carmanah®
we put solar to work

SpeedCheck®
RADAR SPEED SIGN USER MANUAL

For the SPEEDCHECK-12

SPEEDCHECK-12
(battery-only/AC-powered model)

SPEEDCHECK-12
(solar-powered model)

89840_MANUAL_SPEEDCHECK-12_RevD

Table of Contents

1.0 Introduction

The following symbols indicate important safety warnings and precautions throughout this manual:

WARNING indicates that serious bodily harm or death may result from failure to adhere to the precautions.

CAUTION indicates that damage to equipment may result if the instructions are not followed.

NOTE suggests optimal conditions and provides additional information.

1.1 Warranty Disclaimer

This manual will familiarize you with the features, operation standards and installation of Carmanah's SPEEDCHECK-12 radar speed sign. Failure to comply with the use, storage, maintenance, installation or placement instructions detailed in this manual could void the warranty.

1.2 Standards

Perform all installation, wiring, grounding and maintenance in conformance with local building and electrical codes. Adherence to the National Electrical Code (NEC) is mandatory to comply with any certification markings. Non-adherence to code may void the warranty.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

1.3 Safety and Usage Precautions

Batteries are shipped fully charged. Use extreme caution when handling the batteries as they can generate hazardous short-circuit currents. Remove all jewelry (bracelets, metal-strap watches, etc.) before handling the batteries.

Solar panels produce DC electricity when exposed to light and can therefore produce an electrical shock or burn. To render solar panels inoperative, remove them from sunlight or fully cover their front surface with an opaque material.

Before lifting any heavy or bulky equipment, ensure the load is secured so moving parts do not shift, and that it can be lifted as far as needed without back strain or loss of grip. Installation may require more than one person.

Ensure the equipment is not powered during installation and wiring of the system.

Recheck all completed wiring for proper polarity prior to energizing the system.

Changes or modifications to Carmanah equipment not expressly approved by Carmanah could void both the user's authority to operate the equipment and the warranty.

Not all traffic products are compatible with external outputs. Please contact Carmanah for additional information and guidance when adding or replacing beacons or other hardware.

The electronic equipment used generates, uses, and radiates radio frequency energy, which can cause radio interference.

The specifications of the products and components described in this manual are subject to change without notice.

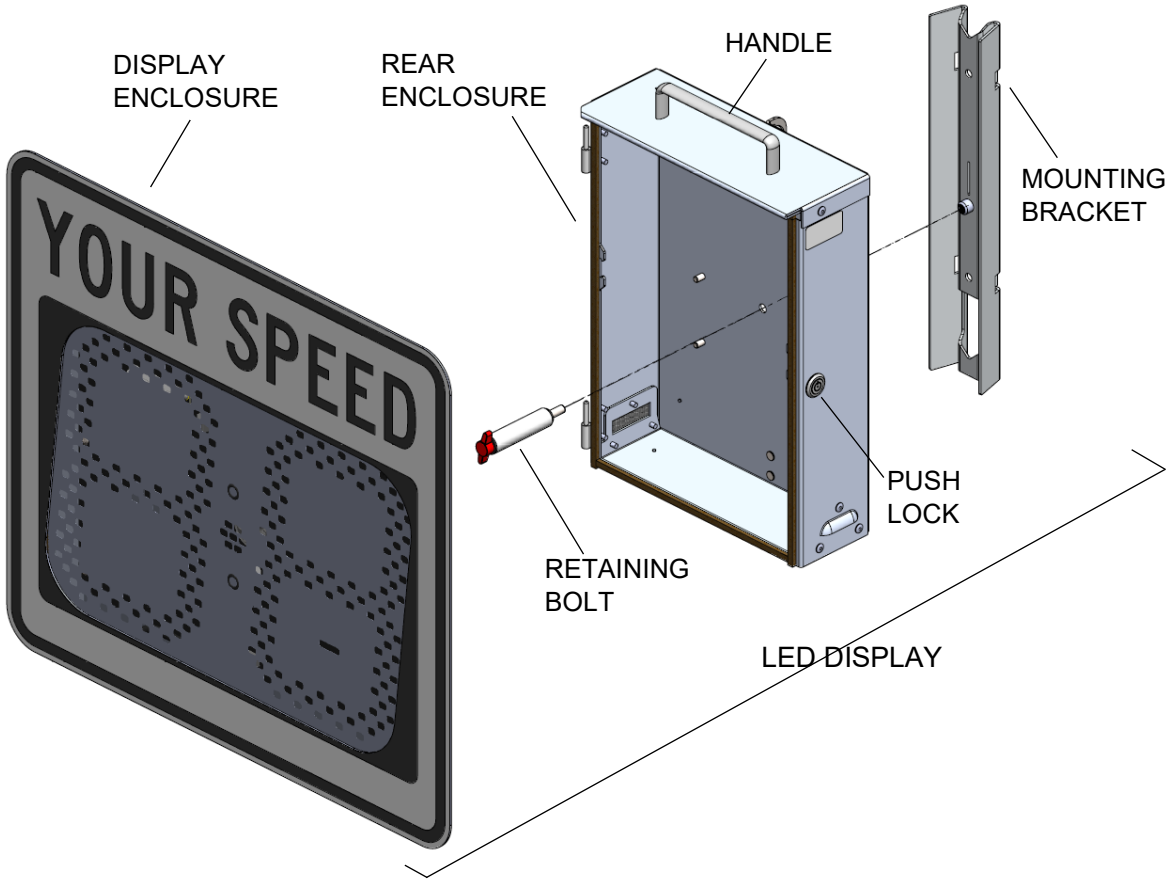
Product can have sharp edges. Accidental movement of hinged components can cause injury.

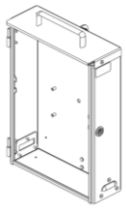
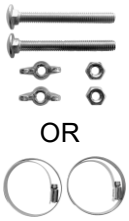
The SPEEDCHECK-12 radar speed sign is an effective and portable solution for slowing traffic in pedestrian and school zones, residential areas, and arterials and rural roadways with posted speeds less than 45 mph. Based on MUTCD guidelines of character height the 12" sign has a legible distance of 360 feet.

2.0 System Overview

2.1 Base Components

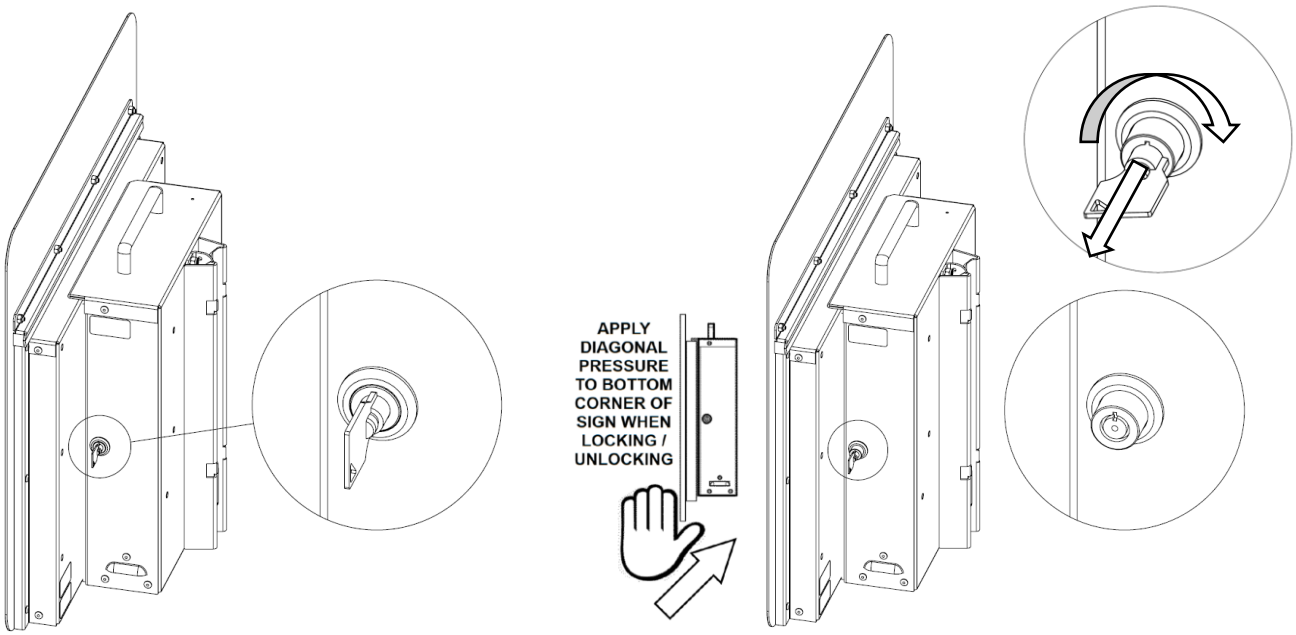
Each Carmanah SPEEDCHECK-12 radar speed sign has the following common parts:



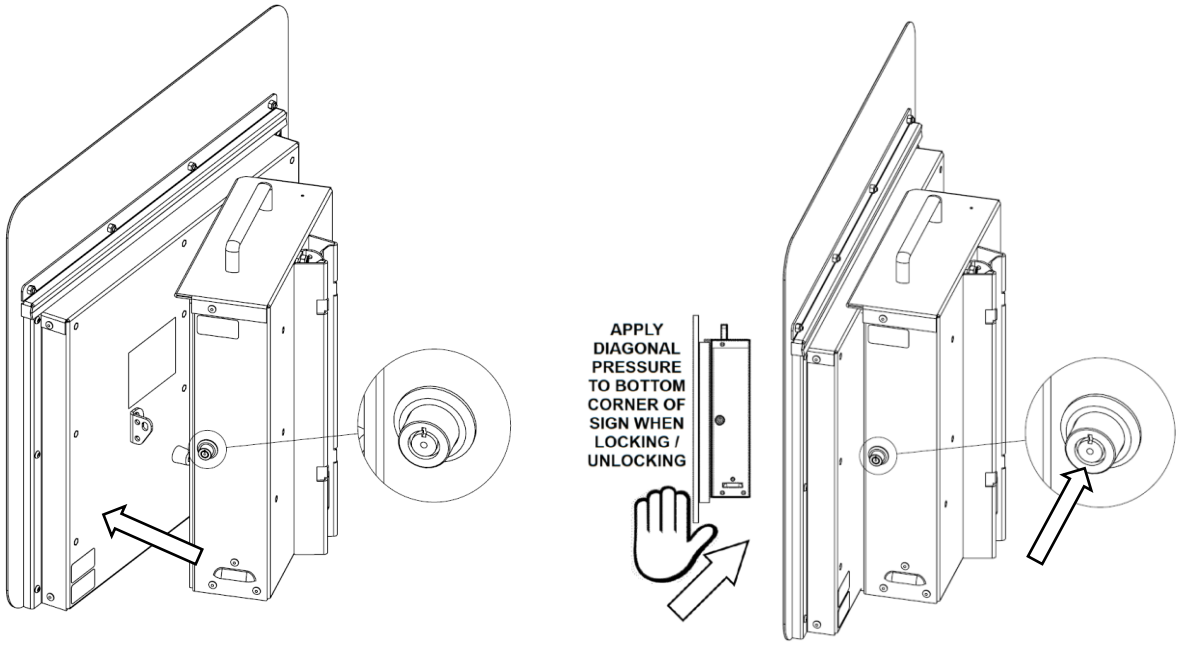
				
Display Enclosure:	**Rear Enclosure:**	**Mounting Bracket:**	**Retaining Bolt:**	**Display Mounts:**
Contains the sign, LED display, strobe, radar and electronics.	Contains the power source (AC or DC) and any optional communication devices.	Connects the radar speed sign to the pole. Can be attached with through bolts or banding.	Attaches rear enclosure to mounting bracket.	Contains all the hardware required to mount the product.

2.2 Push Lock Operation

1. To open SPEEDCHECK-12, insert included key into lock and rotate clockwise.
2. Apply diagonal pressure to the bottom right corner of the sign face then PULL on the key.
3. Once unlocked, the key can be removed.

