

Over Height Vehicle Detection System

Installation, Operation and Maintenance Manual



Model ME-IR/330 (Version 2.0)

Metro Economy

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FOREWORD

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SYSTEM OVERVIEW

The Model ME-IR/330 (Version 2) 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 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, a Timer Relay (TR-1) inside the Controller is energized. The Timer Relay energizes the Alarm Relay (RL-1) which has three sets of double throw contacts:

ALARM RELAY CONTACTS	FUNCTION
SET 1	120VAC TO FLASHER RELAY (FR-1)
SET 2	120VAC TO TERMINAL STRIP 1 (TS-1)
SET 3	FORM C RELAY TO TERMINAL STRIP 1 (TS-1)

Flasher Relay (FR-1) provides alternating 120VAC output for flashing signals. Flash rate is factory set to 60 flashes per minute (FPM) with a duty cycle of 50%.

Terminal Strip (TS-1) in the Controller provides wiring termination and overcurrent protection for device input and output.

CONTROLLER OUTPUT	FUNCTION DURING OVDS ALARM	TYPICAL OPTIONAL EQUIPMENT
TS-1 #1-6	ALTERNATING FLASHER 120VAC OUTPUT	LED TRAFFIC SIGNALS
TS-1 #7-9	STEADY 120VAC OUTPUT	SIREN, STROBE, BELL, BLANK OUT SIGN (BOS)
TS-1 #10-13	FORM C RELAY ACTIVATES (C & NO CLOSED, C & NC OPENED)	VARIABLE MESSAGE SIGN (VMS), PROGRAMMABLE LOGIC CONTROLLER (PLC), RADIO FREQUENCY LINK (RFL)

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.

