

SIMRAD®

ECDIS900

Installation manual

ENGLISH



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The relevant declaration of conformity is available in the product's section at the following website: **www.navico-commercial.com**.

Warranty

The warranty card is supplied as a separate document. In the case of any queries, refer to the brand website of your unit or system: **www.navico-commercial.com**.

About this manual

Manual version

This manual is written for the software version in effect at the date of release for this manual. It is continually updated to match new software releases. The latest available manual version can be downloaded from **www.navico-commercial.com**.

Intended audience

This manual is written for professional installation and service engineers.

The manual assumes that the reader has basic knowledge about this type of equipment with regards to:

- installation work to be carried out
- nautical terminology and practices.

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SYSTEM OVERVIEW

Hardware

SIMRAD ECDIS systems come in several variants:

Stand-alone unit

- SIMRAD ECDIS900 MK15B 19" 4S (Windows 10® Operating System)
- SIMRAD ECDIS900 MK15B 24" 4S (Windows 10® Operating System)
- SIMRAD ECDIS900 MK15B 27" 4S (Windows 10® Operating System)

Split unit

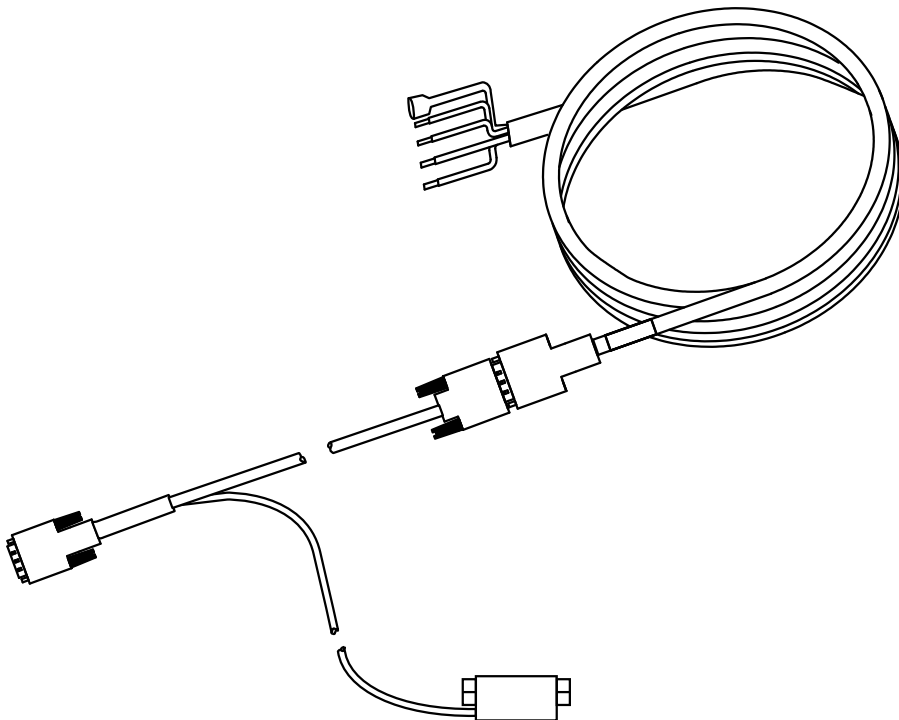
SIMRAD ECDIS900 MK5B (Windows 10® Operating System) can be delivered with two different monitors:

- Simrad M5024
- Simrad M5027

The split units can be configured to different monitor sizes, you can selected from 24 to 27 inches.

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

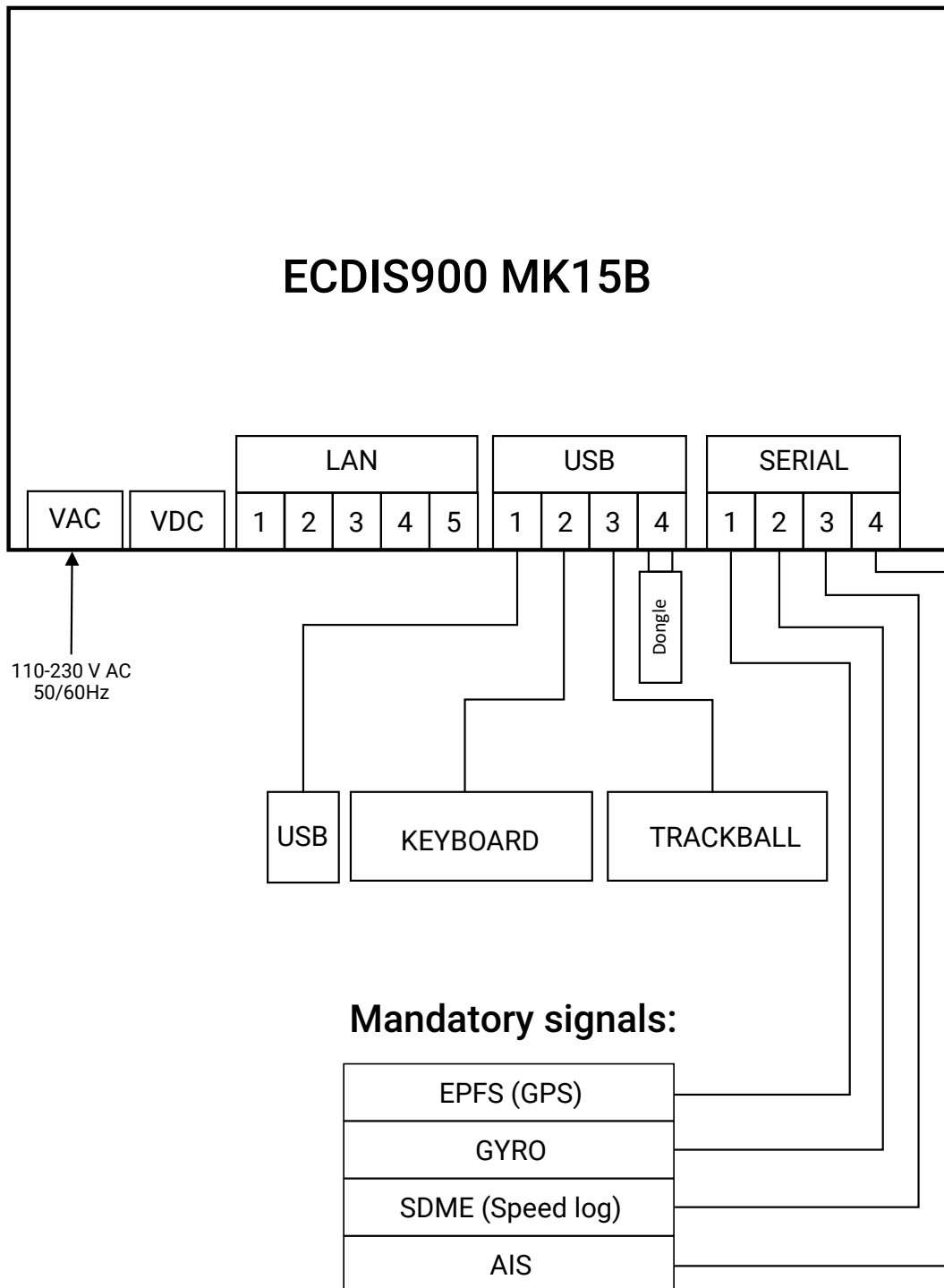
The split solution MK5B requires a special serial cable between the units. This cable carries control signals for the color table, dimmer and audible alarm.



Single ECDIS

Minimum configuration

The MK15B minimal configuration is as follows:

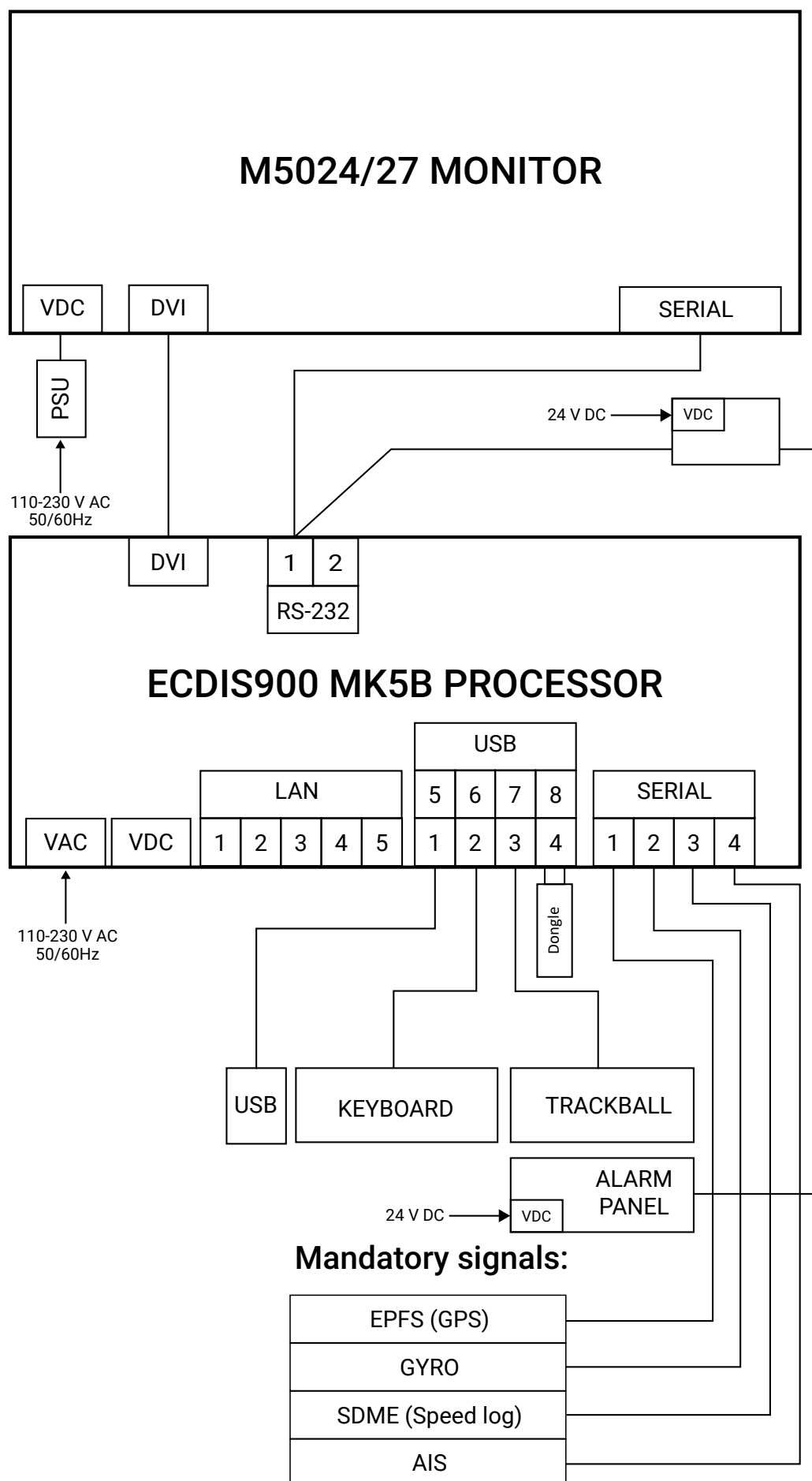


Standard delivery for MK15B

The standard delivery of a single ECDIS includes:

- ECDIS900 MK15B FPC
- Keyboard
- Trackball
- Unlock dongle
- USB extension cable
- USB DVD drive

The MK5B minimal configuration is as follows:



Standard delivery for MK5B

The standard delivery of a single ECDIS includes:

- Monitor
- ECDIS900 MK5B Processor
- Keyboard
- Trackball
- Alarm panel
- Monitor power supply
- DVI/DVI cable 3 m
- CT&A cable
- Unlock dongle
- USB extension cable
- USB DVD Drive

Dual ECDIS (Paperless ECDIS - PLECDIS)

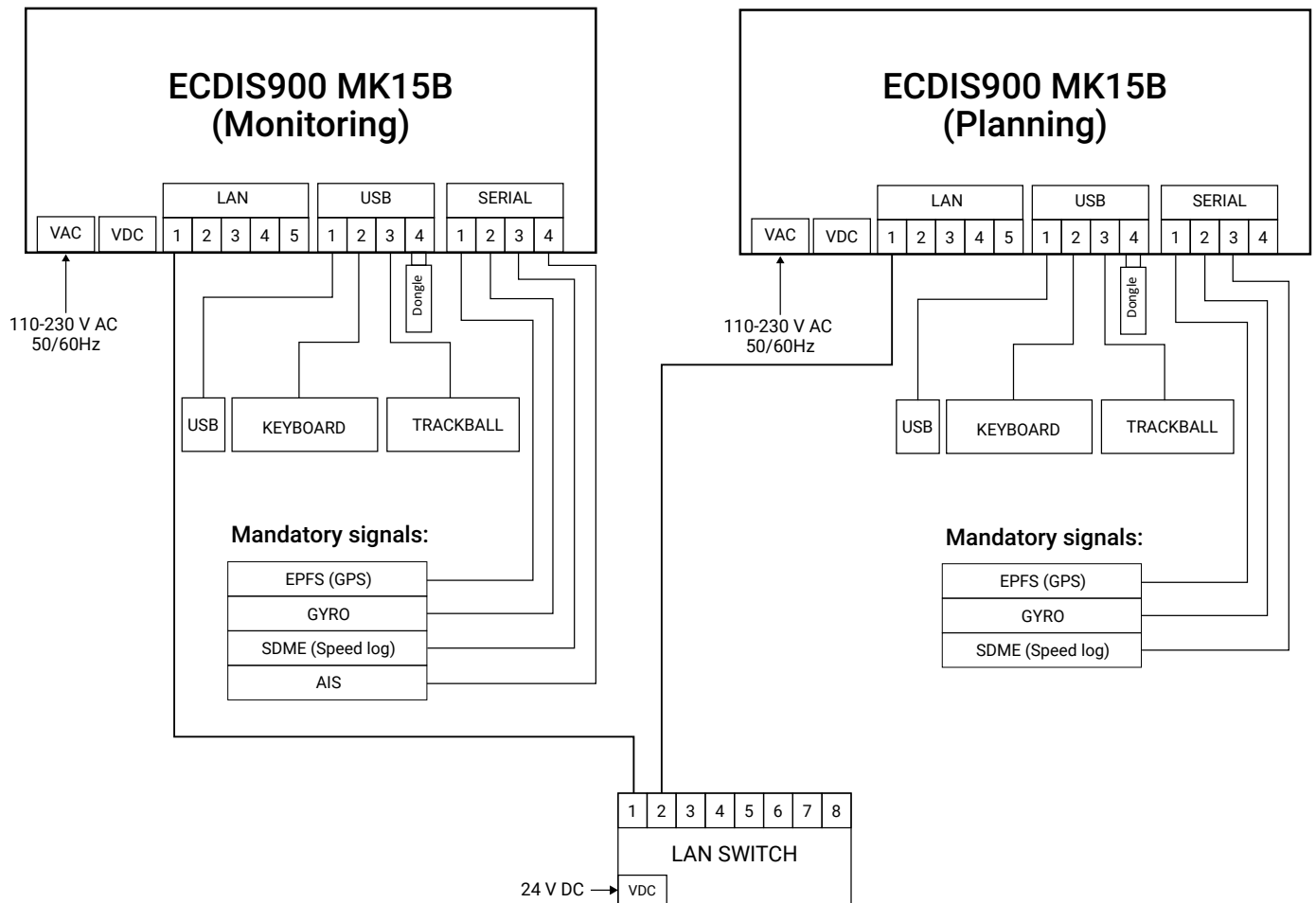
Minimum configuration

This is the typical configuration on board most ships.

The system meets IMO minimum requirements for paperless navigation. Note that the mandatory signals are hardwired to each computer. Multiple ECDIS installation ensures safe passage in the event of an ECDIS failure. The ECDIS computers are networked, so charts, routes etc. can be shared among the computers. Additional sensors, for example AIS and ARPA, can be connected to the free ports or using optional serial interface box.

→ **Note:** All sensors are shared between the two interconnected ECDISs over the network.

