TAHER ®

M
NUCLEUS
WLC-03

Product Overview:

The Tiltamax Nucleus-M Wireless Follow Focus System:

Made for industry professionals

Quick, Easy, and Reliable precision control of Focus, Iris, and Zoom

Compatible with Cine Lenses and Photo Lenses

Ambidextrous FIZ Unit design

Ergonomic Handle grips

Low Noise High Torque Motors

Compact and Modular

Multi-Channel System

Disclaimer:
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1. Please read this disclaimer before use

2. User is responsible for operation and consequences of operation

3. Tilta is not responsible for any modification made by the user to software or hardware

   which may cause immediate or prolonged immeasurable damage to the unit

FCC Statement:

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.

Technical Specifications

Total Weight	4167g (including battery handle)	Case Size	330*280*150mm

FIZ Hand Unit	Dimensions	142*90.5*70mm (L*W*H)
	Weight (with battery)	430g
	Operating Frequency	2.4G
	Max Transmission Distance	Main handwheel 150-300M, handle 75-150M, maxium distance with amplifier 2000M
	Emission Power	30MW~100MW /100MW~800MW (Additional Long Distance Module)
	Current	0.15A
	Voltage	7.2V EXT. 7.2V~14.8V
	Battery Type	18650
	Operating Temperature Range	-20℃~+50℃
	Ideal Environment	Dry Climates. Avoid condensation in high humidity.
Motor	Dimensions	114*92*30.7mm (L*W*H)
	Weight (with battery)	225g
	Operating Frequency	2.4G
	Max Recieving Distance	500M (unobstructed and upgradeable to 2000M)
	Emission Power	30MW~100MW / 10MW~800MW (Additional Long Distance Module)
	Current	Quiescent Current : 0.10A/14.8V Conventional Current : 0.5A/14.8V
		Locked Rotor Torque Current: 2.8A/14.8V
	Voltage	7.2V~24V
	Rod Compatibility	15mm/19mm
	Noise	15db
	Gear	Module: 0.8 Teeth: 39
	Operating Temperature Range	-20℃~+50℃
	Ideal Environment	Dry Climates. Avoid condensation in high humidity
Handles	Dimensions	85*59.5*175.5 mm (L*W*H) (including thumb unit)
		85*31*175.5 mm (L*W*H) (not including thumb unit)
	Weight (with battery)	340g / 355g (including thumb unit)
	Current	0.1A
	Voltage	Battery: 7.2V EXT : 7.2V~14.8V
	Battery Type	18650
	Operating Frequency	2.4G
	Emission Power	10MW~100MW
	Max Transmission Distance	10M~100M
	Operating Temperature Range	-20℃~+50℃
	Ideal Environment	Dry Climates. Avoid condensation in high humidity

Standard Packing List

|			
FIZ Wireless Hand Unit	Left Wireless Handle	Right Wireless Handle	Wireless Motor X2
Follow Focus Marking Disk X4	740mm P-TAP Power Cable	Straight 180mm Motor Cable	Straight 296mm Motor Cable
Handle to Arri Standard Rosette Adaptor X2	Handle to Gimbal Bar Adaptor (25mm/30mm diameter) X2	Follow Focus Ring X2	Battery Charger
FIZ Unit Lanyard X2	Motor Antenna	Waterproof Safety Case	

Optional Accessories

- Quick Release Handgrip Bridge
- Wireless Motor
- Run/Stop Cable
- Follow Focus Marking Disk
- Motor Antenna
- 0.4/0.5/0.6 Gear

- Left Handle Thumb Joystick Unit
- Nucleus-N Motor
- Universal Gimbal Ring Adaptor w/ Rosette
- Battery Charger
- 18650 Battery Flight Case
- Follow Focus Ring x2

- 740mm P-TAP Power Cable
- 740mm 2pin Lemo Cable 740mm
- 3Pin Fischer Cable
- Straight 296mm Motor Cable
- Straight 180mm Motor Cable
- Long Distance Wireless Module

Component Functions   FIZ Hand Unit
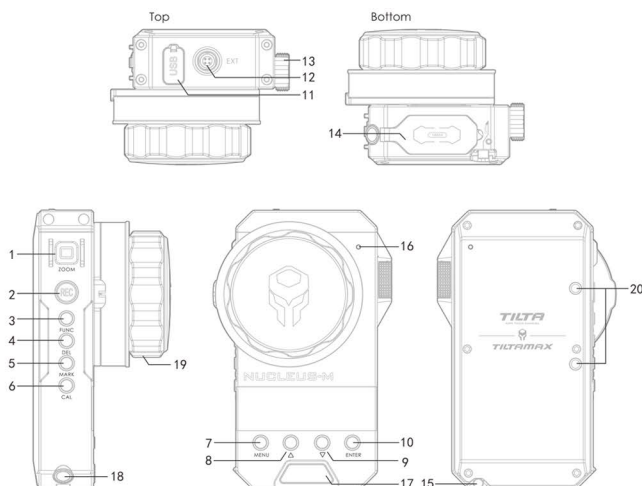
Transmitter：

01. ZOOM Joystick
    Zoom Controller
02. REC Button
    Activate Run/Stop
03. FUNCTION Button
04. DELETE Button
05. MARKER Button
    Make Marks
06. CALIBRATE Button
    Hold to Calibrate Range of Lens
07. MENU Button
    Enter Main Menu
08. UP Button ▲
    Upward Selection
09. DOWN Button ▼
    Downward Selection
10. ENTER Button

11. USB port
    For Data Transfer and Updating Firmware
12. EXT port
    Power and Communication In/Out
13. IRIS Wheel
    Iris Controller and Controls Zoom Speed
14. 18650 Battery Compartment Latch
15. Battery Compartment Button
    Push to open Battery Compartment latch
16. Light Sensor
    Adjusts Key LED and Screen Brightness
17. POWER Button
18. Lanyard Attachment
19. FOCUS Knob
    Focus Controller
20. Attachment Bracket

Firmware Update

FIZ Unit

Firmware updates are first downloaded to the FIZ Unit by connecting it to a Mac or PC via MircoUSB cable. The FIZ unit will appear on the computer as an external drive called, "Tilta." Drag the files into the FIZ and unplug. Now follow the images below to update the FIZ Unit itself
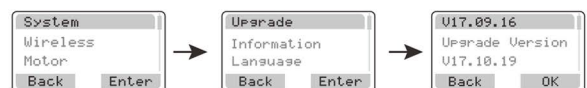
Handles

Use the 7-pin to 7-pin LEMO cable to connect the FIZ to a Handle and on the FIZ, repeat the following steps to update the Handle. Repeat this process for the other handle

Motors

Use the 7-pin to 7-pin LEMO cable to connect the FIZ to a Motor and on the FIZ, repeat the following steps to update the Motor. Repeat this process for the other motors


You are able to control the motors and their specifications by TILTA APP instead of handwheel and handles

This function will be available later through APP

For more information on the: Nucleus-M Wireless Follow Focus System
Visit the product page on our website: www.tilta.com

Double click 【MENU】, select " Joystick SPD. ", double click 【MENU】to enter, and use ▼ to select Joystick SPEED - values from 1-99, with 99 being the fastest and 1 being the slowest setting

```
JoyStick SPD ←--
Calibrate Kb          →    JoyStick SPEED
Restore                         = 50
Information
```
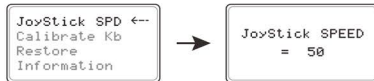
9. ZOOM/SPEED

When Motor No. on the Knob is "0", the Knob is used as the Speed Controller for the Zoom

```
V7.8 STBY S +010L 0
L01 J FREE 2
  -000 R
```

When Knob is assigned a Motor Number from 1 thru 4, speed must be changed in the menu; however a snap zoom or "Zip" can still be performed by holding down the front 【AB】 - this will instantaneously multiply the current speed value by 5 when using the Zoom Joystick

```
V7.8STBY K FREE 1
  +000L
L01 J FREE 2
  -000
  S:30 R
```

10. Factory Reset

Double click 【MENU】, select "RESTORE", double click to 【ENTER】. Double click ▼ to restore to factory default settings
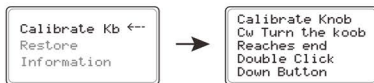
```
Restore default?
Double Click
Down Button
```

