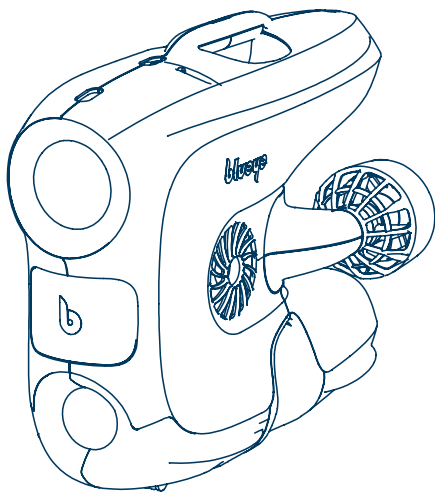


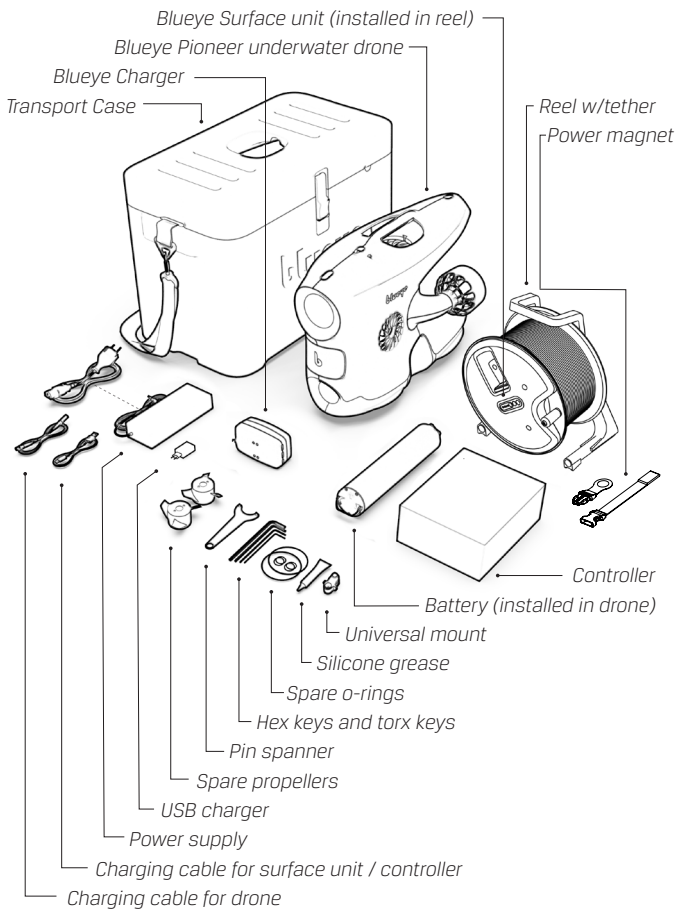
# USER MANUAL



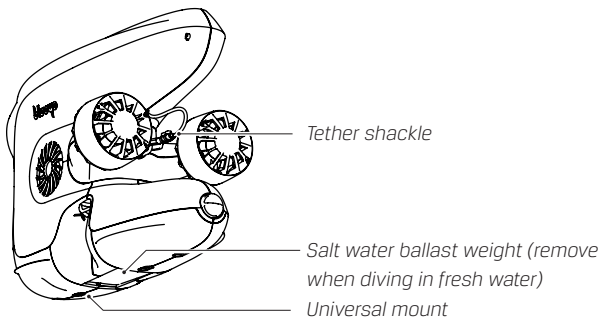
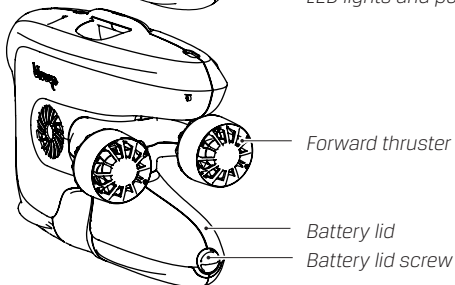
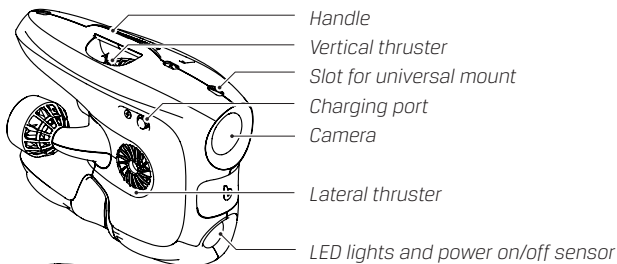
REV C

