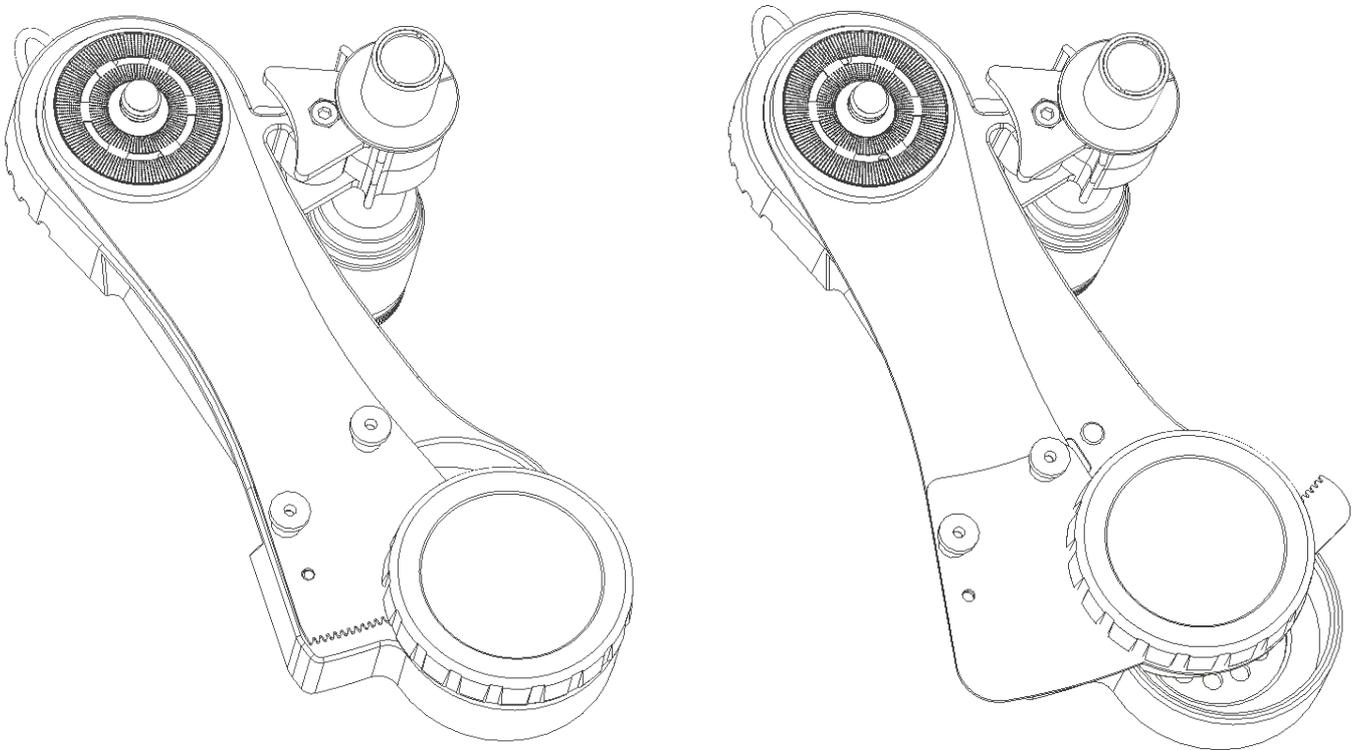


Instruction Manual

omegon



Northern Hemisphere & Southern Hemisphere

Omegon® MiniTrack Quattro NS

English Version 11.2021 Rev. A, Art.-Nr. 69307

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The Omegon® MiniTrack Quattro NS

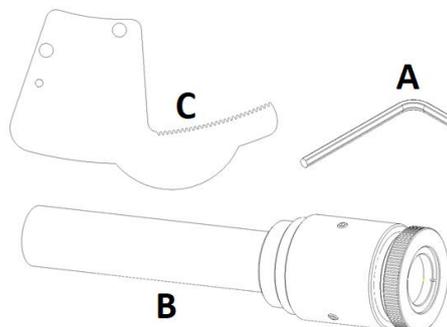
Congratulations on the purchase of the Omegon® MiniTrack Quattro NS. This mechanical mount will give you hours of fun. It is the ideal companion for the beginner, intermediate and advanced amateur who is looking for a compact and carry-on mount solution. It's simple design and mechanical quality makes the MiniTrack Quattro NS a unique tool for wide-field astrophotography. It can work everywhere on the planet, i.e. both in the Northern and Southern hemispheres.

1. What's included?

- A- Hex Key;
- B- Polar finder;
- C- South arm;

