Omegon Mini Track LX2 Review

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This new purely mechanical tracker based on a simple clockwork is conquering the sky tracker market. We gave it a closer look.

The Mini Track LX2 is a small camera tracker that provides 60 minutes of tracking time. It was developed by Italian astrophotographer Christian Fattinnanzi and is distributed by Omegon. The device stands out among the other available sky trackers, since it is driven by a mechanical clock that needs no electrical power source. Besides that, it brings another innovation: To compensate for the camera weight, it features a spring mechanism that helps to stabilize the tracking rate.

Image: www.omegon.eu

The device is well built in an almost all metal design and makes a good overall impression. At 430g the Mini Track LX2 is very lightweight and compact, its dimensions are 21x8x5cm. In September 2018 we bought a unit and immediately started with thorough tests. Here is what we found out.

Shipping

The little device gets shipped in a neat cardboard box. As the picture below shows, the Mini Track LX2 is available in a bundle with a ball head. The ball head is Arca Swiss compatible and a dovetail plate is included.

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The shipment also includes a 1/4" adapter screw to replace the 3/4" version for mounting the ball head. This allows the photographer to attach a ball head with the smaller 1/4" thread. A key to switch between the two adapter screws is also provided. Besides the tracker itself, the shipping box also includes a small sighting tube. It is basically a piece of a black plastic pipe that can be attached to the tracker and is serving as a means to align the tracker with the celestial pole.

Manual

The shipping box does not include a printed manual, only a note that refers to the Omegon website, where the user manual can be downloaded as a PDF in several languages. The manual is actually very well written, illustrated with many drawings and highly informative, especially for photographers who are not familiar with astronomical terms and procedures. Have a look at the manual for yourself at www.omegon.eu

