CB 1-w
Solar Tower

Model: ENTM06, ENTM07

Admin Guide

Installation | Configuration | Support | Maintenance | Use

Code Blue®
800.205.7186 • www.codeblue.com

WARNING

ONLY QUALIFIED PERSONNEL SHOULD INSTALL THESE UNITS. THE INSTALLATION SHOULD CONFORM TO ALL LOCAL CODES. IN SOME COUNTRIES, A CERTIFIED ELECTRI- CIAN MAY BE REQUIRED.

NOTICE TO USERS

Table of Contents

Table of Contents (continued)

2 Introduction

Thank you for choosing the **CB 1-w Solar Tower** for your Code Blue application.

The **CB 1-w Solar Tower** is a unique solution created in partnership with Solis based on the original Code Blue pedestal units that set the industry standard for rugged construction, full feature availability and high visibility. The **CB 1-w Solar Tower** is easily recognized throughout a full 360-degree area. The user friendly lighted faceplate and the integral area light ensure rapid location in an open environment. The high output strobe is easily identifiable by security when activated.

The **CB 1-w Solar Tower** is an excellent choice for walkways, parks, college and commercial campus areas, open landscape areas and anywhere a freestanding pedestal unit is required.

Pair with our faceplate speakerphones, which are designed for maximum reliability, vandal resistance, auxiliary functions, mass notification control, and fault monitoring and reporting capability. (See IA4100, IP5000, LS1000 and LS2000 guides for more information.)

Our unmatched craftsmanship makes our Help Points® the most rugged on the market, withstanding the punishment of natural and man-made disasters. With durable construction, our pedestal units can meet any requirement or purpose. **CB 1-w Solar Tower** units have a rugged steel construction, shatterproof Lexan Lens, industrial engineering grade reflective graphics and weather, UV and graffiti resistant paint. They are illuminated by a high-powered, 270 lumens/92 candela LED blue beacon/strobe.

Features and accessory options include:

- IP and analog phone options
  - LS2000 - VoIP Handset phone with volume button and keypad options
  - LS1000 - VoIP Emercomm® speakerphone with color IP camera option, single or double call button options, and keypad option.
  - IP5000 - VoIP speakerphone with single or double call button options, and keypad option.
  - IA4100 - Analog speakerphone with single or double call button options, and keypad option.
- Long-life LED area light behind shatterproof Lexan Lens.
- Low power consumption LED faceplate light
- Custom cut-out stainless steel plates for camera and/or card reader openings
- Second opening
- Solar panel

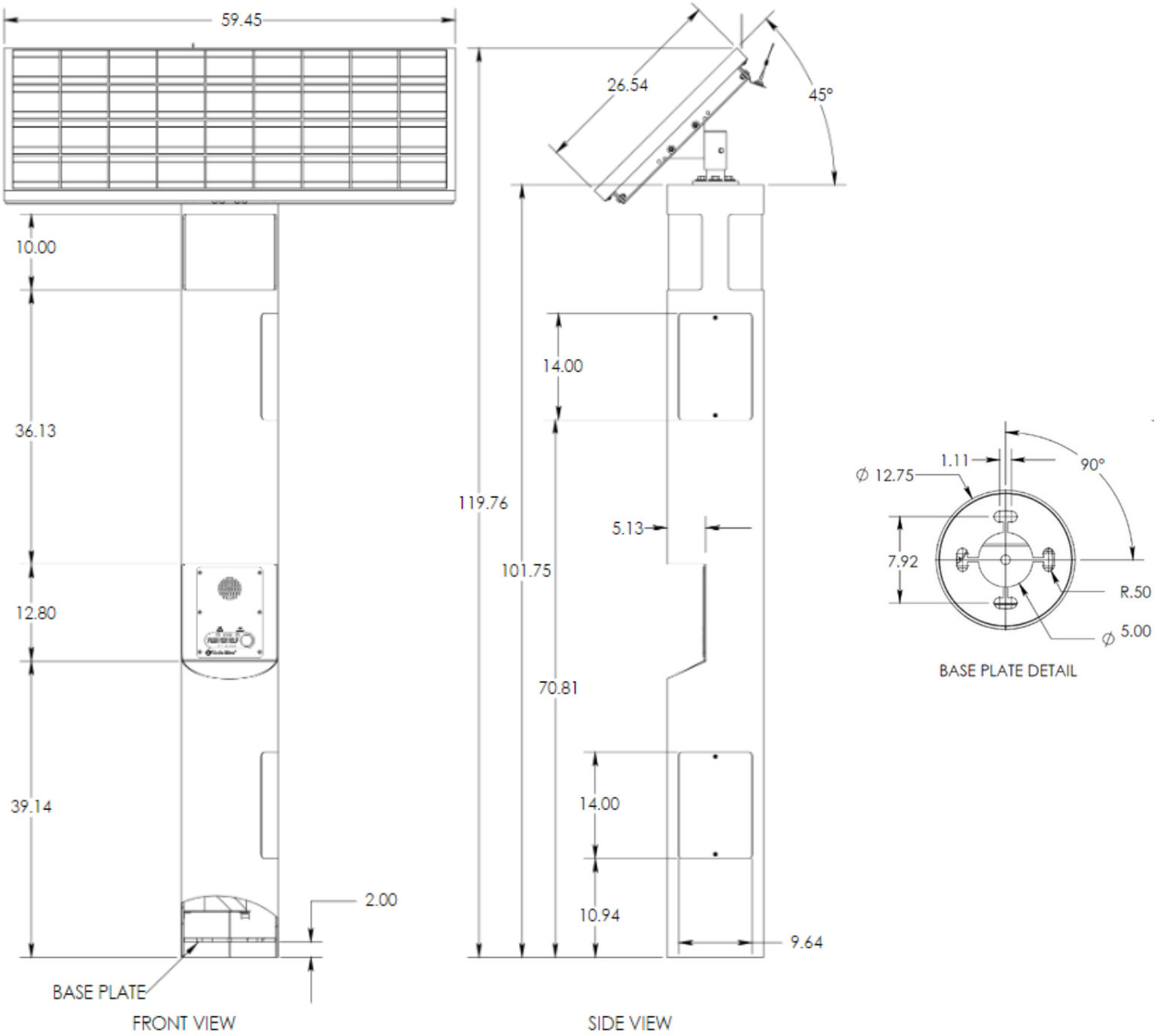
CB 1-w Solar Tower with Solar Audio Paging Array

CB 1-w Solar Tower

This guide contains all of the CB 1-w Solar Tower information, including: options, application, installation and wiring.

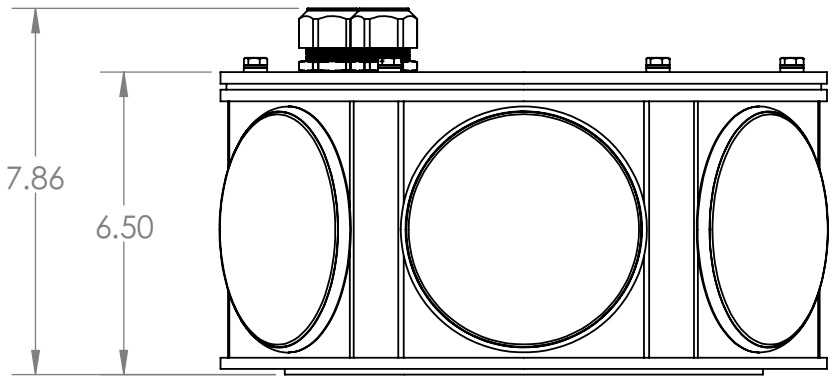
3 Dimensions

CB 1-w

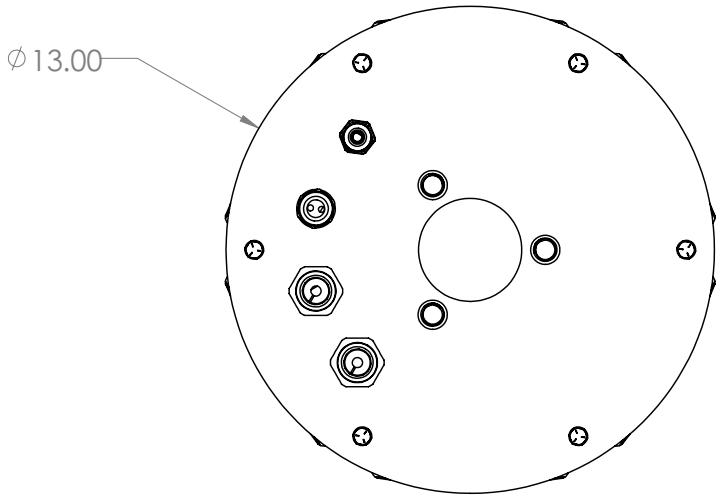


3 Dimensions

Solar Audio Paging Speaker Array



SIDE VIEW



TOP VIEW

4 Safety Information

HAZARD LEVELS LEGEND

DANGER	Indicates a hazardous situation which, if not avoided, *will* result in death or serious injury.
WARNING	Indicates a hazardous situation which, if not avoided, *could* result in death or serious injury.
CAUTION ⚠	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates a situation which, if not avoided, could result in damage to property.
IMPORTANT	Indicates significant information that is essential for proper product functionality.
NOTE	Indicates useful information that helps get the most out of a product.

Safety Instructions

WARNING
- Code Blue products shall be installed by trained professionals. The installation should conform to all local codes. In some countries, a certified electrician may be required.

NOTICE
- When transporting a Code Blue product, use the original packaging or equivalent to prevent damage to the product.
- Code Blue products shall be used in compliance with local laws and regulations.
- Store the Code Blue product in a dry and ventilated environment.
- Do not install the product on unstable brackets, surfaces or walls.
- Use only applicable tools when installing Code Blue products.
- Do not use chemicals, caustic agents, steel wool or aerosol cleaners other than those tested and recommended by Code Blue.
- Use only accessories that comply with technical specifications of the product. These can be provided by Code Blue or a third party.
- Use only spare/replacement parts provided by or recommended by Code Blue.

Transportation

NOTICE
- When transporting a Code Blue product, use the original packaging or equivalent to prevent damage to the product.

5 Installation Instructions

Getting Started

Important Notes:

- EIA/TIA, ANSI, CSA and BICSI cabling or similar standards shall be adhered to for proper operation of Code Blue communication devices connected to copper or fiber infrastructures communications cable and electrical cable in the same conduit is not an acceptable installation and shall not be supported. Analog phones require a minimum of 23mA for proper operation (26-29mA recommended).

- Each analog speakerphone requires its own phone line or PBX extension. Multiple units shall not be supported.

- Speakerphones require programming before operation. Consult the speakerphone's Administrator Guide for instructions.

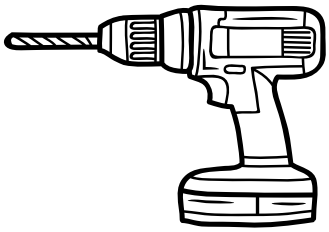
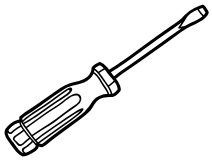
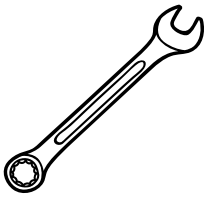
- If you are installing IP speakerphones, please read the appropriate manuals and consult with your Network Administrator.

- Size electrical wiring based on length of run.

Tools Needed

All CB 1-w Units Require:

- Ladder to reach the top of the unit.
- Drill & Security Bit for removing & inserting security screws on phone, dome top, & access door.
- 1-1/8” Socket set & extension
- Phillips and flat head screwdrivers
- 1/2" wrench for solar batteries
- Volt/Amp Meter (AC/DC)
- Solar Insolation Meter
- Angle Finder
- Level
- Compass/GPS
- Electrical Termination Tools(crimper, wire cutter, etc.

Solar Battery Prep

1. If needed, remove all batteries from enclosure.
2. Using a multimeter, verify the voltage of each battery. The battery voltage should be 12.7 VDC or higher. If the battery voltage is less, charge the battery with a battery charger. If a battery charger is not available, then the SPP should operate without load for 24 hours to recharge the batteries.
3. Refer to page 34 for battery wiring during installation.

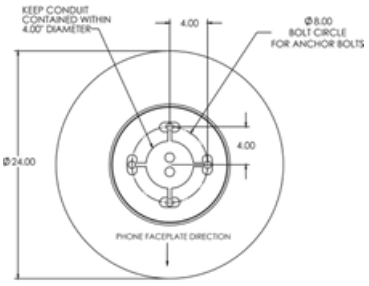
Solar Panel Prep

1. Remove the solar panels from the shipping containers.
2. Voltage and current should be verified for each panel before installation. To do this, temporarily place a solar panel pointing directly at the sun. Using the multimeter, verify the Voc of the panel. The reading should be +/- 15% of the manufacturer specification.
3. Using a spare piece of 10 AWG wire, short the positive and negative terminal of the solar panel. Read the insolation value using the insolation meter and the DC current using the ring multimeter. The current reading should be +/- 15% of the Isc. For example, if the Isc specification is 8 A and the insolation meter is reading 500, then the multimeter should be reading approximately 4 A.

Perform this procedure for each panel. Remove the shorting wire when completed.

Anchor Bolt Kit Instructions

1. FOUNDATION

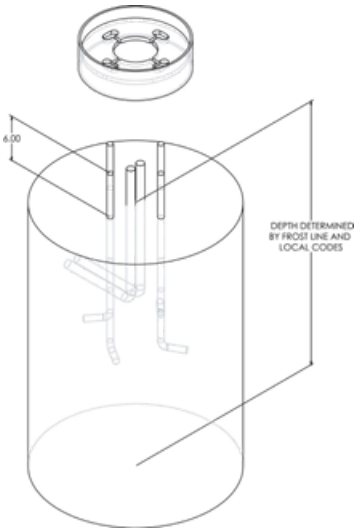


USE PROVIDED TEMPLATE TO LOCATE ANCHOR BOLTS

1.1 Run Conduit

Electrical and telephone line conduit, with a maximum combined diameter of four inches, should be run up through the center of the foundation hole. A minimum of four inches and a maximum of six inches of conduit above the finished grade level is required. To ensure proper grounding, a ½-inch x 8-foot copper rod should be inserted in the center of the foundation and tied to the steel pedestal.

NOTE: Follow all national and local codes governing this installation.



1.2 Pour the Foundation

The foundation should be at least 24 inches in diameter and to the correct depth for the frost line in your area, with a mini- mum depth of at least three feet (follow local building codes for foundations).

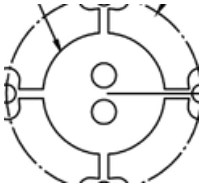
1.3 Set the Anchor Bolts in the Wet Foundation

Four 24-inch L-shaped anchor bolts and an aligning template are supplied for anchoring the Code Blue unit. The bolts should be set into the foundation so that six inches are left showing above the finished grade level. The anchor bolts should be aligned, using the supplied template in such a way that the phone faceplate on the unit face in the desired direction.

2. PULL WIRING

IMPORTANT:

- *Wire gauge must be selected to meet code for voltage/current required for the product to operate correctly: Minimum 14 AWG.*
- *Conduit used must comply to National Electrical Standards as observed locally.*



2.1 Pull Power and Phone Line up through Conduits

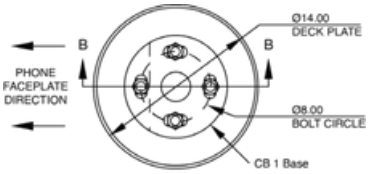
A minimum of two feet of wire must be available from the con- duit for electrical and communications wiring.

NOTE: Communications wire must be shielded phone line. The phone line must be pulled into the unit using a separate conduit from the power. Along with a service loop of wire, as noted by the NEC standards.

Deck Mount Kit Instructions

SKIP if installation does not include a Deck Mount Kit

1. DECK FOUNDATION

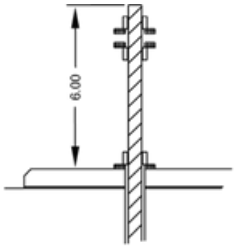


1.1 Drill Deck Holes

Drill four holes through the deck or floor for the four 3/4" threaded rods. The holes should be aligned, using the tem- plate provided in such a way that the phone faceplate on the unit will face in the desired direction.

1.2 Drill Conduit Hole

Drill a fifth hole in the center to accommodate the conduit.



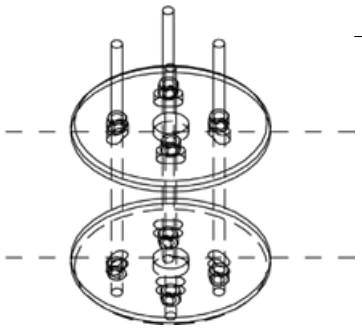
1.3 Position Upper Deck Plate

Position the first plate working from above the deck.

1.3.1 Thread a nut and washer on the end of each rod so that approximately six inches extends beyond the base of the washer.

1.3.2 Insert each rod through the top side of the plate, plate gasket, and down through the four holes in the deck.

NOTE: The top of the plate is the side with the tapered edge.



1.4 Position Lower Deck Plate

Position the second plate working from below the deck. Have another worker hold the upper plate and rods in place from above the deck.

1.4.1 Place the second plate gasket and then the second plate over the threaded rods.

1.4.2 Secure the second plate with nuts and washers pro-

vided. If required, readjust the nuts so that six inches of the rods are above the top of the upper plate.

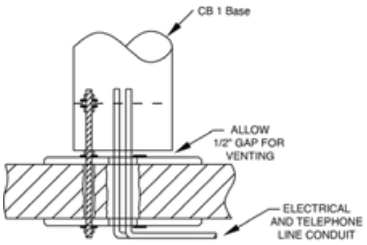
1.5 Secure Lower Nuts

To prevent tampering, it is advisable to tack weld the lower nuts to the threaded rod.

2. PULL WIRING

IMPORTANT:

Wire gauge must be selected to meet code for voltage/current required for the product to operate correctly: Minimum 14 AWG. Conduit used must comply to National Electrical Standards as ob- served locally.



2.1 Pull Power and Phone Line up through Conduits

A minimum of two feet of wire must be available from the conduit for electrical and communications wiring.

2.2 Conduit

Electrical and telephone line conduit is run through the deck and the center openings (two-inch diameter) of the upper and lower deck plates. A minimum of four inches and a maximum of six inches of conduit above the upper plate is required.

NOTE: Communications wire must be shielded phone line. The phone line must be pulled into the unit using a separate conduit from the power. Along with a service loop of wire, as noted by the NEC standards.

Base Gasket Instructions

1. SET THE NUTS AND WASHERS

IMPORTANT: Leveling the bottom nuts is crucial to leveling the unit.
A small error will be magnified after installation.

Screw one set of nuts and washers onto the anchor bolts:

After the foundation has set, screw one set of nuts, followed by one set of washers, onto the anchor bolts. Set the nuts so the lowest washer is about 2½ inches above the concrete at an even height.

To accomplish this, use a small level and check from front to back, side to side, & diagonally. These nuts are NOT adjustable after the unit is in place.

The bottom edge of the Code Blue unit will be 1/2" above the concrete when in stalled.

2. SET UNIT UPRIGHT ON ANCHOR BOLTS

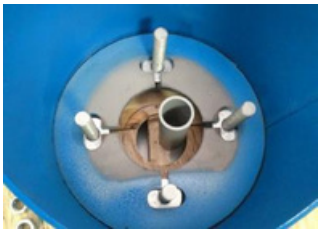
IMPORTANT: A ½-inch minimum air gap is required between the foundation and the unit to prevent moisture problems.

Set the Code Blue unit on the anchor bolts:

Align the phone plate in the desired direction and lift the Code Blue unit over the anchor bolts. The unit may be lifted using the bracket on the inside of the unit.

Note that the unit weighs approximately 200-400 pounds. Use appropriate lifting materials and methods to avoid possible injury and/or damage.

3. SECURE THE UNIT



Use Access Door to reach mounting studs

Access the mounting studs through the door on the side of the unit.

Place the base gasket

Set the gasket on the bolts and cut a small hole where the conduit is located.

Stretch the screen tightly around the conduit pipe. Slide the gasket over the bolts to the base of the unit.

*For an extra-strong seal, a bead of silicone caulk can be put on the gasket from bolt hole to bolt hole before setting the gasket into place and around the conduit.

Fasten

Place the second washer on the anchor bolt and place the nut on top.

Tighten the mounting nuts onto the anchor bolts. This may be more convenient if a long socket (extension and universal joint) is used to tighten the hardware.

Tower Installation

IMPORTANT

The following list is provided as a checklist for items required prior to installation or items that will be required on installation site:

1. Batteries must be FULLY bench charged before installation.
2. A local cellular dealer must provide a SIM card before unit can place calls.
3. Hand/Powered tools, including torque wrench, truck or mechanical lift for the CB 1 unit.
4. At least two persons and ladders for attaching support collar, adjusting solar panel, etc.

FOUNDATION - (see Anchor Bolt Installation Instructions on page 10)

SET THE UNIT -

- **Screw one set of nuts and washers onto the anchor bolts** – After the foundation has set, screw one set of nuts followed by one set of washers onto the anchor bolts. Set the nuts so the lowest washer is about 2½ inches above the concrete and at an even height. To accomplish this, use a small level and check from front to back, side to side and diagonally. These nuts are NOT adjustable after the unit is in place. The bottom edge of the Code Blue unit will be ½-inch above the concrete when installed.

IMPORTANT: The leveling of the bottom nuts is crucial to the leveling of the unit. A small error in the adjustment of these will be magnified after installation.

IMPORTANT: A ½-inch minimum air gap is required between the foundation and the unit. Moisture problems may result if this condition is not complied with.

- **Set the Code Blue unit on the anchor bolts** – Align the phone plate in the desired direction and lift the Code Blue unit over the anchor bolts. The unit may be lifted using the bracket on the inside of the unit. Note that the unit weighs approximately 330 pounds. Use appropriate lifting materials and methods to avoid possible injury and/or damage.

- **Secure the Code Blue unit** – Access the mounting studs through the door on the side of the unit. Place the second washer, then nut and tighten the mounting nuts onto the anchor bolts. This may be more convenient if a long socket, extension and universal joint is used to tighten the hardware.

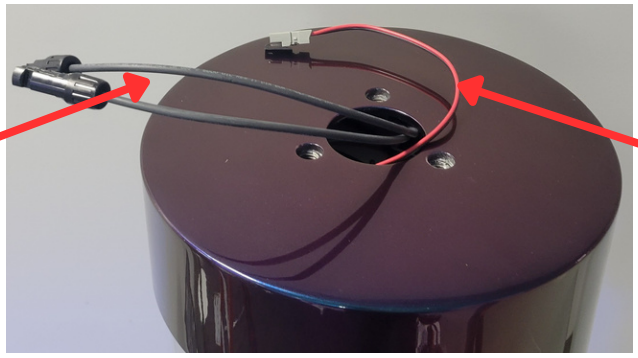
Solar Audio Paging Installation

SKIP if installation does not include Audio Paging Array

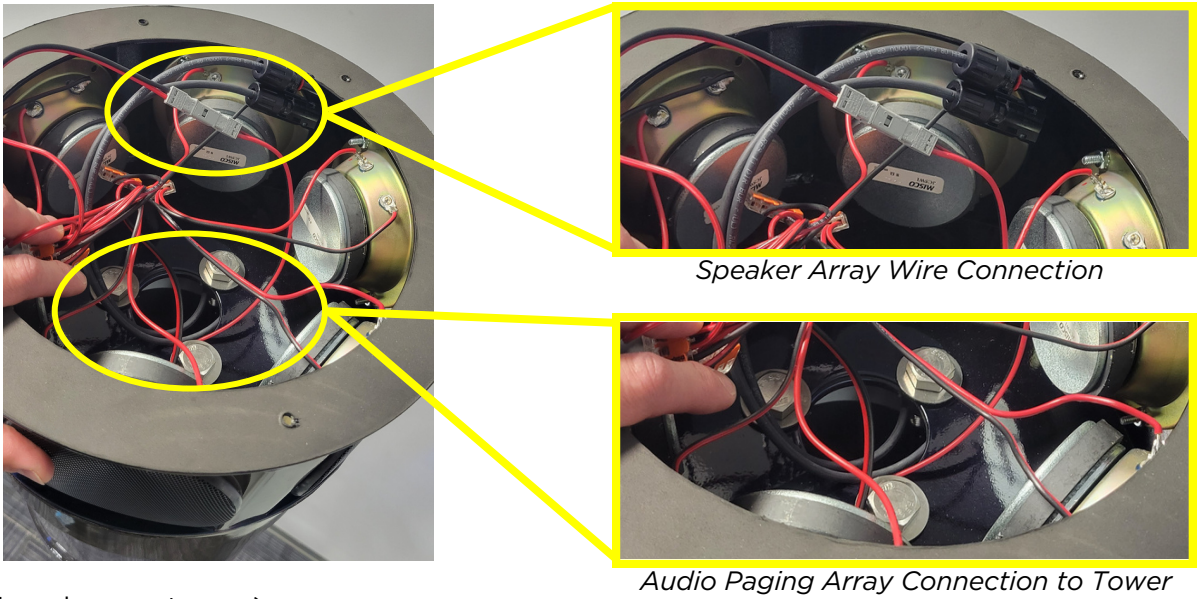
NOTE: *Prior to beginning the steps below, remove the 6 bolts & washers on top of the Solar Audio Paging Array to remove the top plate. This is necessary to make the connections referenced in the following steps.*

Installing Solar Audio Paging Array on NEW Unit

- **Fish Audio Paging & Solar Panel connection wires** - Utilizing the opening in the top of the tower (location where Solar Panel would typically be attached when installing without an Audio Paging Array), fish the connection wires through the opening.



- **Position & Secure Audio Paging Array on Tower** - Place the Solar Audio Paging Speaker Array on top of the tower unit & ensure the all holes align properly. Using the provided bolts and washers, securely attach the speaker array to the tower.
- **Connect Audio Paging Speaker Cables** - Using the pre-installed Wago connectors, connect the Audio Paging Speaker Cable to the cable that was fished up through the opening on the top of the tower in previous steps.



Speaker Array Wire Connection

Audio Paging Array Connection to Tower

(Continued on next page)

Solar Audio Paging Installation (continued)

- **Re-attach Solar Array Top Plate** - Using the 6 bolts & washers that were removed previously, reattach the top plate of the Audio Paging Speaker Array.
- **Fish Cables Through Cord Grips** - Pass the solar panel power & cellular antenna cables through the pre-installed cord grips located on the top of the Solar Array Top Plate.
- **Attach Solar Panel Mounting Bracket** - While feeding the solar panel connection cables through the aluminum solar panel mounting bracket, align the bracket on top of the Solar Audio Paging Array. Secure it to the unit with the 3 bolts & washers provided.

IMPORTANT NOTE: The pre-installed cord grips are only hand tightened at the factory, allowing for easy wiring adjustment during install. When connections are completed on site, the cord grips **MUST** be fully tightened in order to prevent water from entering the enclosure.

- **Mount & Connect Solar Panel** - See steps beginning on page 20 for proper solar panel installation.

