

# CARDET-501 manual

V 1.0

MAGO Technology

2024.03.04



①	CARDET-501 Head
②	Relay Controller
③	12V 1A Power(optional)

## Sensor Characteristics

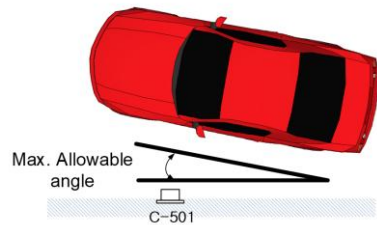
**CARDET-501** sensor is a synthetic smart vehicle detector that is comprised of a **magnetic** sensor and a cutting edge **RADAR** sensor. It was designed to detect the side wall of a vehicle which can replace a conventional loop coil.

## Sensing distance of a C-501

Operation Mode	Detection distance	Sensing method	Feature
LPR mode	0.1 ~ 2.5m	RADAR + Magnetic	Fast detection
Bar control mode	0.1 ~ 2.5m	RADAR + Magnetic	Reliability priority
Long distance mode	0.1 ~ 4.5m	RADAR	Long distance detection

☑ In the long-distance mode, people can also be detected.

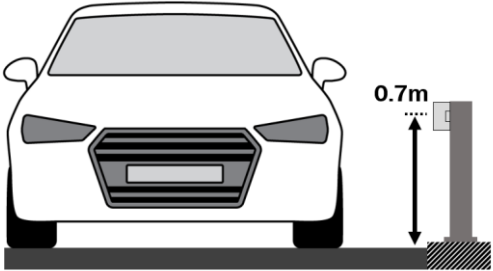
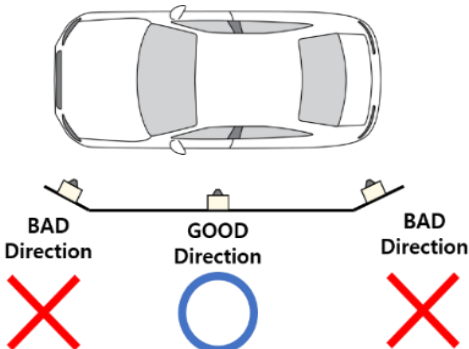

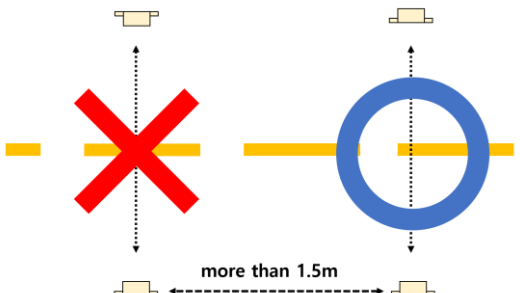
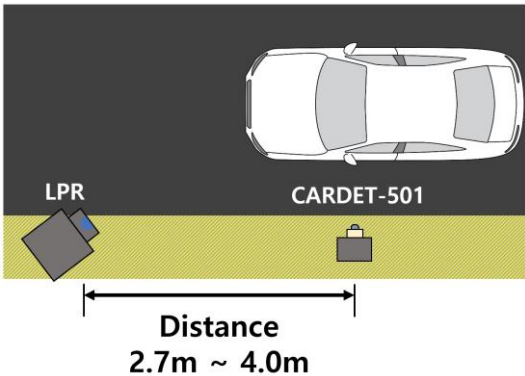
## Allowable detection angle

Operation mode	Allowable detection angle		
	0.1 ~ 2.5m	2.5 ~ 4.5m	
LPR mode	± 25°		
Long distance mode	± 25°	± 10°	



Caution: Never touch or move a working sensor.

# Installation

parameters	Description	
Height	<ul style="list-style-type: none"> <li>✓ The installation height will be good at <b>0.7m</b> from the surface of the road.</li> </ul>	
Direction	 <ul style="list-style-type: none"> <li>✓ The direction of C-501 must be orthogonal with the side wall of vehicle.</li> </ul>	 <ul style="list-style-type: none"> <li>✓ Do not rotate the sensor which makes false detection characteristics.</li> </ul>
Caution	<ul style="list-style-type: none"> <li>✓ Do not install C-501 sensors face to face.</li> <li>✓ Keep the distance between sensors at least 1.5m.</li> <li>✓ Keep the distance between sensor and relay controller at least 0.5m</li> </ul>	
Tigger for a LPR	<ul style="list-style-type: none"> <li>✓ For LPR trigger mode, install the sensor <b>2.7m ~ 4.0m</b> in front the LPR box. (Distance may vary depending on vehicle speed.)</li> </ul>	

# Check before operation

- ✓ After fixing the sensor first, turn on the power with no people or vehicle in front of the sensor, then initialization will proceed for about 1 second.
- ✓ Do not move the sensor while it is in operation. The sensor must be fixed (do not attach it to a revolving door.)
- ✓ Please check the magnetic disturbance such as a big motor or a relay near the sensor.
- ✓ You can test the sensor by a large steel plate (30cm x 30cm or more) in an open space. In this case, **the detection distance can be shortened**, but there is no problem in real vehicles.