PLECDIS MK15B Configuration

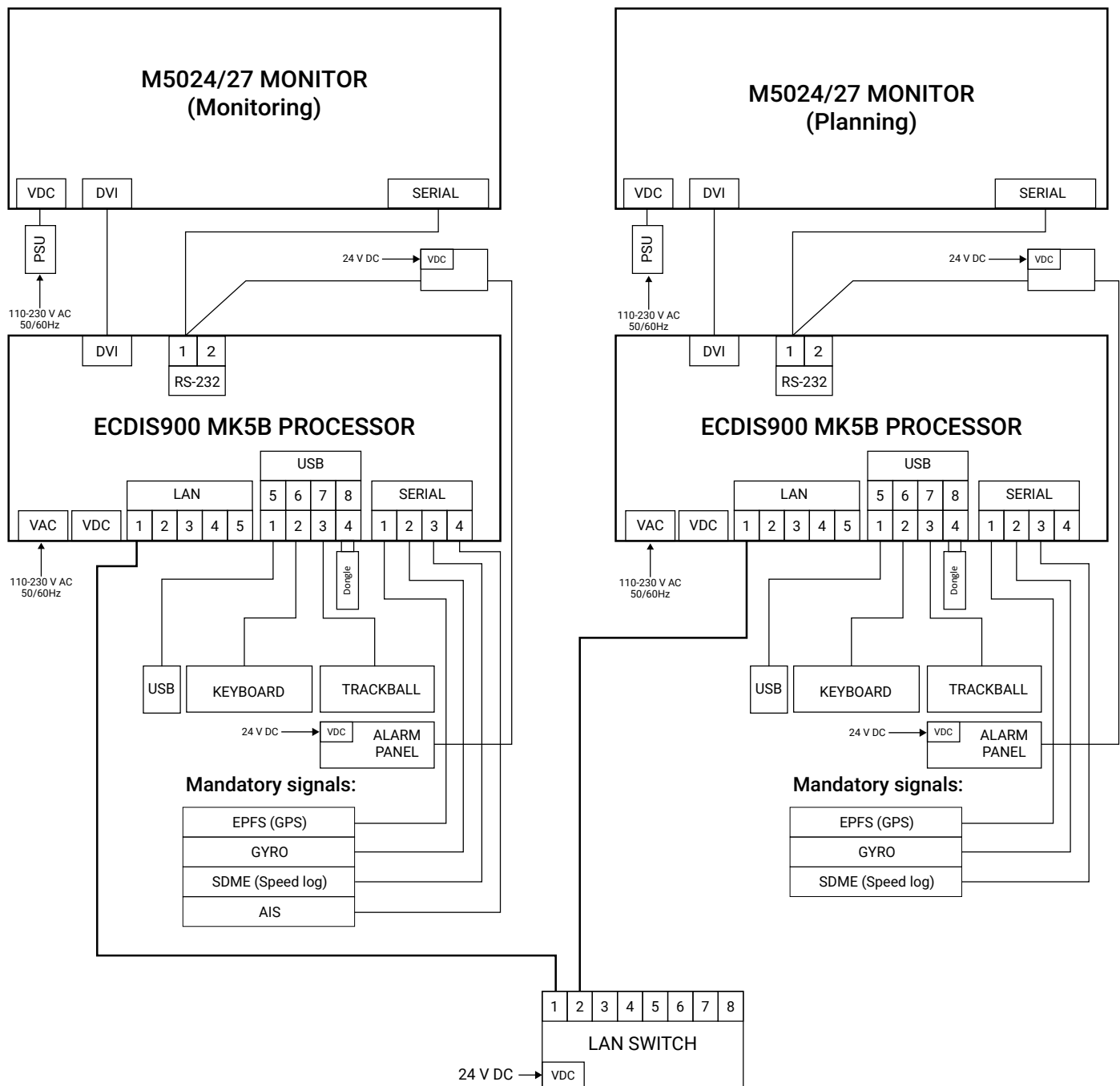


Standard delivery of PLECDIS MK15B

The standard delivery of PLECDIS includes:

- Two ECDIS900 MK15B
- Network switch
- One USB DVD drive

PLECDIS MK5B Configuration



Standard delivery of PLECDIS MK5B

The standard delivery of PLECDIS includes:

- Two ECDIS900 MK5B
- Network switch
- One USB DVD drive

Triple ECDIS

In case of a triple ECDIS configuration an extra ECDIS workstation is added to a PLECDIS configuration.

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

Factory defaults for SIMRAD ECDIS900

All computers leave the factory with these settings.

Windows 10 logon

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

Network

Name:	ECDIS Network
Type:	Work
IP-Address:	192.168.3.150
Subnet mask:	255.255.255.0
Gateway/DNS	Not used

→ **Note:** Unused networks are disabled.

Pre-installed programs:

- ECDIS900
- Sensor Monitor With Display Controller Configured
- Application Manager
- Radar Video Converter
- NAVTEX Server and Inbox

Additional serial interface

ECDIS900 supports additional data inputs via a serial interface. External devices can be connected over LAN or USB.

The following SIMRAD accessories are sold separately:

- Serial to LAN device adding 8 serial input and connected to Sensor LAN
- Serial to USB device adding 4 serial input and connected to USB port

→ **Note:** MK15B has a limited number of USB ports, LAN is recommended.

IEC 61162-450 Compliance

System function block

ECDIS900 uses UDP communication and datagrams.

Network requirements

All equipment connected to the ECDIS900 network must be tested against the relevant requirements contained in IEC 60945. See relevant certificates.

Error logging function

Errors occurring during transmission or reception of route as well as binary files are stored in two log files titled **61162-450Route.log**, and **Error61162-450.log**.

The log files are in the folder **C:\Programdata\MARIS\Log\ECDIS900**.

Error logs and error type counters are stored in: **C:\Programdata\MARIS\Capture\Capture.ini**

Error types:

- ERROR2: Transmission stopped!
- ERROR4: ACK ERROR
- ERROR5: QUERY RECEIVED
- ERROR6: Corrupted Header error
- ERROR7: Transmission stopped! Error in header
- ERROR8: WRONG Destination
- ERROR9: Non retransmittable route error.

→ **Note:** The error log files and error counters are reinitialized every week.

Unique system function ID (SFI)

The ECDIS900 SFI is coded and stored in the Capture.ini file. It can be edited using the CaptureScreenClientApp.

Multicast group

Open the Capture.ini file using the CaptureScreenClientApp and in the Network and [RouteProtocol] sections enter the IP addresses/port numbers and DestID for the recipients of the binary file and for route sending.

Other Network Function (ONF)

Sensor Monitor (SM) is used as ONF. It sends 61162-1 sentences to the network using broadcast messages and internal format. SM doesn't use multicast, IPs and ports from the standard. It uses ports 8001 and 8005, and broadcast IPs **192.168.3.255 (255.255.255.0)**.

Network protocol

The ECDIS900 uses network IP Version 4 protocol.

IP address assignment

- MONITORING ECDIS: **192.168.3.150** (LAN PORT 1 for ECDIS interconnection)
- PLANNING ECDIS: **192.168.3.151** (LAN PORT 1 for ECDIS interconnection)

In an ECDIS900 network, each datagram is transmitted and received within the multicast address range **239.192.0.1 to 239.192.0.64**.

→ **Note:** The ECDIS900 does not reserve any sub-nets.

Network interface

To avoid potential problems with certain network infrastructure equipment, repeater hubs shall not be used to interconnect components of an IEC 61162-450 network. The Ethernet switch, Moxa EDS-405A Series, is used in an ECDIS900 installation. It provides IGMP Snooping, QoS, IEEE 802.1Q VLAN, port-based VLAN support, and supports standards IEEE 802.3u for 100BaseT(X), 100BaseFX and IEEE 802.3x for flow control. For more information, refer to the EDS-405A Managed switch installation guide.

The Ethernet cables used in an ECDIS900 system are CAT5 STP four shielded twisted pairs, or ISO/IEC 11801 (Class D).

→ **Note:** Typically, a simple network consisting of only IEC 61162-1/2 sentences, screen capture images from radars / ECDIS to VDR, and ECDIS route exchange transmitted over LAN using IEC 61162-450 protocol would not need any filtering of the network traffic.

Datagrams

The maximum datagram input rates are:

- A** 1000 for the maximum number of datagrams per second received, intended for, and processed by the equipment.
- B** 500 for the maximum number of datagrams per second received by, but not intended for the equipment.
- C** 300 for the maximum number of datagrams per second received by, but not intended for the equipment, at 50 % of the maximum load for item a) in this list.

Maximum outgoing rate

The ECDIS900 uses 100 MB LAN. Significant network traffic is split between sensor data traffic, radar overlay when it exists, and communication with VDR.

Sensor traffic is limited to a maximum of 3000 datagrams, which is about 1 MB per second. Traffic to send an image to the VDR is 100 kb once per 15 seconds.

→ **Note:** For the ECDIS900, it is recommended to not set the UDP packet send limit lower than the default setting (150,000 datagrams per second).

Datagram types

All UDP multicast datagrams used in the ECDIS900 contain one of the following strings, followed by a null character (all bits set to zero) as the first six bytes of the datagram:

- "RaUdP" for transmission of binary file e.g., screen dump to VDR.
- "RrUdP" for transmission of re-transmittable binary files e.g., route transfer to and from the ECDIS900.

Bridge alert management interfaces

The system supports Bridge Alert Management (BAM). The ECDIS900 uses a communication protocol based on an interface using a series of sentences: **ALF**, **ALC**, **ACN**, **ARC**, and **HBT**.

The interface for alerts complies with the IEC 61162-1 standard.

Alert list

The alerts can be category A or category B. Alert type abbreviations:

- **A**: Alarm
- **C**: Caution
- **W**: Warning

Category A alerts

Type	Information
A	Crossing safety contour
C or W	Crossing area with special conditions (selectable)
C	Crossing navigational hazards
A	Deviation from route
A or W	Approach to critical point
A	CPA/TCPA
C	AIS target processing/display capacity is about to be exceeded
W	AIS target processing/display capacity have been exceeded
A or W	Outside anchor watch area (escalation)
A	User-defined alarm
A	Course change (TCS)
A	Back-up Navigator (TCS)
W	End of track alert (TCS)

Category B alerts

Type	Information
W	Position system failure
W	Gyro failure
W	STW failure
W	Different geodetic datum. (If the local datum on the GPS is different from the WGS-84 datum, a warning is generated.)

➔ **Note:** The ECDIS900 doesn't handle Emergency alarms, or category C alerts.

Alert ID and Text

When BAM is connected by serial line to the Monitoring station, the ECDIS900 sends alarms, warnings and cautions to the BAMS.

→ **Note:** *The alert titles sent to BAM may be shorter and slightly different from the alert text displayed on the ECDIS900.*

Alert titles and Alert IDs sent to BAM

Alert ID	Alert title
99	Back up navigator
3005	Different geodetic datum
3015	Position system failure
3016	Failure of GYRO
3017	Master GPS changed
3018	Failure of STW
3024	Dev from pld route off-trk alm
3025	End of track
3027	Early COG change indication
3030	Crossing safety contour
3033	Anchor watch - (Alarm)
3032	Anchor watch - (Warning)
3035	Area with spec. conds
3037	Crossing navig. hazard
3038	Approach critical point
3040	User object alarm
3042	Target capacity exceeded
3044	CPA-TCPA

SERIAL INTERFACE SIS4000-MK2

Hardware notes

SIS4000-MK2 is a network-based module. All channels are configured for RS422.

- Channel 1 to 6 is input only, Baud rates 4800 or 9600, 8n1.
- Channel 7 and 8 is input/output, Baud rates 1200 to 115200, 8n1.

⚠ IMPORTANT: Once the channels are configured, the Sensor Monitor reads the data and transmits it over the ECDIS network, making it available for all other computers. For that reason, it is imperative that every sensor in the system has its own unique port number to avoid conflicts.

The tables that follow are for general cargo ships. Seismic vessels and other special purpose ships will most likely be different. The same goes for sensors transmitting on an uncommon baud rate. Connect to Ch 7 and move the NAVTEX sensor to another computer with free channels.

Keep to the standard when installing, follow the tables as far as possible.

Single ECDIS900	
Monitoring	SIS4000-MK2
GPS1	Ch1, port 8010
GPS2	
Gyro	Ch2, port 8011
Log	Ch3, port 8012
ARPA_X	Ch4, port 8013
ARPA_S	
Wind	Ch5, port 8014
ES	Ch6, port 8015
NAVTEX	Ch7, port 8016
AIS	Ch8, port 8017
Dual ECDIS900	
Monitoring	SIS4000-MK2
GPS1	Ch1, port 8010
GPS2	
Gyro	Ch2, port 8011
Log	Ch3, port 8012
ARPA_X	Ch4, port 8013
ARPA_S	
Wind	Ch5, port 8014
ES	Ch6, port 8015
NAVTEX	Ch7, port 8016
AIS	Ch8, port 8017
Planning	
SIS4000-MK2	
GPS1	
GPS2	Ch1, port 8020

Gyro	Ch2, port 8021
Log	Ch3, port 8022
ARPA_X	
ARPA_S	Ch4, port 8023
Free	Ch5, port 8024
Free	Ch6, port 8025
Free	Ch7, port 8026
Free	Ch8, port 8027

⚠ IMPORTANT:
Please note the different port numbers!
If the defaults are not changed, the sensors will transmit on the same port, leading to inaccurate data. For example, GPS1 and GPS2 transmitting on the same port will give a jumping position on the ECDIS900.

Triple ECDIS900	
Monitoring	SIS4000-MK2
GPS1	Ch1, port 8010
GPS2	
Gyro	Ch2, port 8011
Log	Ch3, port 8012
ARPA_X	Ch4, port 8013
ARPA_S	
Wind	Ch5, port 8014
ES	Ch6, port 8015
NAVTEX	Ch7, port 8016
AIS	Ch8, port 8017

Planning	SIS4000-MK2
GPS1	
GPS2	Ch1, port 8020
Gyro	Ch2, port 8021
Log	Ch3, port 8022
ARPA_X	
ARPA_S	Ch4, port 8023
Free	Ch5, port 8024
Free	Ch6, port 8025
Free	Ch7, port 8026
Free	Ch8, port 8027
Backup	SIS4000-MK2
GPS1	Ch1, port 8030
GPS2	
Gyro	Ch2, port 8031
Log	Ch3, port 8032
Free	Ch4, port 8033
Free	Ch5, port 8034
Free	Ch6, port 8035
Free	Ch7, port 8036
Free	Ch8, port 8037

⚠ IMPORTANT:

Please note the different port numbers!
If the defaults are not changed, the sensors will transmit on the same port, leading to inaccurate data. For example, GPS1 and GPS2 transmitting on the same port will give a jumping position on the ECDIS900.

General

When installing, keep in mind that every ECDIS900 must be able to run as a standalone unit.

⚠ IMPORTANT: The SIS4000-MK2 must be installed as a dedicated unit for the computer, and NOT shared over the ECDIS900 network!

Installation, power

The SIS4000-MK2 accepts 10-40 V DC. Note the polarity.

- From AC/DC power supply, it is mandatory that the AC power comes from the same source as for the computer.
- From emergency or radio batteries, take the power from the same source that feeds the main navigational GPS.

Configuration

Please read the Annex SIS4000-MK2 installation and configuration.

ELECTRICAL

AC Power

ECDIS900 standardize on 220 V AC 50/60 Hz.

Plugs and power strips are in accordance with European standard.

On ships with 110 V AC and specifically Japanese build ships with 100 V AC, SIMRAD recommends an UPS is installed. Refer to the Annex More about UPS for the correct types.

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

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

- Do NOT power the equipment from the Lighting Switchboard as it may not be connected to the emergency diesel generator.
- Powering from the Lighting Switchboard may lead the class society or the flag state to reject the installation and deny the final approval.

UPS

The ECDIS900 is certified to run without UPS as it will start up from where it left off.

Connecting the ECDIS900 to a UPS will greatly improve stability and protect against brownouts and noise. The UPS used must be an approved type. Read more about UPS in the Annex.

DC Power

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

- AC/DC power supplies connected to the nearest wall outlet are not accepted. Use the power strips from the installation kit and take the power from the same source as for the ECDIS900 computer.

➔ **Note:** DC power is required for the Alarm panel in a MK5B installation.

➔ **Note:** DC power is required for the LAN SWITCH in a dual ECDIS installation.

Buffers and EPFS

Electronic Position Fixing System (EPFS).

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

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

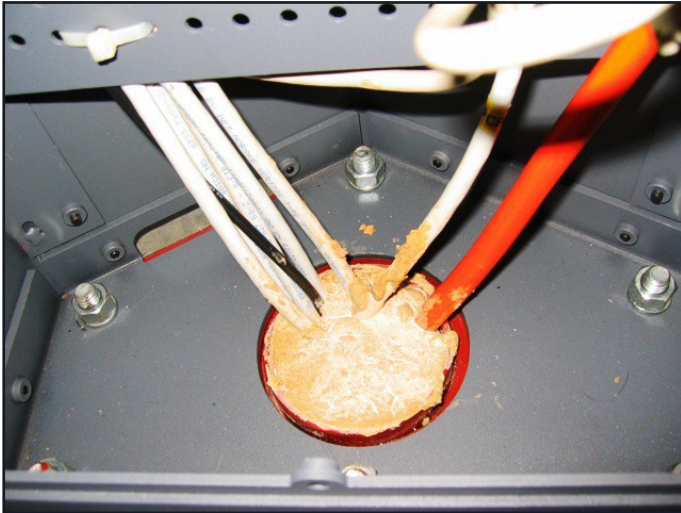
The majority of ships have two or more navigational GPS and they are typically heavily overloaded. Add buffers to GPS, gyro and log.

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

- The GPS messages usually have the NMEA 0183® format. It is advisable to change the output format to IEC and enable the IMO recommended sentences GGA, GLL, GNS, DTM, ZDA and VTG. These sentences are required by the ECDIS as a minimum configuration. Disable other sentences to reduce traffic load on the output port.
- The GPS must be capable of transmitting the above-mentioned sentences and must be Wheel Mark approved. Discard the GPS and install a new one if these requirements are not met.

Cable run

Plan the installation and lay up the cables. Use existing cable ways and transitions as much as possible. New transitions must be made in accordance with good workmanship and they must be properly sealed (for fire protection).



Accepted by class



Rejected by class



Accepted by class



Rejected by class

All cables in the installation kit are screened cables. Do not forget to make a proper grounding of the cables and the computers. The ToughCat network cable is perfect for connecting the sensors and has 4 individually screened pairs. The RJ45 network plugs supplied will ground the cable when fitted.

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

Connecting sensors

Each ECDIS computer or panel computer has four RS422 serial line channels. Connect GPS, Gyro and Speed log to these channels. Channel 4 is usually used for non mandatory sensors like AIS, depth or wind.

There is also the possibility to use SIS4000-MK2 serial port expander. This will add eight extra serial ports. Alternatively, a USB expander with four RS422 ports can be used as serial port expander.

⚠ WARNING: Never use RS232!

This standard is not galvanic isolated and will ground the entire 24 V network on the ship and this may damage connected equipment. RS232 is not allowed on a SOLAS ship and violates any type approval. Not only does it violate the rule work, it is also bad engineering and installation practice, which can result in the loss of data and compromise safety of navigation.

PREPARING THE COMPUTER FOR THE FIRST RUN

All computers must be prepared for their particular installation – installations of two ships are never alike. Windows operating system is pre-installed and configured according to ECDIS900 specifications.

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

All computers leave the factory with these settings.

Windows logon

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

Network

Name: ECDIS Network
Type: Work
IP-Address: 192.168.3.150
Subnet mask: 255.255.255.0
Gateway/DNS: Not used

Network basics, ECDIS network

Verify and then change settings for TCP/IPv4 as shown in the table. Other items including TCP/IPv6 are not used and must be left as is.

Computer name	Workgroup	IP-Address	Subnet mask	Gateway
Monitoring	SIMRAD	192.168.3.150	255.255.255.0	Not used
Planning1	SIMRAD	192.168.3.151	255.255.255.0	Not used
Planning2	SIMRAD	192.168.3.152	255.255.255.0	Not used
Planning3	SIMRAD	192.168.3.153	255.255.255.0	Not used
Planning4	SIMRAD	192.168.3.154	255.255.255.0	Not used

Important notes:

- Computer names — The suggested names must be changed to something descriptive, for example, Monitoring, Planning, Chart Table, Planning 1.
- Workgroup name — This workgroup name “SIMRAD” must **NEVER** be changed.
- IP-address — Addresses in the range 150 to 199 can be freely used.

