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Wig-Wag (D) 'Witch™ Light-Flasher Improves Aircraft Visibility

WARNING: Wig-wagging lamps larger than 85W or HID lamps, without using a Surge Suppressor (See Manual) violates the warranty of this device. We can supply the Surge Suppressors (and for the HID lamps, an added High Voltage suppressor).

Late in World War II, the British and Americans tested anti-sub aircraft outfitted with forward facing bright lamps. A rear-facing photocell automatically adjusted the lamps to match the background sky's brightness. This would have been invisible to German U-boats that could not have seen an approaching attack bomber until it was far too late!

Steady (non-pulsed) lights during the daytime *can actually make an approaching airplane invisible!*

But wig-wags alternately flash the taxi and landing lights to improve your aircraft's visibility. Pilots are innately aware of motion, so this really gets their attention! Wig-wag lighting markedly improves flying safety, especially in airport traffic patterns and during limited visibility operations.

Bonus: Recent studies show that wig-wags are the best way to avoid bird strikes.

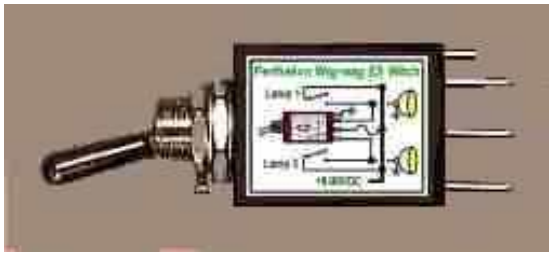
Not one of those wimpy <u>100W</u> flashers; this little wig-wag is <u>250W per lamp</u>!

Safety doesn't get any simpler…or smaller. This wig-wag is built *into* the switch and it will run on 10-18 VDC aircraft voltages (We can supply 28V devices, too). Custom features are easily accommodated. Please inquire.

FOR EXPERIMENTAL AIRCRAFT USE ONLY.

Basic Specifications:
Body Size: 1.00"X1.25"X0.60" (25X32X15 mm)
Weight: About 1.5 ounce (42.5 g)
Mounting: 12 mm threaded bushing
Connectors: 0.250" male Fastons®).110" Faston, Molex C-Grid SL .
Input Voltage=10-18 V (28V version available)
60VDC Load Dump Transient Capable
Maximum Switched Lamp Watts =2 X 250Watts
Flashing Speed =~ 0.750 sec ON, 50% duty cycle, 8 flashes per minute combined (FAA legal)
Toggle switch has gold contacts.

Appx. Actual Size:



US$88.00
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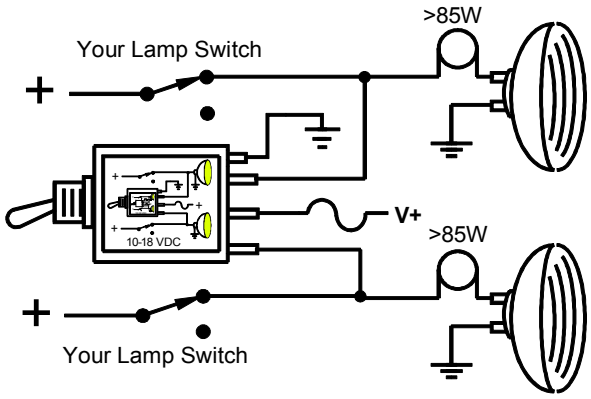


Installation and mounting—

The Wig-Wag (D) 'Witch module is designed to mount just like any other switch in your instrument panel. Wire as shown. Crimping two wires in the Fastons or using a Tee connector is allowed and will simplify the wiring. The ground connection is very low current BUT VERY IMPORTANT!

Fusing:

The device can be protected by a slow-trip circuit breaker or slow-blow fuse rated at the current of the largest lamp and installed as shown on the + terminal. This is up to the user. Also remember that the turn-on surge of incandescent lamps can be very large, typically 3X the steady state current. FAA regulations allow using an in-line fuse, since easy access and replacement of a wig-wag fuse is not required for the safe continuation of flight.

At 250 Watts for each lamp, the module should only get to 48 ºC (only 11 ºC over human body temperature), so for most purposes the module runs cool to the touch. No inrush-current limiter is needed for lamps up to 85W each side (200W lamps on 28 VDC systems) Larger lamps must have an inrush current limiter (available through us) installed in series to prevent the initial turn-on surge from damaging the lamp or the wig-wag device.

