

# WHAT ARE GATE AUTOMATION PHOTOCELLS AND WHAT IS THEIR FUNCTION?

Automatic gates open and close when instructed by a variety of methods. Remote transmitters are carried by gate owners to operate their gates at the push of a button on the remote. Access control systems use gate release buttons inside the property to open the gates. And keypads or proximity readers installed outside the gates allow access for anyone with the code or programmed proximity tag.

It is also possible to bury a loop cable in the driveway inside the gates that operates the gates when a vehicle passes over it.

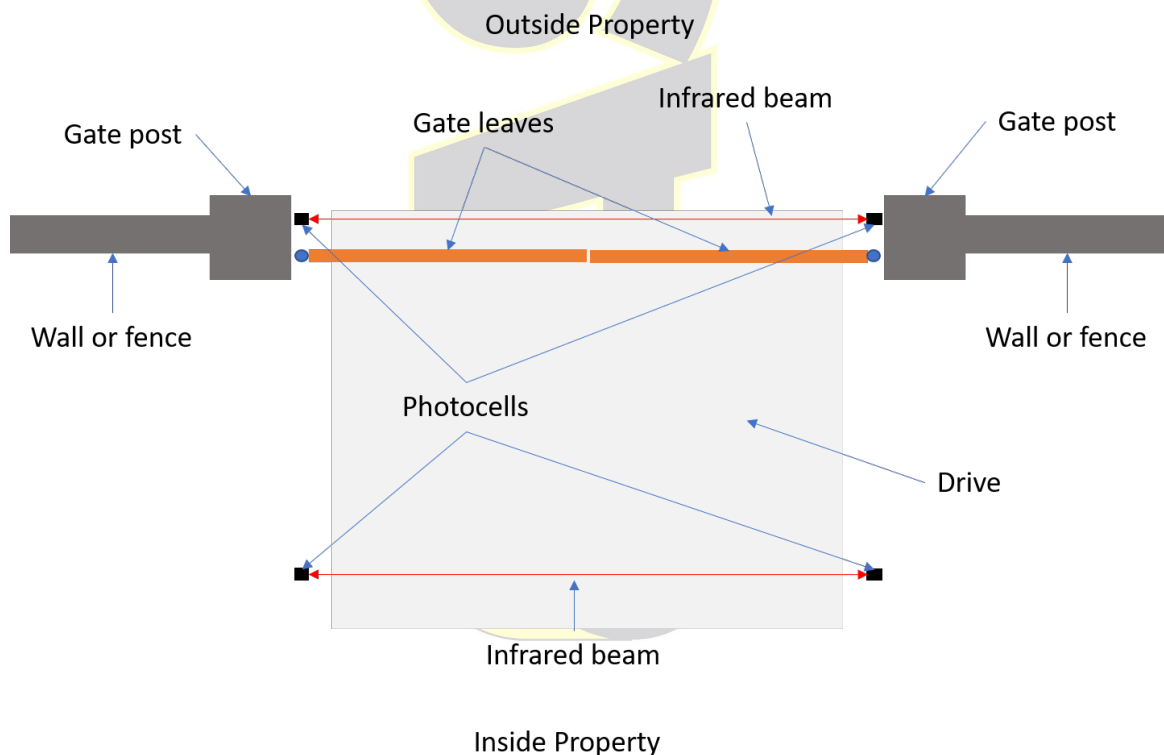
Under normal conditions, automatic gates open when instructed to do so and then close after a certain period of time.

However, moving gates should not be allowed to hit anything or anyone, so a way to tell them that something is in their path is needed. This is what safety photocells are for.

Photocells come in pairs and function by sending an infrared beam from one to the other. If this beam is broken, the photocells send a signal to the gate automation control panel. This signal usually tells the gates to stop and to fully open.

