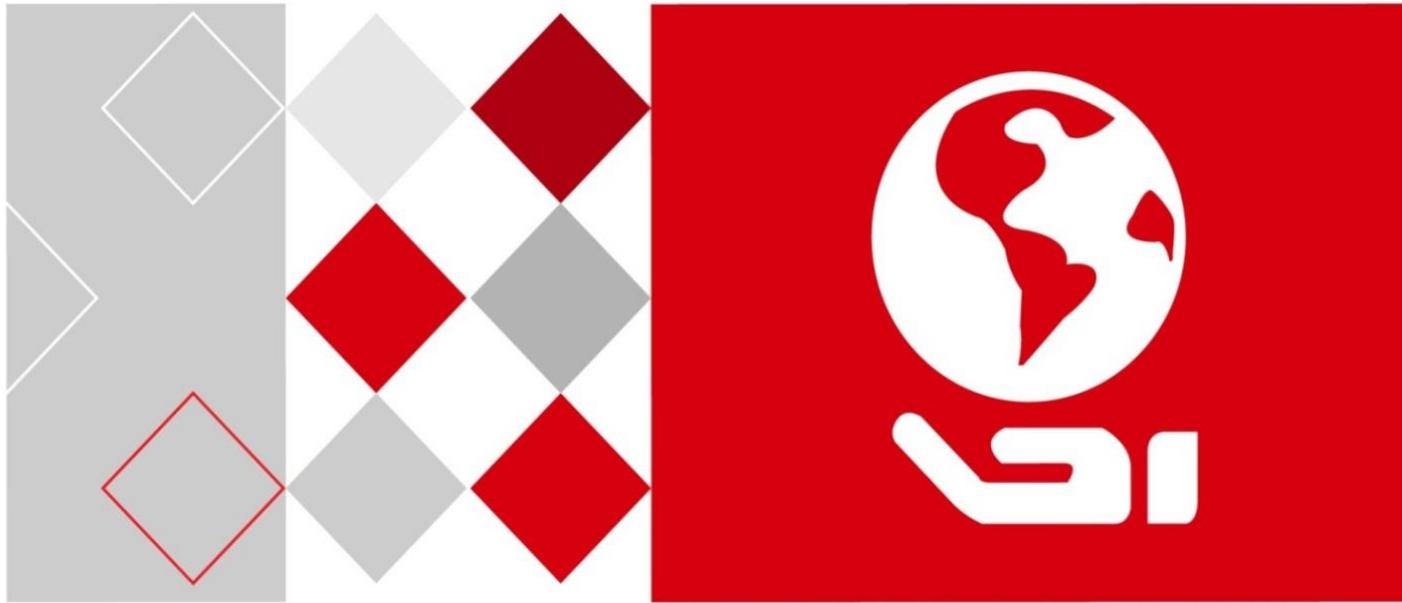


**HIKVISION**



# DS-TMG022 Vehicle Detector

User Manual

UD06901B

## **User Manual**

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### **About this Manual**

This Manual is applicable to DS-TMG022 Vehicle Detector.

The Manual includes instructions for using and managing the product. Pictures, charts, images and all other information hereinafter are for description and explanation only. The information contained in the Manual is subject to change, without notice, due to firmware updates or other reasons. Please find the latest version in the company website (<http://overseas.hikvision.com/en/>).

Please use this user manual under the guidance of professionals.

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## Regulatory Information

### FCC Information

Please take attention that changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

**FCC compliance:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

### FCC Conditions

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

### EU Conformity Statement



This product and - if applicable - the supplied accessories too are marked with "CE" and comply therefore with the applicable harmonized European standards listed under the EMC Directive 2014/30/EU, the LVD Directive 2014/35/EU, the RoHS Directive 2011/65/EU.