**blueye**  
PIONEER

# In the package



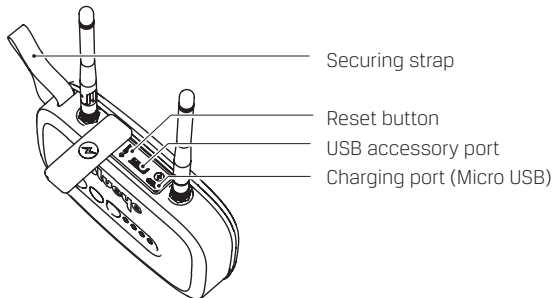
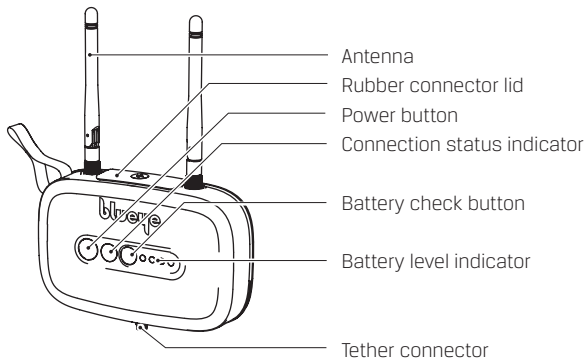
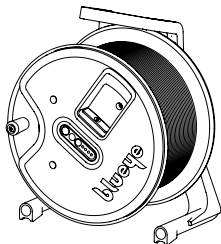
# Drone

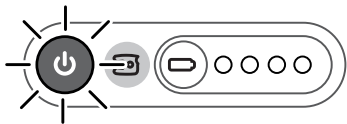


The drone is safe to submerge in water to a depth of 150 m.

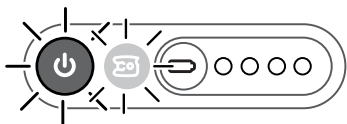
# Surface Unit

The Blueye Surface Unit(S.U.) is installed inside the tether reel. All S.U. buttons and cable ports are accessible through openings in the front cover on the reel. *If you need to separate the S.U. from the reel, use the included tools to unscrew the reel cover.*

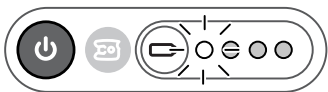




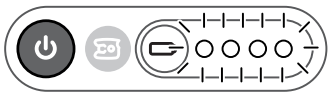
The surface unit is turned on.



The surface unit is turned on and connected to the drone.



Battery level is low. Push the button with the battery symbol to check the battery level.



Battery is fully charged. Push the button with the battery symbol to check the battery level.

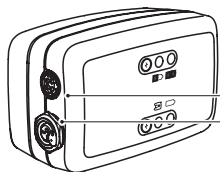


The surface unit can withstand water spray from any direction (IP64) when the rubber connector lid is properly attached. ***The surface unit CANNOT be submerged in water.***



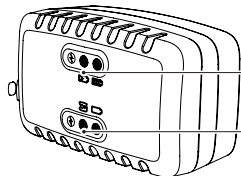
**The operator shall maintain a minimum distance of 20 cm to the surface unit.**

# Charger



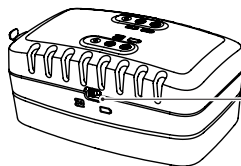
DC input

Drone charging output

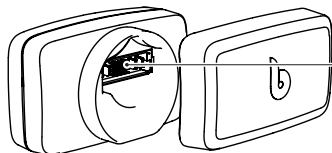


Charging status

Indicates whether the battery is selected for charging inside or outside the drone



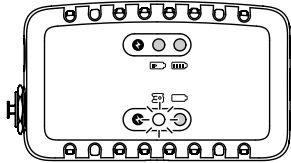
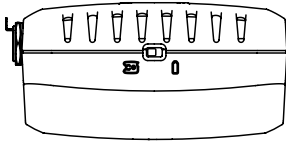
Select to charge via drone or battery



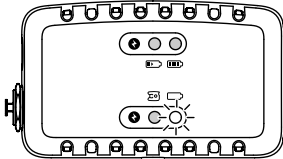
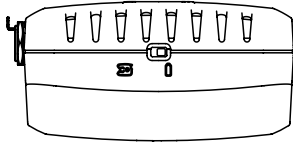
Battery charging connector



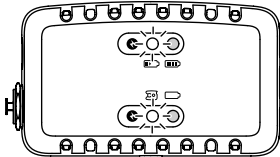
**The charger is NOT splash proof. it needs to be kept away from water and dust.**



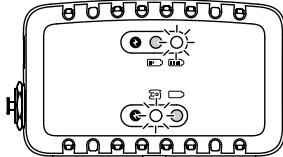
To charge the battery inside the drone with the charger cable, set the charger selector switch to the drone symbol.



To charge the battery outside the drone by connecting it directly to the charger, set the charger selector switch to the battery symbol.



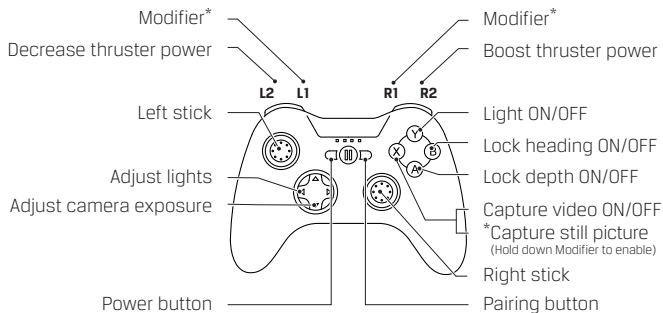
The battery is charging.



