

# Installation manual



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## Kongsberg MDM 500 Marine Data Management







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# ***Kongsberg MDM 500***

## ***Installation manual***

Release 2.0.0

This manual provides you with the basic information required to install the Kongsberg MDM 500. For more detailed information about the practical use of the product, refer to the *Kongsberg MDM 500 Operator manual* or the *Kongsberg MDM 500 Reference manual*.

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**The equipment to which this manual applies must only be used for the purpose for which it was designed. Improper use or maintenance may cause damage to the equipment and/or injury to personnel. All users must be familiar with the contents of the appropriate manuals before attempting to install, operate, maintain or in any other way work on the equipment. Kongsberg Maritime AS disclaims any responsibility for damage or injury caused by improper installation, use or maintenance of the equipment.**

## Support information

If you require maintenance or repair, contact one of our offices, distributors or dealers. You can also contact us using the following address: [km.hydrographic.support@kongsberg.com](mailto:km.hydrographic.support@kongsberg.com). If you need information about our other products, visit <http://www.km.kongsberg.com>. See also *Support information* on page 12.

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# About this manual

## **Purpose**

The purpose of this manual is to provide the information and basic procedures required for installation of the Kongsberg MDM 500 software.

For more detailed information about the practical use of the product, refer to the *Kongsberg MDM 500 Operator manual* or the *Kongsberg MDM 500 Reference manual*.

## **Target audience**

The manual is intended for technical personnel; qualified maintenance engineers and technicians. It is assumed that the personnel is conversant with the general principles of maritime electronic equipment, in particular echo sounder and hydrographic systems. The personnel must also be familiar with computer hardware, signal processing, interface technology and traditional troubleshooting on electronic and mechanical products.

We assume that you are familiar with the Windows® 7 operating system, and conversant with network addressing and communication principles.

## **Installation instructions**

The instructions provided in this manual must be followed carefully to ensure optimal performance. As a guide, installation procedures are presented in the order they are to be performed.

## **Note**

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*The installation instructions given in this document must be adhered to. Failure to do so may render the guarantee void.*

*Kongsberg Maritime AS will accept no responsibility for any damage or injury to the system, vessel or personnel caused by equipment that has been incorrectly installed or maintained, or by drawings, instructions or procedures that have not been prepared by us.*

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# MDM 500

Study this chapter to familiarize yourself with the Kongsberg MDM 500.

## **Topics**

- *System description* on page 7
- *System diagram* on page 8
- *System modules* on page 9
- *Network security* on page 11
- *Scope of supply* on page 12
- *Support information* on page 12

## **Related topics**

- *Software installation* on page 13



## System description

The Kongsberg MDM 500 Marine Data Management system is a Windows-based utility for storage and distribution of the data recorded by the various sensors normally found on oceanographic research vessels.

These sensors may include instruments such as:

- navigation systems
- weather sensors
- sound propagation sensors
- hydrographic instruments

The MDM 500 collects data from these sensors, and stores the data in a relational database. All sensors are physically connected to the MDM 500 system through dedicated Client computers or are accessible over the LAN. Each Client computer offers the necessary software drivers to accept and decode the information provided by the sensors. You can use any number of Client computers on your MDM 500 system. You can also connect any number of sensors to each Client computer, this is only limited by the interface capabilities on each computer.

Data may also be distributed to other instruments or computers on board. Each Client computers offers a remote output. You can add any number of Client Monitor computers to the network to supervise the data traffic.

### *Example 1 Data distribution*

The exact time received from the GPS system may be distributed to all personal computers on the network, as well as all to other instruments that need time data.

Position data from the GPS may be distributed to any system on sensor that need geographic information.

By means of the MDM 500 applications and tools provided, you may select which sensor to log data from. For each sensor you can define logging parameters, such as the sampling rate.

