

**01** 1.6-inch Circular Touch Screen  
Lens & Camera Data/Parameter Display & Control

**02** [REC] Button  
01 Single Press: REC Run/Stop Function  
02 Long Press 3s: Power On/Off  
03 Long Press 8s: Force Power Off

**03** Control Rocker  
Control One Assigned Motor

**04** [FUNC] Button  
01 Set Marks  
02 Hold to Calibrate Lens

**05** Rotation Limit Switch  
Switch TF/DF Mode  
(TF Mode: Compatible with TILTA Wireless Follow Focus Systems;  
DF Mode: Compatible with DJI Follow Focus Systems)



↑ Switch Up to TF Mode ( Limits Focus Knob Rotation to 360 Degrees )

↓ Switch Down to DF Mode ( Focus Knob can Rotate Freely )

**06** NATO Mount  
For Mounting the Hand Unit

**07** Electronic Contact Points  
01 Power the hand wheel controller via the Power Handle or Control Handle  
02 Compatible with other external devices for data transmission

**08** Safety Pin  
Prevents Accidental Disconnection

**09** Tie Down  
Lock to Secure a NATO Accessory

**10** USB-C Port  
For PD Fast Charging

**11** Hand Wheel  
Motor/Parameter Control

## FEATURES



Circular Touch Screen  
Dynamic Interaction/350ppi



USB-C  
Supports PD Fast Charging



Built-in High Capacity Battery  
with Extended Life  
Continuous Operation for Over 7 Hours  
& Smart Standby up to 20 Hours

## TECHNICAL DATA

• Material: Aluminum Alloy+Plastic

• Dimensions: 73\*72\*53mm

• Weight : 175g

• Color : Black

## BATTERY USAGE GUIDELINE



Built-in Battery Capacity  
**3.7V 1800mAh 6.66Wh**

(1) Operating Temperature: Charging: 0°C to 45°C (32°F to 113°F); Discharging: -10°C to 60°C (14°F to 140°F)

(2) Storage Temperature: -5°C to 45°C (23°F to 113°F)

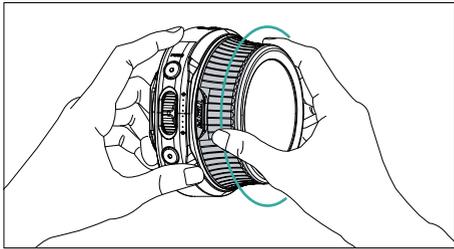
(3) Operating Humidity: 45±20% (Recommended)

(4) Warranty Period: 12 months and less than 500 charge cycles

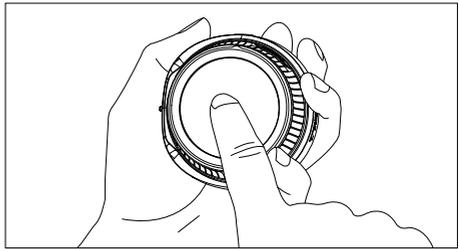
# 14 USE THE HAND UNIT

## USE INDEPENDENTLY

The focus motor can be controlled by operating the hand wheel or using the control rocker.



The Nucleus-N II and some camera settings can be controlled through the touch screen.