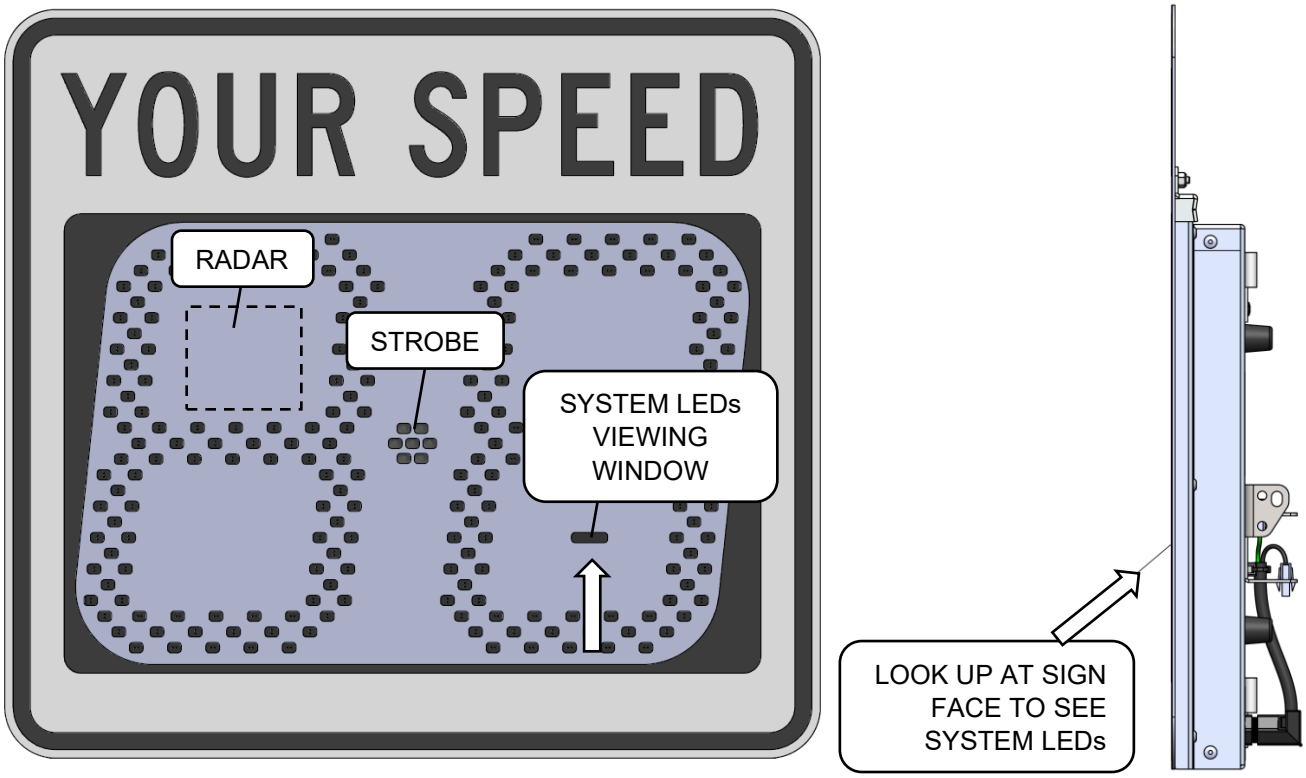


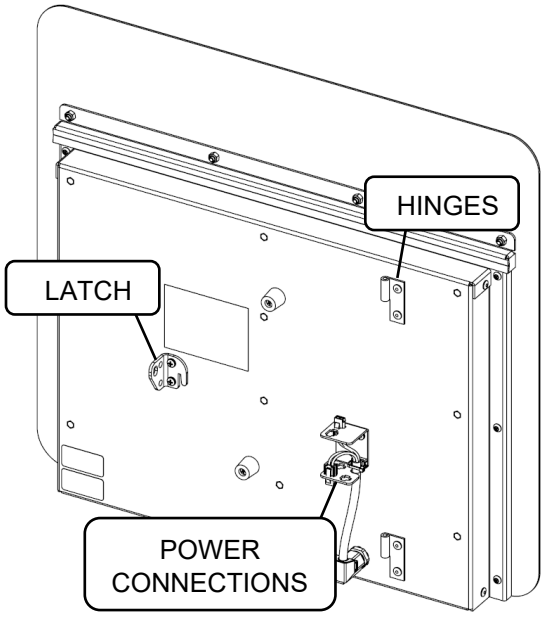
4. Swing the display enclosure away from the rear enclosure.
5. To close, push the display enclosure against the rear enclosure and then apply diagonal pressure in the bottom right corner of the sign face. Once fully closed then PUSH the lock to secure in place.



2.3 Display Enclosure

The Display Enclosure is pre-assembled at the factory and contains the system electronics, radar, LED display, strobe and sign. To view the system status LEDs, look up from below the viewing slot in the silkscreen. On the rear of the Display Enclosure are the signs hinges, latch and power connections.

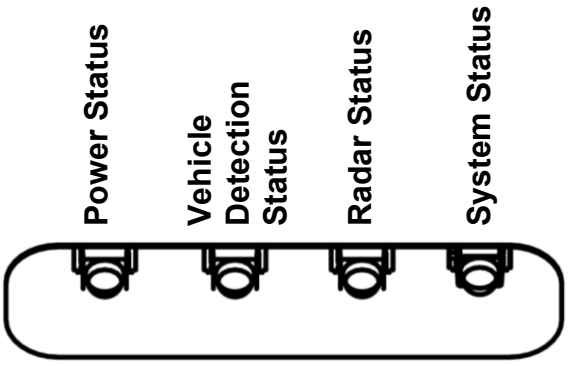




Rear View of Display Enclosure

2.4 System Status LEDs

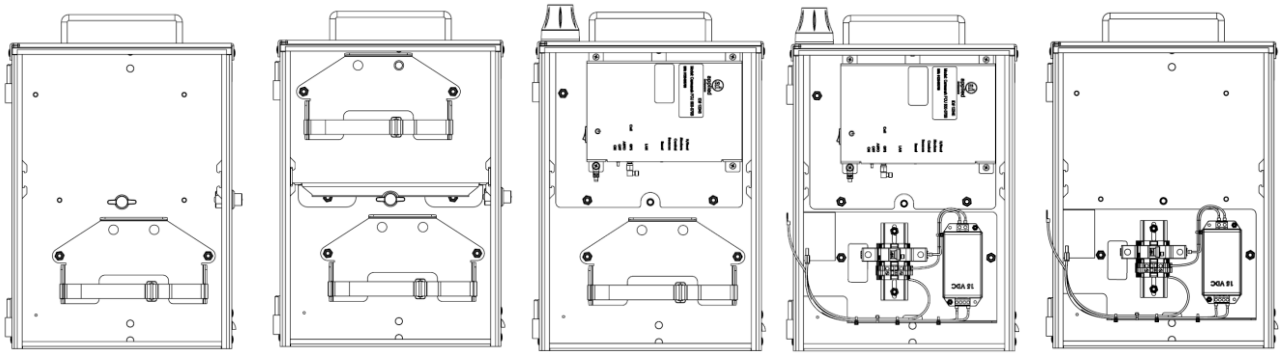
Refer to the diagram and table below to determine the state of the sign.



LED	State	Meaning
Power Status	Off	System not powered
	Flashing green	Battery needs charging, but is not in Low Voltage Disconnect (LVD)
	Steady green	AC systems: power is good Battery systems: battery voltage is good
Vehicle Detection Status	Off	No vehicles being detected
	Flashing green	Vehicles are being detected and data is being logged
Radar Status	Off	Not receiving data from the radar
	Flashing green	Receiving data from the radar
System Status	Off	System not powered
	Flashing red	System is in Low Voltage Disconnect (LVD)
	Flashing green	No system faults
	Steady red	One or more system faults (radar, Bluetooth, real-time clock, display LEDs, strobe)

2.5 Rear Enclosure Options

The rear enclosure comes in a variety of options shown below which could include a Carmanah solar power kit and/or StreetHub™ remote monitoring:

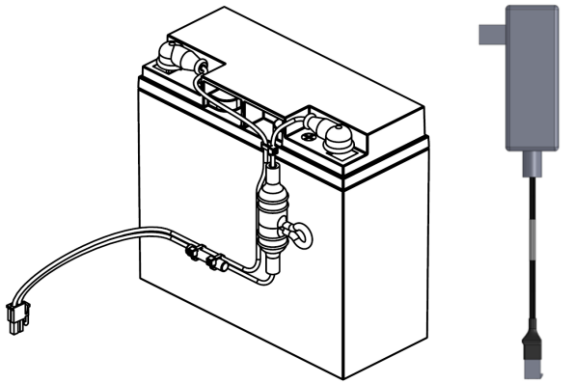


One Battery | Two Battery | One Battery with StreetHub | AC Power with StreetHub | AC Power

2.6 Battery Power Option

Offering a more portable solution for temporary installations, this sign option comes with a battery(s) that has the harness(es) pre-installed for ease of assembly. Battery state of charge can be checked via the SpeedCheck Manager mobile app.

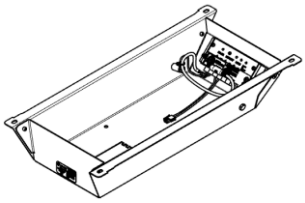
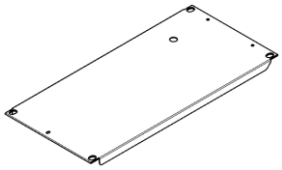
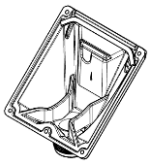
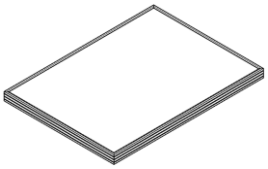
- For battery-powered signs, the batteries will have to be charged as needed.
- The included battery charger can charge one battery at a time. Older versions of the battery charger came with an adapter harness to connect to the battery cable.
- The battery charger must be connected to an AC power source.
- Depending on the state of charge of the battery, it can take up to 11 hours to fully charge.

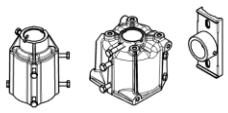


NOTE Spare fuse is included with each battery.

2.7 Solar Kit Option

The solar kit offered for the SPEEDCHECK-12 contains the following items:

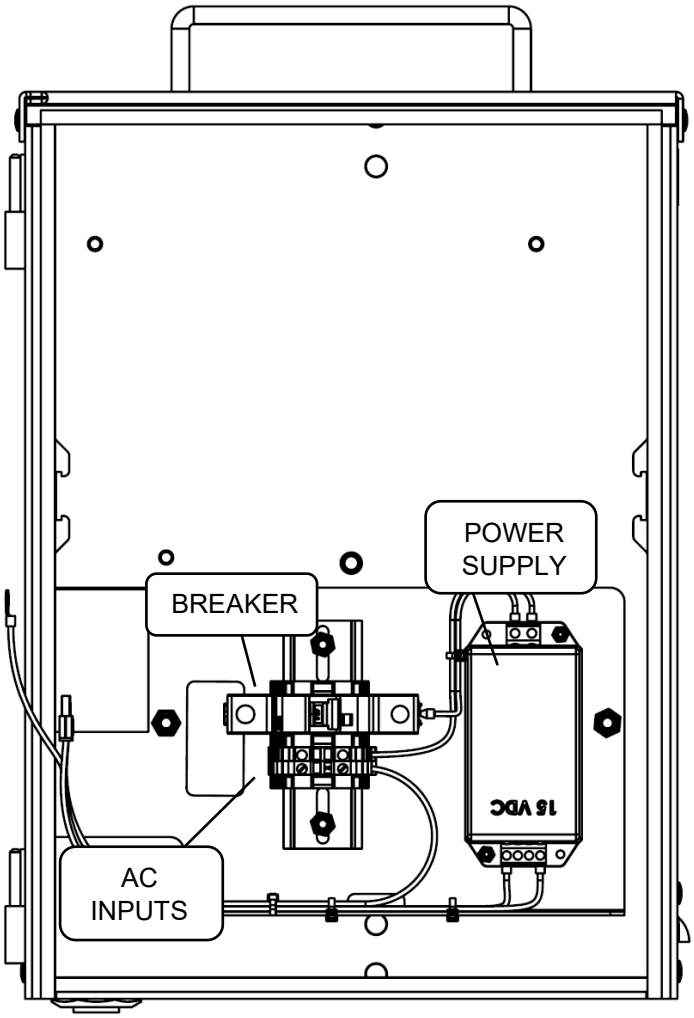
			
Housing:	**Gasketed Cover:**	**45-degree Wedge Casting:**	**Solar Panel:**
Contains the battery charge controller and provides mounting for the solar panel.	Seals the housing under the solar panel to provide a NEMA 3R rated enclosure.	Connects the housing and the pole mount. Includes a drilling mark to locate the hole for an optional conduit fitting.	High-quality framed solar panel sized for location.

		
Pole Mount Kit:	**Battery Harness:**	**Hardware Kit:**
Different versions are available depending on pole size and mounting orientation.	Connectorized harness to connect charge controller to the batteries located in the SPEEDCHECK-12 rear enclosure.	Contains this guide and all the hardware required to assemble the product.

NOTE Certain configurations will require the batteries installed in the solar kit housing. For more information see Section 4.10.

