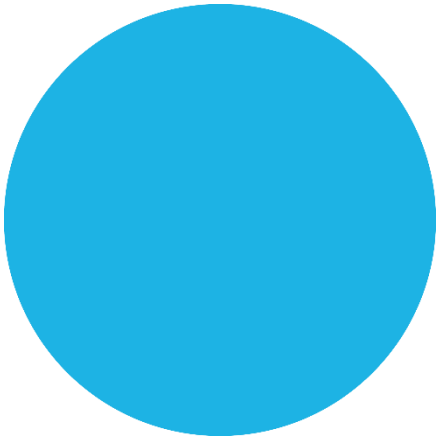

Rovins

Navigating & Positioning

QUICK START GUIDE

Objective

This guide describes the Rovins installation and the basic configuration required before operating the product. For more information, please refer to the flash drive available in the product package. It contains:

- the required software for the use of the embedded web-based user interface
- the full user manuals to get detailed technical information about the product, including product specifications/ performances. These documents will help you configuring and operating the product in specific installation or application.

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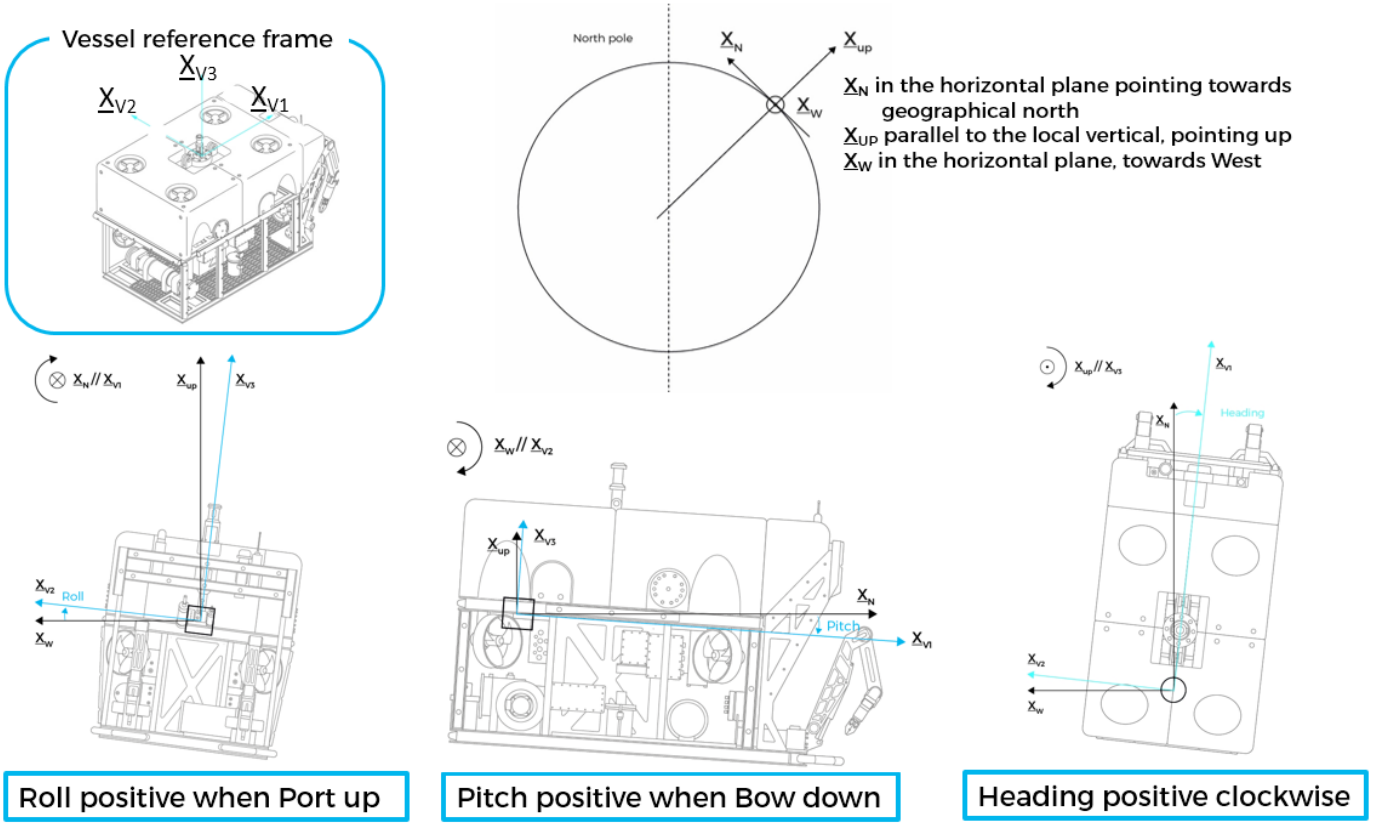
Rovins System Overview

The Rovins system is an Inertial Navigation System (INS). It delivers heading and attitude information as well as position and speed to control systems, acquisition software or other third party systems. It can receive data from external sensors to improve its accuracy. Rovins contains a self-consistent navigation algorithm based on Kalman Filtering. This structure enables Rovins to work either as a standalone system or to be connected to external sensors (GNSS, Dopler Velocity Log, Depth sensor, acoustic positioning systems etc.). Rovins is delivered with a powerful and easy-to-use embedded Web-Based User Interface, which allows you to configure and operate your product.

Basic Installation: Rovins + DVL + Depth (+ acoustic)

This guide describes how to install Rovins with a DVL and/or DEPTH, and the typical configuration required before operating the product. Rovins being versatile, you have to define its configuration to insure optimal operation. **In this installation, we assume that Rovins is aligned with respect to the vessel reference frame** (XV1, XV2, XV3). Angular convention and reference frame used by Rovins are detailed in the figure below. Note that on some output message/protocol, sign convention may differ (refer to product Interface Library).



