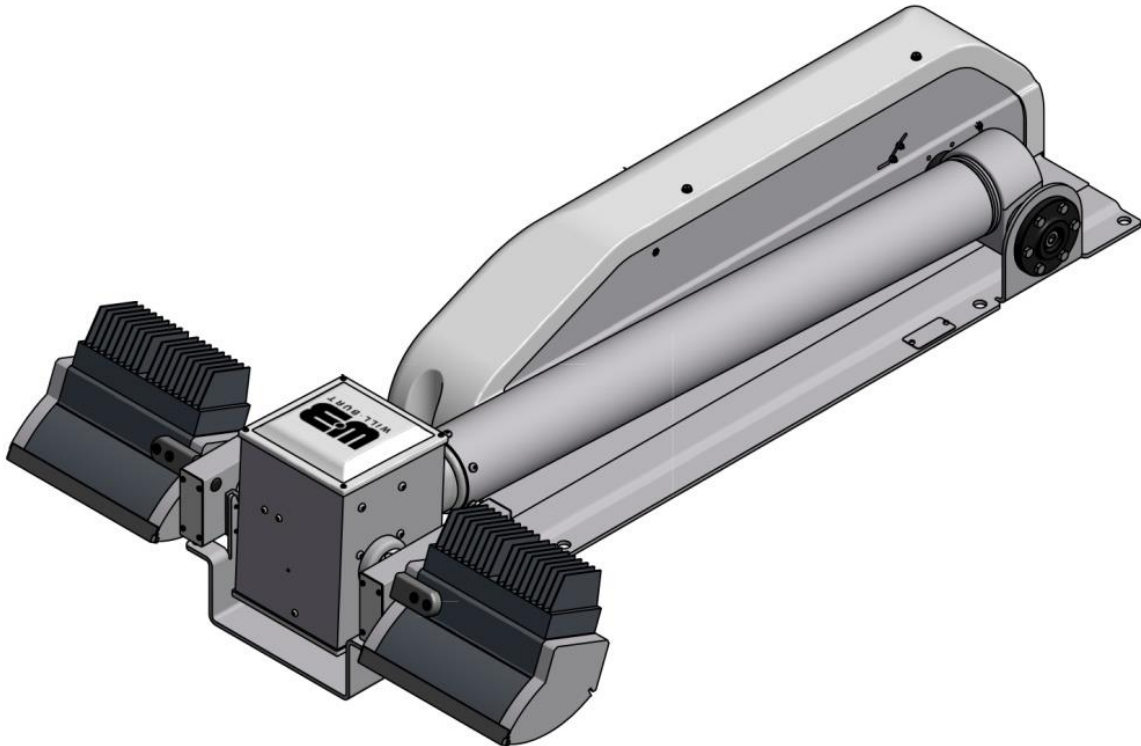


**NIGHT SCAN 1.0 & 1.5
INSTALLATION, OPERATION & MAINTENANCE MANUAL**

NIGHTscan



The Will-Burt Company
169 S. Main Street
Orrville, OH 44667
www.willburt.com

TP-4862701-A, July 2013

Night Scan® Warranty

Will-Burt warrants its Night Scan® to be free from defects in material and workmanship for a period of two (2) years, with such time period running from the date of shipment by Will-Burt. Will-Burt shall not be responsible for any damage resulting to or caused by its products by reason of failure to properly install, maintain or store the product; use of the product in a manner inconsistent with its design; unauthorized service, alteration of products, neglect, abuse, accident, or acts of God,. This warranty does not extend to any component parts not manufactured by Will-Burt; provided, however, Will-Burt's warranty herein shall not limit any warranties by manufacturers of component parts which extend to the buyer.

THE FOREGOING WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, AND NO REPRESENTATIONS, GUARANTEES OR WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO, A WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT ARE MADE BY WILL-BURT IN CONNECTION WITH THE MANUFACTURE OR SALE OF ITS PRODUCTS. NO EMPLOYEE, DISTRIBUTOR, OR REPRESENTATIVE IS AUTHORIZED TO CHANGE THIS WARRANTY IN ANY WAY OR GRANT ANY OTHER WARRANTY ON BEHALF OF WILL-BURT.

Claims for defects in material and workmanship shall be made in writing to Will-Burt within thirty (30) days of the discovery of defect. Failure to provide notice as required hereby shall be conclusive evidence that the product was in conformity with the warranty, and Will-Burt shall be released from any and all liability relating to the product. Will-Burt may either send a service representative or have the product returned to its factory at Buyer's expense for inspection. If judged by Will-Burt to be defective in material or workmanship, the product will be replaced or repaired at the option of Will-Burt, free from all charges except authorized transportation.

THE REMEDIES OF BUYER SET FORTH HEREIN ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER REMEDIES. THE LIABILITY OF WILL-BURT WHETHER IN CONTRACT, TORT, UNDER ANY WARRANTY, OR OTHERWISE, SHALL NOT EXTEND BEYOND ITS OBLIGATION TO REPAIR OR REPLACE, AT ITS OPTION, ANY PRODUCT OR PART FOUND BY WILL-BURT TO BE DEFECTIVE IN MATERIAL OR WORKMANSHIP. WILL-BURT SHALL NOT BE LIABLE FOR COST OF INSTALLATION AND/OR REMOVAL, OR BE RESPONSIBLE FOR DIRECT, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES OF ANY NATURE.

Document History

Manual	Version	Date	Remarks
TP-4862701-00	00	April 2013	Original Version
TP-4862701-A	00	July 2013	Warranty Increased to 2 Years

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SAFETY SUMMARY

SIGNAL WORD DEFINITION

Per the ANSI Z535.4 standard, the following signal words and definitions are used to indicate hazardous situations:

DANGER

DANGER indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.

CAUTION

CAUTION indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It is also used to alert against unsafe practices.

GENERAL SAFETY PRECAUTIONS

The following are general safety precautions that are not related to any specific procedures and therefore do not appear elsewhere in this publication. These are recommended precautions that personnel must understand and apply during many phases of operation and maintenance.

DANGER

Electrocution Hazard! Contact with high voltage will result in death or serious injury. Observe general safety precautions for handling equipment using high voltage. Do not locate or operate mast near electrical lines, cables or other unwanted sources of electricity. Do not operate mast in lightning. Be certain electrical cables are undamaged and properly terminated. Always disconnect power before performing service, repair or test operations.

WARNING

Safety Instruction - Read Manual! Failure to follow operating instructions could result in death or serious injury. Read and understand the operator's manual before using the mast.

WARNING

Tip Over Hazard! Mast tip over could result in death or serious injury. Do not operate in high winds. Operate on level ground only. Stand clear of mast and mast payload during operation. Be certain mast is level and secure before and during installation, operation and maintenance.

WARNING

Safety Instruction - Trained Personnel Only! Death or serious injury could result if proper inspection, installation, operation and maintenance procedures are not observed. Installation, operation and maintenance to be performed by trained and authorized personnel only. Proper eye protection should be worn when servicing the mast.

WARNING

Health and Safety Hazard! Solvent used to clean parts is potentially dangerous. Avoid inhalation of fumes and also prolonged contact to skin.

WARNING

Safety Instruction-Do not look at lights! Do not look directly into lights when they are illuminated. Temporary impairment or permanent vision damage could occur.

SPECIFIC SAFETY PRECAUTIONS

The following are safety precautions that are related to specific procedures and therefore appear elsewhere in this publication for emphasis. These are recommended precautions that personnel must understand and apply during specific phases of installation, operation and maintenance.

⚠ WARNING

Safety Instruction-Operation! For outdoor use only. Do not use in areas that have been classified as hazardous as defined in Article 500 of the National Electric Code.

⚠ WARNING

Crush Hazard! Death or serious injury could result if mast fails suddenly. Do not stand directly beneath the mast or its payload. Be certain payload is properly installed and secured.

⚠ WARNING

Burst Hazard! Over pressurizing mast will trip safety valve and could result in death or serious injury. Do not exceed maximum operating pressure of 20 psi (138 kPa) for Standard Duty masts. Keep personnel clear of safety valve exhaust direction.

⚠ WARNING

Fire Hazard! Cleaning solvent, used for maintenance, is flammable and can be explosive resulting in death or serious injury. Do not smoke. Use cleaning solvent in a well-ventilated area. Keep cleaning solvent away from ignition sources. Always store cleaning solvent in the proper marked container.

⚠ WARNING

Relocation Hazard! Relocating the mast during operation or after being raised could result in death or serious injury. Do not relocate the mast during operation or while raised. This applies especially to masts mounted to vehicles. Operate the mast only if the vehicle is stationary and the vehicle engine is off.