2.8 AC Power Option

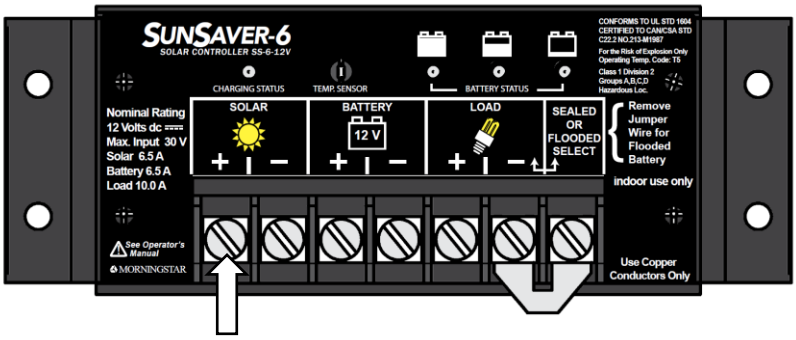
Signs powered by AC are ready to be wired with appropriately rated cables:



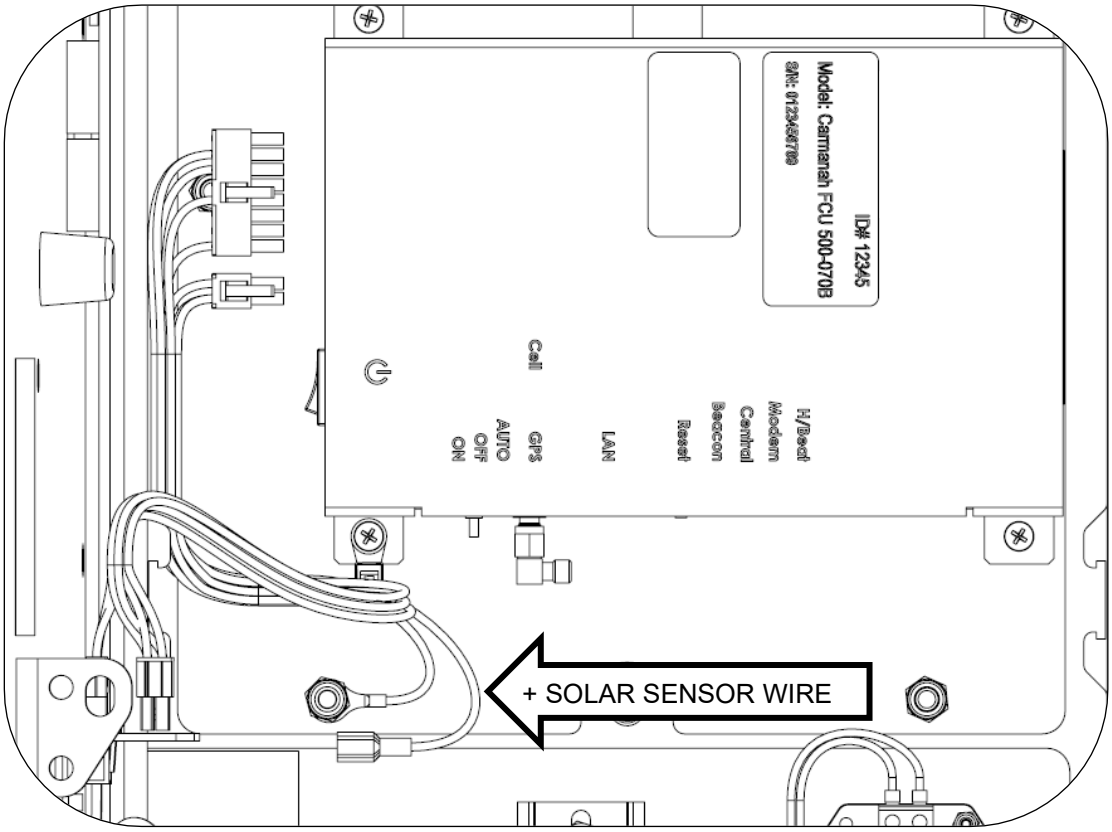
2.9 StreetHub™ Remote Monitoring Option

The SPEEDCHECK-12 is available in a StreetHub model that includes a fully-integrated monitoring unit from the factory and Glance cloud-based software for two-way communication of real time status in the field. For additional information, refer to https://carmanah.com/streethub-remote-connectivity/.

1. For solar kit versions equipped with StreetHub, there is a length of yellow sensor wire to be routed with the battery harness from the solar kit to the LED display.
2. This sensor wire is pre-installed to the Solar positive (+) terminal of the charge controller.



3. Once the sensor wire is inside the rear enclosure, connect it to the yellow wire shown below.



3.0 System Preparation

3.1 Tools and Materials Required

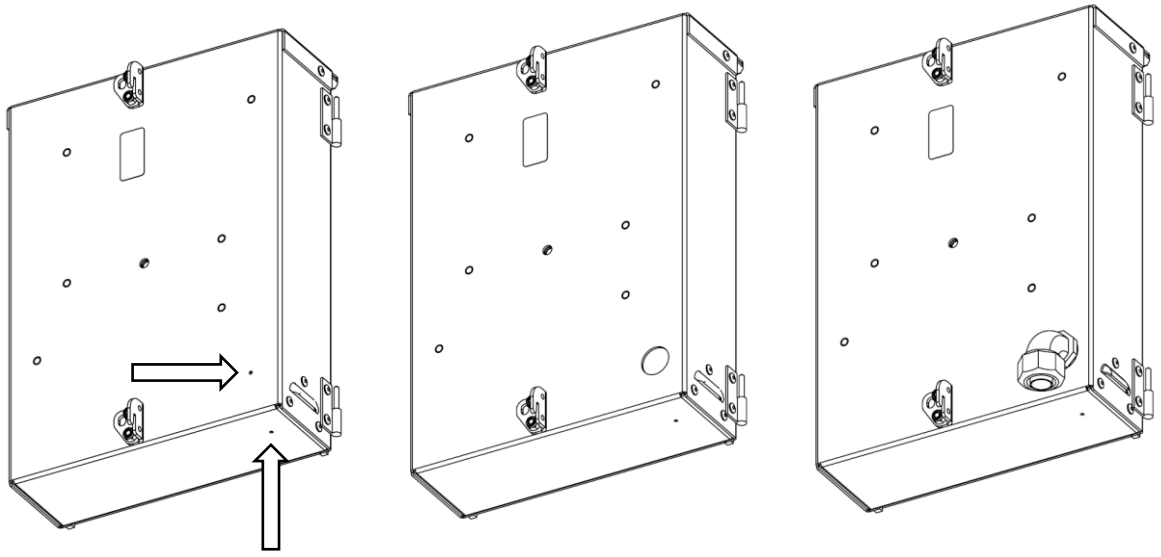
The following tools and materials may be required to mount your Carmanah SPEEDCHECK-12 depending on the model and configuration:

1. Imperial socket set 2. Crescent wrench 3. Fish tape 4. Level 5. Compass or pre-determined equatorial direction (for solar powered displays)	6. Drill and drill bits / step drill 7. Fine-tip felt marker 8. Multi-bit screwdriver 9. Ladder or lift device 10. Banding tool and material 11. Smartphone or laptop

NOTE Download the SpeedCheck Manager mobile app to configure the SPEEDCHECK-12 here: https://carmanah.com/appSC.

3.2 Rear Enclosure Conduit

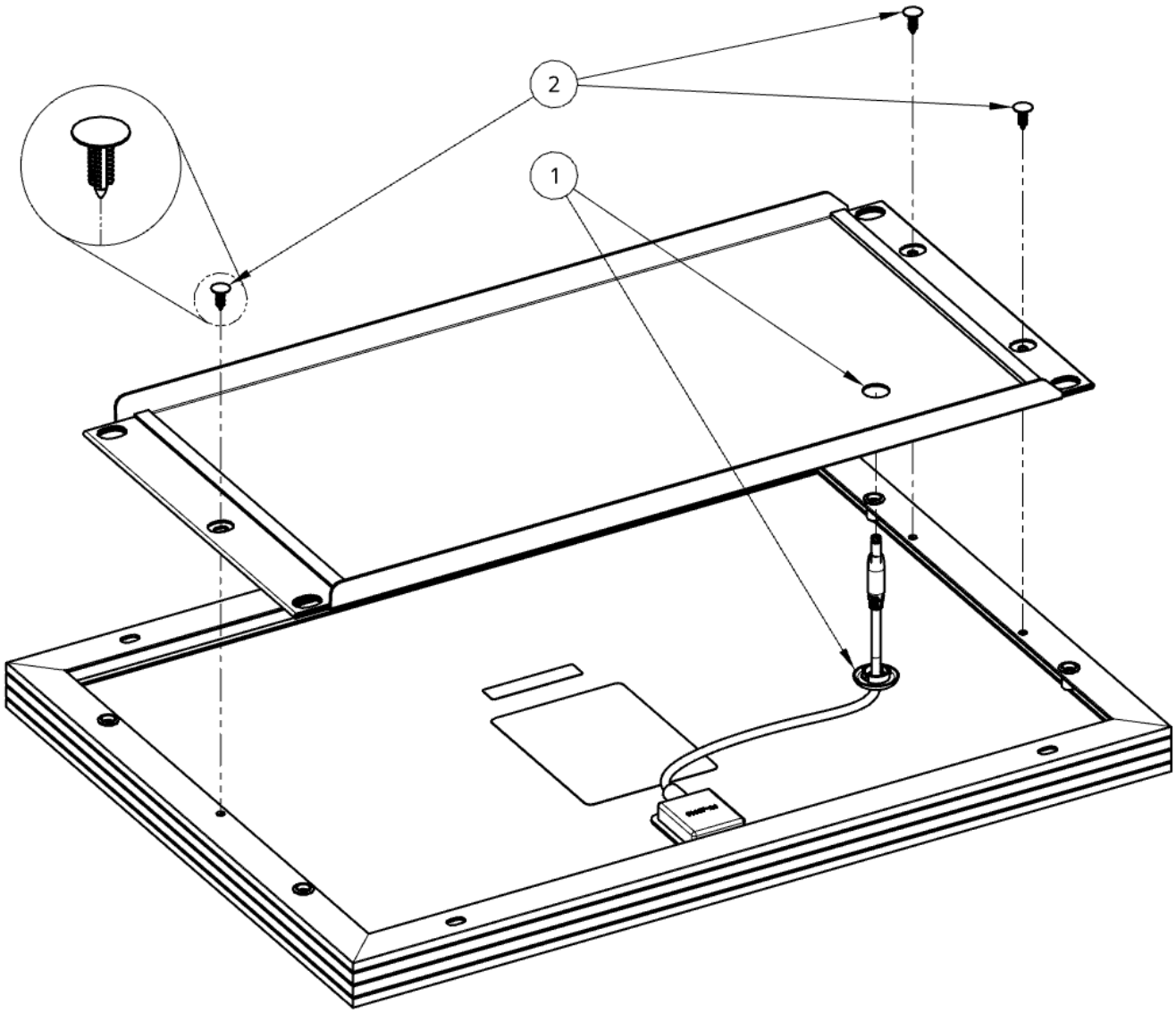
1. If system is solar-powered, use one of the indentations shown to drill and deburr a 1-1/8" hole for the included conduit fitting either in back or bottom of rear enclosure and install.



2. For AC systems, source and install a conduit fitting with liquid tight conduit as required in one of the above locations.

3.3 Solar Kit – Solar Panel Preparation

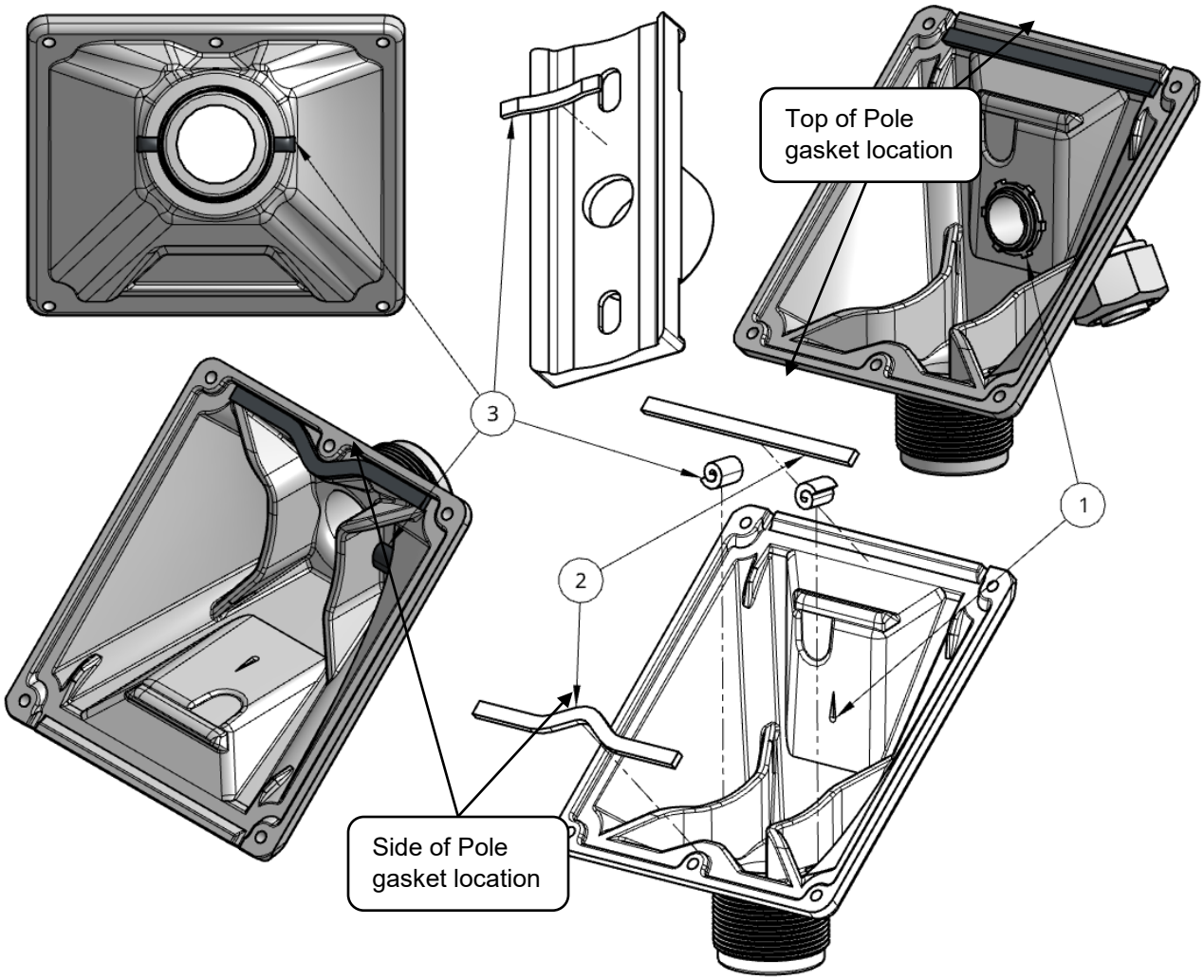
1. Install grommet in cover hole, ensuring it is fully seated against cover face.
2. Secure cover to solar panel using 3x supplied push-in rivets.



3.4 Solar Kit – 45-degree Wedge Casting

1. If required, drill hole at marked location and install appropriate conduit fitting on casting. Remove any chips or shavings.
2. Apply supplied 4.5" long adhesive gasket strip to correct edge of 45-degree wedge casting for side of pole or top of pole mounting orientation.
3. Side of pole mounting only: roll up 2x 1" long supplied butyl rubber strips and use to plug openings of casting as shown. Also apply 2" long strip of gasket to hub plate above hole to prevent any water ingress.

Failure to apply gaskets and sealant could result in water entry in the housing or conduit (if used) and cause damage to the product.



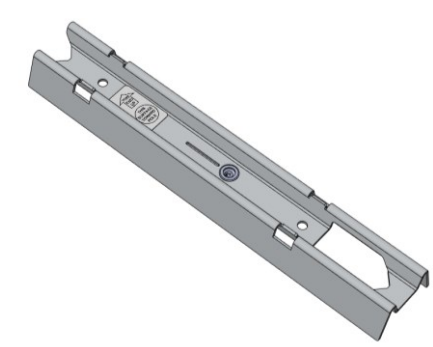
4.0 Installation

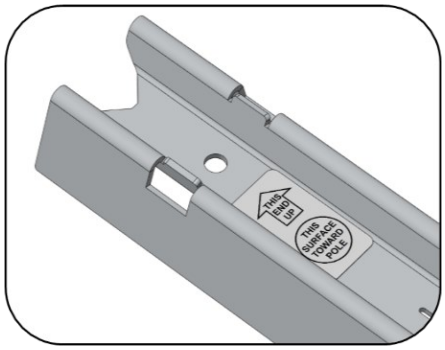
4.1 Mounting Bracket

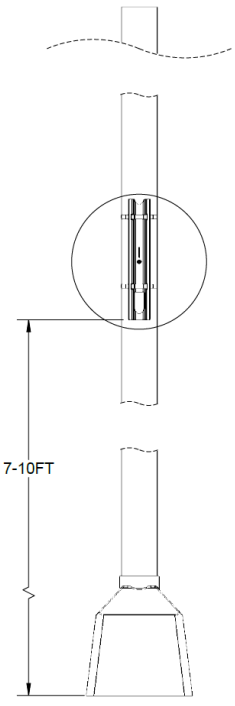
1. Enclosure mounting bracket is labeled to identify the correct orientation when installing onto pole.
2. Install mounting bracket onto pole 7-10 feet above grade noting orientation as indicated by label.
3. Two potential attachment methods are shown below: through bolting and banding.

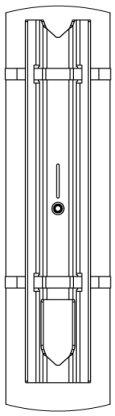
WARNING Use only Carmanah approved high-strength band clamp or commercial banding for mounting bracket to pole.

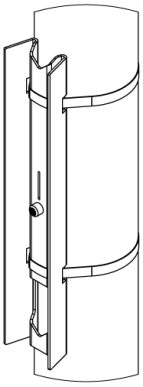
NOTE It is recommended to mount the sign between five and twelve feet from the roadside.

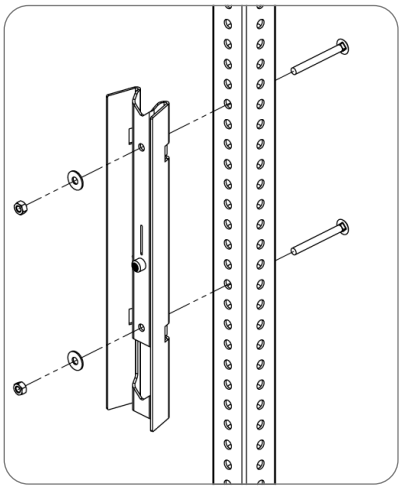






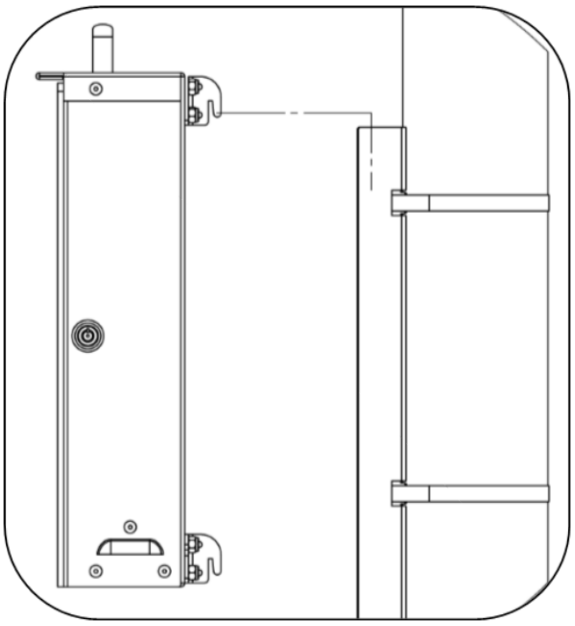


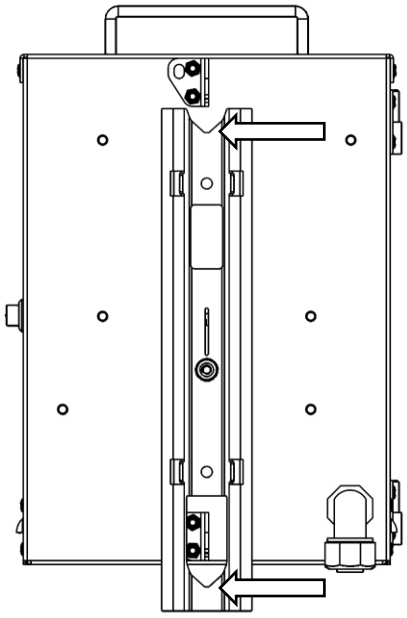


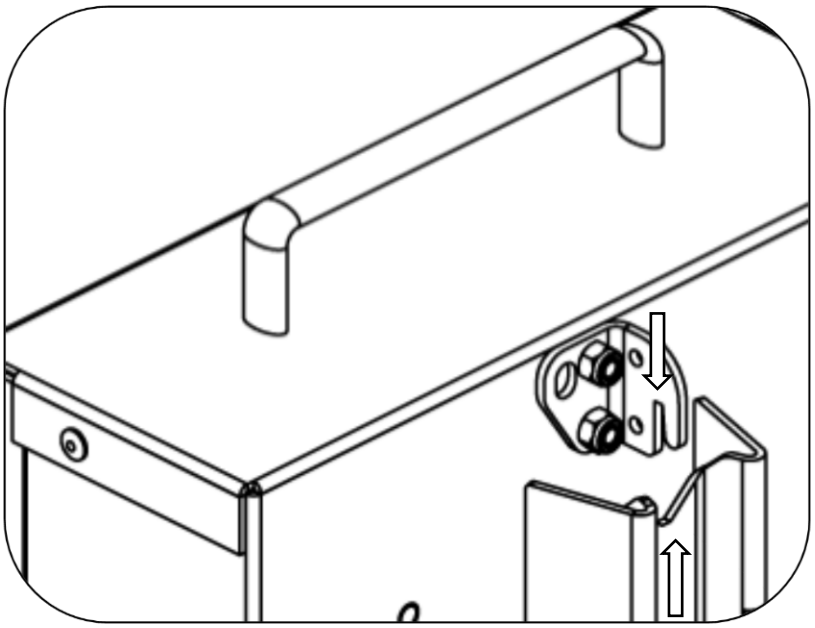


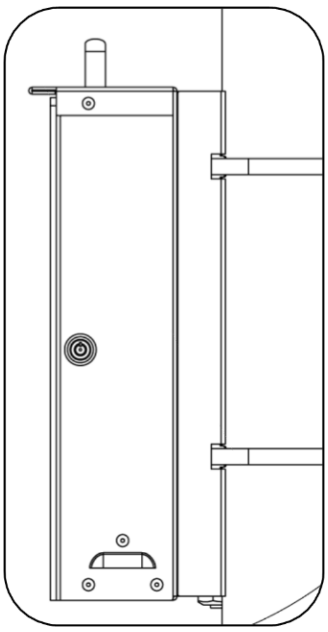
4.2 Rear Enclosure

1. Hold the rear enclosure as indicated.
2. Line up the hooks on the back of the rear enclosure so that they will slide into cradle features on the mounting bracket when the rear enclosure is lowered onto the bracket.
3. When installed correctly, the rear enclosure should hang securely from the mounting bracket and the hole at the back of the rear enclosure should then line up with the threaded insert of the mounting bracket.

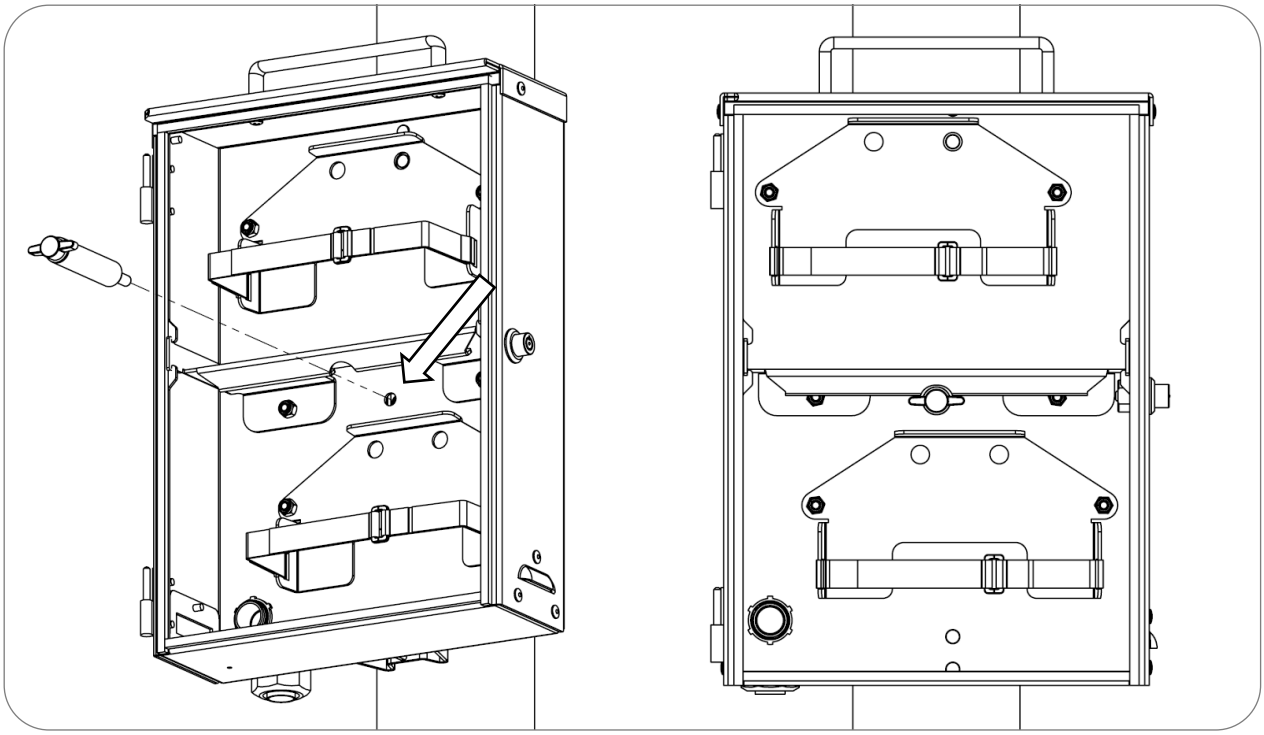


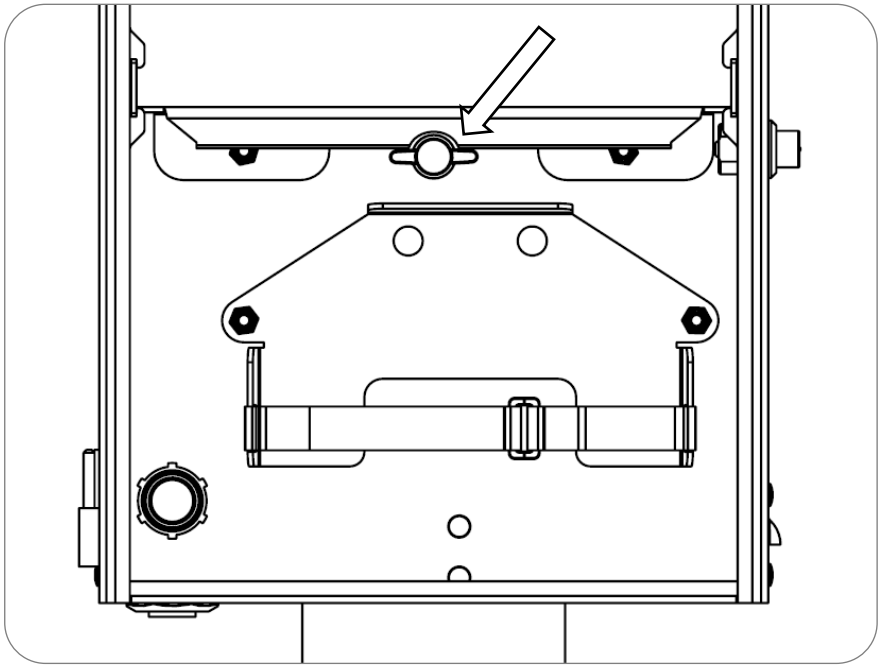






4. To attach the rear enclosure to the mounting bracket, thread the retaining bolt into the location shown.
5. Install retaining bolt until it is sufficiently tight. Do not overtighten.

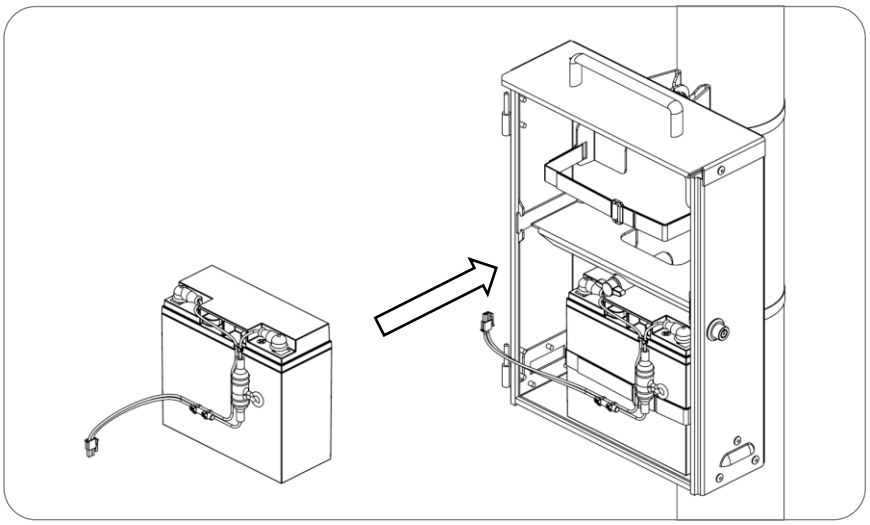




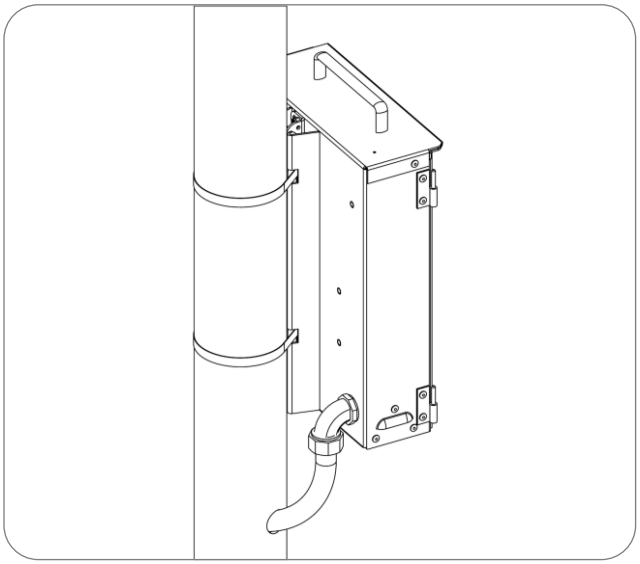
NOTE For battery and solar-powered versions, tighten the retaining bolt so that the handle is horizontal.

4.3 Battery-Powered Systems

1. Undo battery strap(s) and install provided battery(s) in the orientation shown.
2. Secure battery strap(s) to hold battery(s) in place.



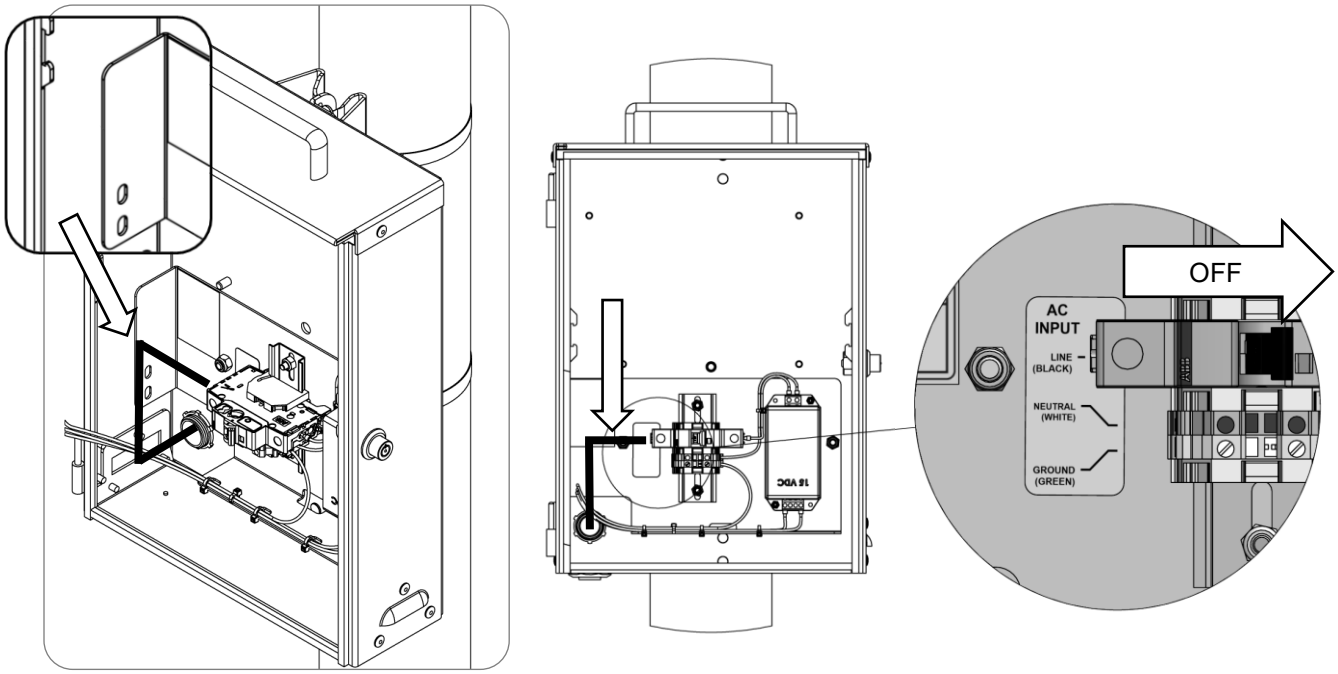
If the SPEEDCHECK-12 has been supplied with a Carmanah solar power kit, route the battery cable from the solar housing to the sign through the pole internally. Drill an appropriate hole near the rear enclosure and route the power cable through provided conduit. This short length of conduit is only intended to go from the rear enclosure directly to the pole.



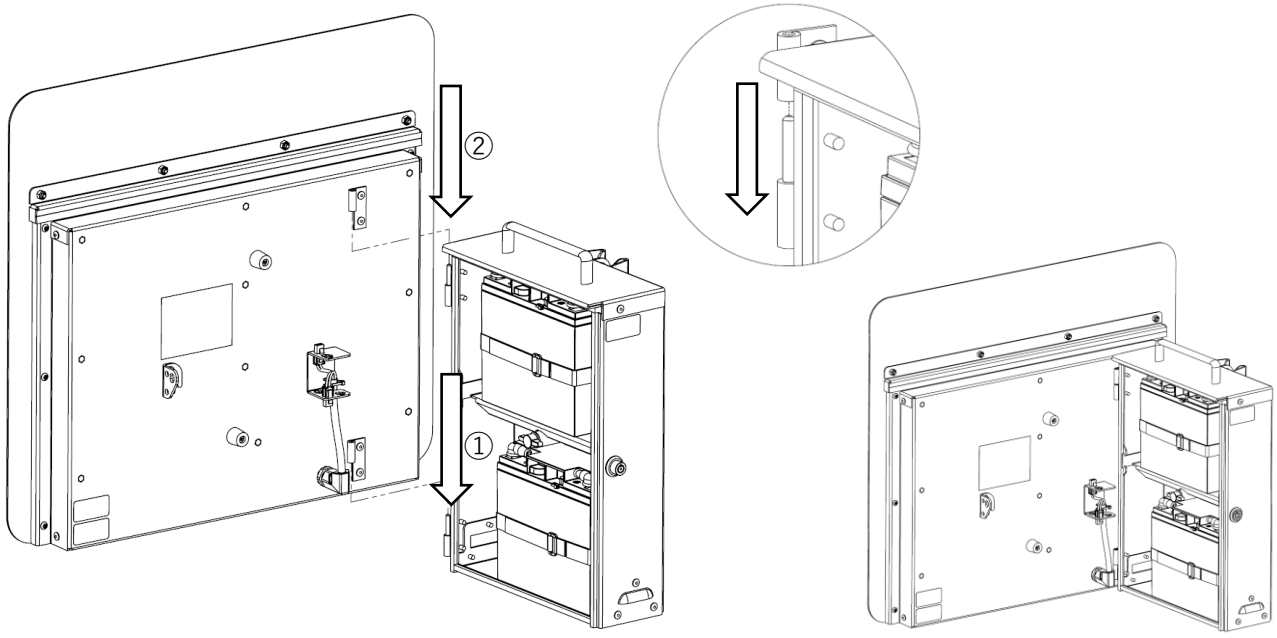
NOTE Typically solar equipped systems will have the batteries installed in the rear enclosure. See Section 4.10 if your system contains more than two batteries or configuration requires batteries to be installed inside the solar kit housing.

4.4 AC-Powered Systems

1. Supply and install appropriate liquid tight fittings and conduit as required.
2. Ensure breaker is turned off (switch is pushed to the right) and route AC wires into rear enclosure.
3. Install wires into the labelled locations shown and tighten screw terminals.
4. Strain relief AC wires using highlighted feature.

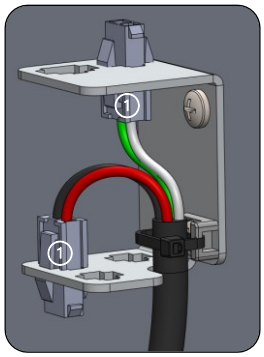


4.5 Display Enclosure Installation

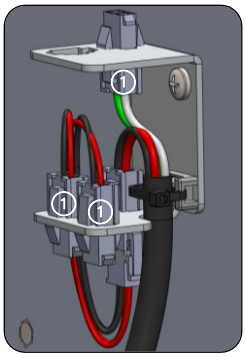


4.6 Power Connections

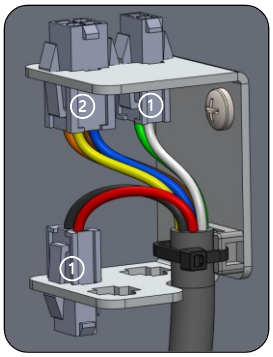
1. The sign's power connections are located on the back of the display enclosure and vary for each option.
2. Mate the rear enclosure harness connectors with those on the display enclosure.



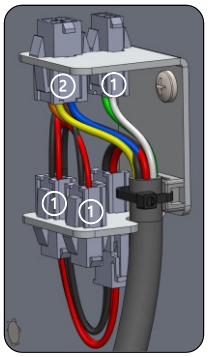
AC or Battery Only



Solar Kit w/ Battery

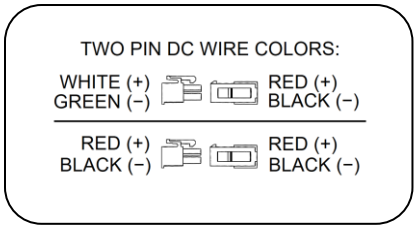


Battery Only or AC w/ StreetHub

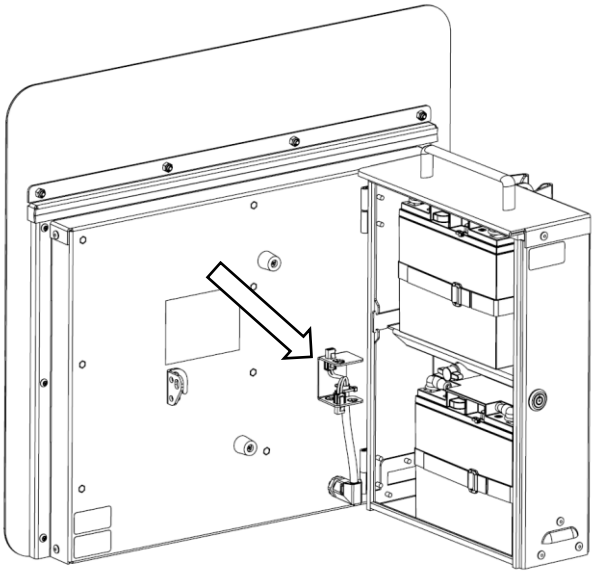


Solar Kit w/ Battery & StreetHub

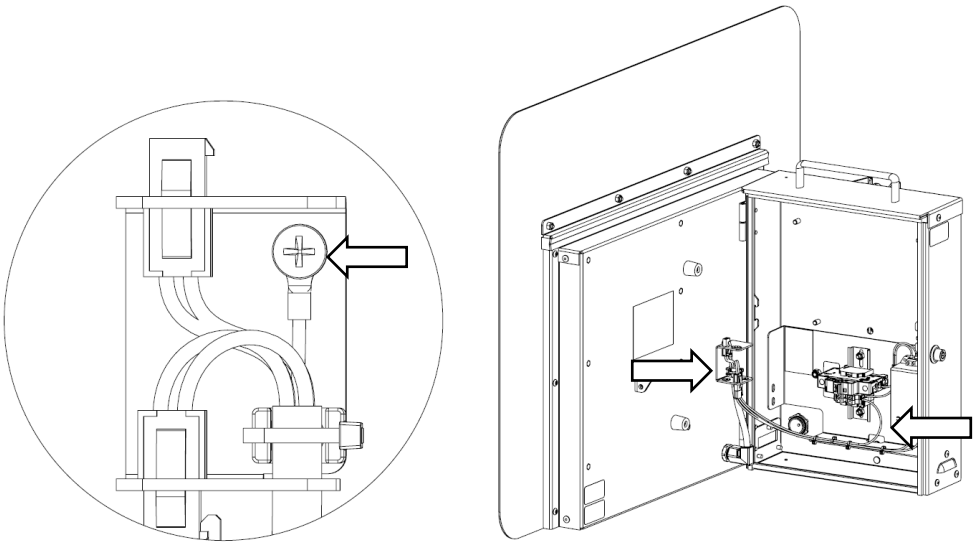
- 1 = 12 VDC power; connect battery harness(es) or AC power supply harness here
- 2 = StreetHub/Applied Information; connect StreetHub/Applied Information harness here (if applicable)



NOTE All 2-pin connectors carry 12 VDC power and are interchangeable. Red/white is positive and black/green is negative. The 4-pin connector is for systems equipped with StreetHub or customer supplied Applied Information modem.

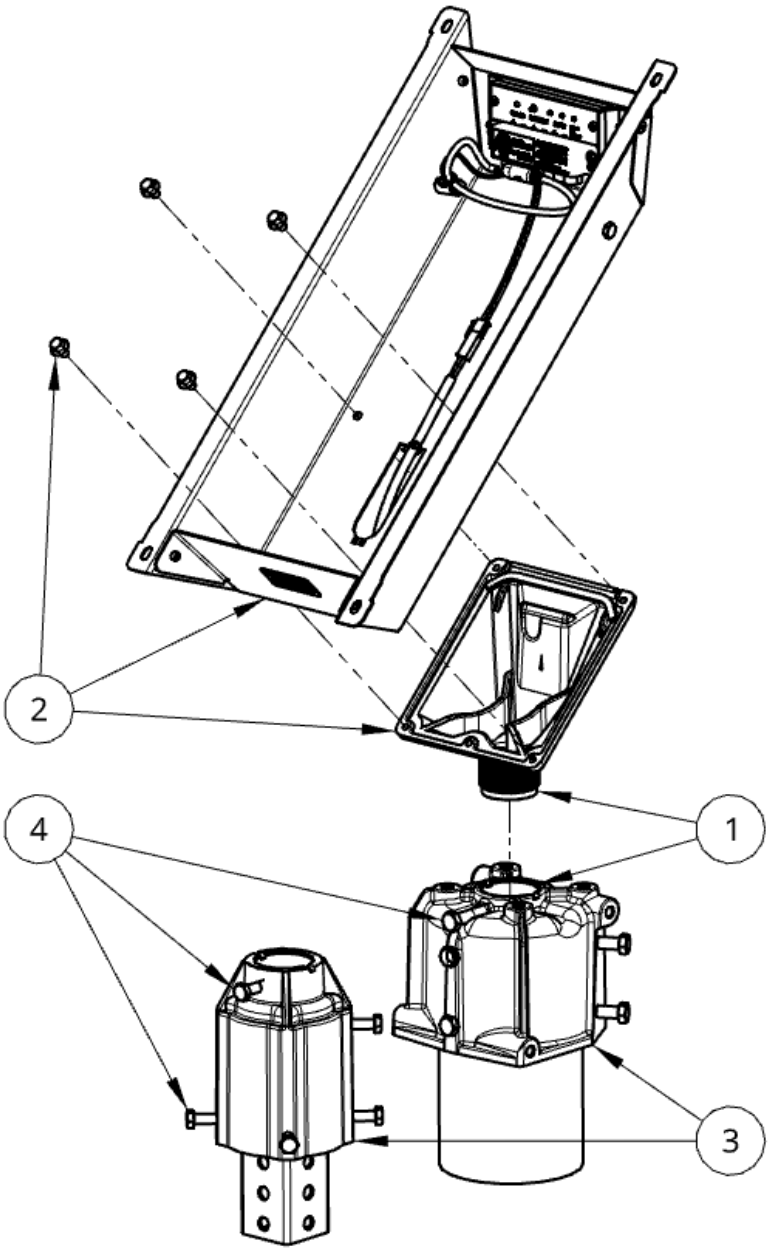


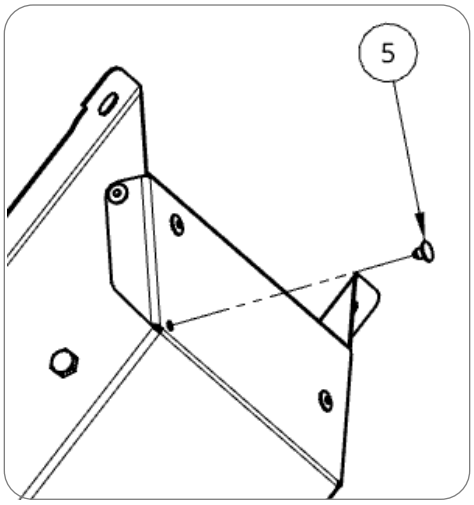
3. For AC-powered LED displays, connect the ground wire ring terminal coming from the breaker assembly to the ground screw located on the display enclosure power harness junction.



4.7 Solar Kit – Top of Pole Mounting

1. Thread 45-degree wedge casting onto mount (do not tighten yet if mounting to square post).
2. Fasten 45-degree wedge casting to housing using 4x supplied bolts.
3. Install on pole and orient solar panel to face South (or as per specific instructions provided by Carmanah) by rotating mount (round post) or 45-degree wedge casting thread (square pole).
4. Tighten set screws or bolts onto post and to lock 45-degree wedge thread.
5. Install supplied plug into top drain hole.

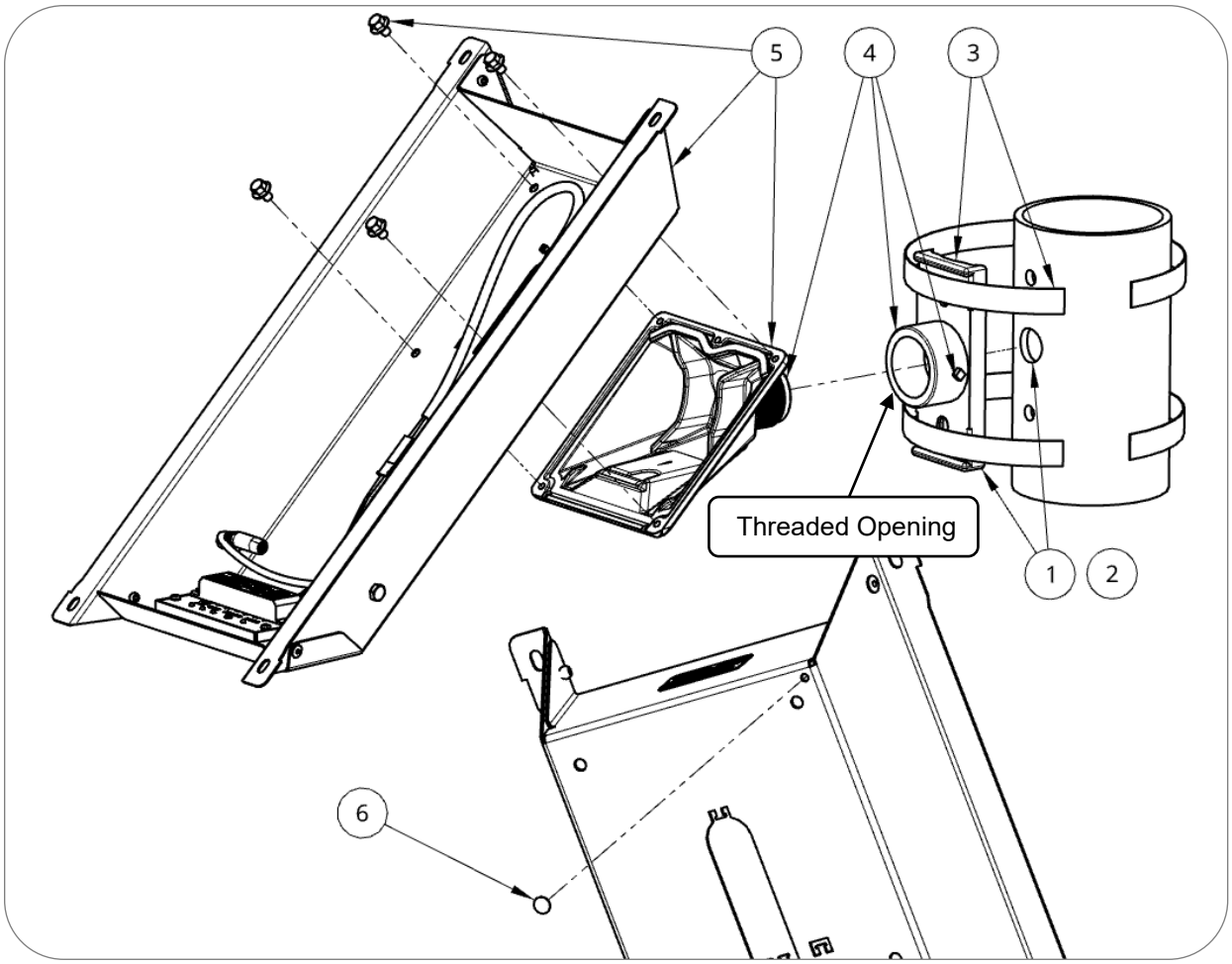




4.8 Solar Kit – Side of Pole Mounting

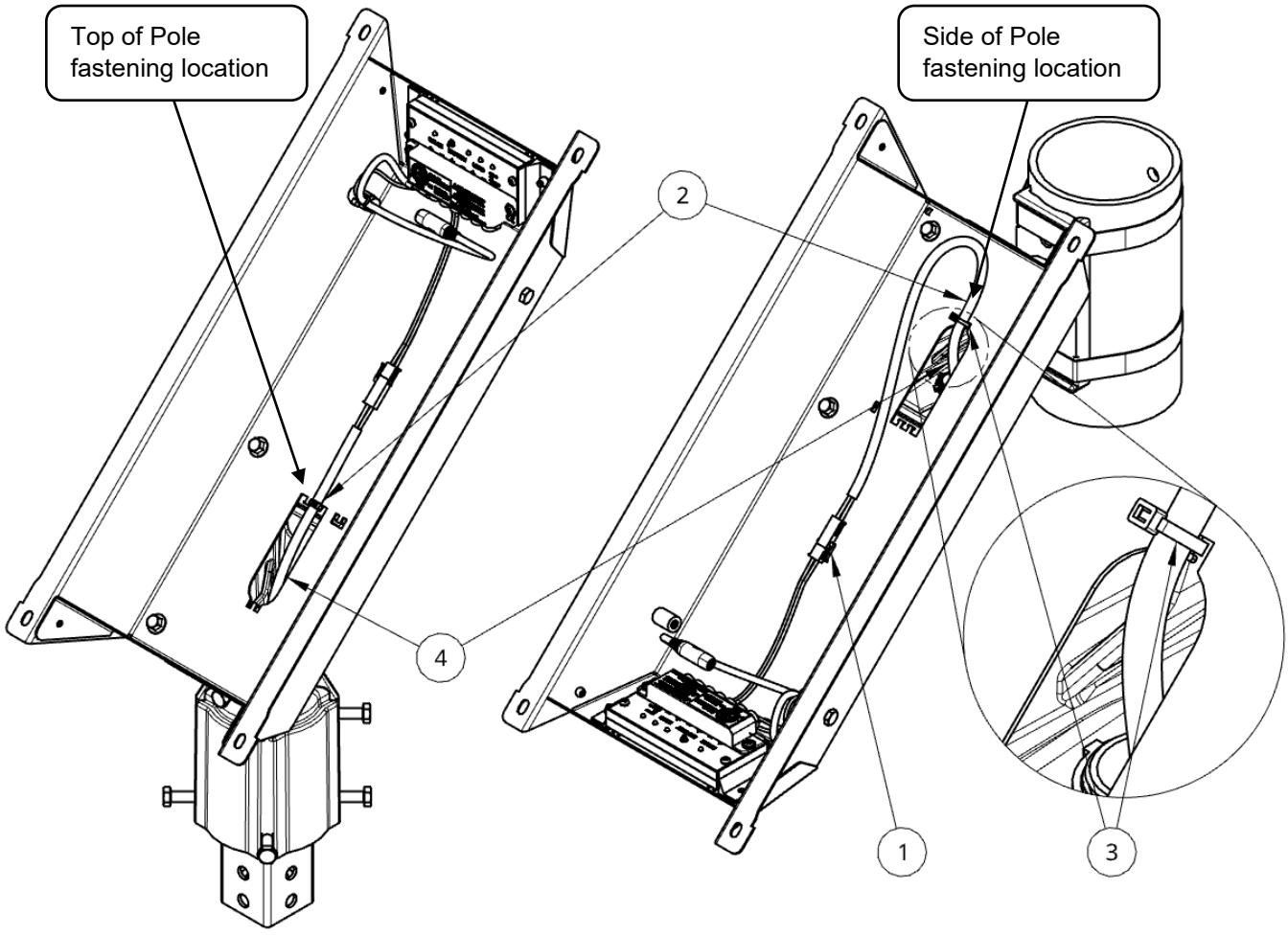
1. Determine mounting location and mark center of hub plate and bolt hole locations (if applicable), ensuring threaded opening faces South (or as per specific instructions provided by Carmanah).
2. If applicable, drill suitable bolt holes (for 3/8" hardware) and/or cable entry hole (1" recommended) at center of hub plate. Ensure there are no sharp edges left that could damage the cable.
3. Mount Side of Pole hub plate to post using banding (or through bolts).
4. Thread 45-degree wedge casting into hub plate as far as it will go, then back out until level and lock with set screw.
5. Fasten 45-degree wedge casting to housing using 4x supplied bolts.
6. Install supplied plug into top drain hole.

Use only Carmanah supplied high-strength band clamp or commercial banding to secure hub plate to pole.



4.9 Solar Kit – Power Harness

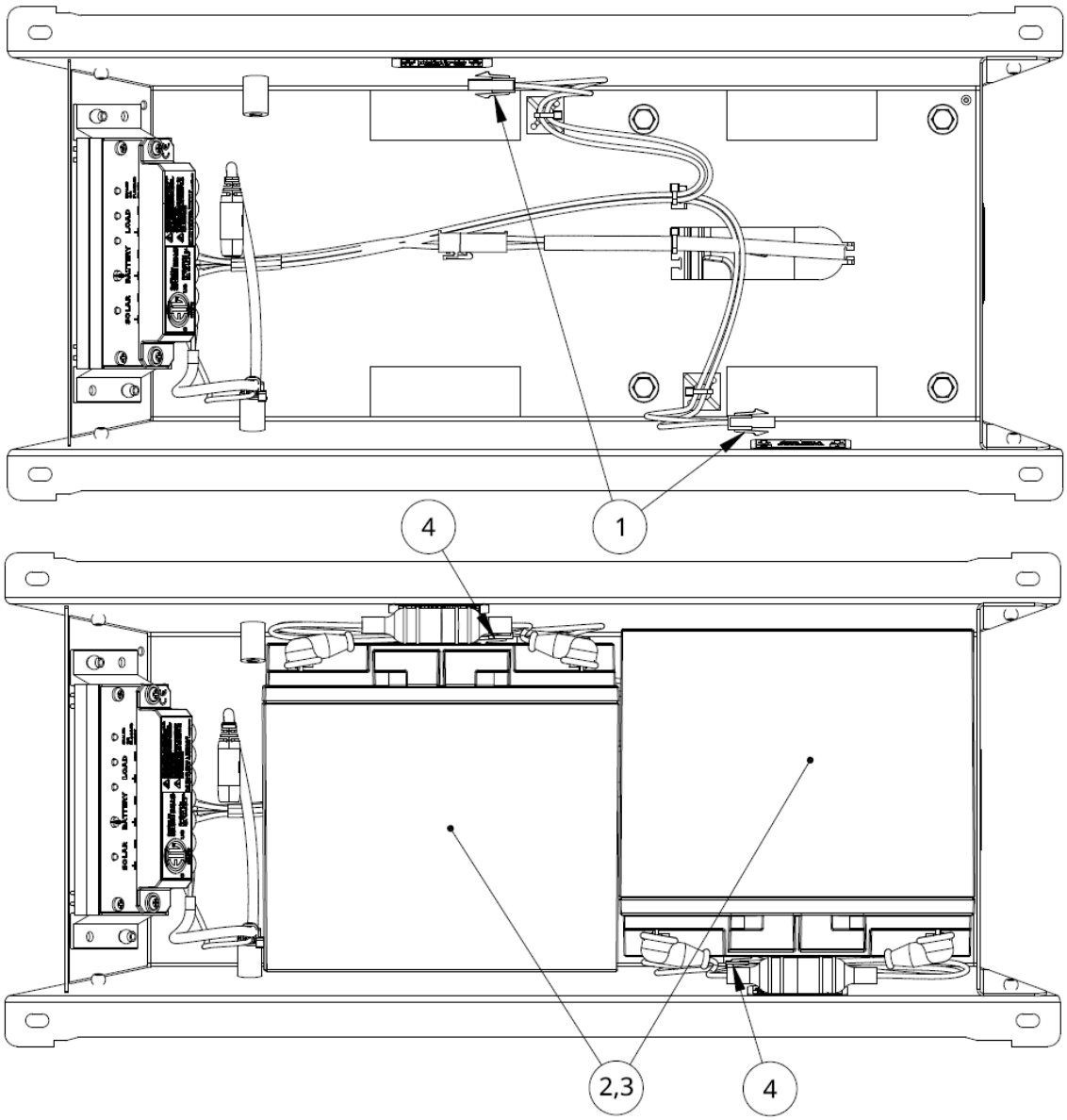
1. Connect power harness to charge controller. Ensure connector is latched.
2. Use appropriate harness fastening location depending on system mounting orientation so harness enters housing facing up to prevent any drop of water from flowing into housing along jacket.
3. Secure power harness jacket to “dog-bone” feature using supplied cable tie as shown ensuring the connector is not under tension.
4. Fish harness down through pole or conduit to SPEEDCHECK-12 cabinet.



4.10 Solar Kit – Batteries

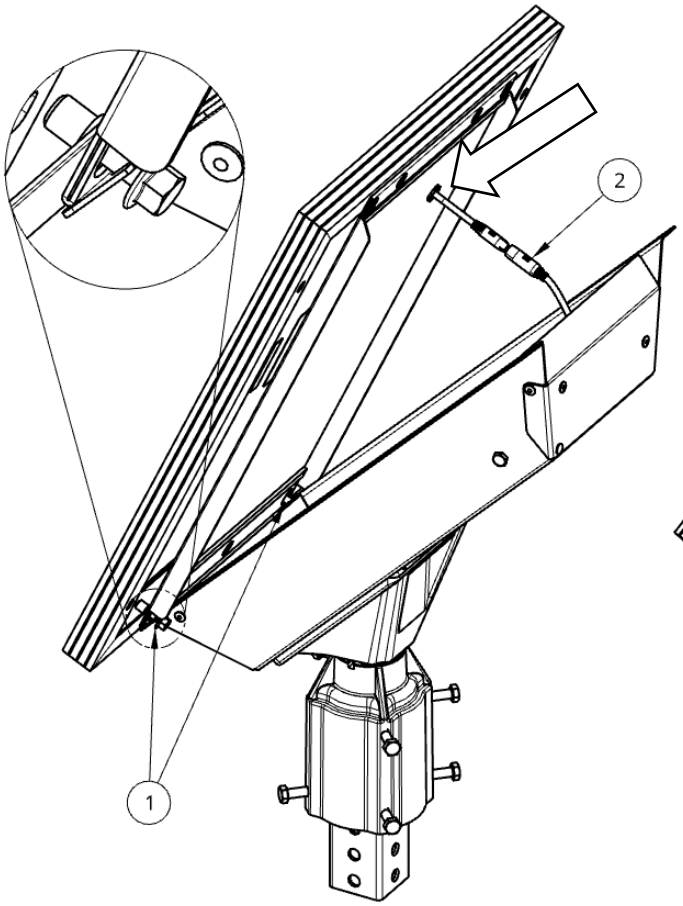
NOTE This procedure is only for batteries that are installed in the solar kit housing. These installations require a battery splitter harness as shown below.

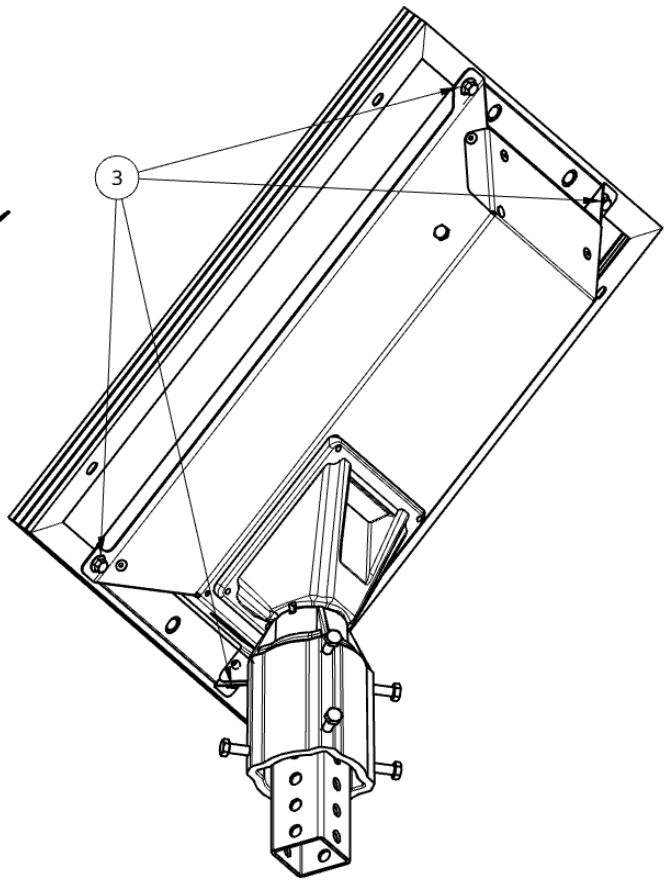
1. Identify battery connectors in housing.
2. Orient lower battery as indicated by label and view below and install into housing.
3. Orient upper battery as indicated by label and view below and install into housing.
4. Mate battery connectors and place harness between battery and housing side as shown, ensuring that harnessing doesn't protrude above top face of housing.



