



clearwater
LIGHTS™



Operation Manual

Billie Brake Light

Dimmable

Patent Pending



Made in USA

Summary of CANopener Features & Operation

Step 1: Mounting & Wiring The Billie Brake Light

Congratulations on the purchase of this revolutionary Billie brake light. This is a high output brake-tail light that is computer controlled by the Clearwater CANopener. This brake light is intended for use on specific BMW motorcycles that use the CANbus control system.

This brake light installs in place of your license plate frame (our apologies to your dealer for robbing his valuable advertising space). The Billie brake light and frame are CNC machined from solid aluminum (Why? Because we can.....) and are very solid. The aluminum frame not only helps mount your license plate, but it serves a more important function as a heatsink for the powerful RED LED emitters inside the custom housing. This high quality product is made here in California.

Installation is simple. Just feed the small black cable up through your bike's rear fender section and up to the area under your rear seat. Then, secure your license plate to the Billie frame with the included bolts. Use the included bolt spacers if the bolts protrude too far out from the mounting location.

Now, connect the RED wire from the Billie to the RED wire coming out the back of the CANopener. Finally, connect the BLACK wire from the Billie to the BLACK wire coming out of the back of the CANopener.

Check routing of wires and tuck the CANopener back in place. Now, be prepared for additional safety from behind you. Your Billie brake light is pre-set from the factory to meet 90% of riders preferences.

Note: The bike must be running for the brake light to function.

Billie Brake Light Features

- Automatic brake light activation with variable flash rates.
- Adjustable tail light and brake light intensity for daytime.
- Adjustable tail light and brake light intensity for nighttime.
- 4 brake light flashing programs
- Speed sensitive activation

TSC = Turn Signal Cancel

WW = WonderWheel (BMW multifunction controller)

TPM = Tire Pressure Monitor

FTP = Flash To Pass

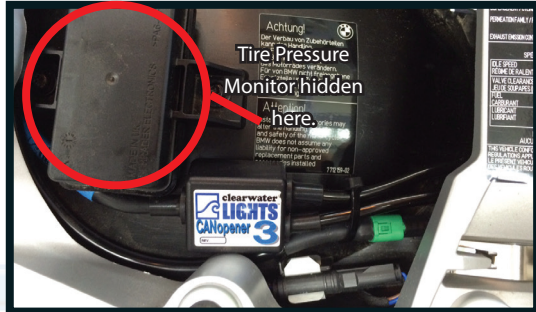
Function	Command	Modes
Clearwater Brake Light Dimmer	To enter dimmer program, you must first hold the front brake, next press the Turn Signal Cancel (TSC) switch once before holding the WW to the right for dimming. Note: The light will flash twice to indicate you've entered the dimming mode.	Rotate WonderWheel to select 10 brightness levels (10% to 100%) <ul style="list-style-type: none">• To adjust brightness on the tail light - release the brake after entering dimming mode, then rotate the WW.• To adjust brightness on brake light- hold the brake while rotate the WW.
Clearwater Brake Light	While stationary, press the TSC then press and release the front brake lever 5 times within 5 seconds to cycle through Modes 1 - 4. Example: Brake light begins in Mode 1, pressing the front brake 5 times brings you to Mode 2. If you were to press the front brake 5 more times you'd enter Mode 3. Etc.	Mode 1 – off Mode 2 – functions identically to BMW brake light (default) Mode 3 – California legal strobe on brake activation (4Hz flash) Mode 4 – speed sensitive (flashes faster and brighter with harder braking) Note: Modes 3 & 4 will only activate when speed is above 5 mph.

CANopener Mounting Location

CANopener Mounting Location:

The CANopener module can be found mounted under the seat on most CANbus equipped bikes.

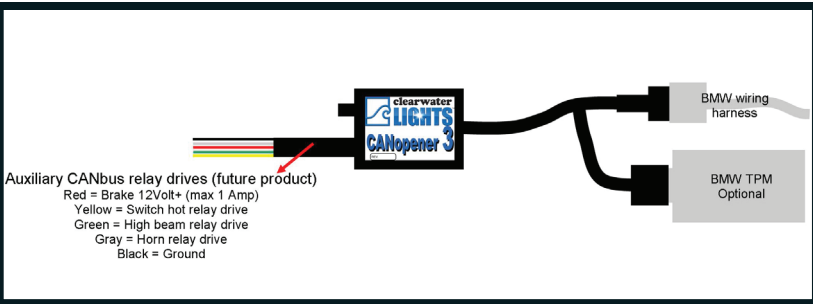
CANopener location on an R1200GSW.



CANopener location on a K1600GT.



CANopener location on an R1200RTW.



Clearwater Billie Brake Light Features & Operations

How To Adjust Brake Light Intensity:

1. To enter dimmer program, you must first hold the front brake, next press the Turn Signal Cancel (TSC) switch once before holding the WW to the right for dimming. The light will flash twice to indicate you've entered the dimming mode.
2. Rotate Wonderwheel to change brightness in 10% steps. Hold brake to set brake level, release brake to set running light level.
3. Wait 3 seconds with no adjustments or press the TSC again to end the programming mode. A single flash indicates end of programming mode.

