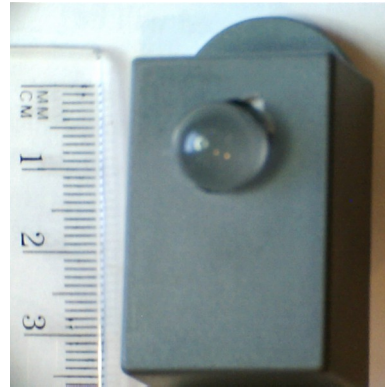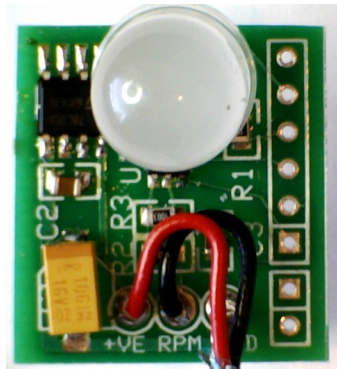**GyroBump**
Gyroplane rotor bump warning device
v1
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What it is

GyroBump is a device to warn the gyroplane pilot of potentially dangerous rotor rpm situations. It monitors the rotor rpm and acceleration/deceleration and displays it in a simple red/green indication to the pilot.

The two situations it can help with are avoiding rotor blade flap (bump) on take-off, and loss of rotor rpm during flight manoeuvres.

How it works

GyroBump monitors the rotor rpm via a pick-up off the pre-rotator ring gear, and indicates whether the rotor is above nominal rpm, or below nominal and accelerating or decelerating.

During the take-off run the rotor should be in positive acceleration until it reaches nominal flight rpm. Lack of progressive acceleration is an indication that the groundspeed/airspeed is too high for the current rotor rpm, with the associated risk of retreating blade stall, blade flap, rotor bump and possible aircraft rollover.

In flight the rotor rpm should remain in the nominal flight rpm band. Low and decelerating rpm is an indication the rotor is being unloaded with associated risk of loss of lift and control.

GyroBump indicates these conditions via a simple red/green led indicator showing three states. With the indicator in line-of-sight of the pilot during take-off it helps manage rotor rpm without constant reference to the instruments.

- **Flashing green** indicates rotor rpm is below nominal but positively accelerating. This is the desired state during the take-off run.
- **Steady green** indicates the rotor rpm is above the nominal rpm. This is the desired state during flight.
- **Flashing red** indicates rotor rpm is below nominal and decelerating. Immediate recovery is required.
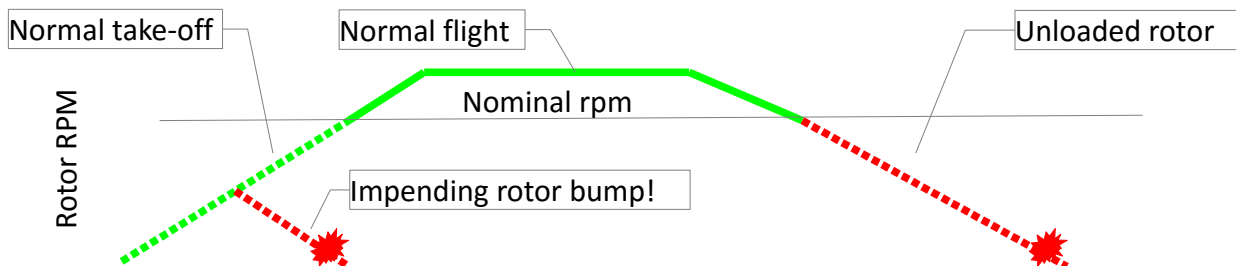

Acceleration	RPM	Below nominal	Above nominal
Positive		FLASH	STEADY
Negative		FLASH	STEADY

Specifications

Size	35x25x20mm module (excluding geartooth sensor)
Weight	Approx 25g
Power supply	7-24VDC (nominal 12VDC) @ 15mA
Sample rate	260mS (~4 samples/second)
Nominal rpm	250rpm (assuming ~100 tooth ring gear) Enquire for other rpm/ring gear requirements.
Maximum rpm	400rpm (assuming ~100 tooth ring gear) May give false indications above this rpm.

Installation

Ring gear   Geartooth sensor   GND   GyroBump
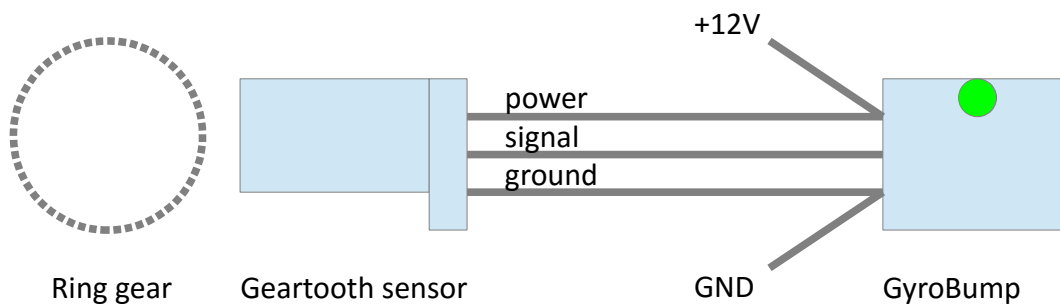
Geartooth sensor.
- The recommended sensor is the Honeywell 1GT101DC sensor (Element14 part number 1225630).
- Any open collector or 0-5V/0-12V Hall effect sensor will work.
- Follow the manufacturer's installation instructions regarding positioning to the ring gear teeth.
- If an existing geartooth sensor is fitted, you can tap into its signal output.

Power supply.
- Connect to the aircraft 12V supply via the avionics master switch and a 500mA fuse.

GyroBump
- Fit to the panel or appropriate part of the airframe so it is visible when looking ahead.