11. Calibrate Handle Knob
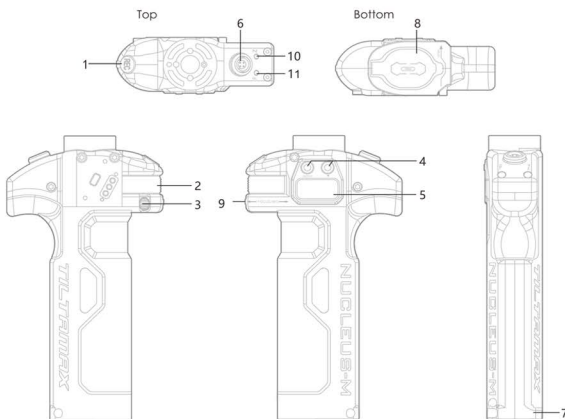
⚠ When does the Handle Knob need calibration ?

1) If the motor spins one way then rapidly spins the other way in the same instance
2) If the Knob is completely rotated to the end and the Knob Rotation Value on the display is not at 000 or 999

Double click 【MENU】,select "Calibrate Kb", and double click 【MENU】to enter. Follow the on screen directions. Rotate the Knob clockwise to the end for "Minimal", then confirm with double clicking ▼
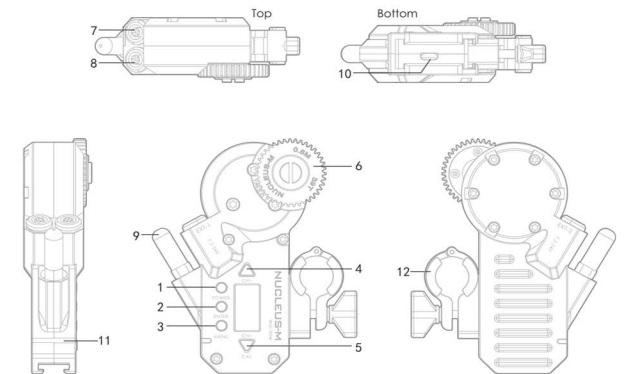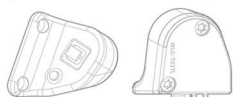
Repeat the previous steps for the second calibration

```
Calibrate Kb ←--        Calibrate Knob
Restore             →    Cw Turn the koob
Information               Reaches end
                          Double Click
                          Down Button
```

Top   6   Bottom   8
1   10
11
2
3 9   4
5

7

Controller:

01. RECORD Button
    Activate Run/Stop

02. FOCUS / IRIS Knob

03. Knob Degree Adjustment Switch
    Rotation Settings: 85, 180, 310 Degrees

04. MENU Button
    Enter Main Menu

05. LCD Display

06. EXT Port
    Power and Communication In/Out

Optional: Left Handle Thumb Joystick Unit

07. Battery Compartment Button
    Push to open Battery Compartment Latch

08. 18650 Battery Compartment Latch

09. A-B Marker Button
    Creating Close Focus and Infinity Focus Marks

10. Z LED
    Joystick LED Indicator

11. F LED
    Knob LED Indicator

Top   7   Bottom
8   10

6
9
4
1
2   5
3
11   12

Reciever：

01. POWER Button
    Turn on/off

02. ENTER Button
    Confirm Selection

03. MENU Button
    Enter Main Menu

04. UP Button and CHANNEL +
    Upward Selection and Increase Channel Number

05. DOWN Button and CHANNEL -
    Downward Selection and Decrease Channel Number

06. 0.8 Gear
    Connects to Lens Gear to
    Adjust Focus, Iris, or Zoom

07. EXT-2 Port
    Power and Communication In/Out

08. EXT-1 Port
    Power and Communication In/Out

09. Wireless Antenna
    Receives Wireless Signal

10. Micro USB Port
    For Data Transfer and Updating Firmware

11. Indicator Light
    Indicates Status of Motor

12. 15/19mm Rod Adapter
    Compatible via 15mm Bushing

5. Knob Torque

Double click 【MENU】,and use the ▼ to select "Knob torque" 30%,50%,90% different Knob Motor Torques can be selected

```
Knob Torque ←--         Knob Motor
JoyStick No.        →     Torque
JoyStick Dir              =50%
JoyStick Tor
```

6. Knob Motor Control Number

Double click 【MENU】, select " Knob No. ", double click MENU Button to enter , and use ▼ to select Motor Number. Setting Knob No. to "0" prevents a signal transmission

```
Knob No.    ←--         Knob Motor
Knob Dir            →     Control No.
Knob Torque               = 0
JoyStick No.
```

7. Knob Motor Direction

Double click 【MENU】, select "Knob Dir. ", double click 【MENU】to enter , and use ▼ to select Knob Motor Direction. " CW " is " Clockwise. " " CCW " is " Counter Clockwise "

```
Knob Dir    ←--      Knob Motor        Knob Motor
Knob Torque      →    Direction    →    Direction
JoyStick No.          = CW              = CCW
JoyStick Dir
```

8. Joystick

Double click 【MENU】, select "Joystick No. ", double click 【MENU】to enter , and use ▼ to select Joystick Motor Control No. - setting Joystick No. to " 0 " prevents a signal transmission

```
JoyStick No. ←--        JoyStick Motor
JoyStick Dir        →     Control No.
JoyStick Tor              = 1
JoyStick SPD
```

Double click 【MENU】, select " Joystick Dir. ", double click 【MENU】to enter , and use ▼ to select Joystick Motor Direction. " CW " is " Clockwise. " " CCW " is " Counter-Clockwise "
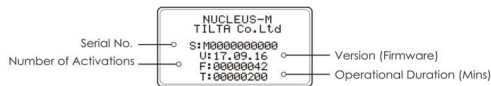
```
JoyStick Dir ←--     JoyStick Motor     JoyStick Motor
JoyStick Tor     →    Direction     →    Direction
JoyStick SPD          = CW               = CCW
Calibrate Kb
```

Double click 【MENU】, select " Joystick Tor. ", double click 【MENU】to enter , and use ▼ to select Joystick Motor Torque: 30%, 50%, or 90%

```
JoyStick Tor ←--        JoyStick Motor
JoyStick SPD        →     Torque
Calibrate Kb              = 90%
Restore
```

5. Motor Information

Double click MENU, select "INFORMATION" to check Motor Information

```
        NUCLEUS-M
        TILTA Co.Ltd
Serial No. ———— S:M0000000000
Number of Activations ——— U:17.09.16 ———— Version (Firmware)
                  F:00000042
                  T:00000200 ———— Operational Duration (Mins)
```

6. Factory Reset

Double click 【MENU】, select "RESTORE", 【ENTER】, double click ▼ to confirm

```
Wireless              Restore default?
Motor No.             Double Click
Auto CAL Mode    ——>  Down Button
Restore    <--
Information
```

Handles

1. Home Screen

```
Recording Status ———                        ——— A-B Mark
Voltage ——————  V7.8 STBY K FREE 1          ——— Motor No.
Knob Data ————            +000L              ——— Range Switch Data
Wireless Signal ——       L01 J FREE 2        ——— Zoom Angle
Range (2.4G) ——             -000             ——— T/R (signal)
                            S:30 R           ——— Zoom Speed
                  Joystick Data
              Focus角度
```
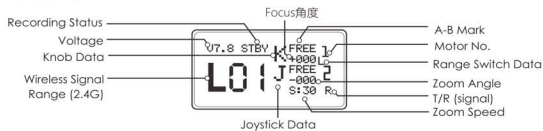
2. Setting the 2.4G

Double click 【MENU】 select " Wireless ", 【ENTER】 and select 2.4G with ▼. Press 〔REC〕 to return to the Home Screen

```
Wireless    <--       Wireless Mode
Knob No.          ——>     = M
Knob Dir
Knob Torque
```

3. Changing the Channel

Double click 【MENU】 select " Channel ", 【ENTER】 and select Channel Number with the ▼, Press 〔REC〕 to return to the Home Screen

```
Channel    <---       Wireless Channel
Wireless          ——>     = 12
Knob No.
Knob Dir
```

