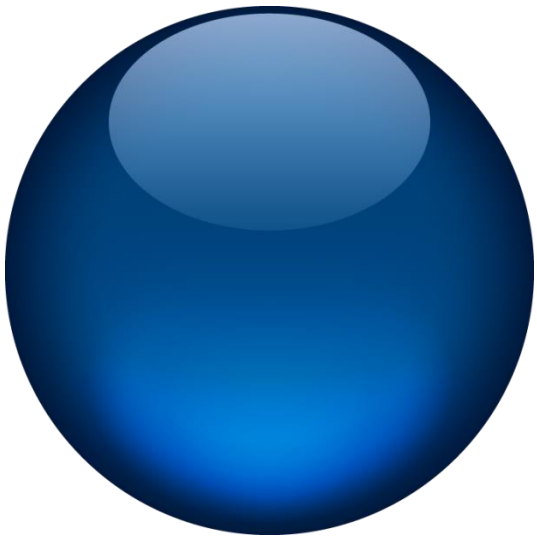


OCTANS NANO

Interface Control Document

iXblue
DEEP INSIGHT. SHARPER SENSES.

Document Revision History

Edition	Date	Comments
A	05/2017	First Edition

Copyright

Disclaimer

iXBlue specifically disclaims all warranties, either express or implied, included but not limited to implied warranties of merchantability and fitness for a particular purpose with respect to this product and documentation. iXBlue reserves the right to revise or make changes or improvements to this product or documentation at any time without notify any person of such revision or improvements.

In no event shall iXBlue be liable for any consequential or incidental damages, including but not limited to loss of business profits or any commercial damages, arising out of the use of this product.

Trademarks

Microsoft and Windows are registered trademarks of Microsoft Corporation. Intel and Pentium are registered trademarks and Celeron is a trademark of Intel Corporation.

Abbreviations and Acronyms

Abbreviations and acronyms are described in the document I*nertial Products - Principle & Conventions (Ref.: MU-INS&AHRS-AN-003).*

Table of Contents

1 INTRODUCTION

This document is the OCTANS NANO Interface Control Document. It provides general information on the OCTANS NANO interface, with a focus on mechanical and electrical interfaces.

2 GENERAL INTERFACE SPECIFICATION

2.1 Communication link

OCTANS NANO is able to receive and transmit data through 2 configurable asynchronous serial communication lines (Digital I/O):

- Baud rates, parity and number of stop bits can be configured independently for each serial links.
- Electrical level (RS-232) can be configured either independently.
  Note that for each serial port, the input and output will share the same serial settings (level, baudrate, stop bits).

OCTANS NANO is able to receive and transmit data through a 10/100 Mbits/s Ethernet link:

- TCP/IP and UDP protocols are available
- 4 input / 5 output virtual ports can be opened simultaneously

The output messages can be selected as presented in the *AHRS-Interface Library* document.

OCTANS NANO can be connected to a PC for configuration, installation and display purposes through the Web-based Graphical User Interface through Ethernet port available on “Central” connector. Alternatively, configuration commands can be transmitted through serial repeater ports available on “Central” connector.

By default, access to the Web-based Graphical User Interface is made through the Ethernet port. Alternatively it can be access by using the RS232 connector of your PC.
In this case the Installation and Repeater port of the product has to be configured in PPP mode, as well as the computer (see *Network Set-up Guide Ref.: MU-INS&AHRS-AN-005* for more details).

For the Ethernet link, the following parameters are default defined:

- IP Address: 192.168.36.1xx, xx being the last two numbers of the OCTANS NANO serial number (i.e: for QA-2345 xx= 45).
  Refer to Ethernet Factory Setting Certificate to retrieve IP address.
- Connection through http web server (port 80)
- Repeater flow available on TCP port 8110

By default, serial repeater link is configured as follows:

- Protocol used: OCTANS Standard, refer to *AHRS Interface Library* for a description of OCTANS Standard data frame output *(Ref.: MU-AHRS-AN-003)*
- Baudrate: 19200 Bauds
- Flow Control: Odd, 2 stop bits
- Refresh rate: 5 Hz (200 ms)

2.2 Software interfaces and library

Input and output digital interfaces are user-configurable with a comprehensive set of protocols (or formats) to be selected from the digital interface library.
Digital protocols in binary format and NMEA compliant ASCII format are available for input and output data.
To get details on protocols, please refer to *AHRS - Interface Library* document *(Ref.:MU-AHRS-AN-003).*

System configuration and operation can be performed either through the Web-based User Interface (refer to the Inertial Products - Marine Applications, Web-based interface user guide, ref.: *MU-INSIII-AN-021*) or with text control command (refer to AHRS – Advanced Configuration, ref.: *MU-AHRS-AN-002*).

