

Kongsberg Norcontrol IT Vessel Traffic Management & Information System VTMIS5060



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The Vessel Traffic Management and Information System (VTMIS) 5060 is an open architecture system developed by Kongsberg Norcontrol IT AS to fulfil the needs of a wide range of users. The design employs a variety of hardware and software modules that collect, integrate, assess and display sensor data in a manner that provides a comprehensive representation of the vessel traffic situation to VTS Operators. Whether the requirement is for surveillance of coastal areas, large ports, small ports, rivers or offshore installations a VTMIS5060 can be supplied to meet that need. Each VTMIS5060 is configured to suit the customer's specific needs that in most cases are fulfilled with standard off-the-shelf VTMIS5060 modules, however Kongsberg Norcontrol IT AS take pride in our ability to develop Customer specific solutions wherever required.

Purpose

The purpose of a VTMIS is to provide the operator with a clear and concise real-time portrayal of vessel movements and interactions in the Vessel Traffic Service (VTS) Area. The information provided by the VTMIS must allow the operator to:

- ✦ Provide the required level of VTS: Information, Assistance or Organisation
- ✦ Enhance safety of life and property
- ✦ Protect the environment
- ✦ Reduce the risk associated with marine operations
- ✦ Enhance efficiency of vessel movements and port marine resources
- ✦ Distribute VTS related information
- ✦ Provide Search and Rescue assistance
- ✦ Record VTS data for administrative purposes, analysis of incidents and planning

VTMIS5060 fulfils this purpose by processing and presenting information in a manner which enables the operator to obtain a clear and accurate picture of the vessel traffic situation, quickly understand and assess situations, make appropriate decisions and take appropriate action where necessary.

Architecture

A VTMIS5060 typically consists of a VTS Operator Workstation(s) that is connected to Sensor Sites either via a Local Area Network (LAN) or a dedicated communication link. The open architecture allows maximum use of commercial off the shelf (COTS) components including standard Personal Computers for processing and display. Various development tools are utilized to build the software components including Microsoft Windows 2000/XP® that are used as Operating Systems. Sensors and peripheral equipment are all selected from proven and reliable sources that when combined ensure low maintenance costs and long-term availability of compatible components.

Communication

One of the strengths of the VTMIS5060 is its flexibility in connecting to remote sites. All data transfer uses standard TCP/IP protocol over a variety of cost-effective communication links including: Telephone line, ISDN line, Fibre-optic cable, Spread spectrum radio, Microwave link or Satellite link.

VTMIS5060 Modules

All VTMIS5060 comprise of a number of modules. For detailed information on each module, please refer to their individual Data Sheets.



➤ Video Extractor and Tracker

The Kongsberg Norcontrol IT Video Extractor and Tracker is world renowned as the best in the world for providing realistic representation of the radar "raw" video. This is converted from analogue into a digital format that is suitable for transmission over communication links. Secondly, the Video Extractor and Tracker extracts target information for vessels and navigational aids from the radar video and automatically tracks the positions of these targets.

Additionally, the Video Extractor and Tracker maximises the amount of filtering and processing done at the radar, thereby reducing the amount of real time information transmitted to the VTS Centre.

➤ Warning and Integration Server

The Warning and Integration Server is the "heart" of the system as it collects tracking information from radar and transponder sensors, correlates or "fuses" the information and creates a single integrated result that is distributed throughout the VTMIS5060. This process ensures that when a ship is tracked by more than one sensor, Operators are presented with a single integrated target. The Warning and Integration Server also monitors targets against a set of VTS Operator defined criteria and issues warnings if these are violated.

➤ VTS Operator Workstation

The VTS Operator Workstation application is the primary interface to the VTMIS5060. It provides the VTS Operator with access to all the information in the system and the ability to control system functions.

