FT NavVision®

HMS

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4. References

Not applicable.

5. Introduction

helideck monitoring systems provide reliable information on helideck motion and weather conditions which are required during pre-flight planning and continually during the flight. This gives maximum opportunity for the flight to be completed safely and efficiently.

Meteorological and oceanographic sensors are combined in the system to ensure real-time, clear, accurate and relevant measurements of the prevailing conditions are provided to all who require them. These measurements can be viewed offshore, as well as onshore at the heliport, and used to compare environmental trends with forecasts to improve planning accuracy.

6. Abbreviation list

HMS	Helideck Monitoring System
P/R	Pitch/Roll
Incl.	Inclination
SHR	Significant Heave Range
QNH	Altitude (Above Mean Sea Level)
QFE	Height (Above Ground Level)
Heave	Raise or lift (positive and negative)

7. Safety instructions

This section provides only a summary of the most important safety requirements and notes, which will be mentioned in the individual sections. To protect your health and prevent damage to the devices, it is essential to read and carefully follow the safety instructions.

The indications NOTE, CAUTION and WARNING have the following significance:

NOTE:
An operating procedure, practice or condition etc., which it is essential to emphasize.

CAUTION

An operating procedure, practise or condition etc., which, if not strictly observed, may damage or destroy equipment.

WARNING

An operating procedure, practise or condition etc., which, if not carefully observed may result in personal injury or loss of life.

8. Revision history

Revisions issued since publication.

Issue	Date	Revision	Reason
1.0	April 18, 2013		initial release
1.1.5	August 1, 2013	Changes	Divers

9. HMS

9.1 Introduction

The FT NavVision© HMS is configured according the CAP437 and CAP746 standards. It is the world's first HMS that is actually working exactly according rules and is beautiful to look at. It has all the data right at hand where you want it and it is easy to see all the important data at a glance. Besides that it can generate a report that can be in raw data (as most pilots like it) and decoded. This way both professionals and other labor can work with the report easily. The report can be send to anyone through email or can be printed. In the near future it will be possible to make the data available for a larger group through web service.

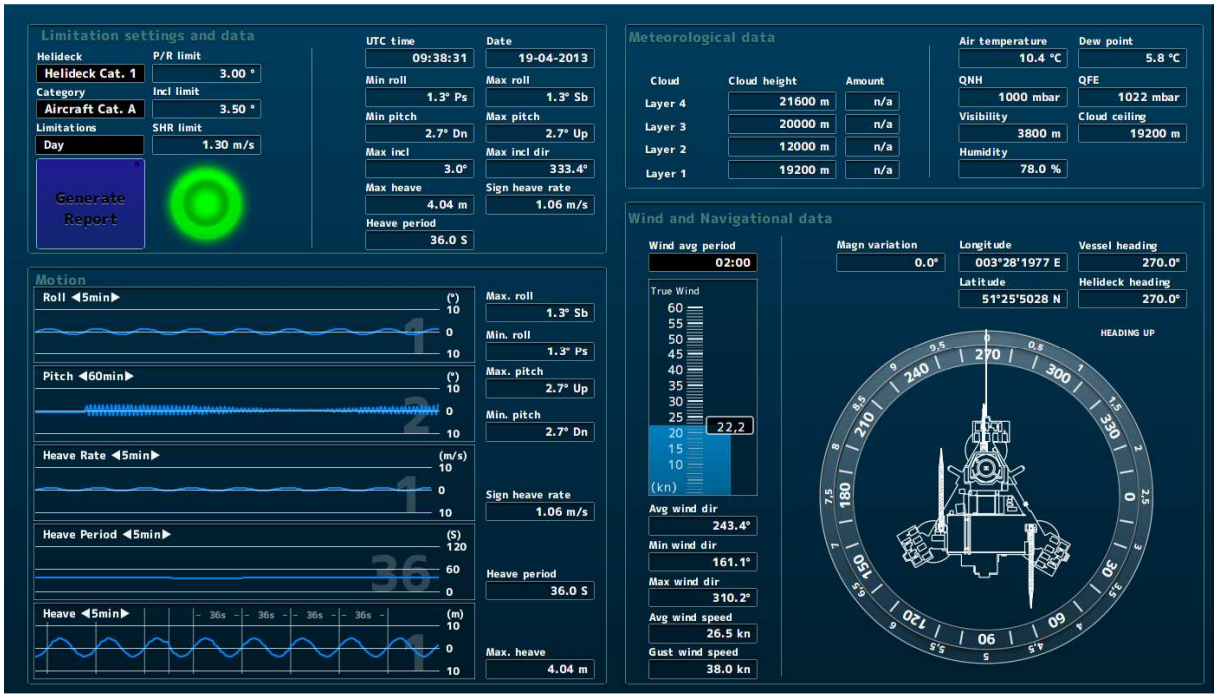


Figure 9-1: FT NavVision® HMS

9.2 The groups

The HMS mimic is divided into four groups. This to make it more distinct where you are looking at. These four groups are:

- Limitation settings and data
- Motion
- Meteorological data
- Wind and navigational data

9.3 Limitation settings and data

This section is meant for the overall settings of the limitations. You can imagine that you can land a helicopter during daytime with higher deviations then during nighttime. However,

CAP437also provides different helideck categories and different aircraft categories that will alter the limitations. These settings can be done here. You can also see directly what the limitations are for the settings and you can see the actual values (see Figure 9-2).