2.2.1 WEB BASED INTERFACE

The OCTANS NANO Web-based user interface runs either on a workstation or on a laptop and allows full installation and operation of the system.

The user interface requires a web-client (e.g.: Firefox) and is qualified with PC running Windows XP operating system with the following minimum requirements:

- Minimum processor frequency : 2 GHz
- Minimum RAM : 2 048 Mo
- Minimum storage available : 10 Go

Necessary software versions are detailed in the web MMI user guide and these versions can be found on the CD delivered with the product.

2.2.2 CONTROL COMMAND

The control command gives access to the following features:

- Installation
  - Orientation and misalignment configuration
  - External sensor input
  - Warning configuration
  - Communication link configuration (physical parameter and software parameters)
- Operation
  - User position & speed fix
  - Display in real time data delivered or used by *OCTANS Nano*
  - *OCTANS Nano* Status displayed
  - System restart
  - Data output @ 5 Hz (including all navigation and quality check data)

For more control commands, refer to AHRS – Advanced Configuration user guide (ref: MU-AHRS-AN-002).

3 MECHANICAL SPECIFICATIONS

3.1 OCTANS NANO General Mechanical Specifications

Characteristics	OCTANS NANO Unit alone (see Figure 1 - OCTANS NANO housing dimensions)
Housing overall dimensions (Ø x h) in mm	∅178 mm x 237(1) mm

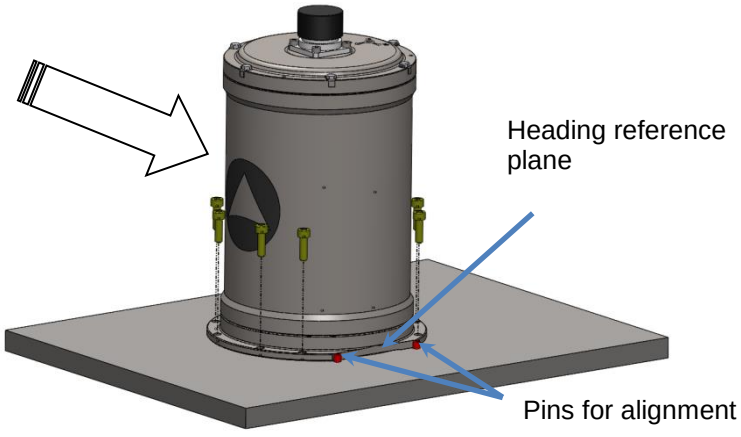
(1) Height without connector. Add 29 mm for the overall height

3.2 OCTANS NANO Mechanical Alignment

OCTANS NANO mechanical drawing is available on Figure 1.
The eight holes located on bottom plate of the product are designed for the installation mounting screws.
The OCTANS NANO heading baseline is defined by the edge located on the left side of the housing bottom plate. This reference edge is used in factory to calibrate the heading of the product.

Alignment of OCTANS Nano to vehicle axes can be carried out against precisely mechanized baseline* or by means of two centering pins* (distant from each other of maximum 85.7mm).

The smaller edge is not mechanized with same tolerance as the longer one. It is therefore recommended not to use it for the alignment process.
The OCTANS Nano left edge shall be firmly pressed against the reference baseline or pins (along +X2 direction), then OCTANS NANO has to be tighten with eight screws*.
* (not part of standard delivery).



For mechanical mounting recommendations refer to *Inertial Products - Application Note - Mechanical Integration of Inertial Systems (Ref.: MU-MECHAAPN-AN-001)*.

