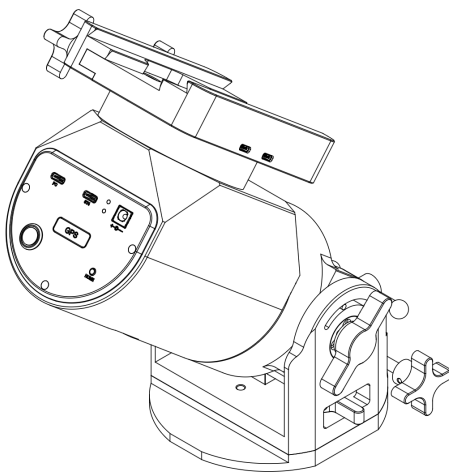


# WARPDRIIVE WD-20P

## Quick Start Guide

v1.0



(For latest version, please visit <https://www.warpastron.com>)

# Safety Precautions



Welcome to use WARPDRIVE Harmonic Equatorial Mount

Before using this product, please carefully read safety precautions and visit <https://www.warpastron.com> for the "User Guide" and related documents.

Safety precautions are in place to protect your personal safety and property. Users should read and fully understand the safety precautions before performing any operations.



## WARNING

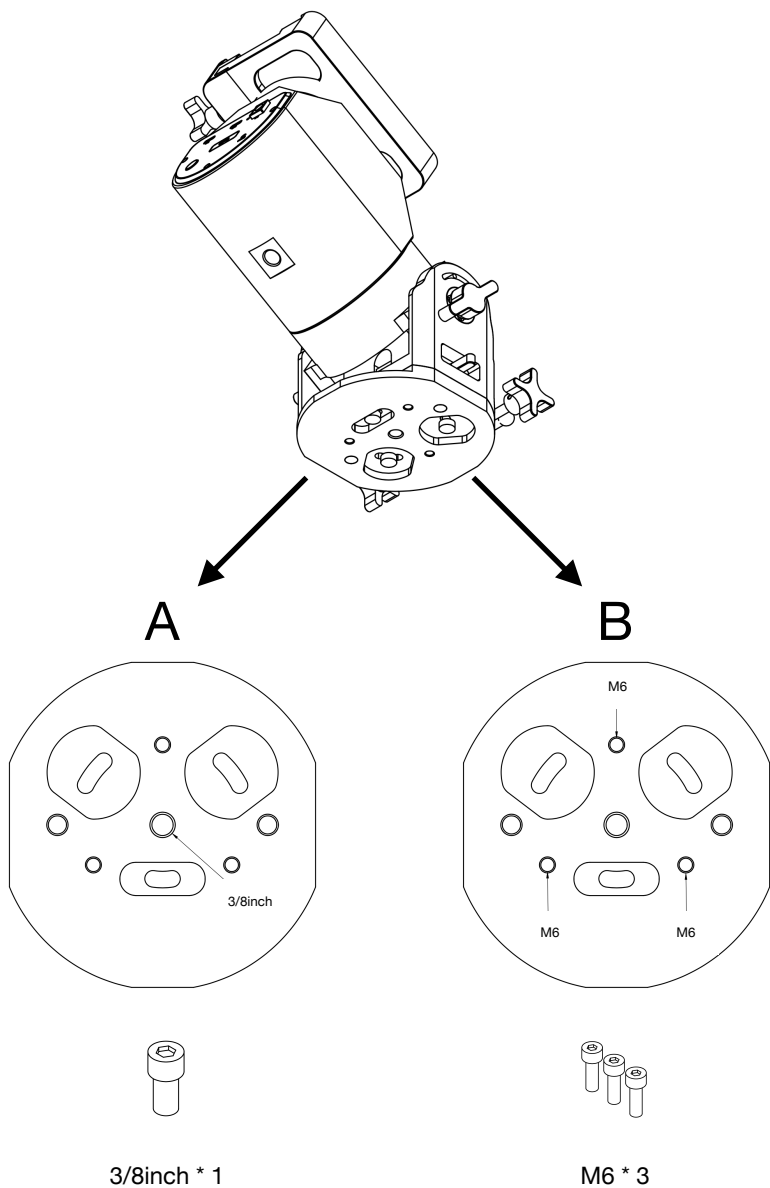
- Do not operate the power cable when your hands are wet, as it may cause electric shock.
- Do not pull or tug the power cord. Ensure that the power cord is insulated and intact before use to prevent electrical short circuits, fires, or electric shock. Do not use AC adapter in wet environment.
- When using a battery as a power source, make sure to use the DC plug with the correct polarity to avoid short-circuiting. Use regulated DC power supply source only.
- When transporting or installing the mount, hold it firmly to prevent accidental dropping and injuries to your feet or other body parts. Do not touch the mount when it's slewing.
- Avoid sudden and forceful operations when adjusting and installing the mount to prevent scratching or injuring your hands on protruding parts or edges. It is recommended to wear gloves when operating in low-temperature environments.
- Keep the mount and related accessories out of the reach of children. This product contains small parts that may pose a choking hazard if accidentally swallowed. Children under 12 years old are not allowed to use this product. Minors under 18 years old should operate under the guidance of a guardian.