Pack Contents Verifying

You will find in the shipping case a Packing List detailing all the items delivered.

However, **we recommend checking the equipment of the pack immediately after receipt**. Specifically, you should check that at least all the items shown below are present upon delivery and that none have sustained damage.

If you observe any non-conformity or damage, please inform the carrier and iXBlue without delay by certified mail, describing in detail the problem encountered.

Rovins

Power supply block & Power supply cable

19-Pins Ethernet test cable

SEACON 12-pins Ti pigtail

SEACON 19-pins Ti pigtail

SEACON 26-pins Ti pigtail

12, 19, 26 pins pressure cap

SEACON 12 or 19, 26 pins O-ring tool

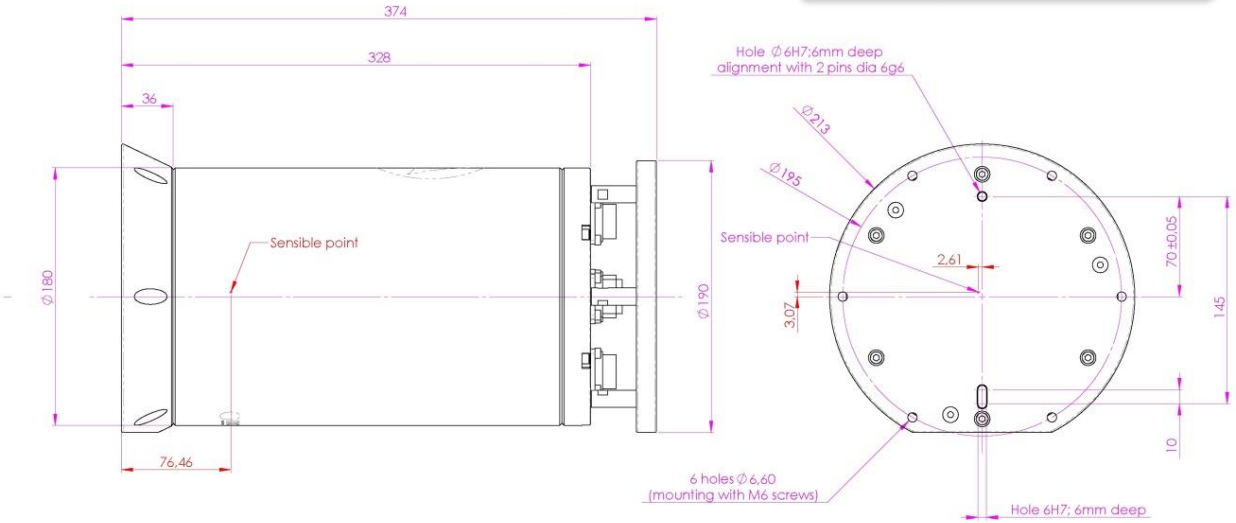
O-ring Kit

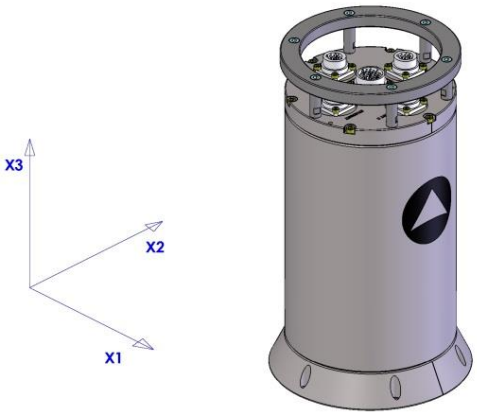
Step 1 Placing the Rovins on the mounting plate/surface

Rovins has to be aligned either with ROV reference frame either with imagery survey sensor. Reference frame center is defined by (P) and shown in the figure below, it is not located at the center of the unit.

iXblue product reference frame may differ from 3rd party equipment convention.

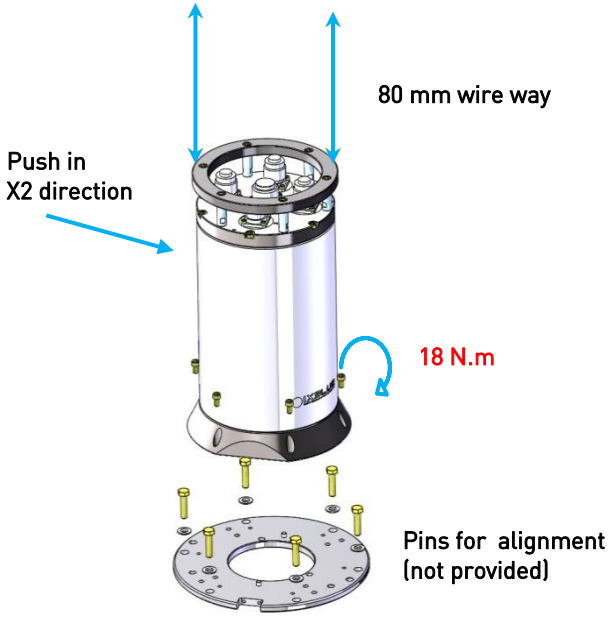
The unit has to be fixed on a strong and very stable place.