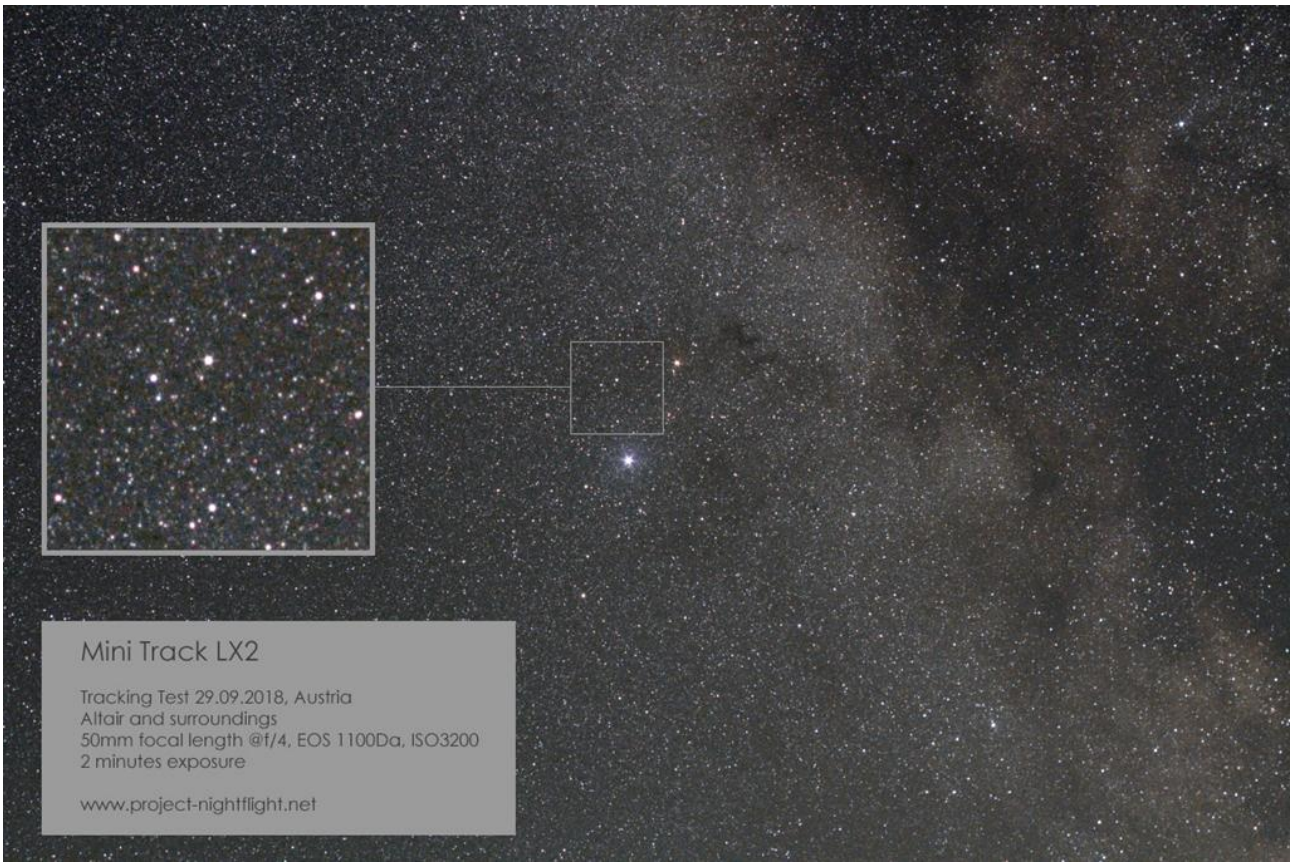
Storage and Transport

Sadly, the Mini Track LX2 comes without a bag. We did not dare to stuff it into our camera backpack without an additional layer of protection. For this reason we customized a padded wrapper bag that folds around the device and is closed with Velcro pads:

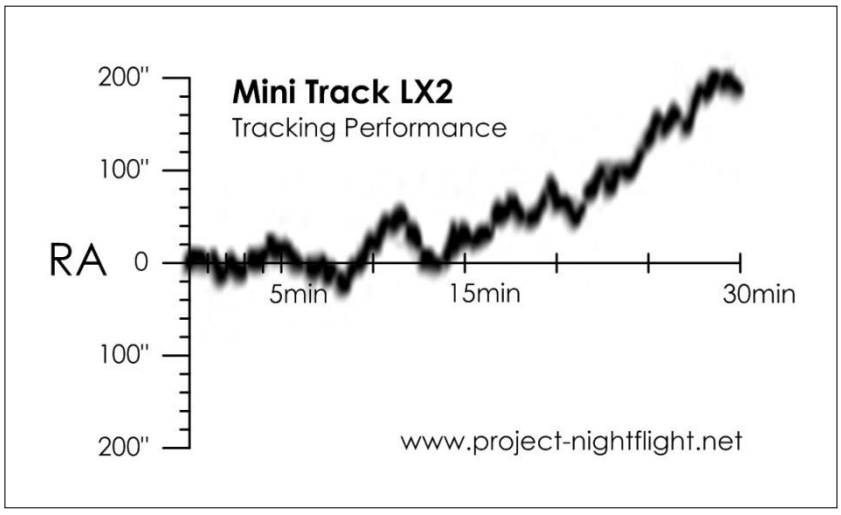
In our opinion it would be a good idea for the manufacturer to design a padded pouch or bag for the Mini Track LX2. The metal plate on the bottom of the tracker that holds the spring for camera weight compensation has quite sharp edges. This has the potential of severely damaging other photographic equipment that gets in contact with it during storage and transportation.

Tracking Accuracy

On the evening of September 29, 2018 we did a first test of the device's tracking precision from our dark sky site in Austria. The tracker was mounted on a photo tripod with a geared head. For testing we used a Baader modified EOS 1100Da body. Our target was Altair, which was near the meridian during our tests. Altair is also close to the celestial equator, which makes sure that the tracking errors of the device show to their full extent. Several exposures with a 50mm lens made it clear that the exposure time should not exceed 2 minutes at this focal length. This nicely confirms the rule of thumb the manufacturer gives for the valid exposure times. It says that the maximum exposure time in minutes is 100 divided by the focal length. Here is one of the 2min sample images shot with the 50mm lens, with the inset being a 100% crop:



To quantify the tracking precision in greater detail we monitored it over a time span of 30 minutes with a 135mm lens. Here is the result:



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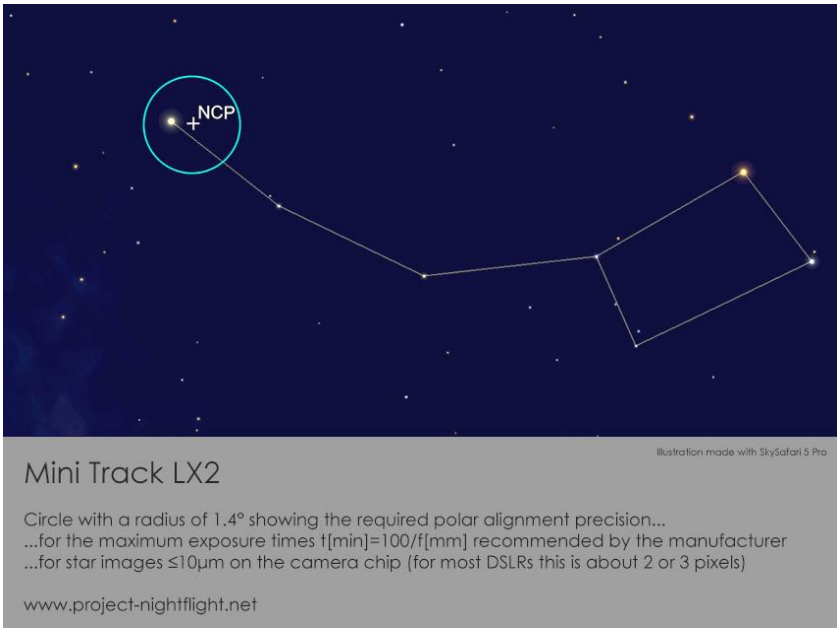
The graph once again confirms the manufacturer's rule of thumb for maximum exposure times (T[min]=100/fl[mm]) and makes it obvious that with a 50mm lens most 2 minute exposures will turn out fine. With a 25mm lens 4 minute exposures will be possible and with focal lengths of 16mm or less exposure times could even exceed that. For these short exposure times polar alignment does not have to be very accurate. As we discuss below in more detail, the needed accuracy can easily be achieved with the included sighting device.

Polar Alignment

For polar alignment, the Mini Track LX2 comes with a small plastic pipe as a sighting tube. The manual states that simply aiming the tracker at Polaris by looking through the small tube will suffice. What the manual does not say: To get a clear line of sight at Polaris it is often necessary to temporarily rotate the camera away by using the ball head. In any case, polar alignment should be done when the camera is already mounted on the tracker.

In various forum postings there has been some guessing whether improving the means for polar alignment would increase the tracker's performance and minimize trailing. These ideas include the use of a laser pointer, application of the Kochab method and even substituting the sighting device with an optical finder. In our opinion these customizations are not worth the effort. Some simple math shows that when exposure times are kept within the manufacturer's rule of thumb, the needed polar alignment precision is +/-1.4 degrees, even if the photographer goes for tiny round star images smaller than 10 micrometers on the camera chip. The blue circle on the illustration depicts the pointing accuracy needed for these applications:



If the instrument pole is within this circle of 2.8 degrees diameter around the celestial pole, no trailing due to polar misalignment will occur. This coarse alignment precision of +/-1.4 degrees can easily be achieved with the sighting tube. If the sighting tube is carefully oriented toward Polaris, any trailing that remains is most likely due to other causes, like errors of the clock drive, slippage of the ball head, strong winds, an unstable surface or flexure of an overloaded tripod.

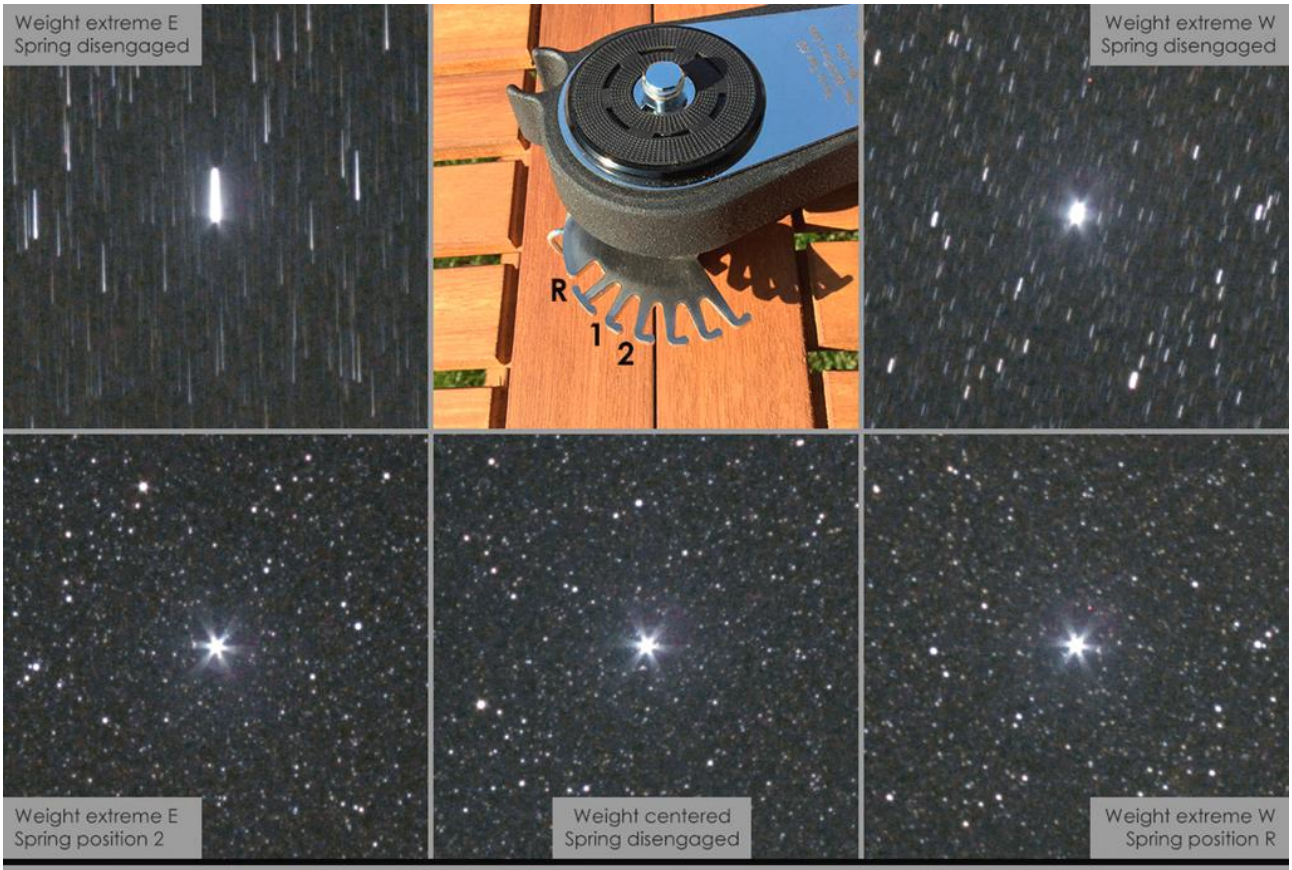
To sum it up, the provided sighting device is sufficient for polar alignment of the tracker. When sticking to the exposure times recommended by the manufacturer, simply aiming through it at Polaris absolutely does the job.

