

Over Height Vehicle Detection System

Installation, Operation and Maintenance Manual



Model ME-IR/330

Metro Economy

SEPTEMBER 2020

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Doc: trigg-ohvds-manual-metro-economy
 Original Issue – November 2007
 Revised – September 2008
 Revised – July 2014
 Revised – January 2016
 Revised – September 2020



FOREWORD

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SYSTEM OVERVIEW

The Model ME-IR/330 is designed for off highway, lower speed over height object detection applications with medium range (up to 200 feet maximum between source and detector) but Trigg Industries (TI) suggests that in order to ensure reliable operation, the distance between Source and Detector be limited to 125 feet.

This system is designed to detect an object that breaks a pulsed beam of Infrared energy which energizes a relay in the Detector eye. In turn, an Alarm Timer relay (.1 to 120 minutes, user adjustable) is energized. The Alarm Timer relay has two sets of Form C, double pole double throw, dry contacts, rated at 10A, 240VAC. One set of contacts sends 120VAC to an alternating flasher and from the flasher 120 VAC is connected to a terminal strip to connect externally to two LED style traffic head devices. This same contact also sends 120VAC to another terminal strip to activate a Blank-Out Sign, Bell or Siren. The other set of Alarm Timer contacts are isolated and is connected to another terminal strip. Other devices that are activated by an isolated relay contact closure, such as a PLC, TI VMS Ground Controller or TI RF Link can be connected to this isolated terminal strip.

Figure 1, WIRING DIAGRAM, shows in simplified form the operation of the system. In normal operation, the Source eye generates a pulsed Infrared beam that is detected by the Detector eye and since the Detector is utilized in the “dark operate” mode, the alarm relay is not energized. Once the beam is broken, the system operates as described above.

