

# CARDET-301 Installation Manual



MAGO technology  
2021.08.30 revision

## 1. Introduction

CARDET-301 sensor is a synthetic vehicle detector that is comprised of a magnetic sensor and a digital integral proximity sensor.

CARDET-301 only detects vehicles passing in front of the sensor.

The maximum detection distance between the sensor and a car is **1.8m for a full-sized sedan**. (1.7 m for an economy car)



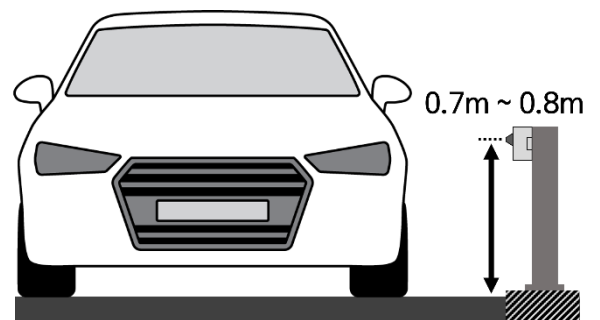
Never touch or move the sensor while it is running.

## 2. Installation

### 2.1 Installation conditions

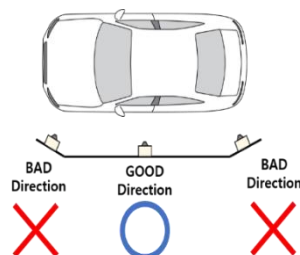
#### Height constraint

CARDET-301 sensor should be fixed on a stable fixture, and the installation height will be good at 70-80cm from the surface of the road.



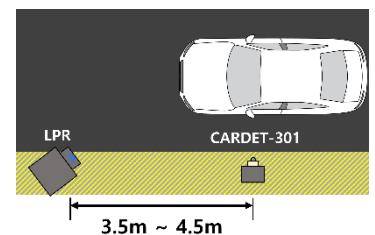
#### Direction

The sensor must face the side of the vehicle at right angles.



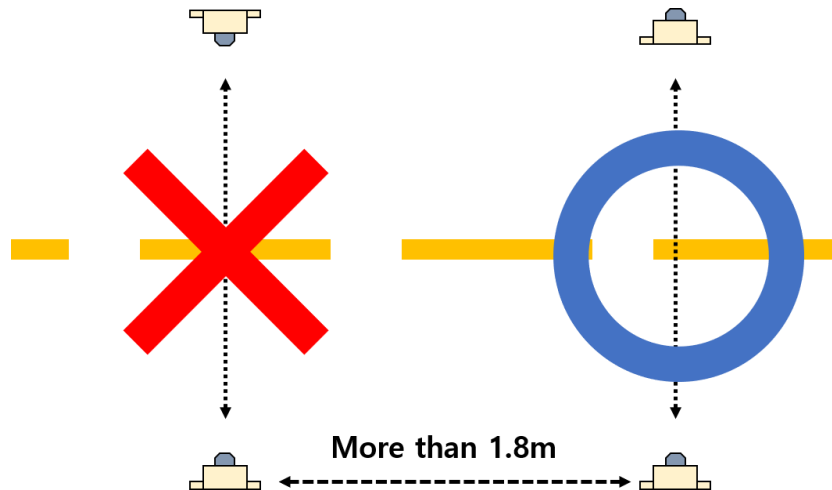
#### LPR Trigger

When using as an LPR trigger, install the sensor 3.5m to 4.5m in front of the LPR.



## 2.2 Caution

- When installing multiple sensors, do not point the sensors at each other.
- Keep a distance of at least 1.8m between the sensors.
- The sensor and controller must be at least 50 cm apart.

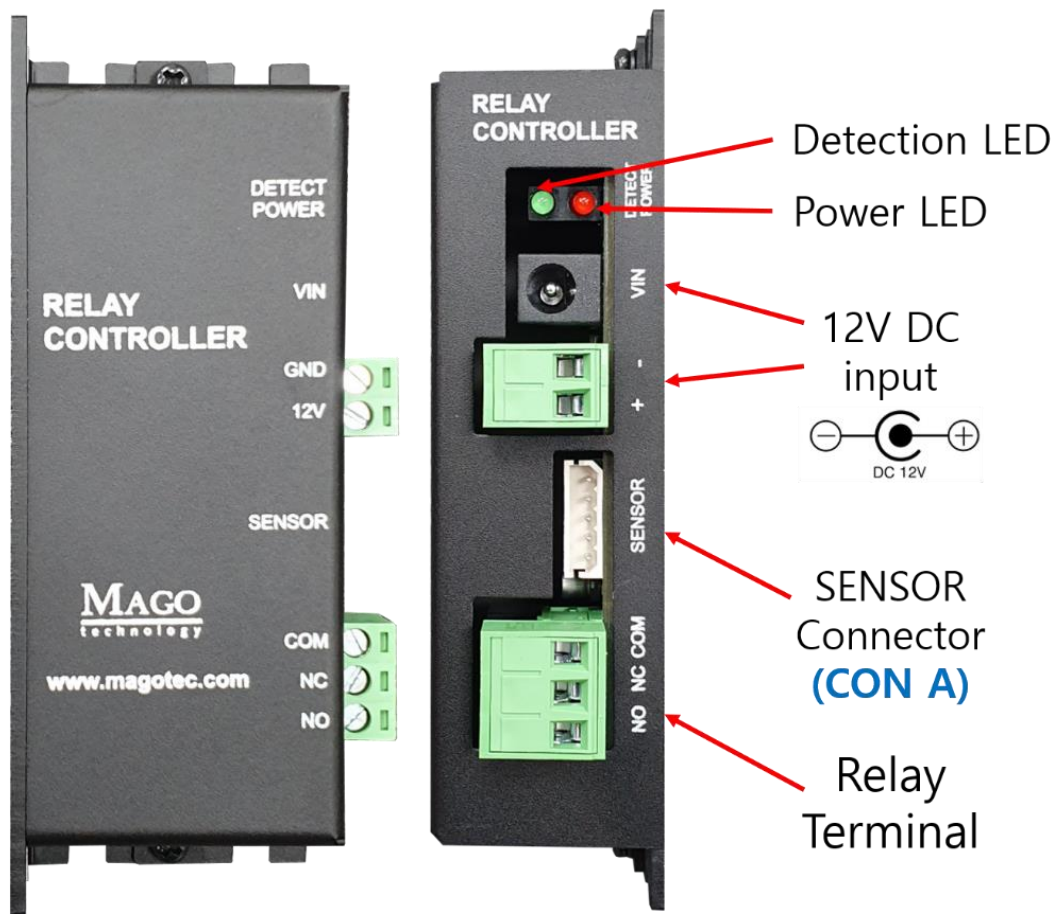


- When mounting the sensor inside the user case, expose the silver protrusion to the outside of the case.
- Drill a hole in the case with a size of at least 24mm.
- Avoid contact between the case and the silver protrusions.



### 3. Sensor Interface

Figure shows the picture of the relay controller for CARDET-301, the controller use **DC 12V** for the power supply, user can use a standard **DC 12V** adaptor (5.5 pi jack).



☑ The max capacity of the **power supply** should be **more than 1A**.

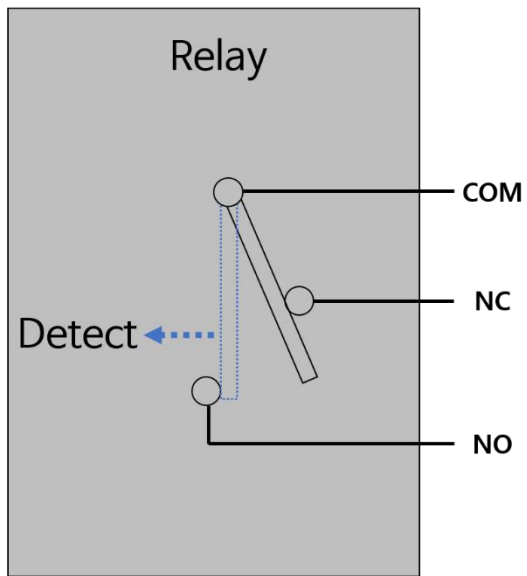
If user wants to extend the cable between the sensor head and the relay controller more than 80m, then user should use an adaptor that has a bigger current capacity. Please check the supply voltage drop inside the sensor head (12V) for the case of the cable extension.

The relay controller has a RELAY that makes it easy to interface it to the user's device. The RELAY has a following maximum electrical capability (table 1). Users can use both of **AC** and **DC** to the RELAY.

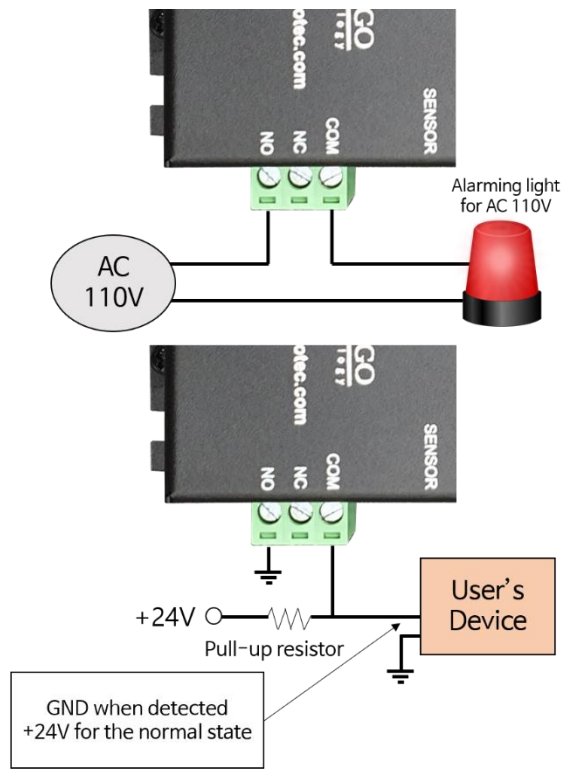
<Table 1 maximum electrical capability of the RELAY on the relay controller >

|    | Max voltage | Max current | Max power |
|----|-------------|-------------|-----------|
| DC | 30V         | 3A          | 90W       |
| AC | 220V        | 2A          | 440W      |

Here are two connection examples of the relay controller, the dry contact (RELAY) will enable you to interface easily CARDET to your system.



