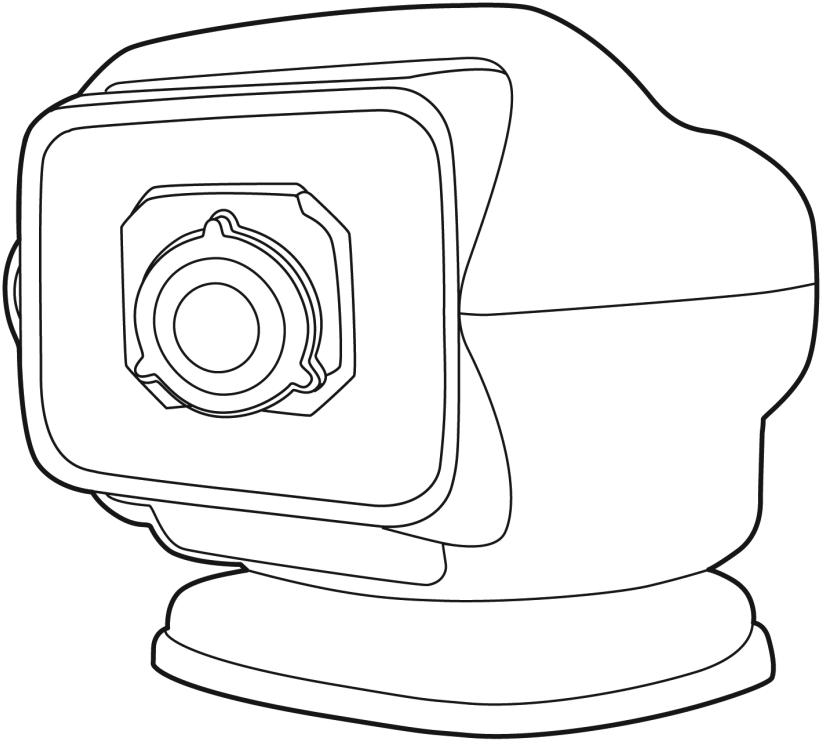


HELIOS

(Heat Enhanced Low-Light Imaging Observation System)



Instruction Manual

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Introduction: Overview

The Helios is a state-of-the-art thermal imaging system that will provide you with excellent night visibility and situational awareness, without any form of natural or artificial illumination.

The Helios system is designed for simple, intuitive operation. The basic system includes a camera assembly, wireless remote and/or a wired joystick control panel. The system offers 370° horizontal rotation and a 135° vertical tilt with fingertip controls. The Pan/Tilt operation has two speeds (Fast/Slow) that are determined by pressing the speed button on the remote control.

The Helios operates using standard 12 VDC battery power and the images from the 320 x 240 pixel detector are compatible with virtually any existing display and recorder that accepts composite video.

The Helios is compatible with standard NTSC output, the same format used on common television and VCR video input in the Americas and some Asian countries. It is also available with PAL output by special order.

The Helios features a wide field-of-view and is capable of providing an image even in absolute darkness.

Thermal Imaging Driver Vision Enhancement System

The Helios utilizes the FLIR Systems, Inc. uncooled microbolometer camera which is a high performance, rugged, thermal imaging camera designed to provide driver vision enhancement in adverse weather conditions and better situational awareness than with traditional head lamps.

Different than visible light cameras, thermal imagers do not display reflected light as seen with human eyes. Rather, thermal imaging cameras only 'see' temperature differences which are converted into shades of grey, from black and white. The Helios camera displays cold objects as black and hot objects as white.

When using a thermal imager in darkness, the image is created based on temperature differences of objects in the field of view, rather than reflected light.

Furthermore, because thermal imaging cameras only 'see' heat sources and not reflected light, they are ideal to assist with driver vision and situational awareness for oncoming obstructions such as animals, people, and other vehicles.



The above images show a comparison of typical night time driving compared to using the Helios thermal imager. The image on the left is from an ordinary digital camera and shows the amount of visible light as illuminated by oncoming headlights. The image on the right is a thermal image created by the Helios thermal imaging camera. Note the Helios camera is sensitive to warm objects, such as the people, and provides visibility over a much greater distance.

