

NAVIPAC

PHINS/ROVINS DRIVER

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Version: 4.2.2

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1 General driver information

The Phins driver acts as a special interface between NaviPac and the Ixsea PHINS/ROVINS system.

- Send raw position (USBL, LBL or similar) out to the Ixsea system. Using the Ixsea \$PUSBA format
- If the ROV is on deck (or the raw position is missing) send the vessel position to the Ixsea system using NMEA \$GPGGA
- Receive position data and attitude data from the Phins in the Halliburton SAS format (\$PIXSE, HSPOS and HSATIT) and pass this on to NaviPac (and optional NaviScan)
- The Phins system and NaviPac must be synchronized to same time source (GPS time)
- The interfacing between Phins and EIVA must be either serial (COM port) or UDP/IP (networked)

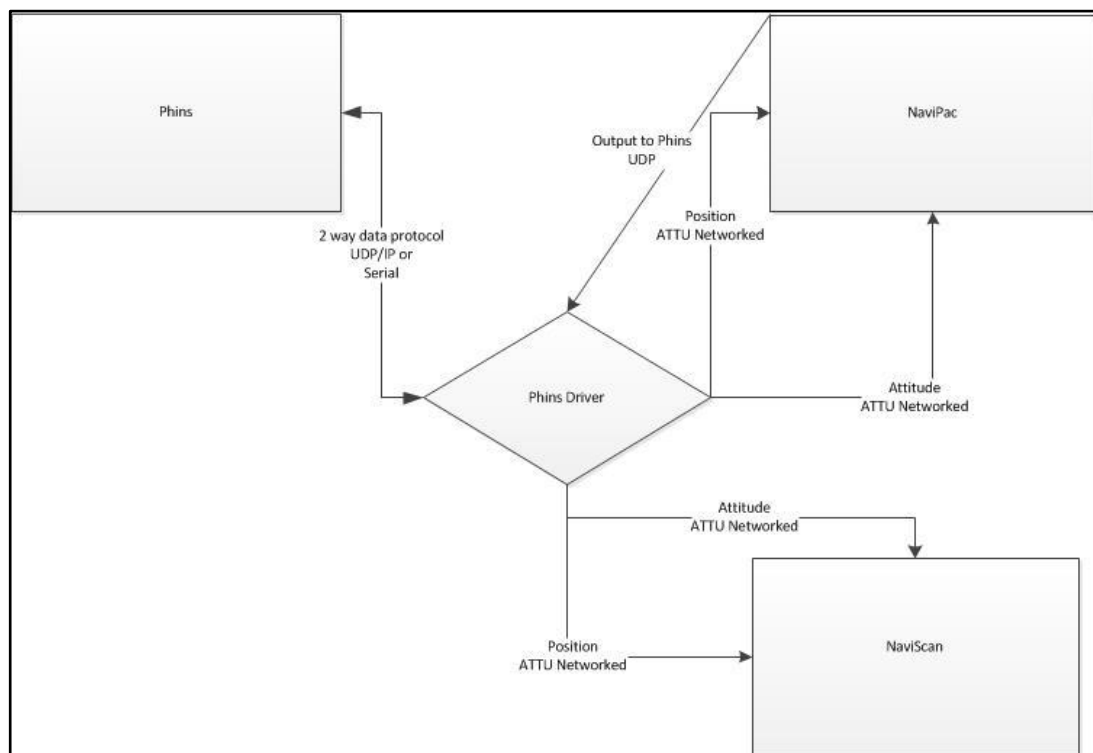



Figure 1 Flow diagram

Data supplied from the Phins driver will be using the same string as the Halliburton SAS data, but encapsulated in ATTU stream, so the data will be time tagged based on timestamp in the position record.

2 The PHINS (PhinsOut) module

If NaviPac is configured with one or more PHINS/ROVINS driver(s) then a special PhinsOut window pops up for each driver:


NaviPac PHINS Interface: PHINS
—
□
✕

Communication and Positions

I/O Definition	UDP/IP 6043 127.0.0.1	11239
On Deck Location	POS (511489.00 507979.00) H 37.40 DOP -1.00	70
Sub-surface (To INS)	POS (511991.57 508163.63) H -34.84 DOP 1.20	0
From INS		140 0.385

☒ PHINS sub-surface (PUSBA)
☐ PHINS on Deck (GGA)
Restart Comm...

```
$PUSBA,100847.66,0435.84452,N,00906.48664,E,0.0,0.0,0.0,0.0,0.0,0.0,0.1,,,,34.8,*7C
```

```
$PUSBA,100847.66,0435.84452,N,00906.48664,E,0.0,0.0,0.0,0.0,0.0,0.0,0.1,,,,34.8,*7C
```

Gyro/Motion Port	10001	-1	Manual SD Values...
Position Port	10002	-1	

Raw Export Port
-1
View Setup File...

