

SPEEDCHECK-15/18

Radar Speed Sign Data Sheet



Quality radar speed sign systems packed with features to maximize effectiveness:

- ✓ Large 15" or 18" LED digits with various static sign sizes
- ✓ Optional "SLOW DOWN" message, strobes and external beacons available
- ✓ High-contrast display provides the greatest readability at a distance
- ✓ Stealth mode
- ✓ Calendar/schedule operation
- ✓ Data collection with visualization and reporting software
- ✓ 3-year warranty

Fully Compliant, Ultra-clear Display

Compliant to MUTCD standards for legibility, including LED color, character and letter height. The bright LED displays use 15-inch and 18-inch digits against a background designed for high-contrast visibility that prevents "88" ghosting—ensuring readability in all weather and lighting conditions. The unique safety mask limits the viewing angle to prevent drivers from watching the display as they pass. The "SLOW DOWN" message can be programmed to flash at user-defined speed thresholds.

Long-lasting, Reliable Operation

The LED display is housed within a durable, weatherproof aluminum unit and is shielded with a tough polycarbonate window for added vandalism protection. Every solar-powered model is solar-sized by location to ensure year-after-year operation. Carmanah includes a Solar Power Report to prove sustainability over a 12-month period.

Easy Installation and Connectivity

The modular design makes it easy to repair using standard tools—without removing the device from the pole. Bluetooth® allows for quick connectivity and setup via the SpeedCheck Manager PC software. A StreetHub™ model comes factory prewired and pretested for remote communication—enabling cloud-based access within minutes. Carmanah's comprehensive support system includes product support technologists and our 24/7 on-demand [Product Support Center](#).



SPEEDCHECK-15

15-inch digits for speeds less than 45 mph (70 km/h)

SPEEDCHECK-18

18-inch digits for speeds equal/greater than 45 mph (70 km/h)



MUTCD compliant



Buy America compliant



3-year limited warranty



Solar-sized for every location



Up to 1000 feet radar detection

SPEEDCHECK-15/18

Radar Speed Sign Data Sheet

1.844.412.8395 | traffic@carmanah.com | carmanah.com



"YOUR SPEED" STATIC SIGN

Sign	Meets MUTCD legibility standards for color, character and height
Sheeting	3M High Intensity Prismatic or Diamond Grade retroreflective sheeting and components
Color	Available in yellow, fluorescent yellow/green, white, and orange

SPEEDCHECK-15

30" x 30"
(762 mm x 762 mm) 42" x 30"
(1067 mm x 762 mm)

SPEEDCHECK-18

48" x 36"
(1219 mm x 914 mm) 60" x 48"
(1524 mm x 1219 mm)

OPTIONAL PRODUCT FEATURES

Slow Down	Flashes MUTCD-compliant "SLOW DOWN" message when drivers exceed user-defined speed thresholds; available in yellow or red* LEDs
Outputs	Triggers external devices, such as flashing beacons, strobes, or cameras by speed threshold or schedule, or from centralized remote location Strobe*: rapid-flashing strobe with white LEDs or red/blue LEDs (for 15" display only). * Not FHWA MUTCD compliant Yellow or red round beacons: 12" (305 mm) or 8" (203 mm) LED modules
Inputs	Allows external devices to manage display operation with external contact closure and the included wiring harness

LED DISPLAY

SPEEDCHECK-15

26.6" (676 mm) 4.6" (117 mm) 19.7" (500 mm)

SPEEDCHECK-18

31" (787 mm) 4" (102 mm) 23" (584 mm)

LED Display	Meets MUTCD legibility standards for character height and LED color for roadways with speed limits under 45 mph and 45 mph and over
	Seven-segment digit design using amber LEDs LEDs automatically dim during nighttime operation, minimizing light bounce into neighboring windows
Radar	Includes stealth mode for data collection 3rd-party tested radar detection range to 1000 ft. Single-direction, K Band Doppler radar (+/- 1 mph), 12° radar beam width
Construction	Corrosion-resistant aluminum chassis with stainless steel hardware 1/4" polycarbonate window protects digital display from weather and vandalism

LED DISPLAY MOUNTS

Standard Banding or U-Bolt

Flat Bracket

COMMUNICATION AND DATA COLLECTION

Local Communication	Bluetooth, direct serial (cable) and third-party device communication options available
Remote Monitoring	Optional StreetHub model includes fully integrated monitoring unit from the factory and Glance cloud-based software for two-way communication

POWER OPTIONS

Solar	12 VDC operation, solar sized to specific geographic location Includes 12-month Solar Power Report to ensure system sustainability System designed for 5+ year battery life
	Integrated solar kit option: includes solar panel, charge controller and batteries; lower cost option (18 Ah battery option) Separate solar panel and cabinet option: includes batteries, charge controller, room for 3rd-party devices
AC	100-240 VAC in standard configurations.

INTEGRATED SOLAR KITS AND MOUNTS

Top of Pole Mount

Side of Pole Mount

PANEL	LENGTH	WIDTH
30 W	21.5" (545 mm)	15.7" (400 mm)
50 W	26.3" (668 mm)	21.2" (538 mm)

SEPARATED SOLAR PANEL/CABINET AND MOUNTS

Top of Pole Mount

Side of Pole Mount

PANEL	LENGTH	WIDTH
50 W	26.3" (668 mm)	21.2" (538 mm)
80 W	30.7" (780 mm)	26.5" (672 mm)
170 W	59.1" (1500 mm)	26.3" (668 mm)

Cabinet	Weatherproof, gasketed cabinet with vents for ambient air transfer tested to NEMA 3R
	Corrosion-resistant aluminum chassis with stainless steel hardware
	Lockable, hinged door with #2 lock; optional padlockable latch
	Raw aluminum finish or yellow, black, or green powder coated 15.7" x 8.2" x 21.0" (399 mm x 208 mm x 534 mm)

INCLUDED WITH EVERY SIGN

Software	SpeedCheck Manager PC software for all setup and programming options, including calendar scheduling, data collection Traffic Analyzer software for data visualization and reporting
Warranty	3-year limited warranty on LED display 1-year limited warranty on batteries
Support	Carmanah's North American product support technologists available for solution building, solar sizing and troubleshooting 24/7 access to Carmanah's online Product Support Center database
Customize	Build a SPEEDCHECK-15 online OR Build a SPEEDCHECK-18 online

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Document: Carmanah_DATA_SPEEDCHECK-15-18_RevB



March 15, 2023

Re: Iowa DOT Statewide Radar Speed Feedback Signs (RFB FY2023 #097)

To Whom it May Concern,

The SpeedCheck-15 and SpeedCheck-18 Radar Speed Signs manufactured by Carmanah Technologies meet the NHSN-000-T(275)--2R-00 specifications.

The SpeedCheck-15 (15" LED digits) is offered because it displays the 'SLOW DOWN' word message; it is available with a 30"x30" sign.

Best regards,

Trisha Bartlett
Business Development Representative, Inside Sales
Carmanah Technologies Corp.
tbartlett@carmanah.com
250-412-8368



Carmanah Technologies – Technical Support

Toll-free: 1-877-722-8877

Hours: M-F 7:00 AM – 5:00 PM PST

Contact Carmanah's Support Team: [Contact Us or Online Chat](#)

Email: customersupport@carmanah.com

RECOMMENDED SYSTEM:

In order to meet the performance requirements at Sample Site in Mason City, IA, Carmanah recommends the following system:

SPEEDCHECK-15

- 30 Watt Solar Panel**
- 18 Ah Battery Capacity**

Key Parameters Considered:

- Number of expected vehicle activations during peak, off-peak and nighttime hours (ADT)
- Worst month** (month with least sunlight, coldest temp, and highest system load over 24 hours)

**See glossary of terms on page 4 for clarification

System Configuration:

Product	SPEEDCHECK-15
Total Solar Panel Power (Watts)	30
Total Battery Capacity (Amp-Hours)	18
Strobe	
Strobe Type	
Beacon Type	
Beacon Quantity	
Time Switch	
Other Devices	

Weather Data:

Worst Month	December
Peak Sun Hours (during month)	2.65
Solar Panel Orientation	South
Solar Panel Tilt Angle	45°
Minimum Temperature - deg.F (deg.C)	20.1°F / -6.6°C
Day Length (hours)	9.08
Night Length (hours)	14.92



Actual product configuration may vary.

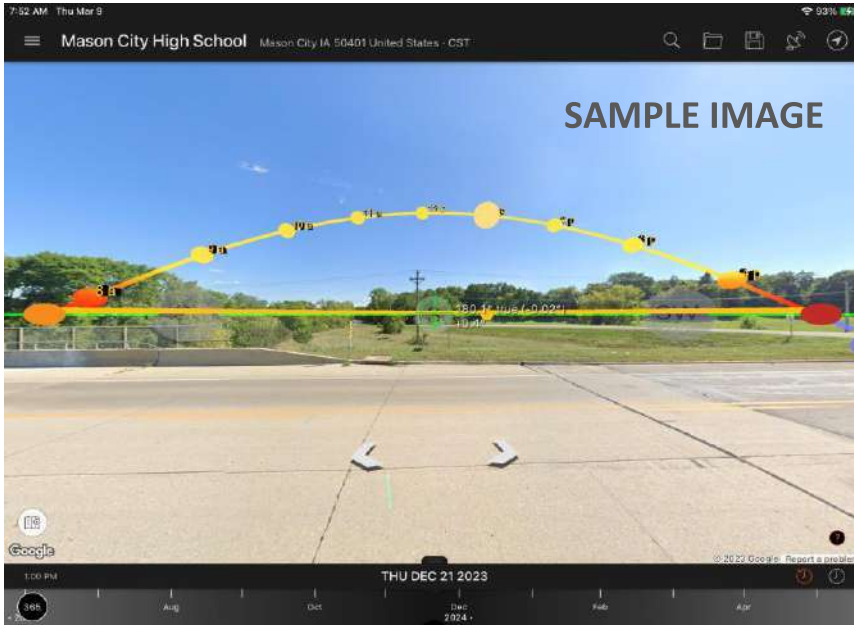
Additional Notes:

Adjusted battery for temperature	75%
Sunlight available after shading is applied	80%

Performance Summary for Worst Month

Energy In (Watt-Hours)	34.4
Average Daily Traffic (ADT) (17280 = simulated continuous 24-hr. operation)	7500
Energy Out (Watt-Hours)	20.6
Autonomy (Days)	7.0
Array-to-load Ratio (ALR)	1.7
24-Hour Battery Usage - Depth of Discharge (%)	6.2%

**See page 3 for in-depth system details

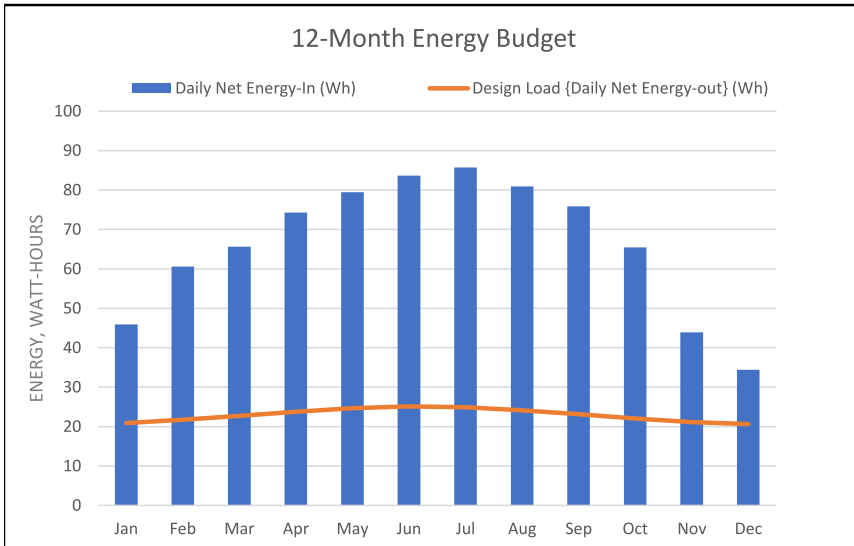


Sun Path and Shading:

The image on the left depicts the sun's path during the worst month*. Both the sun's path and shading affect the amount of available energy and determines the size and performance of the system.

Solid objects such as buildings block most light, while the effect of other objects – like trees, depending on their type and time of year– varies.

Location Shade De-rating: 20%



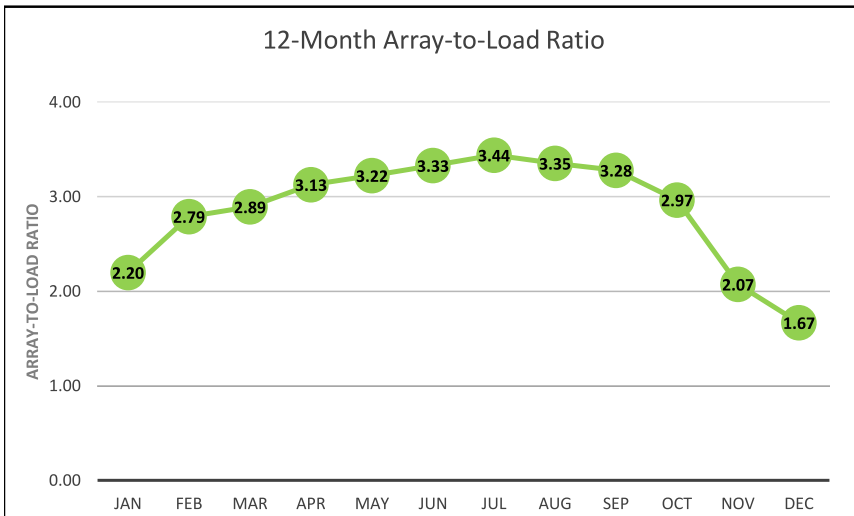
12-Month Energy Budget:

Blue bars: Energy available to run the system and charge the batteries (energy-in).

Red line: system load (energy-out) due to vehicle detection.

Includes:

- All system components and ancillary devices
- System standby load



12-Month Array-to-Load Ratio:

Green line: array-to-load ratio, or ALR, is the (energy-in) divided by the (energy-out) over a 24-hour period.

The values displayed represent the minimum expected ALR each month.

The typical industry recommendation for minimum ALR is 1.2:1 or (1.2).

A value at or greater than 1.2, helps ensure that the batteries are at, or close to 100% state-of-charge at the end of each day

ENERGY-IN CALCULATION:

Specified Panel Wattage (W)	30	
Worst Month Peak Sun Hours	2.65	Sun Hours at degree tilt angle for December
Effective Shading (%)	80%	100% is full sun. Based on site evaluation
Peak Sun Hours Adjusted for Shading	2.12	Peak Sun Hours X Effective Shading
Solar Panel Energy Pre-Battery Charger (Wh)	63.7	Gross energy-in before efficiency adjustments
System Charge Efficiency (%)	75%	Operating specification based on PWM charging
Battery Charge Acceptance (%)	72%	Value based on battery manufacturer's specifications
Energy Into the Battery (Watt-Hours)	34.4	

ENERGY-OUT CALCULATION:

Daytime System-Active Hours	2.84	Daytime percentage of ADT
Nighttime System-Active Hours	2.37	Nighttime percentage of ADT
System Idle Hours	18.79	Total time that no traffic is being detected based on ADT
Daytime Active Sign Load (Wh)	9.20	Daytime load based on average peak and off-peak operation
Nighttime Active Sign Load (Wh)	2.21	Nighttime load - 20% display intensity (when active)
Beacon Load (Wh)	0.00	Beacon power X beacon operational hours
System-Idle Load (Wh)	6.92	Includes time switch and sign control board
Total 24-hour Energy Consumption (Wh)	20.6	Includes system charge controller

Note: Day, night and system-idle loads include 3rd-party devices - when present.

SYSTEM AUTONOMY:

Specified Battery Capacity (Ah)	18	Manufacturers specification
Number of Batteries	0	User Specified
Battery Low Voltage Disconnect (%)	10%	Operating specification
Battery Capacity (Wh)	194.4	Battery capacity (Ah) X 12 Volts X (1 - Battery LVD %)
Battery Capacity Temperature De-rate Amount	24.5%	Reduced capacity due to temperature effects
Temperature-Adjusted Battery Capacity (Wh)	147	Battery capacity X temperature de-rating factor
Total Daily Energy Consumption (Wh)	20.6	Restated from above
Autonomy (Days)	7	Adjusted battery capacity / daily energy consumption

ARRAY TO LOAD RATIO:

Energy Into the Battery (Wh)	34.4	Energy-in through the solar panel and charge controller
Total Daily Energy Consumption (Wh)	20.6	Energy-out through the system
ALR (Energy In / Energy Out)	1.7	Recommended minimum = 1.2

DAILY DEPTH OF DISCHARGE:

Nominal Battery Capacity (Wh)	216	Battery capacity (Ah) x battery voltage (12V)
Daytime Energy drawn from Battery (Wh)	9.2	Energy-out through the system - daytime activations
Nighttime Energy drawn from Battery (Wh)	2.2	Energy-out through the system - nighttime activations
System-Idle Energy drawn from Battery (Wh)	6.9	Energy-out through the system - system idle
Total Energy Provided by Battery Only (Wh)	20.6	Total energy battery supplies system during a 24-hr cycle
24-Hour Battery Usage - Depth of Discharge %	6.2%	Daily Cyclical Battery Capacity Used

Glossary

12-Month Energy Budget: The amount of daily energy available during any month to run the system and charge the batteries plotted against the amount of daily energy used for a specified usage model - the "design load".

Hours per Day: The number of hours during the day that the sign is flashing in response to a control signal from the internal radar, time switch or other device.

Array-to-Load Ratio (ALR): Defined as the total system energy consumption (Energy-Out) divided into the net energy available to the system (Energy In) on a day during the worst month. It is an accepted industry practice to specify a minimum ALR of 1.2:1 in order to account for variability of sunlight energy over time. Providing a sufficient ALR will help ensure that the batteries will return to a full-state of charge at the end of each charging day.

Autonomy: The length of time (in days) that a system can function without sunlight (insolation). For autonomy calculations, net battery capacity is adjusted for the effect of temperature (during the worst month of sunlight) and low-voltage-disconnect (LVD) (see LVD definition below).

Battery Depth of Cycle/Depth of Discharge: The percentage of battery capacity used on a daily basis. This value considers times when sunlight can power LED fixtures directly, eliminating the need to draw from the battery. For lead-acid batteries, reducing the depth of discharge dramatically improves battery life. **Note:** For a system activated during the daytime only, the battery will power the system during dawn and dusk when insolation levels are lowest.

Daily Quiescent Energy: The passive energy drawn (measured in watt-hours) by a system when it is idle. This includes the power draw of the main circuit board (EMS), LED beacon loads, and a time switch (if present).

Energy-In: The total amount of useable energy collected by the solar panel during a 24-hour period. This value accounts for efficiencies between the solar panel and the battery, as well as shade de-rating. Efficiencies related to the charge controller and battery-charge acceptance are also factors.

Energy-Out: The total energy used by a system in a 24-hour period based on the stated number of activations per day. It includes Daily Quiescent Energy (see definition above)

Low-Voltage-Disconnect (LVD): The voltage at which the system will not flash when activated. LVD is a temporary state and is the result of too little sunlight or too many activations. LVD ensures that a minimal charge is retained in the battery to enable system recovery and to protect against permanent battery damage.

Location Shade De-Rating: Percentage of available sunlight blocked by buildings, trees and other objects. This factor is specific to the end user's site, which is why a system is always optimally sized when its exact final installation location is known or can be simulated.

Worst Month: The month with the least sunlight, coldest temperatures, and highest system load over 24 hours.

Energy Management System (EMS): The control module inside the Carmanah Solar Traffic Product responsible for all aspects of energy management and system control.

Maximum Power Point Tracking (MPPT): MPPT dynamically maximizes the amount of power the solar panel can produce by allowing the solar panel voltage to operate at its optimal point independent of the battery voltage.

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RECOMMENDED SYSTEM:

In order to meet the performance requirements at Sample Site in Mason City, IA, Carmanah recommends the following system:

SPEEDCHECK-18

- 30 Watt Solar Panel**
- 18 Ah Battery Capacity**

Key Parameters Considered:

- Number of expected vehicle activations during peak, off-peak and nighttime hours (ADT)
- Worst month** (month with least sunlight, coldest temp, and highest system load over 24 hours)

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System Configuration:

Product	SPEEDCHECK-18
Total Solar Panel Power (Watts)	30
Total Battery Capacity (Amp-Hours)	18
Strobe	
Strobe Type	
Beacon Type	
Beacon Quantity	
Time Switch	
Other Devices	

Weather Data:

Worst Month	December
Peak Sun Hours (during month)	2.65
Solar Panel Orientation	South
Solar Panel Tilt Angle	45°
Minimum Temperature - deg.F (deg.C)	20.1°F / -6.6°C
Day Length (hours)	9.08
Night Length (hours)	14.92



Actual product configuration may vary.

Additional Notes:

Adjusted battery for temperature	75%
Sunlight available after shading is applied	80%

Performance Summary for Worst Month

Energy In (Watt-Hours)	34.4
Average Daily Traffic (ADT) (17280 = simulated continuous 24-hr. operation)	7500
Energy Out (Watt-Hours)	20.6
Autonomy (Days)	7.0
Array-to-load Ratio (ALR)	1.7
24-Hour Battery Usage - Depth of Discharge (%)	6.2%

**See page 3 for in-depth system details

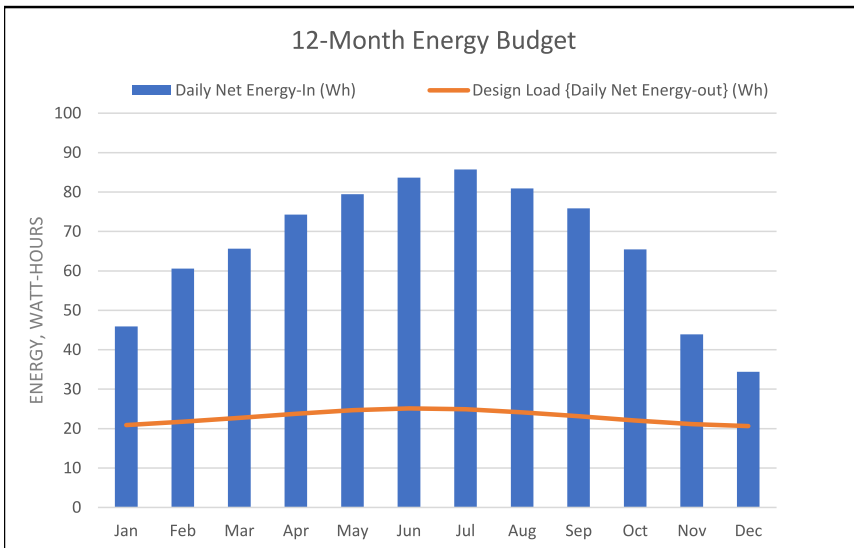


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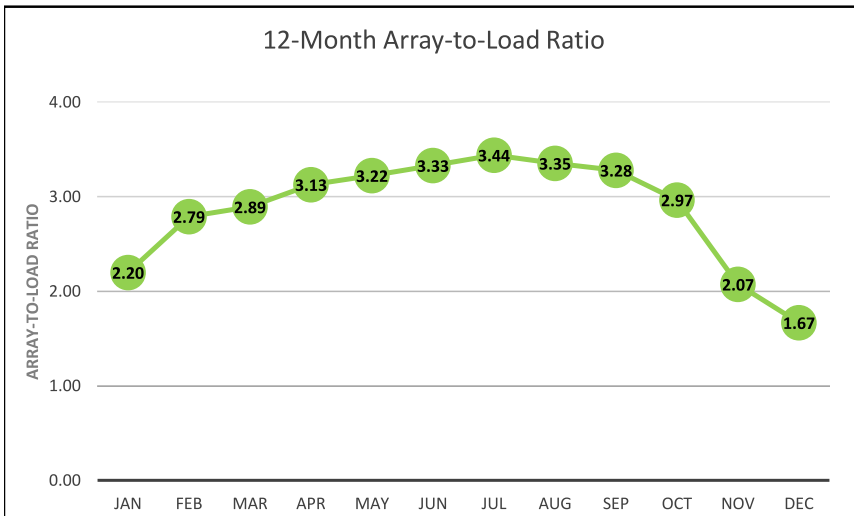
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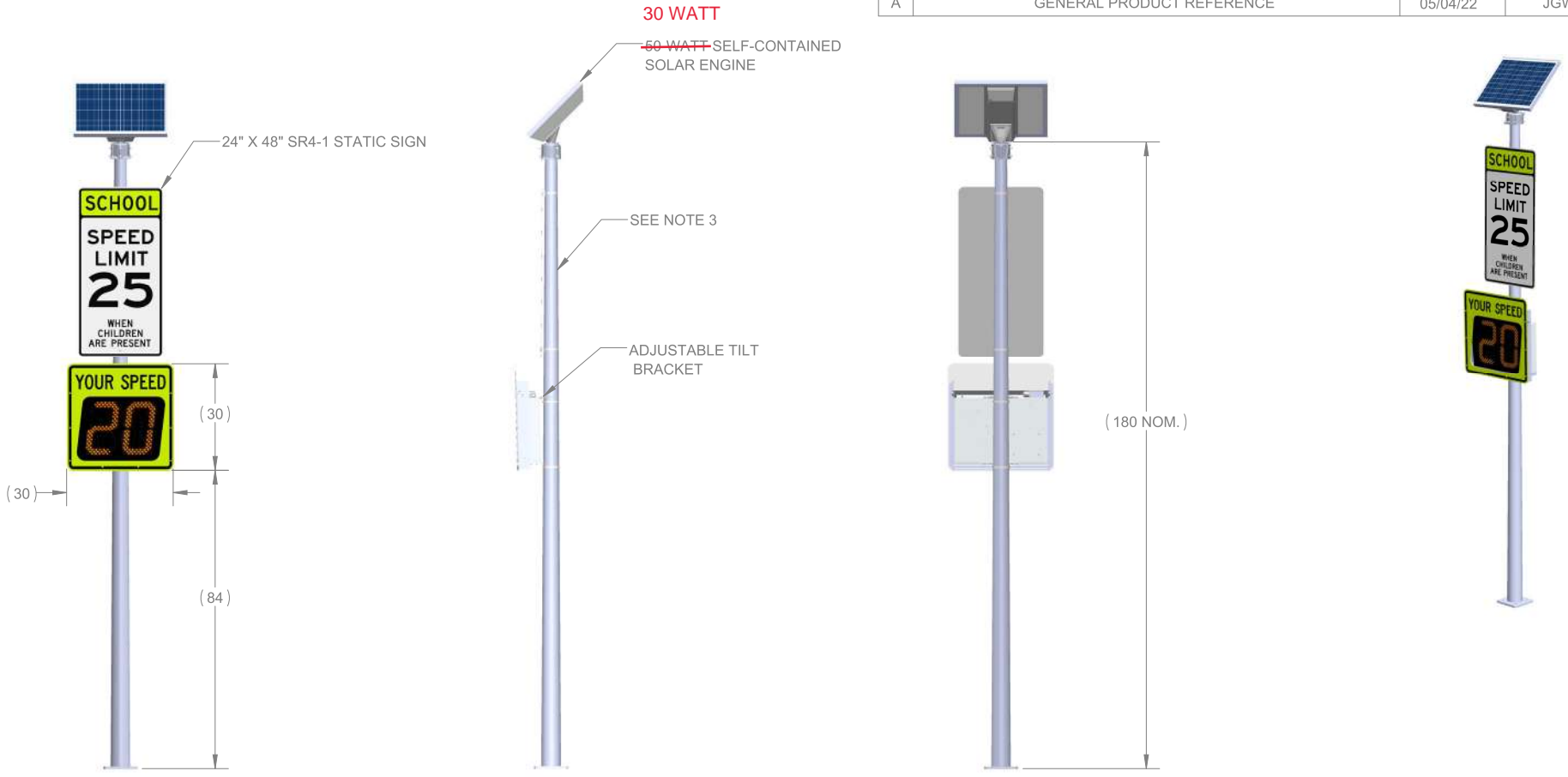
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REV	DESCRIPTION	DATE	DRAWN BY
A	GENERAL PRODUCT REFERENCE	05/04/22	JGW