3.3 OCTANS NANO Center of Measurements

The OCTANS NANO center of measurement P is the intersection of the three OCTANS NANO reference axis X1, X2 and X3 defined in the *Inertial Products - Principle & Conventions* document (Ref.: MU-INS&AHRS-AN-003). It lies inside OCTANS NANO, and its exact position is reported on Figure 1.

The OCTANS NANO center of measurements P is the reference and sensing frame center of OCTANS NANO as well as reference point for external sensor lever arms. Refer to the *Inertial Products- Principle & Conventions* document *(Ref.: MU-INS&AHRS-AN-003)* for details.

.

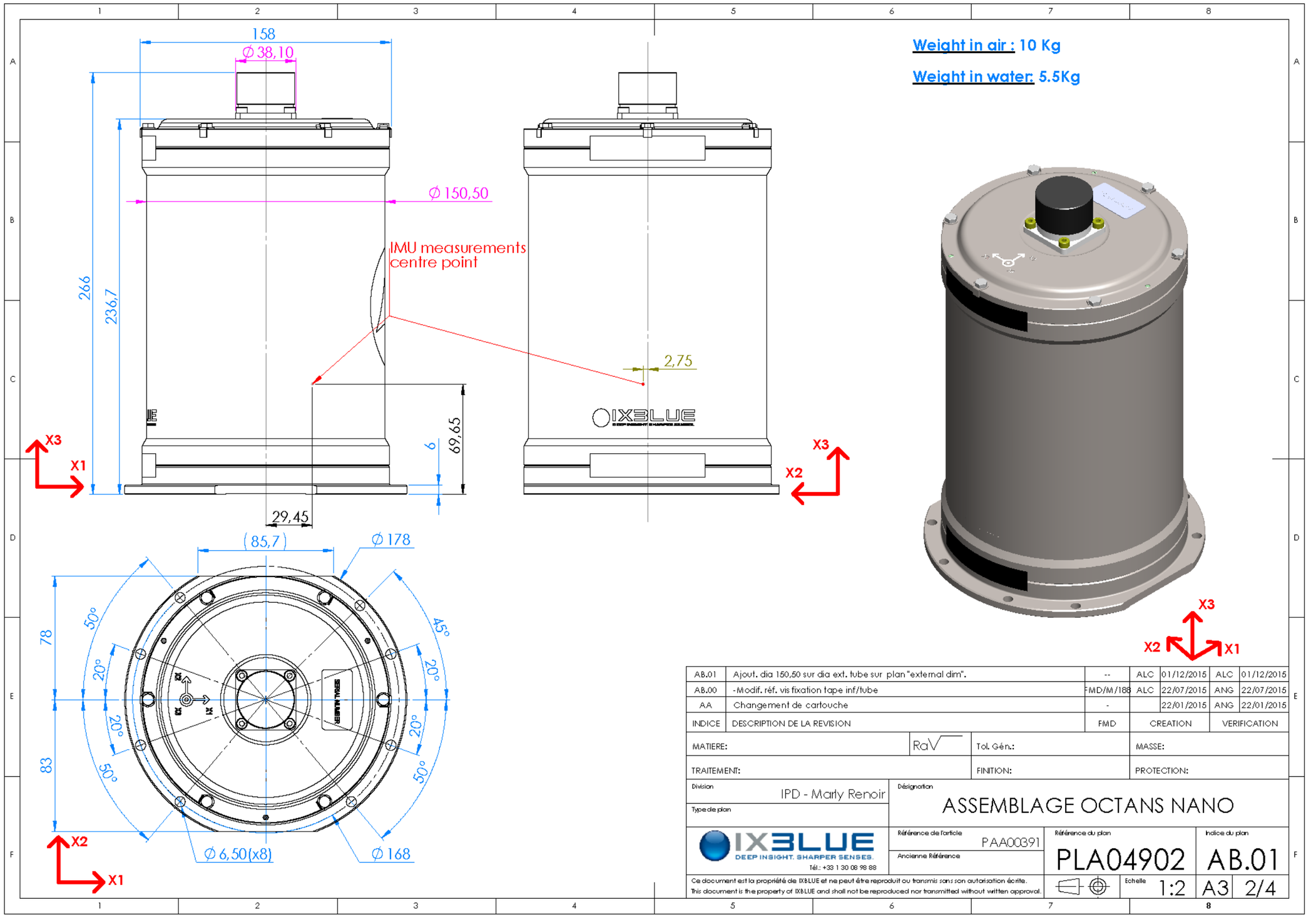


Figure 1 - OCTANS NANO housing dimensions and sensitive point P

PAGE LEFT INTENTIONALLY BLANK

4 ELECTRICAL INTERFACE SPECIFICATIONS

4.1 Overview of OCTANS NANO Electrical Interface

A single Titanium connector is available on the top view of OCTANS NANO.