2012/19/EU (WEEE directive): Products marked with this symbol cannot be disposed of as unsorted municipal waste in the European Union. For proper recycling, return this product to your local supplier upon the purchase of equivalent new equipment, or dispose of it at designated collection points. For more information see: [www.recyclethis.info](http://www.recyclethis.info)



2006/66/EC (battery directive): This product contains a battery that cannot be disposed of as unsorted municipal waste in the European Union. See the product documentation for specific battery information. The battery is marked with this symbol, which may include lettering to indicate cadmium (Cd), lead (Pb), or mercury (Hg). For proper recycling, return the battery to your supplier or to a designated collection point. For more information see: [www.recyclethis.info](http://www.recyclethis.info)

### Industry Canada ICES-003 Compliance

This device meets the CAN ICES-3 (A)/NMB-3(A) standards requirements.

## Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
 <b>NOTE</b>	Provides additional information to emphasize or supplement important points of the main text.
 <b>WARNING</b>	Indicates a potentially hazardous situation, which if not avoided, could result in equipment damage, data loss, performance degradation, or unexpected results.
 <b>DANGER</b>	Indicates a hazard with a high level of risk, which if not avoided, will result in death or serious injury.

## Safety Instructions

- Proper configuration of all passwords and other security settings is the responsibility of the installer and/or end-user.
- In the use of the product, you must be in strict compliance with the electrical safety regulations of the nation and region. Please refer to technical specifications for detailed information.
- Input voltage should meet both the SELV (Safety Extra Low Voltage) and the Limited Power Source according to the IEC60950-1 standard. Please refer to technical specifications for detailed information.
- Do not connect several devices to one power adapter as adapter overload may cause over-heating or a fire hazard.
- Please make sure that the plug is firmly connected to the power socket.
- If smoke, odor or noise rise from the device, turn off the power at once and unplug the power cable, and then please contact the service center.

## Preventive and Cautionary Tips

Before connecting and operating your device, please be advised of the following tips:

- Ensure unit is installed in a well-ventilated, dust-free environment.
- Unit is designed for indoor use only.
- Keep all liquids away from the device.
- Ensure environmental conditions meet factory specifications.
- Ensure unit is properly secured to a rack or shelf. Major shocks or jolts to the unit as a result of dropping it may cause damage to the sensitive electronics within the unit.

- Use the device in conjunction with an UPS if possible.
- Power down the unit before connecting and disconnecting accessories and peripherals.
- A factory recommended HDD should be used for this device.
- Improper use or replacement of the battery may result in hazard of explosion. Replace with the same or equivalent type only. Dispose of used batteries according to the instructions provided by the battery manufacturer.
- Ensure to use the attached power adaptor only and not to change the adaptor randomly.

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# Chapter 1 Introduction

## 1.1 Product Overview

DS-TMG022 loop vehicle detector is a dual-channel stand-alone vehicle detection device. Applying high-performance microprocessor, high-stability oscillating circuits, multi-channel cycle scanning technology, and highly stable vehicle detection algorithm, the device can detect passing vehicles in a fast, efficient, and precise way, with a normal vehicle capture rate of over 99%.

## 1.2 Specifications

Table 1-1 DS-TMG022 Specifications

Name	Parameters
Power Supply	DS-TMG022(110V): 88 to 132 VAC, 50 to 60 Hz DS-TMG022(220V): 176 to 264 VAC, 50 to 60 Hz
Power Consumption	≤ 3 W
Working Temperature	-30 °C to +70 °C (-22 °F to +158 °F)
Working Humidity	< 90%, no condensation
Vehicle Detection Rate	≥ 99%
Fastest Response Time	3.5 ms
Loop Working Frequency	25 to 100 KHz, 4 levels (high, medium high, medium low, and low)
Sensitivity ( $-\Delta L/L$ )	0.02% to 0.16%, 4 levels adjustable
Inductance Self Tuning Range	20 to 1000 uH, recommended inductance value: 100 to 300 uH
Self Recovery after Loop Failure	The detector can resume detecting automatically after loop failures are removed.
Output Port	2-ch relay output