8 7 6 5 4 3 2 1



NOTES:

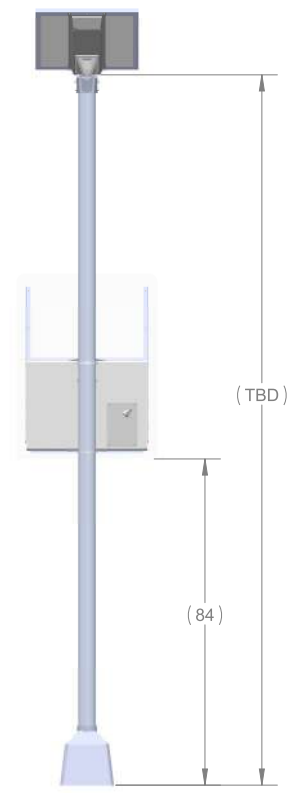
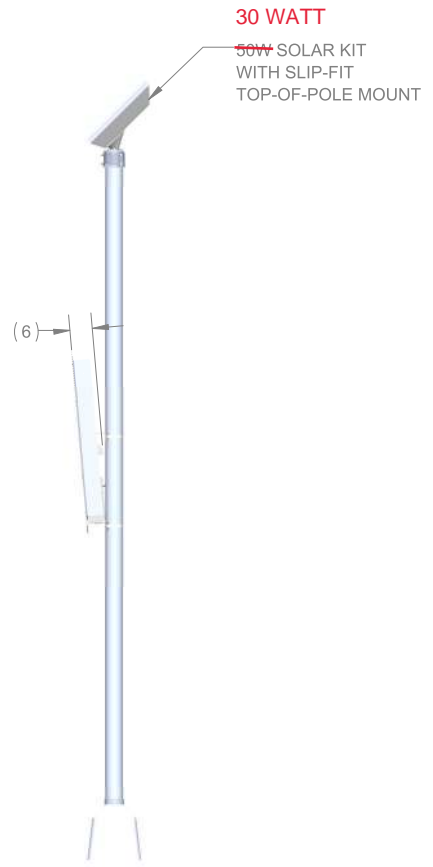
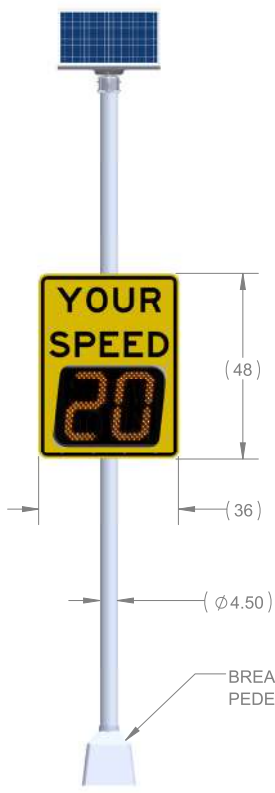
- FOR GENERAL PRODUCT AND DIMENSIONAL REFERENCE ONLY
- REFER TO PRODUCT DATA SHEETS FOR ADDITIONAL PRODUCT FEATURES AND OPTIONS
- POLE CONFIGURATION AND HEIGHT VARIES BY APPLICATION - 15' TYPE 1A SHOWN
- SOLAR ENGINE ARRANGEMENT AND MOUNT TYPE VARIES BY CONFIGURATION - 3.5"- 4.5" DIA., TOP-OF-POLE SHOWN
- SOLAR ENGINE CABLING CAN BE RUN INTERNALLY, OR EXTERNAL TO THE POLE
- RADAR SPEED SIGN CAN BE SECURED TO THE POLE WITH U-BOLTS OR BANDING

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		TITLE SPEEDCHECK-15, SOLAR POWERED, RADAR SPEED SIGN, 30" X 30" GENERAL ARRANGEMENT	
DIMENSIONS IN: INCHES		SIZE B	DRAWING NO 90134
THIRD ANGLE PROJECTION 		SCALE NTS	REVISION A SHEET 1 OF 1

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1

REV	DESCRIPTION	DATE	DRAWN BY
A	GENERAL PRODUCT REFERENCE	04/28/2022	JGW



- NOTES:
- DIMENSIONS IN PARENTHESIS ARE FOR REFERENCE ONLY
 - SEE PRODUCT SPECIFICATION SHEETS AND USER MANUAL FOR COMPLETE DETAILS
 - POLES AND BASES ARE NOT PROVIDED AND ARE INCLUDED FOR ILLUSTRATION PURPOSES ONLY.
 - POLE SHOWN IS 4.5" NOMINAL O.D. POLE HEIGHT VARIES BY APPLICATION AND PRODUCT CONFIGURATION.
 - AVAILABLE STATIC SIGN SIZES: 48" X 60" AND 36" X 48" - SHOWN
 - AVAILABLE STATIC SIGN COLORS: WHITE, FLUORESCENT YELLOW/GREEN, YELLOW - SHOWN
 - STATIC SIGN LETTERING HEIGHT: "YOUR SPEED", 6.5-INCHES
 - LED DISPLAY CHARACTER HEIGHTS:
 - SPEED DISPLAY NUMBERS: 18-INCHES
 - "SLOW DOWN" MESSAGE: 6-INCHES
 - SOLAR PANEL AND BATTERY SIZING VARIES BY PRODUCT CONFIGURATION AND APPLICATION - ~~50W~~ SELF
 CONTAINED SOLAR KIT SHOWN

30 WATT

PROPRIETARY
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 Carmanah Technologies Corp.

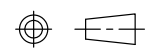


250 Bay Street
 Victoria, BC Canada V9A 3K5
 Tel [250] 380-0052
 Fax [250] 380-0062

**SPEEDCHECK-18, RADAR SPEED SIGN
 GENERAL ARRANGEMENT**

DIMENSIONS IN: INCHES

THIRD ANGLE PROJECTION



SIZE	DRAWING NO	REVISION
B		A
SCALE		SHEET
NTS	90131	1 OF 1

Declaration of Conformity

Model Numbers

- SS-6-12V
- SS-6L-12V
- SS-10-12V
- SS-10L-12V
- SS-20L-12V
- SS-10L-24V
- SS-20L-24V



Standards Compliance

Standards Compliance	NRTL	Issued
UL1741 -Ed.2 Feb 15, 2018	ETL	Jan-2021
CSA C22.2 No. 107.1-16 Ed.2	ETL	Jan-2021
UL121201: 2017 Ed.9	ETL	Jan-2019
CSA C22.2 No. 213-2017 Ed.3	ETL	Jan-2019
IEC/EN 62109-1 Ed.1 2010	TUV	Aug-2021
IECEX&ATEX: IEC/EN 60079-0 & 7	ETL	Dec-2020
EN 55024:2010 Immunity, Ind. Environments	MET Labs	Nov-2016
EN 55032:2013 (Class B) Emissions	MET Labs	Nov-2016
ICES-003 Issue 4, Feb 2004 (Class B)	MET Labs	Dec-2010

Directives & Regulations

FCC (Title 47 of CFR), Part 15 Subpart B Class B
 REACH EC 1907/2006 compliant
 Electromagnetic Compatibility Directive 2014/30/EU
 EPS intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU
 RoHS Directive 2011/65/EU and Amendment 2015/863/EU

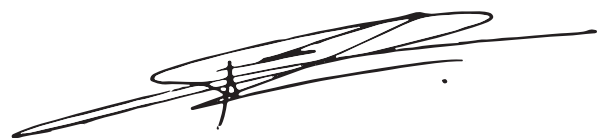
This declaration is issued under the sole responsibility of the manufacturer. The undersigned hereby declares, on behalf of Morningstar Corporation, that the above referenced product, to which this declaration relates, is in conformity with the standards, listings, and directives as stated in this document.

Manufacturer



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SpeedCheck®

RADAR SPEED SIGN USER MANUAL

For the SPEEDCHECK-15/18



SPEEDCHECK-15/18

85495_MANUAL_TRA_SPEEDCHECK-15-18_RevH

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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-15/18 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.

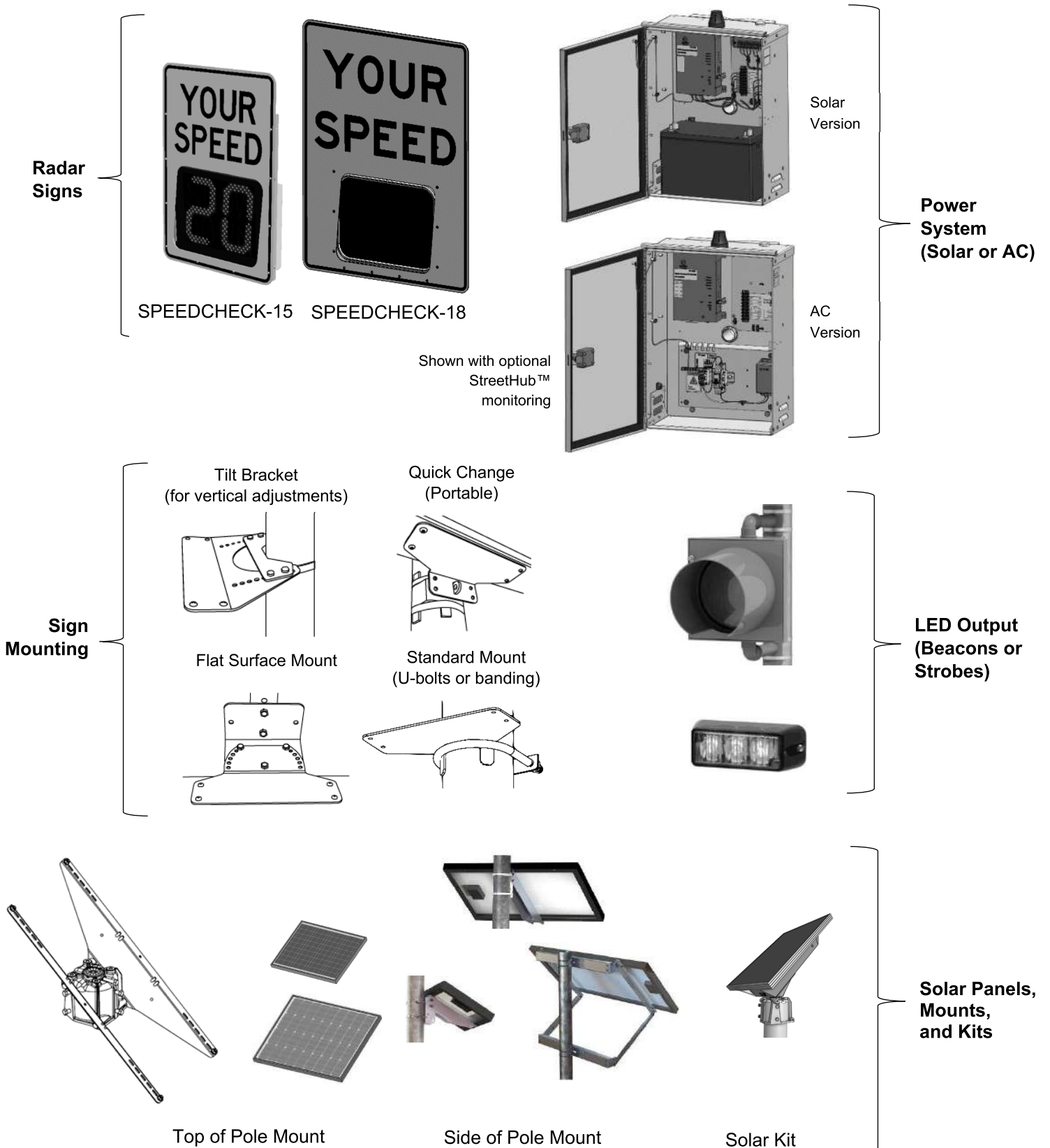


The specifications of the products and components described in this manual are subject to change without notice.



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

1.4 System Components

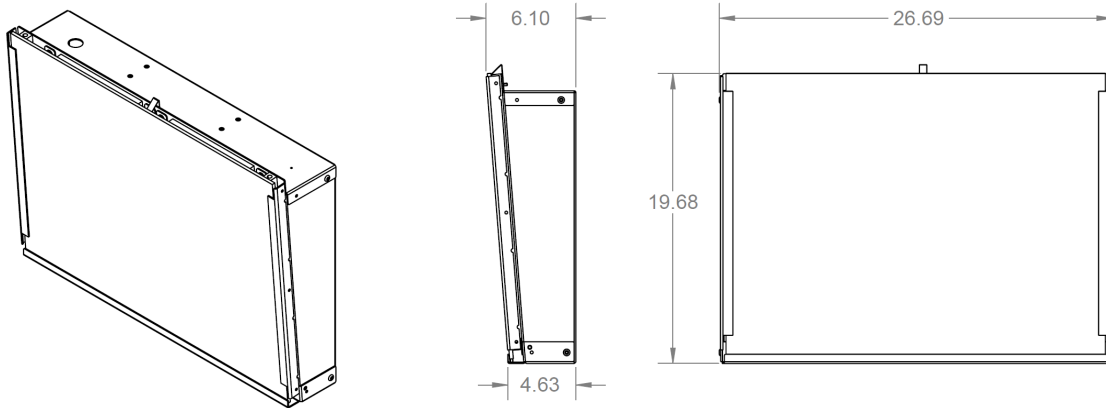


2.0 System Overview

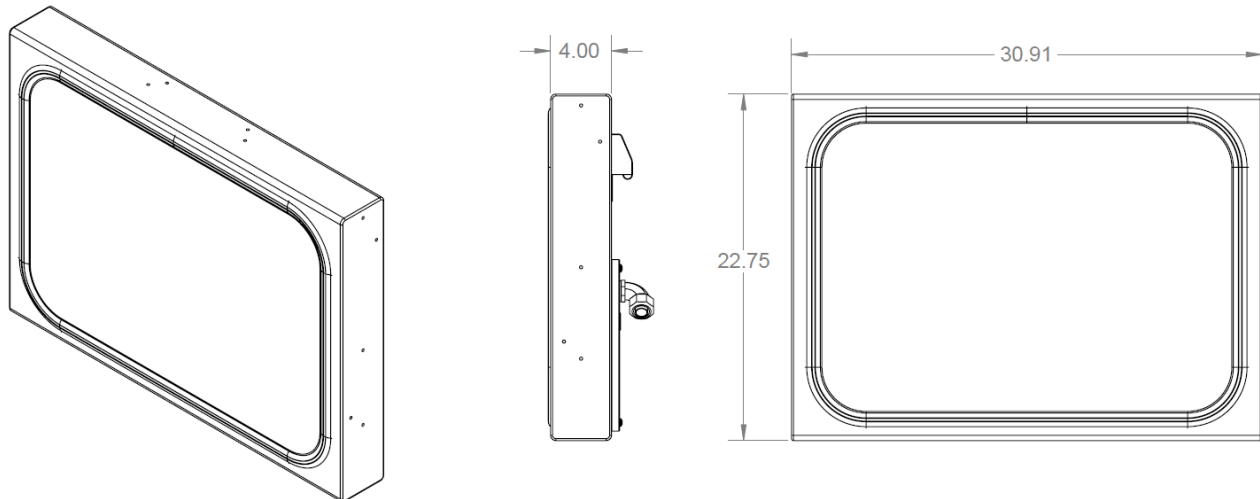
2.1 SPEEDCHECK-15/18 Display Sign Enclosure Dimensions

This manual describes information on the installation, maintenance, troubleshooting, service, and support options for the SPEEDCHECK-15 and SPEEDCHECK-18 radar speed signs.

SPEEDCHECK-15 Display Sign Enclosure Dimensions



SPEEDCHECK-18 Display Sign Enclosure Dimensions



2.2 Typical Configurations – Overview

SPEEDCHECK-15/18 display signs are available with a variety of options:

Model	Cabinet	Battery Quantity	Battery Capacity	Solar Panel Wattage	Beacons	Strobes	StreetHub™ Remote Monitoring
SPEEDCHECK-15 (AC Internal)	No	N/A	N/A	N/A	Optional	Optional	N/A
SPEEDCHECK-15 (AC/Solar Power Cabinet)	Yes	1*	Up to 100 Ah*	Up to 170 W*	Optional	Optional	Optional
SPEEDCHECK-18 (AC/Solar Power Cabinet)	Yes	1*	Up to 100 Ah*	Up to 170 W*	Optional	N/A	Optional
SPEEDCHECK-15 (Solar Kit)	No	1 or 2	18 or 36 Ah	30 or 50 W	Optional	Optional	N/A
SPEEDCHECK-18 (Solar Kit)	No	1 or 2	18 or 36 Ah	30 or 50 W	Optional	N/A	N/A

* Solar-equipped systems only

NOTE

Beacons cannot be combined with strobes in the same system.

1. SPEEDCHECK-15 with AC power routed directly to sign

- AC input wires connect in junction box, located on the sign chassis (see image on following page)
- Optional 12V circular LED beacons with internal driver connect in junction box (red/black two conductor cable)
- Optional strobes prewired to the controller

2. SPEEDCHECK-15 or 18 with Solar/DC battery power in cabinet

- Two conductor red/black DC power cable coiled up as it exits the junction box conduit fitting
- Optional 12V circular LED beacons with internal driver connect in junction box. For SPEEDCHECK-18, optional beacon versions ship with standard load cables pre-attached to a four-position terminal block on the back panel assembly.
- Optional strobes prewired to the controller
- Optional StreetHub™ remote monitoring prewired in the cabinet

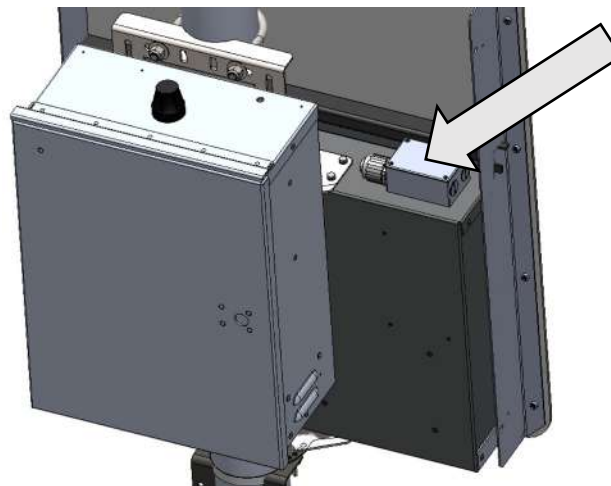
-
3. **SPEEDCHECK-15 or 18 with AC/DC power supply in separate cabinet**
 - a. SPEEDCHECK-15 – two conductor red/black DC power cable coiled up as it exits the junction box conduit fitting on the sign
 - b. SPEEDCHECK-18 – two conductor red/black DC power cable coiled up as it exits the back panel conduit fitting on the sign
 - c. Optional 12V circular LED beacons with internal driver connect in junction box. For SPEEDCHECK-18, optional beacon versions ship with standard load cables pre-attached to a four-position terminal block on the back panel assembly.
 - d. Optional strobes prewired to the controller
 - e. Optional StreetHub™ remote monitoring prewired in the cabinet

 4. **SPEEDCHECK-15 or 18 with solar kit (no cabinet)**
 - a. Includes solar panel, housing with charge controller and mount
 - b. Batteries housed inside the solar kit with charge controller (no external cabinet)

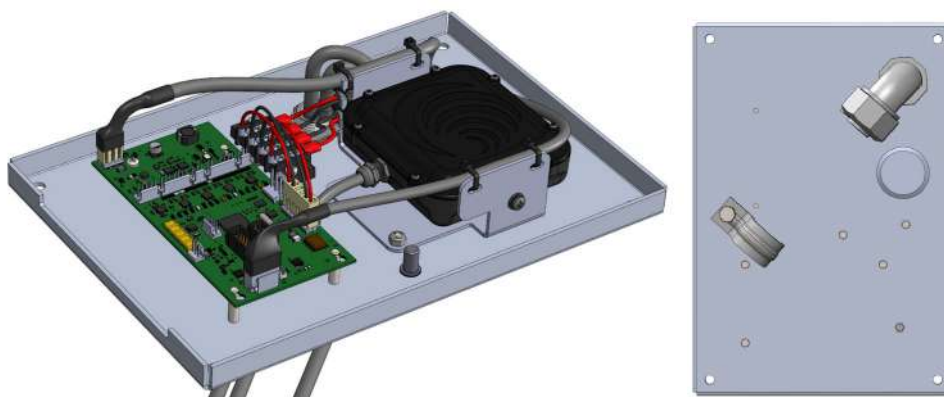
SPEEDCHECK-15/18 Solar Kit:



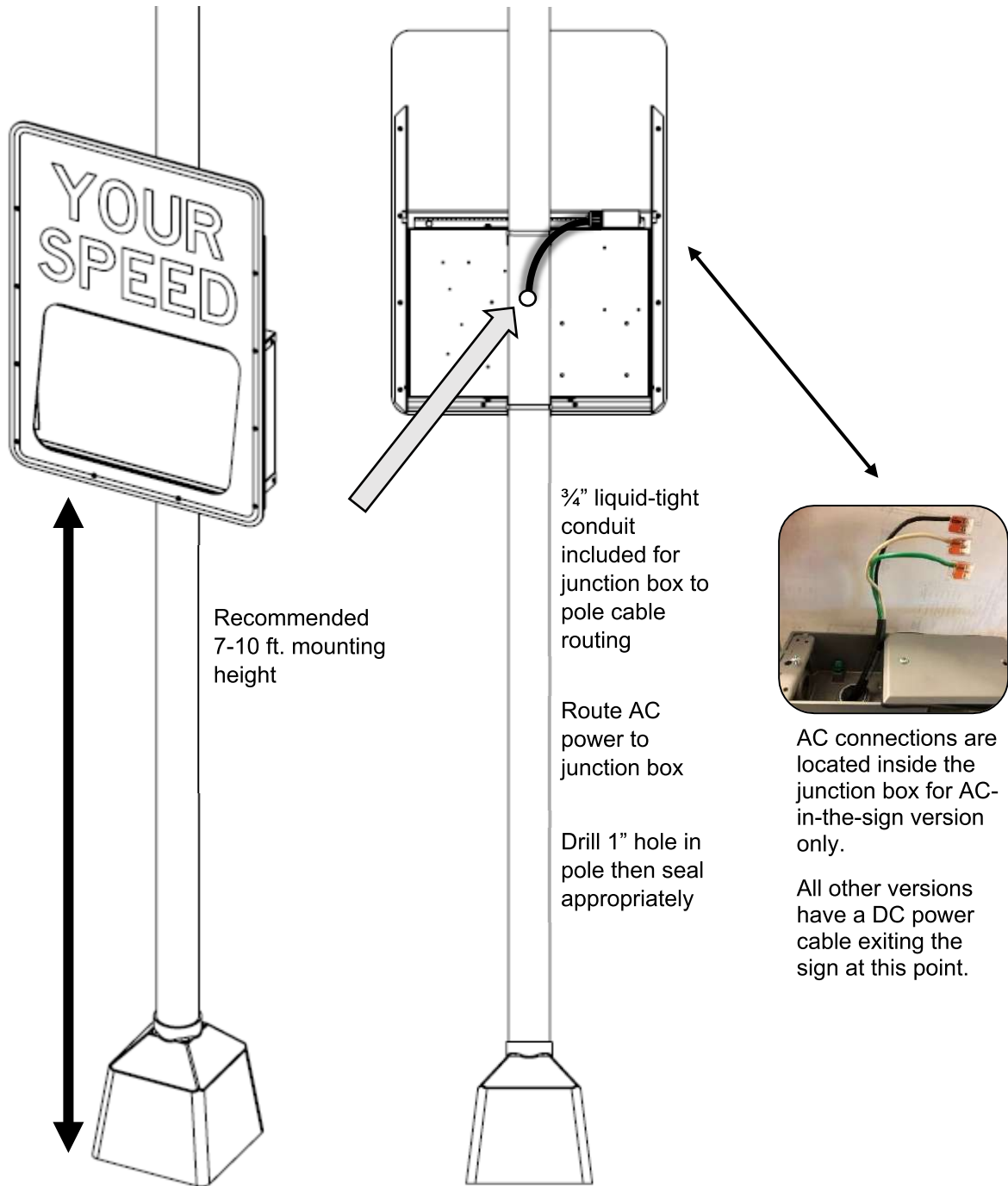
SPEEDCHECK-15 Junction Box:



SPEEDCHECK-18 Rear Panel:



2.3 Typical Configurations – SPEEDCHECK-15 with AC Power Routed to Sign

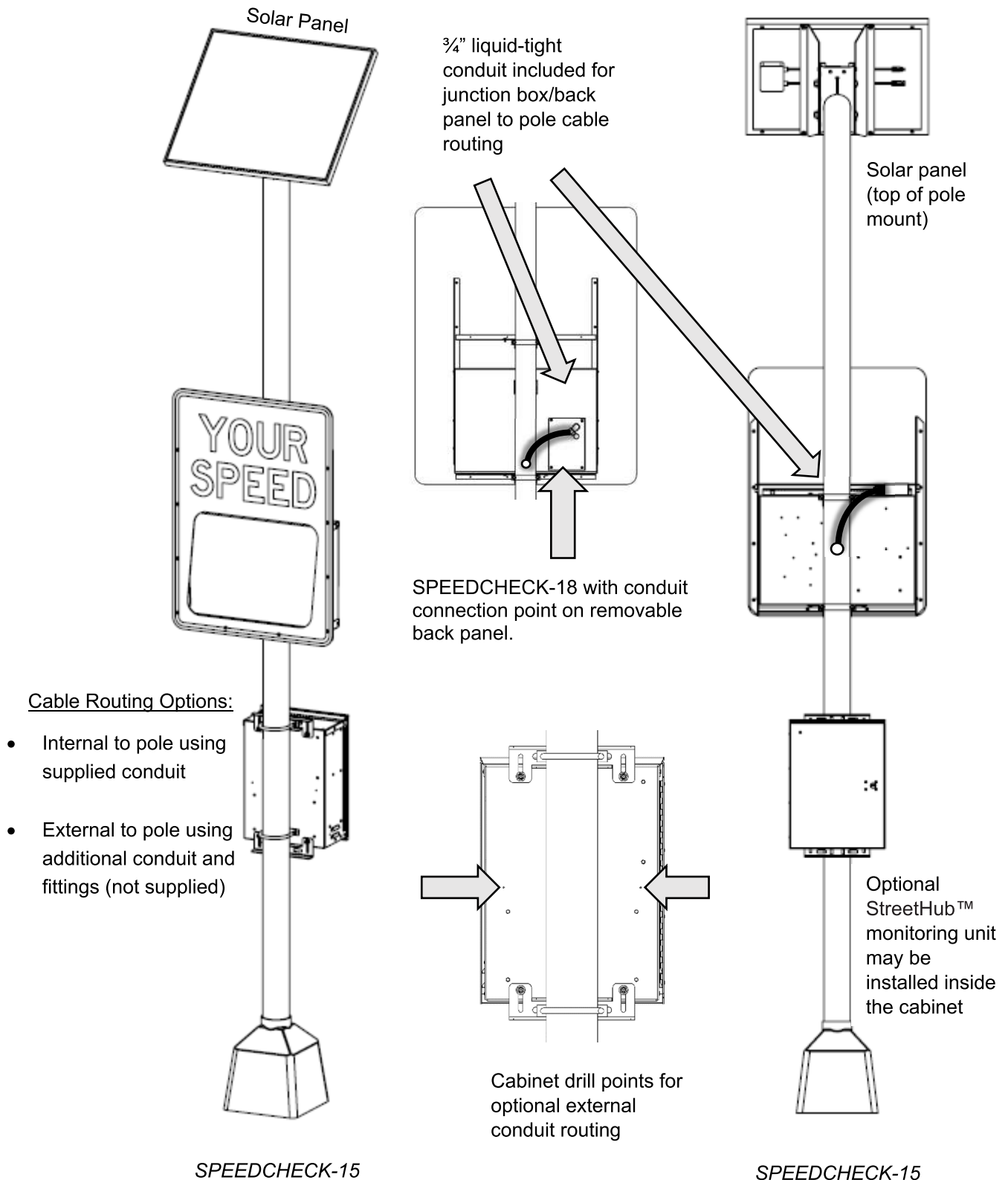


SPEEDCHECK-15

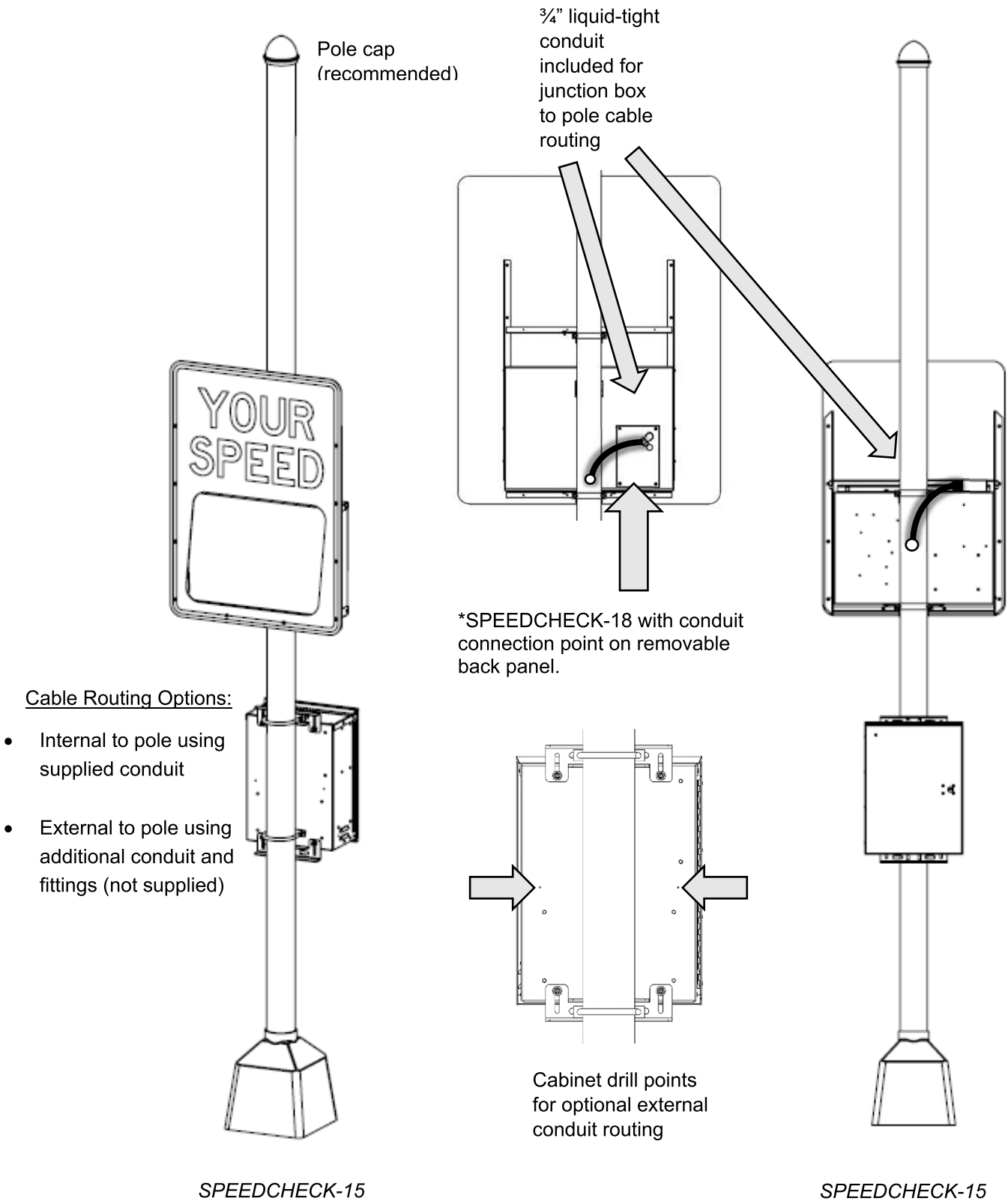
NOTE

Internal AC power supply option not available with SPEEDCHECK-18.

2.4 Typical Configurations – SPEEDCHECK-15/18 Solar Power from Cabinet



2.5 Typical Configurations – SPEEDCHECK-15/18 AC Power from Cabinet



2.6 Typical Configurations – SPEEDCHECK-15/18 Solar Kit

Power cable from SPEEDCHECK-15/18 to solar kit may be routed with or without external conduit. Conduit may be routed into the pole without the use of a fitting.



Solar Kit

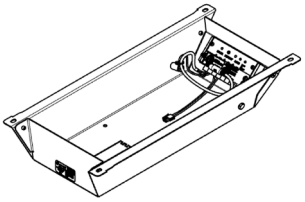
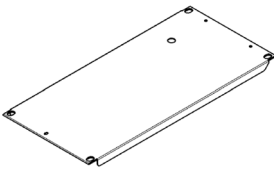
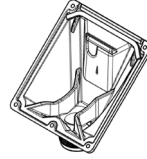
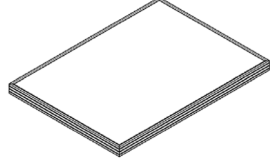
Side-of-Pole Mount Configuration

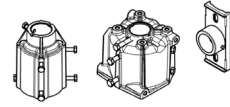
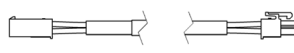



*Top-of-Pole and
Side-of-Pole Mounting
with internal cable routing*

*Top-of-Pole and
Side-of-Pole Mounting
with external cable routing*

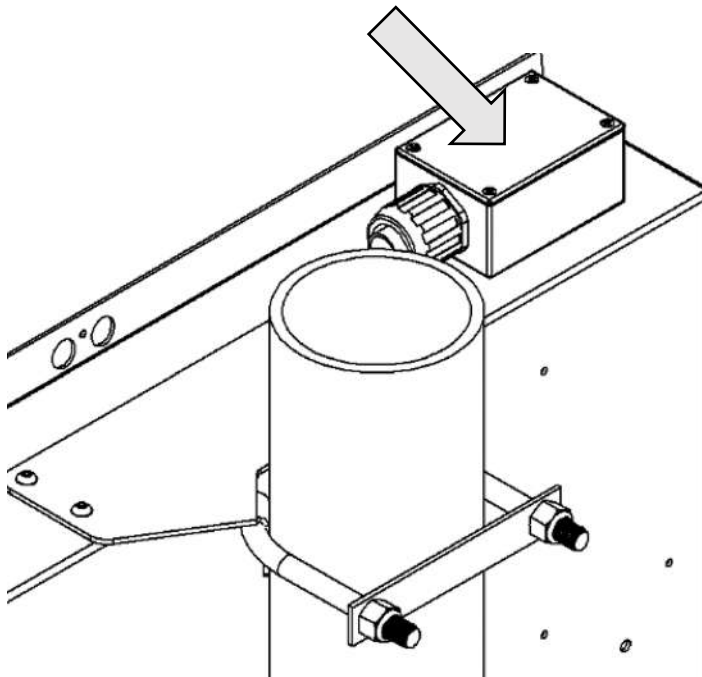
The solar kit contains the following items:

			
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 SPEEDCHECK-15/18 system.	Contains a printed guide and all the hardware required to assemble the product.

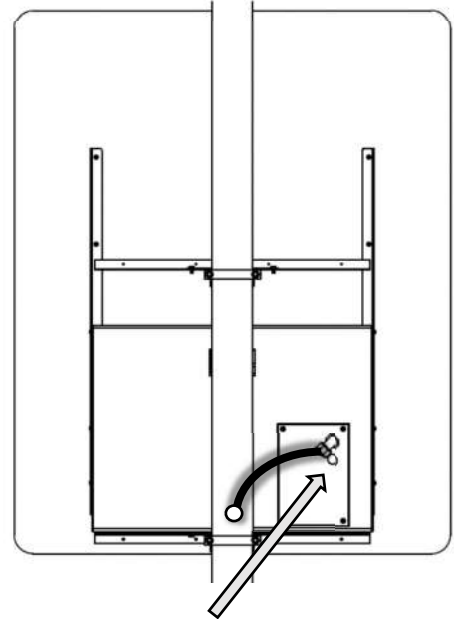
2.7 Typical Configurations – SPEEDCHECK-15/18 – External Beacons

Connection points for the SPEEDCHECK-15 output harness can be found in the junction box at the top of the enclosure. Outputs from the SpeedCheck controller are suitable for powering standard 12V, circular LED beacons, that contain internal LED drivers. See [Section 4.21](#) for more information on circular beacon installation.



SPEEDCHECK-15 Junction Box

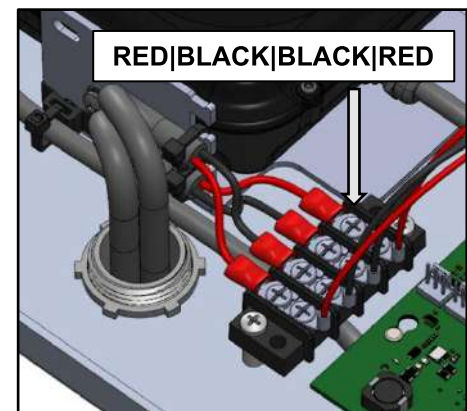
SPEEDCHECK-18 alternate point of connection for external beacons:



To access the SPEEDCHECK-18 controller, remove four screws. Beacon cables are pre-installed if ordered. Otherwise, install a 3/4" conduit fitting to route external 12" circular beacons using the color code shown below (red positive, black negative)



Circular Beacon Installation Example

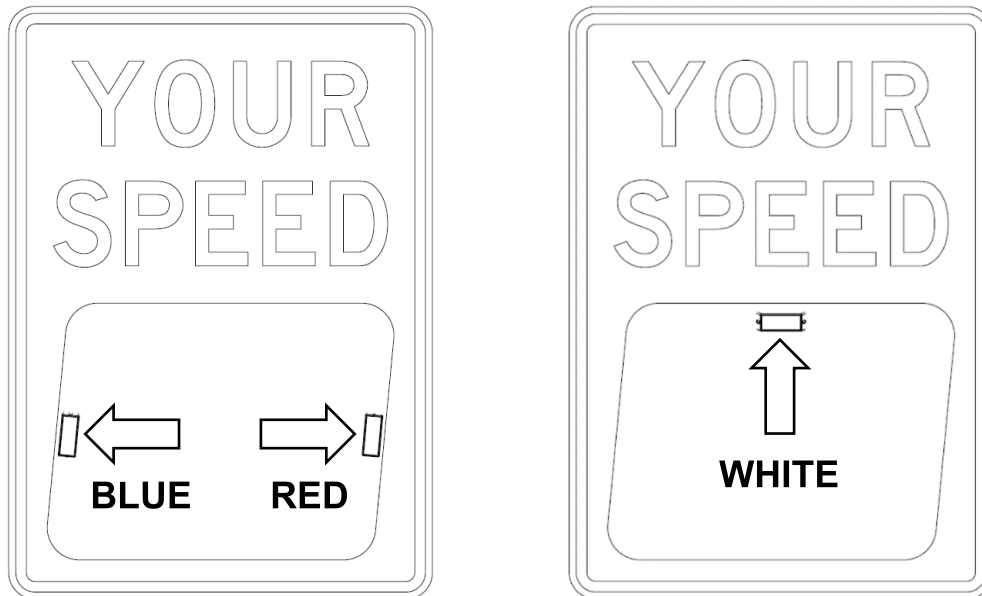


SPEEDCHECK-18 Beacon cables are factory installed to terminal block.

2.8 Typical Configurations – SPEEDCHECK-15 – Strobe Flashers

Optional strobe kits are supported for SPEEDCHECK-15 only. Strobes kits are an alternative to using external beacons (but cannot be combined). There are two strobe kits available:

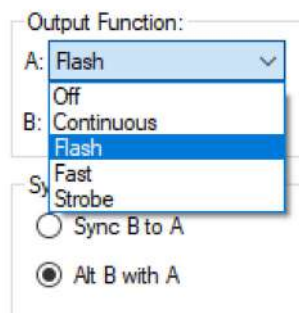
1. Dual strobe (Blue and Red)
2. Single strobe (White)



Strobe flashers contained in the strobe kits are Whelan TIR3 series and come with various flash patterns. The white-violet wire controlling flash pattern and gray wire controlling the synchronization option are capped with heat-shrink which can be removed in case strobe flash pattern needs to be modified in the field.

See the single page instruction sheet included with each strobe order for reference or consult the Whelan website for more strobe flasher information.

The standard flash pattern used for strobe kits is “**ComAlert™ 150.**” The SPEEDCHECK-15 Output Function is set to “**Flash**” and if the dual strobe option is ordered, the synchronization is set to “**Alt B with A.**”



3.0 Components and Preparation

3.1 Components Supplied

The components below are required to install your SpeedCheck radar speed sign.

Display system (sign assembly):

- SpeedCheck display sign (15-inch or 18-inch displays)
- Regulatory sign face and mounting brackets (specified during ordering)
- Flexible conduit: 3/4-inch liquid-tight (included with display sign, for routing from sign to pole)
- Conduit connector (included with display sign)
- Mounting bracket kit (specify during ordering)
- Installation kit (USB dongle for use with SpeedCheck Manager software, alignment kit and foam cone)
- Optional beacons and output harness
- Optional input harness
- Optional strobes (SPEEDCHECK-15 only)
- Optional serial to Ethernet converter for remote connectivity

Solar-powered cabinet-based systems include these components:

- Solar panel
- Solar panel mount (top or side of pole)
- Solar panel harness (available lengths are 8, 16, 36, and 75 ft.)
- Pole-mounted solar cabinet with charge controller, fuses, and wiring
- 12V non-spillable lead acid battery

Solar kit-based systems include these components:

- Solar panel (30 W or 50 W)
- Solar panel mount (top or side of pole)
- Housing with charge controller
- Up to two 18 Ah, 12V non-spillable lead acid battery

AC-powered systems include these components:

- Pole-mounted AC cabinet (for configurations other than SPEEDCHECK-15 with internal AC power supply)

3.2 Other Components Required

NOTE

Review the following items carefully to ensure you have all components required to complete your installation. If necessary, contact Carmanah for assistance.

The components below are readily available from electrical or traffic control equipment suppliers.

- Sign attachment banding and installation tool or heavy-duty tamper-proof band clamps
- Appropriate hose clamps for temporary positioning during the sign alignment process before permanently banding the display sign to the pole.

3.3 Tools Required

The following tools may be required to mount your SpeedCheck radar speed sign, depending on the model and configuration:

<ul style="list-style-type: none"> a. Imperial socket set b. Crescent wrench c. Tap set d. Imperial Allen-Wrench set e. Fish tape f. Level g. Compass or pre-determined equatorial direction h. Banding installation tool 	<ul style="list-style-type: none"> i. Drill and drill bits j. Fine tip felt marker k. Multi-bit screwdriver l. Pelco Roger-Wrench (signal head beacons) m. Hook spanner wrench, 1-1/2" trade size (some configurations) n. Ladder or lift device o. Lithium grease
---	---

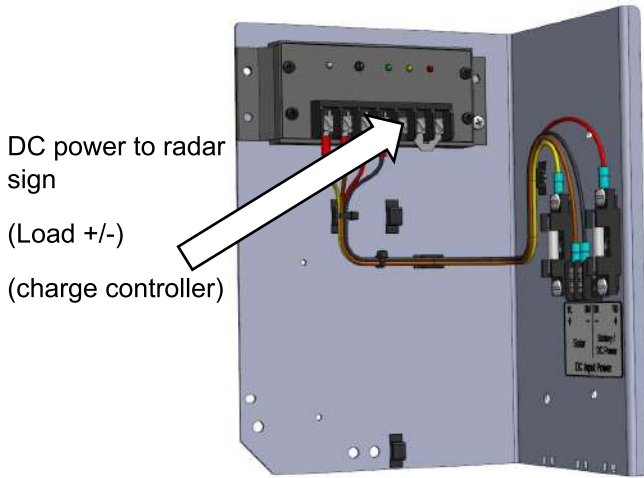
3.4 Banding Recommendations

NOTE

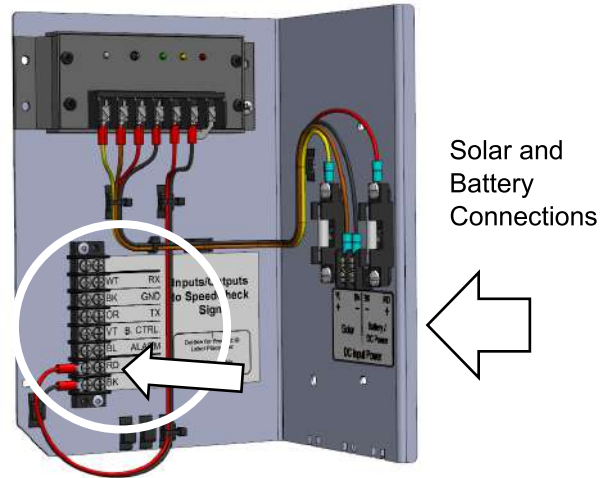
Banding provides the most secure and vandal-resistant mounting. If banding is not available, U-bolts can be used for most applications.

90 MPH Wind Loading	
3/4" x 0.030" band	Single wrap provides adequate strength for 90 MPH wind loading.
5/8" x 0.030" band	Single wrap provides adequate strength for 90 MPH wind loading.
1/2" x 0.030" band	Single wrap provides adequate strength for 90 MPH wind loading. However, double wrap is preferred on upper mounting bracket to prevent rotational slippage.

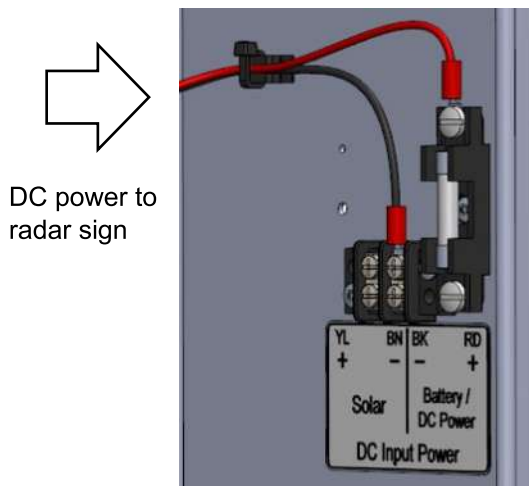
3.5 Overview of Cabinet Connection Terminals



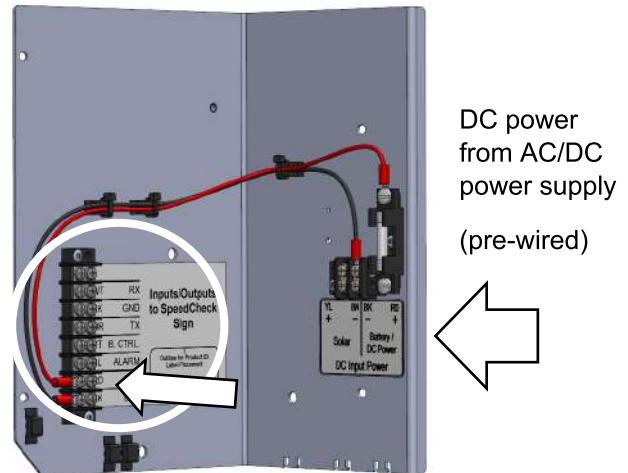
Solar Cabinets



Solar Cabinets with StreetHub™



AC Cabinets



AC Cabinets with StreetHub™



For solar systems without the StreetHub™ monitoring option, ensure the power cable going to the radar sign is terminated on the Load +/- terminals of the SunSaver charge controller. This will utilize low voltage disconnect (LVD) protection which will prevent the battery from complete discharge in the event of insufficient or loss of charging.



The circled sections contain the StreetHub™ monitoring device connections, including the DC power out to the radar sign (DC +/- terminals).

3.6 Controller

There are three different hardware variations of the SpeedCheck controller. See [Sections 3.7 – 3.9](#) to find the one that matches your system configuration.