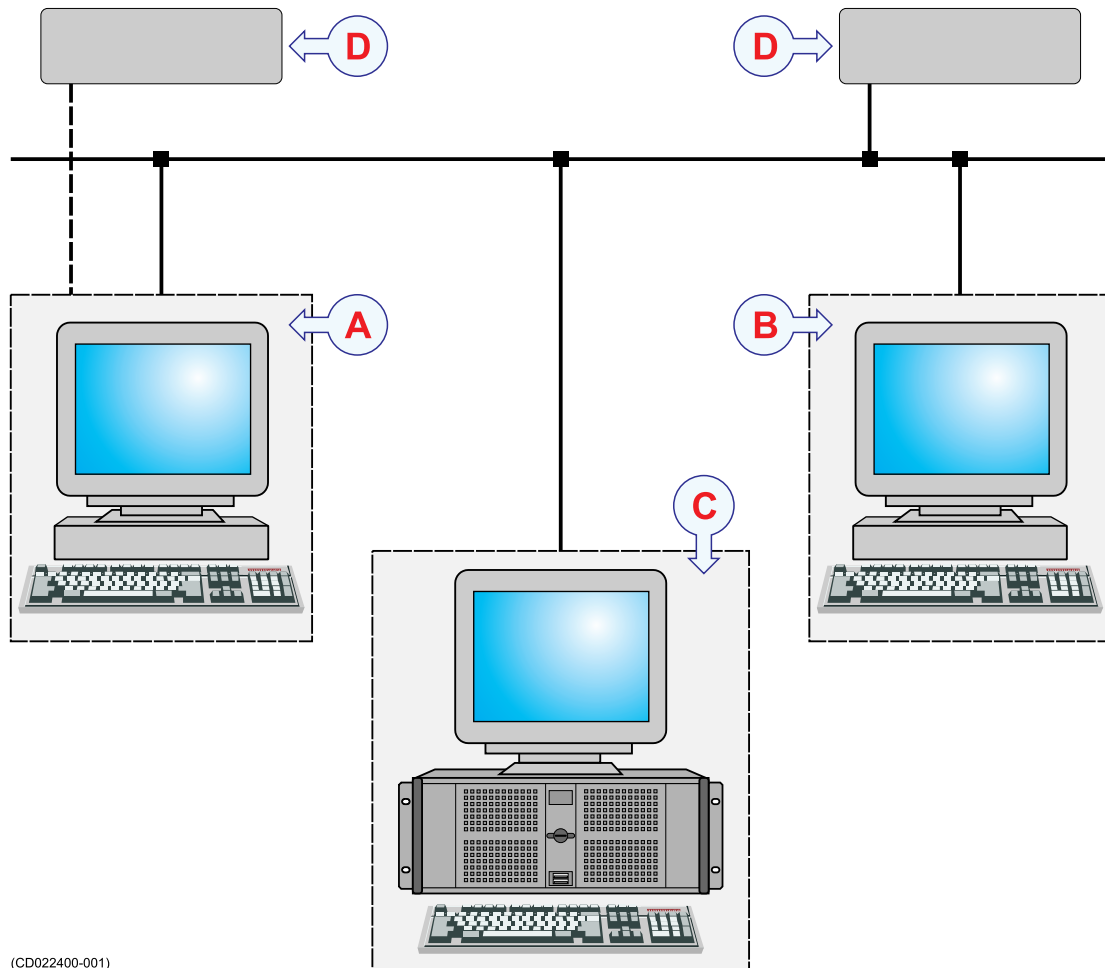
All data from sensors without their own logging facility are recorded. From sensors with their own logging facility, usually only a reduced data set is recorded.

The MDM 500 provides a selection of either alphanumerical or graphical data for on-line monitoring. Reports based on the data stored in the database can be generated, either as standard reports or custom reports via an open database connectivity (ODBC) protocol interface.

## System diagram

A simplified system diagram is provided.