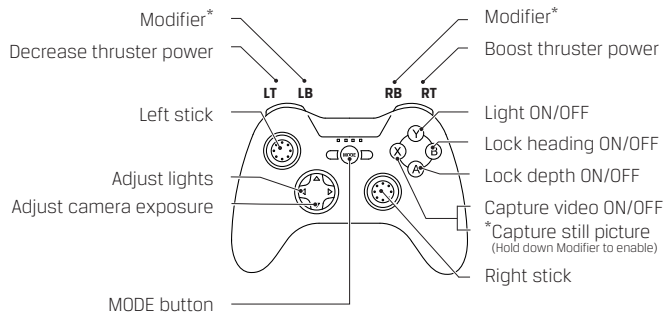
The battery is fully charged.

# Remote controller

## iOS



## Android



**Some of the buttons have multiple functions:** Press and hold down the left or right Modifier (L1 or R1) (LB or RB) to enable the (\*)-actions.





**The remote controller is NOT splash proof. It needs to be kept away from water and dust.**

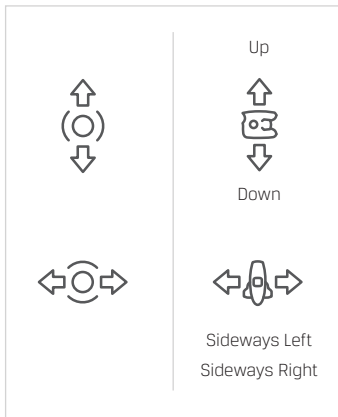


**Changes in the controller layout can occur.**

Diagrams and information regarding changes in control mapping will be provided in the Blueye App Settings and the Blueye Help Center (*support.blueye.no*). Also make sure you are updated with the latest app.

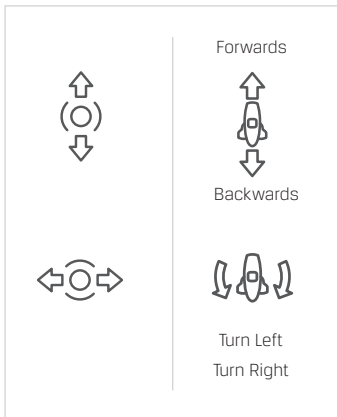
## Left stick

Up/down *and* sideways



## Right stick

Forward/backwards *and* turning



The left and right sticks controls the movements of the drone under water. Press and hold the left and right lower triggers (**L2** and **R2**) (**LT** and **RT**) to gradually decrease or boost the thrust power.

Decreasing the thrust is recommended in situations where higher precision is needed, for example stable video shoots or tricky navigation. Boosting of the thrust can be helpful when diving in higher currents or if faster motion is needed. Note that boosting will drain the battery faster.

## Modifiers

Adjust camera exposure



Press and hold down one of the **Modifiers** + Up/down **D-pad**

Capture still picture



Press and hold down one of the **Modifiers** + Press **X-button**

# Evaluating conditions and safety

Do your first few dives in line of sight in calm waters to get accustomed to the controls and the behaviour of the vehicle.

## Ok to dive



Dive down to 150 m.



The drone can handle rain and snowy weather.



Dive in open water.

## Beware



Avoid diving close to precious corals.



Beware of structures and rocks where the tether may get stuck.



Avoid diving in unknown water with very poor visibility.



Beware in areas with kelp and seaweed as the tether may get stuck.

## Beware of Wi-Fi limitations



In areas with lots of electromagnetic interference you may experience lag or artefacts in the video stream. Electromagnetic interference may be caused by large steel or concrete structures or areas with lots of other Wi-Fi activity. To resolve this you can try to move closer to the surface unit or move to another location.

 **Beware**

---



Children should only operate under the supervision of adults.

 **DO NOT DIVE**

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Currents greater than 1,5 m/s.



Keep tether away from propellers.



Keep a safe distance of 20 m from people.



During thunder storms.

 **SAFETY**

---



NEVER drop the surface unit into water.



DO NOT spin thrusters in air, they rely on water as lubricant for the bearings.

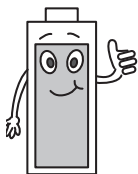


DO NOT touch spinning propellers.



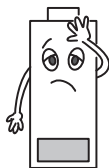
DO NOT turn on the lights in air to prevent the LEDs from overheating.

# Preparing for launch



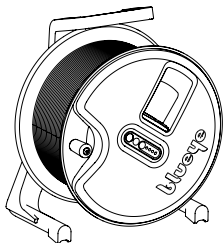
**80%**

Make sure the batteries on the drone, surface unit, controller and mobile device are at least 80% charged before you go diving.



**20%**

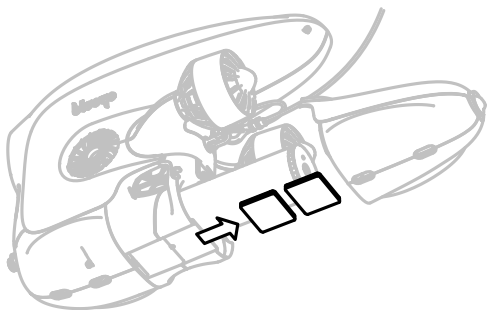
When the battery in the drone reaches 20% when diving, go back to shore.