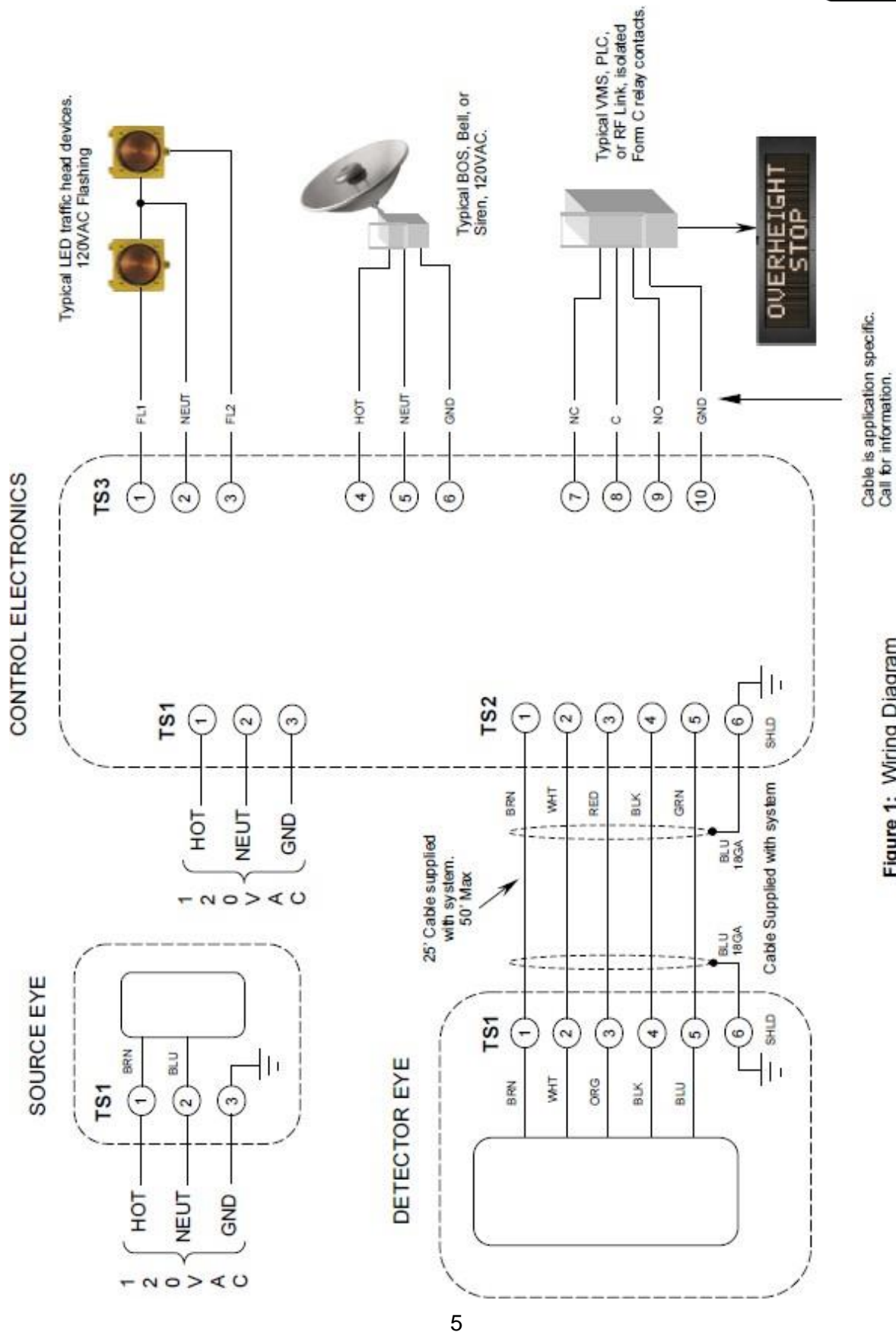


Figure 1: Wiring Diagram

INSTALLATION

MECHANICAL

1. Ensure the poles or mounting assemblies are near vertical.
2. Place the Source Assembly and the Detector Assembly brackets (distinguished by ID labels located at the back of each assembly) on their respective mounting fixtures such that the center of each eye is 1/4 inch below the desired detection height. Detection height will be confirmed following alignment.
3. Slightly loosen the bolts of the two-axis mount securing the eye to the bracket.
4. "Sight" along the top of the Source and Detector eyes to ensure that each eye is "looking" at the opposite assembly. Adjust as necessary in the horizontal and vertical planes. Final optical alignment will be accomplished later.
5. Mount the Control Electronics Housing within 25 feet of the Detector Assembly so that the cable from the Detector Assembly can reach the housing.

ELECTRICAL



CAUTION

Exercise caution when making connections to terminal strips with a common screwdriver. Blades more than ¼ inch width may damage the control panel terminal strips. Verify system power variation **before** connecting power. (230VAC and 24VDC dependent upon power variation)

1. Refer to Figure 1, Suggested Wiring for the following steps.
2. Connect 120 VAC (230VAC and 24VDC dependent upon power variation) to the Source eye per Figure 1. Suggested Wiring, at the Euro terminal strip. The Amber LED in the Source eye should be on.

NOTE

When connecting the 5 conductor, shielded cable that runs from the Detector Junction Box to the Control Electronics, strip the ends twice the length needed, twist the bare wire and fold in back on itself. This effectively doubles the diameter of the bare wire and ensures a good connection at the Euro style terminal strips.

3. Connect the 5 conductor, shielded cable to the Euro style terminal strip at the Detector Junction Box per Figure 1.
4. Connect the Detector cable to the Control Electronics Detector Euro style terminal block (TS2) per Figure 1.

- Loosen, but do not remove, the four Phillips head screws securing the Detector eye hood and tilt the hood back so that the top of the Detector eye can be observed.

SUGGESTED WIRING

Table 1 Suggested Wiring Junction Boxes

| SOURCE EYE JUNCTION BOX | | |
|---------------------------|-----|--------------------------------|
| Wire | TS1 | Signal |
| Brown wire in eye cable | 1 | 120VAC HOT |
| Blue wire in eye cable | 2 | 120VAC NEUT |
| Green wire in box | 3 | GROUND |
| DETECTOR EYE JUNCTION BOX | | |
| Wire | TS1 | Signal |
| Brown | 1 | 120VAC when power switch is ON |
| White | 2 | NC relay contact, not used |
| Red | 3 | C relay contact |
| Black | 4 | NO relay contact |
| Green | 5 | AC NEUT |
| Blue, 18 GA | 6 | GROUND |

Table 2 Suggested Wiring Control Electronics

| CONTROL ELECTRONICS – 120VAC POWER | | |
|------------------------------------|-----|--------------------------------|
| External Source | TS1 | Internal Signal |
| 120VAC Input power | 1 | 120VAC HOT |
| 120VAC Neut | 2 | 120VAC NEUT |
| Frame Ground | 3 | GROUND |
| CONTROL ELECTRONICS – DETECTOR EYE | | |
| Wire | TS2 | Signal |
| Brown | 1 | 120VAC when power switch is ON |
| White | 2 | NC relay, not used |
| Red | 3 | C relay contact |
| Black | 4 | NO relay contact |
| Green | 5 | AC Neut |
| Blue, 18 GA | 6 | Ground |
| CONTROL ELECTRONICS - OUTPUTS | | |
| Function | TS3 | Signal |
| FL1 Hot | 1 | 120VAC when active |
| FL Neut | 2 | AC Neut |
| FL2 Hot | 3 | 120VAC when active |
| BOS 120VAC | 4 | 120VAC when active |
| BOS Neut | 5 | AC Neut |
| BOS Gnd | 6 | Frame ground |
| NC Contact | 7 | Isolated contact |
| C Contact | 8 | Isolated contact |
| NO Contact | 9 | Isolated contact |
| Shield Ground | 10 | Frame Ground |

6. At the Detector eye, ensure the Dark Operate/Light Operate switch is set to DO and the SENS control to MAX. Be gentle with the SENS control as damage to this control voids the warranty. These are the normal settings from Trigg Industries.
7. Connect 120VAC to TS1, Euro style terminal strip in the Control Electronics per Figure 1. Turn power on and the Amber LED in the Detector eye should be on. The Red LED in the Detector eye may also be on. Any alarm devices connected may activate on initial power up for the duration of the alarm time setting.

NOTE

If the 'coarse' alignment in Step 4 of the Mechanical installation was successfully accomplished, the Red LED on the top of the Detector eye should be on and the relay in the Control Electronics Housing should not be energized. Alarm wiring should not be connected until FINAL ALIGNMENT has been accomplished. The Green LED on the top of the Detector eye is used to monitor the status of the solid-state output relay and may come on during the installation and alignment process. This LED should also come on during an alarm.

FINAL ALIGNMENT

NOTE: The following steps are best accomplished by two people.

1. Obtain the final alignment by manually moving the Detector Assembly two-axis mount in the horizontal plane to find the extreme positions where the Red LED in the Detector eye goes off. Position the Detector Assembly midway between the two extremes and secure in place.
2. Repeat the above procedure for the Detector Assembly in the pitch plane and secure in place. The vertical alignment is dependent upon the type of mounting bracket used.
3. Repeat Step 1 and 2 for the Source Assembly while observing the Red LED on the top of the Detector eye.

NOTE: It may be necessary to repeat Steps 1 through 3 if either the Source or Detector Assemblies required major adjustment from their original positions.

DETECTION HEIGHT TEST

1. Using a surveyor's rod or pole with the top end having a cross section of at least 2.5 inches and the rod/pole length the desired detection height, place the rod/pole on the roadway where the right side tires of a vehicle would run when passing through the beam. Move the rod/pole such that the beam should be interrupted (within the speed criteria of the system) and note that an alarm is issued.
2. Move the rod/pole to where the left side tires of a vehicle would run when passing through the beam. Move the rod/pole such that the beam should be interrupted (within the speed criteria of the system) and note that an alarm is issued. It may be necessary to adjust the height and/or slope of the eyes to match that of the roadway surface. If any height adjustment is necessary, ensure the final alignment procedures are again followed.
3. This tests the crown or slope of one lane. If more than one lane is being detected, check each lane per Steps 1 and 2. It may be necessary to adjust the height of either the source or detector eye to establish the "best fit" for the particular application. If any height adjustment is necessary, ensure the final alignment procedures are again followed.
4. Secure all hardware and latch the Control Electronics box.

SUGGESTION

Based on the environmental conditions at each location, it is suggested that both the Source and Detector eyes be cleaned with a soft brush to remove airborne contaminants on an "as required" basis. Cleaning the eyes may cause several false alarms, since the IR beam will be broken during this process. It is suggested that this process be undertaken during periods of no traffic.

SPECIFICATIONS

MODEL # ME-IR/330

METRO-ECONOMY NON-HIGHWAY SINGLE EYE INFRARED OVER-HEIGHT VEHICLE DETECTION SYSTEM

Suitable for non-highway applications such as parking structures, garages, and warehouses.



| MODEL | ME-IR/330 | ME-IR/330-230 | ME-IR/330-12 | ME-IR/330-24 |
|---------------------------------|--|------------------|--------------|--------------|
| OPERATING VOLTAGE | 120 VAC, 50/60HZ | 240 VAC, 50/60HZ | +12 VDC | +24 VDC |
| OUTPUTS | Output 1 - (1) Set alternating flash output, 60 FPM, protected by fuse Output 2 - (1) Steady voltage output, protected by fuse Output 3 - (1) Form C, dry relay contacts (NC/NO), protected by fuse | | | |
| OUTPUT 1 VOLTAGE | 120 VAC, 50/60HZ | 240 VAC, 50/60HZ | +12 VDC | +24 VDC |
| OUTPUT 2 VOLTAGE | 120 VAC, 50/60HZ | 240 VAC, 50/60HZ | +12 VDC | +24 VDC |
| ALARM TIME | 6 to 60 seconds, user adjustable | | | |
| SENSORS | Infrared (880 nm) opposed source and detector, NEMA 6P, IEC IP67 | | | |
| EFFECTS OF AMBIENT LIGHT | Field of view 2.4 degrees with 6-inch (152 mm) hood | | | |
| MAXIMUM RANGE | 200 feet (60 m). Suggested maximum range 125 feet (31.8 m) to allow for bad weather and lens contamination. | | | |
| ALIGNMENT | Go/no-go red LED indicator. No special tools required. | | | |
| REACTION SPEED | <u>IMPERIAL</u> : 1 MPH to 45 MPH for a 2.5-inch diameter object 1-inch above the established height of detection. <u>METRIC</u> : 1.6 KPH to 72.4 KPH for a 63.5 mm diameter object 25.4 mm above the established height of detection. | | | |
| TEMPERATURE RANGE | -13°F to +131°F (-25°C to +55°C) | | | |
| SENSOR MOUNTING | Installed on a two-axis mount for ease of alignment. 10 in (254 mm) long mounting bracket can be wall or pole mounted | | | |
| CONTROLLER ENCLOSURE | Fiberglass with 304 stainless steel hinge/latch and aluminum back panel. NEMA 4X, IEC IP66, 14 x 12 x 6 in (356 x 305 x 152 mm), pad lockable, wall mountable | | | |