

Application note

Connecting the WindSensor P2546A-OPR

The output of the WindSensor P2546A-OPR Cup Anemometer is a switch closure function with the switching frequency proportional to the wind speed. Magnets mounted inside the P2546A-OPR causes the switch to open and close when the cup rotor assembly is rotated by the wind.

When connecting the P2546A-OPR to a datalogger a pull-up (or pull-down) resistor must be used to provide a well-defined input signal with the switch open. 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 P2546A-OPR.

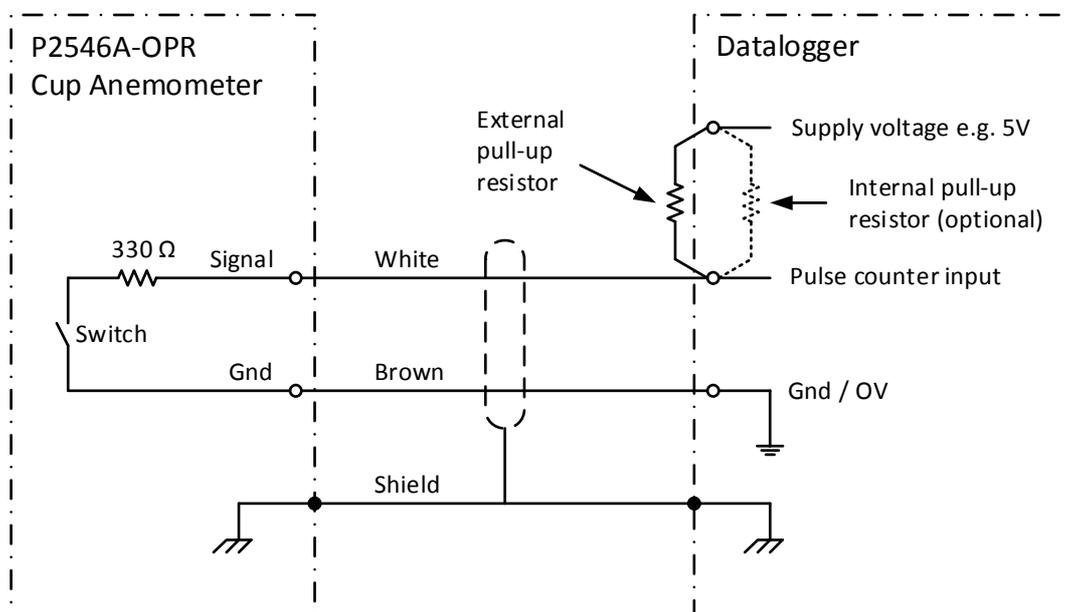


Figure 1: P2546A-OPR connection diagram using pull-up resistor.

When the P2546A-OPR switch is open (contacts are separated and no current flow) the pull-up resistor will tie the pulse counter input to the supply or excitation voltage giving a “high” input level. When the P2546A-OPR switch is closed (contacts are touching and current flow) the switch will tie the pulse counter input to ground giving a “low” input level. This switching between high and low input levels is used by the datalogger to determine the wind speed. Figure 2 shows the waveform for one revolution of the cup anemometer rotor.

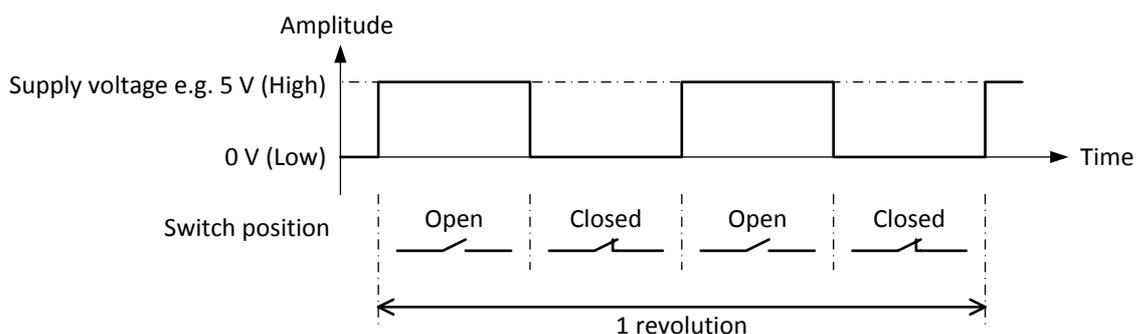


Figure 2: Datalogger pulse counter input using a pull-up resistor.