Spring Mechanism

Since our initial test results with the Mini Track LX2 were quite promising, we decided to go a little deeper with a follow-up test. This time we looked into the tracker's innovative spring mechanism for weight compensation.

The manual says that the spring should be set to different positions depending on where the payload's center of gravity is located. This would compensate for the payload weight and prevent the clock drive from running slow or fast. When the camera weight is above the tracker, the spring can be disengaged. When the camera weight is west of the tracker, it will speed up the clock drive and the spring should be set to the retaining position "R". When the camera weight is east of the tracker, it will slow down the clock drive and the spring should be set to one of the compensating positions "1" through "5". The manual also says that the position "5" with the highest tension should be able to handle a payload of 2kg.

Since we do not want to strain the small device with the maximum payload of 2kg we only use the Mini Track with very lightweight equipment. For the test we used a 50mm lens on a DSLR body, weighing in at a total of 0.8kg. Again, we shot Altair, this time with different camera positions. We made exposures with the camera's center of gravity above the tracker, east of the tracker and west of the tracker and tried different settings of the spring. The results showed that at the extreme positions in the west and east, with this payload weight the spring settings "R" and "2" work effectively to stabilize the clock drive's tracking rate. With heavier camera bodies the settings might differ, but without any doubt we could verify that the spring mechanism for weight compensation is actually working. See the illustration below:



In addition to the tests of the spring mechanism with Altair we also did a test run of the tracker with the camera pointing to the zenith. The payload weight was in an extreme position to the west of the tracker, the spring was set to the position “R”. Again, the result turned out fine:

Mini Track LX2

Test of the spring system, 13.10.2018, Austria
Constellation Cassiopeia, single shot, no darks, no flats
50mm focal length @f/4, EOS 1100Da, ISO3200, Neodymium lens filter, 2min exposure, payload weight (body & lens) 0.8kg
Camera in extreme position west of the tracker pointing at the zenith, spring set to position R

This test image is a single 2 minute shot of the constellation Cas with a Baader modified EOS1100Da body set to ISO3200 and a 50mm lens working @f/4. We used a Neodymium lens filter to increase the contrast.

Wide Angle Shots

After the initial tests, we took the device with us on a trip to La Palma island. To show what first steps with the Mini Track might result in, we did a typical picture a beginning astrophotographer would be eager to make: A scenic image of the Milky Way. For this, we shot from a viewpoint at sea level near Puerto Naos and used an EOS 1100Da at ISO1600 with a 16mm lens working @f/5.6. We made two 4-minute exposures, one tracked and with a diffuser filter for the sky, one untracked and unfiltered for the foreground. The two shots were combined in Photoshop and some additional slight processing was applied.

