

Over Height Vehicle Detection System

Installation, Operation and Maintenance Manual



Model ME-IR/330-24 (Version 3.0)

Metro Economy

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FOREWORD

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WARRANTY

Equipment manufactured by Trigg Industries, LLC is guaranteed to the original purchaser to be free from defects in material and/or workmanship for one year from the date of shipment when the equipment is used in accordance with operating instructions.

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SYSTEM OVERVIEW

The Model ME-IR/330 (Version 3) is designed for off highway, lower speed over height object detection applications with medium range (up to 75 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 50 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 Relays (RL-1 and RL-2) which together have four sets of double throw contacts:

ALARM RELAY CONTACTS	FUNCTION
SET 1	24VDC TO FLASHER RELAY (FR-1)
SET 2	24VDC TO TERMINAL STRIP 1 (TS-1)
SET 3	FORM C RELAY TO TERMINAL STRIP 1 (TS-1)
SET 4	(NOT USED)

Flasher Relay (FR-1) provides alternating 24VDC output for flashing signals. Flash rate is factory set to 56 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 24VDC OUTPUT	LED TRAFFIC SIGNALS
TS-1 #7-9	STEADY 24VDC 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.

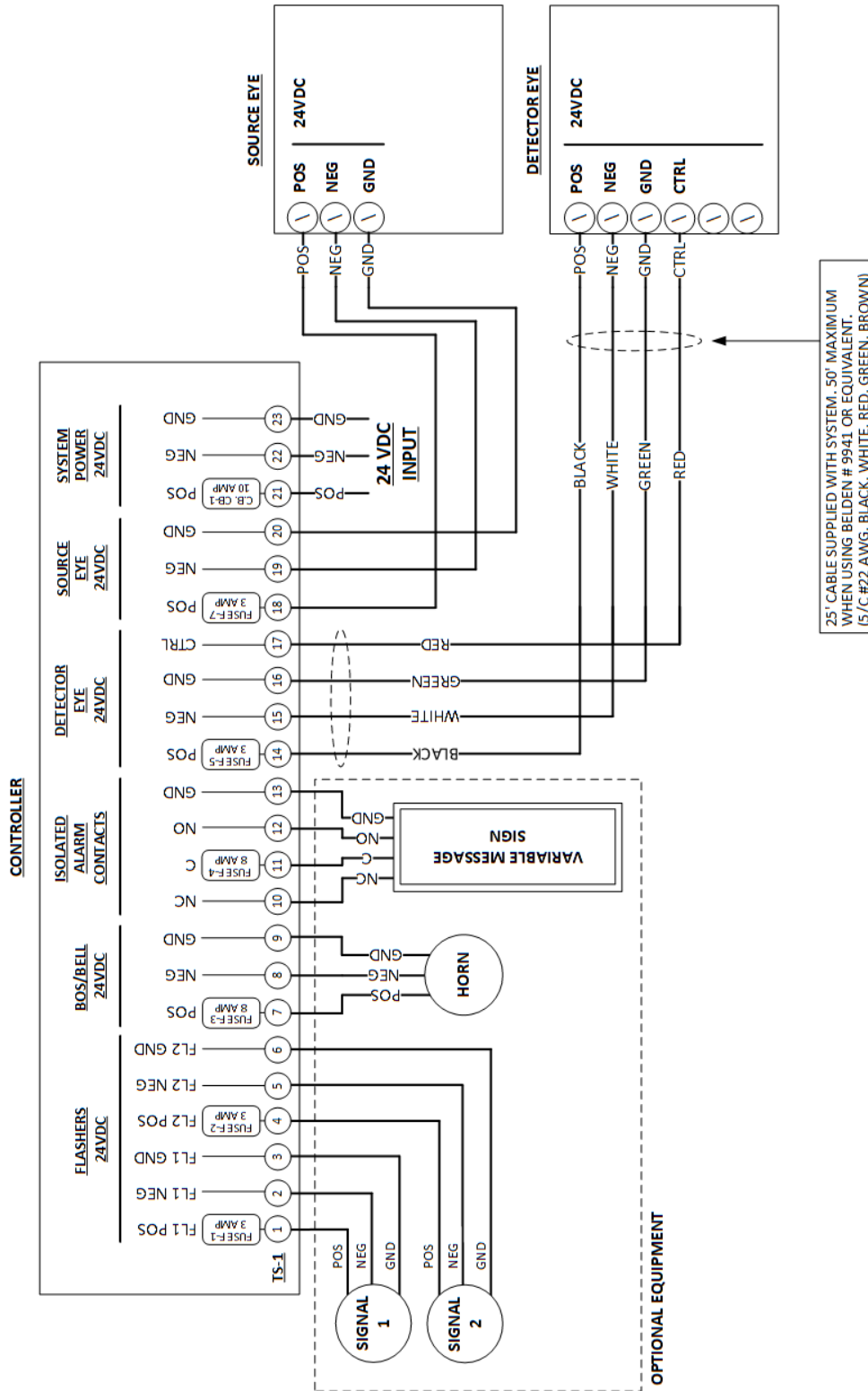


Figure 1 – Wiring Diagram

RECOMMENDED WIRING

Table 1 – Recommended Wiring – Source Eye

EXTERNAL WIRE	TERMINAL LABEL	FUNCTION	INTERNAL WIRE
#12-16 BLACK	POS	24VDC POS	BROWN
#12-16 WHITE	NEG	24VDC NEG	BLUE
#12-16 GREEN	GND	24VDC 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 24VDC power source using supplemental overcurrent protection.

Table 2 – Recommended Wiring – Detector Eye

EXTERNAL WIRE	TERMINAL LABEL	FUNCTION	INTERNAL WIRE
#12-22 BLACK	POS	24VDC POS	BROWN
#12-22 WHITE	NEG	24VDC NEG	BLUE
#12-22 GREEN	GND	24VDC GND	GREEN
#12-22 RED	CTRL	CONTROL SIGNAL	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 - 24VDC POS	FLASHERS (24VDC)
2	FLASH #1 - 24VDC NEG	
