SIMRAD

Maris ECDIS900 System
Technical Manual

ENGLISH

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STANDARD **MARIS ECDIS** INSTALLATION

The standard installation of MARIS ECDIS includes two workstations connected by LAN: the Monitoring workstation and the Planning station used as a Back up station.

In this chapter learn more about:

- Monitoring and Planning stations
- System description
- Functional description
- Redundancy in the system
- Tests facilities
- Input/Output management - Sensors Monitor application.
- Failure detection
- Security
- Maintenance
- Power

MONITORING AND PLANNING WORKSTATIONS

The Monitoring workstation acquires Position, Gyro/Log and Arpa Targets data via serial lines and a second DGPS delivers Position information to the Planning station. All serial sensor inputs are broadcast on the network and shared by the two ECDIS stations.

REMARK

The second DGPS is optional and the same DGPS can be used on both stations. However it is recommended to use two different DGPS for redundancy and safer installation.

INSTALLATION

During ECDIS installation process the user has to select the option Monitoring for the monitoring station and Planning for the other ECDIS workstations.

However it is possible to switch between Monitoring and Planning modes by right double clicking in the window title of ECDIS and activate the menu "Set as planning station" or " Set as Monitoring station". The only one Monitoring workstation can exist in the ECDIS LAN. As soon as the Planning station is switched to Monitoring, all monitoring functions are available on this PC.

SHARED DATA

The charts and routes databases are installed on both stations. Therefore, in case of breakdown of the Monitoring station, the Planning station can immediately be used as main

ECDIS. Then it is required to switch from Planning to Monitoring mode as described above to access all route monitoring functions.

Planned routes

When routes have been planned on a Planning station, they can be copied to another ECDIS workstation. Right click on the route and access menu "Synchronize". Route will be copied to all active ECDIS workstations. Alternatively it's possible to import route using the following procedure:

- On the target PC, open the dialogue **Load/Unload objects** panel Routes and press **Import**
- Select the folder containing the route located on the Planning station: C:\\ ECDIS_userdata\Routes
- Select Routes to be imported
- Press OK and the routes are copied on the local PC.

Another way to copy a route is: right click on the route, select **Synchronize**; the route is copied to all active ECDIS workstations.

ACTIVE ROUTE

A route can be activated only on the Monitoring workstation. When the route has been activated, it will be automatically transferred and displayed to the other ECDIS workstations running on the LAN.

IMPORTANT

Activation of route is possible only on monitoring workstation.

CHARTS

To synchronize ENC or ARCS charts collections use "Copy database" function available in the chart handling dialogue.

HARDWARE PLATFORMS

MARIS ECDIS computers come in several variants:

- Flat panel computer MK15/16:
    - MARIS ECDIS900 MK15 24" 4S
    - MARIS ECDIS900 MK16 19" 4S
- MARIS ECDIS900 MK5 is delivered with 2 diffident monitors:
    - MARIS ECDIS900 with Hatteland 24" monitor
    - MARIS ECDIS900 with Hatteland 26" monitor

For more information about hardware see "MARIS ECDIS installation Manual", Chapter 1

User Input

GENERAL

The ECDIS900 is a window based Human Computer Interface (HCI) where operator requested information is obtained from menus and dialogue boxes on the display. The mouse is the main operating tool for the system. A keyboard is also necessary for alphanumeric data entering .

STORAGE MEDIAS

HARD DISK

ECDIS workstation is delivered ready to work with Windows XP and Windows 7 and necessary system drivers and libraries already installed.

When ECDIS is installed on the computer, the necessary files are copied to the hard disk and four folders are created:

- C:\Program Files\MARIS\ECDIS900_4 or C:\Program Files(x86)\MARIS\ECDIS900_4 containing:
  - The application ECDIS900 and necessary libraries in the Bin folder
  - The Sensor Monitor application
  - Utilities
  - C-MAP library components
- C:\Charts containing all data related to chart collections
- C:\Ecdis_UserData containing user data like routes, tracks, object editor, tide database, weather, logbook.
- C:\Program Data\MARIS containing:
  - Configuration files.
  - S-52 presentation library components.
  - Log files of ECDIS900 including listing of chart installation and updates.

MEMORY STICK

Memory sticks are used:

- To install chart permits when S57 or ARCS permits are transmitted by memory stick or received by email.
- To update S57 chart database when the updates are received by memory stick or email.
- To back up and restore routes, logbooks and user data stored on the hard disk.
- To boot the system when a complete restoration of the hard disk is necessary.

CD(DVD)-ROM

CD-ROM are used:

- To install and update charts
- To restore the hard disk when it has failed. ECDIS is delivered with a CD-ROM called "Ghost". This CD-ROM is a mirror of the hard disk. Running the Ghost application, you

restore the complete ECDIS system (Operating system, ECDIS application, basic charts, etc.) that has the initial configuration.

SENSORS

For a complete description of the interface between Sensors and ECDIS900 see the **Input/Output** chapter.

ETHERNET: INTERNAL AND EXTERNAL DATA FLOW

Ethernet and TCP/IP protocol are the core of the system for the intercommunication between software modules and also for data exchange between the ECDIS Planning (Back-up) and Monitoring stations.
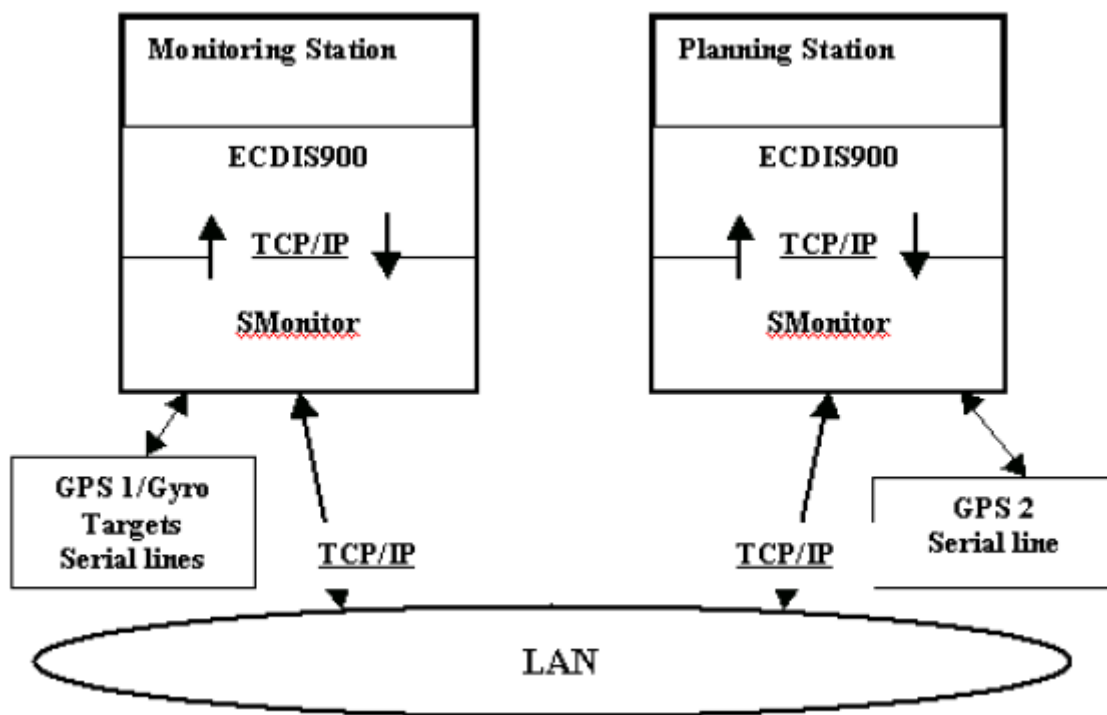
INTERCOMMUNICATION

LAN communication is basic the technology used in the system for communication between ECDIS900 applications. For example, the ECDIS application launches the application called Sensor Monitor responsible for I/O of the system. This application runs in parallel with ECDIS and manages serial and TCP/IP input/output. ECDIS and Sensor Monitor use TCP/IP protocol for data and commands exchanging.

EXTERNAL DATA EXCHANGE

Monitoring and Planning stations are on the same LAN and communicated using TCP/IP protocol:

- The two ECDIS share same sensor data information. Serial data is analysed and broadcasted on the LAN and therefore the other ECDIS workstation can use the same sensor input data.
- Routes are usually planned on the Planning station and then transferred to the Monitoring station via Ethernet.
- The Monitoring station is in charge of active route and waypoint. Information about the active route and waypoint is sent to the Planning station via Ethernet.
- Ship's settings and Safety parameters are synchronized on the network. The ship's settings and safety parameters can be adjusted on the Planning station and then the parameters will be updated on all Planning stations for a while.
- Alarm acknowledgement is also synchronized. When an alarm is acknowledged on the monitoring station it is also acknowledged on other planning stations.

Chart databases on both ECDIS stations can be updated in two different ways:

- The update procedure can be run twice on both workstations.
- The update procedure is run once and the updated chart database transferred to the other workstation via Ethernet.

Technical

REDUNDANCY

BACKUP SYSTEM

ECDIS dual systems installation includes ECDIS Monitoring station working as Master, and a Planning station working as Slave ECDIS. The Planning station is used as backup. In case of breakdown of the main ECDIS Monitoring station, the Planning station can immediately replace the Master ECDIS and can be used for navigation.

CONTINUOUS MONITORING

To avoid any interruption and discontinuities in the ship's position monitoring, the ECDIS backup is connected to the second GPS. If the Master ECDIS breakdown occurs, the ship is monitored on the backup system.

ACTIVE ROUTE

Monitoring workstation is responsible for the active route and waypoint. The active route and waypoint information is sent continuously to the Planning station, which displays same route. Any changes of active route are prohibited.

DUPLICATE DATABASES

All ECDIS stations should use the same chart databases. The user is responsible of maintaining the consistency of the chart collections and transferring routes from the Planning station to the Monitoring station.

LOGBOOK

The logbook database, containing all navigation information of the current voyage, is stored on both workstations. In case of breakdown, no data is lost and the second PC continues to store navigation data to the logbook. Time interval of logbook recording could not be changed and is equal to 15 seconds.

SET UP

The logbook window gives access to the button **Change Settings**. Tick on the check box **Save** in the Voyage Data recorder section to make sure that the logbook will be recorded by VDR. A logbook recorded in VDR could be replayed in ECDIS900 together with other data.
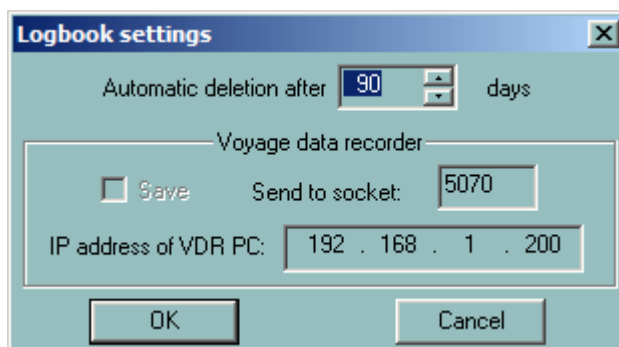
IMPORTANT

Logbook settings are not synchronized in the LAN.

POSITIONING SYSTEMS

Two ECDIS workstations are connected independently to two different GPS sensorsthrough SIS4000 unit. However, they share the same data and both ship's positions are displayed on the chart: GPS1 data, acquired by one of the ECDIS workstations is sent to the other one by Ethernet and vice versa. GPS2 data acquired by the second station are sent to the first one.

MASTER GPS

When two different GPS are used, a user has to select which GPS sensor is the master positioning system, i.e. which position data is used for route monitoring calculations. At any time a user gets information about the quality of the position calculation for the GPS and another Master GPS can be selected if necessary.

GYRO AND LOG DATA

Gyro as source of heading are interfaced to both SIS4000 units.

SYNCHRONIZATION

Ship's settings and Safety parameters (safety contour and safety depth) are synchronized on the network. On the monitoring Station the ship's settings and safety parameters can be adjusted and regularly these parameters will be updated on all Planning Stations. Alarm acknowledgement is also synchronized.

TEST FACILITIES

BOOT TESTS

When you power on or restart the computer, it goes through Power On Self Test (POST) routine, which determines:

- The amount of real memory
- Whether the needed hardware components are present.

Once the computer has run its POST routine, each adapter card with BIOS runs its own POST routine. The computer and adapter card manufacturers determine what appears on the screen during the POST processing.

WINDOWS OPERATING SYSTEM CONSISTENCY

Windows XP or Windows 7 does not start up or operate correctly if any hardware components do not initialise correctly. Start up fails if any of the files required to start Windows XP or Windows 7 are not present in the correct folder or if one of the files has been corrupted.

CONNECTION TESTS

When one or more input and/or output devices are connected to the computer, the connections must be tested to ensure that all is working correctly. ECDIS provides a useful tool to help perform this test.

Hyperterminal is an application built into Windows operating systems that allows testing the connections with input devices. If input devices are correctly connected, the Hyperterminal displays recognisable characters. Incorrectly connected input devices will either show no information or garbled characters.

FAILURE DETECTION

POWER FAILURE

VISUAL FAILURE DETECTION:

- Check the LED on the UPS.
- When the system is powered the LED in the front panel of the screen is immediately switched on.

AUDIBLE ALARMS

The UPS has an audible alarm feature to inform you about potential power problems. When the alarm is activated the UPS beeps in different intervals according to a particular condition.

Alarm	Cause	Action
Power on Indicator is not on. UPS does not start.	The line cord is not connected The wall outlet is dead.	Connect the line cord to the UPS. Electrician test.
UPS operates in Battery mode only.	A circuit breaker or input fuse is open	Turn off the UPS, reduce the load and push the circuit breaker.
UPS does not provide the back up time	Battery must be full discharged.	Plug the UPS into a wall outlet for 24 hours.
UPS beeps 1 time every 4 seconds	Or the UPS is running on battery power because the line voltage is too high or low.	Extend the input/output voltage range with the DIP switches.
1 beep every second	The battery is running low	2 to 5 minutes remains. Prepare a shut down.
1 beep every 2 seconds	Weak battery	Plug the UPS into a wall outlet for 24 hours.
3 beeps very 20 seconds	Detecting procedure	The battery is weak and should be replaced
3 beeps every 5 seconds	Battery replacement required.	The battery is weak and should be replaced

1 beep every 0.5 seconds	Power requirements exceed UPS capacity	Remove some of the equipment from the UPS.
Continuous beep	Fault condition	Shut down and contact Navico

COMPUTER HARDWARE FAILURE

AUDIBLE FAILURE DETECTION:

During the boot process an audible alarm is triggered in case of RAM or Video problems. The sound sequences are different in accordance with the type of problem.

VISUAL DETECTION:

- If the hard disk cannot start during the boot process, a warning is displayed in grey on a black background screen.
- During Windows operating system boot, the system displays the log of all events on a blue background screen.

COMMUNICATION FAILURE

After Windows XP or Windows 7 has been started, ECDIS is automatically launched and the network initialised. In case of an Ethernet problem, the different sockets cannot be created and a warning is displayed.

If the connection with the sensors cannot be well established or a failure occurs, ECDIS warns the navigator.

SOFTWARE FAILURE

Software failures are reported to the user in two different ways:

- Exception and memory errors messages are displayed in an alarm dialogue.
- The error freezes the system, for example, the mouse is still moving but menus are no more accessible.

SECURITY

The computers running ECDIS are dedicated to navigation purposes and SHOULD NOT be used for any other tasks.

SYSTEM SET-UP

Access to system set-up and configurations functions is restricted, the main window of ECDIS is not resizable, hiding that window is impossible and the Windows task and the caption bars are not displayed. Other applications are accessible only when operating Application Manager in the Service mode. When the computer boots, ECDIS is automatically launched and Windows system functions are not accessible when ECDIS900 is running in the operational mode.

System hot keys are disabled

In the operational mode ECDIS900 restart and shutdown functions are available only through the Application Manager. All windows system hotkeys are disabled.