## CAUTION

- If the equipment produces abnormal noises or smoke during use, immediately disconnect the power and contact customer support.
- Do not disassemble the mount without authorization, as it may result in product damage or void the warranty.
- Handle the mount with care to avoid impact during transportation or handling.
- Before installing the mount, ensure that the compatible tripod is securely fixed on a relatively flat and sturdy surface to prevent the equatorial mount from falling due to an unstable center of gravity
- Place the mount stably on a flat surface. If the mount is placed on the base at a non-vertical angle, it may accidentally fall and cause damage.

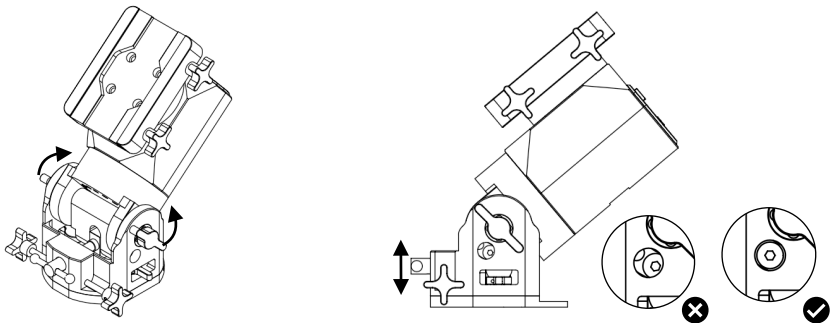
# Connect Mount to Tripod



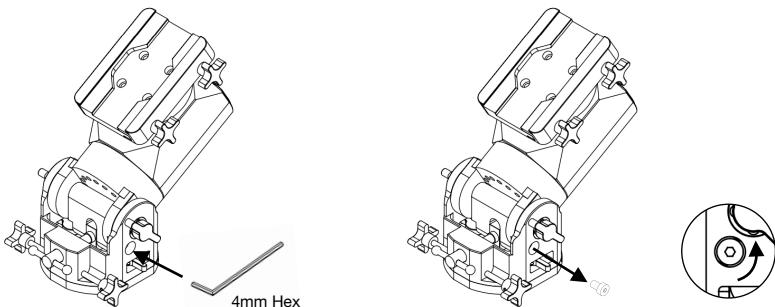
- Note:**
- 1. The depth of screw thread should not exceed 10mm.
  - 2. Do not remove the three bolts with shims, as they are designed for backlash control.