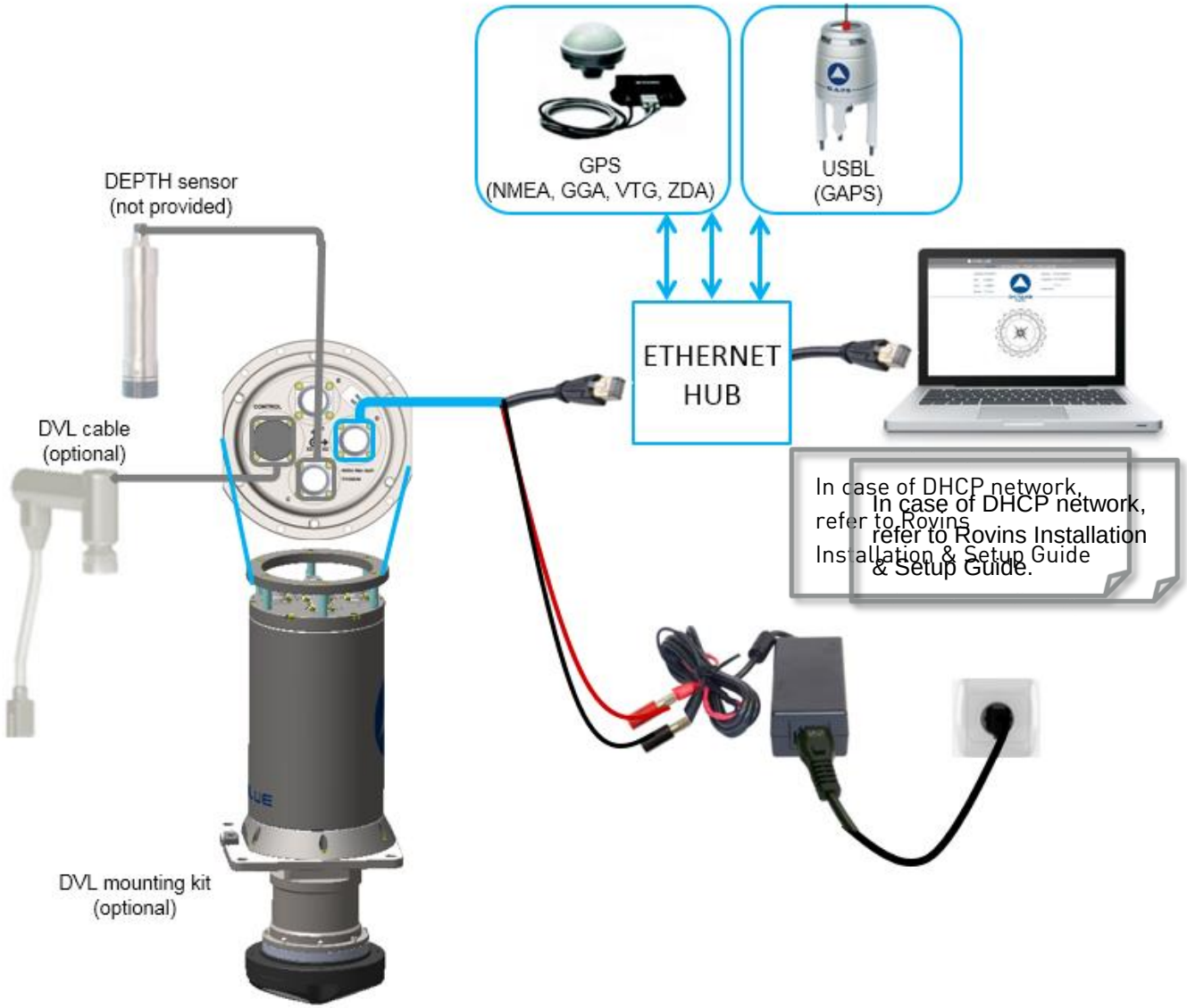
Step 2 Fixing Rovins with 6 CHC M6 screws

In case of installation with alignment pins (e.g. with DVL) it is recommended pushing Rovins against the pins in X2 direction while securing the screws to insure best mounting repeatability.



For mechanical installation recommendations refer to the Rovins Installation and Setup Guide.

Step 3 Connecting Rovins



Caution

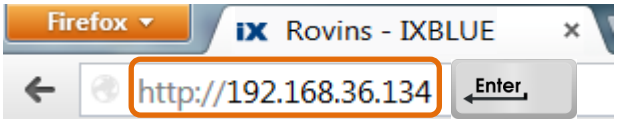
At any power supply outage, Rovins restarts its full alignment process.
It is then recommended to use an Uninterruptible Power Supply.

Step 1 Checking the version of the required software available on the flash drive

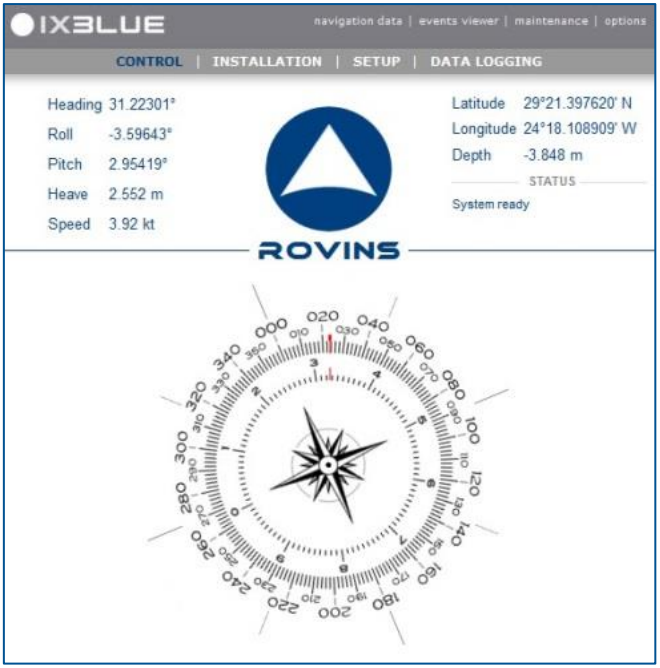
Firefox

Java Environment

Step 2 Launching the web-based user interface with Firefox



The control page is displayed with the compass.