Figure 2 Included version in NaviPac 4.2.2.

NaviPac PHINS Interface: POI2

Communication and Positions

I/O Definition	COM01 9600 N81	12205
On Deck Location	POS (467249.90 7119699.79) H 99.80 DOP 1.90	4422
Sub-surface (To INS)	POS (467374.15 7119538.53) H -37.00 DOP 1.20	0
From INS	\$PXSE.HSPOS_120453.43,5711.628202.N,00205.619760.W,-0.21,0.0	2232

☒ PHINS sub-surface (PUSBA)
 ☐ PHINS on Deck (GGA)

\$PUSBA,121121.26,6411.91745,N,00219.57593,E,1.0,1.2,0.0,0.0,0.0,0.0,0.0,0.3,6412.00356,N,00219.42032,E,37.0,*4F

\$PXSE.HSSTAT,0001E904*27

Gyro/Motion Port: 10001
 Position Port: 10002
 [Manual SD Values](#)
[View Setup File](#)

Figure 3 Included version in NaviPac 4.2.1 (and previous NaviPac versions, e.g. 3.10.5)

The window is default minimized and will in normal operation not require any operations.

The window contains the following informative items.

- I/O Definition
Identification of the physical interfacing and the instrument id
- Vessel
The vessel position and DOP
- To INS
The raw position object
- From INS
The position telegram from the Phins
- PHINS sub-surface or PHINS on Deck
Select if the unit is in water (send out PUSBA) or on deck (send out GGA)
- The output
The telegram send out to the Phins (GGA or PUSBA)
- Other telegrams
Other incoming messages such as attitude and status telegrams
- Attitude and position port
The two internal ports NaviPac uses for data reading (ATTU Format)
- Manual SD Values
Edit the manual parameters. A new window pops up.

The screenshot shows a dialog box titled "Enter Manual SD Values". It has a standard Windows-style title bar with a close button (X). The dialog is divided into two main sections: "USBL" and "LBL". Each section contains two input fields: "SD (Lat) (m)" and "SD (Long) (m)". For the "USBL" section, the values entered are 1.1 and 2.34. For the "LBL" section, the values entered are .98 and 1.2. To the right of the input fields are two buttons: "OK" and "Cancel".

Figure 4 Manual SD Values

The items correspond to the data fields output to the Phins system. As soon as new values are accepted by OK they will be used in the output (squared as the output uses covariance)

- View setup file
View the setup file. See 4.4 for details.

- Interface counters

The right side of the window shows some interface counters and info numbers

- Instrument Id (11239/12205)
- Packets from NaviPac
- Empty UW position cycles (no data from ROV)
- Packets from PHINS

2.1 Restart Comm... [NaviPac 4.2.2]

In NaviPac 4.2.2 a new option **Restart Comm...** has been added. If the PHINS system has been down due to a power failure, etc., then in previous NaviPac versions it was required to restart NaviPac in order to re-establish the connection to the restarted PHINS system. From NaviPac version 4.2.2 only the PhinsOut module itself is required to be restarted. That can be done by using the **Restart Comm...** option.

If this option is not applicable due to a non-responsive PhinsOut module then a more manual approach has been added as well, basically restarting the module manually from a terminal window. But first the right instrument Id must be obtained. The instrument Id can be obtained in either of the following 4 ways:

- copy/capture the topmost ID to the right in the PhinsOut GUI, e.g. 11239
- run NaviPac.exe and select the Vehicle with the associated PHINS driver, then copy/capture the ID listed in the **Setup Id** field, e.g. 11239
- run NPConfig and expand Data output, locate the PHINS/ROVINS instrument and copy/capture ID1 from the properties to the right, e.g. 11239
- look in the ..\NaviPac\Setup\Phins.ini file and extract the ID from the associated section name, eg for section [INSID11239] copy/capture 11239

Then manually kill the non-responsive PhinsOut process using the Windows Task Manager, start up a command prompt, cd to **C:\EIVA\NaviPac\bin** and finally restart the module with the instrument Id as the second argument, e.g.

