

QUICK START  
GUIDE

**QUADRANS**



**Objective**

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This guide describes the QUADRANS installation and the basic configuration.  
For more information, please refer to the CD-ROM available in the product package. It contains:

- the required softwares for the use of the 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 applications.

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## QUADRANS SYSTEM OVERVIEW

QUADRANS is both a fiber-optic survey-grade IMO certified gyrocompass and a Motion Reference Unit for Marine applications. QUADRANS is certified to meet the requirements of the International Marine Organisation (IMO) for gyrocompass.

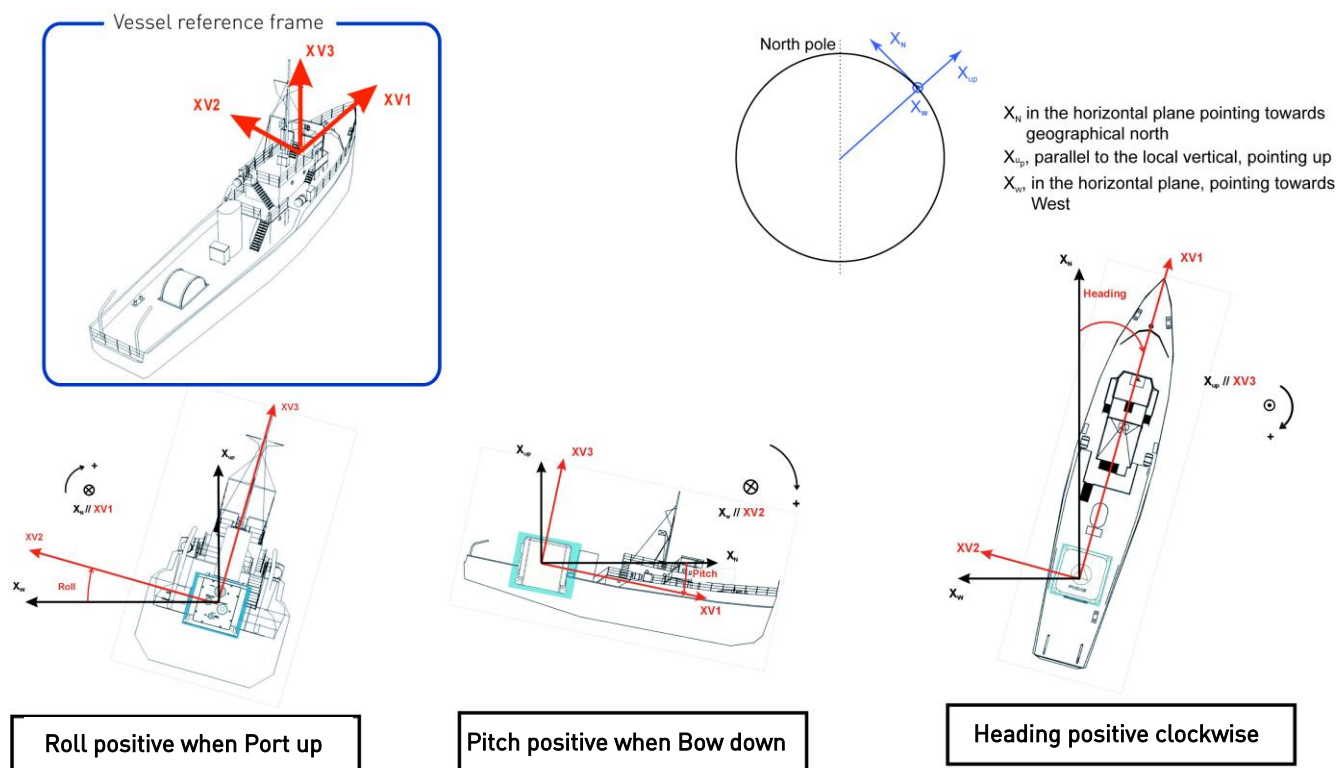
The QUADRANS system is used to deliver true heading, roll, pitch and rates of turn. Position and speed are available with QUADRANS. Position accuracy being dependent on aiding sensor accuracy.