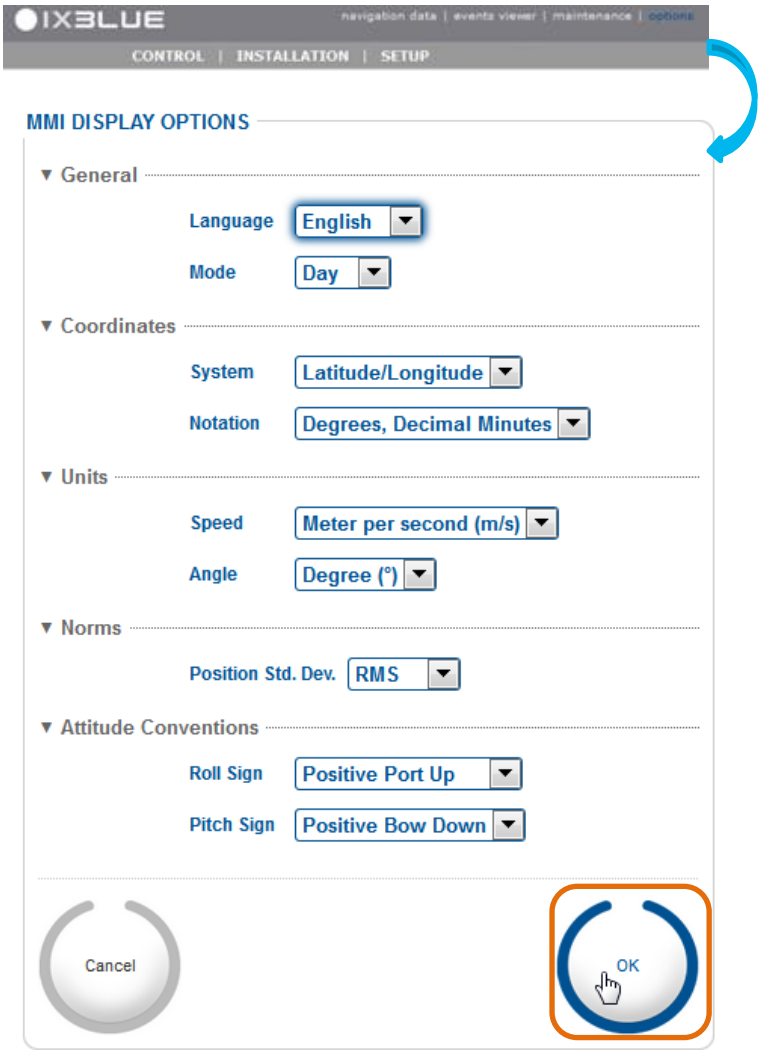


Factory default TCP/IP address

- Note the two last numbers of the Rovins serial number from product label ID.
- Type the following URL address: 192.168.36.1xx
  xx is the two last numbers of the Rovins serial number.
  For example: in the screen capture the two last numbers of the Rovins is 34 and the URL address is:

  192.168.36.134
- To change this URL address, refer to Rovins Installation & Setup Guide.

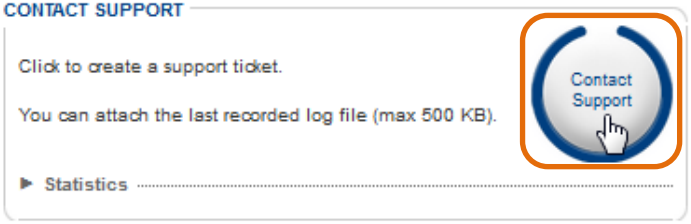
Configuring the Language and the Display Options



Activating the licence code (only in case of an upgrade)

Step 1 Getting the license ID

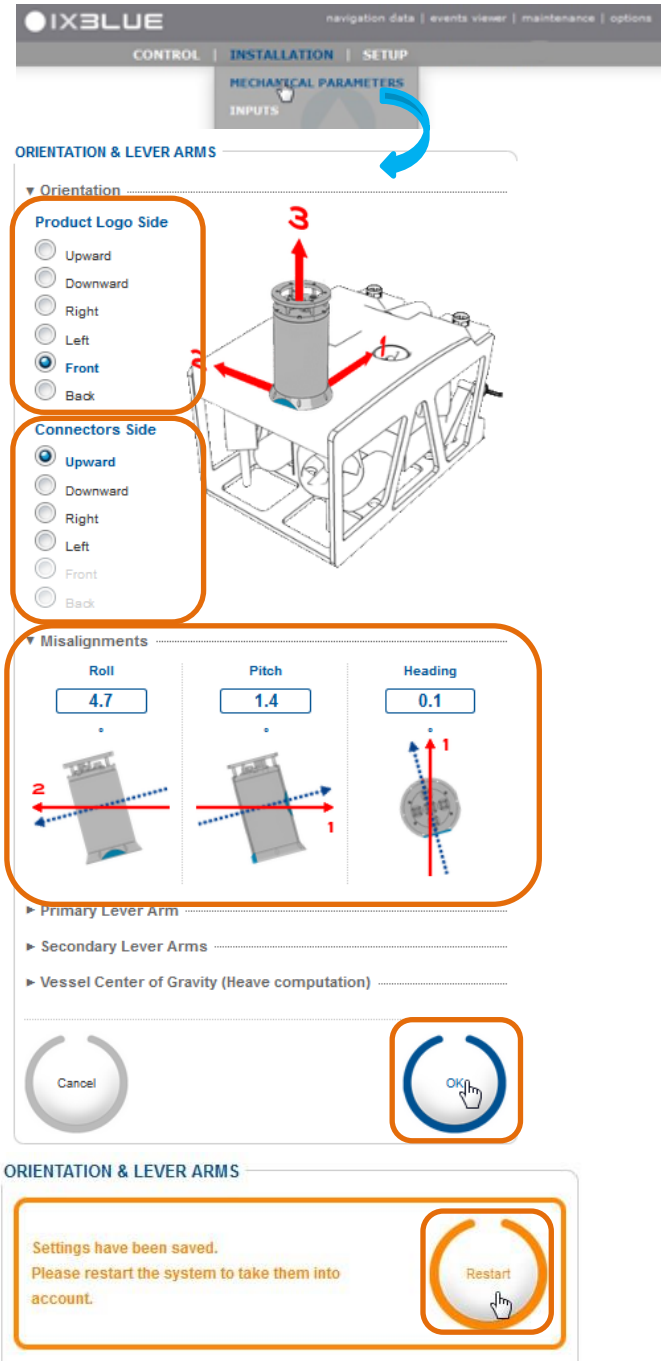
Step 2 Sending the license ID to iXblue support



Step 3 Entering the activation code received by mail from iXblue support

Upgrades may require to load a new set of firmwares: ask iXblue Support.