The result shows the center of the Milky Way setting behind the Atlantic Ocean's horizon. To make the star patterns more obvious, the stars were deliberately blurred with a diffuser lens filter. In the center of the image Saturn shines brightly. As mentioned above, the foreground is from a second unfiltered shot made without tracking.

Tele Lens Shots

As a final test, we wanted to find out the limits of the small tracker. We set ourselves the goal to produce an image of a less bright deep sky object with a typical DSLR tele lens. After some discussions we chose to shoot NGC 1499, the California Nebula, with a 135mm lens. Our approach was to keep the individual exposures short, shoot at a high ISO setting and compensate for that with a large number of individual frames. The actual exposures were made during Halloween night, on October 31, 2018 from La Palma island at an altitude of 800m above sea level. The shots turned out quite nice. We had to sort out some of the subs due to clouds that passed during the exposure series, but not a single frame was ruined by trailing. Here is the processed result:

This test image of the California Nebula was acquired on October 31, 2018, from La Palma island with an EOS 1100Da body and a Zeiss Sonnar 135mm lens working @f/4. The ISO setting was 6400 and a Hutech LPS-P2 light pollution lens filter was used. The image is a photoshopped stack of 109 subframes, 20 seconds each. Flats, flatdarks and darks were applied.

Summary

The Mini Track LX2 is a very nice device that perfectly fulfills its advertised claims. It is small, lightweight, portable and provides basic sky tracking ability for DSLR photographers on every budget. In our opinion, the Mini Track LX2 is primarily a tracker for wide angle lenses. With focal lengths up to 50mm spectacular deep images of star fields and the Milky Way are within everybody's reach. When using longer focal lengths, like 135mm, we advise beginners to stick to brighter targets that can be captured with short exposure times, e.g. the moon's earthshine, lunar eclipses or bright star clusters. With more experience, one might even try to shoot dimmer deep sky objects with tele lenses. In this case, we recommend to keep the exposure times short, use a high ISO setting and reduce the inevitable noise with a large number of subframes that are later combined with stacking software.

Pro	Con
+ Very easy to use + Fast setup + Lightweight and portable + No power source needed + High build quality + Well written manual + With wide angle lenses long exposures possible + Reliable when exposure times are within specs + Low price	- No bag included or available as accessory - Works only on northern hemisphere - With tele lenses only short exposures possible

Disclaimer

The authors are founding members of project nightflight and in no way affiliated with Omegon or Christian Fattinnanzi. project nightflight is an Austrian astrophotography group that internationally promotes the conservation of the starry sky as environmental resource. See their work here: www.project-nightflight.net

See updates on the next page.

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Updates

Last update: March 4, 2019

Since the first publication of this review in November 2018 we gathered some new informations:

Version for Southern Hemisphere

A new version of the tracker has been released that also works on the southern hemisphere. The new version goes by the product name *Mini Track LX2 NS*.

Finderscope Adapter

For those who want to enjoy the convenience of an optical polar finder Omegon released a finderscope adapter. The adapter gets screwed onto the tracker body, replaces the polar sighting pipe and provides a clamp that holds any finderscope with a diameter around 23mm. We tested the adapter with a typical 6x24 crosshair finderscope. These small scopes are low-cost, widely available from numerous telescope dealers and fit nicely into the adapter. We found out that although the achievable polar alignment precision is not increased very much, the procedure of polar alignment becomes easier. Polaris is much better visible in the finderscope and can be centered more easily than with the sighting pipe that comes with the tracker. As we pointed out in our review, for the recommended exposure times in minutes of 100/f[mm] the polar alignment is accurate enough when simply aiming at Polaris, with or without a finderscope.

The photo below shows the finderscope adapter out of the box (bottom right), attached to the tracker (bottom left) and with a 6x24 finderscope inserted (top):

Carrying Bag

In the meantime, a small carrying bag for the Mini Track LX2 has also been released. When the guys at Omegon read our initial report, they contacted us and sent us one of these bags for free, asking to take a look at it. Holding the bag in our hands it was immediately clear that this is the accessory we recommended and asked for in our review. The bag is of high quality, softly padded and fits the tracker perfectly. The Mini Track even goes into the bag with the polar scope adapter attached and there is room for a small finderscope, too. We highly recommend this accessory since the tracker has some very sharp edges. With the Mini Track kept in the bag for transportation, other photographic equipment in your camera backpack is sufficiently protected, as well as the tracker itself.

The photo below shows the bag with the Mini Track LX2 with the attached polar scope adapter and a 6x24 finderscope: