



KH INDUSTRIES

The Permanent Name in Temporary Lighting & Power



NightRay™ with Long Range Remote

Operator and Service Manual

Introduction

Congratulations on the purchase of a new NightRay™ Spotlight with Long Range Remote Control. The NightRay LR has been designed for use in adverse environmental conditions with all corrosion resistant materials. A "slip drive" protects the drive unit from damage should manual positioning of the light be required. A wireless remote or wired controller operates the spot or spot-flood combination lamp and the vertical and horizontal movement of the beam. With normal care, this light will give many years of service. NightRay LR is manufactured in the USA to exacting standards for performance, convenience and reliable service.

Contact KH Industries

For questions, sales or service please contact:

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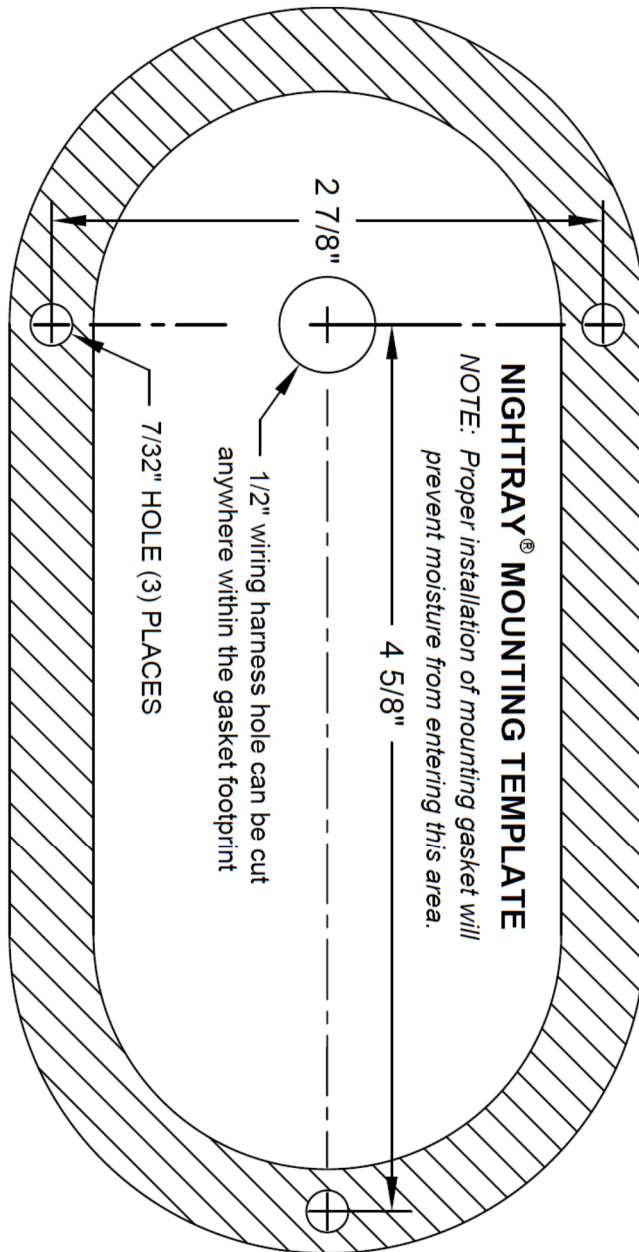
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Warnings

READ ALL WARNINGS BEFORE USING OR INSTALLING THE NIGHTRAY LR!

IMPORTANT! This light can cause fatalities if shined at a person operating a motor vehicle. Some municipalities require work lights to be covered while vehicle is driven.

Consult local laws before placing this light in operation.

DO NOT use light on road or highway. This device is intended for off-road use only.

DO NOT shine light into anyone's eyes, especially if operating a vehicle or other equipment.

DO NOT use light in explosive atmosphere. This device is NOT explosion proof.

DO NOT touch hot lamp. Allow lamp to cool before replacing.

DO NOT leave light face down on any surface during operation. Fire or surface damage may result.