Heading and attitudes are computed whether the system is in movement or not, and without an external reference point. Computation is based on (filtered) measurement of shifts in local gravity as the Earth rotates. It involves angle integration using quaternion algebra, a heading search algorithm, and Coriolis force correction for vessel speed.

## BASIC INSTALLATION: QUADRANS + GPS

This guide describes how to install QUADRANS with a GPS. QUADRANS being versatile, you have to define its configuration to insure optimal operation.

**In this installation, we assume that QUADRANS is aligned with respect to the vessel reference frame ( $X_1, X_2, X_3$ ).** All the mechanical information necessary to fix QUADRANS is detailed in the figure below.



## PACK CONTENTS VERIFYING

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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 reception against the delivery packing list** and that none has sustained damage. The below items are typical delivered.

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.

**Power supply block**



**Power supply cable**



**Power supply cable  
(local standard)**



**Ethernet cable**



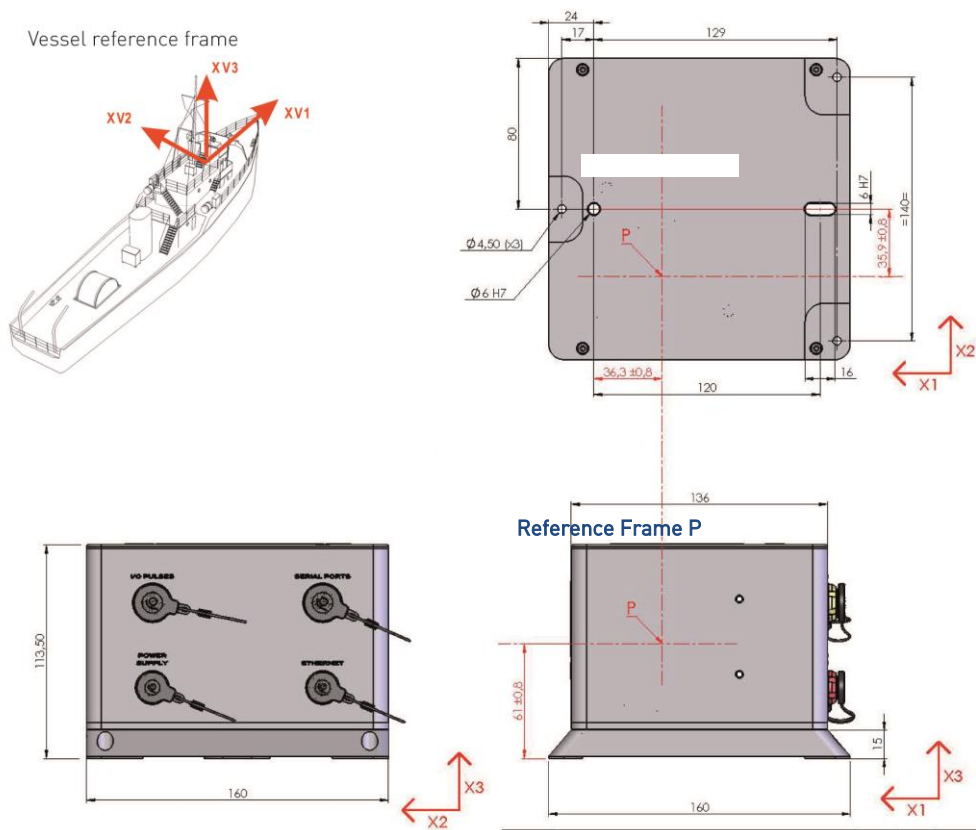
**QUADRANS**



## INSTALLING & CONNECTING QUADRANS

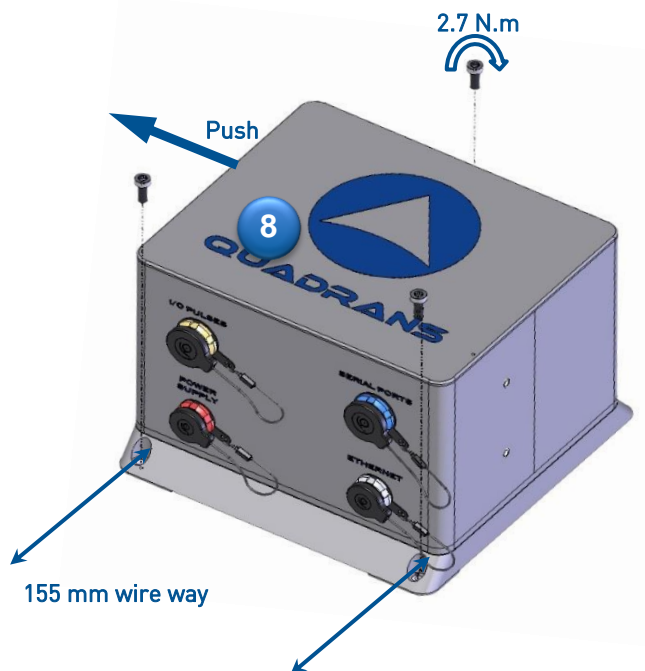
### Step 1 Place QUADRANS on the mounting plate/surface.

All inertial measurements are default performed with respect to QUADRANS reference frame (P) defined in the figure below, it is not located at the center of the unit.



QUADRANS must be mounted on a rigid structure (plate) firmly linked/attached to the vehicle/ platform.  