Configuring the Mechanical Parameters



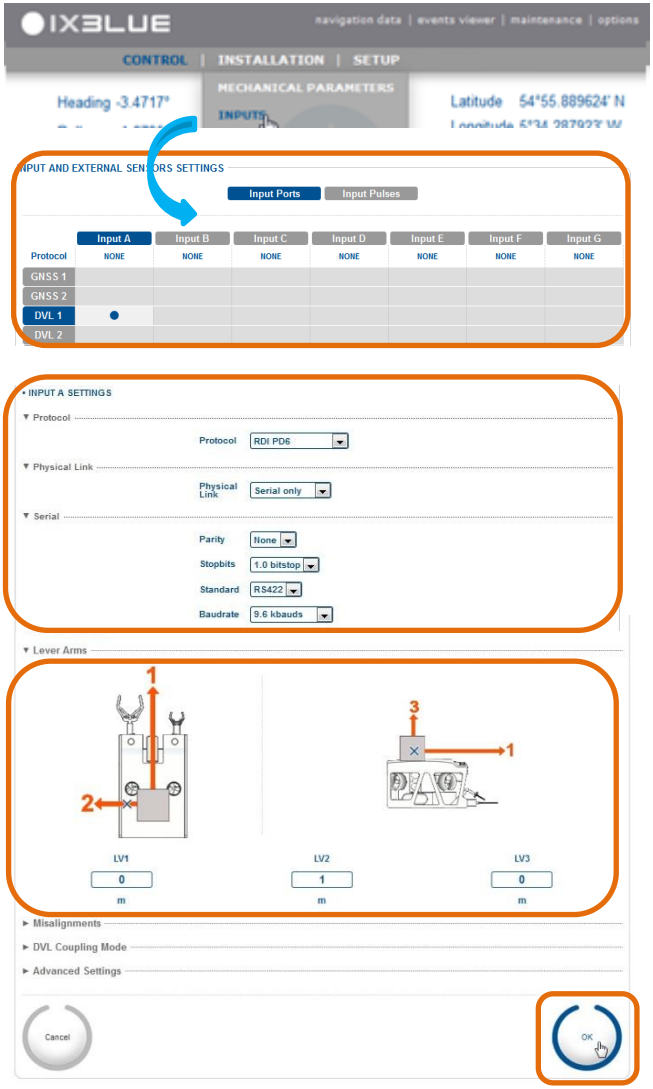
The orientation menu is used when the product axes orientation differs from vehicle axes orientation (displayed in red).
It allows to change axes orientation with 90 degrees rotations of any of the product axis with respect to the vehicle axes.

1. Define simply the orientation by indicating:
   - The direction to which the **Product Logo Side** is pointing to.
   - The direction to which the product **connector side** is pointing to.

2. **Enter the value of "misalignments" measured by the metrology survey**.

Primary Lever Arm and Secondary Lever Arm allow to compute the inertial position, the heave, surge and sway at remote location.
Primary Lever Arm allows to compute speed and accelerations at remote location.

Step 1 Configuring the DVL input parameters



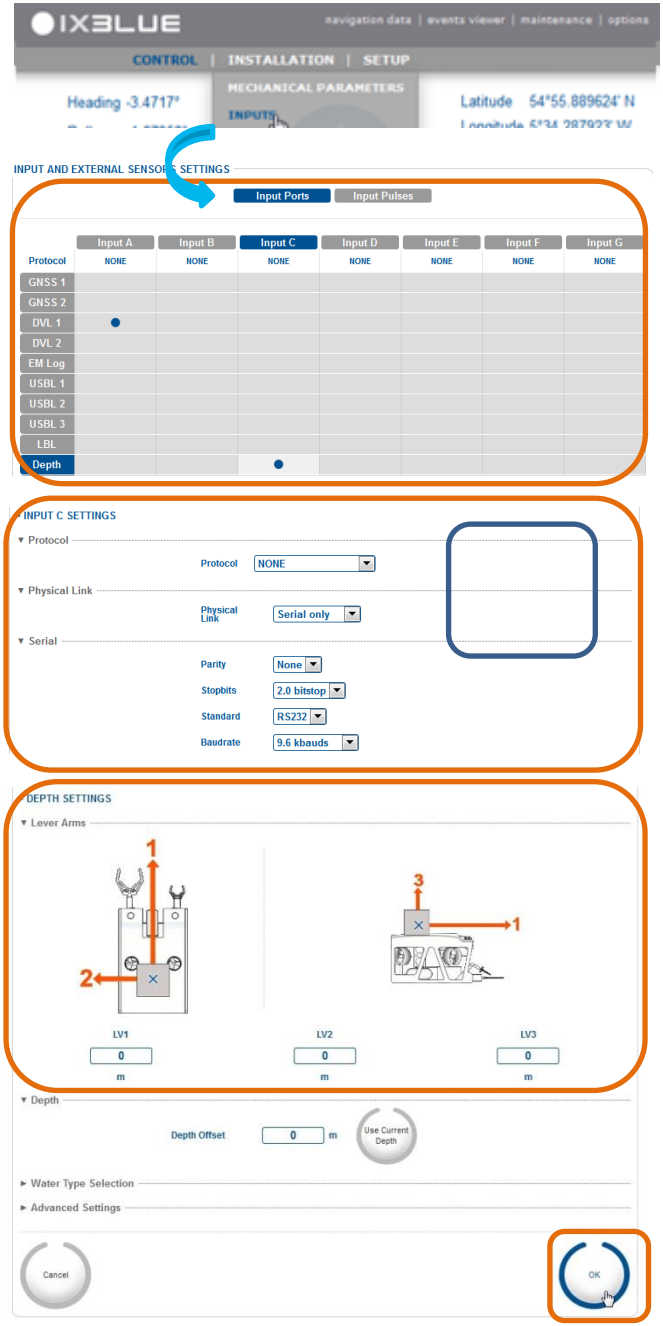
Refer to Application note - INS + DVL Calibration:

- to configure the DVL input parameters
- to configure the lever arms
- to calibrate the DVL.