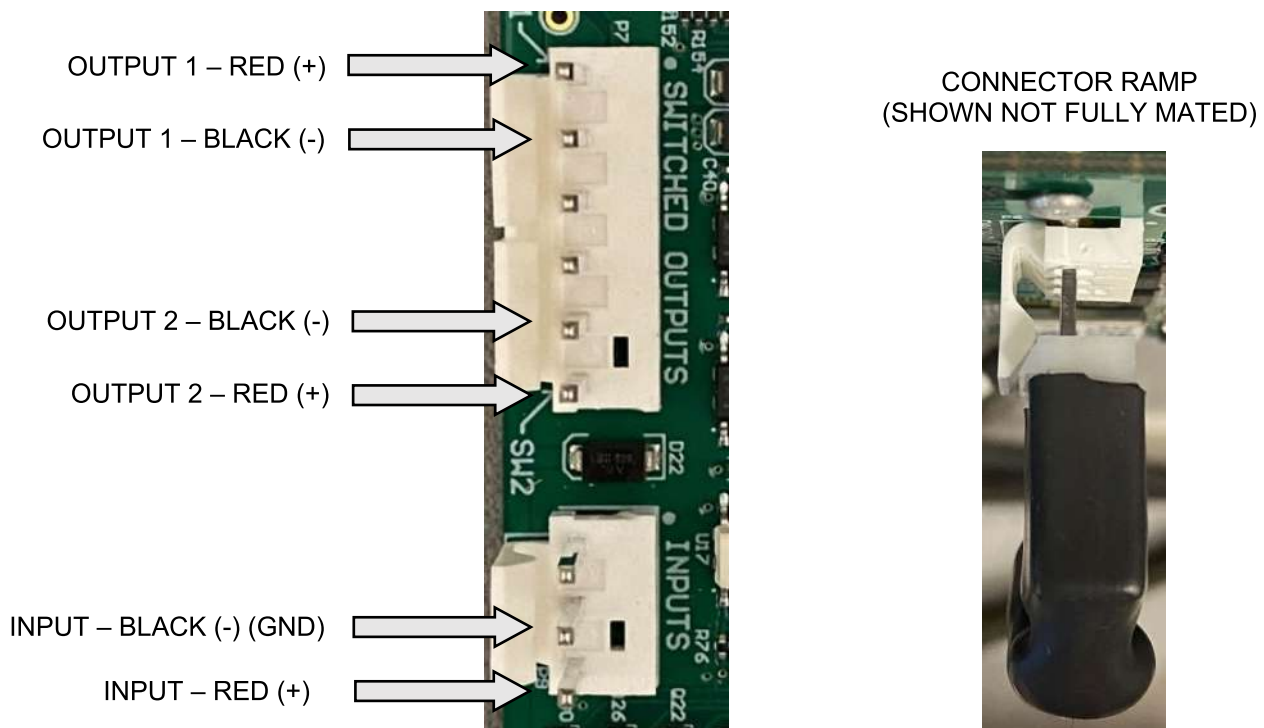
General Notes

Before accessing the controller, ensure that power has been disconnected.

1. Turn off the external source powering the display sign.
2. Open the fuse block(s) in the display sign.
3. Wire harness connectors have ramp and clip features to hold the connector in place. If inserting connectors, ensure the connector ramp engages with the corresponding mating features.

For more information on the external input options, see the SpeedCheck Manager Configuration Guide. When the input is open, Mode 1 is utilized. When the input is closed, Mode 2 is utilized. Input cables are routed through the SPEEDCHECK-15 junction box or SPEEDCHECK-18 back panel.

Do not apply voltage to the input connections; the input is activated by shorting the input pins.



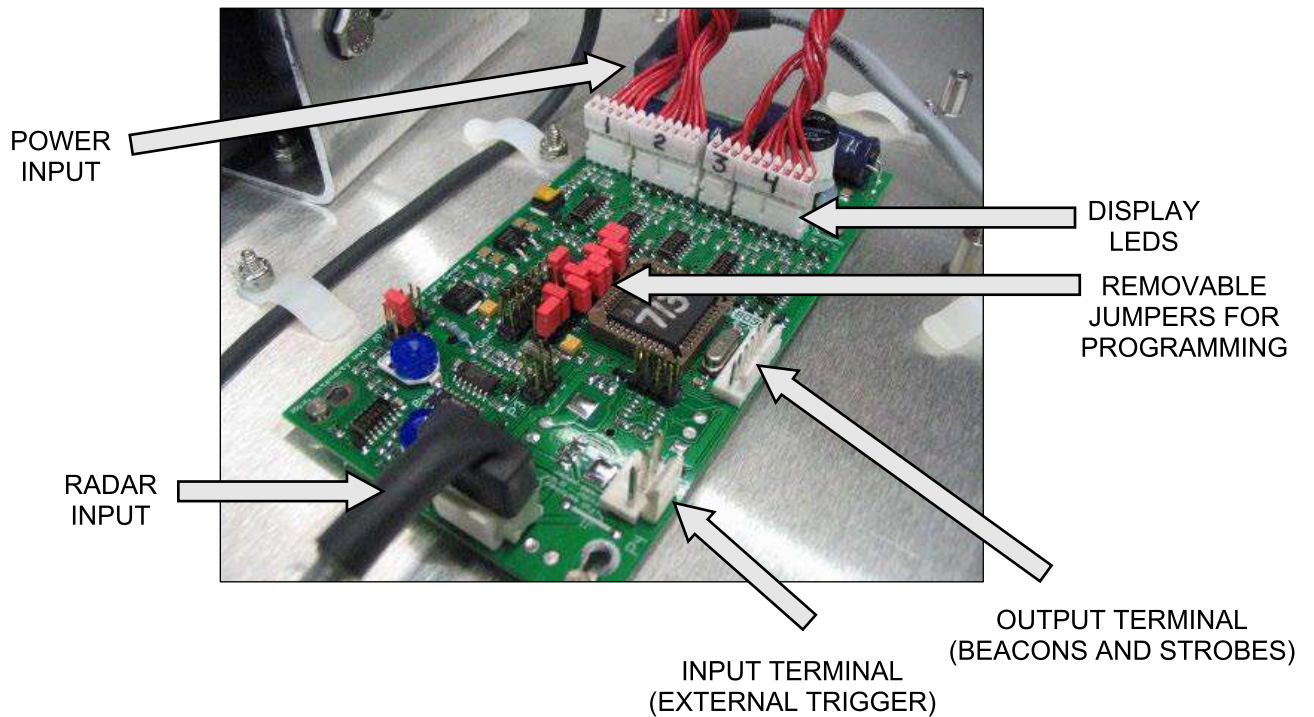
THE CONTROLLER CAN BE DAMAGED IF VOLTAGE IS APPLIED TO THE EXTERNAL TRIGGER INPUTS (AS SHOWN ABOVE).



ENSURE THE NOTES ABOVE ARE CAREFULLY REVIEWED BEFORE MAKING ANY CONNECTIONS. CONTACT CARMANAH CUSTOMER SUPPORT IF THERE IS ANY UNCERTAINTY BEFORE MAKING ANY CONNECTIONS, MODIFICATIONS OR ALTERATIONS.

3.7 Controller – Classic (Legacy)

The controller below is no longer available from Carmanah and is replaced by the updated programmable board. The various settings and parameters are controlled by several DIP switches. Contact Carmanah for information on adjusting the settings.

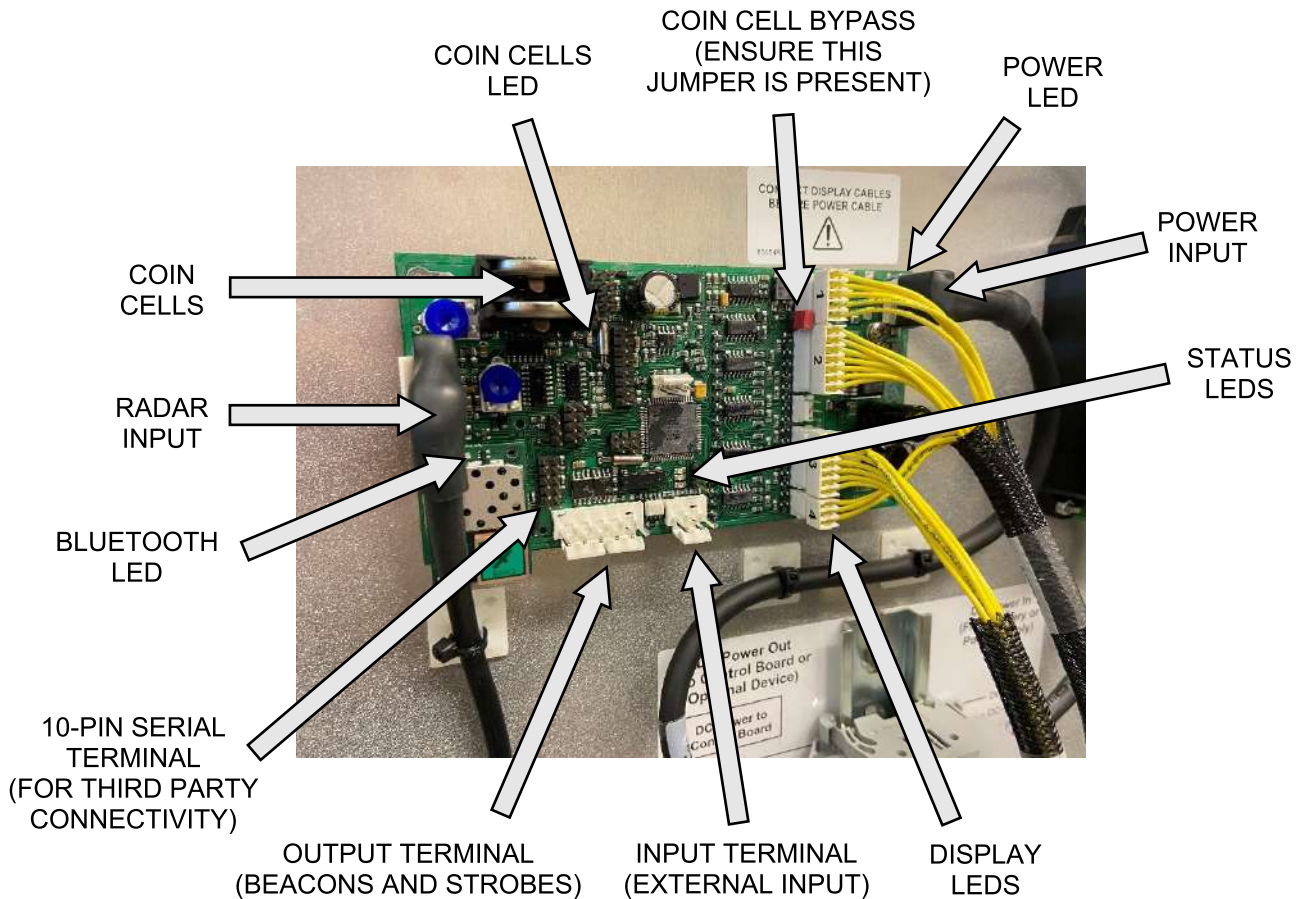


NOTE

This controller does not have a Bluetooth radio and therefore cannot be used with SpeedCheck Manager configuration software.

3.8 Controller – Programmable (Legacy)

The controller below is being phased out and replaced by the updated programmable board ([Section 3.9](#)).



Status LEDs:

- Power LED = input power; this will illuminate when power is applied
- Coin Cells LED = coin cells active; this will illuminate when input power has been removed and coin cells are actively keeping date/time
- Bluetooth LED = Bluetooth connection; this will illuminate when a Bluetooth connection is active
- Top Status LED = radar active; this will illuminate when the radar is powered and operational
- Middle Status LED = vehicle detect; this will intermittently illuminate when a vehicle has been detected
- Bottom Status LED = display active; this will illuminate when the display is powered and operational

NOTE

Momentarily shorting the two bottom pins on the 10-pin serial connector will perform a reset.

NOTE

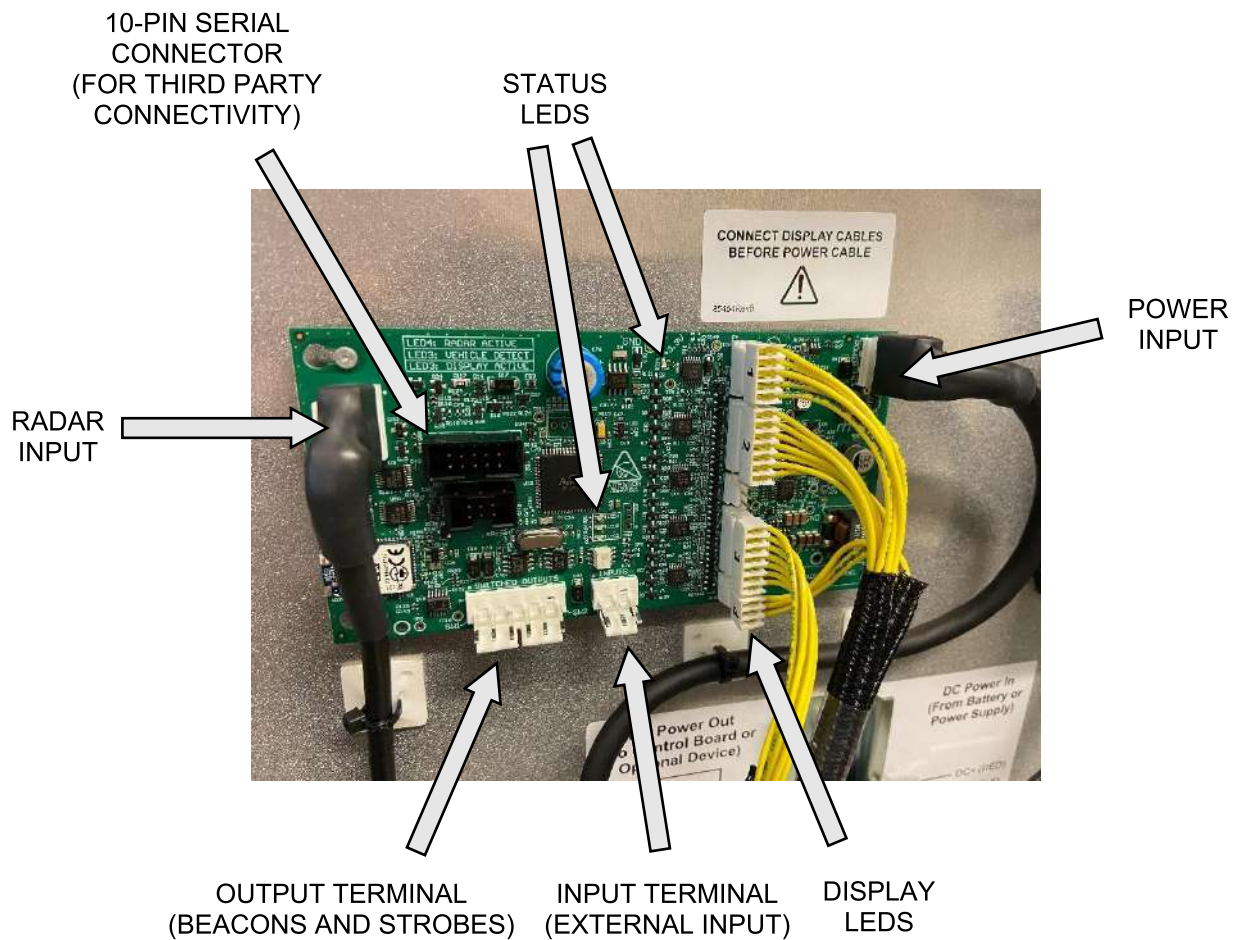
The coin cell bypass jumper must be present for the system to power up if the coin cells are dead or removed.

NOTE

Coin cells are installed with the positive side facing up or towards the outer edge of the controller PCBA.

3.9 Controller – Updated Programmable

The SpeedCheck controller is factory programmed to a default set of values based on your system configuration and may require changes based on your installation requirements. Carmanah can assign custom programming (speed settings) as requested, otherwise the programming can easily be adjusted using SpeedCheck Manager software.



Status LEDs:

- LED1 = input power; this will illuminate when power is applied
- LED2 = display active; this will illuminate when the display is powered and operational
- LED3 = vehicle detect; this will intermittently illuminate when a vehicle has been detected
- LED4 = radar active; this will illuminate when the radar is powered and operational

NOTE

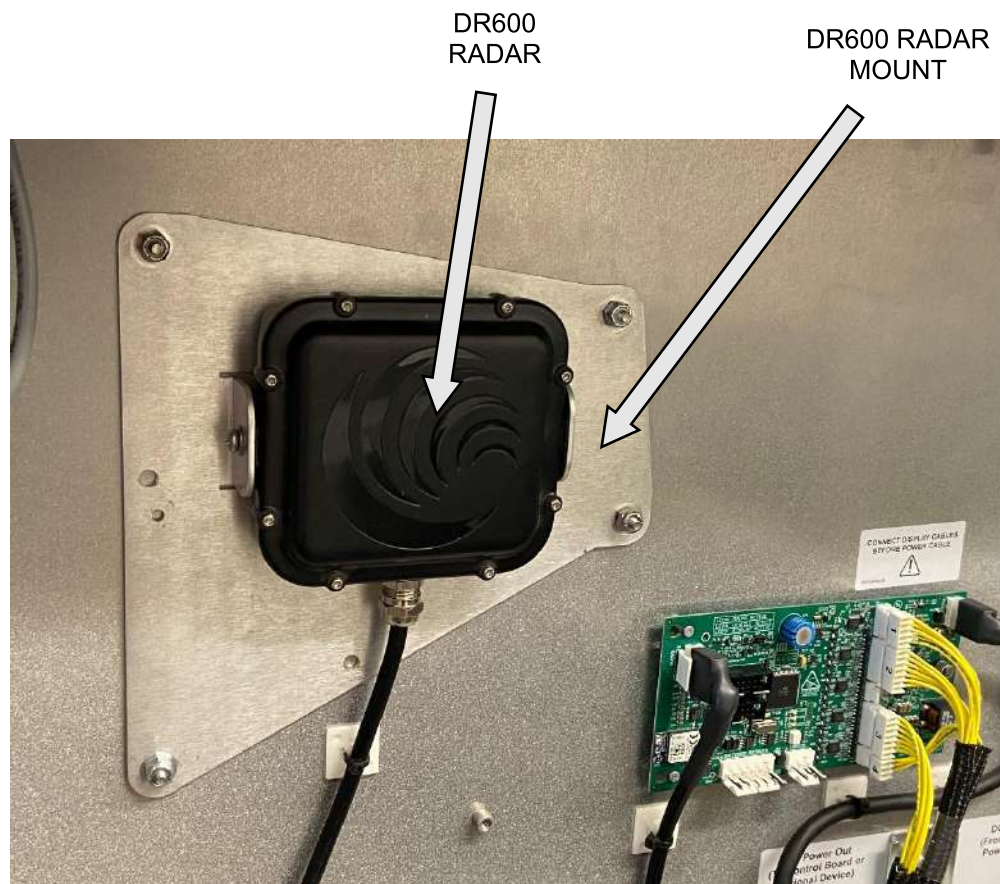
This controller requires SpeedCheck Manager version 3.0.1.16 or newer of to communicate. Download the latest version at support.carmanah.com.

NOTE

The replaceable coin cell batteries have been removed in this controller version in favor of a capacitor bank. You will have >24hrs of date/time retention with power disconnected to the controller.

3.10 Radar

The DR600 radar comes factory programmed for maximum range and cannot be adjusted. If you need to change the unit of speed (MPH/KPH) this can be done via SpeedCheck Manager. This will program the radar and is not an on-the-fly conversion by the controller, so the setting will remain programmed within the radar

**NOTE**

The DR600 radar is capable of being externally mounted. Contact Carmanah for more information or visit support.carmanah.com

NOTE

There is a green status LED that is located on the back of the radar that will continuously flash during normal operation. The radar will generate an audible beep during system the boot sequence or during a system reset.

4.0 Installation

NOTE

Use hose or gear clamps for the initial setup and alignment of the display sign to determine proper radar detection of oncoming vehicles. Adjust as necessary before permanently attaching the display sign to the pole with banding or U-bolts. [See Section 5](#) for proper sign alignment with respect to the roadway prior to permanently applying banding (for round pole applications).

4.1 Pole Preparation

NOTE

For solar applications, ensure the installation location has an unobstructed view of the sun's path. Obstructions such as trees or buildings could significantly reduce the amount of sunlight on the solar panel. Shade analysis is highly recommended to understand how shadows will change according to the time of year. Contact Carmanah for a detailed examination and solar simulation for your site.

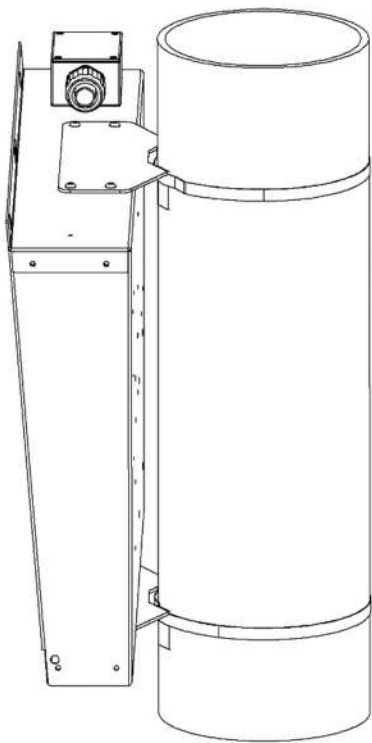


Ensure proper safety practices are observed and systems are de-energized before beginning work.

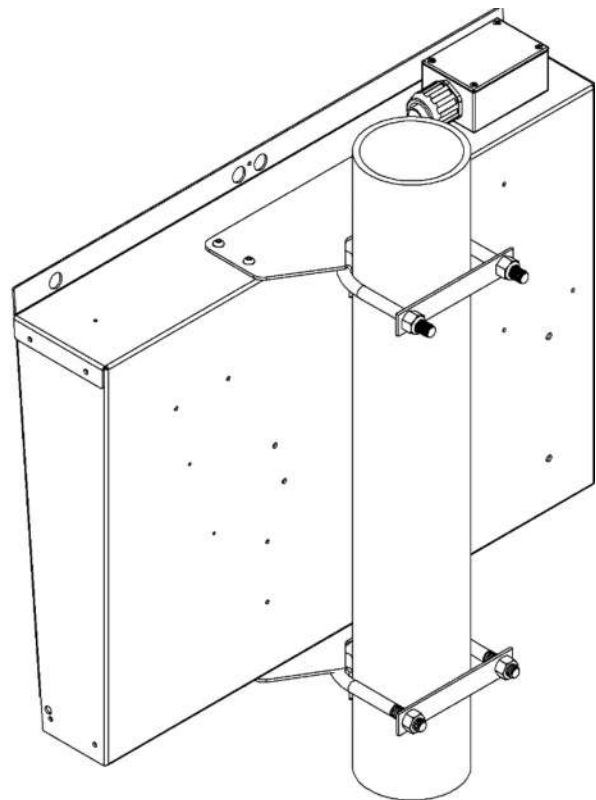
1. Mark desired positions of cabinet and pole-mounted elements on pole.
2. Drill cable exit/entry points for pole-mounted elements as needed.
3. Fish AC input cable to cabinet or sign (depending on version).
4. Fish DC harness between power supply cabinet and SpeedCheck sign (if required).
5. Fish solar harness between top of pole to cabinet nipple hole (if required).
6. Fish flashing beacon harnesses between SpeedCheck conduit fittings and flashing beacon holes (if required).

4.2 Round Pole Installation

1. Attach sign mounting brackets to top and bottom of the SpeedCheck enclosure using eight ¼"-20 X 0.5" hex head screws. Ensure both brackets have bent tabs facing downwards.
2. Loosely secure sign to pole using hose clamps while making fine adjustments for alignment and commissioning (see [Section 5](#)).
3. Once alignment has been finalized, secure brackets to pole in a more permanent manner using stainless steel banding (not provided) or U-bolts (an orderable option).



6+ Inch Round Pole Mount with Banding



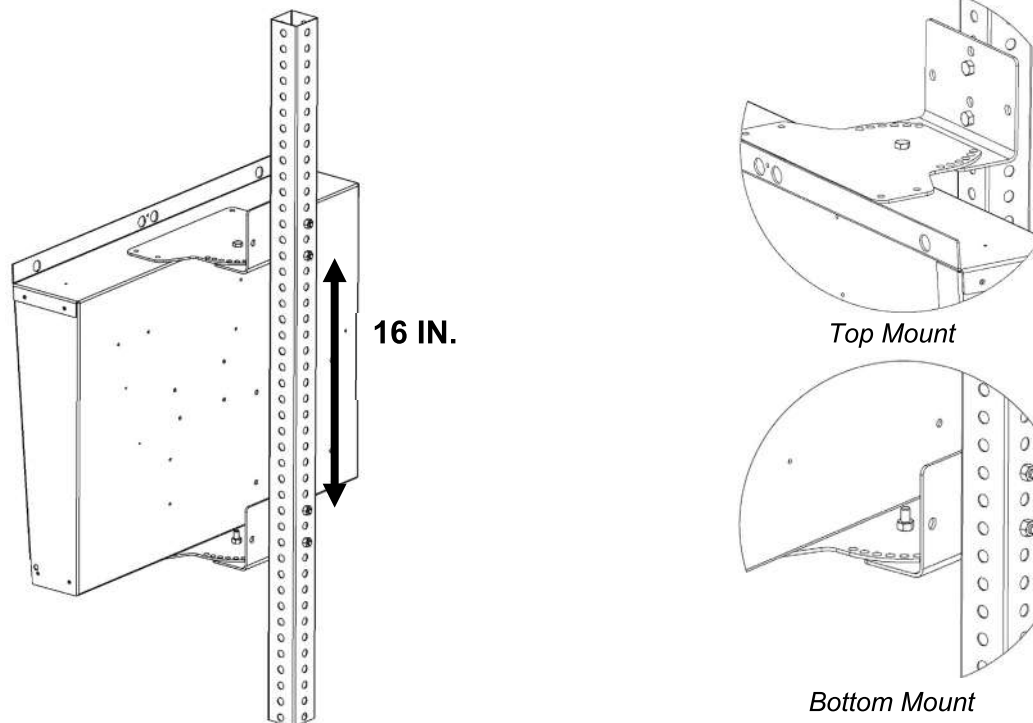
4-6 Inch Round Pole Mount with U-Bolts

4.3 Flat Surface Mount Installation

1. Attach the two “L” shaped brackets to a suitable pole such as 2” Telespar with 1” standard spacing between holes. Ensure there is 16” between the two inner-most bolt locations. The upper “L” bracket uses the 2nd and 4th holes from the top of the bracket, and the lower “L” bracket uses the 1st and 3rd holes from the top of the bracket.
2. Attach the flat rotational plates to the top and bottom of the SpeedCheck sign using the provided eight ¼”-20 X 0.5” hex head (5/32” drive) screws.
3. Attach the rotational plates to the “L” brackets by aligning the centrally located pivot bolt holes. Rest the upper plate on top of the upper “L” bracket, and the lower plate on top of the lower “L” bracket then loosely secure them finger tight using the provided 5/16”-18 X 1” nuts and bolts in the pivot bolt holes.
4. Align the display sign to aim at the oncoming vehicles by installing two sets of nuts and bolts to both upper and lower plates.
5. Tighten all fasteners in an alternating manner until they are all completely tight.

