



ECCO®

Installation and Operation Instructions 7100 Series LED Beacon

ECCO's 7160 Series - Reflex™ LED Beacons offer SAE Class I, high intensity light output along with modern styling and premium features. Reflex™ beacons use reflector technology to produce a powerful, SAE Class I/California Title 13 warning signal in a light that offers 12-24V operation, 15 flash patterns, hi/lo intensity control and synchronization capability. Reflex™ Beacons offer a long, maintenance-free service life, extremely low amp draw and a robust, vibration resistant design.



WARNING!

Failure to install or use this product according to manufacturers recommendations may result in property damage, serious bodily/personal injury, and/or death to you and those you are seeking to protect!



Do not install and/or operate this safety product unless you have read and understand the safety information contained in this manual.

1. Proper installation combined with operator training in the use, care, and maintenance of emergency warning devices are essential to ensure the safety of you and those you are trying to protect.
2. Exercise caution when working with live electrical connections.
3. This product must be properly grounded. Inadequate grounding and/or shorting of electrical connections can cause high current arcing, which can cause personal injury and/or severe vehicle damage, including fire.
4. Proper placement and installation are vital to the performance of this warning device. Install this product so that output performance of the system is maximized and the controls are placed within convenient reach of the operator so that s/he can operate the system without losing eye contact with the roadway.
5. It is the responsibility of the vehicle operator to ensure during use that all features of this product work correctly. In use, the vehicle operator should ensure the projection of the warning signal is not blocked by vehicle components (i.e., open trunks or compartment doors), people, vehicles, or other obstructions.
6. The use of this or any other warning device does not ensure all drivers can or will observe or react to a warning signal. Never take the right-of-way for granted. It is your responsibility to be sure you can proceed safely before entering an intersection, driving against traffic, responding at a high rate of speed, walking on or around traffic lanes.
7. This equipment is intended for use by authorized personnel only. The user is responsible for understanding and obeying all laws regarding warning signal devices. Therefore, the user should check all applicable city, state, and federal laws and regulations. The manufacturer assumes no liability for any loss resulting from the use of this warning device.

Specifications:

Size: Permanent 6.5" dia. x 3.9" high
V/Magnet 6.5" dia. x 4.7" high

Weight: Permanent approx. 2.75 lbs.
V/Magnet approx. 3.8 lbs.

Input Voltage: 12 to 24 VDC (9-32V)

Current Draw: 2.0 Amps - Peak
26.0 Watts - Maximum

Operating Temp. Range: -30°C to +50°C

Installation & Mounting:

Important! This unit is a safety device, and it must be connected to its own separate, fused power point to assure its continued operation should any other electrical accessory fail.

Carefully remove the beacon and place it on a flat surface. Examine the unit for transit damage, and locate all parts. If damage is found, or parts are missing, contact ECCO. Do not use damaged or broken parts.



Caution! When drilling into any vehicle surface, make sure that the area is free from any electrical wires, fuel lines, vehicle upholstery, etc. that could be damaged.

Permanent Mounting:

1. Select the desired location on a flat surface for the beacon to be mounted. The visibility of the flash and ease of wiring access should be taken into consideration in the selection of the mounting location.
2. Using the base gasket as a template, mark the three mounting hole locations (see Figure 1).
3. Drill the holes using a 7/32" drill size.
4. A fourth hole may be drilled for wire access as shown in Figure 1, or the wires may be routed through the slot in the base for external access.
5. Connect the power wires as shown in the wiring section (see Figure 3).
6. Mount the beacon with #10 hardware.

Pipe Mounting:

The base features female 1" NPT threads for pipe mounting the beacon.