> **PhinsOut.exe 0 11239**

3 Automated setup [NaviPac 3.10.5]

This part is currently only applicable in NaviPac 3.10.5.

The setup consists of several drivers to fulfil the operation, and this can be defined manually as defined in next section or using a high-level wizard in NPConfig.

- Select the Instrument, Dynamic positioning item
- Activate right mouse Add New Item

- Select the PHINS item

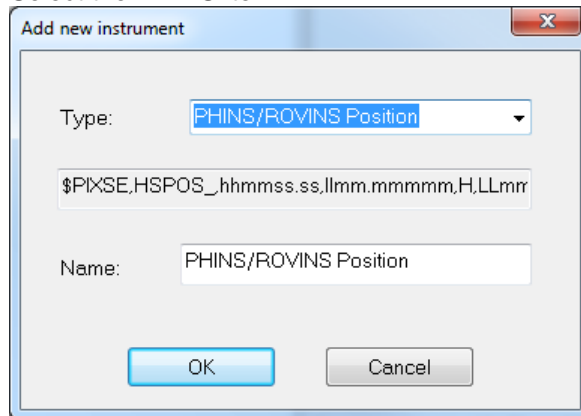


Figure 5 Phins item

- A pop-up dialogue asks if you want to follow the wizard. Answer yes to do so or no to define the steps manually (and jump to next chapter)

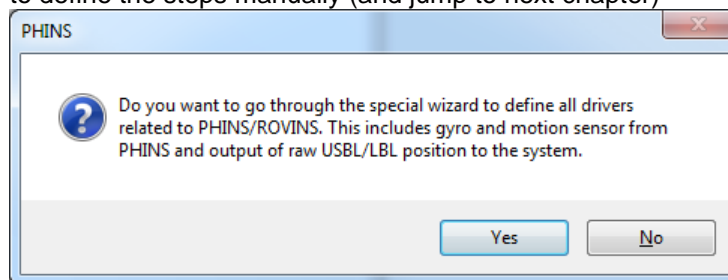
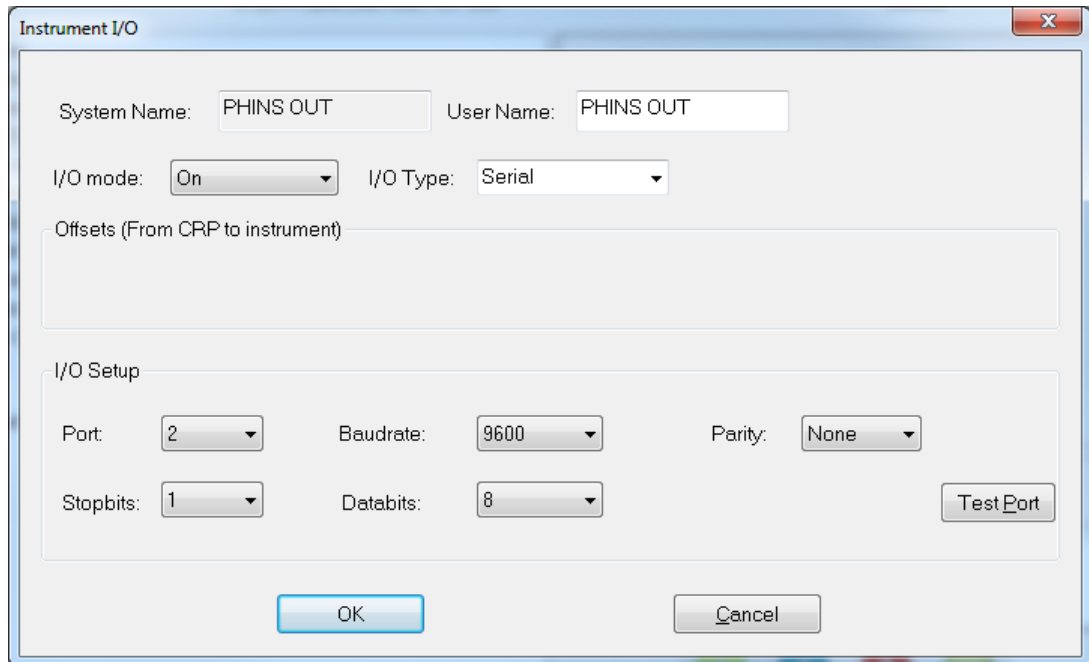