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

Network basics, Sensor network

Enable the network connection then change settings for TCP/IPv4 as shown in the table. Other items including TCP/IPv6 are not used and must be left as is.

Computer name	Workgroup	IP-Address	Subnet mask	Gateway
Name of the Computer (i.e Monitoring, Planning1, Planning2,...)	SIMRAD	192.168.4.200	255.255.255.0	Not used

➔ **Note:** This is for use with SIS4000-MK2 and other network-based sensor modules.

Network basics, Radar network

Enable the network connection then change settings for TCP/IPv4 as shown in the table. Other items including TCP/IPv6 are not used and must be left as is.

Computer name	Workgroup	IP-Address	Subnet mask	Gateway
Name of the Computer (i.e Monitoring, Planning1, Planning2,...)	SIMRAD	192.168.5.200	255.255.255.0	Not used

→ **Note:** This is reserved for radar kit network module.

Share folders/Security options

- Share the folders Charts and ECDIS_UserData for full read/write access: Start Explorer. Right-click the folder and select Share with/Specific people. Click the down arrow, select Everyone, and click Add. Change Permission Level to **Read/Write**. Click **Share**.
- Charts and ECDIS_UserData should be "Full Access" for "Everyone". Open the "Security" Tab, add "Everyone" in the list of Username. Then allow all permissions for "Everyone" (check ON all checkboxes in the list).
- Password-protected Sharing should be OFF Menu: Control Panel\Network and Internet\Network and Sharing Center\Advanced sharing settings.

Test the network

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

The final touch

Automatic updates

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

Antivirus protection

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

Firewall

Turn OFF Firewall, Open Action Center, and enable the alerts. When starting new programs, place tick marks in private and public networks



By now the system is fully functional and the installation and configuration of the ECDIS900 programs can be completed.

INSTALLING ECDIS900 APPLICATIONS

The computers come with pre-installed software. Check the versions and update if needed. An update may be done on top of the existing version and overwrite configurations or user data. Please be sure to save ECDIS900 configurations and user data before starting an update process. Sensor Monitor and Application Manager are installed as part of ECDIS900. Other programs must be installed separately.

➔ **Note:** Create a folder "Backup" on the desktop. Share the folder. Copy all configuration and installation files (ECDIS900, NAVTEX and Application Manager) and wallpaper image(s) to that folder. This will enable the crew to reinstall failing programs if the need arises.

ECDIS900

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

Type of monitor

Select the monitor installed. If you are in doubt, select Unknown Monitor. The selection here loads the correct color table for the monitor in use or loads a standard color table.

Screen dimensions

Confirm the actual dimension values. Incorrect settings will give incorrect aspect ratio and circles on the chart will appear as ovals. This is important on wide- screen monitors.

User password

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

Select monitoring or planning station

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

Sensor monitor

This program is installed as part of the ECDIS900 package.

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

This chapter describes how to configure the most commonly used sensors, NMEA 0183®, AIS Transponder and Display Controller. For other sensors, or for a more detailed explanation, read the Sensor Monitor Chapter in **ECDIS900 Technical Manual**.

General settings

- A** Turn on checksum for all sensors (release the button "Check Checksum").
- B** Do not use sensor data routing.
- C** Turn off Immediate Data Forward.
- D** Verify Network Mode is selected. There is no communication to/from other computers if Sensor Monitor runs in Local Mode.
- E** Enable AIS Target Table filter with 15 NM range and 150 targets in the ECDIS computer.

Display controller SIMRAD ECDIS900

Verify correct Display Controller is installed.

In the case of MK5B, the Y-cable is used for connection between computer and monitor/alarm panel. The sensor also controls the alarm sound, check that ECDIS900 alarms give an audible sound from the alarm panel. Check that colors look right. If not, check the connection of the serial cable between the units and make a factory reset of the monitor.

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

NMEA 0183® sensor

This sensor is used for almost all connected equipment such as GPS, gyro, log, AIS, ARPA, wind, echo sounder etc. Try this

sensor first. If it does not work, select one of the dedicated sensors.

AIS transponder sensor

Remote control from the ECDIS900 is possible but is turned off by default.

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

- AIS input — The AIS transponder sends a lot of information to the ECDIS900, especially in busy areas such as Singapore or Rotterdam. Therefore, it is important to connect the AIS to only one PC to avoid overloading the network.
- In addition, filtering of AIS targets must be set up in Sensor Monitor as described in the paragraph AIS.

Ship specific settings

All ship-specific settings must be entered from the monitoring ECDIS900. From here the settings are distributed to the other computers on the network. The list of very important settings that **must** be done on every installation is below.

Ship properties, tabsheet general and voyage

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

Ship properties, tabsheet shape

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

Also set radar and conning positions.

Ship properties, Tabsheet shape/F-Distance

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

Ship properties, Tabsheet AIS

Click the Update Ship Library button.

Safety depth

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

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

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

Options, Tabsheet route

Adjust default values for Turning Radius and Speed.

NAVTEX

Connect the NAVTEX receiver data output (not printer output) to ECDIS900. It is common practice to connect to the monitoring computer, but very often it is easier to connect to the planning computer at the chart table. Reset the NAVTEX receiver to factory defaults. Set up the NAVTEX receiver to receive all messages from all stations and to send everything to the data output port.

The ECDIS900 computer that is physically connected to the NAVTEX receiver runs as the NAVTEX Master. Run NAVTEX Server and NAVTEX Inbox software on that computer. Accept default settings but select NMEA® extension.

The other computers in the network run as NAVTEX Slaves.

Run Inbox only, do NOT keep running the server on NAVTEX slave workstations. Accept default settings but select NMEA® extension.

NAVTEX Master configuration

- 1 On the desktop's process line, right-click the server icon and then click "Open Server Dialog".
- 2 The server is running. Click "Options/Port Settings". Select "Network" and enter the SIS4000-MK2 NAVTEX sensor port to where the NAVTEX receiver is physically connected.
- 3 Select "Options".
 - Verify that "Use NMEA® Extensions" is ticked on.
 - Remove all other tick marks and check that something is rolling in.
 - This depends on the receiver in use, these examples are from a JRC NCR333:
\$CRALR, (list of possible errors - normally flagged V for not active).
\$CRNRX, (list of received messages, line by line).
LOREMIPSUM..., (message in plain text).
 - If the message is corrupted, the signal is inverted. Swap the wires. The data must be clearly readable and in plain text.
 - Look for the NRX message. This is needed to continue.
 - If NRX messages are correct, turn off the terminal window by clicking "Options/Pause".
- 4 Click "Options/Position Settings".
Select "Accept the Position From Sensor Monitor". Click "Ok". Note that the Server title bar has changed, and now shows you're the current position and NAVTEX area.
- 5 Click "Options/Expiry".
Select "Enable Auto Check" and set it to 3 days.
- 6 Make sure the server is running by clicking "Actions" and verify that you have a tick mark at "Start". Then minimize the server.
This concludes the server setup.
- 7 Open the Inbox program. Click "Tools/Options/Position Settings". Select "Accept the Position from Sensor Monitor". Click "Ok".
- 8 Click "Options/Expiry". Select "Enable Auto Check" and set it to 3 days.
- 9 Click "Tools/Options/Mailbase Path".
Click "Browse" and point to **C:\ProgramData\MARIS\Navtex\InBox**. Click "Ok". This concludes the Inbox setup.
- 10 Share the folder **C:\ProgramData\MARIS\Navtex\Inbox** for Everyone and give full read/write access. Sharing is needed to allow other computers on the network to read incoming messages.
- 11 Open the ECDIS900 and check that incoming messages will close the NAVTEX book on the acknowledge panel. A red NAVTEX book is also dropped at the ship's present position, or at the position of interest. This function can be turned on/off in the box. Read the information by clicking the NAVTEX book on the acknowledge panel or by re-clicking the icon on the chart.

NAVTEX slave configuration

- 1 Click "Start/Computer/Tools/Map" network drive...
- 2 Click "Browse..." and select the Inbox folder on the ECDIS900 computer running the NAVTEX Server.
Place a tick mark in "Reconnect" at Logon. Click "Finish". You have now a direct access to this remote folder over the network. Close all open windows, click "Computer" again and verify the remote Inbox folder is listed under Network Drives.
- 3 On NAVTEX Inbox, click "Tools/Options/Position Settings". Select "Accept the Position From Sensor Monitor". Click "Ok".
- 4 Click "Tools/Options/Mailbase Path". Click "Browse" and select the network drive you have just created in step 1. Click "Ok". This is crucial. If you do not point to the shared network folder on the computer running NAVTEX Server, nothing will show up.
- 5 Click "Options/Expiry". Select "Enable Auto Check" and set it to 3 days.
This concludes the slave setup.

Application Manager

General

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

The application runs in two security modes:

- **Service mode** — This mode is used by the installer or the captain during installation or changes in ECDIS900 system configuration.
- **Operation mode** — The operational mode is used to protect the PC against any changes which may affect the operating system and to make it impossible to install third-party software. In this mode, ECDIS900 computer access is restricted to mandatory ECDIS900 functions and to other SIMRAD applications which are selected during configuration. Application Manager replaces Windows Explorer and all standard shortcuts such as Ctrl-Alt-Del are disabled.

Configure AM Application Manager

A Start

Start Application Manager by double-clicking the icon on the desktop. Double-click inside the Application Manager grey rectangle at the top right of the screen to show the console.

B Select the administrator mode

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

C Set up password

To set up the passwords:

- Click Security Setting - the icon with a yellow key.
- Press "Change Administrator password", enter "e900service" as old password, enter and confirm the new administrator password.
- Press "Change user password", old password left empty and enter a new user password.

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

- To toggle between operational (ECDIS900 Approval mode) and service mode (Open system).
- To set up Application manager as described below.

D Operational mode versus service mode

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

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

E Configure

1 Select Service mode

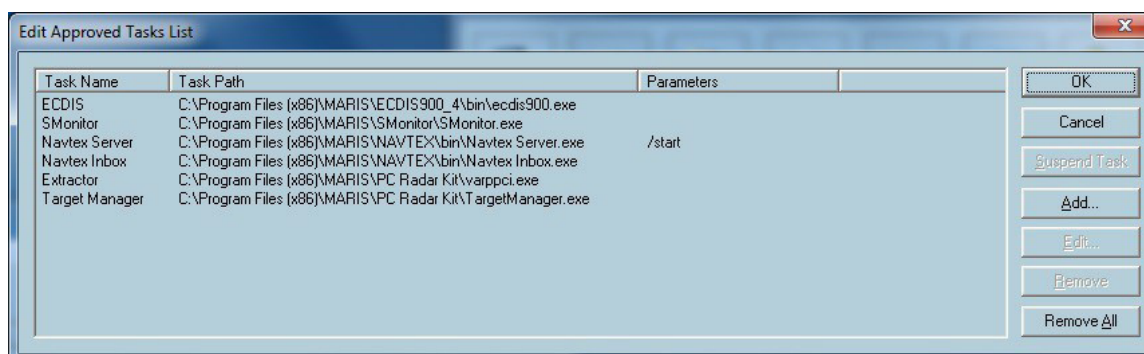


Click the button with a yellow key and then click the button with a red shield. Enter password and restart. The computer restarts in maintenance mode and Application Manager is not running.

2 Setting up Auto Start Programs



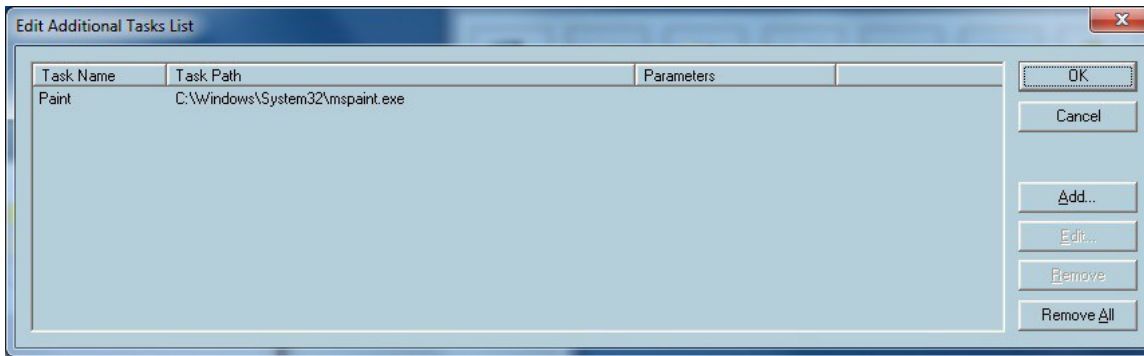
Press the button. Edit the list by pressing the button AUTO. Populate the list with the programs installed on the computer. This example shows a computer running ECDIS900, Radar interface and NAVTEX Master. Programs listed here will always run and cannot be shut down. If you try to close a program or it stops, it will be started again automatically.



3 Setting up Other Programs

Click the button “Other”. Populate the list with other useful programs.

The applications listed in OTHER could be started by user demand by clicking the appropriate button. These applications can be stopped.



Application Manager main window in Operational mode showing the programs you have allowed to run.

→ **Note:** Your configuration will differ, depending of the programs are installed on the computer.

F Last steps

⚠ WARNING: Never leave the computer in Service mode! It is against regulations and navigators can, and will, make changes to the system.

When configuration is complete, the Operational mode must be selected to run the ECDIS900 in Approval mode.



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

Dead man alarm

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

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

➔ **Note:** This function requires optional hardware.

Configuration in Application Manager:

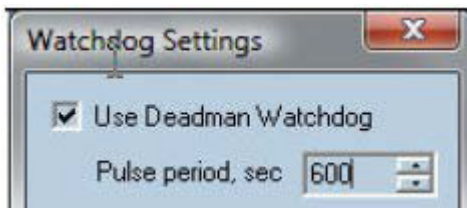
- 1 Activate "Administrator mode".



- 2 Press the button

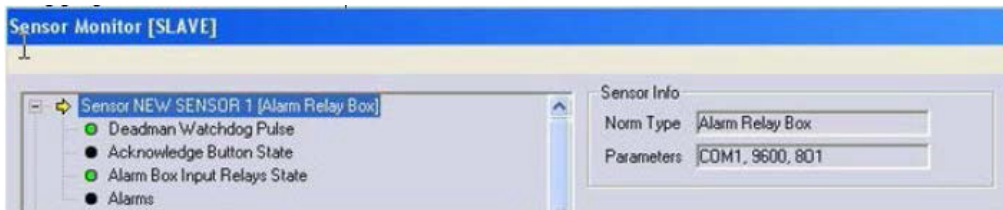


- 3 Activate the function



Configuration in Sensor Monitor

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



- 2 In the alarm Box sensor panel, populate the "Output mask DEADMAN" which defines the pins that are pulsed when Application Manager sends an alarm message. (See PLC manual).

CHARTS INSTALLATION

ENC and AVCS

First install the permits and then install the charts from the CDs provided. Update the other computers over the network by using the function Copy Database.

ARCS

First install the charts from the CDs provided and then install the permits. Update the other computers over the network by using the function Copy Database.

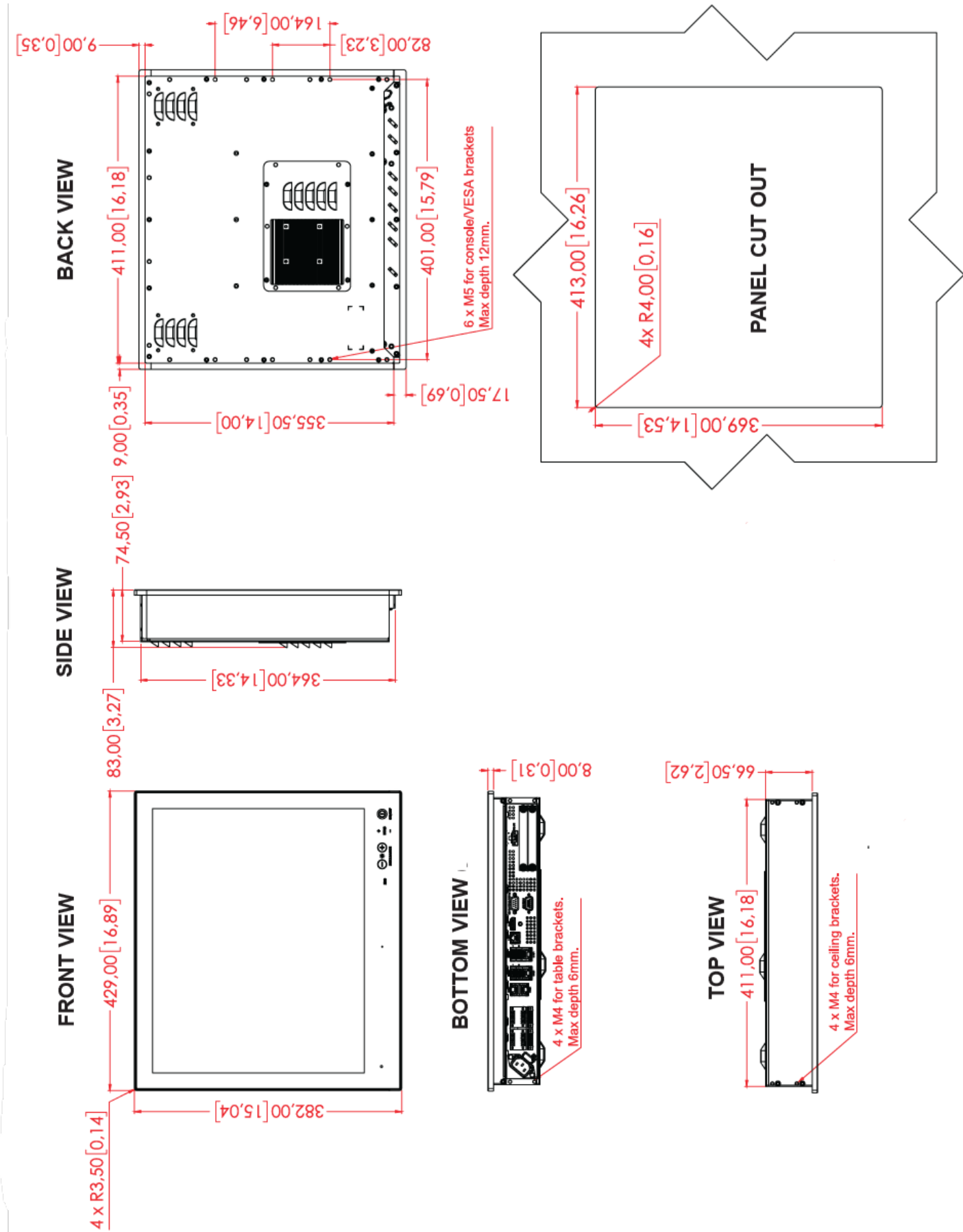
BIOS SETTINGS

Select the menu 'Load setup defaults' and answer yes. Follow the table below and change settings as indicated

Menu	Submenu	New setting
Standard CMOS features	Date	Set UTC date
	Time	Set UTC time
	Halt on	All errors
Advanced BIOS features	First boot device	CD-ROM
	Second boot device	Hard Disk
	Third boot device	Disabled
	Boot other device	Disabled
	Boot up Num Lock status	Off
PC health status	CPU warning temperature	80°C

Select the menu 'Save & exit setup'. Answer 'Yes' to save the settings and restart.