## Chapter 2 Loop Installations

### 2.1 Loop Layout Principles

- Avoid damaged pavement and concrete pavement joints for layout.
- There must be no large amounts of metals within 50 cm, such as manhole covers and gully cover plates.
- There must be no power supply circuit of over 220V within one meter. At the layout location, the AC voltage generated by the disturbing loops of interference source should be no more than 2mv. The measurement method is to lay a prepared loop on the layout pavement first, and then use a multi-meter to directly measure the voltage between the two terminals of the loop by millivolt gear, without access to the device. If the voltage is within 2mv, there is no interference; if the voltage is over 2mv, the interference increases with the voltage and it may easily causes problems such as empty capture and random flashes.
- The loop coil is usually winded by 5 turns. If the annular loop is placed over the rebar of the reinforced concrete, it should be at least 5 cm above the rebar and the number of turns should be increased by 1-2.

### 2.2 Loop Specifications

1. For projects focusing on small vehicle detections, the cut width of the anti-smash loop coil slot should be 1m. For projects focusing on large vehicle detections, the cut width of the anti-smash loop coil slot should be 1.5m. The four edges of the rectangular slot need to be cut, so as to prevent sharp corners from damaging the loop cables. The cut chamfer should be 15 × 15 cm, as shown in Figure 2-1.

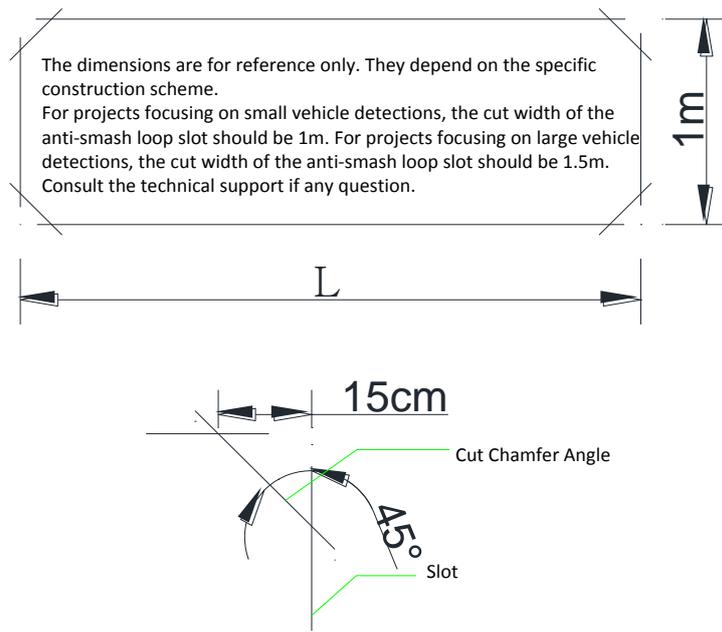


Figure 2-1 Slot Cutting Detail Drawing

2. The loop coil slot should be 4-8 mm wide and 50-80 mm deep, as shown in Figure 2-2. After the loop coil slot is cut, lay fine sands in the slot first and then wind the loop coil. Spread another layer of fine sands over the loop next and pour asphalt or epoxy resin to fill the slot at last.