ACCESS

The two workstations are used for navigation purpose only and no other application can interfere with ECDIS, except for approved applications and **Application Manager**. The workstations are connected by a point to point Ethernet connection and are not a part of the ship's network. **Therefore no access from outside of the ship is possible. But the MBA Application can be connected to email using a Router, configured as Firewall in order to allow only email protocol in "Email Mode".**

SOFTWARE MODULES

Following the list of the software modules necessary to run ECDIS:

Name	Version	Description
C:/Program files/MARIS/ ECDIS900_4/bin/ ECDIS900.exe *for Windows 7* C:/Program files(x86)/MARIS/ ECDIS900_4/bin/ ECDIS900.exe	4.7	ECDIS application. Chart display and route and logbook management
C:/Program files/MARIS/ECDIS_4/ bin/ Notepad.exe	The current version from the OS application	Utility used to display and print the logbook and the route planning.
C:/Program files/MARIS/ECDIS900_4/ Sensor_Monitor/SMonitor.exe	3.7	Application in charge of management of the I/O.

DLLS AND OTHER NECESSARY FILES

C:/PROGRAM FILES/MARIS/ECDIS900_4/SENSOR_MONITOR

Name ▲	Date modified	Type	Size
alarms	11/21/2008 21:02	Configuration settings	1 KB
Autopilot	5/8/2003 23:29	Configuration settings	6 KB
MarisGyro	4/30/2003 00:49	Configuration settings	2 KB
SMonitor	3/1/2012 01:53	Application	1,324 KB
SMonitor	6/15/2012 20:15	Configuration settings	7 KB
Template	11/15/2002 01:40	Configuration settings	10 KB

C:\PROGRAM FILES\MARIS\ECDIS900_4\BIN

Name ▲	Date modified	Type	Size
📁 Docum	5/13/2014 15:29	File folder	
ARCSkernelu.dll	10/6/2014 10:56	Application extension	272 KB
Dongleu.dll	10/6/2014 10:56	Application extension	108 KB
🌐 ECDIS900	10/6/2014 10:57	Application	6,002 KB
Filecopy.avi	3/25/2014 16:28	AVI File	10 KB
HelpFile	3/25/2014 16:28	Compiled HTML Help...	7,826 KB
HTMLEditu.dll	10/6/2014 10:56	Application extension	44 KB
MGU2007u.dll	10/6/2014 10:56	Application extension	340 KB
MZipUtilu.dll	10/6/2014 10:56	Application extension	294 KB
notepad	10/14/1996 05:38	Application	45 KB
ObEdBitmaps_ap.btm	3/25/2014 16:28	BTM File	52 KB
ObEdBitmapsCS.btm	3/25/2014 16:28	BTM File	52 KB
ObEdBitmapsMS.btm	3/25/2014 16:28	BTM File	115 KB
ObEdBrushes.brh	3/25/2014 16:28	BRH File	3 KB
ObEdStylesCS	3/25/2014 16:28	Certificate Trust List	1 KB
ObEdStylesMS	3/25/2014 16:28	Certificate Trust List	5 KB
ObjEditDLL7Csu.dll	10/6/2014 10:56	Application extension	667 KB
RadarLAN	3/25/2014 16:28	Configuration settings	1 KB
S57Kernelu.dll	10/6/2014 10:56	Application extension	773 KB
🟢 squat_info	3/25/2014 16:28	Chrome HTML Docu...	13 KB
TideDllu.dll	10/6/2014 10:56	Application extension	73 KB
VBSuppu.dll	10/6/2014 10:56	Application extension	101 KB
VDS_config	3/25/2014 16:28	Application	60 KB
VoyagePlan2006u.dll	10/6/2014 10:56	Application extension	1,153 KB
Weatheru.dll	10/6/2014 10:56	Application extension	586 KB

INPUT FILTERING

 Keyboard inputs are secured, i.e. filtering functions check that the use of letters and numbers is correct and the values are within defined limits.

In case of insufficient input, the system cancels the input or asks for additional data.

COLOUR TABLES AND BLACK ADJUSTMENT

In the Presentation Library VS52 V3.4 three colour schemes are available:

- Day bright
- Dusk
- Dark night.

The color scheme selection is possible by pressing **F8** or in the **Chart setting** dialogue.

BACKLIGHT ADJUSTMENTS

The monitor backlight level is automatically adjusted to the calibrated value when a colour scheme is selected. Three levels of backlight corresponding to the three colour tables have been defined during the colour calibration process.

MANUAL ADJUSTMENT

The monitor Pot meter is disabled. To adjust the backlight level, press the key combination "Ctrl +" or "Ctrl –" to increase or decrease the backlight level from the predefined backlight value. The minimum display brightness is maintained for keeping the ECDIS alarms visible under any conditions.

WARNING

Changing manually the backlight level may alter the colours used in ECDIS.

COLOUR DIFFERENTIATION – CHART 1

The presentation library contains colour differentiation test diagram to check that the display can be use to discriminate important features by colour. The cell called AA5C1W00 displayed at the scale 1/25 000 and located at 15N, 5W contains several coloured differentiation diagrams. To access the Chart1 cell, open Chart handling, select Chart1 tab and double click on one of cells in the list. Data will loaded and appropriate cell displayed. Use scroll and zoom tools to review other neighbour cells from Chart1 collection.

MAINTENANCE

POWER – UPS -

BATTERIES CARE

For the best preventive maintenance, keep the area around the UPS clean and dustfree.

For full battery life, keep the UPS at an ambient temperature of 25 C.

REPLACING BATTERIES

- Turn off and unplug the computer from the UPS.
- Turn off the UPS and unplug the power cord from the power source and wait 30 seconds.
- Turn the UPS over and remove the power cord and the screws holding the battery door in place on the bottom of the UPS. Slide the door off.
- Pull out the battery by grasping the removal tabs.
- Disconnect the two wires connecting the battery to the UPS.
- Connect the battery wires of the new battery, red to positive, black to negative.
- Carefully place the new battery into the case
- Slide the door on and reconnect the power cord to the power source. Turn on the UPS.
- Reconnect the computer to the UPS. Turn on one item at a time.

TESTING NEW BATTERIES

Press the **Hold** button for three seconds to initiate the battery test. The UPS automatically distributes some of the load to the batteries for 15 seconds and tests the battery's performance. If there is a problem with the battery6 the UPS returns to normal mode and alarms beeps.

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Restore ECDIS

ECDIS is delivered with restore facilities, i.e. it is possible to restore the hard disk, as it was when the system has been delivered. A CD called Ghost is part of the delivery.

To restore completely the system do the following:

1. Shut down the computer.
2. Insert the CD.
3. Switch on the computer. The system boots from the CD.
4. Click 2 times OK in the presentation dialogues.
5. In the menu select Local -> Disk -> From image.
6. Select CD drive in the following dialogue and press **Open.**
7. Confirm by pressing **OK**.

Once the hard disk has been restored, insert the ECDIS installer disk and run the set up software to reinstall the latest version of ECDIS. Then reinstall the charts with the appropriate CDs and copy the routes backed up on a memory stick.

The hard disk will be reconfigured with the default settings:

ID	Planning station	Monitoring station
Name:	Planning	Monitoring
Workgroup	MARIS	MARIS
TCP/IP	192.168.2.151	192.168.2.150
Mask	255.255.255.0	255.255.255.0
Gateway	not defined	not defined

IMPORTANT

HDD sharing:

C drive should not be shared.

C:\\Chart – shared with full access for everyone.

C:\\ECDIS_UserData – shared with full access for everyone

C:\\ECDIS_UserData \Routes – shared with full access for everyone

Settings

Colour palette	65536	**Desktop area**	1280 * 1024
Frequency	60 Hertz	**Fonts**	Small
Keyboard	English	**HD**	shared

ECDIS runs automatically at boot with login Administrator, password admin.

User Accounts

Administrator. No password.

Guest. No password

Standard CMOS Setup

 Halt on: All but Keyboard.

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TESTS

FUNCTIONAL TESTING BEFORE DELIVERY

The different parts of the system shall be tested for correct functionality. They shall first be verified as <OK> by the system itself (BIOS). Before and after burn-in a special test program (CheckIT) shall be run, with test reports printed and saved for each unit.

COMPUTER

Check the BIOS self-test reports and verify that there are no errors.

CD(DVD)-ROM

Verify reading. Test throughput.

HARD-DISK

Verify Read/Write performance. Test throughput.

I/O PORTS

NETWORK

Ethernet 10/100 MB TP: Test connection.

Ethernet 1Gb TP: Test connection

SPEAKER

The frequency of audible alarms is about 750 Hz and the volume is set to the maximum, which gives an audio level of 75 dB at a distance of 1 meter from the ECDIS workstation.

LCD MONITOR

The testing of the monitors must be done PRIOR TO DISMANTLING. If errors are found, the monitor MUST NOT BE OPENED, but returned for warranty replacement.

Back Light

Verify the intensity, both maximum and minimum, to be subjectively within normal range.

Graphics

Verify that there are no 'hanging pixels', cracks, stripes or other visible flaws on the units, by connecting them to a PC running in 1280 x 1024 resolution. Also there should not be any visible 'ghosting' or blurring.

SYSTEM PERFORMANCE

Upon power-up, automatically start the ECDIS software. Test that it is possible to zoom and pan on the maps. Using integrated simulator (functions Dead Reckoning and Simulation active) test that both 'own ship' and 'target ships' move on the map.

FUNCTIONAL TESTS

INDICATORS AND ALARMS

- Disconnect the GPS cable. After the GPS alarm timeout, the GPS alarm is triggered.

- Start the logbook replay function: the GPS indicator is changed to Replay and the normal alarm concerning the replay status is shown.
- In the panel D.R. of the ship's properties dialogue select the simulation mode.

ROUTE ALARMS

- Activate route in the Simulation mode and when the ship arrives to the active waypoint, all active alarms should be triggered.
- Activate route in the Simulation mode and when the ship is out of safety passage the XTE alarm is shown.

CHART ALARMS

- Set display scale twice smaller than the compilation scale of the cell: overscale symbolization and overscale indicator are used.
- More precise cell exists under the ship's position.

TARGET ALARMS

- Plot a manual target close to the ship's position. Enter speed and course of the target and in simulation mode check that CPA / TCPA alarms are generated properly.

S57 CHARTS: TECHNICAL FEATURES

STANDARDS

TheECDIS900 chart kernel comprises several hundred software components that are compliant to the IMO Performance Standard for ECDIS, the IHO Standards S-52 V3.4 / S-57, IEC 61174 Ed.3. , IEC 672288 Ed.1..

ENC

It is impossible to alter the contents of the ENC. If an ENC cell is modified, the ECDIS900 detects the modification and rejects the cell during the installation procedure. Official ENC are converted and stored with a proprietary format. The conversion maintains the precision of the data and does not alter the accuracy of the data.

CHART AREA AND RESOLUTION

The chart area size in ECDIS900 is bigger than 270 * 270 mm.

The pixel size of the screen is about 0.255 mm.

PRESENTATION

The ECDIS900 chart information has been designed to be clearly visible for more than one observer under different light conditions. The symbols are always drawn with the size described in the presentation library V3.4. The character size of the text may be adjusted to be clearly visible. See User Manual for more details.

All superimposed windows are temporary and can be moved and hidden at any time.

The 64 colours used for chart and MMI displays are compliant with S52 Publications.

The redraw of the chart, including scales change or scroll of the chart takes never more than 5 seconds. During the re-generation of the data the display is maintained until the new display is ready for redraw.

DANGERS AND WARNINGS

The Route Checking function (Route Planning and Route Monitoring) checks all dangers inside the safety zone against the ship's draught and air draught. ECDIS senses alarms related to both ENC cells and manual updates. The list is of object classes to be warned about by ECDIS is displayed below:

OBJECT	TYPE	COMMENTS
ACHBRT	ANCHOR	WARNING
ACHPNT	ANCHOR	WARNING
BCNCAR	BEACON	WARNING
BCNISD	BEACON	WARNING
BCNLAT	BEACON	WARNING
BCNSAW	BEACON	WARNING
BCNSPP	BEACON	WARNING
BERTHS DEPTH DRVAL1	BERTHING	DANGER
BOYCAR	BUOY	WARNING
BOYINB	BUOY	WARNING
BOYISD	BUOY	WARNING
BOYLAT	BUOY	WARNING
BOYSAW	BUOY	WARNING
BOYSPP	BUOY	WARNING
BRIDGE HEIGHT VERCCL	BRIDGE	DANGER
BRTFAC	BERTHING	WARNING
CAUSWY	CAUSEWAY	WARNING
CBLOHD HEIGHT VERCLR VERCSA	CABLE	DANGER
CHNWIR	CHAIN	WARNING
COALNE	COAST	WARNING
#CONVYR HEIGHT VERCLR DANGER	CONVEYOR	DANGER
CTNARE	CAUTION	WARNING
CTSARE	CARGO	WARNING

DEPARE DEPTH DRVAL1	DEPTHAREA	DANGER
DEPCNT DEPTH VALDCO	DEPTHCONTOUR	DANGER
DIFFUS DEPTH VALSOU	DIFFUSOR	DANGER
DRGARE DEPTH DRVAL1	DREDGEDAREA	DANGER
DRYDOC	DOCK	WARNING
FAIRWY DEPTH DRVAL1	FAIRWAY	DANGER
FLODOC	DOCK	WARNING
FSHFAC	FISHING	WARNING
FSHHAV DEPTH VALSOU	FISHING	DANGER
GATCON DEPTH DRVAL1	GATE	DANGER
HULKES	HULK	WARNING
ICNARE	INCINERATION	WARNING
ITDARE	INTERTIDAL	WARNING
LIGHTS	LIGHT	WARNING
LITFLT	LIGHT	WARNING
LITMOI	LIGHT	WARNING
LITVES	LAND	WARNING
LNDPLC	LAND	WARNING
LNDSTS	LAND	WARNING
LOGPON	POND	WARNING
MONUMT	MONUMENT	WARNING
MORFAC	MOORING	WARNING
MSTCON	MAST	WARNING
OBSTRN DEPTH VALSOUN	OBSTRUCTION	DANGER
OFSPLF	PLATFORM	WARNING
OILBAR	BARRIER	WARNING
PILPNT	PILE	WARNING
PINGOS	OBSTRUCTION	DANGER

DEPTH VALSOU		
PIPOHD HEIGHT VERCLR	PIPELINE	DANGER
PIPSOL DEPTH DRVAL1	PIPELINE	DANGER
PONTON	PONTON	WARNING
PRDINS	INSTALLATION	WARNING
PYLONS	PYLON	WARNING
RESARE	RESTRICTION	WARNING
RSCSTA	RESCUESTATION	WARNING
RTPBCN	BEACON	WARNING
SLCONS	CONSTRUCTION	WARNING
SLIPWY	SLIPWAY	WARNING
#SOUNDG DEPTH VALSOU	DEPTH	DANGER
#SPLARE	SEAPLANES	WARNING
SWPARE DEPTH DRVAL1	SWEPTAREA	DANGER
TELPHC HEIGHT VERCLR	HEIGHT	DANGER
TOWERS	TOWER	WARNING
TSELNE	TRAFFICZONE	WARNING
TSEZNE	TRAFFICZONE	WARNING
TSSBND	TRAFFICZONE	WARNING
UWTROC DEPTH VALSOU	OBSTRUCTION	DANGER
WIRLNE	WIRE	WARNING
WRECKS DEPTH VALSOU	WRECK	DANGER
ZEMCNT	ZEROMETER	WARNING
dnghlt	DANGERZONE	DANGER
vessel	VESSEL	WARNING
aistar	VESSEL	WARNING

TIME DEPENDENT WARNING

Each ENC object may have a time dependent behaviour. A specific object can be dangerous during a limited period of time starting and ending at times specified by the data producers.

ACCURACY

The accuracy of calculations performed by ECDIS is independent of the characteristics of the display and the calculation error is always less than the data accuracy of the most accurate SENC. The resolution of the screen gives the limits of the accuracy of the displayed bearings and distances.

Input Output

IEC 61162-1 COMPLIANCE STATEMENT

ECDIS900 digital interfaces meet all requirements of IEC 61162-1.

Sensor Monitor is the application, which manages the I/O for ECDIS.