DVL calibration is required for optimum performances.

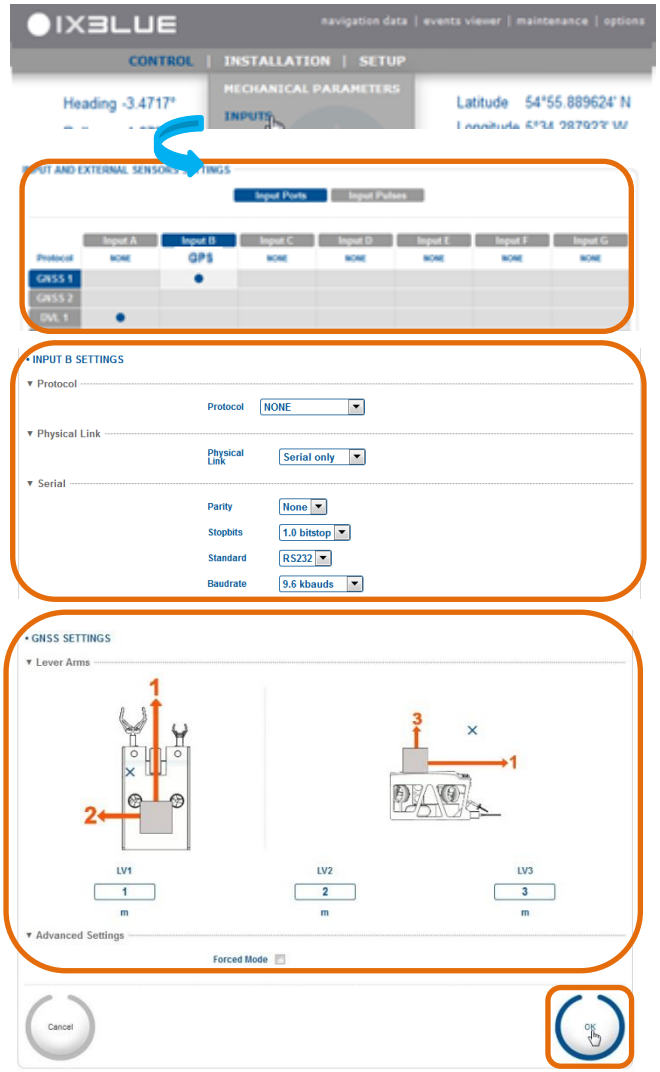
Purpose is to estimate accurately the angular misalignment and DVL scale factor.
Typical process is to navigate on surface with accurate GNSS + DVL bottom track.

Step 2 Configuring the Depth input parameters



Refer to Rovins Installation & Setup Guide to configure the depth input parameters.
Refer to Rovins Interface Library to get information about the available protocol and formats.

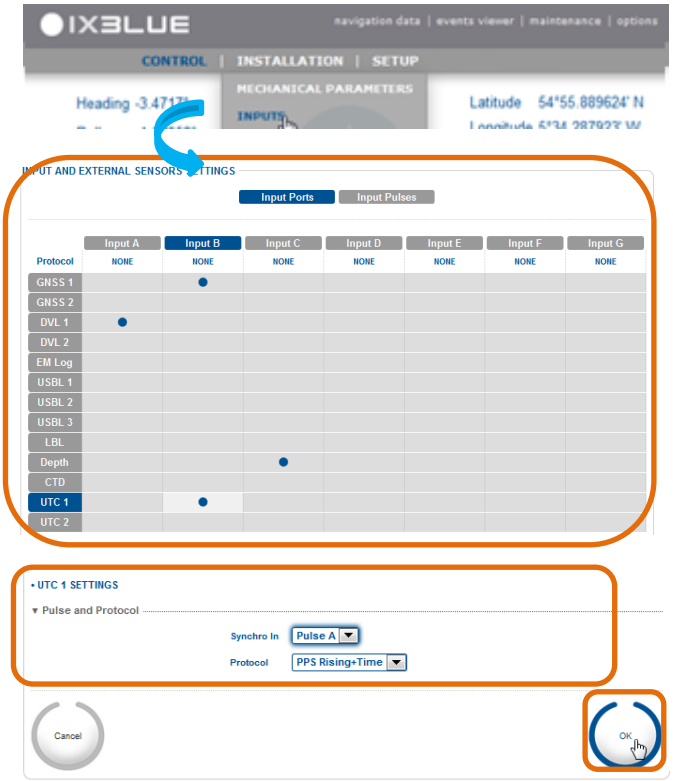
Step 3 Configuring the GNSS (resp. USBL) input parameters



- For example, parameters of the inputs for the GNSS:
  Protocol: **GPS**
  Physical link: **Ethernet only**
  Transport layer: **TCP client**
  (if the GNSS is acting as a TCP server)
  IP: **IP address of GPS receiver**
  Port: use the same port ID on the both side (GNSS & PMINS)

