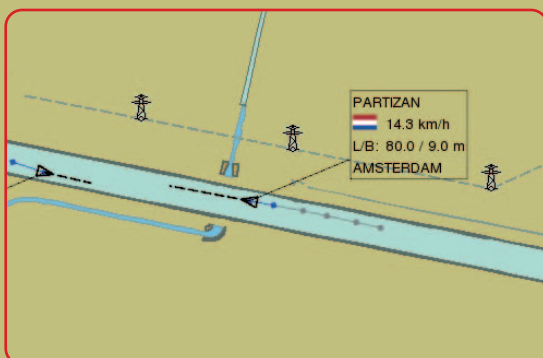
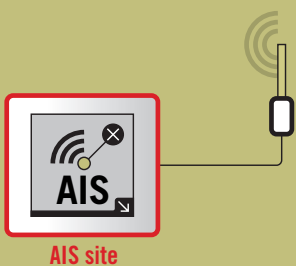
Recording

- Radar information can be stored together with other input data
- Recording periods only depending on capacity of storage devices
- Full support of NAS devices



Traffic display at a control room of a lock

Central monitoring of locks and bridges



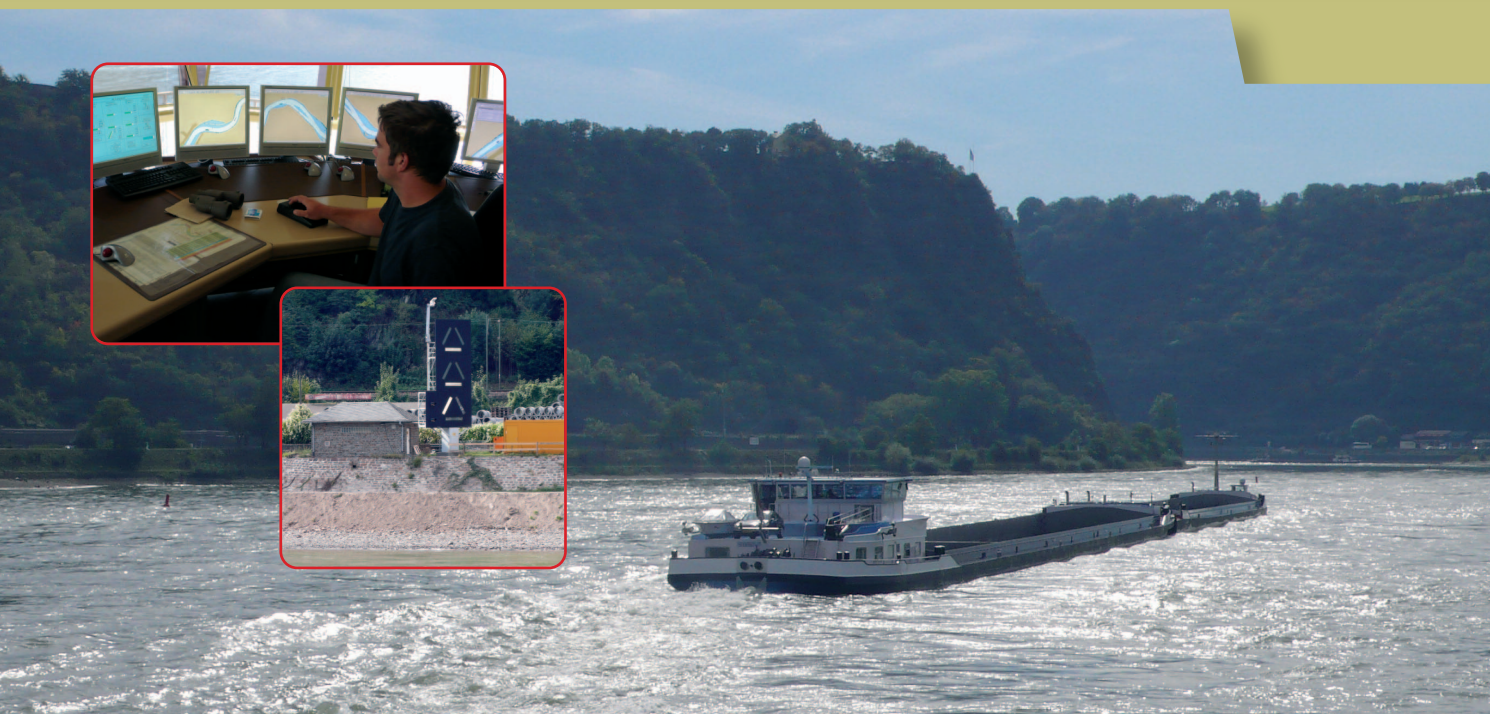
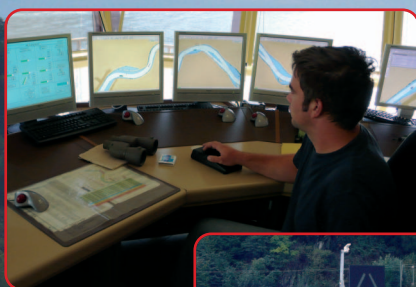
Today, locks are often operated from remote. Through radar images transmitted over WAN, the lock master can easily monitor the situation in the layby basin as well as in the connecting waterways up to a distance of several kilometres. The radar image is not affected by light conditions or by fog. Thus, it is a well suited complement to Video surveillance. Including AIS enlarges the range covered by the system, and ships names can be added into the display.