NOTE

Through bolts for square pole mounting are not provided. Recommended bolt size is 3/8”-16.


NOTE

Ensure that three nuts and bolts are used between each flat bracket and pole bracket.

NOTE

Legacy versions of the “L” brackets have two holes oriented vertically instead of four. Two-hole versions are used with SPEEDCHECK-15 display enclosures that have an angled top.

4.4 Quick Change Pole Mount

1. Remove sign face from main enclosure to allow for easier access.
2. Fasten the top bracket to the sign enclosure (Note: Legacy version with angled top shown pictured below. New version has a flat top.)
3. Fasten bottom bracket to the sign enclosure.
4. Loosely secure the top bracket hanger to the pole using hose clamp.
5. Hang sign enclosure without sign face on top of the top bracket hanger.
6. Loosely secure the bottom bracket hanger to the pole using hose clamp.
7. Make fine adjustments for alignment and commissioning (see [Section 5](#)).
8. Once the alignment has been finalized, secure the brackets to the pole in a more permanent manner using stainless steel banding (not provided) or U-bolts (an orderable option).
9. Complete installation wiring.
10. Attach sign face.
11. Secure cabinet in place with padlock.



*Upper Housing Mounting Bracket
(note legacy version angled top version shown)*



Top Bracket Hanger



Installed Top Bracket



Lower Housing Mounting Bracket



Installed Bottom Bracket

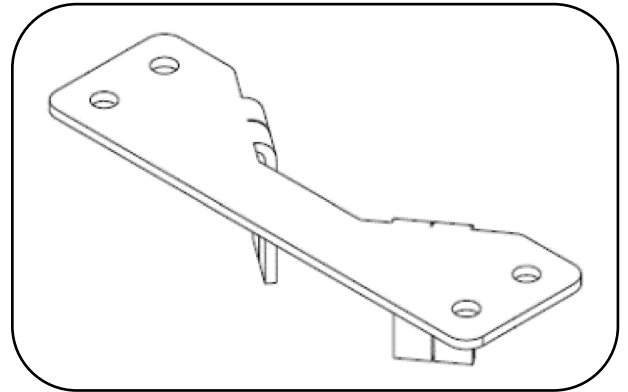
4.5 Tilt Mount

Tilt brackets are used for locations that require the display to be tilted up or down depending on local conditions. See [Section 5](#) for more information on alignment recommendations.

Install tilt mounts following the same process used for round mounts ([Section 4.2](#)).



*SPEEDCHECK-15 Upper Tilt Brackets
(legacy angled top version shown)*



SPEEDCHECK-15 Lower Tilt Bracket



SPEEDCHECK-18 Upper Tilt Brackets



SPEEDCHECK-18 Lower Tilt Bracket

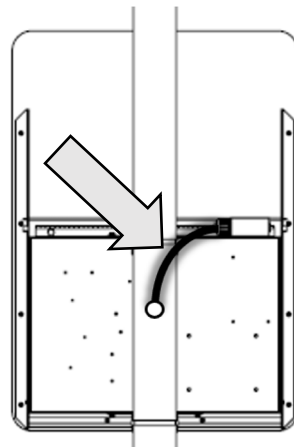
4.6 Conduit Routing

Included with each system is a short run of conduit that is intended to be installed as follows:

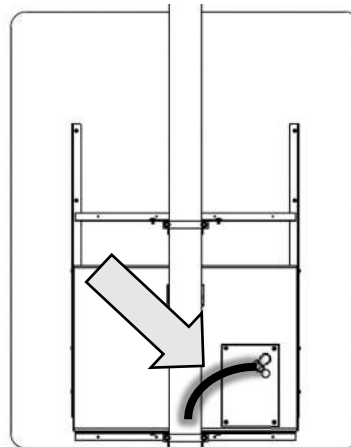
- SPEEDCHECK-15 junction box to the pole
- SPEEDCHECK-18 rear panel to the pole

NOTE

The conduit can be fed directly into the pole without a fitting. Optional conduit kits at various lengths, including fittings, can be purchased from Carmanah. These kits or user-supplied conduit are required to feed directly into the cabinet instead of the pole.

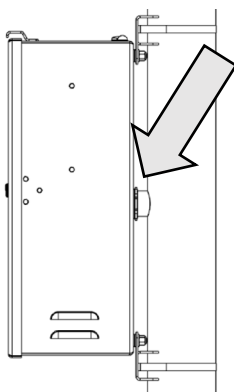


SPEEDCHECK-15

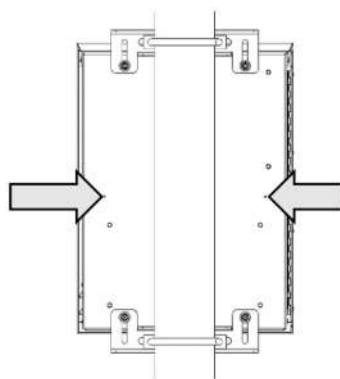


SPEEDCHECK-18

The SpeedCheck cabinet contains two externally marked drill points to choose from for terminating external conduit. In situations where external conduit routing is utilized the cabinet nipple may or may not be required. Removing the cabinet pipe nipple will allow the cabinet to sit closer to the pole or mounting surface. Contact Carmanah to obtain the optional hole plug kit that is required to seal the cabinet hole when the nipple is removed.



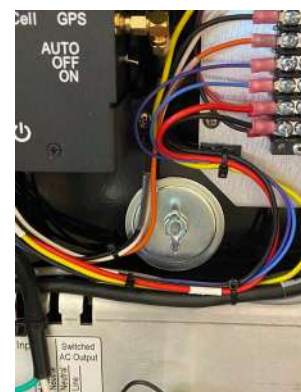
Pipe Nipple into Pole



Conduit Drill Points



Hole Plug



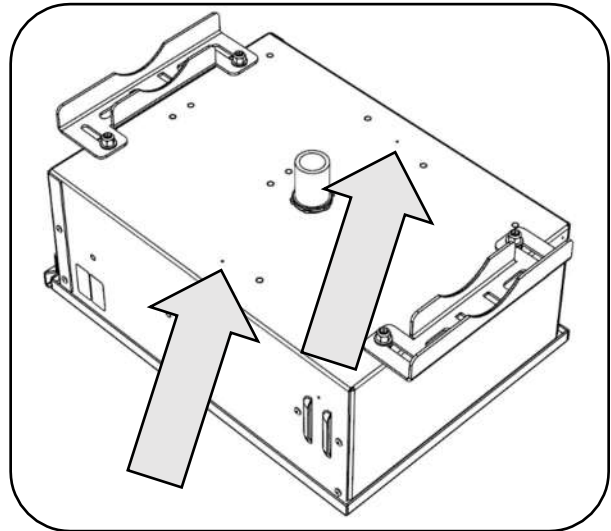
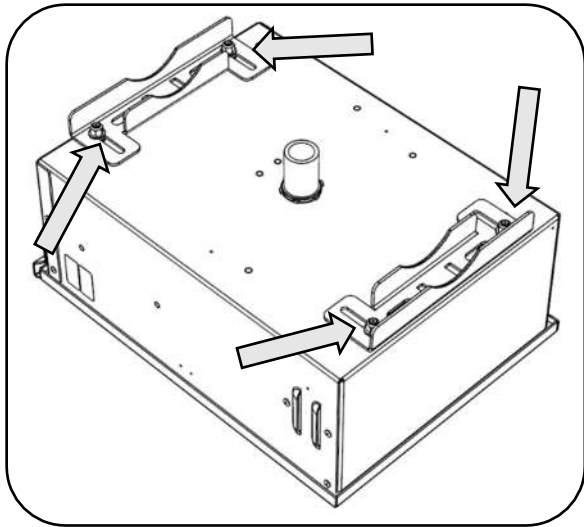
Hole Plug Installed

4.7 Cabinet Installation

NOTE

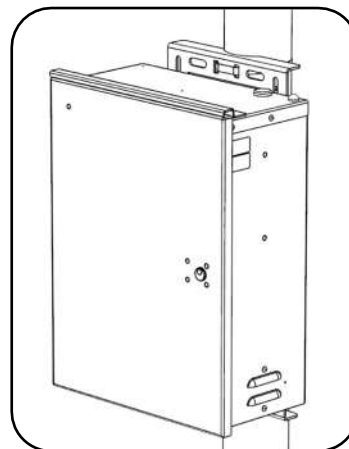
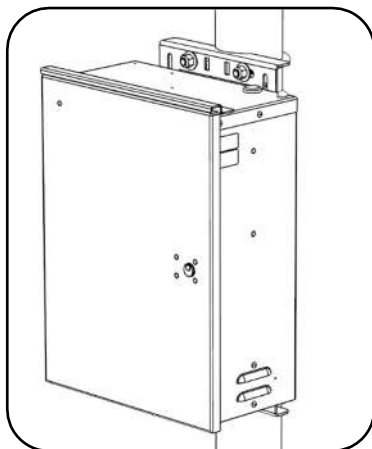
Before mounting the cabinet to the pole, all wiring internal to the pole (power, LED, optional StreetHub™ serial and ground cables) should be fished.

1. Loosen four nuts on back of cabinet and spread brackets outward. Tighten nuts to 20 ft-lb.


NOTE

On the back of the cabinet, there are 2 drill points that may be used for routing of liquid-tight conduit external to the mounting pole. Prior to drilling the cabinet, ensure there are no components which may be damaged on the inside of the cabinet.

2. Drill a 1-3/4" diameter hole in pole for cabinet pipe nipple at desired position. An optional hole plug kit is available if the pipe nipple is removed from the cabinet.
3. Route cables from pole into cabinet and temporarily affix cabinet against the pole. For U-bolt mounting, install U-bolts, washers and nuts then torque to 30 ft-lb. For banding, install banding through openings in brackets.



4. If desired, before tightening banding, brackets and banding can be adjusted inboard again. Tighten banding (up to 3/4" wide) as per banding manufacturer's instructions.

4.8 Solar Panel vs Solar Kit

There are two options for solar-equipped systems:

- Cabinet-based – external solar panel, up to 170 W
- No cabinet – integrated solar kit, up to 50 W

Sections 4.9 – 4.13 are for cabinet-based systems. Proceed to [Section 4.14](#) for solar kit-based installations.

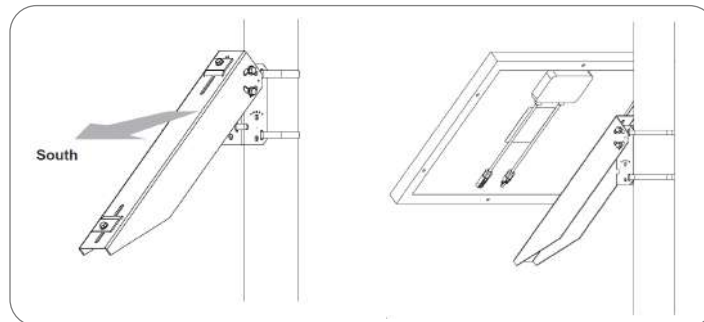
4.9 Solar Panel Mount Options

There are two options for mounting the solar panel:

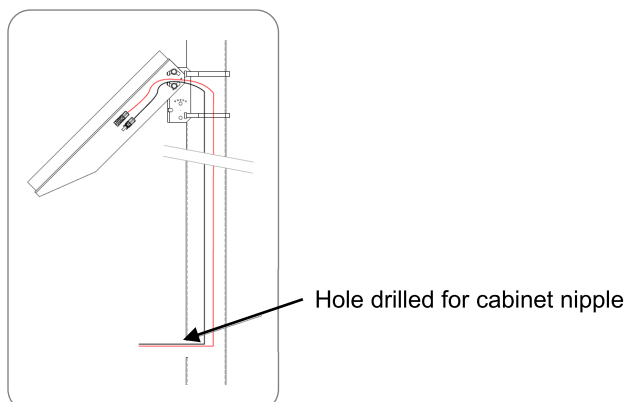
- Side of Pole – Adjustable tilt angle. Set it for 45° unless Carmanah has conducted solar simulations that resulted in a recommendation for a different panel tilt angle.
- Top of Pole – Fixed at a 45° angle with supplied bird deterrent
 - Cast Mount – 2.0" to 2.5" square post and 2.0" to 2.88" round pole (solar kits only)
 - Cast Mount – 3.5" to 4.5" round pole (cabinet systems and solar kits)

4.10 Solar Panel Mounting – Side of Pole (for cabinet systems)

1. Mark position of solar panel mount on pole and drill a suitable hole for the solar panel wires. Follow instructions supplied with mount. Install using 45° tilt angle. Ensure solar panel is facing South (for Northern Hemisphere locations).



2. Route supplied solar panel wires down pole and through hole for cabinet conduit nipple.

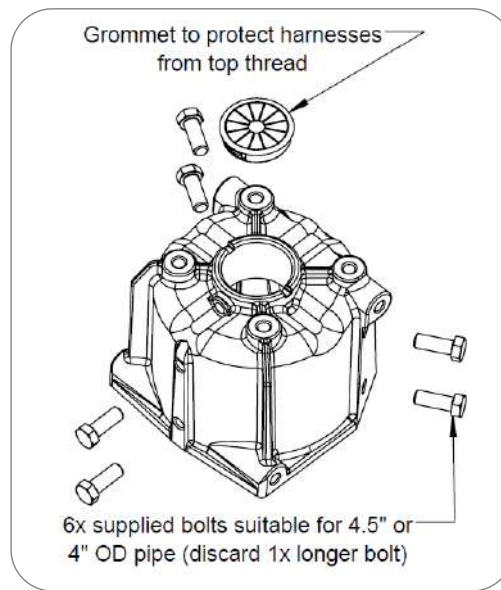


4.11 Solar Panel Mounting – Top of Pole (for cabinet systems)

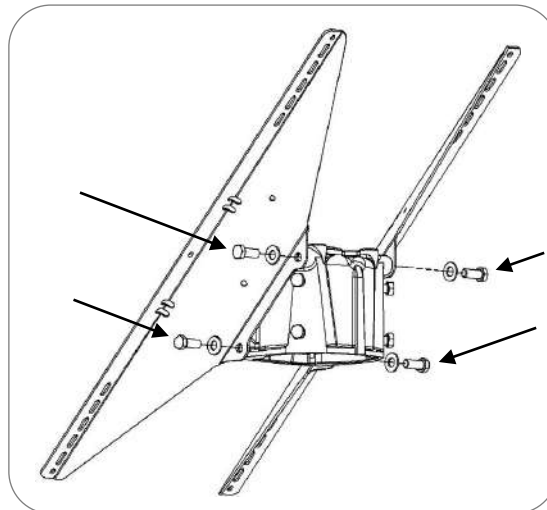
NOTE

Contact Carmanah for additional support for legacy galvanized steel mounts not covered in this manual.

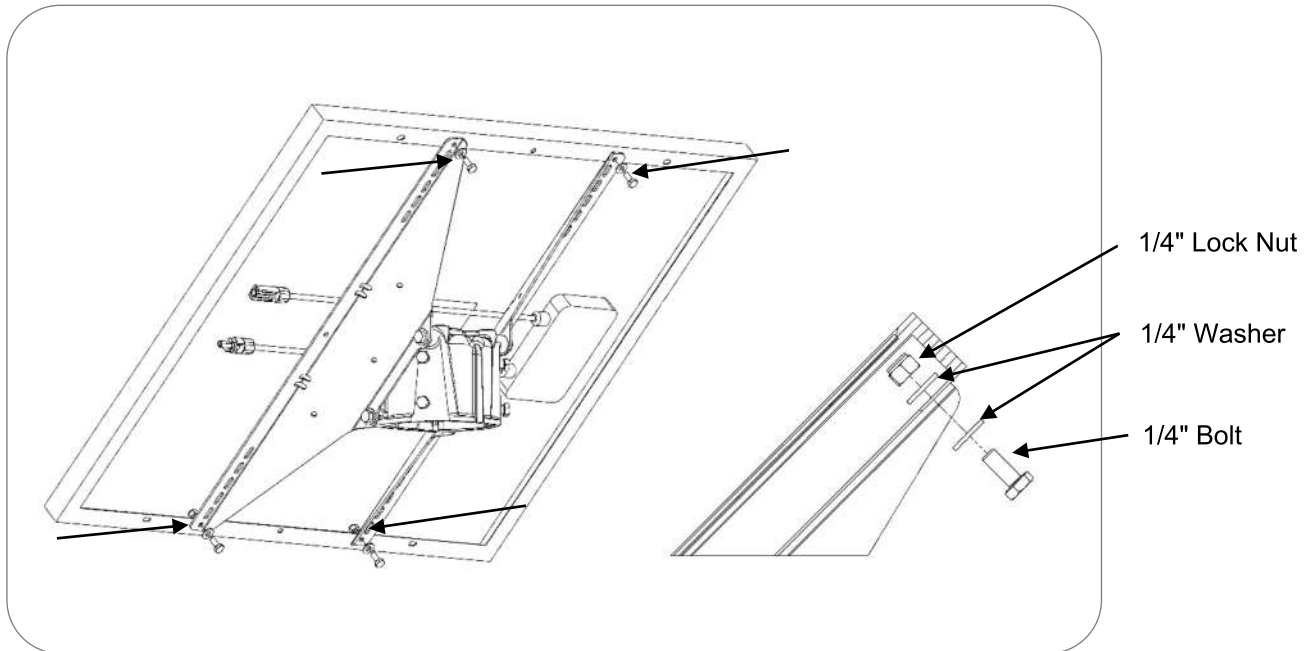
1. Install grommet and thread 6x 3/8" bolts into casting. Only thread in a couple turns so bolts do not protrude inside.



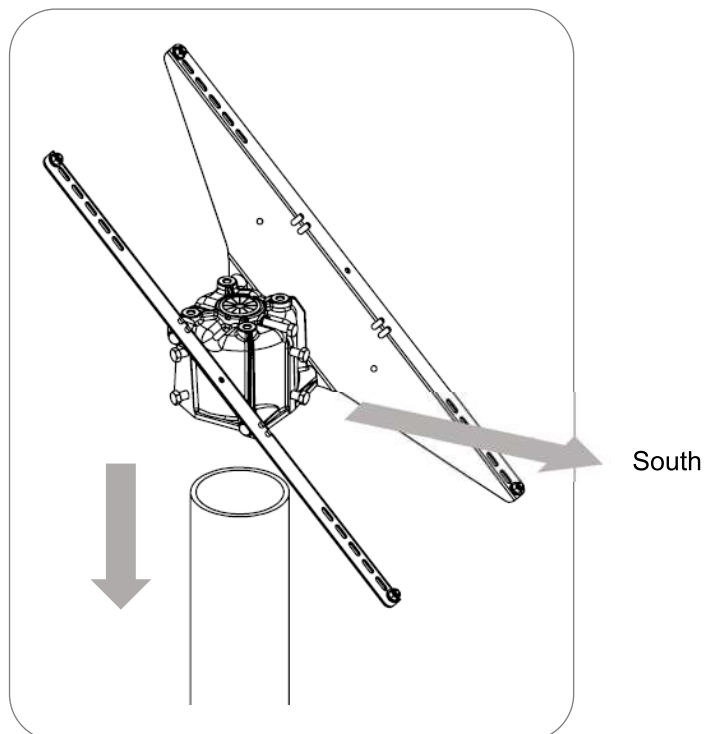
2. Attach both sheet metal brackets to solar panel using supplied 1/4" bolts, washers, and locknuts. Install casting between brackets with supplied 3/8" bolts and washers. Tighten 3/8" bolts first.



3. Attach solar panel to top of pole mount using supplied 1/4" bolts, washers, and locknuts.



4. Slide casting over top of pole and orient so panel faces South (in Northern Hemisphere). Tighten the 6x 3/8" bolts to secure casting to pole and route solar panel wires down pole (image shows solar panel removed for illustration purposes).



4.12 Solar Power System Wiring – Cabinet Based

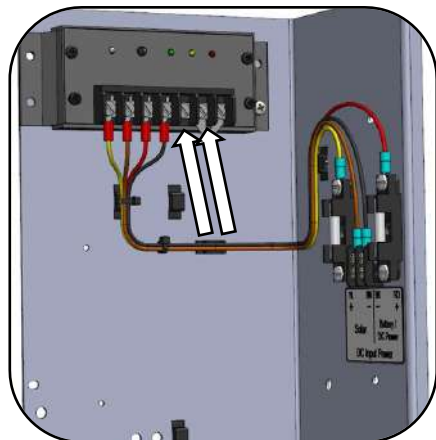
NOTE

Before mounting the cabinet to the pole, all wiring internal to the pole (power, LED, optional StreetHub™ serial and ground cables) should be fished through the pole as applicable.

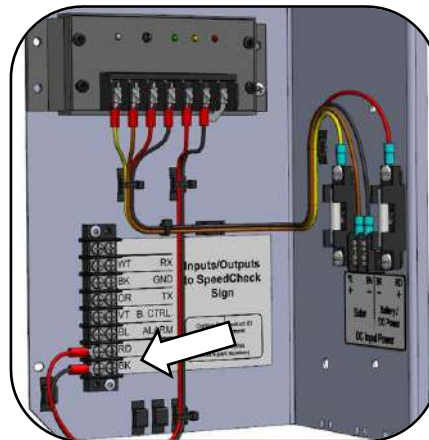
1. In-pole wiring: fish solar cable from solar panel down through hole in pole for cabinet nipple.
2. External wiring: route solar cable through a liquid tight conduit.
3. Remove battery and solar fuses from fuse holders in cabinet.
4. Connect solar positive spade terminal (red wire, yellow heat shrink) to the Solar+ fuse holder screw terminal. Connect solar negative spade terminal (black wire, brown heat shrink) to Solar- screw terminal.
5. Connect the sign DC input power wires to one of the following terminals:
 - a. Load+ and Load- terminals (red is +, black is -)
 - b. DC+ and DC- terminals (StreetHub™ equipped systems only, red is +, black is -)
6. Check the battery for voltage (recommended ~12.6V or greater for new installs) and polarity.
7. Connect the battery to the battery harness ring terminals.
8. Mate solar panel connectors to solar harness connectors.
9. Install battery fuse, then solar fuse.
10. Ensure green charging status LED illuminates on solar charge controller indicating proper solar charging.



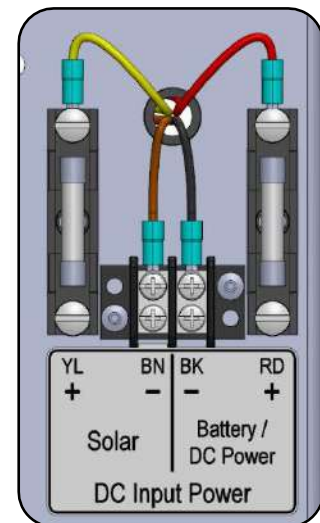
Ensure cabinet door is fully closed and latched otherwise damage may occur.



*DC out to radar sign
(Load +/- terminals)*



*DC out to radar sign
(StreetHub™ equipped only)*



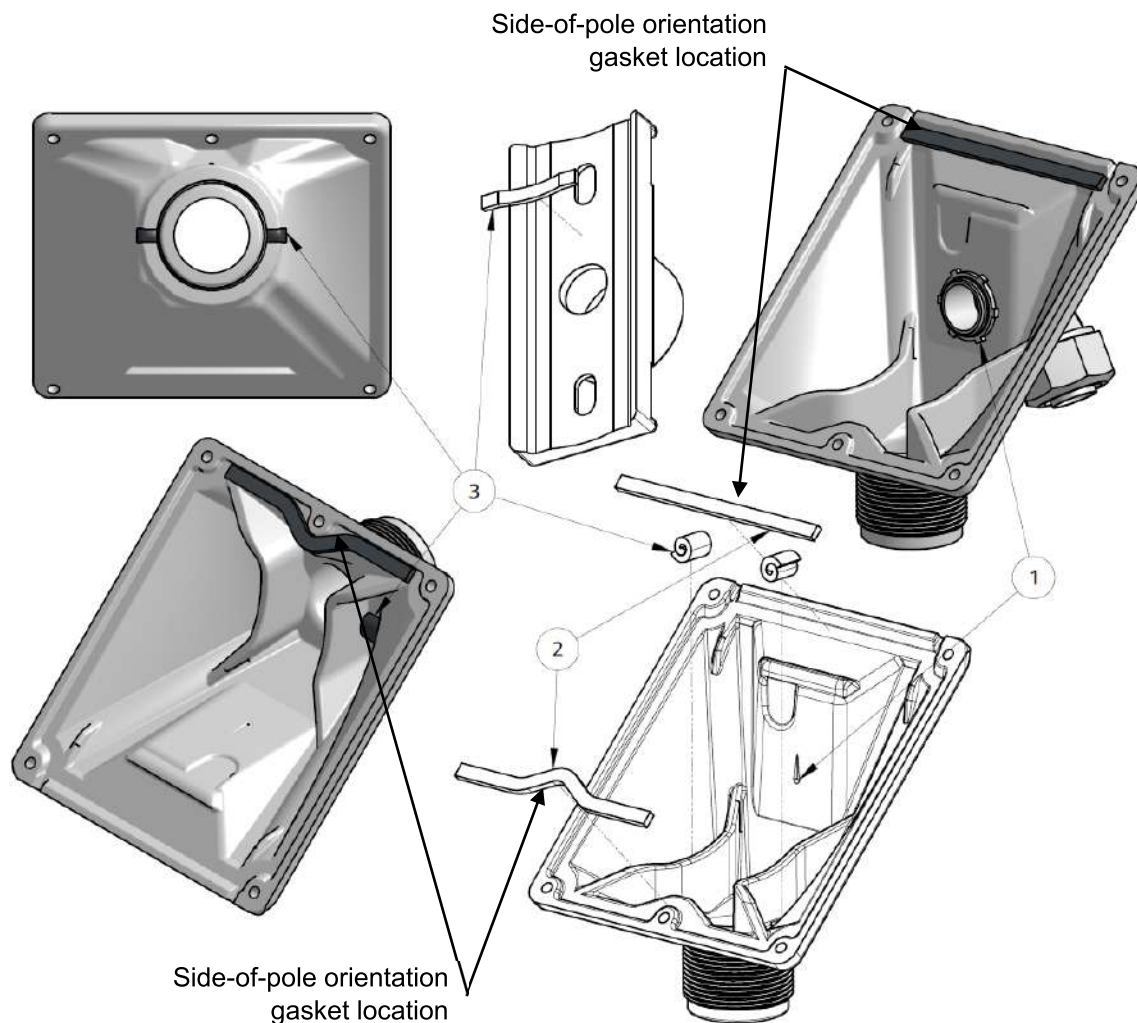
*Cabinet DC input power
terminals*

4.13 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.

