

# User manual for PHOTOROBOT



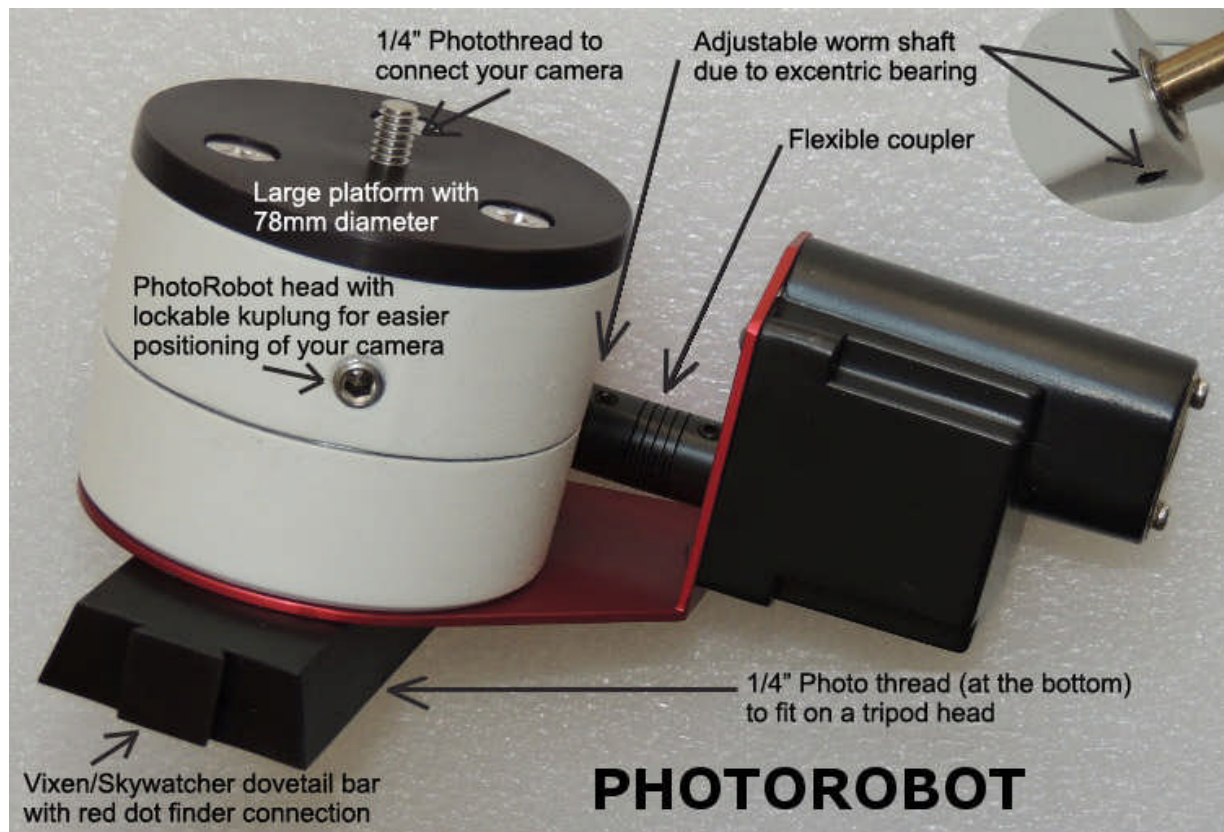
Photo Robot is a simple, small, lightweight (only 900g), but very reliable panoramic and astro photo head. It is motorised and allows quick and easy entry to all three "exotic" areas of astrophotography:

- Time-lapse panorama
- TWAN (The World At Night)
- Astro-Panoramic Photography

These three basic functions are combined in a single device. For advanced users there are other more expensive devices with advanced functions (e.g. Merlin for panoramic photography, Star Adventurer or Fornax-10 for classic astrophotography, or POLARIE for TWAN).

The PHOTOROBOT can be **powered by 4 "D" sized batteries (incl. rechargeables)**, but **DO NOT EVER ATTEMPT TO POWER THE PHOTOROBOT FROM 12V !** (you might damage the device and consequently lose the warranty...)

## Parts of the PhotoRobot



### Specifications:

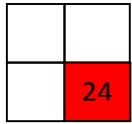
- Worm gear / worm shaft system with 120 teeth
- Working platform with 78mm diameter
- Standard 1/4" photo thread connectivity for photo heads and prism clamps / dovetail bars
- Single axis motor with hand control (developed and programmed in Hungary)
- Possibility to connect a star pointer / red dot finder for more accurate polar alignment
- Handset with integrated Autoguider Interface available as optional upgrade

# Controlling the Photo Robot

Red boxes show which buttons need to be pressed.