Sensor Monitor is automatically launched when the system starts and runs in parallel with ECDIS. With Sensor Monitor, the user selects the type of communication (Serial or Network), configures the input media, checks the input and the communication status, selects the Master parameters and eventually route data to other receivers.

To bring to front Sensors_Monitor, click on the icon Switch to SMonitor in the tool bar **SM** .

Hardware a and connections are described in the paragraphs Hardware and Connections.

To customise the I/O according to the sensors connected to the PC, the technician must create new sensors and adjust **settings**.
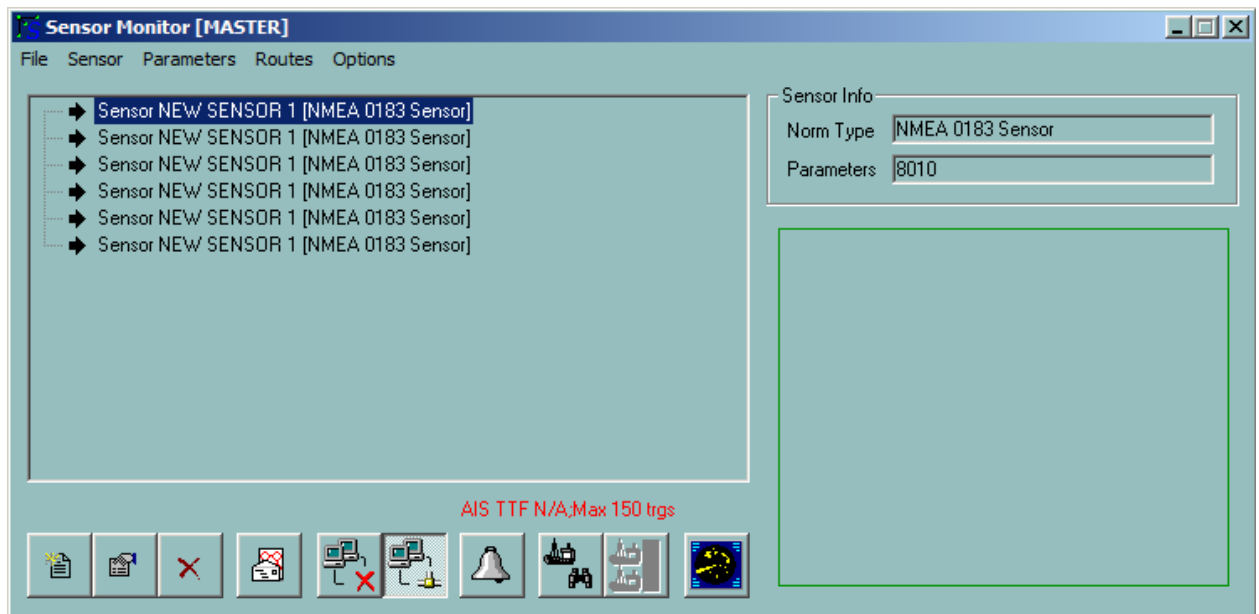
Main Window

Icon	Description
	Create new sensor (by default, NMEA 0183 sensor; media type – serial; COM1; 8N1)
	Open sensor configuration window for selected

Delete selected sensor

Send route from ECDIS user data folder to GPS or radar

Local Mode. Forces Sensor Monitor to send all data locally

Broadcast mode. Sensor Monitor will broadcast all data unless settings for those data demand other method. See below for details.

Browse alarm journal

Switch on/off AIS target filtering
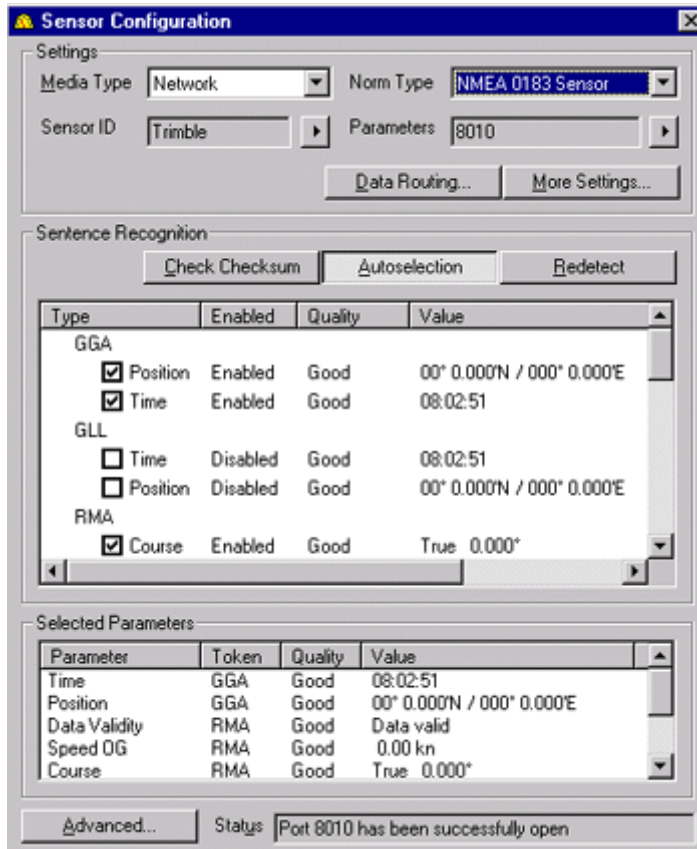
Change AIS target filter range

Activate/deactivate radar target tables

SENSORS

SENSOR CONFIGURATION

To configure a newly created sensor select a sensor and push the button

The Configuration dialogue is used to:

- Modify the communication and sensor **settings**
- List the input messages **automatically selected**
- To access advanced functions to eventually adjust the selection of input messages.
- **Check the communication** with the terminal window and the serial status.

REMARK: Sensor Monitor can accept the same data type from different sensors but only the data master is used in ECDIS.
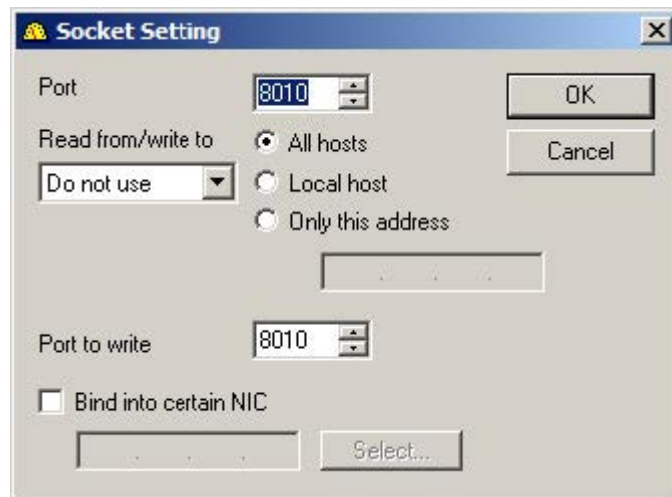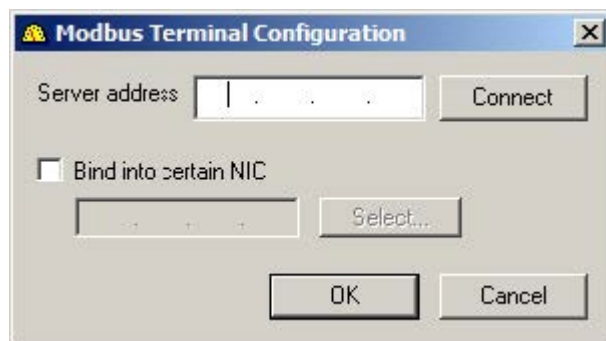
SETTINGS
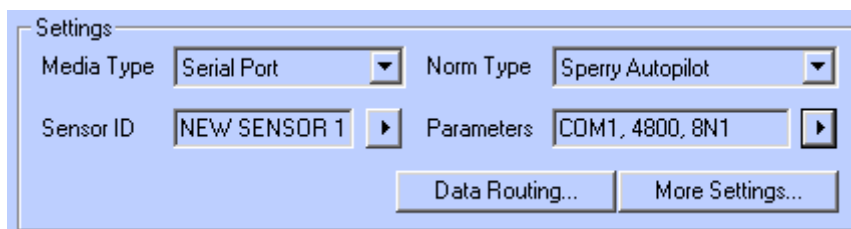
- **Media type:** select between serial port of Network with the pop up menu
- **Sensor ID:** press the arrow and enter a proper name for the sensor.
- **Norm:** select the type of norm used for the communication with the sensor.
- **Parameters:** adjust the parameters Port number, baud rate, parity, stop bits for serial interface or the socket port for LAN communication.

MEDIA TYPE

- Serial communication: Select the COM port and parameters
- Network: data are read and sent to selected UDP ports. In general case, input and output ports are different. Reading can be optionally filtered by sender IP address. Writing can be sent broadcast, multicast, locally or to the certain IP address.

- File, Internet, NC Node Manager: Use only by technician
- Modbus: Modbus is a protocol used for communication with complicated hardware such as programming logic controllers. SMonitor can work with Modbus only by TCP.

Settings:Remote host IP

DATA ROUTING

Data received on a selected serial port can be routed on the Network to a specified IP Port. This advanced function allows other applications to use the same raw data received on the serial port.

MORE SETTINGS

Depending on the selected norm additional settings may be required:

- **NMEA 0183:** use the option when a GPS is connected to set up the route transfer between ECDIS and the GPS
- **E/T Target Output:** targets acquired by Maris PC Radar Kit can be sent on serial line with NMEA format. Then target table can be used by another application.
- **Lehmkuhl Gyro**.
- **AIS Transponder**. Adjustment may be necessary during installation.
- **NMEA Gyro Emulator**. Sensor Monitor can be used as Gyro repeater.
- **Network repeater** may be used when several PCs run ECDIS.

REMARK

Other norms are related to the VDR and are not described in this documentation

AUTO DETECTION

When the adequate norm is selected in the list, NMEA for example, the input data flow is automatically analysed by Sensor Monitor and the different parameters extracted from the sentences (Speed through Water, Wind direction, etc.).

When Auto detection is ON and Sensor Monitor starts, the Sensor Monitor application selects the first valid sentence for each data type. For example, a GGA sentence may be selected for a position.

In order to select another sentence for the same data (GLL for example), it is necessary to set Auto detection OFF and toggle the check box in front GLL.

REMARK

This feature may be used to ignore a specific sentence and data.

CHECKSUM VALIDATION

NMEA-based and NMEA-like protocols provide CRC-based checksum to validate integrity check for all sentences.

Checksum validation increases data reliability but takes some time and resources. For strong and fast data flow (such as AIS) it could be significant.

ADVANCED

The button Advanced allows the user to check an input and output data flow with a terminal window, which displays the raw data acquired on the specified serial port.

The left side of the window displays the input data and the right side the output.
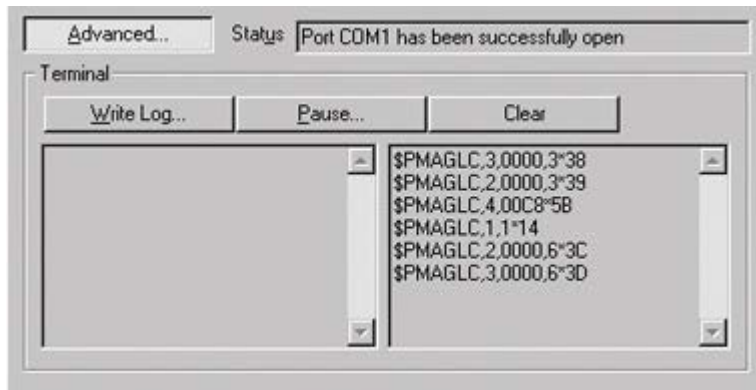
LOG FILES

It is possible to record the input and output data flow and save the data in files for further analysis. Proceed as follow:

- Press **Write log**
- Select Input or/and output
- Browse to get the destination folder and enter a name.
- Press **OK**
- After few minutes Press again Write Log to stop the recording and close the file(s).

COMMUNICATION STATUS

PARAMETER ICONS

- **Green** **circle** indicates that the parameter is correctly analysed.
- **Black circle** indicates that the parameter is either no longer received or is received with errors. (Further checking recommended using Configuration Dialogue)

SENSOR ICONS

- **Yellow** **arrow** indicates that the Sensor is working properly and receives data.
- **Black arrow** indicates that the data source has stopped sending data

MASTER ICONS

- **Master Parameter Indicator ON** indicates that the parameter is the master. This is important when several sensors deliver the same data type.
- **Use for Extractor ON** indicates that the value is sent to the Extractor Tracker board.

MASTER AND SLAVE MODES

Sensor Monitor can work in two modes – Master and Slave. The mode is linked to ECDIS Monitoring and Planning mode, i.e. switching ECDIS from Monitoring to Planning mode switches Sensor Monitor from Master mode to Slave mode automatically.

The Master or Slave mode is important only for the Extractor/Tracker data because the Master Sensor_Monitor sends data to Extractor/Tracker.

LOCAL OR BROADCASTING MODE

Sensor Monitor may be used either in local mode or in broadcast mode.

Local mode means that data acquired by Sensor Monitor are used locally.

In broadcasting mode data are sent on the LAN to be shared with all ECDIS installed on LAN.

REMARK

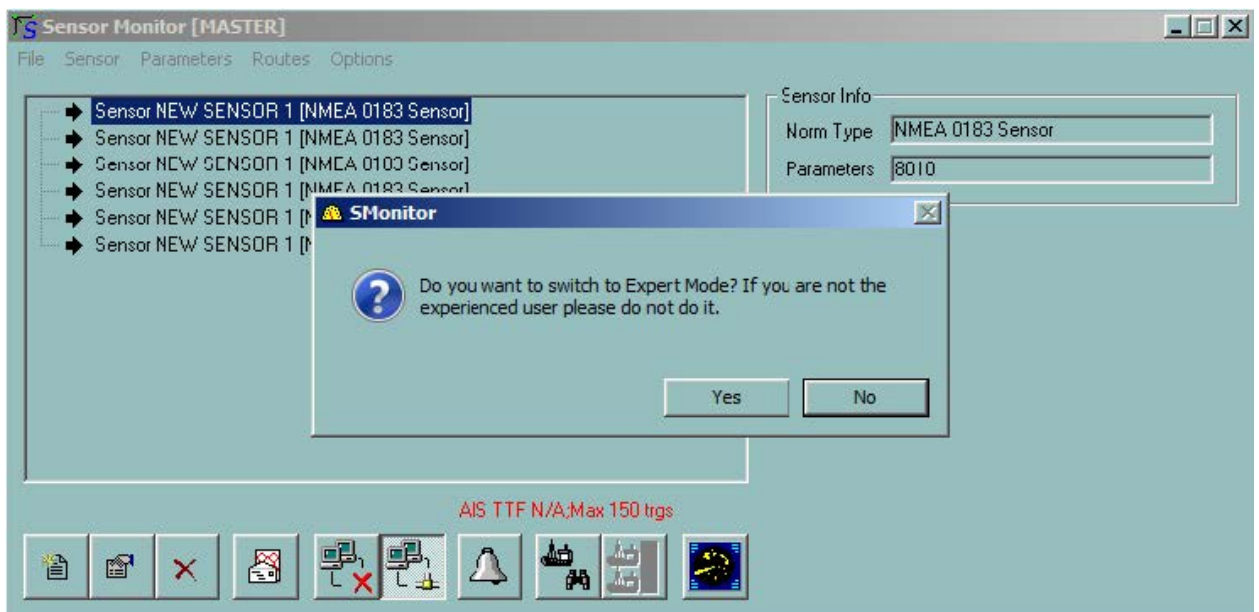The Local mode is set automatically by Sensor Monitor when it detects that there is not network connection or a failure in the LAN connection.
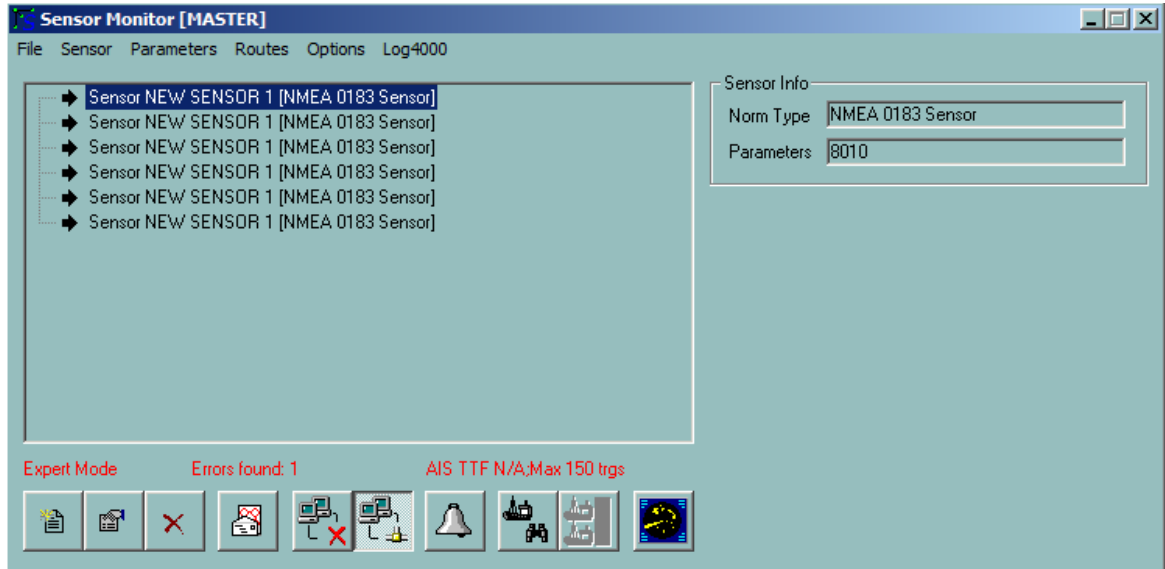
EXPERT MODE

