☆ Two wires for opto-switch ☆

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Here's a simple way to run two wires instead of four to a remote opto-switch, as in the case of a wind speed indicator which provides pulses proportional to the rotational speed of a perforated disc.

An opto-coupler consisting of a LED and a phototransistor, either of the packaged variety or made from discrete devices, normally requires four connections. However, twin-pair cable is common, cheap and convenient and it's more economical (and more elegant) to use two wires rather than four for a remote sensor.

The further away the sensor may be located from the indicator, the more attractive a two-wire system becomes.

In the circuit, resistor R1 provides a 'starting' current for the LED. Current through R1 and R2 will provide a certain dc level at the output when the path between the LED and phototransistor is blocked. When the path is unblocked, the phototransistor saturates, virtually shorting out R1, thus providing more current through R2, increasing the output dc level. This change can be sensed and used as required.