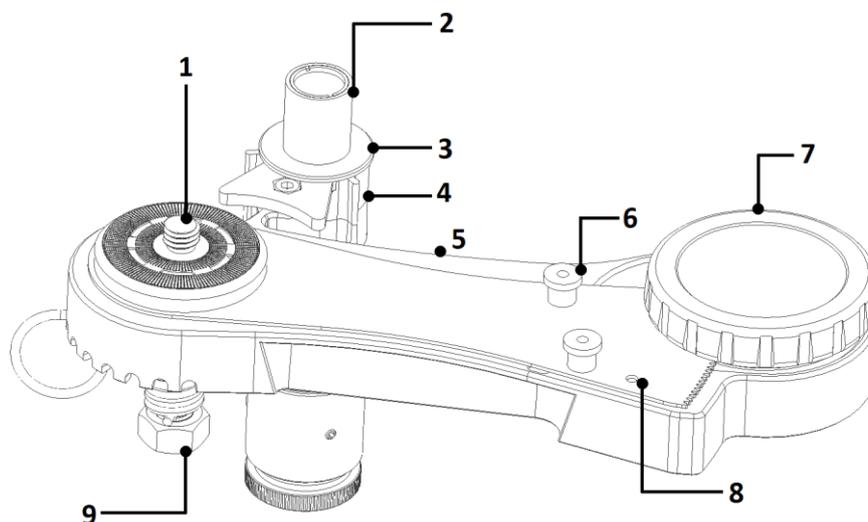
2. MiniTrack's features.

We recommend knowing the different MiniTrack's Quattro NS features.



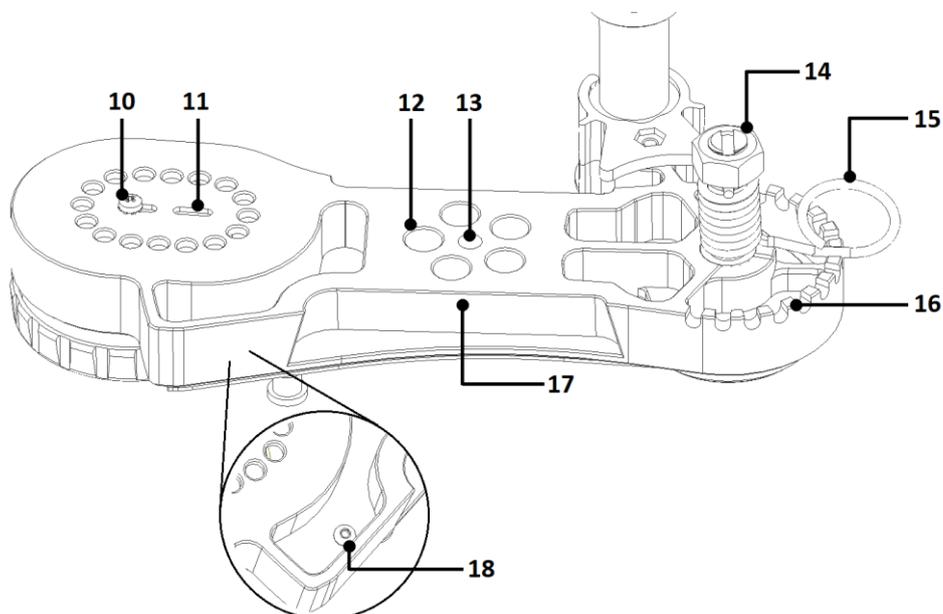
Side A components:

- 1- 3/8" thread for ball-head;
- 2- Polar finder scope;
- 3- Polar finder holder;
- 4- Plastic retainer;
- 5- Body;
- 6- Thumbnut (two);
- 7- Winding-knob;
- 8- Alignment through-hole;
- 9- Spring retainer.



Side B components:

- 10- Timer screw with washer;
- 11- Screw slit;
- 12- 3/8" thread for tripod;
- 13- 1/4" thread for tripod;
- 14- Spring post;
- 15- Spring;
- 16- Spring castellations;
- 17- Vixen-style dovetail;
- 18- Locking bolt.



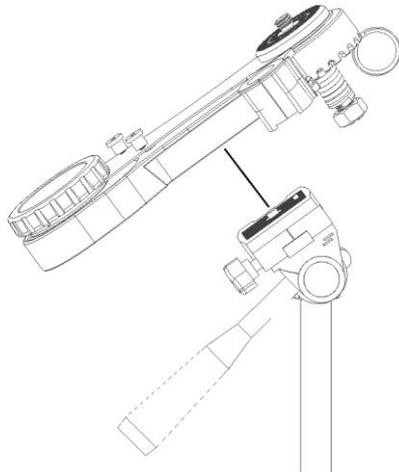
3. How does the MiniTrack Quattro NS mount work?

The MiniTrack Quattro NS "follows" i.e. tracks the apparent movement of the night sky. The NS stands for Northern and Southern Hemisphere as the mount is capable of tracking the sky on both earth's hemispheres. The sky "rotates" roughly around Polaris – the northern Star – in the Northern Hemisphere and

around the South Celestial Pole (or SCP) in the southern hemisphere. In order to successfully track, the mount must point either to Polaris or to the SCP. This is called setting the mount in station. The mount sits on a tripod head allowing a certain degree of inclination. Usually the inclination corresponds to the latitude of the user's location. Besides that, a ball head is required so that the camera can be easily pointed to the desired object. Then wind-up the built-in timer and you are ready to go!

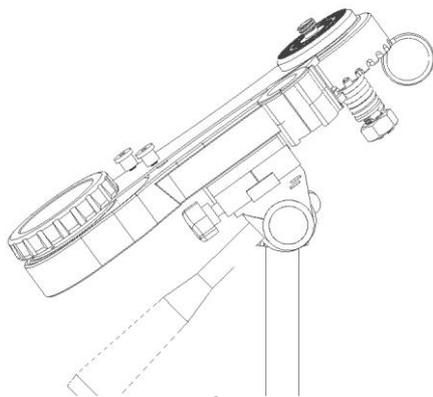
Attention!

