LET'S CALCULATE THE LONGEST EXPOSURE WITHOUT TRACKING….

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If we have a star tracker and wish to take astronomy pictures with "fixed" stars, we must limit the exposure time to periods that are usually no greater than 30 seconds. The simplest formula is based on the focal length we are using to take the photo (with reference to the full-frame size sensors). To ensure the movement is irrelevant, even on large prints, all you need to do is apply the result of the following division:

300 / focal length (mm) = seconds of exposure

"300" is a constant. When film was still in use it was more forgiving and "600" was the number. Unfortunately, or perhaps fortunately, the greater resolution of digital sensors made it necessary to revise this number.

With the Minitrack LX2 tracking this value can be lengthened by about 20 times and can instead be calculated in minutes using the following equation:

100 / focal length (mm) = minutes of exposure

For the most precise...

If we desire, we can calculate the maximum time with greater precision based on the length of the stars' trailing that we are willing to accept (with the trailing measured in pixels). A trailing value of 3 pixels is practically invisible, but if we accept a slightly higher trailing value we can better register the subtlest tones of nocturnal subjects. To do so in the following formula we have the constant "500" divided by the focal length, and the result is divided by the root of the reflex's Megapixel. Then, finally, the result is multiplied by the length "L" of the trailing measured in pixel that we are willing to accept:

500 / focal length (mm) / √Mpx x L (pixel) = seconds of exposure