# Latitude Range Adjustment

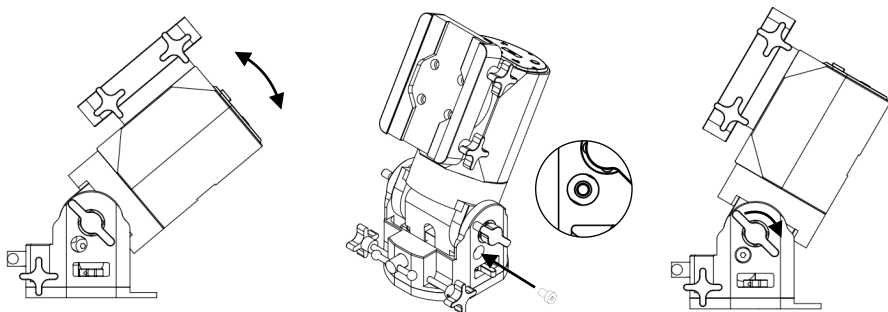
1



2



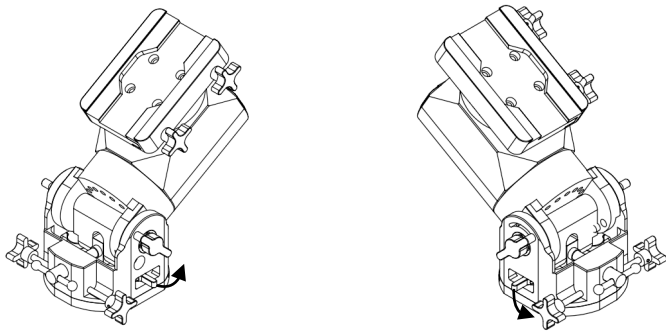
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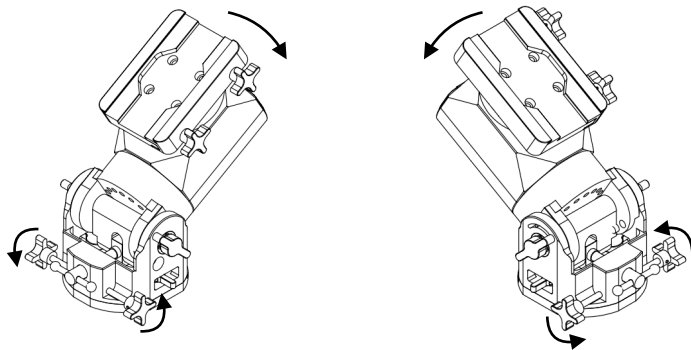
4

# Azimuth Fine Adjustment

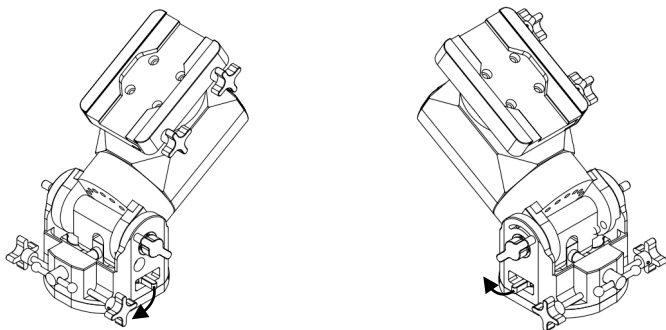
1



2



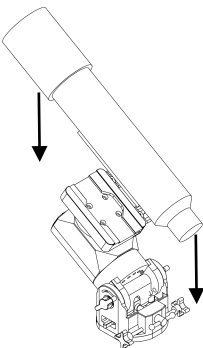
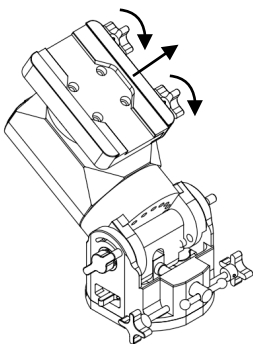
3