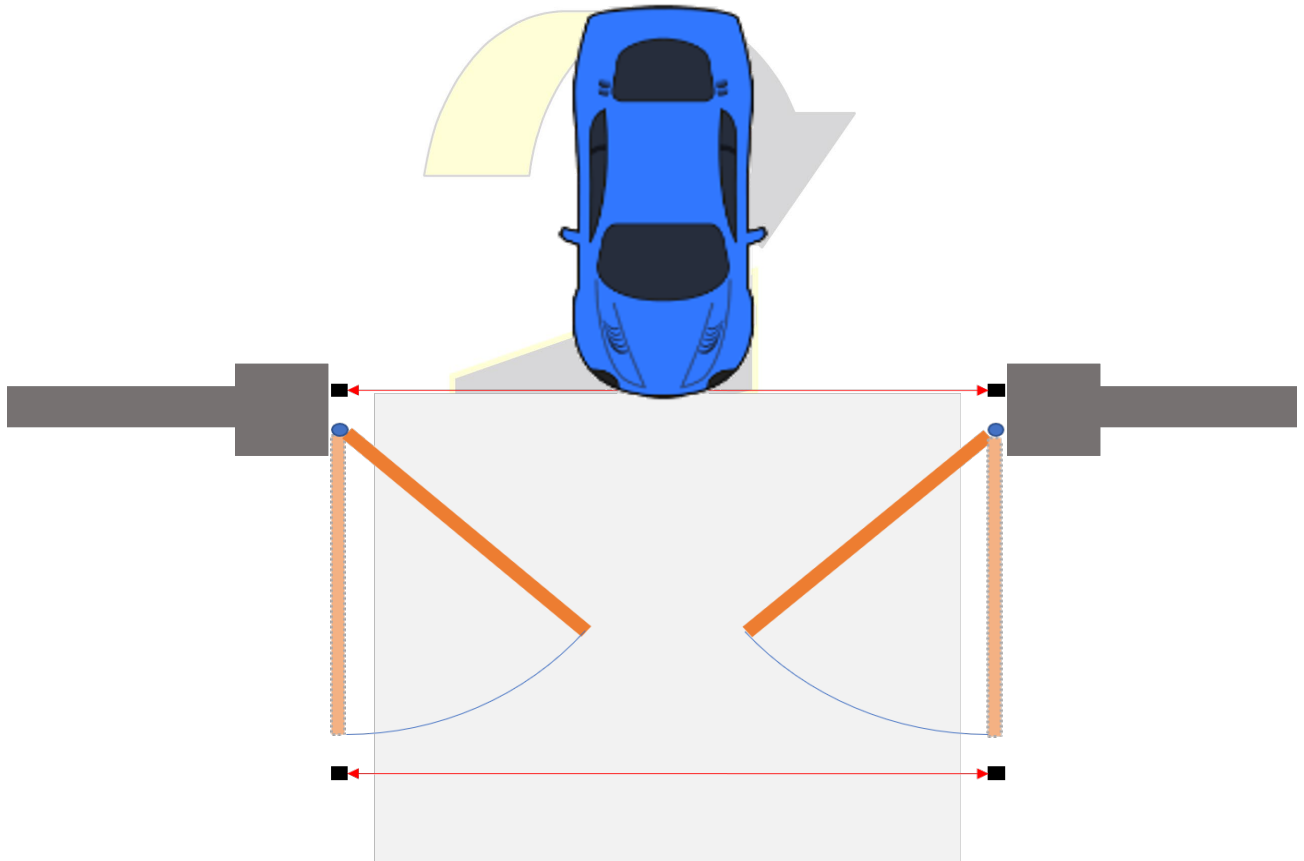
## A Typical Swing Gate Automation Photocell Set Up

With swing gates, a pair of photocells should be placed just outside the gates (assuming they open inward) on opposite sides of the drive and facing each other. A second pair should be placed inside the gates across the driveway but just outside the reach of the fully open gates.

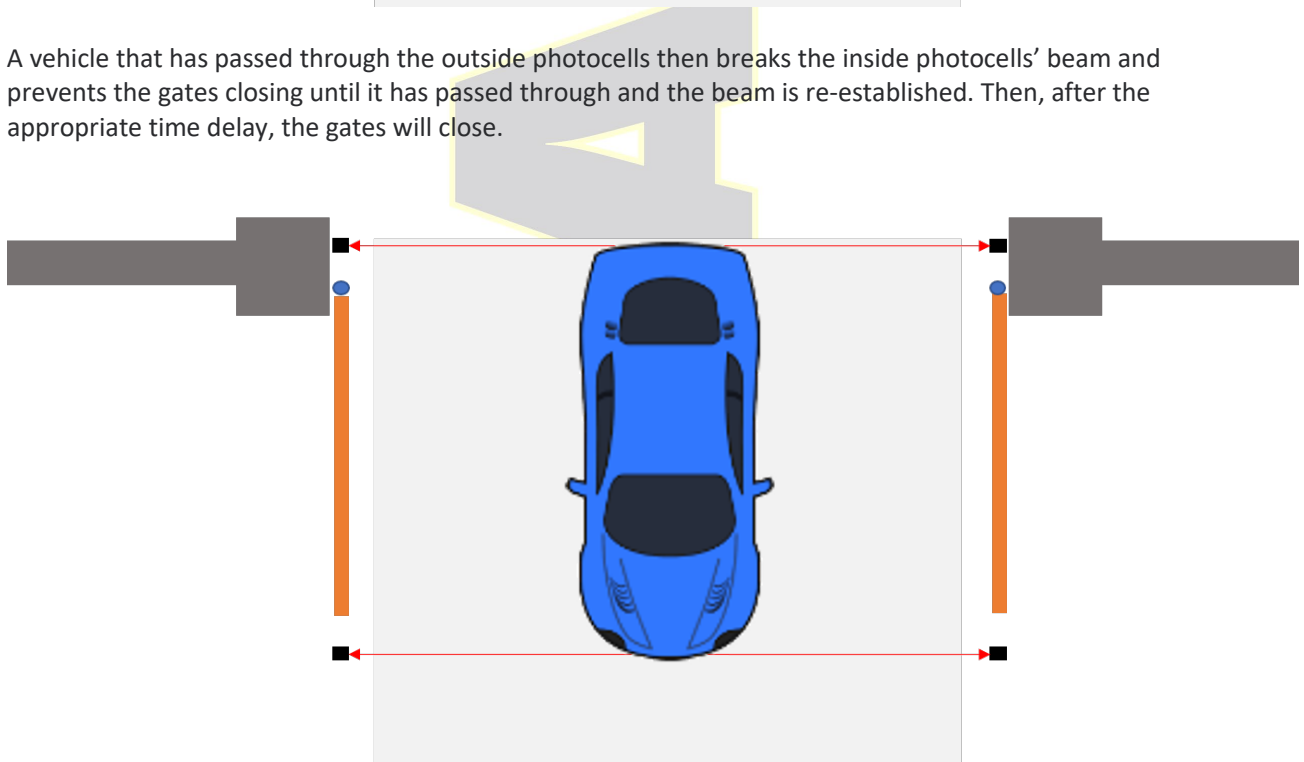


## Arriving at Automatic Swing Gates from the Outside

If gates are closing and a vehicle arrives from the outside, the outside photocell beams is broken, and the gate stops closing and reverses to open the gates and prevent them hitting the vehicle.

