

Nucleus integration with BlueROV2

The purpose of this tutorial is to demonstrate how the Nortek Nucleus can be integrated with an ROV. To achieve this, we will be integrating it with a BlueROV2. If there are any questions with regards to this, please contact support and we will help you in any way we can.

Please keep in mind that this manual is specifically to integrate the Nucleus to BlueROV2, and steps/materials needed might differ from other integrations.

Preparation. We used:

- Nortek Nucleus
- BlueROV2
- Nortek Nucleus cable
- Cable cutters
- Screwdriver
- [Penetrator](#) to fit Nucleus cable with diameter 7.75mm
- [Ethernet switch](#)
- Heat shrink tubes
- Cable shoes
- Soldering kit

References:

- Electronic housing: The closure where all electronics are located on the BlueROV2.
- Dry end cable vs wet end cable: When referring to the wet end, we refer to the side of the cable that will be plugged into the Nucleus' connector. The dry end is attached to the BlueROV2 electronic housing.



Steps:

1. Create a static IP address to connect to the Nucleus. We have set it to '192.168.2.201'. This can be done by:

1. Download and open the Nucleus Software
2. Connect your Nucleus either through Serial or Ethernet connection.
3. Open the Terminal, and type:

1. SETETH,IPMETHOD="STATIC",IP="192.168.2.201"
2. SAVE,COMM

2. Connect the ethernet switch to the interface board.

- [BlueROV guide](#)



3. Decide where to place the Nortek Nucleus on your ROV. Things to keep in mind:

1. Use the two mounting holes in the Nucleus when attaching.
2. Avoid in front/behind thruster.
3. It is recommended to avoid placements where the Nucleus is at risk of damage in case of collision.



4. Cut the cable on the dry end, to the appropriate length. Leave a bit of extra cable.

- The cable should be able to reach the housing + ethernet switch and power internally, and Nucleus position externally.

5. Strip the cable where it enters the housing to expose the wires.



6. Feed the cable into the penetrator.

- [BlueROV guide](#)

7. Insert the penetrator into the BlueROV2.



8. Identify the Ethernet and Power wires. The other wires are for serial communication, and can be ignored/packed away safely (perhaps a shrink tube on the edge).

- The TX+, TX-, RX+, and RX- wires are used for ethernet communication, that is the white/ orange and white/green wire pairs. Refer to cable guide.

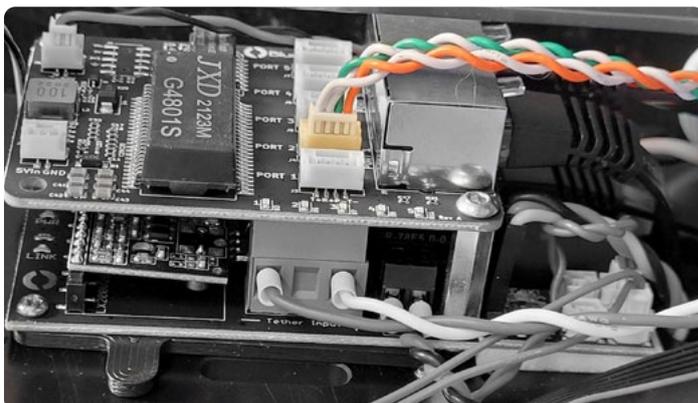
From	To	Conductor	Color	Gauge	Notes
C1.1	LW1	CBL1.White		26 AWG	TX+
C1.2	LW2	CBL1.Orange		26 AWG	TX-
C1.3	LW3	CBL1.White		26 AWG	RX+
C1.4	LW4	CBL1.Green		26 AWG	RX-
C1.5	LW5	CBL1.White		26 AWG	SYNC A
C1.6	LW6	CBL1.Black		26 AWG	SYNC B
C1.7	LW7	CBL1.Blue		26 AWG	TX232
C1.10	LW10	CBL1.White		26 AWG	RX232
C1.11	LW11	CBL1.Black		26 AWG	PWR-
C1.12	LW12	CBL1.Red		26 AWG	PWR+

9. Solder the Nucleus Ethernet cables onto the correct cables on the JST-GH connector and cover the soldered wires with shrink tubes.



10. Insert your connector in either port 2, 3 or 4 of the switch PCB.

- Make sure your cables matches the silk screen print



11. Attach a cable shoe to the power cables and connect them directly to the BlueROV2 power lines.



12. Reassemble the electronics enclosure.

13. Attach Nortek Nucelus to chosen position.

14. Perform a pressure test

- This is especially important now that we have added another cable going into the wire system. A proper pressure test of the electronic housing will ensure that it is waterproof.
- The pressure testing is a part of the original assembly of the ROV which can be seen here.

15. Power up the ROV and connect to the Nucleus through the ROV network using the static IP address.

For Nucleus driver integration with BlueOS extension, please follow the link to [GitHub](#).

