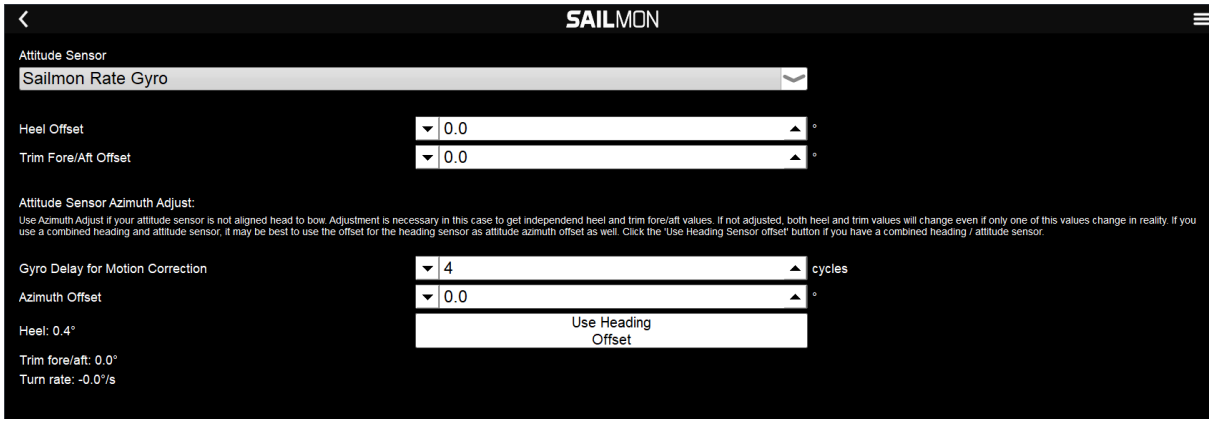
2.3.8 RATE GYRO

The new Sailmon Rate Gyro improves windreadings massively by removing boat motion in waves in the windcalculations. The Sailmon Rate Gyro collects data at 100Hz.

The unit can be mounted in 4 different ways giving a large freedom of orientation. Either horizontal, horizontal upside down, vertical facing forward and vertical facing aft.
Cable either always face aft in horizontal positions or down in vertical positions.
Please let Sailmon know which orientation the unit will be mounted so we can adjust settings in the box.

Try to mount the unit as close to centreline as possible.
Connection is established by an Ethernet cable and a 12-24VDC powersupply utilising the same type powercable as our E4 prcessor (Supplied).

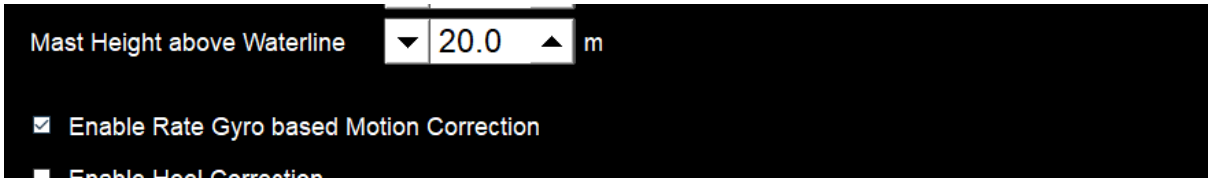
The unit is recognized automatically by the E4 and shows as Sailmon Rate Gyro in the Sensor Description list.
In Calibration> Attitude select the sensor as the attitude sensor.



Set the Heel and Trim offset with the boat being still. Set the Gyro Delay for Motion correction to 4 cycles for use with analog windsensors and NMEA183 windsensors outputting at 25Hz. For 10Hz windsensors set the delay to 10.

WIND SETUP

Go to Wind calibration and tick the box for Enable gyro based Motion Correction. Set the mastheight above Waterline as well.



2.3.9 EXTERNAL CHANNELS

OVERVIEW

Sailmon provides an interface to receive data and display it on the displays. This function is called External channels. Sailmon supports to reception of up to 256 external channels. The external channels are available inside Sailmon, and the description text can be changed by the user to fit the interface.

The data from the external channels must be sent to the following network interface:

Protocol: UDP only
Destination UDP Port: 7100
The data are available on all instruments if you send it to the server only. Don't broadcast the data! (Avoid broadcasts to reduce network load)

Due to internal calculations and calculation power limitations, make sure the following is not exceeded:

Any particular data value send 10Hz max.
Max 128 data values/s sent to Sailmon in total.

Exceeding the above might result in slower system response and excess heating of the server instrument.

The channel names, units and formats are assigned inside a Sailmon menu. The user selectable channel names are static and cannot be changed on a regular basis. (No alternating channel text).
UDP packets are parsed on a packet basis, packet data must not be started in one packet and continued in the next packet.
Large packets, containing multiple or all channels are preferred to save network overhead and parsing effort.(recommended, not obligatory)

Channel data will be displayed on the Sailmon instruments and automatically aligned to fully take use of the available space. Sending data is possible in 32bit float and 32bit integer format (see below)

External Channel Data show up in Sailmon as “External Channels”. The user can assign a unit the each channel, so the display shows the correct unit afterwards.

UDP PACKET FORMAT

Packets have to start with 32bit magic cookie 0x21431902, followed by the total number of channels, followed by random number of channel data containing

- Channel id: 1 byte channel identifier: 0-255, external Channel number
- Channel Type: 1 Byte: 0x00: 32 bit signed integer; 0x01: 32bit float;
- Channel data: 32bit field for integer and float type, random size field for text
- followed by next channel Id, type and data etc.

Description	Value	Size
Magic Cookie	0x21431902	4 Byte
Total Channels	Total # of channels in this message	1 Byte
Channel ID	ID of Channel, 0-255	1 Byte
Channel Type	Type: 0x00 = 32bit integer, 0x1 = 32bit float,	1 Byte
Channel Data	32bit Float or 32bit int according to the type field	4 Bytes
Repeating:	Channel ID; Channel Type;Channel Data	

2.3.10 WTP3 FASTOUT PROTOCOL

Sailmon can receive data from a B&G WTP3 usig the B&G fastout protocol and a serial to Ethernet device like the Moxa Nport 5110.

The file fastout.d specfiies the B&G variable to be transmitted, with a single character as identifier and baudrate. Refer to B&G WTP3 manual on how to set this up.

An example of the fastout.d file:

1 0 Channel 1
Device 4
txfreq 1
Com 2 rs232 38400 N 8 1

91 A 5 2
10 D 5 0
11 E 5 1
12 F 5 1
16 J 5 0
169] 1 0

Where the first number is the variable in WTP3, character is the identifier used by Sailmon, third number the reserved places, fourth number amount of decimals.
The last line 169] 1 0 is always needed as last in the file as it is a stripdelimeter for the packets that are sent.
Example of setup of the Moxa Serial-Ethernet device:

IP address range 192.168.1.10-192.168.1.12 if this is the range in which the E4 is operating.
UDP is 4100 reserved in the E4 to receive Fastout data.
Delimiter 1 is 5d which is character]
Serial setup equivalent as what is set in the Fastout.d file in the WTP3.

If you need assistance contact support at Sailmon.

2.3.11 FARO UDP INPUT

There are 2 ways to get Faro data into a Sailmon system. The first one is to add an E4 processor to the system and set the Faro system to output data to the Sailmon E4 over NMEA2000, NMEA183 or UDP. The second one is to ask Sailmon for a special software loaded on either an Element 7 or Element 10 display so it acts like a server that receives data from the Faro system over UDP. In this case an E4 is not needed and all calibrations are done in the Faro system. Please contact Sailmon when this is the case.

2.3.12 CAMERA'S

The Sailmon system can receive video from camera's using the RTSP (Real Time Streaming Protocol) format.

To connect a camera with ethernet connection (Webcam) make sure the camera is set to a fixed IP address and set up to output video using the rtsp protocol in H264 format.
In Navdesk>Displays select the display where video needs to be displayed and select the video button to open the playlist.

In edit playlist select custom url and click on the Right arrow, now put in the line:

rtsp://<IP-address of camera>/Channel number (Usually Channel1)

Note that actual video will never show in Navdesk, only on the selected display. Also never put more than 2 camera's on one display due to refresh speeds.

Video imagary will not be able on Screenview nor in Navdesk, the video is sent directly to the display.