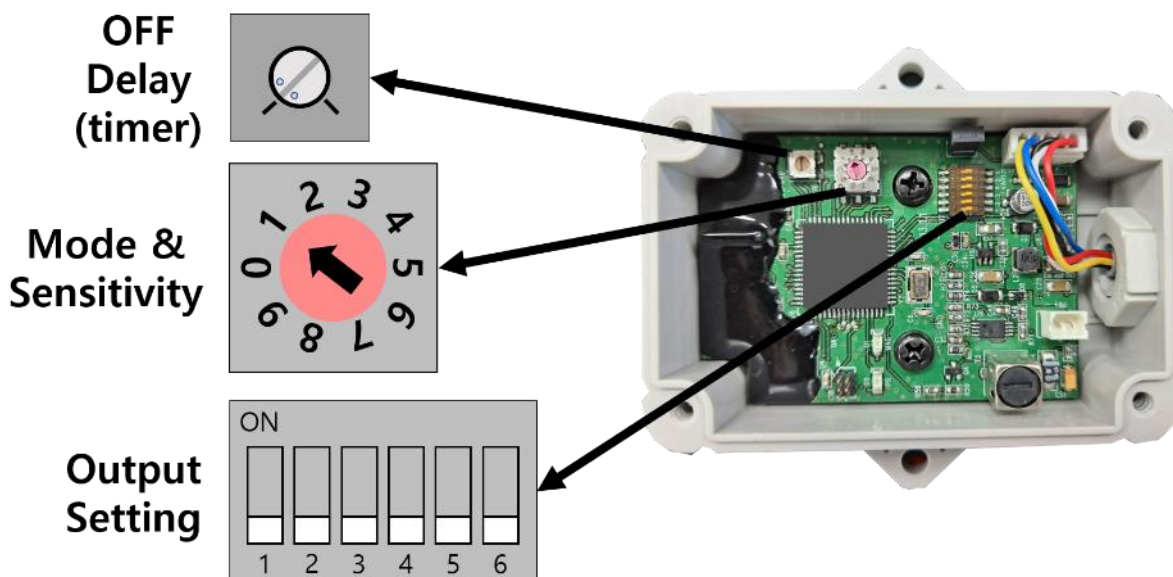
- Relay connection



- Connection examples

## 4. CARDET-301 Sensor output

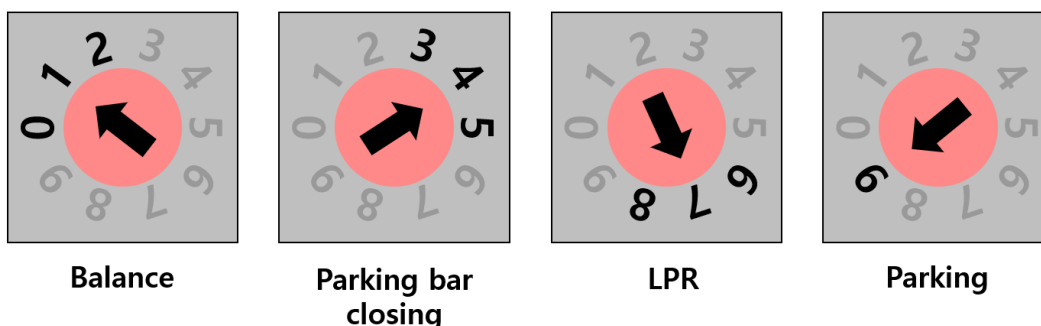
If you open the upper cover of CARDET-301 sensor module, then you can find a DIP S/W and a small volume as following. User can choose the mode of operations among following 4 modes (table 2).



The sensitivity and mode of the sensor can be adjusted by changing the rotary switch setting attached to the sensor. There are 4 modes, **balance / parking bar closing / LPR / parking**. High numbers make the sensor more sensitive. But low numbers make the sensor less sensitive.

<Table 2 Setting of the mode & sensitivity of proximity>

| Mode                | Switch | Setting  | characteristic                                 |
|---------------------|--------|--|--|
| Balance             | 0-2    | <b>Balance mode</b><br>0(less sensitive) – 1(default sensitivity) – 2(more sensitive)        | Can be used in any situation                   |
| Parking bar closing | 3-5    | <b>Parking bar closing</b><br>0(less sensitive) – 1(default sensitivity) – 2(more sensitive) | Optimized for parking bar closing control      |
| LPR                 | 6-8    | <b>LPR mode</b><br>0(less sensitive) – 1(default sensitivity) – 2(more sensitive)            | Turns on about 20% faster                      |
| Parking             | 9      | <b>Parking mode</b>  | Optimized for parking detection, slow response |

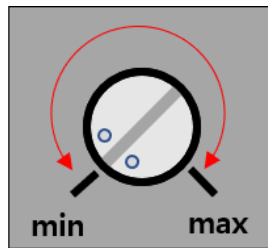


Sensor should be RESET if setting is changed.

<Table 3 Setting of the output mode of CARDET-301 >

| Switch | Set | Operation   |
|--------|-----|---|
| 1      | ON  | proximity and magnetic sensors are both <b>OFF</b> → relay <b>OFF</b>   |
|        | OFF | proximity <b>OFF</b> → relay <b>OFF</b>   |
| 2      | ON  | Automatically <b>OFF</b> after the pre-defined time<br>The width of the pulse can be adjusted by the timer (0.1 ~ 60sec.)       |
|        | OFF | Continuously <b>ON</b> when vehicle is detected<br><b>OFF</b> time delay can be adjusted by the OFF Delay on the PCB (0-10sec.) |
| 3      | ON  | undetected → relay <b>ON</b> , detected → relay <b>OFF</b>  |
|        | OFF | undetected → relay <b>OFF</b> , detected → relay <b>ON</b>  |

You can set the OFF delay or timer of the output signal by adjusting the parts below.  
Adjust by turning clockwise or counterclockwise using a small flat screwdriver.  
Turning it counterclockwise (left) decreases it, and turning it clockwise (right) increases it.



**Sensor should be RESET if setting is changed.**

## 5. Sensor Initialization

When a CARDET-301 is powered on, the sensor executes the automatic calibration to make the magnetic map around it on the spot (approx. 3 sec.), so during the calibration, cars should not pass in front of the sensor.

## 6. Warning

CARDET-301 use Earth magnetic field, so it might make an incorrect operation against severe electromagnet noises, motorcycles, a large size truck, a motor beside the sensor, etc. User should design the whole system will be safe even if the sensor makes a false operation. There is no responsibility for the makers and distributors for safety issues.

## 7. Specification

<Table 4 specification of CARDET-301 sensor head>

| CARDET – 301 Sensor Specification       |      |         |      |        |                     |
|---|------|---------|------|--------|---------------------|
| Characteristics                         | Min. | Typical | Max. | Unit   | Remark              |
| Power supply                            |      | 12      |      | Volt   |                     |
| Current consumption                     |      | 45      |      | mA     | Sensor head only    |
| Operation temp.                         | -20  |         | +85  | Degree |                     |
| Detection distance from the sensor head | 0.1  | 1.3     | 1.8  | m      | 1.8m for a sedan    |
| Cable distance                          |      | 5       | 80   | m      | Case of 1 A (DC12V) |

Please contact to [sales@magotec.com](mailto:sales@magotec.com)

