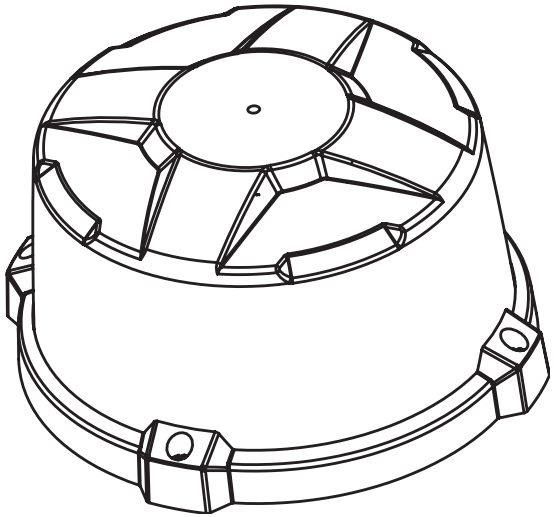
nROADS® H BEACON

HIGH DOME: ENRBHC024AH - AMBER
ENRBHC024FDHBB - BLUE/BLUE
ENRBHC024FDHRR - RED/RED
ENRBHC024FDHBA - BLUE/AMBER
ENRBHC024FDHBR - BLUE/RED
ENRBHC024FDHBRA - BLUE/RED/AMBER

LOW DOME: ENRBHC024B - BLUE
ENRBHC024R - RED
ENRBHC024A - AMBER
ENRBHC024FDBB - BLUE/BLUE
ENRBHC024FDRR - RED/RED
ENRBHC024FDBA - BLUE/AMBER
ENRBHC024FDBR - BLUE/RED



TECHNICAL SPECIFICATIONS	
Dimensions:	Low Dome: 3.64" (9.25cm)H x 8.62" (21.8cm) D High Dome: 5.27" (13.4 cm) H x 8.62" (21.8 cm) D
Input Voltage:	12/24 VDC
Operating Temperature	-25 °C to +55 °C

ELECTICAL SPECIFICATIONS			
SUPPLY VOLTAGE	CURRENT DRAW (AMBER)	CURRENT DRAW (OTHER)	AVERAGE POWER CONSUMPTION
12 VDC	4.8 A	3.6 A	20 W
24 VDC	2.4 A	1.8 A	20 W

⚠ WARNING

- HIGH CURRENT interconnects must be properly terminated. Poor crimp quality can cause heat build-up and fire. Follow crimp connector manufacturer instructions.
- DO NOT install this product or route any wires in the Air Bag Deployment Zone. Refer to vehicle Owner's Manual for deployment zones.
- DO NOT use system to disconnect headlights, brake lights or other safety equipment.
- Unit may become hot to touch during normal operation.
- Failure to properly install connectors, fuses or wiring may cause vehicle failure or fire.
- Installation must only be performed by trained technician. Installer must determine vehicle wiring configuration and proper integration of system.
- Use proper wire gauge. All power wires connecting to positive (+) or negative (-) battery terminal or local chassis ground (-) must be sized to supply at least 125% of max. current and properly fused at power source.
- Install protective grommets when routing wire through firewall or metal.

