Directional counting using beam sensors

WinCounter can be configured to detect the direction of foot traffic by configuring two beam sensors per entrance. Typically the beam sensors will be SICK WL250 retro-reflective sensors.

To achieve this, you need to install two beam sensors so they project two parallel beams across the opening you are monitoring. In the WinCounter options screen you configure the two sensors to act as a direction sensing pair. When a person walks past the sensors and breaks the beams, one beam will be broken first. WinCounter can determine the direction by analysing the order that the sensors are triggered.

Mounting

Sensors

The recommended height for mounting beam sensors is 1.25 metres (about 4 feet). At this height your sensor will count people but will not count small children, prams, shopping trolleys etc.

The two beam sensors need to be side by side so they project two parallel beams across the opening you are monitoring. Ideally, the beams should have a separation of 10-20mm. You can achieve this by mounting the sensors on separate mounting brackets or you can use a single mounting bracket with a spacer to separate the sensors.

Reflectors

For WL250 sensors, the reflectors should not be more than 8 metres (26 feet) from the associated sensor.

It is important that the beams are parallel and separated. If the beams are not parallel, it is possible to have them cross over each other at some point. If your beams cross over each other you can end up with some triggers being erroneously recorded in the opposite direction.

It is possible to use a single reflector for both beams, but this can cause problems with the beams being too close or even crossing over. We recommend you use a dedicated reflector for each beam to ensure your beams are separated and don't interfere with each other.

The width of the beam from a retro-reflective sensor will generally become wider closer to the reflector. This needs to be taken into account when you are lining up the beams and the reflectors. The further away the reflector is from the sensor, the more obvious this becomes.

Alignment

Before tightening the screws on your sensors, you should align each one so the beam is as close as possible to the centre of the corresponding reflector. Make sure the two inside edges of the beam are separated at the reflector end.

A good way to check is to slide a sheet of cardboard across the face of the reflector and observe the LED on the corresponding sensor. Make sure that each sensor can only be triggered by covering the corresponding reflector.

NOTE: The beam from the WL250 sensor has a dim visible light. If you can darken the room enough it is possible to see a spot that you can use to align the sensor with the reflector.

Examples

Here are some examples of beam alignment:

Figure 1
The ideal configuration. Both sensors and reflectors are mounted separately and operate independently.

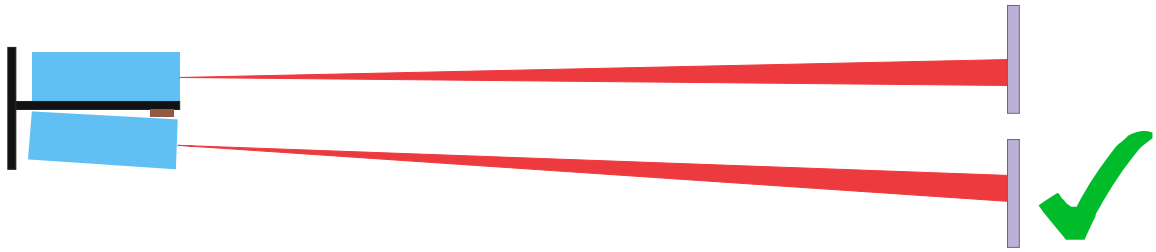


Figure 2
An alternate mounting scenario. Both sensors are mounted on the same bracket with a spacer to ensure beam separation.

Figure 3
The beams cross over. This will cause counts in the opposite direction near the reflector.