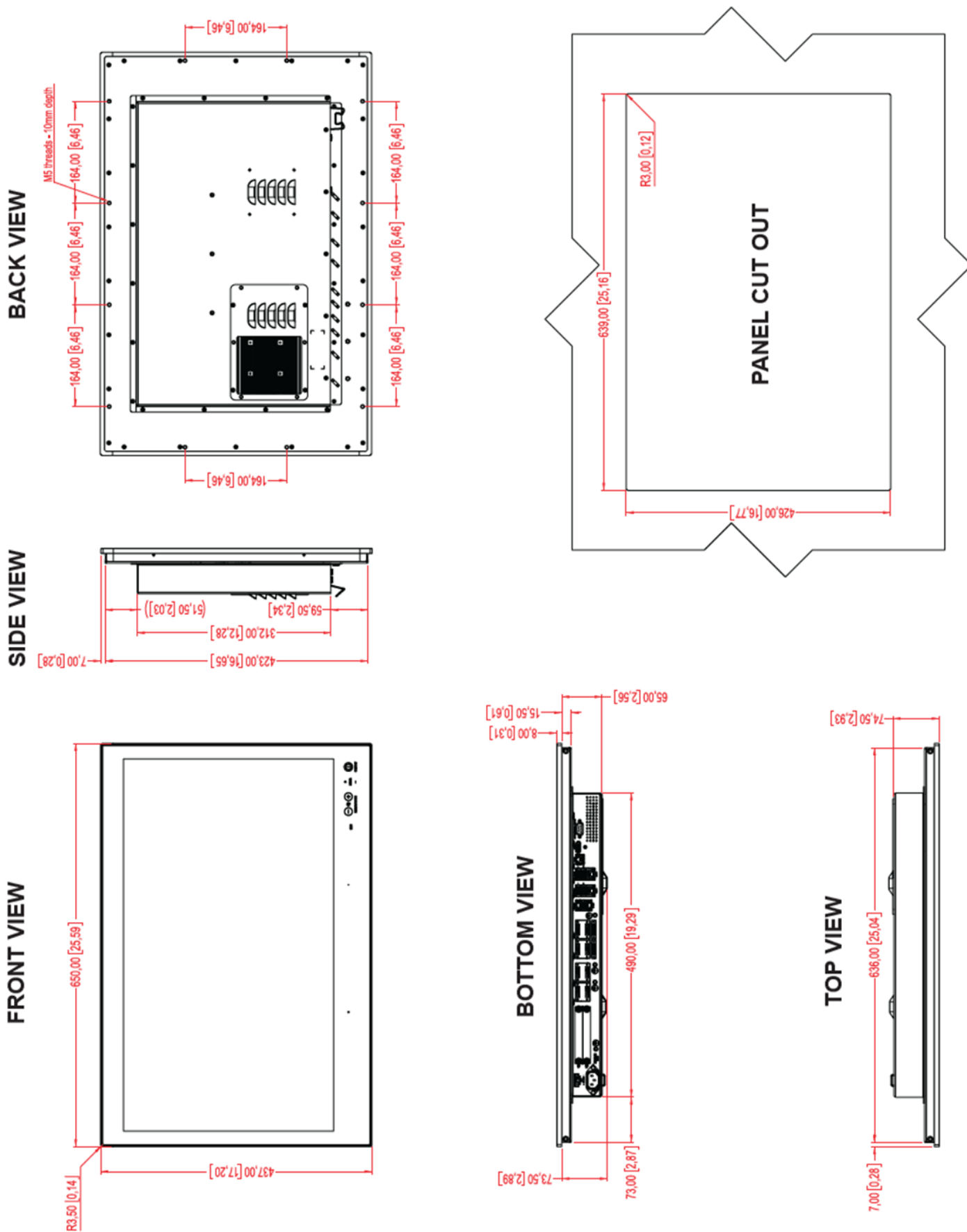
ECDIS900 MK15B 19" FLAT CONTROL PANEL PC



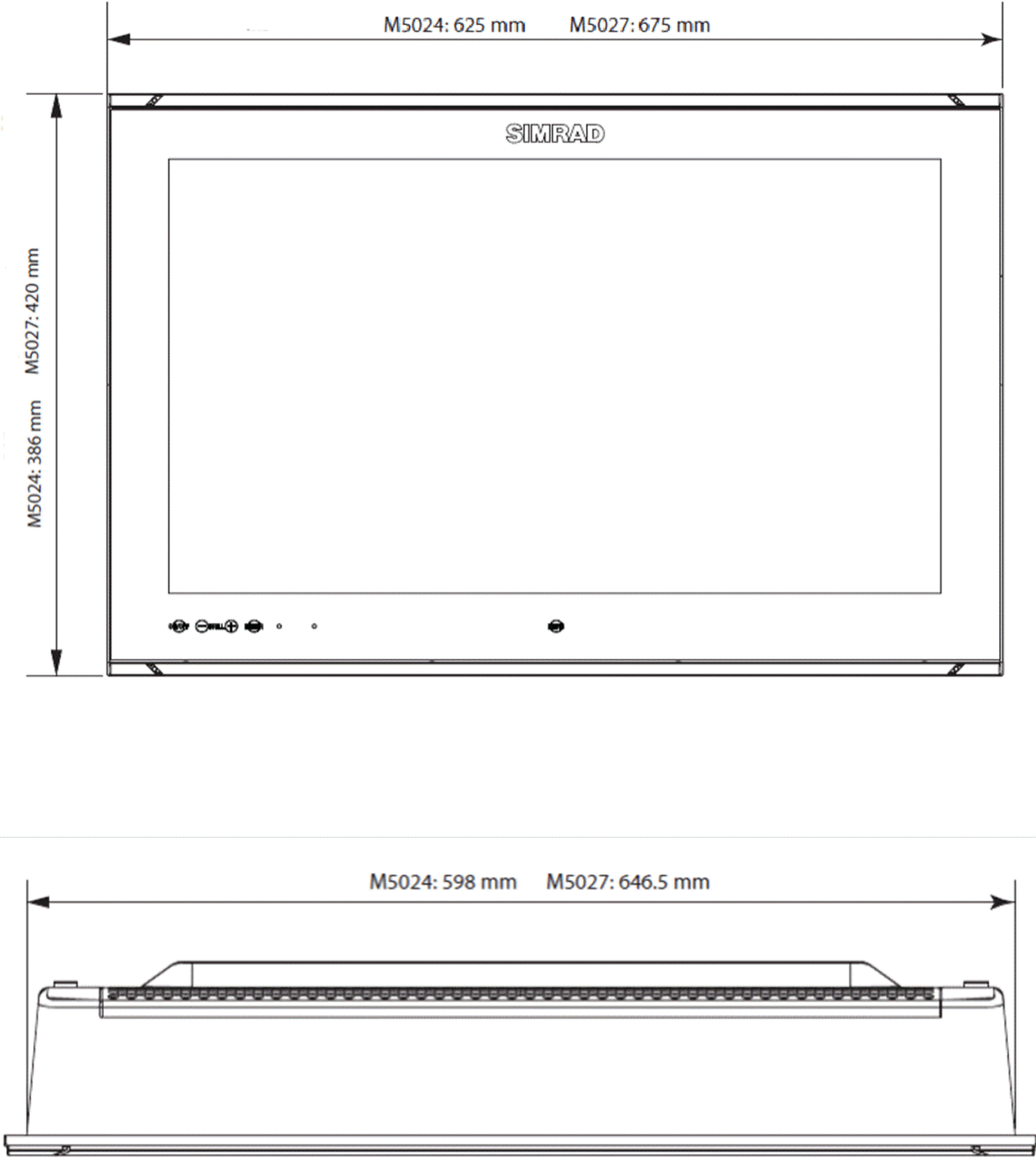
ECDIS900 MK15B 24" FLAT CONTROL PANEL PC



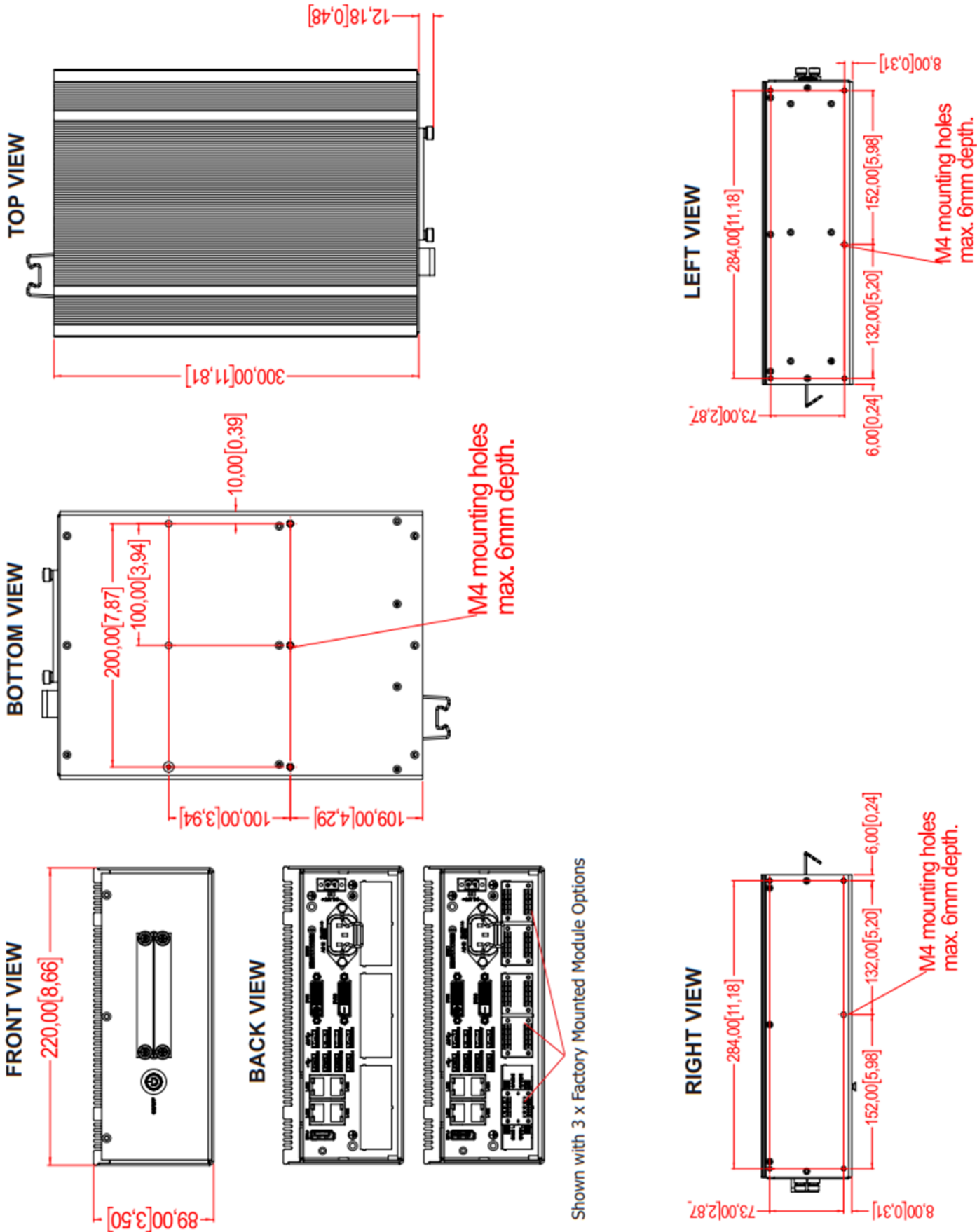
ECDIS900 MK15B 27" FLAT CONTROL PANEL PC



