SIMRAD

Maris ECDIS900 System
Installation Manual

ENGLISH

MARIS ECDIS900 Installation

Table of contents

SYSTEM OVERVIEW

HARDWARE

MARIS ECDIS systems come in two variants:

Stand-alone unit   MARIS ECDIS900 MK15 FPC 19" 4S

                              MARIS ECDIS900 MK16 FPC 24" 4S

Split unit   MARIS ECDIS900 MK5 is delivered with 2 diffident monitors:

- Maris ECDIS900 24" monitor,
- Maris ECDIS900 26" monitor

Both variants have VGA output for a slave monitor that can be used for Conning Display or installed in the captain's quarter. The maximum cable length is 15 meters.

The split units are flexible as the monitor size can be selected from 24 to 26 inches. Wide screen monitors are supported.

More information about the installation possibilities can be found in the chapters Electrical drawings and Mechanical drawings.

The split solution requires a standard RS232 serial cable between the units. This cable carries control signals for colour table, dimmer and audible alarm.

For configurations using the M5024 monitor refer to the E0102 Alarm Panel User Guide and the M5000 Series Monitors User Guide.

```
Hatteland HTC01                          Hatteland

         DVI ————————————————————— DVI
        COM2 ————————————————————— COM2
```

```
MK5                                      Hatteland

          DP  ]  DP/DVI converter  [ ]——— DVI
        COM1 —————————————————————————— COM1
```

The video connection must be DVI or DP (Display Port) for correct colour representation. The DP/DVI converter is a small cable delivered together with the MK5 computer.

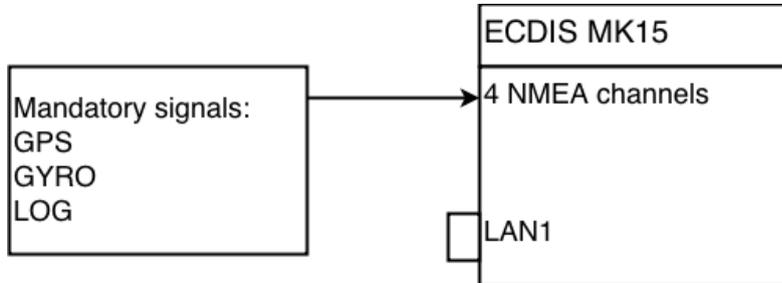The VGA connection is intended for a slave monitor or VDR.

SINGLE ECDIS

MINIMUM CONFIGURATION

Important:

RJ45 loop-through network plug must be fitted to avoid network problems.

The MK15/16 minimal configuration is as follows:

STANDARD DELIVERY FOR MK15/16

The standard delivery of single ECDIS includes:

- MARIS MK15/16 FPC 19''/24" 4S
- USB DVD DRIVE SAMSUNG SE208
- USB PANEL MNT EXTENSION CABLE,1M
- KEYBOARD CHERRY US/ENGLISH,USB
- MOUSE,LOGITECH MARBLE USB
- ECDIS900 Documentation and installation kit

The minimal configuration of ECDIS MK5 is as follows:
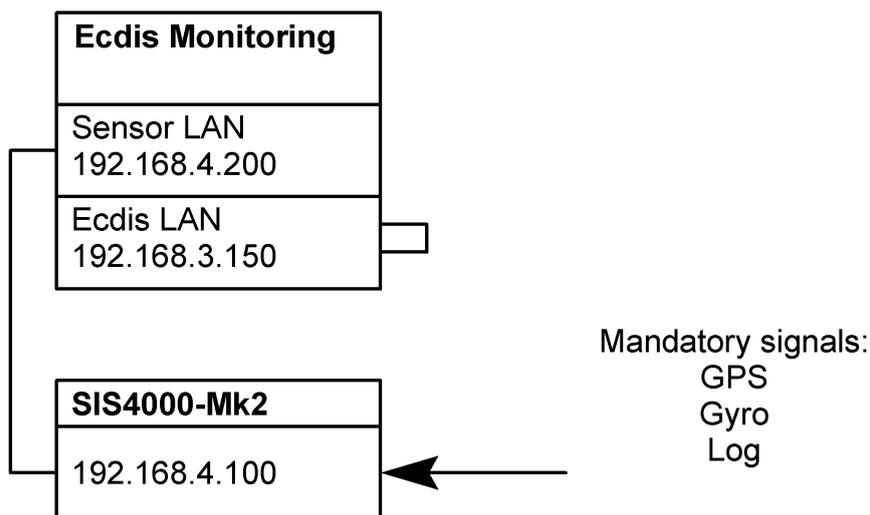
STANDARD DELIVERY FOR MK5

The standard delivery of single ECDIS includes:
- MARIS ECDIS900 MK5 PC

- BRACKETS FOR MK5 PC

- MARIS ECDIS900 24" Monitor

- KIT,D-SUB FOR HATTELAND MONITORS

- KEYBOARD CHERRY US/ENGLISH,USB

- MOUSE,LOGITECH MARBLE USB

- SIS4000 MK2 - 8CH SERIAL TO LAN

- ECDIS900 Documentation and installation kit

DUAL ECDIS

MINIMUM CONFIGURATION

This is the typical configuration on board most ships.

The system meets IMO minimum requirements for sailing paperless. Note that the mandatory signals are hardwired to each computer. One fail does not affect the rest equipment that stay fully functional. The ECDIS computers are networked, so charts, routes etc. can be shared among the computers. Additional sensors, for example AIS and ARPA, can be connected to the free ports and also shared over the network.
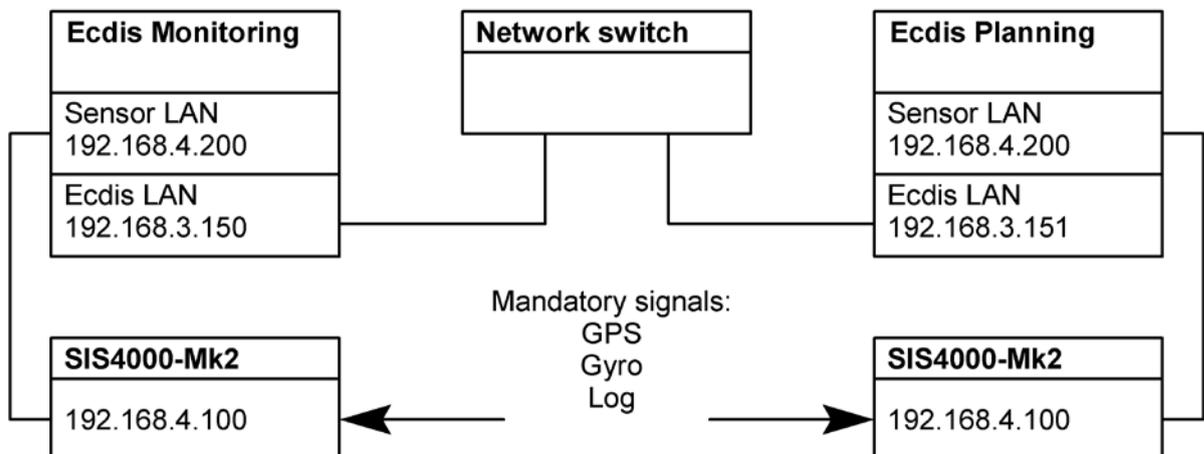
ECDIS MK15/16 CONFIGURATION (DUAL)
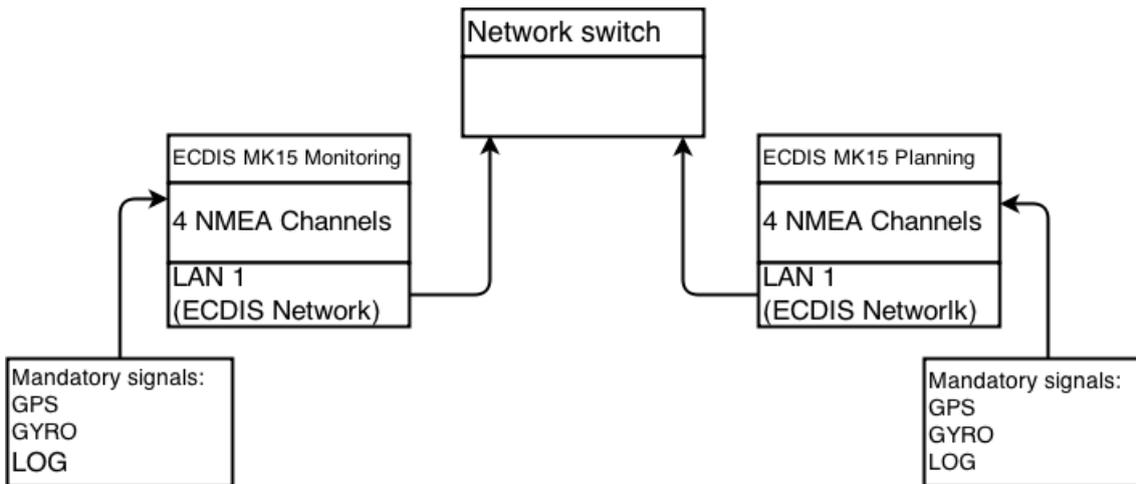
STANDARD DELIVERY OF ECDIS MK15/16

- Two split units (PC and monitor)
- Network switch

ECDIS MK5 CONFIGURATION (DUAL)

### STANDARD DELIVERY OF ECDIS MK5

The standard delivery of dual ECDIS includes:

- Two split units (PC and monitor), including 8 channels NMEA interface (SIS4000-MK2)
- Network switch

TRIPLE ECDIS

An extra ECDIS work station is added.

Should one fail, the system falls back to a fully functional dual ECDIS, which still meets the IMO requirements. The ship is not forced to repair the failing ECDIS before leaving the harbour. It can continue to the next convenient port of call.
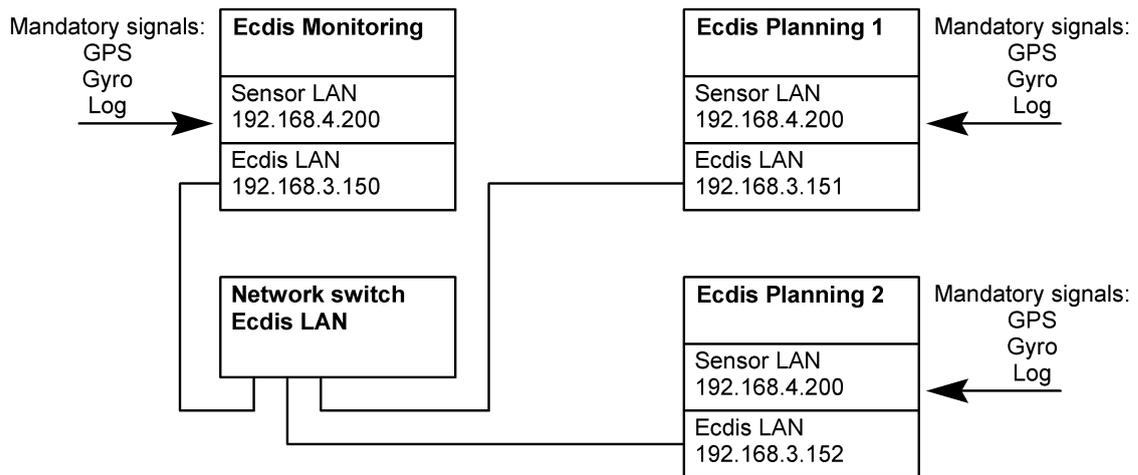
ECDIS CONFIGURATION WITH MBA/PAYS

MBA is the application in charge of communication with shore based databases, by e-mail or direct Internet connection, if broadband is available on board. MBA is used to order chart permits, receive weekly updates for the ENC or AVCS collection and weather data.

PAYS stands for Pay As You Sail.

In contrast to paying for the charts (including charts you never use), PAYS keeps a record of which cells have been in use and for how long. The record is transmitted to the chart server, and the final bill is based on this record.

It is like riding a taxi. You pay for the trip, not for the car.

The application can run on a 3rd computer, where LAN1 is connected to the ECDIS network and LAN2 is connected to the Internet, or the application can run on the Planning ECDIS. A router is included into the network to separate the ECDIS network from the Internet.

FULL MARIS SYSTEM

The Conning station displays in a graphical manner data that is available from the network. For example, engine, rudder, thruster, etc. This is typically engine data from the VDR and navigational data from the ECDIS.

The system is modular in nature, and can be extended in many ways, for example with MARIS LOG4000 and/or VDR as shown below.

With the Internet connection, remote maintenance is an option when broadband is available on board, which greatly reduces the running service costs.