Please release the tiny locking bolt (#18) before using the Minitrack Quattro NS!

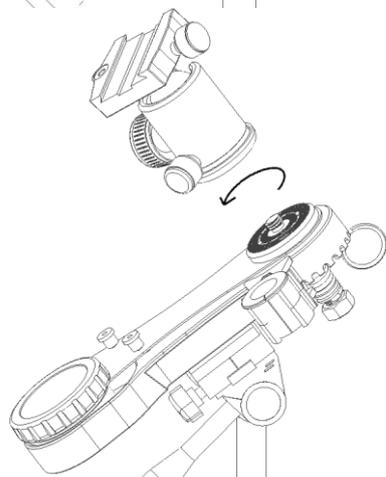


4. How to mount the MiniTrack Quattro NS?

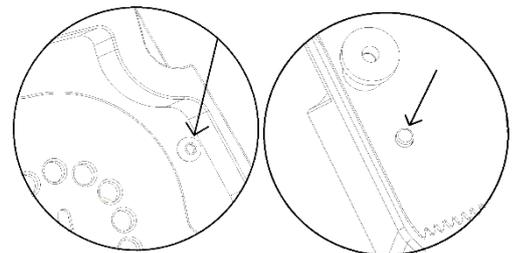
4.1. The MiniTrack Quattro NS is compatible with any 1/4" or 3/8" tripod plates. Set the mount to the tripod's plate (not supplied) as shown. Make sure that the mounts is set so that the inclination can be adjusted if necessary.



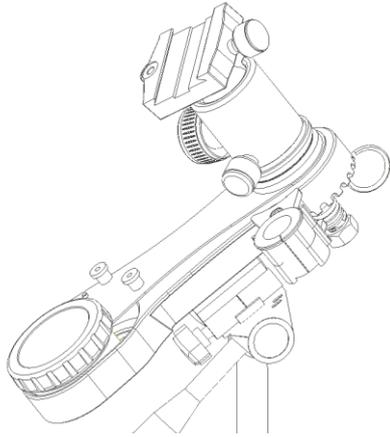
4.2. Make sure the mount is parallel to the adapter base. This is important because the inclination needs to be fine-tuned to set the mount in station. Check "how to set the mount into station" in 5.2. (for the Northern Hemisphere)



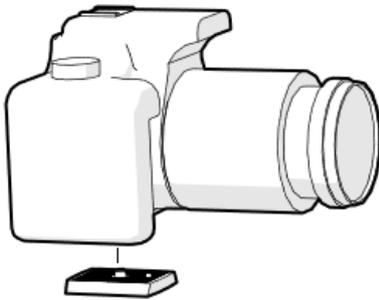
4.3. The mount is supplied with a locking mechanism. It is important to lock the mount first before attaching the ball head. Use the supplied hex-key (A) to tighten the Alignment screw (#18) so that it protrudes the Alignment through-hole (#8) as shown below. Now that it is locked you can thread the 3/8" threaded ball head (not included).



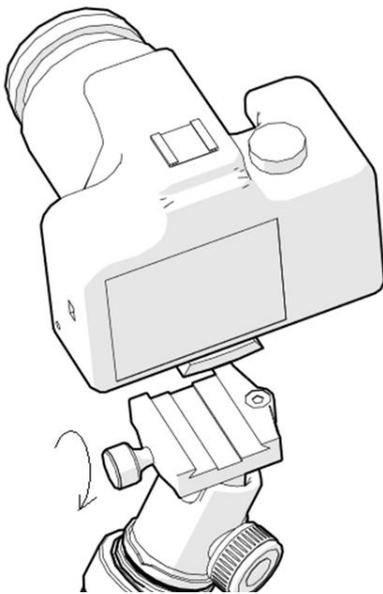
Locking mechanism: please release the locking bolt before use otherwise the winding-knob will be locked!



4.4. The ball-head must be securely fixed. Make sure to tighten it well. All the weight from the camera will rest on the ball-head. Besides that, a well-fixed ball-head ensures that there will be no slippage during long-exposures. At this point, it is important that the ball-head knobs are also tight. This prevents movement when installing the camera.



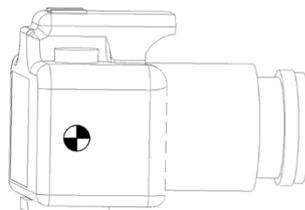
4.5. Install the tripod plate (included only with the ball-head version) to the camera. Make sure the adapter is square to the camera base and well tighten.



4.6. Set the camera (with the adapter) to the ball's-head base. Make sure to tighten it well. Please notice that the ball-head has two additional knobs. One fixes the ball's-head position in azimuth (360 deg) while the other fixes the ball's-head pointing direction (in altitude). These two degrees of orientation allows the user to point to any desired object in the sky. Make sure both are well tighten before installing the camera. Release the knobs – just slightly – to allow pointing the camera to different directions. Please note that good balance is a required for a proper functioning mount.

How to balance the camera on the ball head?