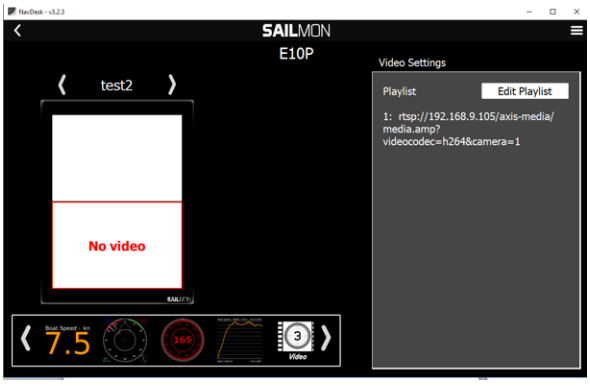
AXIS VIDEOSERVERS

When using analog camera's a video server is needed to transform the data to Networking. An Axis videoserver can be used for that.

Set the Axis up to a fixed IP address, remove passwords for the output. Set rtsp as being the output format.

Again use the custom url to put in the following line:

rtsp://<IP address of Axis server>/axis-media/media.amp?videocodec=h264&camera=1 where camera number is the channel to which the camera is connected to the videoserver.



3 NETWORK INSTALLATION

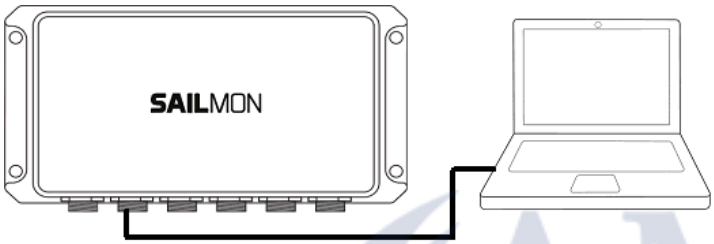
3.1 CONNECT THE E4 TO THE BOAT NETWORK

It is vital for good communication that all network cables are of good quality and are being used as designed . Ensure that all non Sailmon products are in good condition and are fit for purpose.

Connecting the E4 to a PC or tablet, several options are available.

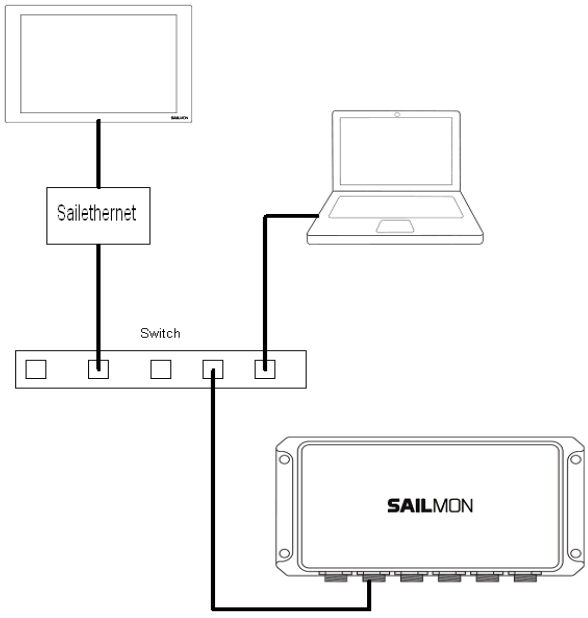
3.1.1 ETHERNET:

Network cable: Simply connect the network cable into the ethernet port of the E4 and the PC. Make sure you set the E4 in DHCP server mode using the Sailmontool.



3.1.2 SWITCH:

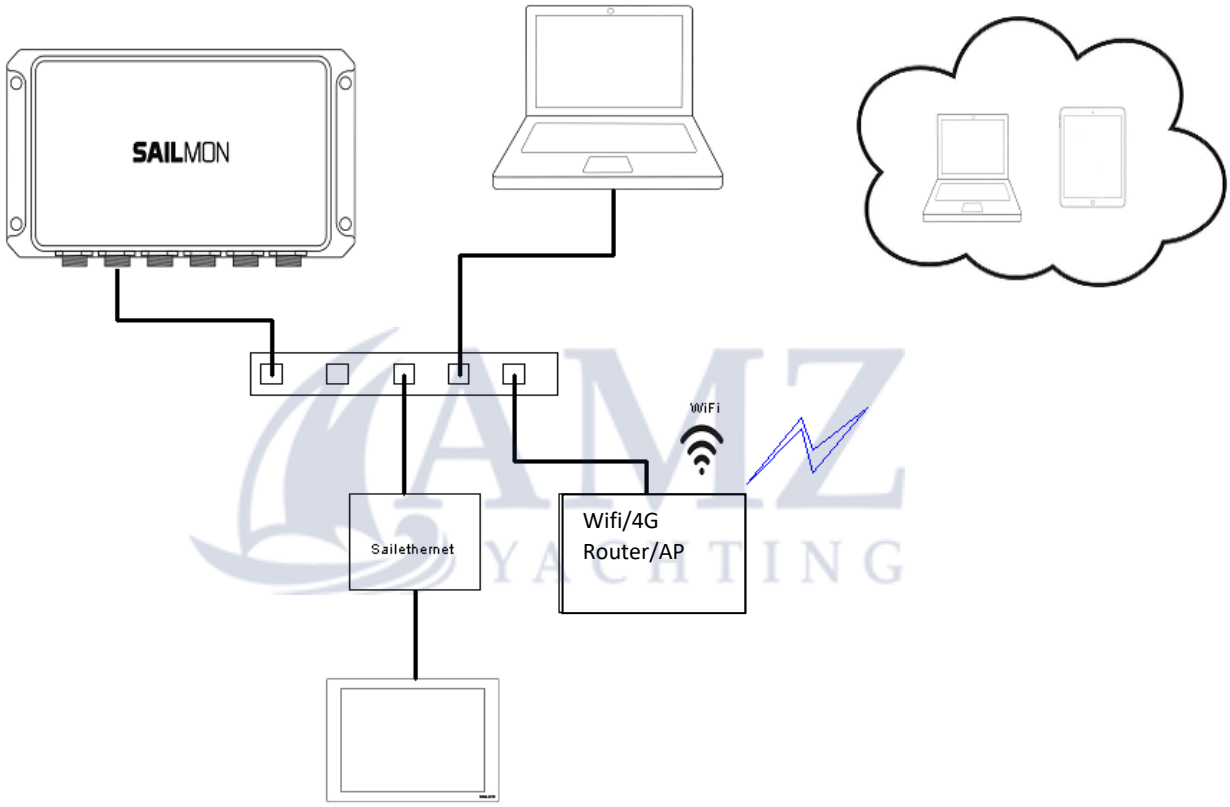
Sailmon displays are connected using the ethernet port of the E4. Because of this, no more ports are available to connect the PC. A network switch is used to extend the number of network ports in your system.



3.1.3 WIRELESS / 4G ROUTER

With a router a wireless system can be setup so tablets and computers can connect wireless to the E4.

One of the benefits is the possibility to insert a 4G SIM card so you are able to connect to the internet. Besides this, the wifi network can be used to view data on a tablet or smartphone and remotely view your boat on LOGS.
Ofcourse you can still connect the onboard PC to the boat network with a network cable.



With a wifi router or access point a wireless system can be setup so tablets and computers can connect to the E4 either wired or wireless.

3.2 SAILMON NETWORK

3.2.1 OVERVIEW

Sailmon devices (the E4 Processor and all Screens) communicate using IPv4 over a standard 100 MBit/s ethernet network. Using an S-Net box, or a direct ethernet connection to the E4, it is possible to use standard networking equipment. Sailmon devices are designed to work in any existing local area network, where they will acquire IP addresses from a DHCP server and not interfere with other devices or services. Sailmon can be deployed as a standalone as well, without a DHCP server on the network. In this case Zeroconf addressing is used. The Model E4 processor can be configured to provide a DHCP server, or act as simple Wifi access-point for convenience.

Sailmon applications (NavDesk, Mobile Apps, etc.) are designed to be connected to the same LAN as the devices and require no additional configuration. Applications will automatically detect the presence of Sailmon products using two parallel methods of discovery via UDP heartbeats and requests. The exact TCP and UDP port numbers used by Sailmon are described in the next sections.

More complex LAN configurations, as well as external Wifi access-points, are possible given they can fulfill the following requirements:

- At least 10 Mbps unicast bandwidth available between nodes
- At least 1 Mbps bandwidth for multicast or broadcast messages
- All given UDP and TCP ports must be open in both directions
- Additional ports are needed depending on the installation (see below)
- UDP multicast or broadcast packets must be able to reach every participant

3.2.2 COMPLEX NETWORK INSTALLATIONS

All Sailmon devices are required to share the same network. However, it is possible to run Sailmon applications from a remote network, given they are connected by layer 2 (switches, Wifi APs) or layer 3-4 (routers).