This connector is SEACON MINM-FCR connector receptacle, size M 26#20 (26 pins) for powering, data output, to interface with external sensors and for configuration of the product. It is fool-proof to avoid any misconnection.

The reference of the corresponding connector to be plugged directly to the central connector receptacle is MINM-26#20-CCP-TI.

Figure 2 - OCTANS NANO top wiew with the central connector

4.2 Listing of Interfaces

OCTANS NANO is fitted with 1 connectors configured to provide the following:

	Central connector
Power system supply	X
1 Repeater and configuration port through the Central connector	RS232 or RS422
Ethernet inputs	4
Ethernet outputs	5
RS232 or RS422 inputs	2
RS232 or RS422 outputs	2
1 user-configurable pulse Input	Pulse A

The I/O port configuration is done through the Web-based User Interface. Refer to document *Inertial Products* – Marine applications – Web-based interface user guide *(Ref.: MU-INSIII-AN-021*) for details.

4.3 Central Connector Specifications

4.3.1 DEFINITION

This single connector provides power and data connections between OCTANS NANO and 3rd party equipments as well as access to the embedded Web-based Graphical User Interface (GUI) for installation, configuration and monitoring purposes.
Refer to *Inertial Products-Marine applications, Web-based interface user guide (Ref.: MU-INSIII-AN-021*) for details.

In default configuration, the Web server will be accessible using the PC Ethernet port. Alternatively, monitoring and configuration can be achieved with serial interface: computer and product would need to be configured in PPP mode (TCP/IP over serial port). Refer to Network set-up guide (Ref.; *MU-INS&AHRS-AN-005).*

4.3.2 CONNECTOR & PIN OUT

The OCTANS NANO connector is a MINM-FCR size 26#20, (26 pins).

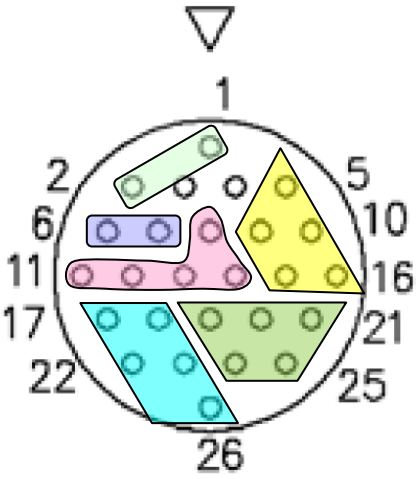


Figure 3 - Central connector

It is very important to screw the connector tight. You might feel resistance, make sure it is tightly screwed unless the sealing is not guaranteed.

The full pin assignment for the central connector is described in Table 1, see next page.

.

Table 1 – Central connector pin definition

PIN	Signal
1	**System Power In (+24 V)**
2	**System Power In GND (0/24 V) (*)**
3	*Reserved*
4	*Reserved*
5	**Repeater** : GND_R (*)
6	**Pulse A**: IN TTL
7	**Pulse A:** GND_A (*)
8	**Port A**: GND_A (*)
9	**Repeater** : RS422 TX(+)(B)/RS232 TX(+)
10	**Repeater** : RS422 TX(-)(A)
11	**Port A**: RS422 TX(+)(B)/RS232 TX(+)
12	**Port A**: RS422 TX(-)(A)
13	**Port A**: RS422 RX(-)(A)/RS232 RX(+)
14	**Port A**: RS422 RX(+)(B)
15	**Repeater** : RS422 RX(-)(A)/RS232 RX(+)
16	**Repeater** : RS422 RX(+)(B)
17	**Port B**: RS422 TX(+)(B)/RS232 TX(+)
18	**Port B**: RS422 TX(-)(A)
19	**Ethernet TX(+)**
20	**Ethernet TX(-)**
21	**Ethernet RX(+)**
22	**Port B**: RS422 RX(-)(A)/RS232 RX(+)
23	**Port B**: RS422 RX(+)(B)
24	**Ethernet RX(-)**
25	**Shield Ethernet**
26	**Port B**: GND_B (*)

(*) Serial GND pins are isolated from each other (i.e: GND_A is isolated from GND_B, GND_R...) and from power supplies GND and mechanical ground (housing).