SMonitor can work in two different levels: Basic mode and Expert. To switch from one level to the other, double right click in the grey area in the main window.
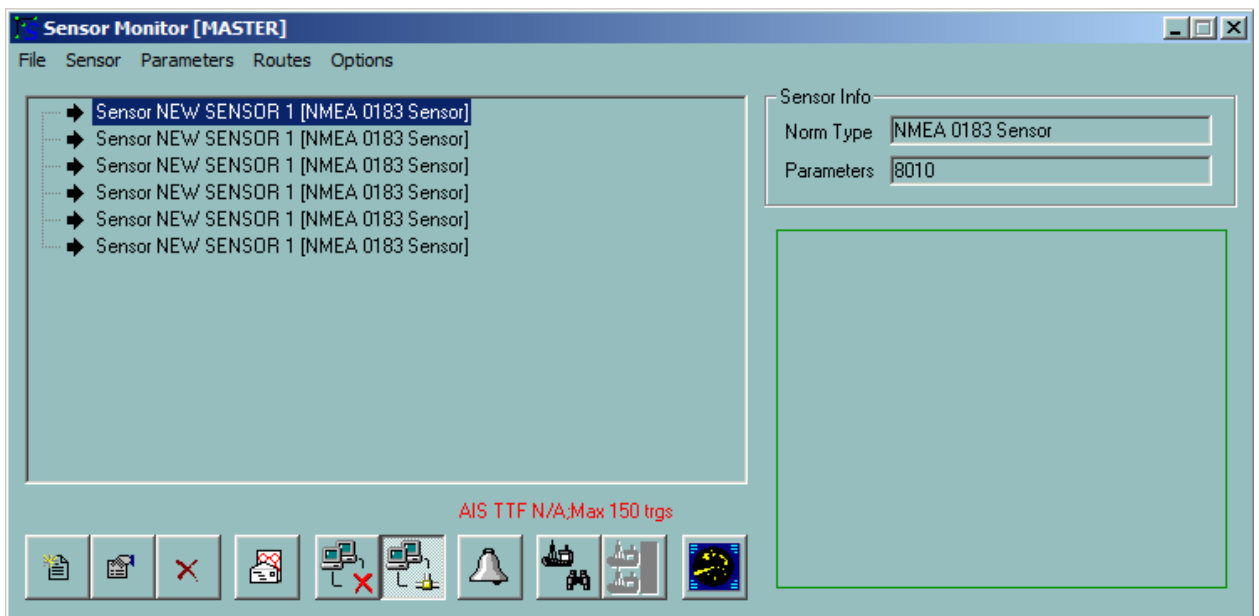
Basic mode with area to click for switching the mode

*Switching dialogue box*

Expert mode

Expert mode offers more possibility to tune SMonitor and is reserved to qualified persons. Restoring default settings for the current page is possible by pressing the button Restore Default.

ALARM LOG

Each significant event is logged into the special Alarms Log. To display the log press the button Alarm Journal located button right of the main window.

GENERAL SETTINGS
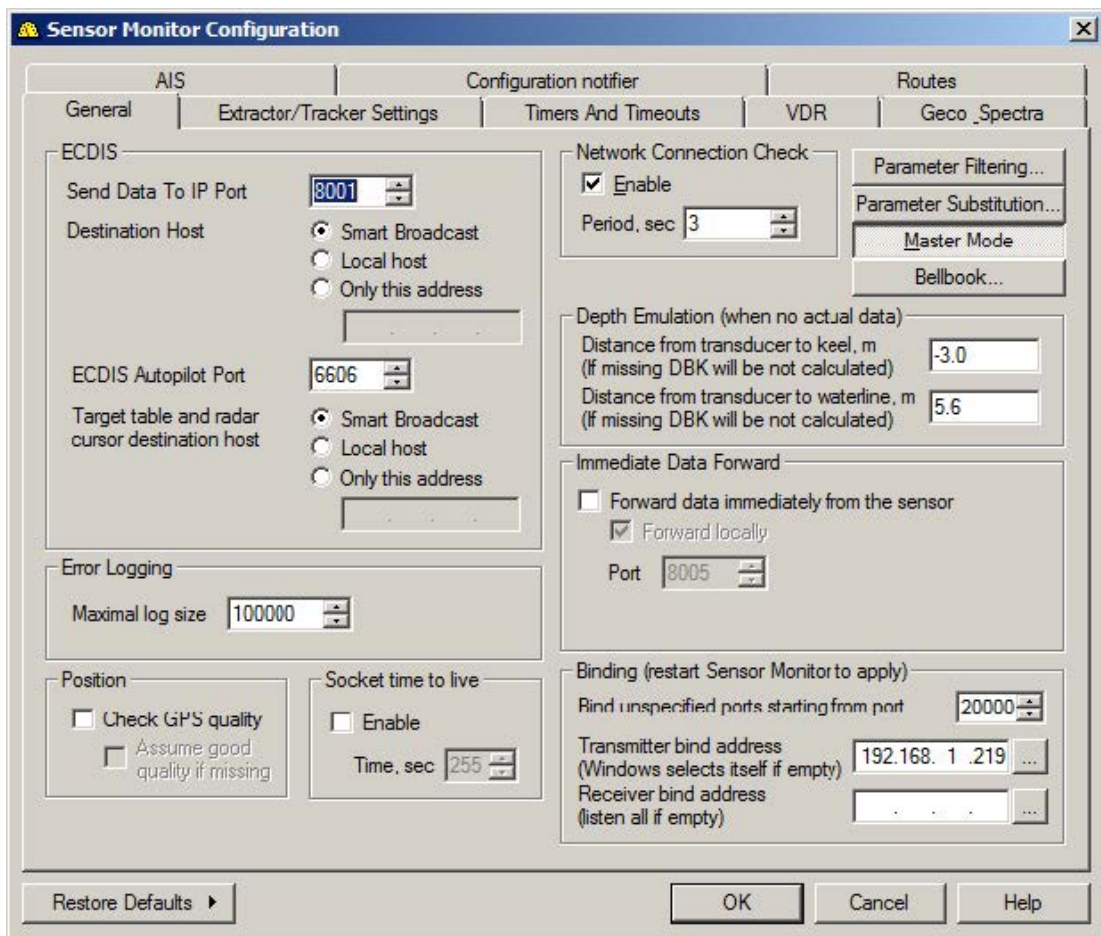
Settings in EXPERT MODE

- **Send data to IP port** specifies main output UDP port to which will be sent parameter data and target tables (non-AIS)
- **Destination host** specifies destination mode for this port. Smart broadcast means that Sensor Monitor will broadcast data if there is network connection, otherwise it sends data to 127.0.0.1.
- **ECDIS autopilot port** specifies port for receiving of different ECDIS feedback (autopilot data and so on). ECDIS always broadcasts these data if possible.
- **Check GPS quality** controls "position quality protection". The position is marked as faulty if there is no GPS quality indicator or if the quality is different from Autonomous or differential. Important: AIS sensor does not send position quality indicator.
- **Assume quality if missing** when ticked forces to assign good quality state to the position when GPS quality indicator is missing but not present and invalid. This allows to use position sources like AIS transponders
- **Socket time to live** allows limiting number of hops between network routers that packets might do. It is possible to disallow packets to be sent outside of certain subnets. This feature is an alternative to multicast groups.
- **Network connection check** specifies if it is necessary or not to check the network connection periodically. If this mode is activated, Sensor Monitor will periodically check the network connection.

- **Depth emulation** allows Sensor Monitor to emulate depth below keel and surface using given offsets in case if there is only depth below transducer.
- **Immediate data forward** sets up special quick data transmission protocol that is used for PC Radar Kit and for some OEM solutions. Activate it only when it is really needed (i.e. PC Radar Kit presents) as it loads LAN traffic. You also can force it to be local only.
- **Bind unspecified ports** sets up how to assign "implicit" (unspecified) UDP ports to avoid collision with other software.
- **Transmitter bind address** and **receiver bind address** (when specified) allows using the only LAN interface card for the computer that has more than one. If these fields are empty, the transmitter and/or receiver will use all LAN cards instead.
- **Parameter filtering** button enters into parameter filtering setup dialog (see above)
- **Parameter substitution** button enters into parameter substitution setup dialog (see above)
- **Master Mode** button switches Sensor Monitor from Master mode to Slave mode and back. This affects immediately ECDIS900.ini file so if ECDIS is running it will be also switched from Monitoring mode to Planning mode and back.
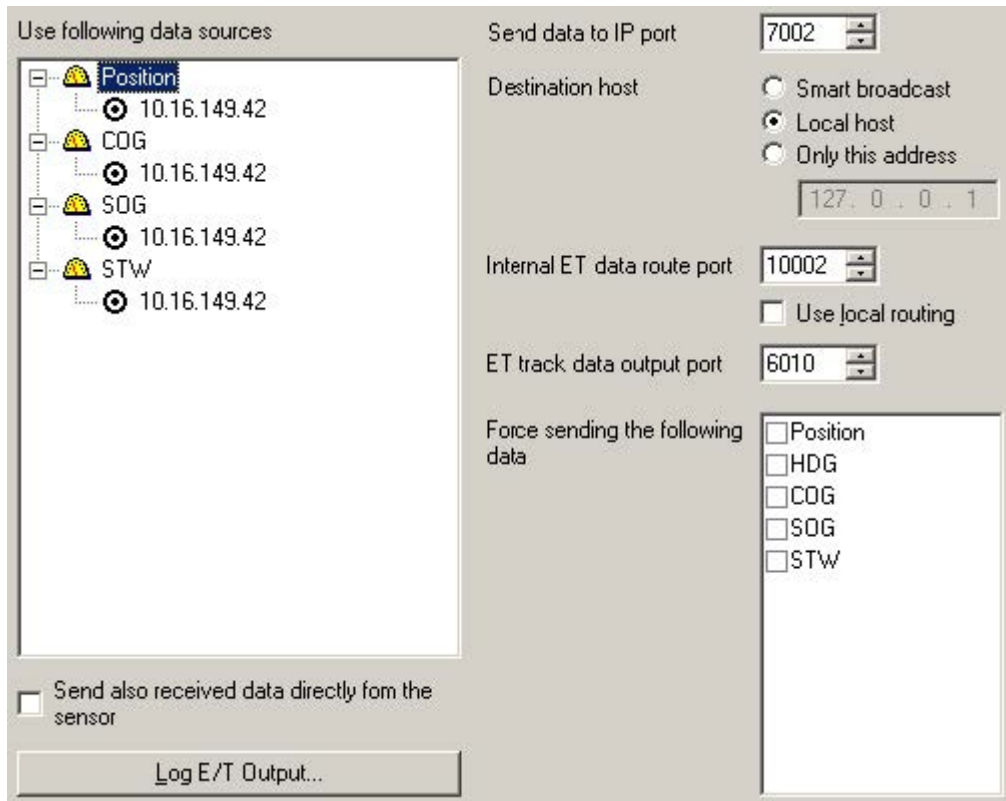
EXTRACTOR/TRACKER SETTINGS

When the Simrad MK6.0 radar interface box is used, Sensor Monitor MASTER is in charge of sending appropriate data to the extractor/Tracker application responsible for radar video delivery.

It collects all information related to Extractor Tracker from other Sensor Monitor applications running on the LAN and sends the appropriate data to the Extractor Tracker board. For instance

The Gyro source is the most important and must be selected as follow: If one Gyro is connected to the Planning station and another Gyro to the Monitoring station, the user has to select which gyro data is used by the Extractor Tracker software. On the Master ECDIS workstation it is necessary to select the source of data for E/T as follow:

- Menu Option, item Settings panel Extractor / Tracker settings.
- Select the sensor that provided the data parameter you want E/T Data Source.
- Expand it if did not expanded already.
- Select the parameter to be selected as E/T Data Source.
- Check on E/T Data Source check box.

Settings in Expert mode

- **Send data to IP** port specifies main output UDP port to which is sent Extractor/Tracker data
- **Destination host** specifies destination mode for this port. Smart broadcast means that Sensor Monitor broadcasts data if there is network connection, otherwise it sends data to 127.0.0.1.
- **Use following data sources** tree shows all usable data presented in the network. Data are grouped first by their kinds and then – by sending host. Only one data of each kind can be chosen. By default Sensor Monitor chooses first coming data of each kind, but the user can change this layout.
- **Send also received data directly from the sensor** specifies if Master or Slave Sensor Monitor that receives some Extractor/Tracker-related data must send them out directly from the sensor (immediately when received) instead of normal data dispatching.
- **Internal ET data route port** specifies UDP port that is used to send Extractor/Tracker related data internally from Slave Sensor Monitors to Master Sensor Monitor. If Local routing is switched on (applicable for standalone installation only) this routing will be completed only for the local PC.
- **ET track data output port** specifies UDP port to read set and drift information
- **Force sensing the following data** allows Sensor Monitor to send some kinds of data even they are not present in the input data flow (in this case data will be filled with zeros).

AUTOPILOT

The ECDIS can be interfaced with standard NMEA compatible auto pilots and with different Track pilots including Emri Track pilot.

WARNING

STANDARD AUTOPILOT
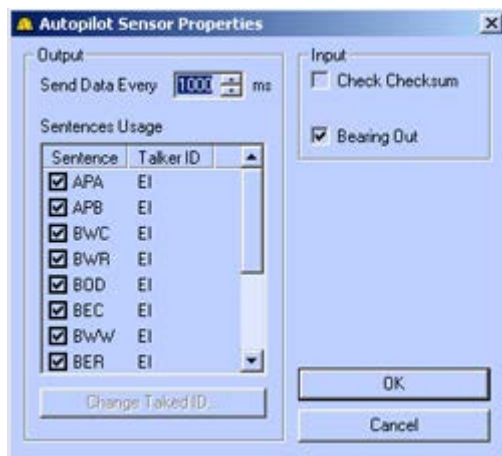
- Select the sentences to be sent to the Autopilot.
- Select the talker ID by double clicking on each output.
- Select another frequency for data sending to the Autopilot.
- Force to check the checksum for each data received from the Autopilot.
- Bearing out parameter to be ignored.

TRACK PILOT

This sensor has been designed to provide the Imtech autopilot with active route information. It receives this information from ECDIS and writes it down into the serial line or UDP port as standard NMEA RTE and WPL sentences.