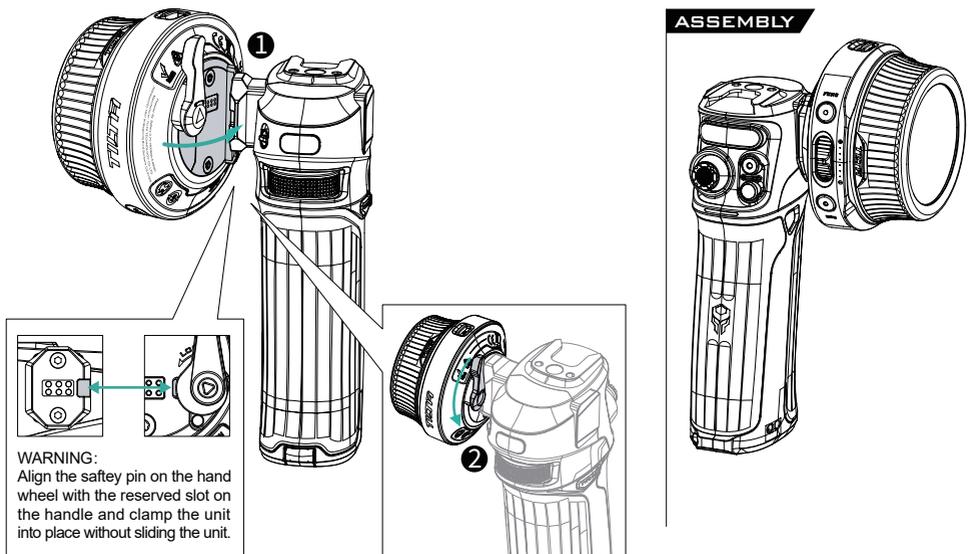
## ATTACH TO OTHER ACCESSORIES

The Nucleus-N II hand unit features a NATO quick-release mount, allowing it to be attached to NATO rail. (such as NATO rail on the side of a camera cage or DJI RS 2/RS 3 Pro, etc..)

**Note:** When assembling and disassembling, pay attention to the contact pins on the Control Handle to prevent damage from external force.

### USE WITH THE NUCLEUS NANO II CONTROL HANDLE (as shown below)

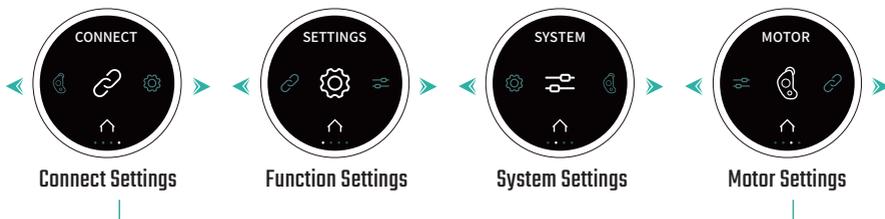
Attach the hand unit to the Control handle using the NATO mount, lock the tie down to secure.



**WARNING:**  
Align the safety pin on the hand wheel with the reserved slot on the handle and clamp the unit into place without sliding the unit.

The Nucleus-N II hand unit UI consists of Three Main Screens and Four Settings Menus. The Three Main Screens include the Camera Control Interface, Motor Parameter Interface, and Focus Distance Interface. The Four Settings Menus are Connect Settings, Function Settings, System Settings, and Motor Settings.

After turning on the device, the hand wheel controller will enter the main Interface. Swipe left or right to switch between the Three Main Screens. Swipe up from the bottom of the screen to access the Four Settings Menus. Swipe left or right to select the desired settings menu and tap the center icon to enter the secondary menu.



Swipe up from the bottom



Camera Control Interface- REC



Camera Control Interface- STBY

- 13 Camera Settings Lock Button
- 14 REC/STBY Indicator
- 15 Iris Info
- 16 ISO Info
- 17 Communication Protocol Info
- 18 Recording Run Time
- 19 Shutter Speed Info
- 20 Color Temperature Info
- 21 Resolution/ Data Rate/ Frame Rate



Motor Parameter Interface

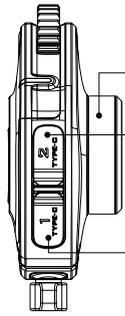
- 01 WIFI Status
- 02 Wireless Channel Indicator  
A: Automatic Channel Mode  
M: Manual Channel Mode  
Number: Channel No.
- 03 Motor Parameter (0-999)
- 04 Motor Indicator  
FOCUS Indicator / IRIS Indicator / ZOOM Indicator
- 05 Additional Settings (Swipe Up)
- 06 AF/MF Switch Button
- 07 Battery Information
- 08 Bluetooth Status
- 09 REC/STBY Indicator
- 10 Focus Knob Range Indicator
- 11 Set Mark Button
- 12 Touch Screen Lock Button



Focus Distance Interface

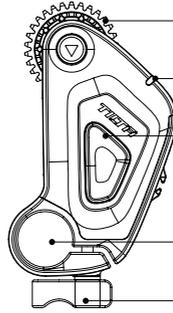
- 22 Focus Distance
- 23 Lens Manufacturer
- 24 Lens Model
- 25 Focal Length Info
- 26 Set Mark Button

# 16 INTRODUCING NUCLEUS NII MOTOR



< Left Side >

- 01 Motor Driver
- 02 USB-C Port 2  
Supports PD input,  
(input voltage: 7.4V-16.8V)  
Supports USB-C to C  
control cables
- 03 USB-C Port 1  
Supports PD Input/Output,  
(input voltage: 7.4V-16.8V)  
Supports USB-C Run/ Stop  
cables