Figure 1 MDM 500 Marine Data Management



**A** This is the Client computer.

Any number of Client computers may be used in a MDM 500 system. Any number of peripheral sensors may be connected to each Client computer by means of serial or Ethernet lines. Each Client computer runs the MDM 500 Client Manager software, as well as any tool applications that are required. The Client Manager software also provides the necessary drivers to accept and decode the information from the sensors.

**B** This is the Client Monitor computer.

Any number of Client Monitor computers may be used in a MDM 500 system. No sensors are connected to this computer. The MDM 500 Client Manager software allows you to monitor the information provided by any sensor connected to the network.

**C** This is the MDM 500 Server computer.

Only one Server computer is used in the MDM 500 system. The Server computer runs the MDM 500 Server Manager software, as well as any tool applications that are required. The Server computer also provides the database application supported by the necessary data storage hardware.

Normally, no sensors are connected to this computer. However, it is possible to install the Client Manager software on the Server computer, and thus allow this computer to have two roles in the system. The relevant sensors are then connected directly to the Server computer.

**D** This is an external sensor.

Any number of external sensors can be connected to the Client computer by means of serial or Ethernet lines. The number of sensors is only limited by the interface capabilities on the Client computer. Several different sensor types may be connected to collect navigation, weather, sound propagation or hydrographic data.

## System modules

### Topics

- *Hardware* on page 9
- *Interchangeability* on page 9
- *Software* on page 10

### Hardware

The design philosophy for the MDM 500 is to use standard high-end personal computers both for the MDM 500 main server, spare server and MDM 500 client computers.

All MDM 500 software will run under any personal computer with the Windows 7 operating system.

All data equipment belonging to the MDM 500 system, including the hubs must be connected to a uninterrupted power supply.

### Interchangeability

The hardware can be upgraded with parts approved by Kongsberg Maritime without changing any MDM 500 software.

New sensors and/or instruments are added by installing a new driver on the relevant Client computer. All interface configuration is done on the Client computer, while other logging parameters are defined on the Server computer.

## Software

The following software applications, modules and drivers are implemented:

### 1 MDM 500 Server Manager

This is the main software application on the MDM 500 Server computer. It provides a relational database management system for storing sensor data and reduced data sets from single- and multibeam echo sounders. It also controls the data recording and distribution, as well as the overall system performance. A Display Driver module allows the software to communicate with you.

### 2 MDM 500 Tools

A set of tool applications is available for dedicated purposes.

- SVP Editor
- SVP Manager (no longer used, replaced by SVP Editor)
- Report Manager
- Watchdog

### 3 MDM 500 Client Manager

This is the main software application that runs on the Client and Client Monitor computers. The Client Manager holds all the Sensor Drivers to render possible the data inputs from the peripheral sensors and instruments. It also provides an Output Data Formatter to distribute the sensor data on the internal MDM 500 format. A Display Driver module allows the software to communicate with you.

The Output Data Formatter also provides an auxiliary data output to the network.

For use on a Client Monitor computer, the Client Manager includes a Input Data Decoder module. This module will convert the sensor data from the internal MDM 500 format to formats fitted for supervision.

The MDM 500 Client Manager can be started in different modes:

- Normal mode: this is the mode described in this manual.
- Floating mode: in this mode you can show more than six sensor forms simultaneously, and they can be moved freely around the screen.

Floating mode is started by adding the parameter `-floating` when starting the Client Manager.

- Debug mode: this is a special mode used for debugging. In this mode a log file `mdm.log` is created in the folder `MDM 500` under `%AppData%`

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#### Note

*The log file is not deleted automatically and can become very large. Do not use Debug mode for normal operation, it is provided for investigation of problems.*

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Debug mode is started by adding the parameter `-debug` when starting the Client Manager.

## Network security

Equipment manufactured by Kongsberg Maritime are frequently connected to the ship's local area network. Connecting any computer to a network will always expose the data on that computer to all other computers connected to the network. Several threats may immediately occur:

- Remote computers can read the data.
- Remote computers can change the data.
- Remote computers can change the behaviour of the computer, for example by installing unwanted software.