Connecting the P2546A-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.

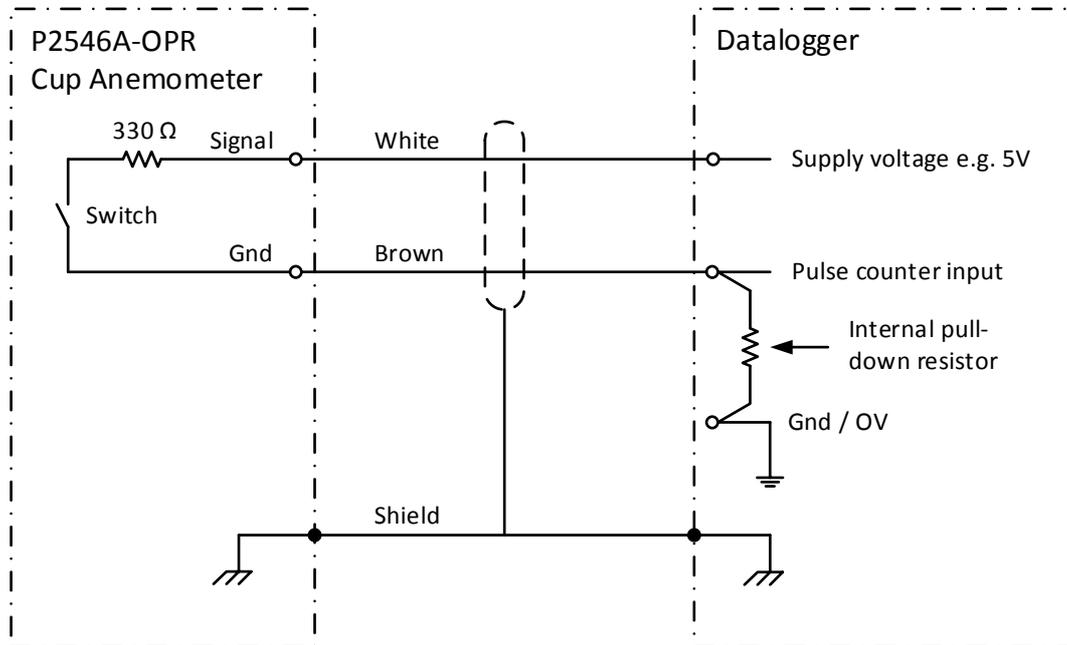


Figure 3: P2546A-OPR connection diagram using pull-down resistor.

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.

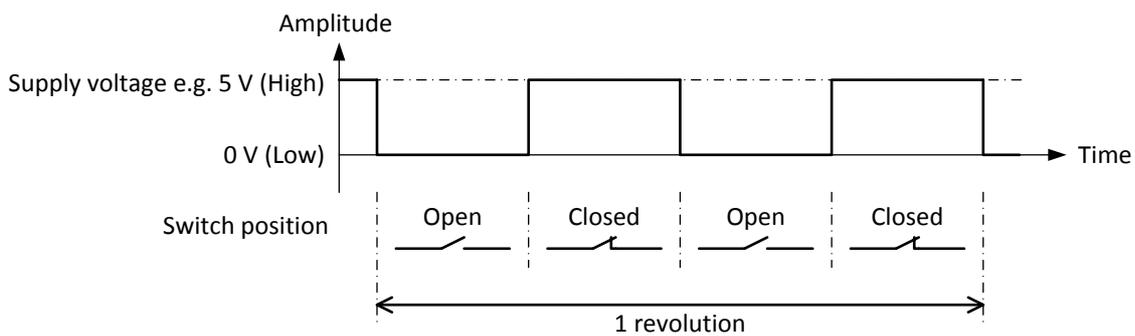


Figure 4: Datalogger pulse counter input using a pull-down resistor.

A recommended value of the pull-up or pull-down resistor is 33 KΩ.