5

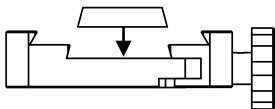
# Telescope (OTA) Installation

1

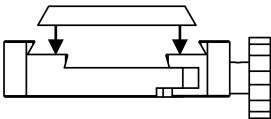


2

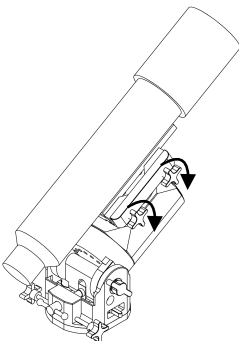
Vixen



Losmandy

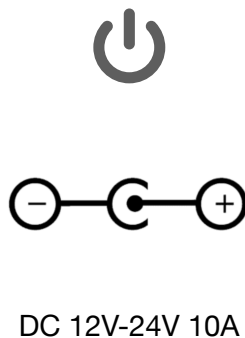
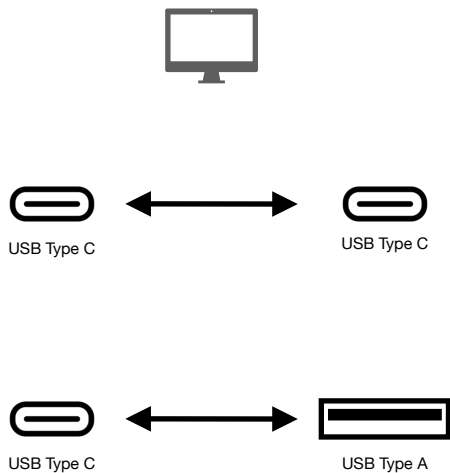
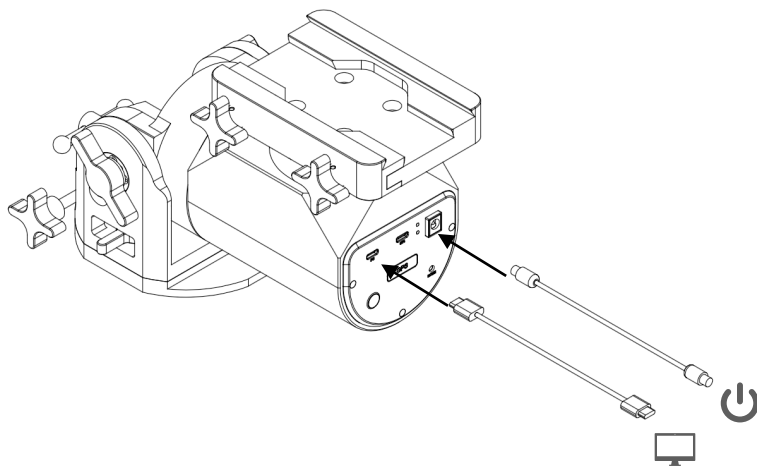


3



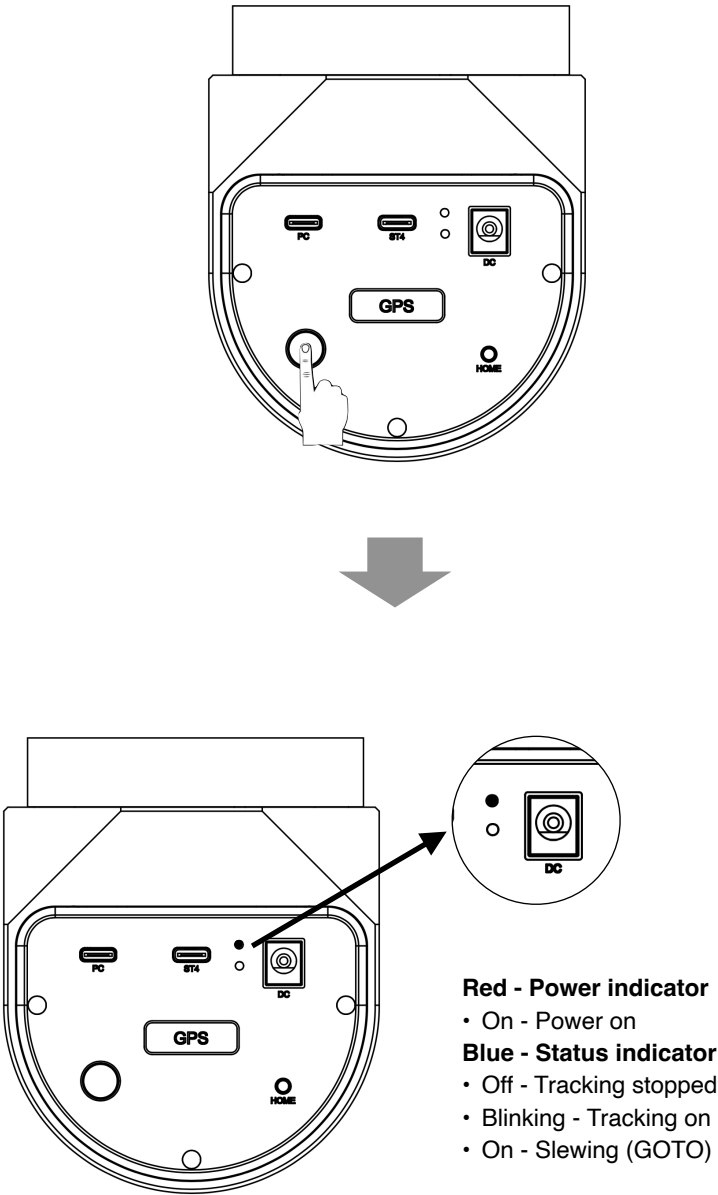
6

# Cables Connection



- Note:
1. The USB Type-C port on the saddle is only compatible with USB Type-A ports on PCs.
  2. Use a regulated DC power supply only. Do not use battery cells, as voltage drop may cause malfunction.
  3. Saddle power output supports up to 12V 3A with 12V input. For 12V 5A or higher, use a 24V power supply.