4. Run / Stop

Properly attach a Run/Stop cable. Click 〔REC〕 on the top of the Handle. If "STBY" on the display changes to 〔REC〕, the recording has commenced

```
V7.8 STBY K FREE 1          V7.8 REC K FREE 1
          +000L                      +000L
L01 J FREE 2          ——>   L01 J FREE 2
      -000                        -000
      S:30 R                      S:30 R
```

Attaching the Motor to a DSLR Camera

Add the follow focus ring to the lens. Secure it tightly. Make sure the fastener is not in a position where the motor's gear will hit it during it's calibration run.
Once the follow focus ring is on the lens, follow the same steps for calibration as if it were a cine lens
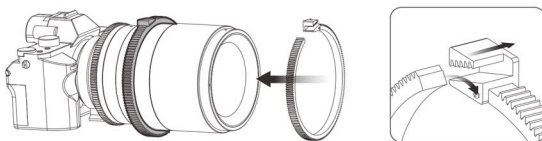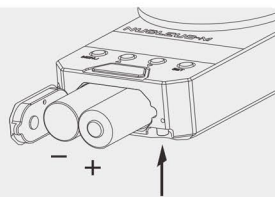
Note: If the lens already has a 0.8 gear or has been modified to have one, then the motor can be attached and calibration can begin just as if it were a cine lens

Inserting the Batteries

Installing the Batteries in the FIZ

Hold the FIZ Unit. Push the 【Open】.
The battery compartment latch will release.
Place (2) 18650 Batteries in any direction and then close the latch

Installing the Batteries in the Handles

Hold the Handle. Push the 【Open】.
The battery compartment latch will release.
Place (2) 18650 Batteries in any direction - as long as positive and negative ends on the batteries touch - and then close the latch
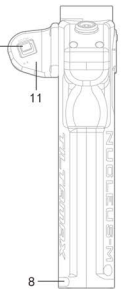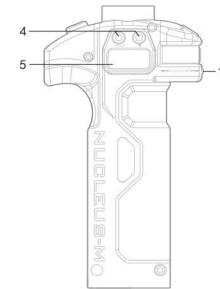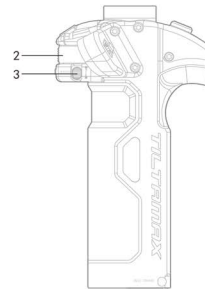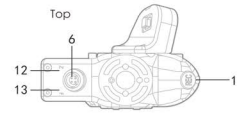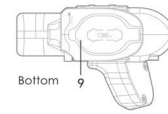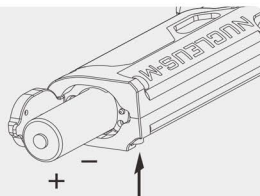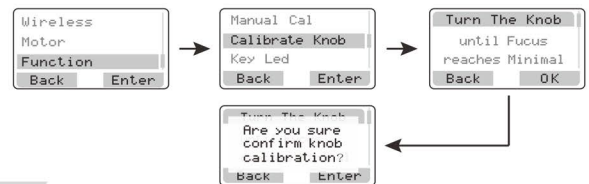
Right Wireless Handle   Component Functions

Controller :

01. RECORD Button
Activate Run/Stop

02. FOCUS / IRIS Knob

03. Knob Degree Adjustment Switch
3 Rotation Settings: 85, 180, 310Degrees

04. MENU Button
Enter Main Menu

05. LCD Display

06. EXT Port
Power and Communication In/Out

07. ZOOM Joystick
ZOOM Distance can be control

08. Battery Compartment Button
Push to open Battery Compartment Latch

09. 18650 Battery Compartment Latch

10. Knob A-B Marker Button
Creating Close Focus and Infinity Focus Marks

11.Joystick A-B Marker Button
Creating Close Focus and Infinity Focus Marks

12. Z LED
Joystick LED Indicator

13. F LED
Knob LED Indicator

10. Calibrate FIZ Knob

Click the 【MENU】, highlight " FUNCTION ", and click 【ENTER】. Highlight " Calibrate Knob" and 【ENTER】. Follow the on screen directions. Rotate the Knob clockwise to the end for "Minimal", then confirm with 【ENTER】. Repeat the process until FIZ Knob calibrates

```
Wireless          Manual Cal              Turn The Knob
Motor             Calibrate Knob          until Fucus
Function          Key Led         ——>     reaches Minimal
Back    Enter     Back    Enter           Back      OK
```

```
     Turn The Knob
     Are you sure
     confirm knob     <——
     calibration?
     Back    Enter
```

Motor

1. Home Screen

```
Voltage ——————                              ——— Auto Focus Status
Range (Metric) ——   U:14.0 AF-ER  STBY
Range (Standard) —— RAG:00 00m 00'00" R100  ——— Power of Signal
                    L01 NO.2                ——— Motor Number
Wireless Signal Range (2.4G) —— POS+000 50% ——— Position/Degree of Motor
                    MOT:000                 ——— Damp of Motor
Elapsed Working Duration —— p00:03:22 CUR:0.0 NO ——— Data Origin
                        Current
```

2. Setting 2.4G

Double click the 【MENU】, select "Wireless", 【ENTER】 Button, and use the ▲▼ to pick between the 2.4G settings

```
Wireless    <--       Wireless Mode
Motor No.         ——>     = M
Auto CAL Mode
Restore
Information
```

3. Changing Channel

Double click the 【CH-】 to decrease the Channel number or double click the 【CH+】 to increase the Channel number

```
U:14.0 AF-ER  STBY          U:14.0 AF-ER  STBY
RAG:00 00m 00'00" R100      RAG:00 00m 00'00" R100
L01 NO.2            ——>     L02 NO.2
POS+000 50%                 POS+000 50%
MOT:000                     MOT:000
00:03:22 CUR:0.0 NO         00:03:22 CUR:0.0 NO
```
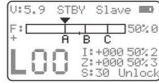
4. Changing Motor Number

Double click the 【MENU】, select "Motor No.", 【ENTER】, and use the ▲▼ to assign a Motor Number

```
Wireless              Motor Mode
Motor No.    <--  ——>     = 3
Auto CAL Mode
Restore
Information
```

② Setting and Deleting Marks

The FIZ unit can create up to 10 "soft" marks. Rotate the Focus Knob to the desired mark. Double click the 【MARK】 on the side of the FIZ Unit to set a mark. The mark will appear as a letter. Rotate the Focus Knob to the next desired position and then double click the 【MARK】 to create another marker. Vibrations will occur when marks are passed along the Focus pull. Double clicking the 【DEL】 will erase markers in reverse alphabetical order

```
V:5.9  STBY  Slave ▭
F:▐        ▼        ▌50%0
+         A B C
L 00      I:+000 50%:2
          Z:+000 50%:3
          S:30  Unlock
```

8. Factory Reset

Press the 【MENU】 , highlight "System", 【ENTER】 , highlight "Factory Reset", and 【ENTER】

```
System          Fcatory Reset    Restore default
Wireless        Update           settings?
Motor           Information
Back    Enter   Back    Enter    Back      OK
```
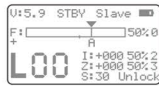
9. Adjusting the Zoom with the Speed Controller Setting

Set the Iris to "0" by having no Motor No. synced to the Iris controller on the FIZ. The Home Screen will now show an "S" where "I" used to be. "S" refers to speed. Now the speed of the Zoom controller can be changed by spinning the Iris wheel controller on the FIZ

```
V:5.9  STBY  Slave ▭
F:▐        ▼        ▌50%0
+
L 00      S:000
          Z+000   50%
          Unlock
```

If the Iris is set to a Motor No. of 1-4, speed can be controlled by double clicking ▲▼ . The speed range will increase or decrease by increments of 1 with a range from 1-99, where 99 is the fastest and 1 is the slowest setting

```
V:5.9  STBY  Slave ▭
F:▐        ▼        ▌50%0
+         A
L 00      I:+000 50%:2
          Z:+000 50%:3
          S:30  Unlock
```

To perform a snap zoom or "ZIP",hold down ▲ while using the Zoom Joystick Zoom, hold ▼ while using the Zoom Joystick,dividing the current speed value by 10

⚠ **When does the FIZ Knob need calibration ?**

1) If the FIZ Knob has been rotated to end and this icon: ▼ does not reach the end of the display bar