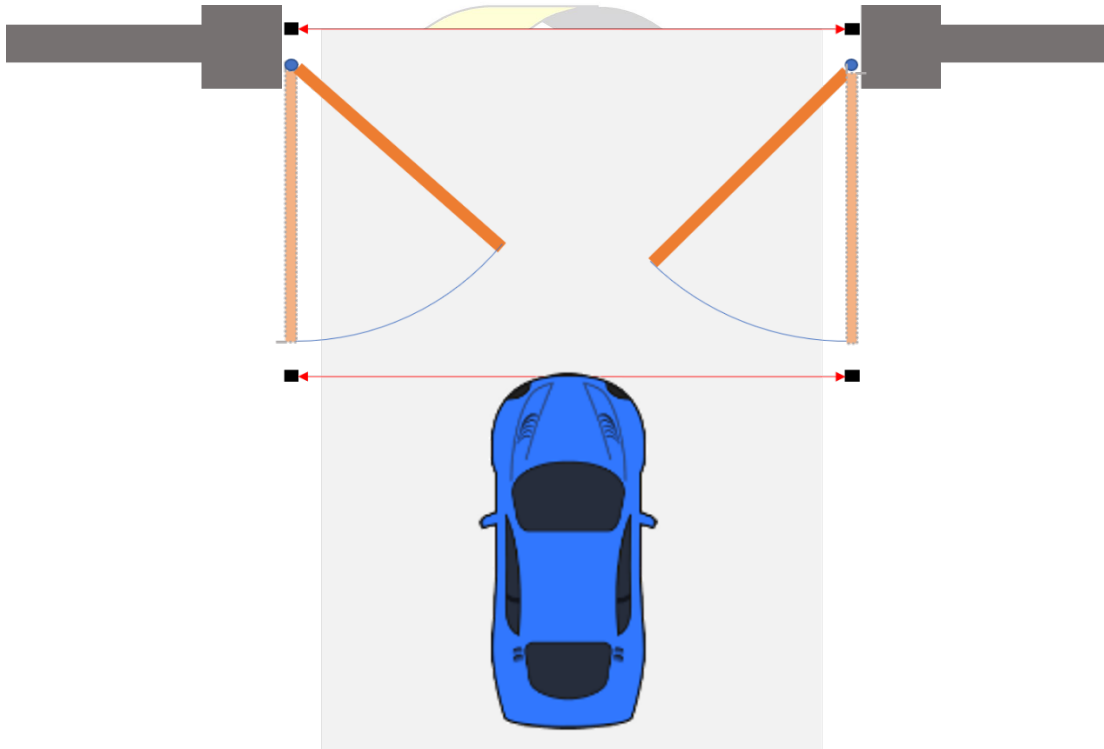


A vehicle that has passed through the outside photocells then breaks the inside photocells' beam and prevents the gates closing until it has passed through and the beam is re-established. Then, after the appropriate time delay, the gates will close.



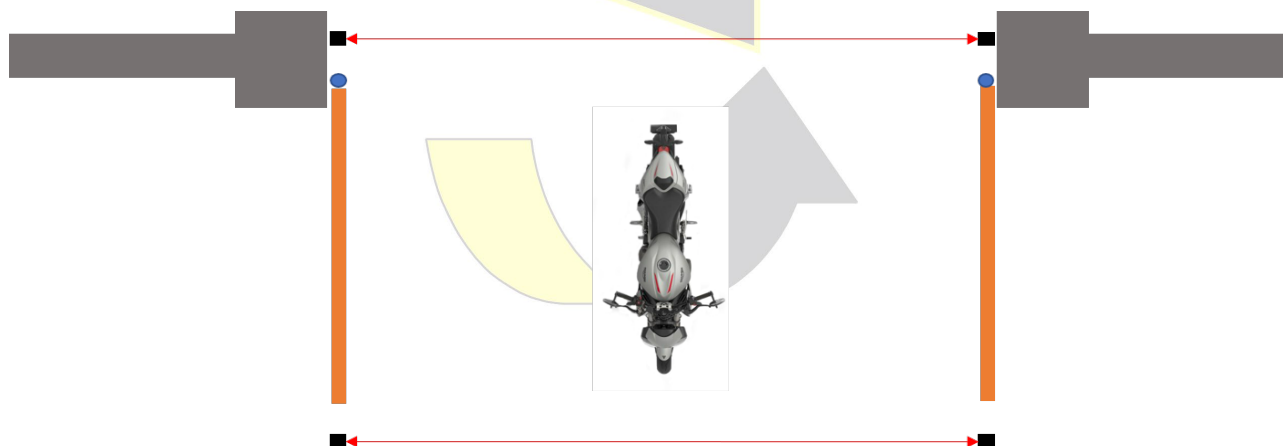
## Arriving at Automated Swing Gates from the Inside

Vehicles approaching open gates from the inside as the gates are closing will break the inside photocell beam and stop the gates closing. They reverse and open fully allowing the vehicle to pass through.



## Smaller Vehicles and Pedestrians

The time delay set to keep gates open after a beam is re-established is important where slow moving smaller vehicles or pedestrians pass through gates. This is because at some point the person or vehicle will not be breaking either the inside or outside beams. Where long gates such as a single 5-bar gate is installed, even a car can be in a position where it is breaking neither beam.



The potential danger this situation creates can be reduced by adding safety edges to the gates. The gates will then stop and reverse if they close on an object between the inside and outside photocell beams. Installing 24V gate motors with obstacle detection will achieve the same result. However, this does involve contact with the gates.

One alternative is to install latching relays which latch the gate open when one set of photocells' beams is interrupted and only release the open latch command when the relay on the second set of photocells is activated by breaking their beam.

Once the vehicle or pedestrian breaks the inside beam, the gates will be kept open until they pass through and the beam is no longer broken.