MARIS keeps a sharp eye on the modular functionality. A failing or malfunctioning work station will not bring the whole system down and will not compromise safety of navigation.
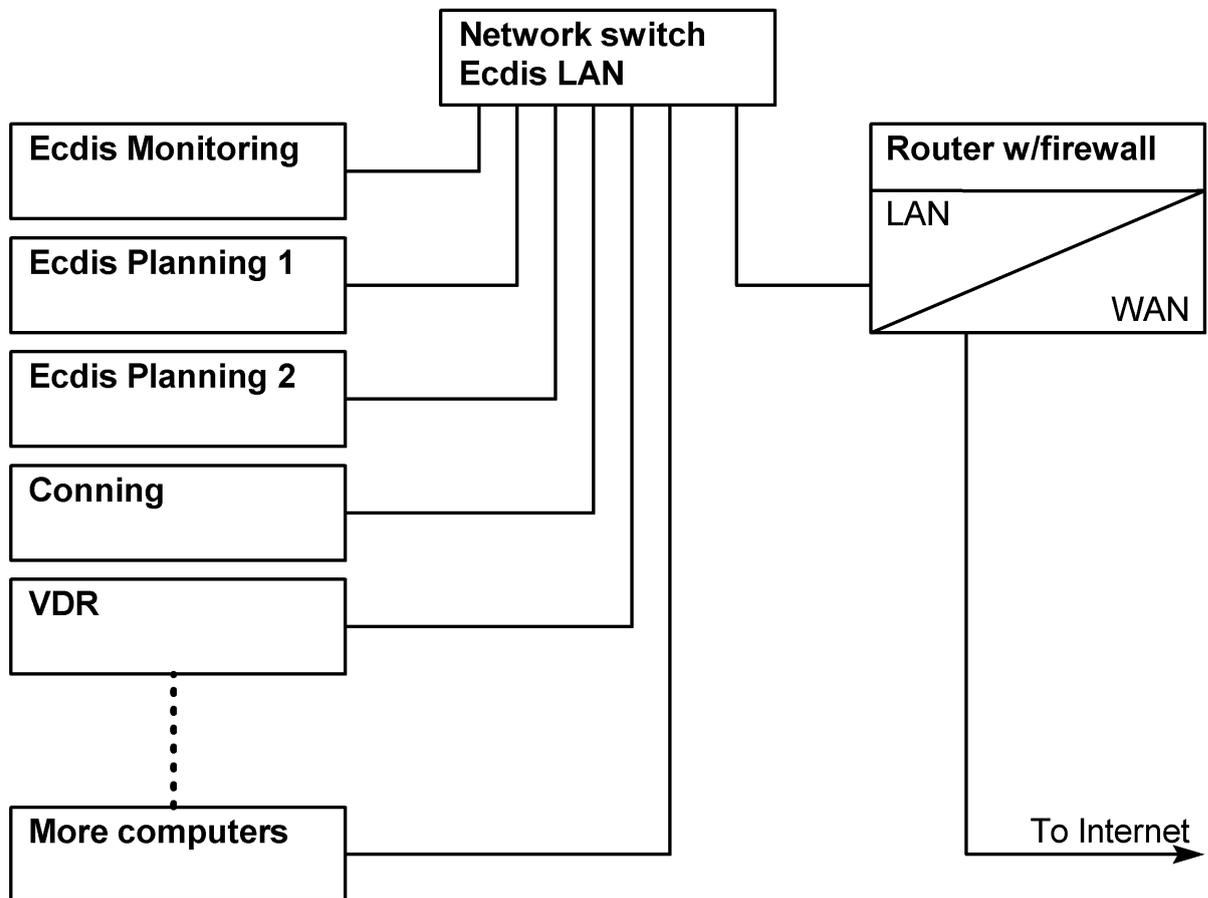
The router is mandatory in order to separate ECDIS network from ship's network, and is normally part of the ship's IT equipment. If it is missing MARIS can supply a router.

Simply connecting to the ship's network without a router is not allowed.

FACTORY DEFAULTS FOR **MARIS ECDIS900 MK15/16**

All computers leave the factory with these settings.

Windows 7 log on:

Computer name:	Monitoring
Workgroup:	Maris
User name:	Maris
Password:	Empty

Network:

Name	Type	IP-Address	Subnet mask	Gateway/DNS
ECDIS network	Work	192.168.3.150	255.255.255.0	192.168.123.1/
Preconfigured 2nd IP Cx to MARIS Router		192.168.123.150	255.255.255.0	192.168.123.1
Sensor network	Public	192.168.4.200	255.255.255.0	Not used
PcRadar network	Public	192.168.5.200	255.255.255.0	Not used

Unused network are disabled.

Serial interface:

Monitoring	**SIS4000-Mk2**
GPS	Ch1, port 8010
Gyro	Ch2, port 8011
Log	Ch3, port 8012
ARPA_X	Ch4, port 8013
Wind	Ch5, port 8014
ES	Ch6, port 8015
Navtex	Ch7, port 8016
AIS	Ch8, port 8017

Note:

The sensor names must not contain spaces – use the underscore character. Maximum

length is 6 characters to be in accordance with SIS4000-Mk2 specifications.

Programs pre-installed:

- Sensor Monitor with SIS4000-Mk2 and 8 sensors configured.
- Sensor Monitor with Hatteland Display Controller configured.
- ECDIS900.
- Application Manager
- TeamViewer

Additional software ready for installation, can be found in the folder "Maris Apps" on the desktop.

SERIAL INTERFACE, SIS4000-MK2

HARDWARE NOTES

SIS4000-Mk2 is a network based module. All channels are configured for RS422.

Channel 1 to 6 is input only, Baud rates 4800 or 9600, 8n1.

Channel 7 and 8 is input/output, Baud rates 1200 to 115200, 8n1.

Once the channels are configured, Sensor Monitor reads the data and transmits it over the ECDIS network making it available for all other computers.

For that reason it is imperative, that every sensor in the system has its own unique port number to avoid conflicts.

The tables that follow are for general cargo ships. Seismic vessels and other special purpose ships will most likely be different.

The same goes for sensors transmitting on a weird baud rate. Connect to Ch 7 and move the Navtex sensor to another computer with free channels.

Keep the standard when installing, stick to the tables as far as it will go.

SINGLE ECDIS

Monitoring	SIS4000-Mk2
GPS1	Ch1, port 8010
GPS2	
Gyro	Ch2, port 8011
Log	Ch3, port 8012
ARPA_X	Ch4, port 8013
ARPA_S	
Wind	Ch5, port 8014
ES	Ch6, port 8015
Navtex	Ch7, port 8016
AIS	Ch8, port 8017

DUAL **ECDIS.**

Monitoring	SIS4000-Mk2
GPS1	Ch1, port 8010
GPS2	
Gyro	Ch2, port 8011
Log	Ch3, port 8012
ARPA_X	Ch4, port 8013
ARPA_S	
Wind	Ch5, port 8014
ES	Ch6, port 8015
Navtex	Ch7, port 8016
AIS	Ch8, port 8017

Planning	SIS4000-Mk2
GPS1	
GPS2	Ch1, port 8020
Gyro	Ch2, port 8021
Log	Ch3, port 8022
ARPA_X	
ARPA_S	Ch4, port 8023
Free	Ch5, port 8024
Free	Ch6, port 8025
Free	Ch7, port 8026
Free	Ch8, port 8027

Please note the different port numbers!

If the defaults are not changed, the sensors will transmit on the same port leading to inaccurate data.

For example GPS1 and GPS2 transmitting on the same port will give a jumping position on the ECDIS.

TRIPLE ECDIS.

Monitoring	SIS4000-Mk2
GPS1	Ch1, port 8010
GPS2	
Gyro	Ch2, port 8011
Log	Ch3, port 8012
ARPA_X	Ch4, port 8013
ARPA_S	
Wind	Ch5, port 8014
ES	Ch6, port 8015
Navtex	Ch7, port 8016
AIS	Ch8, port 8017

Planning	SIS4000-Mk2
GPS1	
GPS2	Ch1, port 8020
Gyro	Ch2, port 8021
Log	Ch3, port 8022
ARPA_X	
ARPA_S	Ch4, port 8023
Free	Ch5, port 8024
Free	Ch6, port 8025
Free	Ch7, port 8026
Free	Ch8, port 8027

Backup	SIS4000-Mk2
GPS1	Ch1, port 8030
GPS2	
Gyro	Ch2, port 8031
Log	Ch3, port 8032
Free	Ch4, port 8033
Free	Ch5, port 8034
Free	Ch6, port 8035
Free	Ch7, port 8036
Free	Ch8, port 8037

Note the different port numbers!

If the defaults are not changed, the sensors will transmit on the same port leading to inaccurate data.

For example GPS1 and GPS2 transmitting on the same port will give a jumping position on the ECDIS.

GENERAL

When installing, bear in mind that every ECDIS must be able to run as a stand-alone unit.

The SIS4000-Mk2 must be installed as a dedicated unit for the computer, **and NOT shared over the ECDIS network!**
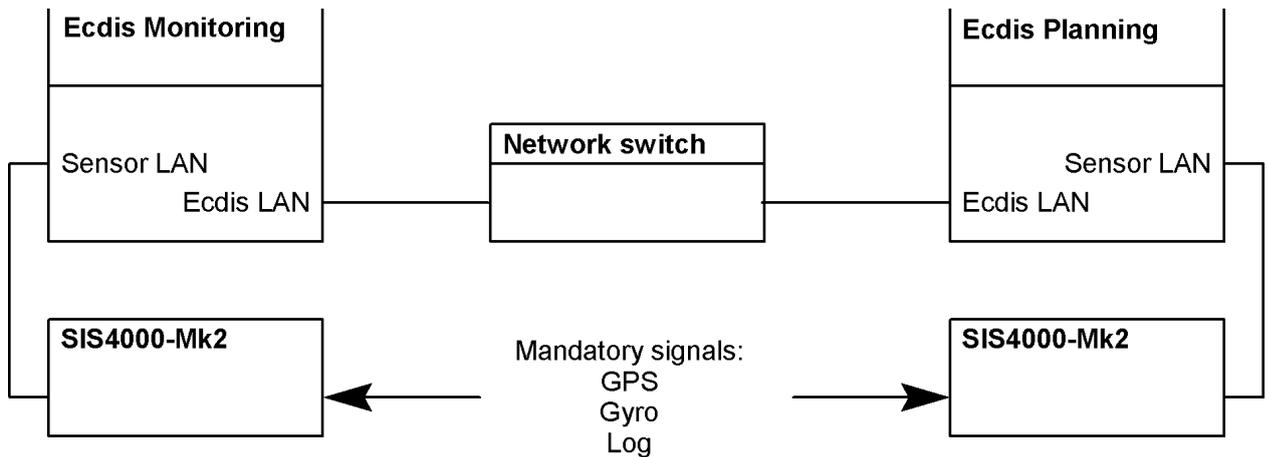
INSTALLATION, POWER

The SIS4000-Mk2 accepts 10-40 VDC. Note polarity!

From AC/DC power supply:

It is mandatory that the AC power comes from the same source as for the computer.

From Emergency or Radio batteries:

Take the power from the same source that feeds the main navigational GPS.

CONFIGURATION

Please read the Annex SIS4000-Mk2 installation and configuration.

ELECTRICAL

INSTALLATION KIT

For each work station an installation kit is available. This kit contains approved ToughCat network cable, approved power cable, power strips, cable ties and markers and much more.

See Annex Installation kits for more information.

Note that the network cable requires special RJ45 connectors, which are also included.

❌ Failure to use approved items may lead the class society or the flag state to reject the installation and deny the final approval.

✅ Do not get caught in the net – use the installation kit!

AC POWER

MARIS standardize on 220VAC 50/60 Hz.

Plugs and power strips are in accordance with European standard.

On ships with 110VAC and specifically Japanese build ships with 100VAC, MARIS recommends an UPS to be installed. Refer to the Annex More about UPS for the correct types.

Power must be taken from the Navigational Equipment Switchboard or from the Emergency Switchboard. Two (2) circuit breakers are needed, one for the monitoring station and one for the planning station (IMO requirement).

Other items can be powered from the same source or from elsewhere.

> ❌ Do NOT power the equipment from the Lighting Switchboard as it may not be connected to the emergency diesel generator.

> ❌ Powering from the Lighting Switchboard may lead the class society or the flag state to reject the installation and deny the final approval.

UPS

MARIS ECDIS is certified to run without UPS as the ECDIS will start up from where it left off. Nevertheless, it will greatly improve stability and protect against brownouts and noise to add an UPS. The UPS used must be type approved. Read more about UPS in the Annex.

DC POWER

NMEA buffers must be powered from the radio battery or the emergency battery. In other words, when connecting a GPS buffer take the power from the GPS source. The buffers are protected by internal auto resettable fuses.

> ❌ AC/DC power supplies connected to the nearest wall outlet is not accepted. Use the power strips from the installation kit and take the power from the same source as for the ECDIS computer.

BUFFERS AND EPFS

Electronic Position Fixing System (EPFS).

An EPFS can be any navigation system, receiver or integrated navigation system, having an IEC 61162 NMEA interface. According to the Safety of Life at Sea (SOLAS), the navigation system must meet IMO performance standards, being certified and Wheel Mark approved.

In practice most EPFS systems are currently GPS. Other candidates are the Russian GLONASS and the European Galileo.

The most of ships have two or more navigational GPS and they are typically heavily overloaded. Add buffers to GPS, gyro and log.

Connect GPS1 to the monitoring station and GPS2 to the planning station.

🛈 The GPS messages usually have the NMEA0183 format.

It is advisable to change the output format to IEC and enable the IMO recommended sentences GGA, GLL, GNS, DTM, ZDA and VTG. These sentences are required by the ECDIS as a minimum configuration. Disable other sentences in order to reduce traffic load on the output port.

🛈 The GPS must be capable of transmitting the above mentioned sentences and must be Wheel Mark approved. Discard the GPS and install a new if these requirements are not met.

CABLE RUN

Plan the installation and lay up the cables. Use existing cable ways and transitions as far as it possible. New transitions must be made in accordance with good workmanship and properly sealed (fire protection).
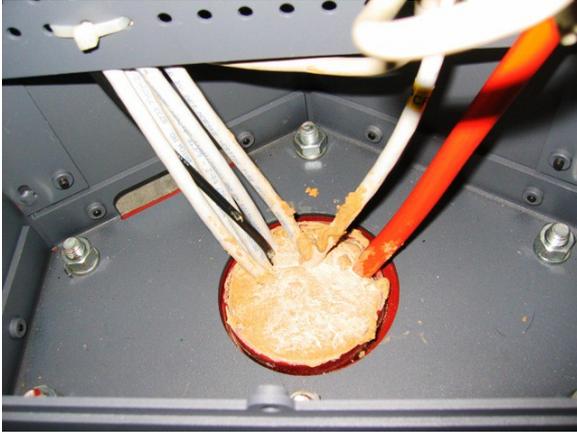
Yes, accepted by class

No, rejected by class

From hall of fame

From hall of shame

All cables in the installation kit are screened cables. Do not forget to make a proper grounding of the cables and the computers. The ToughCat network cable is perfect for connecting the sensors and has 4 individually screened pairs.

The RJ45 network plugs supplied will ground the cable when fitted.