Make sure to place the tether reel in a steady and secure position, to avoid that the reel and surface unit gets dragged into the sea.

It's recommended to tie/secure the reel to something stationary, like the boat, dock railing or a tree.

## Ballast weights



Sea water and fresh water have different density, and ballast weights are provided to compensate for the difference.

### **Configurations:**

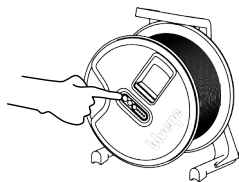
Fresh water:	no ballast weights
Brackish water:	1 ballast weight
Salt water:	2 ballast weights

Variations in salinity may occur. Always check that the drone floats before diving. If not, remove a plate.

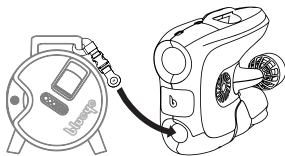
# Turn on & connect



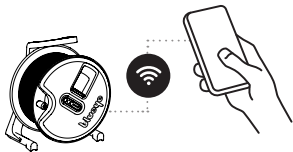
**Download the Blueye App.** Search for "Blueye" in the App Store or Google Play. To avoid interruptions during the dive, put the mobile device in Airplane mode before diving. Make sure that Wi-Fi and Bluetooth are still on.



**Turn on the surface unit** by pressing the power-on button. The power button will light up and the surface unit will initialize. The battery status LEDs will sweep from side to side. Once the initialization is completed the battery status LEDs will show the current battery charge.

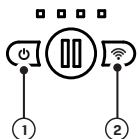


**Turn on the drone** by putting the "ON" side of the magnet against the LED light window until a melody is played and lights start blinking. The magnet is attached to the reel.



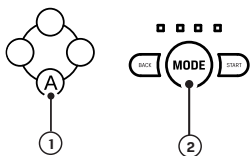
**Connect the drone to a mobile device:** go to Wi-Fi settings, connect to "**Blueye\_XXXXXX**". The default password is: **1234567890**.



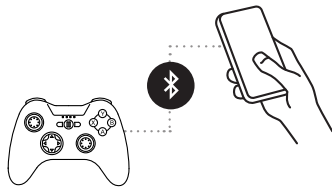


### Turn the controller in pairing mode

**iOS:** Press and hold the power button **(1)** until all LEDs start blinking red, then hold the Bluetooth button **(2)** for about 5 seconds until the LEDs start blinking at a faster rate.



**Android:** Press A button **(1)** and then the MODE button **(2)** at the same time until a blue LED starts blinking at a fast rate.



### Connect the controller

To connect the controller to a mobile device, go to Bluetooth settings and select the controller. The name of the iOS controller is **Speedy Gaming Controller** and on Android the name is **PXN-9613**. (May appear as «00:11:22:33:FF:EE» first time).

If the controller is not found or you are unable to connect, re-start the controller and turn Bluetooth off/on.

# Calibrating the drone compass



**Do not calibrate your compass where there is a chance of strong magnetic interference, such as magnetite, large steel structures or steel reinforcements underground.**

It is recommended to calibrate the compass in the following situations:

- Before the first dive after receiving your drone
- Diving at a new location after traveling with your drone
- When the Blueye app warns you that the compass needs calibration

## Compass Calibration



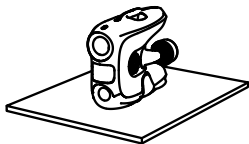
1. Tap the "Compass Calibration" button under "Drone Settings" in the app, then follow the on-screen instructions.
2. Hold the drone vertically and turn around 360°. Flip the drone upside down and turn back around 360°.



3. Hold the drone lying on its side and turn around 360°. Flip the drone so that it is lying on its other side and turn back around 360°.



4. Hold the drone with the camera pointing up and turn around 360°. Flip the drone so that the camera is pointing down and turn back around 360°.



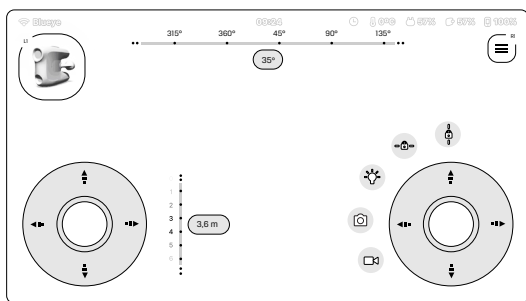
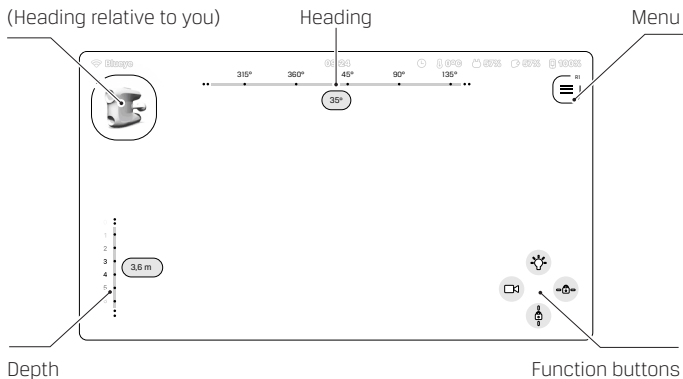
5. Place the drone securely on a horizontal surface and tap "Finish calibration" in the app. Wait for the drone to finish the calibration process.