Unicast (point-to-point) communications generally work without issues over Wifi, and even between multiple routed LANs or VLANs, which makes the initial discovery via UDP multicast the most critical requirement. The network installation must ensure that packets to the Sailmon multicast group “239.255.83.77” on ports 4019 and 4020 are not filtered and can traverse to all desired devices. This means that switches may need to use “IGMP snooping” option if the packets are filtered otherwise. When multiple networks / IP address ranges are present, a router must be configured to forward multicast packets to the neighboring networks. Additional forwarding of UDP traffic may be required (see optional ports).

3.2.3 UDP TRAFFIC

Post required for Sailmon Apps:

4019 HEARTBEAT REQUESTS

Applications send broadcast requests to this port. Sailmon Instruments will respond by sending their heartbeat packet back to the source port on the requesting computer. This is a fallback if clients are not able to join the multicast group, and used as a quick way to discover devices on the network.

4020 HEARTBEATS

Source of heartbeat broadcasts sent every 2 seconds by Sailmon devices. Heartbeats are required by every application to find the IP of the Sailmon server in an unknown network. Heartbeats are broadcast and sent to the Sailmon multicast group. Join the multicast group to receive them. They contain the serial number, software versions, etc. for each device.

4021 SYSTEM CONFIGURATION

Sailmon tool will send broadcast packets to all Instruments for global settings and server management.

6130 INSTRUMENT COMMANDS

Receive port for commands to real or virtual Instruments. Used to trigger reload of configuration and to show or hide the help screens during initial configuration.

6150 DATA REQUESTS TO SAILMON SERVER

Used to request data values from the Sailmon data server. The client sends unicast UDP packets containing desired IDs to the server at port 6150. The server responds to the source host and port with the current values and status flags. When blocked, instruments will show “no data”.

6152 RAW DATA OUTPUT FROM SERVER

Output port of live raw data values from all sensor

Ports required between Sailmon Devices:

6000 COMMANDS / REQUESTS FOR BLACKLIGHT CONTROL

Receive port for commands / requests to the backlight controller on each screen.The backlight controller will respond to source host and port.

4001 BUTTON EVENTS SENT TO SAILMON MULTICAST GROUP

Optional ports for certain features

4044 Sailmon Cloud (Internet access)

4100 WTP3 Fastout data input (optional)

5010 Expedition data output (optional)

5011 Expedition data input (optional)

7000 NMEA0183 data output (optional)

7001 NMEA0183 data input (optional)

10001 Mer Agitee E-Tell Tales

10110 NMEA0183 data input (optional)

7100 External channels input (optional)

5353 Avahi multicast DNS (optional)

502,503,504 Modbus interface

URLs and IP addresses

Hardcoded IPv4 addresses

239.255.83.77 Sailmon Multicast Group (used instead of broadcasts)
192.168.4.1 E4 wired ethernet when E4 has DHCP server is enabled
192.168.5.1 E4 wireless interface when used as Access Point

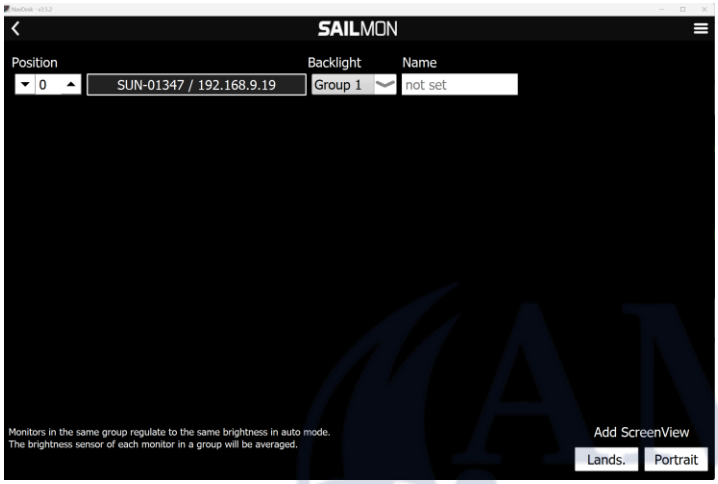
4 COMMISIONING

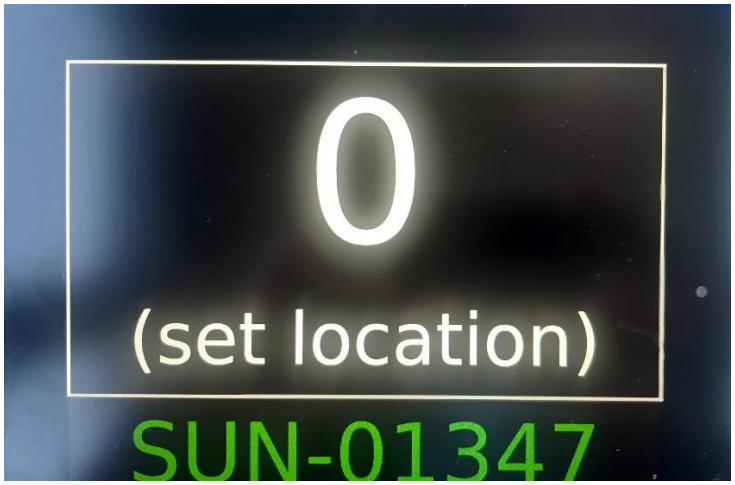
4.1 IDENTIFYING DISPLAYS

In the Setup>Commissioning>Display definition all connected displays are listed with their IP address and SUN Number. When a new system is commissioned all displays will have Position 0. This **MUST** be altered to any number other than 0. On the displays themselves this information will also be shown to make identification of each display simpler.

Each display can be given a name and a backlight group can be set here as well.

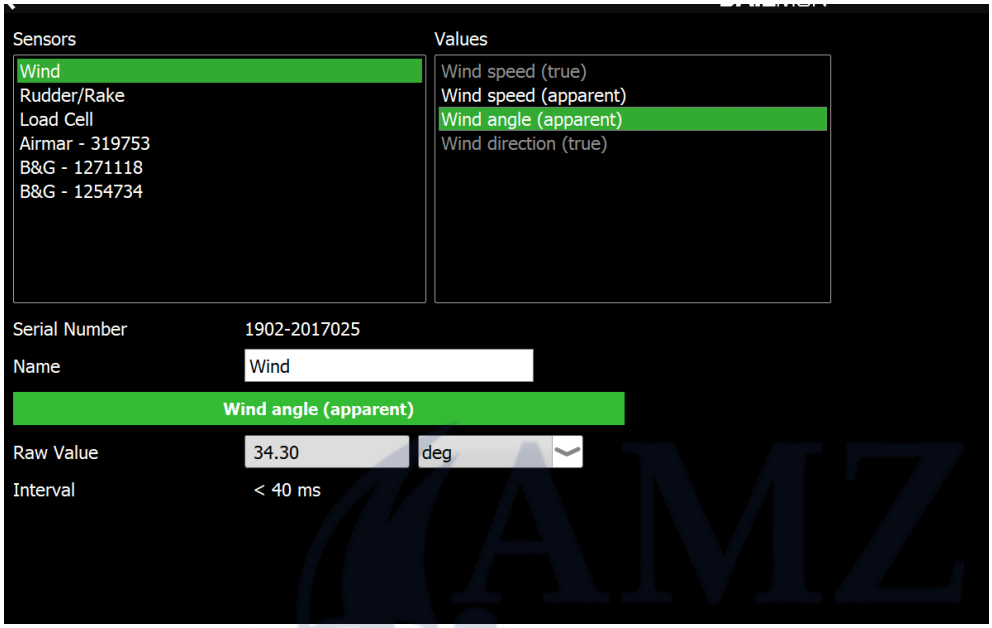
In the lower right corner Sccreenview displays can be setup and configured as they would be a real screen.





4.2 IDENTIFYING SENSORS

The sensors can be connected using the NMEA2000 network directly or by either using windboxes,linearboxes and, or loadcellboxes.
In the Setup>Commissioning>Sensor Definition section you find the sensors and sensor boxes connected to and recognized by the system. If needed the naming convention can be changed to identify relevant boxes, ie. change the serial number to Wind for a Windbox.
In this section you will also see the raw data if the sensors are connected.



4.3 CALIBRATION

In the calibration section you find the standard variables like Depth, Heading, Boatspeed, Wind , Attitude and GPS listed. Each sensor needs to be defined in this section in order to be able to show data on the displays.
For Depth sensors the amount and offset to waterline and total draft need to be input here.