⚠ WARNING

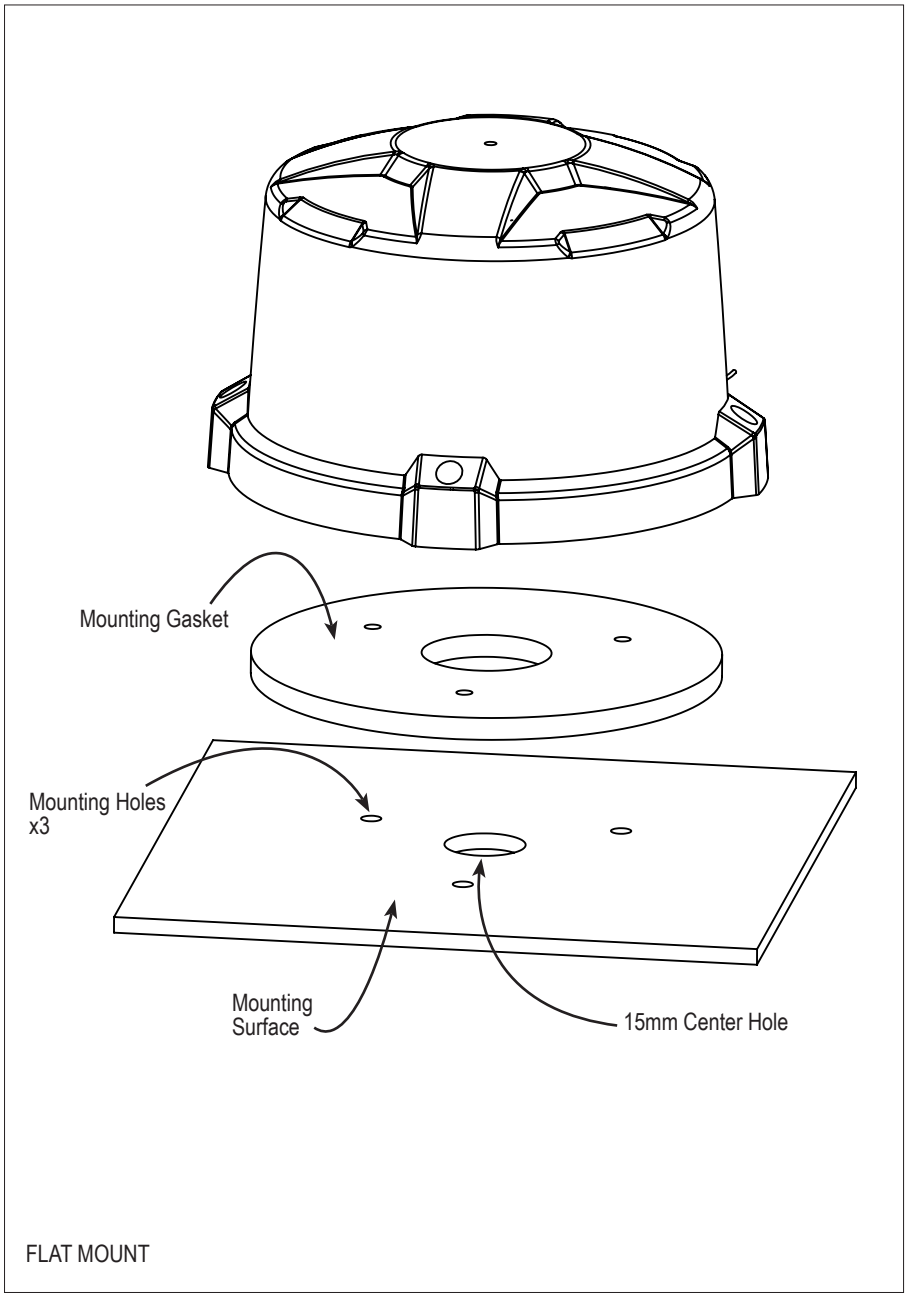
This product includes high intensity LED devices. To prevent eye damage, DO NOT stare directly into the light beam at close range.

Please see page 2 for Mounting Instructions

NOTICE:

Installers and users must comply with all applicable federal, state and local laws regarding use and installation of warning devices.

Improper use or installation may void warranty coverage. To review our Limited Warranty Statement & Return Policy for this or any SoundOff Signal product, visit our website at ***www.soundoffsignal.com/sales-support****. If you have questions regarding this product, contact* ***Technical Services 1-800-338-7337*** *(press #4 to skip the automated message). Questions or comments that do not require immediate attention may be emailed to* ***techservices@soundoffsigal.com.***



FLAT MOUNT

nROADS® H Mounting Instructions

1. Using the supplied gasket, mark the center hole and three mounting holes on the surface the beacon will be mounted to.
2. Drill your holes.
   a. The center hole should be 15mm for the wires to pass through
   b. The 3 mounting holes should be drilled for clearance for M5 mounting bolts (6.5mm)
3. Using M5 botls of suitable length (installer supplied) secure the beacon to the mounting surface making sure the gasket is between the beacon and the mounting surface. SoundOff Signal recommends using flat washers and lock washers to secure the beacon to your mounting surface).

ELECTRICAL INSTALLATION

Always install the beacon before connecting the wiring to the vehicle electrical system. The recommended minimum wire conductor cross-section is 1.5mm^2 for power leads and 0.5mm^2 for all other wires.