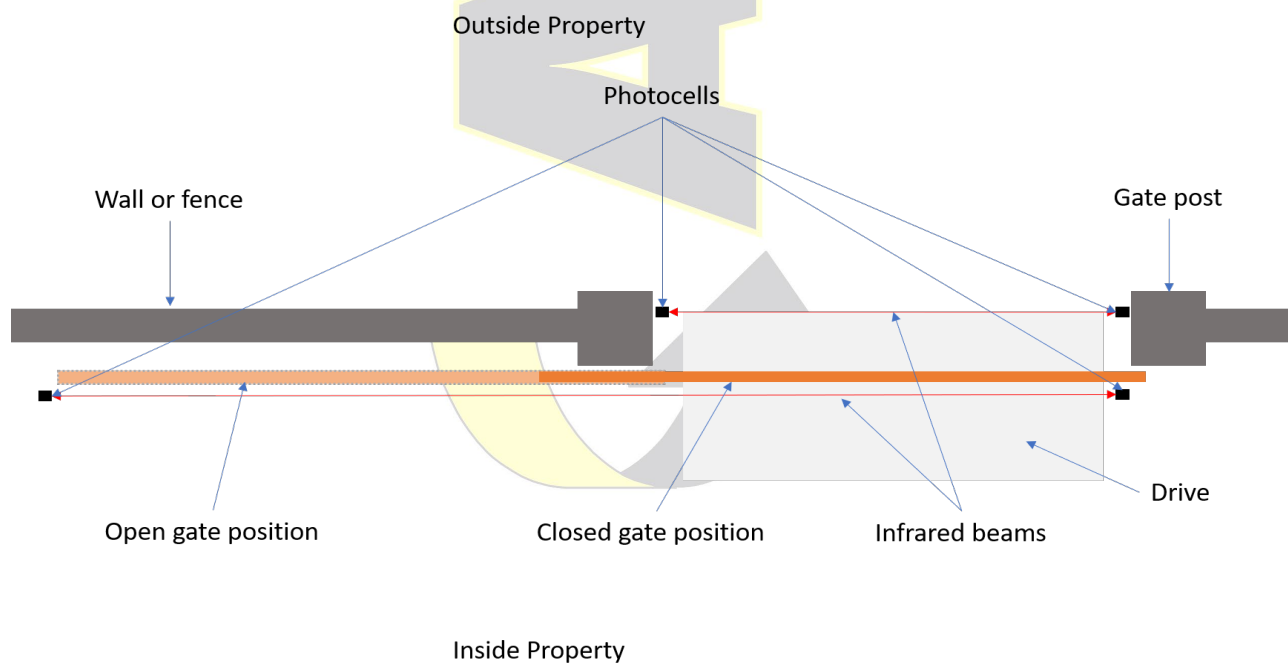
It may be considered obvious that any delay between unbroken photocell beams will cause the gates to close. However, while the homeowners can be educated to this risk, visitors who have no experience with automatic gates will not be aware of the possible dangers and the workings of automatic gates. Consequently, it is always vital to reduce any possible risk with safety equipment or by preventing access to danger areas.

One final solution for removing pedestrian access to possible risk areas in gates designed for vehicle access is facilitated by the installation of a separate pedestrian gate. This can be locked with an electric lock that can be released through the access control system used for the automatic gates, but the gate itself will be manually opened and closed.