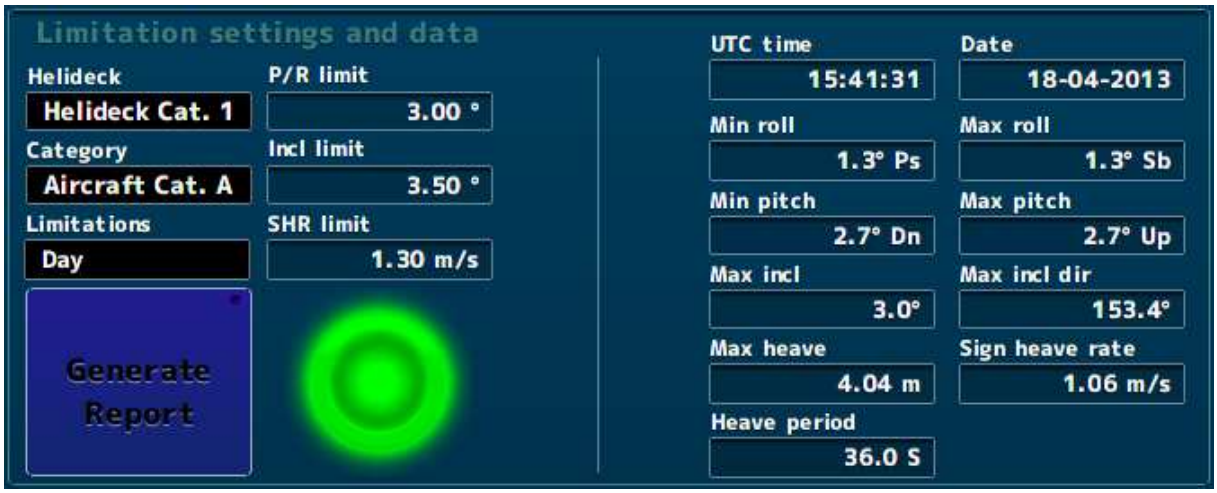


Figure 9-2: Limitation settings and data

The “limitation settings and data” section consists of the following fields:

Field	Explanation
Helideck	Choose the Helideck type category
Category	Choose the Aircraft type category
Limitations	Choose between day or night
P/R limit	Pitch and roll limits depending on settings
Incl limit	Inclination limit helideck depending on settings
SHR limit	Significant Heave Range limit depending on settings
Generate report	Generate a report for flight preparation (see chapter 11**Fout! Verwijzingsbron niet gevonden.**)
Light	Green means within limit, red means beyond limits
UTC time	Uniformed Time Coordinated (Old GMT)
Date	Date
Min roll	Minimum Roll during past 20 minutes
Max roll	Maximum Roll during past 20 minutes
Min pitch	Minimum Pitch during past 20 minutes
Max pitch	Maximum Pitch during past 20 minutes
Max incl	Maximum Inclination during past 20 minutes
Max incl dir	Maximum Inclination Direction during past 20 minutes
Max heave	Maximum Heave during past 20 minutes
Sign heave rate	Significant Heave Rate during past 20 minutes
Heave period	Period between highest and lowest heave

Table 9-1: Limitation settings and data

9.3.1 Limitation settings

In CAP437 there are a few different situations that you need to choose. These settings are the type of helideck, the type of aircraft and if it is day or night. Depending on these settings the limitation settings will change.

When you click on the Helideck value bar you get a window where you can choose which type of helideck the installation is installed on (see Figure 9-3).

When you click on the category value bar you get a window wgere you can choose which type of aircraft category the report is meant for (see Figure 9-4).

When you click on the limitations value bar you can choose whether it is day or night (see Figure 9-5).