## Caution for external case

- ✓ If you want to insert the sensor in user's additional case, then the case should have a wide hole for RADAR sensor in **CARDET-501**(upper 60%).
- ✓ If there is no hole for RADAR sensor, then the sensor does not operate.
- ✓ **Do not rotate** a **CARDET-501**, because the sensor has a horizontal radiation direction.

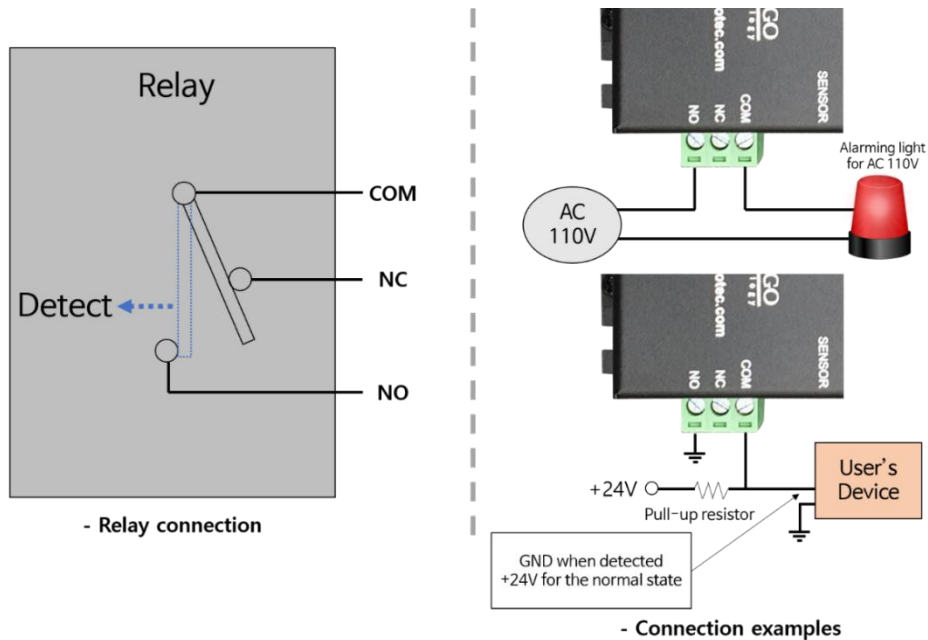


## Connection to a Relay controller

- ✓ 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 (more than 2A). Please check the supply voltage drop inside the sensor head for the case of the cable extension.
- ✓ The relay controller has a **RELAY** (dry contact switch) that makes it easy to interface it to the user's device. The **RELAY** has a following maximum electrical capability (following table). Users can use both of **AC** and **DC** for the RELAY.

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

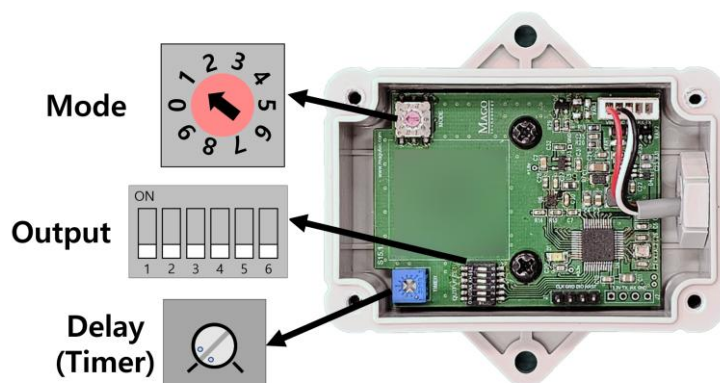
- ✓ Here are two connection examples of the relay controller, the dry contact (RELAY) will enable you to interface easily **CARDET** to your system.



- ✓ Normally (no vehicle) terminals **COM** and **NC** are connected, and if there is a vehicle to detect, then terminal **COM** and **NO** are connected (**COM** and **NC** are separated.)

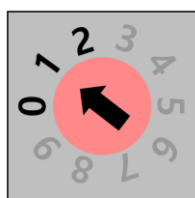
## Change of operation mode

- ✓ If you open the upper cover of **CARDET-501** sensor head, then you can find a rotary and a DIP switches and a small volume as following. User can choose the mode of operations among following 4 modes (table 2).
- ✓ Power must be off when the switches are changed.

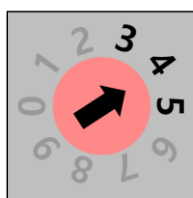


- ✓ User can change the operation mode and sensitivity of the sensor by following instruction.
- ✓ **CARDET-501** has four kind of operation modes ( **LPR / Bar control / Long distance / parking** )
- ✓ Please be careful when adjust the small switch.