The following features are available:

- ✦ *Electronic chart of the coverage area with overlays - supporting both encrypted S63 charts and unencrypted S57 edition 3 charts, using the S52 IHO standard presentation library*
- ✦ *Digitised radar "raw" video*
- ✦ *Radar target tracks (symbol, vector and ID tag depicting a target's position, course, speed and identity)*
- ✦ *AIS transponder target tracks*
- ✦ *Bearing lines from VHF Direction Finders*
- ✦ *Target track data & detailed vessel data (VTS Database)*
- ✦ *Target, Buoy & System warnings*
- ✦ *Status and controls for sensors; Radar, AIS, Closed Circuit Television (CCTV), Meteorological/Hydrological, Supervisory Control and Data Acquisition (SCADA)*

➤ **Operator Panel**

The Operator Panel provides the VTS Operator with a direct interface to the most frequently used functions and significantly enhances operation of the VTMIS5060 by means of an intuitive, fast and simple interface through dedicated "quick-action" keys.

➤ **VTS Sensor Server**

The VTS Sensor Server typically collects, transforms and multiplexes data from sensors such as radar, AIS, VHF DF, Meteorological/ Hydrological, SCADA and CCTV systems into a uniform message layout for use in the VTMIS5060.

It also relays control commands from the VTS Operator Workstation to the sensors.

➤ **VTS Logging and Replay**

The VTS Logging and Replay is a user-friendly module that can be configured to record and replay virtually any data that is available on the LAN including: tracked targets, digital radar video, voice communications, VHF/DF data, CCTV images, Operator actions, system performance and AIS text messages.

➤ **Port Management Information System**

The Port Management Information System (PMIS) is an SQL database system that extends the data handling capacity of any VTS system and transforms it into a true VTMIS. The PMIS uses the latest in "web-based" application technology to deliver a simple and intuitive user interface. Port Managers typically use the PMIS for the management of Vessels, Voyages, Resources, Waste, Cargo, Risk, Port Facility Security, Port Services and Reports.

➤ **VTS Remote Display**

The VTS Remote Display application provides an alternative to the VTS Operator Workstation when VTS related information must be available to other personnel or parties on a "read only" basis. The VTS Remote Display is functionally similar to the VTS Operator Workstation but does not allow control of VTMIS5060 sensors or alteration of VTS data.

Availability and Reliability

All VTMIS5060 systems are configured to provide an availability of at least 99.9% as recommended by IALA. The required level of availability is provided by a combination of redundancy that is built-in into each VTMIS module and that provided where necessary by duplicate modules.

Duplicate modules are configured as "hot" stand-by so no loss of information occurs during a changeover. Duplication of critical modules such as the Warning and Integration Server, Video Extractor and Tracker, radar transceivers and LAN should be carefully considered. Where multiple VTS Operator Workstations are configured, any failure of one console will not affect any of the others.

Expandability

Due to the VTMIS5060 open architecture and modular design, future expansion is easily accommodated whether it involves the addition of sensors, relocation of existing modules or additional functionality.

System Design

Kongsberg Norcontrol IT is independent of all 3rd Party suppliers including radar, AIS and computer manufacturers. We provide independent advice and ensure that each VTMIS5060 is designed to meet the precise requirements.

Typically this would include an evaluation of:

- ✦ *Marine Operations requirement*
- ✦ *Locations including a Site Survey*
- ✦ *Existing infrastructure*
- ✦ *Future Plans*

Options

Typical options include:

- ✦ **Communication Links** - A variety of communication links are available.
- ✦ **Consoles** - Standard or custom-designed workspaces for an ergonomic and aesthetic work environment.
- ✦ **Printers** - A wide range of compatible printers.
- ✦ **Equipment Enclosures** - Standard or custom-built enclosures to house and protect remote site equipment.
- ✦ **UPS** - Uninterruptible power supplies.
- ✦ **Documentation** - Comprehensive operation and maintenance manuals.
- ✦ **Training** - On-site or in-factory training in operation, maintenance and system administration.
- ✦ **Operator eLearning** - Web-based, guided software simulations.
- ✦ **Customisation** - In-house resources are available for customisation of VTMIS5060 features, development of new applications, and interfacing non-standard sensors.

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