This sensor is also useful to provide the radar with the active (working) route.
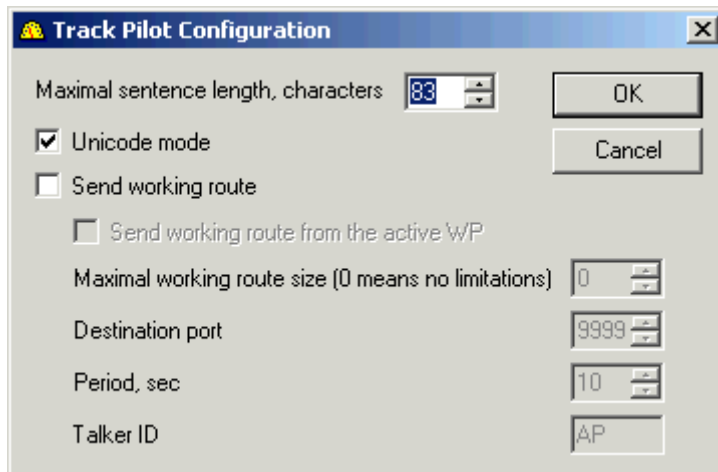
- **Maximal sentence length** specifies the maximum length of each. This defines how many waypoints may be placed into one RTE sentence.
- **Unicode mode** specifies which protocol is used for the communication between ECDIS and Sensor Monitor (UNICODE or ANSI).
- **Send working mode** specifies if Sensor Monitor should mark the producing route as working and send it out to the certain UDP port (in addition to normal route output to the serial line).
- **Send working route** from the active waypoint specifies if Sensor Monitor should not send waypoints of the active route that precede the active waypoint.

- **Maximal working route size** specifies if Sensor Monitor should not send the working route longer than present number of waypoints. All extra waypoints in this case will be ignored and sent , after the active waypoint will be reached and passed.
- **Destination port** specifies port to send route out.
- **Period** specifies how often Sensor Monitor must send the working route out.
- **Talker ID** specifies talker ID for working route NMEA sentences output.

EMRI AUTOPILOT

This sensor is almost similar to Standard autopilot. The only difference is that sensor provides other NMEA sentences set oriented to EMRI autopilot type. The second difference is that autopilot sends some NMEA sentences that inform Sensor Monitor about autopilot state and must be transferred to ECDIS.

List of input sentences: SSA, SSD, ISC

List of output sentences: SSA, SSD, SSX, HSC, HTR, HTC, WFM

PLC AND ADC/DAC

PLC (programming logic controller) could be used for different purposes. They are used as analog-digital converter and input and output relays. That means, PLC is able to measure voltage or current in the electrical chain, recognize the trigger state (high/low voltage level) and generate output trigger signal.

NMEA XDR sentence set belongs to the same sensor group because transducers provide analog signal measurement results or trigger/valve states. So this sensor is described here and uses the same protocol to transfer data.

ALARM RELAY BOX

This sensor is communicating with DigitalLogic PLC DL05. This device has 6 input and 8 output relays that can be queried/scheduled.

Usually DL05 is used as the link between the software and alarm control system such as BNWAS for Dead Man alarm or Alarm buzzer.

The sensor accepts from ECDIS current alarm status and if the status is non-zero, the sensor switches output relays into "alarm on" state.

When the user presses "Acknowledge" button in ECDIS, the sensor switches output relays into "Acknowledge alarms" state. Normally the installer must use this state to signal hardware alarm system to clear any alarm sound. This state will be kept for some given time and then cleared again.

Optionally the sensor can switch output relays into "Deadman alarm" state. This happens when nobody from officers on duty touches ECDIS for some certain period. Note that Application Manager must be installed and configured on the same computer.

Optionally the sensor can query periodically input relays (that can be connected to "acknowledge" or "horn off" buttons of the hardware alarm system). If they are shorted, the sensor will force ECDIS to acknowledge alarms. Note that this feature works only if the user has created and configured "NMEA alarms generator" sensor.
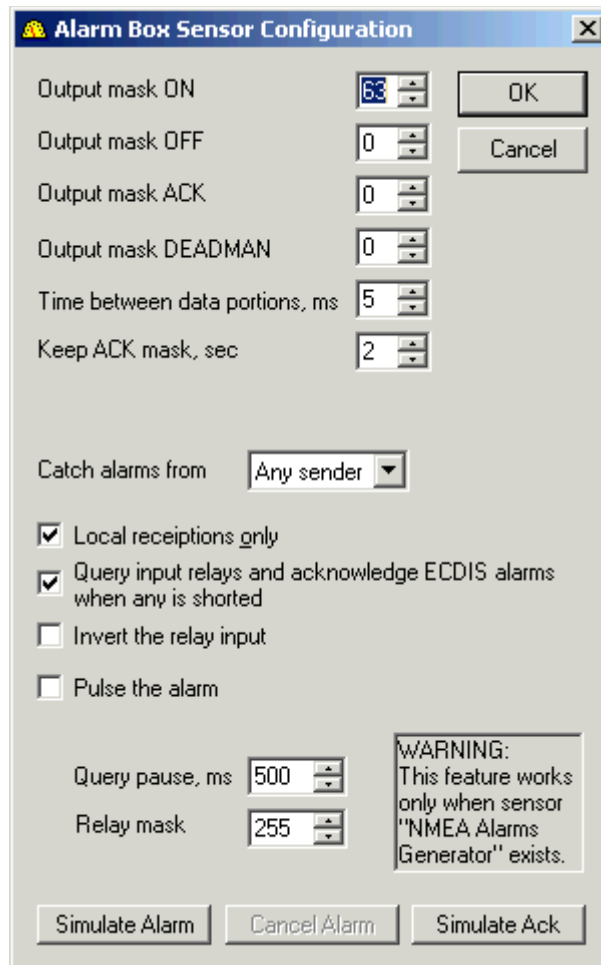
Advanced configuration dialog

- **Output mask ON** specifies which relays have to be shorted when Sensor Monitor is informed of unacknowledged alarms. This value is a mask where bit 0 represents relay №1, bit 1 represents relay №2 , etc. Value 63 means that all 6 output relays have to be shorted.
- **Output mask OFF** specifies which relays have to be shorted when Sensor Monitor is informed that there is no unacknowledged alarm.
- **Output mask ACK** specifies which relays have to be shorted when Sensor Monitor is informed that user has pressed acknowledge button.
- **Output mask DEADMAN** specifies which relays have to be shorted when Sensor Monitor is informed that nobody from the watch has touched any button of the navigational computer for some certain time.
- **Time between data portions** specifies how often sensor should send control signals to the PLC.
- **Keep ACK mask** specifies how long Sensor Monitor should keep ACK state. After this time PLC will be reverted to OFF state.
- **Catch alarm from** specifies from which software must Sensor Monitor receive and take into account alarm state. Alarm state received from other software will be ignored. If the user chooses "any sender" Sensor Monitor will accept any alarm state.

- **Local receptions only** specify if Sensor Monitor should ignore any alarm-related information received from other PCs.
- **Query input relays and acknowledge ECDIS alarms when any is shorted** ticked on means that Sensor Monitor query input relay(s) connected to "acknowledge" or "horn off" buttons of the hardware alarm system; in case the buttons are pressed, the SM forces ECDIS to acknowledge all its alarms.
- **Invert relay inputs** specifies if the relay is open when "acknowledge" or "horn off" buttons are pressed, and shorts the relay(s) inversely.
- **Pulse the alarm** specifies if Sensor Monitor must make short pulse when it receives information that "acknowledge" or "horn off" buttons are pressed.
- **Query pause** specifies how often Sensor should query input relays.
- **Relay mask** specifies which input relays must be queried.
- **Simulate alarm, Simulate Ack and Cancel Alarm** buttons imitate certain situation.

EXPORT/IMPORT ROUTES TO/FROM GPS

To export and import routes to or from a GPS it is necessary to activate the export function and select the format for the data transfer. The protocol can be different from one GPS to another. To activate the route transfer function select the GPS type by pressing the button More Settings in the Configuration window of the GPS port and select the format with the pop up menu Route Download.

IMPORTANT

The two ways communication between ECDIS and GPS requires a three wires RS 232 connection (Rx, Tx and Ground) or RS 422 connection.

RECEPTION IN ECDIS

The routes sent from the GPS are automatically converted to ECDIS format and placed in the Route/GPS folder and then can be loaded on the chart.

Two different types of route can be sent from GPS: active route or a complete route. The first waypoint of an active route sent to ECDIS is the active waypoint.

- When an active route is received by the ECDIS, it is stored in the route database and automatically loaded and activated in the ECDIS.
- When a non acitve route is received it is stored in the database but not loaded automatically.
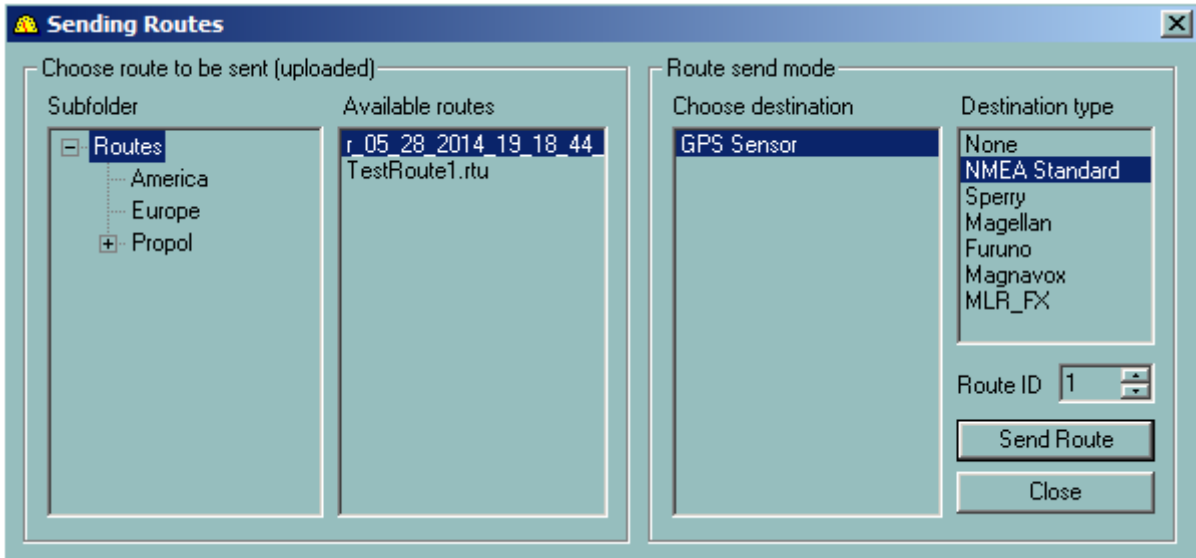
SENDING ROUTES FROM ECDIS

The routes created in ECDIS can also be sent to the GPS.

Press the button and select the route, the available serial port and the address.

The route is sent by default an integer as route name and each waypoint ID of the route is identified by an integer starting at 0.

Additional Hardware

MOXA SERIAL INTERFACE

DESCRIPTION

Both hardware platforms provide four or eight optical isolated RS422 serial ports for communication applications in difficult environment. Serial card holds four or eight serial ports, which are optically isolated and support the serial communication types RS-485 and RS-422.

Smartline Mk6 has two onboard 16C550 UARTs (on-chip 16-byte FIFO buffers) making serial I/O more reliable. By buffering data into 16-byte packets before putting it on the bus the UARTs drastically reduce the CPU load. This makes the interface especially suitable for high speed serial I/O applications under MS Windows.

On-board optical isolators protect the PC and equipment against damage from ground loops to increase system reliability in harsh environments.

MOXA CP-134, 4-PORT RS232/422/485 SERIAL PCI-BOARD

MOXA CP-134 Series of Smart Multiport Serial Boards is designed by Moxa for Industrial Automation system integrators for long distance, multi-point PC-based data acquisition.

On-chip Automatic Data Direction Control for Precision RS-485 Communication

RS-485 communication requires precise timing control for line driver enable and disable. Powered by Moxa's Turbo Serial Engine™ chip that comes with on-chip ADDC™, sending RS-485 packets over CP-134 is as easy as using RS-232.

RS-485 multidrop for up to 31 devices within 1.2 km

CP-134U V2 Universal PCI Multiport Serial Board provides 4 RS-422/485 serial ports, each capable of data rates up to 921.6 Kbps. In RS-485 mode, the serial port can connect up to 31 daisychained RS-485 devices within a range of 1.2 km. For long distance RS-485 communication, optional 2 KV isolation protection is available (CP-134) to prevent equipment damage.

Features:

- Over 700 Kbps data throughput, for top performance in the world 4-port RS-422/485 interface with ADDC™ and up to 921.6 Kbps 2-wire/4-wire RS-485 communication up to 1.2 km
- Built-in 15 KV ESD and optional 2 KV optical isolation protection 128-byte FIFO and on-chip H/W, S/W flow control
- Universal PCI compatible with 3.3/5V PCI and PCI-X
- Windows 7/XP/, Linux, Unix driver support

Dimensions and layout
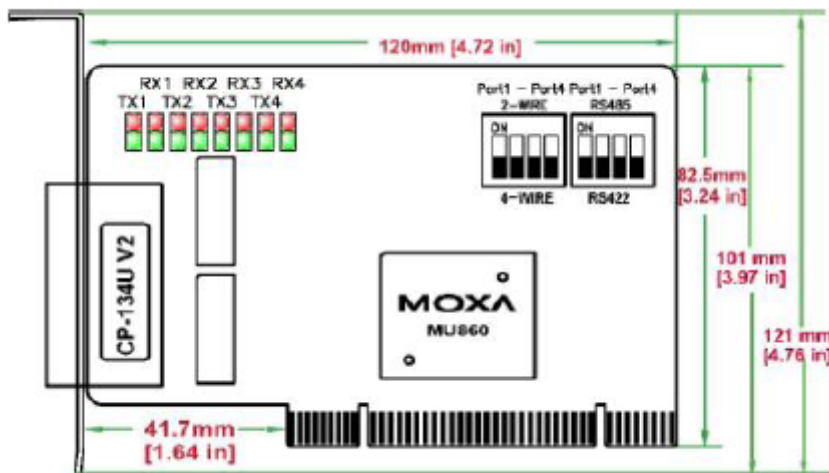
Connection Options

DB44 to DB25 Male x 4   DB44 to DB9 Male x 4
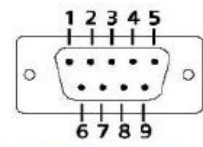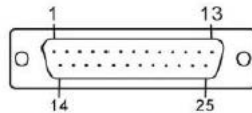

PIN	RS-232	RS-422	4W RS485	2W RS-485
2	TxD	RxD+(B)	RxD+(B)	Data+(B)
3	RxD	TxD+(B)	TxD+(B)	
4	RTS	RTS+(B)		
5	CTS	CTS+(B)	---	---
6	DSR	RTS-(A)	---	---
7	GND	GND	GND	GND
8	DCD	TxD-(A)	TxD-(A)	---
20	DTR	RxD-(A)	RxD-(A)	Data-(A)
22	---	CTS-(A)	---	---

PIN	RS-232	RS-422	4W RS485	2W RS-485
1	DCD	TxD-(A)	TxD-(A)	
2	RxD	TxD+(B)	TxD+(B)	
3	TxD	RxD+(B)	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	RxD-(A)	Data-(A)
5	GND	GND	GND	GND
6	DSR	RTS-(A)	---	---
7	RTS	RTS+(B)	---	---
8	CTS	CTS+(B)	---	---
9	---	CTS-(A)	---	---

Specifications

Bus Interface	32-bit Universal PCI
Number of Ports	4
Max No. of Boards	4
I/O address/IRQ	BIOS assigned
Comm. Controller	MOXA UART (16C550C compatible)
Baud Rate	50 bps to 921.6 Kbps
Data Bits	5, 6, 7, 8
Stop Bits	1, 1.5, 2
Parity	None, Even, Odd, Space, Mark
Flow Control	RTS/ CTS, XON/ XOFF
RS-232	TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422:	TxD+(B), TxD-(A), RxD+(B), RxD-(A), RTS+(B), RTS-(A), CTS+(B), CTS-(A), GND
4-wire RS-485	TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND

2-wire RS-485	Data+(B), Data-(A), GND
Connectors	DB44 Female
Surge Protection	Embedded 15 KV ESD Surge Protection
Optical Isolation	2KV (CP-134U-I V2)
CP-134U V2	180mA(+5V)
CP-134U-I V2	850mA(+5V)
Operating Temperature	0 to 55°C
Storage Temperature	-20 to 85°C
Humidity	5 to 95% RH
Dimensions (W x D)	120 x 82.5 mm (4.72 x 3.24 in)(CP-134UV2) 120 x 115 mm (4.72 x 4.52 in) (CP-134U-I V2)

ME-9001 (PCI CARD)

The Multi Port Serial Board, type ME-9001 (PCI card) offers the possibility to use 8 opto isolated serial port RS 485 or RS 422.