⚠ WARNING

Mounting Structure Hazard! Mounting mast into a structure unable to resist the forces generated from customer-specific loading scenario could result in death or serious injury and could damage the mast. Before operation, be certain mounting structure is capable of resisting forces generated from all loading and environmental conditions, including, but not limited to, mast size and weight, payload size and weight, sail size, wind speed, guy line arrangement, support bracket or roof line location and base plate assembly.

⚠ WARNING

Electrocution Hazard! Do not touch live wires. Death or serious injury could result.

⚠ WARNING

Safety Instruction – Operation! Make sure all power has been disconnected prior performing maintenance.

⚠ WARNING

Safety Instruction -Trained Personnel Only! Only trained and qualified personnel should perform installation, adjustments, and servicing. Only a properly trained and qualified certified electrician should perform electric installations and service.

⚠ WARNING

When relamping an installed fixture, make sure all power to fixture is off and that the fixture is cool

⚠ WARNING

Safety Instruction – Operation! At all times prior to mast operation, insure that:

- 1.) The mast area is free of personnel and mechanical obstruction;
- 2.) All electrical cables are undamaged and properly terminated;
- 3.) The operator must have full view of the mast during use;
- 4.) Any transit tie-downs on the payload have been removed;
- 5.) The vehicle is not moving;
- 6.) The area above the mast is free of mechanical obstructions.

⚠ CAUTION

Safety Instruction-Operation! Lamps are extremely hot and should not come into contact with people or combustible and/or explosive materials. Do not operate if breakage occurs or unit is knocked over.

⚠ CAUTION

Entanglement Hazard! Tangled cables can cause equipment damage. Ensure control cables are not tangled and are free to pay out as mast is raised.

⚠ CAUTION

Safety Instruction – Installation! At all times while using pipe and hose during installation, recognize that:

- 1.) Pipe and hose should be routed, mounted and restrained to protect from damage;
- 2.) Do not use second hand piping for installation;
- 3.) Do not bend air pipe and hose at a radius less than specified by the manufacturer;
- 4.) Pipes should be marked to avoid hazards from incorrect connection;
- 5.) The exhaust should be fitted with a silencer and be directed away from personnel;
- 6.) When routing piping, install in such a way as to minimize torsion on the joints;
- 7.) Mounting air pipe and hose shall be accomplished only by the use of tools to prevent readily disconnecting air pipe and hose from mast.

⚠ CAUTION

Safety Instruction – Operation! Do not operate the mast during an electrical storm.

⚠ CAUTION

Lifting Hazard! Manually lifting over 55 lb (25kg) is prohibited. In the UK, all lifting equipment must be thoroughly examined annually by a competent person according to the Lifting Operations and Lift Equipment Regulations 1998. Equivalent regulations exist in other EU states.

⚠ CAUTION

Safety Instruction – Operation! All operators must read the Operation section of this manual and be properly trained.

CHAPTER 1 INTRODUCTION

1.1 SAFETY PRECAUTIONS

Refer to the Safety Summary for precautions to be observed while operating or servicing this equipment.

1.2 MANUAL INTRODUCTION

This manual covers installation, operation, maintenance, and troubleshooting for the Night Scan masts. The manual should be reviewed in its entirety. Contact the Will-Burt factory with any questions before performing any procedures outlined in this manual. The Night Scan 1.0 and Night Scan 1.5 masts will be referred to as the “Night Scan” mast in this manual.

1.3 NIGHT SCAN DESCRIPTION

The Night Scan mast is a transportable platform elevation system which serves as a platform for communications antennae, camera, or lighting. The unit is designed for installation on any vehicle for the purpose of providing temporary lighting, communications, or surveillance. See Figure 1-1 for identification of the major components of the Night Scan mast.

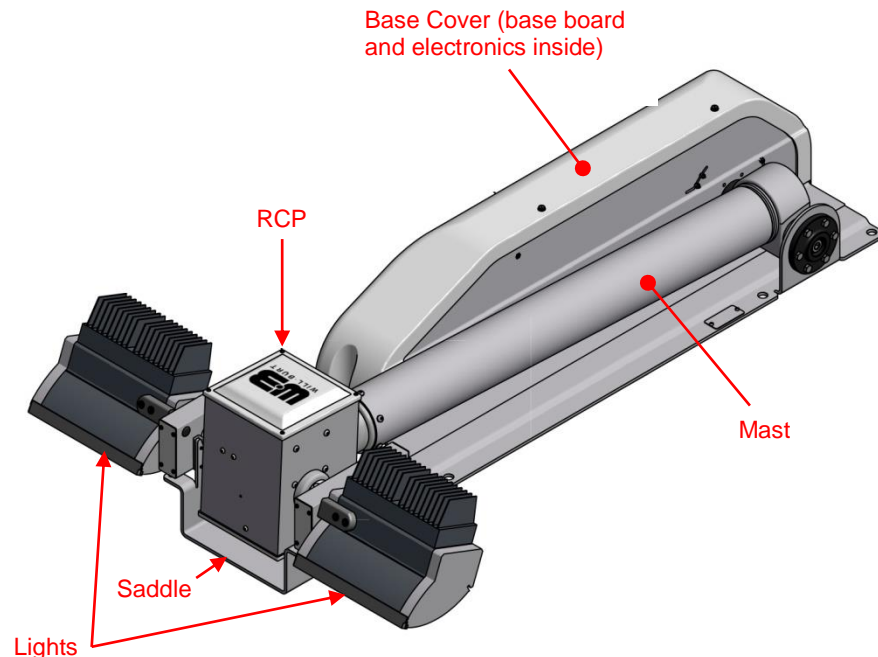


Figure 1-1 Night Scan Mast Major Components (NS 1.0, model 720378040 shown)

1.4 DIMENSIONS

Dimensions for both the Night Scan 1.0 and 1.5 masts with lights are shown in Figure 1-2 and Figure 1-3. These figures do not show the dimensions of all models. Please refer to product literature or www.willburt.com for additional information including length, width and height information.

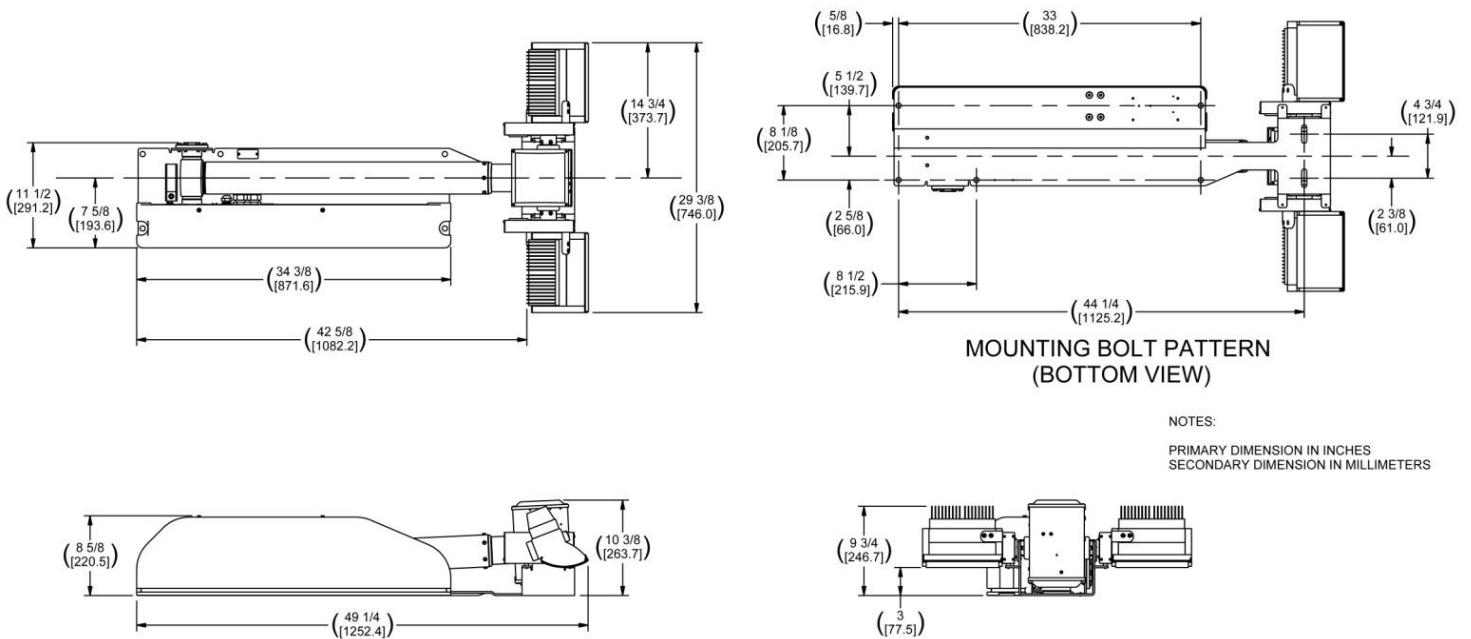


Figure 1-2 Night Scan 1.0 Model Number 720378040 Dimensions

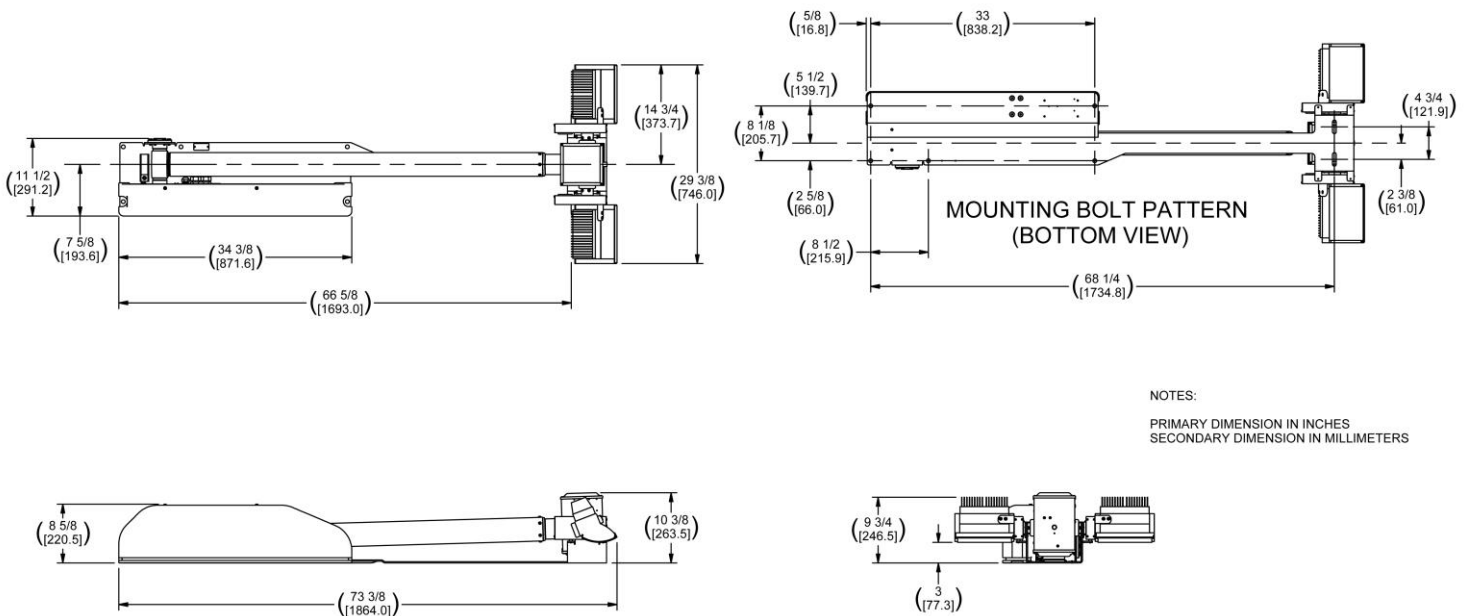


Figure 1-3 Night Scan 1.5 Model Number 720578040 Dimensions

1.5 MAST LOAD

It is important that the mast be securely mounted to a sturdy platform, which will not overturn during operational loading of the mast. Following is the loading information for the mast, which can be expected during operation:

- 35 lbs at saddle of mast
- 200 lbs at the front of the base cover
- 575 lbs at rear of base cover (mast pivot)

1.6 POWER REQUIREMENTS

The DC power for the Night Scan base board is supplied by the vehicle and wired to the mast base board. The Night Scan is available in 12 volt DC. The DC power is internally protected on the baseboard with a 20 amp fuse for the 12 VDC mast. Long runs of cable can introduce power loss. For long runs, it may be necessary to increase the wire gauge of incoming power wires. If required, the vehicle-integrator is responsible for installing an ON/OFF switch to disconnect power from the unit. This is to be put in line with the power cable (from battery voltage).

In addition to DC power to the base board, AC or DC is also required for the lights, which is separate from the power to the base board. Depending on the requirements of the lights, the power supplied would vary. It is required that the vehicle integrator run the largest gauge wire from the light power source to the terminals on the baseboard. If a filter and/or fuse/breaker is required between the light power source and the light connection on the baseboard, it is necessary that the vehicle-integrator properly install the appropriately sized components.



Night Scan 1.0 & 1.5

CHAPTER 2 INSTALLATION

⚠ WARNING

Safety Instruction -Trained Personnel Only! Only trained and qualified personnel should perform installation, adjustments, and servicing. Only a properly trained and qualified certified electrician should perform electric installations and service.

⚠ WARNING

Safety Instruction -Trained Personnel Only! Only trained and qualified personnel should perform installation, adjustments, and servicing. Only a properly trained and qualified certified electrician should perform electric installations and service.

⚠ CAUTION

Lifting Hazard! Manually lifting over 55 lb (25kg) is prohibited. In the UK, all lifting equipment must be thoroughly examined annually by a competent person according to the Lifting Operations and Lift Equipment Regulations 1998. Equivalent regulations exist in other EU states.

⚠ CAUTION

Safety Instruction – Installation! The Night Scan should be installed on a location that is out of reach from unauthorized personnel.

2.1 INTRODUCTION

The Night Scan has been designed to provide for ease of installation. This section of the manual provides the procedures that must be followed to ensure a successful installation. Be sure to read and understand the entire installation procedure before you begin.

2.2 TOOLS AND MATERIALS REQUIRED FOR INSTALLATION


Table 2-1 provides a list of tools and materials required to install and test the Night Scan.

Wrenches	Crimping tool or Solder set
Screwdrivers	Wire cutter/stripper
½ inch or M12 Mounting Hardware (6 each)	Multimeter (to verify power is turned OFF)
Torque wrench	Clean Shop Rags
Drill	
Hoist (minimum 250 lb capacity)	

Table 2-1 Tools and Materials Required for Installation

2.3 UNPACKING

Unpack the Night Scan as follows:

1. Carefully open and remove all parts from shipping container.
2. Lift the unit from the shipping container by the base tube at the center of gravity of the mast shown by the  symbol. Do not lift the Night Scan by the lights or RCP.
3. Inspect for any shipping damage. If damage has occurred, notify carrier.
4. Be sure that all components are included and that the required tools are readily available.

2.4 ATTACHING TO VEHICLE

If the Night Scan is mounted in a well on a vehicle, be certain that adequate drainage is provided. A minimum of (4) drain holes (one per corner) at least half inch in diameter is recommended to be drilled in the well around the unit so that water drains out of the well. While the unit has been designed to withstand adverse environmental conditions, it cannot be submerged.

(7) 9/16" bolt holes will be needed to mount mast (Figure 2-1 and Figure 2-2) to the vehicle. There are (3) strain relief holes in the side of the base for cable entry. It is important that the surface be flat such that the saddle and base plate are in the same plane. The areas to which the unit is mounted must be reinforced to withstand operating loading. Torque all hardware as appropriate for its material and size.

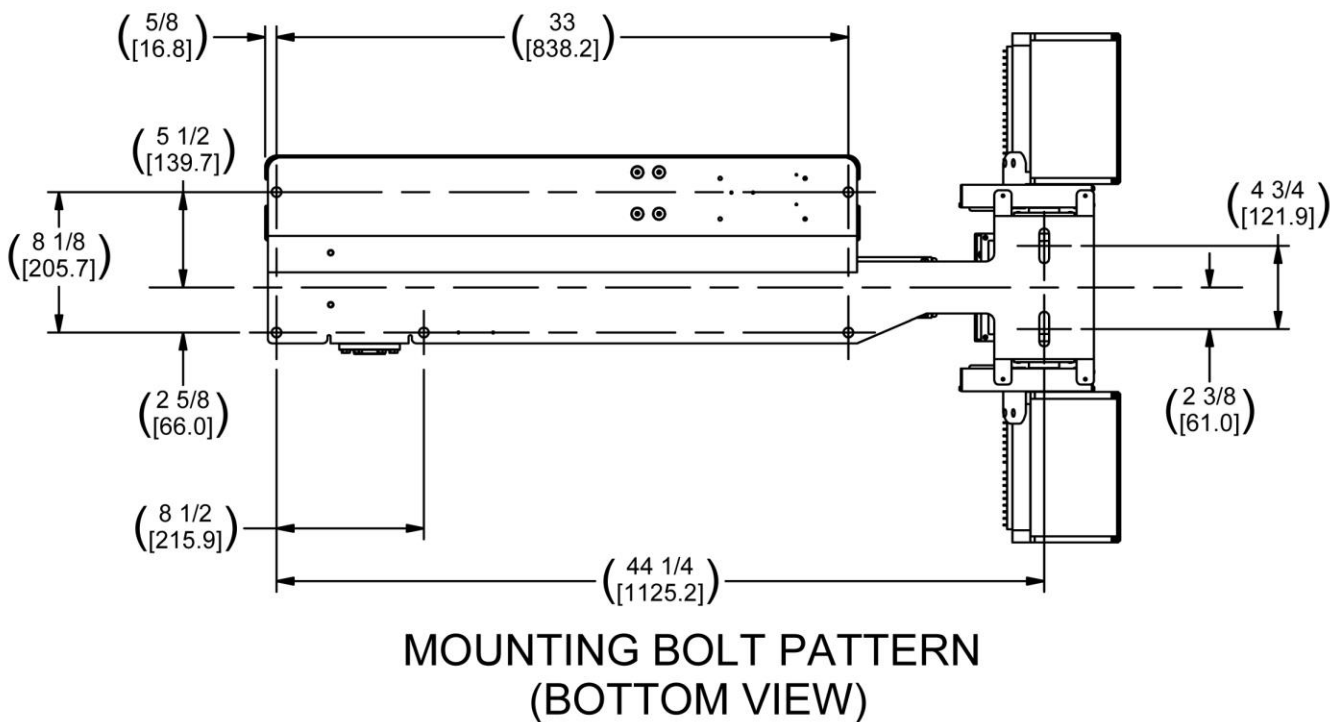


Figure 2-1 Night Scan 1.0 Mounting Hole Pattern

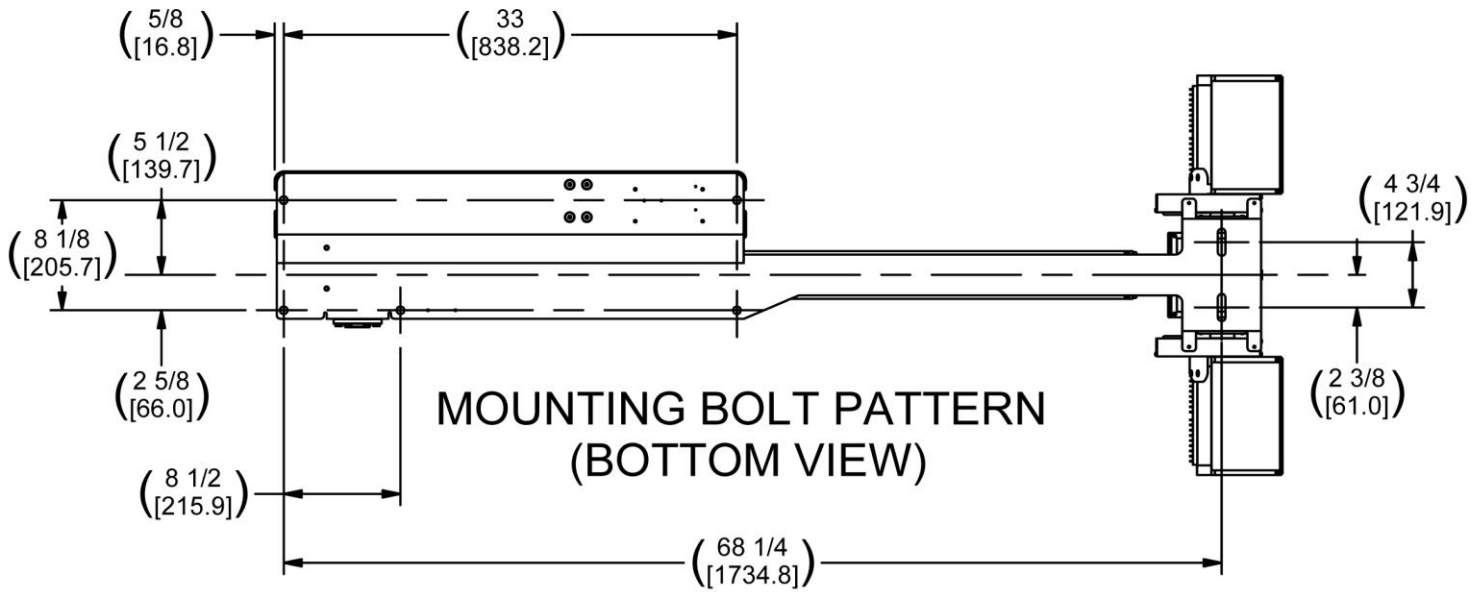
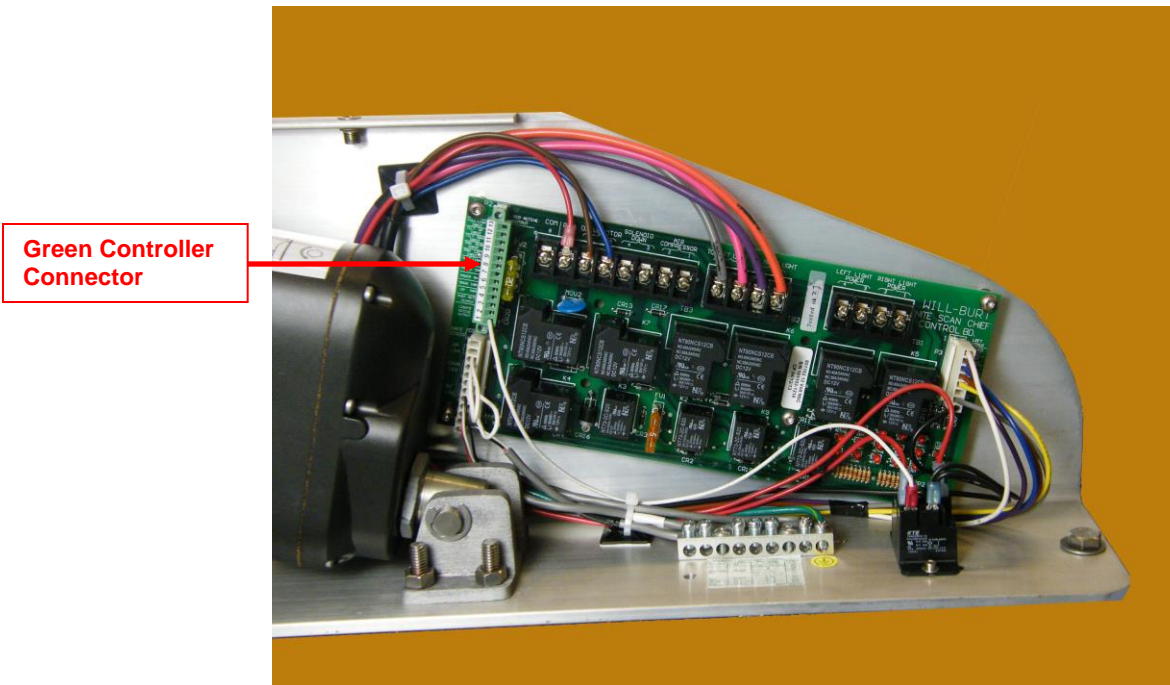


Figure 2-2 Night Scan 1.5 Mounting Hole Pattern

2.5 CONNECTING POWER TO THE BASE AND LIGHTS

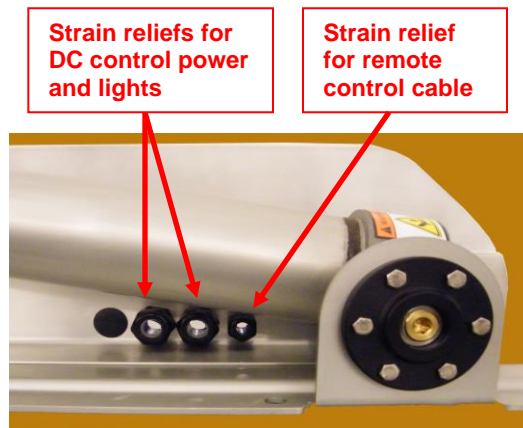
1. Remove the base cover of the Night Scan and locate the green controller connector.



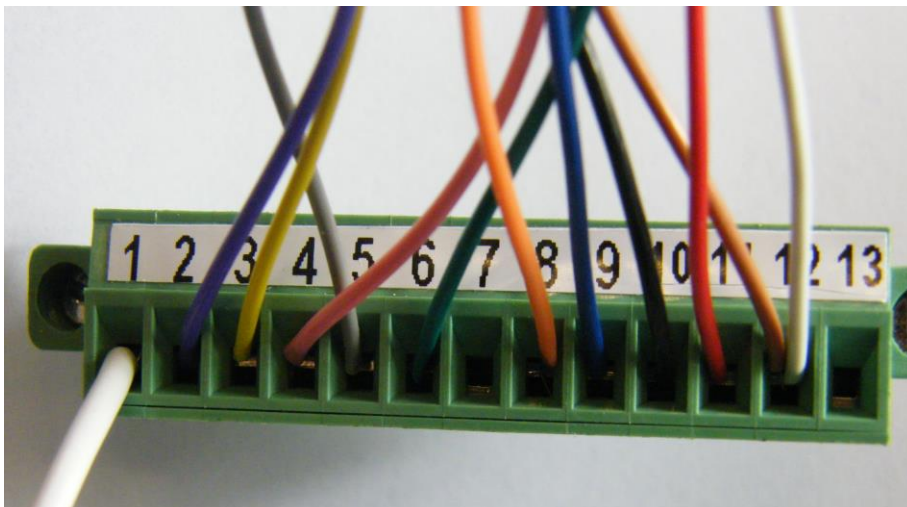
2. Locate the remote control that comes with the Night Scan.



3. Run the controller cable through the strain relief on the side of the Night Scan.

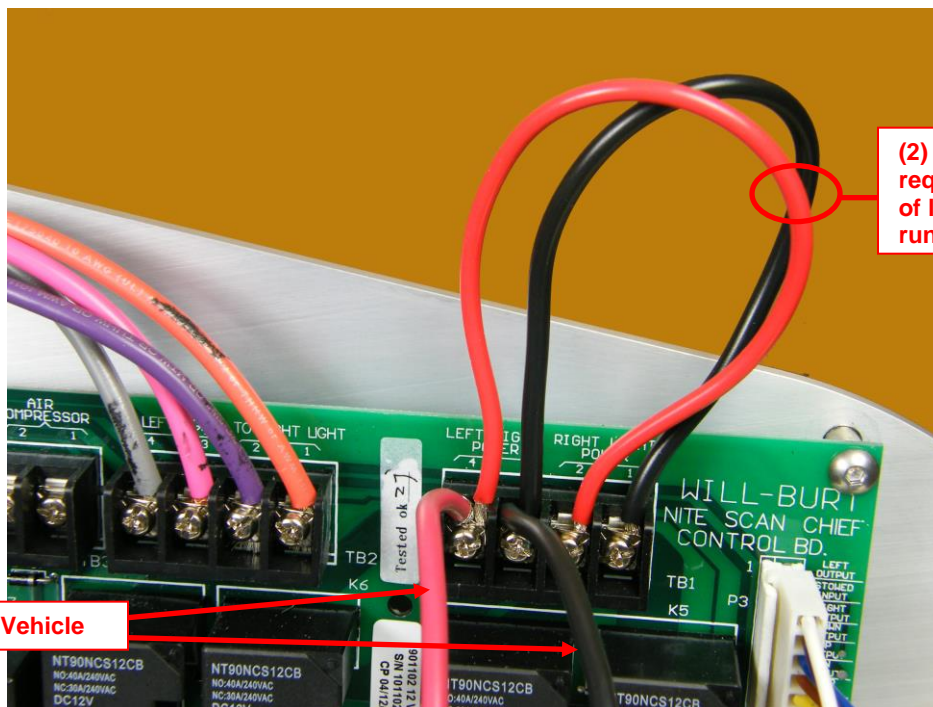


4. Connect the wires on the controller cable to the green connector. There will be a white wire from the board already connected to position 1, this wire should remain in position 1. There will be an extra light purple wire in the controller cable that does not need to be connected. With electrical tape, tape it to the controller ensuring that the metallic wire end is covered with tape.



Connector Number	Wire Color
1	White (from board)
2	Purple
3	Yellow
4	Pink
5	Gray
6	Green
7	Empty
8	Orange
9	Blue
10	Black
11	Red
12	Brown & White
13	Empty

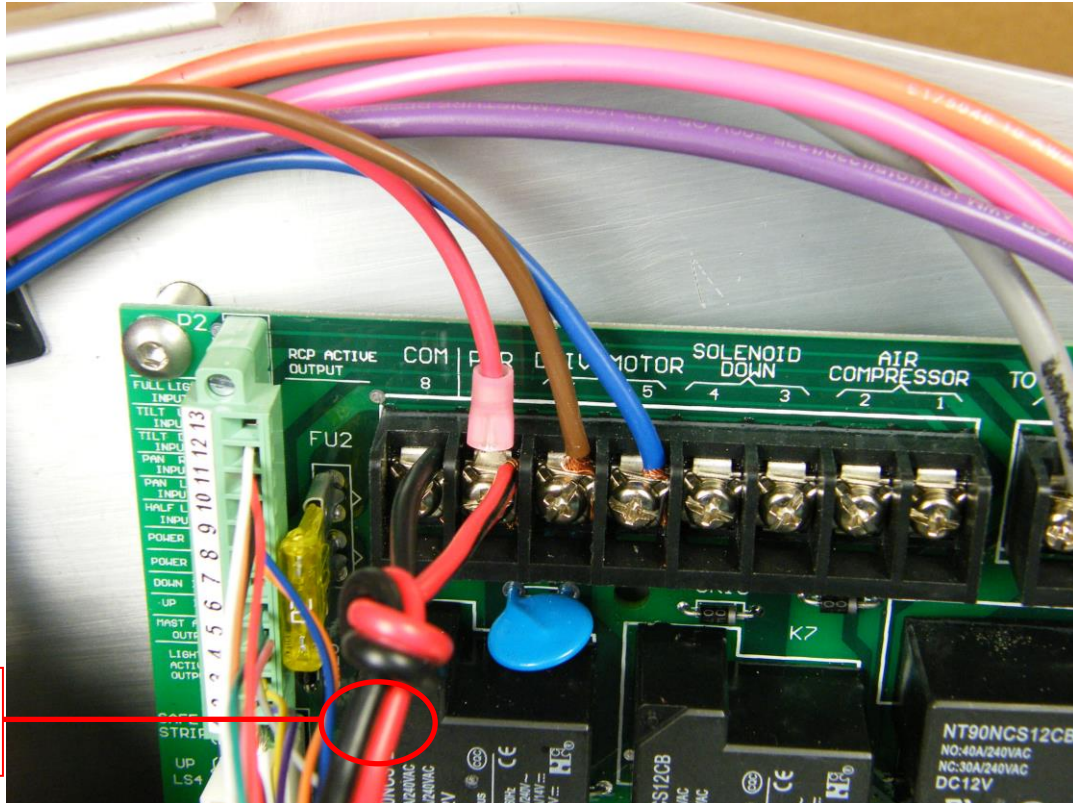
5. Fasten the green connector to connector at P2 on the base board (position 13 on top). Screw the connector into place.
6. Run the light power cable(s) for the lights through one of the strain reliefs. Ensure that the cables are at least AWG 10. To reduce line voltage drop for DC lights, it is recommended to run (2) pairs of voltage/ground lines to both the “left light power” and “right light power” terminals. If only (1) pair of light power lines are to be connected to the board, jumpers must be placed from “left light power”, terminal 4 to the “right light power” terminal 2. Along with this jumper, another jumper must be placed from “left light power”, terminal 3 to the “right light power” terminal 1.



⚠ CAUTION

Safety Instruction – Installation! The length of the light cables should not be more than 32ft.

- Run the red 12V DC control power wires through one of the strain reliefs in the side of the base. Ensure the cables are at least AWG 10 and not longer than 50ft from the power supply to the unit. Connect the positive cable to PWR 7 and the common cable to COM 8. operations.



Red 12VDC and black common for control power

- Make a final check on the wiring to ensure they are correct and properly secured before connecting to DC power source.

2.6 CONNECTING THE LIGHTS

The Night Scan has two light bars. Each light bar has one light fixture. The right and left light bars are shipped in smaller cartons inside the mast carton. The installer must attach the light bars to the RCP.

There are two (DC) or three (AC) wires for the lights that extend from inside the RCP shaft. These RCP wires connect to the wires in the light bar. The wires are shipped with the wire ends exposed. The light bar mounts to the RCP shaft after connecting the light wires.

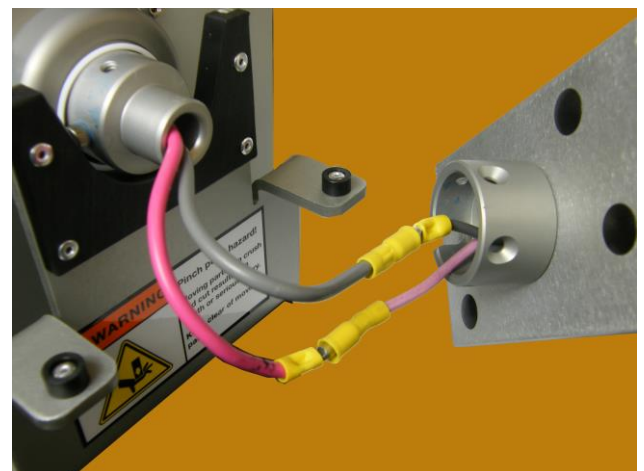
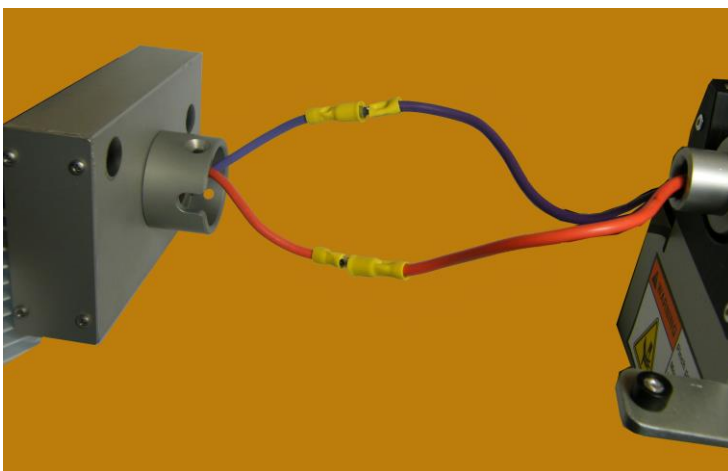
The color of the wires depend on whether the lights are AC or DC lights as shown in Table 2-2. The light bar wires connect color-to-color to the RCP. For example, for one side of DC lights, the pink wire in the light bar connects to the pink wire in the RCP and the gray wire in the light bar to the gray wire in the RCP.

Light Type	Left Side Lights	Right Side Lights
AC	Pink	Violet
	Gray	Orange
	Green	Green
DC	Pink	Violet
	Gray	Orange

Table 2-2 RCP Shaft Wire Colors

Attach the lights to the mast as follows:

1. Power up the Night Scan using the Power up button on the controller.
2. Press the “Mast Up” button long enough to raise the RCP shaft several inches out of saddle.
3. Power down the Night Scan.
4. Before connecting the light wires to the RCP wires, disconnect all AC and DC power to the mast.
5. With a multimeter check the RCP wires that all power is disconnected.
6. With the mast slightly raised, the mast saddle can be bolted down if it was not previously bolted down. If the mast saddle has not been bolted down, fasten the saddle to the vehicle surface with two 9/16” bolts (not provided).
7. To connect a light bar, connect the light bar wires to the RCP wires matching colors as shown in Table 2-2.



8. Align the notch in the light bar collar to the pin on the RCP shaft.

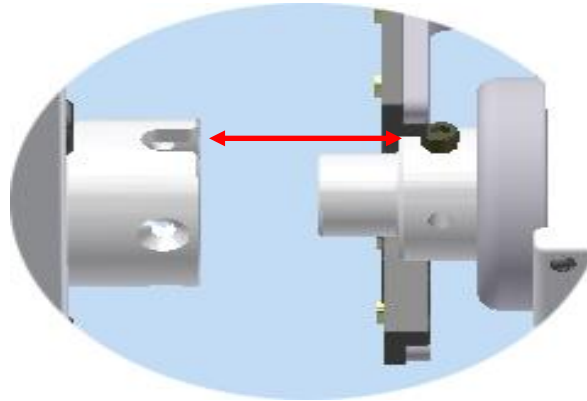


Figure 2-3 Align Notch to Pin (connected wires not shown)

9. After connecting all the wires, carefully push the wires into the light bar.
It is best to push the wires back into the light bar, not back into the RCP.
10. Repeat steps 7 through 9 for the other side of lights.

2.7 PRE-OPERATIONAL CHECK

⚠ WARNING

Before beginning installation, make certain that the area is free of overhead power lines and other unwanted sources of electricity. Follow OSHA safety regulations when working near energized power lines. Be sure to allow sufficient clearance on all sides of mast to allow for side sway.

⚠ WARNING

This mast is for outdoor use only. Do not use in areas that have been classified as hazardous as defined in Article 500 of the National Electric Code.

⚠ WARNING

Do not use in the presence of flammable gases or liquids such as paint, gasoline or solvents. Do not use in areas of limited ventilation or where high ambient temperatures are present. Contact with combustible materials can cause ignition resulting in fire or explosion.

Before operating the Night Scan, be sure that there are no overhead obstructions and that there are no power lines within 20 feet of the mast. Visually inspect the unit for any damage. If damage is apparent, do not use the mast. Have it serviced prior to use. Check for any objects which might obstruct motion of the mast or cause binding. Remove any material that may hinder mast function.

2.8 FUNCTIONAL TESTS

To test the installation, proceed as follows. If any part of the testing fails, check the LEDs on the base board as described in Section 4.4:

1. Reconnect AC and DC power.
2. Check for proper clearance above the mast.
4. Press and hold the “Mast Up” button until the mast is at 90 degrees (90°). There is no Auto-up feature). Release the “Mast Up” button.
5. Press and release the “Light” button several times to turn the lights off and on.
6. Press and release the pan buttons and check that the lights pan.
7. Press and release the tilt buttons and check that the lights tilt.
8. Using the pan and tilt buttons, orientate the lights to their home position.
9. Press the “Mast Down” button twice rapidly. This invokes the Auto-stow feature which places the mast into the saddle and turns power off. Note, the Auto-stow feature does not automatically move the lights to the home position. The lights must be moved to home using the pan and tilt buttons, as described in step 8.



Night Scan 1.0 & 1.5

CHAPTER 3 OPERATING INSTRUCTIONS

⚠ WARNING

All operators must read the Operation section of this manual and be properly trained.

⚠ WARNING

Keep personnel clear of mast while during operation.

⚠ WARNING

For outdoor use only. Do not use in areas that have been classified as hazardous as defined in Article 500 of the National Electric Code.

⚠ WARNING

Do not use in the presence of flammable gases or liquids such as paint, gasoline or solvents. Do not use in areas of limited ventilation or where high ambient temperatures are present. Contact with combustible materials can cause ignition resulting in fire or explosion.

⚠ WARNING

Before operating, make certain that the area is free of overhead power lines and other unwanted sources of electricity. Be sure to allow sufficient clearance on all sides of mast to allow for side sway.

⚠ WARNING

Do not move vehicle until mast has been securely stowed.

3.1 GENERAL MAST OPERATION

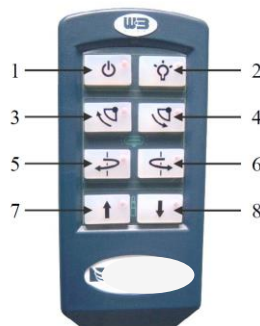
When the “Mast Up” button is pressed and held, the Night Scan operates the DC powered actuator and drives the mast from the stowed position to the 90° position. Note there is no Auto-up feature to automatically raise the mast to 90°. When at 90°, the 90° proximity switch detects the magnet in the actuator arm and stops further driving of the actuator. At 90°, the light buttons and pan and tilt buttons are enabled and the lights can be turned on, panned, and tilted.

To stow the mast, you must first use the pan and tilt buttons to move the lights to the home position. The home position is preset at the factory. The home position is preset at one end of the maximum pan travel and at one end of the maximum tilt travel. Once the lights are in the home position, press and hold the “Mast Down” button until the mast stows into the saddle and automatically shuts off. The Auto-stow feature can also be used to stow the mast but the operator must still position the lights to the home position using the pan and tilt buttons. The Auto-stow feature is invoked by pressing the “Mast Down” button twice rapidly.

3.2 REMOTE CONTROL (HAND HELD)





Wired Hand Held Remote Control (HHRC)





- If the operator engages a switch, the Remote Control will appropriately send commands repeatedly as long as the operator continues to engage that switch. The Base control will pass along appropriate commands to the RCP in response to the Remote Control.



