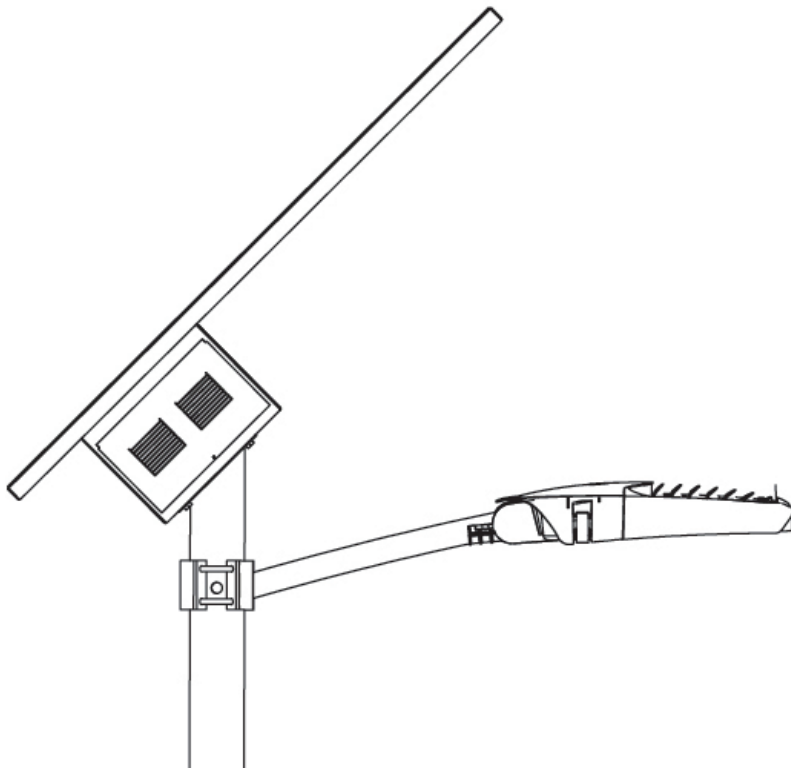




HighLight ALPHA™



INSTALLATION GUIDE

HighLight ALPHA™ is a registered trademark of SolarPath™. All other trademarks are the property of their respective owners.

Notice of non-liability: SolarPath Inc. (SolarPath) is providing the information in this document to you "AS-IS" with all faults. SolarPath makes no warranties of any kind (whether express, implied or statutory) with respect to the information contained herein. SolarPath assumes no liability for damages (whether direct or indirect), caused by errors or omissions, or resulting from the use of this document or the information contained in this document or resulting from the application or use of the product or service described herein. SolarPath reserves the right to make changes to any information herein without further notice.

Copyright © 2011 by SolarPath Inc. | All Rights Reserved

Contents

- Introduction** **4**
 - Getting started** **5**
 - Who this manual is for5
 - System components overview6
 - Before you begin** **7**
 - Required tools and equipment.....7
 - Pole installation guidelines.....8

- Installing the system** **10**
 - Stage 1: Unpacking the shipping crate** **11**
 - Stage 2: Connecting the LED light fixture to the light arm** **13**
 - Stage 3: Connecting the light arm to the pole tenon mount**..... **16**
 - Stage 4: Connecting the pole tenon mount to the solar engine** **18**
 - Stage 5: Wiring the system**..... **20**
 - Stage 6: Mounting the system on the pole**..... **21**
 - Stage 7: Testing the installation**..... **23**

- Maintaining the system** **24**

- Wiring specifications** **25**

Section 1

Introduction

Thank you for selecting the HighLight ALPHA™ system. This manual provides instructions for installing the system.

In this section

Getting started.....5
Before you begin.....7

Chapter 1

Getting started

This section defines who should work with this manual and orients you to the main components of the system that you will be working with during the installation procedures.