Offshore monitoring of wind parks

GLOBAL TECH 1 will be the first commercial offshore wind park located in the North sea. Surveillance of the area including radar and AIS will be done with an inVTSbox solution.

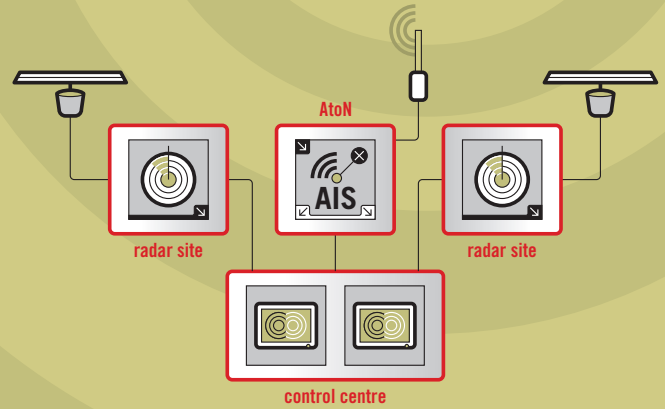
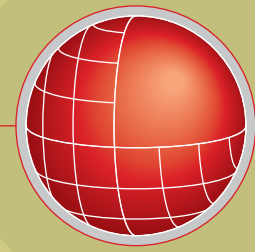
inVTSbox provides full remote monitoring by seamless integration of all sensor information (Radar, AIS, CCTV), controlling radar and video camera, and highly reliable tracking with MultiSensorTracker MST detecting all air and sea targets around the offshore wind farm. Customized display functions are available with the proven and powerful GUI **inDTS**. Automatic traffic analysis and alarm generation can be configured for the specific requirements of the environment. The possibility of full virtual AtoN support and people tracking round up the specific demands in offshore monitoring. Recording and replay function provide court-presentable data.

Traffic monitoring and control on waterways



The vessel traffic on the river Rhine is monitored with 4 radars and AIS. inVTSbox provides the data processing and the integration of all information, and presents it as combined display in the control centre at Oberwesel.

