



STATE OF HAWAII  
DEPARTMENT OF HAWAIIAN HOME LANDS  
91-5420 Kapolei Parkway,  
Kapolei, HI. 96707

# **REFERENCE INFORMATION FOR BIDDING AND CONSTRUCTION**

FOR  
FURNISHING LABOR AND MATERIALS FOR  
**R & M OF STREETLIGHTS AND SIGNS IN  
VARIOUS DHHL SUBDIVISIONS ON OAHU**

ISLAND OF OAHU, HAWAII,

IFB No.: IFB-24-HHL-011

MARCH 2024



Specifications  
for the Class:

ELECTRICIAN I

**Distinguishing Characteristics**

This class reflects the fully competent worker level in the series.

An Electrician I independently performs a variety of skilled electrical work in the repair, maintenance and installation of electrical systems and equipment as a regular and continuing assignment, and may supervise one or more helpers assisting in the work.

This class differs from the Electrician Helper which performs duties that are essentially routine and repetitive, as well as manual and semi-skilled, and assists, under the supervision of a licensed electrician, in the repair, maintenance and installation of electrical systems and equipment.

This class differs from the Electrician II in that the Electrician I performs skilled electrical work in the repair, maintenance and installation of electrical systems and equipment and may occasionally lead the work of other skilled Electricians but mainly confines supervision to electrician helpers and other semi-skilled or unskilled workers; whereas the Electrician II, in addition to performing skilled electrical work as the major work assignment, supervises the work of skilled electricians as a continuing work assignment including setting the pace and quality of work.

**Examples of Duties:** *(Positions may not be assigned all of the duties listed, nor do the examples necessarily include all of the duties that may be assigned. The omission of specific statements does not preclude the assignment of such duties if they are a logical assignment for the position. The classification of a position should not be based solely on the examples of duties performed.)*

Installs conduits, transformers, traffic signals, airport signaling systems, pull boxes, and switches from drawings and blueprints; services and repairs pumps, motors, generators, switchboards, oil circuit breakers, and various other types of electrical equipment and apparatus; repairs and replaces broken or defective parts in motors, switches, and fixtures; tests, locates, and repairs trouble in electrical circuits and equipment; replaces fuses and incandescent and fluorescent lights; plans electrical installations; traces and diagrams wiring circuits; inspects traffic signal, street lighting, and airport lighting systems; reads blueprints and compiles materials list; may assign

tasks to electricians and supervise the work of helpers; may assist in other related trades when not utilized as an electrician.

**Minimum Qualification Requirements**

License Required: Applicants must possess a valid State of Hawaii Journey Worker Electrician License, Journey Worker Industrial Electrician License, Supervising Electrician License, or Supervising Industrial Electrician License.

Knowledge of: Practices and methods used in the electrical trade, including safety procedures and electrical code; tools, equipment and materials used in the electrical trade.

Ability to: Use hand and power tools common to the electrical trade; read and interpret blueprints, sketches, manuals and other materials; recognize hazards typical of the work; estimate time and materials needed to complete a job; understand and follow oral and written instructions; perform heavy lifting, moving and other manual work typical of the class.

**Physical and Medical Requirements**

Applicants must be able to perform the essential functions of the position effectively and safely, with or without reasonable accommodation.

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This is an amendment to the specifications for the class ELECTRICIAN I, which were approved on November 9, 1993.

DATE APPROVED: 7/16/2012

  
\_\_\_\_\_  
BARBARA A. KRIEG, Director  
Department of Human Resources Development

Specifications  
for the Class:

ELECTRICIAN II

**Distinguishing Characteristics**

This class reflects the working supervisor in the series.

An Electrician II, in addition to performing skilled electrical work in the repair, maintenance and installation of electrical systems and equipment, as a major work assignment, supervises the work of skilled electricians as a continuing work assignment, including setting the pace and quality of work.

This class differs from that of Electrician Supervisor I in that the Electrician II spends a majority of the work time performing skilled electrical work and, in addition, supervises other skilled electricians; whereas the Electrician Supervisor I plans, lays out and inspects the work of a group of several skilled electricians, and perhaps other workers, on a substantially full-time basis and only occasionally may perform skilled electrical work.

**Examples of Duties:** *(Positions may not be assigned all of the duties listed, nor do the examples necessarily include all of the duties that may be assigned. The omission of specific statements does not preclude the assignment of such duties if they are a logical assignment for the position. The classification of a position should not be based solely on the examples of duties performed.)*

Plans, lays out, assigns and reviews the work of electricians and participates in adjusting, repairing and maintaining electrical equipment and wiring systems; estimates time and materials needed to perform the various repair jobs; periodically inspects jobs underway to determine work progress and to assure that an adequate quality of work is being performed; periodically prepares reports of work accomplished, and the progress of jobs underway; reads and interprets blueprints and wiring diagrams of circuits and equipment; plans electrical installations; submits requisitions for electrical supplies, materials, tools and equipment; enforces safety regulations; periodically meets with electricians to discuss any major problems which may arise in work activities; may assist in other related trades when not utilized as an electrician.