In this chapter

Who this manual is for.....	5
System components overview	6

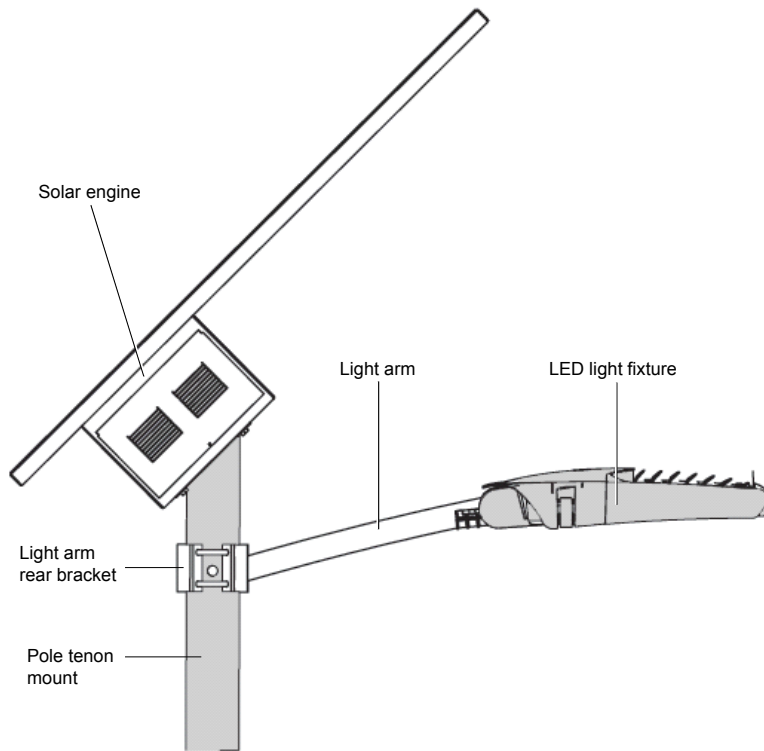
Who this manual is for

This manual is for people who are responsible for installing one or more HighLight ALPHA™ systems.

No specialized training is required to install this system other than a working familiarity with standard tools and power tools. Also you must be sure to follow the wiring diagram as illustrated in order to prevent any short circuits, which can cause sparks and fire if near any flammable substances.

System components overview

The following diagram and table describes the core components of the HighLight ALPHA system.



Component	Description
Solar engine	An integrated component that includes the solar panel and the box that houses the battery and the controller electronics.
Light arm	The metal arm that extends to the LED light fixture, houses the wiring from the battery and electronics controller, and includes the fixed bracket that connects to the pole tenon mount.
LED light fixture	The component that houses the LED light array and ballast.
Light arm rear bracket	The metal component that pairs with the fixed matching bracket at the bottom of the light arm.
Pole tenon mount	The hollow metal pole length that slides over the top of the installed pole and supports all the other components.

Chapter 2

Before you begin

This section introduces you to the prerequisite information you should know before you begin the installation.

In this chapter

Required tools and equipment.....	7
Pole installation guidelines	8

Required tools and equipment

You will need the following tools and equipment to complete the installation procedures detailed in this manual:

- Electric screwdriver with Phillips bit
- Compass
- Ratchet with 7/8" socket, 1/2" socket and an extension
- Two 7/8" open-end wrench
- 3/8" box-end wrench
- Electric drill with twist drill bit of 5/8" diameter, 7-8" long
- Hammer
- DC voltmeter
- Small magic marker such as a Sharpie
- Two hydraulic manlifts and safety harnesses. You need to have one person on each side of the system as you work with the mounting pole. One manlift is not sufficient.