2) If the motor spins one way then rapidly spins the other way in the same instance

Motor:
Power Supply and Run/Stop

Each Motor has (1) EXT-1 port and (1) EXT-2 port
Both ports can Power In/Out as well as control Run/Stop

1. Power can be sent directly to the Motor and/or daisy-chained from Motor to Motor

2. A single cable can be used to power the motor and activate the camera's R/S, if the camera port is capable of power out and R/S - such as the 3-pin LEMO ports on the Tilta Alexa Mini and RED DSMC2 Cages

For Example :
ARRI XT-RS port
TILTA FOR ALEXA MINI Cage -14.8v 3pin R/S port
TILTA FOR RED DSMC2 Cage -14.8v 3pin R/S port

If Camera Port is not capable of both R/S and Power out, then separate cables must be used to achieve motor power supply and R/S (see image below)

POWER+R/S
camera
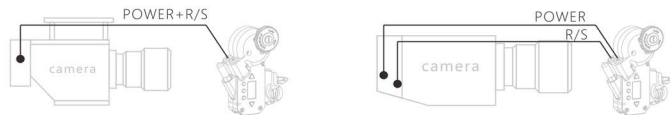
POWER
R/S
camera

3

1. Connect Motor to Motor via motor connection cable through its EXT-1 to the other motor's EXT-2 port

2. Use the P-TAP cable to provide power from the battery to a motor through its EXT-1 port

POWER P-tap

* Use either the straight 296mm cable or the straight 180mm cable to connect the motors according to your needs

Warning: If the motors are already connected to the camera through a R/S with Power Output port (as seen in Fig 1) an additional power cable will cause the motors to shut down
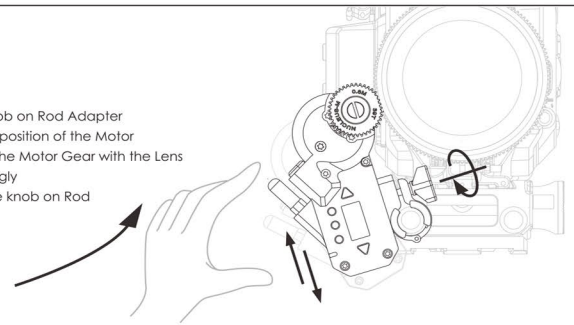

Nucleus-M: Shoulder Mount Assembly

19mm Rod Compatibility   15mm Rod Compatibility
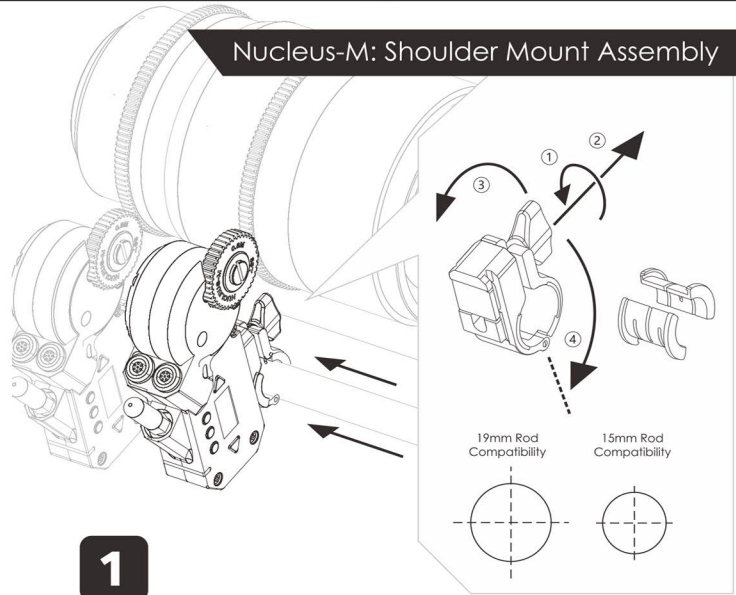
1

Slide the Motor into position under the lens gear.
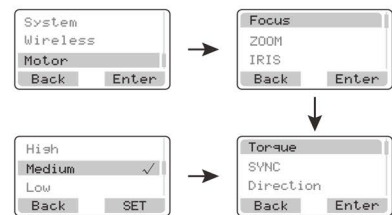Bushing allows for 19mm to 15mm compatibility

2

1. Loosen knob on Rod Adapter
2. Adjust the position of the Motor
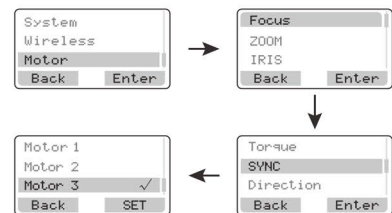3. Embrace the Motor Gear with the Lens Gear snuggly
4. Tighten the knob on Rod Adaptor

5. Changing the Torque of Motors

Click on the 【MENU】 to enter the menu system. Use ▲▼ to highlight " Motor " and 【ENTER】 . Highlight " Focus ", 【ENTER】 . Highlight " Torque ", 【ENTER】 . Three options will appear: High,Medium, and Low - highlight and select the desired Torque value. Click enter and a confirmation will appear as a check mark. Press the 【MENU】 till the Home Screen appears

```
System          Focus
Wireless        ZOOM
Motor           IRIS
Back    Enter   Back    Enter

High            Torque
Medium    ✓     SYNC
Low             Direction
Back    SET     Back    Enter
```

6. Syncing the Motor

Click on 【MENU】 enter the menu system. Use ▲▼ to highlight " Motor " and 【ENTER】 . Highlight " Focus ", 【ENTER】 . Highlight " SYNC ", 【ENTER】 .Three options will appear: Motor 1, Motor 2, Motor 3 - highlight and select the desired Motor. Click enter and a confirmation will appear as a check mark. Press 【MENU】 till the Home Screen appears

```
System          Focus
Wireless        ZOOM
Motor           IRIS
Back    Enter   Back    Enter

Motor 1         Torque
Motor 2         SYNC
Motor 3   ✓     Direction
Back    SET     Back    Enter
```

7. Setting Hard Stops / Limits

Hard Stops/ Limits can be made on the FIZ unit. Position the Knob to the desired 【A】 Mark. Hold down 【MARK】 . With the 【MARK】 held down, rotate the Knob to the desired 【B】 Mark. Release 【MARK】 when finished. Confirmation is defined by a vibration. The limited range selected will expand to the entire throw of the Knob. Below the limited range is identified by the white bar. Hold the 【DEL】 to delete the Hard Stops /Limits
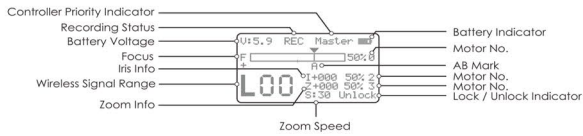
```
V:5.9  STBY  Slave ▭
F:▐        ▼        ▌50%0
+
L 00      I:+000 50%:2
          Z:+000 50%:3
          S:30
```

Menu and Function

FIZ Hand Unit

1. Home Screen

Controller Priority Indicator
Recording Status
Battery Voltage
Focus
Iris Info
Wireless Signal Range
Zoom Info

Battery Indicator
Motor No.
AB Mark
Motor No.
Motor No.
Lock / Unlock Indicator

Zoom Speed

```
U:5.9  REC  Master ▭
F▭▭▭▭▭▭▭▭▭▭  50%0
        A◦
L00    I+000 50% 2
       Z+000 50% 3
       S:30  Unlock
```

2. Change the Language

Click on 【MENU】 to enter the menu system. Use ▲▼ to highlight "System". Highlight "Language" and choose the language as needed by clicking 【ENTER】 . A confirmation will appear as a check mark. Push 【MENU】 repeatedly to return to the Home Screen

```
System          Update          简体中文
Wireless        Information
Motor           Language        ENGLISH
Back   Enter    Back   Enter    Back   OK
```