The positive power supply lead to the beacons must be protected by a fuse according to the following specifications:

- 1 beacon (any color): 5 Amp fuse
- 2 beacons (both amber): 10 Amp fuse
- 2 beacons (other): 7.5 Amp fuse

Do not connect more than 2 beacons to one power supply lead.

Wires spliced to extend the beacon wiring harness input wires to the positive power supply must be protected by a 1 Amp fuse. Insulate any unused wires.

To operate the beacon, connect the supply voltage (+Up and GND) and the activation wire (ON, or AMBER_ON as applicable).

If the beacon supply is switched by a power stage or relay, connect the activation wire to the +Up wire.

If permanent connection of the beacon to the vehicle power network is required, the activation wire is used to activate the beacon.

To enable fault indication, connect the SIPO-IN and SIPO-OUT signals.

Connect the SYN wire to synchronize to other beacons or lightbars.

If night operation of the beacon is required (reduced light intensity), connect the NP signal to the corresponding controller.

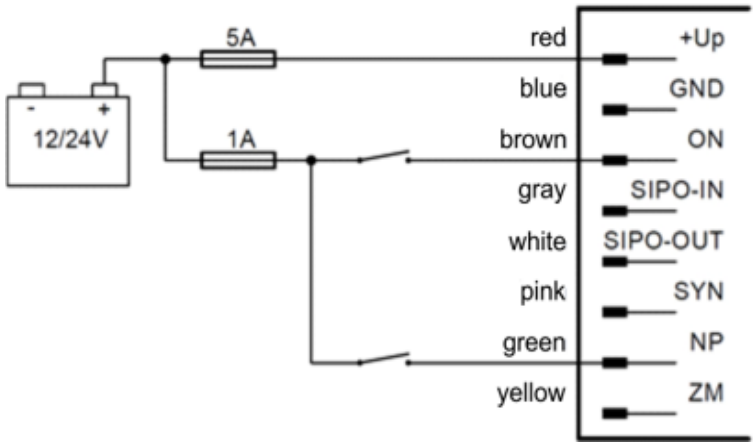
SINGLE COLOR AND BLUE/RED DUAL COLOR BEACONS			
WIRE COLOR	SIGNAL	TYPE	DESCRIPTION
RED	+UP	POWER	+SUPPLY VOLTAGE
BLUE	GND	POWER	- SUPPLY VOLTAGE
BROWN	ON	INPUT	BEACON ACTIVATION
GRAY*	SIPO-IN	INPUT	FAULT INDICATION
WHITE*	SIPO-OUT	OUTPUT	FAULT INDICATION
PINK	SYN	INPUT/OUTPUT	SYNCHRONIZATION
GREEN*	NP	INPUT	NIGHT OPERATION
YELLOW	ZM	INPUT	FLASH PATTERN CHANGE

*Signal/wire not used on amber beacons

BLUE/AMBER DUAL-COLOR AND BLUE/RED/AMBER TRI-COLOR BEACONS			
WIRE COLOR	SIGNAL	TYPE	DESCRIPTION
RED	+UP	POWER	+SUPPLY VOLTAGE
BLUE	GND	POWER	- SUPPLY VOLTAGE
BROWN	ON	INPUT	BEACON ACTIVATION (BLUE/RED COLOR)
BLACK	AMBER_ON	INPUT	BEACON ACTIVATION (AMBER COLOR)
GRAY*	SIPO-IN	INPUT	FAULT INDICATION
WHITE*	SIPO-OUT	OUTPUT	FAULT INDICATION
PINK	SYN	INPUT/OUTPUT	SYNCHRONIZATION
GREEN*	NP	INPUT	NIGHT OPERATION
YELLOW	ZM	INPUT	FLASH PATTERN CHANGE

*Fault indication applies only to red and blue LEDs. Amber LEDs do not have fault indication output.

**Blue/red color has priority - if ON and AMBER_ON inputs are active at the same time, the beacon will flash blue/red



⚠ WARNING

ALL CUSTOMER SUPPLIED POWER WIRES CONNECTING THE POSITIVE (+) OR NEGATIVE (-) BATTERY TERMINAL OR LOCAL CHASSIS GROUND (-) MUST BE SIZED TO SUPPLY AT LEAST 125% OF THE MAXIMUM CURRENT AND PROPERLY FUSED AT THE POWER SOURCE WITH APPROPRIATELY RATED FUSE.

