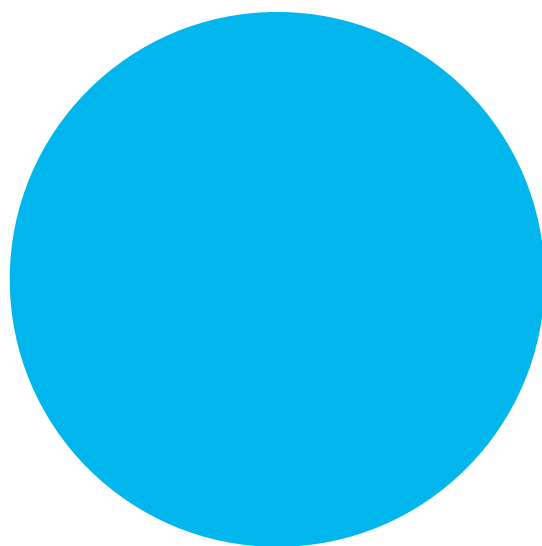




Subsea Products

Maintenance Manual

Revision History

Edition	Date	Comments
A	02/2014	Creation
B	11/2015	Updated with the new style chart. iXblue contact updated
C	05/2016	Updated the O-ring part number
D	03/2019	Rovins Nano / Octans Nano / Phins Compact SERIES products added
E	11/2020	Updated to the new commercial specification
F	01/2020	Changed Autostatic bench Zupt mode to Autostatic
G	01/2022	Changed FOG 90 criteria and procedure. Added firmware restrictions. Deleted the heading SD requirement before the free inertial test
H	06/2022	Chapter A.5.2 updated

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Abbreviations and Acronyms

AC	:	Alternative Current
DC	:	Direct Current
I/O	:	Input/Output
NMEA	:	National Maritime Electronics Association
TTL	:	Transistor-Transistor Logic
RMA	:	Return Merchandise Authorization
UATR	:	User Acceptance Test Report

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1 Preventive maintenance policy

With more than twenty years' experience and more than 7,500 units operating, iXblue maintenance records confirm MTBF far beyond the observed 150,000 hours.

As such, there is no required scheduled maintenance or test schedule required due to the ageing of the equipment in normal operation.

Nevertheless, iXblue acknowledge that some customers may require performance verification for three reasons:

First, when iXblue products are used in a metrology application, the standard methodology is to test the equipment before use or periodically to ensure it is performing within specification.

Second, iXblue products being used for multipurpose operations with multiple integrations, frequent handling and harsh environments (e.g. rental pools for offshore subsea systems), performance checks may be useful before starting significant new operations.

Third, if your application has a requirement for periodic testing, iXblue recommends checking performance typically every two (2) years (in accordance with typical metrology and nautical standards).

For customers being affected by at least one of the reasons above, iXblue recommends checking the systems performance using the systems "User Acceptance Test" procedure as dictated by the applications above. Such verification does not require returning the unit to iXblue factory, a "User Acceptance Test" procedure can be performed by customers themselves (refer to Appendix A and Appendix B). No specific tools nor reference table are required. However, this operation must be conducted onshore since a stable attitude is required.

In case of test failure, it is recommended to contact your iXblue local customer support representative (refer to section 7-iXblue Contact) in order for our engineers to confirm diagnostic and organize the unit return to factory for verification.

2 Subsea systems specific maintenance

2.1 List of products applicable

The following section deals with maintenance of the following products:

Product Designation	Part Number	System type
Octans Subsea	PAA00026, PAA00170 PAA00037, PAA00038	AHRS
Octans Nano	PAA00391	AHRS
Octans Nano OEM	00129336	AHRS
Rovins Nano	PAA00349	INS
Phins Compact C3	PAA00923	INS
Rovins	PAA00026, PAA00167 PAA00037, PAA00038	INS
Phins Compact C5	PAA00202	INS
Phins Subsea	PAA00020, PAA00166 PAA00036	INS
Phins Compact C7	PAA00919, PAA00978	INS

If your product part number is not in this table, please contact your local iXblue support representative.

2.2 Firmware Restrictions

The *Subsea Products – Maintenance Manual* includes specifications which may vary depending on the firmware that is being used. Therefore, the specifications may be required to be updated with the the release of new firmware.

The table below shows the product type followed by the firmware version.

Product	CINT Firmware Version higher than
Octans Subsea	FrmWDSP4_OCT_6_50_6
Octans Nano	FrmWDSP4_INS_v3_20_1
Rovins	FrmWDSP4_INS_6_43_5_6
Rovins Nano	FrmWDSP4_INS_6_43_5_6
Phins Compact C3	FrmWDSP4_INS_6_43_5_6
Phins Compact C5	FrmWDSP4_INS_6_43_5_6
Phins Compact C7	FrmWDSP4_INS_6_43_5_6
Phins Subsea	FrmWDSP4_INS_6_43_5_6

To check the firmware version currently being used in your unit, go to the maintenance page on the MMI under the 'Software Version' section. Alternatively, you can find the firmware version at the top section of a settings file.

Contact iXblue customer support (support@ixblue.com) to check if your system is eligible to a firmware upgrade.

2.3 Checking and replacing O-rings in Seacon Connectors

2.3.1 SEACON CONNECTOR AND RECEPTACLE WATER TIGHTNESS DESCRIPTION

The cable connection water tightness is performed with 2 O-rings (1 in receptacle, 1 in connector) which provides redundancy: ref. 3 on Figure 1 and ref. 24 on Figure 2.

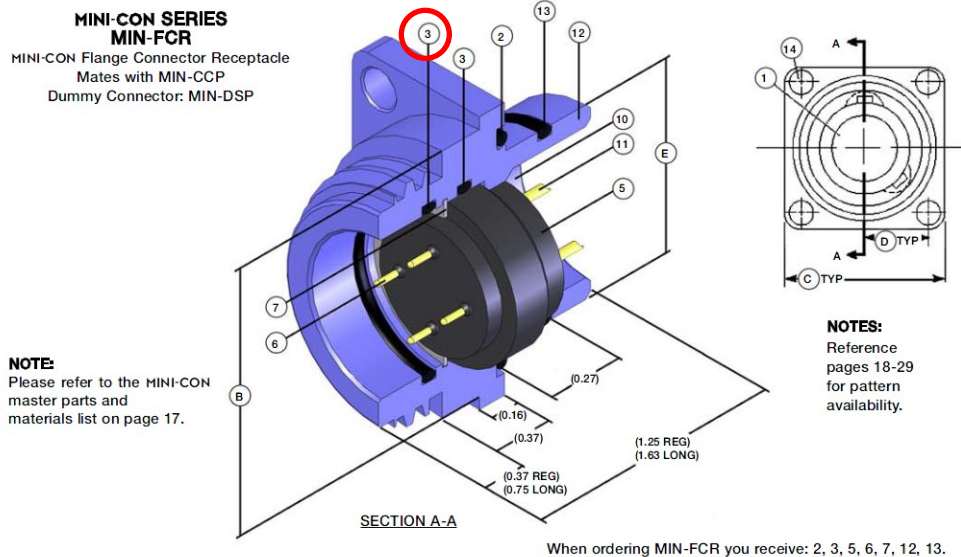


Figure 1: SEACON MIN-CON receptacle (MIN-FCR)

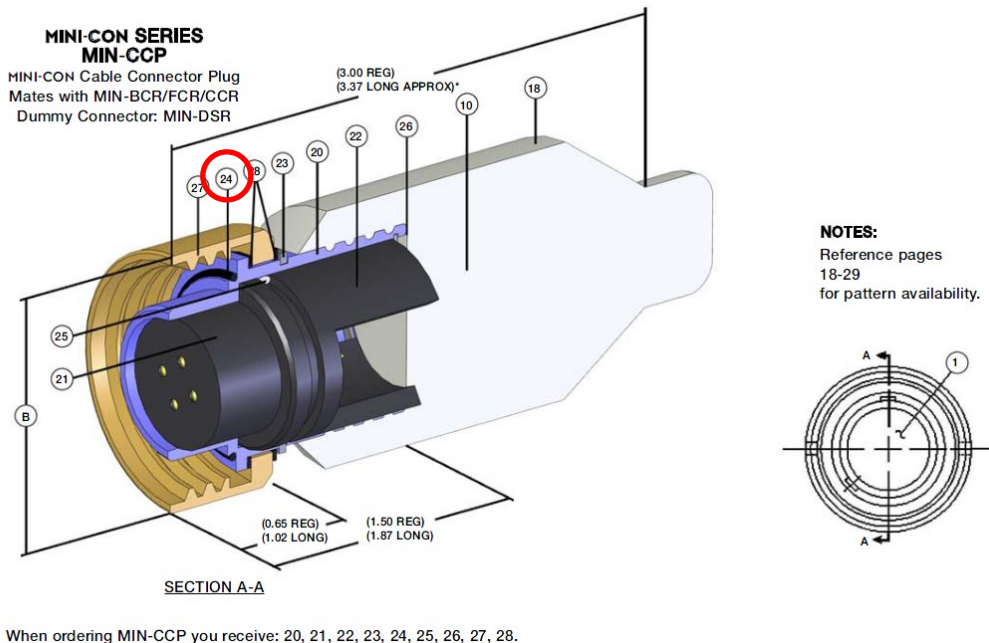


Figure 2: Seacon cable connector (MIN-CCP)

Make sure that the O-rings are in place in both the receptacle on the system and in the cable connector, prior to connecting the cable.

An O-Ring kit is provided with each delivered system. These O-Ring's are industry standard references that can be found world-wide. Additional set of O-rings for the connectors can also be provided by iXblue.

Description	iXblue P/N	Seacon Connector	Seacon P/N	Drawing
<u>O-Ring kit comprising:</u> 20 spare O-Rings 17.17x1.78 (PC851) 5 spare O-Rings 21.95 x 1.78 (PC851)	CAS00000	MINK-CCP MINM-CCP	2-017 2-020	Part N°24 Figure 2
O-Ring 15.60 x1.78 (PC851)	HJO00130	MINK-FCR	2-016	Part N°3 Figure 1
O-Ring 20.34 x1.78 (PC851)	HJO00129	MINM-FCR	2-019	

The O-RING's are made of 80 (DIDC) NBR (Nitrile) material. PC851 is a trademark of the "Le Joint Français" company. Shelf Life is 15 years (according to ARP 5316, Aerospace Recommended Practice).