# App

## App layout

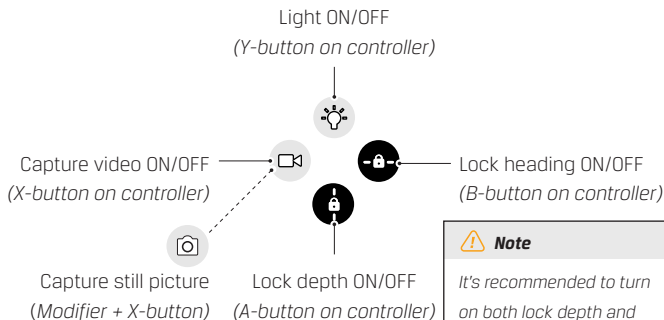
3D-view of drone

(Heading relative to you)



Tap the screen to open the touch interface controller.

## Function buttons



 **Note**

*It's recommended to turn on both lock depth and lock heading for easier manoeuvrability.*



**CHANGES IN THE CONTROLLER LAYOUT CAN OCCUR.**  
Updated information and diagrams of the control mapping is displayed in the Blueye App Menu. For more detailed information regarding the app layout and functions please visit the Blueye Help Center at [blueye.no](http://blueye.no)

# Diving



Lower the drone slowly into the water by hand. A boat hook can also be used from heights.

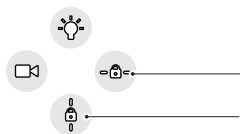


It's not recommended to lower the drone by the tether as this will shorten the lifetime of the tether.



**DO NOT** throw the drone into the water.

# Ending a dive



Before picking the drone up from the water, make sure that both lock depth and lock heading are turned off. If not, the thrusters will try to compensate for movements also when the drone is out of the water.



Pick up the drone from the water.

## End dive in app

Press the drone icon in the top left corner and hit the «End Dive» button.

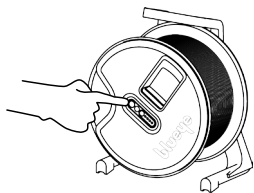
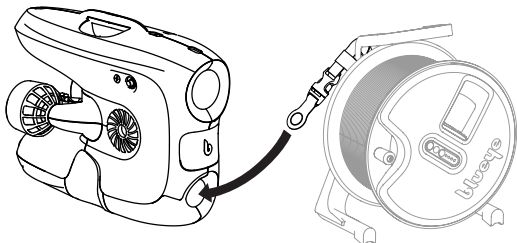
## Transfer files

Press the «Transfer video files» button to transfer videos and images to a mobile device directly after the dive. The connection screen will appear in the app. Tap «Download video files» to choose which files to download to the mobile device.

*For more information see «Transferring videos and images» on page 26.*

## Power OFF the system

When finished with the dive, make sure that both the drone and the surface unit are turned off.



The drone is turned off by putting the "OFF" side of the magnet against the LED light window on the drone. The magnet is attached to the reel. When the drone is turned off all indicator lights in the LED light window will be off. Turn off the surface unit by pressing the power button.

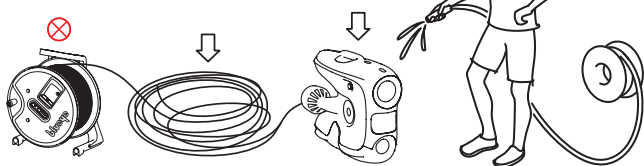


# After each dive in salt water

## Rinse drone and tether

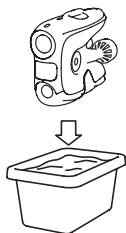
To avoid unnecessary wear on the drone and tether, rinse with fresh water after each dive.

The drone can either be submerged in fresh water (indoors and outdoors) *or* rinsed with a garden hose. Running the thrusters submerged in fresh water after each dive will keep them in shape longer.



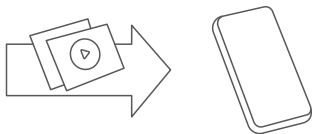
The tether should also be rinsed when used in salt water. Unroll the tether from the reel to **keep the Blueye Surface Unit away from the water.**

Also check the thrusters and remove any foreign objects, for example sea weed. Instructions for changing propellers can be found in the Blueye Help Center at [support.blueye.no](http://support.blueye.no)



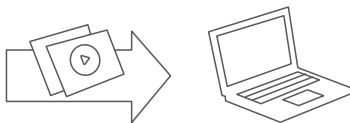
# Transferring videos and images

Transferring video and images from the drone can either be done in the app or on a PC.



**To transfer videos and images to a mobile device**, turn on the drone and the surface unit, connect the mobile device to the surface unit Wi-Fi, start the app, and choose "Transfer video files".