ELECTRICAL INSTALLATION (CONTINUED)

Flash Patterns

1. The flash pattern of the beacon is set by temporarily applying +12 VDC to the ZM wire. Flash pattern functionality includes:
   a. Select alternating or simultaneous flashing
   b. Choose alternation of colors in two-color beacons
   c. Select flash mode (double flash, triple flash, etc.)

2. Checking Current Flash Pattern:
   a. Apply +12 VDC to the ZM wire for 2 seconds, until the the beacon stops flashing and changes to steady-on mode.
   b. Disconnect the ZM wire. The beacon will flash the number of indication flashes that correspond to the currently selected flash pattern.

3. Move Forward in the Flash Pattern Table:
   a. Apply +12 VDC to the ZM wire for >2 seconds and <4 seconds. The beacon will change to steady-on mode after 2 seconds and the increase in light intensity after 4 seconds.
   b. Disconnect the ZM wire. The flash pattern will advance to the next position in the table.
   c. The beacon will flash the number of indication flashes that correspond to the newly selected flash pattern.
   d. The beacon will resume flashing the newly selected flash pattern.

4. Move Backward in the Flash Pattern Table:
   a. Apply +12 VDC to the ZM wire for >6 seconds. The beacon will change to steady-on mode after 2 seconds and then increase in light intensity after 4 seconds.
   b. Disconnect the ZM wire after 6 seconds. The flash pattern will return to the previous position in the table.
   c. The beacon will flash the number of indication flashes that correspond to the newly selected flash pattern.
   d. The beacon will resume flashing the newly selected flash pattern.

Synchronization

1. Asynchronous Mode:
   a. The beacons are not synchronized in any way, each beacon flashes its own selected flash pattern. This mode is not permitted for dual color beacons.

2. Synchronous Mode:
   a. The beacons are synchronized with each other.
   b. Alternating, simultaneous, and other flashing modes are selected by setting the flash pattern of the individual beacons.

3. Synchronization of Beacons with a Lightbar:
   a. A beacon may be synchronized with a lightbar only if both the beacon and lightbar have the same number of LED colors. For example, a single color beacon may only be synchronized with a single color lightbar, while a 2 color beacon can be synchronized with a 2 color lightbar.
   b. To synchronize, connect the SYN wires of the beacon and lightbar. The desired flash pattern can be set by setting either the flash pattern of the beacons and/or the lightbar.

⚠ WARNING

Route wires only in locations that are not subjected to potential wear. Make sure to avoid routing wires in the deployment area of your airbag. Refer to your vehicle's owner's manual for airbag deployment zone.

IMPORTANT

WHEN PASSING CABLES THROUGH FIREWALL OR OTHER SHEET METAL, INSERT GROMMET TO PROTECT THE CABLE!

FLASH PATTERNS - SINGLE COLOR BEACONS AND BLUE/AMBER DUAL-COLOR BEACONS

Example of setting an alternating double flash for the left and right halves of the vehicle: set the beacon on the left to flash pattern 1 and the beacon on the right to flash pattern 4.

Alternating flash pattern: beacons mounted on the vehicle flash alternately when the beacons on one side of the vehicle (left) are flash first, followed by the beacons on the other side (right).

Simultaneous flah pattern: Beacons mounted on the vehicle flash simultaneously when they are active at the same instant. The main use for synchronization is for synchronizing the front and rear beacons on the same longitudinal half of the vehicle.

#	Name	TIMING PHASE
1	DOUBLE FLASH	PHASE 1
2	TRIPLE FLASH	PHASE 1
3	QUAD FLASH	PHASE 1
4	DOUBLE FLASH	PHASE 2
5	TRIPLE FLASH	PHASE 2
6	QUAD FLASH	PHASE 2

FLASH PATTERNS - BLUE/RED DUAL-COLOR AND BLUE/RED/AMBER* TRI-COLOR BEACONS

Example of setting simultaneous double flashes in the same color: set the same flash pattern on all beacons.

Example of setting alternation of sides (left and right half of the vehicle) and colors at the same time (color 1 left -> color 1 right -> color 2 left -> color 2 right): set beacon 1 to flash pattern 1 and beacon 2 to flash pattern 7.