NOTE: *It is highly recommended that when Solar Audio Paging is being installed on a unit, that all connections between the Audio Paging Array, Solar Panel, & Tower are stored inside the speaker array housing. This provides easier access and protection when the unit is being serviced.*

Solar Audio Paging Installation (continued)

Solar Audio Paging Amp Connection

- **4 Connections From Amp**
  - **Black & Red 2 Conductor Wire w/ Female Wago Connector** – Connect to Amp on 5 Way Manifold
  - **Black Wire w/ 7 Pin Connector** – Connect to 7 Pin Input on Phone Board (See Figure 2 for phone inputs)
  - **Gray 4 Pin RJ 11 Cable**- Connect to PAS Audio Input on Phone Board. (See Figure 2 for phone inputs)
  - **Black & Red 4 Conductor Wire w/ Male Wago Connector** - Connect to Amp/Speaker wire that is pre-installed inside the unit. (See Figure 3 for pre-installed wire)

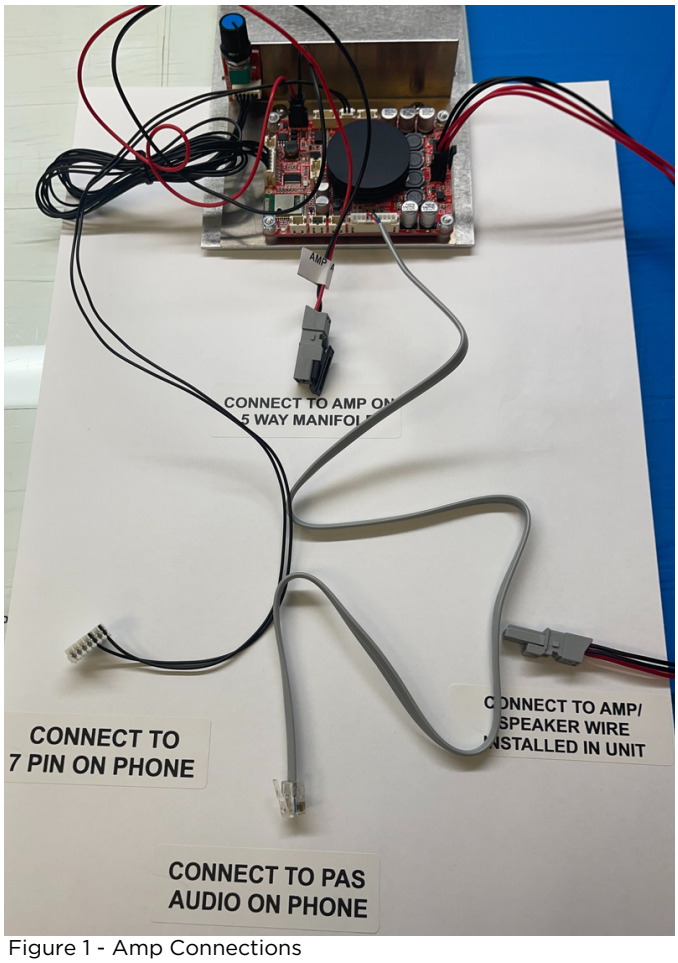


Figure 1 - Amp Connections

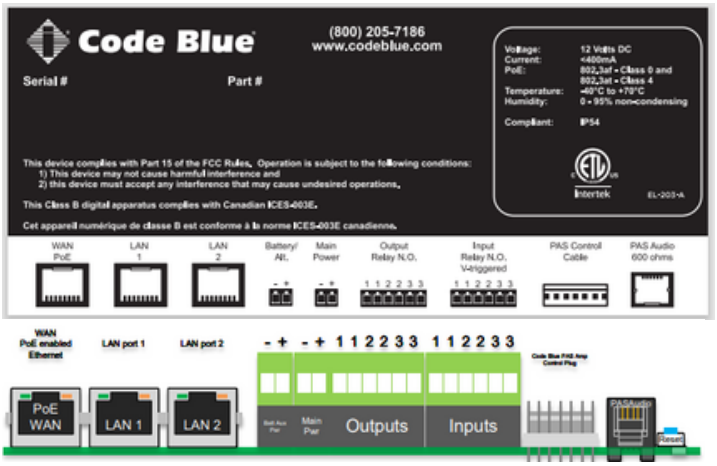


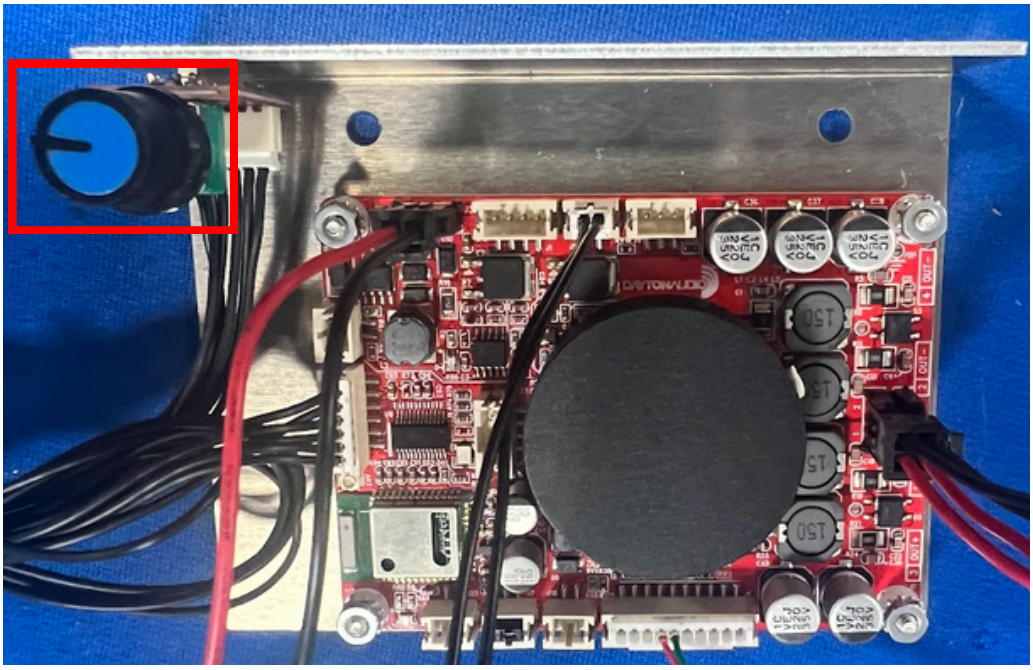
Figure 2 - Speakerphone Input Locations

Figure 3 - Pre-Installed Speaker/Amp Wire

Solar Audio Paging Installation (continued)

Solar Audio Paging Amp - Volume Level Adjustment

- **Locate Volume Adjustment Knob on Paging Amp** - See location in below photo



- **Adjust Volume to Desired Level** - By turning the knob clockwise or counter clockwise, this will increase or decrease the volume level of the Audio Paging Speaker Array.

Solar Panel Bracket Installation

NOTE: *If installing the optional Solar Audio Paging Array, the following steps take place on top of speaker array housing after attaching it to the tower by using the previous instructions, instead of on the top of the CB 1-w tower itself.*

- **Attach the aluminum solar panel base mount to the tower** – Align the solar panel base gasket over the 3 coordinating holes on the tower. Place the solar panel base mount on top of the gasket. Install a combination washer (rubber, then metal) on each of the three 5/8 bolts with Loctite treated threads. Secure the bolts tightly to ensure proper attachment. See Fig. 1.

NOTE: Completely coat Loctite around the threads. Loctite MUST dry for 24 hours before being exposed to moisture.

NOTE: Each time the bolts are removed, they must be retreated with the Loctite PST.

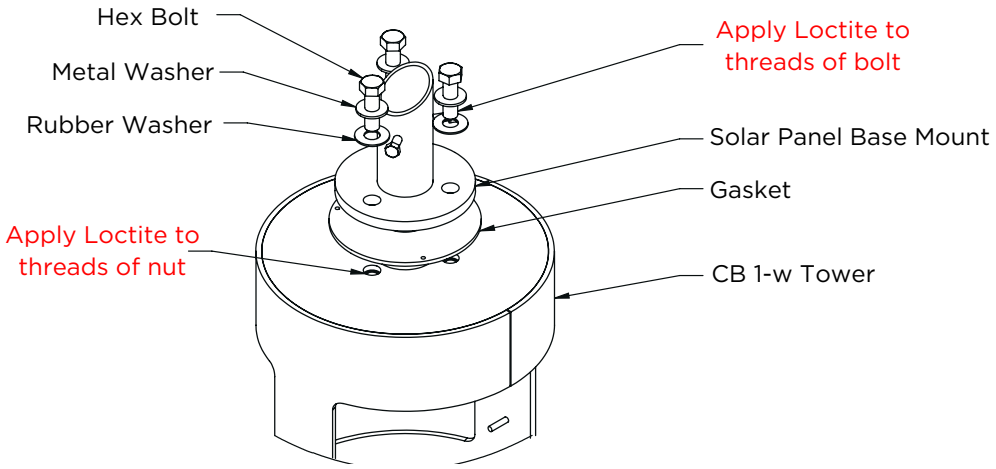


Figure 1

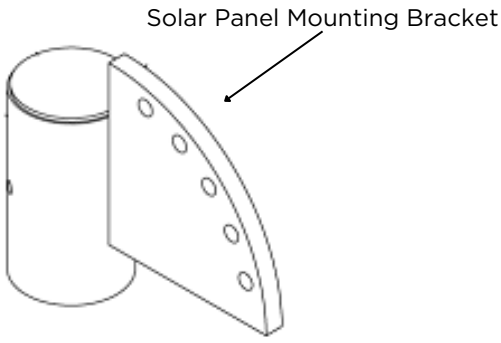


Figure 2

Solar & Cellular Wiring Installation

IMPORTANT NOTE: Previous versions of the CB 1-w were designed with the solar panel connection wires running through the panel mounting brackets. The current version of the CB 1-w has cord grip pass throughs integrated into the top of the tower. Both installation types are detailed on this page.

- **Route solar panel power wiring through mount** – Fish the solar panel power wires up through the top of the panel mounting bracket. Use the provided gasket to seal in top hole once wires are fed through. See figure 3.

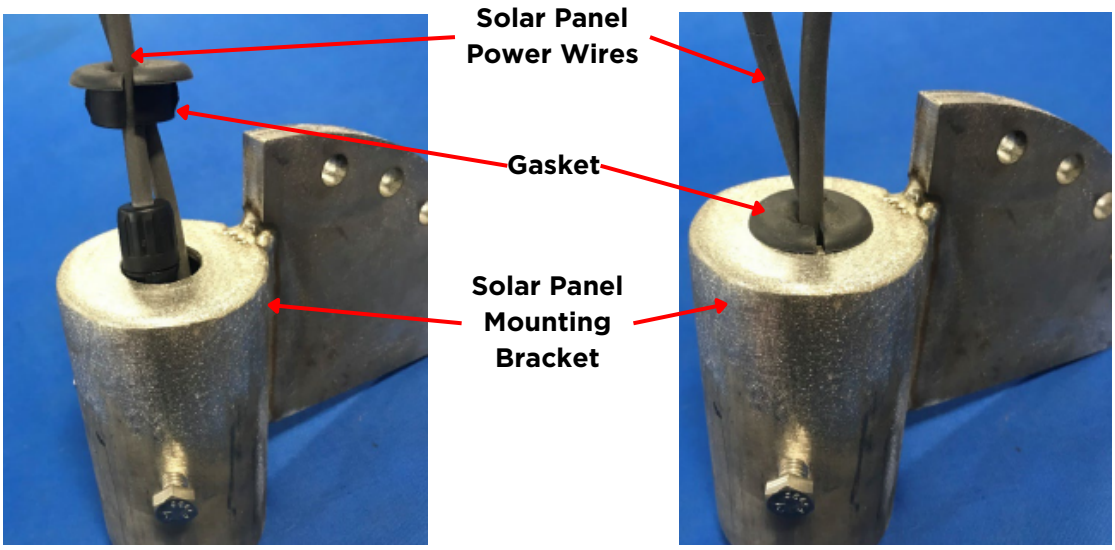


Figure 3

- **Solar panel power & cellular communication wiring through cord grips** – The current version of the CB 1-w is shipped from the factory with the solar panel power and cellular communication antenna wiring already run through the four cord grip pass throughs located on top of the tower. See Figure 4.

IMPORTANT NOTE: The pre-installed cord grips are only hand tightened at the factory, allowing for easy wiring adjustment during install. When connections are completed on site, the cord grips **MUST** be fully tightened in order to prevent water from entering the enclosure.

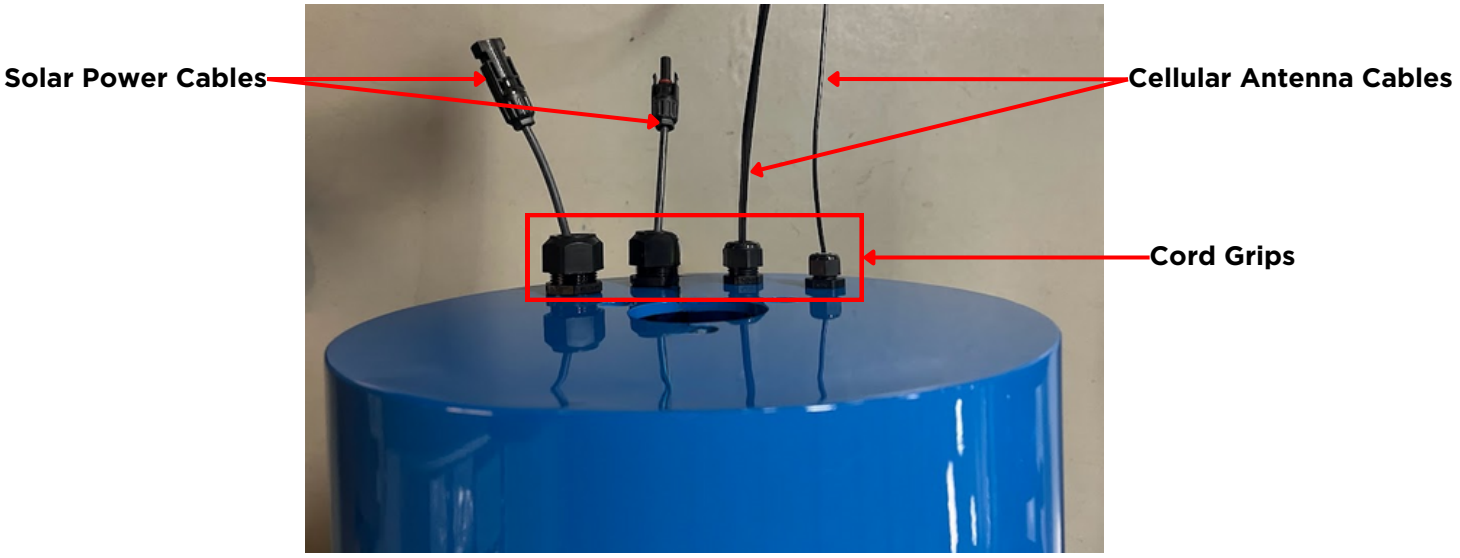


Figure 4

Solar Panel Installation

- **Connect solar panel to mounting bracket** - Attach the mounting bracket to the solar panel as shown in Figure 5, using the supplied 1/4"-20 bolts & nylock nuts.

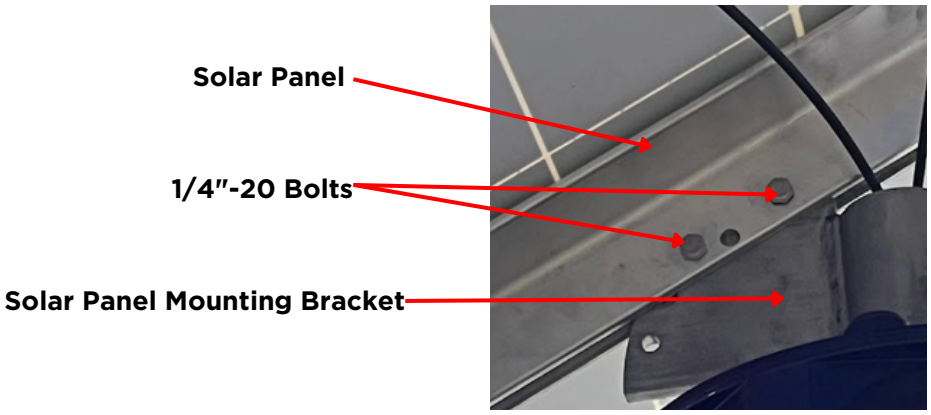


Figure 5

- **Mount the solar panel assembly to the tower** – Slide the aluminum bracket sleeve over the pole. The sleeve will rest on the collar of the aluminum pole just above the pull box. Point the solar panel due south and securely tighten the two 3/8 set-screws. Figure 6. Feed the power and antenna wires through the open hole in the bottom of the pull box. Attach the connector with the supplied lock nut and allow the wires to hang out of the box.