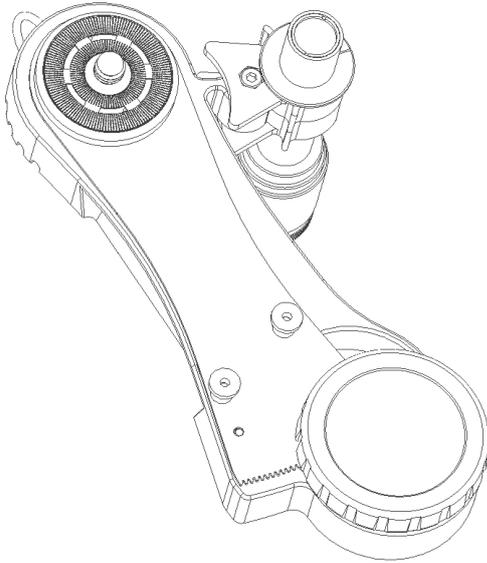
The centre of gravity must always sit on an imaginary line to the centre of the ball's-head base, as shown below. If that is not the case, please use a dovetail system to achieve this.



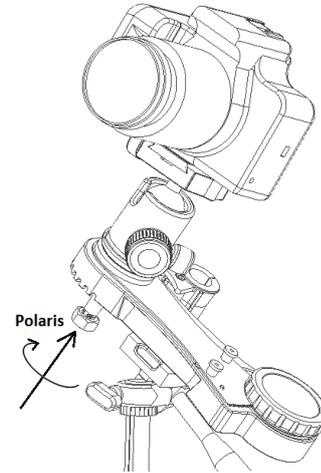
Centre of gravity: the setup's centre of gravity plays a major role for accurate tracking. Please make sure to determine where the centre of gravity is and use an additional (not supplied) Arca Swiss-type of dovetail if necessary.

5. Northern Hemisphere configuration

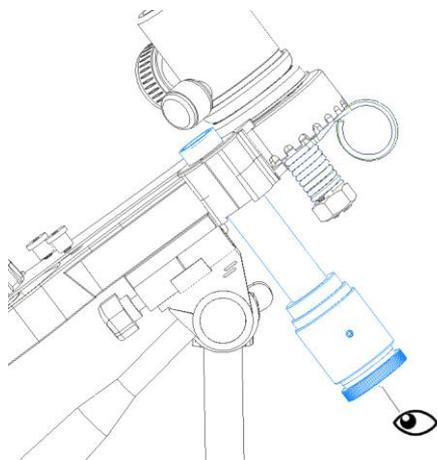
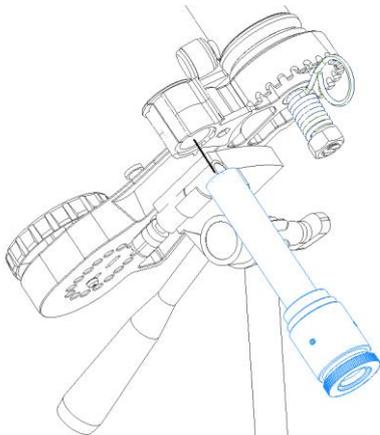
5.1. Alignment with Polaris



Point the mount to the Polaris. It is not important to be exactly aligned with the Polaris– a rough alignment is fine. Upon installing the supplied polar finder (B) we will look in more detail on how to have the star in the centre of the polar finder (B) field of view.

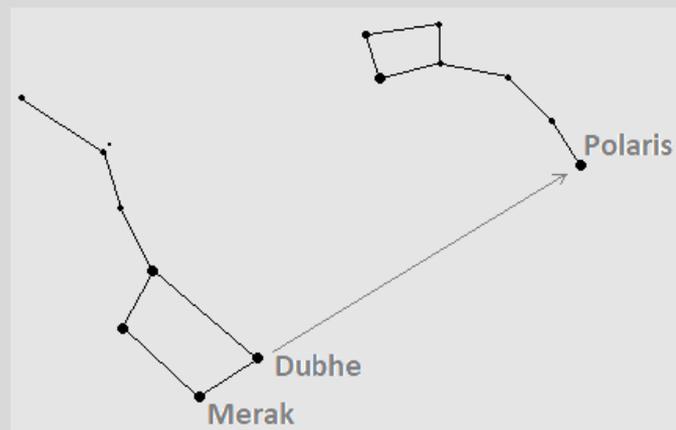


5.2. To align the mount to Polaris with more precision slide the polar finder (B) to the polar finder holder (#1).



How to identify Polaris?

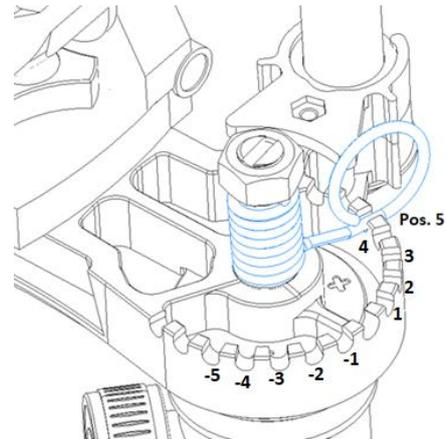
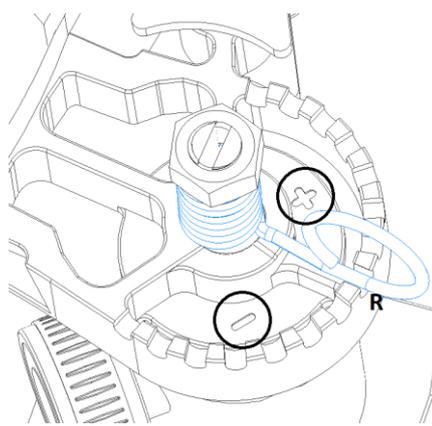
Polaris is not the brightest star on the sky but still easy to identify. Look up to north and try to find the Big Dipper (constellation). This is a very recognisable constellation. Polaris is about six times the distance and direction of two of its brightest stars – Merak and Dubhe.