For tri-color beacons, the amber LEDs are controlled seperately and should be programmed according to the "SINGLE COLOR BEACONS AND BLUE/AMBER DUAL-COLOR BEACONS" flash pattern table above.

#	Name	TIMING PHASE - COLOR 1	TIMING PHASE - COLOR 2
1	DOUBLE FLASH	PHASE 1	PHASE 3
2	TRIPLE FLASH	PHASE 1	PHASE 3
3	QUAD FLASH	PHASE 1	PHASE 3
4	DOUBLE FLASH	PHASE 3	PHASE 1
5	TRIPLE FLASH	PHASE 3	PHASE 1
6	QUAD FLASH	PHASE 3	PHASE 1
7	DOUBLE FLASH	PHASE 2	PHASE 4
8	TRIPLE FLASH	PHASE 2	PHASE 4
9	QUAD FLASH	PHASE 2	PHASE 4
10	DOUBLE FLASH	PHASE 4	PHASE 2
11	TRIPLE FLASH	PHASE 4	PHASE 2
12	QUAD FLASH	PHASE 4	PHASE 2

*For amber modules in a tri-color beacon, refer to the single color and blue/amber dual-color beacon flash pattern table

FUNCTIONAL CHECK AND FAULT INDICATION

The nROADS® H Beacon is equipped with internal diagnostics and fault indication capabilities. Optically, faults are indicated to the user by flashing and error code with reduced light intensity

Possible Causes of Faults

The operation and parameters of circuits belonging to one of the following four groups are continuously monitored:

1. Interal control electronics circuits
2. Supply voltage level
3. Load on the analog outputs of the lamp
4. Presence of LEDs and correct operation of the current sources

Operating mode and Error Mode

Switching on the Beacon:

If any fault is detected when the beacon is turned on, it enters an "error-mode" state. In this state the beacon is inactive and diagnostics with indication of the detected fault are triggered at approximately 5 second intervals.

- If the symptom of the detected fault disappears, the beacon automatically changes to operating mode and flashes in the selected flash pattern.
- If the fault symptom persists but does not prevent the basic function of the beacon, the beacon change to operating mode after approximately 20 seconds. This informs the user that the warning system may not be fully functional and inspection is required while still allowing emergency return of the vehicle.

Operation of the Beacon:

During operation, the beacon switches to error mode only if a critical fault is detected. With other types of faults, the beacon remains active and continues operating. The user will be informed of the persistent fault the next time the warning system is started.

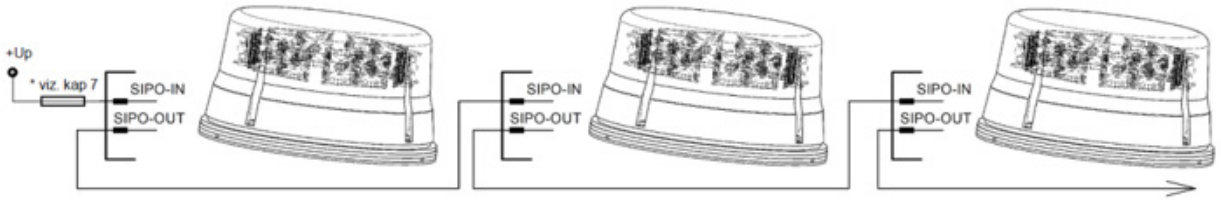
Fault Indication Flashes

In error mode, the type of fault is indicated by the number of flashes. The number of flashes corresponds to the number of the monitored parameter group. For example, a problem with the supply voltage level is indicated by 2 flashes. If multiple faults are detected at the same time, the indication flash groups follow one another in immediate succession.

Fault Indication - SIPO Bus

The SIPO bus is designed for the transmission of an analog signal in a daisy-chain configuration. The output of the previous device is connected to the input of the next device. Information about a fault of any beacon is thus transmitted onwards to the higher-level device, typically an amplifier, which evaluates the state and reacts accordingly.

For proper operation of the SIPO bus, the SIPO-IN input of the first device on the bus must be connected to logic H (+Up). During fault-free operation, or in the case of a non-critical fault, the +Up signal is available at SIPO_ OUT. In the event of a serious fault, the output is disconnected.