1. On / Off Switch for Remote Control
2. On / Off Switch for Lights
3. Tilt Lamps Upwards
4. Tilt Lamps Downwards
5. Pan Lamps to the Left
6. Pan Lamps to the Right
7. Raise Up the Mast
8. Lower the Mast

1. Basic Functions of the Remote Control

- a. The button  signifies the on / off switch for the remote control. Press once would activate the power to the remote control and the background of the rest of the buttons would be lighted and become functional. To power off the remote control, press and hold the same button for 2 seconds. The background lights on the buttons would be switched off to signify that the power to the remote control is off.
- b. The button  signifies the on / off switch for the lights. Press once would power on the lamps on the Night Scan and the indicator lights on the button would be on. Pressing the same button again would power off the lamps and the indicator light on the button would also be off.
- c. The button  is to tilt the lamps upwards. To tilt the lamps upwards to the desired position, press and hold this button until the position is reached. Whenever this button is pressed, the indicator light on this button would be lighted. The lamps would stop tilting once this button is released.
- d. The button  is to tilt the lamps downwards. To tilt the lamps downwards to the desired position, press and hold this button until the position is reached. Whenever this button is pressed, the indicator light on this button would be lighted. The lamps would stop tilting once this button is released.

- e. The button  is to pan the lamps to the left. To pan the lamps to the left to the desired position, press and hold this button until the position is reached. Whenever this button is pressed, the indicator light on this button would be lighted. The lamps would stop panning once this button is released.
- f. The button  is to pan the lamps to the right. To pan the lamps to the right to the desired position, press and hold this button until the position is reached. Whenever this button is pressed, the indicator light on this button would be lighted. The lamps would stop panning once this button is released.
- g. The button  is to raise the mast from its stowed position to the upright position. The indicator light on this button would be lighted as this button is pressed.
- h. The button  is to lower the mast from its upright position to the stowed position. To lower the mast, press and hold this button until the mast is fully stowed. The indicator light on this button would be lighted as this button is pressed.

Note: For functions b. to f., the mast has to be fully raised before they are available.



2. Other Functions

Note: For the following functions, the mast has to be fully stowed before execution of the functions.




a. Indicator Beep

This function serves to give users an indication when buttons are successfully pressed. When buttons are successfully pressed, a “beep” sound can be heard.

- To activate the indicator beep function

Press and hold the  button and press the  button once. 3 sounds of the “beep” would be heard to indicate the successful activation of this function.





- To deactivate the indicator beep function

First, press the  button once and its indicator light would be lighted. Pressing and hold the  button, press the  once. 3 sounds of the “beep” would be heard, indicating the successful cancellation of the function.




b. Warning Alarm

This function serves to alert drivers when they attempt to drive their vehicles with their vehicle mounted Night Scan still raised. This function requires the gray/purple wire in the cable of the remote control to be connected to ground signal of the handbrakes of the car.

- To activate the warning alarm

Press and hold the  button and at the same time press the  button once. 3 sounds of the “beep” would be heard to indicate the successful activation. With this activation, whenever the operator releases the handbrake to drive off, the remote control would give a continuous “beep” alarm and disables all the functions on the remote control. At this moment, the operator would have to engage his handbrake and stow the Night Scan. Alternately, the operator can press and hold the buttons  and  simultaneously to cancel the alarm and enable the functions on the remote control to stow the Night Scan.

- To deactivate the warning alarm

First, press the  button once and its indicator light would be lighted. Then while pressing and holding the  button, press the  once more. 3 sounds of “beep” would be heard to indicate the successful deactivation of the warning alarm function.

3.3 EMERGENCY STOW (LOSS OF POWER):

⚠ WARNING

Make sure all power has been disconnected from the Night Scan prior to manually lowering mast.

⚠ WARNING

Make sure lights have cooled completely before manually panning or tilting the RCP.

In the event of power loss or an unrecoverable error condition, the Night Scan will not automatically return to its fully stowed, horizontal position. This must be accomplished manually and must be done with extreme caution. It may be necessary to manually pan the RCP so that when it is manually stowed, the lights do not make contact with the mounting surface or the saddle. To manually pan the unit, firmly grasp the RCP by the horizontal shafts and **slowly** rotate to a point perpendicular to the length of the base. Additionally, it may be necessary to manually tilt the lights to prevent damage when stowing the mast. Tilt the lights by grasping the top and bottom of the light bar and **slowly** rotating the lights such that they face down when fully stowed.

To emergency stow the mast, proceed as follows:

1. Remove the base access cover.
2. Make sure all power has been disconnected from the system by turning all breakers to the OFF position.
3. Ensure your payload is secure and may be safely lowered.
4. Remove the base cover.
5. Remove the 6mm Allen (set screw) on the end of the actuator cover (Figure 3-1).
6. Place a long 6mm Allen wrench into the hole to reach the 6mm Allen-head drive screw. A socket Allen wrench may be used but care must be taken not to damage the adjacent air compressor.
7. Turn the socket Allen wrench clockwise to lower the mast. Lower the mast until it seats firmly in the saddle.
8. Replace the 6mm Allen set screw.
9. Replace the right side base cover.

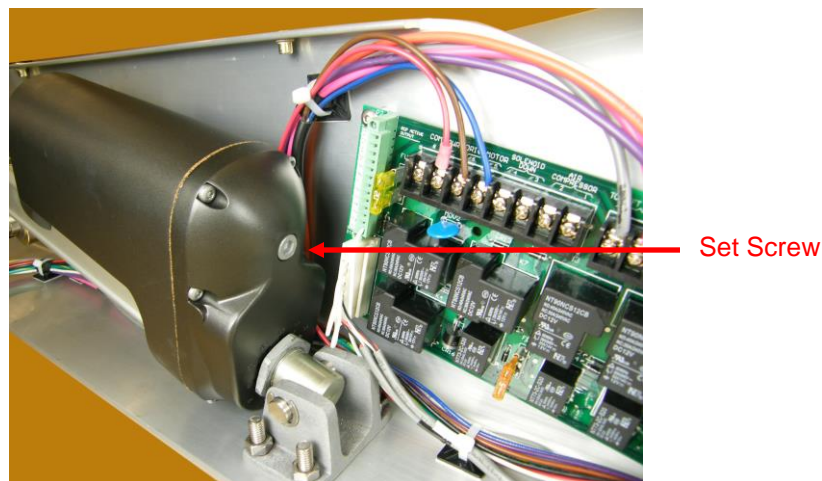


Figure 3-1 Emergency Stow Allen Screw Location

CHAPTER 4 MAINTENANCE AND SERVICE INSTRUCTIONS

4.1 INTRODUCTION

This section of the manual describes routine maintenance procedures and covers general service information.

4.2 CLEANING THE NIGHT SCAN

⚠ WARNING

Make sure lights are completely cool before attempting to clean.

The exterior of the RCP and Night Scan base should be wiped down periodically to remove dirt and road grime using a soft cloth or sponge and a mild solution of soapy water. The lenses of the lights should be cleaned using standard glass cleaner and a soft towel.

4.3 ADJUSTMENTS

The proximity switches (Table 4-1) are intended to stop the actuator when the mast is at 90° when it is stowed. It senses the position of the mast as it rolls on the clevis assembly and signals the base circuit board to cut power when the actuator is in the correct position.

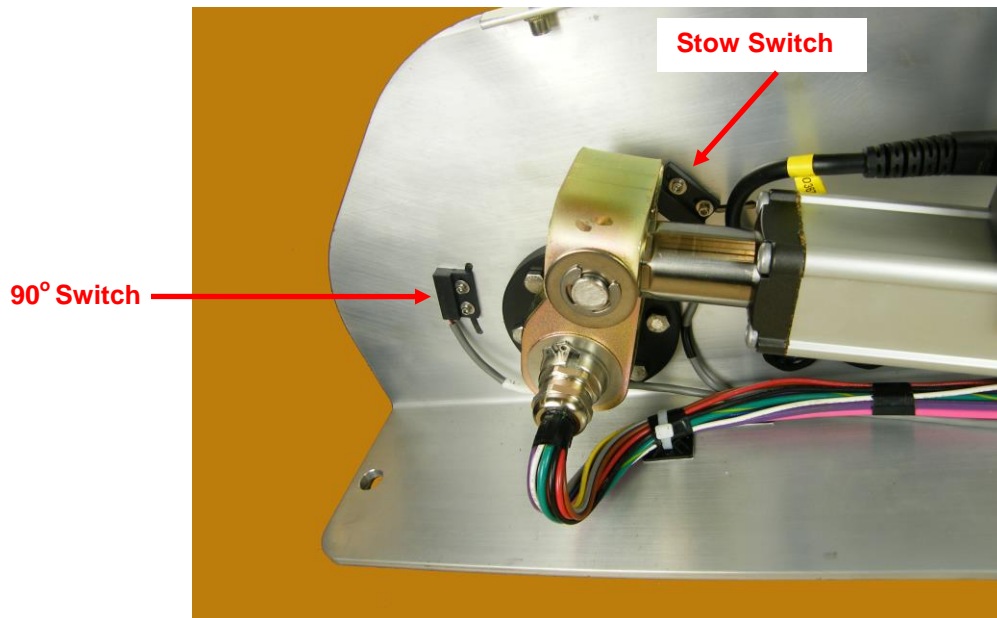


Figure 4-1 Proximity Switches

Adjusting the 90° Proximity Switch

Before delivery of a new Night Scan, all switches are properly set and tested and normally no switch adjustment is necessary. However, if the 90° switch needs adjusted, like after the actuator was replaced, follow these steps to adjust the 90° switch:

1. Make certain that the NS base is level.
2. Remove the base side cover.
3. Loosen the upper jam nut to lower the switch approximately 1/8".
4. Raise the mast to 90° by holding the "Mast Up" button until the mast is at 90°. Do not use the Auto-up feature to raise the mast to 90°.
5. Check that the mast is at 90° by using a level and also ensuring that the mast is square to the sheet metal side plate on the base. A value in the range of 89.5° to 90.5° is acceptable.
6. Raise the 90° switch until it senses the actuator. This will be indicated by the status LED on the base circuit board (Figure 4-2).
7. Secure the switch in position using the upper and lower jam nuts.
8. Raise and lower the mast several times, checking that the mast is plumb each time and adjust the switch if necessary.
9. Replace the cover.

Adjusting the Stow Proximity Switch

Before delivery of a new Night Scan, all switches are properly set and tested and normally no switch adjustment is necessary. However, if the stow switch needs adjusted, like after the actuator was replaced, follow these steps to adjust the stow switch:

1. Make certain that the NS base is level.
2. Remove the base side cover.
3. Loosen the upper jam nut to lower the switch approximately 1/8".
4. Raise the mast to 90° by holding the "Mast Up" button until the mast is at 90°.
5. Hold the "Mast Down" button until the mast stows firmly into the saddle then release the "Mast Down" button.
6. With the mast stowed, carefully grasp the RCP and attempt to slowly lift the RCP off the saddle. If the saddle is not snug into the saddle, repeat steps 4 through 6 until the mast is firmly in the saddle.
7. Secure the switch in position using the upper and lower jam nuts.
8. Raise and lower the mast several times, checking that the mast is stowed each time and adjust the switch if necessary.
9. Replace the cover.

4.4 TROUBLESHOOTING

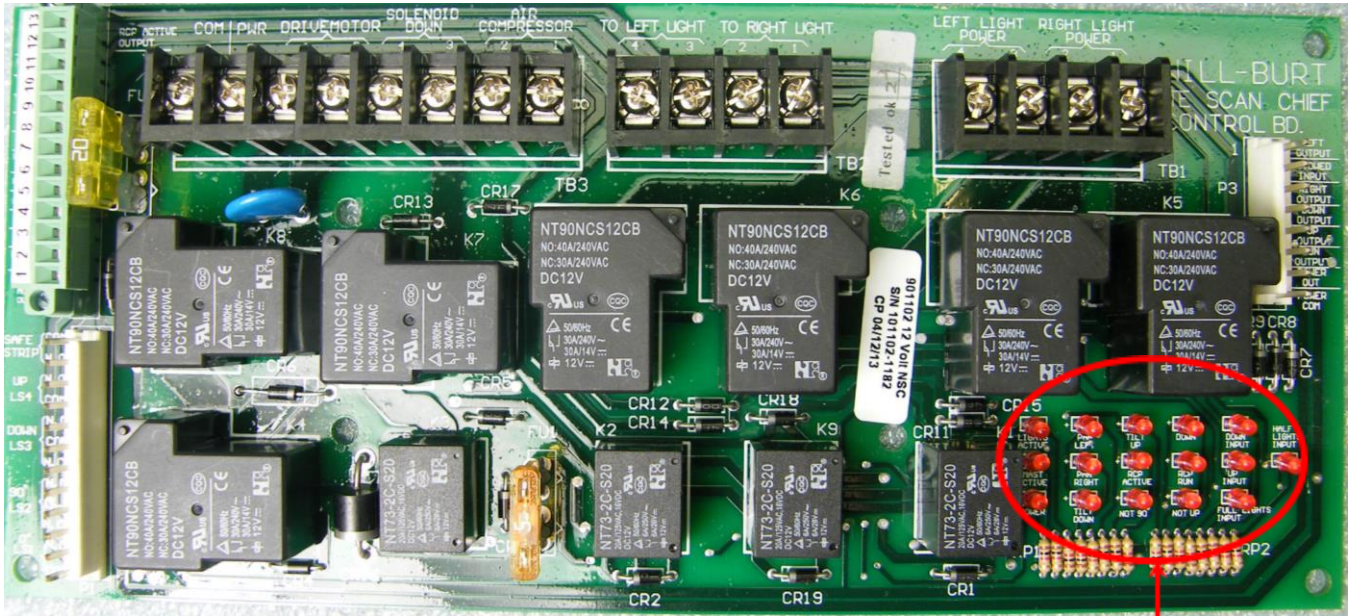
Refer to Table 4-1 troubleshoot Night Scan issues.

 **WARNING**

WARNING: Only trained and qualified personnel should install, adjust, service and use Night Scan Chief.

 **WARNING**

WARNING: Before troubleshooting, read the operating instructions and the safety summary. Always obey the warnings in the operating instructions.



LED	Definition
Power	12V is at the base board
Mast active	Mast is out of the saddle
Lights active	Mast is at 90° and the lights are available to turn on
Tilt Up or Down	Tilt up or down key pressed
Pan Right or Left	Pan right or left key pressed
Not 90 Deg	Mast is not at 90°
RCP active	RCP is out of the home position
Not up	Always lit when the mast is at 90°
RCP run	Never lit
Down	Always lit
Full lights	Lights are on
Up input	Mast up key pressed
Down input	Mast down key pressed
Half lights	Never lit

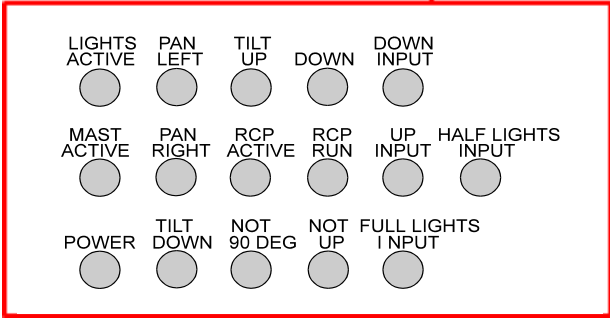


Figure 4-2 Status LEDs on Base Board

PROBLEM	CAUSE	EVIDENCE
Actuator is not functioning at all.	Blown fuse FU1 or FU2 on circuit board.	No status LEDs are lit on the control board.
	MAST UP/DOWN switch in remote Operator Station is defective.	Neither the "UP INPUT" nor the "DOWN INPUT" status LEDs light when the corresponding switch is activated.
	Actuator is defective.	Contact Customer Service.
Actuator is not functioning properly in the UP direction.	MAST 90° limit switch is misadjusted or defective.	The "NOT 90 DEG" status LED is not lighted.
	MAST UP switch in Remote Operator Station is defective.	The "UP INPUT" status LED does not light when the switch is activated.
Actuator is not functioning properly in the DOWN direction	Magnetic (MAST RETRACTED) limit switch is misadjusted or is defective.	The "NOT 90 DEG." Status LED is not lighted.
	MAST DOWN switch in remote Operator Station is defective.	The "DOWN INPUT" status LED does not light when the switch is activated.
	The safety pressure strip sensor is defective or activated.	Make sure nothing is against it.
Lights will not illuminate at all.	MAST 90° limit switch is misadjusted or is defective.	The "LIGHTS ACTIVE" status LED is not lit.
	ON/OFF switch in remote Operator Station is defective.	"FULL LIGHTS" status LEDs are lit.
	No light power is provided.	Meter reads zero volts between Terminal 1 and 2 of TB2 or between Terminal 3 and 4 of TB2.
	Relay K5 and/or K6 is defective.	Meter reads zero volts between Terminals 1 and 2 of TB1 or between Terminals 3 and 4 of TB2.

Table 4-1 Troubleshooting Table

4.5 SYSTEM SCHEMATICS

Attached to this manual is system schematic drawing to aid in electrical wiring and troubleshooting.