5.3. Peek through the polar finder (B) and centre Polaris in the visual field. Turn the tripod's fine-adjustment levelers to do so. Please read the following section for more details on how to correctly use the MiniTrack Quattro NS and the importance of correct balance.

6. Balancing the MiniTrack Quattro NS on the East hemisphere (applies only for Northern Hemisphere configuration).

The built-in timer pushes the photo setup to track the night sky. If the setup's centre of mass is slightly off to the West side of the hemisphere, the generated arm-moment helps the timer to track the objects, this is good. However, the opposite, i.e. if the setup is more off-balanced to east side it may happen that the timer will have difficulties to push and track conveniently. For that reason the built-in spring system acts as a counterweight and gives an extra help to the timer by adding additional push force.



How to determine if the timer is not able to push the setup?

Listen to the timer ticking without any load. Compare that sound to when the setup is assembled. Is there a huge sound difference? – i.e. the timer is not as loud as it should be – then the spring tension must be adjusted.

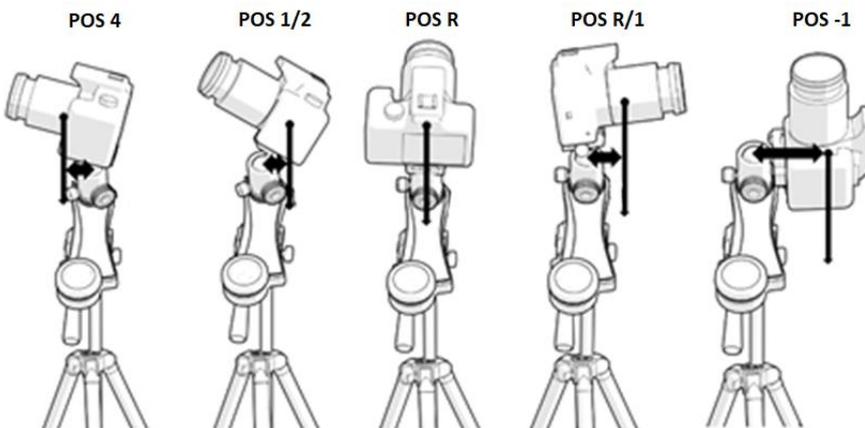
The ticking tempo should be around **135 bpm**. Adjust the spring position to the “+” sign side to accelerate tempo or to the “-” sign to slower the tempo.

Note: Several Apps are available to count tempo. We suggest to use one to better determine the exact tempo.

6.1. Tensioning the spring.

For setups, slightly off-balance use the first positions. You can feel that the spring is not under a lot of tension. Use the spring at its highest tension only for heavy setups and strong unbalance. See below how to choose the spring's position.

Please avoid unnecessary spring tension as this might alter the timer's clock tracking rate!

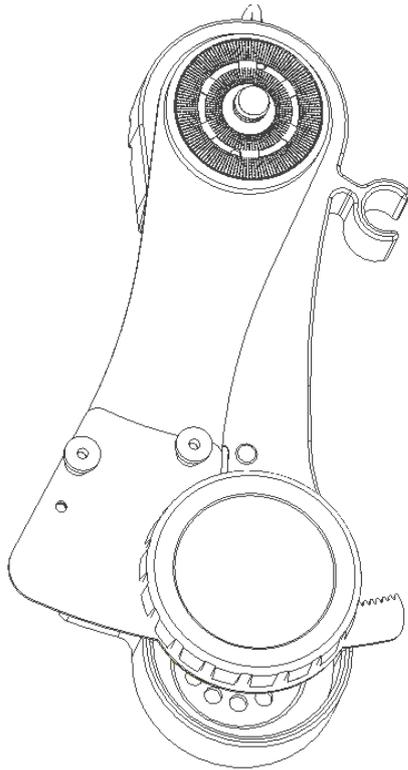


towards the east in respect to the ball-head.

6.2. Pointing East. When the weight of the camera setup tends to rotate the ball-head in an anti-clockwise direction, the spring should be tensioned to one of the numbered teeth, based on how strong the imbalance is. By tensioning the spring in position 5 (worst case scenario) a weight of up to 4kg can be balanced – i.e. pointing to the Zenith with the camera body

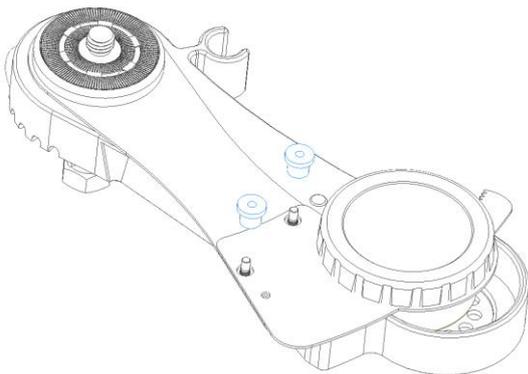
6.3. Pointing South. The spring can be completely disengaged (position “0”) or let it work at idle (position “1”).