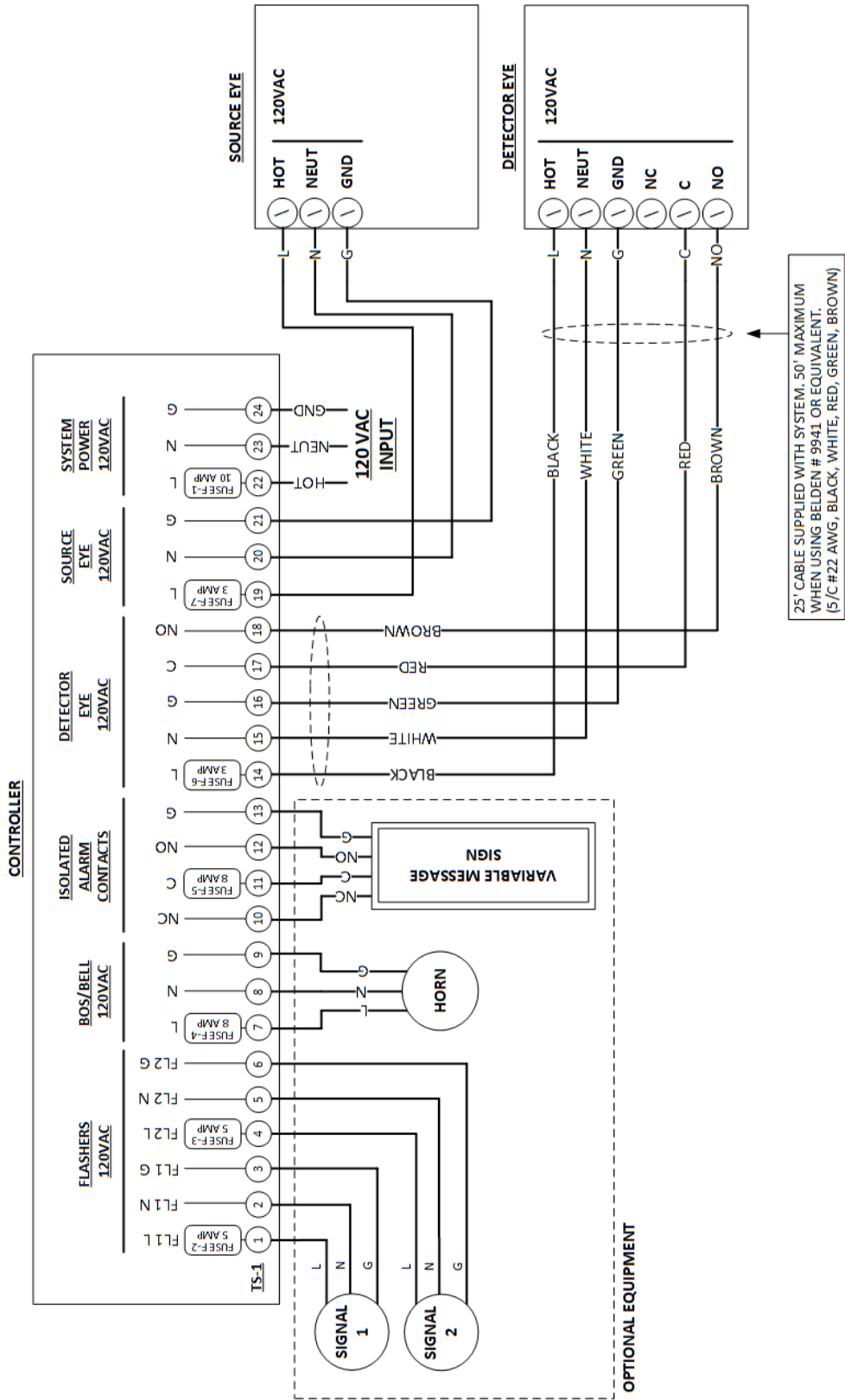


Figure 1 – Wiring Diagram

RECOMMENDED WIRING

Table 1 – Recommended Wiring - Source Eye

EXTERNAL WIRE	TERMINAL LABEL	FUNCTION	INTERNAL WIRE
#12-16 BLACK	HOT	120VAC HOT	BROWN
#12-16 WHITE	NEUT	120VAC NEUT	BLUE
#12-16 GREEN	GND	120VAC GND	GREEN

Installer to provide wiring between the Source Eye and the Controller. If wire path to the controller is not available, the Source Eye may be connected to an always-on 120VAC power source using supplemental overcurrent protection.

Table 2 - Recommended Wiring - Detector Eye

EXTERNAL WIRE	TERMINAL LABEL	FUNCTION	INTERNAL WIRE
#12-22 BLACK	HOT	120VAC HOT	BROWN
#12-22 WHITE	NEUT	120VAC NEUT	BLUE
#12-22 GREEN	GND	120VAC GND	GREEN
-	NC	NC RELAY CONTACT (NOT USED)	WHITE
#12-22 RED	C	C RELAY CONTACT	YELLOW
#12-22 BROWN	NO	NO RELAY CONTACT	BLACK

One 25-foot multi-conductor cable is supplied with the system and is intended for installation between the Detector Eye and the Controller. Maximum cabling distance between the Detector Eye and the Controller is 50 feet when using Belden # 9941 or equivalent 5/C #22 AWG cable.

Table 3 – Recommended Wiring - Controller

TS1	FUNCTION	
1	FLASH #1 - 120VAC LINE	FLASHERS (120VAC)
2	FLASH #1 - 120VAC NEUT	
3	FLASH #1 - 120VAC GND	
4	FLASH #2 - 120VAC LINE	
5	FLASH #2 - 120VAC NEUT	
6	FLASH #2 - 120VAC GND	
7	120VAC LINE	BOS/BELL (120VAC)
8	120VAC NEUT	
9	120VAC GND	
10	NC CONTACT	ISO ALARM CONTACTS
11	C CONTACT	
12	NO CONTACT	
13	GND	
14	120VAC LINE	DETECTOR EYE (120VAC)
15	120VAC NEUT	
16	120VAC GND	
17	C CONTACT	
18	NO CONTACT	
19	120VAC LINE	SOURCE EYE (120VAC)
20	120VAC NEUT	
21	120VAC GND	
22	120VAC LINE	SYSTEM POWER (120VAC)
23	120VAC NEUT	
24	120VAC GND	

Table 4 – Fuse Ratings

FUSE	RATING	TYPE	DEVICE	REPLACEMENT PN
F-1	10 AMPS 250VAC	3AG FAST-ACTING	SYSTEM POWER	LITTELFUSE # 0312010.MXP
F-2	5 AMPS 250VAC	3AG FAST-ACTING	FLASHER OUTPUT #1	LITTELFUSE # 0312005.HXP
F-3	5 AMPS 250VAC	3AG FAST-ACTING	FLASHER OUTPUT #2	LITTELFUSE # 0312005.HXP
F-4	8 AMPS 250VAC	3AG FAST-ACTING	BOS/BELL OUTPUT	LITTELFUSE # 0312008.HXP
F-5	8 AMPS 250VAC	3AG FAST-ACTING	ISOLATED ALARM CONTACTS	LITTELFUSE # 0312008.HXP
F-6	3 AMPS 250VAC	3AG FAST-ACTING	DETECTOR EYE POWER	LITTELFUSE # 0312003.HXP
F-7	3 AMPS 250VAC	3AG FAST-ACTING	SOURCE EYE POWER	LITTELFUSE # 0312003.HXP

Fuse holder is integrated into Terminal Strip 1 (TS-1) located inside the controller. Turn off power to the system and then lift on the respective handle to inspect and replace fuse.



For continued protection against risk of fire, replace only with a fuse of the same type and having the same electrical rating.