Figure 6

- **Connect power cables to solar panel** - Connect the corresponding positive & negative power cables to the inputs located on the back side of the solar panel, as shown in Figure 7.

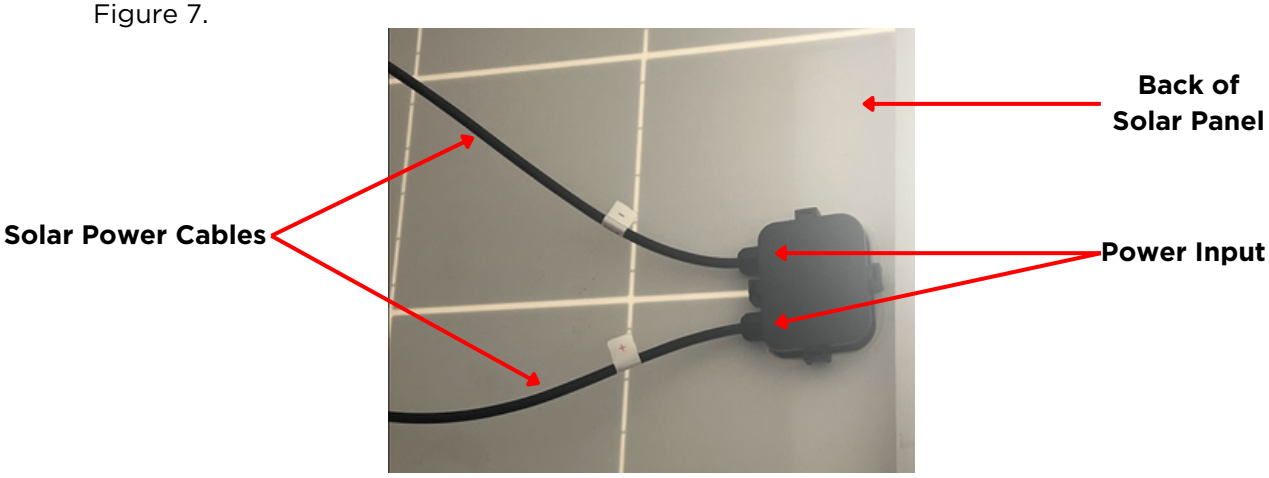


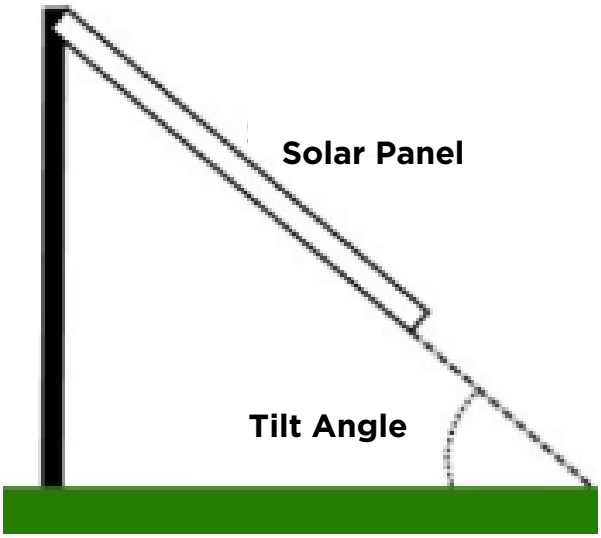
Figure 7

Solar Panel Installation

- **Position the solar panel** - The orientation of the solar array is important for proper system performance. In the northern hemisphere the solar array should be pointing true south and in the southern hemisphere the solar array should be pointing true north. Use a GPS or compass to verify azimuth. To find the proper tilt angle for the solar array, use the following formula:

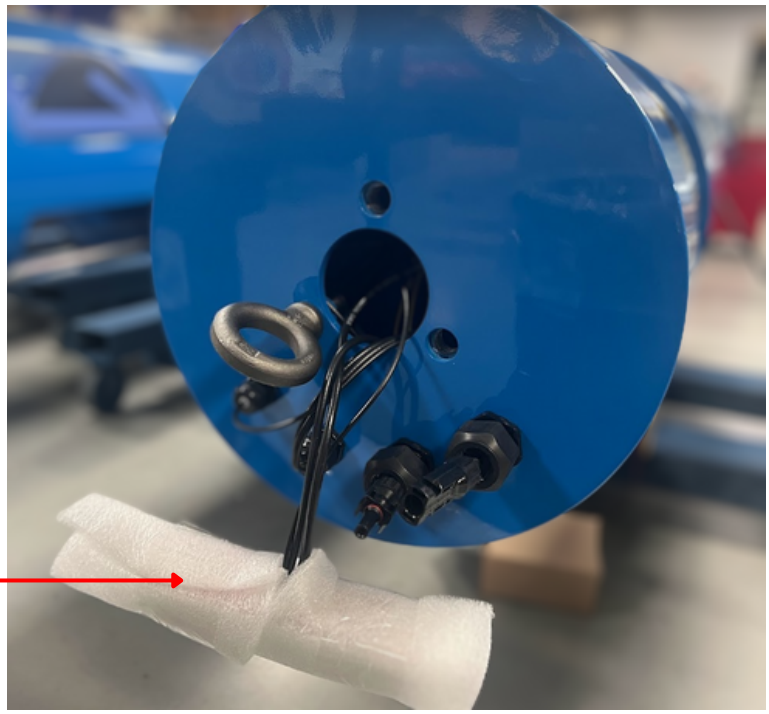
  Tilt Angle = [(Latitude)*(0.9)] + 23°

  The tilt angle is the angle between the ground and the panel as shown in the diagram below.



Cellular Communication Wiring & Antenna Installation

- **Shipping** - Unless your CB 1-w unit is ordered with an Audio Paging Speaker Array, the Cellular Communication Antenna is shipped pre-installed through the cord grips & wrapped to help reduce install time and protect it during transit. The antenna will be mounted to a specific location on Solar Panel during the following step.
- **Unwrap the Antenna -** Remove the foam wrapping from the antenna unit.

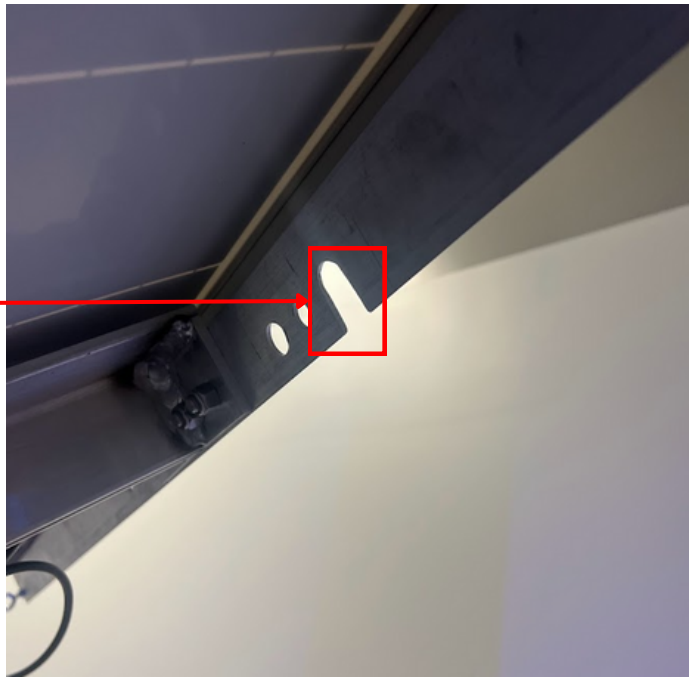


- **Remove Adhesive Backing -** Turn the antenna over & remove the red film covering the adhesive that will help keep the antenna in place once fully installed.

(Continued on next page)

Cellular Communication Wiring & Antenna Installation (continued)

- **Mounting Location -** On the top edge of the solar panel, locate the “U” shaped slot. This is where the antenna will be mounted.



- **Place the Antenna -** Insert the threaded stud located on the bottom of the antenna into the “U” shaped slot. Press the antenna firmly onto the frame & hold for several seconds, allowing the adhesive to take hold.

(Continued on next page)

Cellular Communication Wiring & Antenna Installation (continued)

- **Slip-On Lock Nut -** Slide the supplied slip-on locking nut(Figure 7) around the cables, & secure it tightly to the threaded stud on the antenna.

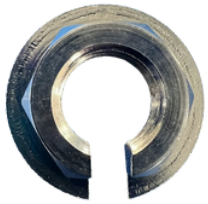
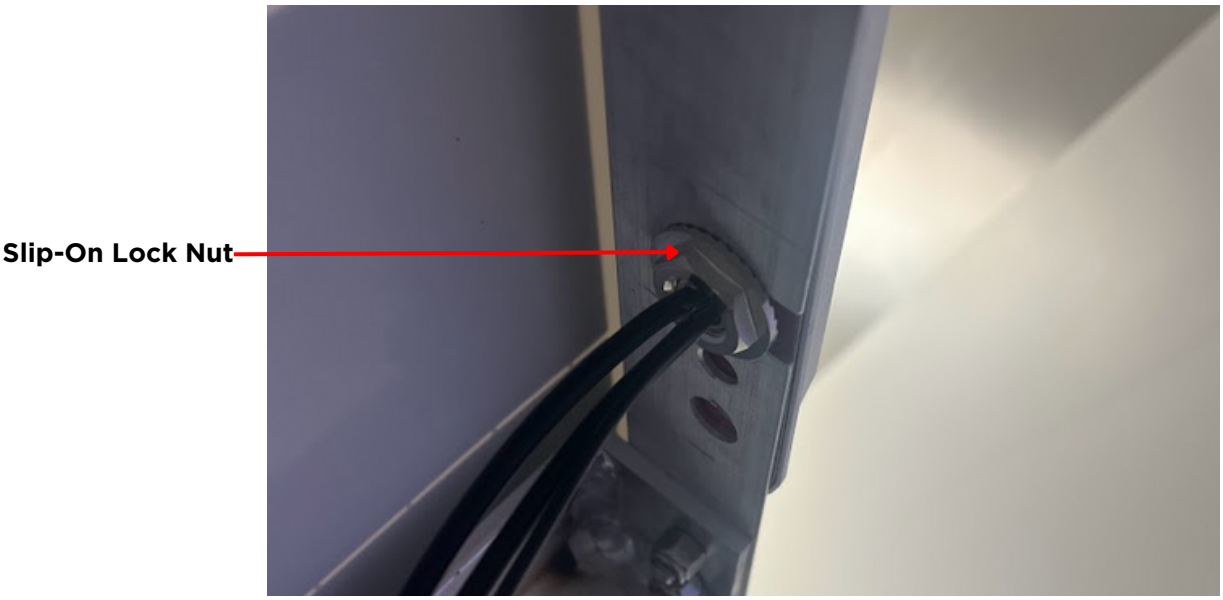


Figure 7



The antenna assembly should appear as pictured below when complete.

Solar Power Installation

- **Fish the wires into the unit and connect them to the battery** – Use the existing pull wire and attach the solar panel and antenna wires to pull down into the unit. Once the wires are into the unit, separate them. Attach the supplied forks to each black and red wire. The green wire should be attached to the existing ground lug on the bottom of the panel. One set of wires will have white electrical tape approximately 8-10 inches from the end. These are the solar panel wires.

- **Attach the solar panel wires** – Connect the red wire to the solar charge controller on the positive (+) lug and the black wire on the negative (-) lug.

Battery Leads

INSTALL THE BATTERIES

***NOTE:* Batteries must be FULLY bench charged before installation.**

WARNING: Reversing the battery wires (reversed polarity) will cause damage to the solar charge controller, cellular, and IP wireless circuits and is NOT covered by the warranty.

***NOTE:* The use of 2 people while installing the batteries, is highly recommended.**

- **Locate the battery hoist strap & battery terminal covers** - These will be used in upcoming steps.

(Continued on next page)

Solar Power Installation (continued)

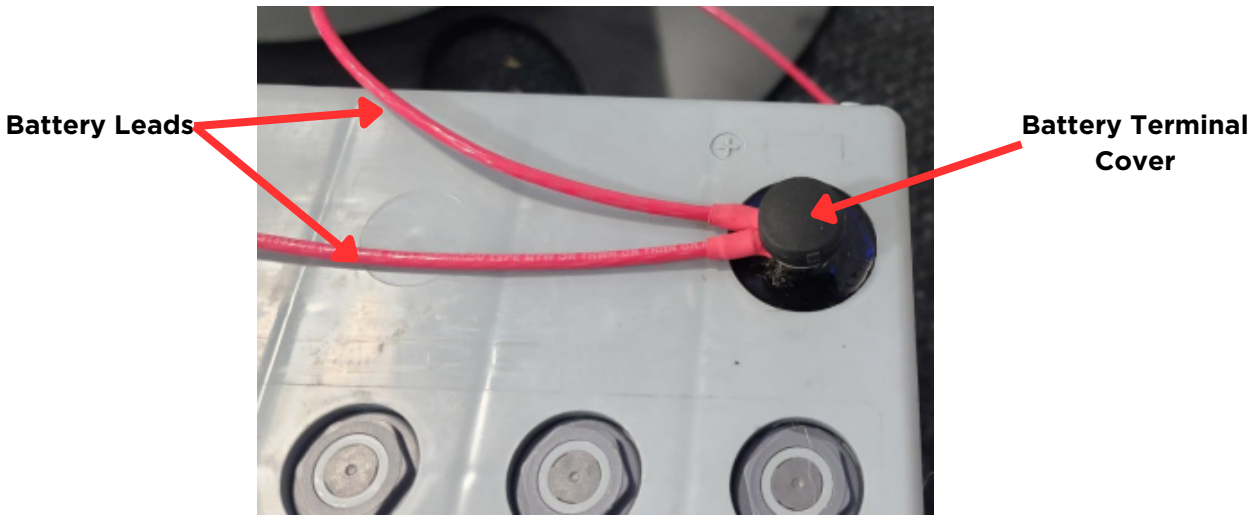
- **Remove the faceplate speakerphone & lower access door from the tower** – The faceplate speakerphone opening will be utilized to properly used the battery hoist strap.
- **Insert the battery shelf** – Using the lower access door opening, place the battery shelf plate on the tabs located inside the tower. This is where the first battery will be placed when installed.