6.4. Pointing West. Aiming towards West, especially if there is a strong imbalance, it could happen that the timer “accelerates” because of the load in favour of the movement, for which the “R” tooth has been added, which allows to compensate also this unbalancing type, by braking the rotation motion (last figure on the right – top).

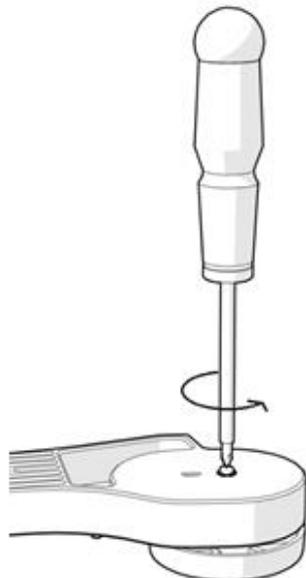


7. Southern Hemisphere configuration

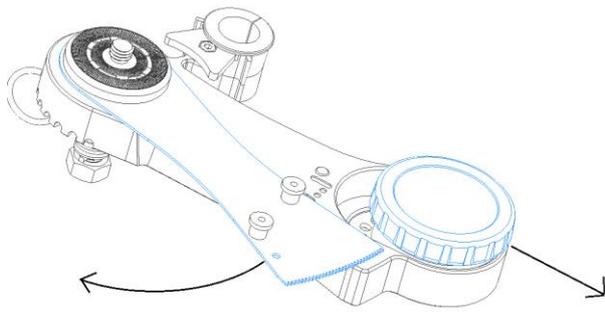
The south hemisphere configuration is to be used below the equator. In the southern hemisphere, the sky “rotates” on the opposite direction. For that reason, it is necessary to add an additional arm (C) to the mount and invert the sense of the timer’s movement.



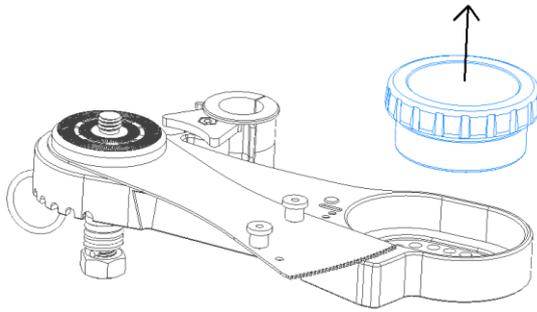
7.1. Release and remove the two thumbnuts (#8 Side A).



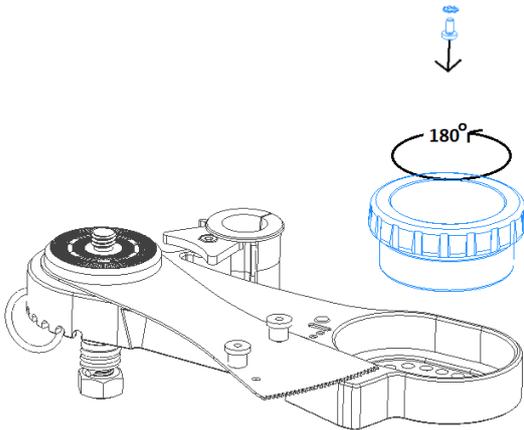
7.2. Release and unscrew the timer screw with washer (#10) using a Philips-style screwdriver (not included).



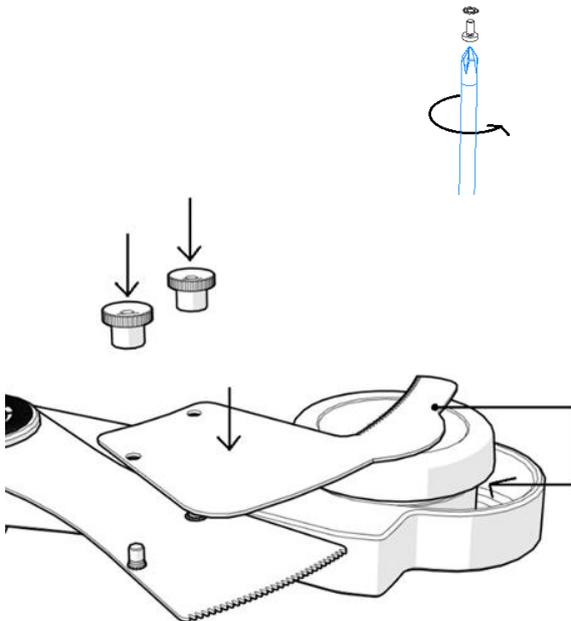
7.3. Push the winding knob (#6) away from the arm in order to slide the arm to the left – please push it slightly only and make sure the spring preventing this movement.