I.e. avoid unexpected displacement against vehicle or third party equipment reference frame.

**Step 2** Fix QUADRANS onboard using three CHC or CZX M4 bolts.



For mechanical installation recommendations, refer to:

- Inertial Products – Application Note – Mechanical Integration of Inertial Systems (Ref.: MU-MECHAAPN-AN-001)

In case of optional interface plate, refer to:

- QUADRANS-ATLANS Interface plates - Product Description (Ref.: MU-QATPLATE-AN-001)

**In case of installation with alignment pins it is recommended** to push the unit into the X2 direction during the fixation of the 3 bolts in order to ensure the best mounting repeatability.

### Step 3 Connecting QUADRANS

PC IP address is: 192.168.36.1



For QUADRANS configuration through the Web-Based User Interface



Ethernet Link

Alternative Serial link



GPS  
(NMEA GGA, VTG, ZDA)

Ethernet connector pin definition

Pin	Signal
1	TX +
2	TX -
3	RX +
4	RX -
Body	Shield

Power Supply Pin Definition

Pin	Signal
1	24V DC (12V to 32V)
2	Electrical ground (0V)
3	Mechanical ground

Power Supply

HUB  
(Not included)

Ethernet link



# QUADRANS STARTING SEQUENCE

As soon as QUADRANS is powered up, it starts its alignment phase. During the alignment phase, heading and attitude data are available, but have not reached full accuracy (see **Erreur ! source du renvoi introuvable.**). This alignment phase must be carried out at quay side or adrift. After this 5-minute alignment phase, direction changes are recommended. QUADRANS reaches its full accuracy outputs in about 15 minutes after the end of the alignment phase.