The card is tested according to IEC60945, as a part of the Marine PC, which is used for the ECDIS.

Specifications

Data transmission

Interfaces	• ME-9100i RS232: RS232 with handshakes • ME-9100i RS485: RS422, RS485 half-duplex, RS485 full-duplex
Ports	4 or 8
Baud rates	75/110/134/150/300/600 baud,1.2/1.8/2.4/4.8/7.2/9.6/14.4/19.2/38.4/57.6/115.2/128/230.4/460.8/921.6 kBaud
Data bits	4..8
Parity	No, even, odd mark, space
Stop bits	1, 1.5 or 2
Protocol	Xon/Xoff, hardware, no
UART Type	Multiple UART(s), register compatible with 16550, with integrated send and receive FIFOs per port
FIFO size	128 bytes each
Isolation	All lines: Opto-isolation up to 500 V

General Data

Bus interface	32 bit/33MHz StandardPCI bus or PXI/CompactPCI bus. PCI Local Bus 2.1 compatible
Size(mm)	PCI: 136x99; PXI/Compact PCI: 160x100 (# U Europa card standard)
Connectors	78-pin D-sub female; depending on version split/breakout cable with 4x/8x 9-pin D-sub male included.
ESD protection	Up to 15 kV(IEC 1000)

CONNECTION AND CABLING

The connector provided on the delivered data cable is a standard 9-pin 'D' connector as used on computers. If there is an unused 9-pin serial port on the computer, then simply plug in the cable. If the computer's serial port is the 25-pin type, an inexpensive adapter is available at any store that sells computers and accessories.

It may be necessary to turn on NMEA data output. Refer to the GPSs instruction manual.

- Set the datum to WGS84. Refer to the GPS instruction manual.
- Connect a GPS directly as follows:

Computer cable	GPS
RX(red)	Data to Computer (RX). Connect to the NMEA+ output which may be labelled TX, TX+, Data Out+ or NMEA OUT+ depending on the GPS model
TX (White)	Data from Computer (TX). Not Connected
GROUND (green)	Signal Ground. Connect to the NMEA- output, or if there is no NMEA- output, connect to the ground on the GPS instead. It may be labelled TX-, Data Out-, NMEA OUT- or Ground, depending on the GPS model

If a standard 9-pin 'D' connector is used, connect the device as follows:

Computer cable	Connector
RX +	Pin 2
GROUND	Pin 5

RS422 CABLING

If the electronic equipment is compliant to RS422 type electrical characteristics, use a standard 9-pin 'D' connector as used on computers and connect the device as follows:

Computer cable	Connector
RX +	Pin 1
RX -	Pin 2
GROUND	Pin 5

If the computer's serial port is the 25-pin type contact the dealer.

SERIAL NMEA RADAR CONNECTION

To display ARPA targets, the radar must output either the NMEA TLL or TTM strings. To use this feature, ensure the radar is correctly tracking ARPA targets before attempting to connect it to the ECDIS.

Connections to the radar system are as follows:

Computer cable	NMEA Radar
RX	Data to Computer (RX). Connect to the NMEA+ output which may be labelled TX, TX+, Data Out+ or NMEA OUT+depending on the radar
TX	Not Used

Ground	Signal Ground. Connect to the NMEA- output, or if there is no NMEA- output, connect to the ground on the radar instead. It may be labelled TX-, Data Out-, NMEA OUT- or Ground, depending on the radar.

It may be necessary to turn on NMEA output. Refer to the radar systems instruction manual.

DATA TRANSMISSION

ECDIS is able to accept different norm for the data in particular NMEA183 (4800 bps, 8 data bits, No parity, 1 stop bit).

ECDIS is also compatible with:

- YokogaviCMZ300x (4800, 8, N, 1)
- ATLAS ARPA(4800, 8, N, 1)
- Lehmkuhk (9600, 8, N, 1)
- ARPA Sperry (1200, 8, N, 1)

The first bit is a start bit and is followed by data bits least significant bit first.

DATA FORMAT PROTOCOL NMEA

Implementation of the NMEA data analysis has been made in ECDIS according to the standard document Standard For Interfacing Marine Electronic Devices Version 2.1, edited by the National Marine Electronics Association.

All transmitted data are interpreted as ASCII characters. The null character is not used.

The NMEA sentence contains the following elements:

$ <Talker> <, data field> <, data field>, ...< Check Sum> <CR> <LF>.*

Different fields are separated by delimiters "," and consist in a string. The checksum field may be transmitted in any sentence.

POWER SUPPLIES

UPS

ECDIS ON FLAT PANEL PC OR SPLIT SOLUTION

Two different UPSs are offered, depending on the user's requirements. The UPS protects the ECDIS computer from basic power problems: power failure, power sags and power surges. It safely eliminates the effects of power disturbances and guards the integrity of ECDIS equipment.

The UPSs are "plug and play", but can be controlled via a serialport.

Both offered UPSs are EN60945 compliant and manufactured by MGE UPS System.

SPECIFICATIONS OF THE MGE UPS SYSTEMS, MODEL PULSAR EVOLUTION 800 MARINE.

- Power (VA/W) 800/560
- MIni-Tower version, vertical or horizontal
- Number of IEC 320 Outlets: 4
- Part number 66 239

Performances

- Technology High-Frequency Line-Interactive
- Automatic voltage regulation Booster/Fader
- Output voltage waveform Sinewave
- Input voltage tolerances 160V/294V, adjustable to 150V/294V via supplied UPS-Driver software
- Frequency 50/60 Hz, auto-select
- Output voltage on battery power 230V (adjustable to 200/220/240V via supplied UPS-Driver software)

Features

- Automatic battery test Weekly (interval adjustable via supplied UPS-Driver software)
- Hot swappable batteries
- Cold start
- Deep discharge protection
- UPS-Driver for Windows® Settings: Input voltage tolerances,
- Sensitivity, Battery test, ON/OFF conditions

Standards

- Safety EN 50091-1-1/EN60950(RD),IEC 60950,Tüv
- GS-Mark, IEC 60 945
- Electromagnetic compatibility EN 50091-2,EN 50022/B,IEC 62040-2,IEC
- 61000-3-2,IEC 61000-3-3, IEC 60 945
- Design, production and services ISO 9001
- Marking CE, TÜV GS-Mark, DnV
- Dimensions and weight
- Tower dimensions (HxWxD in mm) 150x237x415
- Tower weights (in kg) 10.5

SPECIFICATIONS OF THE MGE UPS SYSTEMS, MODEL PULSAR EXTREME C RACK MARINE 1500.

- Power (VA / Watts) at full load 1500 VA / 1050 W
- # of receptacles 6 w/ 2 switchable
- Part Number UPS + EMC filter 66 353 + 5102174900
- Part number extra battery module 66 356
- Part number alarm card (dry contacts) 66 246

Features Benefits

- True On Line Technology (1) Utility power is constantly conditioned within very tight limits without draining the batteries
- Smart battery management The built-in microprocessor optimizes the charging sequence to prolong battery lifetime
- Complete front panel display Check the battery or capacity levels for peace of mind. Get valuable information on the UPS status and operating parameters.

- Hot-swappable batteries Faulty batteries can be replaced on site without interrupting power to the application
- Sinewave output Total compatibility with any kind of PC power supplies or other ship electronic equipment
- Fault tolerant mode (automatic bypass) Increased availability, as the application will not be affected should the UPS fail
- Frequency management 50/60 Hz or 40-70 Hz Works default on 50 / 60 Hz frequency (auto (special ship feature) select) without draining batteries. Can be easily adjusted to accept 40 – 70 Hz (max. half load) without draining batteries, or drop load.
- Suitable for frequencies powered from ship genset.

Environment

- Acoustic noise 40dBA
- Operating temperature -15 deg. C. to 55 deg. C. (IEC 60 945)

Standards

- performance EN 50091-3 / IEC 62040-3
- safety EN 50091-1, EN 60950, IEC 60945
- EMC EN 50091-2/IEC62040-2, EN 50022/B, FCC 47 Part 15- subpart B - class A, IEC 60 945
- IEC 61000-4-2/-3/-4/-5/-6/-8/-11, IEC 61000-3-2/-3
- Marking and certifications CE, TÜV/GS, UL, cUL, C-Tick, DnV
- Design and manufacturing ISO 9001

Dimensions (HxWxD in mm) and weight (Kg)

- Dimensions 132(3U)x482,6x493
- UPS weight Rack + filter 22
- Pulsar EXB battery extension weight 27,5

Battery Runtimes

- All values shown 1500 C
- are in minutes Full load/Half load
- Base module 6/19
- EXtreme C + 1 battery pack 24/79
- EXtreme C + 2 battery packs 43/119
- EXtreme C + 3 battery packs 62/168

VIDEO

- Efficiency: above 85%
- High Power Density: over 7 watts/inch.
- Ultra Miniature Size: 2" x 4" x 1"
- Lightweight: 6 ounces
- Input Voltage: 90 - 132 / 180 - 264 VAC
- FCC & CISPR Class B EMI filter
- Operating Temperature: 0 to 50 C

- Convection Cooled
- Reliability: MTBFs above 100,000 hours
- Meets Worldwide Safety Standards
- CE Marked

COMPUTER

- Efficiency: above 85%
- High Power Density: over 7 watts/inch 3
- Ultra Miniature Size: 3" x 5" x 1"
- Lightweight: only 10 ounces
- Input Voltage: 90 - 264 VAC, Single Phase
- FCC & CISPR Class B EMI Filter
- Over Voltage Protection
- Operating Temperature: 0 to 50 C
- Convection Cooled
- Reliability: MTBFs above 200,000 hours
- Meets Worldwide Safety Standards
- CE Marked

PRODUCT MARKING

MARIS SMARTLINE MK10

Made in	Norway
Serial number	xxxxxxxx
Safe compass distance	5 meters
Input Voltage	230V AC / 3.2 A
Type Approval	CE Wheel Mark

Indoor use only according to Lloyds ENV2

To be mounted only with the manufacture supplied devices. Refer to manual for proper installation.

Application Manager

GENERAL

Application Manager is the special software which works as Shell on the computers.

Application Manager is well specialized for the tasks. At the same time, Application Manager gives the administrator the minimal set of required system functions in order to restrict access to the system.

The application runs in two modes:

- Full access mode
- **Approval mode**

APPROVAL MODE

ECDIS computer access is restricted to necessary function for ECDIS and others delivered applications allowed after configuration.

In this mode, it replaces Windows Explorer and takes some important functions which improve the reliability of the software.

In Approval Mode all standard shortcuts except some of them which are used in the applications are unavailable. Ctrl-Alt-Del is disabled too.

Reboots, locks or switches off PC if necessary

VIEW AND ADMINISTRATOR LEVEL MODES

VIEWS MODES

Application Manager can work in two different view mode:

- Iconic (collapsed Small Square or Thin Bar on the right)
- Full (bar window).

Application Manager can run in 2 security level mode :

- Operational mode (restricted access)
- Administrator mode (full access)

Views modes

APPLICATION MANAGER ICONIC VIEW

### DISPLAY

Iconic view is normal state of the program.

2 iconic representation are available (option available during installation):

- Movable icon. This icon can be placed trough the screen at any position. The last position is remembered

- Small bar on the right part of the screen.

MENU

Double Click or Right Click + Menu "Open Application manager" on the icon/bar to get access to Application Manager full window, 2 possible modes : Operational and Administrator.

Operational mode menu   Action
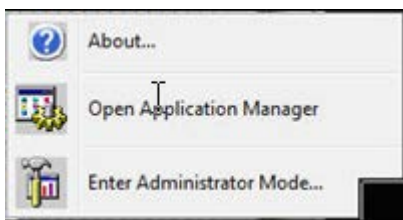
Show information about the program

Open Application Manager window in Full View Mode

Change to Administrator mode: Password is required

Administrator mode menu   Action

Show information about the program

Activate File Browser (manage files and folders)

Activate Network Browser (manage remote computers and shared resources)

Activate Data Browser (analyze MARIS internal data protocols)

Open Application Manager window in Full View Mode

Run Task Manager

Switch to Operational Mode

Stop the software (not recommended)

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APPLICATION MANAGER FULL VIEW

Full view gives the user maximum power of the program. The icon is transforming into vertical-oriented window which has 4 main areas – button area, system tray and two task lists – Approved Tasks and Additional Tasks. If the user moves the mouse out of window and keeps it there more than 3 seconds, the window will be collapsed back to Iconic view.

Normal mode   Administrator mode

SECURITY LEVEL MODE

OPERATIONAL MODE

	Reboot PC	Reboot Computer button

	Switch off PC	Switch off computer
	Security settings	Open Security Settings dialogue

In the Operational Mode Application Manager completes the following functions:

- acts as a shell.
- keeps all Approved Applications running; if some of them crash it restarts them; if some of them will be frozen it restarts them too.
- shows all enabled applications in System Tray (see Security Settings dialogue)
- controls the the applications protection system (each application is password-protected during Approval Mode)

ADMINISTRATOR MODE

	Reboot PC	Reboot Computer button
	Switch off the PC	Switch off computer
	Security settings	Open Security Settings dialogue
	AM Settings	Open Administrative Settings dialogue
	Run external programs	Run an external application using Windows Run dialogue

In the Administrator Mode, Application Manager works similar as Operational Mode but some additional functions are available:

- administrative settings

  - Control Panel (other than Standard Control Panel which is implemented in Windows Explorer)
  - Run Windows Explorer (not recommended in Approval Mode because some shell functions will be catched by Explorer)
  - Open Administrative Tools folder (and open some tools if necessary)
  - Open My Documents folder
  - Find files
  - Run an external application
  - Edit all three task lists (approved applications, additional applications, system tray applications

- File browser (other than Windows Explorer)
- Network browser (other than Windows Explorer)
- Data browser (analyzes MARIS internal data protocols, informs administrator about size, number and type of data packets)

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- Run Windows Task Manager
- Change MARIS application passwords

TASKS LIST

APPROVED APPLICATIONS

Approved applications have to be running all the time. If some of them crash (or are closed), Application Manager starts them again. The built in watchdog keeps those applications if they are frozen and restarts them then. In Administrator mode some of them could be suspended temporarily. Each application has its own button. User (not Administrator only) could activate any approved application and pop-up its window using one click on the button.

Application manager watches "missing" applications. This means that if some application is included into Approved Tasks List and the corresponding executable file is missing or corrupted, Application Manager periodically tries to run it and immediately when problem is resolved, the application will be started.

If application is OK, the corresponding button has image – first icon from resource list of the executable. If application is suspended by administrator, the button is grayed. If application is not running by some reason except missing/corrupted file, button is blinking. In case of missing/corrupted file image is red question mark.

ADDITIONAL APPLICATIONS

Additional (other) application list is mostly similar to Approved applications list. There are the following differences:

- Application Manager does not keep Other Applications working. If some of them crash or are closed, Application Manager just shows their new state but does not restart them
- No freeze watchdog
- No suspend
- No auto-start (in fact the same than 1st point)

All other points are identical to Approved applications list.

SYSTEM TRAY APPLICATIONS

System Tray Applications are not started and not watched. But if they try to put some icons into Windows System Tray, Application Manager catches them and put them into its internal Tray Area.