< Rear Side >

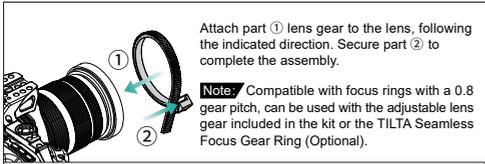
- 04 0.8M Lens Gear  
Connects to Lens
- 05 LED Indicator
- 06 Function Button  
Single-Click : Switch Motor  
FOCUS/IRIS/ZOOM/OTHERS  
Double-Click : Enter Pairing Mode  
Long Press 3s : Calibrate Lens
- 07 15mm Rod Holder  
For Mounting via a 15mm Rod
- 08 Tie Down  
For securing the Motor

## TECHNICAL DATA

- Material: Aluminum Alloy+Plastic
- Dimensions: 83\*46\*31mm
- Weight: 80g
- Color: Black

## ATTACHING MOTOR TO LENS

### (1) Attaching Lens Gears



Attach part ① lens gear to the lens, following the indicated direction. Secure part ② to complete the assembly.

**Note:** Compatible with focus rings with a 0.8 gear pitch, can be used with the adjustable lens gear included in the kit or the TILTA Seamless Focus Gear Ring (Optional).

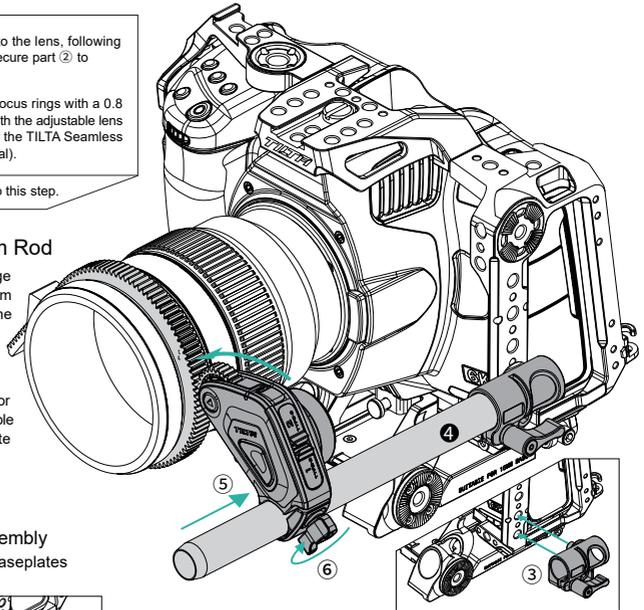
Note: If the lens comes with a 0.8 module gear ring, skip this step.

### (2) Attaching the Rod Holder & 15mm Rod

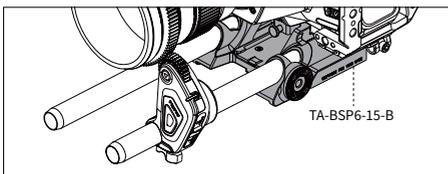
Attach the ③ rod holder to the 1/4" thread on the cage side arm, and tighten the screw. Then, secure the 15mm rod ④ to the rod holder, which will be used to attach the motor.

### (3) Attaching the Motor

Mount the ⑤ motor onto the 15mm rod, adjust the motor angle, and then engage the motor gear with the adjustable lens gear and then tighten the tie down ⑥ to complete the assembly.



Optional TILTA rod adapters for motor assembly  
Including: 15mm Single Rod Holders and LWS Baseplates



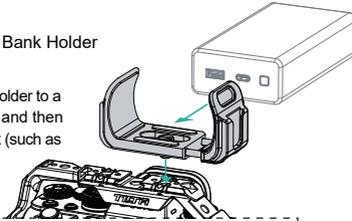
TA-BSP6-15-B

# 17 MOTOR POWERING GUIDELINE

You can use TILTA's Universal Power Bank Holder or TILTA's L Series Battery Plate (Optional) for supporting various power options, in order to supply power to the focus motor via the USB-C port (PD protocol).