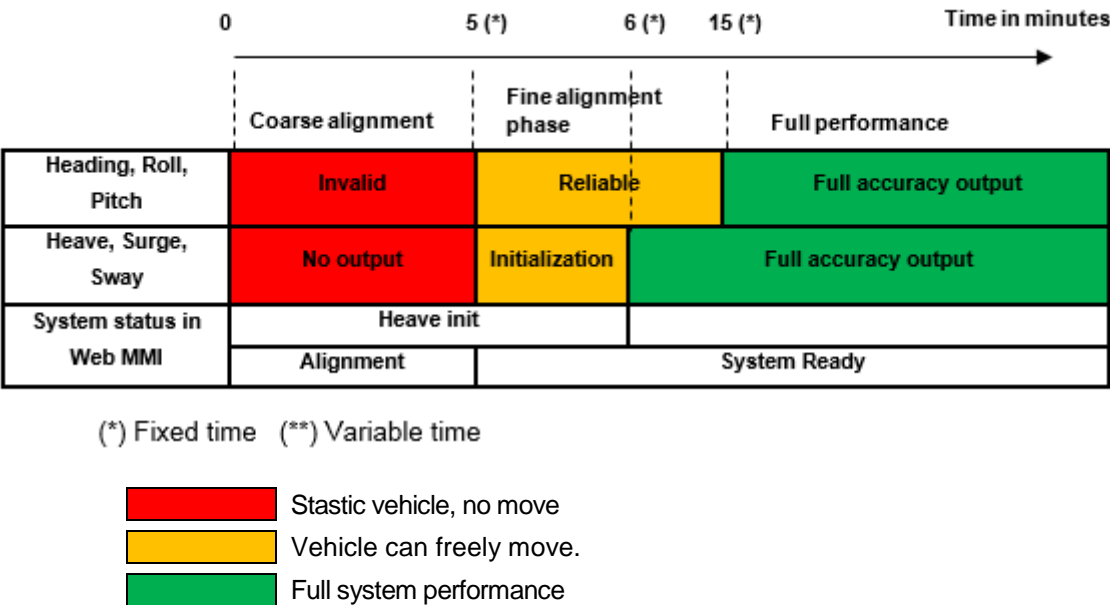


Figure 1 – QUADRANS Starting Sequence (at powering on or software restart)

## Important

QUADRANS is delivered with a default latitude setting that corresponds to iXBlue’s factory location. At first powering on, without external GPS connected, QUADRANS will start seeking north with this latitude input, which may be quite different from the current QUADRANS latitude.

Latitude has to be modified by the user (see page 10). Once this modification is performed, it is recommended to save it and restart the system. This procedure allows for the QUADRANS to enter the correct latitude value as an input in the North finder algorithm as soon as computation starts. Otherwise QUADRANS will not stabilize on correct heading.

At any power supply outage, QUADRANS restarts its full alignment process. It is then recommended to secure power supply on UPS.

## LAUNCHING THE WEB-BASED USER INTERFACE

### Step 1 Checking the version of the required software available on the CD-ROM



Firefox

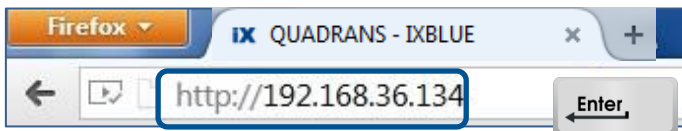


Flash Player

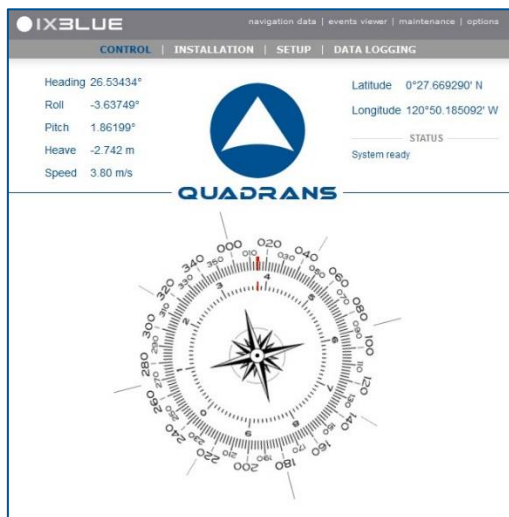


Java Environment

### Step 2 Launching the web-based user interface with Firefox



The control page is displayed with the compass.