INSTALLATION

MECHANICAL

1. Ensure the poles or mounting assemblies are near vertical.
2. Place the Source Eye Assembly and the Detector Eye Assembly brackets (distinguished by labels located on 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 Controller 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 $\frac{1}{4}$ 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, Wiring Diagram for the following steps.
2. Make wiring connections to the Source Eye as indicated on Figure 1 and Table 1.
3. Make wiring connections to the Detector Eye as indicated on Figure 1 and Table 2.
4. Make wiring connections to the Controller as indicated on Figure 1 and Table 3.
5. 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.
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. Turn on power source to the Controller (and Source Eye if fed separately).
8. Set Main Power Switch (SW-1) in Controller to 'ON' position.
 - a. Red LED on the Main Power Switch (SW-1) in Controller should be on steady.
 - b. Green LED on top of the Detector Eye should be on steady.
 - d. Green LED on top of the Source Eye should be on steady

Note: Amber LED on top of 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 flashing and the relay in the Controller should not be energized. Warning device wiring should not be connected until FINAL ALIGNMENT has been accomplished. The Amber 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. Rotate the Detector Eye Assembly two-axis mount (left and right) in the horizontal plane to find the position where the Red LED on top of the Detector Eye blinks most rapidly. Secure in place.
2. Tilt the Detector Eye Assembly two-axis mount (up and down) in the vertical plane until the Red LED on top of the Detector Eye blinks most rapidly. Secure in place.
3. Repeat Steps 1 and 2 for the Source Eye Assembly while observing the Red LED on the top of the Detector eye.
4. When alignment is complete, the Red LED on top of the Detector Eye should be rapidly blinking at a rate faster than 8 flashes per second (approximately).

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.

ALARM TIME ADJUSTMENT

Alarm on time is user configurable using the adjustments located on Timer (TR-1) as shown in Figure 2. Turn “Time Range Setting” dial to set ON time range (Refer to Figure 3). Turn “Adjustment within Range” dials to fine-tune ON time range. Full clockwise is the maximum ON time within the set time range. Full counterclockwise is minimum ON time within the set time range. The “Function Setting” dial should remain at factory configured “H” setting.

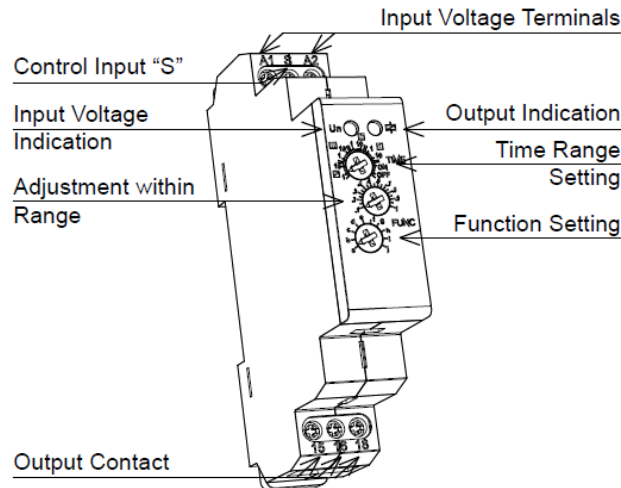


Figure 2 – Timer Diagram

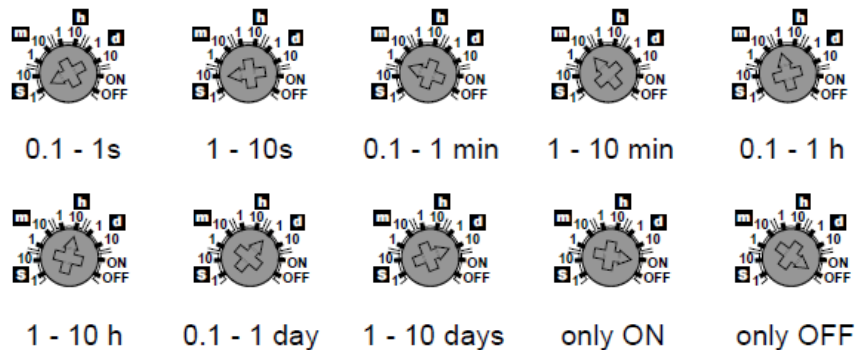


Figure 3 – Timer Settings

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 Controller.

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 (VERSION 2.0)

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	0.1 seconds to 10 days, user adjustable, self-resetting			
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			



SPECIFICATIONS (CONT'D):

MODEL	ME-IR/330	ME-IR/330-230	ME-IR/330-12	ME-IR/330-24
CONTROLLER ENCLOSURE	Non-metallic with stainless steel hinge/latch and metallic back panel. NEMA 4X, IEC IP66, 16 x 14 x 8 in (406 x 356 x 203 mm), pad lockable, wall mountable, light-grey. Pole mountable with optional kit.			
WARRANTY	Standard 1-Year Full Warranty. Extended Warranty options available			

OPTIONAL ACCESSORIES:

MODEL #	DESCRIPTION
PMB-1003	Pole Mount Bracket for Non-Metallic Enclosure
3601	Vibrating Horn
3602	Electronic Siren
3611	Medium Duty Strobe
3617	LED Signal with Polycarbonate Traffic Head
3701	Telescoping Mounting Pole (10 to 16 Feet)
TG-CAM-1010	Network Camera - Provides Snapshot Images and Video Recordings

Additional accessories and warning devices are available from Trigg Industries LLC.
Contact sales@triggindustries.com for details.