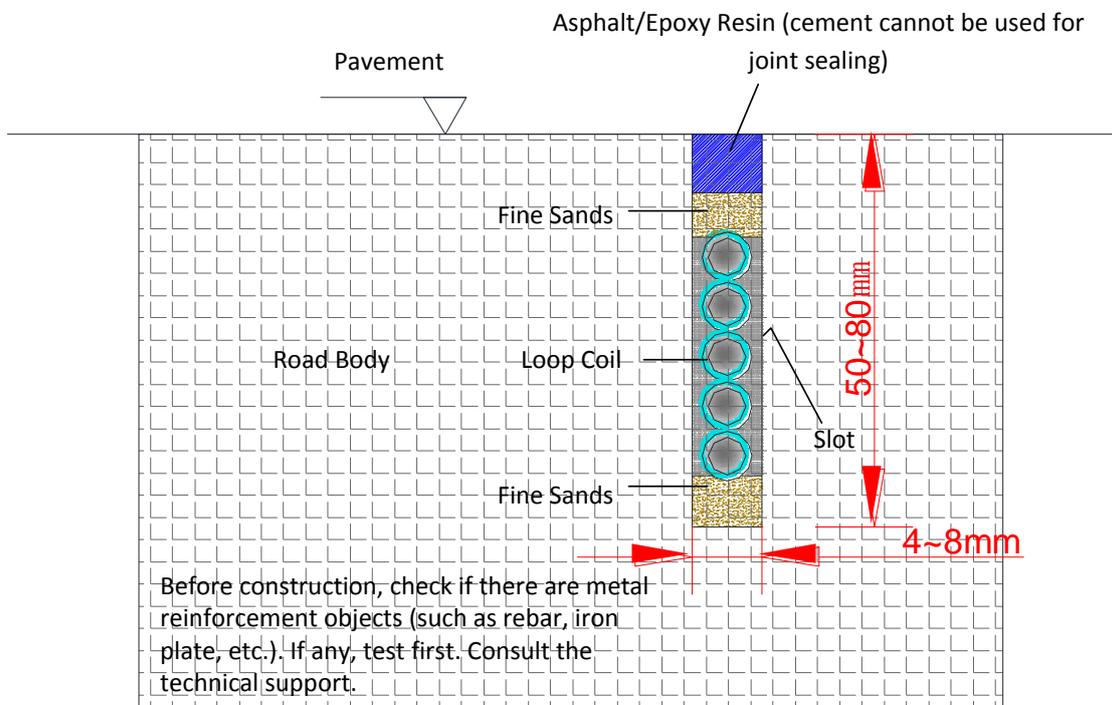


Figure 2-2 Sectional View of Loop Construction

3. The total cross sectional area of the stranded wire should be approximately 1.5 mm<sup>2</sup> (like 7-core copper wire). The stranded wire needs to be covered by polypropylene or cross-linked polyethylene as insulating layer, of which the average thickness is approximately 0.8-1.0 mm. The external diameter of cable should be no more than 4 mm and its performance should meet the requirements of ultra-low voltage (32 VA below) cable. A variety of loops have been used in practical projects, and the heat-resistant FVN49/0.26 loop coil is needed.
4. The loop leads should be twisted clockwise by over 20 turns per meter and then put into the lead slot and embedded pipe.