Call a local equipment rental company to discuss your needs and arrange a rental. A couple of manlift examples are shown below:



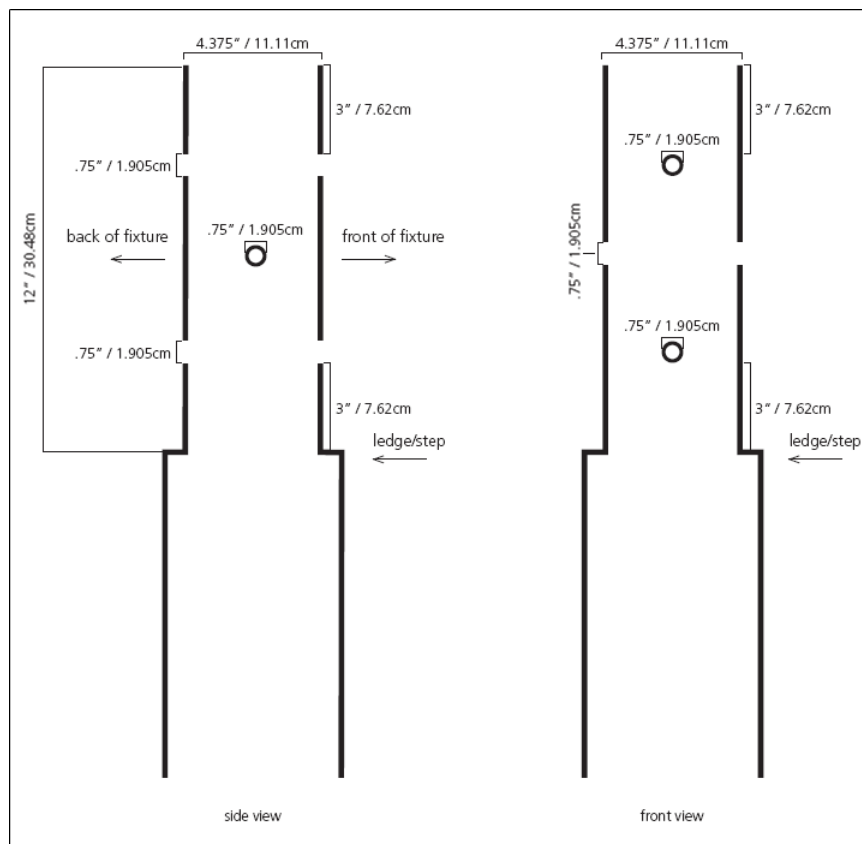
Pole installation guidelines

Typically you should complete the pole installation at least a week before you install the HighLight ALPHA system. This is especially critical when the poles are set in or on concrete.

Safety and stability

SolarPath provides you with the information you need to provide to your local pole manufacturer so they can fabricate the pole to meet the required building codes.

Common to each design is the tenon mount at the top of the pole, shown here:



Positioning the pole to ensure maximum solar energy collection

The objective of this procedure is rotate the pole so that the front and back of the pole (the sides with the two pass-through bolt holes) are lined up so they face north and south.

► To position the pole:

1. At the top end of the pole, use your Sharpie marker and write **NORTH** between the two pass-through bolt holes on one side of the pole, and write **SOUTH** between the

two holes on the other side. You will be covering these markings when you install the pole tenon mount in the final installation stage.

2. Use your compass to determine north and then keep your eye on which sides of the pole are labeled north or south as you raise the pole.
3. Rotate the pole position so that the side labeled NORTH faces north, and SOUTH faces south.
4. Plumb and secure the pole.

When you reach the final installation stage, all you will have to do to make sure everything is lined up correctly is match the north and south orientation of the fixture to the north and south orientation of the pole.

Section 2

Installing the system

This section details the procedures in the installation stages.

If you have not installed a HighLight ALPHA system before, it typically takes about 1.5 hours to complete the first install, not including the pole installation. After that you will probably complete any additional unit installations in less than an hour.