RS232/RS422 ports have to be wired with twisted shielded pairs. Refer to section 4.4 for wiring recommendations.

4.4 OCTANS NANO Recommended Wirings

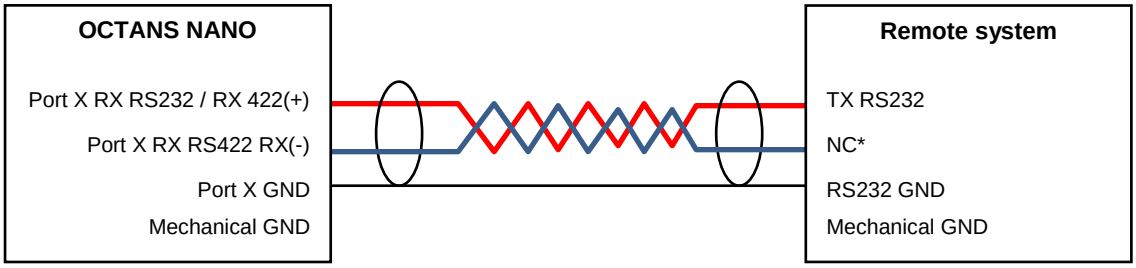
The recommended wirings with Shielded Twisted Pairs for RS232 (Output and Input), RS422 (Output and Input), and Pulse (Output and Input) cables are described hereafter.

Important

If you do not use shielded multi-twisted pairs, you may encounter cross-talk problems between input and output, and this may give error or dysfunction. Shield link should be done at one end only to avoid ground loops unless shield is used as an electrical ground.

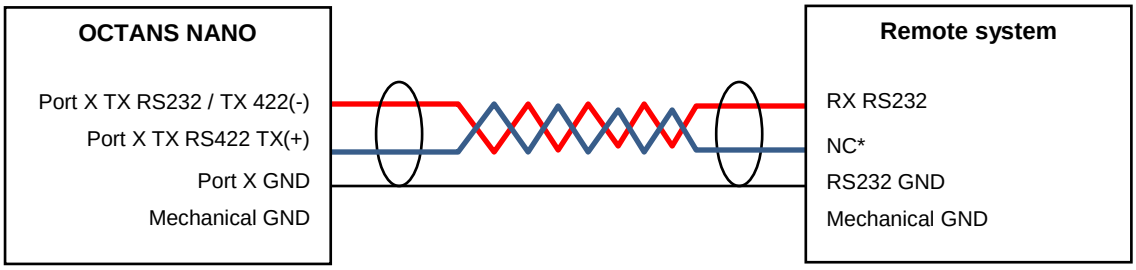
It is recommended to link external cable shielding to mechanical ground.

It is recommended to link the wires not used to the mechanical ground of the related port.



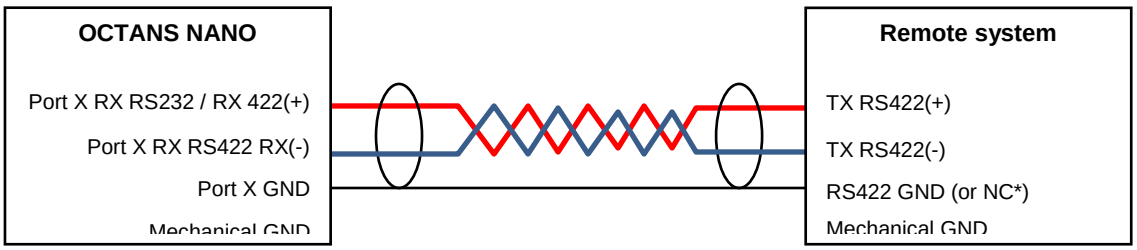
Cable is designed for subsea application and no external cable shielding is present in this cable design.