3	FLASH #1 - 24VDC GND	
4	FLASH #2 - 24VDC POS	
5	FLASH #2 - 24VDC NEG	
6	FLASH #2 - 24VDC GND	
7	24VDC POS	BOS/BELL (24VDC)
8	24VDC NEG	
9	24VDC GND	
10	NC CONTACT	ISO ALARM CONTACTS
11	C CONTACT	
12	NO CONTACT	
13	GND	
14	24VDC POS	DETECTOR EYE (24VDC)
15	24VDC NEG	
16	24VDC GND	
17	CONTROL SIGNAL	
18	24VDC POS	SOURCE EYE (24VDC)
19	24VDC NEG	
20	24VDC GND	
21	24VDC POS	SYSTEM POWER (24VDC)
22	24VDC NEG	
23	24VDC GND	

Table 4 – Fuse Ratings

FUSE	RATING	TYPE	DEVICE	REPLACEMENT PN
F-1	3 AMPS 250VAC	3AG FAST-ACTING	FLASHER OUTPUT #1	LITTELFUSE # 0312003.HXP
F-2	3 AMPS 250VAC	3AG FAST-ACTING	FLASHER OUTPUT #2	LITTELFUSE # 0312003.HXP
F-3	8 AMPS 250VAC	3AG FAST-ACTING	BOS/BELL OUTPUT	LITTELFUSE # 0312008.HXP
F-4	8 AMPS 250VAC	3AG FAST-ACTING	ISOLATED ALARM CONTACTS	LITTELFUSE # 0312008.HXP
F-5	3 AMPS 250VAC	3AG FAST-ACTING	DETECTOR EYE POWER	LITTELFUSE # 0312003.HXP
F-6	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 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, 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. Turn on power source to the Controller (and Source Eye if fed separately).
6. Set Circuit Breaker (CB-1) in Controller to 'ON' position.
 - a. SYSTEM POWER (Green) indicator in Controller should be illuminated
 - b. POWER ON/OFF (Green) indicator on top of the Detector Eye should be illuminated.
 - d. POWER ON/OFF (Green) indicator on top of the Source Eye should be illuminated.

NOTE

Warning device wiring should not be connected until FINAL ALIGNMENT has been accomplished. The OUTPUT CONDUCTING (Amber) indicator on the top of the Detector eye is used to monitor the status of the output control signal and may come on during the installation and alignment process. This indicator should also come on during an alarm.

FINAL ALIGNMENT

The following steps are best accomplished by two people.

The Signal Strength Light Bar on the back of the Detector Eye Assembly (Figure 2) will be used to check alignment. Signal strength of 4 is ideal. Signal strength of 2 is the minimum required, anything less than 2 will not operate.