In This Section

Stage 1: Unpacking the shipping crate.....	11
Stage 2: Connecting the LED light fixture to the light arm.....	13
Stage 3: Connecting the light arm to the pole tenon mount.....	16
Stage 4: Connecting the pole tenon mount to the solar engine.....	18
Stage 5: Wiring the system	20
Stage 6: Mounting the system on the pole	21
Stage 7: Testing the installation.....	23

Chapter 3

Stage 1: Unpacking the shipping crate

The shipping crate includes all the components and hardware for installing the HighLight ALPHA system. This includes:

- 1 x light arm
- 1 x light arm rear bracket
- 4 x 1/2"-20 x 5" bolts
- 4 x 1/2"-20 hex nuts
- 4 x 1/2" spring washers
- 1 x pole tenon mount
- 3 x one-inch hole grommets
- 1 x solar panel fixture
- 2 x 12V DC batteries
- 1 x 12VDC LED light fixture

Before you begin

CAUTION: The crate includes electronics and lighting materials that are fragile. Be careful as you unpack and inspect the contents of the crate.

► To unpack the shipping crate:

1. Unload the crate carefully to the ground.



- Carefully remove the solar engine assembly and then remove the full-length divider.



- Carefully remove the divider panel and then carefully remove the components boxes.



- Unwrap the contents, document any physical damage, and contact us immediately if there are any discrepancies between the contents of the crate and the bill of materials.

Chapter 4

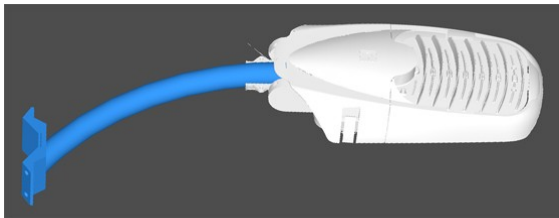
Stage 2: Connecting the LED light fixture to the light arm

The LED light fixture is a separate component. Depending on the selected system configuration, the fixture may or may not be factory pre-wired before it arrives at the installation location.

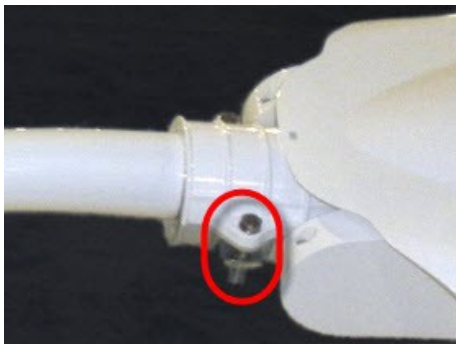
- When the LED light fixture is delivered in the crate, it is pre-wired at the factory
- When the LED light fixture is delivered separately, you must connect the wiring before you connect the fixture to the light arm

▶ To connect the factory prewired LED light fixture to the light arm:

1. Feed the LED light fixture 4-wire bundle from the fixture (highlighted in white, below) into the mouth of the light arm tube (blue, below) and carefully extend the bundle through the bracket end of the light arm tube.



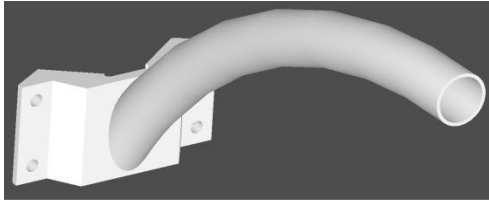
2. Insert the mouth end of the light arm tube into the LED light fixture connector sleeve (ensure that the fixture is level) and then fasten the sleeve connector bolts.



▶ To connect the unwired LED light fixture to the light arm:

1. Carefully remove the LED light fixture and the light arm from the packing boxes.

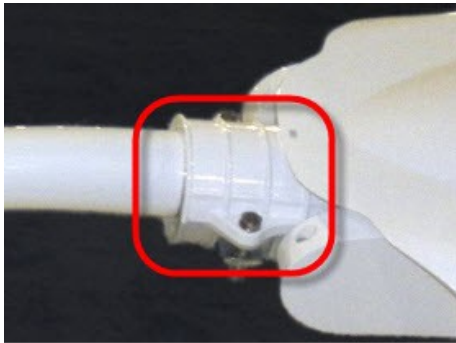
2. Feed the LED light fixture 4-wire bundle into the mouth of the light arm tube. Carefully extend the bundle through out of the bracket end of the light arm tube and leave enough of the bundle extending out of the mouth of the tube so you can work with it.