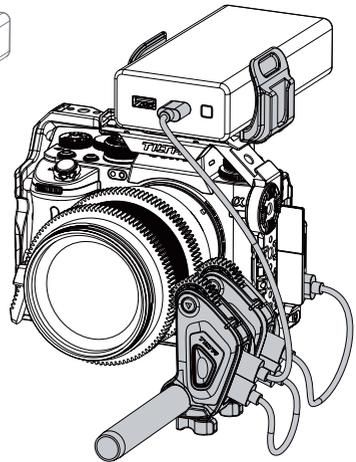
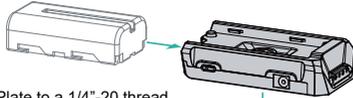
## Attaching the Universal Power Bank Holder (TA-UPBH-B)

Attach the Universal Power Bank Holder to a 1/4"-20 thread. Tighten the screw and then secure the power supply equipment (such as a power bank).



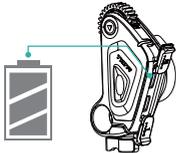
## Attaching the Tilta L Series Battery Plate (TA-BTP2-F970-B)

Attach the Battery Plate to a 1/4"-20 thread. Tighten the screw and then secure the power supply equipment (such as an F970/F550 battery).

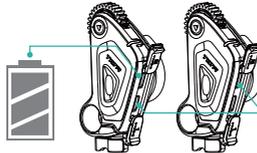


## MOTOR CABLE SETUP

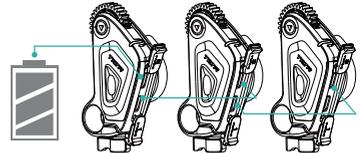
**Note:** When using multiple motors, you can connect them in series by using the USB-C (PD protocol) for passthrough power.



Power Source + 1 Motor + PD Power Cable (USB-C to C)

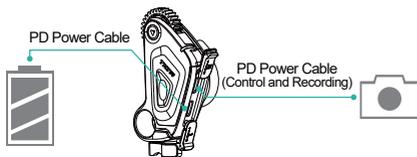


Power Source + 2 Motors + PD Power Cable (USB-C to C)



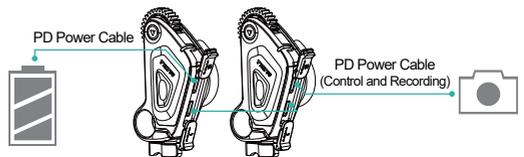
Power Source + 3 Motors + PD Power Cable (USB-C to C)

## USB-C TO C CABLE



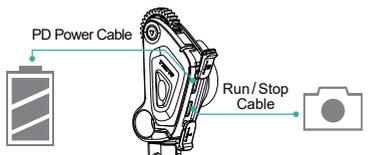
Power Source + 1 Motor + PD Power Cable (USB-C to C) + Camera

**Note:** When connecting multiple motors in series, use Port 2 as the power input for the first motor and connect the second motor via Port 1 on both motors. Use Port 2 on the last motor to connect to the camera.

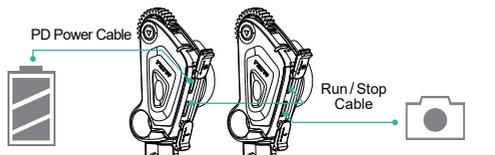


Power Source + 2 Motors + PD Power Cable (USB-C to C) + Camera

## USB-C RUN/STOP CABLE



Power Source + 1 Motor + PD Power Cable (USB-C to C) (Port 2 Input) + Run/Stop Cable (Port 1 Output)



Power Source + 2 Motors + PD Power Cable (USB-C to C) (Port 2 Input) + Run/Stop Cable (Port 1 Output) + Camera

**Note:** When using a USB-C Run Stop Cable, use Port 2 as the power input for the first motor and connect the next motor from Port 1 to Port 2, leaving Port 1 on the last motor open for the Run/Stop Cable.

○ White: Motor is not assigned to any function

Purple: FOCUS

● Purple Light: Pairing completed, motor assigned to FOCUS.

Green: IRIS

● Green Light: Pairing completed, motor assigned to IRIS.

Blue: ZOOM

● Blue Light: Pairing completed, motor assigned to ZOOM.

Yellow: OTHERS

● Yellow Light: Pairing completed, motor assigned to OTHERS.