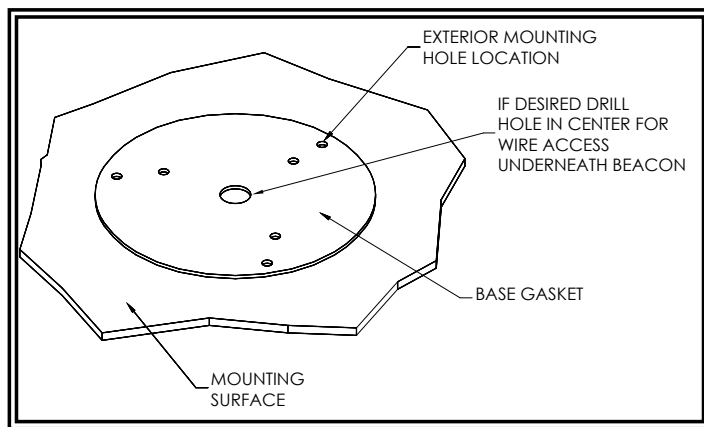


Figure 1

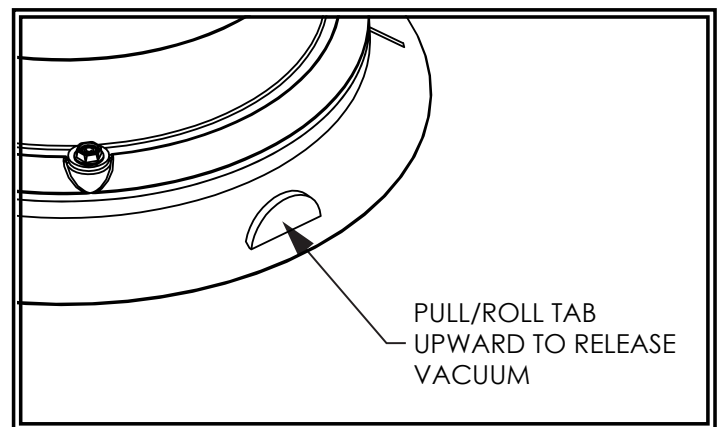


Figure 2

Temporary Mounting, Vacuum-Magnet Mount:

The Vacuum-Magnet Mount feature includes a suction cup on the bottom of the beacon, with a magnet inside of the suction cup, for a secure, temporary mount. The beacon should be placed in the center of the roof where the least amount of curvature occurs. Before installing, make sure the mounting surface is clean and there is no debris on the bottom of the beacon or on the roof of the vehicle, which could reduce the holding power of the suction cup and magnet. Place and remove the beacon without sliding to avoid scratching the paint on the vehicle. After placement, the beacon should adhere firmly to the surface. If the unit slides or moves easily, a proper installation has not been obtained. To release the vacuum, lift the tab to release the airlock (see Figure 2). To protect the Vacuum-Magnet Mount assembly, return beacon to the box when not in use. **Do not attempt to attach the beacon to an ice-covered surface.**



WARNING!

Maximum recommended vehicle speed for safe operation using the Vacuum Mount model is 65 mph (104 km/h), when fitted to the center of a vehicle roof of steel construction. Higher speeds could cause the mount to fail, resulting in the beacon flying off of the vehicle, which could cause damage to other vehicles, and injury or death to the passengers. The vacuum-magnet mount is not intended as a permanent mounting for the beacon. The vacuum-magnet mount unit must be mounted on a flat smooth magnetic surface (i.e. no fiberglass, ribbed style roofs, etc.). Ensure that the magnet is kept clean.



WARNING!

Failure to follow these instructions can result in fire or injury from excessive heat build up.

Operator is responsible for ensuring cigarette adapter fits correctly into cigarette/auxiliary outlet used.

For proper operation, verify cigarette/auxiliary outlet circuit is rated to supply a minimum of 10 amps. (See specifications section for rated current in amperes).

Do not exceed the current rating for the cigarette lighter power outlet recommended by vehicle manufacturer.

Keep cigarette lighter adapter and outlet, clean and free of debris.

Do not use the cigarette lighter adapter when wet.

Insert cigarette lighter adapter fully into the outlet for proper connection.