3. 2.4G and CHANNEL

Click on 【MENU】 to enter the menu system. Use ▲▼ to highlight "Wireless". Highlight "2.4G". Pressing 【ENTER】 will change the 2.4G Setting. Use ▼ to change the Channel; Use ▼ to change the the High, Medium, and Low Torque value
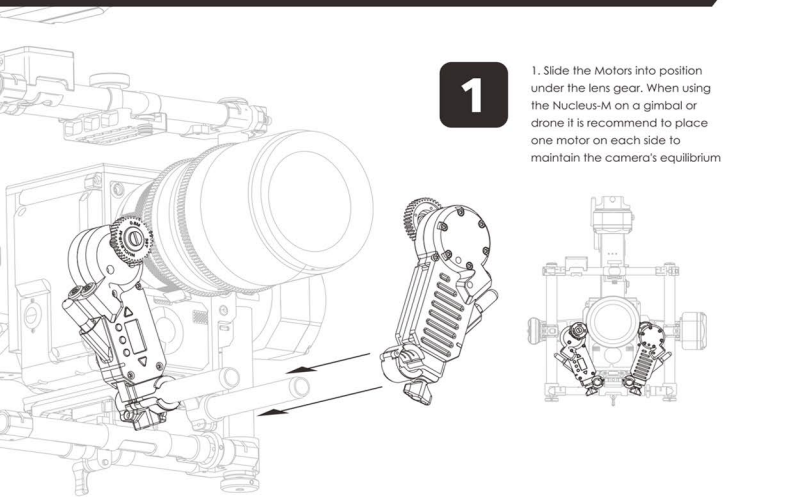
```
Wireless         2.4G
Motor
Function
Back   Enter     Back   Enter

MODE : OFF       MODE : M
Channel:12       Channel:00
Back   Enter     Back   SET
```
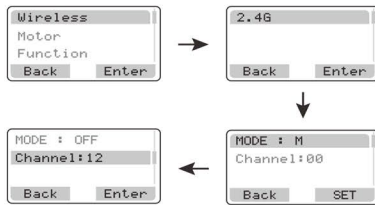
4. Run/Stop

Properly attach the R/S cable to the camera. Click (REC) on the left side of the FIZ Unit. On the display, "STBY" will turn into (REC) . A vibration will notify the AC that recording has begun

```
U:5.9 STBY Master ▭        U:5.9  REC  Master ▭
F▭▭▭▭▭▭  50%0              F▭▭▭▭▭▭  50%0
      A◦                         A◦
L00  I+000 50% 2           L00  I+000 50% 2
     Z+000 50% 3                Z+000 50% 3
     S:30  Unlock               S:30  Unlock
```
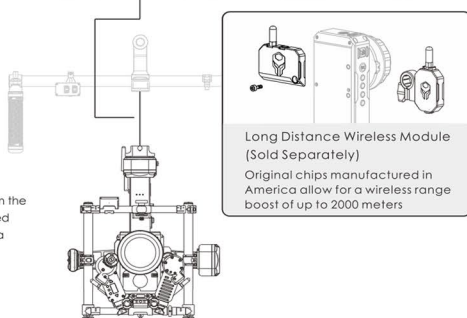
Nucleus-M: Gravity Gimbal and Drone Assembly

1

1. Slide the Motors into position under the lens gear. When using the Nucleus-M on a gimbal or drone it is recommend to place one motor on each side to maintain the camera's equilibrium

2

2. Utilizing the quick release from the gimbal, easily mount a balanced camera with the Nucleus-M to a Drone, Handle Bars, or Jib Arm
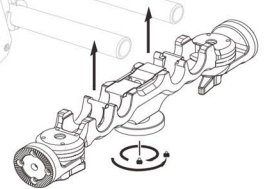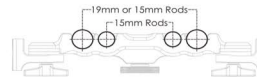
Long Distance Wireless Module (Sold Separately)

Original chips manufactured in America allow for a wireless range boost of up to 2000 meters

## Nucleus-M: Shoulder Mount Assembly

4

1. Attach the Handgrip Bridge to the Rods
2. Lock down the bridge connection via tightening screw disk

—19mm or 15mm Rods—
—15mm Rods—

5

The Handle to Arri Standard Rosette Adaptor connects to the Quick Release Handgrip Bridge and any other accessory with Arri Standard Rosettes

1. Use Allen Key to screw down the Arri Standard Rosette Adaptor into the Handle

2. Attach Arri Standard Rosette from Handle to the Quick Release Handgrip Bridge and secure connection via large thumb screw
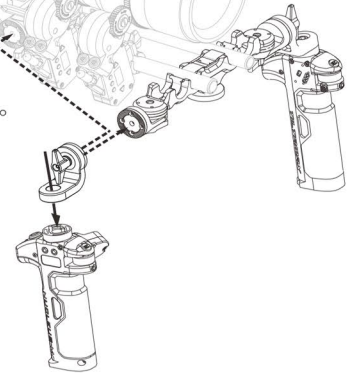
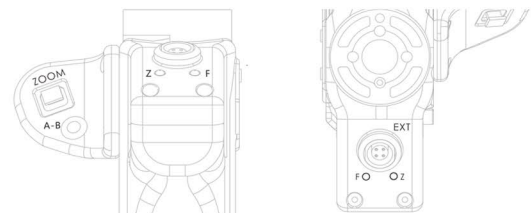### 2. Creating and Deleting Hard Stops from the Handle

2.1 Creating Hard Stops / Limits via Knob controller
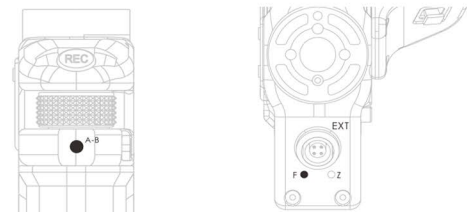
Hard stops can be set on the Handles' Knob. Rotate the Knob and double click on the front 【AB】 to set 【A】 Mark. The mark has been confirmed when the "F" LED blinks green. Rotate the Knob to the next mark and double click 【AB】 to set a 【B】 Mark. The "F" LED will glow solid green. Now the full 310 degree throw of the Knob controller will reflect 【A】 to 【B】 Mark. To delete the hard stops, double click on 【AB】 again. The "F" LED will turn off

```
U7.8 STBY  K A--B 1
              +000 L
              FREE
L01        J -000 2
           S:30  R
```

#### 2.2 Hard Stops / Limits via Thumb Unit / Joystick controller

Hard stops can be set on the Handles' Joystick. Position the joystick and double click on the thumb unit's 【AB】 to set 【A】 Mark. The mark has been confirmed when the "Z" LED blinks red. Position the joystick to the next mark and double click 【AB】 to set a 【B】 Mark. The "Z" LED will glow solid red. Now the full throw of the Joystick controller will reflect the 【A】 to 【B】 Mark. To delete the hard stops, double click on 【AB】 again. The "F" LED will turn off. On the Joystick, the speed from which 【A】 to 【B】 Marks are reached is determined by the Speed controller, when Iris has been assigned to "0"

```
U7.8 STBY  K FREE 1
              +000 L
L01        J A--B 2
             -000
           S:30  R
```

Setting the Range & Hard Stops on Handles

1. Setting the Rotation Degree on the Knob

Some lenses have long focus throws. To compensate for this, the Handle's knob can be set to various rotational degrees. Both the left and right handles can change their rotational degrees. Shortening the knob's rotational degrees will shorten long focus throws by making the motor speed up and vice-versa; long knob degrees can be used on short focus throws. There are 3 ranges that can be chosen. The following directions pertain to the Right Handle. When using the Left Handle inverse the spin direction
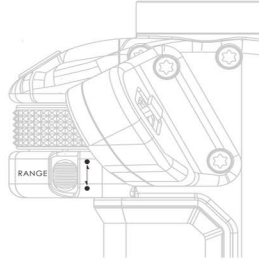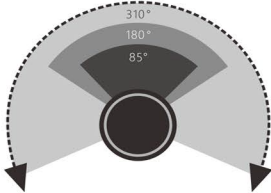
Pull【RANGE】↓. The letter "L" will appear on the Handle's display. "L" or ""Long" sets the knob to the longest distance it can rotate from left to right, 310 degrees. The motor will move slowly in this setting

```
V7.8 STBY K FREE  1
          + +999L
H04       J FREE  2
            -000
          S:30    R
```