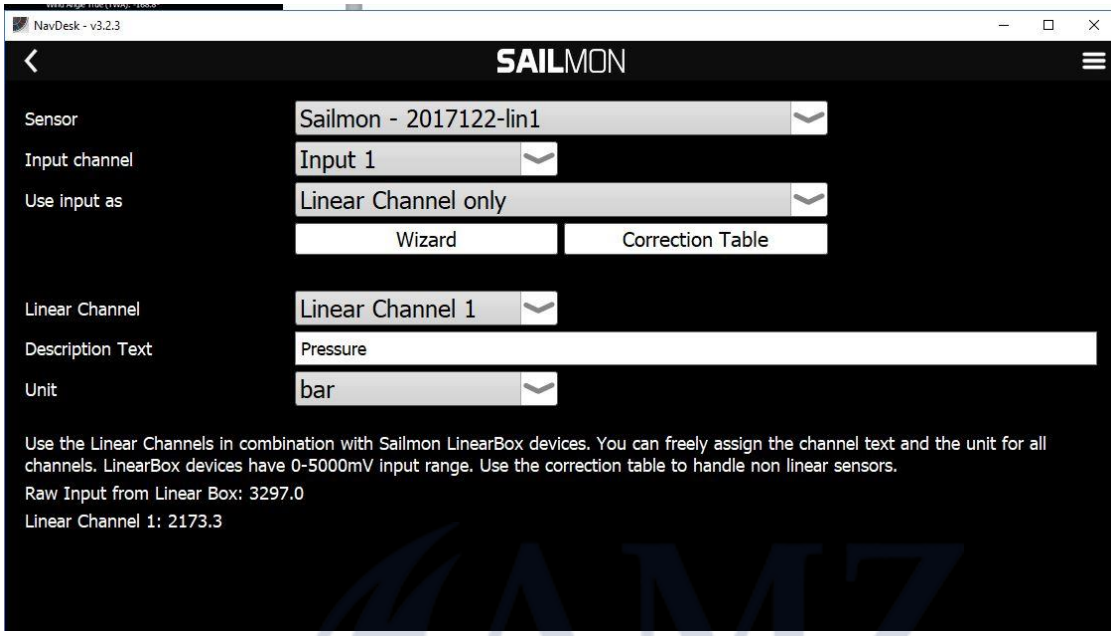
To calibrate the wind sensor, automated calibration runs and a help section are available. See the Calibration and Data Reference Manual for an extensive paragraph on wind calibration.

WIND CALIBRATION

***Please read the Operators Manaul for extensive calibration explanation**

4.4 MISCELLANEOUS SENSORS

In the Others.. section you find, among others, linear channels.
Here you select the relevant linear box and linear channel. If it is a non-standard variable you want to assign, select “linear channel only” and a dialog box opens where the description,title and correction table can be entered.



5 SOFTWARE

5.1 SOFTWARE DOWNLOAD

The Sailmon software can be downloaded from https://sailmon.com/support-articles/software-updates/ for your PC or Mac or from the App/Play store on your Apple or Android device.

Here you will find:

- Latest software releases
- Release notes
- Older software versions
- Manuals
- FAQ

5.2 MINIMUM SYSTEM REQUIREMENTS

- **MAC** OSX 10.10 or later
- **PC** Windows 7 or later
- **IOS** (Beta) IOS 10 or later

5.3 USING SOFTWARE TO CONNECT TO E4

You have now successfully installed the Sailmon model E4 Instrument system. If you power up then the model E4 will automatically select available sensors. If there is more than one sensor you need to select a sensor in Navdesk.

1. Download the Sailmon Apps from the App Store on your Smart device or from https://sailmon.com/support-articles/software-updates/ for your PC.
2. Power the Sailmon instruments.
3. Connect your computer or smart device directly to the E4, this can be done using a ethernet cable, with a wifi stick or connect the E4 in to your existing boat network.
4. Open the apps to show data or use your system
5. To add model E4 to your ships network disable the DHCP server and connect to the desired network.

For detailed Navdesk info see the Sailmon User manual.

6 DISPLAYS

6.1 PRODUCT OVERVIEW

Sailmon element 7, element 10 and Element Ink displays can be purchased in either Portrait or Landscape version. In all cases the dimensions are the same. The difference is in the high end polarisation filter and software settings. Casings are different shown by the Sailmon logo position.
When installing a display it will need to be connected to the Ethernet port of the E4. The SAILethernet is needed to combine both the data and power from the power supply and E4 to the display.

The displays can be connected in daisy chain, this means, only one cable is necessary from your switching panel to the mast. Using Fast-lock waterproof connectors will reduce the installation effort to a minimum. Sailmon displays includes the most powerful and intelligent technology available, including automatic backlight control with an ultra-high dimming ratio of 1:3000.

This allows absolutely perfect readability under all conditions for convenient reading during day and night. Even high contrast and intense colours are maintained during night sailing. Perfect sunlight readability is achieved with a high-performance anti glare front screen. The front glass is optically bonded to the TFT display, avoiding an air gap. Therefore, you will never experience a foggy display. The displays are further optimized for ultimate visibility with polarized sunglasses. Using polarized sunglasses will even improve the visibility of the instrument.

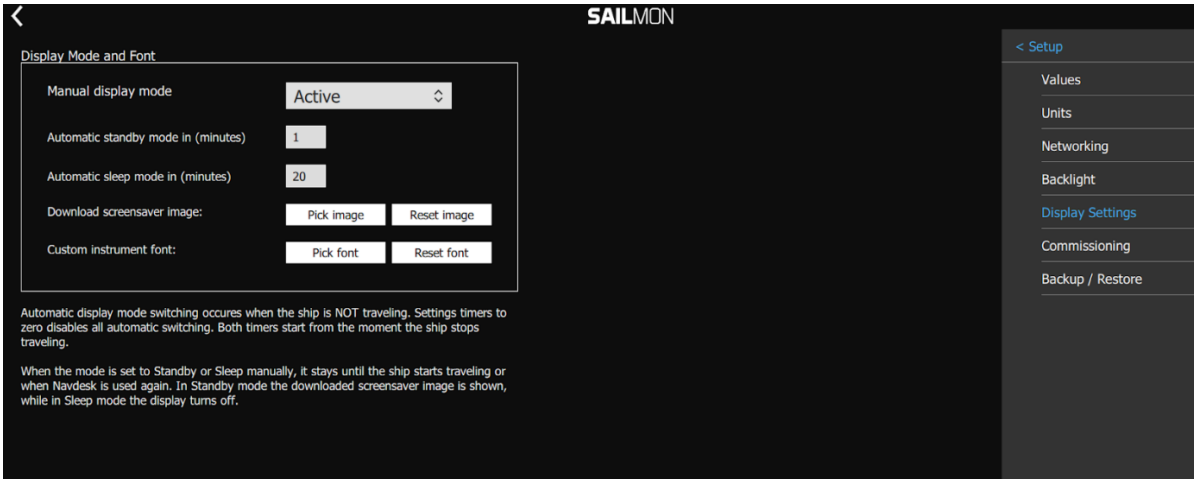
When connecting a display to the cable simply mate the plug with its counterpart and twist it on. This should take no effort and it is a twist lock system. Do not force the connectors, this is likely to damage the electronics inside.

6.2 DISPLAY SETUP

In Setup>Commissioning>Display definition connected displays are listed. Also the name of the display is shown on the relevant display to identify it. They can assigned to different backlight groups which can then be altered in the backlight section. The name of each display can be changed by typing a relevant name.
In the Setup>Display Settings section the following can be set.