Grasp cigarette lighter adapter, NOT cord, to remove from outlet.

Remove cigarette lighter adapter completely from outlet when light is not in use.

Note: Operating the vehicle without the outer lens installed on the product may result in damage that will **NOT** be covered under warranty.

Important! Disable power before wiring up the beacon.

Wiring:

The wiring for this configuration is as shown in Figure 3 below. All wiring should be a minimum of 18AWG. The positive line must have a 5 amp fuse, as shown. A switch can be used to control the on/off function.

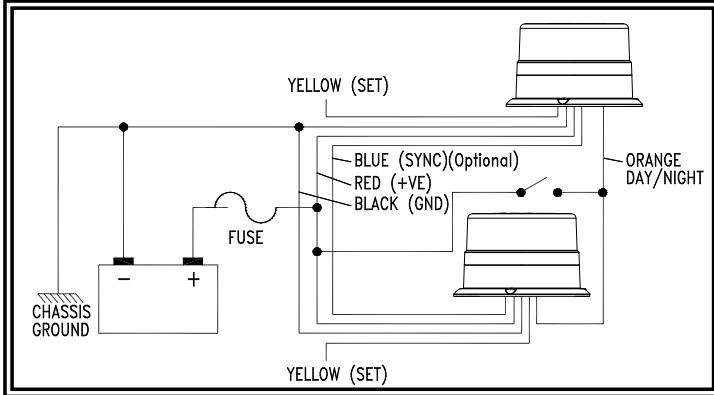


Figure 3

Wire functions are as follows:

- Black Wire:** Ground. Connect to either the battery negative terminal or a suitable chassis point.
- Red Wire:** Power. Switch to +12/24V to operate the flasher. Must be powered through the fuse, located as close to the battery terminal as possible.
- Yellow Wire:** Flash pattern set. Apply +12/24V momentarily (< 1 sec) to cycle through the available flash patterns (see table). Holding power on this wire for > 1 sec will select the previous pattern.
- Blue Wire:** Sync wire. Connect to other blue sync wires of other 7160 beacons to allow synchronizing of flash patterns (see notes). Connecting the sync wires together does not alter the flash patterns of any of the beacons – it only controls the relative timing of the flash patterns (see notes). This wire may also be connected to other compatible ECCO synchronizing products. If unused, leave unconnected and insulated.
- Orange Wire:** When connected to positive supply, the light output is dimmed by 50%.

Changing Flash Patterns for Vacuum Mount Beacons: Use momentary switch on cigarette plug.

Notes on Synchronizing and Phase:

Phases A and B for each style of flash pattern in the table denote the relative timing between beacons connected in a synchronizing installation. To operate simultaneously, each beacon must be set to the same phase (A + A or B + B); to operate alternately, beacons must be set to have the opposite phase (A + B or B + A).

To simplify the set-up of a synchronized installation, the following process is recommended:

- Determine the desired style of flash pattern for each beacon and set each unit individually (without the BLUE wires connected together) to avoid confusion. It is also strongly recommended that the same style of flash pattern be used on all units to produce the most effective warning pattern.
- Connect the BLUE (SYNC) wires together and check that the units are flashing in a synchronized manner as expected. If a pattern on one module appears to be wrong, the YELLOW (PATTERN SET) wire can be used to cycle forward or backward on that individual beacon until the correct pattern is selected. Note: This will only change the pattern in the one beacon and will not affect the other units connected to the BLUE (SYNC) wire.
- Synchronizing is not possible with magnet and vacuum mount beacons.

Flash Patterns

The 7160 series beacon can be configured to flash the following patterns (in the order below) by momentarily applying power to the yellow wire as described in the wiring section. The beacon must be powered through the black and red wires to allow pattern selection.