(Continued on next page)

Solar Power Installation (continued)

- **Connect battery leads and terminal covers** – Attach the battery leads, starting with the battery terminal that will be the lowest inside the unit. Once the leads are secured, attach the battery terminal covers to prevent shorting against the inside of the tower.

NOTE: Two positive cables need to be connected to the terminal. One will connect to the second battery & the other to the solar charge controller.



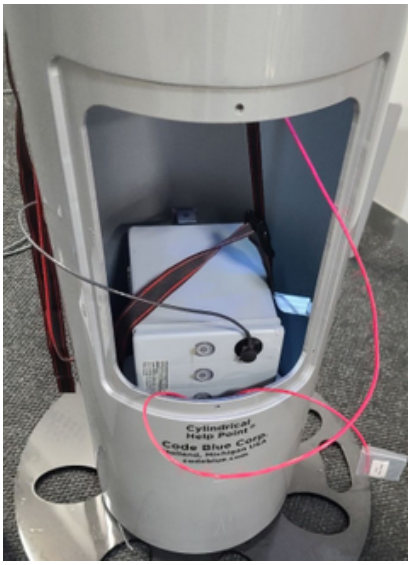
- **Protect the bare connector of the connected battery cable** - It is recommended that the exposed connectors of the installed battery cables are covered to prevent shorting on the inside of the tower.

(Continued on next page)

Solar Power Installation (continued)

- **Attach battery hoist strap to first battery** – Attach the battery hoist strap to the first battery to be installed, & fish the remaining strap through the access door opening & out the speakerphone faceplate opening.

- **Hoist the first battery into position** – With the help of a second person, hoist the battery through the access door & lower it down into position onto the battery shelf plate. It is recommended that the battery terminals face the access door opening to provide easy maintenance & service to the batteries in the future.



(Continued on next page)

Solar Power Installation (continued)

- **Connect the negative terminal cable to the second battery** – Attach the battery cable that previously connected to the negative terminal on the first battery, to the second battery. Repeating previous steps, attach the battery hoist strap to the second battery.

- **Hoist the second battery into position** – With the help of a second person, hoist the second battery through the access door & lower it down into position onto first battery. It is recommended that the battery hoist strap is left attached to the second battery for ease of future battery changes.
- **Connect the positive battery cable to the second battery** – Connect the short cable that is attached to the first battery's positive terminal, to the positive terminal of the second battery. Install the battery terminal cover.

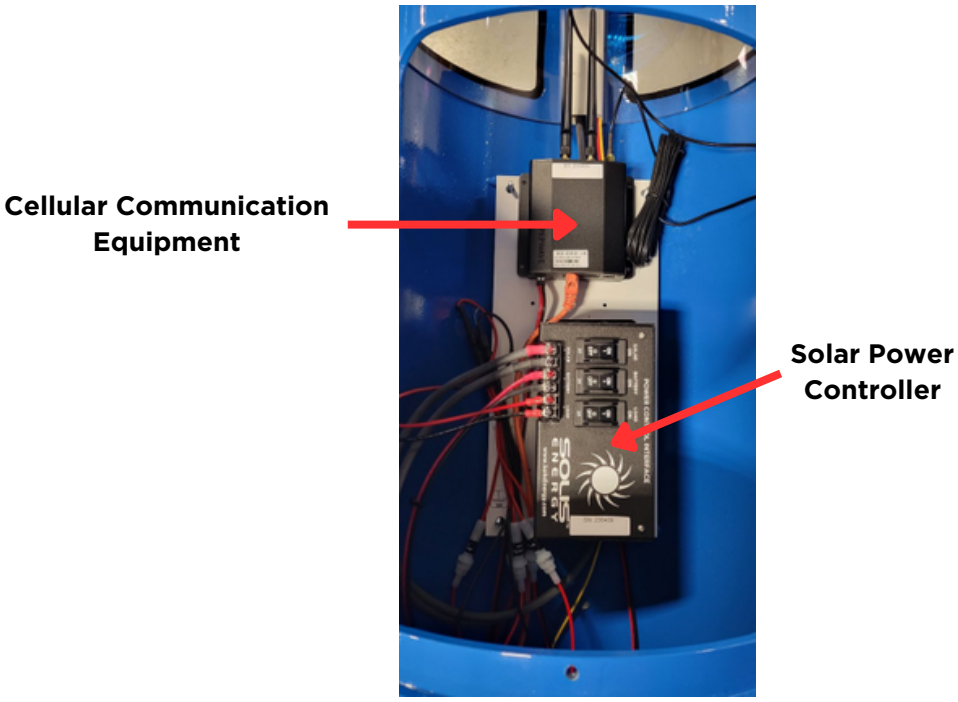
Battery install is complete.

Speakerphone Installation

- **Installation of IP Faceplate Speakerphone** - If not previously installed from the factory, your IP Faceplate Speakerphone should appear as displayed in the photo below. Once connected, it needs to be secured to the CB 1-w tower using the 6 countersunk security screws and security bit included with the unit. See LS1000 VoIP Speakerphone Admin Guide for programming details.

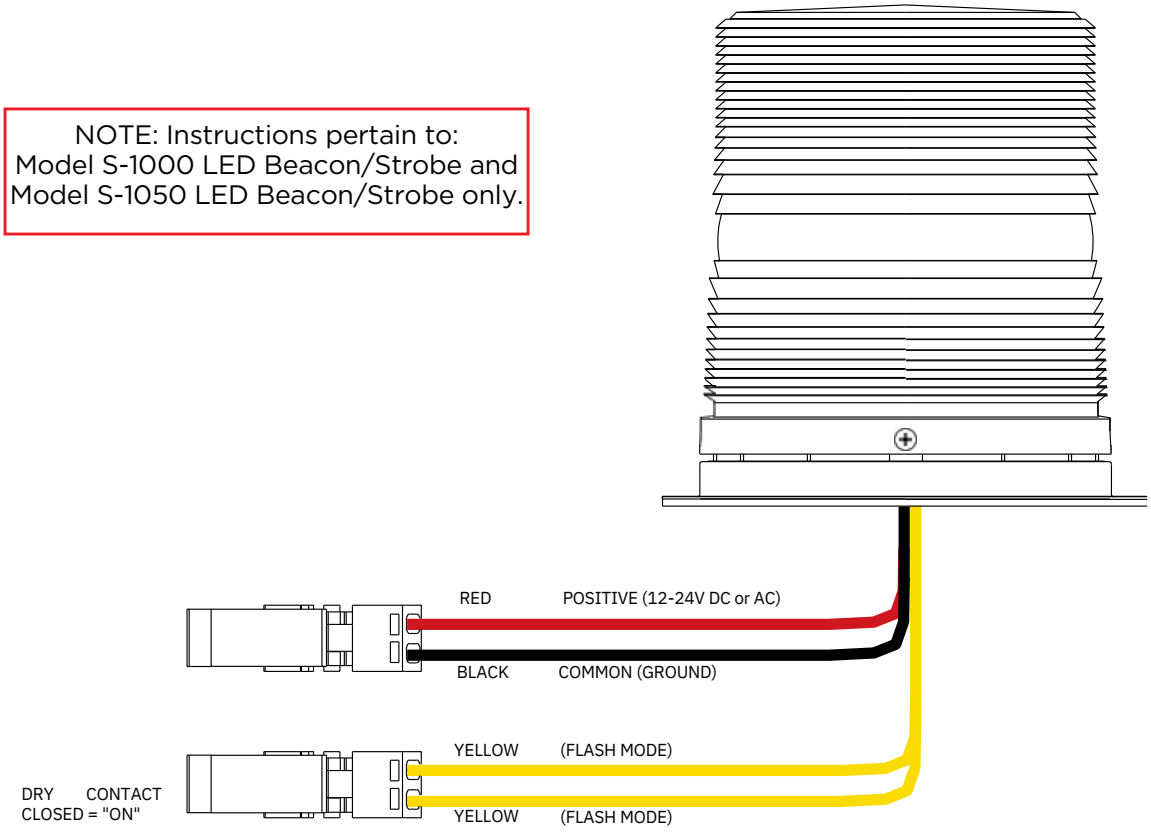
Pre-Installed Components

- **Solar Power Controller** - All of the wires connected to the solar power controller are pre-installed at the factory as shown in the photo below, located behind the upper access door of the tower. Note the 3 circuit breakers are OFF. Once the batteries are installed and all wires connected. Turn the Battery circuit breaker on first, then the Panel, then the Load.
- **Cellular Communication Components** - If your unit was ordered with 4G/5G/LTE Cellular Communication, the components required to operate this system are pre-installed at the factory as shown in the photo below located behind the upper access door of the tower. Please note, service need to be activated upon install by contacting Code Blue Tech Support.



S-1000 & S-1050 Strobe Operation

NOTE: Instructions pertain to:
Model S-1000 LED Beacon/Strobe and
Model S-1050 LED Beacon/Strobe only.



CAUTION ⚠ **REMOVE ALL POWER FROM UNIT BEFORE SERVICING.**

OPERATION

To activate the LEDs in the PRIMARY-STEADYBURN MODE, connect the BLACK and RED wires to 12-24 volts AC or DC.

When in PRIMARY-STEADYBURN MODE, to change the LEDs to SECONDARY-FLASH MODE, connect both YELLOW control wires together (i.e., CLOSED = ON).

PHOTOCELL FEATURE (S-1050 MODEL)

The Steadyburn Mode will be ON in dark or night ambient environments and OFF in bright or daylight ambient environments. The S-1050 LED Beacon/Strobe has two built-in photo response features: (a) dawn/dusk transition delay of 15-30 minutes and (b) transient light acknowledgement delay of at least 3 minutes.

PROGRAMMING PRIMARY & SECONDARY MODES

1. Remove power from unit.

2. Short the Yellow wires together.

3. Restore power to the unit and wait until the unit begins to flash. Once the unit begins to flash, remove the short. The unit will alternately demonstrate the Secondary-Flash Mode and Primary-Steadyburn Mode that will be displayed during operation. For approximately 4 seconds the Secondary-Flash Mode will be demonstrated, followed by the Primary-Steadyburn Mode.

4. To select the next mode of operation, momentarily short the yellow wires. The unit will cycle to the next mode in the list above.

Mode Number	Primary-Steadyburn Mode	Secondary-Flash Mode
1	High	Single - 60 FPM
2	OFF	Single - 60 FPM
3	Low	Single - 60 FPM
4	High	Single - 150 FPM
5	OFF	Single - 150 FPM
6	Low	Single - 150 FPM
7	High	Single - 375 FPM
8	OFF	Single - 375 FPM
9	Low	Single - 375 FPM
10	High	Neobe - 75
11	OFF	Neobe - 75
12	Low	Neobe - 75
13	High	Neobe - 150
14	OFF	Neobe - 150
15	Low	Neobe - 150
16	High	Double - 125
17	OFF	Double - 125
18	Low	Double - 125
19	High	Double - 250
20	OFF	Double - 250
21	Low	Double - 250

5. There are seven Flash Modes and three Steadyburn Modes combinations to choose from.

6. When you reach the desired mode of operation, remove power from the unit. You MUST leave power disconnected for 20 seconds BEFORE reapplying. When power is reapplied, the unit will operate as programmed above.

NOTE: If you do not leave power disconnected for 20 seconds before reapplying power, the light will default to Program Mode.

INPUT VOLTAGE RANGE: 12-24V AC or DC		
TEMPERATURE RATING: -40°C to +65°C (-40°F to 149°F)		
TYPICAL POWER CONSUMPTION AT 25°C		
Voltage Flash Mode		Steady Mode - High
12V DC	0.24 A Max	0.24 A
24V DC	0.12 A Max	0.12 A
12V AC	1.1 A rms Max	0.53 A rms
24V AC	0.22 A rms Max	0.22 A rms
NOTE: Average current draw in Flash Mode will vary by selected Flash mode. The above maximum amperage draw is stated at Single 60 FPM.		

6 Power Requirements

The following tables on pages 35-38 include **CB 1-w** and ALL OTHER Code Blue devices & enclosures for reference.

Faceplates	Voltage	Max Current	Max Watts	Norm Current	Norm Watts	KWHrs
IA4100	24V AC	0.40	9.60	0.22	5.28	0.13
	12V DC	0.90	10.80	0.39	4.68	0.11
	24V DC	0.90	21.60	0.39	9.36	0.22
IP5000	24V AC	0.10	2.40	0.07	1.68	0.04
	12V DC	0.19	2.28	0.15	1.80	0.04
	24V DC	0.19	4.56	0.15	3.60	0.09
Centry	12VDC	0.50	6.00	0.38	4.56	0.11
LS1000/LS2000	12V DC	0.50	3.60	0.40	4.80	0.12
Lights	**Voltage**	**Max Current**	**Max Watts**	**Norm Current**	**Norm Watts**	**KWHrs**
s-1000/S-2000 LED Strobe	24V AC	0.28	6.72	0.22	5.28	0.13
	12V DC	0.26	3.12	0.24	2.88	0.07
	24V DC	0.26	6.24	0.24	5.76	0.14
A-700 Area Light	24V AC	1.80	43.20	0.83	19.92	0.48
	12V DC	2.68	32.16	0.38	4.56	0.11
	24V DC	2.68	64.32	0.38	9.12	0.22
S-1050 LED Strobe W/ Photocell	24V AC	0.28	6.72	0.22	5.28	0.13
	12V DC	0.27	3.22	0.24	2.88	0.07
	24V DC	0.27	6.43	0.24	5.76	0.14
LED Light Bar	24V AC	0.04	0.96	0.04	0.96	0.02
	12VDC	0.04	0.48	0.04	0.48	0.01
	24V DC	0.04	0.96	0.04	0.96	0.02
WM180 PAS With LED Strobe	12-24V DC	7.30	175.20	2.10	50.40	1.21