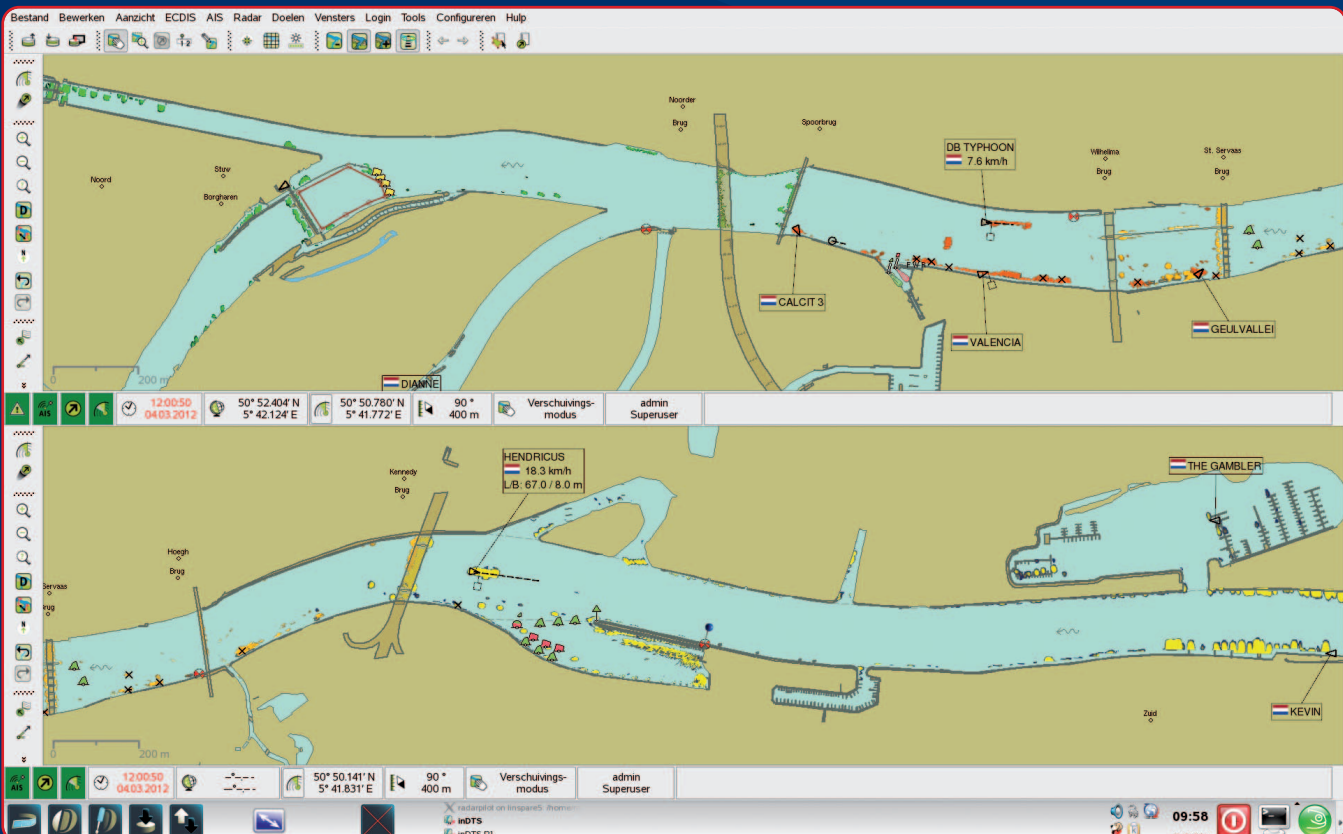
River reaches with sharp curves or narrow fairways are bottlenecks for waterborne transport. The growing size of ships tightens the need for thorough traffic coordination by the waterway authorities. **inVTSbox** makes available that reliable realtime traffic image of the waterway at Oberwesel at the river Rhine. The seamless integration of multiple radar sensors and AIS in one display enables the operators to supervise the traffic over several kilometres with a high level of flexibility. The status of the traffic lights (Wahrschau signs) can also be transmitted to the ships via AIS.