Although adverse conditions such as heavy fog will affect any driver vision enhancement system, thermal imaging cameras such as the Helios have been shown to continue to provide useful information in conditions of reduced visibility, such as haze and smoke. While the Helios can assist drivers with detection of obstructions in the vehicle's path, thermal imagers should not be used as the sole vision method of the driver.

The Helios is specifically designed to withstand harsh environments, with a hermetically-sealed external housing resistant to rocks, sand, salt, and other contaminants. Additionally, the wide operating temperature range allows the Helios to maintain high performance in severe weather conditions.

Introduction: Getting Started

The thermal imaging camera inside the Helios is completely sealed and extremely rugged. The camera has been qualified for operation in all types of weather conditions over the specified operating temperature range and includes an automatic window heater that will prevent icing under most conditions.

Using your Helios

The Helios is easy to use, but you should take a moment to carefully read this section so you fully understand what you are seeing on your display. While the imagery you will see on the monitor may look like black and white daylight video, it isn't! A few tips on how to interpret some of the imagery will help you to make the most of your system.

The camera automatically adjusts to changing scene conditions so no additional camera control is necessary. Scenes with familiar objects will be easy to interpret with some experience. The camera automatically optimizes the image to provide you with the best contrast in most conditions.

The thermal imager inside the camera does not sense light like conventional cameras; it senses heat or temperature differences. As you experiment with the system during nighttime operation, you will notice variances in the “picture quality”; this is normal. The camera senses small “differences” in apparent radiation from the objects in view, and displays them as either white (or lighter shades of gray) for warmer objects, and black (or darker shades of gray) for colder objects.

Initial System Startup

The Helios camera requires power and a connection to an external monitor to provide imagery. Make sure to test the system prior to installation to assure the system is functioning properly. Be sure to remove the protective window sticker prior to test and installation.

Upon initial power up you will hear a slight clicking sound. This click is the internal image correction. This noise is the mechanical shutter assembly which will cause the image to momentarily “freeze.” This noise and image freezing will occur until the unit has reached a thermally stable temperature and periodically thereafter. See “Automatic Shutter” on page 5

General Information

On/Off function of the thermal camera is performed by depressing the On/Off button on the Remote Control.

Note: The camera should be turned off when not in use to avoid unnecessary power drain from the electrical system.

With the 4-way arrows on the remote control, rotate the camera to the desired location. Depending upon conditions, the wireless remote may be used up to 100 feet away from the Helios.

The speed of the camera rotation can be controlled by depressing the fast/slow button one time and by depressing it again to restore the original speed.

Warranty Information

1-year Limited

Golight, Inc. warrants the Helios against any deemed defects that are due to workmanship for parts of faulty materials, for one year from the date of the original purchase. The warranty of the Helios does not cover damage resulting from unreasonable use or misuse, unreasonable maintenance or loss, or labor costs.

Mounting the unit upside down will void the warranty.

If the Helios does fail to operate under warranted specifications, send the camera and remote controls postage paid, plus \$9.95 for shipping and handling to : Golight, Inc • 37146 Old Hwy 17 • Culbertson, NE 69024. No C.O.D.'s accepted. Only the above manufacturer is authorized to perform warranty repair or replacement of the product.

Any consequential damages to person or property are excluded from this warranty. Some states do not allow the exclusion and limitation of incidental or consequential damages, therefore the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights.

Maintenance

Product Cleaning

Caution! Do not open the camera body for any reason. Disassembly of the camera (including removal of the cover) can cause permanent damage and will void the warranty.

Your Helios camera generates images through an infrared transparent window. This window is designed for harsh automotive and marine environments, but may require occasional cleaning. It is suggested that you clean the window of the Helios when image quality degradation is noticed or excessive contaminant build-up is seen on the window.

The camera housing has a durable coating and the rugged protective window is designed to withstand normal cleaning. If the front window of the Helios gets water spots, wipe it with a clean soft cotton cloth dampened with fresh water. If the window requires further cleaning, use a soft moist cotton-based cloth with isopropyl alcohol or dish soap.

Do not use abrasive materials, such as paper or scrub brushes as this will possibly damage the window by scratching it. Only clean the window when you can visually see contamination on the surface.

Temperature

The Helios camera has an operating temperature range of -40°C to 80°C.

Choose an installation location so that the Helios is not subject to temperature extremes that exceed this range.

Maintenance

If you have problems, do not attempt to repair the Helios unit yourself. The Helios camera is a water-tight, sealed unit and can not be opened or serviced in the field. Consult your installation dealer or manufacturer.

If the camera will not produce an image, check the video connection at the camera and at your display. If the connectors appear to be properly engaged but the camera still does not produce an image, have an authorized service representative make the appropriate repairs.

About The Product

Heater Element

The Helios has a built-in heating element to stabilize the window and prevent ice build-up in cold weather conditions. The heating element is automatically turned on when the temperature of the window falls below 4°C and is turned off when the temperature reaches 6°C.

Automatic Shutter

The Helios incorporates an automatic image correction feature via the internal calibration shutter. This shutter will activate every 2 minutes or more frequently during initial start up and large environmental temperature changes. During this function, the image will be “frozen” for approximately half a second. The frozen image will display a small white box in the left middle portion of the image during this calibration.

In Case of Difficulty

The Helios comes with a 12 month limited warranty from the date of purchase. DO NOT OPEN, MODIFY, or ALTER the Helios unit or accessories. Doing so will void any warranty and may cause system malfunction, loss of performance, fire, or bodily harm.

The Helios is a highly sophisticated electronic imaging system. Should the system fail for any reason, do not attempt to fix the system or wiring cables yourself. Check wiring connections, power input, video output. If system is not performing, please contact the manufacturer at 800-557-0098 and ask to speak to the service department. You will need the serial number of the unit to obtain a Return Goods Authorization.

Troubleshooting

No Video

No video image but the system is running and has power supplied to it. Place your ear next to the camera unit. If you hear the mechanical shutter (clicking noise) but you are not getting an image, check the video connections. The Helios works with the most standard NTSC or PAL monitors that have 75 ohm input.

No Video, no clicking

If video is not displayed and you do not hear a “clicking” sound from the Helios, check the power inputs and remote control batteries if applicable. The Helios runs on 6VDC to 16VDC power through the 25 foot power cable. If this voltage is exceeded the unit will not function and may be damaged. The Helios is equipped with an automatic heating element which turns on in colder temperatures. The heater requires a few moments to stabilize the window. Once the window is thermally stabilized the heating element will turn off automatically.

The image has “lines” or screen door appearance

Check to see if the image “freezes” or if you hear a mechanical “clicking noise” from the Helios unit. If you do not see the image freeze momentarily (this may take a few minutes), the internal shutter may be damaged. Contact manufacturer.

The image is shaky

Check your mounting. The Helios does not incorporate image stabilization and must be mounted soundly and securely.

Image is dim

Check your monitor and video connections. It is recommended that you use separate power supplies for the Helios and the local display to make sure you have clean uninterrupted power.

Also, verify the Helios is connected to the 75 ohm input on the monitor. The image may be dim if the camera is connected to an input that requires a different impedance.

The image is dark and no objects are seen

Recycle the power and see if you get the “Splash Screen” on the display. If you get the Splash Screen but no image afterwards (only a black screen), check to make sure that the window is clear of all obstructions (refer to the maintenance section for information on window cleaning). If you do not see the Splash Screen, check the power input and video output.

If you see the Splash Screen but no image afterwards, it is possible the mechanical shutter is stuck in the on position. Contact manufacturer.