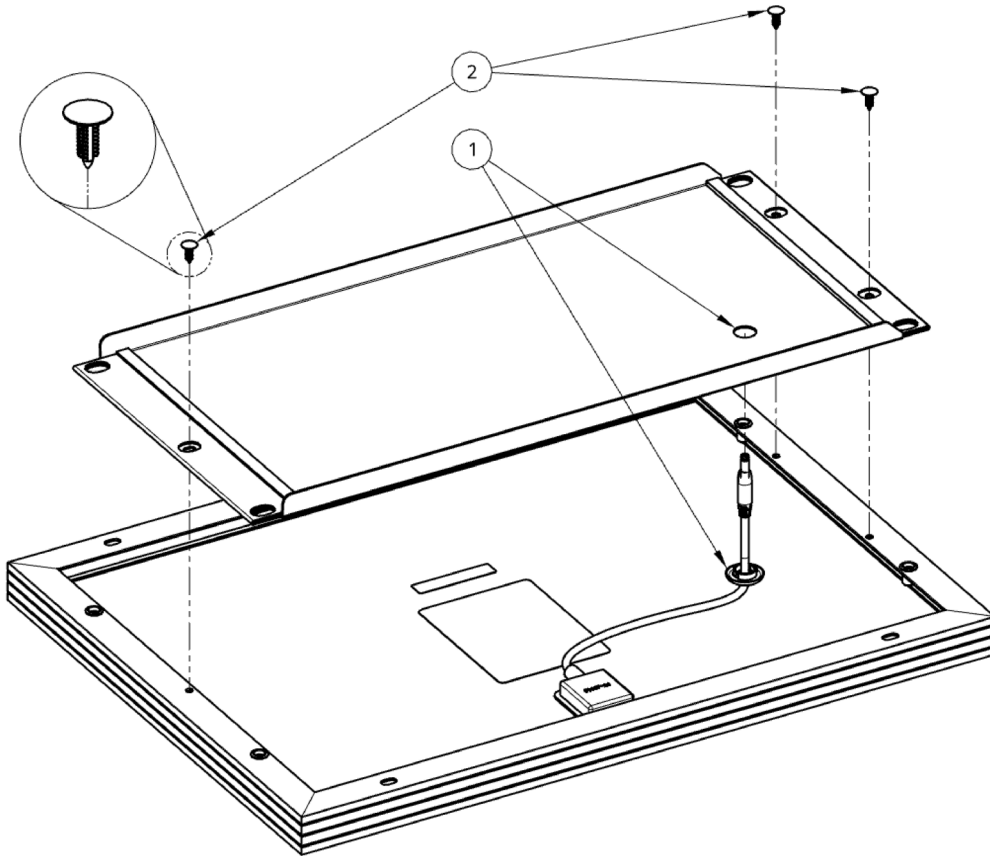


Failure to apply gaskets and sealant could result in water entry into the housing or conduit (if used) and cause damage to the product.



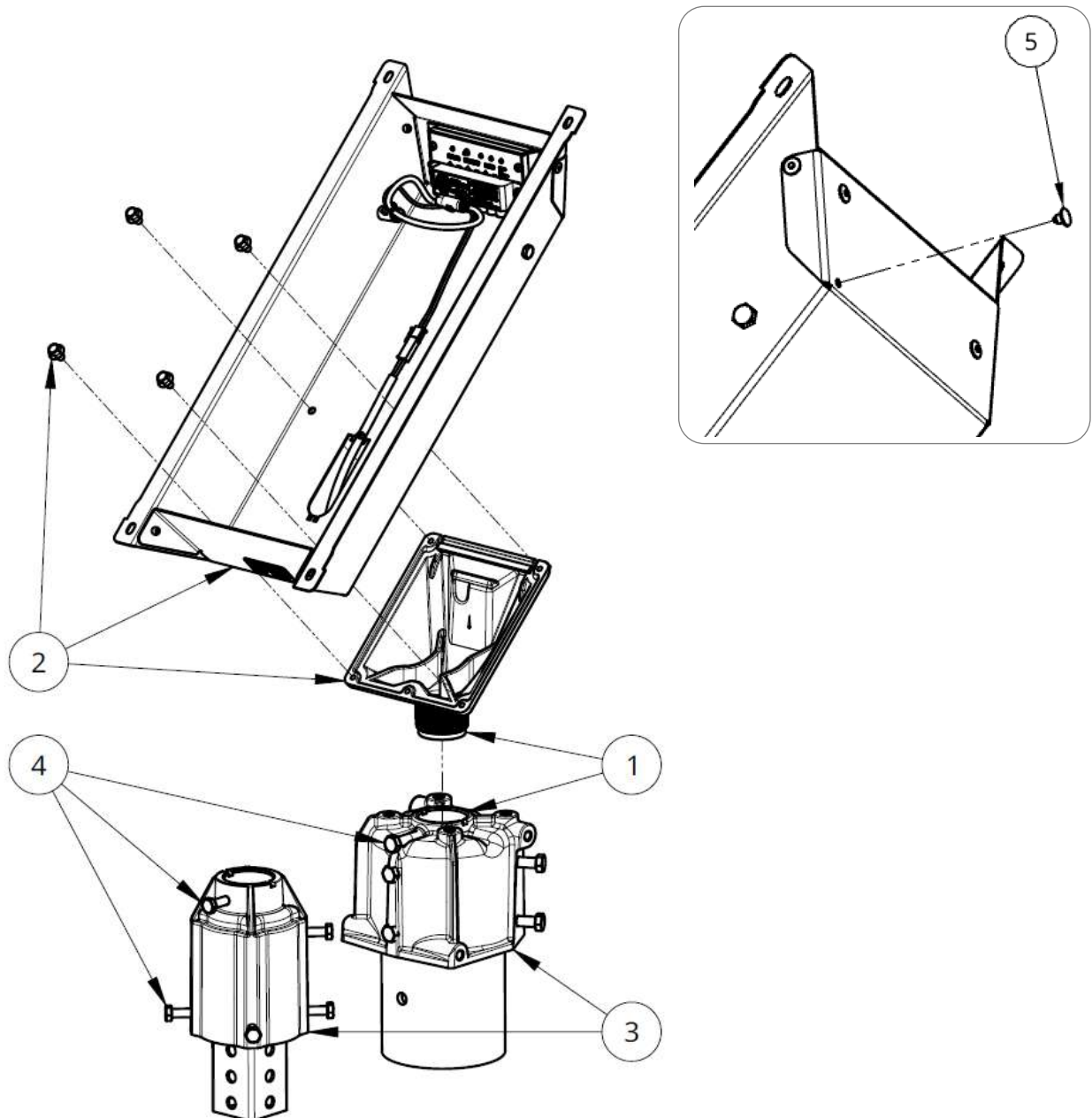
4.14 Solar Kit – Solar Panel Preparation

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.



4.15 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.

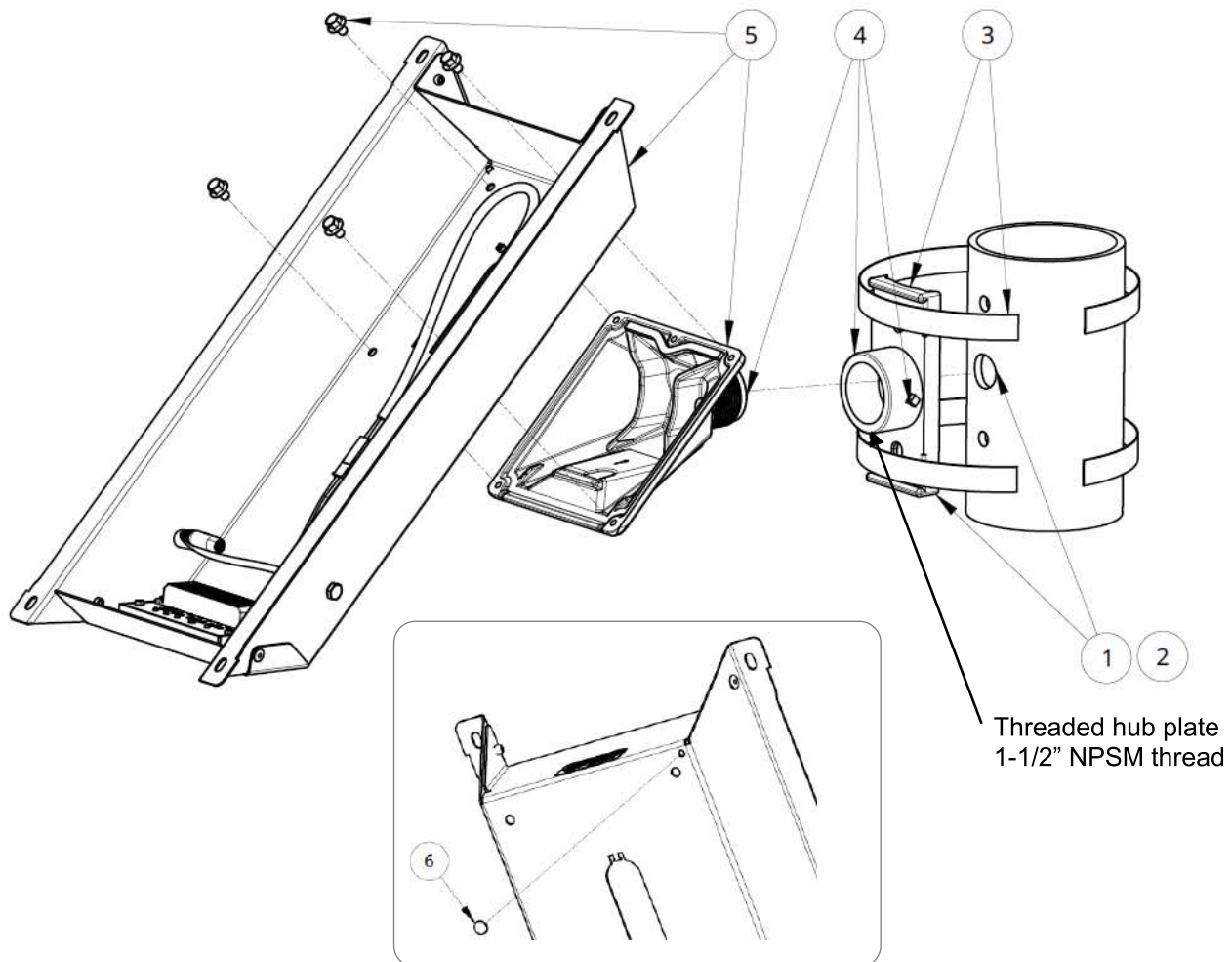


4.16 Solar Kit – Side of Pole Mounting

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.

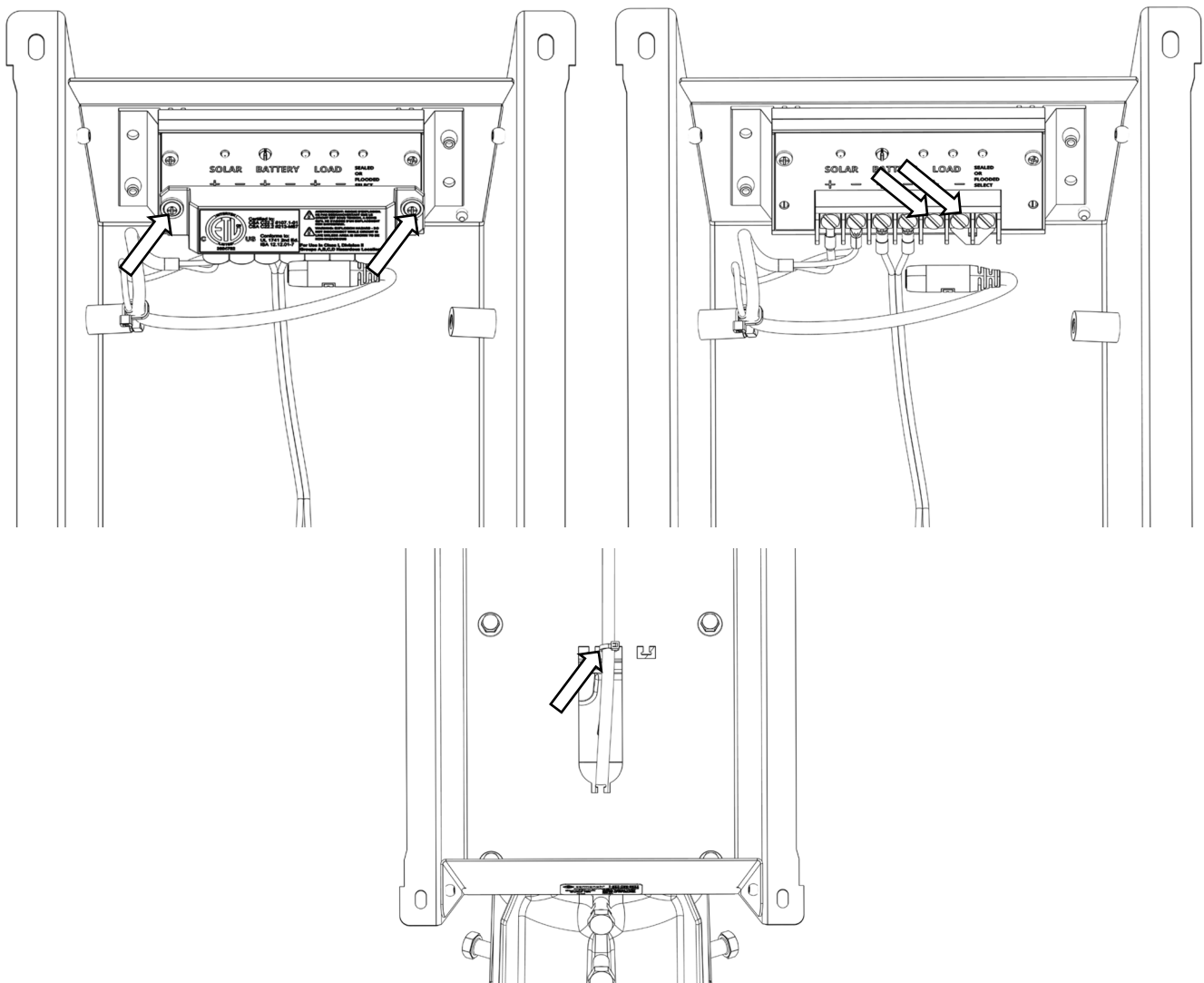


Use only Carmanah supplied high-strength band clamp or commercial banding to secure hub plate to pole.



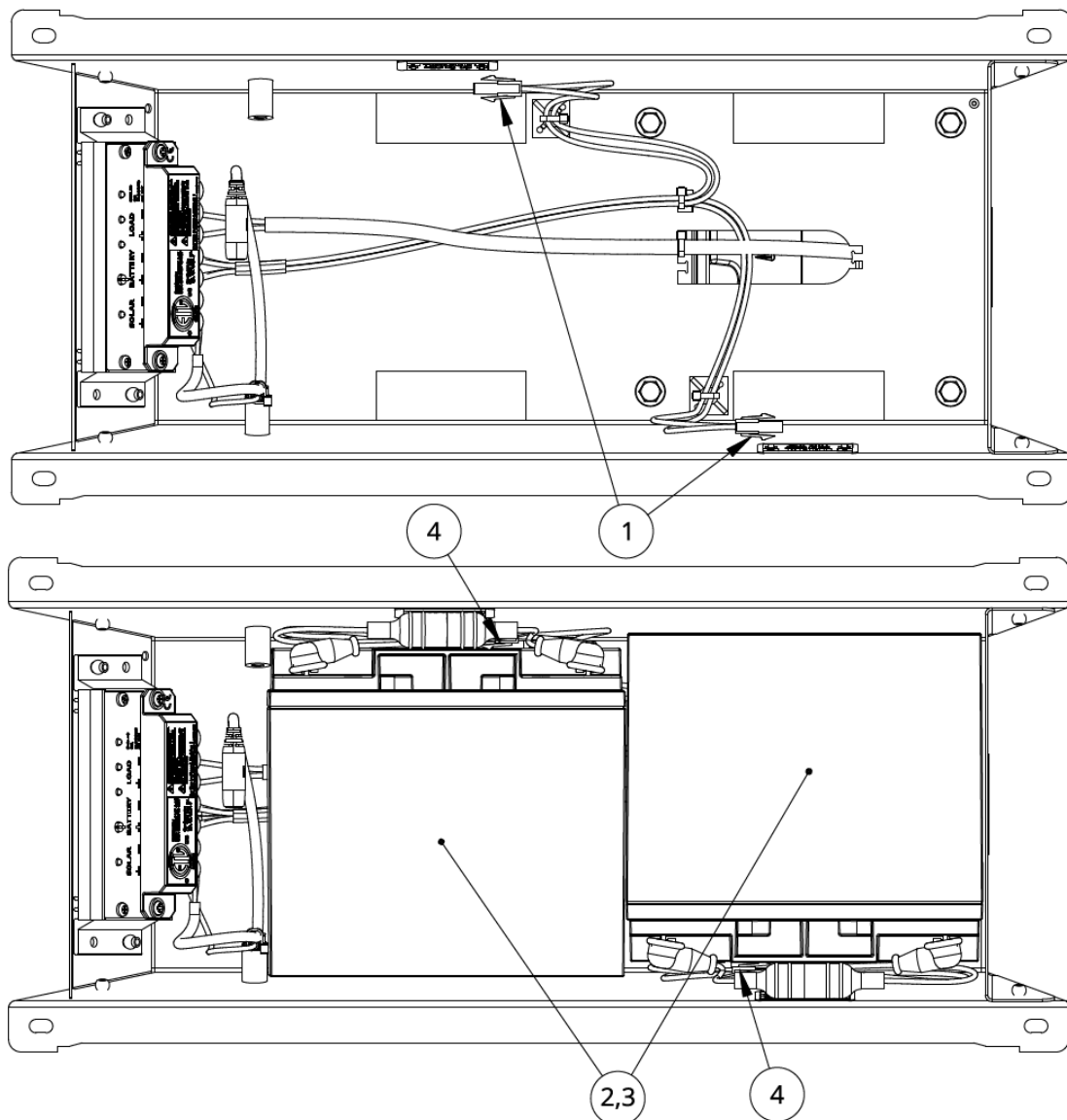
4.17 Solar Kit – Power Harness

1. Fish sign power harness up through pole or conduit to solar kit.
 - a. Power harness will be coiled up and exiting the junction box (SPEEDCHECK-15) or rear panel (SPEEDCHECK-18). See [Section 2.1](#) for more information.
2. Remove the cover to the charge controller.
3. Connect sign power harness to charge controller's Load +/- terminals with red on the positive (+) terminal and black on the negative (-) terminal. Reattach charge controller cover and secure with the included screws.
4. Use appropriate harness fastening location depending on system mounting orientation so harness enters housing facing up to prevent any water from flowing into housing along jacket.
5. Secure power harness jacket to “dog-bone” feature using supplied cable tie as shown ensuring the connector is not under tension.



4.18 Solar Kit – Batteries

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.

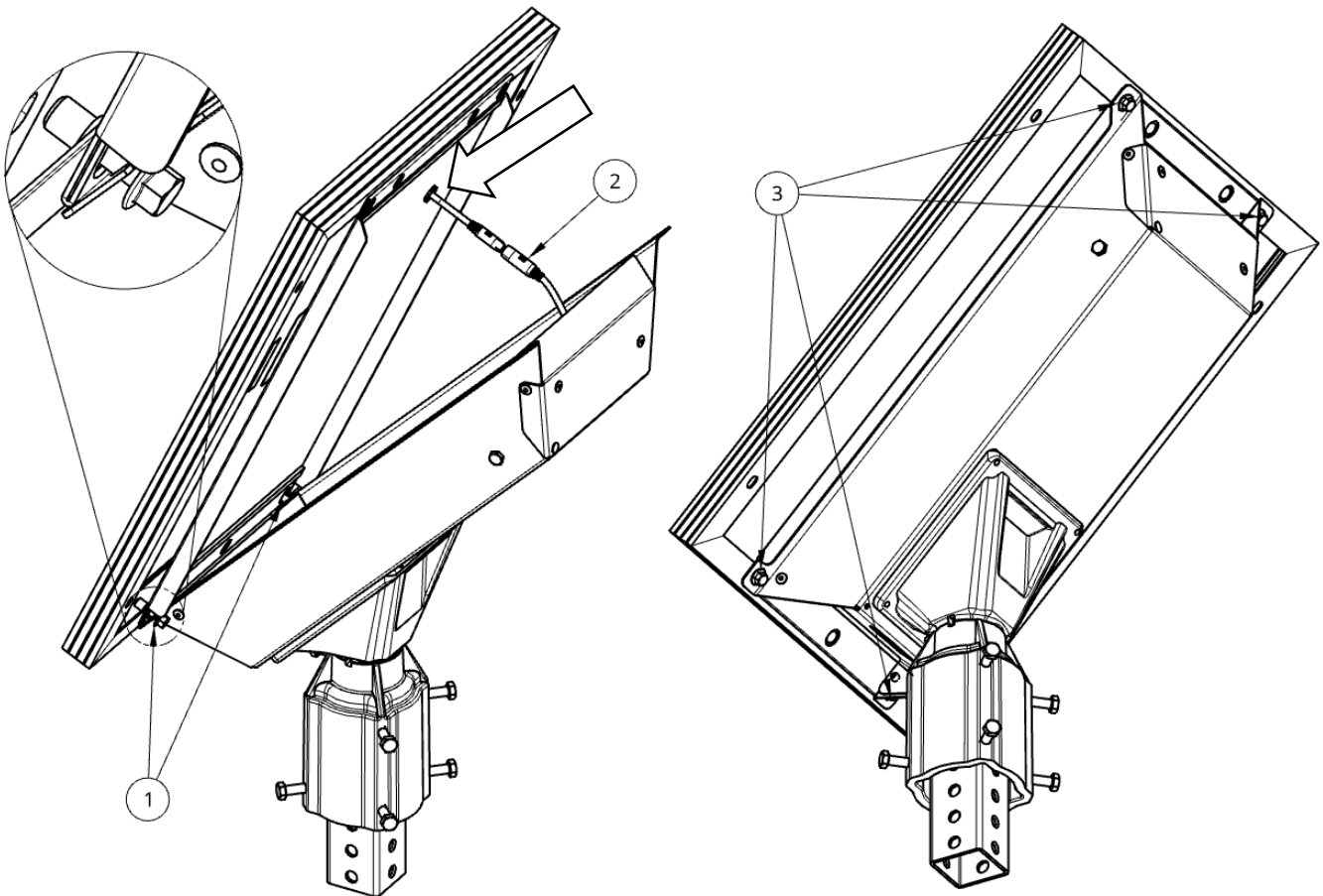


NOTE

For a top of pole mount system, the lower battery will be the one farthest from the charge controller. For a side of pole mount system, the lower battery will be the one closest to the charge controller.

4.19 Solar Kit – Solar Panel

1. Lower solar panel onto 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 solar panel 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.



4.20 AC Power System Wiring

NOTE

Before mounting the cabinet to the pole, all wiring internal to the pole (power, LED, optional StreetHub™ serial and ground cables) should be fished through the pole as applicable.

1. In-pole wiring: fish AC wiring from power source through hole in pole for cabinet nipple. For AC-in-the-sign versions of the SPEEDCHECK-15 wire to the junction box on the display sign.
 - a. Optional cabinet entry points are available for external conduit runs for the power.
2. Turn breaker off and remove DC power fuse from fuse holder in cabinet.
3. Install supply line and neutral wires to AC Input terminals. Connect supply ground to the bus bar. Secure cable jacket to chassis with cable tie.
 - a. Line = black, neutral = white, ground = green
4. Connect the sign DC input power wires to one of the following terminals:
 - a. Load+ and Load- terminals (red is +, black is -)
 - b. DC+ and DC- terminals (StreetHub™ equipped systems only, red is +, black is -)
5. Check the AC supply for voltage and polarity.
6. Install DC power fuse to the fuse holder and turn breaker on to apply power to the system.