Figure 4 - RS232 reception wiring description



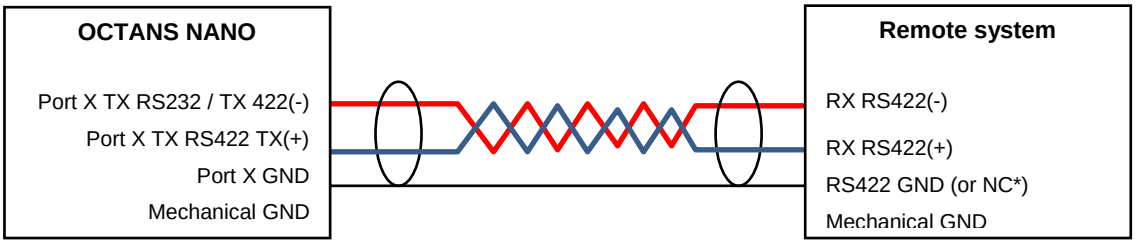
Cable is designed for subsea application and no external cable shielding is present in this cable design.

Figure 5 - RS232 transmission wiring description



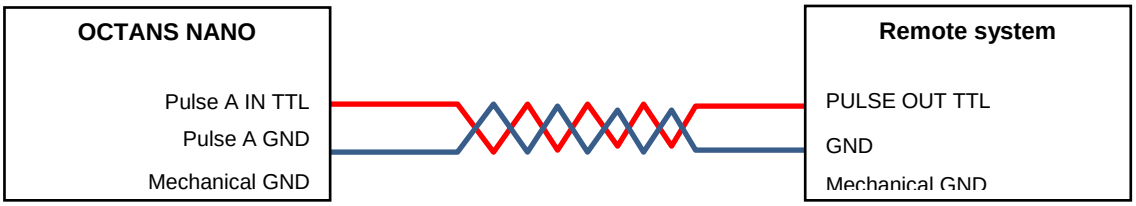
Cable is designed for subsea application and no external cable shielding is present in this cable design.

Figure 6 - RS422 reception wiring description



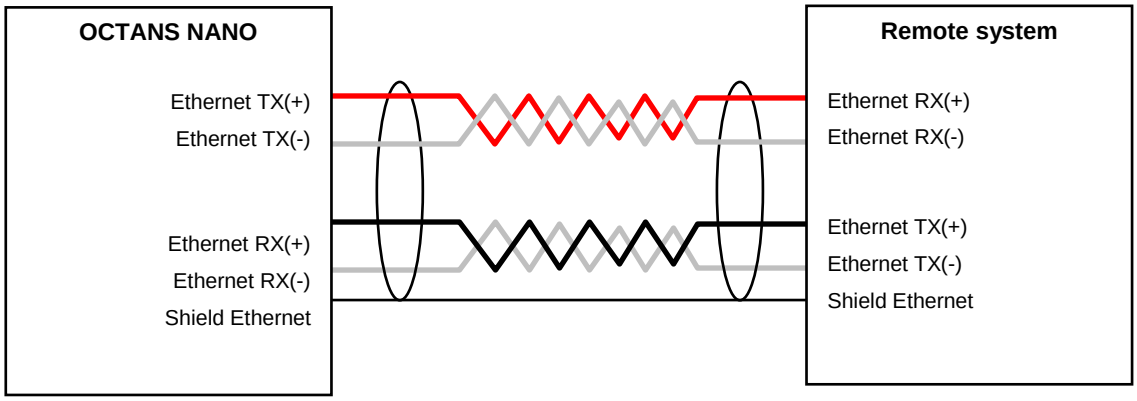
Cable is designed for subsea application and no external cable shielding is present in this cable design.