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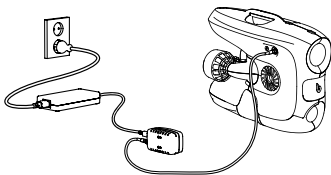
## **To transfer videos and images to a PC**

1. Go to this address: [www.blueye.no/Software/FileTransfer](http://www.blueye.no/Software/FileTransfer)
2. Download and install the Blueye File Transfer Desktop App on the computer.
3. Turn on the drone and the surface unit and connect the computer to the surface unit Wi-Fi.
4. Open the Blueye File Transfer Desktop App and choose which files to download to the computer.
5. Turn off the drone when files have been transferred.

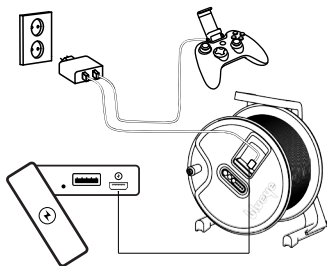
# Charging the batteries

Before charging the drone make sure that the drone is turned off. Connect the power supply to the charger and to an electrical socket. Make sure that the charger switch is set to the drone symbol. *See page 7.*

Place the drone on a robust and stable surface to remove any risk of the drone falling over (preferably laying on the side). Unscrew the charging cap on the drone and connect the charger to the charging port on the drone with the included charging cable.



Open the connector lid on the surface unit and connect an external USB charger to the charging port (micro USB). Make sure the USB output rating is minimum 2.1 A. Use the other USB output on the external USB charger to charge the controller.



After all components are fully charged, disconnect the plugs from the electrical socket.

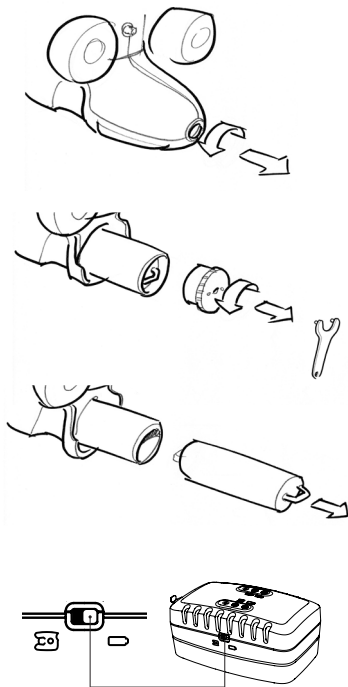


**Do not turn the drone on while charging, it may damage the drone and/or charger. When finished charging remember to put the charging connector cap back on.**

# Charging the battery outside of drone



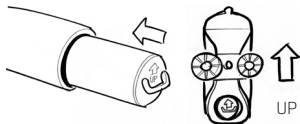
**Warning: We recommend charging the battery inside the drone as often as possible, to limit wear of the o-rings on the aluminium lid.**



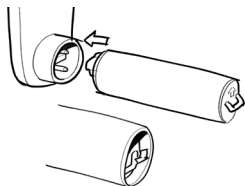
1. Open lid.
2. Unscrew the aluminium lid with the pin spanner to open it.
3. Pull out the battery.
4. Make sure that the switch on the charger is set to the "battery" symbol when charging.
5. Remove the blue cover on the charger and connect the battery directly to the back of the charger. Then connect the charger to an electrical outlet.



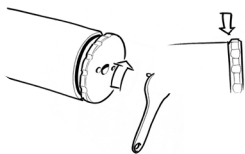
6. Inspect o-ring for damages. Put a small amount of silicone grease on the o-ring before closing the lid.



7. Insert the battery. Make sure that the arrow on the battery is pointing upwards.



8. Make sure that the battery is pushed all the way in. There are two guiding pins at the bottom of the battery canister that will align the battery with the connector. Fold down the handle.



9. Close the aluminium lid with the pin spanner. Make sure to not tighten the lid too much, but there shouldn't either be a large gap between the aluminium lid and the aluminium tube. Be careful to not damage the threads of the lid when closing.



10. Close the battery lid by sliding it along the battery tube. The battery lid cannot be pushed all the way in. Tightening the thumb screw will move the lid into place.

# Maintenance/Service



**Always remove battery from drone before replacing parts. Do not open or detach any parts other than described in the maintenance procedure. Any maintenance work not included in the list is forbidden**

## List of servicable parts:

- Propeller
- Tether\*
- Thrusters\*

*\*See seperate service manuals and online video tutorials.*

## Video tutorials

You can find video tutorials on how to perform maintenance work on the Blueye drone under *Tutorials* at [support.blueye.no](https://support.blueye.no)

# Propeller replacement



**Ensure that the propeller direction of the replacement propeller is the same as the one being replaced.** The propellers are marked with CW (clockwise) or CCW (counter-clockwise).

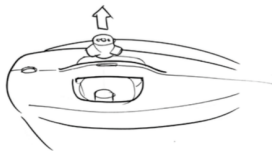
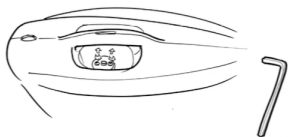
If one of the propellers is broken, they can easily be replaced with a spare propeller. Cleaning the propeller should also be done regularly, especially if diving in salt water.