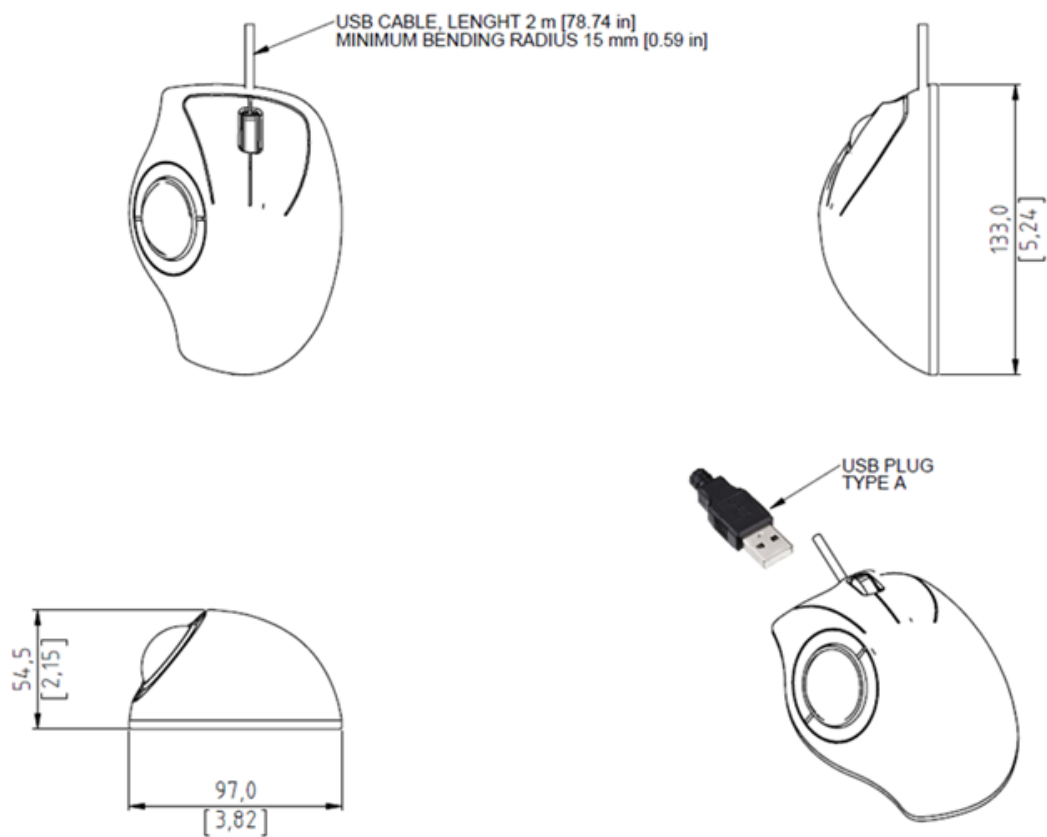
ECDIS900 MK5B MONITORS



ECDIS900 MK5B PROCESSOR

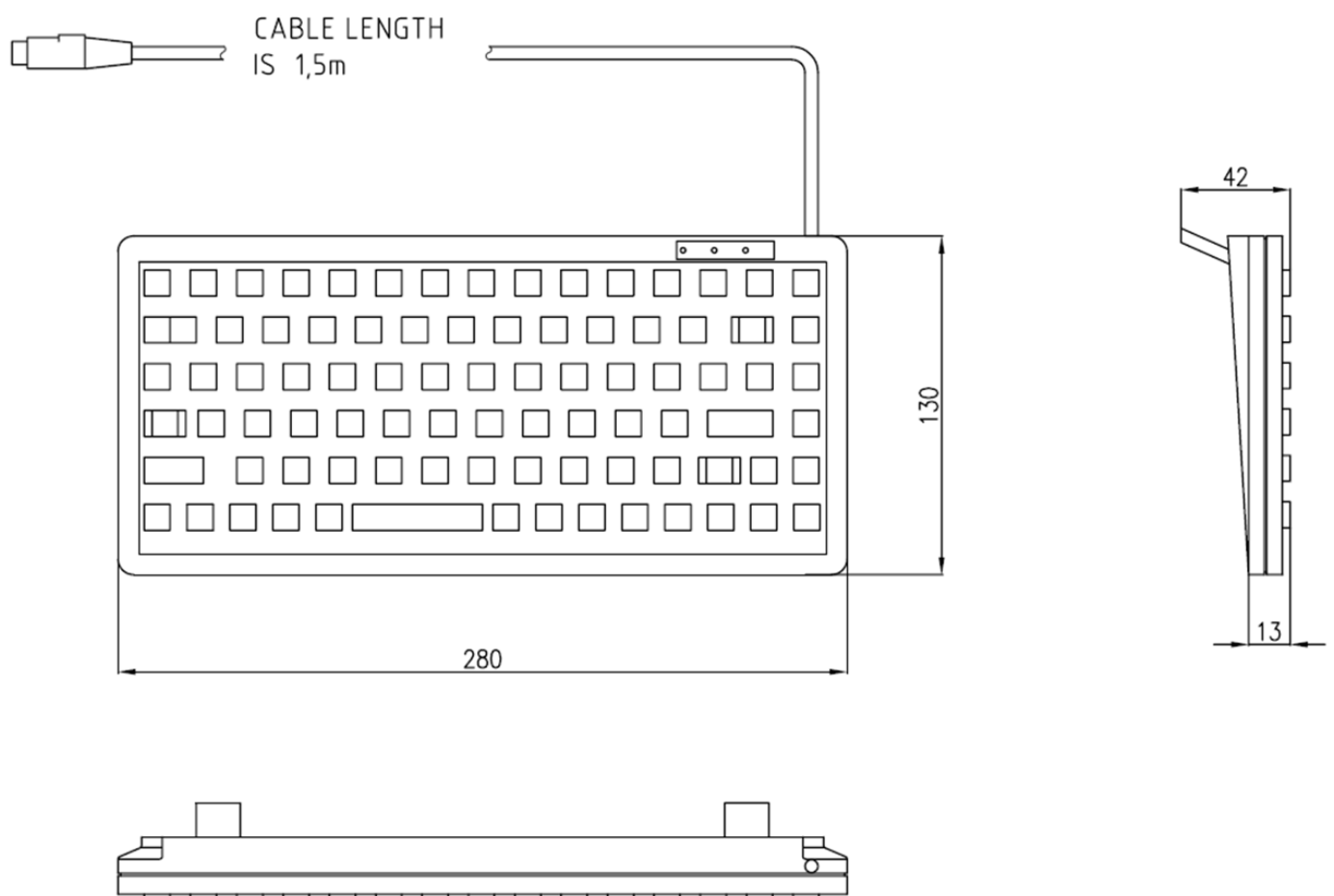


TRACKBALL

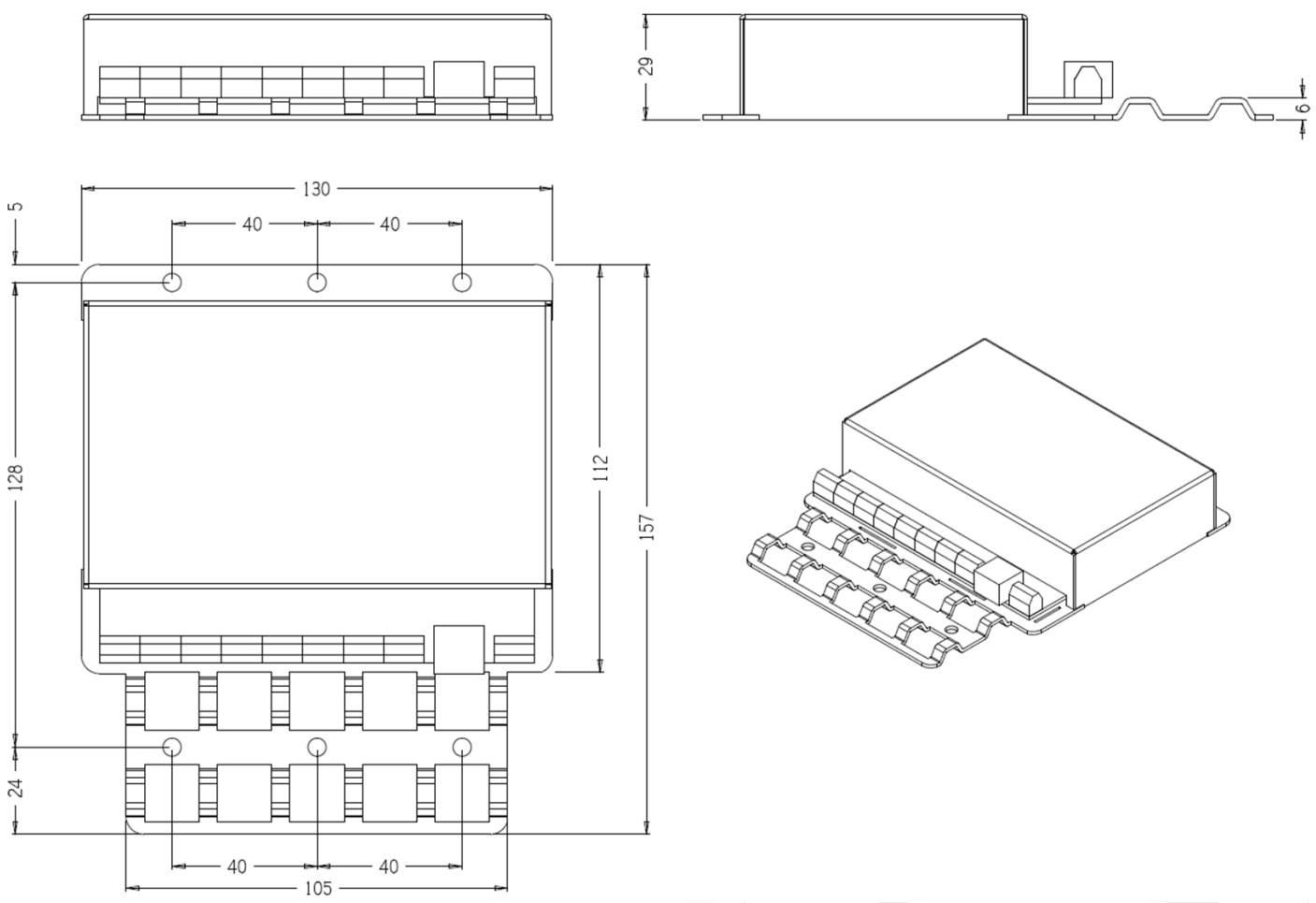


DIMENSIONS $\frac{\text{mm}}{\text{[inches]}}$

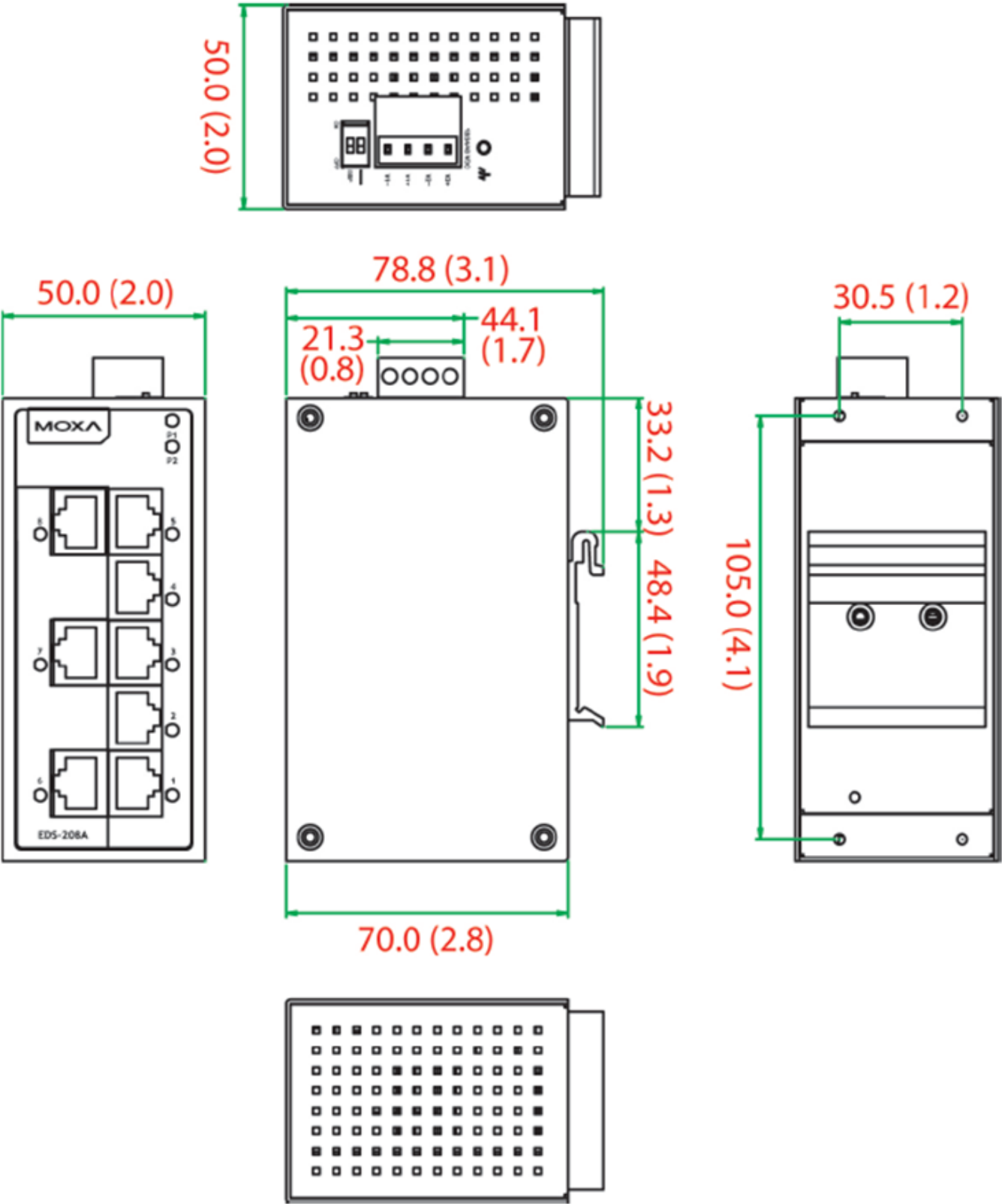
KEYBOARD



SIS4000 - MK2

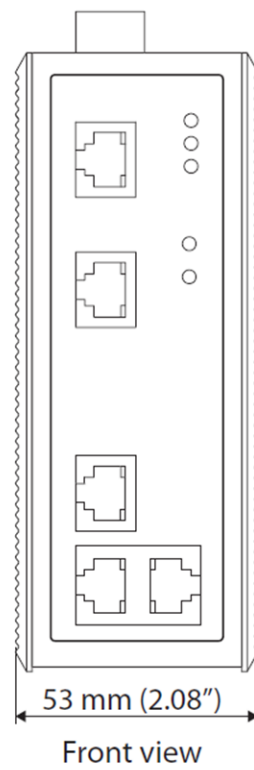
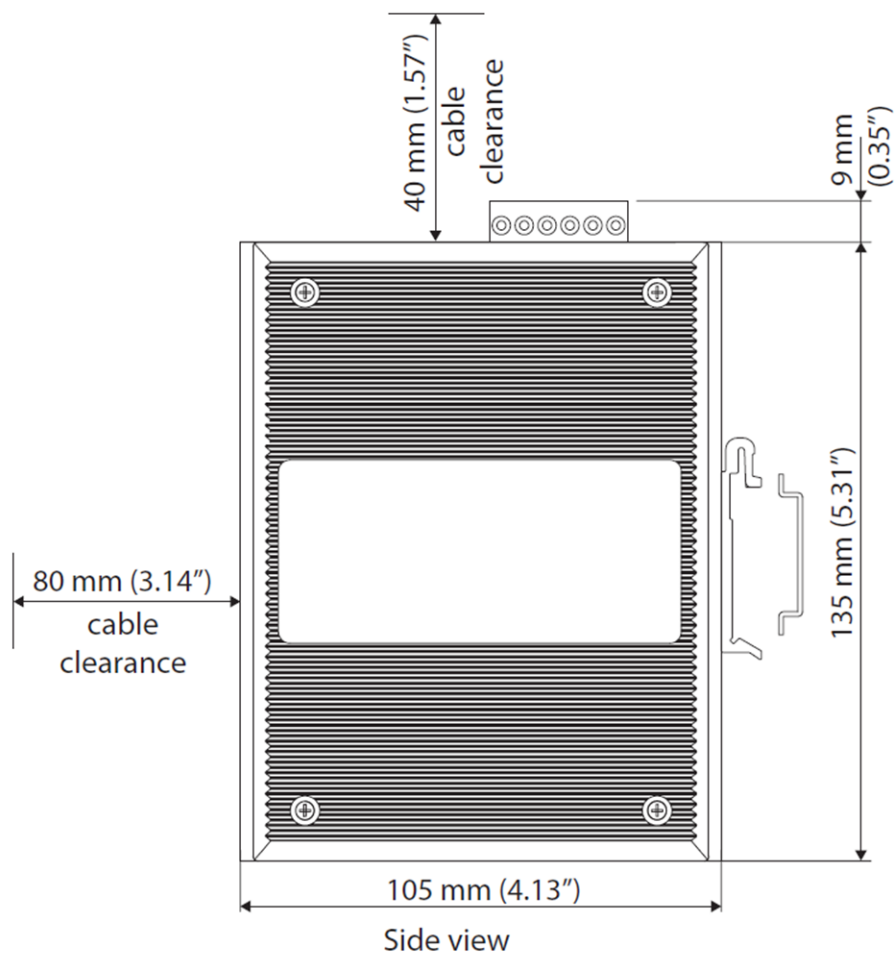


8 PORT NETWORK SWITCH – EDS-208A



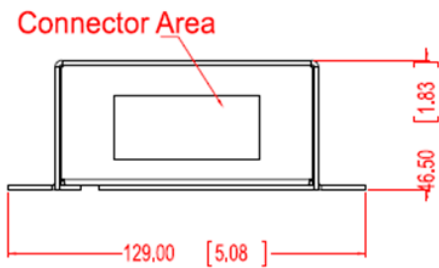
Unit = mm (inch)

5 PORT NETWORK MANAGED SWITCH – EDS-405A

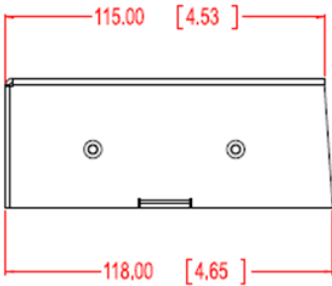


NMEA 0183® 4-PORT EXPANSION (USB)