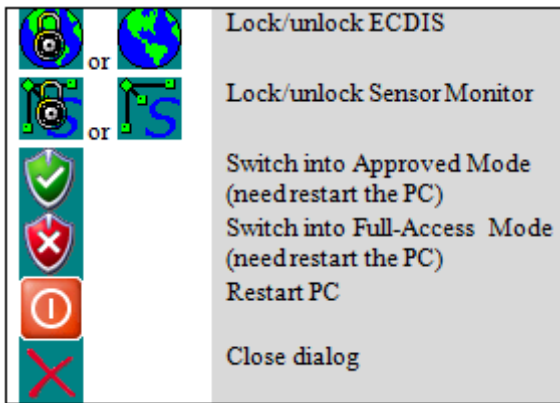**WARNING** **in Administrator mode Application Manager shows all icons in System Tray, not only from the list.**

SETTINGS

SECURITY SETTINGS

You can see here the following buttons (in addition to labelled two):

ADMINISTRATIVE SETTINGS
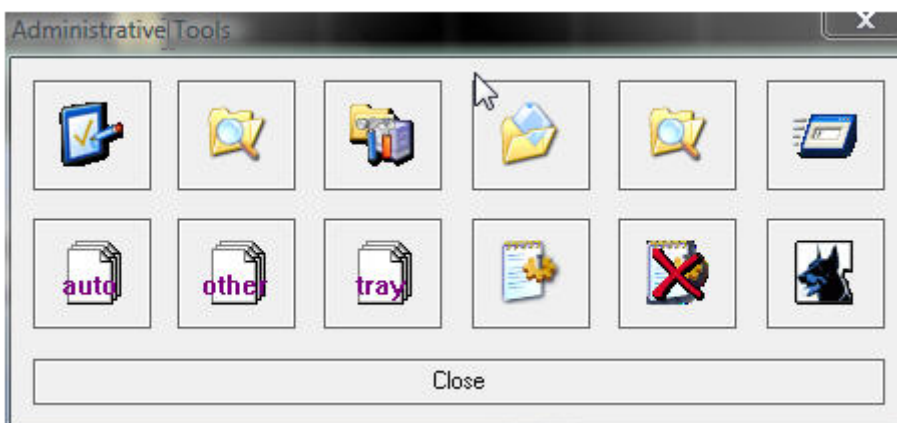
EDITING TASK LIST
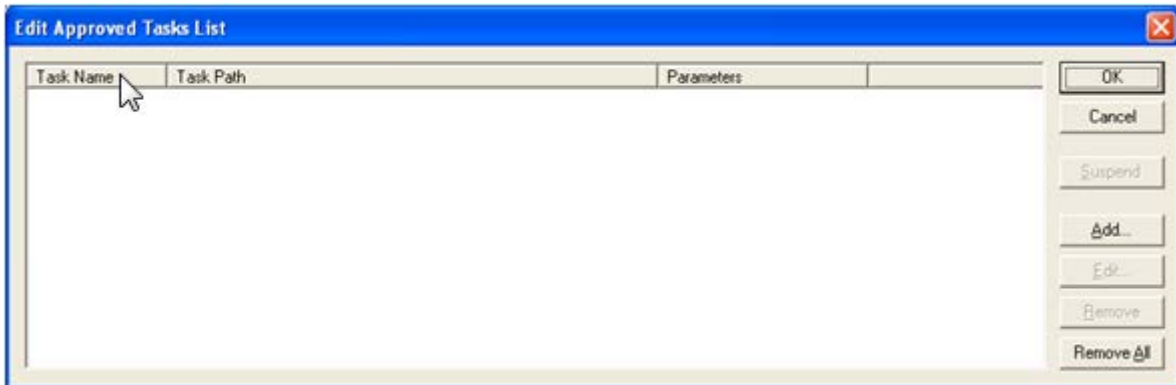
It is the common view of all three task list editing windows. The only difference is that only Approved (Auto) Task List has the **Suspend** button.

OK	Save changes and close the window
Cancel	Do not save changes and close the window
Suspend	Only Auto Tasks List. If this button is pressed, the selected application will not be traced/restarted etc.
Add...	Add new task into list
Edit...	Edit current task properties (see below)
Remove	Remove task from the list
Remove all	Clear task list

TASK LIST MEMBER EDITING
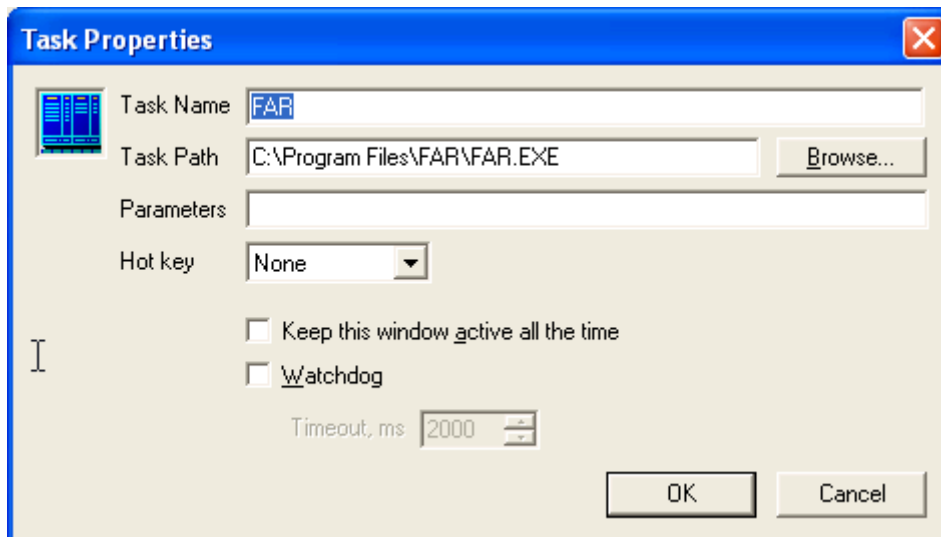
Icon Area	If executable module is chosen, here you can see its first icon
Task Name	Label of the path; this string will be shown in the tooltip when you move mouse cursor to the corresponding button.
Task Path	Path and name of the executable module

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Parameters	List of command-line arguments
Hot Key	Optional keyboard accelerator used to activate this task. This is not relevant for System Tray Task List.
Keep this window active all the time	If this option is checked, Application Manager will keep this window active all the time (and keep in on the front). It will have more less the same behaviour as Windows Task Manager.
Watchdog	Task Freeze Watchdog on/off
Timeout	Assume task to be frozen if it does not respond within this time
OK	Save changes and close
Cancel	Do not save changes and close

DEFAULT PROFILE

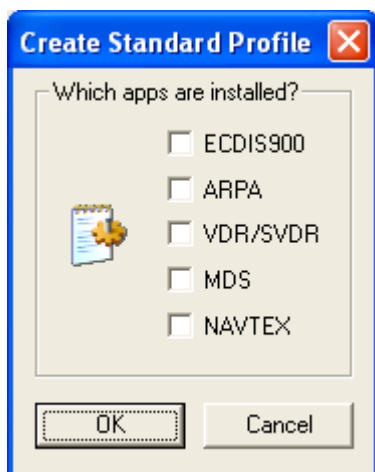Default profile is set of standard settings which control all three Task Lists. You can create most-common set of settings using simple mechanism.

When you press button "Create Standard Profile" the following dialogue will be shown:

You should check the software that is installed on your PC and press OK. Or press Cancel to do not create Default Profile.

Also you can clear completely all three Task Lists using button "Clear Profile".

ADDITIONAL FEATURES

FILE BROWSER

Application Manager File Browser works more less the same way than Windows Explorer.

In the path line you can enter manually path to browse. Or you can press second button on the right to choose path in the dialogue. Button elevates browser one folder level up.

Also you can choose root folder of any logical drive. Use popup menu (see below).

Menu items description

Popup	Item	Included into the context	Meaning

		menu	
File	Choose Drive...	Yes	Choose root folder of selected logical drive (Drive Browser will we opened, see below)
	Open	Yes	Open selected item (or first selected if more than one is selected). The operation is completed according to Windows associations. Use Windows Explorer to edit them.
	Open As...	Yes	Open standard Open As Windows dialogue box
	Print...	Yes	Print selected item to the default printer. If more than one item is selected, first one will be printed out.
	Add printer...	Yes	Run Add Printer Windows wizard
	Browse	Yes	Browse for folder
	Sharing	Yes	Open standard Windows Properties dialogue on Sharing page
	Properties	Yes	Open standard Windows Properties dialogue
	Create folder	Yes	Create new folder
	Map Network Drive	Yes	Open standard Windows Map Network Drive dialogue
	Empty Recycle Bin		Empty Recycle Bin
	Close		Close File Browser window
Edit	Undo	Yes	Undo last operation (not implemented yet)
	Cut	Yes	Cut selection
	Copy	Yes	Copy selection into Clipboard
	Delete	Yes	Delete selection
	Paste	Yes	Paste from Clipboard
	Copy to...	Yes	Copy selection into selected folder
	Move to...	Yes	Move selection into

				selected folder
	Rename		Yes	Rename selected (or first selected) item
	Select All		Yes	Select all items
View	Sort	Name	Yes	Change sort order, sort and rearrange items
		Extension		
		Creation time		
		Modification time		
		Size		
	Large icons		Yes	Change the representation (not implemented yet)
	Small icons		Yes	
	List		Yes	
	Details		Yes	

WARNINGS:

1. Items could be selected using the same way as in Windows Explorer

2. You can open as many instances of File Browser as you need. They use the same Clipboard format so you can easily copy files and folders from one to another one. But this format is not compatible with Windows standard Clipboard format, therefore you cannot use it to copy to and from another file managers.

NETWORK BROWSER

As long File Browser is an analog of Windows Explorer as Network Browser is an analog of Network Neighborhood. It is simple and effective tool that lets you to browse another workgroups, computers and their shared resources. Shared resources could be mapped or browsed using File Browser.

When you open Network Browser, it scans first the network. Then you will see the found network components.

There are few menu items:

- **Open** Browse the selected shared resource using File Browser
- **Map** Network Drive Run standard Windows Map Network Drive dialog for the selected shared resource
- **Close** Close the window

You can open as many instances of the Network Browser as you want.

DRIVE BROWSER

Drive Browser is simple window that lets you to choose one of existing logical drives of any type and/or browse its content.

The following pictograms are used for drives:

	Hard disk
	Compact disk (CD/DVD)
	Mapped network resource
	Removable drive (flash memory stick, etc)

If you right click any drive, the context popup menu will be activated. It contains the following menu items:

- **Select** Select logical drive and close Drive Browser
- **Refresh** Refresh drives list (for instance when new flash disk has been mounted)
- **Browse...** Browse root folder of the selected drive using File Browser (see above)
- **Map Network Drive...** Open standard Windows Map Network Drive dialog
- **Cancel** Close Drive Browser

DATA BROWSER

Data Browser is tool which helps to analyse network traffic and recognize some data packets which are passing through. The applications use more or less standardized protocols and any data could be classified by type and sender.

You should choose UDP port that you want to trace and press Listen. The most useful are ports 8001 (most of data from Sensor Monitor to ECDIS, ARPA and VDR), 6606 (most data from ECDIS to Sensor Monitor), 4101 (ECDIS internal change port).

If you need you can record (log) caught data. Press Record button, choose log path and name and keep button pressed for a while, then release and you can use log file. Warning: This button is visible only when Data Browser is listening.

As you can see Data Browser shows for each sender its IP address and list of packet types received from there. For each packed type are present name of type, program-sender (because different program could send packets from the same IP), summary number of bytes and number of packets received in packets certain type for certain program and certain IP address and last reception type.

RUNNING AN EXTERNAL APPLICATION

It is fully identical to competing menu item Run from Start menu of Windows. The standard Windows Run dialog opens.

OPENING ADMINISTRATIVE TOOLS

Application Manager will open special Windows folder called "Administrative Tools" using File Browser (see above). You can work with shortcuts located in that folder on the same way like any other folder.

LAUNCHING CONTROL PANEL

Application Manager will open special window contains all Control Panel applet shortcuts. You can work with them the same way like in Windows Explorer.

CHANGING MARIS SOFTWARE PASSWORDS

Any delivered software is protected using two passwords – user and administrator. Some functions need user password, some – administrator password. Here you can change those passwords. The following dialogue will be shown:

Enter old password and then new password twice. Press OK to confirm password change or Cancel to do not change password.

DEADMAN ALARM

Application Manager version 1.1.0.0 or later is required.

During AM installation, answer yes to question use DeadMan watchdog

Default pause period is 600 seconds

APPLICATION MANAGER CONFIGURATION

In Administrative Tools press (Administrator mode is required)
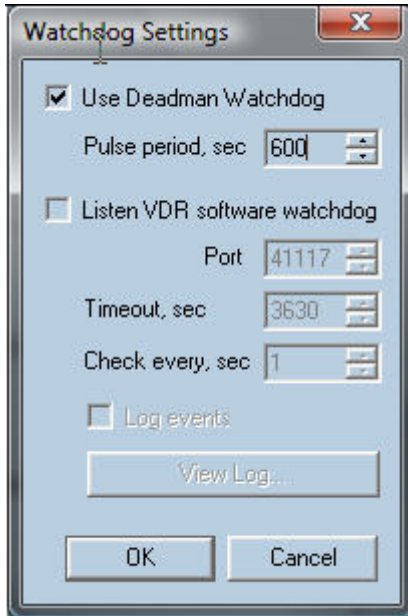
Check On Option "Use Deadman Watchdog"

A pulse will be sent every "Pulse Period" seconds, here 600 seconds or 10 minutes, if mouse or Keyboard were moved during the last 10 mn.

VDR Watch dog configuration : see below

SENSOR MONITOR CONFIGURATION

Create (if does not exist yet) "Alarm Relay Box" sensor. Connect the dedicated serial port to Relay Box using proper cable (here is COM1).

ALARM BOX SENSOR CONFIGURATION
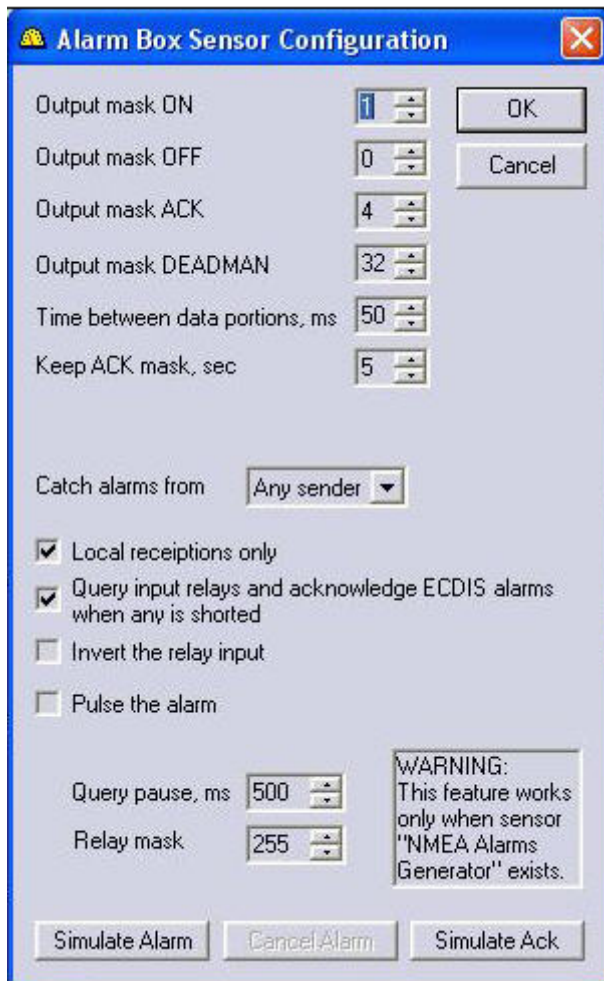
In alarm Box sensor panel,

There is one new setting - "output mask DEADMAN".

It sets up which pins should be pulsed when Application Manager sends message that mouse or Keyboard were used since last check.