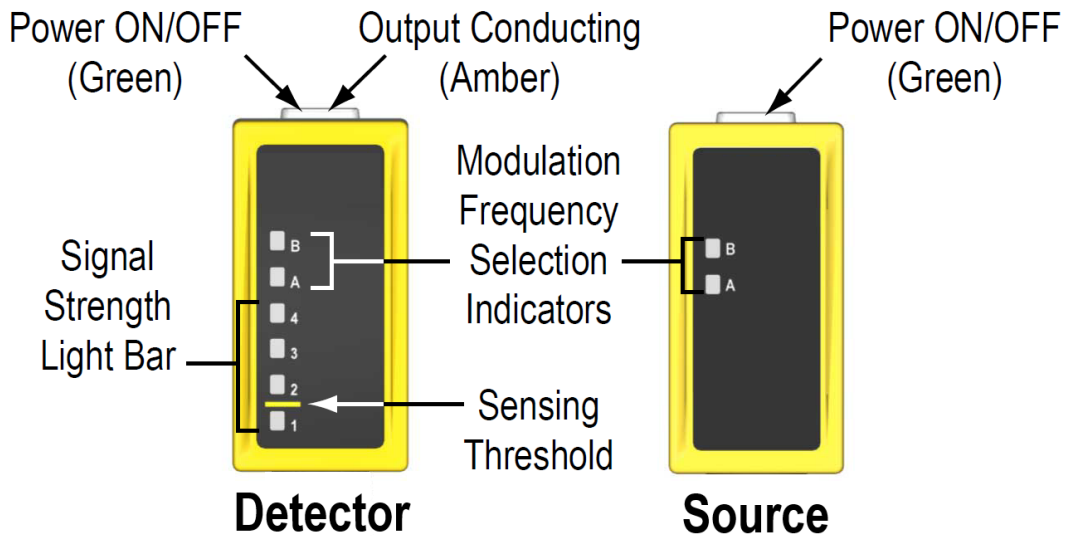


Figure 2 – Detector and Source Indicators

1. Rotate the Detector Eye Assembly two-axis mount (left and right) in the horizontal plane to find the position where the Signal Strength Light Bar has the maximum achievable strength. Secure in place.
2. Tilt the Detector Eye Assembly two-axis mount (up and down) in the vertical plane to find the position where the Signal Strength Light Bar has the maximum achievable strength. Secure in place.
3. Repeat Steps 1 and 2 for the Source Eye Assembly while observing the Signal Strength Light Bar on the back of the Detector Eye Assembly.
4. When alignment is complete, the Signal Strength Light Bar on the back of the Detector Eye Assembly should be 2 (Poor), 3 (Good), or 4 (Excellent).

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 3. Turn “Time Range Setting” dial to set ON time range (Refer to Figure 4). 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.

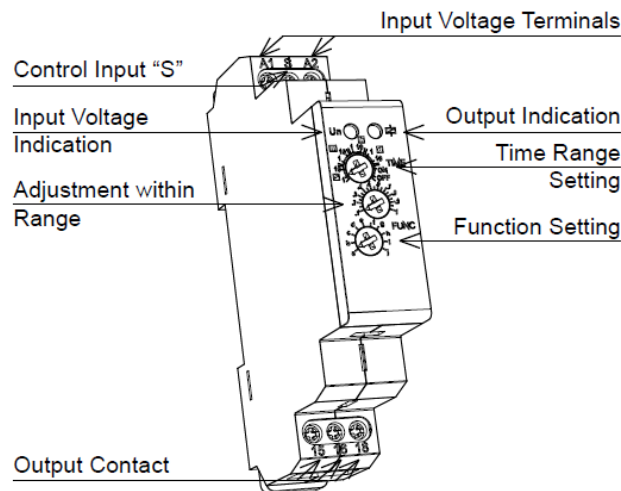


Figure 3 – Timer Diagram

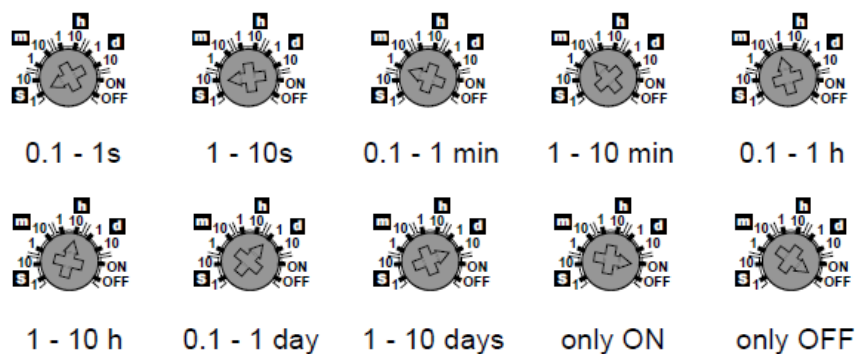


Figure 4 – Timer Settings

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.

TECHNICAL SUPPORT

Contact Trigg Industries for Technical Support

Phone: 757-223-7522

Email: support@triggindustries.com

Website: www.triggindustries.com