## Time-lapse rotation movement:

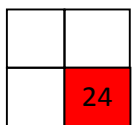
**Drive will start only after the button(s) are being held (pressed) for 3 seconds !**



**24x star speed** = 1x full turn in **1 hour** (Green LED flashes quickly)

**Choose 1x** on the left switch (1x/0.5x) for this function.

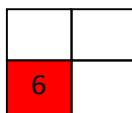
Direction is always as per the Sun's movement (can be changed by the N/S switch accordingly)



**12x star speed** = 1x full turn in **2 hours** (Green LED flashes quickly)

**Choose 0.5x** on the left switch (1x/0.5x) for this function.

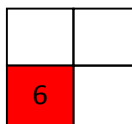
Direction is always as per the Sun's movement (can be changed by the N/S switch accordingly)



**6x star speed** = 1x full turn in **4 hours** (Green LED flashes twice)

**Choose 1x** on the left switch (1x/0.5x) for this function.

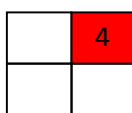
Direction is always as per the Sun's movement (can be changed by the N/S switch accordingly)



**3x star speed** = 1x full turn in **8 hours** (Green LED flashes twice)

**Choose 0.5x** on the left switch (1x/0.5x) for this function.

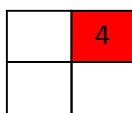
Direction is always as per the Sun's movement (can be changed by the N/S switch accordingly)



**4x star speed** = 1x full turn in **6 hours** (Green LED flashes slowly)

**Choose 1x** on the left switch (1x/0.5x) for this function.

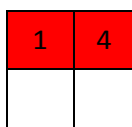
Direction is always as per the Sun's movement (can be changed by the N/S switch accordingly)



**2x star speed** = 1x full turn in **12 hours** (Green LED flashes slowly)

**Choose 0.5x** on the left switch (1x/0.5x) for this function.

Direction is always as per the Sun's movement (can be changed by the N/S switch accordingly)



**STOP** (Press both buttons simultaneously – reacts immediately)

All movements will stop immediately. The LED lights are steady red.

## Time-lapse:

1	
6	

**90 degree movements with 24x speed** = 30 minutes forth and back (15 + 15 min)

Left switch (1x/0.5x) is on **1x** (Red LED flashes slowly)

Direction of rotation is only 45° (7.5 minutes) in the direction of the solar motion (can be changed with the N/S switch), then 90° (15 minutes) in the opposite direction, then back 90° (15 minutes) in the direction of the solar motion, etc. (infinite repetition...)

1	
6	

**90 degree movements with 12x speed** = 60 minutes forth and back (30 + 30 min)

Left switch (1x/0.5x) is on **0.5x** (Red LED flashes slowly)

Direction of rotation is only 45° (15 minutes) in the direction of the solar motion (can be changed with the N/S switch), then 90° (30 minutes) in the opposite direction, then back 90° (30 minutes) in the direction of the solar motion, etc. (infinite repetition...)

6	24

**180 degree movements with 24x speed** = 60 minutes forth and back (30 + 30 min)

Left switch (1x/0.5x) is on **1x** (Red LED flashes twice)

Direction of rotation is only 90° (15 min) in the direction of the solar motion (can be changed with the N/S switch), then 180° (30 minutes) in the opposite direction, then back 180° (30 minutes) in the direction of the solar motion, etc. (infinite repetition...)

6	24

**180 degree movements with 12x speed** = 120 minutes forth and back (60 + 60 min)

Left switch (1x/0.5x) is on **0.5x** (Red LED flashes twice)

Direction of rotation is only 90° (30 min) in the direction of the solar motion (can be changed with the N/S switch), then 180° (60 min) in the opposite direction, then back 180° (60 min) in the direction of the solar motion, etc. (infinite repetition...)

**270 degree movements with 24x speed** = 90 minutes forth and back (45 + 45 min)

Left switch (1x/0.5x) is on **1x** (Red LED flashes quickly)

	4
	24

Direction of rotation is only 135° (22.5 min) in the direction of the solar motion (can be changed with the N/S switch), then 270° (45 min) in the opposite direction, then back 270° (45 min) in the direction of the solar motion, etc. (infinite repetition...)