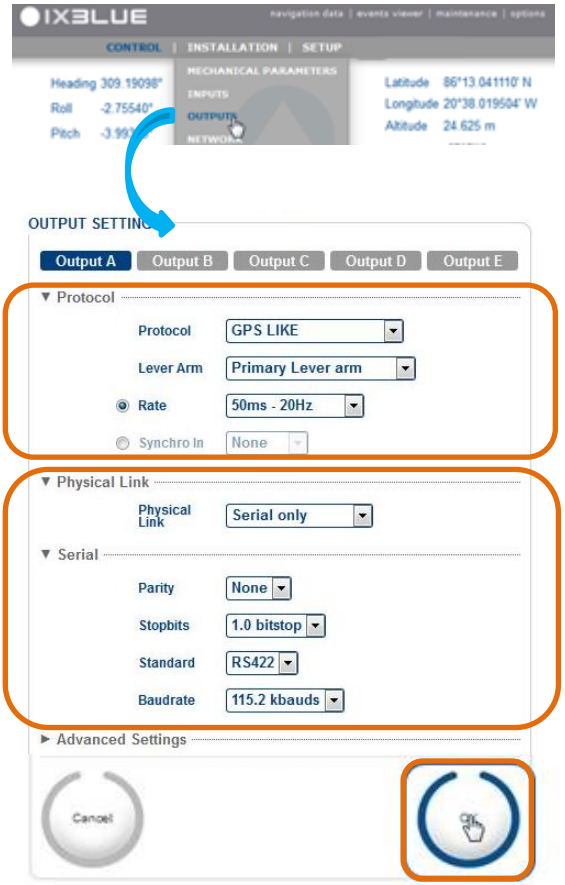
- The GNSS **lever arms** corresponds to the lever arm from the product center of measurements to the GNSS antenna.
  Note that **X** on the drawing gives its rough location not the real scale.

Step 4 Configuring the UTC input parameters



For example, parameters of UTC:
Syncho In (for PPS input): **Pulse A**
Protocol: **PPS Rising + Time**
(depending on GNSS configuration)

Step 5 Configuring the Output parameters



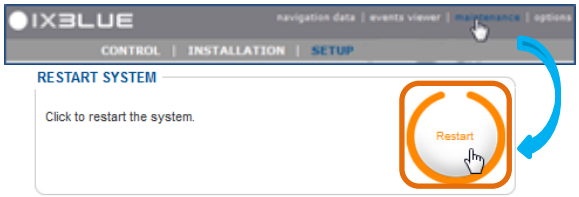
Important: when configuring the output port in serial mode, check that sampling rate and baudrate are consistent with the protocol data field length.
If not, data output will be corrupted and a "SerOut X full" flag will appear in the detailed status from the control window.

Checking procedure as follows:

- Count the maximum number of bits Nb (including parity and stop bits) in the protocol data frame. ASCII characters are 12 bits long max, each.
- Select Baudrate and Sampling period so that:
  Nb x Sampling Period < Baudrate
  Sampling Period is in ms
  Baudrate is in kBauds

Entering the Manual Position

Entering the initial position is only necessary if no position input (GNSS, USBL,…) is available.



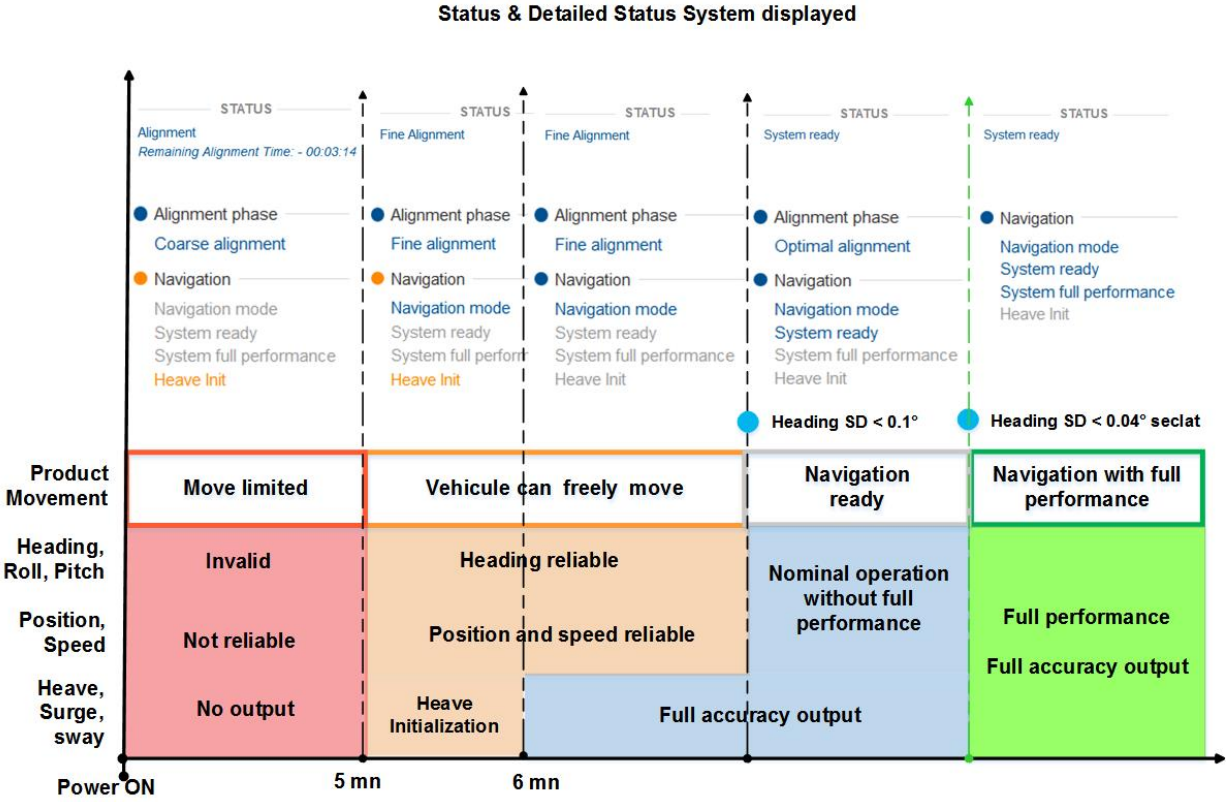
As soon as you have clicked on the Restart button, Rovins starts its alignment phase with the manual position (unless receiving GNSS/USBL).