Figure 6 Phins wizard

- Next step is to define the interfacing between NaviPac and the PHINS. We do support serial interfacing and UDP/IP networking:

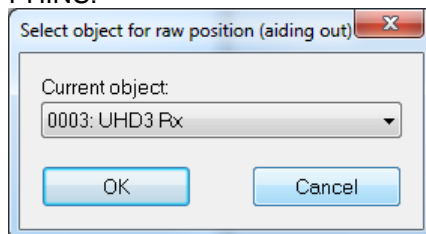


The 'Instrument I/O' window contains the following fields and controls:

- System Name:** PHINS OUT
- User Name:** PHINS OUT
- I/O mode:** On (dropdown)
- I/O Type:** Serial (dropdown)
- Offsets (From CRP to instrument):** (empty text box)
- I/O Setup section:**
 - Port:** 2 (dropdown)
 - Baudrate:** 9600 (dropdown)
 - Parity:** None (dropdown)
 - Stopbits:** 1 (dropdown)
 - Databits:** 8 (dropdown)
 - Test Port:** (button)
- Buttons:** OK, Cancel

Figure 7 Phins Out Instrument I/O

- Hereafter select the object representing the raw position of the vehicle (positioned via USB, LBL or similar) – that is the position send out to the unit for aiding the PHINS:

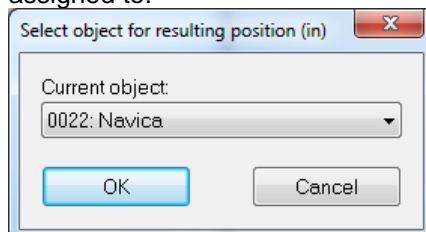


The 'Select object for raw position (aiding out)' dialog shows:

- Current object:** 0003: UHD3 Px (dropdown)
- Buttons:** OK, Cancel

Figure 8 Phins object

- Finally select the object representing the position that the resulting PHINS data is assigned to:



The 'Select object for resulting position (in)' dialog shows:

- Current object:** 0022: Navica (dropdown)
- Buttons:** OK, Cancel

- NaviPac will hereafter generate the needed interfaces and assign the objects as requested – and you are ready to go.

Please observe that gyro and motion data is assigned to both the raw and resulting object.

4 Manual edit setup [NaviPac 3.10.5]

This part can also be done in NaviPac 4.x, using NaviPac.exe. However, only the NaviPac 3.10.5 setup approach is described in the following.

If needed you may configure NaviPac manually to communicate with the Phins system by defining.

- An output to the Phins
- Position input
- Gyro Input
- Motion input
- Some special settings in the INI file

4.1 Position Output

The main component in this is the data output.

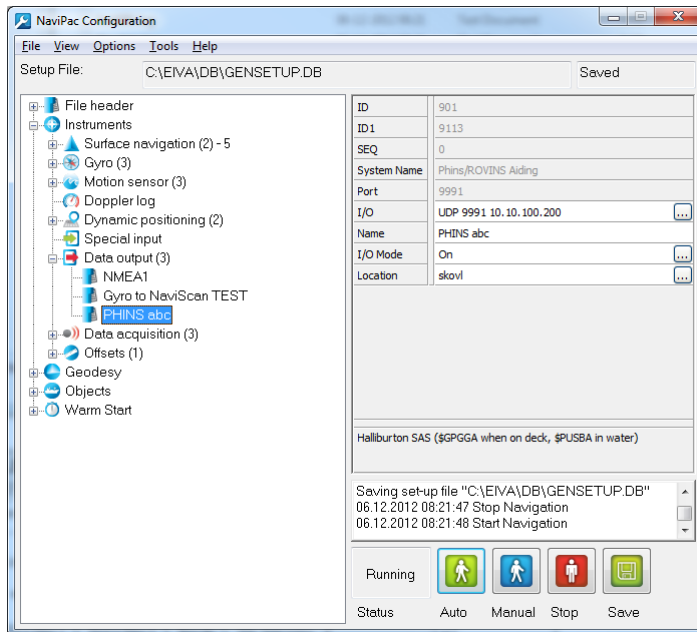


Figure 9 NaviPac Configuration 3.10.5

The interfacing details must specify the physical connection between the EIVA system and the Ixsea system. The above sample illustrates UDP/IP networked.