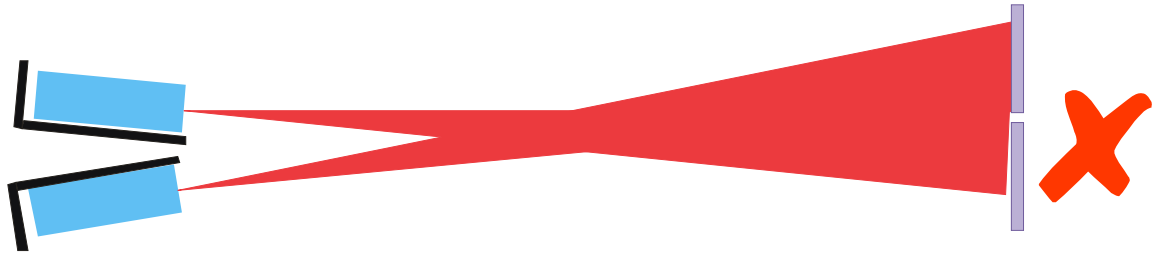
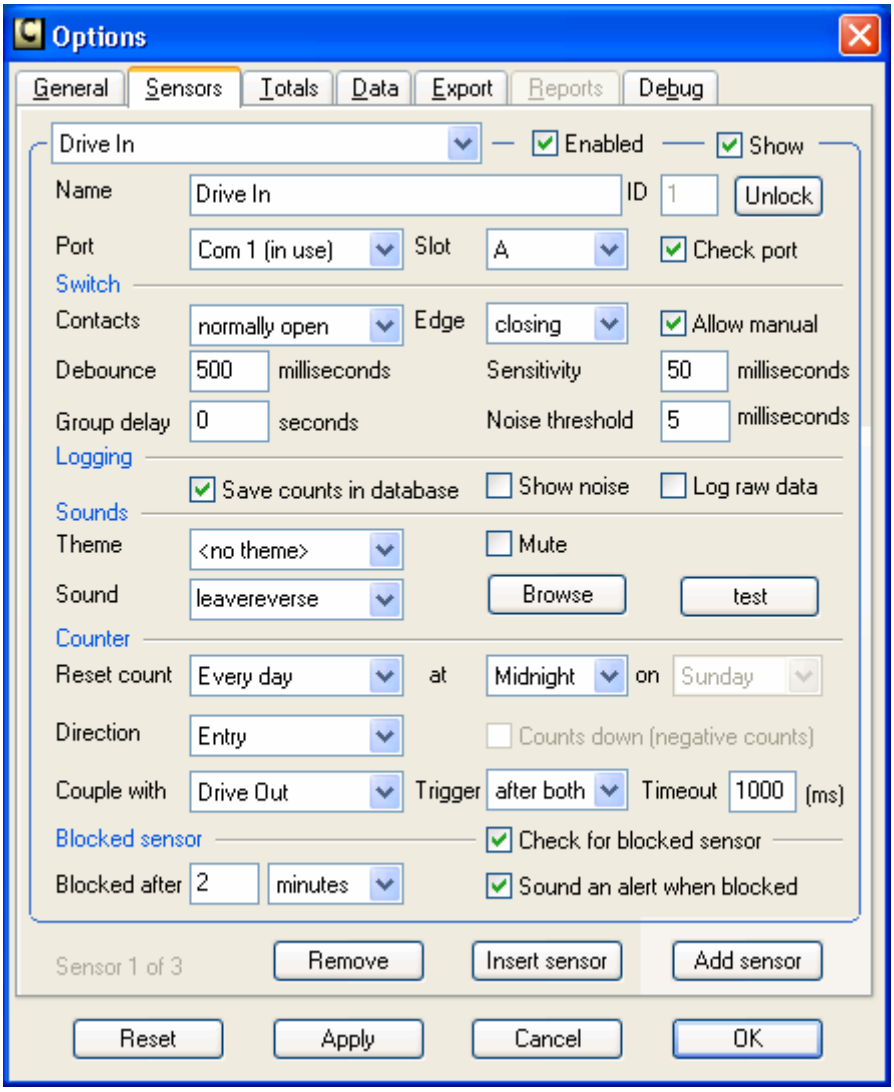


Figure 4
Sensor beams are too close so they share reflectors. This can cause false direction triggers. This scenario is more likely to occur if the reflector is a longer distance away from the sensor. i.e. a wide doorway.

Configuration

For two sensors to work together to determine direction, you need to configure them as a directional pair in the WinCounter options screen.

To do this: Click on the *Sensors* menu in WinCounter and select *Configure.* You should see a screen similar to this one with sensor configuration options. Follow the steps below.



1. Choose the sensor you wish to use as the entry sensor by selecting it from the list of sensors at the top left.
2. If you have not renamed your sensors then you may wish to give it a name that indicates the traffic direction eg. *"Front Door Entry"*
3. In the *"Direction"* box, Choose Entry.
4. Now select the sensor you wish to use as an exit sensor.
5. Rename it if necessary.
6. Set the direction to *"Exit"*

7. In the “Couple with” box select the entry sensor you wish to couple with for direction counting.
8. Leave the *Trigger* to *“after both”*
9. Set a Timeout of around 1000 milliseconds
10. Switch back to the entry sensor
11. The *“Couple with”* box should show the exit sensor
12. Leave the *Trigger* to *“after both”*
13. Set the Timeout. (1000 milliseconds is a good start)
14. Click apply to save the changes

Settings

Timeout
When one of the sensors in a direction pair is triggered, the other sensor will be expecting a trigger shortly afterwards to complete the count. The timeout is the time WinCounter will wait for this second trigger before resetting both sensors and ignoring the count.

Trigger
You can choose to trigger a directional pair after both sensors have been triggered or after the first sensor has been triggered. It is best to leave this setting to “After both” for measuring foot traffic.

Debounce Sensitivity and Noise Threshold
These settings apply to all sensors. It is important that these settings are the same on both sensors in the directional pair.