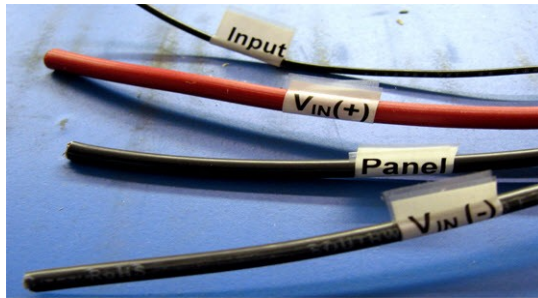
3. Lift the LED light fixture hood door latch (highlighted in blue, below) and open the hood.



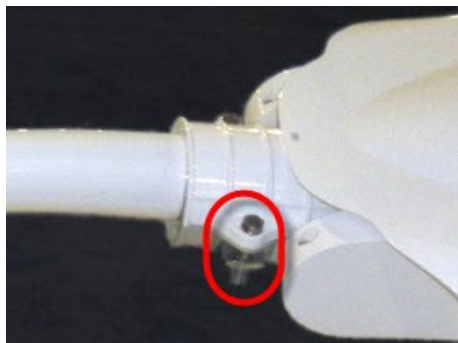
4. Pull the wire bundle through the connector sleeve of the LED light fixture.



5. Connect the labeled wires to the matching labeled terminals.



6. Close the LED light fixture hood.
7. Insert the top of the light arm tube into the LED light fixture connector sleeve (ensure that the fixture is level) and then tighten the sleeve connector bolts.



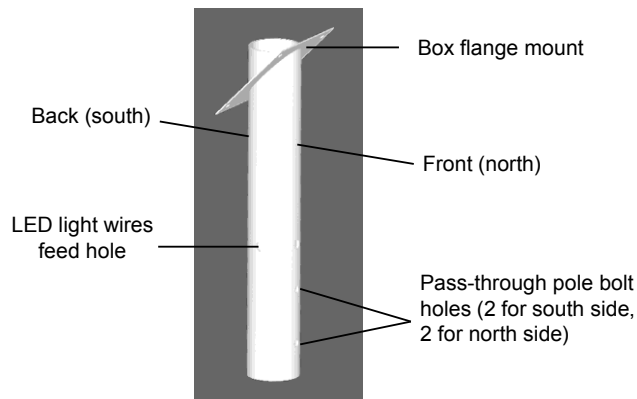
Chapter 5

Stage 3: Connecting the light arm to the pole tenon mount

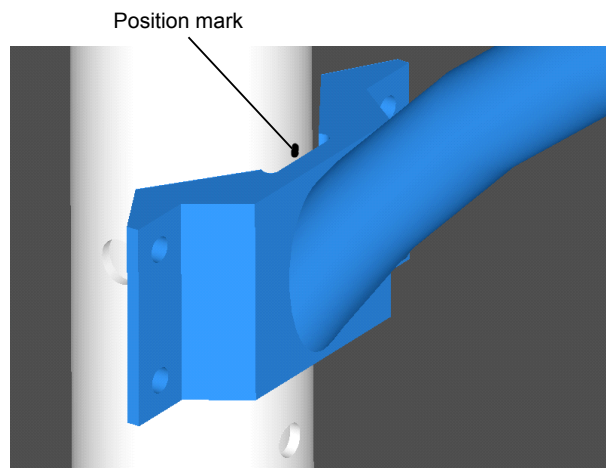
Mechanically, this is a fairly simple four-bolt procedure. The aspect of this procedure that requires extra focus is the need to make sure that you aim the arm in the proper direction.

► To connect the light arm to the pole tenon mount:

1. Set the pole tenon on a flat surface and align the front and back so that it matches the alignment of the installed pole.