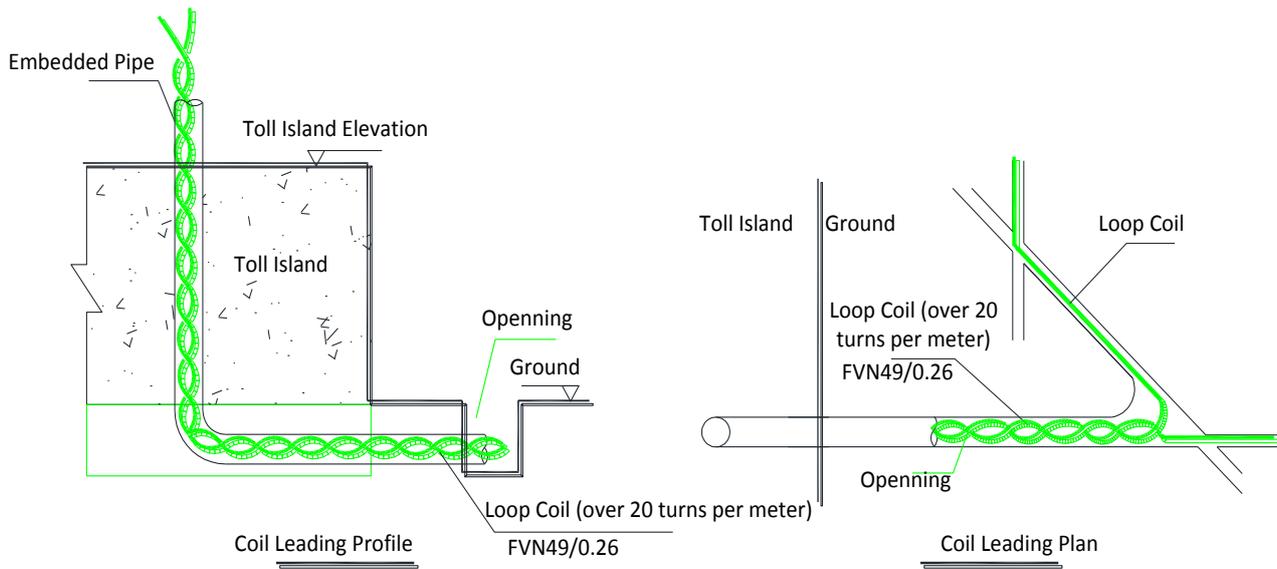


Figure 2-3 Coil Leading Sketch

5. Pour molten hard asphalt or epoxy resin into the loop coil slot and the lead slot installed with inductive loops.

## Chapter 3 Operations

### 3.1 LED Indicators Status Introduction

The vehicle detector's working status can be learned from the LED indicators on its panel.

- After the device is powered on, all indicators except RUN will keep constant on for 2s, indicating that the device is powered on.
- In normal operating condition, red CH1/CH2 indicator indicates that the channel is not connected to the inductive loops or there exists certain fault. While green means that a vehicle is detected within the loop scope of the channel.

### 3.2 Resetting Notes

The resetting button on the panel of vehicle detector won't be effective until being pressed for 3s. Otherwise, it will be taken as a jitter or touch by mistake.

### 3.3 Enabling Logic Function

**Connection:** The loop A away from the barrier is connected to loop 1 and the loop B near the barrier is connected to loop 2.

**Dialing case 1:** When loop A is used as trigger loop, switch S1 to ON and S2 to OFF.

**Dialing case 2:** When loop B is used as trigger loop, switch S1 to OFF and S2 to ON.

See the table below.

Table 3-1 Logic Function

	S1	S2
Logic 1: Vehicle arrives at loop A and no vehicle at loop B.	ON	OFF
Logic 2: Vehicle arrives at loop B and no vehicle at loop A.	OFF	ON

### 3.4 Frequency Stagger

The corresponding dial number is FREQS1/S2. The dial modes of any two adjacent vehicle detectors should be set differently, so as to avoid interferences caused by same frequency.



**NOTE**

Reboot the vehicle detector for all dialing practices mentioned above to take effect.

## Chapter 4 FAQ

This chapter lists common fault phenomenon and the treatments during operations of the vehicle detector.

- The detector keeps triggering signal after the vehicle has passed the loop.

**Fault phenomenon:** The CH1\CH2 indicator is constant green.

**Treatment:** Powering off or resetting the vehicle detector can resume working state temporarily. To solve the problem, degrade the detector's sensitivity level to medium high or medium low, depending on the effects. Check if the loops are twisted and twist them if not. Check if the vehicle detector is grounded and ground it if not.

- The detector is often triggered when no vehicle passes.

**Fault phenomenon:** The CH1\CH2 indicator turns green or flashes green madly when there is no vehicle passing.

**Treatment:** Set the detector's sensitivity level to medium high or medium low, depending on the effects. Check if the loops are twisted and twist them if not. Check if the vehicle detector is grounded and ground it if not.

- The detector fails to detect vehicle passing.

**Fault phenomenon:** The CH1\CH2 indicator doesn't light when a vehicle passes, or won't be triggered until the vehicle passes the loops.

**Treatment:** Set the detector's sensitivity level to medium high. Check if the loops are twisted and twist them if not. Check if the vehicle detector is grounded and ground it if not. In addition, check if the vehicle types and cut width of the loops is appropriate in that scene, and reflect the problem in time if not.

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