Usually, two parameters are used to define the threat level:

- The likelihood that any remote connection will do any of the above.
- The damage done if a remote connection succeeds doing this.

Because Kongsberg Maritime has no information regarding the complete system installation on any vessel, we can not estimate the threat level and the need for network security. For this reason, we can not accept responsibility for network security. Systems provided by Kongsberg Maritime are regarded as stand-alone systems, even though they may be connected to a network for sensor interfaces and/or data distribution.

### Important

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No safety applications are installed on any Kongsberg Maritime computers to protect these against viruses, malware or unintentional access from external users.

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Securing the MDM 500 itself has no meaning unless there is a policy in place that secures all computers in the network, including physical access by trained and trusted users. This must always be a task for the customer to implement.

If you wish to connect the MDM 500 to the ship's network, you must implement the same security mechanisms on the MDM 500 computer(s) as for the rest of the network. In the tentative standard from Det Norske Veritas (DNV) - *Integrated Software Dependent System (DNV-OS-D203)* – this is described as a task for the network responsible person in charge of the overall behaviour of the network system. Some key elements here must be:

- The same anti-virus protection on all computers, including routines for updating this protection.
- The same settings for the firewall on all computers.
- Controlled physical access to computers on the network.
- Trusted operators.
- Log-in access mechanisms
- Same policy for attaching peripheral equipment to the computers (USB devices, hard drives etc)
- Installation of programs on any computer in the network, verification that each program is authentic.
- Definition of which programs are allowed to run on each computer.

- Logging mechanism of computer activity, and inspection of these logs.

How to define and implement these rules depends on each end user's network system configuration, which again must be a result of the policies and threat levels the end user has defined for the complete installation. For some products the network consists of only processor units or work stations, transceivers and a few sensors. On other vessels, larger computer systems can be installed to include numerous products and data systems. As the DNV-OS-D203 suggests, there must be one responsible person for the security of a system, large or small.

## Scope of supply

A typical Kongsberg MDM 500 Marine Data Management will comprise the following items:

- 1 Software dongle
- 2 DVD with database software
- 3 CD with MDM 500 software

Optionally, the following items may be provided:

- 1 Server computer  
Typically, a Hydrographic Work Station (HWS) computer is provided. Keyboard and mouse is included.
- 2 Client computer(s)  
Typically, a Hydrographic Work Station (HWS) computer is provided. Keyboard and mouse is included.
- 3 Colour display(s)

## Support information

If you need technical support on the MDM 500 system you must contact a Kongsberg Maritime office. A list of all our support offices is provided on <http://www.km.kongsberg.com>.

You can also contact our main support office in Norway.

- **Address:** Strandpromenaden 50, 3190 Horten, Norway
- **Telephone:** +47 33 02 38 00
- **Telephone, 24h:** +47 815 35 355
- **E-mail address:** [km.hydrographic.support@kongsberg.com](mailto:km.hydrographic.support@kongsberg.com)
- **Website:** <http://www.km.kongsberg.com>

# Software installation

These sections explain how to install and maintain the main operational software on the Kongsberg MDM 500.

We assume that you are familiar with the Windows® 7 operating system, and conversant with network addressing and communication principles.

## Topics

- *Overall MDM 500 software installation procedure* on page 13
- *Network setup* on page 14
- *Software installation procedures* on page 14
  - *Installation of the Microsoft® SQL Database server* on page 14
  - *Installation of the MDM 500 Server Manager* on page 17
  - *Installation of the MDM 500 Client Manager* on page 17

## Overall MDM 500 software installation procedure

In order to install the complete Kongsberg MDM 500 system on a Server computer and one or more Client and Client Monitor computers, observe the following steps. Each step refers to a more detailed procedure.