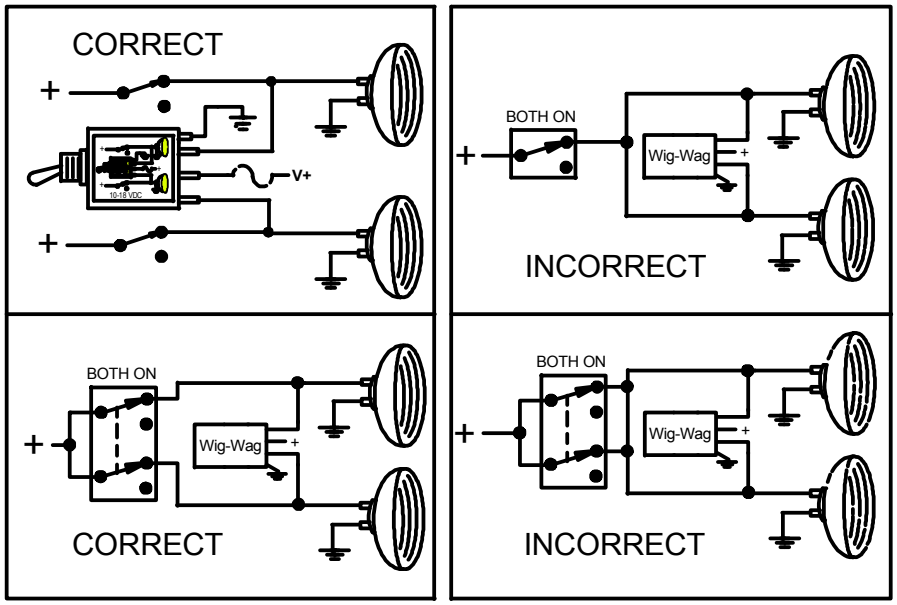
Notes:

The device generates essentially zero EMI or RFI. The toggle switch threaded mounting bushing is 12 mm. The switch contacts are gold. The device is UL94 V-0 flammability rating. The device is not static sensitive. The pulse timing is about 750 milliseconds per-side alternating independent of lamp wattage or supply voltage. That's 80 flashed per minute-- the FAA legal rate.

According to an Aviation Consumer article, some manufacturers (and General Electric) claim that wig-wag pulsing of a lamp will extend the life of the lamp considerably.

Operational Chart: Switch Positions

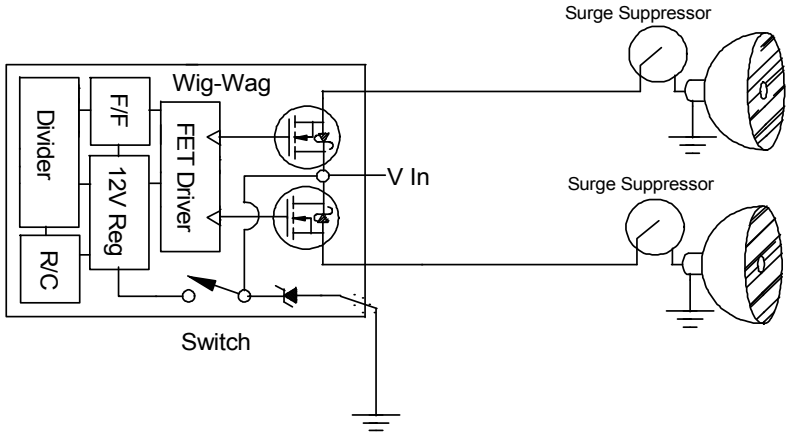
Wig-Wag Switch	Taxi Light Switch	Landing Light Switch	Taxi Light	Landing Light
ON	**OFF**		**Wig-Wag**	
OFF	**Taxi and Landing Lights Operate Normally**			



Note: Occasionally someone calls because their installation doesn't work, usually because the installer neglected to make sure that each lamp CAN operate independently so that it can be wig-wagged. Often a landing and taxi light are wired to operate together. This can be done several ways. So be sure that each lamp can operate independent of the other.