The O-Ring insertion tools are provided with each delivered system. These tools can be procured from Seacon or iXblue. The part-numbers are described in table below:

Description	iXblue P/N	Seacon Connector
MIN-K O-Ring insertion tool	CAS00001	MINK-CCP
MIN-M O-Ring insertion tool	CAS00002	MINM-CCP

2.3.2 PRE-REQUISITE

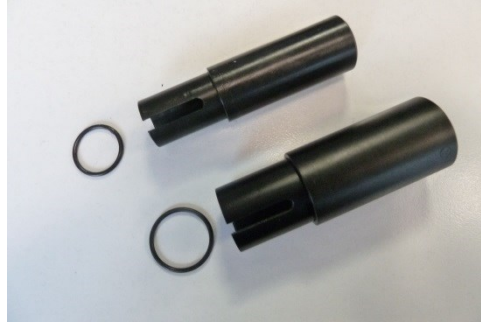


Make sure to have the necessary tooling available and be aware that any dirt on the O-rings can affect the water-tightness.

2.3.3 NECESSARY TOOLING

To insert an O-Ring in a cable connector (MIN-CCP) you will need the following tooling and consumables:

- O-Ring insertion tool (MIN-M or MIN-K)



- Silicone Grease (i.e.: Rhodorsil 70248 or Molykote 111)



2.3.4 O-RING REPLACEMENT PROCEDURE

To extract an O-Ring from a connector perform the following procedure:

Insert a small screwdriver or tool through one of the lateral holes to extract the O-Ring.



Take special care to check that the O-Ring of the cable connector is in place (see Figure 3: O-Ring in place and Figure 4). When in place it should not fall out.

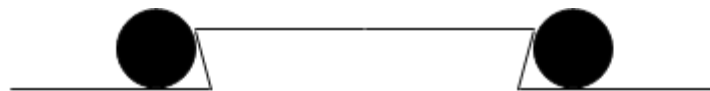


Figure 3: O-Ring in place



Figure 4: O-Ring not in place (not stretched)

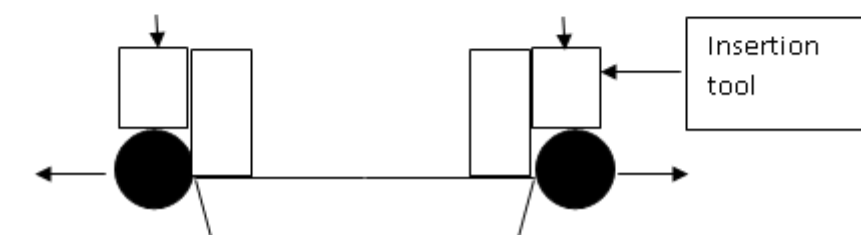


Figure 5: The insertion tool stretches the O-Ring

To insert the O-Ring follow the following procedure:

Step	Action
1.	Grease the O-Ring with Silicone grease.



- Using a thin coat of silicone grease is recommended. It is very important to use silicone grease sparingly. Light films reduce friction and allow the components to work as they are designed to work. Larger quantities create the equivalent of a "Hydraulic Lock" and completely destroy the function of the O-Ring and/or connector..



- | | |
|----|--|
| 2. | Insert the O-Ring on the insertion tool. |
|----|--|



- | | |
|----|---|
| 3. | Place the tool in the connector using the guiding pins and push on the external cylinder. |
|----|---|



- | | |
|----|---|
| 4. | Extract the tool by pulling and rotating the external cylinder at the same time to avoid the O-Ring adhesion to the tool. |
|----|---|



- | | |
|----|---|
| 5. | Check that the O-Ring is in place. Knock gently on the connector, the O-Ring should not fall out. Check the lateral holes to see if the O-Ring is in place. |
|----|---|



2.4 Checking pin corrosion

Avoid any water ingress in the Seacon connectors. If any salt water comes into contact with the pins it should be rinsed with fresh water and dried immediately. The use of connector pressure caps will keep the connector clean and help prevent accidental damage both in storage and in service.

Please contact your local Support representative in the event of pin corrosion (refer to section 7-iXblue Contact).



3 User Acceptance Test

UATR (User Acceptance Test Report) procedure should be performed and the report completed if the units performance requires verification, an anomaly or if a fault is suspected with the unit (i.e.: instability of Heading, roll or pitch, error messages are shown in the iXblue Web-based graphical interface). This procedure can be performed by the owner of the system prior to sending the unit to work or to ascertain if the unit needs sent back for repair. A successful UATR confirms that the unit is still performing as per the specification and the calibration certificate for the unit is then still valid.

Please refer to the Appendices to print out the appropriate UATR for your system.

If any failure occurs during this test you should contact your local iXblue Support Engineer for further assistance (section 7-iXblue Contact).

Support can recommend further testing or returning the unit to iXblue for further investigation and issue RMA number (see section 5).

Please fill in the RMA information form, provided by Support, prior to returning your system.

4 Troubleshooting

4.1 Introduction

This section provides some tips to identify any issues you are facing so that iXblue Support can help you as efficiently as possible. These procedures will help you perform the UATR available at the end of this document.

4.2 Decoding built in test error status

The systems all have a built-in test capability which will provide information on any issues detected by the system from its low-level electronic boards and sensors to higher level algorithm or system level errors. These are described in detail in the unit specific “interface library” document for each system.

4.3 Verifying power consumption

Electrical power consumption can be checked to verify any malfunction in the electronic boards. The figure below shows typical schematic of the test setup. Current measurement can be performed on a laboratory power supply display or using a multimeter.

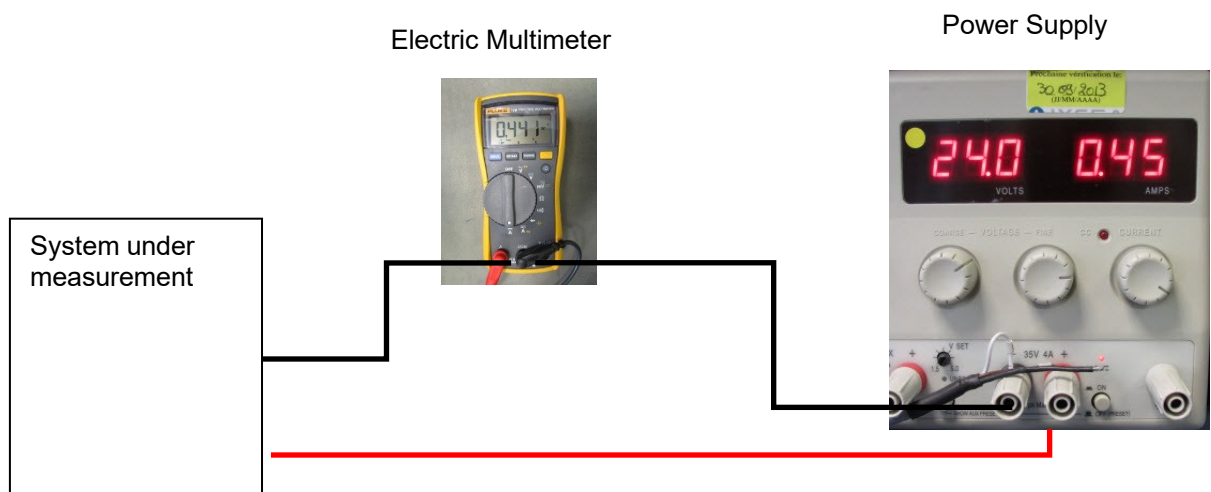


Figure 6 : Current consumption measurement

The typical current consumption under 24 V is detailed in table below:

	Current consumption under 24 V at ambient temperature		
	Min.	Typ.	Max.
Phins / Phins Compact C7	755 mA	820 mA	890 mA
Rovins / Octans / Phins Compact C5	710 mA	740 mA	770 mA
Rovins Nano / Octans Nano	530 mA	580 mA	610 mA
Phins Compact C3	440 mA	500 mA	530 mA

If the measured current is outside [Min, Max] this is a potential electrical fault. Electrically isolate the unit and please contact your local iXblue support Engineer (refer to section 7- iXblue Contact).

4.4 Verifying input/outputs

4.4.1 ETHERNET INPUT/OUTPUT

Connect your INS or AHRS system to a PC using an Ethernet RJ45 cable.

Please refer to the “Installation & setup Guide” product document to configure the system.

Connect to your system by typing the IP address into a web browser.

If this is unsuccessful, check the following items:

- Try the default IP address of your system (by default the IP address is 192.168.36.1XX, with XX the two-last digit of the product serial number).
- Follow “Retrieving the IP address in the unit” section in the “Installation & setup Guide” product document to identify the systems current IP address.

If you cannot retrieve the IP address of your system or fail to be able to connect via the Ethernet connection please contact your local iXblue support Engineer (refer to section 7.1 iXblue SUPPORT).

Once access has been gained to the system via the Web-based graphical interface, this verifies that the Ethernet connection is working. If further verification is needed configure an Ethernet output and monitor it using a terminal program, again refer to “Installation & setup Guide” product document.

4.4.2 SERIAL INPUT/OUTPUT

4.4.2.1 Independent check of serial input and output

To test these, sequential access is needed to each input & output serial port on the system, this may necessitate multiple test cables depending on the system being tested.

First connect your PC to a serial port of your AHRS or INS system. If a native serial port is not available, a USB to serial adapter or similar can be used. The iXblue test/configuration cable can be used to test the serial repeater & possibly the configurable ports depending on the system under test.

To setup the input/output ports using Web-based graphical interface please refer to the “Installation and setup guide” product document.

Checking serial input

To check serial RS232/RS422 inputs are functioning correctly some data needs to be sent to this input and verify its reception. This can be done using real or simulated external sensor data (GNSS, depth sensor...) connected to your system or sending ASCII frames using a HyperTerminal window (i.e.: Tera Term freeware).