In addition to the mandatory sensors, lay-up cables for other sensors. It is common practice to connect AIS, ARPA X, Navtex, Echo sounder and Anemometer to the monitoring station and other sensors to the planning stations. Because these sensors are not mandatory the data can be distributed over the network to all computers.

CONNECTING SENSORS

All serial NMEA data is connected to SIS4000-Mk2.

This box has 8 input channels, 2 of them can be set for input/output.

Communication is network based with the ECDIS computer over the 2nd LAN adapter. Read more about the installation and configuration in the Annex SIS4000-Mk2 installation and configuration.

❌ **Never** **use** **RS232!**
This standard is not galvanic isolated and will ground the entire 24V net on the ship and this may damage connected equipment. RS232 is not allowed on a SOLAS ship and violates any type approval. Not only violating the rule work, it is also bad engineering and installation practice, which can result in loss of data and compromise safety of navigation.

PREPARING THE COMPUTER FOR THE FIRST RUN

All computers must be set for the particular installation, installations of two ships are never alike. Windows 7 US Pro 64 bit is preinstalled and configured according to MARIS specifications.

Start with the monitoring computer and then go through the others.

FACTORY DEFAULT

All computers leave the factory with these settings.

Windows 7 log on:

Computer name: Monitoring

Workgroup: Maris

User name: Maris

Password: Empty

Network defaults:

Name	Type	IP-Address	Subnet mask	Gateway
ECDIS network	Work	192.168.3.150	255.255.255.0	Not used
Sensor network	Public	192.168.4.200	255.255.255.0	Not used
PcRadar network	Public	192.168.5.200	255.255.255.0	Not used

TIME AND DATE

The time and date are important for chart updates. Enter BIOS and change the settings as listed in the tables found in chapter BIOS settings.

Restart and set Windows Date/Time to UTC, Time Zone = Coordinated Universal Time.

NETWORK BASICS, ECDIS NETWORK

Change settings for TCP/IPv4 as shown in the table.

Other items including TCP/IPv6 are not used and must be left as is.

Computer name	Workgroup	IP-Address	Subnet mask	Gateway
Monitoring	MARIS	192.168.X.150	255.255.255.0	Not used
Planning1	MARIS	192.168.X.151	255.255.255.0	Not used
Planning2	MARIS	192.168.X.152	255.255.255.0	Not used
Planning3	MARIS	192.168.X.153	255.255.255.0	Not used
Planning4	MARIS	192.168.X.154	255.255.255.0	Not used
MBA/LOG4000	MARIS	192.168.X.155	255.255.255.0	Not used
Conning1	MARIS	192.168.X.156	255.255.255.0	Not used
Conning2	MARIS	192.168.X.157	255.255.255.0	Not used
Cold Spare	MARIS	192.168.X.160	255.255.255.0	Not used
NAS	MARIS	192.168.X.100	255.255.255.0	Not used

Important notes:

- ℹ Computer names.
  The suggested names must be changed to something descriptive, for example Monitoring, Planning, Chart Table, Planning 1, MBA or Conning. Always change name before software installation.

- ℹ Workgroup name.
  This workgroup name "MARIS" must NEVER be changed.

- ℹ IP-address.
  Addresses in the range 150 to 199 can be freely used.

- ℹ Subnet numbers when interfacing to old, existing equipment.
  This number is marked X in the table and is in the range 1 to 3.
  Set to 1 on systems connected to a MARIS VDR2000 or VDR2200 Mk1.
  Set to 2 on systems not connected to a MARIS VDR.
  Set to 3 on systems connected to a MARIS VDR2200 Mk2.

- ℹ Subnet number on new installations.
  Set to 3.

- ℹ Consilium radars have 2 IP-addresses per radar. In this case increment the IP-addresses by 5 instead of 1 to avoid conflicts.

NETWORK BASICS, SENSORS NETWORK

Change settings for TCP/IPv4 as shown in the table.

Other items including TCP/IPv6 are not used and must be left as is.

Computer name	Workgroup	IP-Address	Subnet mask	Gateway
Monitoring	MARIS	192.168.4.200	255.255.255.0	Not used

This is for use with SIS4000-Mk2 and other network based sensor modules.

NETWORK BASICS, PCRADAR NETWORK

Change settings for TCP/IPv4 as shown in the table.

Other items including TCP/IPv6 are not used and must be left as is.

Computer name	Workgroup	IP-Address	Subnet mask	Gateway
Monitoring	MARIS	192.168.5.200	255.255.255.0	Not used

This is reserved for PC Radar 6.0 network module.

Disable unused network connections.

In general (and regardless of the computer model) all unused connections must be disabled in order not to waste system resources.

NETWORK BINDINGS

Continue from Network and Sharing Center/Change Adapter Settings.

On the menu line click Advanced and then Advanced Settings.

- Click on ECDIS Network and move it to the top of the list.

- Click on Sensor Network and move it to the second line of the list.

- Click on PcRadar Network and move it to the third line of the list.

Other adapters are not important, but it is important that ECDIS network is listed as #1, Sensor network as #2 and PcRadar network as #3.
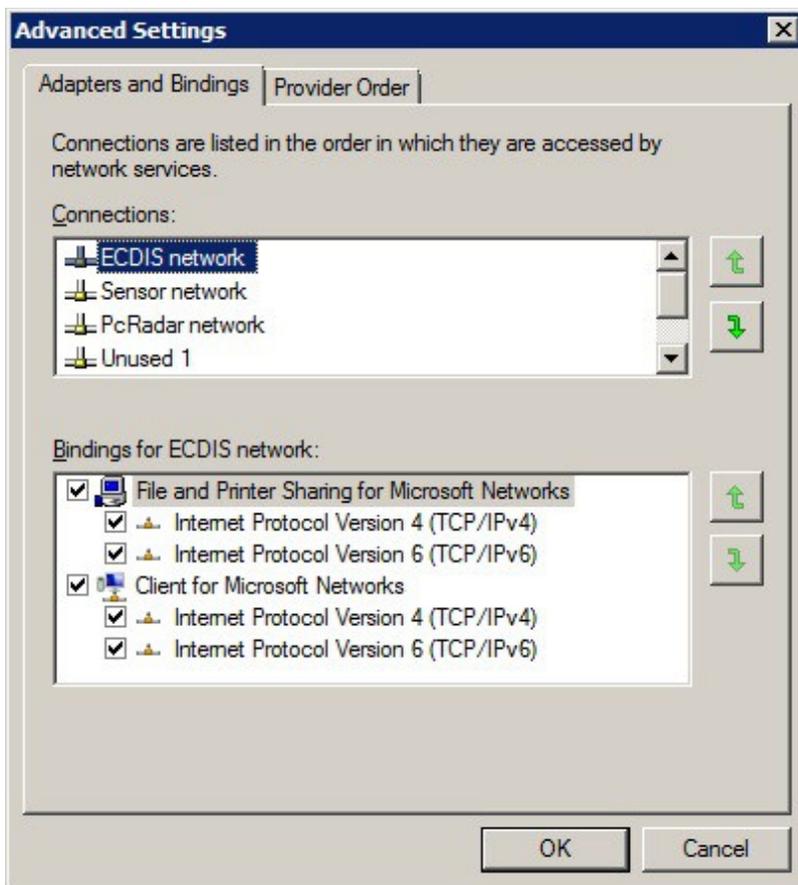
SHARE FOLDERS/SECURITY OPTIONS

- Share the folders Charts and ECDIS_UserData for full read/write access: Start Explorer. Right click the folder and select Share with/Specific people. Click the down arrow, select Everyone and click Add. Change Permission Level to Read/Write. Click Share.

- Charts and ECDIS_UserData should be "Full Access" for "Everyone" (N/A for XP) Open "Security" Tab, Add "Everyone" in the list of Username. Then allow all permissions for "Everyone" (check ON all checkbox in the list)

- Password protected Sharing should be OFF (N/A for XP) Menu : Control Panel\Network and Internet\Network and Sharing Center\Advanced sharing settings

TEST THE NETWORK

Verify that all computers in the network can see each other, shared folders and the files.

THE FINAL TOUCH

AUTOMATIC UPDATES.

Turn OFF Automatic Updates. Open Action Center and disable the alerts.

ANTIVIRUS PROTECTION.

Turn OFF Antivirus Protection. Open Action Center and disable the alerts.

FIREWALL

Turn ON Firewall. Open Action Center and enable the alerts.

When starting new programs place tick marks in private and public networks

By now the system is fully functional and the installation and configuration of the MARIS programs can be done.

INSTALLING **MARIS** APPLICATIONS

The computers come with preinstalled software. Check the versions and update if needed. An update can be done on top of the existing version and will not overwrite configurations or user data. Sensor Monitor and Application Manager are installed as part of ECDIS900. Other programs must be installed separately.

Tips

Create a folder "MARIS Apps" on the desktop. Share the folder.

Copy all installation files (ECDIS900, PC Radar, Navtex and Application Manager) to that folder. This will enable the crew to reinstall failing programs if the need arise later.

ECDIS900

Close all running programs and start the ECDIS900 installation program. Follow instructions on screen, accept default settings and pay attention to these steps:

Type of monitor

Select the monitor installed. If you are in doubt then select Unknown Monitor.

The selection here loads the correct colour table for the monitor in use or loads a standard colour table.

Screen dimensions

Grab a ruler and measure the dimensions. Enter the actual values. Incorrect settings will give incorrect aspect ratio and circles on the chart will appear as ovals. This is important on wide-screen monitors.

User password

Passwords are managed in the Application Manager. See below chapter Application Manager

Select Monitoring or Planning station

Double right click the blue title bar and set the computer as either monitoring (master) or planning (slave). Only one master is allowed, but several slaves can be configured.

SENSOR MONITOR

This program is installed as part of the ECDIS900 package.

Sensor Monitor is the keystone in the MARIS system and takes care of the data flow on the network between the sensors, computers and programs.

This chapter describes how to configure the most commonly used sensors, NMEA0183, AIS Transponder and Display Controller. For other sensors or for a more detailed explanation please read the Sensor Monitor Chapter in ECDIS900 Technical Manual.

General settings

- Turn on checksum for all sensors (release the button "Check Checksum").

- Do not use sensor data routing except for input to the VDR or PAYS.

- Turn off Immediate Data Forward if no PCRadar Kit is installed.

- Verify Network Mode is selected. There is no communication to/from other computers, if Sensor Monitor runs in Local Mode.

- If the vessel is equipped with a MARIS VDR then connect the AIS sensor to the VDR and one of the ECDIS computers. Go to the AIS sensor in the VDR and enable AIS Target Table filter with 15 NM range and 150 targets. Turn OFF Target Sending by placing a tick mark in the box, forcing the AIS sensor into receive-only mode. More than one active connection in the system generates a lot of network traffic and may overload the computers.

- Enable AIS Target Table filter with 15 NM range and 150 targets in the ECDIS computer.

Display controller MARIS ECDIS900 MK15/16
Verify correct Display Controller is installed.

Select port COM2 for HTC01 computer. Select port COM1 for MK5 computer. When using the monitor, the Y-cable is used for connection between computer and monitor/alarm panel. The sensor also controls the alarm sound, check that ECDIS alarms give an audible sound from the monitor. Check that colours look right. If not, then check the connection of the serial cable between the units and make a factory reset of the monitor.

Every monitor comes with its own unique colour table, which Sensor Monitor downloads and installs. If this does not happen either the cable is missing or connected to the wrong port or the configuration is wrong. You can always force a download by deleting the sensor and creating it again.

Creating sensors

Install the SIS4000-Mk2 box first!

Read more about the installation and configuration in the **SIS4000-Mk2 installation and configuration**. Then continue with the other sensors.

NMEA0183 sensor

This sensor is used for almost all connected equipment such as GPS, gyro, log, ARPA, wind, echo sounder etc. Try this sensor first. If it does not work then select one of the dedicated sensors.

AIS Transponder sensor
Remote control from the ECDIS is possible, but is per default turned off.

If the master wants that function enabled then place a tick mark in the box 'Send data to the transponder' and connect the output from the sensor to the AIS for two-way data.

ⓘ AIS input: The AIS transponder sends a lot of information to the ECDIS, especially in busy areas such as Singapore or Rotterdam. Therefore it is important to connect the AIS to only one PC in order to avoid overloading of the network.

ⓘ In addition filtering of AIS targets must be set up in Sensor Monitor as described in the paragraph AIS.

SHIP SPECIFIC SETTINGS

All ship specific settings must be entered from the monitoring ECDIS. From here the settings are distributed to the other computers on the network. The list of very important settings that must be done on every installation is below.

Ship Properties, tabsheet General and Voyage

If the function 'Send data to the transponder' is enabled in the AIS sensor, the AIS can be remotely controlled from here. If disabled all fields are read-only data from the AIS.

Ship Properties, tabsheet Shape

Double click the first GPS listed. Adjust GPS antenna position until the ship is perfectly aligned alongside the quay. Select next GPS sensor and repeat the adjustment. Continue until all GPS sensors have been set correctly (every GPS has its own correction table).

Also set radar and conning positions.

Ship Properties, tabsheet Shape/F-Distance

Set Pivot Point Distance and F-Distance table to match the actual parameters obtained during the sea trial. These values are used to calculate XTD and wheel-over point for track steering.

Ship Properties, tabsheet AIS

Click the button Update Ship Library.

Safety depth

Right click on the chart and select Chart Settings. Click tabsheet Chart Depths. Fill in the actual parameters.

Safety Contour and Safety Depth are very important as crossing the borders activates the audible alarm.

Deep Contour and Shallow Contour control how chart presentation is displayed.

Options, tabsheet Route

Adjust default values for Turning Radius and Speed.

NAVTEX

Connect the Navtex receiver data output (not printer output) to SIS4000-Mk2. It is common practice to connect to the monitoring computer, but very often it is easier to connect to the planning computer at the chart table.

Reset the Navtex receiver to factory defaults. Set up the Navtex receiver to receive all messages from all stations and to send everything to the data output port.