Note: There are two settings for brake and running light levels: day and night. The ambient light sensor in the instrument cluster determines which level will be adjusted during setting. Brake light and running light levels automatically switch between day and night based on ambient light sensor in instrument cluster.

How To Adjust Brake Light Modes:

While stationary, press the TSC, then press and release the front brake lever 5 times within 5 seconds to cycle through Modes 1 - 4. When cycling to a new mode the brake light will flash a number of times equal to the mode it is now in.

Mode 1 – No brake light.

Mode 2 – Standard brake light; functions identically to BMW brake light. (default) (2 flashes from brake and aux lights)

Mode 3 – California compliant brake mode; 4 flashes at 4 flashes/second when front/rear brakes applied followed by constant on. Disabled below 5mph. (3 flashes from brake and aux lights)

Mode 4 – Active brake light; flash rate depends on deceleration rate.

Stationary Brake Flash (CANopener Version 1.82+):

The brake flashing action of the brake lights in either Brake Modes 3 or 4 is suppressed when the bike's speed drops below 5mph. This is to avoid nuisance flashing in heavy, stop-go traffic situations. However, in a case in which it would be beneficial to flash the brake light (sending a friendly message to a driver behind the bike), a 4-flash sequence can be generated in these modes by a double pull of the front brake lever while the bike is stopped.

Clearwater Billie Brake Light Features & Operations

Automatic Brightness (CANopener Version 1.82+):

In Brake Modes 3 and 4 (the two brake flashing modes), the brightness of the brake light is automatically controlled by the rate of deceleration. Light braking always results in a minimum of 25% of the full programmed brake light brightness. This will increase to the full programmed brightness at a deceleration rate of 0.4G.

For very vigorous braking, the intensity can even exceed the maximum programmed value (see previous programming discussion) for braking above 0.4G, limited only by the maximum brightness of the brake light. As the bike comes to a stop (below a speed of 5mph), the brake light returns to the programmed braking brightness as long as the brake lever (or pedal) is held.

Example: If the brake light running level is set to 20% (see how to adjust above) and the nominal brake light brightness is set to 60%, then the brake light will increase to 25% of this difference, i.e. to 30%, under very light braking.

As the deceleration increases, however, the brake light will increase, reaching the full programmed brightness of 60% at 0.4G of braking. However, under very heavy braking in an emergency situation, the brake can reach the full 100% brightness that it is capable of at 1.0G (highest typical braking rate based on tire traction), regardless of the maximum programmed level.

Inertial Braking Mode (CANopener Version 1.82+):

There is an additional braking feature provided by the CANopener in which the brake lights automatically engage when the deceleration of the bike reaches a threshold value, even when the brakes are not engaged (engine braking).

There are three inertial braking modes. To switch between the modes, while stationary, press the TSC, then press and release the rear foot brake lever 5 consecutive times (front brake released). Each mode will be signaled by a corresponding number of flashes by the brake light as well as by any forward running lights, if they are also installed.

- Inertial Brake Mode 1: Inertial braking disabled. The front and/or back brake lever must be engaged for the brake light to activate.

- Inertial Brake Mode 2: Low sensitivity mode. The brake light will activate when the engine braking level reaches 0.4G.

Clearwater Billie Brake Light Features & Operations

Inertial Braking Mode (CANopener Version 1.82+):

-Inertial Brake Mode 3: High sensitivity mode. The brake light will activate when the engine braking level reaches 0.2G. This will make the activation of the brake light during engine braking happen more frequently, under less deceleration. Inertial braking is disabled during standard brake light mirror mode (Brake Mode 2) but works equally well using the California 4-flash (Brake Mode 3) or variable flashing (Brake Mode 4) modes. In either of these modes, the brake light will appear just as if the rider had engaged the brake, including the programmed flashing and automatic brightness control. Adding mechanical braking at some point during the engine braking process provides seamless, uninterrupted action of the brake light.

Note: The auxiliary brake light is configured as an “always on” running light at a reduced light level. When either the front or rear brake is activated, it activates at 100% brightness. All flashing light modes are deactivated below 5mph.

Factory Reset Default:

To reset the CANopener to the factory settings, hold the left turn signal switch and press the flash-to-pass button six times within six seconds. All factory preset dimmer levels and modes will be selected. A successful reset is indicated by five flashes of the Clearwater lights.

Billie Indicator Light:

Included with the Billie Brake Light Kit is an optional feature that allows one to conveniently monitor what the Billie Brake Light is doing while on the bike. The Indicator Light is a very simple install, fasten the LED to an area that is easily seen when riding, then route wiring to the back of the bike near the CANopener. Next, the red and black wires from the Indicator Light should simply be Posi-Locked to the CANopener red and black wires. The image below shows our recommended mounting location.



Thank you for purchasing your **Clearwater Lights**. We hope this product will help make you a safer rider. Please feel free to send us comments or suggestions at any time. We learn from you. Visit our website for more exciting products to help you see better at night.

Ride safe!

Sincerely,

Glenn and the team at Clearwater.



The Clearwater Company - 11305 Sunrise Gold Circle, Suite D
Rancho Cordova, CA 95742
Phone: (916) 852-7029 | Fax: (916) 852-9410 | www.clearwaterlights.com
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