Pull【RANGE】↓. The letter "L" will appear on the Handle's display. Spin the Knob clockwise completely till the knob stops. Push【RANGE】↑. The letter "S" will appear on the Handle's display. " S " or " Short " sets the knob to the shortest rotational distance , 85 degrees

```
V7.8 STBY K FREE  1
          + +866S
H04       J FREE  2
            -000
          S:30    R
```

Pull【RANGE】↓. The letter "L" will appear on the Handle's display. Spin the Knob counter clockwise completely till the knob stops. Push【RANGE】↑.The letter "M" will appear on the Handle's display. "M" or "Medium" sets the knob to 180 degrees
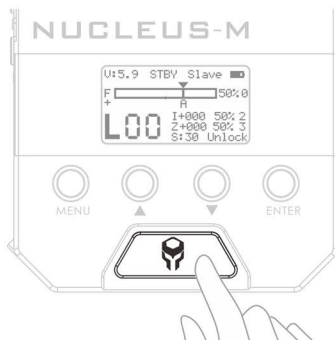
```
V7.8 STBY K FREE  1
          + +456M
H04       J FREE  2
            -000
          S:30    R
```
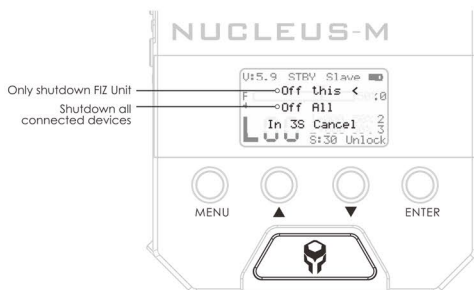
How to Use: Nucleus-M

Turn On / Turn Off

1. FIZ Hand Unit

Turn-On —— Hold【POWER】to Open the Main Menu

Turn-Off —— 1.1 Hold【POWER】then release. Use ▲▼ to toggle between selections. Double Click【POWER】to confirm

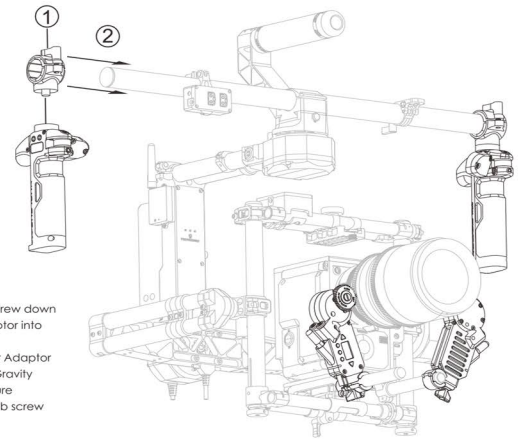1.2 Hold【POWER】Down for 3 Seconds and then the designated unit will shutdown

Only shutdown FIZ Unit
Shutdown all connected devices

Handle to Gimbal Bar Assembly

3.1

1. Use Allen Key to screw down the Gimbal Bar Adaptor into the Handle
2. Attach Gimbal Bar Adaptor from Handle to the Gravity Gimbal Bar and secure connection via thumb screw

Handle to Universal Gimbal Adaptor with Rosette Assembly

3.2

1. Use Allen Key to screw down the Arri Standard Rosette Adaptor into the Handle. Attach Arri Standard Rosette from Handle to the Universal Gimbal Adaptor with Rosette and secure connection via large thumb screw
2. Attach Universal Gimbal Adaptor to Gimbal Ring. Repeat for opposite side

The Universal Gimbal Adaptor is optional.
Bushings are also available for FreeFly and DJI Gimbals

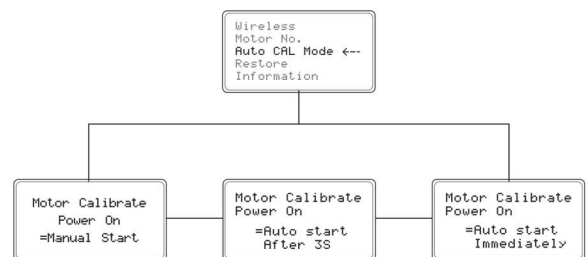### 2. Calibrating from the Motor

2.1 Setting the Auto CAL Mode

When the Motor is powered on, the following screen may appear.

```
Start calibrate
    In 3S
Any Key Cancle
```

This screen is dependent on the "Auto CAL Mode." This auto calibration setting can be found in the Motor's menu. Use ▼ to select "Auto CAL Mode" - toggle between the 3 options pictured below

The **"Manual Start"** setting will prevent the Motor from calibrating when initially turned on

The **"Auto Start After 3 Secs"** setting will automatically trigger calibration after 3 seconds when initially turned on. The user has 3 seconds to press any button on the motor to cancel the calibration

The **"Auto Start Immediately"** setting will immediately trigger calibration from the Motor the moment it turns on

```
Wireless
Motor No.
Auto CAL Mode ←--
Restore
Information
```

```
Motor Calibrate       Motor Calibrate       Motor Calibrate
Power On              Power On              Power On
=Manual Start         =Auto start          =Auto start
                       After 3S             Immediately
```

Once a calibration mode has been selected the Motor will turn red and calibration will begin. When the Motor's LED turns white, calibration has finished

2.2 Single and Multi-Motor Calibration from the Motor

Calibration from the Motor can happen at anytime, simply hold down【CAL】and release. Two options will appear: "CALIBRATE THIS" and "CALIBRATE ALL". "CALIBRATE THIS" will begin calibration on only the motor being programmed. "CALIBRATE ALL" will begin calibration on all motor's daisy-chained to it. Double click【CAL】to confirm and the motor(s) will begin calibration

```
Calibrate This<
Calibrate All

Cal Key Run
Up Key select
Other Keys Cancel
```
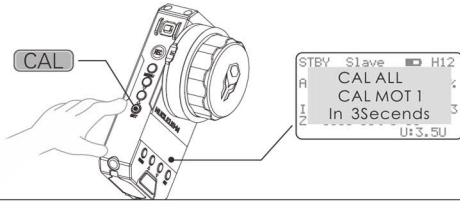
CALIBRATION

1.Calibration from the FIZ Unit

1.1 Calibration of Lens with Hard Stops

When using cine lenses or modified photo-lenses with follow focus gears and hard stops, calibrate from the FIZ unit by holding down【CAL】. The screen will show a 3 second countdown. Holding down【CAL】on the motor will also trigger a calibration

CAL

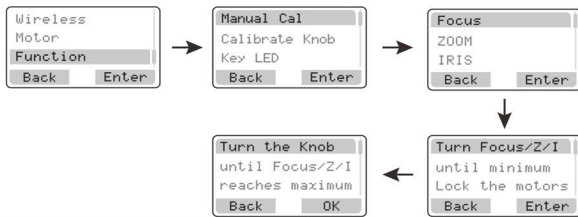STBY Slave 🔋 H12
CAL ALL
CAL MOT 1
In 3Secends
U:3.5U

Note : By default the Motors are set to the "Manual Start" - Auto CAL Mode. Motors need to be set the "Auto Start" Mode and calibrate on a lens before the CAL Button can be used on the FIZ and Handles. Doing so in this order will prevent any damage to the lens
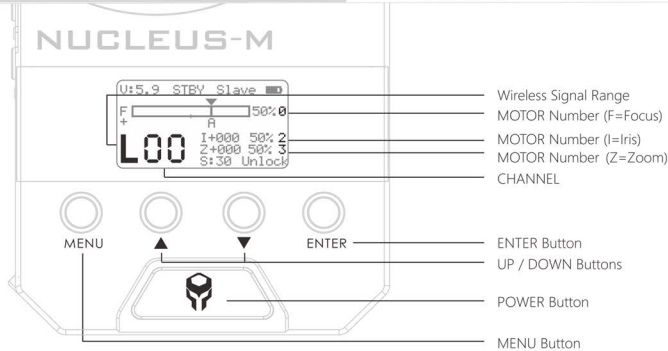
1.2 Calibration of Lens without Hard Stops

Lenses without hard stops need to be manually calibrated. Follow the images below to set manual calibration from the FIZ. For this example, we will calibrate【Focus】