Models With IA4100 Faceplate	Voltage	Current	Watts	KWHrs
CB 1-e	24V AC	0.48	11.52	0.28
	12VDC	0.67	8.04	0.19
	24V DC	0.67	16.08	0.39
CB 1-s	24V AC	1.31	31.44	0.75
	12V DC	1.05	12.60	0.30
	24V DC	1.05	25.20	0.60
CB 5-s	24V AC	0.48	11.52	0.28
	12V DC	0.67	8.04	0.19
	24V DC	0.67	16.08	0.39
CB 9-s	24V AC	0.26	6.24	0.15
	12V DC	0.43	5.16	0.12
	24V DC	0.43	10.32	0.25
CB 2-e	24V AC	0.44	10.56	0.25
	12VDC	0.63	7.56	0.18
	24V DC	0.63	15.12	0.36
CB 2-a	24V AC	0.48	11.52	0.28
	12V DC	0.67	8.04	0.19
	24V DC	0.67	16.08	0.39
CB 2-s	24V AC	1.31	31.44	0.75
	12V DC	1.05	12.60	0.30
	24V DC	1.05	25.20	0.60
CB 2 w/ Audio Paging	12-24V DC	6.44	154.56	3.71
CB 4-s	24V AC	0.22	5.28	0.13
	12V DC	0.39	4.68	0.11
	24V DC	0.39	9.36	0.22
CB 4-r	24V AC	0.26	6.24	0.15
	12V DC	0.43	5.16	0.12
	24V DC	0.43	10.32	0.25
CB 4-u	24V AC	0.26	6.24	0.15
	12V DC	0.43	5.16	0.12
	24V DC	0.43	10.32	0.25
CB 6-F & CB 6-S	24V AC	0.22	5.28	0.13
	12V DC	0.39	4.68	0.11
	24V DC	0.39	9.36	0.22
CB RT	24V AC	0.48	11.52	0.28
	12V DC	0.67	8.04	0.19
	24V DC	0.67	16.08	0.39

Models With IP5000 Faceplate	Voltage	Current	Watts	KWHrs
CB 1-e	24V AC	0.33	7.92	0.19
	12VDC	0.43	5.16	0.12
	24V DC	0.43	10.32	0.25
CB 1-s	24V AC	1.16	27.84	0.67
	12V DC	0.81	9.72	0.23
	24V DC	0.81	19.44	0.47
CB 5-s	24V AC	0.33	792.00	0.19
	12V DC	0.43	5.16	0.12
	24V DC	0.43	10.32	0.25
CB 5-s	24V AC	0.11	2.64	0.06
	12VDC	0.19	2.28	0.05
	24V DC	0.19	4.56	0.11
CB 2-e	24V AC	0.29	6.96	0.17
	12V DC	0.39	4.68	0.11
	24V DC	0.39	9.36	0.22
CB 2-a	24V AC	0.33	7.92	0.19
	12VDC	0.43	5.16	0.12
	24V DC	0.43	10.32	0.25
CB 2-s	24V AC	1.16	27.84	0.67
	12V DC	0.81	9.72	0.23
	24VDC	0.81	19.44	0.47
CB 2 w/ Audio Paging	12-24V DC	6.44	154.56	3.71
CB 4-S	24V AC	0.07	1.68	0.04
	12V DC	0.15	1.80	0.04
	24V DC	0.15	3.60	0.09
CB 4-r	24V AC	0.11	2.64	0.06
	12VDC	0.19	2.28	0.05
	24V DC	0.19	4.56	0.11
CB 4-u	2av AC	0.11	2.64	0.06
	12VDC	0.19	2.28	0.05
	24V DC	0.19	4.56	0.11
CB 6-F & CB 6-S	24VAC	0.07	1.68	0.04
	12V DC	0.15	1.80	0.04
	24V DC	0.15	3.60	0.09
CB RT	24V AC	0.33	7.92	0.19
	12V DC	0.43	5.16	0.12
	24V DC	0.43	10.32	0.25

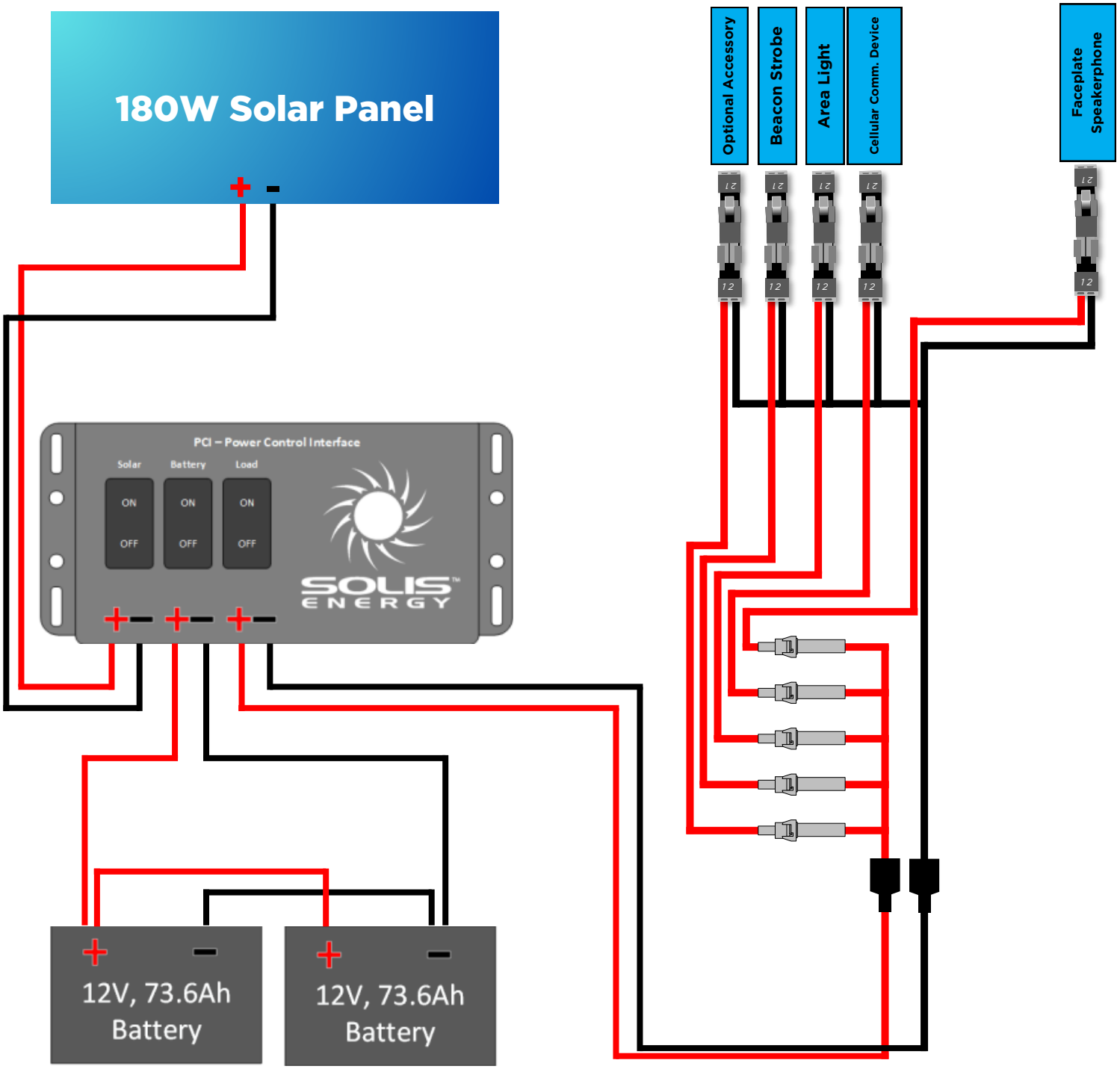
Models with LS1000/LS2000	Voltage	Current	Watts	KWHrs
CB 1-e	12V DC	0.68	8.16	0.20
CB 1-s	12V DC	1.06	12.72	0.31
CB 5-s	12V DC	0.68	8.16	0.20
CB 9-S	12V DC	0.44	5.28	0.13
CB 2-e	12V DC	0.64	7.68	0.18
CB 2-a	12V DC	0.68	8.16	0.20
CB 2-s	12V DC	1.06	12.72	0.31
CB 4-s	12V DC	0.40	4.80	0.12
CB 4-r	12V DC	0.44	5.28	0.13
CB 4-U	12V DC	0.44	5.28	0.13
CB 6-F & CB 6-S	12V DC	0.40	4.80	0.12
CB RT	12V DC	0.68	8.16	0.20

High Voltage Models	Voltage	Current	Watts	KWHrs
CB 1 w/ Audio Paging	12-24V DC	3.83	460	11
CB 5 w/ Audio Paging	12-24V DC	3.33	400	9.6
CB 1 w/ NightCharge	120V AC	2.5	300	2.4
CB 4-U w/ NightCharge	120V AC	2.5	300	2.4

High Voltage AC Components	Voltage	Current	Watts	KWHrs
Multi-Tap Power Supply	120V AC	1.75A/210VAC	210	5.04
DIN Rail Power Supply	120V AC	1.2A/115VAC	115	2.76
Audio Paging Amp	12-24V DC	3.83	459.6	11.03

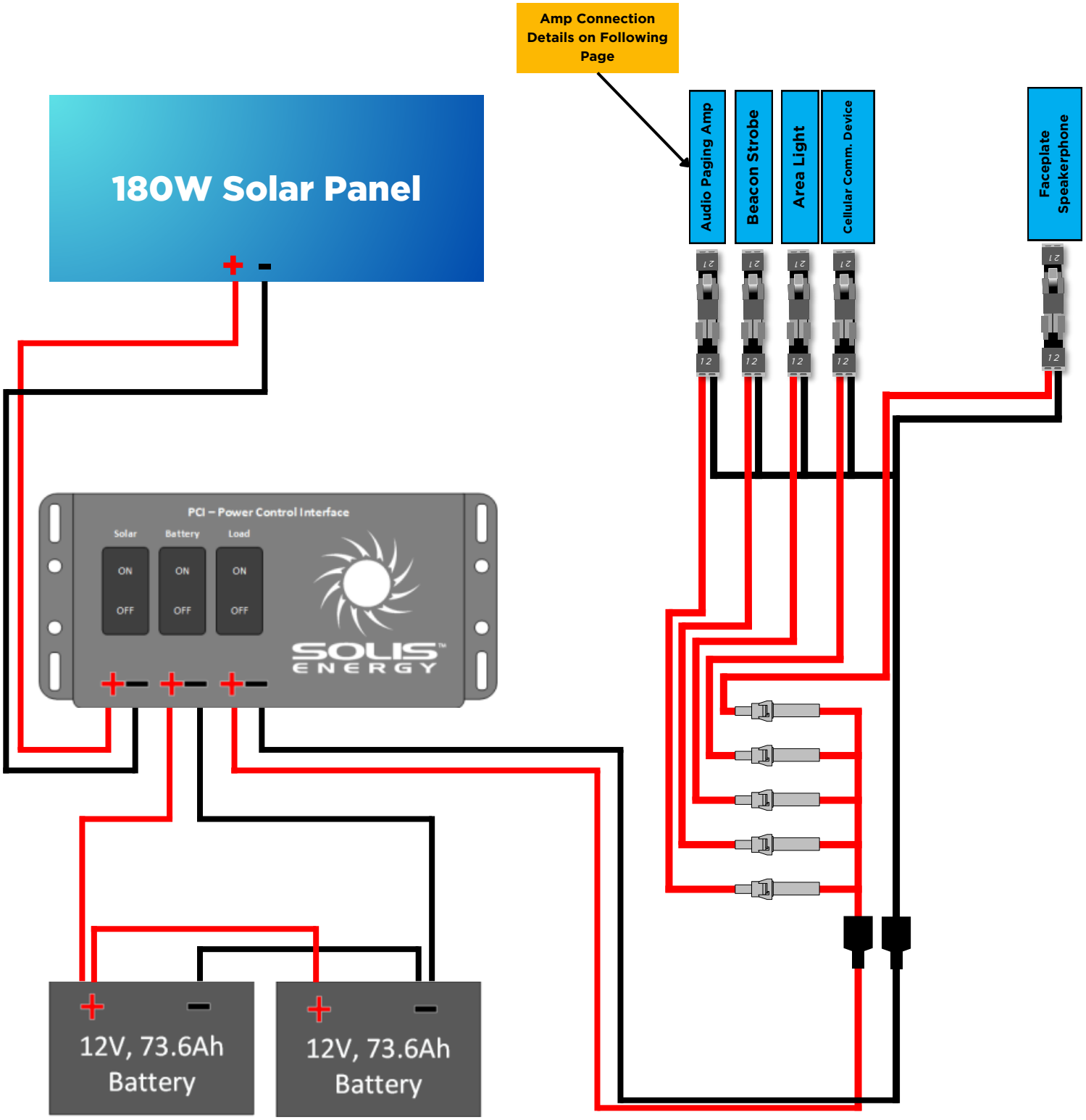
7 Wiring Diagrams

Complete Solar Tower Diagram - No Audio Paging System



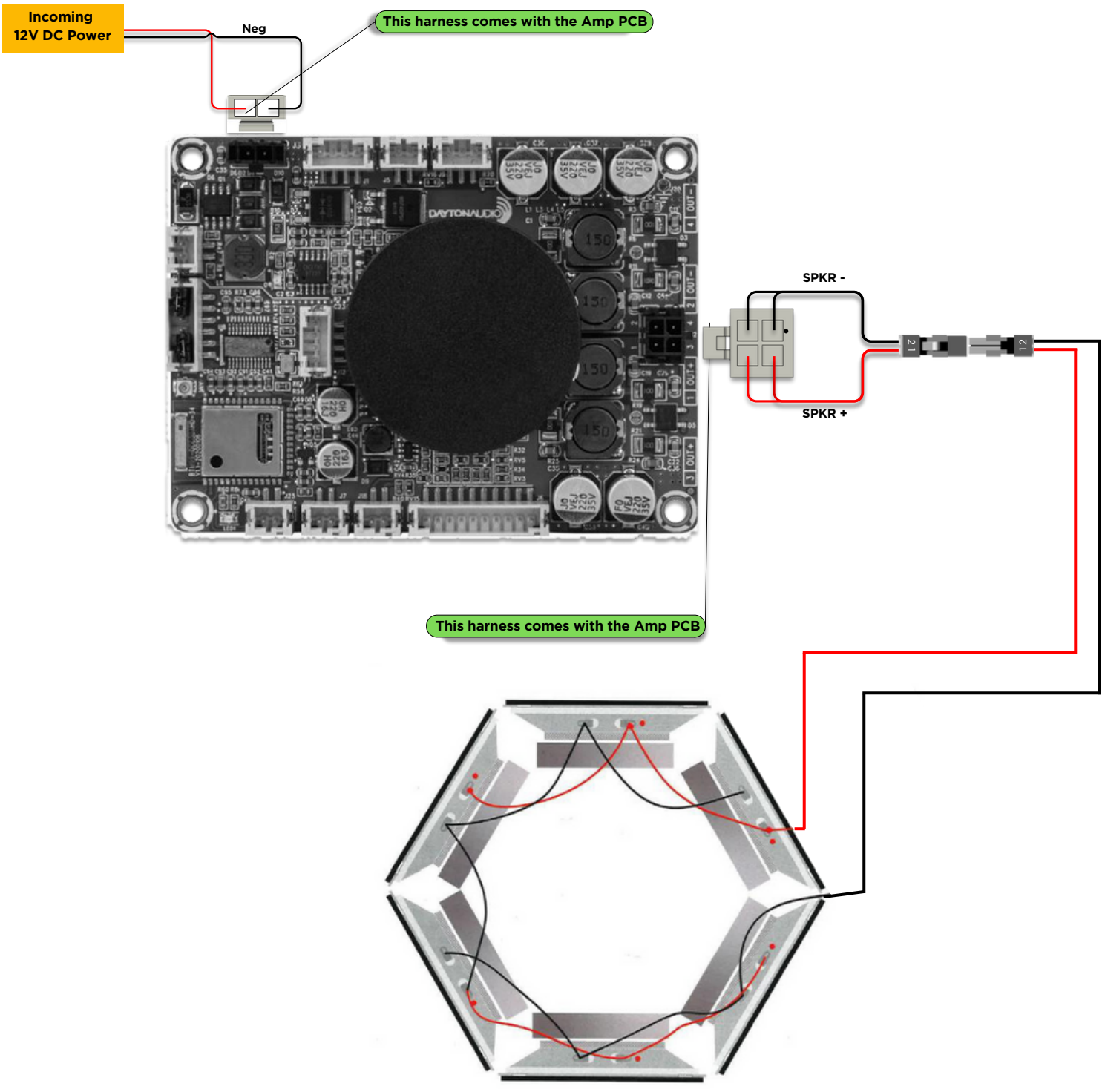
Product wiring diagram shown reasonably represents current offering and is intended to assist in component identification and service. Earlier product production may have different components and wiring connections. Reference the model and serial number from the unit ID tag and contact manufacturer to confirm replacement part version and availability.