DO NOT place arms or legs near device when operating. Observe pinch points and keep clear.

DO NOT submerge the remote in water.

DO NOT attempt to service the NightRay LR. Return to KH Industries for repairs.

ONLY ELECTRONIC TECHNICIANS (QUALIFIED BY KH INDUSTRIES) SHOULD ATTEMPT TO MAKE REPAIRS TO THE ELECTRONIC CIRCUITRY. IF PROPER TESTS AND REPAIR PROCEDURES ARE NOT FOLLOWED, DAMAGE MAY OCCUR AND WILL VOID THE WARRANTY.

KH INDUSTRIES ASSUMES NO LIABILITY FOR DAMAGES RESULTING FROM MISUSE OR ABUSE OF THIS PRODUCT.

The NightRay LR package includes the following items:

- NightRay LR Light
- Mounting gasket
- 8-32x1" mounting screws with nylon insert lock nuts
- Crimp terminals
- Long range wireless remote and/or wired controller and hardwire connection kit

Important! Read all installation procedures before beginning installation.

NightRay LR Spotlight Installation

1. Select a mounting location that will provide sufficient strength to support the light and provide access to the wiring.
2. Use the mounting template provided to locate and drill three 7/32" diameter holes in the mounting surface.
3. Drill one 1/2" diameter hole within the inner ring of the template for access to the wiring.
4. Align the mounting gasket to bottom of light base.
NOTE: Do not allow corrosive sealants (such as silicone sealant) to come in contact with the housing. Proper installation of the mounting gasket will prevent moisture from entering the housing.
5. Use 12 AWG or larger wire and terminations to extend the yellow and black wires and route them to a protected 15 amp 12 volt power source.
6. Route the wires through the 1/2" hole and connect with the crimp terminals.
7. Protect all wires from sharp edges to prevent chaffing.
8. Secure the light to the mounting surface with the screws and nuts provided.
9. Connect the black wire to the **negative** supply.
10. Connect the yellow wire to the **positive** supply.

Troubleshooting Guidelines:

Fault	Possible Problem
No motion and light does not turn on	<ul style="list-style-type: none"> • No 12VDC power at the light (black negative, yellow positive) • Batteries in remote are depleted • Remote and light are not paired • Wrong A or B channel selected • A second remote is still connected. Any number of remotes can be paired with a light but only one remote can be connected at a time. Hold the OFF pushbutton of the active remote for 5 seconds to release a connection.
Light does not turn on or flashes and goes out but motion works	<ul style="list-style-type: none"> • Filament is burned out • High inrush current of the HID, Halogen and Incandescent lamps can cause a voltage drop and controller drop out, make sure the feed wires are large enough for the wire length and the engine is running. • Poor or corroded power or ground connection
Tilt direction is reversed	If the tilt motion passes through the vertical position, the control tilt direction will appear to be reversed. Either pass back through vertical or, with power to the light and the lamp off, hold the UP and DOWN pushbuttons for 10 seconds to reverse control
Pan direction is reversed	If the NightRay LR is mounted upside-down or the tilt motion passes through the vertical position, the left and right direction will appear to be reversed. With power to the light and the lamp off, hold the LEFT and RIGHT pushbuttons for 10 seconds to reverse control



IMPORTANT FCC INFORMATION

(Contains FCC ID: WAP2006 IC: 7922A-2006)

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one of the following measures:

- Reorient or relocate the receiving antennae.
- Increase the separation between the equipment and receiver.
- Connect the equipment on a circuit different from that which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



FCC CAUTION:

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. ***KH INDUSTRIES INC. ASSUMES NO LIABILITY FOR DAMAGES RESULTING FROM MISUSE OR ABUSE OF THIS PRODUCT***

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

- (1) this device may not cause interference and*
- (2) this device must accept any interference, including interference that may cause undesired operation of the device.*

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence.