# Power



Note:  
1. The mount will automatically power on when first connected to a power supply.



# Time & Location



After powering on the mount, it is important to first set the correct time and location. Incorrect time or location information can result in the failure of altitude and meridian flip limit protection functions, leading to unexpected movements or collision risks.

The mount can be set with time and location information using various methods, including::

## A GPS Automatic Positioning

The mount is equipped with a built-in GPS module, which automatically obtains the time and location information of your current position upon startup

- The GPS module requires an unobstructed outdoor environment to receive satellite signals (GPS/BeiDou). If there are obstacles, such as a balcony, in the usage environment, it may result in long wait time or signal reception failure
- During the first use of the mount or when it has been turned off for a long time, the GPS positioning process may take longer. Generally, the GPS module can complete the positioning within 3 minutes after startup.
- Once the GPS successfully locates, it will synchronize the date, time, and latitude/longitude coordinates of the equatorial mount with your current location.

## B Sync using ASCOM Driver

- If you have installed the ASCOM driver on your PC, you can enable the option in the ASCOM OnStep driver configuration panel. This allows shooting software that utilizes the ASCOM driver (such as NINA or Virtual Moon Atlas) to automatically sync the date, time, and location information when connecting to the mount.
- For more information on installing and using the ASCOM driver, please refer to the equatorial mount's "User Guide" manual.

## C Sync using INDI/Kstars

- If you are using imaging software based on the INDI driver platform, such as Kstars or StellarMate, you can utilize the Ekos capture module in Kstars to synchronize the time and location.
- Open the Ekos settings, select the "INDI" panel, and check the "Kstars updates all devices" option under "Time & Location Update". Also, check the "Time" and "Location" options on the right side.

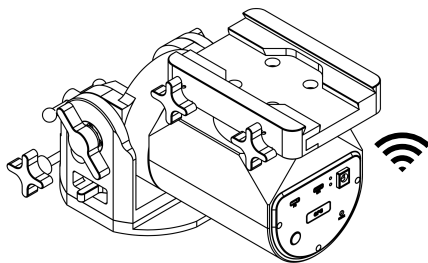
## D Manual Setting using Hand Controller (HC)

- Refer to page 13 for detailed instructions.

# Hand Controller Connection

The mount comes with a standard Hand Controller (HC) for control. The HC is available in both wireless and wired versions.

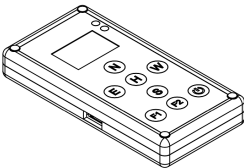
A



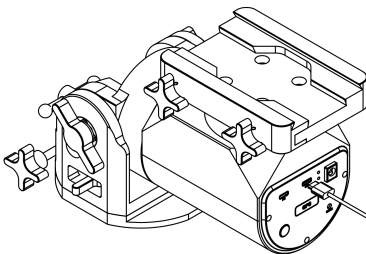
**Single Click - Power on**

- Green Light ON - Power ON
- Blue Light ON - Good Battery
- Blue Light Blinking - Low Battery

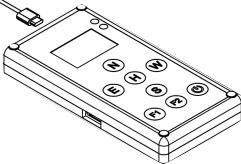
**Double Click - Power off**



B

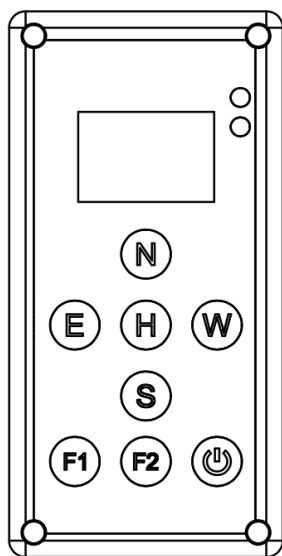


USB Type-C to C Cable  
(USB Gen3.2 20PIN)

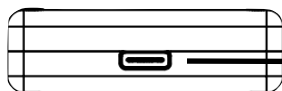


Note: Due to battery and shipping safety regulations, the default remote controller is the wired version.