Display options

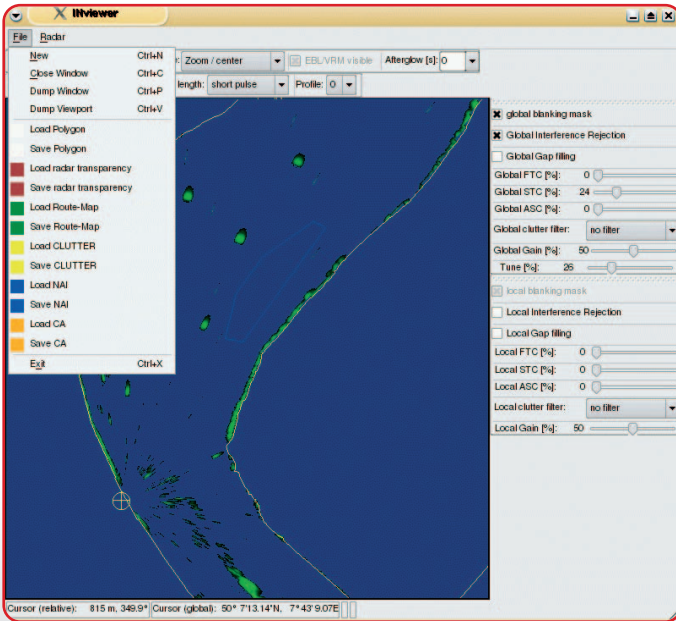
- Up to four displays may be connected to a workstation for different purposes.
- Touch screen operation possible
- Display can be divided in several windows (e.g. one overview and up to three detail windows)
- Within the display of iNVTsbox, warning areas or lines can

- be defined simply on the user interface. If a ship enters or leaves such an area, an alarm will be issued.
- Configurable track labels
- Rule based presentation of track labels
- Track lists with rulebased selection criteria (e.g. vessels with dangerous cargo and speed higher than 2 km/h)



Radar surveillance system Maastricht, 4 radars and AIS, presentation in two windows

Maintenance

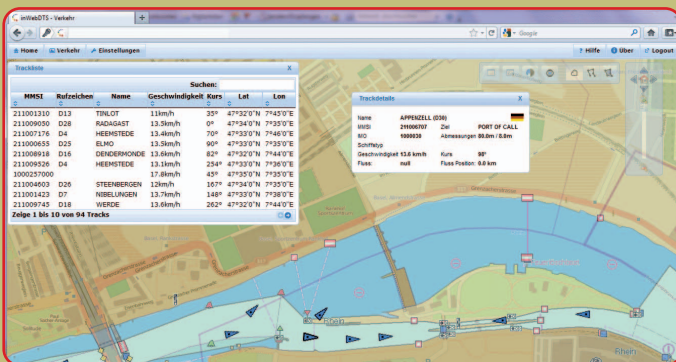


- **inVTSbox** comprises a comprehensive and easy to use set of maintenance functions
- **inViewer** for radar calibration and tracking configuration
- Maintenance screens for system information
- **inVTSbox** systems can be equipped with a service workstation, where calibration work can be carried out without interfering with normal operation. The service workstation can also be used for replay and analyses of recordings.
- Qualified support by local service partners – worldwide !

Options

- Processing and visualisation also available for Windows
- Remote dial in for maintenance purposes
- **inVTSbox** is compatible with other VTS components of **in-innovative navigation GmbH**, allowing flexible adaptation of the standard system in order to fulfil the specific requirements of the customer
- Every **inVTSbox** installation provides the potential to be seamlessly upgraded up to comprehensive multi radar, multi site systems covering large maritime regions
- Electrical alarm output for intergration in security systems

Extension with web front end inWebDTS



- **inWebDTS** is a unique tool for browser based advanced traffic management and traffic analysis with respect to actual and historic traffic data
- Customized layering of ECDIS chart and any other maps



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