Configure the Web-based graphical interface to receive sensor data (i.e.: GPS) on the input port you want to test with the same settings

For
Phins/Rovins/
Rovins Nano



ROVINS
NANO

INPUT AND EXTERNAL SENSORS SETTINGS

	Input A	Input B	Input C	Input D	Input E	Input F	Input G
Protocol	GPS	NONE	NONE	NONE	NONE	NONE	NONE
GNSS	☒						
DVL 1							
DVL 2							
CTD							
LBL							
USBL							
Depth							
UTC 1							
UTC 2							

• INPUT A SETTINGS

▼ Protocol

Protocol

▼ Physical Link

Physical Link

▼ Serial

Parity

Stopbits

Standard

Baudrate

► Sensor Control Panel ☒

• GNSS SETTINGS

► Lever Arms

▼ Advanced Settings

Forced Mode ☐





**For Octans
Subsea**

The screenshot shows the iXblue Octans Subsea web interface. At the top, there's a navigation bar with 'navigation data | events viewer | maintenance | options'. Below it, a tab bar shows 'CONTROL | INSTALLATION | SETUP', with 'INSTALLATION' being the active tab. The main header features the iXblue logo and the 'OCTANS SUBSEA' logo. The section is titled 'INPUT AND EXTERNAL SENSORS SETTINGS'. It contains a table for configuring inputs A through G. Input A is selected, showing 'NMEA STANDARD' for Protocol, 'Position' for the sensor type, and a blue dot icon. Below the table, there are expandable sections for 'INPUT A SETTINGS' and 'POSITION SETTINGS'. The 'INPUT A SETTINGS' section is expanded, showing fields for Protocol (NMEA STANDARD), Physical Link (Serial only), Parity (None), Stopbits (1.0 bitstop), Standard (RS232), and Baudrate (9.6 kbauds). There is also a 'Sensor Control Panel' icon. The 'POSITION SETTINGS' section is collapsed and shows a message: 'no parameters required for this external sensor'. At the bottom, there are 'Cancel' and 'OK' buttons.

	Input A	Input B	Input C	Input D	Input E	Input F	Input G
Protocol	NMEA STANDARD	NONE	NONE	NONE	NONE	NONE	NONE
Position	●						
Speed							
Time							

• INPUT A SETTINGS

▼ Protocol Protocol NMEA STANDARD

▼ Physical Link Physical Link Serial only

▼ Serial Parity None
Stopbits 1.0 bitstop
Standard RS232
Baudrate 9.6 kbauds

► Sensor Control Panel

• POSITION SETTINGS

no parameters required for this external sensor

Cancel OK

Use the “Sensor Control Panel”, on the “Installation /Inputs page”, to check that data is coming as described in the window below.

This is a close-up of the 'Serial' settings section. It shows four dropdown menus: Parity set to 'None', Stopbits set to '1.0 bitstop', Standard set to 'RS232', and Baudrate set to '115.2 kbauds'. Below these is a 'Sensor Control Panel' icon, which is pointed to by a red arrow from the left.

▼ Serial

Parity None

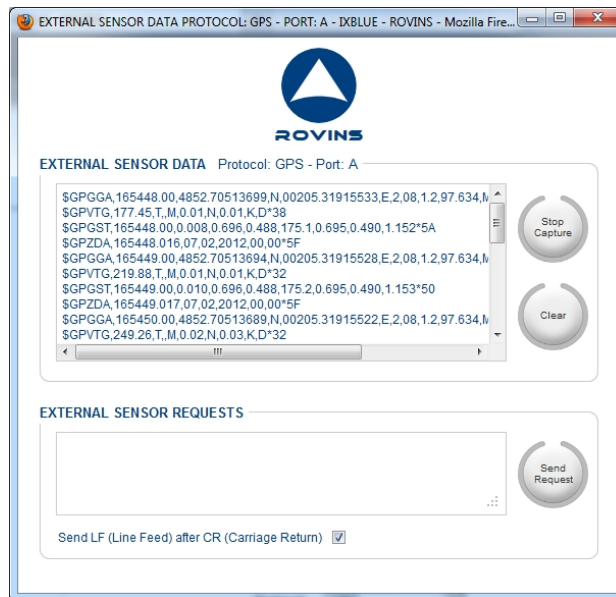
Stopbits 1.0 bitstop

Standard RS232

Baudrate 115.2 kbauds

► Sensor Control Panel

The following window is displayed :



If there is no data verify the following points:

- Com port settings are identical on both the Transmitter (external sensor data) and Receiver (Web-based graphical interface input setting).
- Only use ASCII protocols as binary protocols may not work or show garbled data in the external sensor window
- Invert Rx and Tx using a null-modem inverter like shown below.



Checking serial output:

To check the RSxx2 output is OK setup an output to send a telegram. For example set GPS like protocol or HEHDT protocol at 1 Hz, 9.6 kBauds, parity none, stop bit 1, 8 data bits.

**For Phins/
Rovins/Rovins
Nano/Octans
Subsea/Octans
Nano/Phins
Compact
Series**

The screenshot displays the 'OUTPUT SETTINGS' dialog box within the iXblue software. The interface includes a top navigation bar with 'navigation data | events viewer | maintenance | options' and a sub-header with 'CONTROL | INSTALLATION | SETUP | DATA LOGGING'. The 'INSTALLATION' tab is active. The dialog box features a 'Output Ports' section with tabs for 'Output A', 'Output B', 'Output C', 'Output D', and 'Output E'. The 'Protocol' section is expanded, showing a dropdown for 'Protocol' set to 'GPS LIKE', a dropdown for 'Lever Arm' set to 'Primary', a radio button for 'Rate' (selected) with a dropdown set to '1000ms - 1Hz', and a radio button for 'Synchro In' (unselected) with a dropdown set to 'None'. The 'Heave Output' section shows a radio button for 'Real Time Heave' (selected) and a radio button for 'Smart Heave (100sDelayed)'. The 'Physical Link' section shows a dropdown for 'Physical Link' set to 'Serial only'. The 'Serial' section shows a dropdown for 'Parity' set to 'None', a dropdown for 'Stopbits' set to '1.0 bits top', a dropdown for 'Standard' set to 'RS232', and a dropdown for 'Baudrate' set to '9.6 kbauds'. The 'Advanced Settings' section shows a dropdown for 'Altitude Reference' set to 'Geoid (MSL)' and a text input for 'Extrapolation' set to '0 ms'. At the bottom of the dialog are 'Cancel' and 'OK' buttons.

Configure a terminal window (i.e: Tera Term freeware or windows HyperTerminal) on the PC with the same settings as the output from the unit under test. You should see the telegrams coming in.

If no data can be seen, verify the following points:

- Com port settings are identical on both the Transmitter (external sensor data) and Receiver (Web-based graphical interface input setting).
- Only use ASCII protocols as binary protocols may not work or show garbled data in some terminal programs
- Invert Rx and Tx using a null-modem inverter like shown below.



4.4.2.2 Simultaneous check of serial input and output

Here access is needed to the input and output serial port at the same time.

If access is available to both the input and output serial ports on DB9 connectors for example, the input/output serial test can be done in the following manner.

The principle is to output a message on a port X =A, B, C, D, E and check that you receive it on port Y =A, B, C, D, E. This validates output port X and input port Y at the same time.

Step	Action
1.	Connect the PC to the Ethernet port of your system to access the Web-based graphical interface.
2.	Connect the DB9 input port A to DB9 output port B using an DB9 serial inverter.



3. For an INS (i.e.: Phins), configure the Web-based graphical interface to output on one port “GPS like” protocol.

CONTROL | **INSTALLATION** | SETUP

ROVINS

OUTPUT SETTINGS

Output Ports | Output Pulses

Output A | Output B | Output C | Output D | Output E

▼ Protocol

Protocol: **GPS LIKE**

Lever Arm: **Primary**

☒ Rate: **1000ms - 1Hz**

☐ Synchro In: **None**

▼ Heave Output

☒ Real Time Heave

☐ Smart Heave (100s Delayed)

▼ Physical Link

Physical Link: **Serial only**

▼ Serial

Parity: **None**

Stopbits: **1.0 bitstop**

Standard: **RS232**

Baudrate: **9.6 kbauds**

► Advanced Settings

Cancel OK

4. Configure the Web-based graphical interface to receive GPS on the input port to be tested with the same settings.

CONTROL | INSTALLATION | SETUP



ROVINS

OUTPUT SETTINGS

Output Ports
Output Pulses

Output A
Output B
Output C
Output D
Output E

▼ Protocol

Protocol
GPS LIKE ▼

Lever Arm
Primary ▼

☒ Rate
 ☐ Synchro In

1000ms - 1Hz ▼

None ▼

▼ Heave Output

☒ Real Time Heave
 ☐ Smart Heave (100s Delayed)

▼ Physical Link

Physical Link
Serial only ▼

▼ Serial

Parity
None ▼

Stopbits
1.0 bitstop ▼

Standard
RS232 ▼

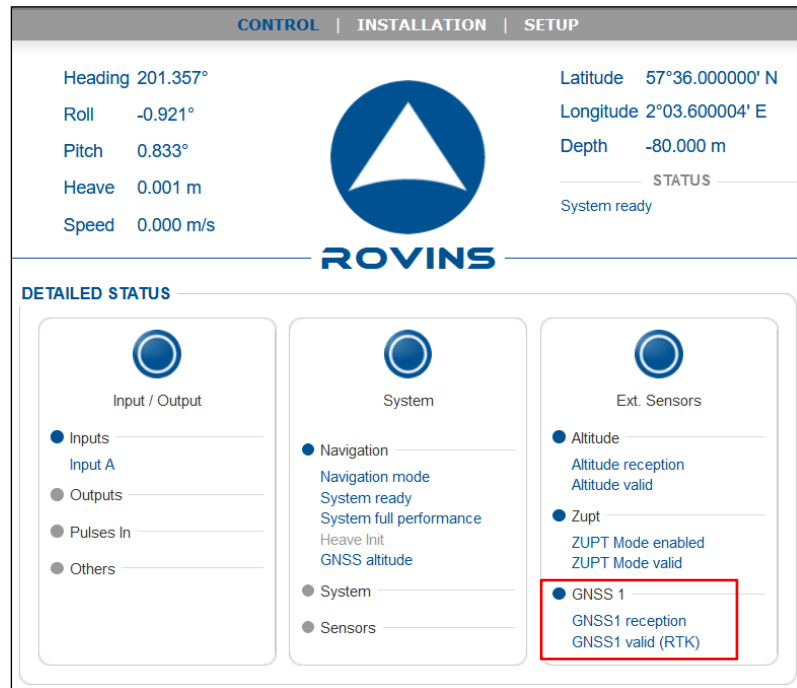
Baudrate
9.6 kbauds ▼

► Advanced Settings

Cancel

OK

- Go to the Control page and check that the “GNSS reception” status is present. This validates input and output port.