# HC Button Functions



- (N) Move North (Tracking mode) / Up (Menu mode)
- (S) Move South (Tracking mode) / Down (Menu mode)
- (E) Move East (Tracking mode) / Return (Menu mode)
- (W) Move West (Tracking mode) / Next (Menu mode)
- (F1) Decrease currently selected Feature
- (F2) Increase currently selected Feature
- (Power) Power On/Off (Wireless version)
- (H) Single Click - Switching Info Display Page  
Long Press - Enter Main Menu  
Double Click - Enter Feature Menu



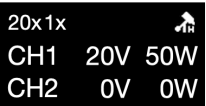
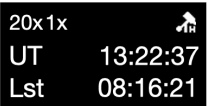
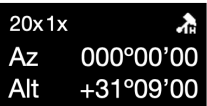
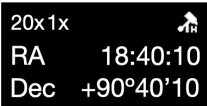
Mount ST4 Port (Wired version) / Charging (Wireless version)



Celestial Equatorial Coordinates



Main Menu



Celestial Equatorial Coordinates

Horizontal Coordinates

Current Time

Saddle Power Status

# Tracking/Manual Guiding





After powering on, the mount defaults to the home position and tracking is stopped. To use the manual guiding function with the directional buttons, you need to first start the tracking.

20x1x

RA 18:40:10

Dec +90°40'10





Mount at Home

## Tracking Start/Stop


- 1. Long press (H) to enter menu: Main Menu->Tracking
- 2. Select “Start/Stop”, single click (W), to display “Value Set! ”, tracking will be started/ stopped
- 3. When tracking is started, the blue light on front panel of the mount will be blinking

Main Menu

Parking

Tracking

Settings




Tracking

Start / Stop


Sidereal

Solar



Value Set!


## Manual Guiding

- 1. Ensure tracking is started (Sidereal tracking icon shown on screen  )
- 2. Press (N) (S) (E) (W), the mount will be move based on current guide speed
- 3. Single click (F2) to increase guide speed, or (F1) to decrease speed
- 4. For failsafe protection: If a button is continuously pressed for more than 30 seconds, the mount will stop moving and you will need to press it again to resume moving.

20x1x

RA 18:40:10

Dec +90°40'10



48x1x

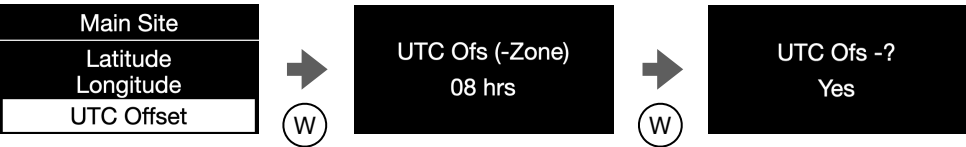
RA 18:40:10

Dec +90°40'10

# Manually Set Time/Location

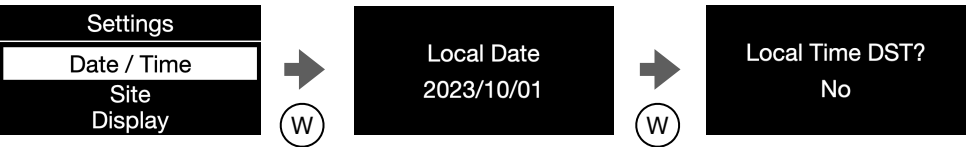
## Timezone

1. Long press **(H)** to enter menu: Main Menu->Settings->Site->UTC offset
2. Press **(N)** **(S)** to select your timezone(e.g. 8 for Beijing), then press **(W)** to confirm
3. If your location at Eastern Hemisphere, such as UTC+8:00, you need to se “UTC Ofs -? ” to “Yes”, for Western Hemisphere, set to “No”



## Date/Time

1. Long press **(H)** to enter menu: Main Menu->Settings->Date/Time
2. Press **(N)** **(S)** to adjust the value of Date/Time, then press **(W)** to confirm
3. For normal operations, please set “Local Time DST? ” to “No” (Default)



## Location

1. Long press **(H)** to enter menu: Main Menu->Settings->Site->Latitude/Longitude
2. 4 preset sites can be set via HC, and select the one you required
3. You can select a “Site”, then set the“Latitude” and “Longitude” for it
4. GPS module will sync the location to Site 1 as default

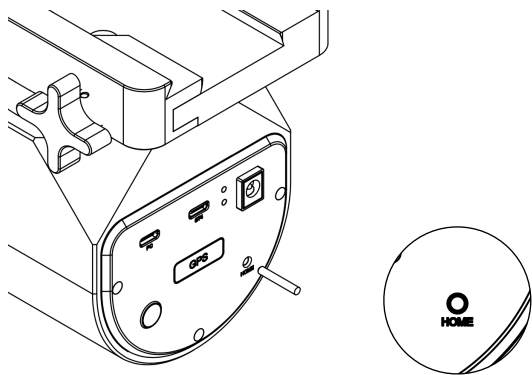


# Return Home

WD-20P equipped with home sensors at both axis, it will return to the home position once activated.