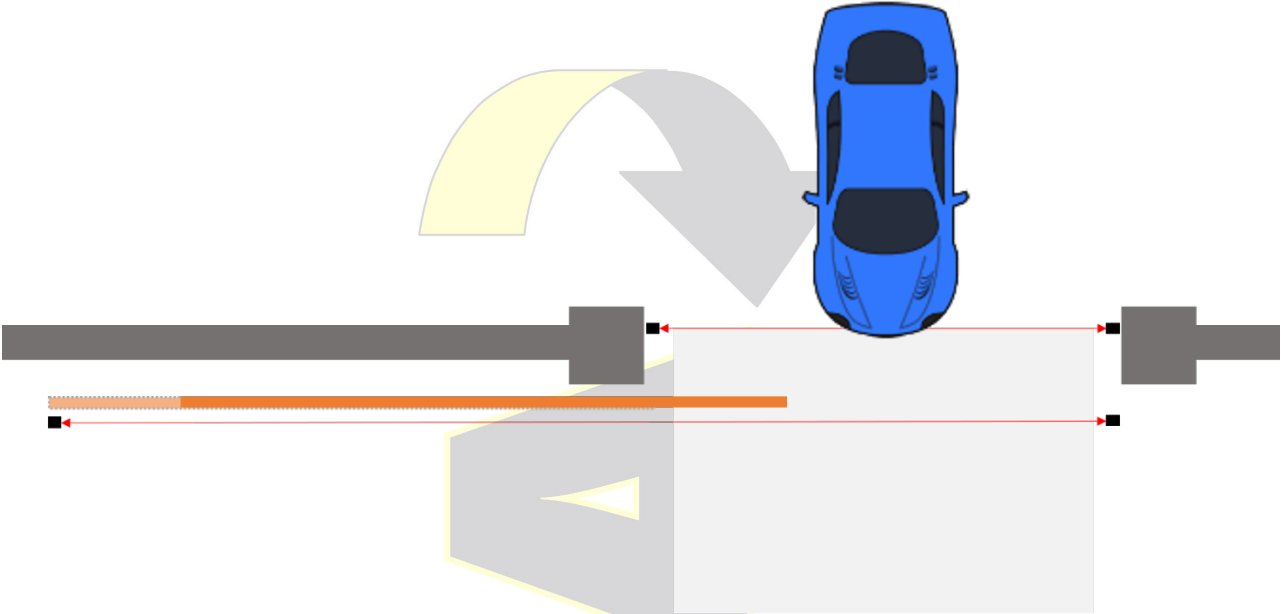
## Sliding Automatic Gates

Automated sliding gates slide along the property boundary when opening. Ideally, photocells should be installed along the full travel path of sliding gate.

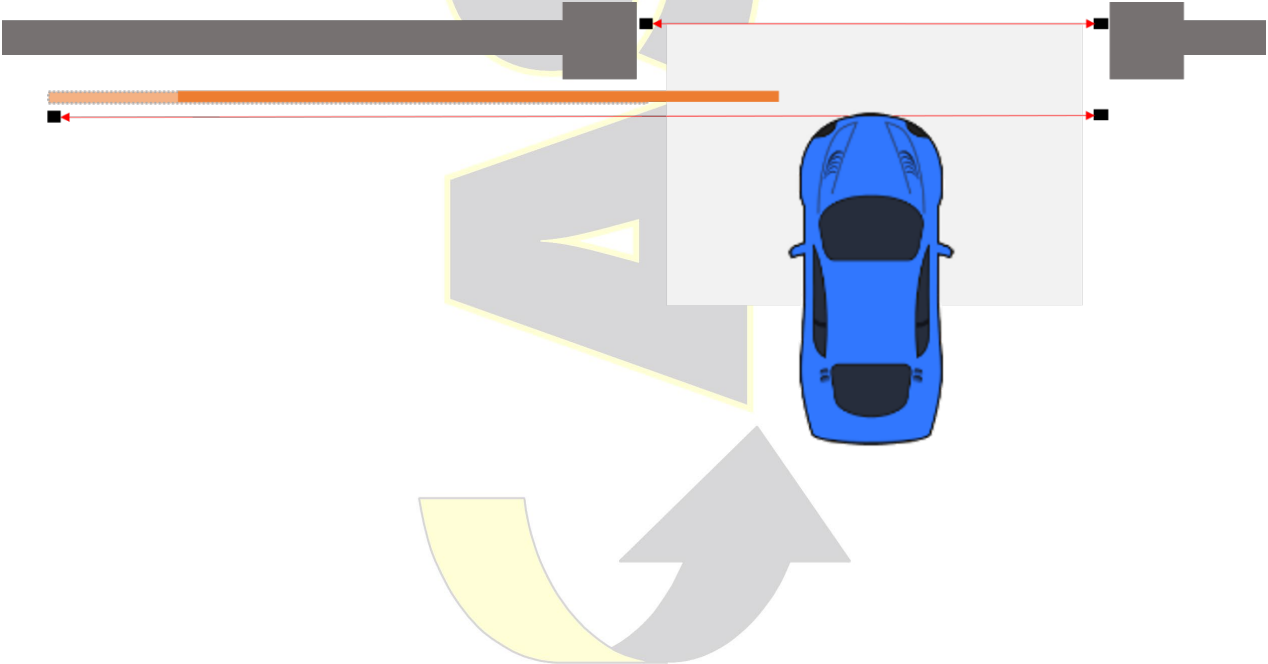
There is a possibility of shearing and trapping injuries where the gate slides against the edges of walls and posts or across open railings. This means that safety photocells on the inside of the gate must accommodate the full travel of the gates to stop the gates moving if it is possible for anyone to enter the danger area.



By installing a pair of photocells just outside the gates, anything that breaks their beam when the gates are closing will stop and open the gates.