- Note the two last numbers of the QUADRANS serial number (by default).
- Type the following URL address: 192.168.36.1xx  
xx is the two last digits of the QUADRANS serial number. For example: in the screen capture the two last digits of the QUADRANS is 34 and the URL address is:

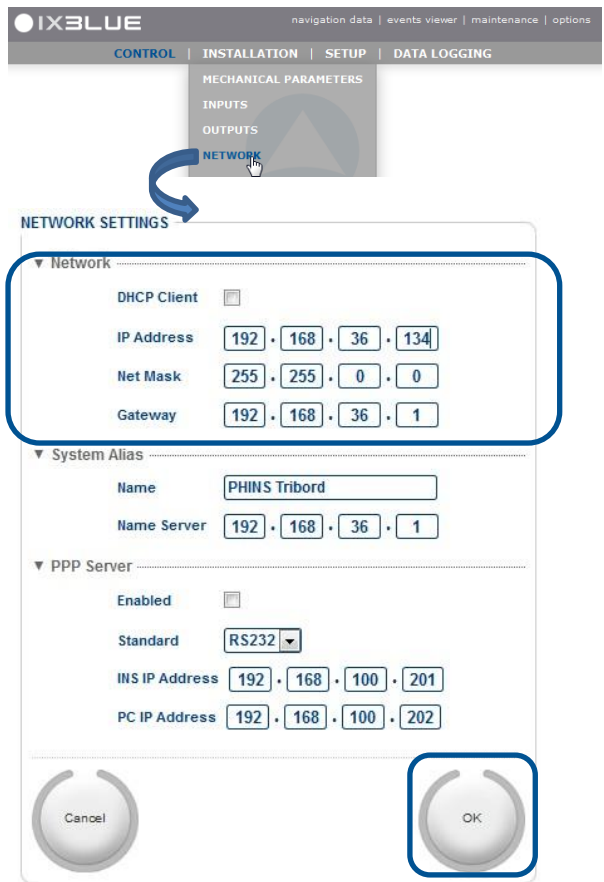
192.168.36.134

# CONFIGURING THE SYSTEM

## Step 1 Choosing the language, if needed



## Step 2 Configuring the network



TCP/IP address change may require to change as well your computer own TCP/IP.

For more information refer to "Inertial Products-Network set-up guide" document.  
Ref.: MU-INS&AHRS-AN-005

### Step 3 Entering the initial latitude and vessel speed

IX3BLUE navigation data | events viewer | maintenance | options

CONTROL | INSTALLATION | **SETUP** | DATA LOGGING

**POSITION & SPEED FIXES** WARNING CONFIGURATION

**POSITION & SPEED FIXES**

▼ Manual Position

Latitude 48° 52.8' N

Longitude 2° 7.3' E

Label

Shortcuts

Delete

Replace By Current Position

▼ Manual Speed

Speed 0 m/s

Cancel OK

Accuracy required on the latitude input depends on the current latitude: 3 degrees accuracy on latitude of 45 degrees, and 1 degree accuracy for latitudes below 30 degrees.

**Optimum results will be given by taking updates automatically from a GPS (with GGA and VTG frames).**

Enter the vessel speed or the estimated adrift speed.

The heading output is sensitive to the vessel speed towards North. This error is given by the following formula:

$$\Delta\text{Heading}[\text{deg}] = \{\Delta V_{\text{north}}[\text{knot}]/5\pi\}.\text{seclat}$$

With  $\Delta V_{\text{north}} < 1.6$  knot

### Step 4 Restarting the system

IX3BLUE navigation data | events viewer | maintenance | options

CONTROL | INSTALLATION | **SETUP** | DATA LOGGING

**RESTART SYSTEM** WARNING CONFIGURATION

Click to restart the system.

Restart

As soon as you have clicked on the Restart button, QUADRANS starts its alignment phase with the manually input position.