The object selected (Location) must represent the raw position from USBL, LBL or similar.

When NaviPac is started with this output enabled the Phins driver window will pop-up during navigation.

4.2 Position Input

The second step in the configuration is to add an object and assign all the data from the Phins system to that.

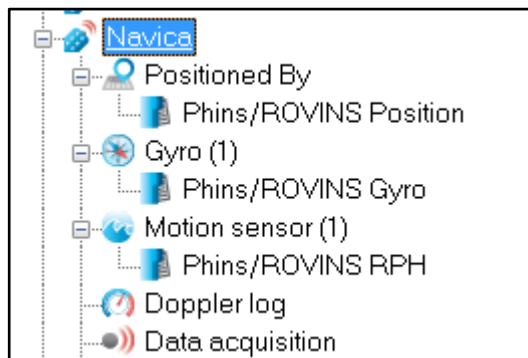


Figure 10 Navica

The position is defined as a dynamic positioning system:

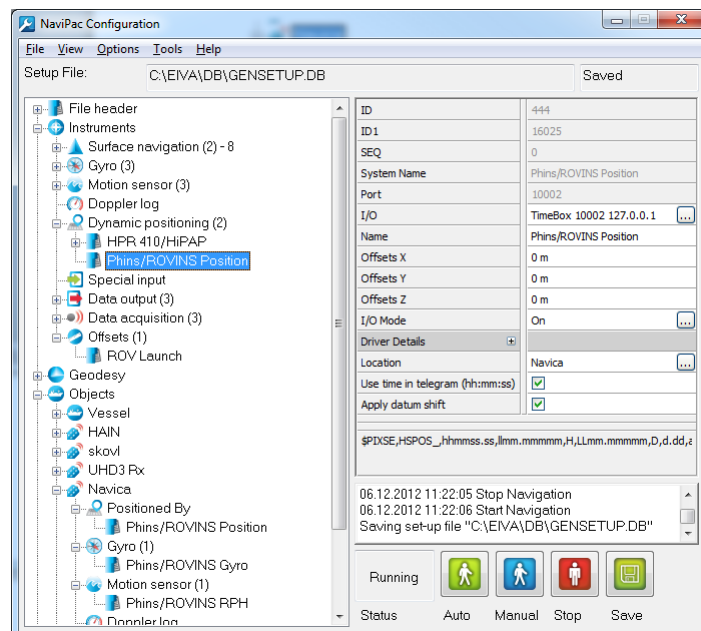


Figure 11 NaviPac Configuration 3.10.5 Phins/ROVINS Position

The I/O mode must be set to TimeBox/ATTU format on local pc (127.0.0.1) and use a unique port number (e.g. 10002).

Offsets must be left to zero to keep the raw position.

4.3 Attitude Input

Second step is to interface the Gyro and Motion sensors in NaviPac.

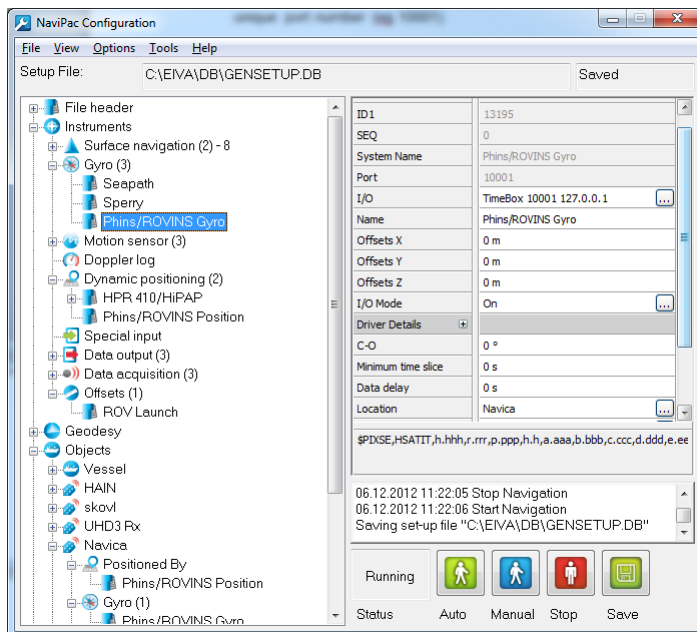


Figure 12 NaviPac Configuration Phins/ROVINS Gyro

The I/O mode must be set to TimeBox/ATTU format on local pc (127.0.0.1) and use a unique port number (eg 10001). Please note that Gyro and motion sensor uses same port configuration.