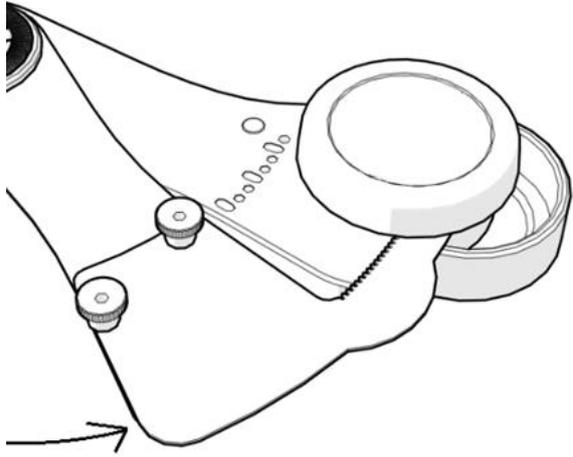
7.4. Remove the winding knob (#6) and the timer screw and washer (#10) as shown.



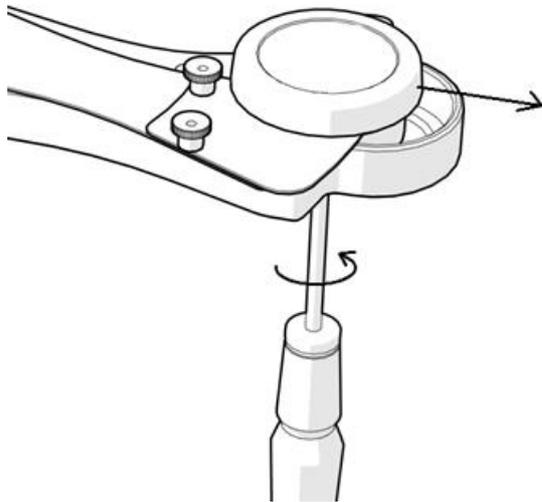
7.5. Turn the winding knob (#6) 180 degrees from its original position (up-side down) and screw back the timer screw and washer (#12 Side B) but **do not tighten it yet!**



7.6. Place the South arm (C) and adjust it to the arm so that it is placed between the winding knob and the timer. Make also sure that the two protruding studs and the arm's thru holes are aligned. The Winding knob should move freely and be easily adjustable to the South arm's teeth.



7.7. Push the assembled arm back to it's original position. Make sure to keep the winding knob remains "up-side down".

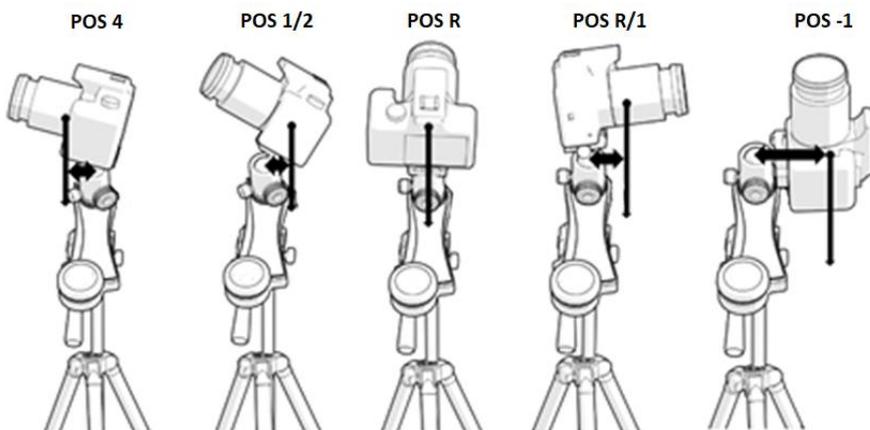


7.8. Push the arm to the timer and the winding knob against the teeth. Use a Philips-style screwdriver (not supplied) to fix it in place. It is important to not overtighten the screw as it may damage the timer and its performance.

9.1. Tensioning the spring.

For setups, slightly off-balance, use the first positions as shown (image to the left). You can feel that the spring is not under a lot of tension. Use the spring at its highest tension only for heavy setups and strong unbalance. See below how to choose the spring's position.

Please avoid unnecessary spring tension as this might alter the timer's clock tracking rate!



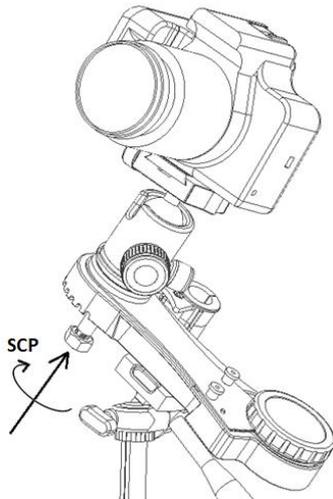
9.2. Pointing West. When the weight of the camera setup tends to rotate the ball-head in a clockwise direction, the spring should be tensioned to one of the castellations, based on how strong the imbalance is. By tensioning the spring in position +5 (worst case scenario) a weight of up to 4kg can be balanced – i.e. pointing to the Zenith with the camera body towards the west in respect to the ball-head.

9.3. Pointing North. The spring can be completely disengaged (position “R”) or let it work at idle (position “1”).

9.4. Pointing West. Aiming towards West, especially if there is a strong imbalance, it could happen that the timer “accelerates” because of the load in favour of the movement, for which the “R” tooth has been added, which allows to compensate also this unbalancing type, by braking the rotation motion (last figure on the right – top).