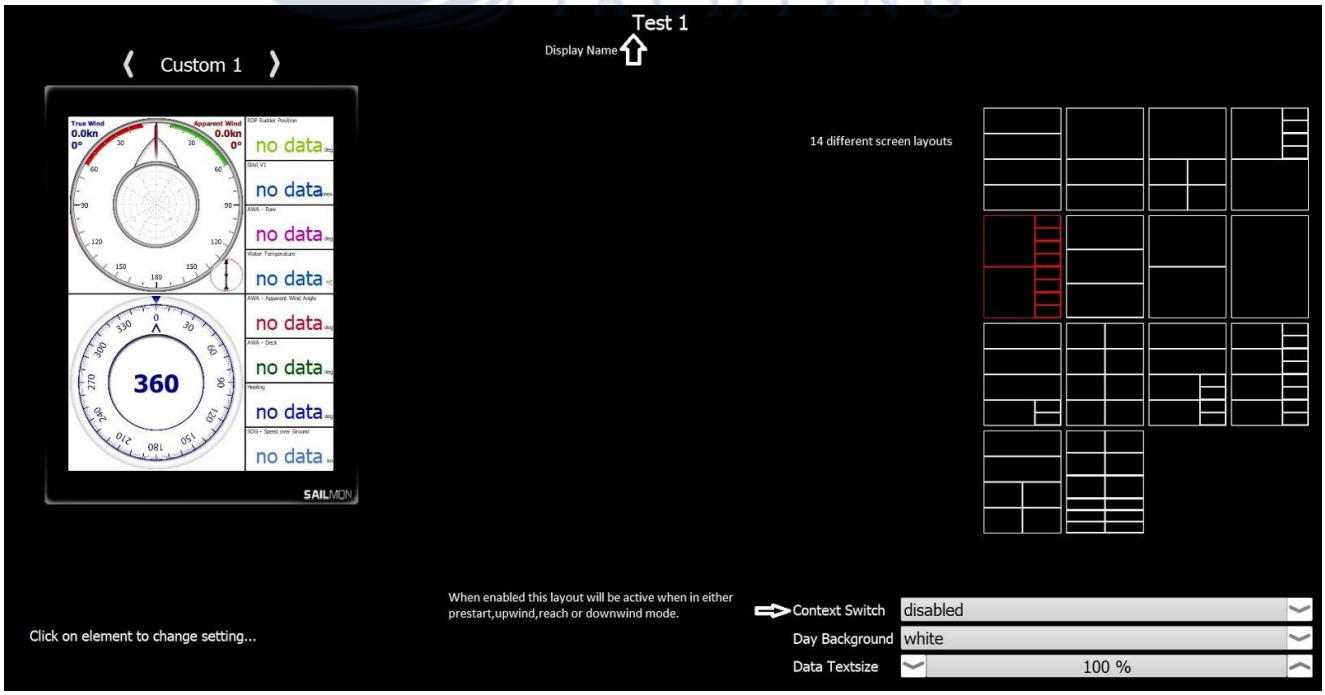
- Mode for the displays can be set to either Active, Standby or Sleep .
- Active timeouts can be set to determine the yacht is moving, motoring (with an Engine interface connected)
- Screensaver images.

- Instrument Font.



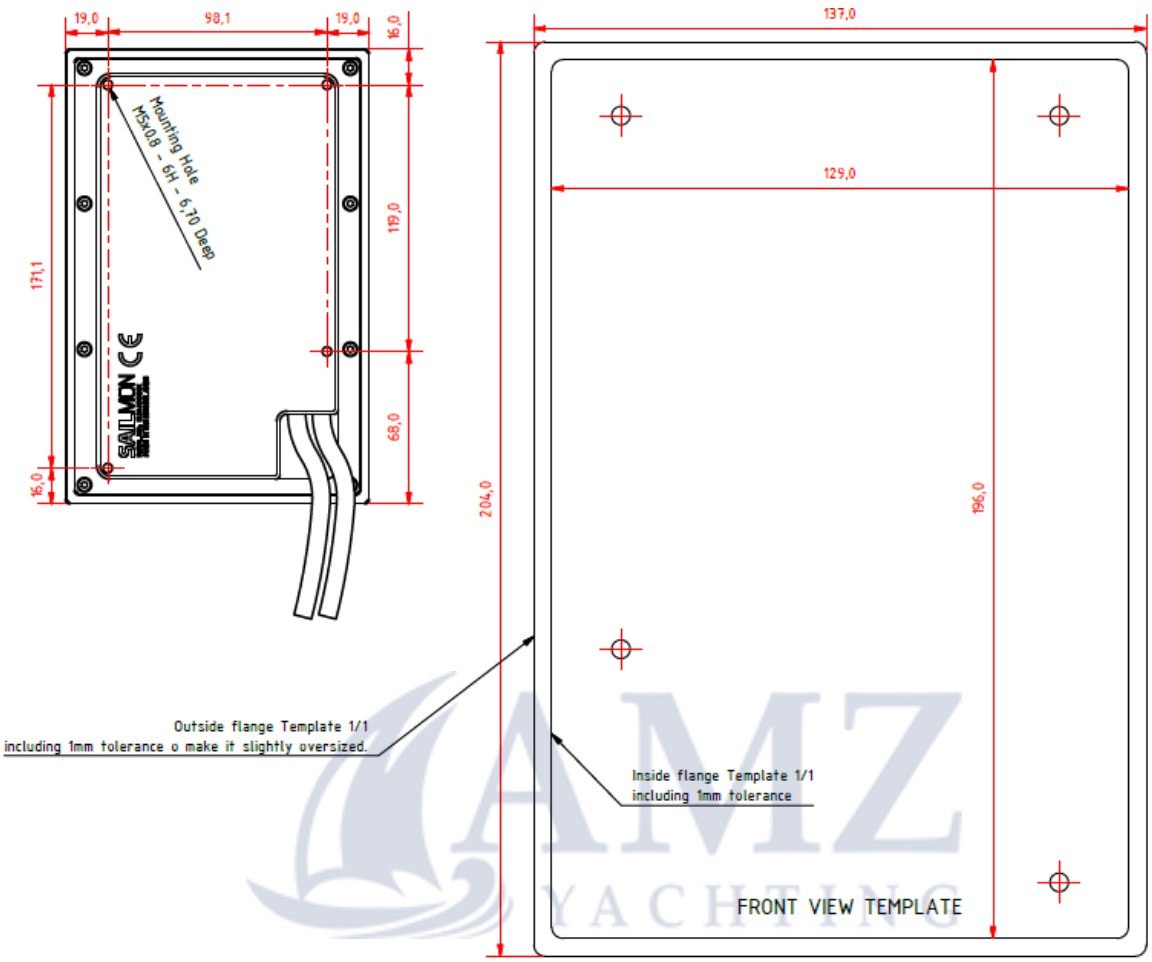
6.3 DISPLAY SETTINGS

To change layouts and variables displayed on a screen go to Displays and select the display you want to change layout or the variable on. On the right hand side 14 different layouts can be selected. Each display has 10 presets that, once changed, keep these setting for each individual display. In the presets tab a different preset can be quickly selected. The name of the preset can be changed in the preset tab. This setting will be activated on all displays.
To change a variable. Click on the area where it needs to be altered and a window will appear where variable and color can be changed.

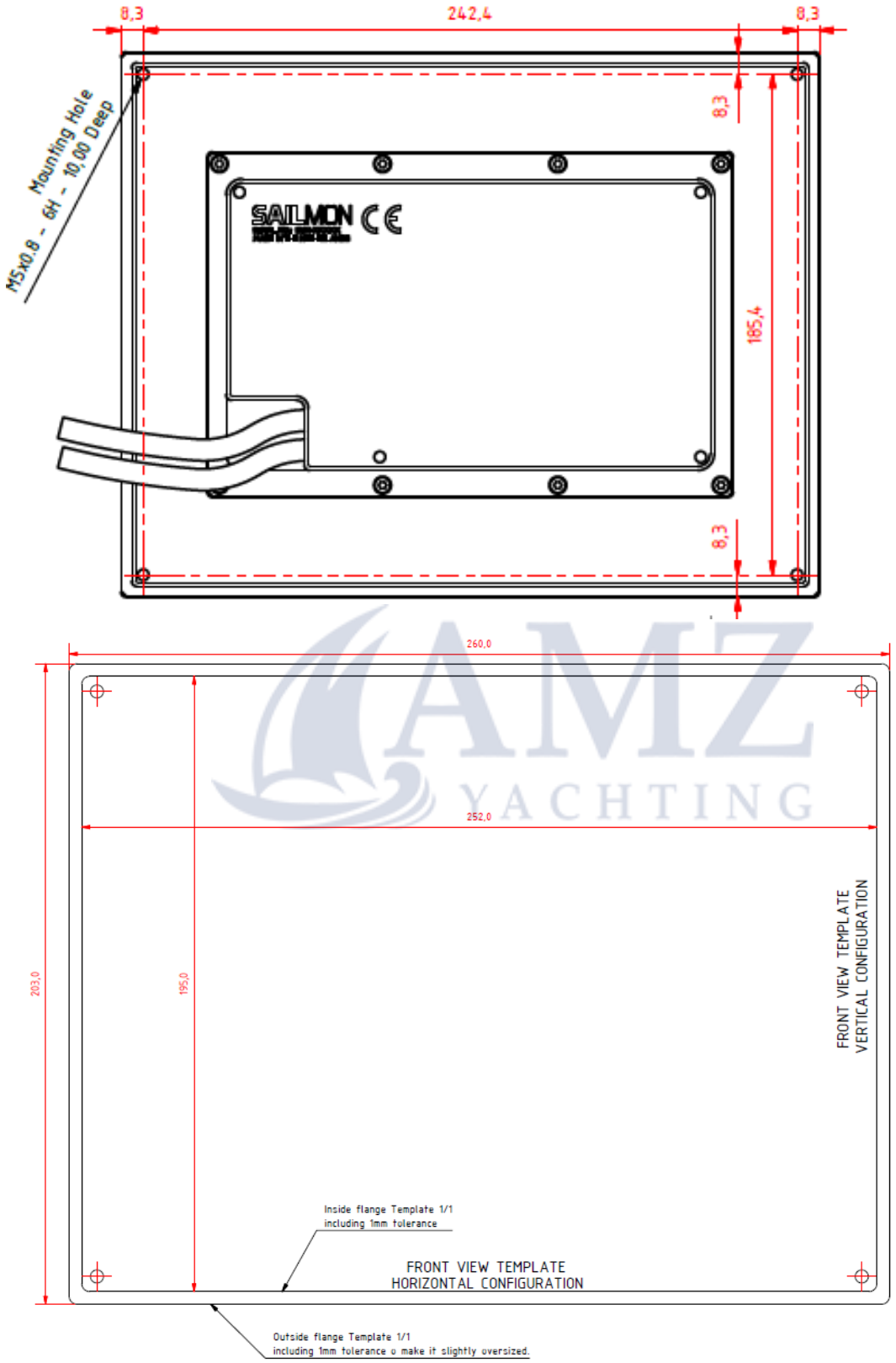


6.4 TECHNICAL SPECIFICATIONS

ELEMENT 7 MOUNTING TEMPLATE



ELEMENT 10 MOUNTING TEMPLATE

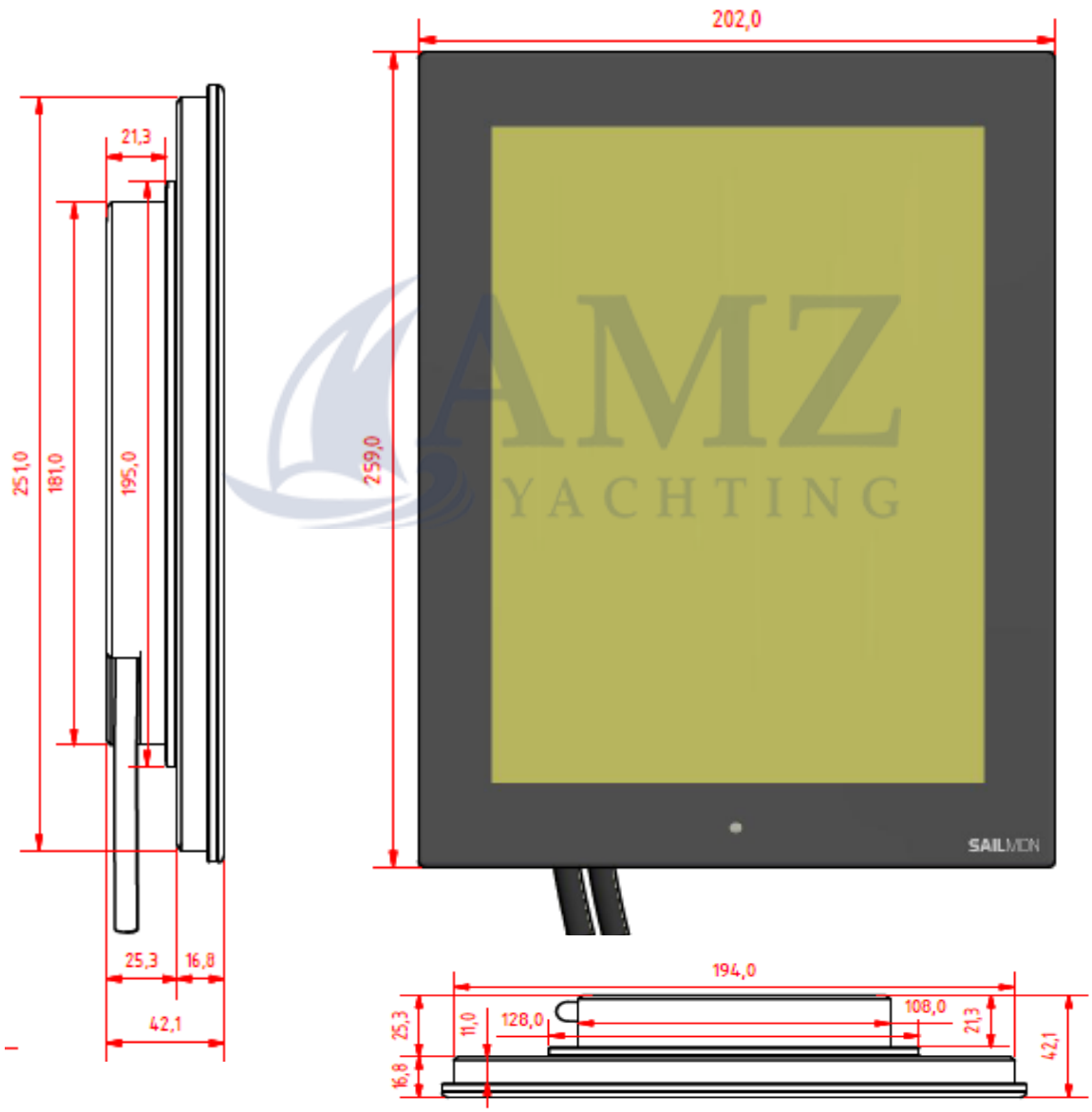


ELEMENT 7

- Display size: 800 x 480 Pixels
- Display type: LED - Backlit LCD
- Brightness: 1000cd/ m2
- Max brightness: min 0,3 / max 1000 nits
- Viewing angle: -85 + 85 degrees
- Maximum digit size: 9 cm
- Weight 1.08 kg
- Power consumption 15W at max Brightness

ELEMENT 10

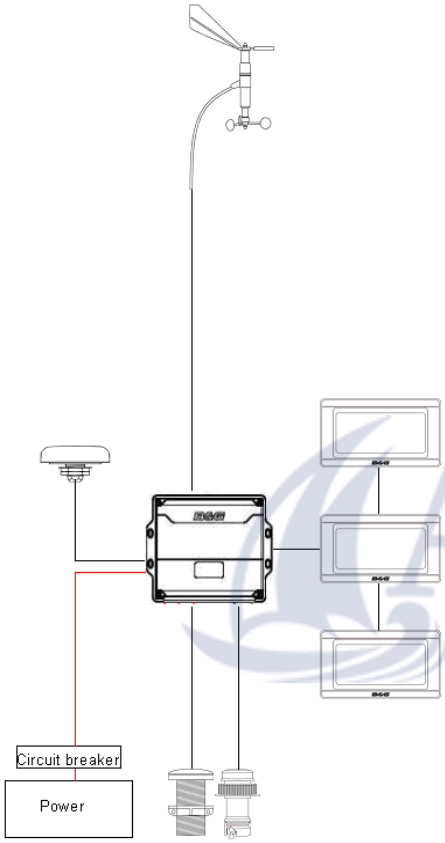
- Display size:1024 x 768 pixels
- Display type: LED - Backlit LCD
- Brightness: 1000cd/ m2
- Max brightness: min 0,3 / max 1000 nits
- Viewing angle: -85 + 85 degrees
- Maximum digit size: 12 cm
- Weight 1.55 kg
- Power consumption 20W at max brightness



7 EXISTING SYSTEM UPGRADES TO SAILMON

What are the minimum requirements of existing instrument systems that Sailmon can work with?

