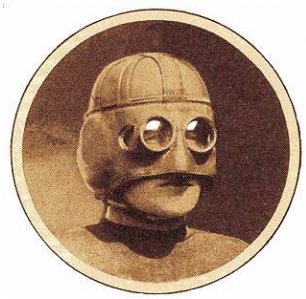

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Wig-Wag (C) Light-Flashing Module Improves Aircraft Visibility

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 deadly 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.

Not one of those wimpy 100W flashers; this little wig-wag is 250W per lamp! Safety doesn't get any simpler…or smaller.

A connection to a user-supplied panel mounted switch is provided. The module may be mounted by supplied 3M double-sided tape or bonded to a small attachment plate as desired. Custom features are easily accommodated. Please inquire.

Basic Specifications:
Dims: 1.03" X 1.50" X 0.30" (26 X 38 X 8 mm).
Weight: About 1/2 ounce (15 g)
Connectors: 0.250" male Fastons. 0.110" Faston, Molex C-Grid SL, 0.100 series

Input Voltage=10-18 VDC
Maximum Switched Lamp Power =2 X 250Watts (*requires surge suppressors, HID's require small modification.) see instructions.
Flash Characteristic = 0.75 sec ON alternating

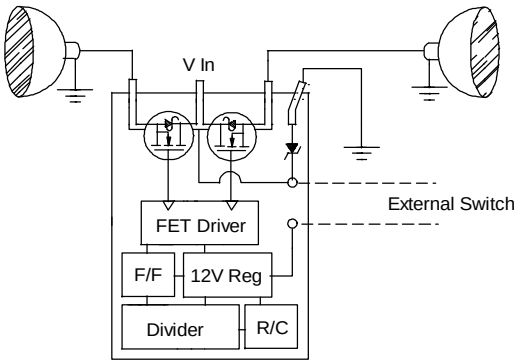
US$78.00
Shipping Free to US-Canada –Foreign USPS at cost. Paypal payment preferred

FOR EXPERIMENTAL AIRCRAFT USE ONLY.

Installation and mounting—

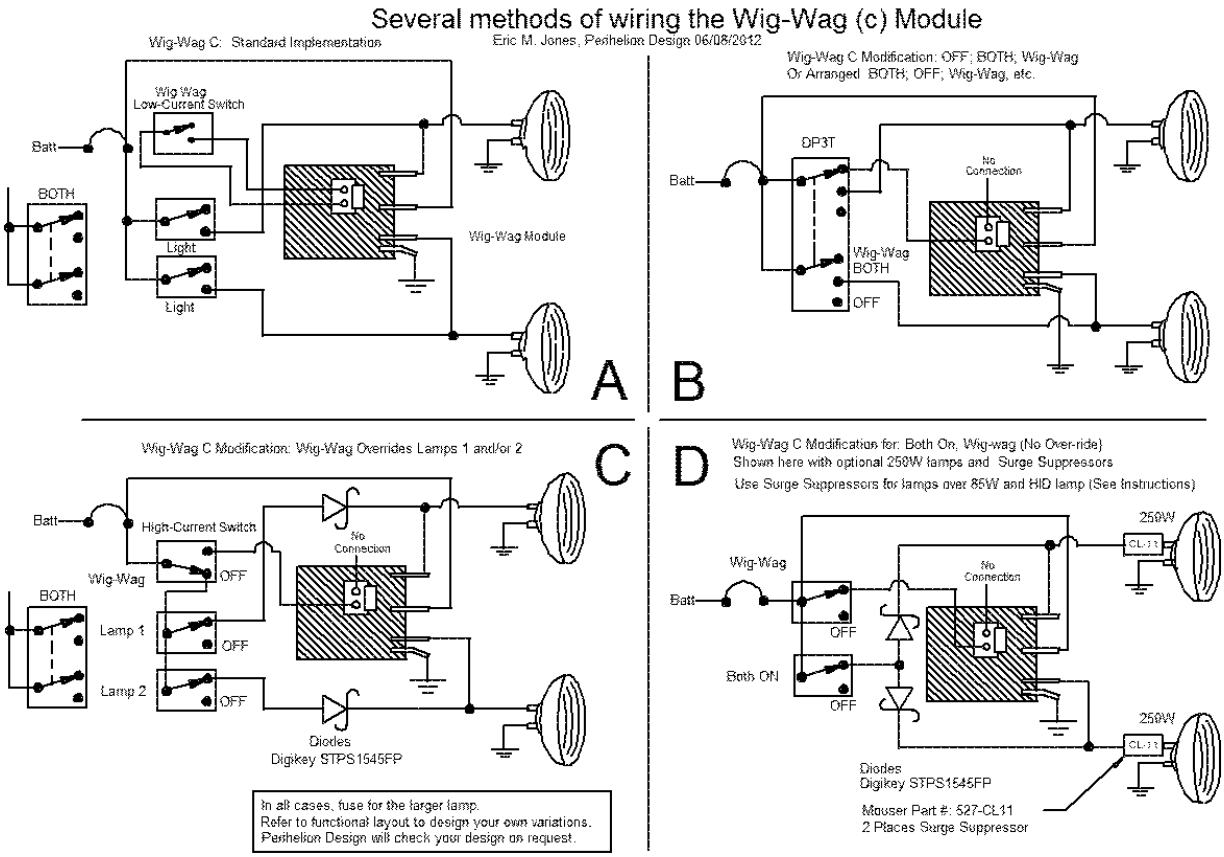
The Wig-Wag module is designed to fasten to any convenient surface by means of the supplied 3M Series-4000 urethane double-coated tape.