SIPO bus - daisy-chain configuration

WARRANTY & RETURN GOODS PROCEDURE

CLEANING & CARE OF YOUR LIGHTBAR:

Keeping the lenses clean and scratch free will optimize the performance of the lightbar. The exterior of the lightbar including lenses should be cleaned with mild soapy water and a soft cotton cloth to remove dirt, grime and insects. Never use window cleaners or harsh chemicals on the lenses; this may cause failure of the lenses or reduce clarity resulting in the reduction of light output.

MOUNTING INTEGRITY:

A review of bolt/hardware/mounting bracket integrity should be performed at the beginning and end of each shift.

WARNING MESSAGES - PLEASE READ:

WARNING - DRILLING ANY HOLES INTO THE LIGHTBAR IS NOT RECOMMENDED! THE RISK OF DAMAGING INTERNAL COMPONENTS AND THE RESULTING FAILURE OF THE LIGHTBAR WILL VOID ANY WARRANTY OF THIS PRODUCT.

WARNING - CARE MUST BE TAKEN WHEN DRILLING THROUGH THE ROOF OF THE VEHICLE NOT TO DRILL INTO ANY EXISTING WIRING AND NOT TO DRILL THROUGH THE HEADLINER OR SUPPORT MEMBERS OF THE VEHICLE. CHECK BOTH SIDES OF THE MOUNTING SERVICE PRIOR TO DRILLING. DE-BURR ANY HOLES AND REMOVE ANY METAL SHARDS OR REMNANTS. INSTALL GROMMETS INTO ALL WIRE PASSAGE HOLES.

WARNING - ROUTE WIRES ONLY IN LOCATIONS THAT ARE NOT SUBJECTED TO POTENTIAL WEAR. MAKE SURE TO AVOID ROUTING WIRES IN THE DEPLOYMENT AREA OF YOUR AIR BAG. REFER TO YOUR VEHICLE OWNER'S MANUAL FOR AIR BAG DEPLOYMENT ZONES.

WARNING - ALL CUSTOMER SUPPLIED POWER WIRES CONNECTING TO THE POSITIVE (+) OR NEGATIVE (-) BATTERY TERMINAL OR LOCAL CHASSIS GROUND (-) MUST BE SIZED TO SUPPLY AT LEAST 125% OF THE MAXIMUM CURRENT AND PROPERLY FUSED AT THE POWER SOURCE WITH APPROPRIATELY RATED FUSE.

IMPORTANT: When passing cables through fire wall or other sheet metal, insert grommet to protect the cable!

WARRANTY RETURN PROCESS:

Please contact our Technical Department (800-338-7337) for a RMA #, Return Merchandise Authorization Number.

The following information is required for issuance of the RMA #:

- Reason for returning the product*
- Address where replacement product is to be shipped*
- Telephone number where you may be reached*
- SoundOff Signal invoice number on which product was purchased**
- SoundOff Signal part number and serial number**
- E-mail address where RMA # should be e-mailed**
- Fax number where RMA # should be faxed**

* RMA # will not be given without this information.
** If available, please provide this information.

SoundOff Signal will NOT accept returns without an RMA #. Each RMA # is good for only one (1) return and will expire (10) days after the date it was issued. Products must be shipped back to SoundOff Signal and the RMA # clearly marked on the outside of the package near the shipping label. Please use the following address on your shipping label:

HOLOMY s.r.o.
ATTN: RMA # / Technical Services
Hemy 829
757 01 Valašské Meziříčí, Czech Republic

WARRANTY EXCLUSIONS:

Shipping & Handling, labor and service fees are non-refundable. SoundOff Signal is not liable for any damage due to installation or personal injury as a result of using SoundOff Signal product.

WARRANTY FORFEITURE:

Warranty will not be granted if the Warranty Return Policy & Procedure rules are not strictly followed. Physical damage resulting from customer abuse will void warranty. Warranty will also be voided if any SoundOff Signal and/or manufacturer serial tags, product stickers, seals, or the like, are removed, altered or tampered with. Returned product that is damaged by shipping via the RMA # procedure is not the responsibility of SoundOff Signal.

Document effective date on cover and below supersedes previously dated policies and statements.

There are no other warranties, expressed or implied, including, but not limited to, any implied merchantability or fitness for a particular use. SoundOff Signal reserves the right to modify this warranty statement at any time; or to discontinue, modify, or upgrade any products of its manufacture with design improvements without prior notice.