WINDSENSOR
reducing uncertainty

Application note

Connecting the WindSensor P2546D-OPR

The WindSensor P2546D-OPR Cup Anemometer has an open collector transistor output with the frequency proportional to the wind speed. A control circuit inside the P2546D-OPR switches the open collector output between floating state (open) and grounded state (closed) when the cup rotor assembly is rotated by the wind.

When connecting the P2546D-OPR to a datalogger a pull-up (or pull-down) resistor must be used to provide a well-defined input signal with the open collector output floating. The pull-up resistor must be connected to the supply voltage or if available an excitation voltage on the datalogger. This principle is shown in figure 1. If the datalogger has an internal pull-up resistor, the external pull-up resistor should not be used. Please refer to the datalogger documentation for further details on how to connect the P2546D-OPR.
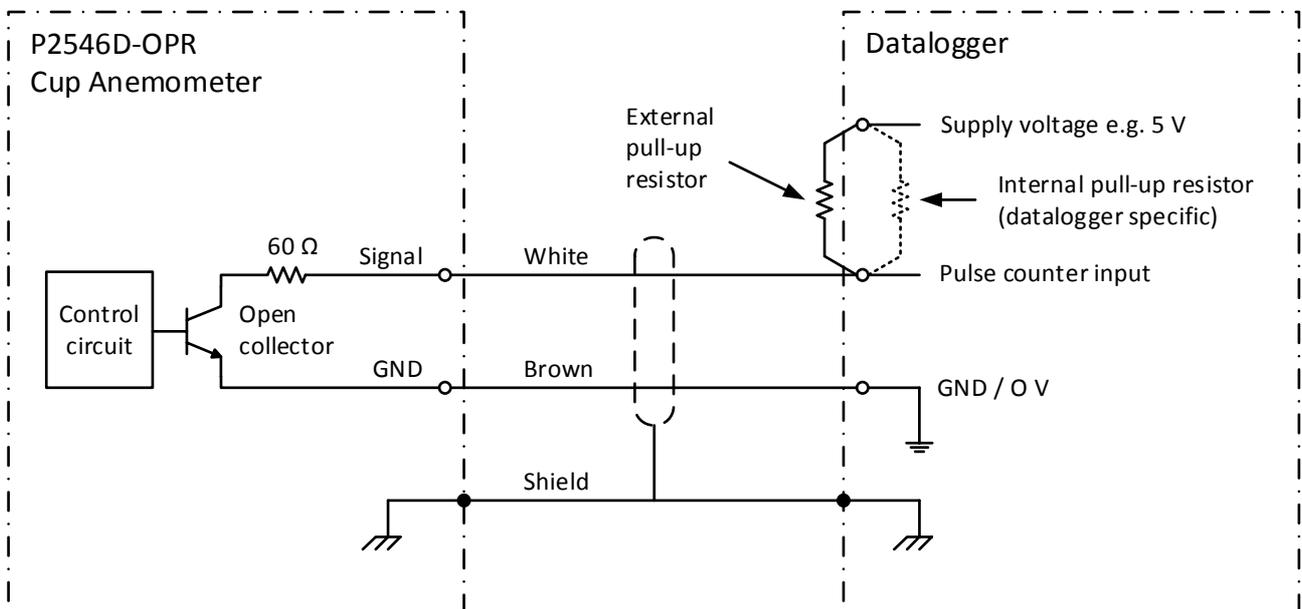

Figure 1: P2546D-OPR connection diagram using pull-up resistor.

When the P2546D-OPR output is open (transistor turned off) the pull-up resistor will tie the pulse counter input to the supply or excitation voltage giving a "high" input level. When the P2546D-OPR output is closed (transistor turned on) the pulse counter input is grounded giving a "low" input level. Figure 2 shows the waveform for one revolution of the cup anemometer rotor.
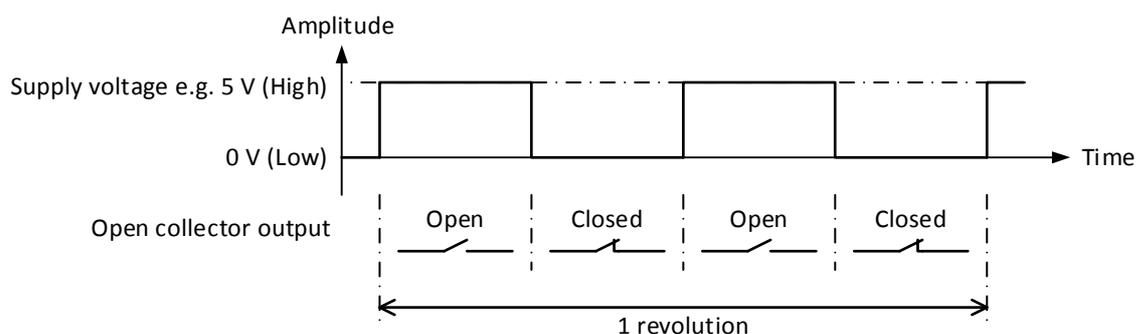

Figure 2: Datalogger pulse counter input using a pull-up resistor.