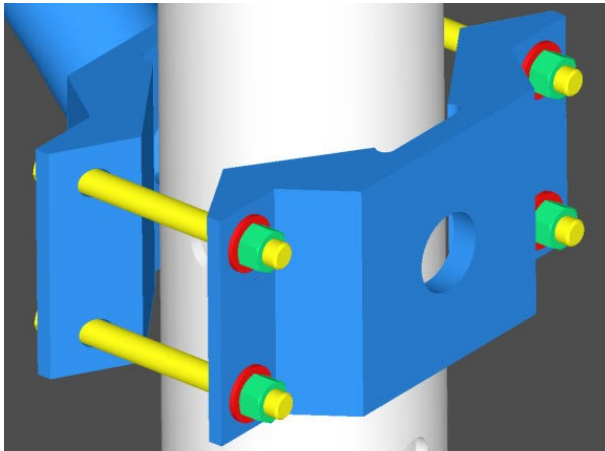
2. Position the fixed light arm bracket (highlighted in blue, below) and position it against the pole tenon mount at the radial angle you want to end up with.
3. Make a small position mark on the pole tenon mount where the top-center of the bracket will go.



4. Feed the wiring from the LED light through the closest feed hole (four are available) and pull the wiring up and through the mouth of the pole tenon mount.



5. Reposition the fixed light arm bracket at the position mark you made and then hold the light arm rear bracket on the other side of the tenon mount.
6. Loosely connect the four bracket bolts. For each bracket hole:
 - a. Feed the 1/2"-20 x 5" bolt (highlighted in yellow, below) through the two brackets.
 - b. Slide on the washer (red) and then loosely thread the nut (green) onto the end of the bolt.



7. When all four bolts are connected, tighten the nuts.

Chapter 6

Stage 4: Connecting the pole tenon mount to the solar engine

► To connect the pole tenon mount to the solar engine:

1. Carefully place the collector panel face down on either the grass or on another protected horizontal surface and then remove one or both of the controller box side panels.



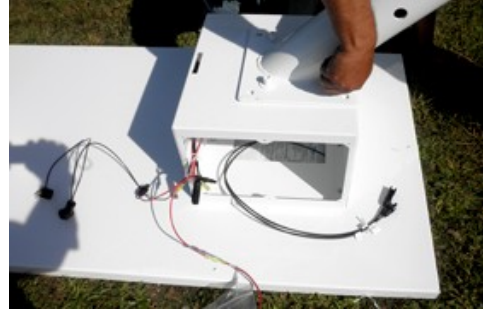
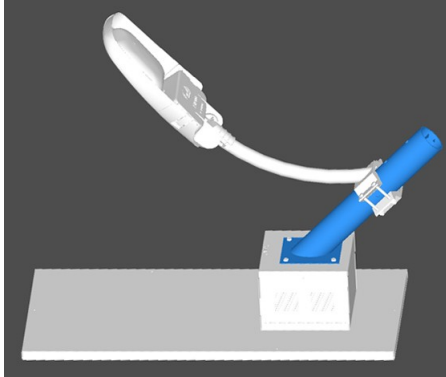
2. Pull out the unconnected ends of the wiring.



3. Carefully turn the tenon mount upside down and pass the wiring bundle through the round wiring portal, then remove the four sets of preinstalled nuts and washers on the bottom of the controller box.



4. Position the tenon pole mount (highlighted in blue, below) in the following orientation (be careful to protect the surface of the solar cell panel) on the exposed bolts and pull the unconnected wiring ends out of the controller box.



5. Re-install the washers and nuts to secure the flange plate to the controller box. Tighten the nuts ratchet tight.



Chapter 7

Stage 5: Wiring the system

All system wiring is labeled so that you just need to match the labels to complete the connections.

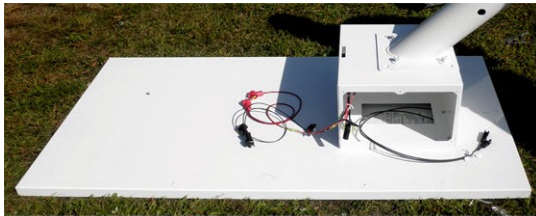


DANGER: A fire could occur and cause skin burns if the battery wires are short-circuited during the wiring installation. Ensure that you carefully follow the labels on the wiring to prevent any short circuits.