## Vertical propeller replacement

Remove the grid on top and unscrew the propeller to replace it with a new one.

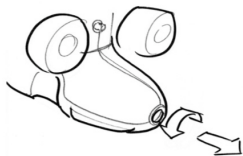


1. Remove the grid on the top.

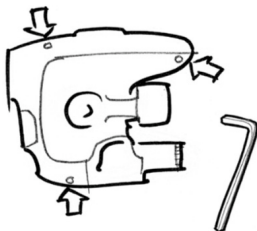


2. Unscrew the propeller with a hex key.

## Lateral propeller replacement



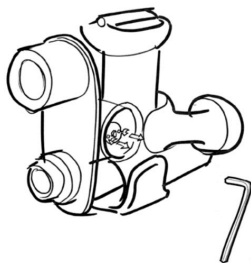
1. Remove the battery cover.



2. Unscrew the 3 screws that hold the side covers with a hex key.

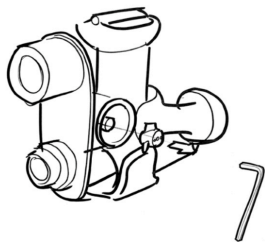


3. Open the side cover.



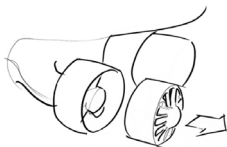
4. Unscrew the 2 screws holding the propeller.



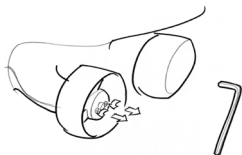


**5.** Pull the propeller out to replace it with a new one.

## Forward/Backwards propeller replacements



1. Unscrew the 4 screws holding the thruster grids in place.
2. Remove the grid.



3. Unscrew the 2 screws holding the propeller.
4. Pull the propeller out and replace the propeller with a new one.

# Specifications Blueye Pioneer

## Drone specifications

### Drone

Ingress protection	<i>IPX8</i>
Dimensions	<i>485 x 257 x 354 mm (LxWxH)</i>
Weight in air	<i>8.6 kg (with salt water ballast)</i>
Construction	<i>ABS enclosures, Aluminium pressure enclosures, Polycarbonate (PC) windows</i>
Buoyancy material	<i>HCP 30 Polymer Foam</i>
Maximum rated depth	<i>150 m</i>
Forward speed at normal use	<i>1.5 m/s (3 knots)</i>
Thrusters	<i>4 x 350 W</i>
Run time at normal use	<i>Approx. 2 hours</i>
Operating temperature	<i>-5 to +35 °C</i>

### Camera

Sensor	<i>CMOS, 1/3 inch</i>
Max image size	<i>1920 x 1080 pixels</i>
Shutter speed	<i>1/30 s - 1/8000 s</i>
Picture max resolution	<i>2M (1920 x 1080)</i>
Picture type	<i>JPEG</i>
Video resolution	<i>FHD: 1920 x 1080 25/30 Fps, HD: 1280 x 720 25/30 Fps</i>
Video type	<i>MP4</i>
Video storage bit-rate	<i>2 to 16 MBit/s</i>
SD card	<i>64 GB</i>

## **LED lights**

Luminous flux	<i>3300 Lumen</i>
Colour temperature	<i>5000 K</i>
Colour rendering index (CRI)	<i>70</i>
Adjustable dimming	<i>Yes</i>

## **Smart Battery Pack**

Nominal Voltage	<i>14.8 V</i>
Nominal Capacity	<i>6500 mAh</i>
Nominal Energy	<i>96.2 Wh</i>
Operating temperature	<i>-5 to +35 °C</i>
Charging temperature	<i>+5 to +30 °C</i>

## **Sensors**

IMU	<i>3 axis gyro &amp; accelerometer &amp; magnetometer</i>
Depth sensor	<i>Resolution: 0.2 mbar</i>
Depth sensor operating range	<i>0 to 30 bar</i>
Temperature sensor	<i>+/-1 °C</i>

## **Tether**

Length	<i>From 75 m</i>
Breaking strength	<i>100 kg</i>
Number of cables	<i>1 twisted pair (copper)</i>
Size	<i>26 AWG</i>

## **Controller**

Compatibility	<i>iOS or Android</i>
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## Surface Unit specifications

### Surface Unit

Ingress protection	<i>IP64</i>
Dimensions	<i>38 x 149 x 158 mm (LxWxH)</i>
Operating frequency	<i>2.4 GHz / 5.8 GHz</i>
Max Wi-Fi distance	<i>30 m</i>
Battery	<i>19.48 Wh</i>
Operating temperature	<i>0 to +35 °C</i>
Charging temperature	<i>+10 to +35 °C</i>
Transmitter power	<i>125 mW</i>
Operating voltage	<i>5 - 8.4 V</i>
Output, USB A	<i>5 V, 400 mA</i>
Input, Micro USB	<i>5 V, 2.1 A</i>
Antenna	<i>Dual-band 3dBi RP-SMA Male</i>

## Charger specifications

### Charger

Dimensions	<i>56 x 107 x 64 mm (LxWxH)</i>
Operating temperature	<i>+5 to +30 °C</i>
Operating rel. humidity	<i>20% to 80%</i>
Input	<i>19.5 V, 4 A</i>
Output	<i>16.8 V, 2.5 A</i>

## Power supply

Input	<i>100 - 240 V, 3A, 50 - 60 Hz</i>
Output	<i>19.5 V, 11.8 A</i>
Operating temperature	<i>0 to +40 °C</i>
Operating rel. humidity	<i>20% to 80%</i>
Manufacturer	<i>FSP GROUP</i>
Model	<i>FSP230-AJAN3</i>

# Symbol overview

## Drone



Standby



Charging. Shows where to connect the charging cable.