The photocells installed inside the gates stop and open closing gates when anything breaks their beam.

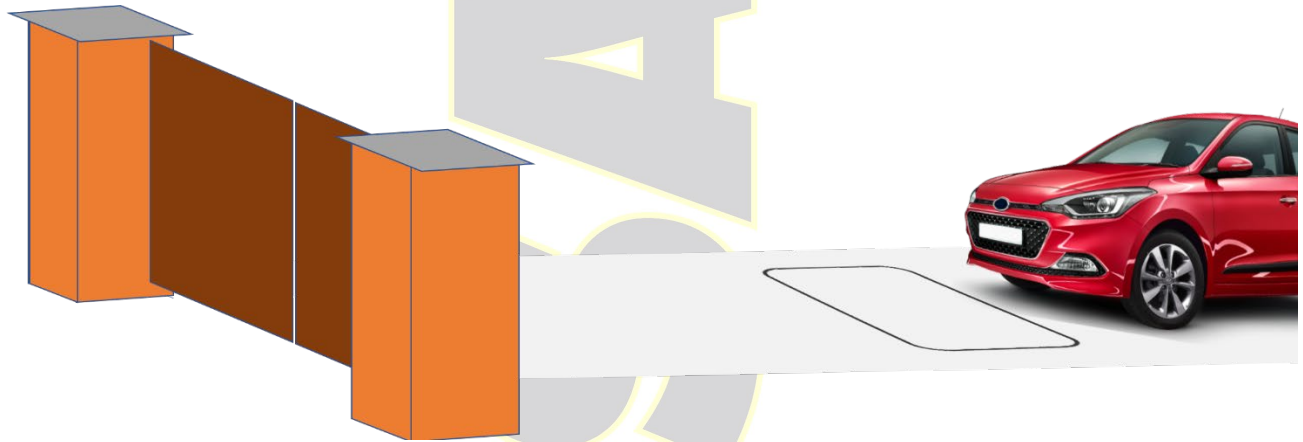


## Can Photocells be used for Egress?

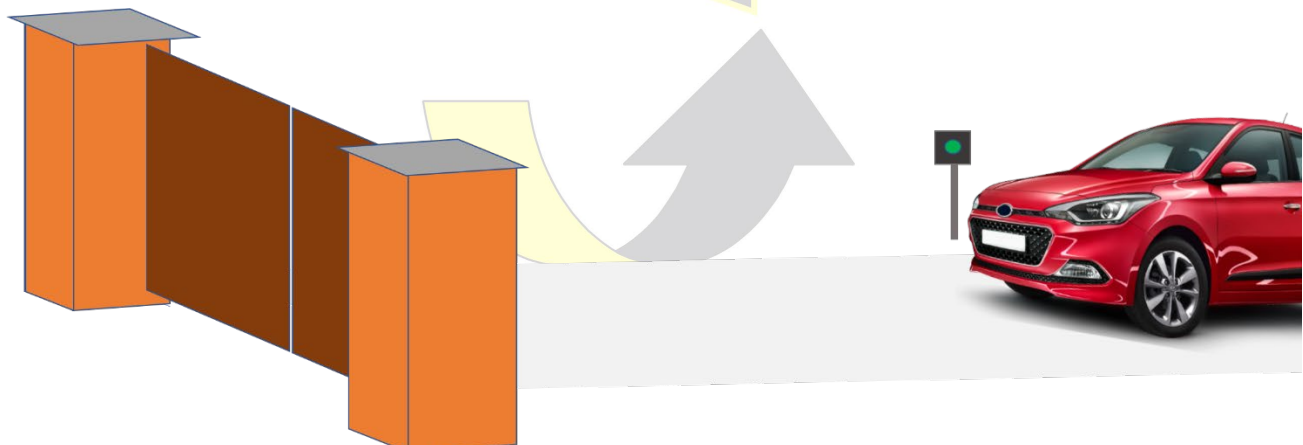
As gates stop closing and open when the beam inside the gates is broken, photocells could be considered as a cheap option for egress control. However, this is not recommended, as it is possible for animals including pets or birds to break the inside beam and cause gates to open at undesirable times. Therefore, safety photocells should be used as just that, safety devices. Their role is to prevent gates from closing onto people or vehicles.

The egress function for anyone wishing to open gates and exit the property should be performed by alternative methods such as loop detectors or push to exit buttons.