1) Be sure that the Motor is not making contact with the lens gear
2) Turn the FIZ knob so that it is in the middle of its range
3) Now, manually position the lens gear to "middle" focus position between close and infinity
4) Securely attach the Motor to the lenses focus gear
5) Take the FIZ Unit and press the MENU Button to open the menu system
6) Highlight and select "FUNCTION"
7) Select "MANUAL CAL". Three options will appear: FOCUS, ZOOM, IRIS
8)Choose the one in need of calibration according to your needs- in this case select Focus
9)Follow the directions on the screen. Turn the knob completely counterclockwise and select enter. This sets the close focus
10) Now follow the directions on the screen once more. Turn the knob completely clockwise, the Motor should pull the lens gear to infinity. Select OK and return to the Main Menu. The Focus should now be properly calibrated


```
Wireless
Motor
Function
Back        Enter
```
→
```
Manual Cal
Calibrate Knob
Key LED
Back        Enter
```
→
```
Focus
ZOOM
IRIS
Back        Enter
```
↓
```
Turn the Knob
until Focus/Z/I
reaches maximum
Back        OK
```
←
```
Turn Focus/Z/I
until minimum
Lock the motors
Back        Enter
```

Syncing FIZ Hand Unit with Motors

NUCLEUS-M

U:5.9 STBY Slave 🔋
F+ ▬▬▬▬▬A▬▬ 50%0
L00 I+000 50% 2
     Z+000 50% 3
     S:30 Unlock

- Wireless Signal Range
- MOTOR Number (F=Focus)
- MOTOR Number (I=Iris)
- MOTOR Number (Z=Zoom)
- CHANNEL

MENU   ▲   ▼   ENTER
- ENTER Button
- UP / DOWN Buttons
- POWER Button
- MENU Button

Note: The FIZ Unit Channel Number must Match one of the daisy-chained Motor Channels. The FIZ Unit defaults to MASTER mode. To use the Handles, set FIZ Unit to SLAVE mode.
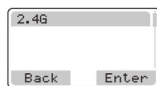
1. Setting the FIZ Unit's Channel


```
U:5.9 REC Master 🔋
F+ ▬▬▬A▬▬ 50%0
L00  I+000 50% 2
     Z+000 50% 3
     S:30 Unlock
```
1. From the Home Screen, use【MENU】to open the Menu System

```
Wireless
Motor
Function
Back        Enter
```
2. Use▲▼ to highlight "WIRELESS"- press【ENTER】to confirm

```
2.4G
Back        Enter
```
3.With "2.4G" highlighted, press【ENTER】to confirm

```
Mode :    M
Channel: 00
返回        设置
```
4. Continue pressing【ENTER】until "M" is selected. This value represents the "2.4G" or Long Range Value:

H MAX: Furthest Wireless Distance, High Power Consumption
M Medium: Recommended Wireless Distance, Average Power Consumption
L MIN: Short Wireless Distance, Low Power Consumption
**OFF:** No Wireless Signal Transmitted used when hardwiring FIZ to motor
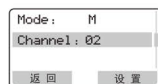
```
Mode :    M
Channel: 02
返回        设置
```
5. Highlight CHANNEL by pressing ▼ , then use ▲▼ to change the Channel Number. Available Channels range from 00-15. Set the CHANNEL to "02"

```
U:5.9 REC Master 🔋
F+ ▬▬▬A▬▬ 50%0
M02  I+000 50% 2
     Z+000 50% 3
     S:30 Unlock
```
6. Press【MENU】to return to the Home Screen. If the screen looks like the image above then the FIZ Unit's Channel has been set
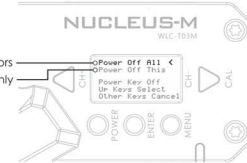
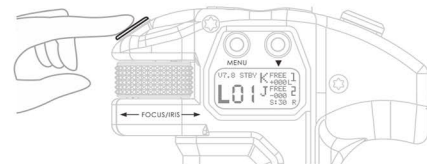### 2. Motor

Turn-on ——— Hold【POWER】to Open Main Menu

NUCLEUS-M
WLC-T03M
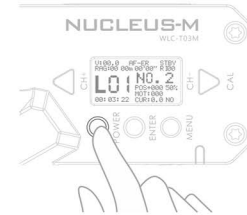
Turn-off ——— 1.1 Hold【POWER】then release, choose the mode
Double click【POWER】to confirm
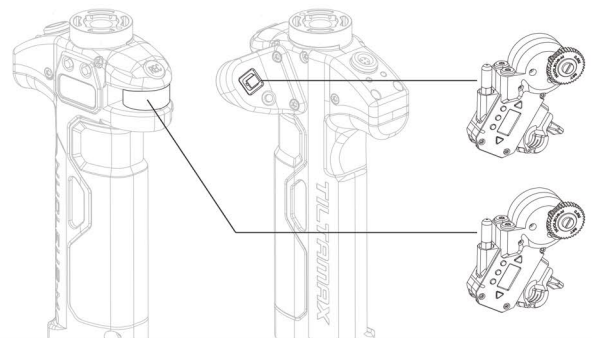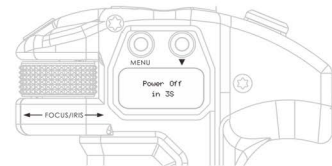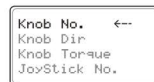1.2 Hold 【POWER】Down for 3 Seconds and then the designated unit will shutdown

NUCLEUS-M
WLC-T03M

Shutdown all the motors ——— >Power Off All <
Shutdown this motor only ——— Power Off This
Power Key Off
Up Keys Select
Other Keys Cancel

3. Handle

Turn-on ——— Hold 🔴 to Open Main Menu

U7.8 STBY K FREE 1
                +000L
              J FREE 2
L01   -000
              S:30 R

Turn-off ——— Hold 🔴 Down for 3 Seconds and then the designated unit will shutdown

Power Off
in 3S

2. Assigning Handle's Knob to Motor


```
Knob No.    ←--
Knob Dir
Knob Torque
JoyStick No.
```

```
Knob Motor
Control No.
    = 1
```

```
U7.8 STBY K FREE 1
                +000L
          J FREE 2
M01       -000
          S:30 R
```

1. From the Home Screen, double click【MENU】to open the Menu System. Use ▲▼ to select "KNOB NO." - double click【MENU】to confirm
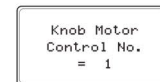
2. When a Motor has a been assigned a Motor No, that number corresponds to the value that can be selected by the Handle's Controller. Thus, the Knob Motor Control No. will sync the the Motor assigned that number between 1 and 4. Using a value of "0" prevents any controller connection to a motor.

In this case, set the Knob Motor Control No. to 1

3. Use 🔴 to return to the Home Screen. If the Home Screen appears like the image above, then the Motor has been synced with the Knob

3. Assigning Handle's Joystick to Motor


```
JoyStick No. ←--
JoyStick Dir
JoyStick Tor
JoyStick SPD
```

```
JoyStick Motor
Control No.
    = 2
```

```
U7.8 STBY K FREE 1
                +000L
          J FREE 2
M01       -000
          S:30 R
```

1. From the Home Screen, double click【MENU】to the open the Menu System. Use ▲▼ to select "JOYSTICK NO." - double click【MENU】to confirm

2. When a Motor has a been assigned a Motor No, that number corresponds to the value that can be selected by the Handle's Controller. Thus, the Joystick Motor Control No. will sync the the Motor assigned that number between 1 and 4. Using a value of "0" prevents any controller connection to a motor

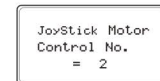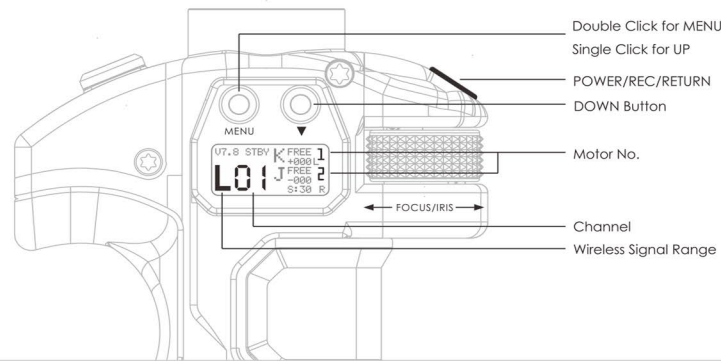In this case, set the Joystick Motor Control No. to 2

Syncing Handles with Motors

Double Click for MENU
Single Click for UP
POWER/REC/RETURN
DOWN Button

MENU

▼

V7.8 STBY K FREE 1
+000L
L01 J FREE 2
-000
S:30 R

Motor No.