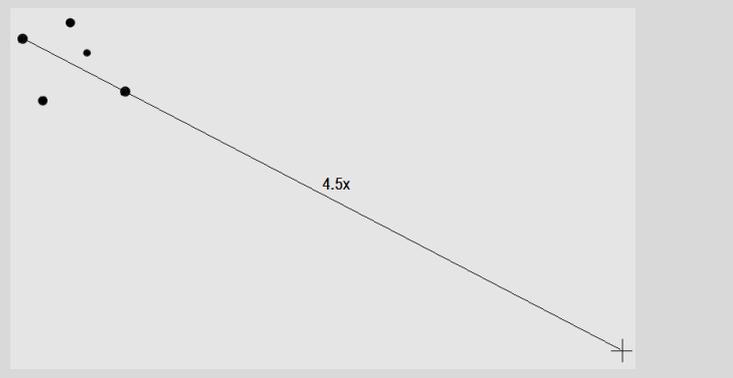
10. Aiming to South Celestial Pole (SCP)

10.1. Identify the Crux constellation near the SCP. Align the stars as shown in the figure and count 4.5x its distance in the same direction to find the SCP. Upon installing the supplied polar finder (B) we will look in more detail on how to have the star in the centre of the polar finder (B) field of view.



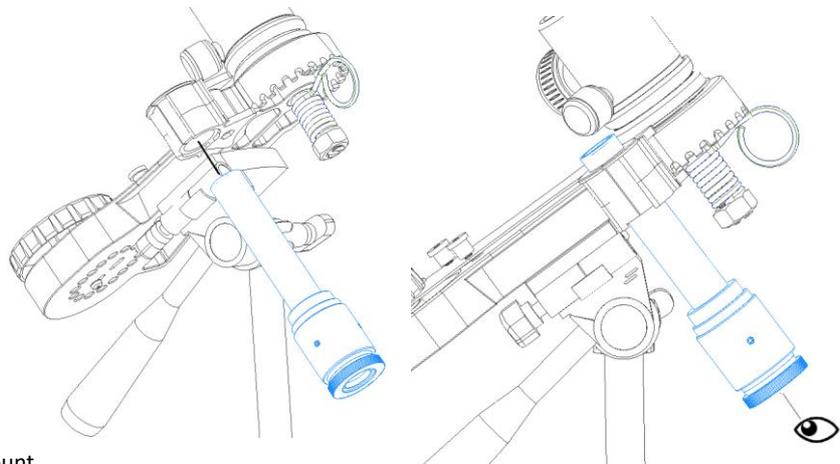
How to identify Crux?

Crux is a constellation with the shape of a kite. If align the head and the tail of the kite and count 4.5x to the tail you get a rough position of the south celestial pole (SCP).



10.2. To align the mount to the SCP with more precision slide the polar finder (B) to the polar finder holder (#3)

10.3. Peek through the polar finder (B) and check if the polar finder is pointing to the region of the sky as shown before. Turn the tripod's fine-adjustment levelers to adjust if necessary. Please read the sections on how to correctly use the MiniTrack LX Quattro NS and the importance of correct balance before using the mount.



Quick overview of what is needed to setup the Quattro!

1. Thread the ball-head
2. Release the locking pin
3. Place the mount with the ball-head to the tripod's base
4. Place the camera to the ball-head making sure that – the camera setup is balanced in regards to the ball head!
5. Install the polar finder
6. Peek through the polar finder to set the mount in station (precise alignment)
7. Rotate the winding knob.
8. Frame the camera
9. Check tempo (metronome)
10. Adjust spring position so that the tempo is correct
11. Start shooting!

11. Calculating maximum tracking time. The MiniTrack Quattro NS is designed to carry setups up to 4 kg and track during 60min. This is important to know because setups exceeding this limit may considerably reduce the tracking quality and total tracking time. Something to notice is the objective's focal length. Wide-field objectives (low focal length) allow for more exposure time. Rule of thumb: one can calculate the tracking time without star trailing by using the following formula:

$$\text{Time (min)} = 100 / \text{Objective focal length (mm)}$$

Objective focal length	Maximum recommended exposure
24mm	4 minutes 10sec
50mm	2 minutes
60mm	1min 40sec
100mm	1 min

11.1. Example.

Camera + objective = 3.8 kg; Objective's focal length 50mm.

This is within the specifications of the mount. We should expect to achieve $100 / 50\text{mm} = 2$ minutes of tracking without any problems.

What if the weight exceeds the carrying capacity or if we use more exposure time than the recommended?

Then we will see some star trailing becoming more evident. It may be necessary to try different exposure times to better judge which one better fit each setup.

12. Resources. For more information please refer to on-line content such as videos. There is also a very active facebook group (in Italian) about the MiniTrack LX with hundreds of followers and many contributions. The inventor, Mr. Cristian Fattinnanzi is also a member of this group and would gladly give some information and tips on how to use this mount. Main language is however Italian.

Minitrack LX

<https://www.facebook.com/groups/445728915521396>

Omegon Minitrack - deutschsprachig (german)

<https://www.facebook.com/groups/509726696204211>

Official Omegon MiniTrack LX group

<https://www.facebook.com/groups/249999025912701>

13. Features.

Carrying capacity: 4 kg

Balancing: using spring system (no counterweight)

accepts ball heads with 3/8" photo thread.

Total tracking time: 60 min

Polar finder: included

Hemisphere: Northern and Southern (NS version)