The ECDIS computer that is physically connected to the Navtex receiver runs as the Navtex Master. Install Navtex Server and Navtex Inbox software on that computer. Accept default settings, but select NMEA extension.

The other computers in the network run as Navtex Slaves.

Install Inbox only, do NOT install the Server. Accept default settings, but select NMEA extension.

Restart; verify that Sensor Monitor and ECDIS900 are running.

NAVTEX MASTER CONFIGURATION

1. On the desktop's process line right-click the Server icon and then click "Open Server Dialog".

2. The   Server   is   running. Click "Options/Port Settings". Select "Network" and enter the SIS4000-Mk2 Navtex sensor port to where the Navtex receiver is physically connected.

3. Select "Options".
    Verify that "Use NMEA Extensions" is ticked on.
    Remove all other tick marks and check that something is rolling in.
    This depends of the receiver in use, these examples are from a JRC NCR333:
    $CRALR, (list of possible errors - normally flagged V for not active).
    $CRNRX, (list of received messages, line by line).
    BLABLABLA…, (message in plain text).
    If the message is corrupted, the signal is inverted. Swap the wires. The data must be clearly readable and in plain text.
    Look for the NRX message. This is needed in order to continue.
    If NRX messages are correct, then turn off the terminal window by clicking "Options/Pause".

4. Click "Options/Position Settings".
    Select "Accept The Position From Sensor Monitor". Click "Ok". Note that the Server title bar has changed, and now shows you're the current position and NAVTEX area.

5. Click "Options/Expiry".
    Select "Enable Auto Check" and set it to 3 days.

6. Make sure the Server is running by clicking "Actions" and verify that you have a tick mark at "Start". Then minimize the Server.
    This concludes the Server setup.

Open the Inbox program.
Click "Tools/Options/Position Settings". Select "Accept The Position From Sensor Monitor".
Click "Ok".

1. Click "Options/Expiry".
   Select "Enable Auto Check" and set it to 3 days.

2. Click "Tools/Options/Mailbase Path".
   Click "Browse" and point to C:\Program Files (x86)\MARIS\Navtex\InBox. Click "Ok".
   This concludes the Inbox setup.

3. Share the folder C:\Program Files (x86)\MARIS\Navtex\Inbox for Everyone and full read/write access. Sharing is needed in order to allow the other computers on the network to read incoming messages.

4. Open ECDIS900 and check that incoming messages will close the Navtex book on the acknowledge panel. A red Navtex book is also dropped at the ship's present position, or at the position of interest. This function can be turned on/off in the box. Read the information by clicking the Navtex book on the acknowledge panel or by r-clicking the icon on the chart.

NAVTEX SLAVE CONFIGURATION

1. Click "Start/Computer/Tools/Map" network drive…
   Click "Browse…" and select the Inbox folder on the ECDIS computer running Navtex Server.
   Place a tick mark in "Reconnect" at Logon. Click "Finish".
   You have now a direct access to this remote folder over the network.
   Close all open windows, click "Computer" again and verify that the remote Inbox folder is listed under Network Drives.

2. On Navtex Inbox click "Tools/Options/Position Settings". Select "Accept The Position From Sensor Monitor". Click "Ok".

3. Click "Tools/Options/Mailbase Path". Click "Browse" and select the network drive you have just created in step 1. Click "Ok".
   This is crucial. If you do not point to the shared network folder on the computer running Navtex Server nothing will show up.

4. Click "Options/Expiry".
   Select "Enable Auto Check" and set it to 3 days.
   This concludes the slave setup.

APPLICATION MANAGER

GENERAL

Application Manager is a software application which works as a Shell on MARIS computers and restricts the access to the computer in order to protect the PC and to run ECDIS900 in Approval mode.

The application runs in two security modes:

- **Service mode**: This mode is used by the installer or the Captain during installation or changes in ECDIS900 system configuration.
- **Operation mode**: The operational mode is used to protect the PC against any changes which may affect the Operating system and to make impossible the installation of third party software. In this mode ECDIS computer access is restricted to mandatory ECDIS functions and to others MARIS applications which are selected during configuration. AM replaces Windows Explorer and all standard shortcuts such as Ctrl-Alt-Del are disabled.

CONFIGURE AM APPLICATION MANAGER

a) **Start**

Start Application Manager by double click the AM icon on the desktop or from the start menu: C:\Program Files\MARIS\AppMan\AppMan.

Double click inside the AM grey rectangle top right of the screen to show the AM console.

b) **Select the administrator mode**

Right-click in AM console and activate the menu "Enter Administrator Mode" and click Ok in the password dialogue as no password has been entered.

c) **Set up password**

To set up the passwords:

- Click Security Setting - the icon with a yellow key.

- Press "Change Administrator password" and enter new password, old password being empty

- Press "Change user password" and enter new password old password being empty

The Administrator password is used to keep control of Application Manager:

- To toggle between operational (ECDIS Approval mode) and service mode (Open system).

- To be able to set up Application manager as described below.

d) **Operational mode versus service mode**

The approved mode is mandatory as stated by IMO. In this mode the computer will only run the programs specified. There is no access to Windows functions whatsoever.

The service mode is intended for service purposes only. The computer runs as any Windows based PC, all settings can be changed and all functions are available.

e) **Configure**

1) Select Service mode

Click the button with a yellow key and then click the button with a red shield [image]. Enter password and restart. The computer restarts in maintenance mode and Application Manager is not running.

2) Setting up Auto Start Programs

Press the button [image] to edit the list by pressing the button AUTO [image]. Populate the list with the programs installed on the computer. This example shows a computer running ECDIS, PC Radar Kit and Navtex Master.

Programs listed here will always run and cannot be shut down. If you try to close a program or it stops it will be started again automatically.
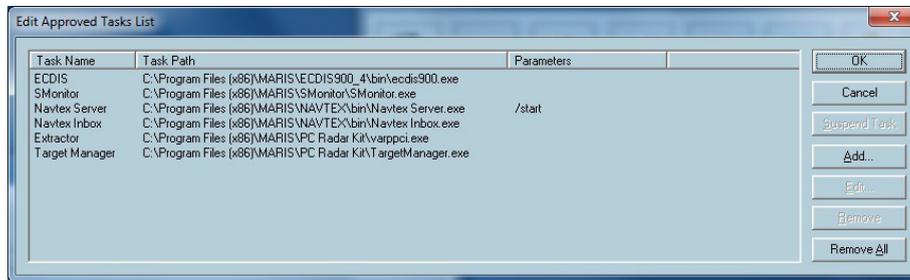
3) Setting up Other Programs

Click the button "Other". Populate the list with other useful programs.

The applications listed in OTHER could be started by user demand by clicking on the appropriate button. These applications can be stopped.
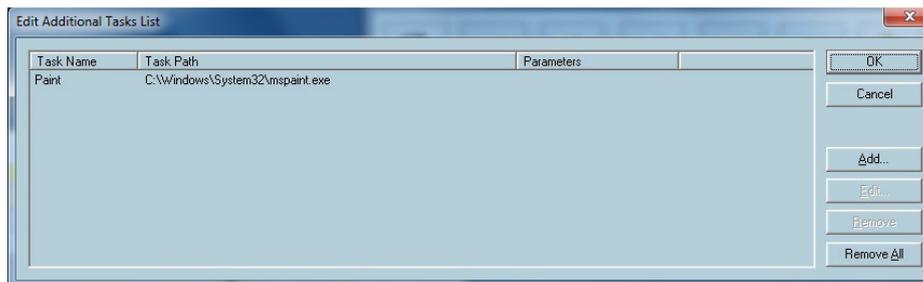
Application Manager main window in Operational mode showing the programs you have allowed to run.

Please note your configuration will be different depending of what programs are installed on the computer, so this is an example only.

Application Manager main window shown in Service (non-approved) mode.

f) **Last steps**

> **Never leave the computer in Service mode!**

> **It is against the regulations and the navigators can and will make changes to the system.**

> When the configuration is completed the Operational mode must be selected to run ECDIS900 in Approval mode.

>

> To select Operational mode press the button
> The PC is now restarted in Approval mode

DEAD MAN ALARM

Dead Man Alarm function is designed to monitor bridge activity and alert the master or other qualified navigators if the bridge becomes unattended.

If the mouse or Keyboard has not been used for a fixed period (By default 10 mn) the module sends an alarm message (Pulse) to the BNWAS system connected by PLC to the PC.

Configuration in Application Manager

1) Activate "Administrator mode"

2) Press the button and then

3) Activate the function

Configuration in SMonitor

1) Create (if does not exist) "Alarm Relay Box" sensor. Connect the dedicated serial port to Relay Box using proper cable (here is COM1).
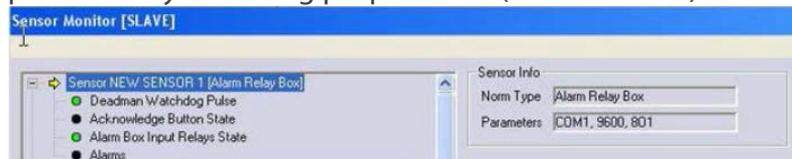
2) In alarm Box sensor panel, populate the "Output mask DEADMAN" which defines the pins should be pulsed when Application Manager sends alarm message. (See PLC manual)

BACKUP AND RESTORE

REDO BACKUP

Solution for Backup and Restore Images From or To Hard drive, using and External Hard Drive (Minimum 500GB) to store disk images.

http://redobackup.org/download.php

Create Bootable CD:

Download iso file from

http://sourceforge.net/projects/redobackup/?source=typ_redirect

File redobackup-livecd-1.0.4.iso, and create a bootable CD.

Create a bootable USB Drive (when PC without CD Drive):

MARIS ECDIS900 Installation

Boot with the CD to create a USB Drive bootable

Backup or Restore: Boot with media (CD or USB) :

Select Start Redo Backup
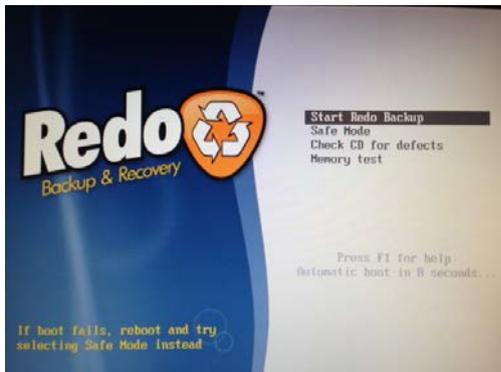
and select option Backup or Restore

<div align="center">
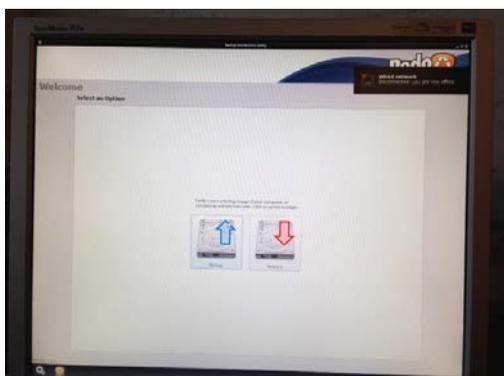
CHARTS INSTALLATION

</div>

ENC and AVCS

First install the permits and then install the charts from the CDs provided.

Update the other computers over the network by using the function Copy Database.

ARCS

First install the charts from the CDs provided and then install the permits.

Update the other computers over the network by using the function Copy Database.

C-Map

The installation is different. Please see Annex C-Map chart installation

BIOS SETTINGS

HTC01

Select the menu 'Load setup defaults' and answer yes.

Follow the table below and change settings as indicated.

Menu	Submenu	New setting
Standard CMOS features	Date	Set UTC date
	Time	Set UTC time
	Halt on	All errors
Advanced BIOS features	First boot device	CDROM
	Second boot device	Hard Disk
	Third boot device	Disabled
	Boot other device	Disabled
	Boot up numlock status	Off
Pc health status	CPU warning temperature	80*C

Select the menu 'Save & exit setup'.

Answer yes to save the settings and restart.