- 1 Install the Microsoft® SQL Database server on the Server computer.
  - *Installation of the Microsoft® SQL Database server* on page 14
- 2 Install the MDM 500 Server Manager on the Server computer.
  - *Installation of the MDM 500 Server Manager* on page 17
- 3 Install the MDM 500 Client Manager on the Client and Client Monitor computers.
  - *Installation of the MDM 500 Client Manager* on page 17

## Network setup

On most computers delivered from Kongsberg Maritime there are more than one local area network connection provided. Only one network connection is enabled, the others are disabled.

If additional network connections are required, they must first be enabled in the operating system.

Computers delivered from Kongsberg Maritime have been assigned static Internet Protocol 4 (IP4) addresses, not Dynamic Host Configuration Protocol (DHCP). This has been done to make sure that the delivered system will work in a stand-alone environment. Read chapter *Network Security* in the MDM 500 end user manuals before attaching the computers to your local area network.

### Tip

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If the access to the MDM 500 database is lost after changing the network address, it is most likely because the Open Database Connectivity (ODBC) connection has changed.

In Windows® 7, The ODBC connection can be verified using the following application:

`C:\Windows\System32\odbcad32.exe`.

On the **System DSN** tab, check entry **MDM4**.

---

The file `C:\Windows\System32\drivers\etc\hosts` has been edited by Kongsberg Maritime to allow the use of logical names rather than IP4 addresses when communicating with other MDM 500 computers. If the IP4 addresses are later changed, for example by allowing DHCP to set the addresses automatically, these entries must be removed.

Changing the network setup requires that the MDM 500 system must be tested afterwards. When there is a connection between the Server and the Client computers, and data from the sensors are stored in the database, the setup has been completed successfully.

## Software installation procedures

This section provides the software installation procedures.

### Topics

- *Installation of the Microsoft® SQL Database server* on page 14
- *Installation of the MDM 500 Server Manager* on page 17
- *Installation of the MDM 500 Client Manager* on page 17

### Installation of the Microsoft® SQL Database server

Whenever computers are provided by Kongsberg Maritime, the Microsoft® *SQL Server 2008 R2* is provided readily installed.

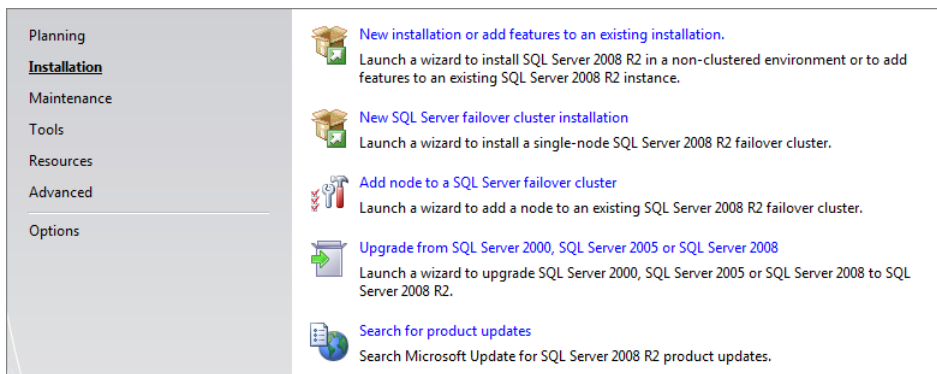


This procedure explains how to install the Microsoft® *SQL Server* on a new computer.

### Important

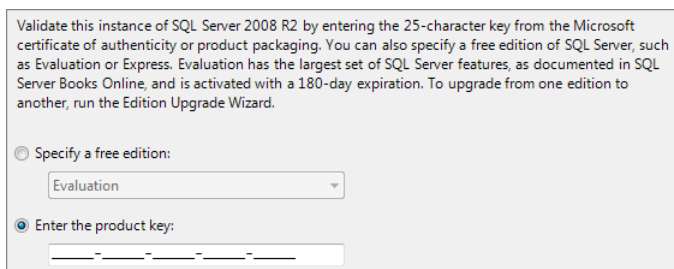
Whenever a screen capture is not shown in the instructions, it means that the default value(s) provided by the relevant dialog shall be used.