Flash Pattern Chart					
Sequence	Description	Phase	FPM	SAE J845 Class 1	Title 13
1.	Steady	N/A	N/A	N/A	N/A
2.	Title 13 Single	A	65	Yes	Yes
3.	Title 13 Single	B	65	Yes	Yes
4.	Title 13 Double	A	65	Yes	Yes
5.	Title 13 Double	B	65	Yes	Yes
6.	Title 13 Quad	A	65	Yes	Yes
7.	Title 13 Quad	B	65	Yes	Yes
8.	Double	A	75	Yes	N/A
9.	Double	B	75	Yes	N/A
10.	Fast Double	A	130	N/A	N/A
11.	Fast Double	B	130	N/A	N/A
12.	Quad	A	75	Yes	N/A
13.	Quad	B	75	Yes	N/A
14.	Quint Hold	A	75	Yes	N/A
15.	Quint Hold	B	75	Yes	N/A
16.	Burst	A	75	Yes	N/A
17.	Burst	B	75	Yes	N/A
18.	Slow Rotate	N/A	75	N/A	N/A
19.	Fast Rotate	N/A	120	N/A	N/A
20.	Wave Rotate	N/A	70	N/A	N/A
21.	Rotate/ Quad	N/A	150/75	N/A	N/A
22.	Ramp Up/Down	N/A	N/A	N/A	N/A
23.	Random	N/A	N/S	N/A	N/A

Title 13. Motor Vehicles
Division 2. Department of the California Highway Patrol
Chapter 2. Lighting Equipment
Article 7. Mounting Requirements

§685. Installation and Maintenance.

Lighting equipment shall be securely mounted on a rigid part of the vehicle to prevent noticeable vibration of the beam and shall be maintained with the proper aim when the vehicle is stationary and in motion. No lighting device, unless otherwise permitted, shall be mounted so any portion of the vehicle, load, or vehicle equipment interferes with the distribution of light or decreases its intensity within the photometric test angles unless an additional device is installed so the combination of the two meets these requirements. Mounting heights shall be measured from the center of the lamp or reflector to the level surface upon which the vehicle stands when it is without load.

Note:

Authority cited: Section 26103, Vehicle Code. Reference: Sections 24012 and 26103, Vehicle Code.

§686. Mounting of Aftermarket Devices.

Aftermarket lamps, with orientation markings such as "top" shall be mounted in accordance with the markings. Sealed and semisealed optical units shall be installed with the lettering on the lens face right side up. Front and rear reflex reflectors shall be securely mounted on a rigid part of the vehicle with the plane of the lens perpendicular to the roadway and parallel to the rear axle. Side reflex reflectors shall be mounted with the lens face perpendicular to the roadway and parallel to the rear wheels. Aftermarket devices with nonadjustable housings shall be mounted with the base on a horizontal or vertical surface, whichever is appropriate, unless different mounting instructions are included with such devices when offered for sale.

Note:

Authority cited: Section 26103, Vehicle Code. Reference: Sections 24012 and 26103, Vehicle Code.

§687. Mounting of Original Equipment Devices.

Original equipment lamps and reflex reflectors designed for a particular make of vehicle and installed on another vehicle shall be mounted at the same angle as on the vehicle for which they were designed. They need not be mounted at the same height or lateral spacing as on the original vehicle but must comply with the appropriate height and location limitations in this title and the Vehicle Code.

Note:

Authority cited: Section 26103, Vehicle Code. Reference: Sections 24012 and 26103, Vehicle Code.

§700. Warning Lamps.

Required front warning lamps other than school bus warning lamps, shall be mounted so the entire projected area of the lens is visible from all eye heights of drivers of other vehicles at angles within 45 deg left to 45 deg right of the front of the vehicle. If the light within these required angles is blocked by the vehicle or any substantial object on it, an additional warning lamp shall be displayed within the obstructed angle. Warning lamps may be mounted at any height.

Note:

Authority cited: Section 26103, Vehicle Code. Reference: Sections 24012 and 26103, Vehicle Code.