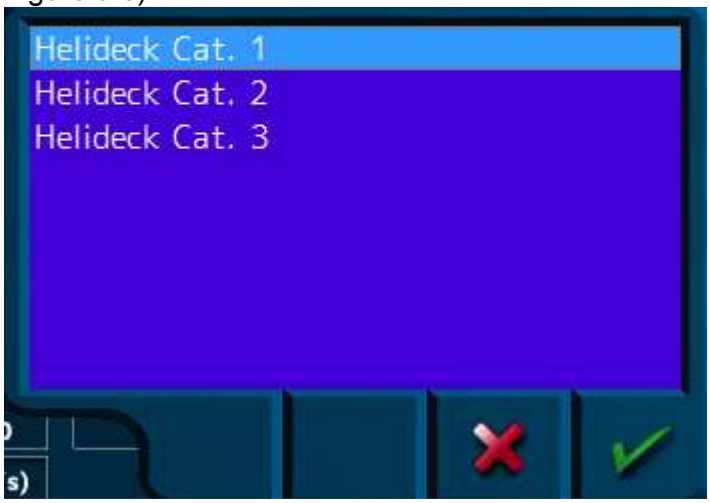


Figure 9-3: helideck choice

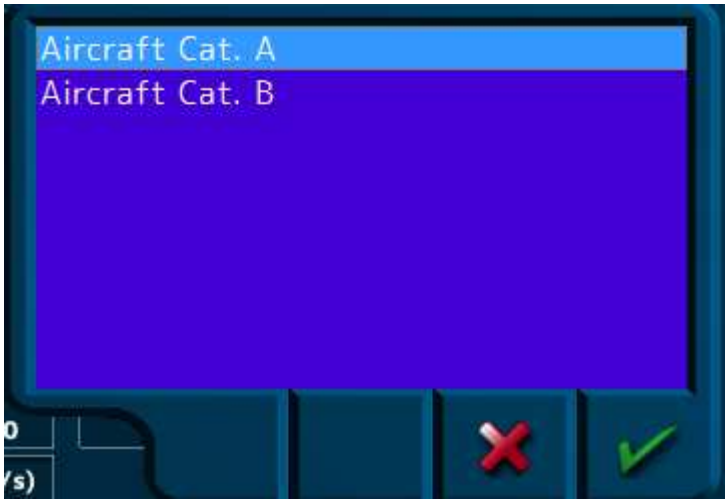


Figure 9-4: Aircraft choice

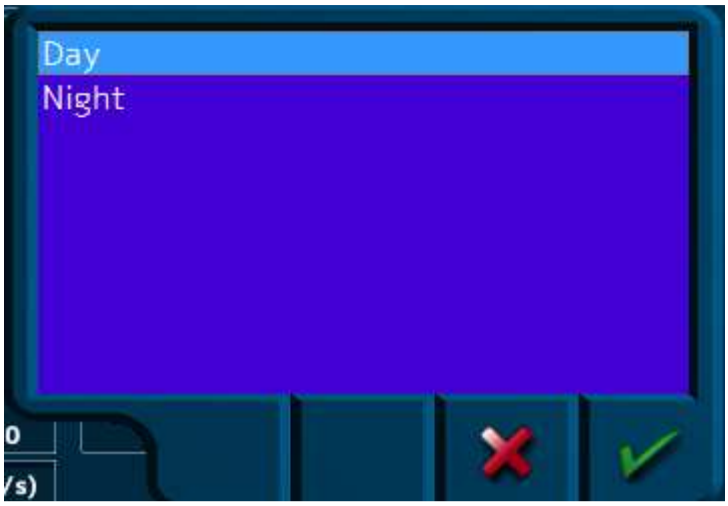


Figure 9-5: Limitation choice

Depending on your choices you will get different limitations. Each category of helideck and aircraft as well as the difference between day and night, will change the limitation settings. The combination of these three settings is crucial for the operation of the HMS.

Next to the settings you will see for each combination what the max pitch and roll is as well as the max inclination of the helideck and the significant heave rate limit (see Figure 9-6).

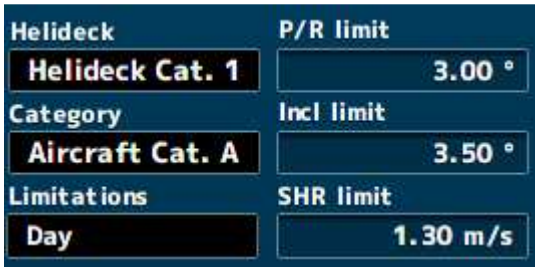


Figure 9-6: choices with limits

9.3.2 Generate report

To be able to send a report to third parties that rely on this information, there is a button that you can click to generate a report. Once clicked it opens a new window (see Figure 9-7).

In this window you first fill in the recipients mail address. While lightning is a very important information type. You can directly click on the “lightning present” checkmark if you need to. Underneath there you can choose multiple phrases that refer to the present weather conditions. to select multiple choices, just hold the CTRL key.

After you have done all this, you click the green checkmark and the report will be generated (see Figure 9-8).

:The pre-flight weather report is still under construction. We will update the manual as soon as these changes have been submitted.

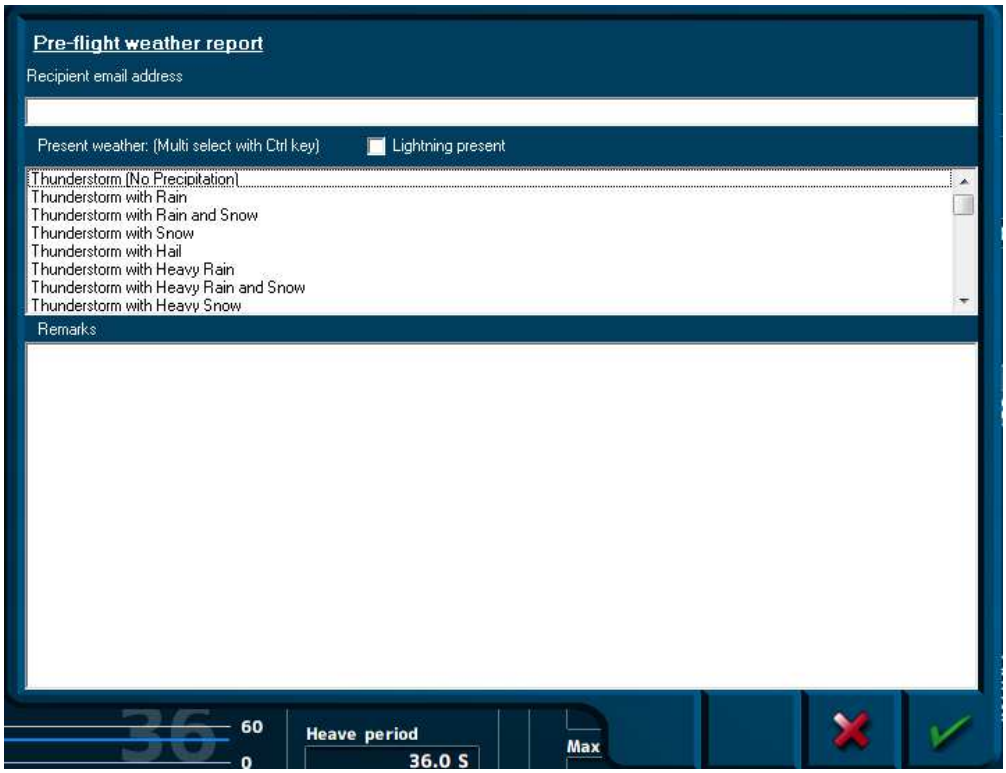
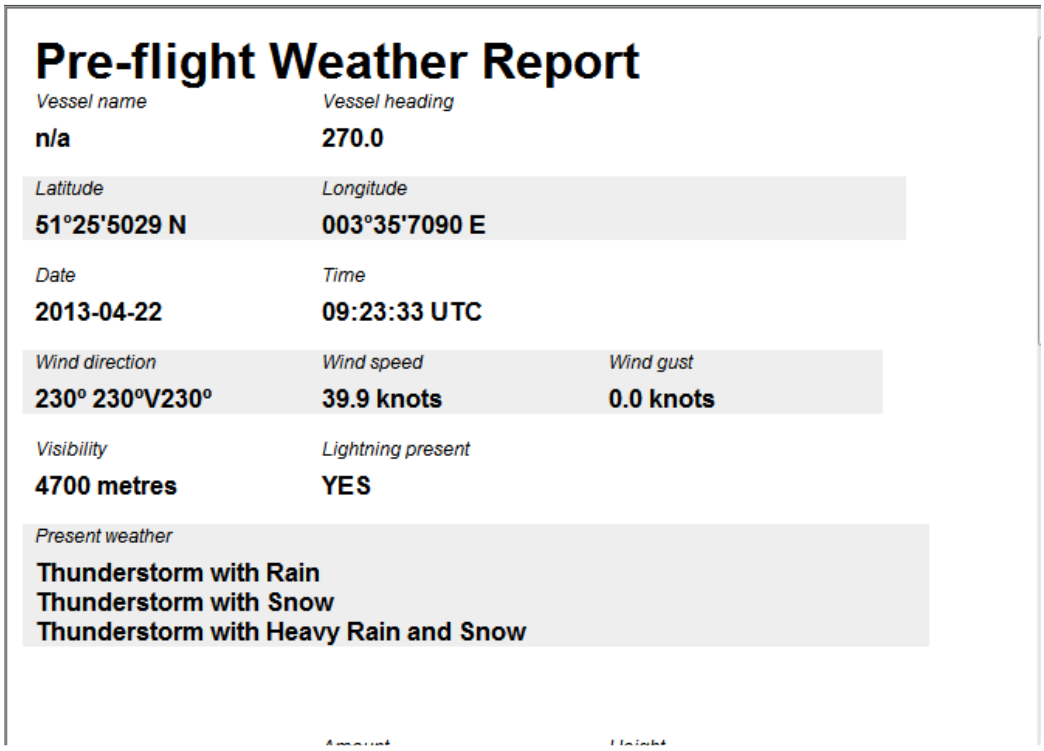