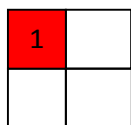
**270 degree movements with 12x speed** = 180 minutes forth and back (90 + 90 min)

	4
	24

Left switch (1x/0.5x) is on **0.5x** (Red LED flashes quickly)

Direction of rotation is only 135° (45 min) in the direction of the solar motion (can be changed with the N/S switch), then 270° (90 min) in the opposite direction, then back 270° (90 min) in the direction of the solar motion, etc. (infinite repetition)

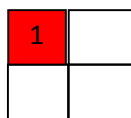
# ASTRO- and TWAN-Photography:



**1x speed rating** = 1 revolution per day

Left switch (1x/0.5x) is on **1x** setting. (Green LED flashes slowly)

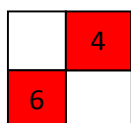
Direction of rotation is always as per the Sun's movement (but can be changed by the N/S switch accordingly)



**0.5x speed rating** = 0.5 revolution per day

Left switch (1x/0.5x) is on **0.5x** setting. (Green LED flashes slowly)

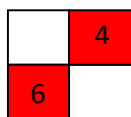
Direction of rotation is always as per the Sun's movement (can be changed by the N/S switch accordingly)



**Polar Align Assist** - 2 minutes\* at 4x star speed rating

Left switch (1x/0.5x) is on **1x** setting. (Green and red LEDs flashing)

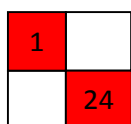
1 minute fast forward at 4x speed, then 1 minute backward, after which it will carry on at 1x speed until you stop it (by pressing 1x and 4x buttons at the same time)  
(direction of movement can be changed by the N/S switch)



**Polar Align Assist** – 2 minutes\* at 2x star speed rating

Left switch (1x/0.5x) is on **0.5x** setting. (Green and red LEDs flashing)

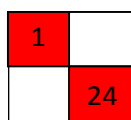
1 minute fast forward at 2x speed, then 1 minute backward, after which it will carry on at 0.5x speed until you stop it (by pressing 1x and 4x buttons at the same time)  
(direction of movement can be changed by the N/S switch)



**Polar Align Assist** – 2 minutes\* at 24x star speed rating

Left switch (1x/0.5x) is on **1x** setting. (Green and red LEDs flashing)

1 minute fast forward at 24x speed, then 1 minute backward, after which it will carry on at 1x speed until you stop it (by pressing 1x and 4x buttons at the same time)  
(direction of movement can be changed by the N/S switch)



**Polar Align Assist** – 2 minutes\* at 12x star speed rating

Left switch (1x/0.5x) is on **0.5x** setting. (Green and red LEDs flashing)

1 minute fast forward at 12x speed, then 1 minute backward, after which it will carry on at 0.5x speed until you stop it (by pressing 1x and 4x buttons at the same time)  
(direction of movement can be changed by the N/S switch)

\*A simple, but well functioning Polar Align Assist comes integrated with the Lacerta PhotoRobot

## Step-by-step instructions of Polar Alignment:

1. Do a rough polar alignment visually (or use our Blitz adapter with a Red Dot Finder on your camera), then point your camera at the western or eastern horizon (or near horizon) and take an image with 120 sec exposure time.
2. Depending on the focal length of your camera lens, choose one of the Polar Align Assist options described on the previous page. Set the left switch to 0.5x or 1x and then press 1x and 24x or 4x and 6x simultaneously, depending on which speed you want to go for. The mount will be moving forward at 2x, 4x, 12x or 24x speed (depending on your previous choice), then back at the same speed. Then it will carry on forward at 1x star speed. (see previous page)
3. If the vertical alignment is bad, there will be an angle between the star trails of the forth and back directions. The smaller this angle the better the alignment in the vertical direction.
4. We will correct to Polaris ONLY VERTICALLY and repeat steps 2 and 3 to see if the angle becomes smaller. If it becomes larger, we were making a correction in the wrong direction. With 3-4 test photos we can set the polar alignment in the vertical direction very accurately.
5. Now turn the camera to the south of the Celestial Equator to take more test photos.
6. Repeat just as in step 2
7. The smaller the angle the better the polar alignment in the horizontal direction.
8. We will correct to Polaris ONLY HORIZONTALLY and repeat steps 6 and 7 to see if the angle becomes smaller. If it becomes larger, we were making a correction in the wrong direction. With 3-4 test photos we can set the polar alignment in the horizontal direction very accurately.

That's it, all done, now you can start taking long exposure photos...