6. For an AHRS (i.e.: Octans), configure the output port in order to test to output HEHDT data.

CONTROL
INSTALLATION
SETUP



OCTANS
SUBSEA

OUTPUT SETTINGS

Output Ports
Output Pulses

Output A
Output B
Output C
Output D
Output E

▼ Protocol

Protocol
HEHDT

Lever Arm
Primary

☒ Rate
1000ms - 1Hz

☐ Synchro In
None

▼ Heave Output

☒ Real Time Heave

☐ Smart Heave (100s Delayed)

▼ Physical Link

Physical Link
Serial only

▼ Serial

Parity
None

Stopbits
1.0 bitstop

Standard
RS232

Baudrate
9.6 kbauds

▼ Advanced Settings

Timestamp (ZDA)
☐

Extrapolation
0 ms

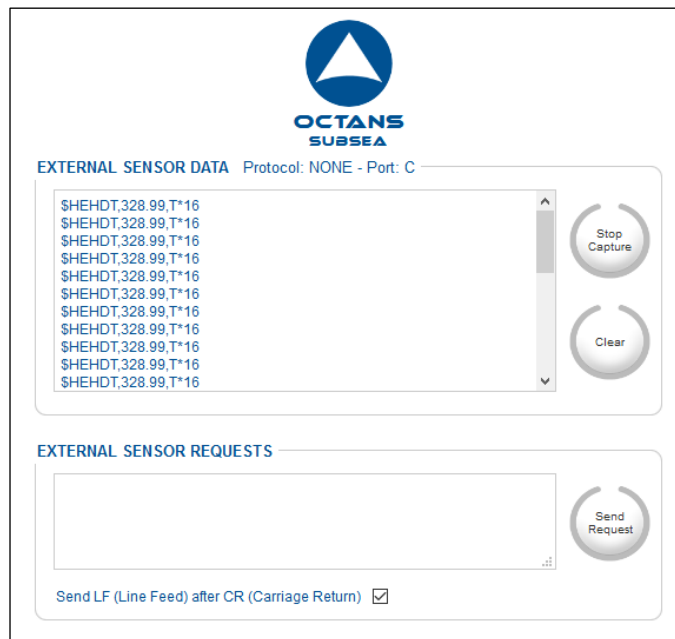
► Heart Beat Management

► Alerts Management

Cancel

OK

7. Check that the data telegram in the capture window is visible of the input port that is being tested. This validates output and input port.



8. Perform one of the following test sequence to cover all input/output serial ports:

Test Sequence
Serial out A → Serial in B
Serial out B → Serial in C
Serial out C → Serial in D
Serial out D → Serial in E
Serial out E → Serial in A

4.4.3 INPUT/OUTPUT PULSE

If simultaneous access to input and output ports on BNC connectors for example, you can perform the input/output pulse test in the following manner.

The principle is to output a pulse on a port X =A, B, C, D, E and receive it on an input pulse Y=A, B, C, D, E. This validates output port X and input port Y at the same time..

Step	Action
1.	Connect your PC to the Ethernet port of your system to access the Web-based graphical interface.
2.	Connect the pulse output port A to pulse input port B.
3.	in the Web-based graphical interface, on the output the “GPS like” output was setup, configure the output pulse to PPS like for Pulse A in the following window.



4. Configure input pulse B to receive the output pulse A.

CONTROL | **INSTALLATION** | SETUP



INPUT AND EXTERNAL SENSORS SETTINGS

Protocol	Input A	Input B	Input C	Input D	Input E	Input F	Input G
GNSS 1	GPS	GPS	NONE	NONE	NONE	NONE	NONE
GNSS 2							
DVL 1							
DVL 2							
EM Log							
USBL 1							
USBL 2							
USBL 3							
LBL							
Depth							
CTD							
UTC 1							
UTC 2							

• INPUT B SETTINGS

▼ Protocol Protocol GPS

▼ Physical Link Physical Link Serial only

▼ Serial Parity None

Stopbits 1.0 bitstop

Standard RS232

Baudrate 9,6 kbauds

► Sensor Control Panel

• UTC 2 SETTINGS

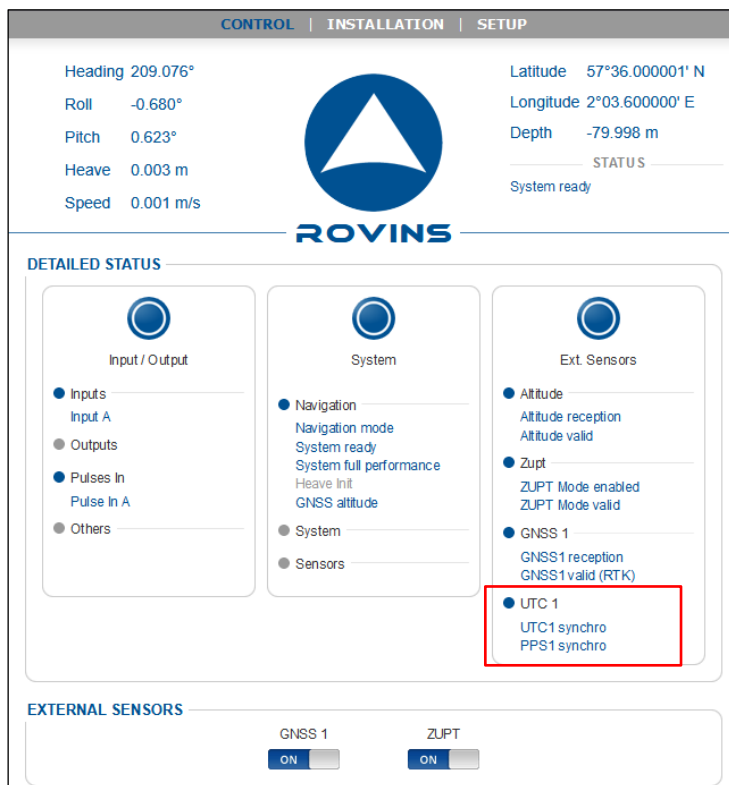
▼ Pulse and Protocol Synchro In Pulse A

Protocol PPS Rising+Time





5. Go to the Control page and check that the “PPS synchro” status is displayed. This validates the pulse input and output port under test.



6. Perform the following test sequence to cover all pulse input/output tests:

Test Sequence
Pulse out A → Pulse in B
Pulse out A → Pulse in C
Pulse out A → Pulse in D
Pulse out B → Pulse in A

5 Returning a unit to iXblue for check-up or repair

The following procedure **is mandatory** when returning a system for repair.

- Contact iXblue support to get an RMA number and an RMA information form from support (support@ixblue.com).
- Fill in the RMA information form provided by iXblue support and return a completed copy with the unit.
- Ask for the custom value of the system to declare if sent from outside the EU.
- Check if you need a specific export license for the return (to be checked with iXblue support if necessary).
- Send the system to the address specified on the RMA information form.

6 Mandatory information to provide to Support regarding INS or AHRS problem

You have contacted iXblue technical support regarding a request about your INS or AHRS product: **Phins Subsea, Rovins Nano, Rovins, Octans Subsea, Octans Nano, Octans Nano OEM, Phins Compact Series.**

This procedure will help you to provide the required information to support in order to quickly process and analyze of the reported issue. By following these points, it will help us to reproduce your configuration and understand your need.

Mandatory information to be provided:

- ☒ SERIAL NUMBER OF YOUR UNIT (1):
- ☒ RECORD THE CONFIGURATION FILE (4):
- ☒ FIRMWARES/LOADERS VERSIONS (2):
- ☒ USER INTERFACE VERSION YOU ARE USING (3):
- ☒ RECORD A SET OF DATA FOR ANALYSIS (5):
- ☒ THE LATITUDE/LONGITUDE WHERE CURENTLY THE SYSTEM IS RUNNING (6):
- ☒ DESCRIPTION OF YOUR APLICATION / POTENTIAL PROBLEM YOUR ARE FACING TO (7):

You will find in the next pages some helps to get all this information.

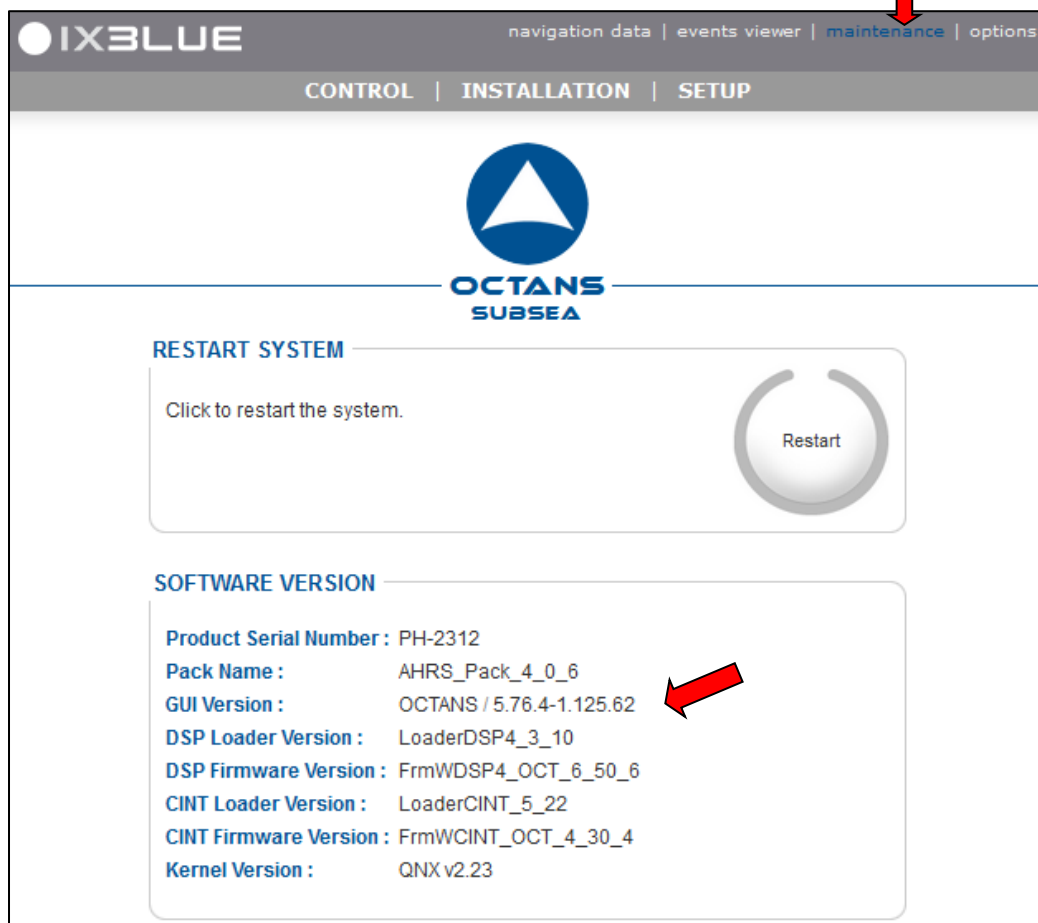
Step	Action
------	--------

1.	Note the serial number of the unit (1) and the software versions (2) & (3)
----	---

You can retrieve the serial number from Web-based graphical interface or on the sticker product.

Connect you unit by using the Ethernet link with the correct IP settings.

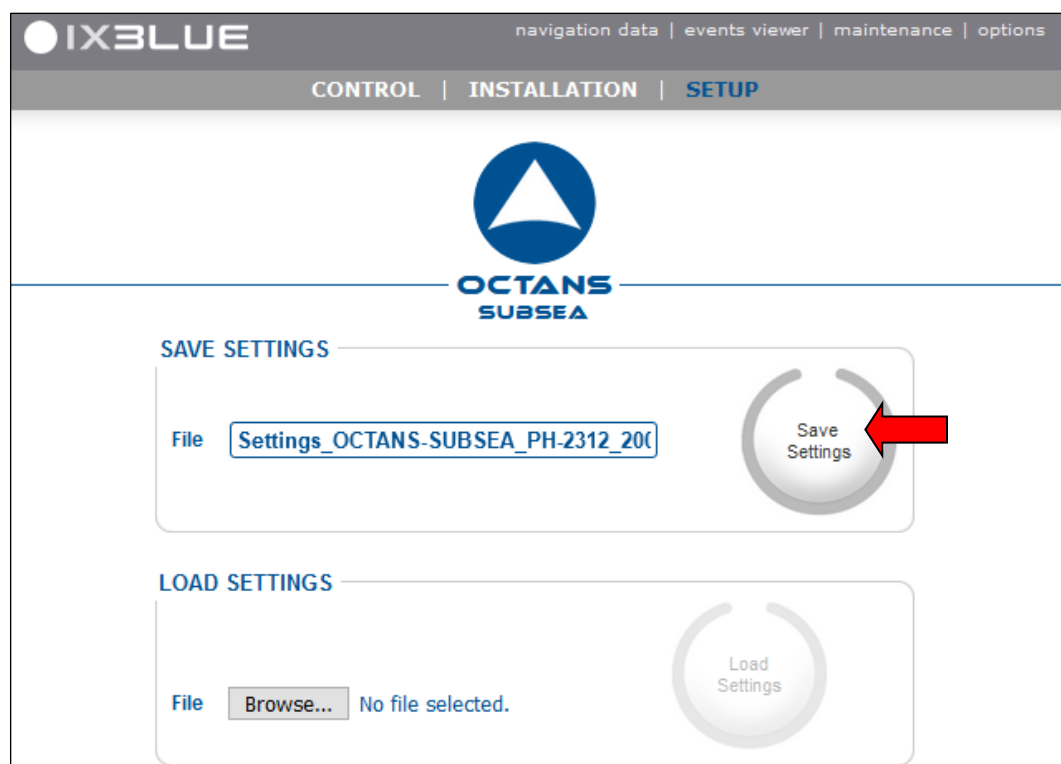
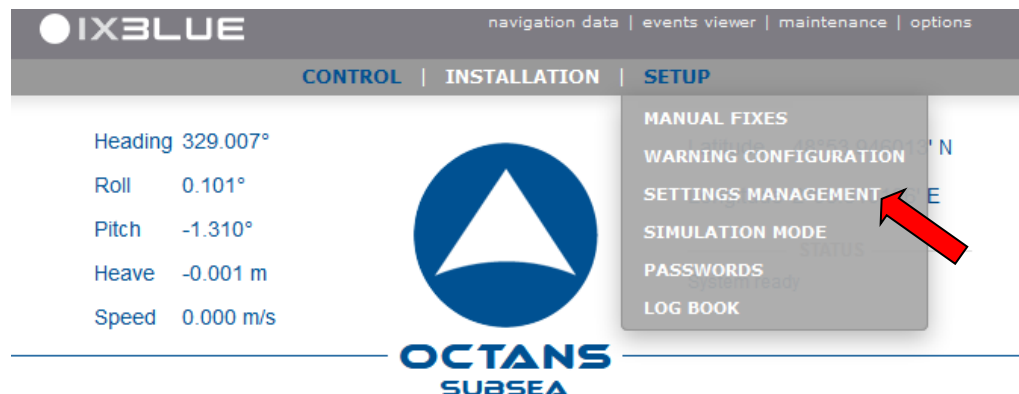
Click on the “**maintenance**” menu.



Note the QNX version if this information is available.

2. Save your configuration file (4).

Click on “**setup**” menu then select “**settings management**”



DATA TO BE SENT TO SUPPORT@IXBLUE.COM



One or two files have to be provided.
(.txt & .dat for Ixrepeater and only .txt file from the Web-based graphical interface).

-
3. **Record a dataset set for analysis (5) by using** the iXblue Multilogger tool provided in the product flash drive.

Refer to iXblue Multilogger User guide provided on the product flash drive.

- Click on Load System Configuration and enter the system IP.
- In the Flow Status area, click on the  icon.
- Configure a flow for the repeater:
 - > Phins standard for INS, Octans standard for AHRS
 - > Frequency 5 Hz
- Configure another flow with Postprocessing protocol, frequency 100 Hz
- Click on OK button then the configuration flow is displayed on the main window.

In the iXblue Multilogger, click on the  icon. Select the flow to be logged then click on **Start Selected Flows** button.

Important: POSTPROCESSING protocol data should be logged as soon as system is powered up so that real time data can be compared to post-processed-data. If needed reboot the INS before start logging. Do not stop logging until the end of the calibration and verification process.

DATA TO BE SENT TO SUPPORT@IXBLUE.COM 

**Start the record as soon the unit is powered on and during 20 minutes.
Record also a data set during the time you are facing the issue.**
These files can be easily compressed.

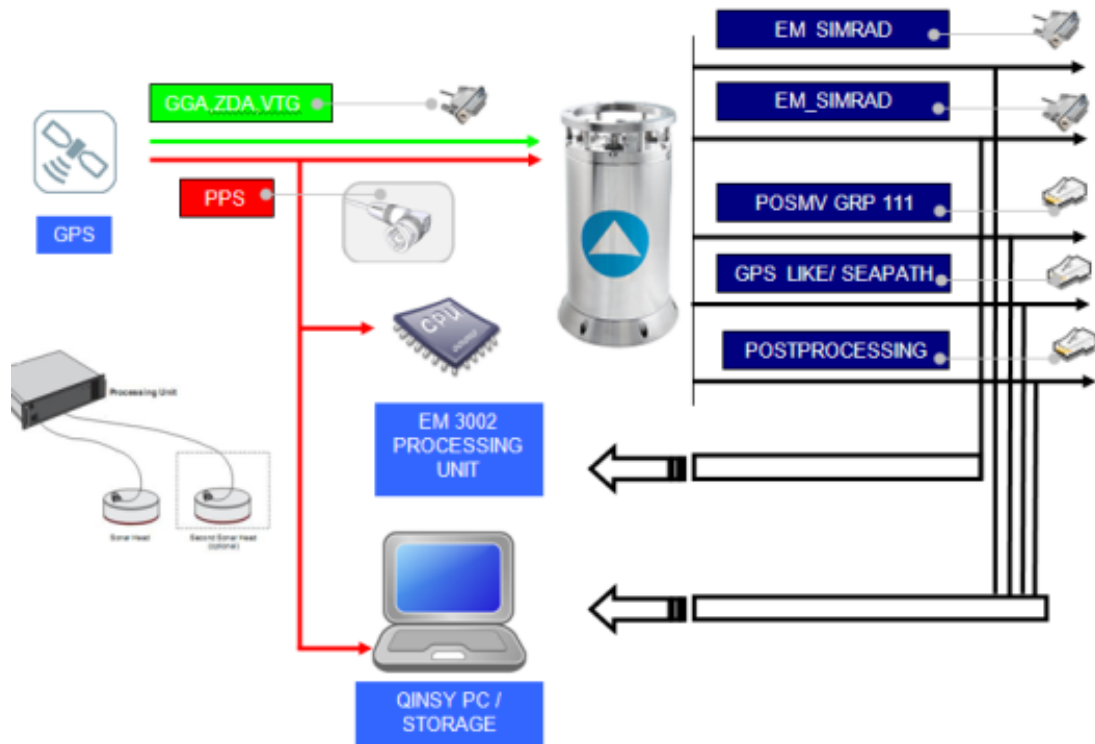
4. Note the latitude/longitude where the system is currently running (6).

Information can be easily taken from the GPS on board or from any other source of input.

5. Draw a short description of the application/issue/integration that is being used (7).

A quick diagram or/and comments on the particular setup / events which can bring more information about the reported issue is always helpful. (Mentioning type of connection/baud rate/frequencies/protocols...).

Here below an example an integration diagram.



7 iXblue Contact

7.1 iXblue CONTACT – SUPPORT

For non-URGENT support:

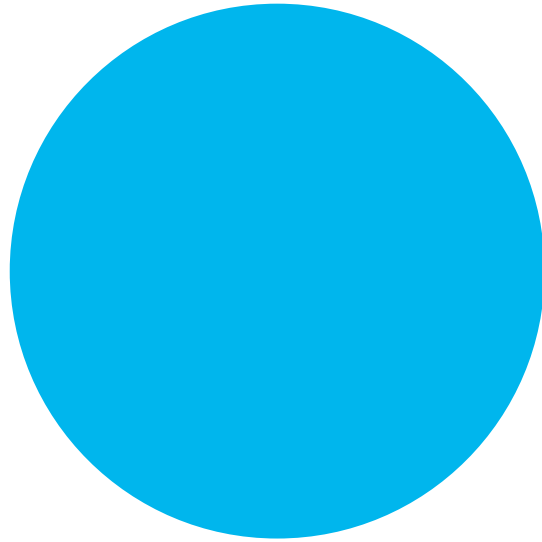
- by email: support@iXblue.com
- using the form on the iXblue web site www.iXblue.com

For 24/7 URGENT SUPPORT:

- North America / NORAM
+1 617 861 4589
- Europe Middle-East Africa Latin-America / EMEA-LATAM
+33 1 30 08 98 98
- Asia Pacific / APAC
+65 6747 7027

Appendices

A APPENDIX A: PHINS COMPACT SERIES, PHINS SUBSEA, ROVINS NANO, ROVINS USER ACCEPTANCE TEST FORM



User Acceptance Test Report

- ☐ Phins Compact C3
- ☐ Phins Compact C5
- ☐ Phins Compact C7
- ☐ Phins Subsea
- ☐ Rovins
- ☐ Rovins Nano

A.1 Object

This document is the User Acceptance Test Report (procedure) for products delivered by iXblue as referenced in the first page. It records the results, as well as a test procedures, of the tests to be performed on the system at users premises.

Compliance to specification criteria is necessary to determine whether the unit can be dispatch to the field/operations or if it needs to be return to iXblue factory for new calibration and/or diagnostic.

A.2 Information on the system

The information below can be retrieved from the label on the product.

Description	Value
Product (Titanium version)	☐ Rovins Nano ☐ Rovins ☐ Phins Subsea ☐ Other
Product (OEM version)	☐ Phins Compact C3 ☐ Phins Compact C5 ☐ Phins Compact C7 ☐ Other
Model	
Serial (serial number)	
Date	

A.3 Test of Product Operation

Within this chapter, software configuration is reported, and initialization sequence is verified. Any error messages in the Web-based graphical interface are reported here.

Description	Value
Product Serial Number	
Pack Name(*)	
GUI Version	
DSP Loader version	
DSP Firmware version	
CINT Loader version	
CINT Firmware version	
Kernel version	

(*) If available

Description	Expected Result	Result	PASS
Status after initialization (**) (typical duration 5 mn)	Course alignment completed; Fine alignment started.		
Error Status	No error status in repeater interface or Web-based graphical interface		

(**) if necessary, setup the "Manual Latitude" to the local one, then restart the unit to perform the test.

Additional comments:

A.4 Test of Electrical Interfaces

The availability of the different electrical interfaces depends on the model as well as the type of connector(s). Only signals marked with a “Y” in the table below are to test and shall be operational.

Description of interface		Phins Subsea / Rovins	Rovins Nano	Phins Compact C3	Phins Compact C5	Phins Compact C7	Other wiring	PASS
		Available (Y / N)						
Ethernet	Rx/Tx	Y	Y	Y	Y	Y		
Serial repeater port (RS232)	Tx	Y	Y	Y	Y	Y		
	Rx	Y	Y	Y	Y	Y		
Serial repeater port (RS422)	Tx	Y	Y	N	Y	N		
	Rx	Y	Y	N	Y	N		
Serial Port A (RS232)	Tx	Y	Y	Y	Y	Y		
	Rx	Y	Y	Y	Y	Y		
Serial Port B (RS232)	Tx	Y	Y	Y	Y	Y		
	Rx	Y	Y	Y	Y	Y		
Serial Port C (RS232)	Tx	Y	Y	Y	Y	N		
	Rx	Y	Y	Y	Y	N		
Serial Port D (RS232)	Tx	Y	Y	Y	Y	N		
	Rx	Y	Y	Y	Y	N		
Serial Port E (RS232)	Tx	Y	Y	Y	Y	N		
	Rx	Y	Y	Y	Y	N		
Serial Port A (RS422)	Tx	Y	Y	N	Y	N		
	Rx	Y	Y	N	Y	N		
Serial Port B (RS422)	Tx	Y	Y	N	Y	N		
	Rx	Y	Y	N	Y	N		
Serial Port C (RS422)	Tx	Y	Y	N	Y	N		
	Rx	Y	Y	N	Y	N		
Serial Port D (RS422)	Tx	Y	Y	N	Y	N		
	Rx	Y	Y	N	Y	N		
Serial Port E (RS422)	Tx	Y	Y	N	Y	N		
	Rx	Y	Y	N	Y	N		
Pulse A IN	Rx	Y	Y	Y	Y	Y		
Pulse B IN	Rx	Y	N	Y	Y	N		
Pulse C IN	Rx	Y	Y	N	Y	N		
Pulse OUT A	Tx	Y	N	Y	Y	N		
Pulse OUT B	Tx	Y	N	N	Y	N		

Additional comments:

A.5 Test of Performances

A.5.1 INTRODUCTION

This chapter describes a procedure to verify your system accuracy with respect to specifications. The system specifications mentioned in this document are described in the “Technical Description” product document (please contact your local support representative to retrieve the appropriate document) and are applicable from firmware pack 12.2.0.

No accurate/referenced base line is required but it can be used if available.

However, the unit must be setup onshore, on a stable surface, away of any vibration and/or dynamic movements: the unit must remain perfectly static during all test duration.

A computer is required, connected via Serial or Ethernet to your system under test to record the data (using any terminal or logging software).

A.5.2 PROCEDURE

Step	Action
1.	Setup the unit on a baseline at a heading close to a half quadrant (45°, 135°, 225°. This is so the rotation of the earth is spread over 2 of the sensor axes. This does not need to be high precision, but cardinal headings should be avoided).
2.	Switch ON / apply power to the system.
3.	Save the settings file.
4.	Click on the maintenance button in the web MMI and press reset to factory.
5.	Measure the power supply voltage and current (if available) drawn by the unit and write it down in Table 2: UATR information recording.
6.	Configure a GPS input and inject a simulated or real GPS (SD <10cm) at 1Hz.
	Latitude must be set with accuracy better than 500 m (17 arc second) of the true position.
7.	Set the ZUPT mode to “AutoStatic” in navigation parameters page then set it ‘ON’ in the control page. <u>NOTE:</u> Do not forget to switch ZUPT to OFF on the Control page when the test is completed.
8.	Set “Altitude mode” to “Stabilization”.
9.	Setup an output (Ethernet TCP preferably) to output “POSTPROCESSING” protocol at 100 Hz on any output (Port X=A, B, C, D or E). This file could be used by support for in depth analysis. “REPEATER” data will be used to perform the performance analysis.

Step	Action
	Repeater data is available on serial or TCP client on port 8110. Multiloggers decode and check function should be used when logging serial data to simplify analysis. The PHINS STANDARD output protocol can also be used if you want a data rate lower than 5Hz to keep file sizes smaller.
10.	If any changes are performed during step 5, 6 or 7, then restart the unit.
11.	Just after powering on or reboot, start logging the “POSTPROCESSING” and “REPEATER” data with the iXblue Multilogger provided by iXblue on the product flash drive.
12.	After the first 5 minutes, the system goes from “Coarse alignment” to “Fine alignment”.
13.	2 hours after the beginning of the Fine alignment, turn the system approximately $\pm 90^\circ$ around yaw axis (to change the heading) without any shock, at an angular speed of approximately 90° in 10 seconds. Do not turn back if you over rotate the system.
14.	Leave the system for 1 hour in this position.
15.	Switch off ZUPT mode and GPS modes via the toggle switches on the main control page of the Web-based graphical interface. Record the time in Table 2: UATR information recording.
16.	- For Phins Compact C7, Phins Subsea products: log data for at least 8 hours (this test can be performed overnight). - For Phins Compact C5, Rovins products: log data for at least 4 hours. - For Phins Compact C3, Rovins Nano products: log data for at least 1 hour.
17.	Stop logging and save the system “Configuration file” using the Web-based graphical interface. This file, together with “POSTPROCESSING” file could be used by iXblue Support for depth analysis if needed.
18.	Load the settings file saved at step 3 or perform a reset to factory.
19.	During the UATR test (when the ZUPT &/or GNSS are OFF) note the following information (see next page): - Heading variation over time OR Heading absolute relative to baseline. - Roll and Pitch variation over time OR Roll/Pitch absolute relative to baseline. Position drift over time.

Heading, Roll, Pitch peak to peak variation is calculated from the logged Repeater file in the following manner:

Heading_Var (time) = Heading(Max) - Heading(Min)

Roll_Var (time) = Roll(Max) - Roll(Min)

Pitch_Var (time) = Pitch(Max) - Pitch(Min)

The absolute time error and variation time error is given as 3 times of the product specification.

Heading, Roll, Pitch Absolute error (C-O) is calculated from the logged Repeater file in the following manner:

Heading_Absolute (time) = Heading (max excursion) - Heading Baseline value

Roll_Absolute (time) = Roll (max excursion) - Roll Baseline value

Pitch_Absolute (time) = Pitch (max excursion) - Pitch Baseline value

Heading Absolute can be computed, If the base line heading is known to a traceable standard with accuracy better than 5 times the heading accuracy (RMS) of the product.

Roll/Pitch Abs can be computed if an attitude base plate is known with accuracy better than 5 times the roll/pitch accuracy (RMS) of the product.

Heading Absolute Error can be computed if the base line heading is known to a traceable standard with accuracy better than 5 times the heading accuracy of the product.

Roll/Pitch Absolute Error can be computed if an attitude base plate is known with accuracy better than 5 times the roll/pitch accuracy of following product:

Products	Specification (RMS)		Maximum Error (3 RMS)	
	Heading(*)	Roll/Pitch	Heading(*)	Roll/Pitch
Rovins Nano Phins Compact C3	0.10°	0.05°	0.30°	0.15°
Rovins Phins Compact C5	0.04°	0.01°	0.12°	0.03°
Phins Subsea Phins Compact C7	0.02°	0.01°	0.06°	0.03°

The base line accuracy must at least 5 times better than the product specification in RMS to minimize its impact on the heading, roll & pitch evaluation:

Products	Base Line Specification	
	Heading (*)	Roll/Pitch
Rovins Nano Phins Compact C3	0,02°	0,01°
Rovins Phins Compact C5	0,008°	0,002°
Phins Subsea Phins Compact C7	0,004°	0,002°

(*) All heading criteria are given as ° seclat RMS.



Position drift is calculated using the UTM latitude/longitude from the logged Repeater file in the following manner:

$$Position\ drift_{(time)} = \sqrt{((UTM_{East}(time) - UTM_{East}(0))^2 + (UTM_{North}(time) - UTM_{North}(0))^2)}$$

Where:

- The 0 subscript indicates the initial UTM value recorded at the start of inertial drift test (GPS and ZUPT OFF).
- The *time* subscript indicates the final UTM value recorded at end of the inertial drift test.

The position time drift error is given as 3RMS which correspond to 2.55 times than the product specification described in CEP50:

Products	Specification (CEP50)			
	2 min	5 min	1 h	x/h (*)
Rovins Nano Phins Compact C3	2.20 m	14.00 m	1865 m	1,00 Nm (**)
Rovins Phins Compact C5	0.60 m	4.90 m	870 m	0,40 Nm
Phins Subsea Phins Compact C7	0.30 m	2.00 m	475 m	0,21 Nm

(*) The long term drift criteria can be applied after 1 h of test until 8h.

(**) The long term drift test on the Phins Compact C3 / Rovins Nano is optional.

A.5.3 CRITERIA

Table 1: test results

Errors	Expected Result	Expected Result	Expected Result	Result	PASS
	Rovins Nano Phins Compact C3	Rovins Phins Compact C5	Phins Subsea Phins Compact C7		(Y/N)
Heading Error (*)	< 0.30 deg seclat	< 0.12 deg seclat	< 0.06 deg seclat		
Roll Error (*)	< 0.15 deg	< 0.03 deg	< 0.03 deg		
Pitch Error (*)	< 0.15 deg	< 0.03 deg	< 0.03 deg		
Heading C-O (****)	<0.15 deg seclat	<0.06 deg seclat	<0.03 deg seclat		
Roll C-O (****)	< 0.15 deg	< 0.03 deg	< 0.03 deg		
Pitch C-O (****)	< 0.15 deg	< 0.03 deg	< 0.03 deg		
Position drift after 2 min	< 5.61 m	< 1.55 m	< 0.77 m		
Position drift after 5 min	< 35.7 m	< 12.5 m	< 5.1 m		
Position drift after 1 hour (**)	< 4750 m	< 2220 m	< 1210 m		
Position drift after 4 hours (***)		< 7886 m	< 4186 m		
Position drift in meter after 8 hours (****)			< 8153 m		

(*) Criteria's Error is applicable for Absolute and Variation error.

(**) Drift in the 1st hour is non linear and builds up exponentially to the long-term rate over the first hour. Drift in the subsequent hours is then lower than in the initial hour. For this reason, the drift in the 1st hour is at the quoted CEP50 specification, then lower in each subsequent hour:

E.g.: The Phins Compact C7 sold 1 hour drift spec is 1210 m/hr, then for subsequent hours for the test we know a healthy unit will drift more slowly at less than 992 m/hr, so in 2 hours it would be less than 2202 m and in 8 hours less than 8153 m.

For FOG 50 units such as Rovins Nano and Phins Compact C3 the long term is not applicable as they are the lowest specification and only require a short amount of investigation.

(***) For FOG 90 units such as Rovins and Phins Compact C5 a medium length drift test of 4 hours is applicable to ensure the performance is suitable for operation.

(****) For FOG 120 units such as Phins Subsea and Phins Compact C7 a longer 8 hour drift test is applicable as they are the highest specification and require indepth investigation to ensure performance.

(*****) If baseline used. C-O means Course minus Origin

Additional comments:

A.6 UATR Information Recordings

Table 2: UATR information recording

Information	Recording
Heading Base Line (accuracy (*)):	deg (± deg)
Roll & Pitch Base Plate (accuracy (*)):	deg (± deg)
Latitude	deg
Longitude	deg
Power Supply Voltage (*)	V
Power Supply Current (*)	A
Beginning data of test	
Beginning time of test	
Time when ZUPT mode is switched OFF	
End date of test	
End time of test	

(*): *if available*

A.7 Conclusion

- If any of the “Pass” items within the above chapter result is a “no” (i.e. results not compliant with the expected results), the unit should be returned to iXblue premises for diagnostic and/or calibration.
Please contact iXblue technical support, with current UATR report, to organize such return.
- If all tests are successful, the product is compliant with its specification.

Test result:

- ☐ **system is ready for service**
- ☐ **system needs to be returned to factory¹**

Product:

Model:

Seria (serial number):

Test performed by :

Company name:

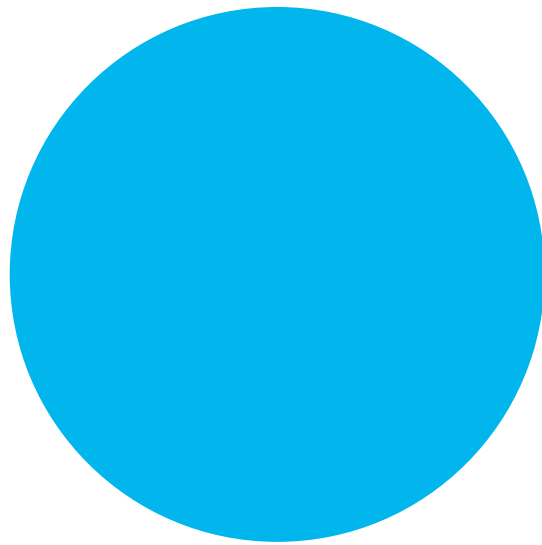
Operator:

Date :

Visa :

¹ Please send the “POSTPROCESSING” data file and “System configuration” file for further analysis at your local support representative or at support@ixblue.com or in packing list of the system you are returning.

B APPENDIX B: OCTANS SUBSEA, OCTANS NANO, OCTANS NANO OEM USER ACCEPTANCE TEST FORM



User Acceptance Test Report

- ☐ Octans Subsea
- ☐ Octans Nano
- ☐ Octans Nano OEM

B.1 Object

This document is the User Acceptance Test Report (and procedure) for products delivered by iXblue as referenced in the first page. It reports the results, as well as a test guideline, of the tests performed on the system at user premises.

Compliance to specification criteria is necessary to determine whether the unit is suitable to be dispatched on the field/operations or need to be return to iXblue factory for new calibration and/or diagnostic.

B.2 Information on the system

The information below can be retrieved from the label on the product.

Description	Value
Product	☐ Octans Nano ☐ Octans Subsea ☐ Octans Nano OEM ☐ Other
Model	
Serial (serial number)	
Date	

B.3 Test of Product Operation

Within this chapter, software configuration is reported, and initialization sequence is verified.

Product Serial Number	
Pack Name*	
GUI Version	
DSP Loader version	
DSP Firmware version	
CINT Loader version	
CINT Firmware version	
Kernel version	

Description	Expected Result	Result	PASS
Status after initialization (*) (typical duration 5 mn)	All data valid and displayed black in Repeater interface main window or blue in Web-based graphical interface		
Error Status	No error status in repeater software or Web-based graphical interface		

(*) if necessary, setup the "Manual Latitude" to the local one and "Manual Speed" to zero, then restart the unit to perform the test.

Additional comments:

B.4 Test of Electrical Interfaces

The availability of the different electrical interfaces depends on the model (Surface or Subsea) as well as the type of connector(s). Only signals marked with a “Y” in the table below are to test and shall be operational.

Description of interface		Ocatns Subsea	Octans Nano	ocatns Nano OEM	Other wiring	PASS
		Available (Y / N)				
Ethernet	Rx/Tx	Y	Y	Y		
Serial repeater port (RS232)	Tx	Y	Y	Y		
	Rx	Y	Y	Y		
Serial repeater port (RS422)	Tx	Y	Y	N		
	Rx	Y	Y	N		
Serial Port A (RS232)	Tx	Y	Y	Y		
	Rx	Y	Y	Y		
Serial Port B (RS232)	Tx	Y	Y	Y		
	Rx	Y	Y	Y		
Serial Port C (RS232)	Tx	Y	N	Y		
	Rx	Y	N	Y		
Serial Port D (RS232)	Tx	Y	N	Y		
	Rx	Y	N	Y		
Serial Port E (RS232)	Tx	Y	N	Y		
	Rx	Y	N	Y		
Serial Port A (RS422)	Tx	Y	Y	N		
	Rx	Y	Y	N		
Serial Port B (RS422)	Tx	Y	Y	N		
	Rx	Y	Y	N		
Serial Port C (RS422)	Tx	Y	N	N		
	Rx	Y	N	N		
Serial Port D (RS422)	Tx	Y	N	N		
	Rx	Y	N	N		
Serial Port E (RS422)	Tx	Y	N	N		
	Rx	Y	N	N		
Pulse A IN	Rx	Y	Y	Y		
Pulse B IN (*)	Rx	Y	N	Y		
Pulse C IN	Rx	Y	N	N		
Pulse OUT A (*)	Tx	Y	N	Y		
Pulse OUT B (*)	Tx	Y	N	N		

Additional comments:

B.5 Test of Performances

This chapter describes a procedure to verify Octans Subsea, Octans Nano and Octans Nano OEM accuracy with respect to specifications. No accurate/referenced base line is required but it can be used if available.

However, Octans Subsea, Octans Nano and Octans Nano OEM must be setup onshore, on a stable bench, away of any vibration and/or dynamic: the unit must remain perfectly static during all test duration.

A computer connected (Serial/Ethernet) to the system records the data (using any terminal or logging software).

B.5.1 PROCEDURE

Step	Action
1.	Setup the unit on a baseline at a heading close to a half quadrant (45°, 135°, 225°. This is so the rotation of the earth is spread over 2 of the sensor axes. This does not need to be high precision, but cardinal headings should be avoided).
2.	Switch ON / apply power to the system and reset it to factory defaults.
3.	Measure the power supply voltage and current (if available) provided to the system and write it down in Table 4: UATR information recording.
4.	Setup an output with a rate of 1 Hz (one sample per 1sec). The output string must contain a minimum of time, heading, roll and pitch.
5.	Check the "Manual Latitude" system, and ensure it is set to the local latitude with an accuracy better than 500 m (17 arc second). No constraint on longitude. Ensure the "Manual Speed" system is set to zero.
6.	If any changes are performed during step 5, then restart the unit to perform the test.
7.	Start/restart data logging of the output configured in step 4 by using the iXblue Multilogger provided by iXblue in the product flash drive.
8.	Ensure that after 5 minutes coarse alignment completes, and then leave the unit to log data for 4 hours.
9.	After 4 hours, turn the system approximately $\pm 90^\circ$ around yaw axis (to change the heading) without any shock, at an angular speed of approximately 90° in 10 seconds. Do not turn the system back if you over rotate the system.