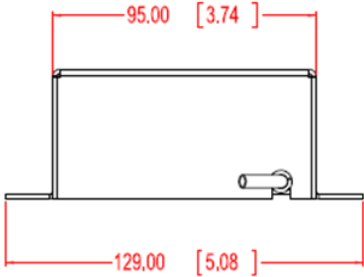
FRONT VIEW



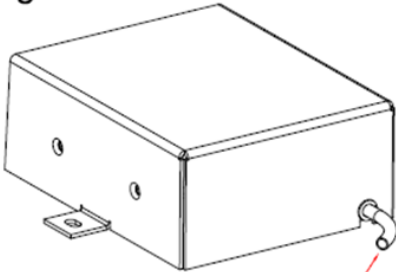
SIDE VIEW



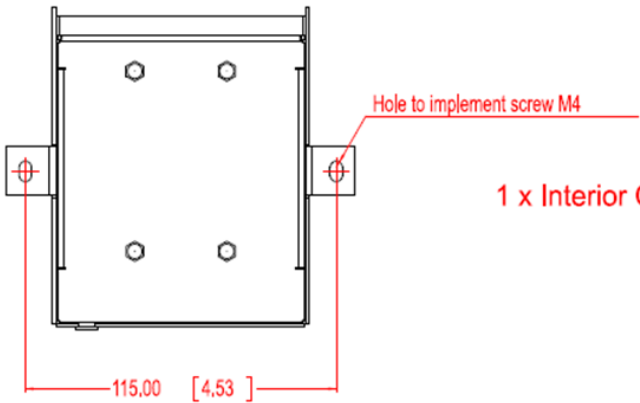
BACK VIEW
Single Cable



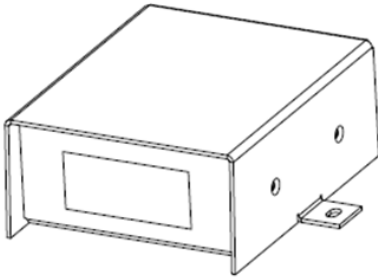
DIMETRIC VIEW A
Single Cable



BOTTOM VIEW



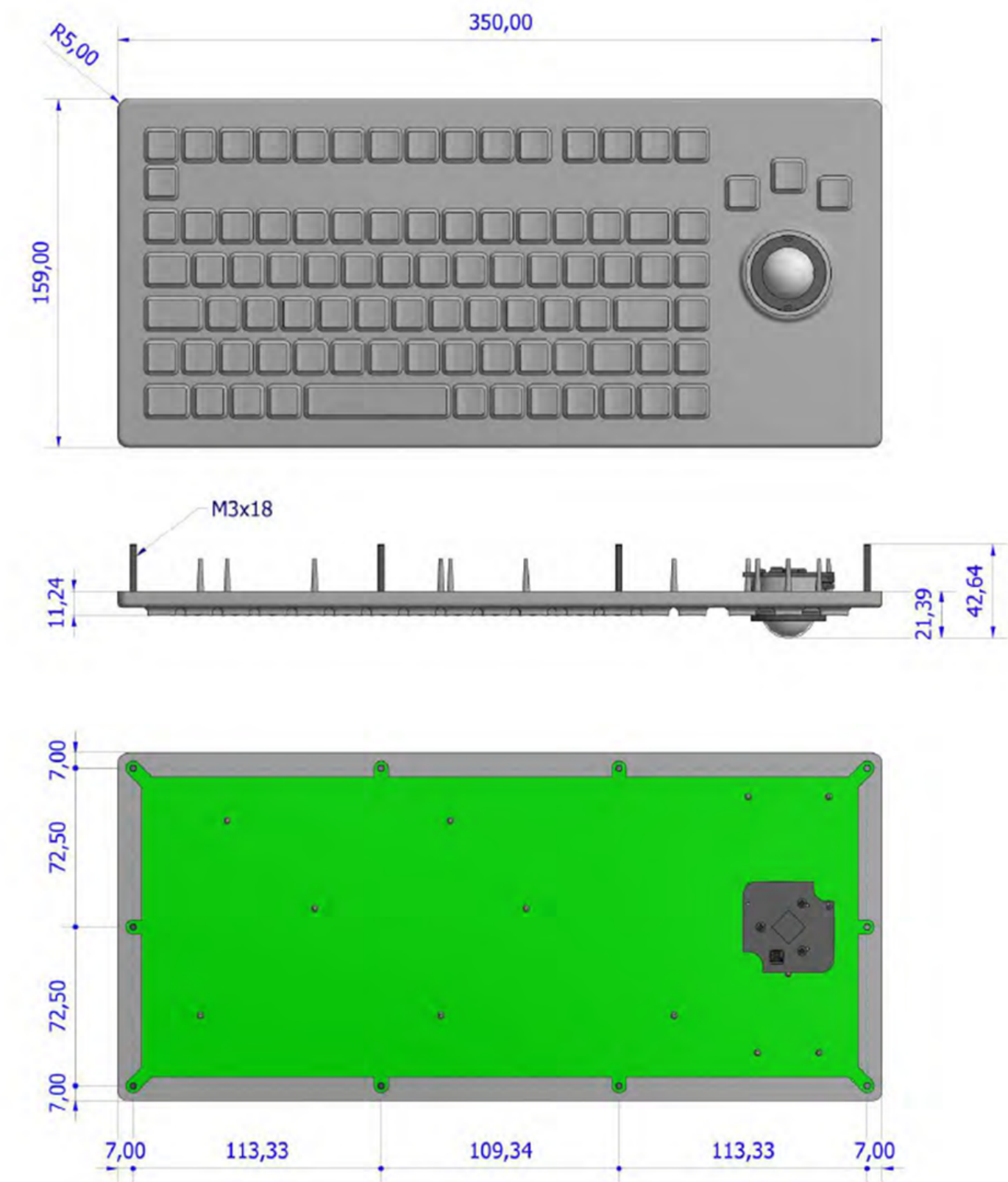
DIMETRIC VIEW C



OP3000 KEYBOARD – DESKTOP

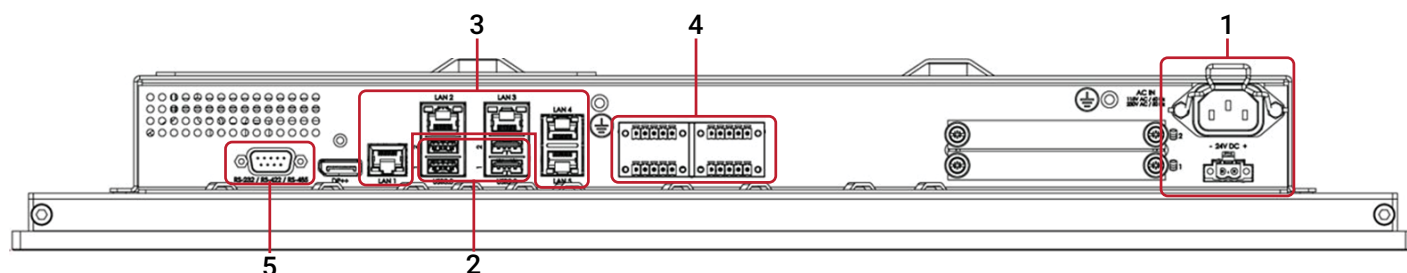


OP3000 KEYBOARD – PANEL MOUNT

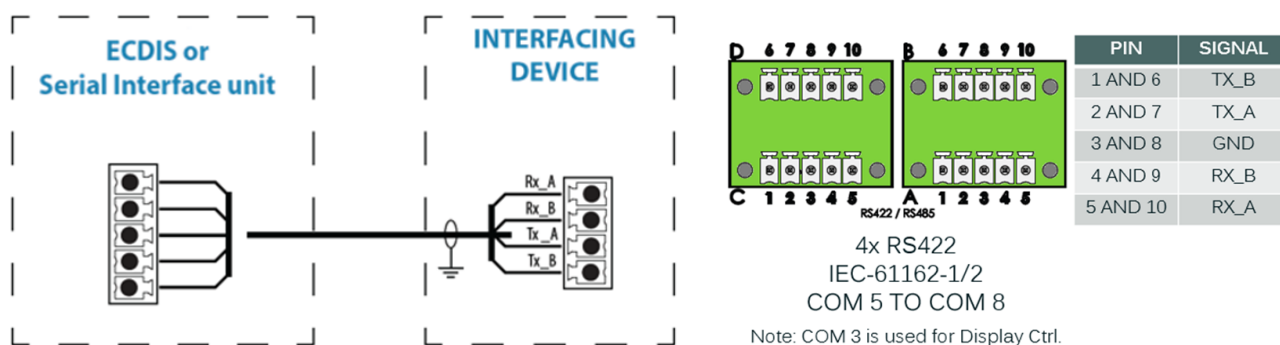


WIRING DETAILS

ECDIS900 FLAT PANEL COMPUTER MK15B



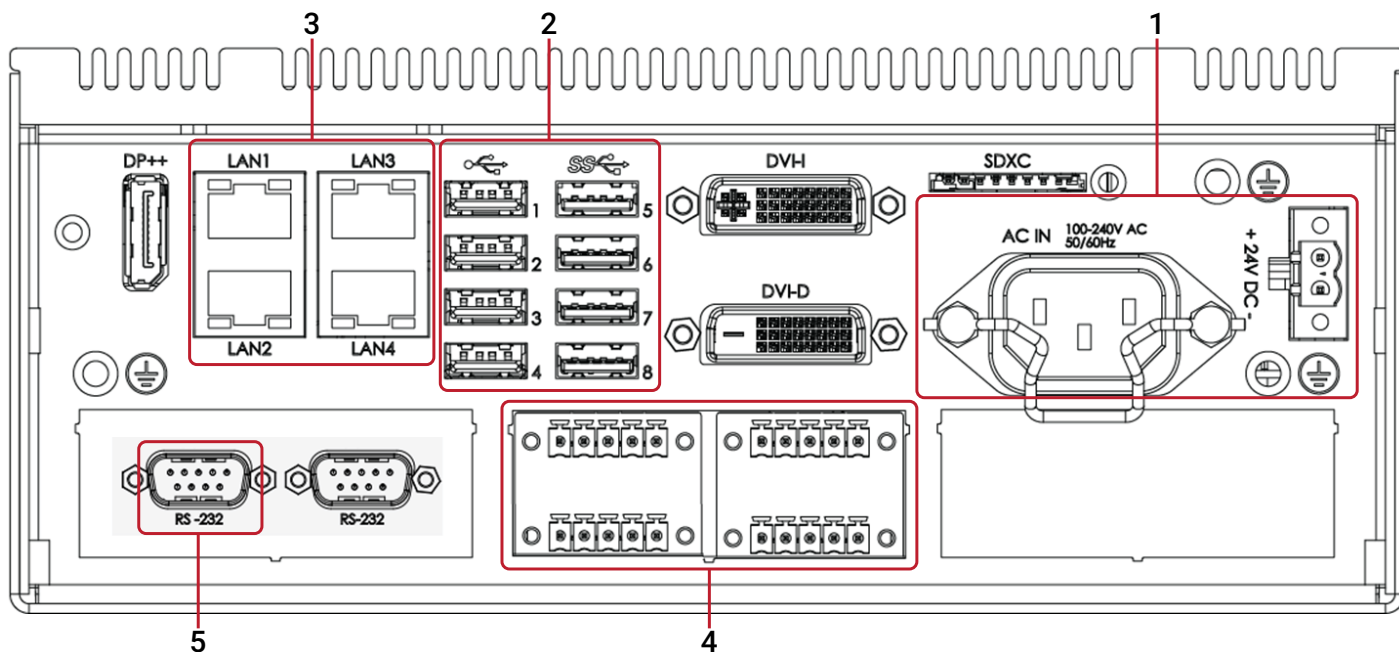
- 1 The ECDIS900 flat panel computer MK15B has a dual input power supply which will accept both AC and DC input. If Both inputs are connected the unit will be powered by AC. If the AC supply fails or is removed, it will automatically switch over to the DC Supply without effecting the operation of the unit. This makes it possible to use AC power as primary with the 24 V DC as a backup supply.
- 2 The ECDIS900 has a four USB ports. Connect the Dongle, Mouse and keyboard. A USB male/female extender cable is supplied by default with MK15B to facilitate Chart updates and backup user data. Use USB3.0
- 3 The ECDIS900 has a 5 Ethernet Ports. Use for the ECDIS network, SIS4000 MK2 port expansion, VDR, Radar overlay,.. By default LAN 1 is preconfigured to be ECDIS network.
- 4 The ECDIS MK15B has 4 RS422 bidirectional ports. All four are compatible with IEC61162-1 and IEC61162-2 sensors. By default this are set up as COM5 to COM8 ports.



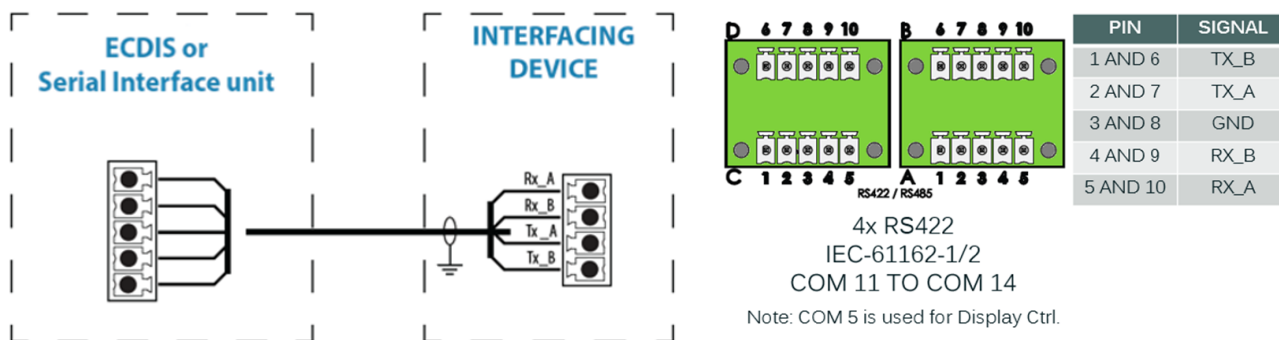
- 5 Never use RS232!

⚠ WARNING: This standard is not galvanic isolated and will ground the entire 24V net on the ship and this may damage connected equipment. RS232 is not allowed on a SOLAS ship and violates any type approval. Not only violating the rule work, it is also bad engineering and installation practice, which can result in loss of data and compromise safety of navigation.

ECDIS900 MK5B PROCESSOR

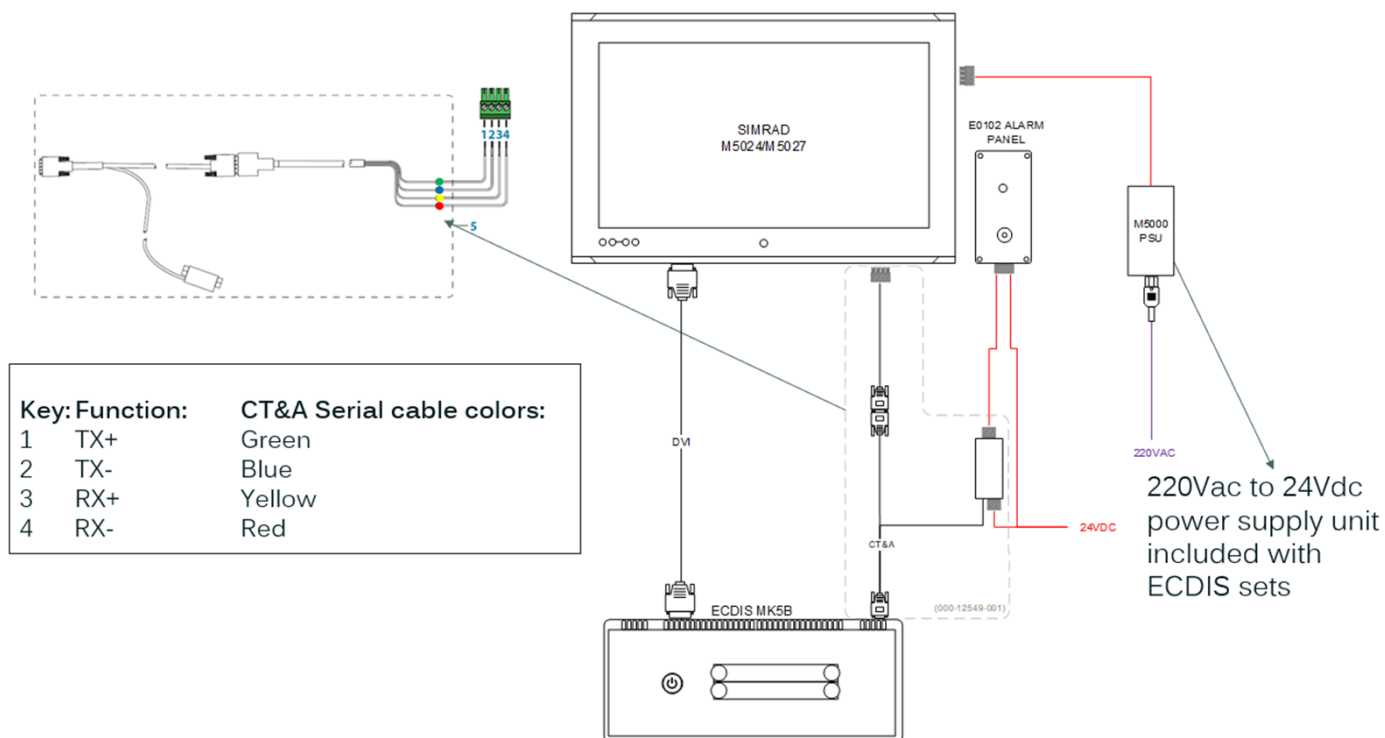


- 1 The ECDIS900 MK5 Processor has a dual input power supply which will accept both AC and DC input. If Both inputs are connected the unit will be powered by AC. If the AC supply fails or is removed, it will automatically switch over to the DC Supply without effecting the operation of the unit. This makes it possible to use AC power as primary with the 24 V DC as a backup supply.
- 2 The ECDIS900 has a eight USB ports. Connect the Dongle, Mouse and keyboard. A USB male/female extender cable is supplied by default with MK5B to facilitate Chart updates and backup user data. Use USB3.0
- 3 The ECDIS900 has a 5 Ethernet Ports. Use for the ECDIS network, SIS4000 MK2 port expansion, VDR, Radar overlay. By default LAN 1 is pre-configured to be ECDIS network.
- 4 The ECDIS900 MK5B has 4 RS422 bidirectional ports. All four are compatible with IEC61162-1 and IEC61162-2 sensors. By default this are set up as COM11 to COM14 ports.



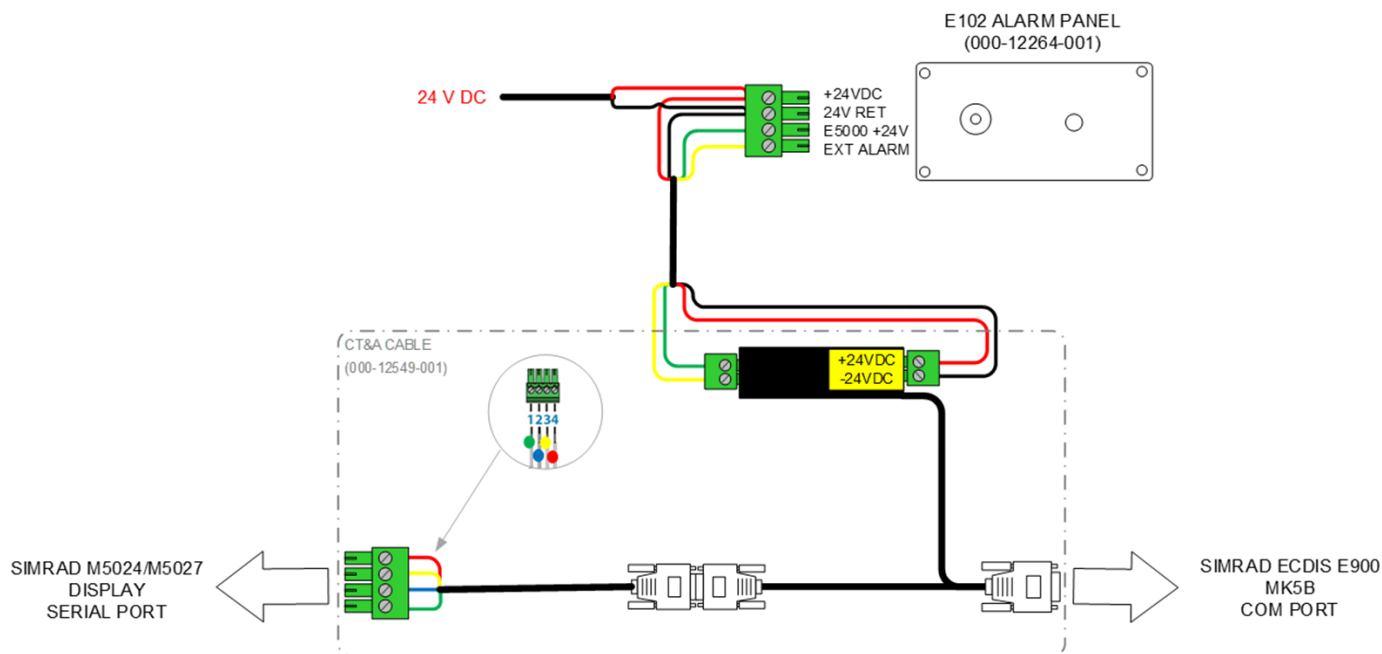
- 5 The ECDIS900 MK5B has 2 RS-232 ports. Use COM 5 to connect with the display for color calibration and alarm panel. Do NOT use for external equipment.

