Re: Hall effect sensor

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Check out www.allegro.com
where you will find many unipolar Hall Effect sensors.
A word or two of advice from my own experience. When I used them I found they worked OK, but the range was poor, even when using an expensive neodymium magnet [See note 1]. Say 3mm. We got another mm or so by putting a ferrite bead behind the magnet. Mind you these were small magnets − about 3mm diameter, 3mm long.
You gotta worry about the magnetic field strength dropping with time (years) and temperature (I forget if the magnets get weaker as temperature goes up or down, the manufacturer will tell you).
So, just be careful about separation between sensor and magnet. If you have a rotating thingy, and the environment is rugged, you may need to mount the sensor & magnet rather far apart to allow for vibration, knocks, misalignment etc (the same would be true of an opto sensor).

If cost is no object I know of another technology being developed at a start up company near me, they're looking for apps. This one sounds suitable but would need to be a mass production or high value one to justify them developing a custom solution for you.

I wouldn't go for a reed switch as they're electromechanical and I just don't trust such things' failure rates when cycled a zillion times. Also I have seen some which were orientation sensitive. They do have the advantage of not caring what polarity they're facing, though.

Something to consider: why does the rpm sensor need to be mounted near the gear teeth?

Note 1 − neodymium magnets
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Neodymium alloys make the best magnets because (a) they're strong (b) they retain their strength even without a keeper forever. Other magnet types' strength decays significantly within a year or two.

Marvellous! So why are these magnets so expensive? Because it's a rare element. There used to only be 2 mines in the world, but the US one closed down for environmental reasons. The remaining one is in China (actually they get the neodymium by processing the waste tailings from a mine which is mainly extracting some other mineral). However a year or two ago that mine had a fire and temporarily closed down, so the price of neodymium magnets shot up. I imagine it's back down again by now.

Just thought that was interesting...
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Nemo
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