MARIS ECDIS900 MK5

Menu	Submenu	New setting
Standard CMOS features	Date	Set UTC date
	Time	Set UTC time
	Halt on	All errors
Advanced BIOS features	First boot device	CDROM
	Second boot device	Hard Disk
	Third boot device	Disabled
	Boot other device	Disabled
	Boot up numlock status	Off
Pc health status	CPU warning temperature	80*C

MECHANICAL DRAWINGS

ECDIS MK15/16
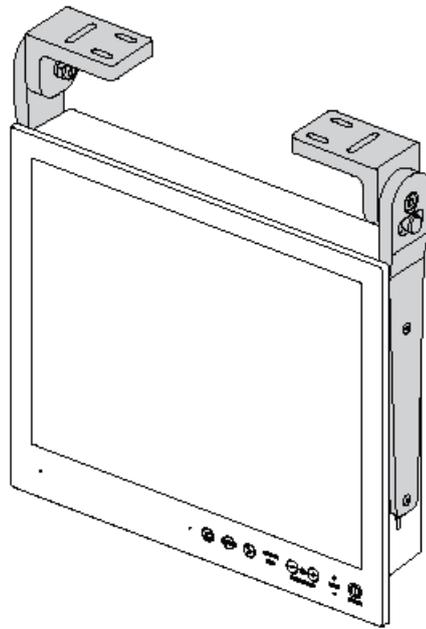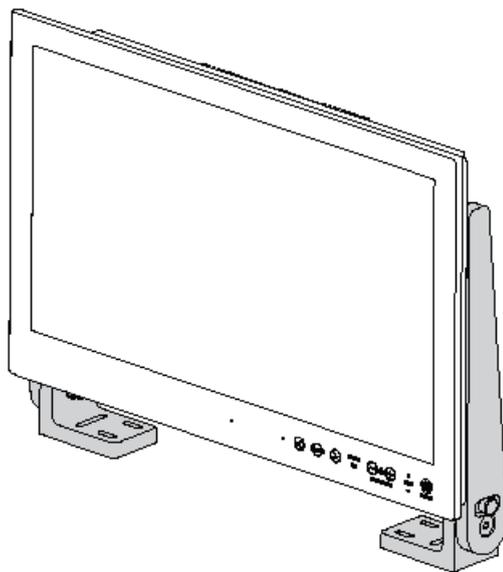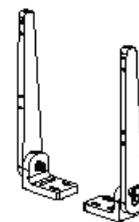
DIMENSIONAL DRAWINGS FOR 19''
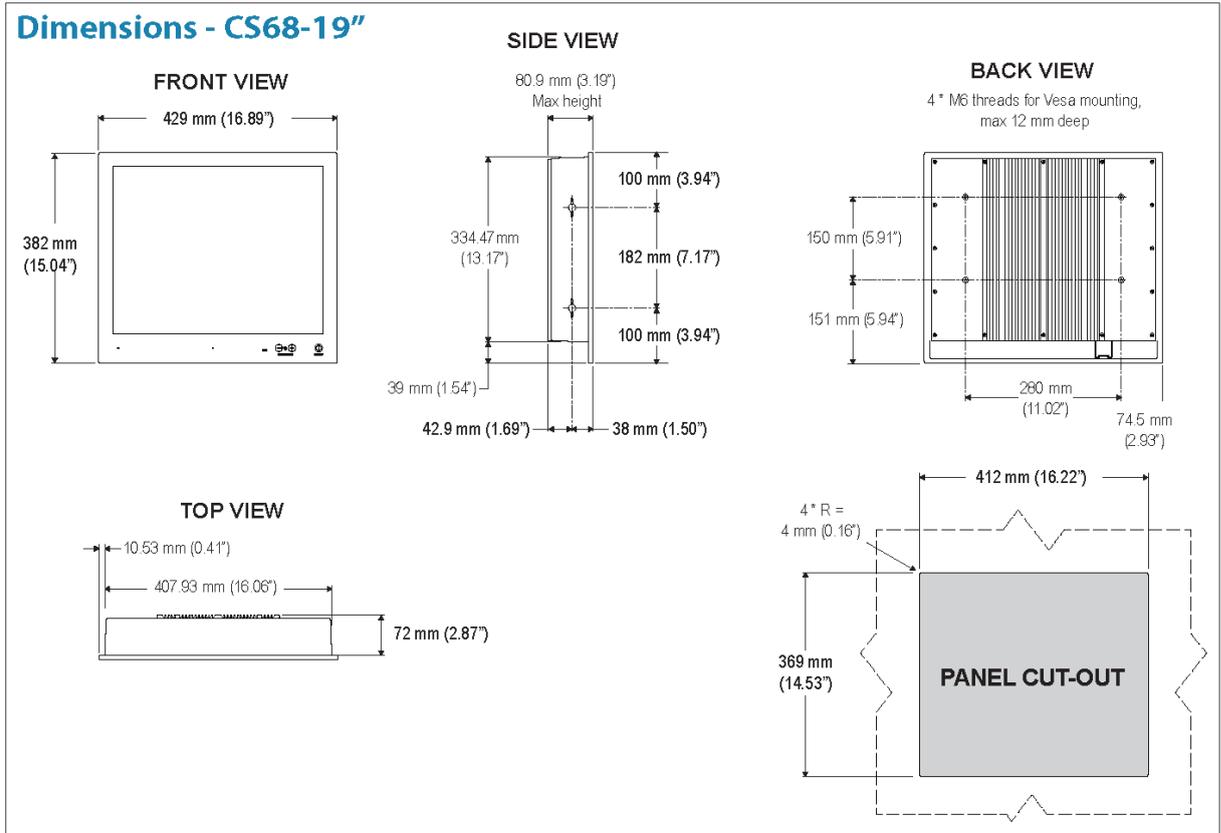
TERMINAL LAYOUT FOR 19''
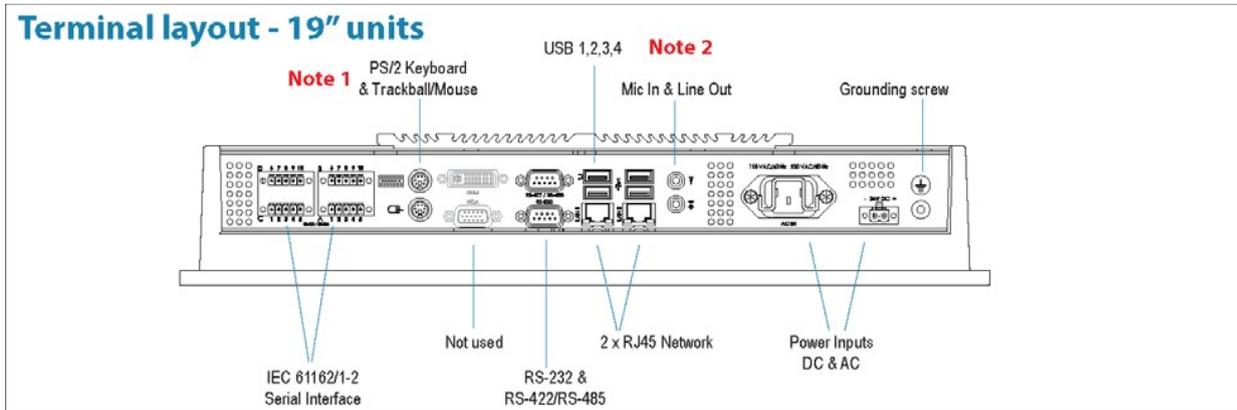
DIMENSIONAL DRAWINGS FOR 24''
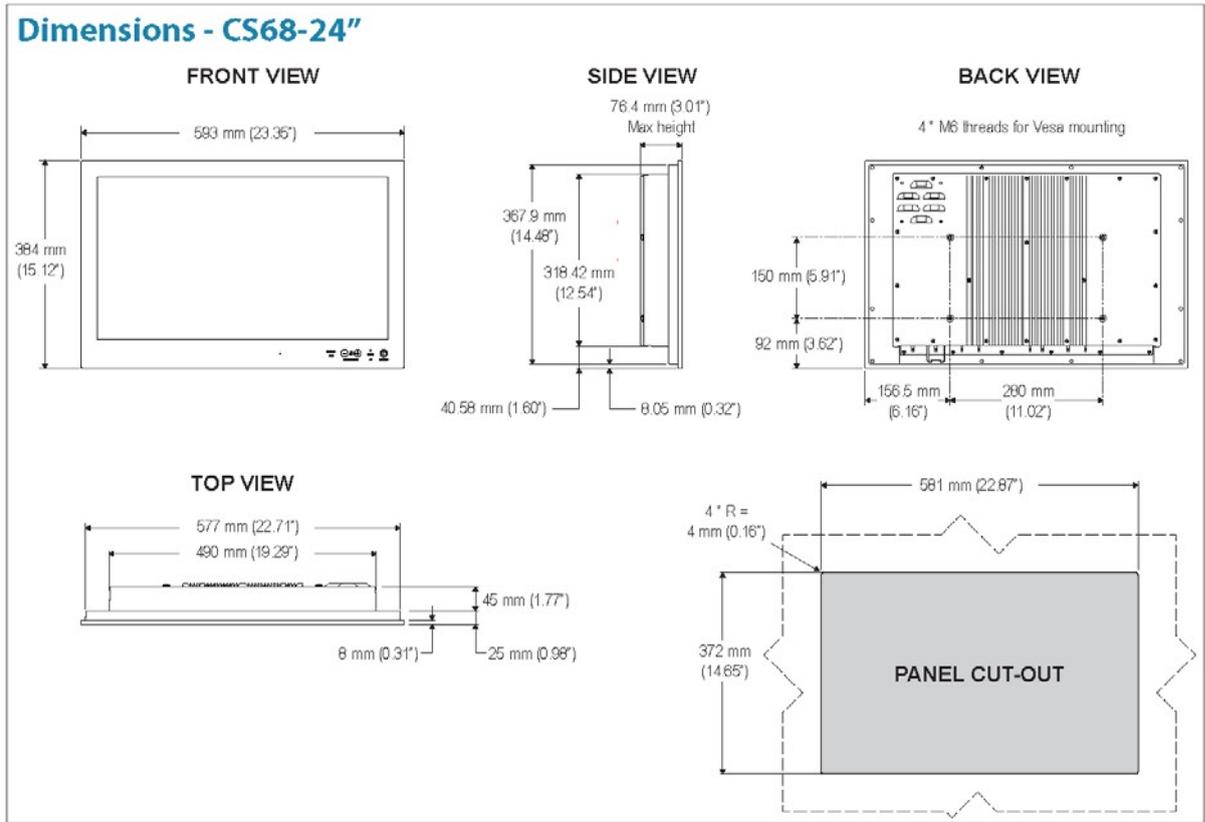
TERMINAL LAYOUT FOR 24''
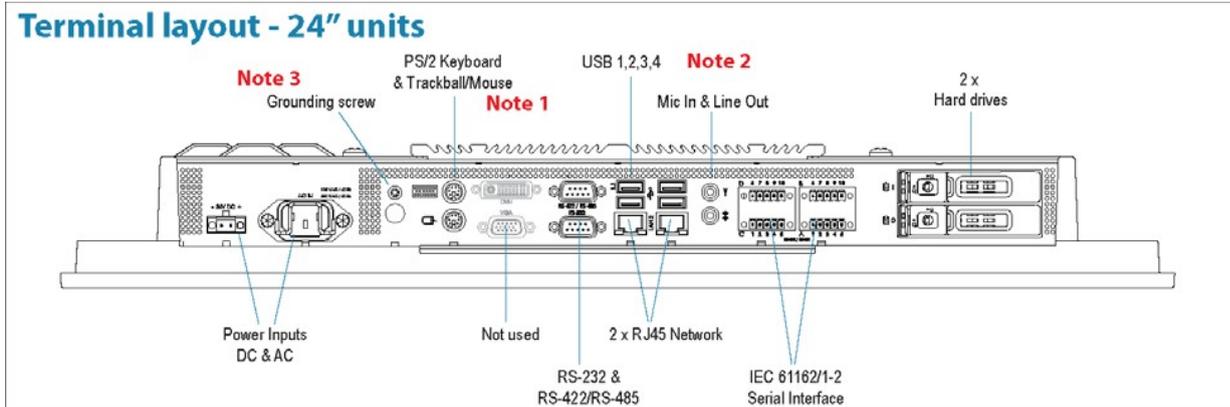
WIRING DETAILS FOR MK15/16

Wiring details - Serial interface

Pin	Signal
1	TX_B
2	TX_A
3	GND
4	RX_B
5	RX_A
6	TX_B
7	TX_A
8	GND
9	RX_B
10	RX_A
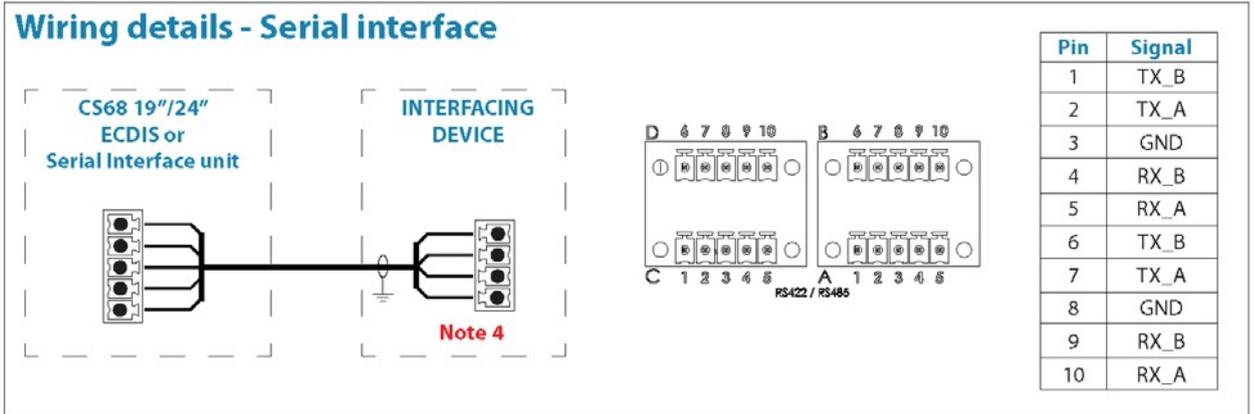
NOTES

Note 1
Keyboard and Trackball/Mouse MUST NOT be connected via USB ports.

Note 2
External IEC 61162/1-2 Serial Interface unit MUST be connected to USB port 1.

USB Extender and E-Token MUST be connected to USB port 2, 3 or 4.

Note 3
DC models must be properly grounded via the screw located on the unit.

Note 4
To form a fully type approved Track steering system according to IEC62065 ed.1 the CS68 19/24" ECDIS system must be connected to an AP80 via an SI80 board (in and SI80, AC80A, AC80S or AC85 computer).