**During the initial alignment phase, the system should be kept static at constant speed and heading.**

## CONFIGURING THE MECHANICAL PARAMETERS

### Step 1 Configuring QUADRANS orientation with respect to vehicle

The screenshot shows the IX3BLUE web interface. At the top, there is a navigation bar with links: navigation data | events viewer | maintenance | options. Below this is a menu bar with tabs: CONTROL | INSTALLATION | SETUP | DATA LOGGING. The 'INSTALLATION' tab is selected, and a sub-menu 'MECHANICAL PARAMETERS' is open, showing 'INPUTS'. The main content area is titled 'Orientation' and contains two sections: 'Product Logo Side' and 'Connectors Side'. The 'Product Logo Side' section has radio buttons for: Upward (selected), Downward, Right (starboard), Left (port side), Front (bow), and Back (stern). The 'Connectors Side' section has radio buttons for: Upward, Downward, Right (starboard), Left (port side), Front (bow), and Back (stern) (selected). To the right of these sections is a 3D diagram of a vessel with a QUADRANS unit mounted on its deck. Red arrows labeled 1, 2, and 3 indicate the orientation of the unit. At the bottom of the interface, there are two circular buttons: 'Cancel' and 'OK' (with a hand cursor icon).

It is considered that the QUADRANS is mechanically aligned with the vessel. However QUADRANS can be mounted in any orientation and it is possible to align the output.

For more information refer to “Web-based interface user guide” document.  
Ref.: MU-INSIII -AN-021

# CONFIGURING THE INPUTS & THE OUTPUTS

## Step 1 Configuring the GPS input parameters by Ethernet

IXBLUE

navigation data | events viewer | maintenance | options

CONTROL

INSTALLATION

SETUP

DATA LOGGING

Heading -3.4717°

Roll -1.67352°

Latitude 54°55.889624' N

Longitude 5°34.287923' W

MECHANICAL PARAMETERS

INPUTS

OUTPUTS

INPUT AND EXTERNAL SENSORS SETTINGS

Input A

Input B

Protocol

GPS

NONE

GPS

EM Log

UTC

• INPUT A SETTINGS

▼ Protocol

Protocol

GPS

▼ Physical Link

Physical Link

Ethernet only

▼ Ethernet

Transport Layer

TCP Client

IP

123

45

67

89

Port

8120

Sensor Control Panel

• GPS SETTINGS

► Lever Arms

Cancel

OK

Protocol: **GPS (standard NMEA)**  
Physical link: **Ethernet only**  
Transport layer: **TCP client**  
(When GPS is acting as TCP server)  
IP: **IP address of the GPS**

## Step 2 Associating UTC input parameters to the same input for a PPS synchronization from the GPS

The screenshot shows the IXBLUE web interface with the 'MECHANICAL PARAMETERS' tab selected. A blue arrow points from the 'INPUTS' sub-tab to the 'INPUT AND EXTERNAL SENSORS SETTINGS' dialog. The dialog has two main sections: 'INPUT A SETTINGS' and 'UTC SETTINGS'. The 'INPUT A SETTINGS' section includes dropdowns for Protocol (GPS), Physical Link (Serial\_only), Parity (None), Stopbits (1.0 bitstop), Standard (RS232), and Baudrate (9.6 kbauds). The 'UTC SETTINGS' section includes dropdowns for Synchro In (Event A) and Protocol (PPS Rising+Time). At the bottom are 'Cancel' and 'OK' buttons, with the 'OK' button highlighted by a blue circle and a hand cursor.