Parts List

Helios w/Wireless Remote Controls:

- Helios Camera
- 7” LCD Video Monitor w/ Mounting Hardware
- 25’ Video Cable w/BNC Connectors
- BNC to RCA Adapter
- Wireless Handheld Remote Control
- Wireless In Dash Mount Remote Control
- Mounting Hardware
- Color: Black 3349 / White 3367

Helios w/Wired In Dash Remote Control:

- Helios Camera
- 7” LCD Video Monitor w/ Mounting Hardware
- 25’ Power/Remote Control Cable
- 25’ Video Cable w/BNC Connection
- BNC to RCA Adapter
- Wired Joystick Control
- Mounting Hardware
- Color: Black 3321 / White 3320

Mounting & Electrical Installation for Camera System with Wireless Remote System

Determine the location for the system on your vehicle or boat. Locate the down arrow on the base of the camera; this is to face forward and orient the camera for full rotation. The camera will rotate 190° to the left and right. Center the mounting plate with the vise screw on the mounting plate to the back. Mark the hole locations for the three mounting screws and drill a pilot hole for each with a 1/8 inch bit. Prior to mounting the plate, note the center of the plate and draw a circle for the wiring hole. Wireless systems will require a ¼" hole to accommodate the power & video wiring.

Fasten the stainless steel mounting plate with the included mounting screws; 3 ea. #10-16x3/4 type AB cross recessed pan head tapping screws. Finish the installation with silicone sealant in each screw hole before tightening down the mounting plate. Install the provided grommet in the ¼" hole. Bring the power and video control cords through the grommet allowing for 1" of slack under the light. It is suggested that the grommet hole is then sealed with a marine grade silicone sealant to prevent leakage.

Note: Manufacturer is not liable for any leakage due to installation of the Helios.

It is recommended that the 12V power wire input be joined to the leads of the camera using the appropriate automotive or marine grade wire attachments. Each camera needs to be wired on a single dedicated circuit and the power be fused at a minimum of 5 amps. It is also recommended that the power wire be connected to an ignition circuit or a separate on/off toggle between the camera and power source.

The 25' BNC Cable includes a BNC to RCA adapter for adaptation to a wide variety of displays. The BNC cable needs to be attached and locked into the camera's BNC jack and then run to the display that is used. *Note: If a display is included, please see the instructions for mounting and wiring the display. Display and Camera must be wired to separate power circuits for proper installation.

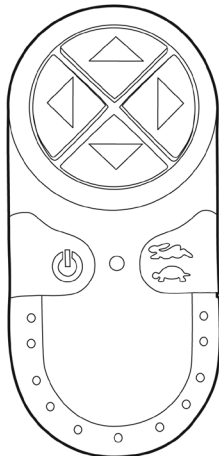
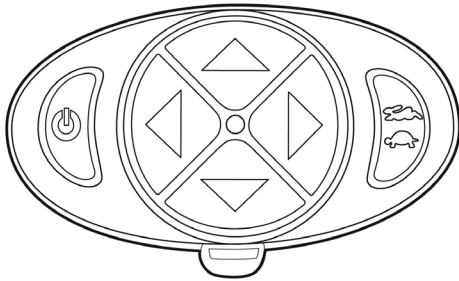
Attaching the camera to the mounting plate

To attach the camera to the mounting plate, lift up the back of the gasket slightly to show the hole for the vise screw. Do not try to completely remove the gasket or it may tear out of the gasket mounting points. Wet the mounting surface with a small amount of water or lubricant for easier installation, then place the camera over the mounting plate by sliding the front of the camera

over the front of the mounting plate. First pull the camera backwards, then seat the back of the camera on to the mounting plate. Displace the back of the gasket, line up the hole and install the vise screw (provided). Tighten the vise screw using a Phillips head screwdriver. Replace the gasket to finalize the installation.

Wireless Remote Controls:

The wireless remote control units included are one dash mount and one hand-held. They use buttons to perform the on/off and pan/tilt functions of the camera. All systems have a main on/off switch for the camera itself. It is suggested that the Helios camera be turned off until it is needed; this will save power consumption and unnecessary draw on the battery. There are also buttons for fast/slow operation of the pan/tilt mechanism of the system. The Turtle Button is the slow function and the Rabbit Button is the faster function for the camera. To install the dash mounted wireless remote, remove the cover and install four screws into the mounting holes and replace cover. The On/Off button should be at the left side of the remote.



Wireless Remote Controls: Programming

Wireless In-Dash & Hand-Held Remote Control Programming:

The camera is controlled with a programmable remote with different channels. This feature allows you freedom to change the channel selection, and the receiver relearns the new selection.