4.4 Manual Configuration

The last step in the manual configuration is to configure the driver module to do the correct data mapping. This is one in a file called PHINS.INI located at \EIVA\NAVIPAC\SETUP

```
[INSID11239]
Covar=1.100 2.340 3.000 4.000
Attitude=10001
Position=10002
m_PhinsMode=0
```

The top line is the instrument identifier given by 5 digits – and must correspond to the ID1 defined for the data output:


ID	901
ID1	9113
SEQ	0
System Name	Phins/ROVINS Aiding
Port	9991
I/O	UDP 9991 10.10.100.200 

Figure 13 Phins/ROVINS Aiding

The Attitude and the Position integers defines the internal socket numbers and must match the number defined in the data inputs:


ID	138
ID1	15302
SEQ	0
System Name	PHINS/ROVINS Gyro
Port	20001
I/O	ATTU 10001 127.0.0.1 
Name	PHINS: Plough L

Figure 14 PHINS/ROVINS Gyro

The Covar data is purely configured inside the Phins module.
The m_PhinsMode defines if the current configuration is on-deck or sub-surface.

Please note that there might be multiple entries in the file in case of more drivers activate at the same time.

4.4.1 Exporting data to NaviScan

It is possible to configure the module to send the position and attitude data on to NaviScan as well as NaviPac. This is configured manually in the INI file:

```
NS-Position=12345
NS-Attitude=12346
NaviScan=127.0.0.1
```

The NaviScan entry defines the IP address of the NaviScan computer – 127.0.0.1 is the same pc as NaviPac.

NS-Position and NS-Attitude defines the UDP port number to use for the interfacing. The value -1 defines not in use.

The driver in NaviScan must then be selected to ATTU/TimeBox.

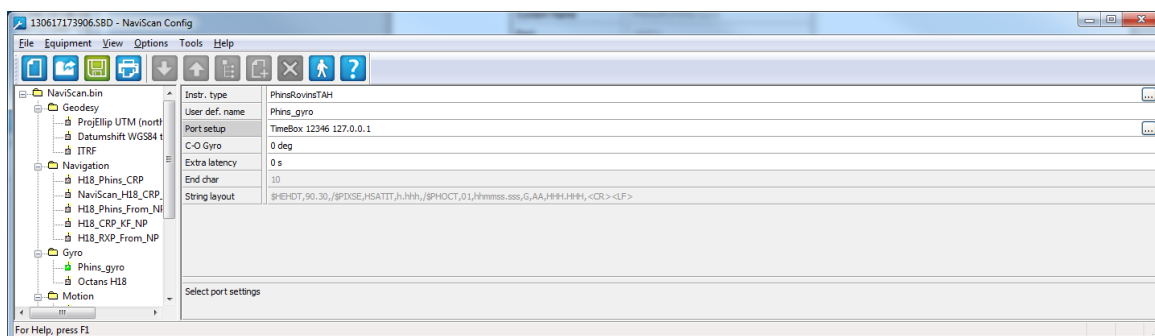


Figure 15 Phins/RovinsTAH

4.4.2 Exporting Raw data on UDP

It is possible to configure the module to send the raw input telegrams out on another UDP port – simple retransmit on UDP. This is configured manually in the INI file:

```
Raw-export=12123
Raw=192.168.1.34
```

The Raw entry defines the IP address of the receiving computer – 127.0.0.1 is the same pc as NaviPac.

Raw-export defines the UDP port number to use for the interfacing. The value -1 defines not in use.

5 Version descriptions

Version	Date	Author	Description
3.10	02/09/2015	OKR	Updated to version 3.10
4.2.2	20/03/2019	JUS	Added chapter 'Restart Comm... [NaviPac 4.2.2]'
4.2.2	05/03/2020	ANS	Moved to new template, added picture captions