- 1 Insert the DVD labelled *Microsoft SQL Server 2008 R2* into the DVD player on the computer.
- 2 If the start-up program does not start automatically, start the file *setup.exe* on the DVD.
- 3 Observe the dialog provided.



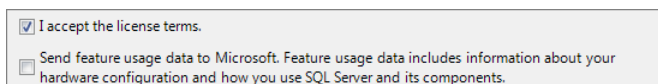
Click **New installation or add features to an existing installation**, then click **Next**.

- 4 Observe the **Product Key** dialog provided.



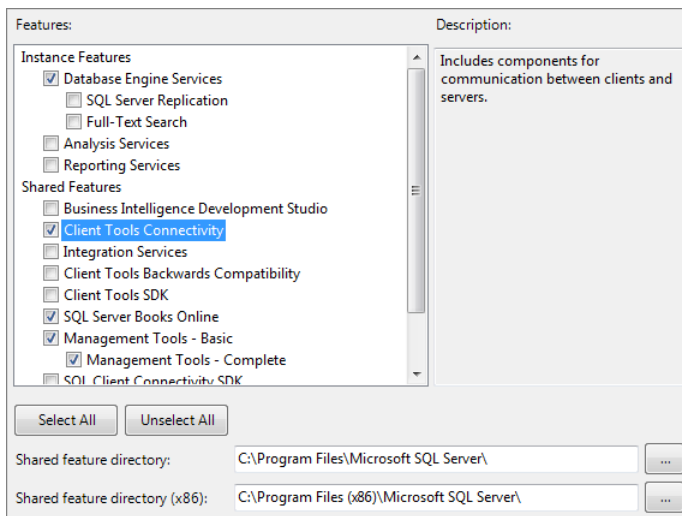
Enter the serial number found inside the DVD cover, then click **Next**.

- 5 Observe the **License Terms** dialog provided.



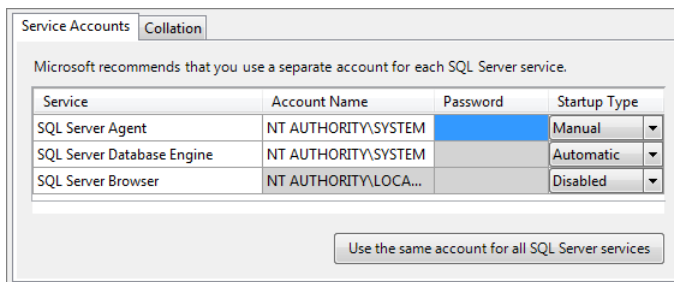
Click the appropriate box to accept the terms, then click **Next**.

6 Observe the **Feature Selection** dialog provided.



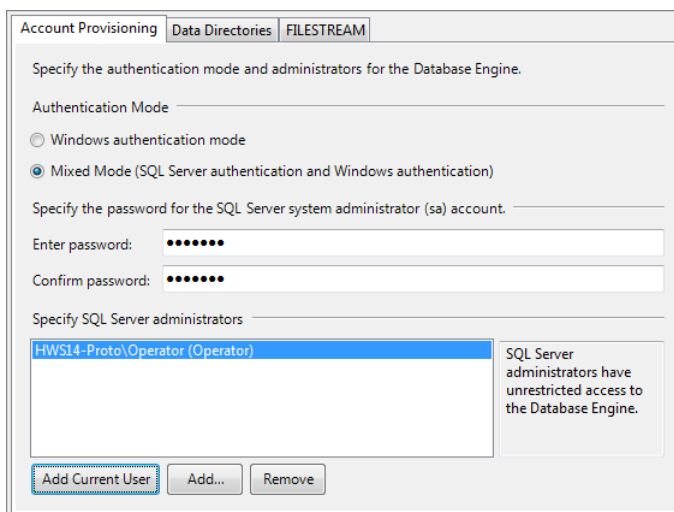
Click to choose the options shown in the screen capture, then click **Next**.