Complete Solar Tower Diagram - With Audio Paging System



Product wiring diagram shown reasonably represents current offering and is intended to assist in component identification and service. Earlier product production may have different components and wiring connections. Reference the model and serial number from the unit ID tag and contact manufacturer to confirm replacement part version and availability.

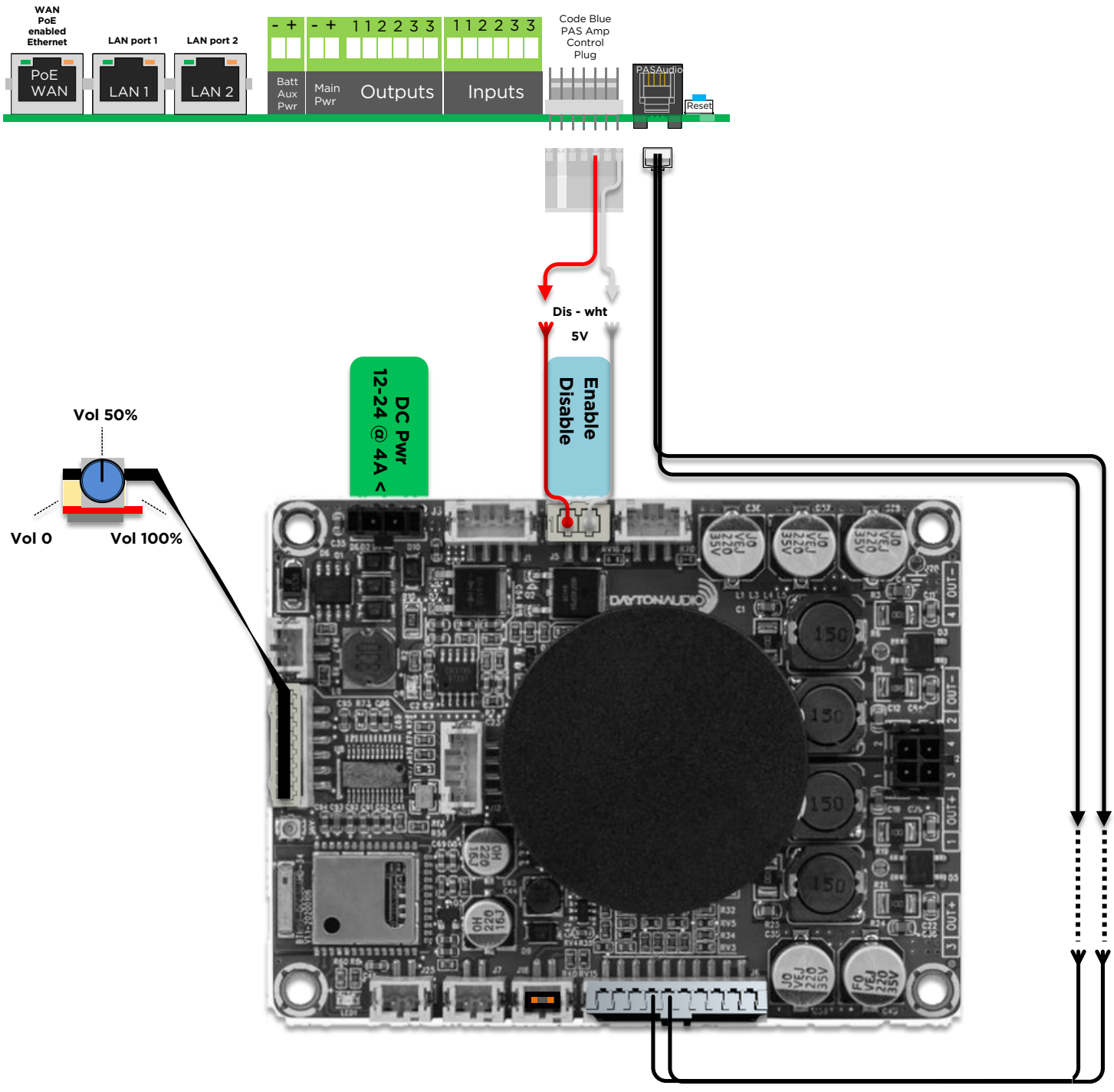
Solar Audio Paging Amplifier Wiring



360°Audio Paging System

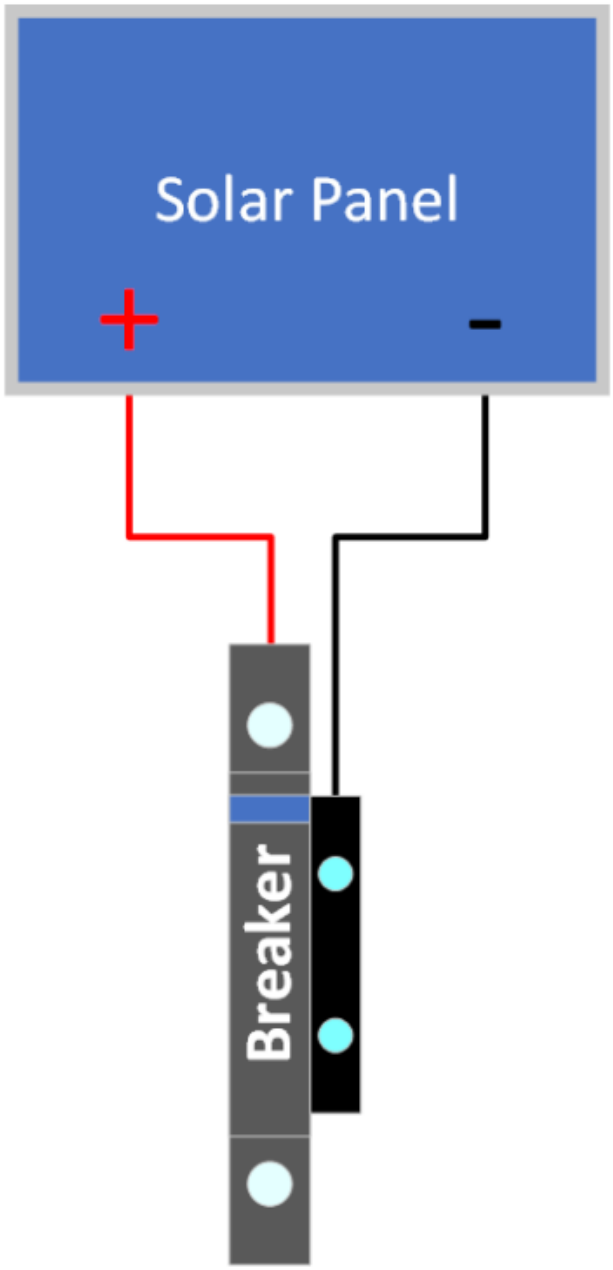
Product wiring diagram shown reasonably represents current offering and is intended to assist in component identification and service. Earlier product production may have different components and wiring connections. Reference the model and serial number from the unit ID tag and contact manufacturer to confirm replacement part version and availability.

Solar Audio Paging Amplifier Connection to Faceplate Speakerphone



Solar Panel To Breaker Detail

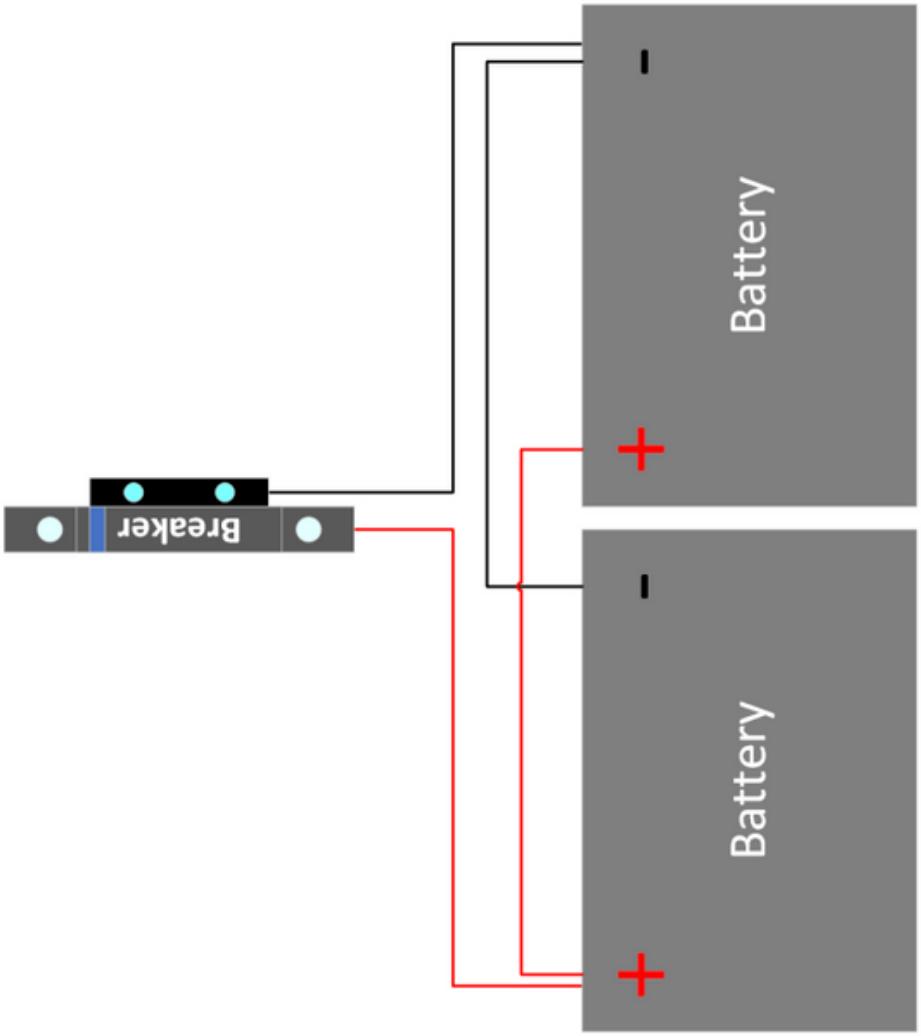
Connection takes place on Power Control Interface(PCI).



Note: This system uses a PCI; the breaker and solar charge controller will be integrated directly into the PCI housing so the solar array will simply connect to the solar leads on the PCI's terminal block.

Solar Batteries To Breaker Detail

Connection takes place on Power Control Interface(PCI).

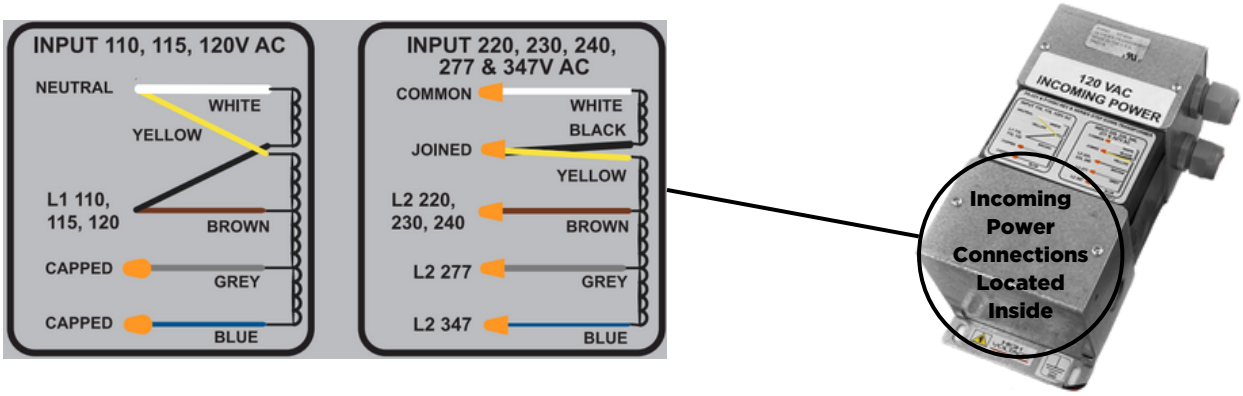


Note: This system uses a PCI; the breaker and solar charge controller will be integrated directly into the PCI housing so the solar array will simply connect to the solar leads on the PCI's terminal block.

110-347V AC Standard Wiring with Multi-Tap Transformer (Power Brick)

Only for use in instances where a solar powered tower is being converted to line powered unit.