● Red & White Lights Flashing: Wireless module configuration in progress

● Green & White Lights Flashing: Channel configuration in progress

● Red & Blue Lights Flashing: Automatic calibration in progress

● Yellow & White Lights Flashing: Manual calibration in progress

● Green & Red Lights Flashing: Motor unlocking (non-controllable state)

● Red Light Flashing: Motor Error Detected

● Purple Light Flashing: Motor FOCUS, voltage below 6V

● Green Light Flashing: Motor IRIS, voltage below 6V

● Blue Light Flashing: Motor ZOOM, voltage below 6V

● Yellow Light Flashing: Motor OTHERS, voltage below 6V

Voltage below 6V, PD protocol disabled

● Purple & Cyan Lights Flashing: Motor FOCUS, voltage above 6V

● Green & Cyan Lights Flashing: Motor IRIS, voltage above 6V

● Blue & Cyan Lights Flashing: Motor ZOOM, voltage above 6V

● Yellow & Cyan Lights Flashing: Motor OTHERS, voltage above 6V

Voltage above 6V, PD protocol enabled

## THE NUCLEUS-N II HAND UNIT PAIRING WITH THE NUCLEUS-N II MOTOR

01



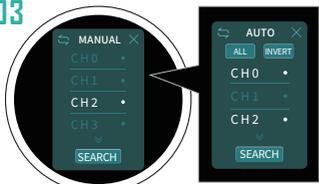
Enter the hand wheel controller's main interface, swipe from bottom to top to access the menu

02



Choose **【CONNECT】** - **【2.4G】** mode, then turn **【ON】** and click **【CHANNELS】** to enter the Auto/Manual Channel mode.

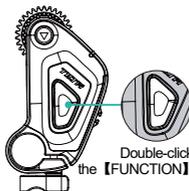
03



Manual Channel Mode ↔ Auto Channel Mode

Search for available channels through Auto/Manual Channel mode

04



Double-click the **【FUNCTION】** Button

After connecting power to motor port 1 or port 2, Double-click the **【FUNCTION】** Button, the indicator light will flash, indicating it's in pairing mode. When the motor is detected on the hand wheel controller's interface, click **【CONFIRM】**, when the motor indicator light (purple/green/blue/yellow) remains constant, pairing is completed.

**Note:** Click the top-left corner switch icon to switch search modes; Auto Channel Mode can automatically select channels based on network conditions, with the option to disable specific channels in the menu; Manual Channel Mode allows specifying a single channel.

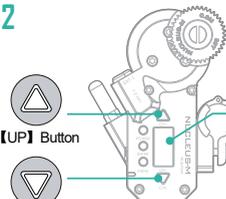
## THE NUCLEUS-N II HAND UNIT PAIRING WITH THE NUCLEUS-M MOTOR (METHOD 1)

01



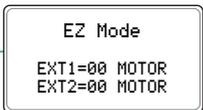
Enter the hand wheel controller's menu, select **【CONNECT】** - **【2.4 G】** mode, then turn **【ON】** and click **【CHANNELS】** to switch to manual channel mode. Select an available channel (e.g., CH2), then **【SEARCH】**.

02



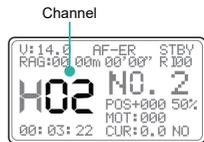
**【UP】** Button

**【DOWN】** Button



After connecting power to Nucleus-M motor, long-press the **【UP】** and **【DOWN】** button to initiate **【EZ Mode】** pairing.

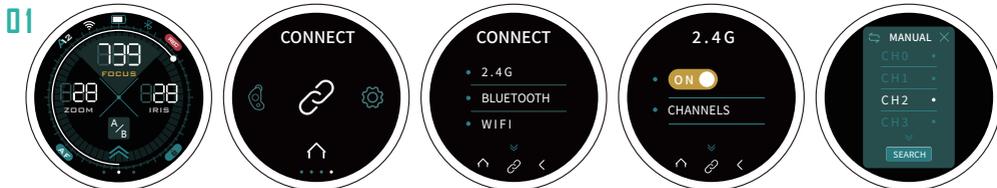
03



After finding the motor on the hand wheel controller's interface, click **【CONFIRM】** to complete pairing. The motor's screen will display the corresponding channel (e.g., 02).

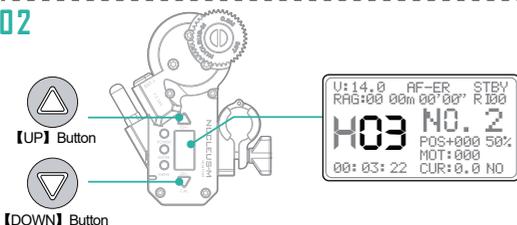
**Note:** The Nucleus-N II hand unit pairs with both the Nucleus-M motor and VND motor through the hand unit **【2.4G】** manual channel mode.