7 Observe the **Server Configuration** dialog provided.



Choose the Account Name as shown in the screen capture, then click **Next**.

8 Observe the **Database Engine Configuration** dialog provided.



Set Authentication Mode to *Mixed Mode*.

Set the password to `simrad0`.

Click **Add Current User** to add the current user to the list, then click **Next**.

- 9 Observe the **Complete** dialog provided.  
This dialog will appear when the installation is complete.
- 10 Click **Close** to exit.

## Installation of the MDM 500 Server Manager

Whenever computers are provided by Kongsberg Maritime, the MDM 500 Server Manager is provided readily installed.

This is the procedure explains how to install the MDM 500 Server Manager on a new computer, or update the installation on an existing Server computer.

- 1 Insert the CD with the MDM 500 software into the DVD player.
- 2 Allow the installation wizard to start automatically.  
If the CD-ROM does not start immediately, use any file manager application provided to start program *MDM500\_Server.exe* located on the CD.
- 3 Follow the instructions provided by the installation wizard.

## Installation of the MDM 500 Client Manager

Whenever computers are provided by Kongsberg Maritime, the MDM 500 Client Manager is provided readily installed.

This is the procedure explains how to install the MDM 500 Client Manager on a new computer, or update the installation on an existing Client or Client Monitor computer.

- 1 Start *Internet Explorer* (or another web browser) on the Client computer.
- 2 In the address field, enter the URL to the Server computer.

*Example 2 Server computer URL*

`http://MyMDM500Server`

- 3 Follow the instructions provided by the website that opens.

# Software maintenance

This chapter provides procedures related to software installation and maintenance.

## Topics

- *How to restore the operating system* on page 18
- *How to troubleshoot the device driver software* on page 19

## Related topics

- *Software installation* on page 13

## How to restore the operating system

### Purpose

Each computer provided by Kongsberg Maritime is equipped with a system restore DVD. This DVD can be used to restore the computer hard disk in case of serious errors or hard disk replacements.

### Note

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*This procedure will delete all data on your hard disk. Use this procedure only for emergency restore.*

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### Procedure

- 1 Insert the Windows® 7 DVD.
- 2 Re-boot the computer.
- 3 When prompted, press any key on the keyboard to boot from the DVD or USB disk.
- 4 When the first installation screen appears, press **Enter**.
- 5 On the second installation screen, select **Repair Computer**.
- 6 In the **System Recovery Options** window that appears, click **Restore your computer using a system image ...** and click **Next**.
- 7 Accept the defaults in the **Re-image your computer window** dialog, and click **Next**.
- 8 Follow the on-screen instructions to complete the restore operation.

## How to troubleshoot the device driver software

The device drivers in the MDM 500 system have been designed using all the information available. However, since the physical products from third party manufacturers are not always available to the developers during software testing, there may be ambiguities in the communication formats from the equipment and in the documentation at hand.

To provide the correct data format, two applications are made available, *SerialLogger* and *UDPLogger*. These applications will log the actual data flow from the sensor to a file that can be sent to Kongsberg Maritime to help correct the device driver software.

- 1 Insert the CD with the MDM 500 software into the DVD player.
- 2 Use any file manager application provided to locate the `readme.txt` file located on the CD.
- 3 Open the `readme.txt` to find additional information.
- 4 Open a command prompt, and use DOS commands to move to the relevant folder on the CD.
- 5 To collect data from a serial line, run this command from the command prompt:  
`SerialLogger 2,9600,8,0,1`  
Replace the communication parameters as required
- 6 To collect data from a network interface, run this command from the command prompt:  
`UDPLogger 10003`  
Replace the UDP port as required
- 7 Collect the log files, and send them to Kongsberg Maritime.

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