(32 in example give the function to the 6th led)

Normally pulse takes 2 seconds but you can change this length (Keep ACK mask sec) option. (here is 5 seconds)

VDR WATCHDOG

INSTALLATION

VDR watchdog requires Application Manager and a VDR module which is running as a service (VdrMon) on the VDR Computer.
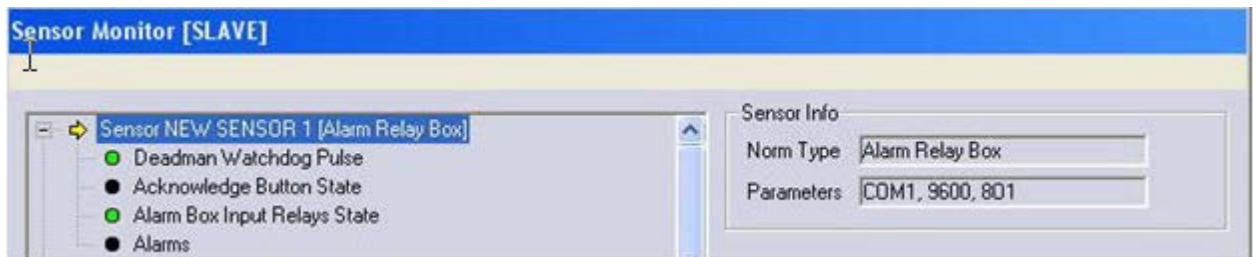
- Copy vdrmon.exe into VDR program folder
- Copy vdrmon.ini into VDR program folder
- Command "run vdrmon.exe –ia"
- Start Service with command line -s or via MMC

The service broadcasts the notifications immediately when VDR changes the currently-writing file on the alternative data storage (normally, root folder of D: drive). Usually this happens once per hour but if the crew wants to have this check more often they could reduce timeframe length in VDR Configuration Manager.

CONFIGURATION IN APPLICATION MANAGER

The settings in Application Manager are simple and located in the same window than Deadman Alarm Settings:

- enter Administrator mode
- click on administrative settings button (second row, middle button)
- click on watchdog settings (second row, the most right button with dog icon)
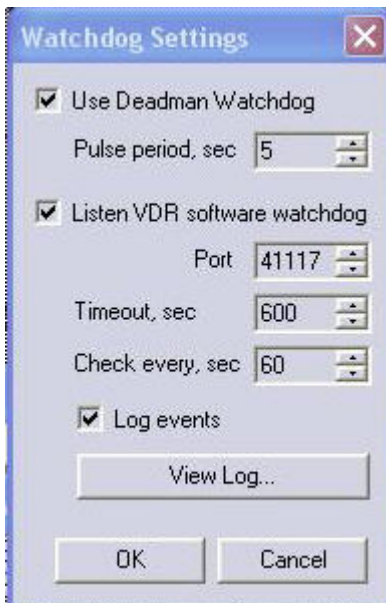
- check "Listen VDR software watchdog"
- choose proper port (by default 41117)
- choose the timeout
- (for instance, if VDR writes new file to D: once per hour, choose something like 3620 seconds)
- choose period of check; one or two seconds is ok; when alarm window pops up, the information will refresh once per the given seconds number
- press OK
- press Close

ALARM

When no file change will happen in given timeout, Application Manager will pop up the alarm window with the text "VDR recorder is not writing data for ..."

Warning is refreshed continuously once per check period.

If Application Manager receives the notification from VDR software watchdog, this window will disappear immediately.

The user can press "Acknowledge" button and then window will be hidden temporarily; but if there will be no notification in the timeout period, then window will appear again.

VIEW LOG

Alarm log available when pressing "View Log" button.

Installation and Troubleshooting

GENERAL

The system is delivered ready to use and no installation is necessary. However, the user may have to re-install a new version of ECDIS900.

Installing the software:

- Insert the Installation DVD into the DVD-DRIVE or use the installation usb flash drive.
- Open the DVD: double click on **My Computer** and on the DVD drive icon or open the usb flash drive
- Double click on the folder **disk 1**
- Double click on the file **Setup.exe** and follow the instructions of the set-up program.
  - If a previous version of the ECDIS900 is installed on the hard disk, the set-up program saves the Sensor_Monitor configurations, installed charts, routes and tracks.
  - Once the ECDIS900 application installed on the hard disk, several folders containing the application, utilities and data have been created. **Launch and quite ECDIS900** as described below.

NOTE
  - ECDIS display is type approved device and should be used with factory settings. Software does not require screen resolution and colour mode, but it is strongly recommended to use resolution no less than 1280 * 1024.

  - In case the Win 7 OS the Windows Classic Theme must be set. In case of using another theme, some GUI colours could be inconsistent.

In case of **technical problems** or to order new charts please contact the **MARIS support**.

OPERATIONAL LIMITS

Operational limits of ECDIS900 listed in the proper section.

TESTS

Regular tests should be performed on board to check that the system works properly.

SOFTWARE INSTALLATION AND SETTINGS

The system is delivered ready to use and no software installation is necessary.

To update the software contact Navico Technical support.

- If a previous version of the ECDIS900 is installed on the hard disk, the set-up program saves the Sensor_Monitor configurations, installed charts, routes and tracks.

- Once the ECDIS900 application installed on the hard disk, several folders containing the application, utilities and data have been created. **Launch and quite ECDIS900** as described below.

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- In case the Win 7 OS the Windows Classic Theme must be set. In case of using another theme, some GUI colours could be inconsistent.

In case of **technical problems** or to order new charts please contact the Navico **support**.

MULTI HARDWARE

ECDIS900 has been approved with different PCs and monitors. ECDIS900 needs a proper colour table to be used. During installation of the ECDIS900 software it is necessary to select the targeted display.

REMARK when Hatteland monitor are used the color table is automatically uploaded from the monitor to the PC.

OPERATIONAL LIMITS

Operational limits of ECDIS900 are listed **here**

TESTS

On board regular tests are to be performed to check that all components of the system work properly

LAUNCH AND QUIT ECDIS900

IMPORTANT All software, including ECDIS900, should run with **Application Manager** operating as Shell on MARIS computers.

The ECDIS900 runs under:

- Windows XP
- Windows 7

When the workstation is powered, Application Manager and ECDIS900 are automatically launched, therefore the Windows file management is not accessible in the Operational mode (see **Security level mode** for details).

It is impossible to hide the application or to access to the file system not operating in the Administrator mode.

To quite the ECDIS900 application the computer should be switched off or rebooted. These operations are performed via Application Manager.

SUPPORT

The ECDIS900 customers can obtain free technical support from NAVICO.

IMPORTANT

Each Navico customer can have access to the MCP (www.chartservice.no) where the latest updates and documentation packages are available.

If you don't have login, ask the Maris Chartservice (service@navico.com) for it.

BEFORE CONTACTING NAVICO

Before contacting Navico looking for help with technical problems, be sure to read the applicable sections of the ECDIS900 User's Guide. The answers might be there without needing to contact Navico.

WHAT IS NECESSARY TO HAVE WHEN CONTACTING NAVICO

The following information will be required when contacting Navcio:

- The dongle ID written on the dongle label.
- The ECDIS900 and Sensor_Monitor version numbers
- Make and model of the GPS receiver or/and other marine instrumentation connected to the computer.
- Make and model of the computer.
- Detailed description of the problem.

HOW TO CONTACT NAVICO

There are a number of different ways to contact MARIS' product support staff:

WORLD WIDE WEB

Browse the product support section of our Web site. It is located at **www.maris.no**

chartservice.no –The Customer Portal

INTERNET E-MAIL

Send email to **service@navico.com**. Be sure to include email address to reply.

TELEPHONE

Call the the product support line on **+ 47 48 000 111**. Support lines are staffed from Monday to Friday from 8:00 a.m. to 5:00 p.m (UTM+1).

BACKUP

Back up is essential and should be done regularly. In the case of computer failure, the software and the charts will be re-installed from the setup DVD and the charts CD/DVDs. The user data will be restored from external storages backup. See the Backup section for details.

TROUBLESHOOTING

WIRING NMEA AND RS-232 INSTRUMENT SYSTEMS

The most of installation issues and faults stem from one of two causes:

- The connecting cables are not wired correct, or are picking up interference, resulting in a non-working or unreliable installation.
- Instruments have not been set up to ensure that the correct data gets from one point in the system to the other.

Clearly getting the cable connection right is the first step in troubleshooting.

CONNECTION TESTS

When one or more input and/or output devices are connected to the computer, the connections must be tested to ensure that all is working correctly. The ECDIS900 provides a useful tool to help perform this test.

Hyperterminal is an application built into Windows XP and Windows 7 that allows testing of connections to the input devices. If input devices are connected correct, **Hyperterminal** displays recognizable characters. Incorrect connected input devices either show no information, or garbled characters.

> *NOTE*   The Sensor Monitor application must be closed before using Hyperterminal

SERIAL PORT BUSY

Depending on the Windows OS configuration, the serial port COM1 could be automatically closed (busy) due to the mouse management. This will prevent any more usable data being available for input.

To free the port COM1:

- Open the file **C:\boot.ini**
- Add the option /noserialmice twice at the end of the two last lines
- Restart

AUTOMATIC LOG ON PROCESS

The system starts using the latest settings including the user name and password.

WINDOWS XP

- Double click on User and Password in the control panel
- Select the panel Advanced

- Check OFF the box: Require users to press Ctrl Alt Delete before logging on
- Select users panel
- Check OFF the box: Users must enter a user name and password to use this computer.
- Restart the PC.

WINDOWS 7

- Input netplwiz in the Run field of the Start menu
- The User accounts dialog appears
- Tick off the "User must enter a user name and password to use this computer" box
- Click Apply
- Go to the Advanced tab
- Press the Advanced button in the Advanced user management group
- Check that box "Password never expires" is ticked on for required groups
- Restart the PC

FAILURES AND FIX

POWER SUPPLY

Equipment	Failure detection	Cause	Effect	Action to fix
Power cables Power switch P11	Black screen No audible start of the computer (Hard disk or fan).	No connection to an external power source. Cables unplugged. Power switch failure	Computer won't run	Connect to an external power source. Check cables plug. Change power switch
12V power unit P12	Black screen Audible start.	Defective 12V power unit	Computer won't run	Replace 12V power unit
5V power unit P13	No data on screen Faint back light visible when back light is fully on	Defective 5V power unit	Computer won't run	Replace 5V power unit
Fan P14	Computer powered off automatically according to BIOS settings	The unit temperature was exceeded. The fan may be blocked	Computer stops	Unit is in an exceedingly environment. Let it cool down. Ensure computer air vents are not

				blocked. Check that internal fan is running. Replace the fan is necessary.
Backlight P16	Black screen	Backlight failure	Black screen	Check cabling. Replace backlight card.
Buzzer P17	No Audible start	Power or Buzzer unit failure	No audible alarms	Replace buzzer board Replace mother board

BOOT

Equipment	Failure detection	Cause	Effect	Action to fix
RAM	Long beep (4 s) Silence 2s. No Picture	RAM failure	Computer won't boot.	Check the RAM plugs. Replace faulty RAM module.
Keyboard	None	Bad plug Keyboard failure	No light on the keyboard. Keyboard does not respond	Reconnect the keyboard with computer off. Ensure that none of the keys are depressed. Replace the keyboard
Processor Main board P13	Fan on. No audible start	Mother board failure Processor failure	No boot	Check that the motherboard and the processor are well plugged. Replace the motherboard
Hard disk controller	Long response time HDD failure	Hard Drive circuitry error	HD does not start	Run Computer set up Check cables seating Run HD diagnostics Replace the HD. Replace mother board.
Hard disk	Long response	Hard Drive	Warning in the	Run Computer

	time HDD failure Fan on. Bios starts	error	system configuration window:" Pri. Master disk None. Sec. Master disk None".	set up Check cables Run HDD diagnostics Replace the HDD.
Ethernet controller	Network driver does not detect network controller	Network controller is disabled	No access to network	Run computer set up and enable controller network.
Ethernet controller System software set up.	Network status link light does not turn on or flashes	No active network is detected Network controller is not set up properly Network driver is not correctly loaded	SMonitor cannot be launched.	Check cabling Use the network control application to verify that device is working properly. Reinstall network drivers Replace system board

VIDEO

Equipment	Failure detection	Cause	Effect	Action to fix
Video cable V1	Black screen	The video cables are unplugged.	No display	Check cables seating
Backlight Front panel P12 , P16	Black screen	Backlight is turned down. On/Off display button of the front panel Off.	No display	Adjust the back light. Button on.

DATA ACQUISITION

Equipment	Failure detection	Cause	Effect	Action to fix
System set up	Cannot use the 4 serial ports	IRQ conflicts.		Quit ECDIS900. Launch Windows NT diagnostic, open the panel: "Resources". IRQ for serial ports should be 03,

				04,07,08. If not reboot the computer, enter the set up and change IRQ. Run the recovery CD. Check the board plug. Replace the serial board.
Serial ports. Serial cables Sensor output set up. S_Monitor configurations	Monitoring station: Warning "GPS – DR alarm" in ECDIS900 In SMonitor GPS1 data not available or faulty. Same for the second GPS and planning station	Bad connection with the GPS 1. GPS 1 failure. Bad selected data format.	The ship's position is not monitored on the chart.	Check the serial cable plugged in the computer and in the GPS. Check the wiring RS232 or 422 … (See technical manual). Open the terminal window in SMonitor and check the incoming data format. Select another format (NMEA or..) ij the configuration window of the serial port Check the output configuration of the GPS. Click right button in the GPS indicator and select GPS1 as master.Check the serial cable plugged in the computer and in the GPS. Check the wiring RS232 or 422 … (See technical manual). Open the terminal

				window in SMonitor and check the incoming data format. Select another format (NMEA or..) ij the configuration window of the serial port Check the output configuration of the GPS. Click right button in the GPS indicator and select GPS1 as master.
Serial ports. Serial cables Sensor output set up. S_Monitor configurations C1	Other data acquisition faulty in SMonitor	Bad connection with the sensor. Sensor failure. Bad selected data format.	Data not correctly acquired. No display.	See above.
Serial ports. Ethernet com. Serial cables Sensor output set up. S_Monitor configurations	Second GPS position not correctly acquired in the Monitoring station. Same on Planning Station.	GPS2 failure. Bad Ethernet connection.	Second ship's position not available (No cross icon displayed on the chart at the second GPS location).	Check the cabling. (Serial and Ethernet). Ethernet problem: see above S1 and S2.

OPERATIONAL LIMITS

OVERSCALING CHARTS

The accuracy of the overscaled charts is not as good as it should be for a safe navigation.

OUTPUT DATUM SELECTION FOR THE GPS

When the GPS sensor does not deliver on serial line information about the datum used for the positioning, ECDIS900 supposes that the datum in use is WGS84. Therefore it is required to select the datum WGS84 in the GPS sensor.

S57 LIMITED COVERAGE

S57 database coverage is still limited therefore ARCS must be used when no vector data are available.

MOVE THE ROUTES

When the route is not locked, it is extremely easy to move and modify them in ECDIS900.

NO PASSWORD CONTROL FOR CHART AND ROUTE MANAGEMENT

No password is required to load or delete charts or edit the routes.

ROUTE DATABASE

When a route is created or modified on the planning station, there is no automatic update of the route database on the monitoring station. The update is performed manually.

BACK UP MANUALLY FOR LOGBOOK, ROUTE USER DATA

The user has the responsibility to make his back up regularly and in the proper way.

LOGBOOK

One logbook file is created every 24 hours. Therefore the replay a manual selection of the files is necessary.

SYSTEM TESTS

DVD-ROM

The test of the DVD reader can be done when the chart is updated. Insert the update CD (S57 update CD or ARCS update CD) and run the update procedure.

SENSOR INPUT

The **Sensor Monitor** application displays a list of sensors and serial ports. Check that data flow is correct.

Then for each serial port check that the data is analysed correctly.

ETHERNET COMMUNICATIONS

Check that the data received from a sensor connected to the workstation is available for the all ECDIS900 stations.

For example, when two different GPS are connected to the two stations, check that the two GPS positions are displayed on the chart.

MOUSE AND KEYBOARD

Perform visual check of a screen for a mouse or a track-ball.

In the waypoint information window or any kind of text edit box enter a string with the keyboard.

The keyboard can also be tested with the chart hot keys: when the focus is on the chart scroll the chart with the arrows keys.

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