

# Ra Twisty™ Flashlight Customization

The Ra Twisty flashlight is marketed and sold as a simple flashlight. However, there are many missions and tasks that may benefit by customizing the brightness settings. You can trade between brightness and runtime or more closely adjust brightness settings to match your desires by selecting different brightness levels for a setting.

The following information is provided to allow you to customize your Ra Twisty flashlight. Please note that the following information is not a warranted part of the Ra Twisty specification and this information is provided to you on a "use at your own risk" basis. Although we believe this information to be generally correct, this information is offered without any warranty of any kind.

Your Ra Twisty flashlight knows about over 20 visually spaced brightness levels. By visually spaced, we mean that the light levels correspond to what your eyes perceive as roughly equal changes in brightness. Your eyes respond to light in a logarithmic (i.e., non-linear) fashion. As such, a visually even change at the low levels is a very small change in output while a visually even change at the high levels is a large change in output. If you are familiar with photography, the visual changes correspond to half an f-stop. Or put another way, every two brightness levels halves or doubles the light output depending on which direction you are going.

## Customizing the Ra Twisty

To customize the brightness level of any of the three settings, follow this procedure:

- **Note:** you can abort the procedure at any time by turning your flashlight off.
- **Note:** you can only customize one setting each time through the procedure.
- **Procedure summary:** 1) perform reset, 2) enter customization mode, 3) select brightness level, 4) select setting to customize, 5) set the selected setting to selected brightness level, 6) turn off flashlight.
- Reset your flashlight - i.e., remove the battery for 60 seconds and reinstall. Your flashlight will light dimly for two seconds and turn off to let you know the reset has taken place. You will have 10 seconds following the reset to begin the customizing procedure. After 10 seconds, your flashlight will ignore attempts to enter customization mode.
- Turn your flashlight on to low.
- Turn your flashlight to medium and back to low 20 times. After the 20 cycles, your flashlight will turn onto high and double-blink to let you know you have successfully completed the entry into customization mode. There is no need to rush as you have 2 seconds to move from low to medium and 2 seconds to move from medium to low. You have 10 seconds to complete the first cycle after performing the reset.
- Once you have entered customization mode, your flashlight will slowly step down through the brightness levels, stepping one level every two seconds. When your flashlight reaches the lowest level, it will double-blink. If your flashlight supports red, it will transition to red following the lowest level. If you do nothing, your flashlight will wrap back to the maximum level, double-blink and repeat the whole sequence.
- Turn your flashlight from low to medium to select the current brightness level.
- Your flashlight will single-flash about once a second to indicate it is ready to change the low setting. Turn your flashlight from medium to low and back to medium to select the

medium setting, indicated by a double-blink. Repeat the medium to low to medium sequence to select the high setting, indicated by a triple-blink. Repeat the sequence again to select factory reset, indicated by rapid flashing. Repeating the sequence wraps back to the low setting.

- Turn your flashlight from medium to high to set the selected setting to the selected brightness level or to perform the factory reset. If there is insufficient power to save the change, your flashlight will flash several times very rapidly. When the light shows steady on the high setting the customization is complete.
- Turn your flashlight off.
- **Caution:** do not set two adjacent settings to the same brightness level or you will not be able to distinguish between them for further customization. You can use the factory reset procedure below to recover from this mistake.

## Factory reset the Ra Twisty

To restore factory settings without going through the customization mode, follow this procedure:

- **Note:** removing the battery case O-ring makes performing this procedure easier. You should replace the O-ring once this procedure has been completed.
- Reset the flashlight - i.e., remove the battery for 60 seconds and reinstall. Your flashlight will light dimly. From the time the light turns on you will have 2 seconds to complete the next step.
- Rapidly screw the battery case into the head until the light goes from dim to brighter. You have 2 seconds to accomplish this step from the beginning of a reset. If your flashlight turns off before changing intensity you will need to restart the procedure.
- Your flashlight will become brighter for 10 seconds and then turn off. When your flashlight turns off the procedure has completed successfully. If there is insufficient power to restore the factory settings, your flashlight will flash very rapidly several times.
- Turn off your flashlight even though it already appears to be off.

## Available brightness levels on the Ra Twisty

Your Ra Twisty flashlight will have between 21 and 23 internal brightness levels depending on your flashlight's maximum rated output. Your flashlight's maximum rated output is used to determine the total number of levels available and which levels those are.

To determine which brightness levels are available on your flashlight, follow this procedure:

- **Note:** ignore entries in the tables that are greater than your flashlight's maximum rated output.
- **Procedure summary:** 1) determine which of the two tables is appropriate for your flashlight, 2) determine how many brightness levels your flashlight has and 3) look up the brightness levels you are interested in.
- There are two tables provided. Each table is offset from the other by half of the standard visual brightness interval. As a practical matter, it is nearly impossible to see the difference between any two adjacent half intervals. The brightness levels within each table are evenly spaced visually at an interval that can be distinguished by most people. The spacing is logarithmic and becomes smaller as the brightness decreases.

- Look in each table and find the table that contains your flashlight's maximum rated output. The table that includes your flashlight's maximum rated output is the table you will use for the rest of this procedure.
- The level number above your flashlight's maximum rated output is the number of brightness levels your flashlight contains.
- You can now look up any available level in the table and find the corresponding output. You can also find an available output and determine which level it corresponds to.
- **Note:** the values shown in the tables are calculated and rounded. These values may be one digit higher than shown in the specifications as the specifications often use truncated values.

Level	23	22	21	20	19	18	17	16	15	14	13	12
Lumens	141	100	71	50	35	25	18	13	8.8	6.3	4.4	3.1

Level	11	10	9	8	7	6	5	4	3	2	1	Red
Lumens	2.2	1.6	1.1	0.78	0.55	0.39	0.28	0.20	0.14	0.10	0.07	--

Level	23	22	21	20	19	18	17	16	15	14	13	12
Lumens	170	120	85	60	42	30	21	15	11	7.5	5.3	3.8

Level	11	10	9	8	7	6	5	4	3	2	1	Red
Lumens	2.7	1.9	1.3	0.94	0.66	0.47	0.33	0.23	0.17	0.12	0.08	--