Figure 9-7: generate report window



Pre-flight Weather Report

Vessel name	*Vessel heading*	
n/a	**270.0**	
Latitude	*Longitude*	
51°25'5029 N	**003°35'7090 E**	
Date	*Time*	
2013-04-22	**09:23:33 UTC**	
Wind direction	*Wind speed*	*Wind gust*
230° 230°V230°	**39.9 knots**	**0.0 knots**
Visibility	*Lightning present*	
4700 metres	**YES**	

Present weather

Thunderstorm with Rain
Thunderstorm with Snow
Thunderstorm with Heavy Rain and Snow

Figure 9-8: Pre-flight weather report

9.3.3 Light

The light simply shows if the helideck is within limits. Red means that the helideck is out of limits and traffic will not be possible. Green means that the helideck is within limits.

 *: the HMS is merely a platform to show all the relevant data. It is always up to the crew on the platform and the aircraft pilots to make the decision if it is safe to manoeuvre.*

9.3.4 Data

Most of the data fields show the average data over the past 20 minutes (see Figure 9-9).

Figure 9-9: Limitation data

UTC time and Date speak for itself. The rest of the fields are taken over a period of 20 minutes to show the average roll, pitch, inclination and heave data. For explanation we refer you to Table 9-1.

9.4 Motion

The “motion” section is meant to give you the real-time data for the most important values (see Figure 9-10). The real-time data is presented in graphs that are situated on the left side. These graphs have the opportunity to change the time range so you can see the real-time information over different periods of time. The range runs from 1 minute to 2 hours (see Figure 9-11 and Figure 9-12). This gives you the opportunity to see a kind of trending.

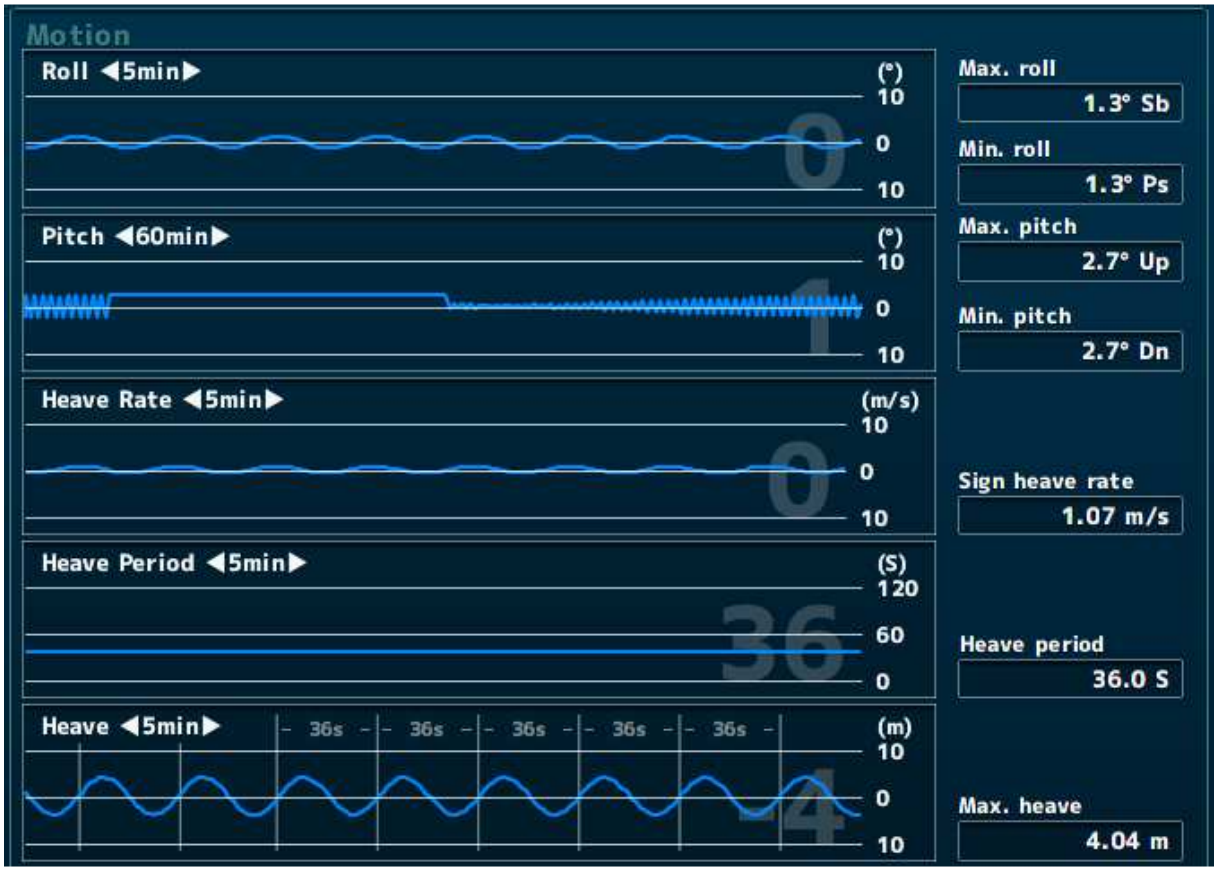


Figure 9-10: Motion section

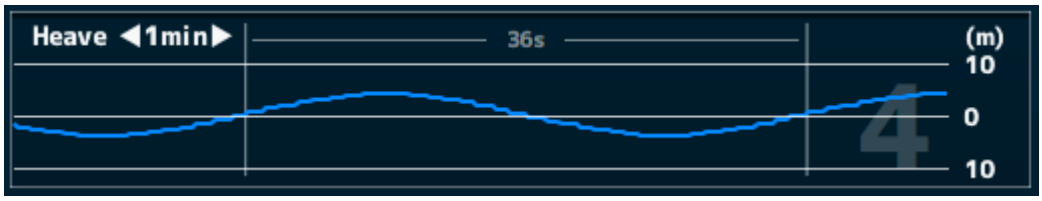


Figure 9-11: Heave 1 minute setting

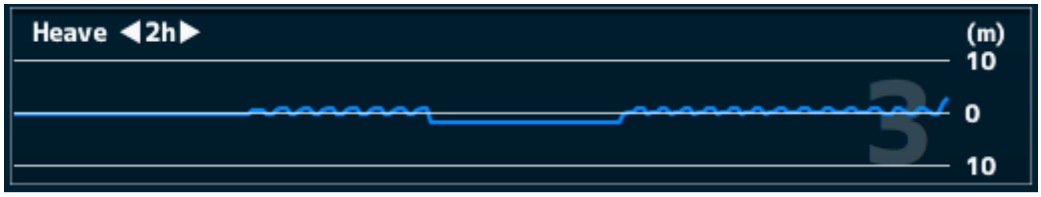


Figure 9-12: Heave 2 hour setting

:no matter what time range you choose, you can always see the actual value as a number on the right side of the graph (see Figure 9-13*).*

Figure 9-13: Actual value graph

9.4.1 Average values

Next to the graphs are the same average values as in the “limitation settings and data” section. This time they are lined up with their own graph for your convenience. For explanation see Table 9-1.

9.5 Meteorological data

The section shows, as the title says, meteorological data. This is all weather data that a pilot will need to plan the flight (see Figure 9-14). It consists the following data (see Table 9-2).

Figure 9-14: Meteorological data section

Field	Explanation
Cloud	Defines one of the four layers of clouds
Cloud height	Shows the distance between the clouds base and the top
Amount	Show how much cloudiness there is (FEW/SCT/BKN/OVC)
Air temperature	Actual outside ait temperature OAT
Dew point	Dew point temperature
QNH	Atmospheric pressure, Corrected to mean sea level
QFE	Atmospheric pressure at sea level
Visibility	Visibility measured in distance
Cloud ceiling	The lowest base of the clouds
Humidity	Humidity in percentage

Table 9-2: Meteorological data explanation

9.5.1 Cloud height

The cloud height is the distance from the base of clouds (or cloud ceiling) and the top of the clouds in a certain layer. These layers are approximately divided into different zones due to international rules.

It is very important to know the height of clouds. High clouds are primarily composed of ice crystals; Medium clouds are a mixture of water droplets (usually super-cooled) and ice crystals, in varying proportion, and low clouds primarily water droplets.

Cloud height is often related to the intensity of precipitation generated by a cloud: deeper clouds tend to produce more intense rainfall. For instance, cumulonimbus clouds can develop vertically through a substantial part of the troposphere and often result in thunderstorms with lightning and heavy showers. By contrast, very thin clouds (such as cirrus clouds) do not generate any precipitation at the surface.

In the 'Low' cloud classification come: Stratus (St); Stratocumulus (Sc); Cumulus (Cu) and Cumulonimbus (Cb). However, note that both Cumulus and Cumulonimbus clouds often extend well into 'medium' levels, and towering Cu, and Cb extend to 'high' levels.

In the 'Medium' cloud class come: Altostratus (As); Altocumulus (Ac) and Nimbostratus (Ns). Nimbostratus often has a base within the 'low' cloud category.

In the 'High' cloud group are: Cirrus (Ci); Cirrocumulus (Cc) and Cirrostratus (Cs).

9.5.2 Amount

Cloud cover (also known as cloudiness, cloudage or cloud amount) refers to the fraction of the sky obscured by clouds when observed from a particular location.

The amount of the sky that is obscured is defined in octa. So if there are no clouds the sky is 0/8 obscured. The following amounts are available”

- FEW sky is obscured form 1/8 to 2/8
- SCT sky is obscured from 3/8 to 4/8
- BKN sky is obscured form 5/8 to 7/8
- OVC sky is completely obscured 8/8

The abbreviations stands for the following, to make it easier to understand.

- Few Few
- SCT Scattered
- BKN Broken
- OVC Overcast

9.5.3 Air temperature and dew point

These two temperatures are used in close combination. The air temperature is the Outside Air Temperature (OAT) on the location. This is already important for the pilot while they need to know if the OAT is low or below zero with reference to carburetor icing.

The relationship between dew point and temperature defines the concept of relative humidity. The dew point, given in degrees, is the temperature at which the air can hold no more moisture. When the temperature of the air is reduced to the dew point, the air is completely saturated and moisture begins to condense out of the air in the form of fog, dew, frost, clouds, rain, hail, or snow.

The closer the OAT is to the Dew point temperature, the more certain is the change that one of these phenomenon's will occur at low heights.

9.5.4 QNH and QFE

QNH - when this pressure is set on your altimeter it will give you your altitude above mean sea level in your area. As all aeronautical charts show elevation in feet amsl this is the one to use to make sure you're going to be above terrain or obstacles (such as TV masts).

QFE - with this set your altimeter will read 0ft on landing. It gives you your height above the airfield for which that particular pressure is valid. At your stage of the game you might want to set this for flying in the circuit so that you can fly at circuit height

9.6 Wind and navigational data

In this section of the HMS you can find all the information on wind and navigation. It has a wind section on the left and a navigational section on the right. Wind speaks for itself. The navigational data is to prepare for the place and direction of the helideck (see Figure 9-15).

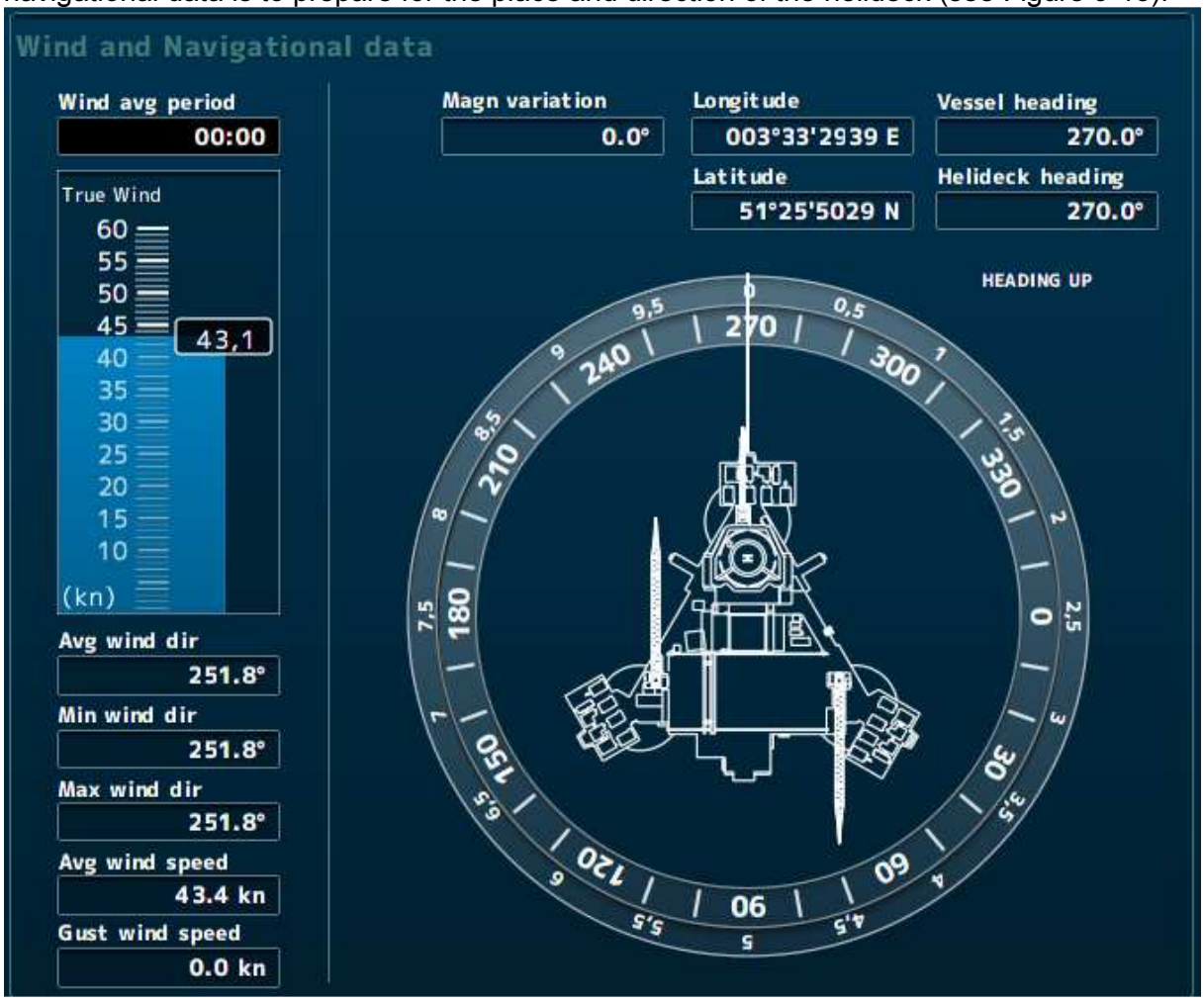


Figure 9-15: Wind and navigational data

9.6.1 Wind

Wind is a very important variable for the pilot to prepare the flight. In particular the wind speed and the gust wind speed are important. The explanation of the fields are as follows:

Field	Explanation
Wind avg period	Setting of period for measuring average wind values
True wind	True wind real time
Avg wind dir	Average wind direction over a set amount of time
Min wind dir	Minimal wind direction over a set amount of time
Max wind dir	Maximal wind direction over a set amount of time
Avg wind speed	Average wind speed over a set amount of time
Gust wind speed	Gust wind speed over a set amount of time

Table 9-3: Wind explanation

Except for the true wind, all the other wind values are depending on the time you have set in the field “Wind avg period”. When you click on this field you will get a pop-up window where you can choose different period (see Figure 9-16).

- Real time — Real time values
- 2 minutes — Average values over the past 2 minutes
- 10 minutes — Average values over the past 10 minutes
- 20 minutes — Average values over the past 20 minutes

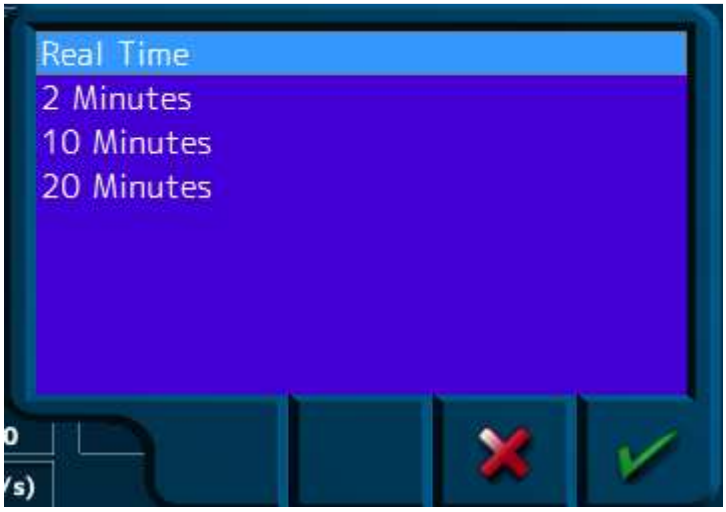


Figure 9-16: Average wind period choice

9.6.2 Navigational data

As mentioned before the navigational data is to prepare the flight. You need to know where the helideck is to plan your flight. Also you need to now the heading of the helideck (if applicable) to now your entrance. Therefor we have a few values and a compass to show how and where the helideck is positioned.

Field	Explanation
Magn variation	Magnetic variation on that spot
Longitude	specifies the east-west position of a point on the Earth's surface
Latitude	specifies the north-south position of a point on the Earth's surface
Vessel heading	The heading of the vessel or object that contains the helideck
Helideck heading	The heading of the helideck itself
Compass	Visualization of the helideck in a true compass

Table 9-4: Navigational data explanation

The magnetic variation is a given deviation that changes every year. It can be found on sea maps and flight maps.

If the helideck is on a vessel it is nice to know the position of that vessel. You can use the latitude and longitude to find the ships position.

For your approach you need to know the heading of the vessel. Mostly you can only approach it from one direction, so knowing the vessels heading gives you the opportunity to plan your approach. If the heading of the helideck differs from the vessels heading, it is most likely that the helideck is on another position of the vessel than the bow. Or even not aligned with the vessel at all. This is also important for your approach planning.

You can change the compass into “heading up” and “north up” by clicking on one of these words at the top right of the compass (see Figure 9-17).

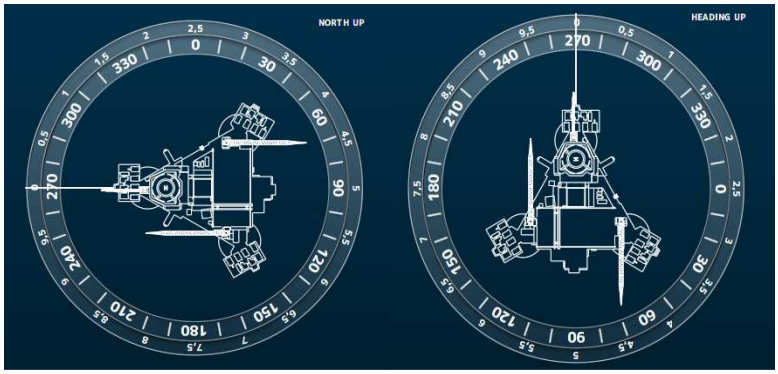


Figure 9-17: Compass north up and heading up

10. Equipment

10.1 Introduction

We have the perfect HMS GUI , but it will not work without good sensors. We have tested a lot of sensors and came up with the following recommendations. These sensors are mandatory for the proper functioning of the system.

10.2 Extra equipment

An external gyro, GPS, log and depth sensor need to be connected. The communication should be based on the NMEA0183 protocol and all this data needs to be available in 1 NMEA0183 string.

10.3 Barometer

For the barometer we recommend the Vaisala PTB330. It provides reliable pressure measurement in a wide range of applications. Digital outputs RS232 and RS422/485 (optional) can be selected. There is also a local digital display available.

: for more information we refer you to the Vaisala PTB330 manual

The vaisala PTB300 will be connected to the serial port of a moxa that is connected to the FT NavVision® system. In FT NavVision® you can go to tools/configuration/serial/serial lan ports and there choose the vaisala PTB330 protocol from the drop down menu (see Figure 10-1). For more information on how to install and set-up the Moxa, we refer you to the “software installation and commissioning manual” chapter 12.9.3.2

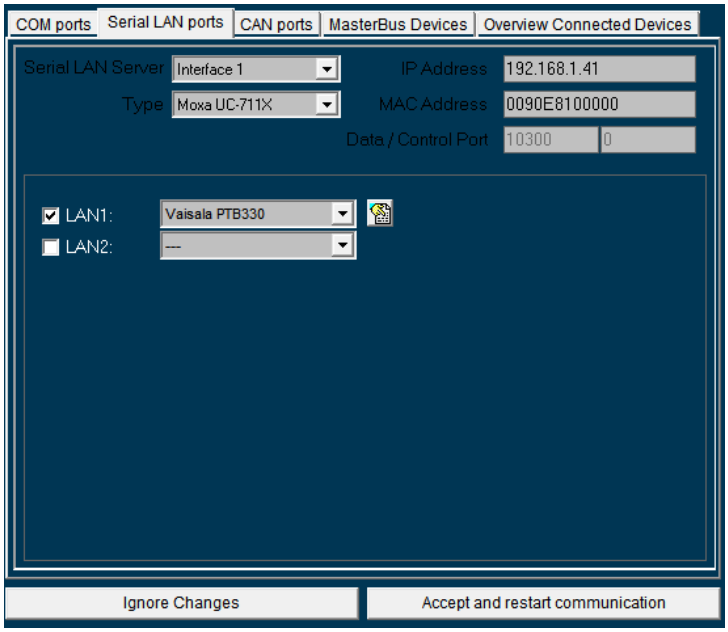


Figure 10-1: Vaisala PTB330 on moxa

10.4 Wind speed and direction

For wind speed and direction we recommend the Vaisala WMT700. Vaisala WINDCAP® Ultrasonic Wind Sensor WMT700 Series is a robust and reliable ultrasonic anemometer. It measures surface wind, which is one of the key parameters for meteorology and aviation. The WMT700 Series meets the updated - WMO-No.8 guide, 7th edition - and ICAO requirements.

: for more information we refer you to the Vaisala WMT700 manual

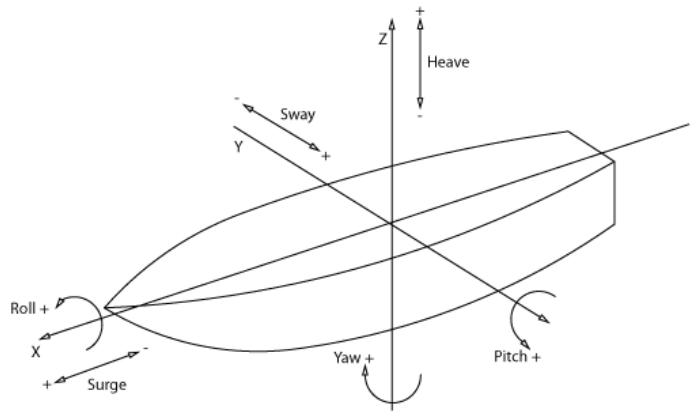
The vaisala WMT700 will be connected to the serial port of a moxa that is connected to the FT NavVision® system. In FT NavVision® you can go to tools/configuration/serial/serial lan ports and there choose the vaisala WMT700 protocol from the drop down menu (see Figure 10-1). For more information on how to install and set-up the Moxa, we refer you to the "software installation and commissioning manual" chapter 12.9.3.2

10.5 Pitch, roll, sway and heave

For pitch, roll, sway and heave we recommend the Ship motion SMC108. SMC has developed its IMU range of Motion Sensors to meet the requirements of the marine sector. The IMU range provides high accuracy motion measurement data in dynamic environment in all areas from small hydrographic vessels to large oil rigs in all weather conditions (see).

: for more information we refer you to the SMC108 manual

The SMC108 will be connected to the serial port of a moxa that is connected to the FT NavVision® system. In FT NavVision® you can go to tools/configuration/serial/serial lan ports and there choose the NMEA protocol from the drop down menu (see Figure 10-1). For more information on how to install and set-up the Moxa, we refer you to the "software installation and commissioning manual" chapter 12.9.3.2



11. FT NavVision© settings

11.1 Introduction

For the proper functioning of the HMS it is necessary that we make some settings in FT NavVision© and have certain files in the NavVision/config/network folder. These settings and files are essential, so we will discuss them here.

11.2 CAP437ReportStructure.html

This file represents the structure of the report that will be sent to the customers once you have pressed the generate report button. This file can be changed over time. It is necessary that you check if this file is available in NavVision/config/network. At this moment the date of the file needs to be 26-4-2013 and it will be 8.51kB. Check this. If it changes, you will be informed.

11.3 SMTPConfig.uc.ini

This file is for the settings of your SMTP server. You need to adjust this file to have it sending the reports as an email over your own SMTP server. At the beginning it will look like the following:

```
[Server]
ServerAddress=
PortNumber=25
SSLVersion=3

[Sender]
SenderAddress=
```

Figure 11-1: SMTPConfig.uc.ini

This file will be generated the first time that you generate a report.

You will have to fill in your own information and add a few lines for your username and password. The next figure is an example. You need to adjust it to your own settings.

```
[Server]
ServerAddress=smtp.gmail.com
Username=*******@gmail.com
Password=*******
PortNumber=587
SSLVersion=3

[Sender]
SenderAddress=*******@gmail.com
```

Figure 11-2: SMTPConfig.uc.ini adjusted

Field	Explanation
ServerAddress	Address of the ships SMTP server
Username	Username of your SMTP server
Password	Password for your SMTP server
PortNumber	Port number for your SMTP server
SSLVersion	1-no authentication, 2=STARTTLS, 3=SSL/TLS
SenderAddress	The name you want as sender

Table 11-1: SMTPconfig