10. Log data for a further 4 hours then end data logging.

11. After end of data logging, compute the following:

- Heading variation PP over the first hour after rotation

If baseline used:

- Heading variation PP over the second hour after rotation Heading absolute error (maximum error raised during the test)
- Roll/Pitch absolute or variation error (maximum error raised during all the test)

Heading, Roll, Pitch Peak to Peak error is calculated from the logged Repeater file in the following manner:

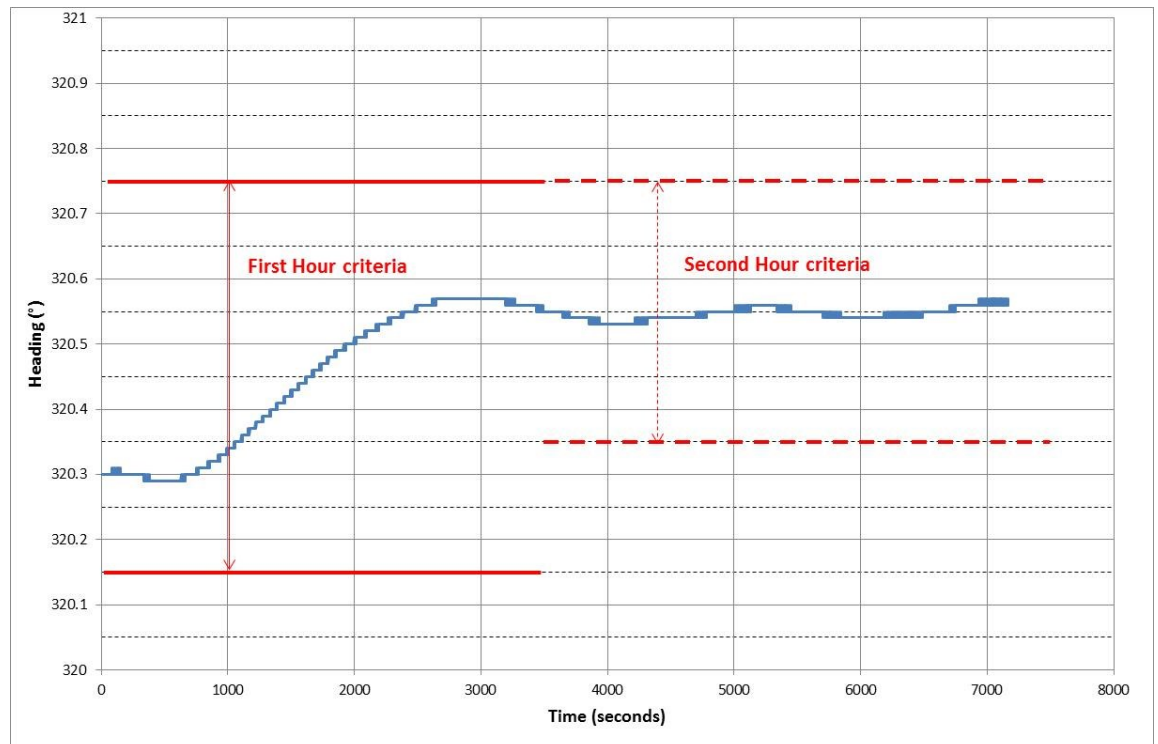
$$\text{Heading_Var (time)} = \text{Heading(Max)} - \text{Heading(Min)}$$

$$\text{Roll_Var (time)} = \text{Roll(Max)} - \text{Roll(Min)}$$

$$\text{Pitch_Var (time)} = \text{Pitch(Max)} - \text{Pitch(Min)}$$

Sort the data maximum to minimum and take the lowest value from the highest value to get the max variation.

The absolute time error and variation time error is given as 3 times of the product specification.



Heading, Roll, Pitch Absolute error (C-O) is calculated from the logged Repeater file in the following manner:

Heading_Absolute (time) = Heading (max excursion) - Heading Baseline value

Roll_Absolute (time) = Roll (max excursion) - Roll Baseline value

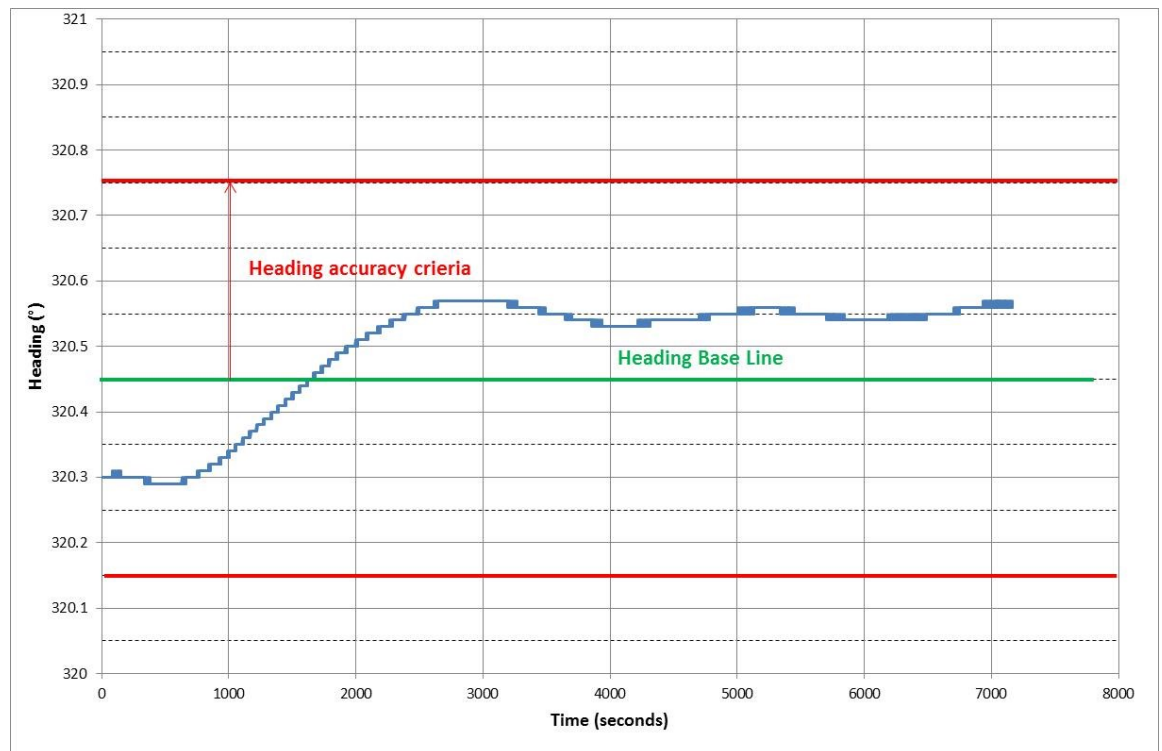
Pitch_Absolute (time) = Pitch (max excursion) - Pitch Baseline value

Heading Absolute can be computed, If the base line heading is known to a traceable standard with accuracy better than 5 times the heading accuracy (RMS) of the product.

Roll/Pitch Abs can be computed if an attitude base plate is known with accuracy better than 5 times the roll/pitch accuracy (RMS) of the product.

Heading C-O can be computed, If the base line heading is known to a traceable standard with accuracy better than 5 times the heading accuracy of the product.

Roll/Pitch C-O can be computed if an attitude base plate is known with accuracy better than 5 times the roll/pitch accuracy of the product.



The heading variation time error over the first hour is given as 6 times of the product specification.

The heading variation time error second the first hour is given as 2 times of the product specification.

The heading absolute time error is given as 3 times of the product specification.

The attitude absolute and variation time error is given as 3 times of the product specification.

Products	Specification (RMS)		Absolute Error		First Hour Error		Second Hour Error	
	Heading (*)	Roll/Pitch	Heading (*)	Roll/Pitch	Heading (*)	Roll/Pitch	Heading (*)	Roll/Pitch
Octans Nano	0.50°	0.10°	1.50°	0.30°	3.00°	0.30°	1.00°	0.30°
Octans Nano OEM								
Octans Subsea	0.10°	0.01°	0.30°	0.03°	0.60°	0.03°	0.20°	0.03°

(*) criteria given in °seclat

The Heading/Roll/Pitch Absolute error can be computed, If the base line heading is known to a traceable standard with accuracy better than 5 times the heading accuracy of the product under test in RMS as dedicated below:

Products	Base Line Specification	
	Heading (*)	Roll/Pitch
Octans Nano Octans Nano OEM	0,10°	0,02°
Octans Subsea	0,02°	0,002°

(*) All heading criteria are given as ° seclat RMS.

B.5.2 CRITERIA

Table 3: test results

Parameters	Expected Result Octans Nano Octans Nano OEM	Expected Result Octans Subsea	Result	PASS (Y/N)
Heading C-O (***)	< 1.5 deg seclat (**)	< 0.3 deg seclat (**)		
Roll C-O	< 0.30 deg	< 0.03 deg		
Pitch C-O	< 0.30 deg	< 0.03 deg		
First hour after rotation				
Heading p-p (*) variation	< 3.0 deg seclat (**)	< 0.6 deg seclat (**)		
Roll p-p (*) variation	< 0.30 deg	< 0.03 deg		
Pitch p-p (*) variation	< 0.30 deg	< 0.03 deg		
Last hour after rotation				
Heading p-p (*) variation	< 1.0 deg seclat (**)	< 0.2 deg seclat (**)		
Roll p-p (*) variation	< 0.30 deg	< 0.03 deg		
Pitch p-p (*) variation	< 0.30 deg	< 0.03 deg		

(*) p-p : peak to peak

(**) seclat= 1/cos(latitude)

(***) C-O: Course minus Origin

Additional comments:

B.6 UATR Information Recordings

Table 4: UATR information recording

Information	Recording
Heading Base Line (accuracy (*)) :	deg (± deg)
Roll & Pitch Base Plate (accuracy (*)):	deg (± deg)
Latitude	deg
Longitude	deg
Power Supply Voltage	V
Power Supply Current	A
Beginning date of test	
Beginning time of test	
End date of test	
End time of test	

(*): *if available*

B.7 Conclusion

- If any of the “Pass” items within the above chapter result is a “no” (i.e. results not compliant with the expected results), the unit should be returned to iXblue premises for diagnostic and/or calibration.
Please contact iXblue technical support, with current UATR report, to organize such return.
- If all tests are successful, the system is compliant with its specification.

Test result:

- ☐ **system is ready for service**
- ☐ **system needs to be returned to factory²**

Product:

Model:

Seria (serial number):

Test performed by :

Company name:

Operator:

Date:

Visa:

² Please send data file and “System configuration” file for further analysis at your local support representative or at support@ixblue.com or in packing list of the system you are returning.