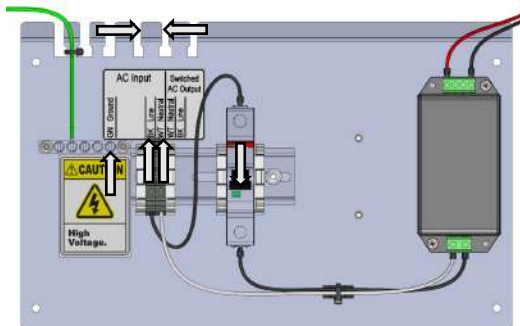


Ensure cabinet door is fully closed and latched otherwise damage may occur.

NOTE

The ground bus bar accepts 4 – 14AWG copper wire. The DIN rail terminal blocks accept 10 – 26AWG copper wire.

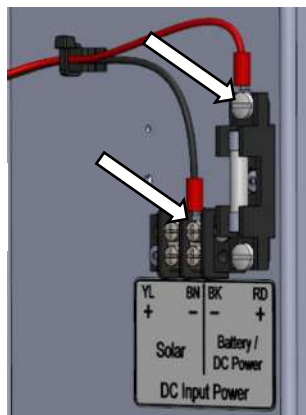
Cabinet AC input terminals



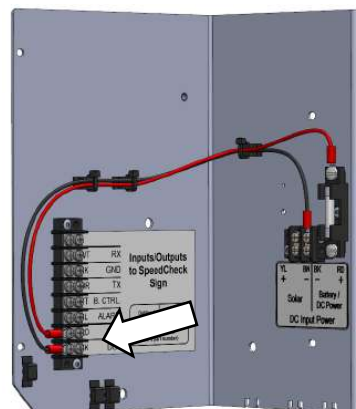
AC-in-the-sign wiring (SPEEDCHECK-15 only)



DC out to radar sign

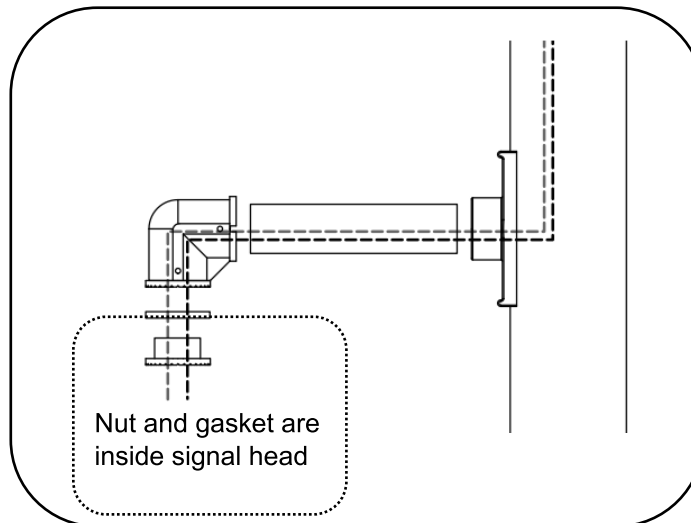


DC out to radar sign (StreetHub™ equipped only)



4.21 Circular Beacon Installation

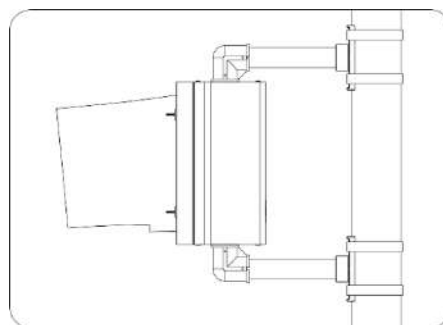
1. Thread the flashing beacon harness through the beacon arms. Then, mount the top flashing beacon arm to the pole using stainless banding or bolts (not supplied). Use the gasket on the top mounting arm to ensure water does not leak past the connection and enter the signal head from the top.



2. Connect the flashing beacon harness to the terminal block inside beacon housing according to the wire connection table below. Complete the flashing beacon assembly and attach the bottom arm mount to the pole using stainless steel banding or bolts (not supplied).

LED WIRE CONNECTIONS

Polarity:	Wire from Controller:	Wire to Yellow LED:	Wire to Red LED:
+	Red	Yellow	Red
-	Black	White	White



NOTE

The Carmanah output harness has connections for a maximum of two beacons. If you wish to connect more than two beacons refer to the support article at support.carmanah.com. The maximum number of beacons that should be connected is four. Beacons must accept a 12VDC input with an internal LED driver.

5.0 Display Alignment

5.1 Display Alignment – Overview

Important Tips for Display Sign Installation

- Avoid installing the display sign immediately after a sharp curve, as the radar might not pick up approaching traffic. The sign needs to be aimed correctly at approaching traffic.
- Avoid installing on a steep incline or decline **unless using tilt brackets** (see [Section 4.5](#)) so that radar and LED display will be properly aimed at oncoming vehicles.
- Avoid installing a solar-powered system in the shade of trees or large structures.
- Avoid installing where large trucks may park and obscure the sign.
- Install where the radar beam has a clear view of oncoming traffic not obscured by trees, foliage, signs, buildings, or other objects.
- Install the sign near the road. Typically, the SPEEDCHECK-15/18 display sign is mounted between five and twelve feet from the roadside.
- Use hose clamps first to determine the best display alignment and radar detection range before permanently banding the display to the pole.

The SPEEDCHECK-15/18 display systems are designed to maximize the contrast of the display and minimize the glare from the window. For these systems to function properly, the display must be aligned in relation to the roadway and other physical conditions.

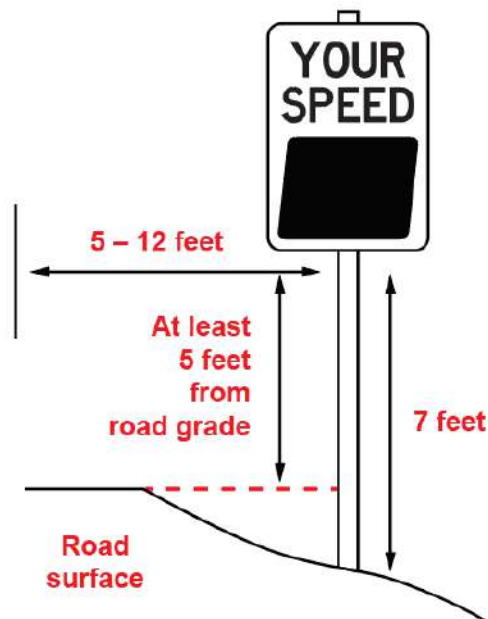
The main sources of severe glare are sun and sky reflections and the headlights of oncoming vehicles. Proper display sign alignment must also factor in existing roadway grades, hills, and curves.



Aiming Guide and Cone

Roadside Placement

Typically, the SPEEDCHECK-15/18 display sign is mounted between five and twelve feet from the roadside. As this diagram shows, the display sign should also be mounted at least five feet above the road grade. To meet Manual on Uniform Traffic Control Devices (MUTCD) standards, the bottom of the sign must be seven feet above the ground.



Road Grades and Curvatures

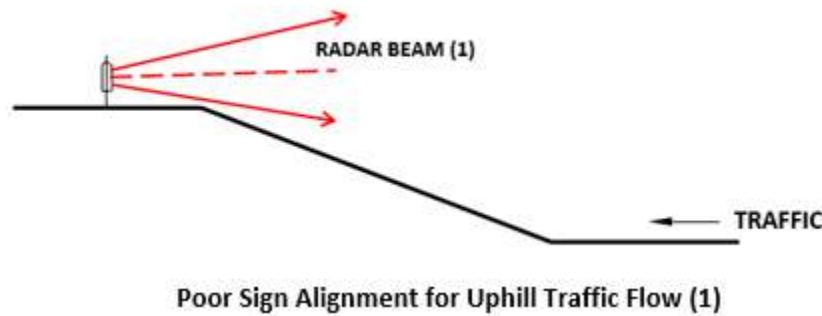
An installation in the uphill or downhill direction of a steep hill might require the display sign to be mounted with the top tilted towards oncoming vehicles to accurately aim the radar at approaching traffic. In this situation, use spacers behind the top or bottom display mounting bracket to tilt the display sign away from the pole, so that the housing is more perpendicular to the grade. Tilt brackets are available for this purpose.



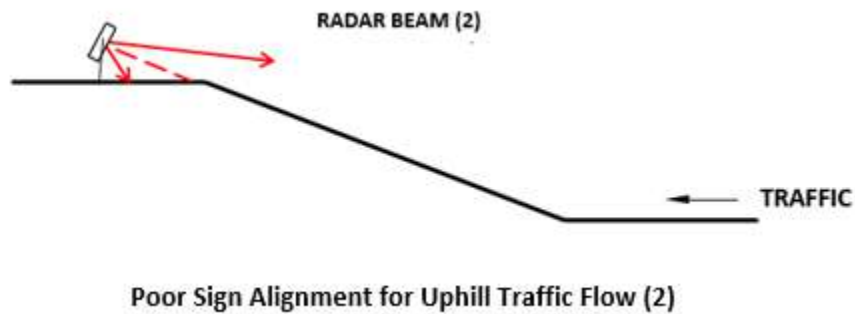
*SPEEDCHECK-15 Upper Tilt Brackets
(legacy angled top version shown)*

5.2 Display Alignment – Hill Alignment

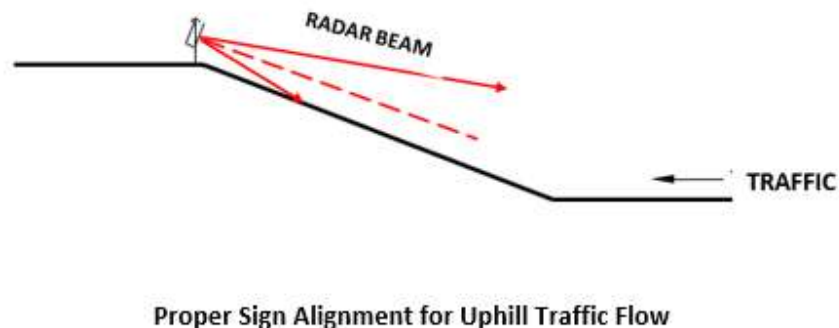
The following diagram demonstrates how a display sign installation near a steep hill can easily result in the improper alignment of the radar beam. With traffic moving in the uphill direction, the radar can be aimed over the top of vehicles as with Radar Beam (1) below.



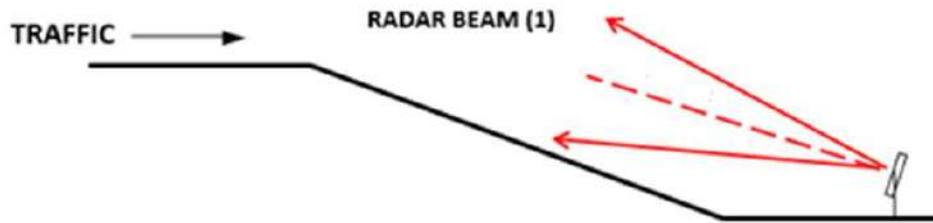
Alternatively, if the display sign is tilted down too far, the radar beam can be aimed into the ground as shown with Radar Beam (2) below.



For a proper alignment, tilt the display sign down so the radar beam follows the grade of the road and captures the uphill traffic stream.

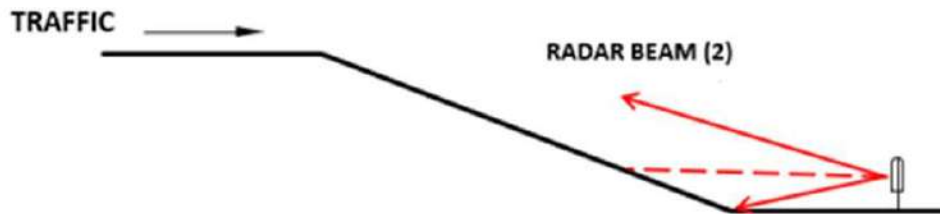


Similar problems can occur with traffic moving over a steep hill in the downhill direction, as shown in the next diagram. If the display sign is tilted up too far, the radar will detect only the traffic at the top of the hill as shown in Radar Beam (1) below.



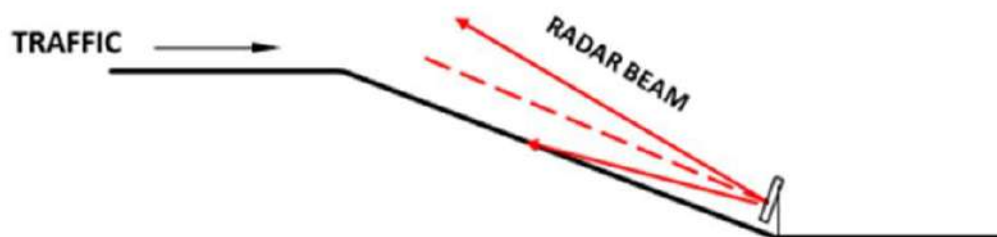
Poor Sign Alignment for Downhill Traffic Flow (1)

However, if the sign is level, the radar beam might aim directly into the road grade, which results in a short detection range, as shown in Radar Beam (2) below.



Poor Sign Alignment for Downhill Traffic Flow (2)

For a proper display sign alignment, tilt the display sign up from the base of the hill. The radar beam follows the grade of the hill to capture the downhill stream of traffic, as shown below.

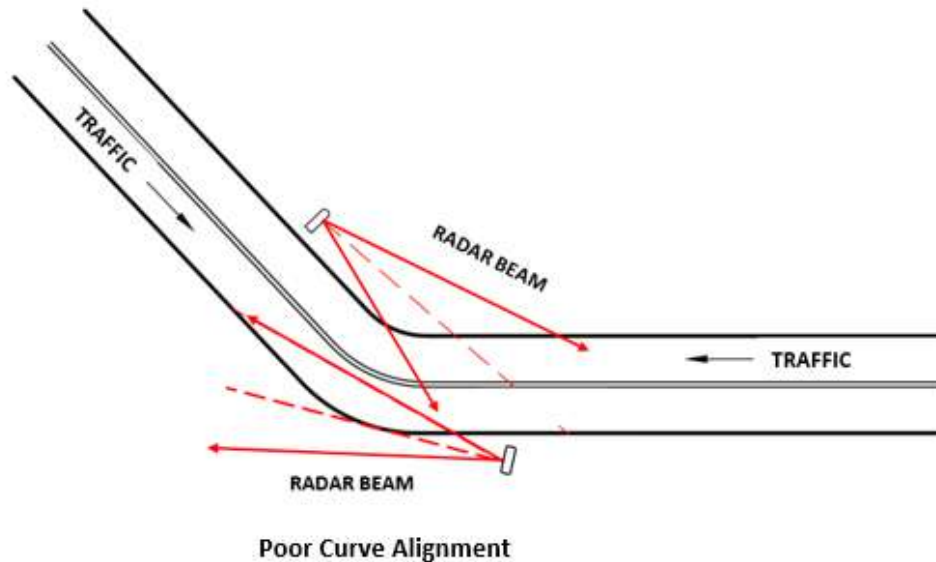


Proper Sign Alignment for Downhill Traffic Flow

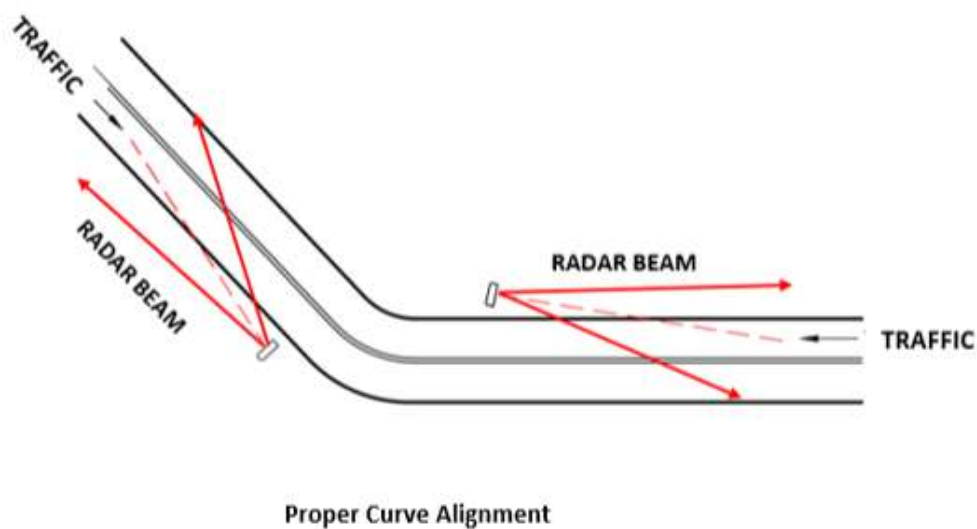
5.3 Display Alignment – Curve Alignment

Additional consideration should be made for road curvature. If the display sign is displaying vehicle speed intermittently, the display sign may need to be turned slightly towards or away from the road to detect vehicles at the appropriate portion of the curve.

The following diagram shows an example of two signs in poor locations relative to a curve. The radar beam is angled to the roadway, resulting in a short detection range.

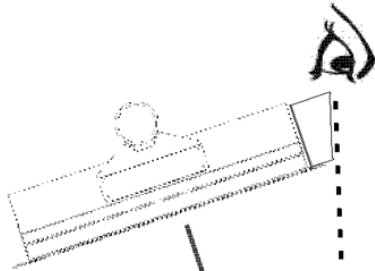


The next diagram shows the same curve configuration, but with display signs in proper locations. The radar is mostly parallel to the roadway, with a good detection range.

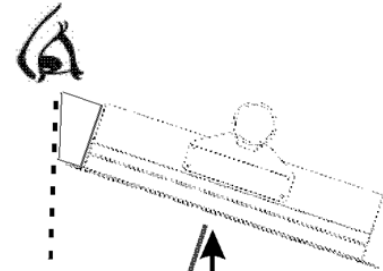


5.4 Display Alignment – Rotational Display Sign Alignment

Left side of roadway
sign mounting:

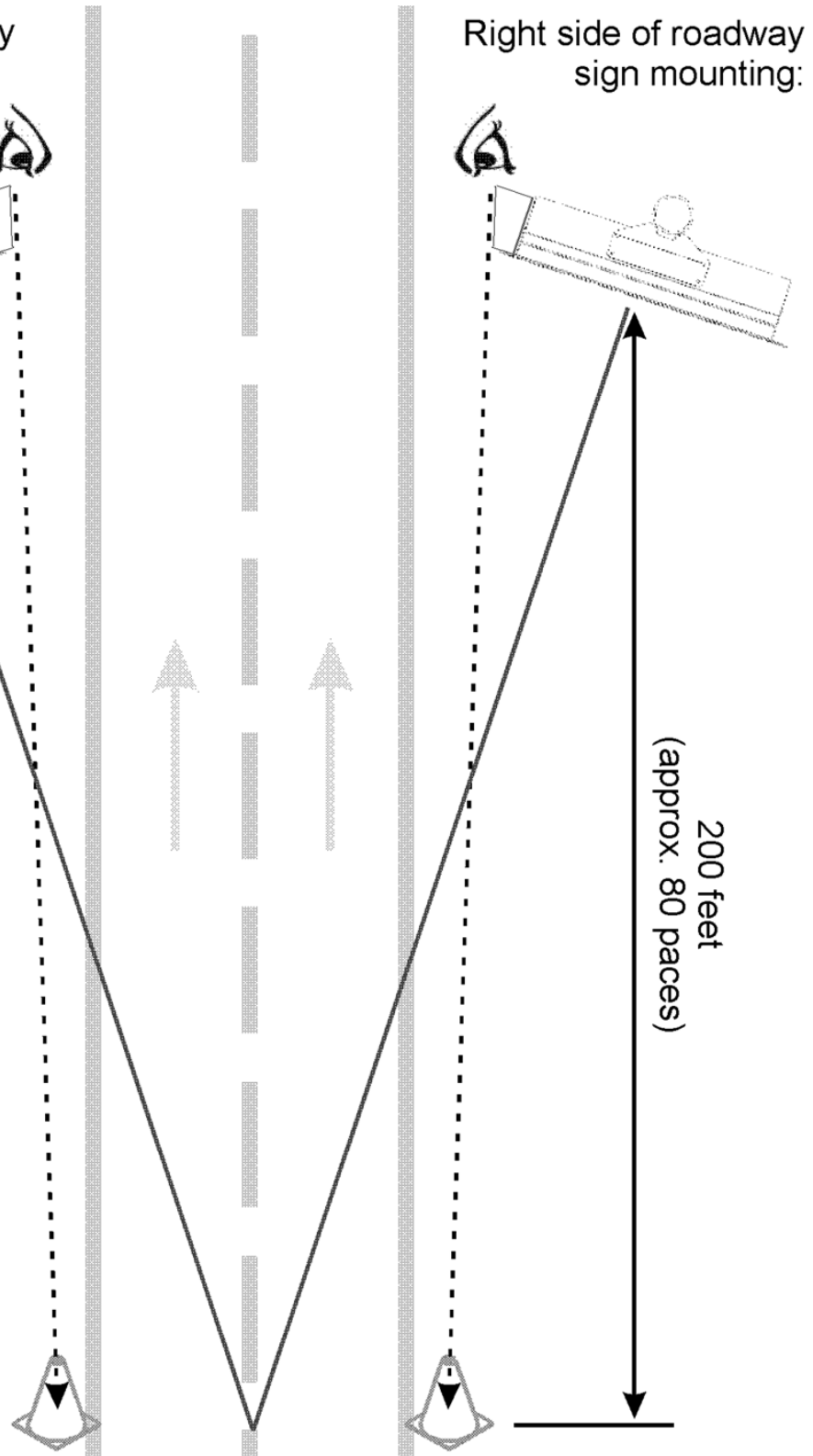


Right side of roadway
sign mounting:



Rotational sign alignment

1. Position the SpeedCheck sign at the correct height, and attach clamping devices loosely to allow rotation of the sign
2. Place the orange cone at the edge of the road (next to the fog line) 200 feet (about 80 paces) from the display, towards the direction of traffic.
3. Hold the aiming guide flange against the roadway side of the sign, with the narrow end of the guide to the front as shown.
4. Rotate the SpeedCheck display on the pole until the two points on the aiming guide visually line up with the orange cone as shown here.
5. If done correctly, the sign face is now aimed at a point in the roadway approximately 200 feet from the sign and 12 feet in from the fog line as shown by the red line.
6. Tighten attachment devices.



6.0 System Configuration

The SpeedCheck radar speed signs are configured using the SpeedCheck Manager software. For more information on programming and to download the latest version of software please visit support.carmanah.com.

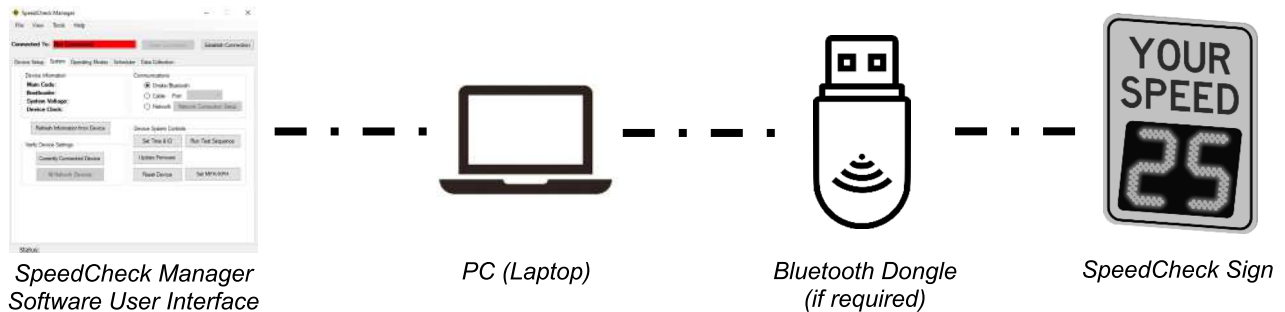
NOTE

Updated programmable controllers will require SpeedCheck Manager version 3.0.1.16 or newer to communicate. Do not continue to use legacy versions of the software known as DisplayManager or DeviceManager.

NOTE

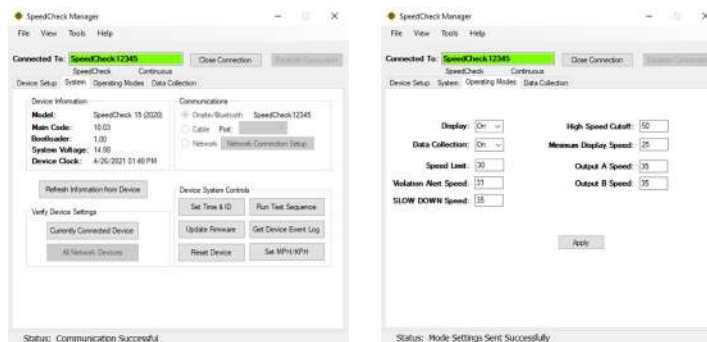
Updating firmware on legacy controllers running version 3.47 or older is **not recommended**.

Once your system has been installed and is operational, proceed with connecting to the sign via SpeedCheck Manager. This will require a PC with Bluetooth connectivity. Carmanah assigns default programming based on your system configuration and may require additional configuration based on your installation requirements.