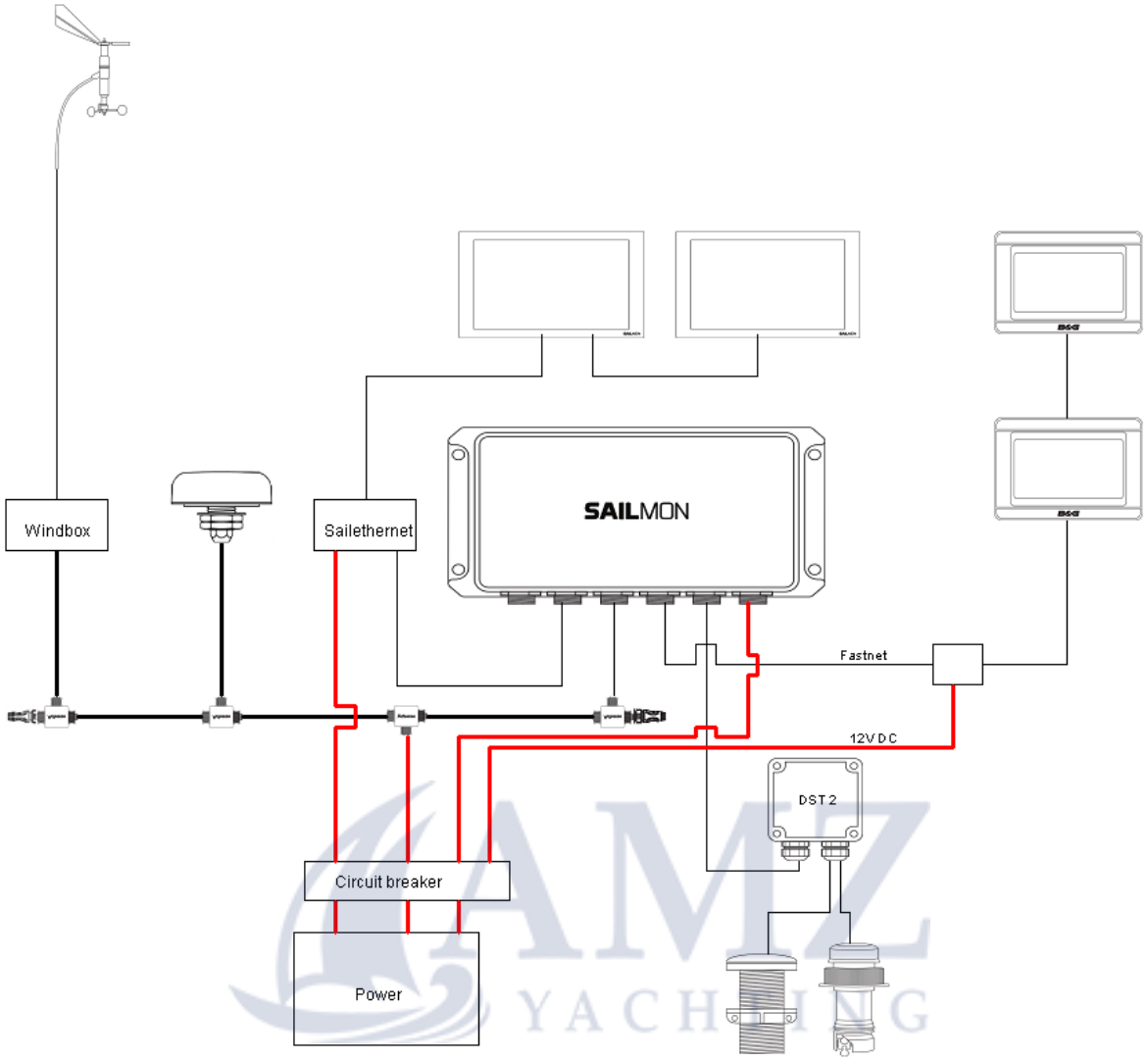
7.1 B&G H3000



BEFORE

A H3000 CPU and Fastnet network can easily be upgraded to an E4 processor.
With the E4 one can connect to the Fastnet installation and retain the B&G Displays.
A wind box will be needed and analog transducers will need to be connected with the use of a DST-2 to the E4 port 2 which is set to receive NMEA 0183.

.



AFTER

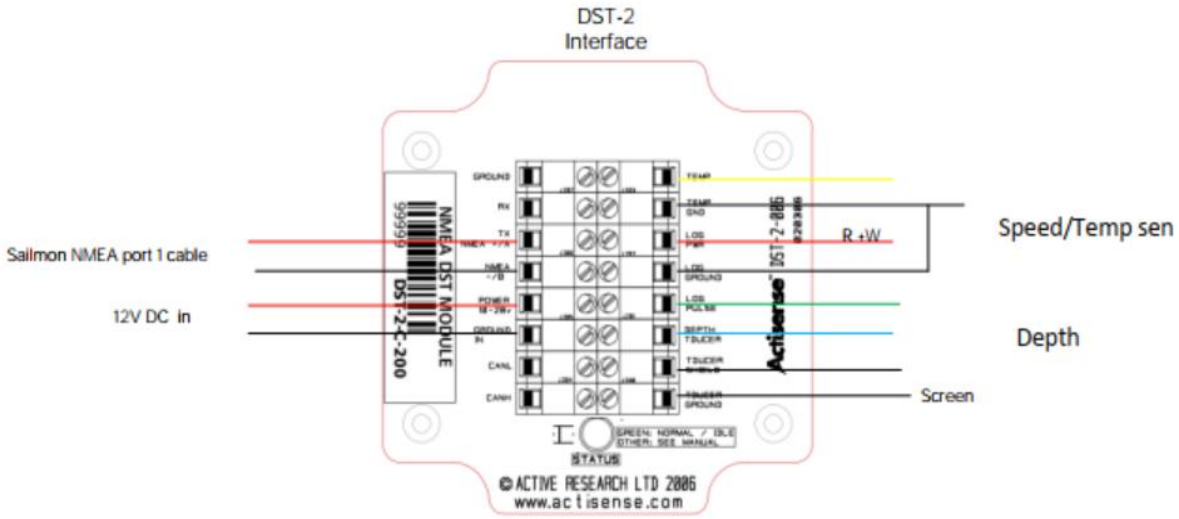
The Schematic shows how the E4 can replace the H3000 CPU and still retain 20/20 displays and through-hull transducers.

Upgrade benefits:

- Reuse of existing transducers with use of an Actisense DST – 2.
- Reuse of existing displays.
- Wifi connectivity to stream data to any wifi enabled device
- Greatly improved calibration capabilities of existing sensors
- The ability to add Sailmon displays

For interfacing with Fastnet displays, a GFD or FFD is still needed. Sailmon will receive and send all data over the Fastnet network but will be unable change display fields.

DST-2 connections



7.2 H5000

Upgrading a H5000 system is very straightforward, resulting in greater usability and connectivity. All existing sensors can be connected directly to the NMEA 2000 backbone or with the use of Sailmon interface boxes.
Calibration and configuration are completed using Sailmon Navdesk.

7.3 GARMIN GNX DISPLAYS

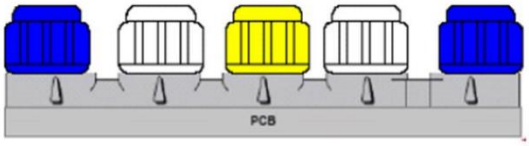
Due to the Garmin GNX displays use of NMEA 2000 data format they can be connected directly to the NMEA 2000 backbone where the E4 processor can send data to the displays as configured in the Sailmon Navdesk.Sailmon has 18 custom channels available for “Exotic” data to be snet to Garmin displays.

7.4 RAYMARINE

ST1:

Seatalk 1 is an older Raymarine protocol, The E4 processor is capable of converting this data format via the Port I/0 connection. However, to be assured of a steady data flow we recommend the use of a STng - St1 converter. With this device, Seatalk 1 is converted to SeatalkNG and then connected to the NMEA 2000 backbone.

If this conversion is required, the following items have to be purchased:



SEATALK 1 – SEATALK NG CONVERTER

this kit includes: converter, power cable, Stng drop cable, ST1 connection cable

SEATALK NG TO NMEA 2000 ADAPTER

RAYMARINE SEATALK NG

Due to the SeaTalk NG's use of the NMEA 2000 data format, the E4 is a simple upgrade, gaining greater usability and connectivity. All exciting system sensors can be connected directly to the NMEA 2000 backbone. Calibration and configuration is all completed through the Sailmon Navdesk tool

Due to Raymarine custom connectors a STng - NMEA 2000 adapter cable will need to be used.

7.5 NEXUS

To upgrade an existing Nexus FXD instrument system a Garmin GND 10 will be needed to convert the data to the NMEA 2000 protocol, this in turn can then be connected to the MNEA 2000 Backbone which is connected to the E4. Calibration and configuration is done through the Sailmon Navdesk tool.