Figure 7 - RS422 transmission wiring description



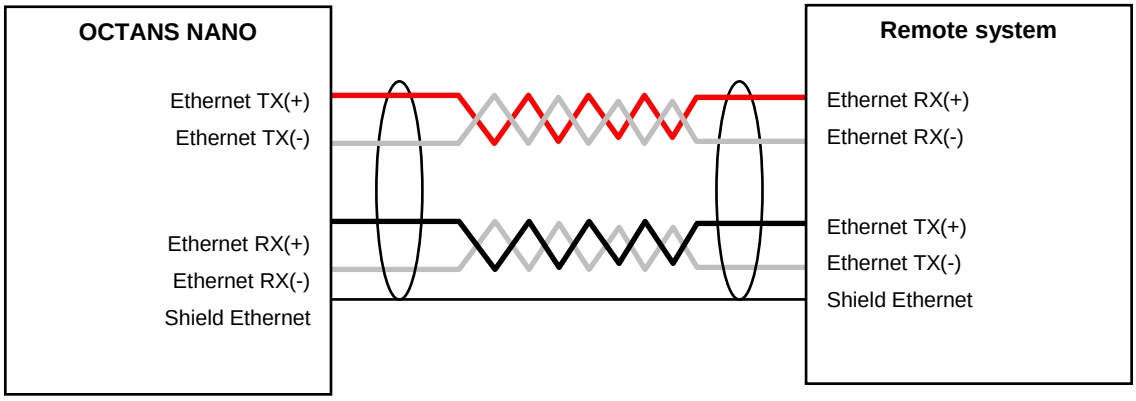
In OCTANS NANO Pigtail pulse input twisted pair has no shielding due to cable design constraint. Splice to cable with shielding is possible. Cable is designed for subsea application and no external cable shielding is present in this cable design.

Figure 8 – Input pulse reception



Cable is designed for subsea application and no external cable shielding is present in this cable design.

Figure 9 - Ethernet input/output



Cable is designed for subsea application and no external cable shielding is present in this cable design.

Figure 10 - Ethernet input/output

Example of cabling with a multi twisted pair MacArtney ref. 4622

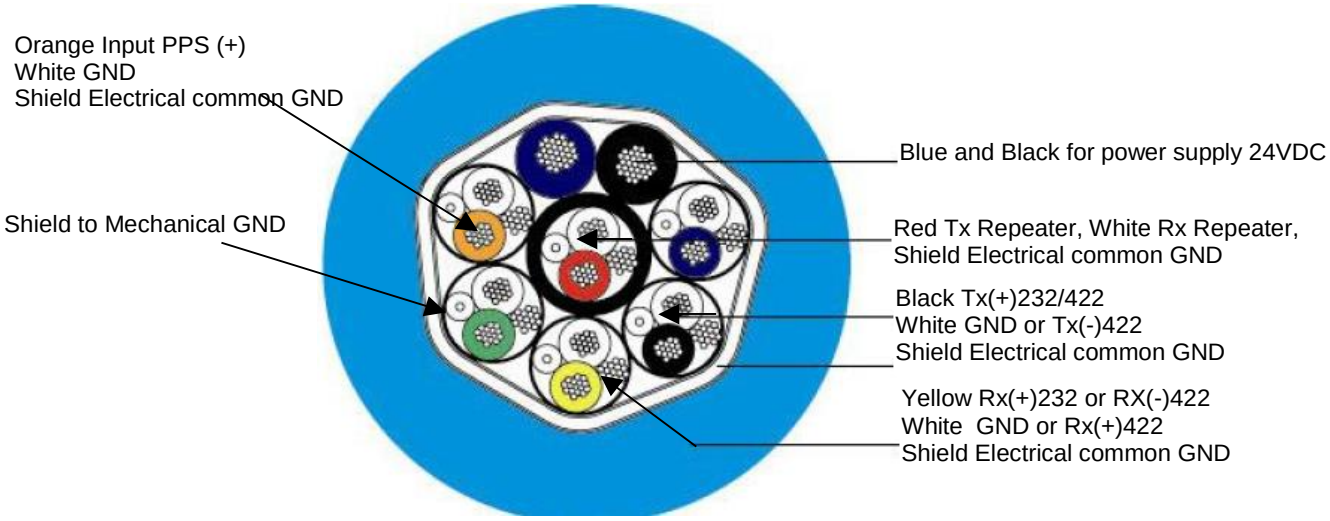


Figure 11 - Example of cabling with a Shielded Multi-Twisted Pairs