HATTELAND FLAT PANEL COMPUTER MK15

4 x NMEA0183 ports

4 x USB ports

N.B. 4 port expansion module must connect To port 1. All other accessories on ports 2-4

AC Power Supply

DC Power Supply

PS/2 Keyboard & Mouse

Not Used

2 x RJ45 Ethernet Ports

Chassis Terminal
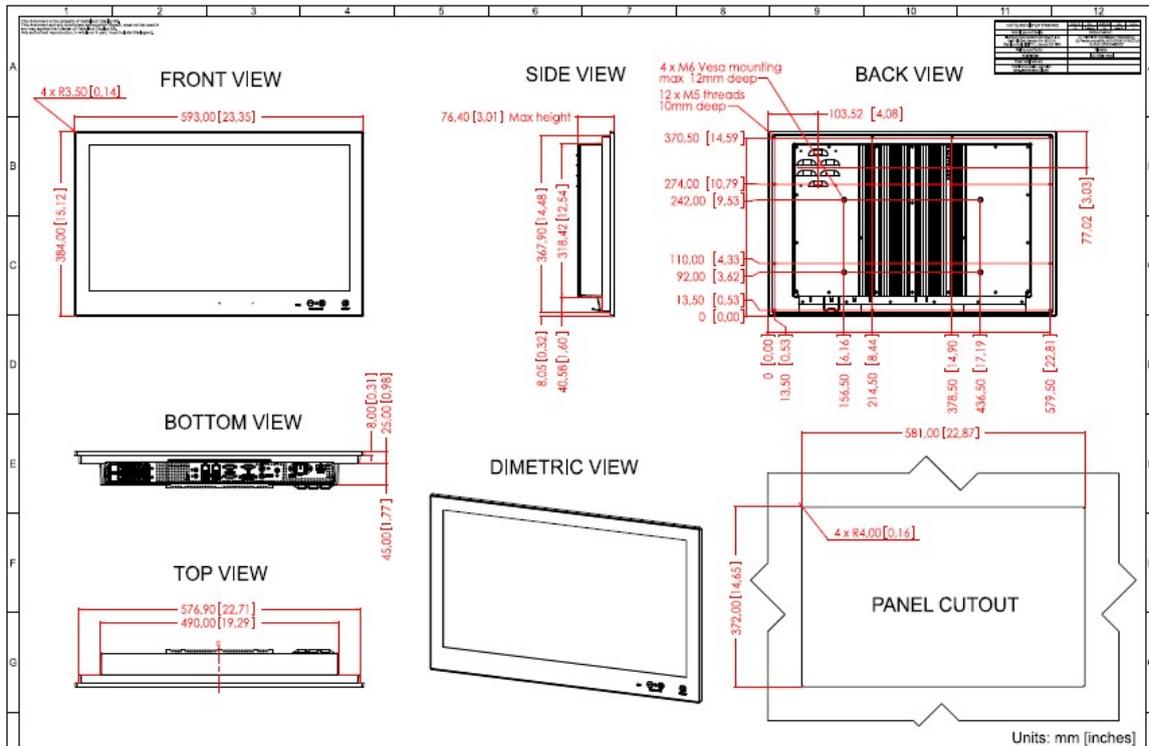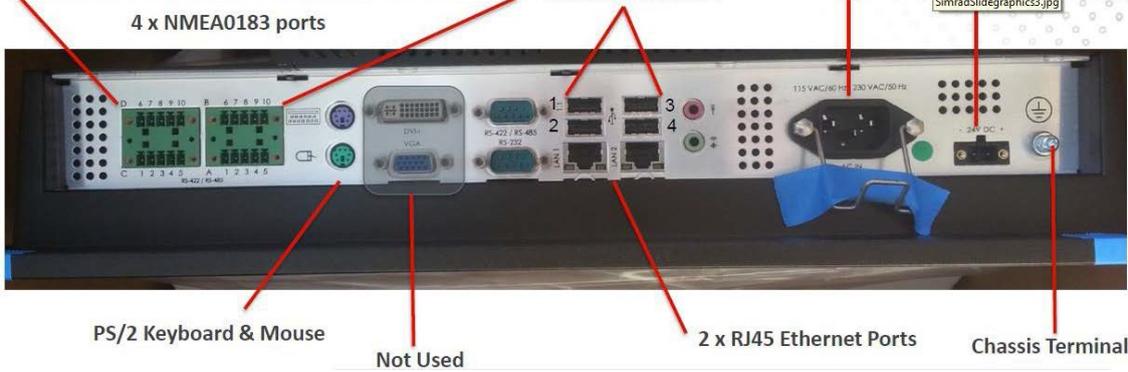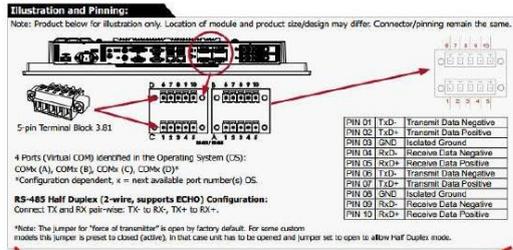
HATTELAND MONITOR HD26T21

SALES DRAWING HD 26T21 MMD-MA1-FAGA
model shown in this drawing, but measurements generally apply for all HD 26T21 MMD-xxx-Fxxx models
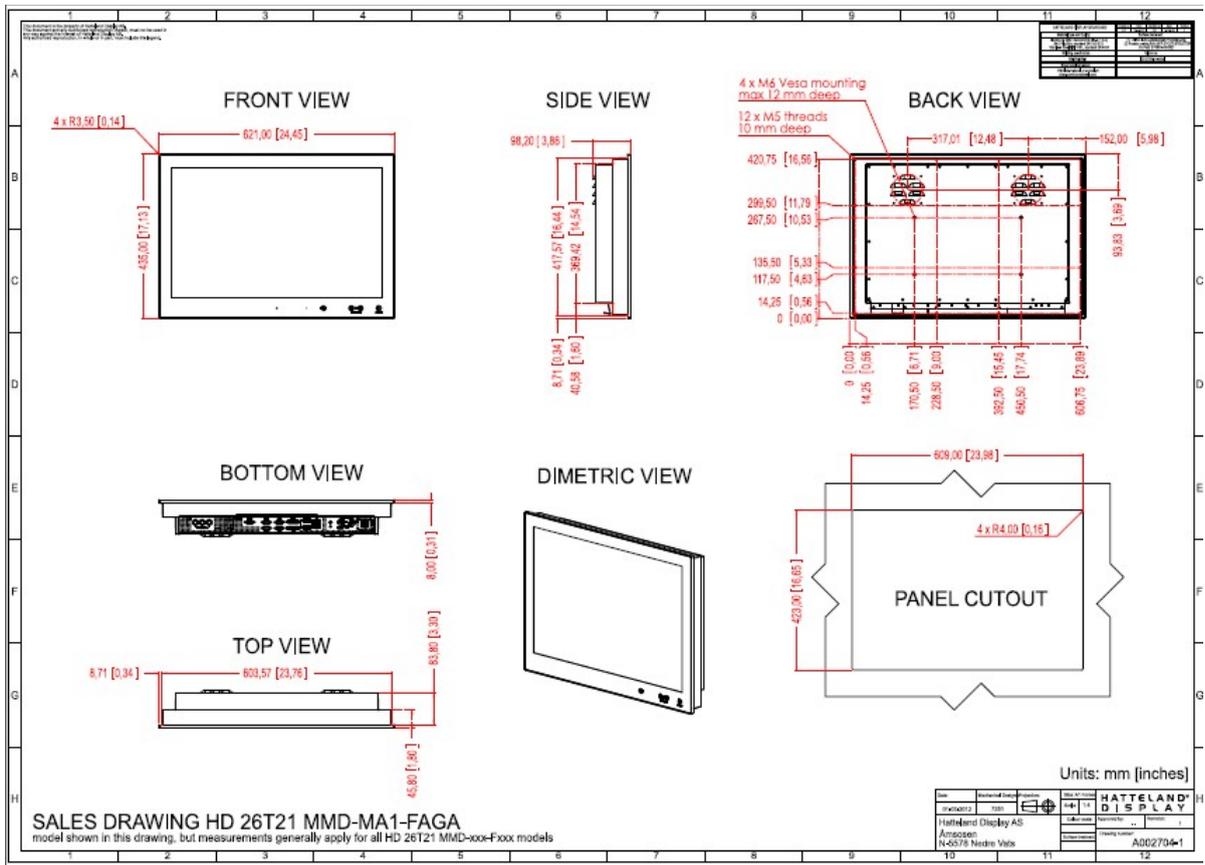
ECDIS900 PC MK5

BRACKETS FOR DELL XE2M COMPUTER

DELL XE2M
(top view)

317 mm

FRONT

121 mm   121 mm

**Mouse
Keyboard**

**DisplayPort
connectors**

**Serial port
VGA**

**2 USB 2.0
2 USB 3.0**

**LAN
2 USB 2.0**

**4 LAN
connectors**

Power

**Power supply
diagnostic Light**

**Power supply
diagnostic button**
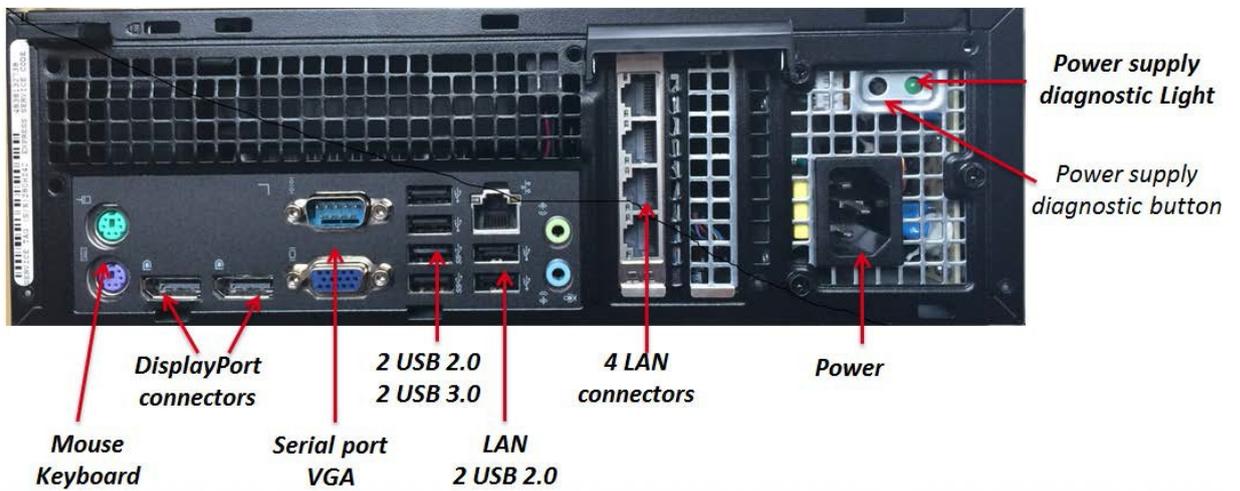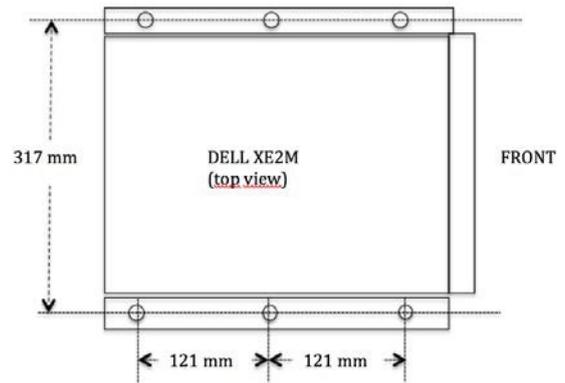
INSTALLATION KITS

ECDIS installation kit

Key	Description	Part no.
1	CS68-19" or CS68-24" ECDIS unit	
2	Power cables (240 V AC and 115 V AC)	
3	Terminal block (for 24 V DC)	
4	Terminal blocks (for Serial Interface)	
5	Ferrite clamp (for keyboard)	000-11764-001
6	USB Flash drive with charts	000-11766-001

7	E-Token (for unlocking charts)	
8	Keyboard	000-11763-001
9	Trackball/Mouse	000-11765-001
10	Panel mounting kit (for CS68-19")	
11	Panel mounting kit (for CS68-24")	

OPTIONAL EQUIPMENT

12	Mounting brackets (for CS68-19'')	000-11804-001
13	Mounting brackets (for CS68-24")	000-11805-001
14	USB Extension cable (1 m)	000-11802-001
15	External IEC 61162/1-2 Serial Interface unit	000-11803-001

	11336 MBA installation kit	
Part no.	Item	Qty.
10626	Cable signal, 4 pairs S/FTP Cat5E LSFRO Toughcat cable	30 m
10185	Plug Phoenix, Industrial RJ45 w/screen for Toughcat cable	6

Buffers are to be ordered separately:

	11236 Buffer NM-251A	
Part no.	Item	Qty.
11236	Buffer NM-251A, 2 input with preference, 5 outputs	1

SIS4000-MK2 INSTALLATION AND CONFIGURATION

PREPARATIONS

Install the box, connect sensors and power up. At least one sensor must be active (yellow LED above connection is blinking). If there is no activity, the box is in sleep mode and cannot be programmed from Sensor Monitor.

PROGRAMMING THE IP ADDRESS

1. Fit a jumper across the pins located above the power input. This forces the IP address to 192.168.5.33.

2. On the controlling ECDIS computer change Sensor network IP address to 192.168.5.200.

3. The box has a web interface for easy programming. Start Internet Explorer and go to 192.168.5.33.

4. Select Set Default Values, answer Yes and click Ok.

5. Select Network Settings.
    Change IP address to 192.168.4.100.
    Change Gateway to 192.168.4.1.
    Change Network mask to 255.255.255.0.
    Click SAVE.

6. Select Restart Device, answer Yes and click Ok.

7. Remove the jumper.

8. On the controlling ECDIS computer change Sensor network IP address back to 192.168.4.200.

9. Log on again and verify settings!
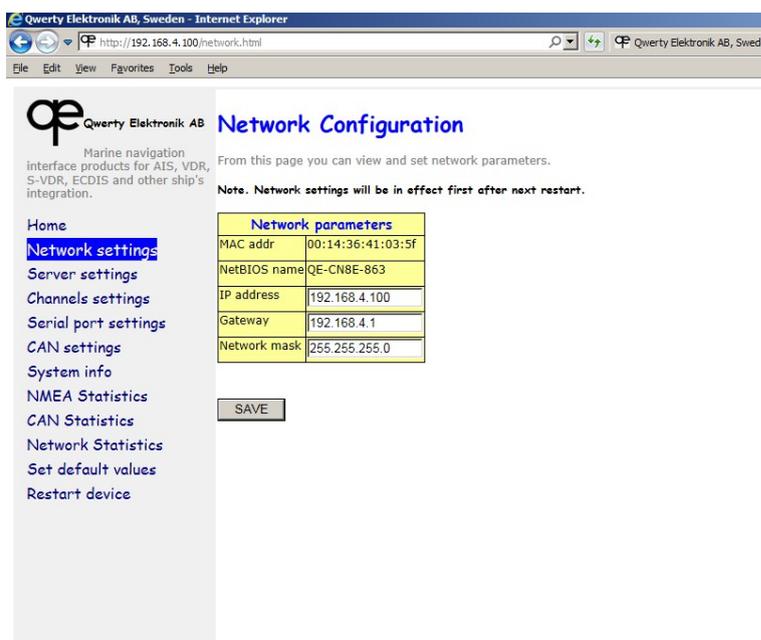
SIS4000 after IP configuration.

PROGRAMMING SENSOR MONITOR

Create a new sensor. Click Norm Type and select CN8E Router. Click Sensor ID and rename it to SIS4000. Click Parameters and set up as shown.