## THE NUCLEUS-N II HAND UNIT PAIRING WITH THE NUCLEUS-M MOTOR (METHOD 2)



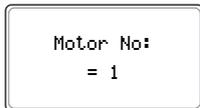
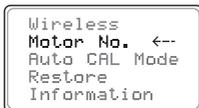
Enter the hand wheel controller's menu, select **[CONNECT]** - **[2.4 G]** mode, then turn **[ON]** and click **[CHANNELS]** to switch to manual channel mode. Select an available channel (e.g., CH3), then exit this interface.

02



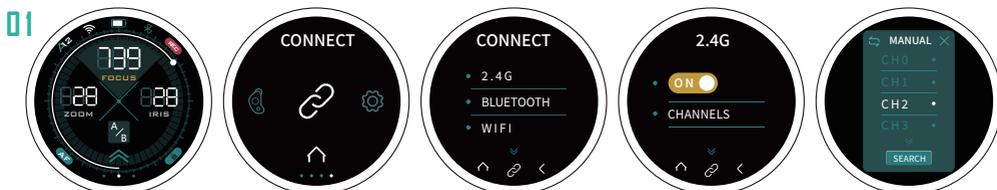
After connecting power to the Nucleus-M motor, long-press the **[POWER]** button to power on. Adjust the channel to match the hand unit by double-clicking the **[UP]** or **[DOWN]** button.

## THE NUCLEUS-M MOTOR NUMBER SETTING



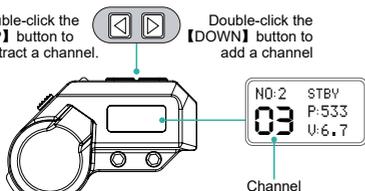
After connecting power to the Nucleus-M motor, double-click the **[MENU]** button to access the menu. Select **[MOTOR NO.]**, press **[ENTER]**, and adjust the motor number by clicking the **[UP]** or **[DOWN]** button. Adjust the motor number to 1 (purple), 2 (green), 3 (blue), or 4 (yellow) to control the Nucleus-M motor by using the corresponding components of the Nucleus-N II hand wheel controller or multi-functional control handle.

## THE NUCLEUS-N II HAND UNIT PAIRING WITH VND MOTOR



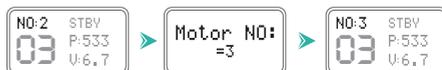
Enter the hand wheel controller's menu, select **[CONNECT]** - **[2.4 G]** mode, then turn **[ON]** and click **[CHANNELS]** to switch to manual channel mode. Select an available channel (e.g., CH3), then exit this interface.

02 Double-click the **[UP]** button to subtract a channel. Double-click the **[DOWN]** button to add a channel



After connecting power to the VND motor, press and hold the **[DOWN]** button to power it on. Adjust the channel to match the handwheel by double-clicking the **[UP]** or **[DOWN]** button.

Triple-click the **[UP]** button to enter the motor number setting:



Adjust the motor number by clicking the **[UP]** or **[DOWN]** button (it will automatically exit after 10 seconds of inactivity, or you can exit by triple-clicking the **[UP/DOWN]** button). Assign motor numbers 1 (purple), 2 (green), 3 (blue), and 4 (yellow) to control the corresponding components via the Nucleus-N II hand wheel controller or multifunction control handle to operate the motor.

## HAND WHEEL CONTROLLER - FIRMWARE UPDATE

- 01** Enter the hand wheel controller's main interface, swipe from bottom to top to access the menu.



- 02** Choose **CONNECT** - **WIFI** mode, then turn **ON** and click **SETTINGS** to enter the WIFI searching mode.



- 03** Click on **SEARCH** to find available WiFi networks, enter the password, then click **OK**, when the green check mark icon appears, the connection is successful.



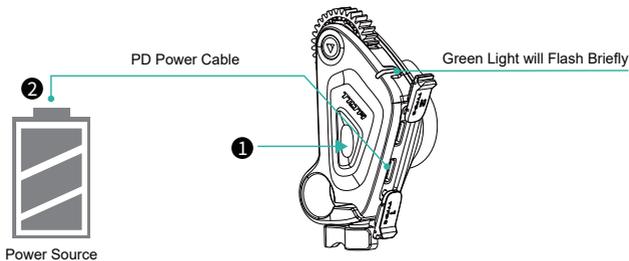
- 04** Enter the hand wheel controller's menu, select **SYSTEM** - **FIRMWARE UPDATE**, choose to update the hand wheel **HAND WHEEL-M**, and click **CONFIRM** to start the update. Once the update progress reaches 100%, the update is complete and the menu will return to the main interface.