Programming the transmitter

This camera has been pre-programmed at the factory, and is not necessary to re-program the transmitter, unless you experience outside interference.

Important Note: Disconnect power by removing fuse or disconnecting vehicle battery.

1. Remove battery cover from remote control.
2. Set the 7 dip switches to a selection of your choice. There are 3 positions on each; positive, negative and neutral. Use a small screwdriver and select a position for each dip switch. Please note that the orientation of the +/- switch positions may vary among different models of wireless remote controls.
3. Make sure batteries are installed correctly and have adequate charge.
4. Replace battery cover.
5. Depress the on/off button and hold it down. Red LED will light.
6. While holding the on/off button down, reinstall the power.
7. Keep your finger on the on/off button for 5-6 seconds, and then release. The camera should now be programmed.

Mounting & Electrical Installation for Cameras with Hard-Wired Remote Controls

Determine the location for the system on your vehicle or boat. Locate the down arrow on the base of the camera; this is to face forward and orient the camera for full rotation. The camera will rotate 190° to the left and right. Center the mounting plate with the vise screw on the mounting plate to the back. Mark the hole locations for the three mounting screws and drill a pilot hole for each with a 1/8 inch bit. Prior to mounting the plate, note the center of the plate and draw a circle for the wiring hole.

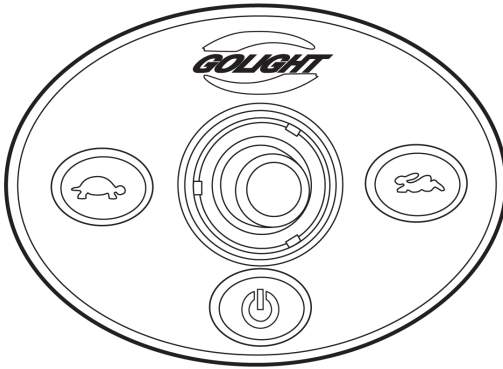
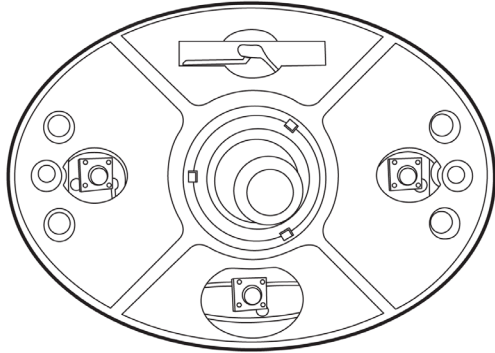
Wired toggle systems will require a 3/4" hole to accommodate the power & video wiring.

Fasten the stainless steel mounting plate with the included mounting screws; 3 ea. #10-16x3/4 type AB cross recessed pan head tapping screws. Finish the installation with silicone sealant in each screw hole before tightening down the mounting plate. Install the provided grommet in the 3/4" hole. Bring the power and video control cords through the grommet allowing for 1" of slack under the light. It is suggested that the grommet hole is then sealed with a marine grade silicone sealant to prevent leakage.

Note: Manufacturer is not liable for any leakage due to installation of the Helios.

Install the in-dash remote control using the mounting holes in the remote assembly. The mounting holes are exposed by removing the rubber molded cover from the remote assembly. A 2" diameter hole needs to be drilled to accommodate the remote control. A 3" minimum depth will be required to accommodate the remote control and wiring. Place the remote in the hole and use the four mounting holes as guides for pilot holes for the included screws. The arrow under the rubber cover should be pointed up for proper installation. Do not screw the remote control into the dash until the electrical system installation has been performed and tested.

Hard-Wired Remote Controls



The remote control has Red (+) and Black (-) power leads for the camera system. It is recommended that these be joined using the appropriate automotive or marine grade wire attachments. Each remote needs to be wired on a single dedicated circuit and the power be fused at a minimum of 5 amps. It is also recommended that the power wire be connected to an ignition circuit or a separate on/off toggle between the camera and power source. Once the power leads are attached, the 20' wire harness needs to be attached to the appropriate 2 and 4 pin connectors to connect with the camera.