M5024/5027 MONITOR

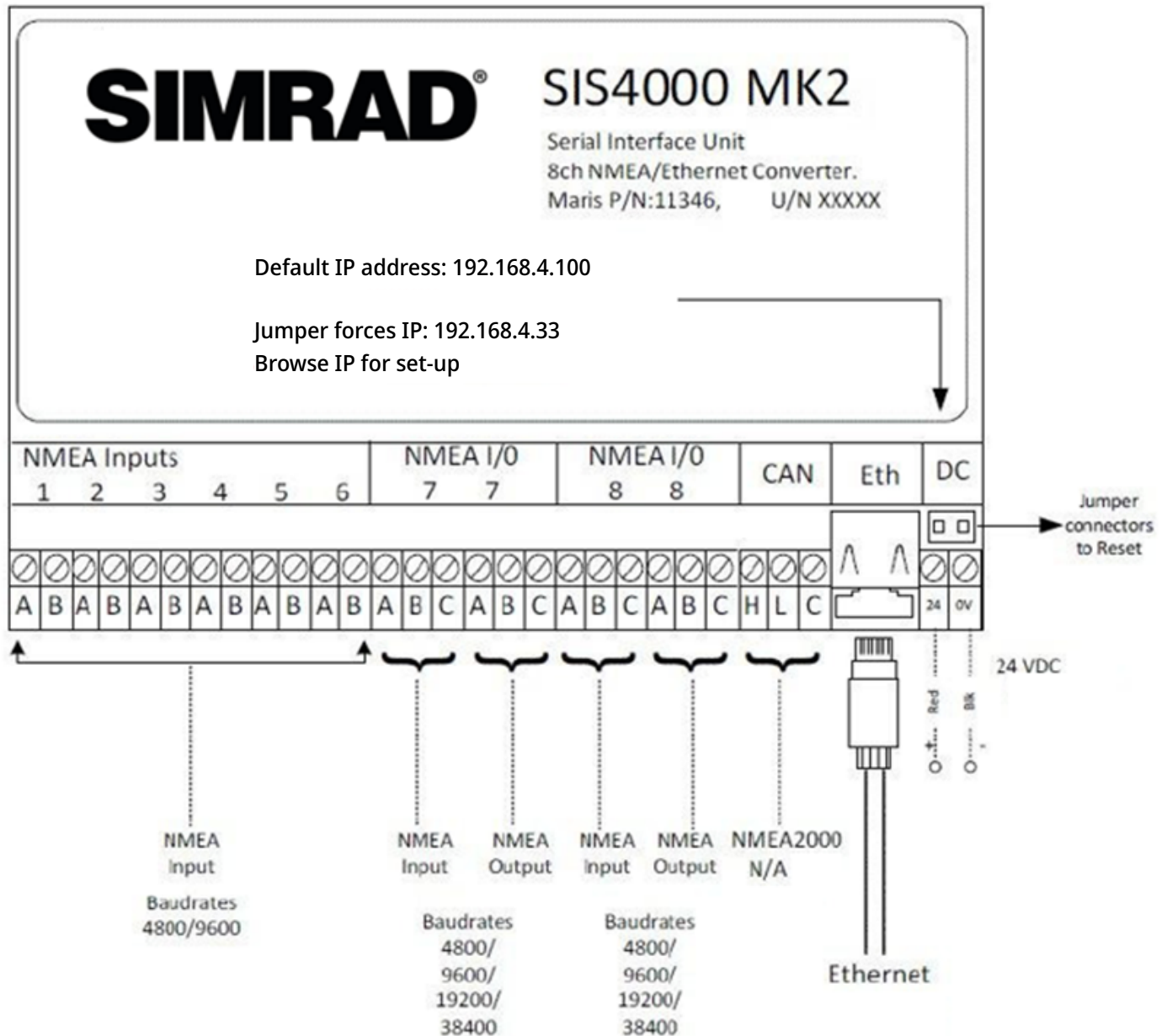


MK5B ALARM PANEL

The push button in the alarm panel is only to mute the alarm, not to accept, the alarms need to be accepted in the Monitoring station.



SIS4000 – MK2

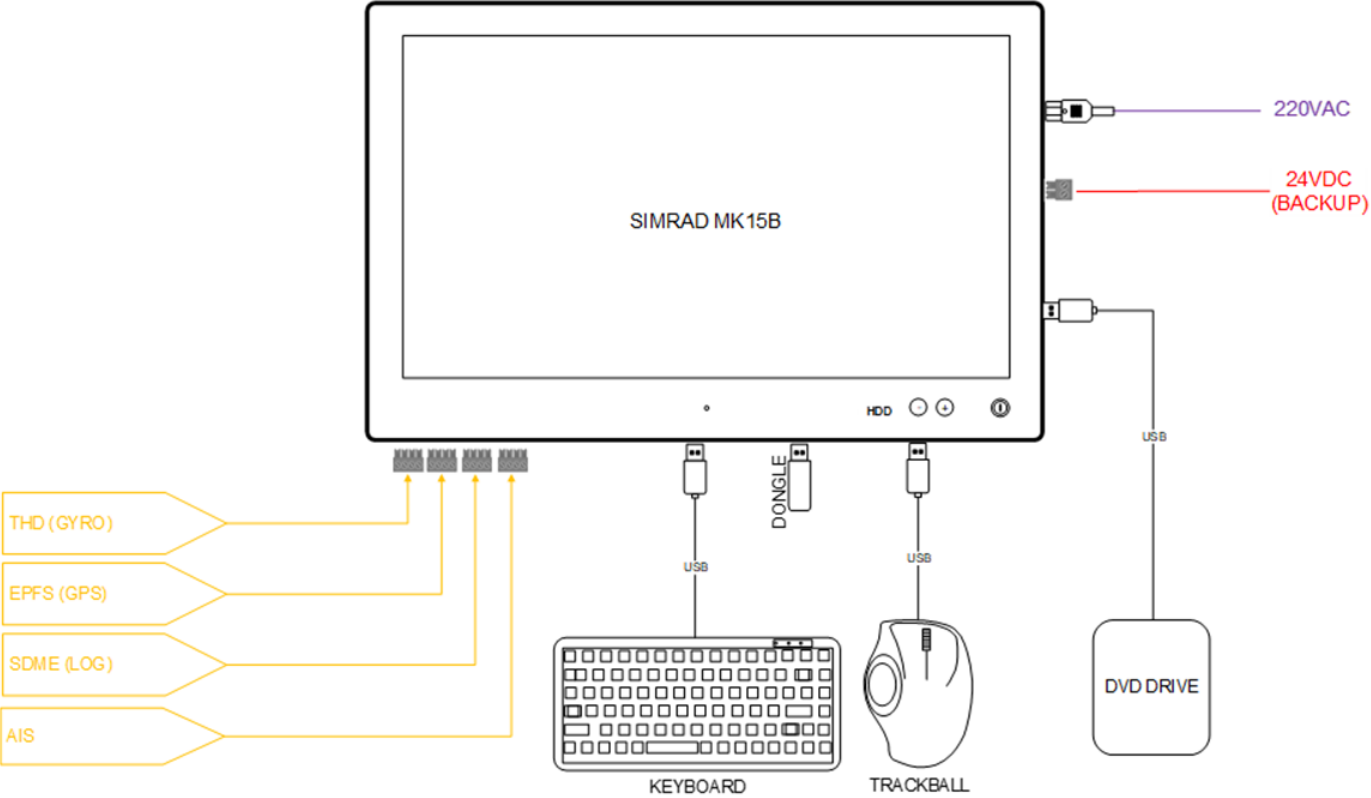


- SIS4000-MK2 is a NMEA 0183® to Ethernet converter.
- All channels are configured for RS422.
- Channel 1 to 6 is input only, Baud rates 4800 or 9600.
- Channel 7 and 8 is input/output, Baud rates 1200 to 115200.
- Once the channels are configured, Sensor Monitor reads the data and transmits it over the ECDIS network making it available for all other computers.
- For that reason it is imperative, that every sensor in the system has its own unique port number to avoid conflicts.
- The SIS4000-MK2 accepts 10-40 V DC. **Note polarity!**

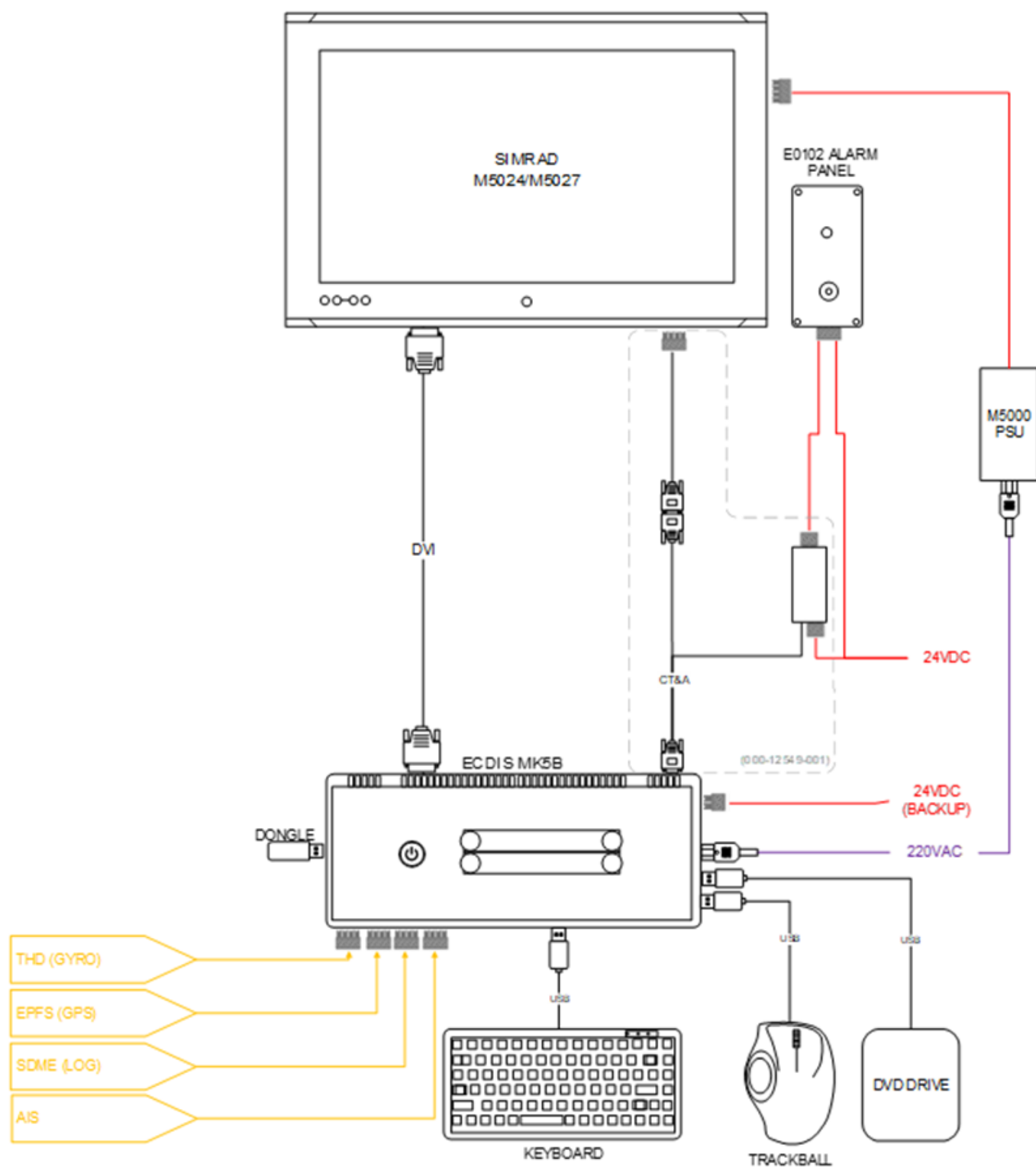
From AC/DC power supply:

- It is mandatory that the Ac power comes from the same source as for the computer.
- From Emergency or Radio batteries:
- Take the power from the same source that feeds the main navigational GPS.

ECDIS900 MK15B



ECDIS900 MK5B



SIS4000-MK2 Installation and configuration

Preparations

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

Programming the IP Address

- 1 Fit a jumper across the pins located above the power input. This forces the IP address to 192.168.5.33.
- 2 On the controlling ECDIS900 computer, change the sensor network IP address to 192.168.5.200.
- 3 The box has a web interface for easy programming. Start Internet Explorer and go to 192.168.5.33.
- 4 Select **Set Default Values**, answer **Yes** and click **OK**.
- 5 Select **Network Settings**.
- 6 Change IP address to 192.168.4.100. Change Gateway to 192.168.4.1.
- 7 Change Network mask to 255.255.255.0. Click **SAVE**.
- 8 Select **Restart Device**, answer **Yes** and click **OK**.
- 9 Remove the jumper.
- 10 On the controlling ECDIS900 computer, change the sensor network IP address back to 192.168.4.200.
- 11 Log on again and verify settings!

SIS4000 after IP configuration:

The screenshot shows a web browser window titled "Qwerty Elektronik AB, Sweden - Internet Explorer". The address bar shows "http://192.168.4.100/network.html". The page content includes a logo for Qwerty Elektronik AB, a description of their marine navigation interface products, and a sidebar with navigation links. The main content area is titled "Network Configuration" and contains a table of network parameters. A "SAVE" button is visible below the table.

Qwerty Elektronik AB, Sweden - Internet Explorer

http://192.168.4.100/network.html

File Edit View Favorites Tools Help

Qwerty Elektronik AB

Marine navigation interface products for AIS, VDR, S-VDR, ECDIS and other ship's integration.

Home

Network settings

Server settings

Channels settings

Serial port settings

CAN settings

System info

NMEA Statistics

CAN Statistics

Network Statistics

Set default values

Restart device

Network Configuration

From this page you can view and set network parameters.

Note. Network settings will be in effect first after next restart.

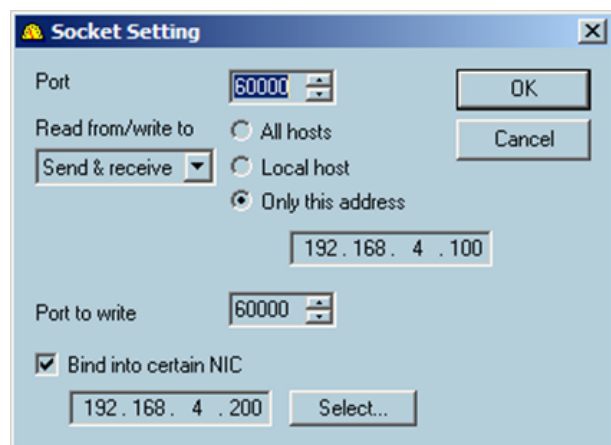
Network parameters	
MAC addr	00:14:36:41:03:5f
NetBIOS name	QE-CN8E-863
IP address	192.168.4.100
Gateway	192.168.4.1
Network mask	255.255.255.0

SAVE

Programming Sensor Monitor

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

→ **Note:** Read From/Write To is set to Send & Receive.



The Socket Setting dialog box is used to configure network communication parameters. It includes fields for Port, Read from/write to, Send & receive, Local host, Only this address, Port to write, Bind into certain NIC, and a Select... button.

Port: 60000

Read from/write to: ☐ All hosts ☐ Local host ☒ Only this address

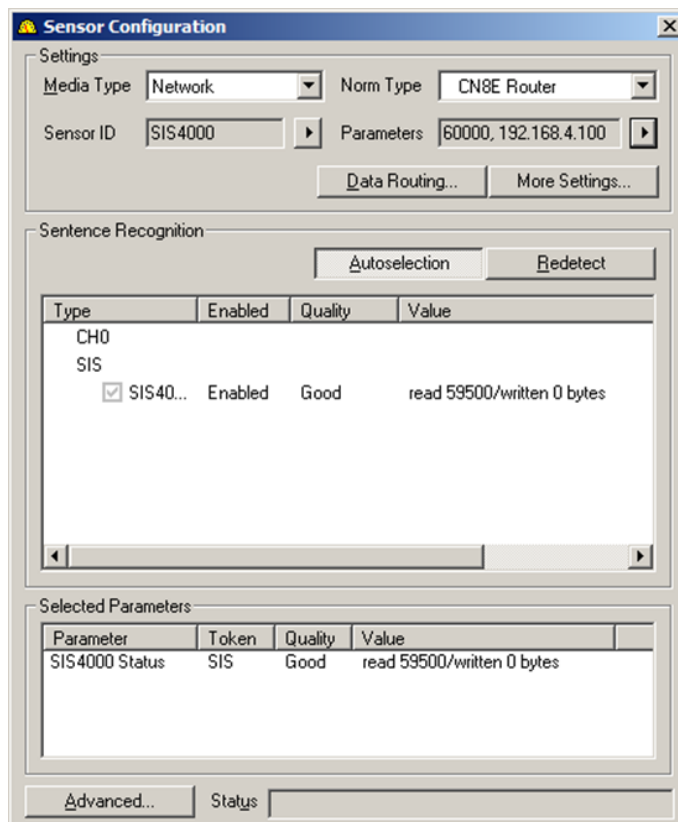
Send & receive:

192 . 168 . 4 . 100

Port to write: 60000

☒ Bind into certain NIC

192 . 168 . 4 . 200



The Sensor Configuration dialog box is used to configure sensor settings. It includes sections for Settings, Sentence Recognition, and Selected Parameters.

Settings

Media Type: Network Norm Type: CN8E Router

Sensor ID: SIS4000 Parameters: 60000, 192.168.4.100

Sentence Recognition

Type	Enabled	Quality	Value
CH0			
SIS			
☒ SIS40...	Enabled	Good	read 59500/written 0 bytes

Selected Parameters

Parameter	Token	Quality	Value
SIS4000 Status	SIS	Good	read 59500/written 0 bytes

Programming channels in SIS4000

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

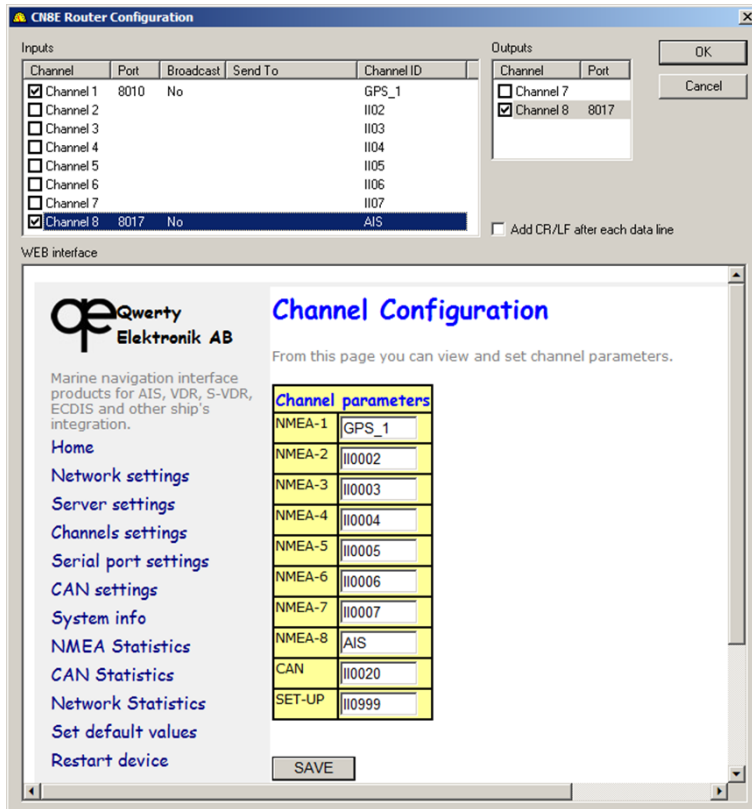
- 1 Place a tick mark on channels you want enabled.
- 2 Click the channel and the line turns blue. Click the column header for the item you want to change and enter the new value. Pay attention to port numbers.
- 3 In the web interface, select **Channels Settings** and change the name to the same as above.