## Use Home Switch

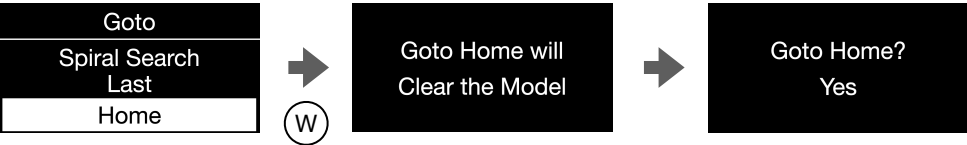
- 1. Long press the “Home” button for 0.5 second, the blue status light will be ON, indicating that the mount is returning to home position.
- 2. Homing will be cancelled if “Home ” button be pressed again, the blue status light will be OFF



Note: This function will return the physical position of mount to home, you may still need to update home position in coordinates via “Reset Home” or complete alignment via “Sync” functions.

## Use “Return Home” in HC

- 1. Long press (H) to enter Menu: Main Menu->Goto->Home
- 2. Screen will display message “Goto Home will clear the Model” , with following message asking “Goto Home? ”
- 3. Press (N) or (S) to select the “Yes”, then single click (W) , the mount will be returning to home position



# Limit Protection



The limit protection parameters directly determine the operational behavior of the mount. Users must have a full understanding of the function and consequences of these parameters before modifying them.

## Overhead & Horizon Limit

1. Overhead and Horizon Limit are limits to prevent mount pointing to target's position in Alt/Az. Target will not reach the area that Alt **above Overhead limit** or **below Horizon limit** value
2. WD-20P Default limits: Overhead Limit = 88°, Horizon Limit = -10°
3. To modify the limits, enter menu: Main Menu->Settings->Configuration->Limits->Horizon Limit / Overhead Limit. Press **(W)** after modification, with message "Value Set!", reboot mount to take effect

Overhead Limit  
88 degree

Horizon Limit  
-10 degree

Note: Overhead Limit will be disabled when it set to 90°; You may need set it to 90° for meridian flip required.

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## Meridian Limits

1. Meridian Limit E and Meridian Limit W will determine when meridian flip will happened. Meridian window - area between Meridian Limit E and W is the area that allow meridian flip for NINA/KStars software. Mount can perform meridian flip by software control/commands or internal OnStep flip feature(Target reach Meridian W).
2. **When mount GOTO/slew to selected target in the meridian window area, mount will at east pier side due to Preferred pier side set to EAST. Just as meridian flip already completed. When mount GOTO/slew to selected target out of meridian window area and at the east of Meridian Limit E, mount still at the west pier side.**
3. Default Meridian Limit E = 15° (60mins), Meridian Limit W = 15° (60mins)
4. To modify the limits, enter menu: Main Menu->Settings->Configuration->Limits->Meridian Limit E / Meridian Limit W, Press **(W)** after modification, with message "Value Set!", reboot mount to take effect
5. Please ensure you already understand meridian flip behavior before change limits

Note: Overhead, Horizon, and Meridian Limits are based on the coordinate system and will only take effect after alignment or plate solving is completed.

# EC HA Limit



EC HA Limit is an encoder-based RA hour angle limit that works independently of mount coordinates, ensuring collision protection even if alignment is incorrect or meridian flip failed.

- 1. EC HA Limit is degrees allowed that rotated from home position.
- 2. Factory Default limits: EC HA Limit E = 95°, EC HA Limit W = 95°
- 3. Main Menu->Settings->Configuration->Limits->EC HA Limit
- 4. **EC HA Limit Status** - Enable(Recommended)/Disable this feature
- 5. To modify the value, change EC HA Limit E or EC HA Limit W in the menu. Press



EC HA Limit
EC HA Limit Status
EC HA Limit E
EC HA Limit W

EC HA Limit Status
Enabled
Disabled

EC HA Limit W
95 degrees

# AEB Tuning



AEB (Autonomous Emergency Braking) is a passive safety feature that detects abnormal torque during motion and automatically stops and reverses to reduce potential collision damage—independent of coordinate system.