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## Charger



Charging symbol



Battery charging symbol



Drone symbol



Battery fully charged symbol



Battery symbol

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## Surface unit



Standby



Battery checking.



Drone. Lights up when the surface unit is turned on and it is connected to the drone.



Charging. Shows where to connect the charging cable.

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## Markings



Waste Electrical and Electronic Equipment (WEEE as in directive 2012/19/EU) should not be mixed with general household waste.



CE (Conformité Européenne) indicates compliance with requirements regarding the safety, environmental impact, health, and consumer protection for products sold within the European Economic Area. The full text of the EU declaration of conformity is available at the following internet address: [www.blueyero-botics.com](http://www.blueyero-botics.com).



Changes or modifications to the equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio

communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- *Reorient or relocate the receiving antenna.*
- *Increase the separation between the equipment and receiver.*
- *Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*
- *Consult the dealer or an experienced radio/TV technician for help.*

## **ISED**

This Device complies with Industry Canada License-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage ; (2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

It is strictly prohibited to replace the antenna by any antenna not approved by Blueye.



## Recycling information



This product should not be disposed of in the general household waste. Instead, in order to prevent possible harm to the environment or human health from uncontrolled waste disposal, please dispose of this product separately in accordance with your local laws and regulations. Please check with your Local Authority or retailer for recycling advice.

## Manufacturer markings

Marking plate for the drone can be found on the outside of the tube containing the battery. See section "Charging the battery outside of drone" for instructions on how to gain access to the battery tube.

# Battery warnings

The following warnings apply to both the Blueye Surface Unit and the Blueye Smart Battery.

**Important: Blueye Surface Unit battery is only accessible to Blueye service personnel and cannot be accessed by any means by the user or operator. Only the Blueye Smart Battery can be accessed by the user or operator.**

- **CAUTION: RISK OF EXPLOSION IF (Drone) BATTERY IS REPLACED WITH AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.**
- Do not dispose batteries in household waste. Obey local waste disposal regulations. Do not subject the battery to mechanical shock.
- Observe the plus (+) and minus (-) marks on the battery and equipment and ensure correct use.
- Always purchase the battery and charger from Blueye Robotics.
- Keep the battery clean and dry.
- Wipe the battery terminals with a clean dry cloth if they become dirty.
- The battery needs to be charged before use. Always use the correct charger and refer to the Start Guide for proper charging instructions.
- Do not leave the battery in prolonged charge when not in use.
- After extended periods of storage, it may be necessary to charge and discharge the battery several times to obtain maximum performance.
- Retain the original product literature for future reference.
- Use the battery only for the application for which it was intended.
- When possible, remove the battery from the equipment when not in use.
- Only charge the drone battery with the supplied charger. A charger that is suitable for one type of battery pack may create a risk of fire when used with another battery pack.
- When battery pack is not in use, keep it away from other metal objects, like paper clips, coins, keys, nails, screws or other small metal objects that can make a connection from one terminal to another. A short-circuit of the

- battery terminals can lead to burns, fire and serious injury.
- Under abusive condition, liquid may be ejected from the battery; avoid contact.
  - If contact accidentally occurs, flush with water. If liquid contacts eyes, additionally seek medical help. Liquid ejected from battery may cause irritation or burns.
  - Do not use a battery pack or appliance that is damaged or modified. Damaged or modified batteries may exhibit unpredictable behavior resulting in fire, explosion or risk of injury.
  - Do not expose a battery pack or appliance to fire or excessive temperature. Exposure to fire or temperature above 130 °C (266 °F) may cause explosion.
  - Follow all charging instructions and do not charge the battery pack outside of the temperature range specified in this instruction. Charging improperly or at temperatures outside the specified range may damage the battery and increase the risk of fire.
  - Do not open, modify or attempt to repair the battery pack.
  - Do not charge the battery pack in a damp or wet environment.
  - Do not cover the charger or the battery pack with cloth or anything else. The charger and battery pack heats up during charge and lack of ventilation may result in fire or serious injury.
  - Do not use the battery pack for appliances that it is not intended for.
  - Keep battery packs and chargers away from children if not thoroughly supervised.
  - Failure to comply with these warnings can lead to explosion, fire, leakage and/or serious injury.

*FOR MORE TIPS,  
TUTORIALS AND VIDEOS VISIT  
**[WWW.BLUEYEROBOTICS.COM](http://WWW.BLUEYEROBOTICS.COM)***

**blueye**