**Note:** Only the **HAND WHEEL-M** hardware requires online updates, while other hardware can be updated offline once the **Hand Wheel-M** component update is completed.

## MOTDR - FIRMWARE UPDATE

- 01** If the hand wheel controller has already been updated press and hold the motor's **FUNCTION** button ① and then connect power ②. A green light will flash briefly, which means the motor is in update mode.



- 02** Enter the hand wheel controller's menu, select **【SYSTEM】 - 【FIRMWARE UPDATE】**, choose to update the motor, such as **【MOTOR-M】** and click **【CONFIRM】** to start the update. Once the update progress reaches 100%, the update is complete. If you need to update **【MOTOR-S】** afterward, you should first disconnect the motor's power and then repeat the above update process.



- When the hand wheel controller is already connected to the internet, access **【SYSTEM】 - 【FIRMWARE UPDATE】**. A **【SERVER】** window will pop up. Please select the appropriate server based on your location, and then proceed with the update.



- To check if the hardware needs an update:

① Check if there is a version number with an arrow "→" below the hardware. If there is, it means the current version requires a firmware update, as shown below.

MOTOR-M  
XXXXXX→XXXXXX

② If there is no version number with an arrow "→" below the hardware, it means the current version does not require a firmware update, as shown below.

MOTOR-M  
XXXXXX

## NUCLEUS NANO II HAND WHEEL CONTROLLER

- When the hand wheel controller is connected to the internet, the system will automatically detect the latest firmware version.
- During the update process, the screen will restart. Please wait for the update to complete. After finishing, the controller's menu will return to the main interface.
- When updating the **【HAND WHEEL-M】** hardware, firmware for other hardware such as **【HAND WHEEL-S】**, **【MOTOR-M】**, **【MOTOR-S】**, and **【CONTROL HANDLE】** will be downloaded simultaneously. Subsequent updates for motors and handles will not require an internet connection.
- After updating the handwheel, check the current firmware version.
- If the controller fails to update in a connected state or if the update is interrupted, please check the network status or restart the controller.
- 【HAND WHEEL-M】**: Hand Wheel main control firmware  
**【HAND WHEEL-S】**: Hand Wheel peripheral device management firmware  
**【MOTOR-M】**: Motor-end camera control firmware; **【MOTOR-S】**: Motor control firmware  
**【CONTROL HANDLE】**: Control handle firmware

## NUCLEUS NANO II MOTOR

- Before updating the motor firmware, make sure that the hand wheel controller has previously updated to the latest version.
- Before updating, ensure that the hand wheel controller has a battery level of at least 50% and no other motors are currently undergoing a firmware update.
- During the update process, do not plug or unplug the motor's power or turn off the hand wheel controller. If this happens, reconnect the motor's power and repeat the update operation.
- Multiple motors cannot undergo firmware updates simultaneously. Only one motor can be updated at a time to avoid signal interference.
- When completing firmware updates, if proceeding with the next firmware update, you need to disconnect the motor's power before proceeding.
- The motor needs to be paired with the hand wheel controller before viewing the current version number of the firmware update.
- If the motor accidentally enters firmware update mode by pressing the **【FUNCTION】** button, please disconnect the motor's power first and reconnect power.
- If the update progress remains between 5% and 6%, or if the download speed is too slow, please turn off the hand wheel controller and restart it. Then repeat the above-mentioned update steps.

## IC CAUTION:

(English)

This device complies with Industry Canada licence-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.

To maintain compliance with RSS-102 RF Exposure guidelines, This equipment should be installed and operated with minimum 20cm distance between the radiator and your body: Use only the supplied antenna.

(French)

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, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Pour être conforme aux lignes directrices d'exposition RF RSS-102, cet équipement doit être installé et exploité à une distance minimale de 20cm entre le radiateur et votre corps: n'utilisez que l'antenne fournie.

## FCC WARNING:

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.

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

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.

To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum 20cm distance between the radiator and your body: Use only the supplied antenna.

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## NUCLEUS NANO II WIRELESS LENS CONTROL SYSTEM

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For more instructions, please scan the QR code in the image. Enter the model number WLC-T05 to obtain the electronic version of the product manual.

更多操作说明请扫描图中二维码, 输入相关产品型号(WLC-T05), 获取产品电子版说明书。

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