FOCUS/IRIS

Channel
Wireless Signal Range

Below is a Figure for conceptual demonstration purposes depicting a default assignment of the FIZ Unit and 3Motors. Use the example below for quick start and troubleshooting

③ FIZ Unit - IRIS Wheel
② FIZ Unit - ZOOM Joystick

NUCLEUS-M

① FIZ Unit - FOCUS Knob

MOTOR 1 (FOCUS)
MOTOR 2 (ZOOM)
MOTOR 3 (IRIS Sold Separately)

1. Setting the Handle's Channel

V7.8 STBY K FREE 1
+000L
L01 J FREE 2
-000
S:30 R

1. From the Home Screen, double click 【MENU】 to open the Menu System

Wireless ←--
Knob No.
Knob Dir
Knob Torque

2. Use the ▲▼ to select "WIRELESS" - double click 【MENU】 to confirm

Wireless Mode
= M

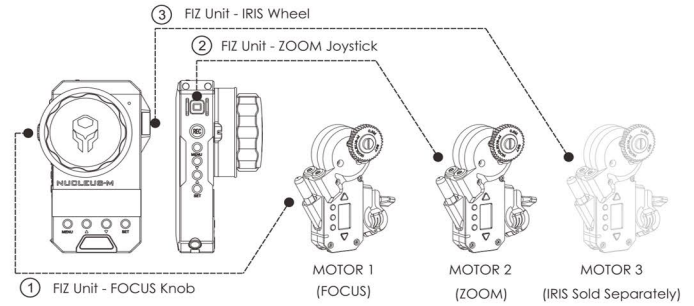3. Use ▲▼ to select "M". This value represents the "2.4G" or Long Range Value:

H MAX: Furthest Wireless Distance, High Power Consumption
M Medium : Recommended Wireless Distance, Average Power Consumption
L Min: Short Wireless Distance, Low Power Consumption
OFF: No Wireless Signal Transmitted For hardwiring to Motor

V7.8 STBY K FREE 1
+000L
M01 J FREE 2
-000
S:30 R

4. Use 🔴 to return to the Home Screen. If the Home Screen appears like the image above, then the LORA has been confirmed

Channel ←--
Wireless
Knob No.
Knob Dir

5. Use ▲▼ to select "CHANNEL" -double click 【MENU】 to confirm

Wireless Channel
= 02

6. Use ▲▼ to change the Channel Number. Available Channels range from 00-15. Set the CHANNEL to "02"

V7.8 STBY K FREE 1
+000L
M02 J FREE 2
-000
S:30 R

7. Use ▲▼ to return to the Home Screen. If the Home Screen appears like the image above, then the Channel has been confirmed

2. Assigning the Motor Numbers to the FIZ Unit

Note: Motors cannot share the same Motor Number. A Motor can identify if its Motor Number is being repeated and will automatically cancel the last Motor Number assigned

U:5.9 STBY Slave ▭
F 50%:0
+ A
M01 I+000 50%:2
Z+000 50%:3
S:30 Unlock

1. Press 【MENU】 to enter the Main Menu

Wireless
Motor
Function
Back Enter

2. Use ▲▼ to highlight "MOTOR" - press 【ENTER】 to confirm

Focus
ZOOM
IRI
Back Enter

3. Choose the corresponding controller of the FIZ Unit to the designated function of each Motor.

For Example, pair the Motor on the Focus gear of the Lens to the Focus Knob on the FIZ. In this case, that Motor has been assigned as Motor Number 1.

Highlight "FOCUS" and press 【ENTER】

Torque
SYNC
Direction
Back Enter

4. Use ▲▼ to highlight "SYNC" - press 【ENTER】 to confirm

Motor 1 ✓
Motor 2
Motor 3
Back Set

5. Use ▲▼ to highlight "Motor 1" - press 【ENTER】 to confirm.

Confirmation is identified by a check mark. If a Motor Number has no check mark, it is not synced with a controller on the FIZ

U:5.9 STBY Master ▭
F 50%:1
+ A
M01 I+000 50%:2
Z+000 50%:3
S:30 Unlock

6. Repeat Steps 1 - 5, to assign the Zoom and Iris Motor to the FIZ Unit.

Press 【MENU】 to return to the Home Screen. If the display looks like the picture above, then all 3 Motors have been synced properly

UP Button
POWER Button
ENTER Button
MENU Button
DOWN Button

CH+
POWER
ENTER
MENU
CH-
CAL

NUCLEUS-M

L01 NO. 2

Motor Number
Channel
Wireless Signal Range

4. Setting the Motor's Motor Number

For the purposes of this tutorial, if the Motor is not assigned to Motor No. 1, it will not be synced with the FIZ's focus knob controller

U:00.0 AF-ER STBY
RAG:00 00m 00"00" R 100
L01 NO. 2
POS+000 50%
MOT:000
00:03:22 CUR:0.0 NO

1. From the Home Screen, double click 【MENU】 to open the Menu System

Wireless ←--
Motor No.
Auto CAL Mode
Restore
Information

2. Use ▲▼ to highlight "MOTOR NO." - double click 【ENTER】 to confirm

Motor No.
= 1

3. Use ▲▼ to assign the Motor a number between 1 and 4.

In this case, set the Motor No. to 1, corresponding to the Focus on the FIZ

U:00.0 AF-ER STBY
RAG:00 00m 00"00" R 100
L01 NO. 1
POS+000 50%
MOT:000
00:03:22 CUR:0.0 NO

4. Press 【MENU】 to return to the Home Screen. If the display looks like the image above then the Motor Number has been set.

Lastly, repeat the steps above to match the corresponding Motor No. 2 and 3 with the FIZ Unit controller

3. Setting the Motor's Channel

U:00.0 AF-ER STBY
RAG:00 00m 00"00" R 100
L01 NO. 2
POS+000 50%
MOT:000
00:03:22 CUR:0.0 NO

1. From the Home Screen, double click 【MENU】 to open the Menu System

Wireless ←--
Motor No.
Auto CAL Mode
Restore
Information

2. Use ▲▼ to highlight "WIRELESS" - double click 【ENTER】 to confirm

Wireless Mode
= M

3. Continue pressing 【ENTER】 until "M" is selected. This value represents the "2.4G" or Long Range Value:

H MAX: Furthest Wireless Distance, High Power Consumption
M Medium: Recommended Wireless Distance, Average Power Consumption
L MIN: Short Wireless Distance, Low Power Consumption
OFF: No Wireless Signal Transmitted Used when hardwiring FIZ and/or Handle to Motor(s)

U:00.0 AF-ER STBY
RAG:00 00m 00"00" R 100
M01 NO. 2
POS+000 50%
MOT:000
00:03:22 CUR:0.0 NO

4. Press 【MENU】 to return to the Home Screen

5. Double click ▲▼ to change the channel.

Set the Channel to "01" then press 【MENU】 to return to the Home Screen. If the display looks like the image on the left. then the Motor Channel has been set

5. Switching between the FIZ Unit and Handles for Control of Motors

By default the FIZ Unit has priority control over the Motors. To release the FIZ Unit's control and give the Handles priority control, double click on the FIZ Unit's 【FUNC】. If "SLAVE" appears on the Home Screen display, this is confirmation that the handles now have priority control over the Motors

Recalibration is not necessary, but be sure to assign a controller and do not attempt to control one motor with the FIZ and Handle simultaneously

The FIZ Unit defaults to MASTER mode. To use the Handles, set FIZ Unit to SLAVE mode

U:5.9 STBY Master ▭
F 50%:0
+ A
L00 I+000 50%:2
Z+000 50%:3
S:30 Unlock

Double Click 【FUNC】 on the FIZ Unit to switch between Master and Slave Modes
When the display reads "**Master**" the FIZ Unit has priority control over the Motors
When the display reads "**Slave**" the Handles have priority control over the Motors
For the purposes of this tutorial, let's keep the FIZ in Master mode