Note Read From/Write To is set to Send & Receive.
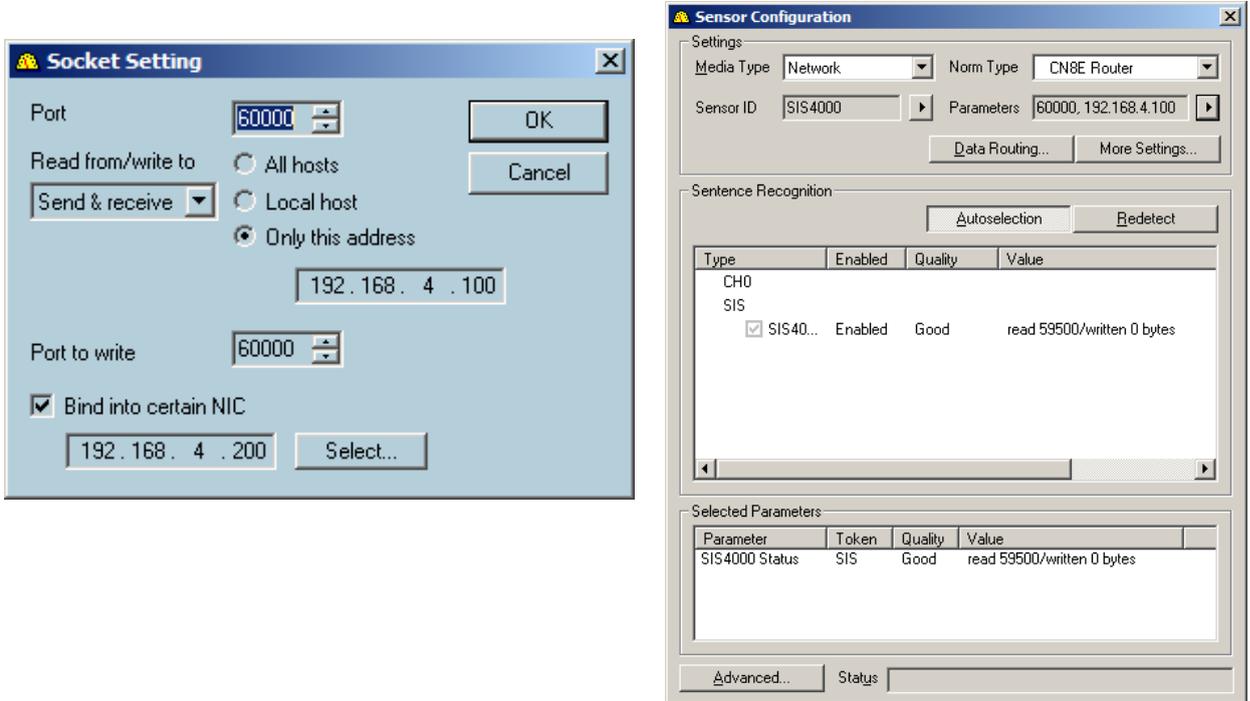
PROGRAMMING CHANNELS IN SIS4000

Open the newly created sensor SIS4000. Click More Settings. If the configuration in the previous chapter is correct a web interface opens, and from here you can set up the sensors in the box. At the same time you can configure Sensor Monitor.

1. Place a tick mark in channels you want enabled.

2. Click the channel and the line turns blue. Click the column header for the item you want to change and enter the new value. Pay attention to port numbers.

3. In the web interface select Channels Settings and change the name to the same as above.
   Note: The names must be identical and they are case sensitive. That is, GPS_1 is not the same as gps_1. Maximum length is 6 characters.

4. Click SAVE when done with all sensors. Then click Ok to close the window.

Channel no.	SIS4000 Monitoring	SIS4000 Planning1	SIS4000 Planning2
1	8010	8020	8030
2	8011	8021	8031

3	8012	8022	8032
4	8013	8023	8033
5	8014	8024	8034
6	8015	8025	8035
7	8016	8026	8036
8	8017	8027	8037

Example showing two sensors enabled. Channel 8 output is also enabled.

The baud rate can be changed in menu Serial Port Settings.

CREATING **NMEA** SENSOR IN **S**ENSOR**M**ONITOR

Create a new sensor. Click Media Type and select Network. Norm Type defaults to NMEA 0183 Sensor. Click Sensor ID and give the sensor a descriptive name. Click Parameters and enter the corresponding port number in SIS4000 for both PortToRead and PortToWrite. Click Ok.
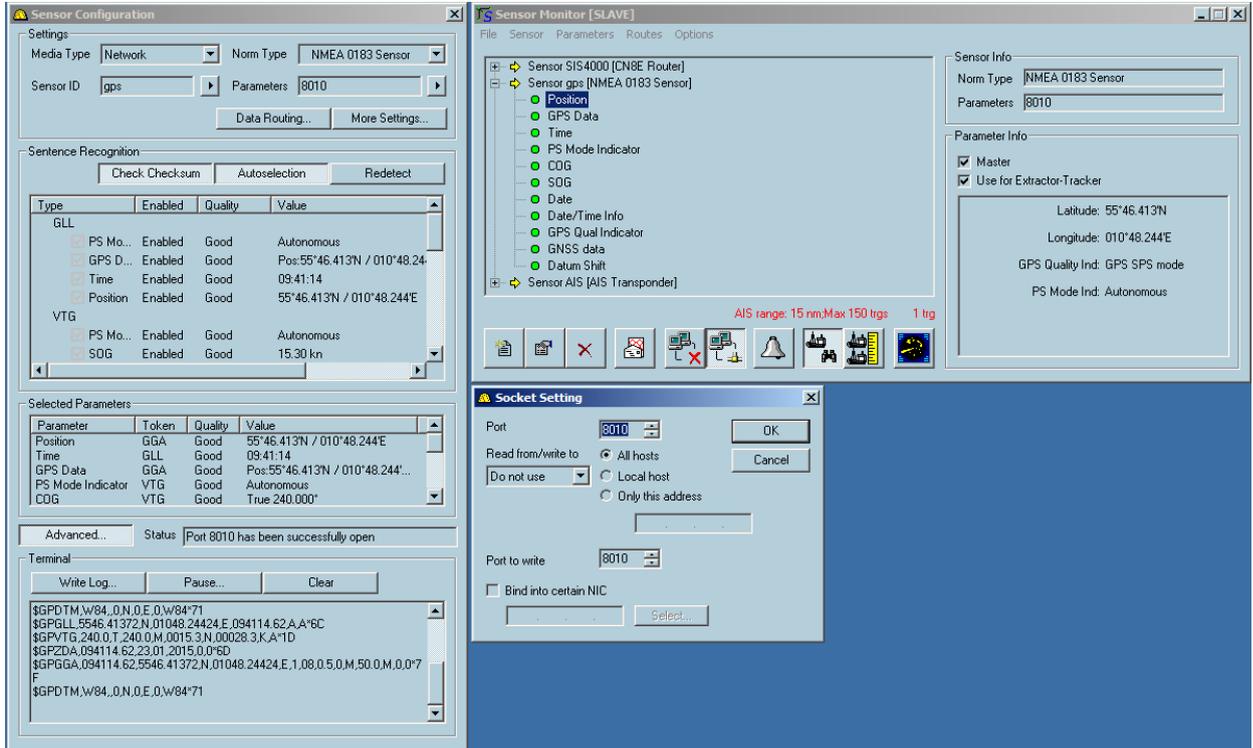
Note!
Always set the same port numbers in PortToRead and PortToWrite.

CREATING AIS SENSOR IN SENSOR MONITOR

As above, but go to Media Type and select AIS Transponder.
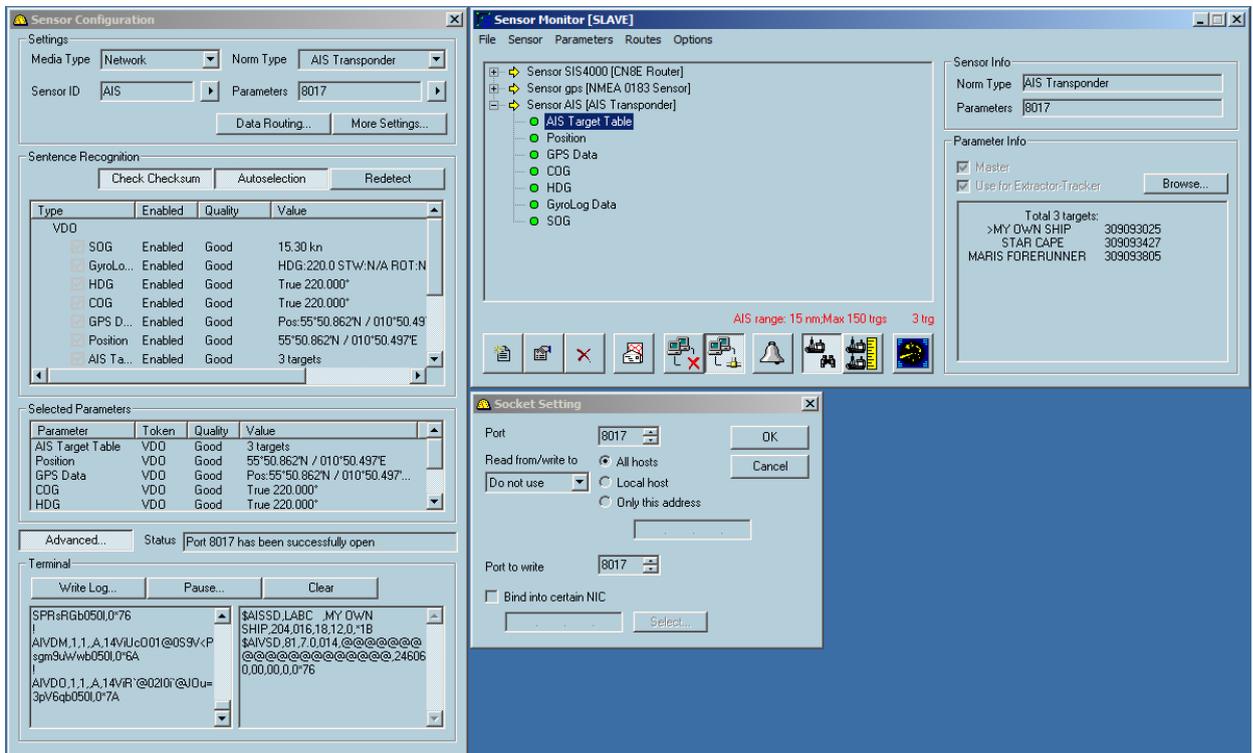
The AIS can be remotely controlled from the ECDIS, where the navigators have a big screen and a decent keyboard and mouse.

In addition a SAR message is automatically transmitted, if the Man-Over-Board button is clicked on the monitoring ECDIS.

To enable these functions click More Settings and place a tick mark in Send Data To The Transponder.
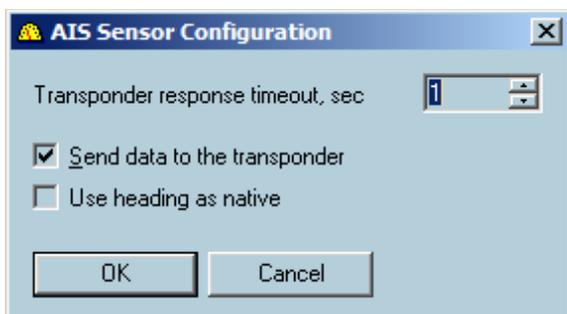
CREATING SENSOR WITH OUTPUT

The AIS sensor from above is used as an example.

1. Enable channel 8 in SIS4000. Change the channel ID name to AIS and the port number to 8017.

2. Select menu Channels Settings and change the NMEA-8 name to AIS. The names must be identical, and they are case sensitive.

3. Enable channel 8 output and set port number to 8017.

4. Change baud rate in menu Serial Port Settings, if needed. It is by default 38400.

5. Open the AIS sensor just created and verify port number 8017 is entered in the fields PortToRead and PortToWrite.

CREATING ARPA SENSOR

Two or more radars transmitting ARPA targets can be a problem. Per default the sensors are set up to use the same Target Table index – index 0.

The data from the radars will overwrite each other, and the final result will be unpredictable and useless.

Change the index for each sensor, so they are different.

1. Place Sensor Monitor in Expert Mode. Double right click in the right pane and select Expert Mode.

2. Open the ARPA sensor and click More Settings.

3. Change Target Table index from 0 to 1.

4. Close the sensor.

5. Double right click in the right pane and leave Expert Mode.

Repeat the procedure on other ARPA sensors created on computers in the network, but select a different index number (2, 3, 4 and so on).

Example:

Radar X-band, 5 plots from #1 to #5. TT index = 1.

Radar S-band, 5 plots from #1 to #5. TT index = 2.

ECDIS TT: 10 targets numbered 201 to 205 and 301 to 305.

The result is no confusion and the numbers tell exactly from what radar they are received.

CREATING SPECIAL SENSOR IN SENSOR MONITOR

Wind and Log instruments often transmit in a format not recognised by the normal NMEA 0183 sensor. If everything looks right in Sensor Monitor, but the data is not accepted in the ECDIS, then select one of the special sensors from the drop down menu in NormType.