The 25' BNC Cable includes a BNC to RCA adapter for adaptation to a wide variety of displays. The BNC cable needs to be attached and locked into the camera's BNC jack and then run to the display that is used. *Note: If a display is included, please see the instructions for mounting and wiring the display. Display and Camera must be wired to separate power circuits for proper installation. See "Attaching the camera to the mounting plate" on page 8

Performance Specifications

Thermal Imaging Performance

Sensor Type: Uncooled microbolometer

Field Of View: 36° h x 27° v

Spectral Band: 8-14 Micron Long Wave Infrared (LWIR)

Resolution: 320 x 240 pixels

Time to Image: < 2 sec.

Focal Length: 19 millimeters

Housing Enclosure

Pan/Tilt: 370° Rotation - 135° Tilt

Speed: Fast / Slow

Operation: Wired / Wireless Remote Control Options

Outputs

Video: NTSC or PAL

Connector types: Power (+/-) Video BNC/RCA

Frame Rate: 30-Hz for NTSC Video, 25 Hz for PAL video < 9 Hz Export Compliant

Note: Hz is equivalent to frames per second

Power

Power Requirements: 12 VDC nominal (range 6VDC to 16VDC)

Power Consumption: 2 Watts (nominal) 8 Watts with heater turned on

Environmental

Operating Temperature: -40°C to +80°C

Impact Protection: High-impact resistant window with heating element

Weather Resistance: Hermetically sealed, pressurized enclosure

Dimensions and Weight

Dimensions (6.75" x 7.25" x 8")

Weight: 4 Lbs.

Mounting Points: Three Screws

Warnings and Cautions

Caution! This guide uses the term Caution to indicate a potentially hazardous situation, which, if not avoided, may result in injury, damage to the vehicle, Helios or other property damage.

Do not operate any function that takes your attention away from safely driving your vehicle.

Any function that requires your prolonged attention should only be performed after coming to a complete stop. Always stop the vehicle in a safe location before performing these functions. Failure to do so may result in an accident.

Consult your local and state driving regulations prior to installation.

In many states, using active monitors in view of the driver is prohibited. Consult your local and state driving regulations for laws and guidelines. User assumes all risks and indemnifies the manufacturer from any liability that may arise from the use of this product.

Minimize display viewing while driving.

Viewing the display may distract the driver from looking ahead and may result in an accident. The Helios thermal imaging system should not be used as a substitution for head lamps or head lamp assisted human vision during vehicle operation.

Use this product for 12 VDC applications only.

Use for other applications may result in excess heat, fire, equipment malfunction and may void the limited warranty.

No Export

Notice: All thermal imaging systems are subject to export control. Standard NTSC (30Hz) and PAL (25Hz) units are subject to export restrictions and licensing by the United States Government. Models with video frame rates at or below 9Hz do not require licensing but do require compliance with other export laws. Please contact Golight Inc's export Dept. for further information.

Warnings

The Helios complies with Part. 15.105 of the FCC Rules. This equipment has been tested and found to comply with the limits for a Class B digital device.

These limits are designed to provide reasonable protection against harmful interference in a mobile or 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 to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced technician to help.

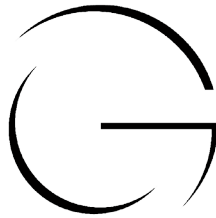
*FCC RULE Part. 15.21 – Changes or modifications made by the user not expressly approved by Golight, Inc. for compliance could void the user’s authority to operate the equipment.

Your Helios wireless remote control is a radio transmitter and receiver operating at 433MHz. Whenever the light is on, the internally mounted antenna sends out and receives radio frequency (RF) energy.

Modern electronic equipment, i.e. personal medical devices such as pace-makers, hearing aids, etc., are shielded from RF energy. However, RF energy may affect some electronic equipment.

Vehicle electronic systems may be affected by RF energy. Check with your vehicle manufacturer representative to be sure that your Helios will not affect the electronic system of your vehicle.

Notes



GOLIGHT

37146 Old Hwy 17 | Culbertson, NE 69024
308.278.3131 | www.golight.com | info@golight.com