Incoming power connection configurations:



Output Options:

Red/Black Wires - 24V AC @ 5 Amps
5 x Fused Outputs

Red/White Wires - 12V DC @ 5 Amps
5 x Fused Outputs

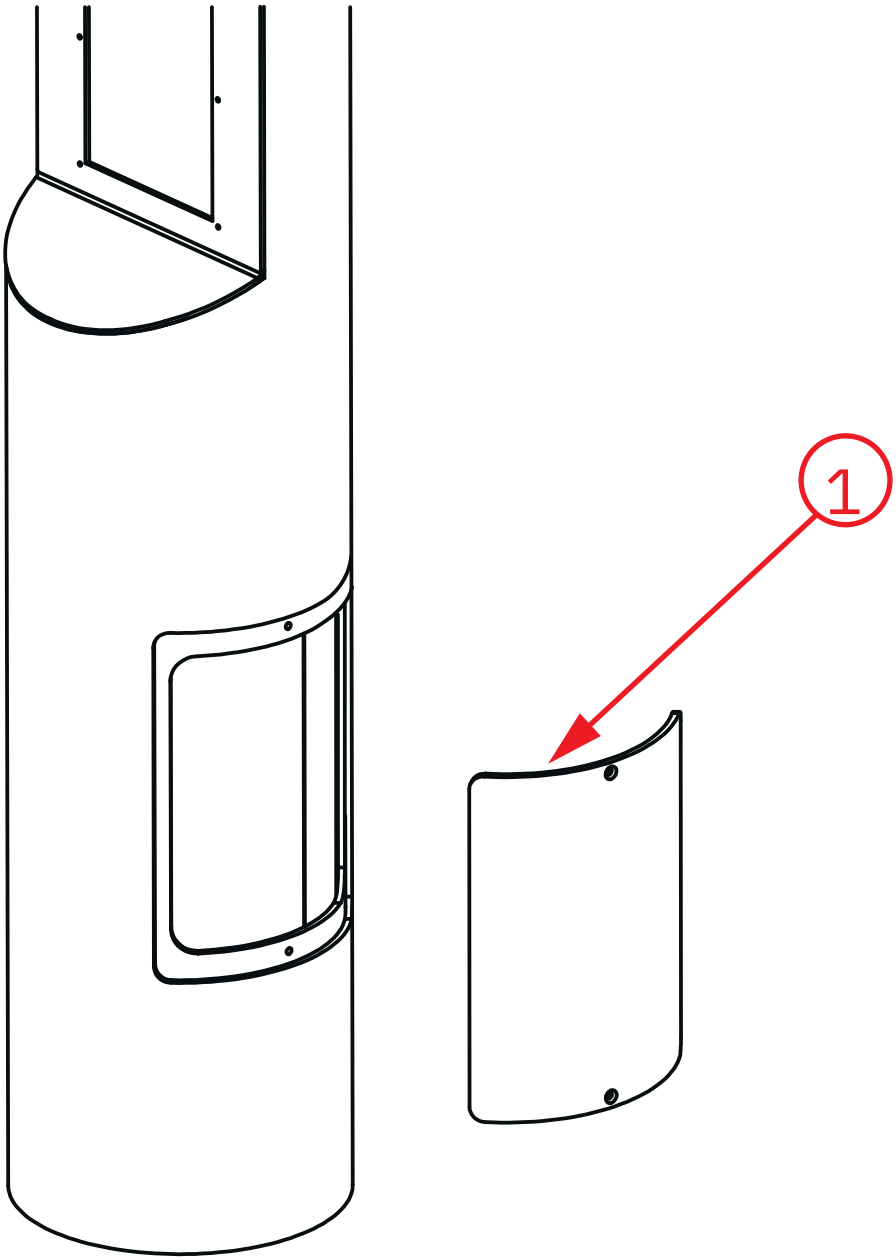
Fused outputs come pre-labeled to assist in connecting the following equipment:

- **Faceplate speakerphone (12V DC ONLY)**
- **Faceplate Light**
- **Beacon Strobe**
- **Area Light**

Remaining outputs can be used for accessory equipment selected at time of ordering.

8 Locating Unit Serial Numbers

Remove the access plate cover with the special security bit. The serial number will be listed on the manufacturer's label located on the backside of the access plate cover (1).



9 Troubleshooting

Common Troubleshooting for Solar Powered Systems

Problem	Possible Cause	Solution
There is no power to the load	There is a loose wire breaking the connection between the load and the battery bank	Ensure that all wires connecting the load to the load terminal blocks and all wires connecting the battery bank to the battery terminal blocks are securely fastened.
	The load has been disconnected from the battery bank by the system	Ensure that all battery and load breakers are in the ON position and, if applicable, that all battery and load fuses are connected.
	The load is attached to the wrong plug	If the load is powered by a Power Over Ethernet (POE) device, ensure that the load is attached to the power out plug and not the data in plug.
The battery bank isn't recharging	There is a loose wire breaking the connection between the solar array and the battery bank	Ensure that all wires connecting the battery bank to the battery terminal blocks and all wires connecting the solar array to the solar terminal blocks are securely fastened.
	The battery bank is wired incorrectly	If there are multiple batteries in the battery bank, ensure that the bank is wired correctly and that all wires are securely fastened.
	The battery bank has been disconnected from the solar array by the system	Ensure that all battery and solar breakers are in the ON position and, if applicable, that all battery and solar fuses are connected.
	The solar array isn't generating sufficient energy to fully recharge the batteries	Ensure that there is nothing preventing direct sunlight from reaching any part of the face of the solar array during daylight hours and that the panels are clean.
The solar array isn't generating optimal power	The solar array isn't receiving full direct sunlight	Ensure that there is nothing preventing direct sunlight from reaching any part of the face of the solar array during daylight hours and that the panels are clean.
	The solar array isn't oriented to the proper tilt angle.	Ensure that the panel is oriented to the tilt angle given by the equation *Tilt Angle = [(Latitude)*(0.9)] + 23°*
The battery bank isn't discharging evenly	The battery bank is wired incorrectly	Ensure that the positive and negative battery terminals are connected to leads on opposite sides of the battery bank.

10 Definitions

Abbreviations, acronyms, & definitions used in this guide

Term:	Description:
VDC	Volts of Direct Current
VAC	Volts of Alternating Current
P_{max}	Maximum Power The maximum amount of power that a solar module will generate under ideal conditions
V_{mp}	Voltage at Maximum Power The voltage at which maximum power is available from a module
I_{mp}	Current at Maximum Power The current at which maximum power is available from a module
V_{oc}	Open-Circuit Voltage The difference of electric potential between two terminals when disconnected from any circuit
I_{sc}	Short-Circuit Current The current between two terminals when directly connected with minimal electric impedance
GEL	Gel Cell Battery A type of maintenance-free battery that adds silica powder to turn its electrolyte into a putty-like gel
AGM	Absorbed Glass Mat Battery A type of maintenance-free battery that uses a fiberglass mesh to contain its electrolyte
LVD	Low-Voltage Disconnect A device which disconnects depleted batteries from the system to avoid damage to the batteries
Amp Hours (100 Hours)	The number of amp hours a battery will need to put out in order to be drained from fully charged to empty over the course of 100 hours.
Nominal Voltage	The average voltage at which a device or system functions
True North/South	The constant geographic poles of Earth. These poles are not located in the same place as the magnetic poles.
Magnetic North/South	The poles of the Earth's magnetic field. These poles are not located in the same place as the true poles.

11 Maintenance Schedule

It is important that the system be regularly maintained to ensure reliable, long-term operation. Code Blue recommends that the Solar Powered system be inspected annually. The inspection should check to make sure all connections are still secure and look for signs of elemental wear or damage due to sun, wind, rain, sand, etc. It may also be necessary, depending on local weather conditions, to clean the panels as heavy dust accumulation may reduce the electric output of solar panels.

LEGEND

G Guard Tasks T Technician Tasks

DAILY OR WEEKLY

G **Perform functional communications check.**
- Action: Press Red Button
  - Strobe activates
  - Red LED "Call Placed" light turns on
  - Message plays
  - Call connects, green LED "Call Received" light turns on
  - Confirm conversation clarity with dispatch

MONTHLY OR QUARTERLY

G **Visually check lighting functions:**
- Faceplate light
- Beacon/Strobe

G **Visually inspect unit for damage to**:
- Faceplate
- Piezo Button
- Microphone
- Speaker

T **Check Batteries:**
- Functioning with full charge.
- Recharging fully, including NightCharge®/Solar Units(Note: Mid-to-late afternoon inspection is recommended)

IMPORTANT NOTE: Depending on the environment in which the batteries are installed, it is recommended that batteries for Solar & NightCharge® products are fully replaced every 2-3 years.

BIANNUALLY

T **Remove access door and faceplate assembly to inspect the following:**
- Ensure all electrical connections are secure
- Check all phone connections for corrosion *(If corroded, clean and coat with dielectric gel or replace)*
- Ensure all battery connections are tight and clean
- Verify no stains exist around gasket areas (stains indicate leaking & gasket should be replaced)
- Verify moisture weep hole on cabinet bottom is open and unobstructed
- Verify bottom of bollards are at least 1/2 inch above footing and free of obstructions (only applies to CB1, CB5, CB9, & CBRT units)

G **Apply automotive paint sealant to unit exterior for protecting finish against environmental pollutants (Suggested products include Black Magic Wet Shine Liquid Wax, Nu Finish NFP-80, and 5 Star Shine)**

G **Clean & coat exterior stainless steel cabinets with cleaner/polish (Suggested products include Chase Products' Champion Spray-on Stainless Steel Cleaner to help protect finish against environmental pollutants)**

T **Visually confirm line-of-sight is still clear to base station (i.e., confirm that new tree growth, new building construction or other obstructions are not bloacking view of base station)**

UNIT SURFACE MAINTENANCE

The painted and stainless steel Code Blue models require periodic care to sustain their aesthetic appearance. Units located outdoors are vulnerable to harsh environmental conditions, including UV rays, acid rain, diesel fumes and airborn iron particles (i.e., dust) which over time may cause unit discoloring. To prevent pollutants developing harmful chemical reactions on Code Blue units, an appropriate surface maintenance schedule should be adhered to. The Surface Care Frequency table below provides general guidelines to assist in configuring a schedule. Please note that the frequency of care required to guard the Code Blue unit's surface from damage will also be dictated by local environmental characteristics.

LEGEND: POLLUTANTS LEVEL

Low	★
Low/Moderate	★★
Moderate	★★★
Moderate/High	★★★★
High	★★★★★

SURFACE CARE FREQUENCY

	MONTHLY	BIMONTHLY	QUARTERLY	BIANNUAL	ANNUAL
Painted		★★★★★	★★★★	★★★	★
Stainless Steel	★★★★★	★★★★	★★★	★	

See scheduled tasks under Biannually for suggested paint sealants or stainless steel cleaners.

AVERAGE COMPONENT LIFE

Component life is based on various mechanical, operational and environmental factors. Your local Code Blue reseller can assist you with a regularly scheduled maintenance program customized to your individual site requirements.

Code Blue strongly recommends contacting a local CB dealer to establish a proactive maintenance schedule.

12 Warranty

Code Blue Corporation provides a limited warranty on this product. Refer to your sales agreement to establish the terms. In addition, Code Blue's standard warranty language, as well as information regarding support for this product while under warranty, is available at **www.codeblue.com/support**

In Case of Breakdown

In case of system breakdown, discontinue use and contact Tech Support at:

technicalsupport@codeblue.com or call **800-205-7186, option 3**.

In Case of Abnormal Operation

If the unit emits smoke or an unusual smell, if water or other foreign material enters the enclosure, or if you drop the unit or damage the enclosure, power off the unit immediately and contact Code Blue Customer Service at:

customerservice@codeblue.com or call **800-205-7186, option 2**.

13 Download Information

Code Blue now has a centralized location where you can find installation, setup, information, configuration and operation instructions.

Admin Guides: www.codeblue.com/resources/guides
Frimware: www.codeblue.com/resources/firmware
Maintenance Tips: www.codeblue.com/support
Product Sheets: www.codeblue.com/resources/sheets
Specifications: www.codeblue.com/resources/specifications

These guides should contain all the information needed for your application. If further information is required, please contact **customerservice@codeblue.com**.

14 Legal & Regulatory Information

Legal Considerations

Video and audio surveillance can be regulated by laws that vary from country to country. Check the laws in your local region before using this product for surveillance purposes.

Liability

Every care has been taken in the preparation of this document. Please inform Code Blue Corporation of any inaccuracies or omissions. Code Blue cannot be held responsible for any technical or typographical errors and reserves the right to make changes to the product and manuals without prior notice. Code Blue makes no warranty of any kind with regard to the material contained within this document, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Code Blue shall not be liable or responsible for incidental or consequential damages in connection with the furnishing, performance or use of this material. This product is only to be used for its intended purpose.

Intellectual Property Rights

Code Blue Corporation has intellectual property rights relating to technology embodied in the product described in this document. This product contains open source code that also contains additional open source libraries.

Equipment Modifications

This equipment must be installed and used in strict accordance with the instructions given in the user documentation. This equipment contains no user-serviceable components. Unauthorized equipment changes or modifications will invalidate all applicable regulatory certifications and approvals.

Trademark Acknowledgments

Code Blue and Centry products are registered trademarks or trademark applications of Code Blue Corporation in various jurisdictions. All other company names and products are trademarks or registered trademarks of their respective companies.

Regulatory Information

Electromagnetic Compatibility (EMC)

This equipment has been designed and tested to fulfill applicable standards for:

- Radio Frequency emission when installed according to the instruction and used in the intended environment.
- Immunity to electrical and electromagnetic phenomenon when installed according to the instructions and used in its intended environments.

USA

This equipment has been tested using a shielded network cable (STP) and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense. The product shall be connected using a shielded network cable (STP) that is properly grounded.

Canada

This digital apparatus complies with CAN ICES-3 (Class A). The product shall be connected using a shielded network cable (STP) that is properly grounded.

Cet appareil numérique est conforme à la norme NMB ICES-3 (classe A). Le produit doit être connecté à l'aide d'un câble réseau blindé (STP) qui est correctement mis à la terre.

Disposal and Recycling

When this product has reached the end of its useful life, dispose of it according to local laws and regulations. For information about your nearest designated collection point, contact your local authority responsible for waste disposal. In accordance with local legislation, penalties may be applicable for incorrect disposal of this waste.

This guide should contain all the information needed for your application. If any further information is needed, please contact **customerservice@codeblue.com.**

Support

Should you require any technical assistance, please contact Code Blue.

Visit **codeblue.com** to:

- Download user documentation and software.
- Find answers to resolved problems in the FAQ database.

Report problems to Code Blue Technical Support via email at:

technicalsupport@codeblue.com or **800-205-7186**