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

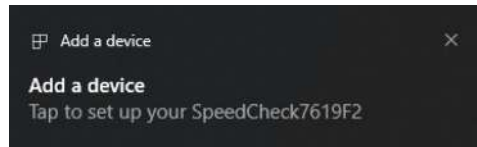
- Speed adjustments
- Radar unit of speed (MPH/KPH)
- Beacon adjustments
- Operating mode selection
- Slow Down option toggle
- System ID, date and time
- Scheduling
- Data collection
- Firmware updating



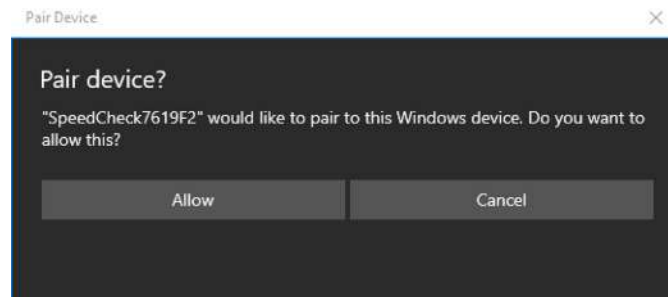
Bluetooth Pairing (updated programmable controller only)

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

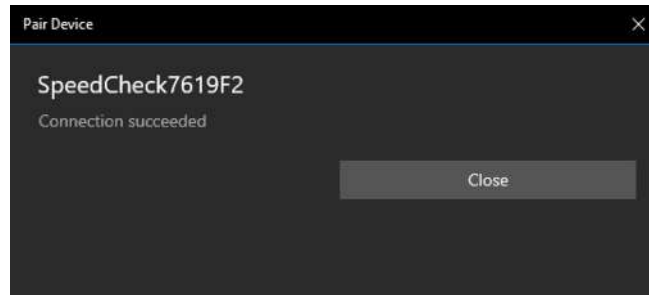
1. Open SpeedCheck Manager and click on Establish Connection.
2. Wait for the software to scan and detect nearby Bluetooth devices. Click on your radar speed sign (designated as SpeedCheckXXXXX) and click Connect.
3. Click on the dialog box in the bottom right corner to begin the pairing process.



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 Checklist

After installing and programming the system using SpeedCheck Manager software, the following commissioning verification checklist helps ensure that everything is working as it should be and that your traffic product is ready to serve the public for many years of reliable and sustained operation.

For All Versions:

- All settings are correct using the SpeedCheck Manager software, including slow down options, external beacon options, calendar-based scheduler, and data collection settings.
- “Roll up” sequence occurs and LEDs light upon startup. External output loads such as beacons power up as expected.
- SpeedCheck enclosure is aimed properly in the correct direction toward oncoming traffic lanes.

For Solar Versions:

- Before installing battery, confirm it is in a good state of health.
- The solar panel is securely mounted with hardware fully tightened.
- Ensure there is a green charging status LED showing on the charge controller to confirm solar charging is taking place.
- System has clear sky access and no removal of obstructions is required.
- Note the possibility for nearby foliage to eventually shade the solar panel. If so, set a reminder to inspect later.
- Solar panel pointed south (or wherever custom instructions indicate).
- Cabinet door is fully closed with an audible “click”.

For AC Versions:

- If present, cabinet door is fully closed.
- Verify all fuses are intact.

For StreetHub™ remote connectivity versions:

- Remote systems are visible in the Glance web interface.

8.0 Maintenance and Product Care

The SPEEDCHECK-15/18 radar speed signs are designed to operate reliably for years with virtually no need for maintenance. For solar models, Carmanah recommends routine inspections of the solar panels to ensure that they are unobstructed by anything that may prevent effective solar charging, including:

- Dirt and dust
- Snow
- Leaves
- Debris
- Shade that may have developed after installation due to adjacent plant growth.

The frequency of the inspections depends on location and local weather patterns. A yearly visual inspection of the solar system is typically enough. The system is designed to be maintenance free, but maximum system performance is achieved when the solar panels are clean. When inspecting the interior of the solar cabinet, ensure the vents are clear and allow airflow. Confirm the green light on the charge controller indicates proper solar charging. Refer to the solar charge controller manual for more detail.

8.1 Sign Inspection

Remove debris and soil from the face of the display and sign as you would with any road sign with a soft microfiber cloth. Do not use oil-based solvents on the polycarbonate window or the sign face as this can cause permanent fogging.

Check the mounting element hardware for tightness and confirm the pole interface hardware is secure.

Check the following items annually and more frequently in harsher environments:

1. Clean and check the radar and mount.
2. Clean both sides of the polycarbonate window. Use a microfiber cloth to minimize scratching.
3. Blow out the LEDs, cabinet, and internal components with compressed air. Ensure power is removed prior to cleaning out the interior of the cabinet and display sign.
4. Visually inspect LEDs for alignment.
5. Visually inspect for corrosion or worn insulation.

NOTE

As a preventative measure, if desired on legacy programmable boards, replace the two CR2032 coin cells for on-board clock backup (note positive battery contacts are closest to the outer edge of the SpeedCheck controller PCBA).

8.2 Battery Replacement (Solar-Powered System)

When the system's 12V battery requires replacement, it is recommended that the original manufacturer and model of battery be used.

The Morningstar SunSaver SS-10L-12V is used to control the battery charging for the SpeedCheck solar power system. A battery low voltage protection circuit prevents deep discharge and potential damage to your battery.

We recommend establishing a maintenance and inspection routine (see [Section 8](#)). The indicator LED on the charge controller should indicate the battery health or state of charge. An ideal time to check the worst-case battery state of charge is before sunrise in the middle of winter.

Remove the solar fuse then the battery fuse before disconnecting the battery and replacing it. After battery replacement, install the battery fuse, then the solar fuse.

BATTERY SOC LEDS

Three (3) battery "state-of-charge" (SOC) LEDs indicate the level of charge on the battery. The SOC indication is based only on battery voltage setpoints, which only provides an approximation of the actual state-of-charge of the battery. Table 3 lists the SOC LED indications.

SOC LED	Indication	Battery Status	Load Status
Green	Fast Flashing (2 Flash / sec)	Full Battery: Equalize Charge	Load On
Green	Med. Flashing (1 Flash / sec)	Full Battery: Absorption Charge	Load On
Green	Slow Flashing (1 Flash / 2 sec)	Full Battery: Float Charge	Load On
Green	On solid	Battery Nearly Full	Load On
Yellow	On solid	Battery Half Full	Load On
Red	Flashing (1 Flash / sec)	Battery Low	LVD Warning (Load On)
Red	On solid	Battery Empty	LVD (Load Off)
None	No LEDS On	Battery Missing	Load Off

morningstarcorp.com



Battery replacements should not be carried out in windy conditions. In all cases, the area at the base of the post must be roped off to prevent people from being injured or killed by a falling battery.

8.3 Internal Components

All internal components are replaceable for the SPEEDCHECK-15. Only the radar and controller are replaceable on the SPEEDCHECK-18. Replacement LED display boards are provided in pairs, including new harnessing, to ensure uniform brightness and color.

On 15-inch displays, LED display boards are field serviceable. On 18-inch displays, LED display boards are not field serviceable.

9.0 Troubleshooting

Symptom	Possible Cause and What to Check
No operation or erratic operation	<ol style="list-style-type: none"> Verify voltage supply connections are correct and tight. Verify fuses in the fuse blocks and inline fuse holder are of the correct rating. <ul style="list-style-type: none"> Solar input and battery fuse: 15A SpeedCheck DC supply fuse: 4A SpeedCheck AC input fuse: 0.5A All fuses are type (250V 3AG 1/4" x 1-1/4") On programmable boards, ensure the coin cells show at least 2.7V each, if not they should be replaced.
Not all vehicle speeds displayed	<ol style="list-style-type: none"> Verify the display has correct alignment with the roadway. See Section 5 on Display Sign Alignment. Check the High Speed Cutoff setting in SpeedCheck Manager. It may be set too low for the prevailing traffic speed. Check the minimum display speed setting. It may be set too high for the prevailing traffic speed. Note that the SpeedCheck display signs are designed to detect moving vehicles, including trucks and golf carts, but will ignore people or small targets. 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.
Sign displays test sequence only upon start up	<ol style="list-style-type: none"> Display may be set to "OFF" in the "Operating Modes" menu of the SpeedCheck Manager software. Timer or scheduler has been set to collect data but not display speeds. Set the program as desired. Radar is not sending data. Contact Carmanah for further diagnostics.
No test sequence and no speeds displayed	<ol style="list-style-type: none"> Key switch if used is in the OFF position, fully counterclockwise (CCW). Coin cell batteries are dead on programmable boards. Below the batteries is a small LED indicator that blinks continuously when the sign power is removed. If the small LED is not blinking when power is off, replace with two CR2032 batteries. Remember to reset time and date and check all sign programming. Controller board may have a jumper on the power bypass pins just to the left of display cables 1 and 2 which enables operation without coin cells. Without this jumper the programmable board cannot power up if the coin cell batteries are dead or missing. Power to display is OFF. Test sequence is disabled. Operating Modes settings set for "Display OFF". Timer or scheduler has scheduled the sign to be off.

<p>Numbers displayed with no vehicles passing</p>	<ol style="list-style-type: none"> 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. 2. "88" displayed indicates the display is programmed for the SLOW DOWN message but the SLOW DOWN message boards are not installed. Disable the SLOW DOWN message operation in the Device Setup menu using your SpeedCheck Manager computer software.
<p>Speed readings are higher than expected</p>	<ol style="list-style-type: none"> 1. Display may be set to read KPH instead of MPH. Use SpeedCheck Manager to set the correct unit of speed. See support.carmanah.com for more information.
<p>Detection range too short</p>	<ol style="list-style-type: none"> 1. Sign alignment is incorrect. See Section 5 on Display Sign 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. Try aligning the sign face towards or away from center line, and/or more towards the grade of the road (up or down) as required. 5. Internal metal radar reflector bent or missing. Check inside the display enclosure. For systems with the DR500 or Decatur SI-3/SI-2 radars only. 6. The display may be angled slightly towards the center line of the road to focus on vehicles closer to the display. The factory setting is a detection range of 400 to 600 feet from the display. This range is affected by target size such as a truck versus a compact car. Contact Carmanah for more information.
<p>Bluetooth[®] communications erratic or not working</p>	<ol style="list-style-type: none"> 1. Display not powered, or key switch set to OFF. 2. PC laptop computer not fully charged. You may get a timeout error if there is insufficient power to maintain a wireless connection. 3. PC laptop too far away. It must be located within 50 feet, in line of sight and free and clear of obstacles in front of the sign. 4. Mismatched software and firmware are loaded on the laptop or controller board. Contact Carmanah for the latest versions.
<p>Display application not downloading data properly</p>	<ol style="list-style-type: none"> 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. Make sure display date and time is set properly with the SpeedCheck Manager Device System tab setup menu.

10.0 Service & Repair

10.1 Accessing Internal Components



Do not attempt to access internal components without first disconnecting the power supply.



**High risk of LED display board damage if handled while sign is powered.
Mating connectors improperly may cause damage.
A controller board damaged in this way may not be covered by the product warranty.**

Use caution when accessing internal components of the display to remove the LED boards. Follow these necessary precautions for safe access:

1. Before attempting to remove the LED boards, disconnect the power to the display sign.
 - a. For an AC-powered display, disconnect the power at the source and power supply cabinet.
 - b. On solar-powered units, disconnect power at the solar power cabinet.
 - c. Wait 30 seconds for the system to discharge before handling and removing the LED display boards.
2. After the power is disconnected, remove the LED boards from the mounting pins.
3. Be very careful not to touch or move the LEDs. They have been factory aligned for optimal visibility.
4. Disconnect all power before reinstalling the LED boards back onto the mounting pins.

10.2 Accessing SPEEDCHECK-15 Display Boards

Power must be turned off to the sign before proceeding with the following steps.



**High risk of LED display board damage if handled while sign is powered.
Mating connectors improperly may cause damage.
A controller board damaged in this way may not be covered by the product warranty.**



*Take note of sign retention bolts,
one on each side*



Remove the two fasteners



Tilt sign to rear



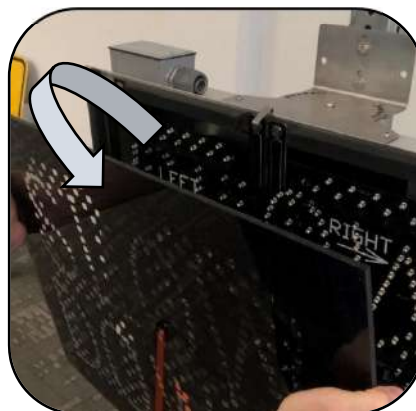
Lift up to remove



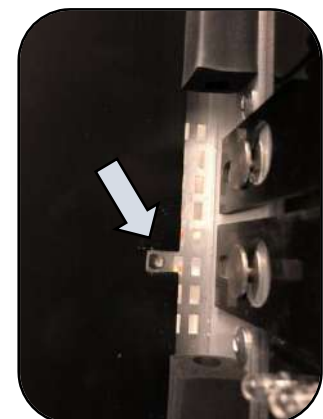
Lift window retainer clip



*Optional: If present, disconnect
strobe connectors.*



*Tilt the window forward and lift to
remove*



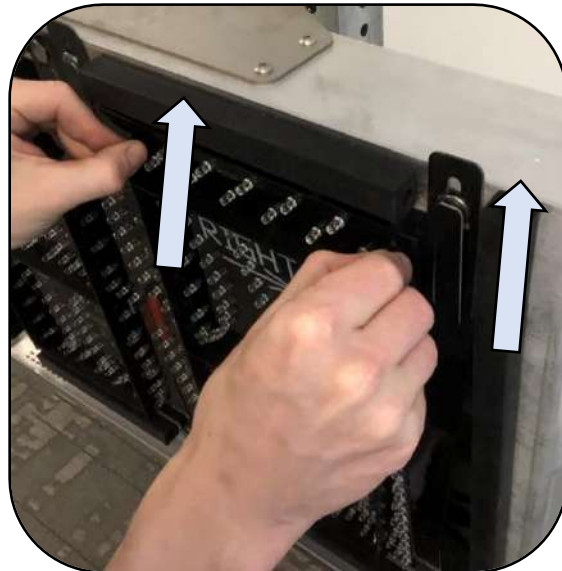
*Take note of window alignment
stud for re-installation*

10.3 Releasing Locking Features

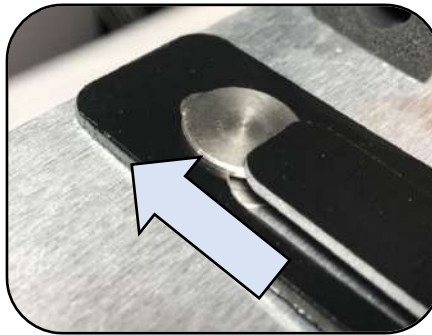
The following photos provide greater detail about how to release the display board locking features.



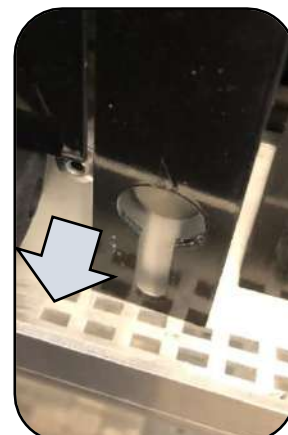
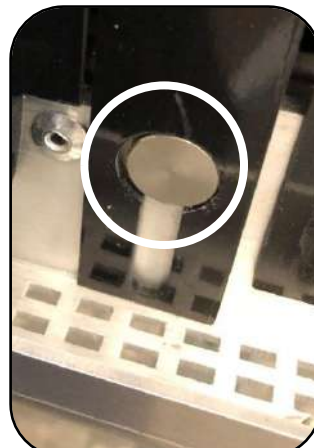
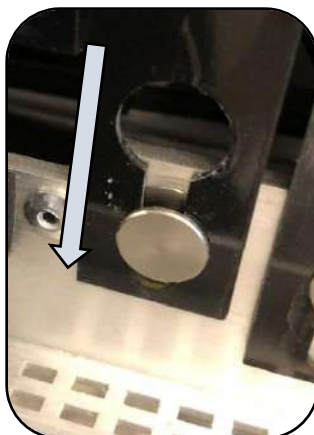
Being very careful not to touch the LED lamps, grasp the circuit board stiffeners at the top.



Pull the circuit board toward you about 1/4". When the retainer tabs clear the hanger pins, slide the circuit board upwards.



Pull on LED boards to raise tabs



When the top part of the circuit board releases from the upper hanger pins, lower the board to where the cut-outs slip off the lower hanger pins.

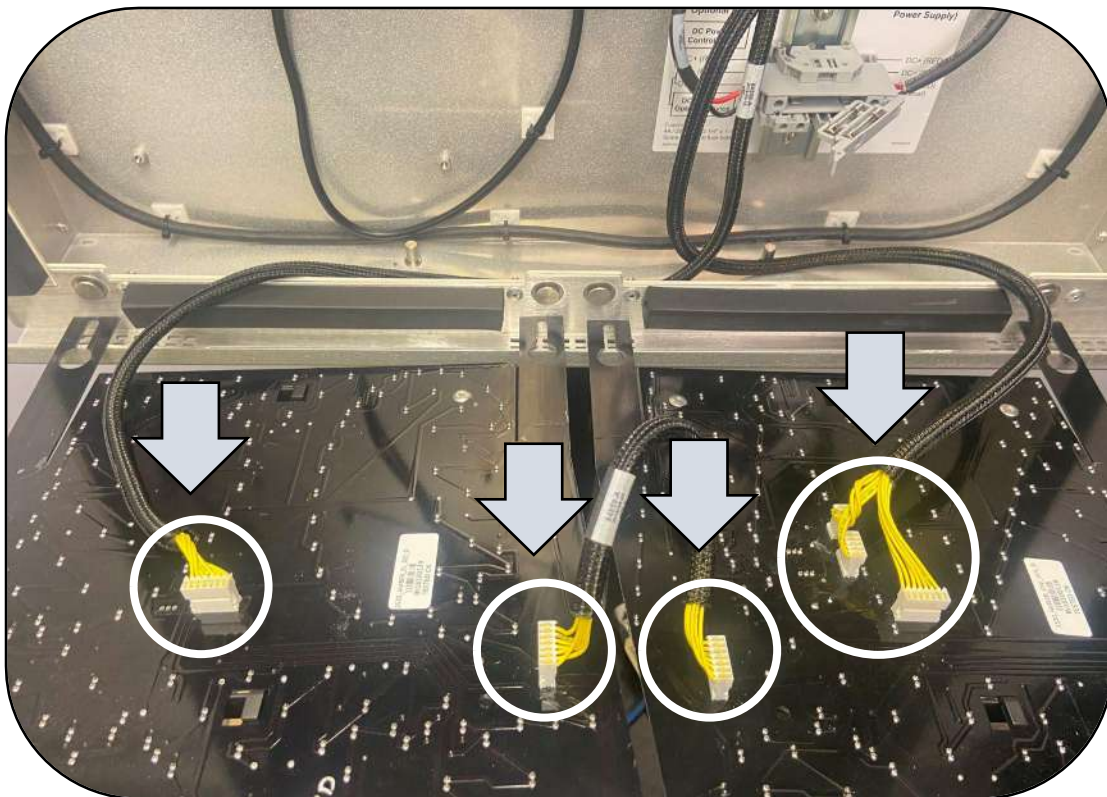
10.4 Removing Display Boards

Remove the connectors from the display boards while taking note of the connector positions.

- Slow Down optioned displays will have six connectors
- Non-Slow Down optioned displays will have four connectors

NOTE

Image below shows a system with the Slow Down option.

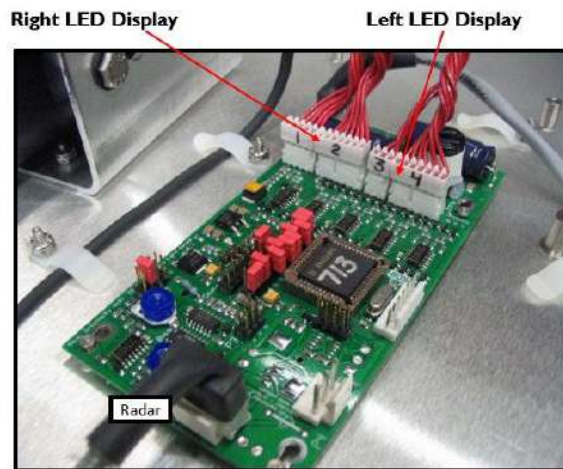


Place the display boards somewhere that they will not be in damaged. The LEDs are easily bent and misaligned. NOTHING SHOULD BE ALLOWED TO TOUCH THE INDIVIDUAL LEDs.

10.5 Classic Controller Cable Connections (Legacy – without Slow Down)

If your display uses a non-programmable driver board (socketed processor chip and no coin cell battery holders), proceed as follows:

1. Connect the display cables before connecting the power cable.
 - a. The 5-pin and 7-pin (1 and 2) connectors go the right LED display.
 - b. The 3-pin and 7-pin (3 and 4) connectors go to the left LED display.

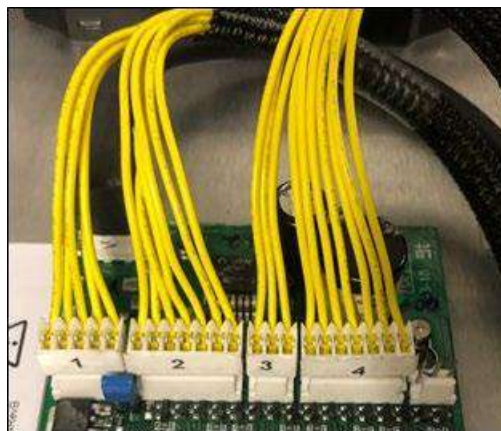


Caution! Do not power up display with cables disconnected. This will damage the circuit board.

10.6 Programmable Controller Cable Connections (without Slow Down)

If your display uses a programmable driver board note the following cable connections:

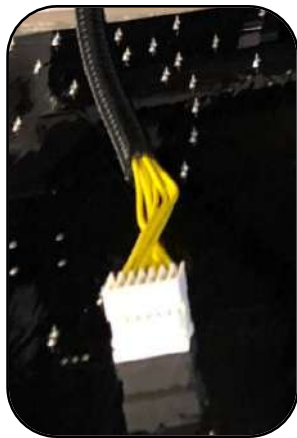
1. Connect the display cables before connecting the power cable.
 - a. The 5-pin and 7-pin connectors (1 and 2) go the right LED display.
 - b. The 3-pin and 7-pin connectors (3 and 4) go to the left LED display.



10.7 Programmable Controller Cable Connections (with Slow Down)

If your display includes the Slow Down display option, note the following cable connections (**connect the display cables before connecting the power cable**):

1. The right LED display board connection cables are bundled together. Note the orientation of the wires. The index pins on the cable socket fit into notches in the board plug.
2. The left LED display board connection is a single cable with a 7-pin connector. Note the orientation of the wires. The index pins on the cable socket fit into notches in the board plug.
3. Jumper connection between left and right display. The cables exit the connector towards the opposite display board. The board plug pins may be on either the front or the back, but the cable installs the same way.
4. Cable connections to the SpeedCheck controller consist of four cables connected as shown in the photo below.



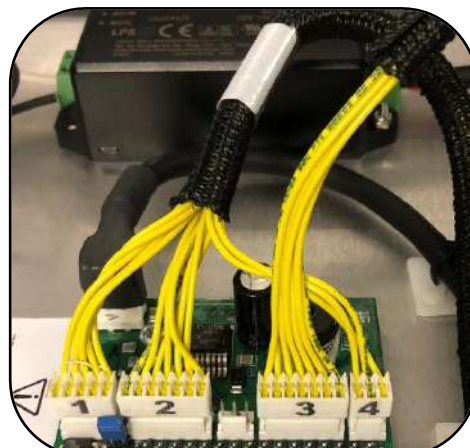
Left Display Board Connector



Right Display Board Connectors



Slow Down Interconnect



SpeedCheck Controller Connectors

11.0 Miami Dade County Hardware Compliance Requirements

SPEEDCHECK-15:

1. Solar or AC: The cabinet (if present) minimum bolt requirement is for two type 304 or 316 stainless steel 1/2"-13 U-bolts meeting the requirements of ASTM F593 with a minimum yield strength of 65KSI. Type 304 or 316 stainless steel lock washers shall be used with the U-bolts. The corresponding 1/2" nuts must meet the requirements of ASTM F594. U-bolts shall be torqued to 90 in-lbs. Cabinet mounts must be used with these appropriate 1/2" U-bolts. The display sign must be used with 4-6" OD round pole mount 88419 containing 85483 mounting plates. Display mounts can be used with banding or U-bolts.
2. Solar: Only Top of Pole Mount 74454 may be used with this system. This mount is supplied with 5/8"-11 galvanized steel bolts that meet the requirements of ASTM A307.
3. Solar: The standard plastic pole cap must be replaced with the metal 82865 pole cap kit.
4. Solar: The system must be used with 80W solar panel and 100Ah battery.

12.0 Customer Service and Warranty

The SPEEDCHECK-15/18 products are covered by a limited warranty for the product excluding batteries and a separate limited warranty for the batteries.

Visit support.carmanah.com for additional information or contact the customer support department.

Before contacting Carmanah's customer support department, please have the serial number of your system available, a brief description of the problem, as well as all details of the installation (location, pole type, type, and quantity of fixtures). The serial number can be found on the outside of the system on the bottom right corner of the enclosure.

To contact the Carmanah's Customer Support Department:

Mail: Carmanah Technologies Corporation
250 Bay Street
Victoria, BC Canada V9A 3K5

Phone: 1.250.380.0052
1.877.722.8877 (Toll Free in U.S. and Canada)

Fax: 1.250.380.0062

Email: customersupport@carmanah.com

Web: carmanah.com



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Worldwide: 1.250.380.0052

Fax: 1.250.380.0062

Web: carmanah.com