A loop detector comprises the detector itself and a loop of special cable. The cable is buried in the driveway and opens the gate via the loop detector when a vehicle passes over the loop. These are highly reliable and long-lived and represent one of the best ways to operate gates automatically from inside the gates. The only real downside is that a channel for the loop has to be cut in the driveway and filled with (usually) bitumen, or the loop is installed in the foundation of a new driveway.



An egress button is placed next to the drive inside the gates (sufficiently far back from swing gates to allow them to fully open) and is simply pushed to open the gates and allow anyone to leave the property. It is essential that egress buttons are not positioned near enough to the gate that it is possible to reach through the gates to operate the push to open button. This is extremely dangerous and there have been significant injury and death caused to people trapped by opening gates they have opened by reaching through the gates to push the release button.



# Different Types of Photocells

<https://www.automaticgatesolutions.com.au/safety.php>

The most common style of photocells is a transmitter and receiver. The first emits the infrared beam and the second detects its presence. Alternatives include photocells that transmit an infrared beam at a mirror 'receiver' that reflects the beam back to the transmitter to also receive the signal. However, these should only be used for egress and not for safety.



## Reflective Photocells vs. Thru Beam Photocells

COMPARE PROS AND CONS TO FIND THE RIGHT DETECTION SOLUTION

In this post, we will be exploring two of the most common types of photocells. These include the reflective photocell and the thru beam photocell.

While both types of photocells utilise an infrared beam to monitor potentially hazardous areas of gate and door installations, there are key configurational and functional differences that should be considered when deciding which one to install in your facilities or spaces.

- A thru beam photocell consists of a two-piece unit with a separate transmitter and receiver. These are mounted opposite each other with the transmitter emitting an infrared beam that is detected by the receiver.
- A reflective photocell combines the transmitter and receiver in one unit. However, a separate reflector (typically a white plastic reflector around 3" in diameter) is also installed with the unit to bounce the infrared beam back to the receiver.

## REFLECTIVE PHOTOCELLS

### Pros

One immediate advantage of a reflective photocell is that it requires running fewer cables. Because this style combines the receiver and transmitter in a single unit, installers don't have to deal with the time and hassle of running cabling to two separate components. This saves time on the installation and keeps the associated cost lower since less material (wiring) is needed. Related, a reflective photocell is also ideal for facilities and spaces with thinner or smaller roadways and entrances. Between these two photocell types, a reflective photocell is generally the less expensive choice. And last but not least, due to the optics used, reflective photocells are less susceptible to interference from the sun.

### Cons

Because a reflective photocell has roughly half the operating range as a thru beam photocell, this style might not work for your facility or space. If you have a particularly wide entryway or roadway, its beam may not be able to accurately detect all obstructions.

## THRU BEAM PHOTOCELLS

### Pros

Thru beam photocells also have a few key installation benefits. The transmitter and receiver, while separate, are easier to align because the angle of the infrared transmitter is much wider. While installers do have to implement two separate devices, reliability will be better due to the stronger beam. Thru beam photocells are also more useful for wider spaces. This particular photocell is also highly recommended for more dynamic and harsh conditions and environments where rain and harsh sunlight are present.

### Cons

Installation will take a bit more time since two units must be implemented. Additionally, wiring will be needed to power both units as well. The cost of a thru beam photocell will also be higher, though the investment in greater performance and reliability proves this photocells value in the long term.



## Positioning Photocells

Photocells are a vital part of gate automation safety and their positioning determines a large part of how safe automatic gates are. In all cases, a safety audit determining the type of gates, their environment, gate use, frequency of operation and user knowledge must be carried out at the design stage. This will determine possible risk areas and the types of potential risk. Safety photocells can then be positioned to cover danger areas. Their primary role is to stop gates continuing to move dangerously when someone or something has entered a risk area and broken an infrared photocell beam.

Once danger areas have been identified and photocells positioned appropriately, the next most important part of photocell installation is their alignment. If the infrared beams emitted and received by a pair of photocells are not received or reflected accurately, the photocells are worthless.

Another important consideration with photocell installation, is their height off the ground. Various posts and columns are available for photocells and many position the photocells at a height of around 600mm. Any lower than this and the beams may pass beneath taller vehicles such as 4x4 vehicles. Any higher and the beams may pass through the windows of low sports cars or completely over the top of convertibles with their tops down.