8 TROUBLESHOOTING

8.1 GENERAL

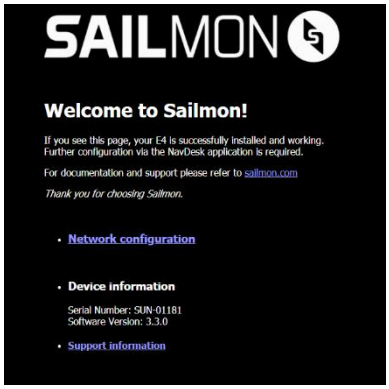
If the E4 works but the displays keep displaying “connecting to server” the displays,E4 and controlling device (PC) are not connected to the same DHCP server. Also check the SAILethernet connections and connections in the junction box are correct.

SENSORS

- When existing Speed and Depth sensors are analog a Actisense DST-2 can be supplied to convert the analog signal to NMEA0183.
- B&G 213 Mast head units can be connected using the WindBox which converts the signal to 25Hz NMEA 2000 wind sensors
- Loadcells can be connected to the Loadcell Box which can interface with most 4 or 6 wire load cells and send the signal to NMEA 2000.
- Linear sensors van be connected using the Linear Box. Each box takes 2 Inputs from 0-5V sensors to measure any value you would like.
- Chartplotters can be connected using NMEA2000 while Navigation software like Expedition and Adrena can connect using either UDP or NMEA183
- Sailmon can assist when custom variables need to be displayed. 128 channels are available to send any data string over UDP, please contact us for the user guide!
- Custom projects can be tailored to.
- When the blue status LED blinks 5 times per second, check the windsensor connection and the sensor cable for errors. In case all connections are working, the MHU sensor is most likely damaged.
- The Wind Box is designed to be integrated into a Sailmon system. It does not provide direct offset features since Sailmon uses advanced calibration which is done in other parts of the system. Contact Sailmon support if you plan to use the Wind Box for other instrument systems.
- Since the Wind Box delivers wind data with a high update rate of 25Hz.

8.2 SAILMONTOOL

The Sailmontool is a very importanttool for general troubleshooting. For us to help you solve an issue with the Sailmon system we need information on the status of the system. To do this we have something called Support information. This can be grabbed by opening Sailmontool, go to the E4 Setup and Updat etab. In there click Open Webinterface you will see this page:

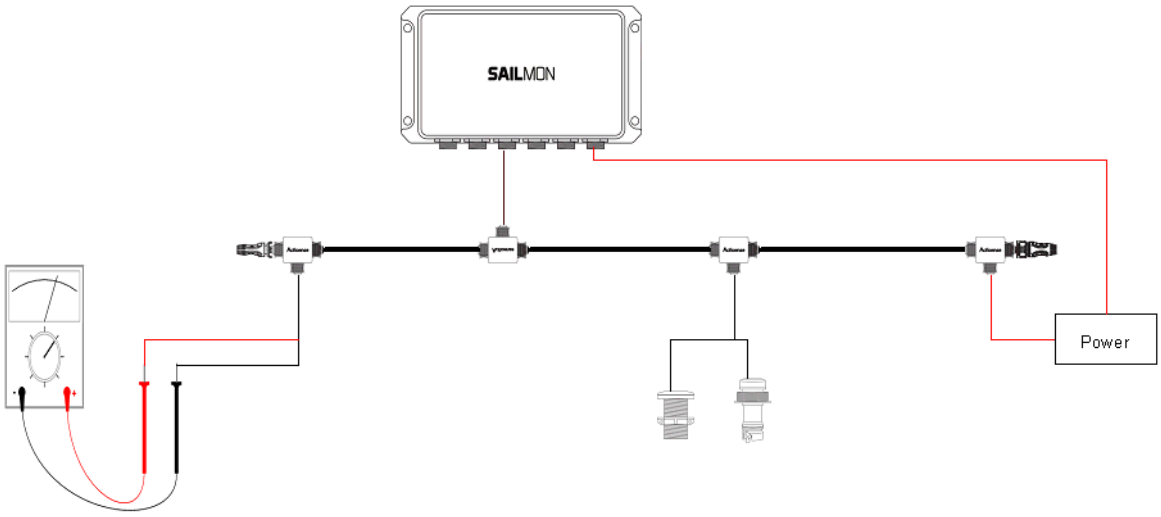


Then click the Support Information link, a second page will open with lots of information. Copy this text and email it to Support@sailmon.com, ideally with a back up of the system:

Setup>Backup/Restore>Backup.

8.3 NMEA 2000 PROBLEMS

In the event the system is up and running, but no data is visible on the displays check the NMEA bus has correct power.
Please see the image below to have a clear view of a NMEA2000 test setup.



For this setup to work, some backbone changes have to be made:

- Look for the terminator which is farthest away from the power supply.
- Place a T - piece between this terminator and the backbone, reconnect the terminator to this junction.
- Connect the modified NMEA 2000 cable to the T-piece.
- Test voltage (red and black wires from NMEA 2000 cable)

A range between 11.5VDC and 14.4VDC is acceptable.

A higher voltage may indicate a possible malfunction of the vessels charging system.
A lower voltages may indicate the presence of faulty connectors or / and a voltage drop in the vessel's power supply.

FURTHER TROUBLESHOOTING NMEA 2000 CABLING
The pin assignments for NMEA 2000 are the following:

Pin 1: Shield (Bare)
Pin 2: NET_C (+12VDC, Red)
Pin 3: NET_S (Ground, Black)
Pin 4: NET_H (CAN High, White)
Pin 5: NET_L (CAN Low, Blue)

Please verify that:
1) All are secure on the NMEA2000 bus.
2) The bus has power.
3) The bus has two terminators attached.

Make the following measurements on the network to verify the integrity of the cabling.

With NMEA2000 devices attached and terminators connected with power supplied to the network, please make sure that you measure 12 VDC between pins 2 (Red) and 3 (Black) of all available open connectors.

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Next, turn the network power off on the NMEA 2000 network.
Keep all devices disconnected, and verify the following resistance measurements:

1) You should measure about 0 (short) ohms betweens pins 1 (Bare) and 3 (Black) of all connectors (This verifies that the shield is connected to ground).

2) The shield should be grounded at one and only one point on the network. Disconnect that connection(at the powertap connection), and measure the resistance between pins 1 (Bare) and 3 (Black) of a network connector. This measurement should be very high

resistance (OPEN). Reconnect the shield after this measurement is made.

3) You should measure about 60 ohms between pins 4 (White wire) and 5 (Blue wire) of all drop connectors (This verifies that both terminators are connected in the BUS. If you measurement is 120 ohms, then only one terminator is connected. If you measure a very high resistance, then no terminator is connected.

Remove both terminators from the NMEA2000 network.

4) Keep a single multimeter lead on pin 4 (CAN+/white wire),You should measure a very high resistance (open) ohms between pins 4 (White wire) and any of the four conductors on the network cable. If you measure a low resistance or zero resistance between pins 4 and other conductors, you have a short somewhere in the cabling.

5) Place a single lead on pin 4 (Blue wire) You should measure a very high resistance (open) ohms between pins 5 (blue wire) and any of the four conductors on the network cable. If you measure a low resistance or zero resistance between pins 4 of any two connectors, check the cabling in between for a possible break.

If all of these measurements are okay, now we should check for any short circuits on powers. All of the following measurements should be very high resistance. If one of these is a low resistance or a zero resistance, check for a possible short in the cable.
1) Pins 1 and 2
2) Pins 1 and 4
3) Pins 1 and 5
4) Pins 2 and 4
5) Pins 2 and 5

Ensure that:

The two terminators are installed at the each end of the “trunk” of the network.

node has a drop from the trunk of no more than 6 meters.
The sum of the length of all drops is less than 78 meters.

If you have gone through all of these steps free from issues, try adding components one by one to the NMEA2000 network to bring the network up slowly.

(NOTE: there must always be at least two components in a NMEA 2000 network (or any CAN network) in order for data communication to take place.

8.4 FASTNET BUS

No signal on the Fastnet bus or no light on the E4:

- Make sure that the Fastnetbus is wired correctly using the Fastnetbus topology.
- Port 2 on the E4 is set to B&G Fastnet in Navdesk.
- Disconnect the power from the Fastnet bus, and measure the resistance between green and white, it should be 50 Ohms. If it reads 70 Ohms there is just one resistor, if it reads 30 Ohms there are 2.
- Model E4 can work with or without the B&G H2000 and H3000 processor, Fastnet output is disabled as default. Make sure to enable it.
- B&G processor still in the network Make sure the Fastnet output is disabled, you can do this through Navdesk.

8.5 NO NETWORK DETECTED

When a router is connected to the system which is used as a switch for the SAILethernet and no network is detected on smart devices.

Take the router out of the network. Then connect the SAILethernet to the E4 and check if the displays work. If so, Sailmon works and the problem lies somewhere in the router.