Step 1 Starting Rovins

When it is powered ON or re-started, Rovins performs an initial alignment which starts by a coarse alignment: Rovins inertial sensor data (accelerometers and gyrometers) are computed to estimate heading, roll and pitch angles. The coarse alignment phase is followed by a fine alignment phase to improve the accuracy of roll, pitch and heading estimations. During this phase the position is initialized with valid position data received from the external sensor. If no position is available, Rovins uses the most recent position saved in the non-volatile memory of the system or a position entered manually.

In the fine alignment mode the algorithm will use both inertial sensors and external sensors to compute optimal estimates of attitude, heading, speed and position. During this sequence the Rovins needs to observe large heading changes (~90°). E.g.: NE = 15 mn, NW = 15 mn.

After the fine alignment, Rovins switches to the Optimal alignment. At this time, the system is ready but it does not reach its full performance. Optimal alignment means that the system is reaching the specified heading performance. When optimal alignment is completed, the system is ready and gives all the data with full performance.



Step 2 Toggle the External Sensors input to navigation solution

While operating, the operator can enable/disable the external sensor into the inertial solution from the main control page.

Step 3 Monitoring Rovins

The embedded Built In Test, also called Status, monitors Rovins stats warning and failures thanks to large set of flags.

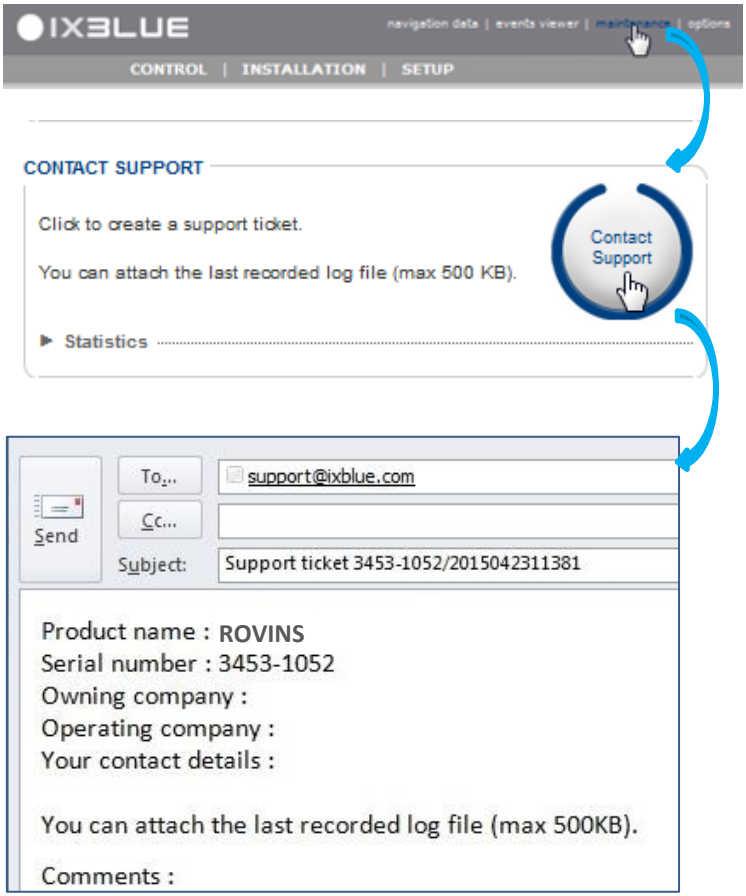
Status are displayed on the web-based user interface with the following colors:

- **Message in blue**: information message
- **Message in orange**: warning message
- **Message in red:** error message
- **Grey:** disabled

For explanation of the status, refer to Rovins Interface Library

In this example:
- Rovins is in full performance mode
- DVL BT rejected status means that the the data is received but it is not taken into account by the rejection filter.

Contacting iXblue Support



Mandatory information to be provided:

- Serial number of your unit
- Firmware/loaders versions
- User interface version you are using
- Record the configuration file
- Record a set of data for analysis
- The latitude/longitude where currently the system is running
- Description of your application / potential problem your are facing to

For more information, refer to the maintenance manual.

Troubleshooting

Rovins has a Built-In status and error Test (BIT) which raises alarms (through the color of the iXblue Logo) and displays messages in the Rovins Web-Based User Interface.
If you encounter problems when installing or using Rovins, please refer to the following table.
If you still cannot resolve the problem, please contact iXblue support (see previous page).

Symptom	**Possible causes**	**Solution**
Impossible to display the Web-based User interface	Incorrect URL address entered in the Web browser	Type in back the URL address Default address is 192.168.36.1xx, xx being the last two numbers of your Rovins serial number. Check computer IP address should be in the same range as the unit.
	The URL address has been changed by another person	1) Retrieve the new Rovins IP address: connect the repeater cable to your PC and start a serial terminal (Hyperterminal, BBTALK, etc.) configured at 19200 baud, no parity, 1 stop bit, 8 data bits. Reboot Rovins once connected. You will get the Rovins boot sequence message that contains its attributed IP address (line beginning with “IFCONF”) 2) Enter this URL address in the Web browser
Status displayed red	Error message	Refer to Rovins Interface Library to get the explanation of the messages
Status displayed orange	Warning message	Refer to Rovins Interface Library to get the explanation of the messages
After clicking on “Contact support” button, a message is displayed	No mail software is installed	Install a mail software on the computer (Outlook for example)

iXblue Contact - Support

For non-emergency support:
support@ixblue.com

For genuine emergencies only:
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