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Connecting the P2546D-OPR to a datalogger with internal pull-down resistor is shown in figure 3. The C terminal of the Campbell Scientific CR1000 datalogger is an example of an input having internal pull-down resistor. Please refer to the datalogger documentation to determine if the datalogger has an internal pull-up/pull-down resistor or if an external resistor must be used.
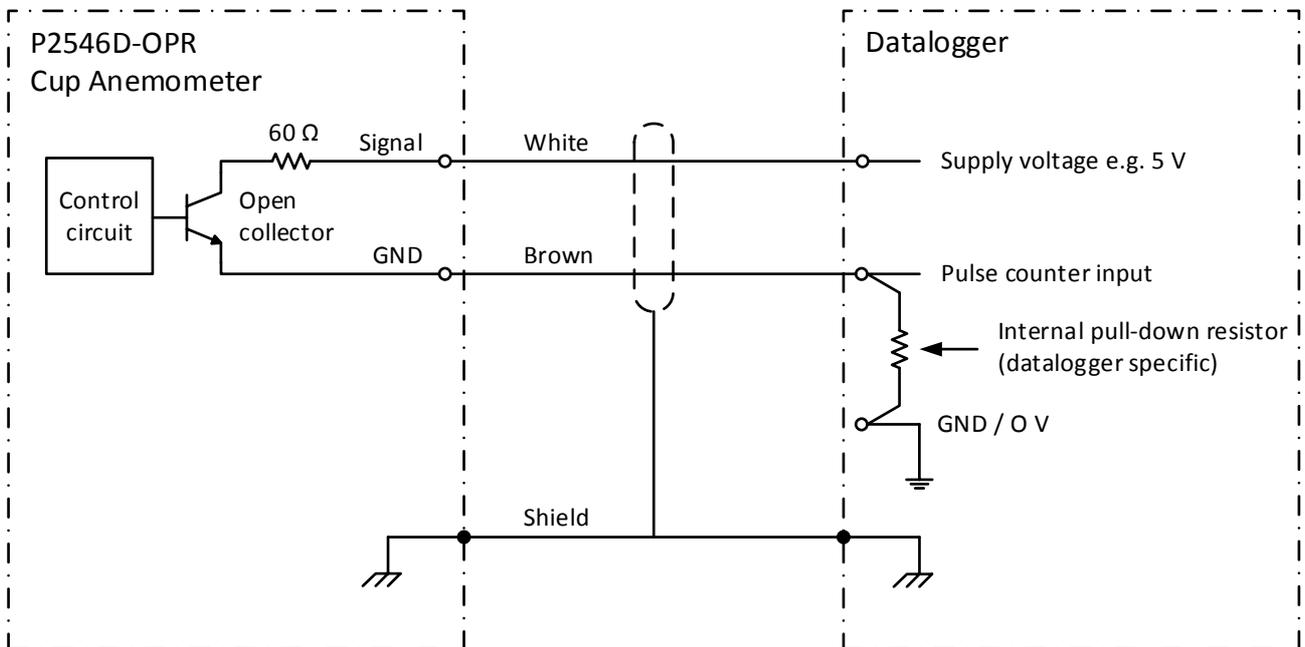
Figure 3: P2546D-OPR connection diagram using pull-down resistor.

The principle of operation when using a pull-down resistor is similar to when using the pull-up resistor except that the periods of low and high input levels have now been swapped. Figure 4 shows the waveform on the pulse counter input when using a pull-down resistor.
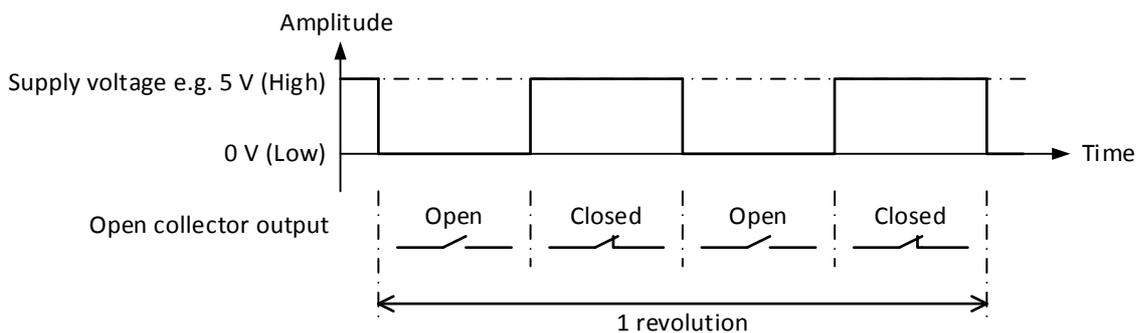
Figure 4: Datalogger pulse counter input using a pull-down resistor.

A recommended value of the pull-up or pull-down resistor is 10 KΩ.

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