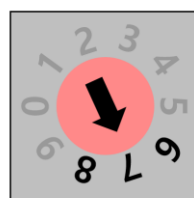
Mode	Number	Operation	Characteristic
LPR	0-2	<b>LPR mode</b> 0(Low) – 1(Medium sensitivity) – 2(High)	Default
Bar Control	3-5	<b>Bar control mode</b> 3(Low) – 4(Medium sensitivity) – 5(High)	Mode for bar-control (Rebound function is ON)
Long distance	6-8	<b>Long Distance mode</b> 6(Low) – 7(Medium sensitivity) – 7(High)	Max. distance: <b>4.5m</b> Magnetic sensor is <b>OFF</b>
Parking	9	<b>Parking mode</b> 9(Medium sensitivity)	Mode for parking (slow detection)



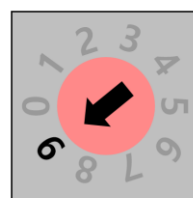
LPR



Parking bar control



Long Distance

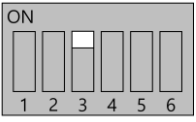
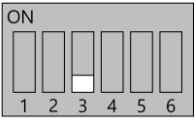
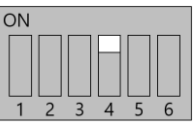

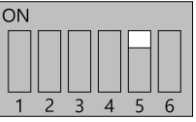
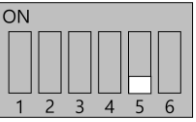


Parking

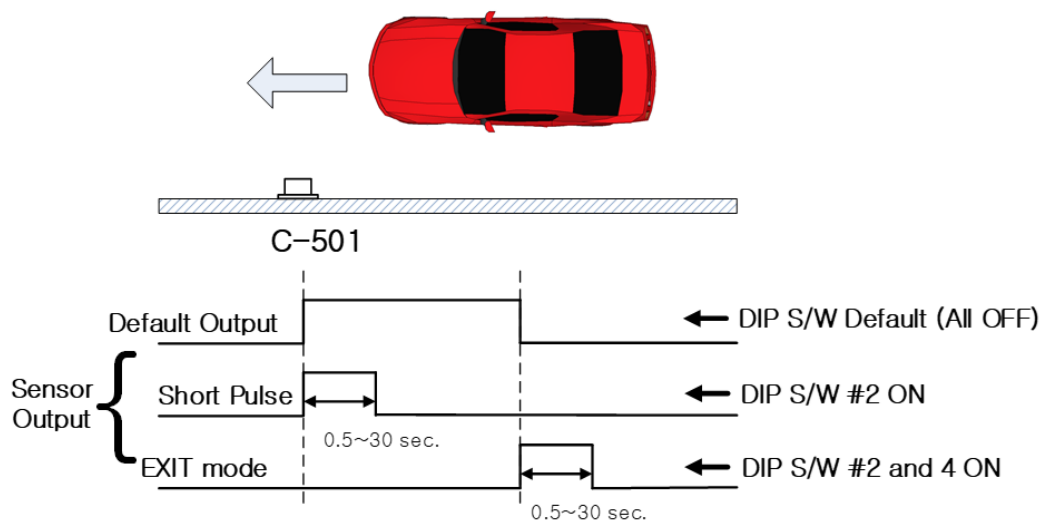
## Output type

Please check the information below and change the settings if necessary.

DIP Num.	Function	setting	Description of sensor output
1	MAGNETIC SENSOR ON/OFF		<b>Magnetic sensor is OFF</b> Magnetic detection distance: Max. 2.5m
			<b>Magnetic sensor is ON</b> (In long distance mode, magnetic sensor is automatically OFF)
2	SHORT PULSE		<b>Output is ON only for a set time when a car is detected</b> Short pulse setting: min. 0.5 ~ max. 30 seconds
			<b>Output is ON continuously while a car is detected.</b> The time delay of OFF can be adjusted (max. 10 sec.)

3	INVERTED OUTPUT		Car detected : <b>OFF</b> , Non-detected: <b>ON</b> (output inversely)
			Car detected : <b>ON</b> , Non-detected: <b>OFF</b> (default)
4	REBOUND/ EXIT		Num. 2 is ON: EXIT mode(it makes a short fixed pulse output)
			Num. 2 is OFF: REBOUND is ON
5	MAGNETICS ENSITIVITY		Magnetic sensitivity is <b>HIGH</b> .
			Magnetic sensitivity is <b>DEFAULT</b> .
6		Reserved	

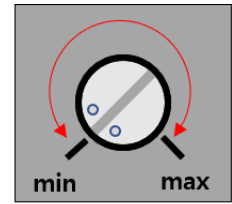
❖ **REBOUND mode:** Even if the sensor is momentarily **turned off**, the sensor output **turns on immediately** when an object is detected (safety function for closing a parking bar)



[Timing diagram of the sensor output]

## Setup for delay or timer

- ✓ You can adjust the OFF delay time 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 Initialization

- ✓ When a **CARDET-501** is powered on, the sensor executes the automatic calibration to make the magnetic map around it on the spot (approx. 1 sec.), so during the calibration, human or car should not be in front of the sensor.

## Specification

Input voltage	12V	
Current consumption	SENSOR HEAD	30mA
	Relay Controller	70mA (Max.)
Operation temp.	-20 ~ 85°	
Time for booting	1 second	
Detection distance	Max. 4.5m(In long distance mode)	
Max cable length	Max. 80m (Power capacity must be more than 2A)	

## Cautions

- ✓ CARDET-501 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.

## Contact

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