Locate an appropriate mounting location. Make sure the mounting surface is flat and clean. Remove the backing from the attachment tape on the rear of the module.
Install in orientation for your application. If in doubt, test it first. The ground connection is very low current <u>BUT VERY IMPORTANT!</u>



Wig-wag (C) Descriptive Diagram

Various Switching Methods:



A— Standard. This arrangement allows either or both lamps to be ON continuously. The Wig- wag switch is very low current and could be a relay contact or microprocessor transistor output. The switches that command the two lamps to be ON must be OFF for the Wig-wag for the Wig-wag to work.

Operational Chart: Standard Implementation

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

B— OFF; Both; wig-wag. This DP3T switch arrangement allows the lamps to be OFF or both ON continuously. Then wig-wagged when the switch is in the top position.

C—When the Wig-wag is selected, it overrides the other lamps. Here either lamp can be turned ON individually when the Wig-wag is in the OFF position only.

D—The bottom SPST switch turns both lamps ON together. The top SPST switch turns ON the Wig-wag. The bottom switch must be OFF for wig-wagging to occur.

The Wig-wag C is extremely versatile. Other switching functions have been developed, so please inquire.

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, so slow-blow fuses and breakers are required. FAA regulations allow using a hidden in-line fuse, since easy access and replacement of a wig-wag fuse is not required for the safe continuation of flight. A blown wig-wag fuse will still allow the lamps to operate.

Notes:

- 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.

- 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.

- We can make these for 28V systems please inquire.

Using the Perihelion Design Wig-Wag Lamp Flasher with lamps over 85W (each).

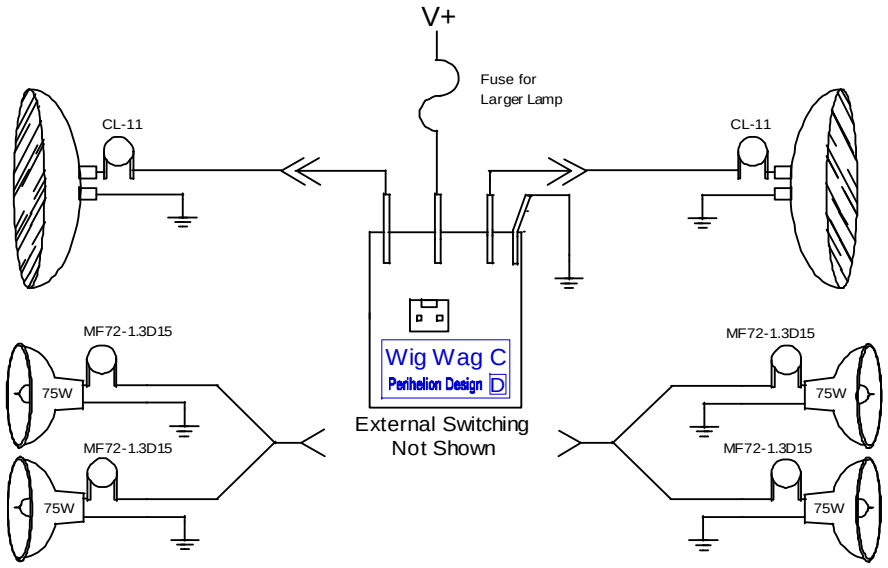
As the wattage of the lamps increase, more care has to be taken to keep the current through the Mosfets inside the Wig-Wag within operational limits.

The Mosfets have no problem with currents as high as 100 amps in some applications, but they are limited in how long they can do this. For the relatively 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.

The Perihelion Design Wig-Wag can be used on lamps up to 85 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.

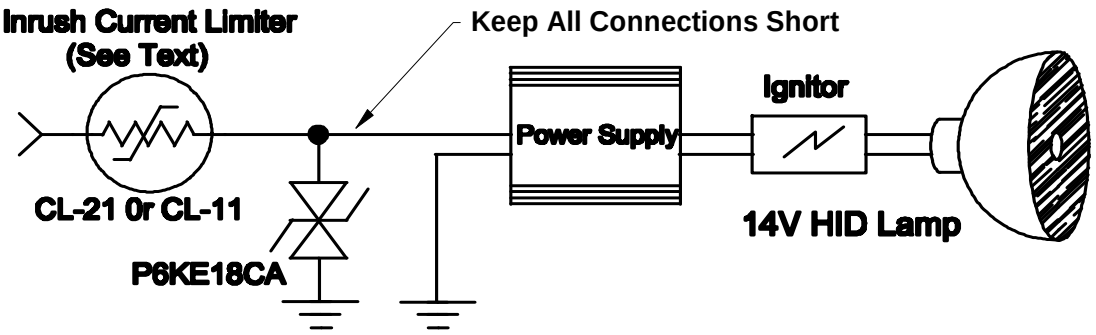


Using the Perihelion Design Wig-Wag Lamp Flasher with HID Lamps.

1: To prevent the high voltage ignition pulse from feeding back into the device I have added a bidirectional Zener, diode near the ballast. DO NOT put it between the HV ignitor and the lamp. These parts are P6KE18CA (for 14V systems).

2: A CL-21 Inrush current limiter will prevent the large current current surge (on starting) for HID lamps up to 50 W. For larger HID lamps use CL-11. The current limiters will get hot, and should be placed where they don't get air-cooled.

I will supply these parts upon request. Remember that the HID needs a minute or so warm-up time before wig-wagging.



Using the Perihelion Design Wig-Wag Lamp Flasher with LED Lamps.

The Perihelion Design Wig-Wag will power normal LED lamps without any changes.

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Revised 09JUN2012