Using surge suppressors with the Perihelion Design Wig-Wag Lamp Flasher

Eric M. Jones 08AUG09



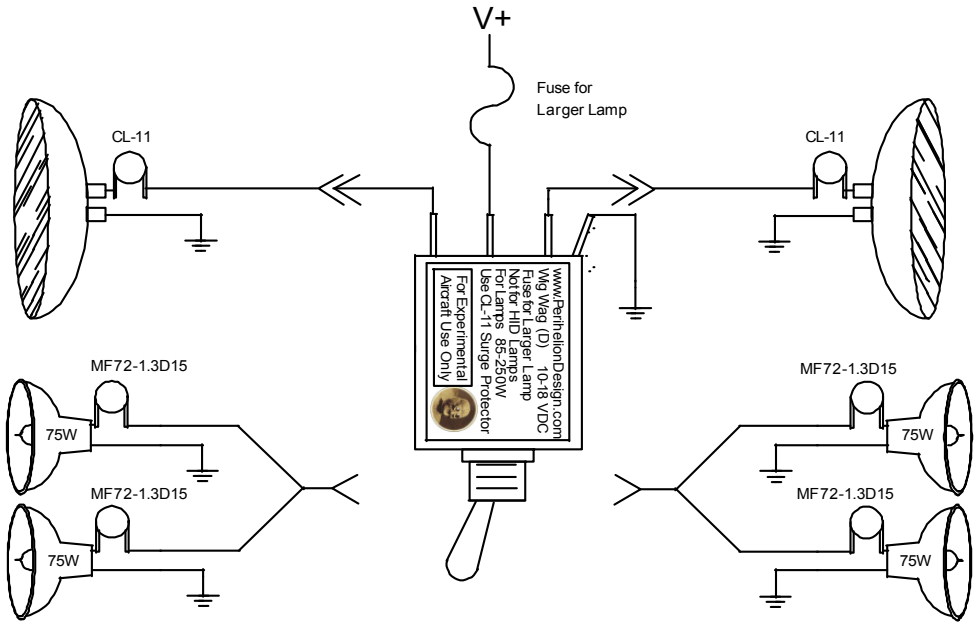
As the wattage of the lamps increase, more care has to be taken to keep the current through the Mosfets inside the Wig-Wag within operational limits.

The Mosfets are Fairchild Trenchfets, FDD6670S that have no problem with currents as high as 76 amps and even 100 amps in some applications, but they are limited in how long they can do this. For the long "ON" time of 750 mS, the Mosfet can only survive currents of 26 amps.

But the problem is that cold lamp filaments (especially in large lamps) have a tiny resistance, and thus a huge inrush current. Whereas lamp filaments have a very low resistance when cold, thermistors have a larger resistance when cold and an insignificantly small resistance when hot. Thus the initial inrush current can be controlled while the lamp output is essentially unaffected. For example, if the cold lamp (and all associated wiring and connections) has a resistance of 0.2 Ohms, the initial current will he I=V/R or 14/0.2=70 amps. This current will fall to the normal DC operating current of the lamp (perhaps 8 amps), in a matter of milliseconds when the lamp filament heats up and the resistance increases. Furthermore, the worst-case condition is with a very cold lamp on the very first wig-wag.

The Perihelion Design Wig-Wag can be used on lamps up to 75 watts directly. But for wig-wagging lamps from 85-250 watts, Perihelion Design requires a surge suppressor such as GE-Thermometrics thermistor surge suppressors CL-11 or CL-101 on each lamp. For 75 Watt MR-16 Halogens, we suggest using MF72-1.3D15 surge suppressors on each lamp. This allows more versatility in flashing one, or two in parallel. (Two 75 Watt lamps in parallel would be 150 Watts).

Installation: Locate the surge suppress as close to the back of the lamp as possible, but protected from the airflow. Surge suppressors are designed to run hot and MUST NOT BE COOLED excessively. Use crimp connectors if possible, or twist and solder. Use high temperature tape or TFE for insulation. Avoid covering the body of the surge suppressor, as this will cause it to change its characteristics.



Our WW(D) has a standard 15/32” (12 mm) bushing toggle switch. If you prefer to use your own rocker switch, or want to do more complex switching, then please see our WW(C). Same basic circuitry, but you use your own switch.

Eric M. Jones 07/23/2012