⚠ IMPORTANT: The names must be identical, and they are case sensitive. That is, GPS_1 is not the same as gps_1. Maximum length is 6 characters.

- 4 Click **SAVE** when done with all sensors. Then click **OK** to close the window.

Channel no.	SIS4000 Monitoring	SIS4000 Planning1	SIS4000 Planning2
1	8010	8020	8030
2	8011	8021	8031
3	8012	8022	8032
4	8013	8023	8033
5	8014	8024	8034
6	8015	8025	8035
7	8016	8026	8036
8	8017	8027	8037

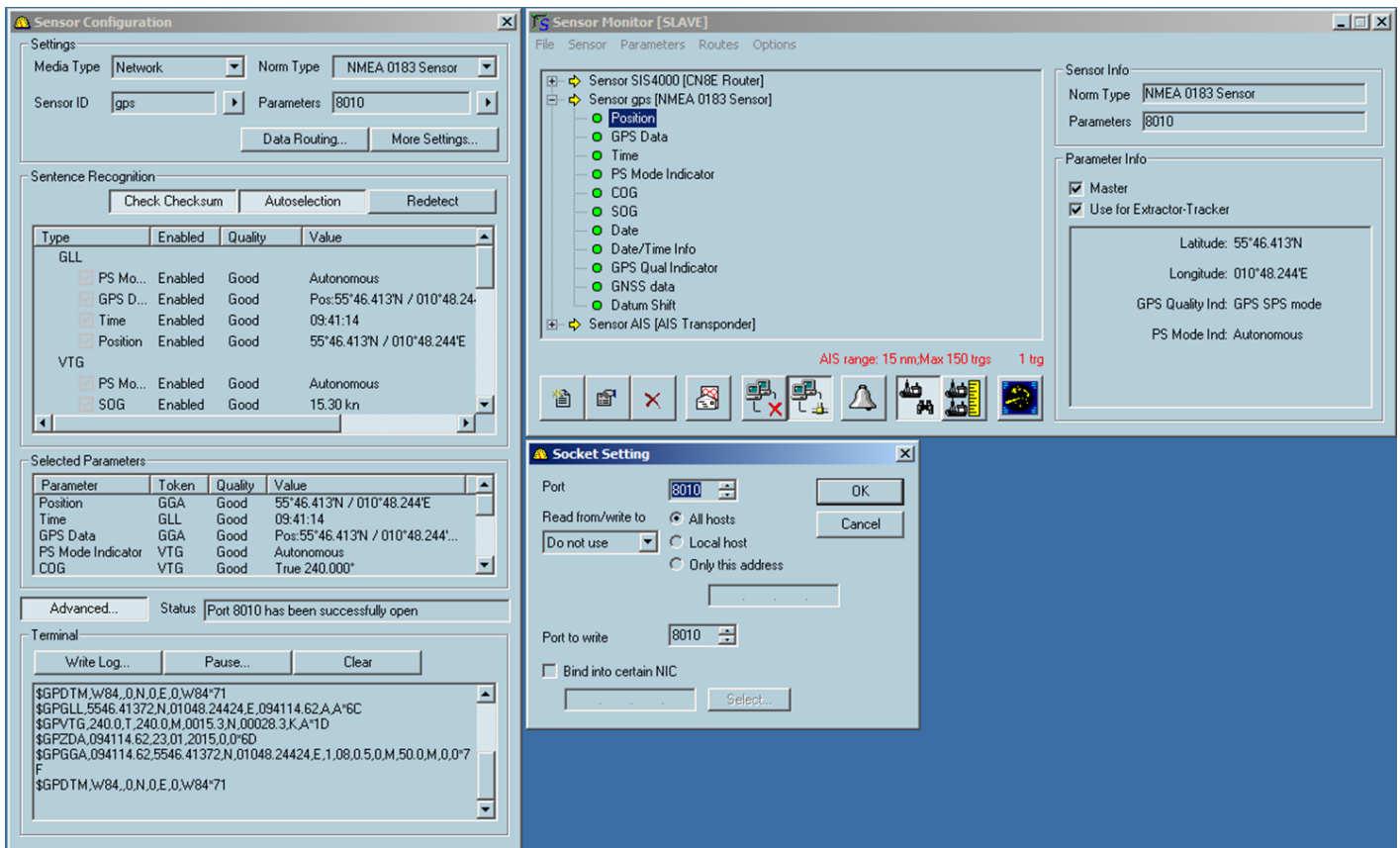
Example showing two sensors enabled. Channel 8 output is also enabled.



→ **Note:** The baud rate can be changed in menu Serial Port Settings.

Creating NMEA® sensor in Sensor Monitor

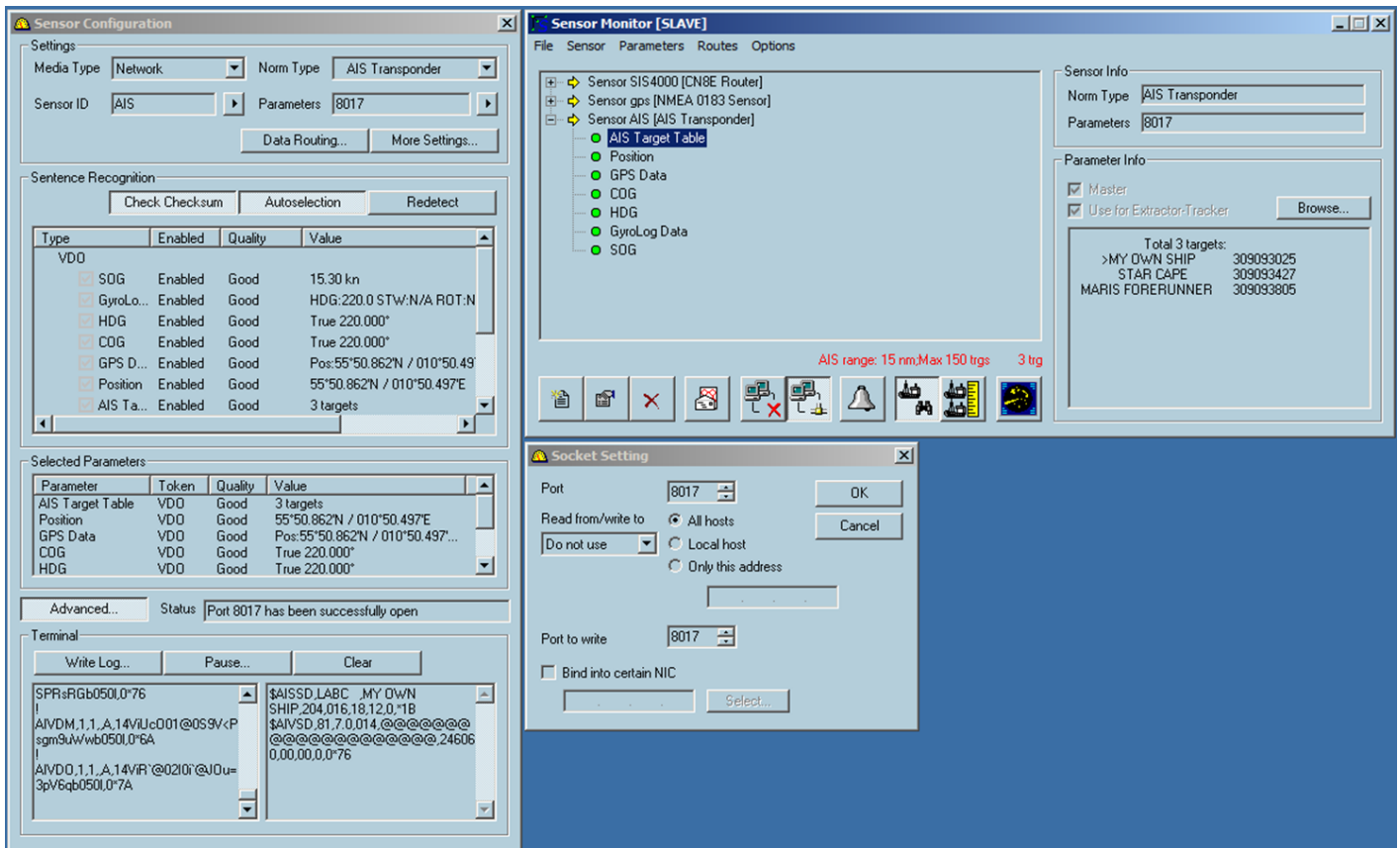
Create a new sensor. Click **Media Type** and select **Network**. Norm Type defaults to **NMEA 0183® Sensor**. Click **Sensor ID** and give the sensor a descriptive name. Click **Parameters** and enter the corresponding port number in SIS4000 for both **PortToRead** and **PortToWrite**. Click **OK**.



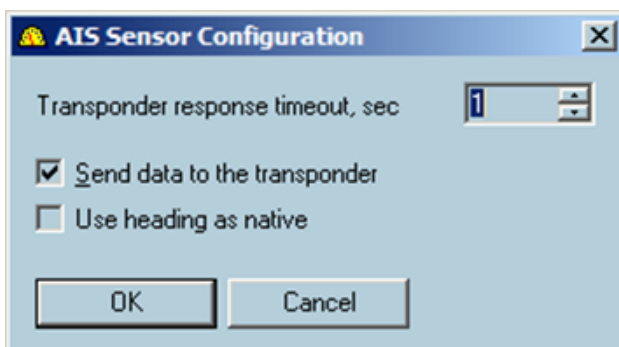
→ **Note:** Always set the same port numbers in **PortToRead** and **PortToWrite**.

Creating AIS sensor in Sensor Monitor

As above but go to Media Type and select AIS Transponder.



- The AIS can be remotely controlled from the ECDIS900, where the navigators have a big screen and a decent keyboard and mouse.
- In addition, a SAR message is automatically transmitted if the Man-Over-Board button is clicked on the monitoring ECDIS900.
- To enable these functions, click More Settings and place a tick mark in Send Data to The Transponder.



Creating sensor with output

The AIS sensor from above is used as an example.

- 1 Enable channel 8 in SIS4000. Change the channel ID name to AIS and the port number to 8017.
- 2 Select menu **Channels Settings** and change the NMEA-8 name to AIS. The names must be identical, and they are case sensitive.
- 3 Enable channel 8 output and set port number to 8017.
- 4 Change baud rate in menu **Serial Port Settings**, if needed. It is by default 38400.
- 5 Open the AIS sensor just created and verify port number 8017 is entered in the fields **PortToRead** and **PortToWrite**.

Creating ARPA sensor

Two or more radars transmitting ARPA targets can be a problem. Per default, the sensors are set up to use the same Target Table index – index 0. The data from the radars will overwrite each other, and the result will be unpredictable and useless.

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

- 1 Place Sensor Monitor in Expert Mode. Double right-click in the right pane and select Expert Mode.
- 2 Open the ARPA sensor and click More Settings.
- 3 Change Target Table index from 0 to 1.
- 4 Close the sensor.
- 5 Double right-click in the right pane and leave Expert Mode.

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

Example:

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

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

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

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

Creating Special sensor in Sensor Monitor

Wind and Log instruments often transmit in a format not recognized by the normal NMEA 0183® sensor. If everything looks right in the Sensor Monitor, but the data is not accepted in the ECDIS900, select one of the special sensors from the drop down menu in **Norm Type**.

More about UPS

The UPS is manufactured in two types.

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

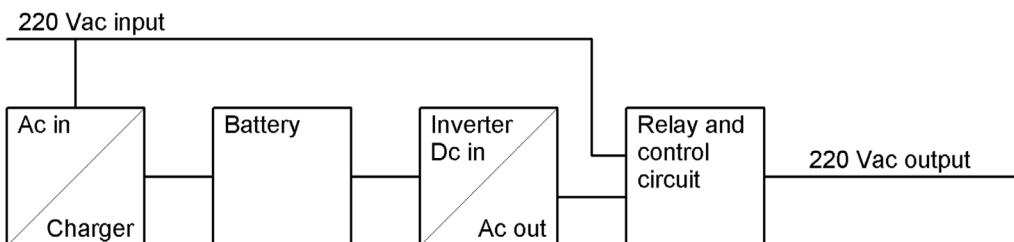
Change-over type UPS

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

Typically, there are no supervisory circuits for battery condition.

- If the power line is stable, as in your office, this type can be a candidate. When running on a stable power line, the power goes straight through the box. It is exactly like powering your computer from the wall outlet.
- In case the power disappears, a mechanical relay will operate and connect the output to the inverter. The inverter is started, powered from the battery, and now supplies power to the computer.
- This takes time as a mechanical relay is involved, and for a short while there is no supply to the computer.
- The question of survival is entirely up to the design of the connected computer, as the build-in capacitors must supply power for this period. If insufficient, the computer will malfunction.
- Running computers on a change-over type on ships is doomed to go wrong, because there is no noise filtering, no protection of brownouts and no protection against drifting frequency.

Block diagram of a change-over type UPS:

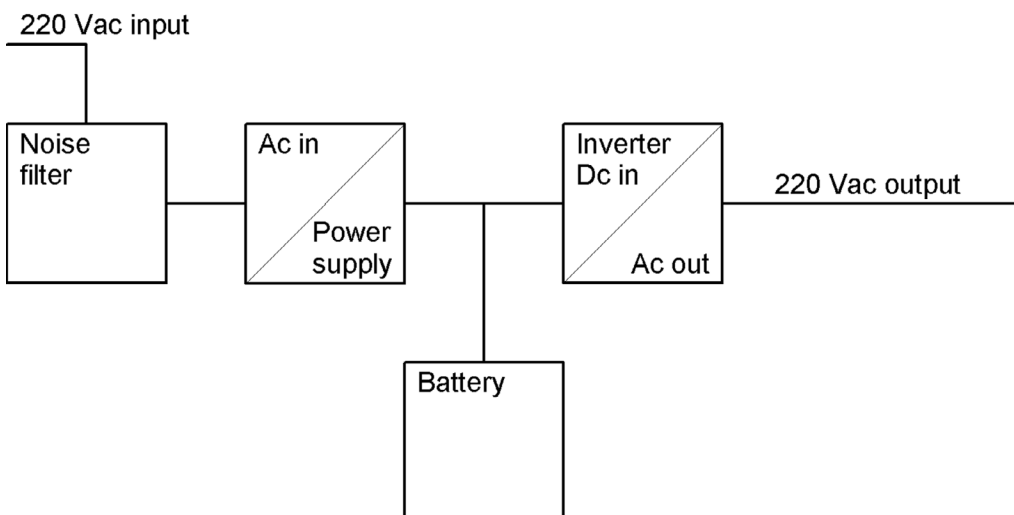


Always-on type UPS

The always-on type has one disadvantage – it is expensive. That said, the rest is just what we need.

- A power line with fluctuating voltage or frequency and filled with noise is not a problem. The output is a stable sinus curve; noise free 220 Vac on 50 or 60 Hz. The UPS can even convert (and will do) frequencies in the range 40-70 HZ to 50 or 60 Hz, depending on the setup. This is important on ships with propeller shaft generators.
- Brownouts are dealt with in the same manner, and because no mechanical parts are involved, there will be no power interruptions whatsoever.
- Supervisory circuits for battery condition and operation are standard, and the battery will even be tested under full load periodically without any need of operator intervention.
- A worn-out battery will raise acoustic and visual alarms.

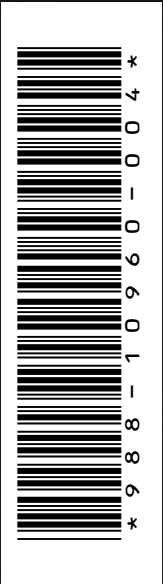
Block diagram of an always-on type UPS:



ECDIS CHECKLIST

Item	Text	Comment	
Computer			
Type			☐
Serial no.			☐
SIMRAD ID, Sentinel dongle no.			☐
Monitor (split installation)			☐ n/a
Type			☐
Serial no.			☐
Network			
Computer name			☐
Workgroup name	SIMRAD		☐
IP address, ECDIS network	192.168.____.____	☐ DHCP	☐
IP address, Sensor network	192.168.004.200	☐ Manual	☐
C: drive unshared			☐
Folder Charts shared			☐
Folder ECDIS_UserData shared			☐
Sensor Monitor	☐ Moxa ☐ SIS		
Display Ctl., audible alarm and dimmer tested			☐
Sensor COM3 or channel1			☐
Sensor COM4 or channel2			☐
Sensor COM5 or channel3			☐
Sensor COM6 or channel4			☐
Sensor COM7 or channel5			☐
Sensor COM8 or channel6			☐
Sensor COM9 or channel7			☐
Sensor COM10 or channel8			☐
Sensor Monitor settings locked			☐
ECDIS			
Version no.			
Mode		☐ Monitoring ☐ Planning	
Ship Properties corrected			
Safety depth and route corrected			
ECDIS settings locked			

Item	Text	Comment	
Radar Overlay		☐ n/a	
Version no.	v4 is PCI, v6 is LAN	☐ 4 ☐ 6	☐
Type of radar connected		☐ S ☐ X	☐
Trigger, Video, HM, AZI adj.			☐
Main bang and skew adj.			☐
NAVTEX		☐ n/a	
Version no.			☐
Type of NAVTEX receiver			☐
Serial or LAN, port no.			☐
Master/Slave		☐ M ☐ S	☐
If Master, folder Inbox shared			☐
If Slave, map network drive			☐
Application Manager			
Version no.			☐
Programs in Auto / Other defined			☐
System locked in Approved mode			☐
Finalizing			
Ghost disk burned			☐
Charts installed			☐



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