- 1. AEB monitors abnormal torque to trigger braking and reverse.
- 2. Default aggressiveness is high—please tune based on OTA load to avoid false triggers or delayed protection.
- 3. Ensure AEB and EC HA Limit are enabled, and OTA can safely rotate to both EC HA Limit positions. Adjust limits if collision risk exists.
- 4. Auto tuning process: Mount At Home-> Slew to EC HA Limit (one side) ->Return to Home. Torque data is recorded and AEB threshold is updated automatically.
- 5. Start Tuning: Main Menu->Settings->Configuration->Limits->AEB->Auto Tuning

AEB
AEB Status
AEB aggressiveness
AEB Ratio

AEB Status
Enabled
Disabled

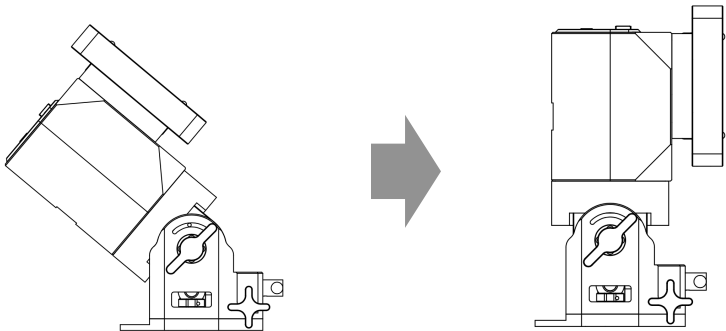
Auto Tuning?
Yes



# Switch to Alt-Azimuth Mode

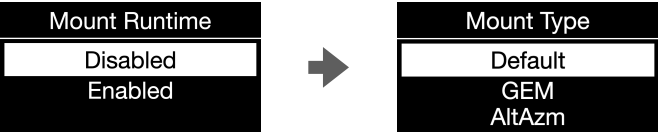
## Adjust Mount Position to Alt-Azimuth

- 1. Level the mount base (tripod) completely — levelness directly affects tracking accuracy.
- 2. Set the mount’s azimuth to true north and adjust the latitude angle to 90°.
- 3. Remove the four M6 bolts on the saddle, rotate the saddle 90°, then reattach and tighten the bolts securely.



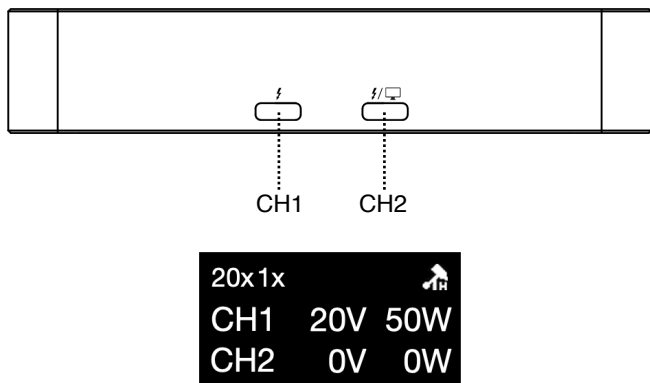
## Switch to Alt-Azimuth Mode in HC

- 1. Long press (H) to enter menu: Main Menu->Settings->Configuration->Mount Runtime
- 2. Select “Enabled” and single click (W) for confirmation
- 3. Enter menu: Main Menu->Settings->Configuration->Mount Type
- 4. Select “AltAzm” and single click (W) , **reboot mount to take effect**
- 5. To resume to equatorial mount mode, please select “Default” or “GEM”



# Saddle Power Status

The WD-20P saddle features two PD-capable USB Type-C ports. Power output status can be viewed via the hand controller.



1. The available power output from the saddle depends on the input voltage of the mount's power supply. Higher input voltage enables higher output power..
2. CH1 Port: 5/9/12V 36W Max(12V Input) / 5/9/12/15/20V 5A 100W Max (24V Input)
3. CH2 Port: 5/9/12V 36W Max(12V Input) / 5/9/12/15/20V 3A 60W Max (24V Input)
4. CH2 Port supports either PD power output or PC data connection via USB Type-C to Type-A cable.