IXBLUE navigation data | events viewer | maintenance | options

CONTROL | INSTALLATION | SETUP | DATA LOGGING

Heading -3.4717° Roll -1.67°

MECHANICAL PARAMETERS

Latitude 54°55.889624' N Longitude 5°34.287923' W

INPUTS OUTPUTS

INPUT AND EXTERNAL SENSORS SETTINGS

	Input A	Input B
Protocol	GPS	NONE
GPS	<input checked="" type="radio"/>	
EM Log	<input type="radio"/>	
UTC	<input checked="" type="radio"/>	

• INPUT A SETTINGS

▼ Protocol Protocol

▼ Physical Link Physical Link

▼ Serial

Parity

Stopbits

Standard

Baudrate

► Sensor Control Panel

• UTC SETTINGS

▼ Pulse and Protocol

Synchro In

Protocol

Cancel OK

For example, parameters of UTC:  
Syncho In: **Event A**  
Protocol: **PPS Rising + Time**  
(following the GPS configuration)

### Step 3 Configuring the Output parameters

The screenshot shows the IXBLUE web interface with the 'OUTPUT SETTINGS' dialog open. The dialog is titled 'OUTPUT SETTINGS' and has tabs for Output A, Output B, Output C, Output D, and Output E. The 'Output A' tab is selected. The dialog is divided into several sections:

- Protocol:** A dropdown menu for 'Protocol' is set to 'HEHDT'. A dropdown for 'Lever Arm' is set to 'Main Lever arm'. There are two radio buttons: 'Rate' (selected) and 'Synchro In'. The 'Rate' dropdown is set to 'None'.
- Physical Link:** A dropdown menu for 'Physical Link' is set to 'Ethernet only'.
- Ethernet:** A dropdown menu for 'Transport Layer' is set to 'TCP Client'. The 'IP' address is set to '11.45.67.3' and the 'Port' is set to '8500'.
- Advanced Settings:** A section with a plus icon.
- Heart Beat Management:** A section with a plus icon.
- Alerts Management:** A section with a plus icon.

At the bottom of the dialog are two large circular buttons: 'Cancel' and 'OK'.

User can freely configure each output.

Select the **Protocol** and its lever arm.

If you want the data output frequency rate be fixed by a connected synchronization source, select **Synchro in** and choose the input pulse to which the external synchronization source is connected.

Select the type of **Physical Link** and configure it.

Tick the **Heart Beat Management** parameter to enable the IMO Heart Beat management on this port.

Tick the **Alerts Management** parameter to enable the ALR of ALF alert on this port.

For full functional description of the Heart Beat and Alerts management, refer to Interface Library document (Ref.: MU-AHRS-AN-003).



## CONTACTING IXBLUE SUPPORT

**IXBLUE** navigation data | events viewer | maintenance | options

CONTROL | INSTALLATION | SETUP | DATA LOGGING

### CONTACT SUPPORT

Click to create a support ticket.

You can attach the last recorded log file (max 500 KB).

► Statistics .....

**To:**

**Cc:**

**Subject:** Support ticket 3453-1052/20150417162659

**Send**

Product name : QUADRANS  
Serial number : 3453-1052  
Owning company :  
Operating company :  
Your contact details :  
  
You can attach the last recorded log file (max 500KB).  
  
Comments :

Complete all the information before sending the mail to iXBlue support.

QUADRANS has a Built-In status and error Test (BIT) which raises alarms (through the color of the iXBlue Logo) and displays messages in the QUADRANS User Interface.

If you encounter problems when installing or using QUADRANS, 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 QUADRANS 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 QUADRANS 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 QUADRANS once connected. You will get the QUADRANS boot sequence message that contains its attributed IP address (line beginning with "IFCONF")  2) Enter this URL address in the Web browser
The compass does not display on the Web-Based User Interface	Flash player not installed on the PC or its version is too old	Install Flash player which is provided on the CD-ROM

Symptom	Possible causes	Solution
Impossible to record data, nothing happens when clicking on DATA LOGGING menu	Java Runtime Environment not installed on the PC or its version is too old	Install Java Runtime Environment which is provided on the CD-ROM
Heading out of the specifications	Wrong initial latitude	Check that the latitude entered in the POSITION FIX page is the current one.  Restart the unit.
Status displayed red	Error message	Refer to “INS-Marine applications, Web-based interface user guide” document to get the explanation of the messages
Status displayed orange	Warning message	Refer to “INS-Marine applications, Web-based interface user guide” document” 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)