L'exploitation est autorisée aux deux conditions suivantes :

- (1) l'appareil ne doit pas produire de brouillage, et*
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.*

Remote Specifications:

Model	NR2CB-W (Wireless)	NR2C-H (Wired)
Power supply	Three AAA Batteries	Powered from light
Flashlight	Three LED	None
Communication	Low Energy	6 wire cable
Light Control	Two lights	One light
Battery Life	One year depending on usage	N/A
Hardwire Connection Kit	-	KH200-01510

Lamp Replacement:

1. The NightRay LR lamp is held in place with a retaining ring. To remove the retaining ring, slide a small thin screwdriver under the retaining ring near one of the retaining pins and carefully push the rim over the pin.
2. Disconnect the wires and connect them to the replacement lamp.
3. Insert the lamp into the housing.
4. Slide the retaining ring over the lamp while aligning holes of the retaining ring with the pins on the housing and snap in place.

NightRay LR PC Board Replacement: (KH200-02871)

1. The PC board is potted into the back cover of the NightRay LR light. To remove the cover, slide a small thin screwdriver under the cover near one of the retaining pins and carefully push the cover over the pin.
2. Disconnect the wire harnesses and reconnect them to the new cover.
3. Slide the cover over the housing while aligning the holes of the cover with the pins on the housing and snap in place.

NOTE:

An existing NightRay wireless light (433.92MHz) can be converted to a NightRay LR system by ordering kit KH200-02998 which includes a NR2CB-W remote and a KH200-02871 cover with transceiver board. The Long Range system adds interference free control up to 200', variable rate speed and the exclusive tilt and roll control.

Warranty:

This product has a five-year limited warranty from factory defects on parts and labor as per the **KH Industries Terms and Conditions of Sale** distributed with the product invoice.

Wired Controller Installation (NR2C-H)

The NR2C-H wired controller is powered by the NightRay LR light control board and does not require batteries.

1. Connect the 35 foot long extension cable to the connector in the base of the NightRay LR.
2. Route the extension cable into the cab of the vehicle.
3. Select a mounting location for the controller bulkhead connector and drill a 1" diameter hole.
4. Use the connector to locate and drill two appropriate sized holes and secure the connector to the mounting surface with two #4 flathead thread cutting screws or machine screws and nuts. (not provided)
5. Connect the extension cable to the back of the connector and the coil cable to the front.
6. Connect the coil cable to the wired controller.

Wireless Remote (NR2CB-W)

- The NR2CB-W wireless remote is powered by three AAA batteries. The batteries can be replaced by removing the two screws securing the battery cover on the back of the remote.
- The remote can remember two paired lights red (A) and green (B) that is retained even when the batteries are changed.
- The red (A) and green (B) control can be paired to the same light.
- Any number of remotes can be paired with a NightRay LR light.
- The red or green LED will stay lit while it is connected to the NightRay LR light. It will release connection after 15 minutes or if the **OFF** pushbutton is held for 5 seconds.
- If your NightRay LR light was ordered with a wireless remote, it is factory paired to the NightRay LR. Use the following procedure to pair the NightRay LR light to additional remotes:
 1. Connect power to the NightRay LR light.
 2. Bring the remote to within 10 feet of the NightRay LR light and make sure any other NightRay LR lights are farther than 20 feet away or not powered.
 3. Make sure the light is not currently connected to another wireless remote. (Hold the off pushbutton for 5 seconds to release a connection.)
 4. Press and hold the **A/B** pushbutton for either green or red control until both red and green LEDs come on (10 seconds)

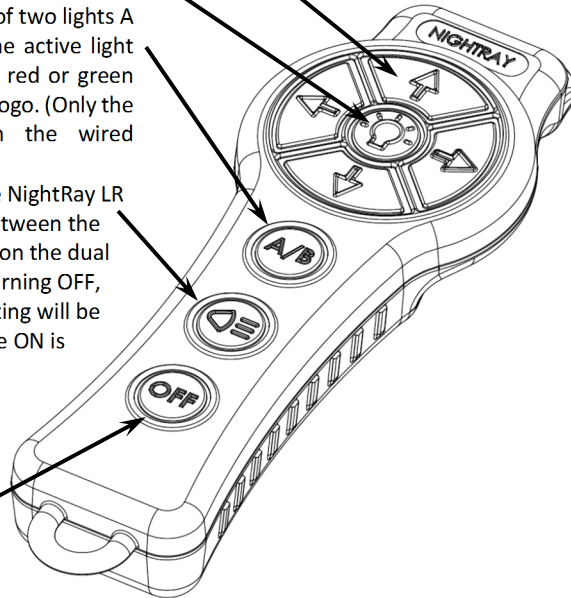
NOTE:

Both red and green LEDs will light while the remote searches for the NightRay LR light. Once the remote is paired with a NightRay LR light, the red or green LED will stay lit corresponding to the one that was selected. The corresponding green or red LED will flash while a command is actuating the light.

Remote Control Operation

Two controllers are available, a wired controller which will control one NightRay LR, and a wireless remote which can control two NightRay LR lights independently. Each light can be paired with any number of wireless remotes but only one wireless remote can be connected and in control at a time. A wired controller will take precedence over a wireless remote. The controllers have eight push buttons:

- **UP, DOWN, LEFT, RIGHT** controls the tilt and pan motion direction.
- **FLASHLIGHT** (only on the wireless remote) will shut off after 1 minute to conserve battery power.
- **A/B** pushbutton control of two lights A and B independently. The active light control is indicated by a red or green LED within the NightRay logo. (Only the red LED is active on the wired controller)
- **ON** pushbutton turns the NightRay LR lamp on and will cycle between the flood and spot filaments on the dual filament models. After turning OFF, the last flood or spot setting will be recalled the next time the ON is pressed.



- **OFF** pushbutton turns the lamp off. If held for 5 seconds, the wireless remote will go to sleep and disconnect communication from the light to enable another wireless remote to take control.
- **SLOW START:** To provide more accurate control, the pan and tilt motion will operate at a slow speed for the first 1-1/2 seconds and then revert to full speed.
- **TILT & ROLL CONTROL:** (only on the wireless remote) With the light on, press and hold the **ON** pushbutton then tilt the remote up or down and/or roll the remote left or right to control the tilt and pan motion.

Reversing the UP/DOWN or LEFT/RIGHT Control

NOTE: If using a wireless remote, first make sure it is paired to the NightRay LR light.

1. Connect power to the NightRay LR light and make sure the lamp is off.
2. To reverse the tilt direction, **press and hold** the **UP and DOWN** pushbuttons for 10 seconds.
3. To reverse the pan direction, **press and hold** the **LEFT and RIGHT** pushbuttons for 10 seconds.
4. Release the pushbuttons when the lamp comes on indicating the change has been accepted.

The change is stored in the NightRay LR light and will apply to all remotes connected to the light.

NightRay LR Long Range Specifications and Part Numbers:

Model Series	NR4SB-1L030B	NR4SB-1D050B	NR4SB-1H130B	NR4CB-1C100B	NR3CB-1C100B
Lamp Type	LED	HID	Halogen	Incandescent	Incandescent
Filaments	1	1	1	2	2
Lamp Life (hrs.)	50,000	2,000	225	25	25
Diameter (PAR)	5.75" (46)	5.75" (46)	5.75" (46)	5.75" (46)	4.5" (36)
Voltage (VDC)	12	12 (24 option)	12	12	12
Current (Amps)	2.5	4	11	8	8
Standby (mA)	20	20	20	20	20
Color CCT (K)	6,000	4,150	3,000	2,800	2,800
Part numbers:					
Replacement Lamp	KH200-00786	KH200-00754	KH200-00261 (incl. lamp & housing)	KH200-00059	KH200-00134
Replacement Housing	-	KH200-00938	-	-	-
Retainer Ring	KH200-00152	KH200-00152	KH200-00152	KH200-00152	KH200-01157
Mounting Gasket	KH200-00257				
Material	UV resistant Polycarbonate/ABS blend				
Pan	370°				
Tilt	250°				