NOTE: For the complete system wiring diagram see *Wiring specifications* (page 25).

► To wire the system:

1. Position the complete assembly face down (be careful to protect the surface of the solar cell panel).



2. Extend the unconnected wires, identify the matching labels for each wire and then connect them.
3. Tuck the wiring inside the controller box and leave one controller box side panel open so you can install the battery in the final installation stage.

Stage 6: Mounting the system on the pole



DANGER: A fall from the height of most poles could be fatal, and working in a manlift basket while handling a large and heavy item can be challenging.

To prevent such an accident when you work on the procedures in this stage, ensure that both installers wear a harness that is firmly secured to the manlift basket. Keep the harness connected to the manlift from the moment you enter the basket until the moment you get out.

Before you begin

- Ensure that you have two people to complete this task
- Ensure that you have two hydrolic man-lifter units on-site
- If the solar panel is dirty, clean it with soap and water and then rinse it off with water

▶ To mount the system on the pole:

1. With your compass, determine north.
2. Position one man lift on the east side of the installed pole and the other on the west side.
3. Carefully place the system and the unconnected battery in the manlift baskets.
4. Lift the manlift to the top of the pole.
5. With both installers in position, together lift the system and lower it onto the pole so that the top of the solar collector points north and the solar cells point south.

The pass-through bolt holes on the tenon mount should line up with the pass-through bolt holes at the top of the pole. Because you oriented the tenon mount properly earlier, you don't need to line up the light array arm extension at all.

The installation example below illustrates an installation where the solar engine fixture aims south, as expected, and the LED light fixture aims somewhere else. In this example the direction is west, but another installation could be any unique, variable direction.



6. Feed the two tenon mount bolts through the pass-through holes, slide on the washers, thread on the nuts and ratchet them tight.
7. Connect the positive and negative leads to the positive and negative battery terminals and then position the battery (or batteries if your system requires 2 batteries) on the shelf.



Stage 7: Testing the installation

Complete this test procedure stage when you have completed all the preceding stages.

► **To test the system:**

1. Look up to the LED status indicator lights located inside the window at the north end of the bottom of the controller box.



LED status indicator lights window

2. Identify the status of the system based on the following indicators:

Lights	System status
Green LED on and blinking (and no other lights on)	Day Detected, if the installation test is done during daylight hours.
Green LED on but <i>not</i> blinking (and no other lights on)	Processing status. Wait 10 minutes and it should blink if the installation test is done during daylight hours. If it does not blink after 10 minutes, check the solar panel wiring connections.

3. Test the light: Disconnect both solar panel wires and wait for the green LED indicator to stop blinking and stay on steady (this may take up to 10 minutes). When the green LED light remains on and not blinking, the LED light fixture should turn on.
4. Re-connect the solar panel wires and wait a) for the green LED light to turn on and begin blinking; and b) for the LED light fixture to turn off.
5. Replace the box side panel.
6. Lower the manlifts and get out.

You have completed the system installation.

Maintaining the system



DANGER: A fall from the height of most poles could be fatal, and working in a manlift basket while handling a large and heavy item can be challenging.

To prevent such an accident when you work on the procedures in this stage, ensure that both installers wear a harness that is firmly secured to the manlift basket. Keep the harness connected to the manlift from the moment you enter the basket until the moment you get out.

▶ **To clean the solar collector:**

1. Using one manlift, lift the maintenance person to the solar panel.
2. Wipe off the panel with warm soap water.
3. Rinse off with water only.

▶ **To replace the battery:**

1. Using one manlift, lift the maintenance person to the solar panel.
2. Open one of the controller box side panels.
3. Disconnect old battery and install the new battery.
4. Complete the test procedure (page 23). With freshly charged batteries, no red lights should turn on.

Appendix A

Wiring specifications

The following diagram details the complete system wiring.