4.11 Solar Kit – Solar Panel

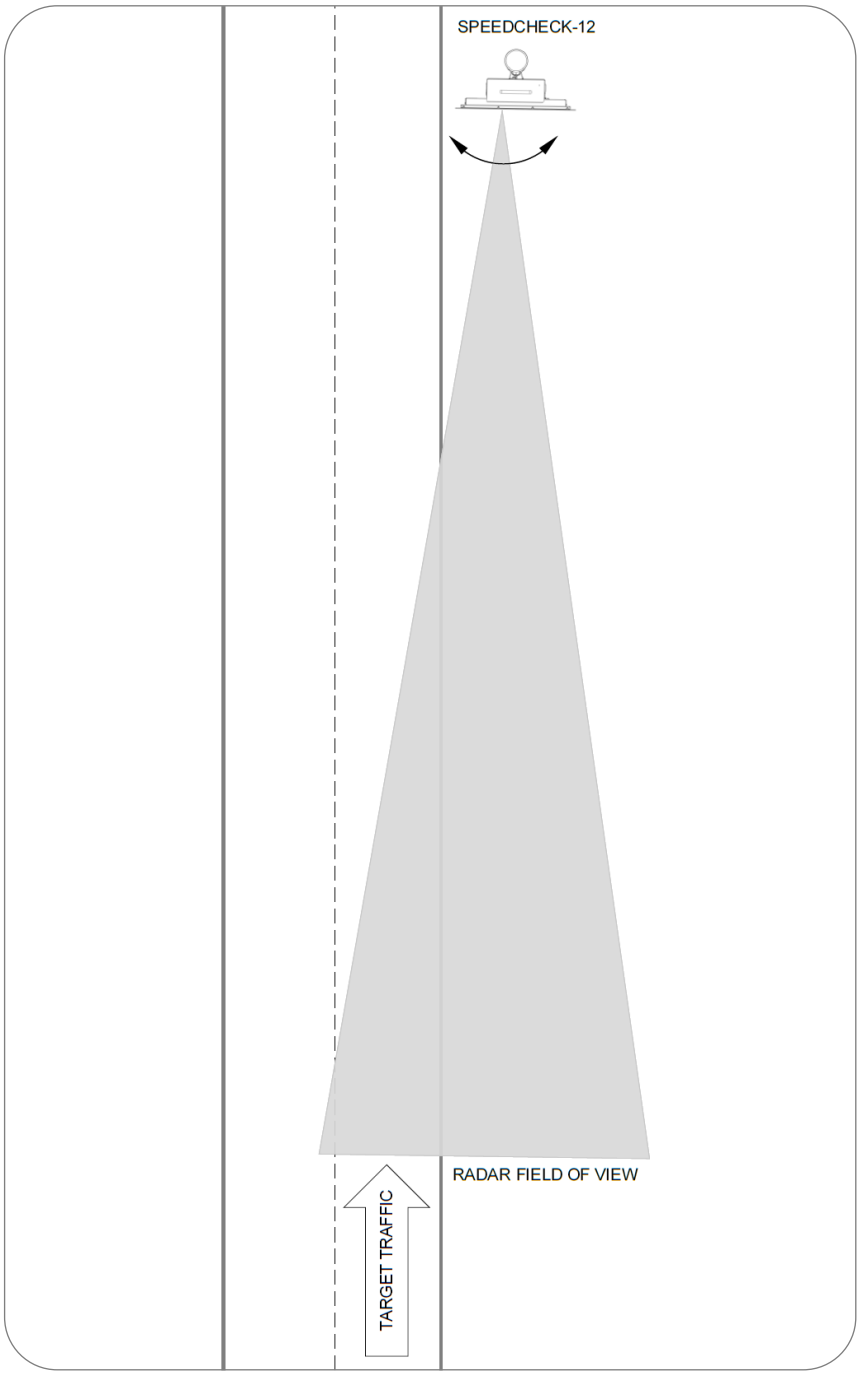
1. Lower solar panel on housing and loosely install 2x bolts at mounted end of housing, noting location of power harness.
2. Lift other end of solar panel up and connect power harness, ensuring connector is fully engaged.
3. Lower solar panel, taking care not to pinch solar panel harness, and install remaining bolts. Tighten all 4 bolts.





5.0 Display Alignment

1. Once sign is ready for final installation, adjust from side to side to ensure that the SPEEDCHECK-12 activates as desired traffic approaches sign.
2. After verification of performance, tighten sign mount and ensure sign is closed securely.



NOTE Diagram is not to scale and is for reference only. Follow local guidelines for installation.

6.0 System Setup

6.1 Configuration with Mobile Device

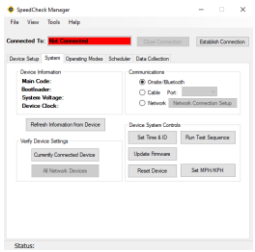
Download the SpeedCheck Manager mobile app to configure the SPEEDCHECK-12 without a PC: https://carmanah.com/appSC.

NOTE The SpeedCheck Manager mobile app default password is “speedcheck”.

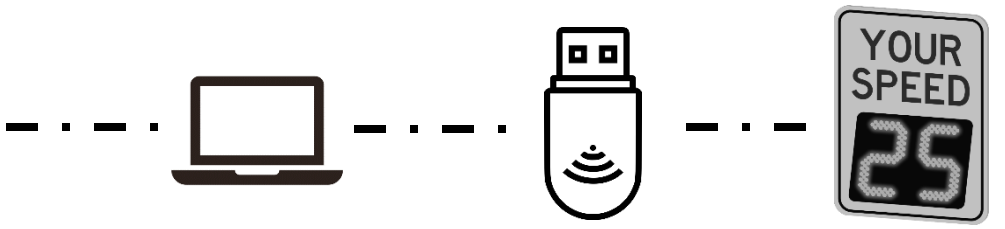
6.2 Configuration with PC

The SPEEDCHECK-12 radar speed sign can be configured with a PC using the SpeedCheck Manager software version 3.0.2.3 or later. For more information on programming and to download the latest version of software, please visit support.carmanah.com.

Once the sign is operational, proceed with connecting to the sign via SpeedCheck Manager. This will require a PC with Bluetooth® connectivity. Changes to the signs default setting may be required depending on local installation requirements.



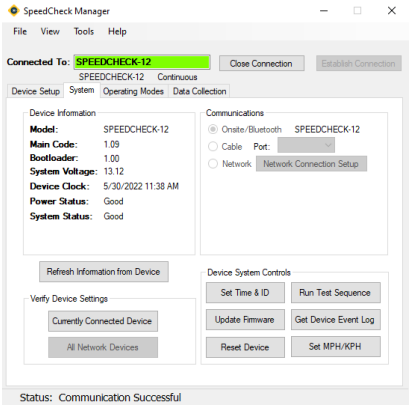
SpeedCheck Manager Software User Interface

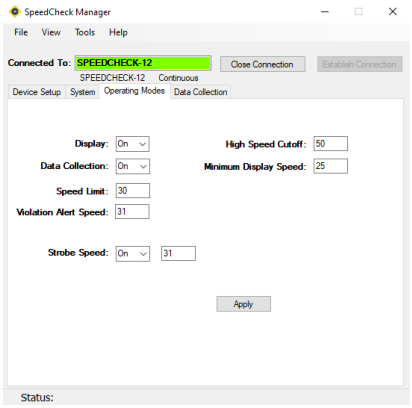


PC (Laptop) *Bluetooth Dongle (if required)* *SpeedCheck Sign*

The following are a few of the features and programming options found within SpeedCheck Manager:

- Speed adjustments
- Radar unit of speed (MPH/KPH)
- Operating mode selection
- System ID, date and time
- Scheduling
- Data collection
- Firmware updating

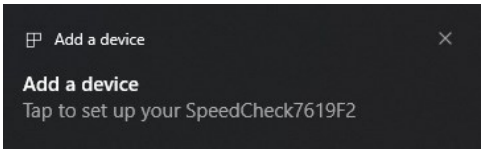




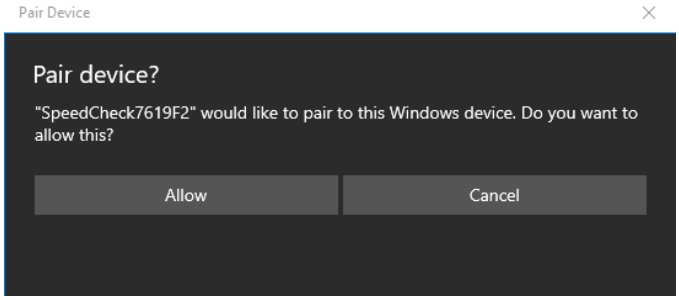
Bluetooth Pairing (PC only)

When connecting to your SpeedCheck radar speed sign for the first time, you will need to pair it via Bluetooth:

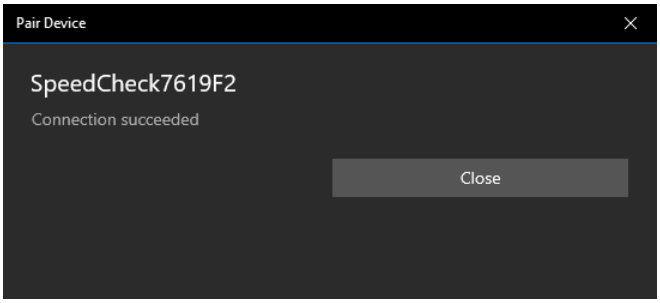
1. Open SpeedCheck Manager and click on Establish Connection.
2. Wait for the software to scan and detect nearby Bluetooth devices. Click on your radar speed sign (designated as SpeedCheckXXXXX) and click Connect.
3. Click on the dialog box in the bottom right corner to begin the pairing process.



4. Click on Allow to pair the device.



5. The sign is now paired and will be connected within SpeedCheck Manager.



This process will need to be completed if you are connecting to a system for the first time or connect via another PC.

7.0 Commissioning

NOTE SpeedCheck Manager is required to configure the SPEEDCHECK-12.

After installing the SPEEDCHECK-12, the following commissioning verification checklist helps ensure that everything is working as it should be and that your system will perform for many years of reliable and sustained operation.

- ☐ Mounting bracket attached securely to pole.
- ☐ Retaining bolt is appropriately tight.
- ☐ Display enclosure is secured to the rear enclosure; push lock is flush with outside of chassis.
- ☐ If used, liquid tight conduit connectors installed as per manufacturer.
- ☐ All connectors are latched, and harnesses incorporate a drip loop if needed.
- ☐ All harnesses and wires clear LED display when sign is closed.
- ☐ If batteries are present, their straps are taught and hold batteries in place.
- ☐ When power is connected to LED display, system begins startup sequence.
- ☐ When operational, status LEDs on front of display are correct.
- ☐ LED display is aimed correctly towards target traffic and displays expected speed as vehicles pass by.
- ☐ SpeedCheck Manager connects to the sign via Bluetooth.
- ☐ If present, solar panel pointed South (or as per specific instructions provided by Carmanah).
- ☐ If solar-powered, ensure system has clear sky access, and the removal of obstructions is not required.
- ☐ If solar-powered, note the possibility for nearby foliage to eventually shade the solar panel at a different time of year. If so, set a reminder to inspect at a later date.
- ☐ If solar-powered, upper drain hole plug installed in solar panel housing.
- ☐ If solar-powered, solar panel harness seal is snapped in completely.
- ☐ If solar-powered, power harness connectors are latched, and harness jacket is secured with no tension on the connector and incorporates a drip loop.
- ☐ If solar-powered, solar panel bolts are tight, and the housing is secured tightly to the mounting pole and unable to spin.

8.0 Troubleshooting

No operation or erratic operation	1. Verify voltage supply connections are correct and tight. 2. Verify fuses in the inline fuse holder are of the correct rating. • Battery fuse: **7A** • All fuses are type (250V 3AB 1/4" x 1-1/4")
Not all vehicle speeds displayed	1. Verify the display has correct alignment with the roadway. See Section 5.0 on SPEEDCHECK-12 Alignment. 2. Check the High Speed Cutoff setting in SpeedCheck Manager. It may be set too low for the prevailing traffic speed. 3. Check the Minimum Display Speed setting. It may be set too high for the prevailing traffic speed. 4. Note that the SpeedCheck display signs are designed to detect moving vehicles, including trucks and golf carts, but will ignore people or small targets. 5. The display may be angled slightly towards the center line of the road to focus on vehicles closer to the display. Detection range may vary depending on target size, such as a truck versus a compact car or moving.
Sign displays test sequence only upon start up	1. Display may be set to “OFF” in the “Operating Modes” menu of the SpeedCheck Manager software. 2. Timer or scheduler has been set to collect data but not display speeds. Set the program as desired. 3. Radar is not sending data. Contact Carmanah for further diagnostics.
No test sequence and no speeds displayed	1. Power to display is OFF. 2. Test sequence is disabled. 3. Operating Modes settings set for “Display OFF”. 4. Timer or scheduler has scheduled the sign to be off.
Numbers displayed with no vehicles passing	1. “06” or “08” displayed indicates the display is picking up noise from such items as fluorescent light ballast or fan blower motors. Eliminate the source of the noise or insulate the radar head from the display cabinet. Contact Carmanah for further information.
Speed readings higher or lower than expected	1. Display may be set to read KPH instead of MPH or vice versa. Use SpeedCheck Manager to set the correct unit of speed. See support.carmanah.com for more information.
Detection range too short	1. Sign alignment is incorrect. See Section 5.0 on SPEEDCHECK-12 Alignment. 2. Sign has metallic or plant obstructions between display and the vehicles. 3. Sign is aligned properly but road curve or grade is affecting detection zone. 4. The display may be angled slightly towards the center line of the road to focus on vehicles closer to the display. This range is affected by target size such as a truck versus a compact car. Contact Carmanah for more information.

Bluetooth® communications erratic or not working	1. Computer or phone not fully charged. You may get a timeout error if there is insufficient power to maintain a wireless connection. 2. Computer or phone too far away. It must be located within 100 feet, in line of sight and free and clear of obstacles in front of the sign.
Display application not downloading data properly	1. Invalid display name. Ensure display name programmed with your laptop computer is valid and does not include special characters or punctuation. 2. PC laptop computer not fully charged. You may get a timeout error if there is insufficient power to maintain a wireless connection. 3. For the PC version, make sure display date and time is set properly with the SpeedCheck Manager Device System tab setup menu.

Technical Support:

Email: customersupport@carmanah.com
Toll Free: 1.877.722.8877 (US & Canada)
Worldwide: 1.250.380.0052
Fax: 1.250.380.0062
Web: carmanah.com