C-MAP CHART INSTALLATION

C-Map charts are copy protected by dongles. 3 options are available:

1. eToken Pro Dongle (Legacy, old device).
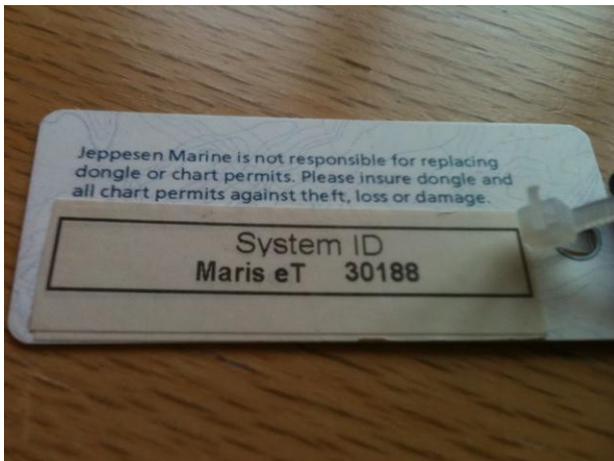
2. eToken Pro 72K Java dongle (Java, new device).

3. No Hardware Protection (Software based dongle).

It is strictly necessary to use the correct option during installation in order to get eToken and license properly installed.

The installation is done in 2 main steps:

- MARIS ECDIS installation, including Sentinel dongle driver.
- C-Map installation, eToken runtime first and then C-Map SDK runtime.

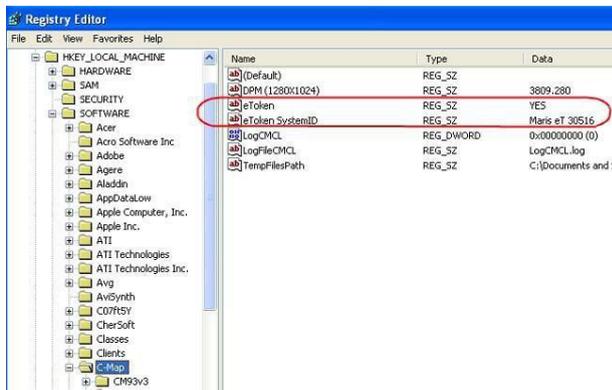## C-MAP CHART INSTALLATION

INSTALLING ETOKEN **L**EGACY

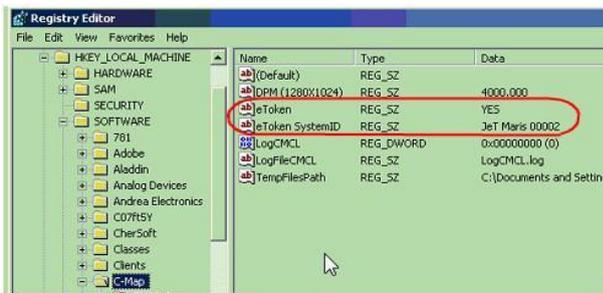Check the current version of ECDIS900. If older than 4.5.4.77 then use Windows Add/Remove programs and uninstall ECDIS900, C-Map Professional SDK Runtime and eToken PKI Client. Note that C-Map services must be stopped before they can be uninstalled. Restart the computer.

Install ECDIS900 and select eToken Pro Dongle (Legacy) as shown here:
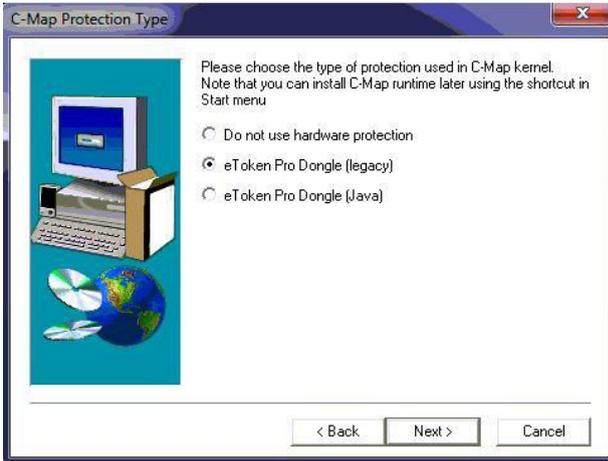
Continue installation by following instructions on screen.

After the installation has finished check Registry for these keys:

Note

The number 30516 is replaced by the actual dongle ID

Check that these programs have been successfully installed:

- C-Map Professional SDK Runtime
- eToken Run Time Environment

INSTALLING ETOKEN **J**AVA

Check the current version of ECDIS900. If older than 4.5.4.77 then use Windows Add/Remove programs and uninstall ECDIS900, C-Map Professional SDK Runtime and eToken PKI Client.

Note that C-Map services must be stopped before they can be uninstalled. Restart the computer.

Install ECDIS900 and select eToken Pro Dongle (Java) as shown here:

Continue installation by following instructions on screen.

After the installation has finished check Registry for these keys:

Note

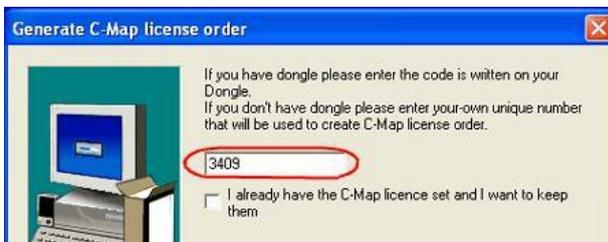The number 00002 is replaced by the actual dongle ID

Check that these programs have been successfully installed:

- C-Map Professional SDK Runtime 5.4.
- eToken PKI Client 5.1.(if Java eToken)
- eToken RunTime Environment3.66 (if Pro eToken)

INSTALLING SOFTWARE DONGLE

Check the current version of ECDIS900. If older than 4.5.4.77 then use Windows Add/Remove programs and uninstall ECDIS900, C-Map Professional SDK Runtime and eToken PKI Client. Note that C-Map services must be stopped before they can be uninstalled. Restart the computer.

Install ECDIS900 and select Do not use hardware Protection as shown here:

Notes.

New installation:

The number 3409 is an example only, must be replaced by the actual ID number as found on the ECDIS Sentinel dongle. Remove the tick mark in the box.

Upgrade:

The number is filled out automatically. Set a tick mark in the box.

Continue installation by following instructions on screen.

Check that C-Map Professional SDK Runtime has been successfully installed.

MORE ABOUT UPS

The UPS is manufactured in two types.

- The change-over type.
- The always-on type.

The change-over type

The change-over type has one advantage – it is cheap. It is manufactured in large quantities and the quality and stability are often doubtful.

Typically there are no supervisory circuits for battery condition.

If the power line is stable, as in your office, this type can be a candidate. When running on a stable power, line the power goes straight through the box. It is exactly like powering your computer from the wall outlet.

In case the power disappears, a mechanical relay will operate and connect the output to the inverter. The inverter is started, powered from the battery, and now supplies power to the computer.

This takes time as a mechanical relay is involved, and for a short while there is no supply to the computer.

The question of survival is entirely up to the design of the connected computer, as the build-in capacitors must supply power for this period. If insufficient, the computer will malfunction.

Running computers on a change-over type on ships is doomed to go wrong, because there is no noise filtering, no protection of brownouts and no protection against drifting frequency.
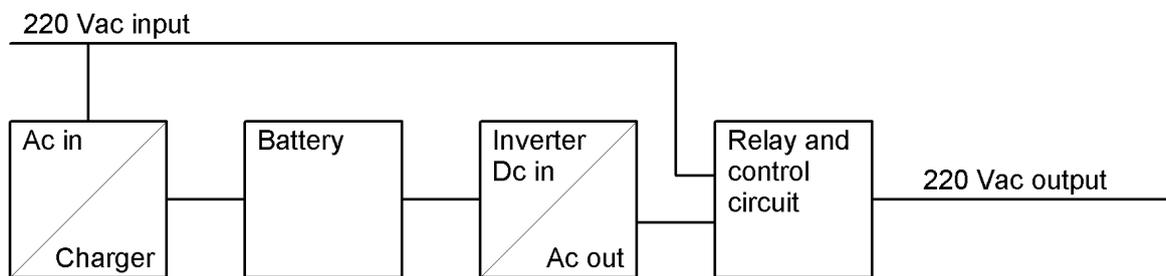

Figure 1 Block diagram of a change-over type UPS.

The always-on type

The always-on type has one disadvantage – it is expensive.

That said, the rest is just what we need.

A power line with fluctuating voltage or frequency and filled with noise is not a problem. The output is a stable sinus curve; noise free 220 Vac on 50 or 60 Hz. The UPS can even convert (and will do) frequencies in the range 40-70 HZ to 50 or 60 Hz, depending on the setup. This is important on ships with propeller shaft generators.

Brownouts are dealt with in the same manner, and because no mechanical parts are involved, there will be no power interruptions whatsoever.

Supervisory circuits for battery condition and operation are standard, and the battery will even be tested under full load periodically without any need of operator intervention.

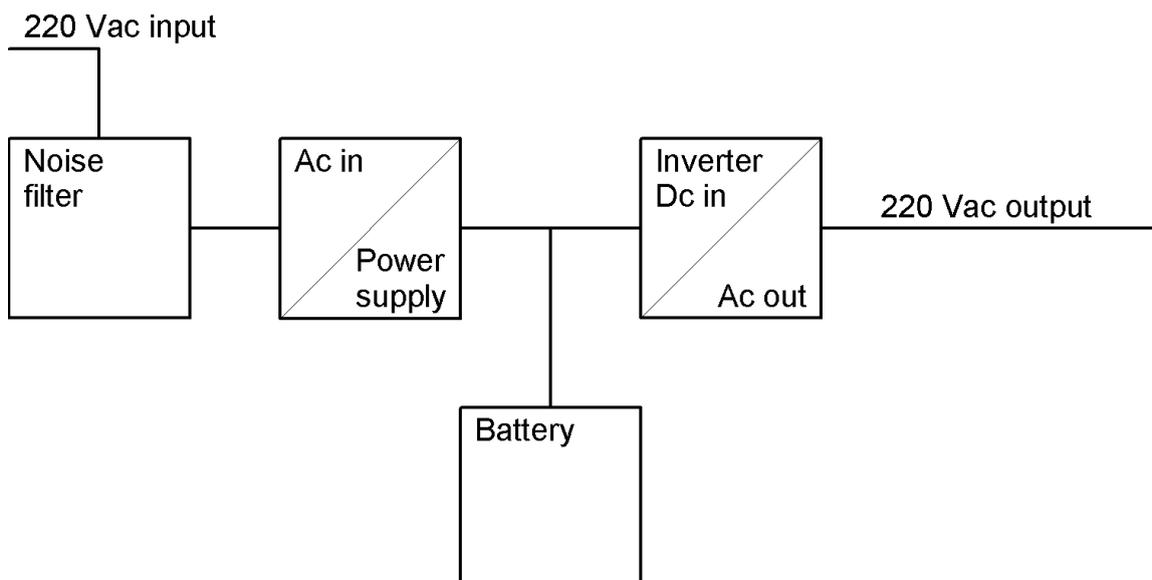A worn-out battery will raise acoustic and visual alarms.

220 Vac input

```
┌──────────┐      ┌──────────┐            ┌──────────┐
│ Noise    │      │ Ac in ╱  │            │ Inverter╱│
│ filter   │      │       ╱  │            │ Dc in ╱  │   220 Vac output
│          │      │   ╱ Power│            │ ╱        │
│          │      │  ╱ supply│            │╱  Ac out │
└──────────┘      └──────────┘            └──────────┘
                        │
                  ┌──────────┐
                  │ Battery  │
                  │          │
                  │          │
                  └──────────┘
```

Figure 2 Block diagram of an always-on type UPS.

Two versions of the always-on type are available from MARIS, DnV approved.

Part number 10167,   UPS, Eaton EX 700 Tower, 110VAC-240VAC.

Part number 11394,   UPS, Eaton EX 700 Tower, 100VAC (Japan).

ECDIS checklist

Item	Text	Comment	

Computer			
Type			☐
Serial no.			☐
MARIS ID, Sentinel dongle no.			☐
C-Map dongle no.		☐ n/a	☐

Monitor if split installation		☐ n/a	
Type			☐
Serial no.			☐

Network			
Computer name			☐
Workgroup name	MARIS		☐
IP address, ECDIS network	192.168.___.___	☐ DHCP	☐
IP address, Sensor network	192.168.004.200	☒ manual	☐
C drive unshared			☐
Folder Charts shared			☐
Folder ECDIS_UserData shared			☐

Sensor Monitor	☐ Moxa ☐ SIS		☐
SIS IP address	192.168.004.100		☐

Display Ctl., audible alarm and dimmer tested			☐
Sensor COM3 or channel1			☐
Sensor COM4 or channel2			☐
Sensor COM5 or channel3			☐
Sensor COM6 or channel4			☐
Sensor COM7 or channel5			☐
Sensor COM8 or channel6			☐
Sensor COM9 or channel7			☐
Sensor COM10 or channel8			☐
Sensor Monitor settings locked			☐

Item	Text	Comment	
ECDIS			
Version no.			☐
Mode		☐ mon ☐ pla	☐
Ship Properties corrected			☐
Safety depth and Route corrected			☐
ECDIS settings locked			☐

Radar Overlay		☐ n/a	
Version no.	v.4 is Pci, v6 is LAN	☐ 4 ☐ 6	☐
Type of radar connected		☐ S ☐ X	☐
Trigger, Video, HM, AZI adj.			☐
Main bang and skew adj.			☐

Navtex		☐ n/a	
Version no.			☐
Type of Navtex receiver			☐
Serial or LAN, port no.			☐
Master/Slave		☐ M ☐ S	☐
If Master, folder Inbox shared			☐
If Slave, map network drive			☐

Application Manager			
Version no.			☐
Programs in Auto/Other defined			☐
System locked in Approved Mode			☐

Finalizing			
Ghost disk burned			☐
Charts installed			☐