**Minimum Qualification Requirements**

Applicants must possess one of the following:

1. A valid State of Hawaii Journey Worker Electrician License or Journey Worker Industrial Electrician License, **and** one (1) year of work experience as a licensed electrician performing work comparable to an Electrician I in the State service; **or**
2. A valid State of Hawaii Supervising Electrician License or Supervising Industrial Electrician License.

Knowledge of: Practices and methods used in the electrical trade, including safety procedures and electrical code; tools, equipment and materials used in the electrical trade.

Ability to: Use hand and power tools common to the electrical trade; read and interpret blueprints, sketches, manuals and other materials; recognize hazards typical of the work; estimate time and materials needed to complete electrical work and keep records and make reports; plan, lay out, assign and review the work of other skilled electricians; understand, give and follow oral and written instructions.

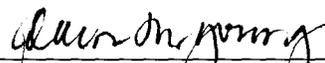
**Physical and Medical Requirements**

Applicants must be able to perform the essential functions of the position effectively and safely, with or without reasonable accommodation.

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This is an amendment to the specifications for the class ELECTRICIAN II, which were approved on November 9, 1992.

DATE APPROVED: 7/16/2012

  
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for BARBARA A. KRIEG, Director  
Department of Human Resources Development

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Specifications for the Class:

ELECTRICIAN HELPER

**Distinguishing Characteristics:**

Performs duties which are essentially routine and repetitive, as well as manual and semi-skilled, and assists, under the supervision of a licensed electrician, in the repair, maintenance and installation of electrical systems and equipment.

**Examples of Duties:** *(Positions may not be assigned all of the duties listed, nor do the examples necessarily include all of the duties that may be assigned. The omission of specific statements does not preclude the assignment of such duties if they are a logical assignment for the position. The classification of a position should not be based solely on the examples of duties performed.)*

Replaces light fixtures, street lights, outlets, switches, breakers, and relay controls; checks traffic lights to see that they are operating properly and makes minor replacements if necessary; digs pole holes, assists in setting poles, sends up equipment and tools with a hand line, and occasionally works on poles; assists in installing cable by preparing, tinning, and wiping metals, preparing lugs, nipples, and taps, and assists in installing racks and racking cable; assists in repairing and rewinding equipment, or performs such work under immediate supervision; assists in the installation of oil circuit breakers, transformers, and similar equipment in electrical distributing stations; performs simple trouble shooting on house lines; installs, maintains and repairs smaller electrical motors, generators and related electrical and mechanical equipment; installs, maintains and repairs refrigeration units, hot plates, fans, water heaters and other similar equipment; installs, maintains, and repairs house wiring, lighting, power appliances, overhead circuits and light machinery; may perform tasks in other building trades when not utilized as an Electrician Helper.

**Minimum Qualification Requirements:**

**Experience and Training:** Two (2) years of work experience in residential and/or commercial structural wiring and in the installation, alteration and repair of electrical equipment, wires and apparatus; or any equivalent combination of training and experience.

**Knowledge of:** Basic principles and practices of the electrical trade, including safety procedures; and common tools, equipment and materials used in the electrical trade.

**Ability to:** Use hand and power tools common to the electrical trade; read and

interpret sketches, simple plans, manuals and other materials; understand oral and written instructions; and perform heavy lifting, moving and other manual work typical of the class.

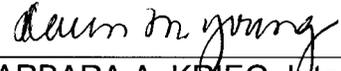
**Physical and Medical Requirements:**

Applicants must be able to perform the essential duties and responsibilities of the position effectively and safely, with or without reasonable accommodation.

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This is an amendment to the specifications for the ELECTRICIAN HELPER, which were approved on May 20, 1983.

DATE APPROVED: 2/1/2012

  
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BARBARA A. KRIEG, Interim Director  
Department of Human Resources Development

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Specifications for the Class:

GENERAL LABORER II

**Distinguishing Characteristics**

Positions in this class perform a variety of semi-skilled manual work tasks involved in the maintenance of roads, buildings, structures and equipment, or refuse collection work involving continuous heavy physical labor as a major work assignment.

This class differs General Laborer I in that the General Laborer II performs a variety of semiskilled manual work tasks involved in road, building and other maintenance projects, or performs refuse collection work involving continuous heavy physical labor as a major work assignment; whereas the General Laborer I performs unskilled manual labor work which does not require a high degree of manipulative skill nor continuous, arduous physical effort.

This class differs from General Laborer III which, in addition to performing a variety of semi-skilled manual work tasks as the major work assignment, supervises the work of a crew in performing a variety of unskilled and semi-skilled manual labor work tasks.

**Examples of Duties** *(Positions may not be assigned all of the duties listed, nor do the examples necessarily include all of the duties that may be assigned. The omission of specific statements does not preclude the assignment of such duties if they are a logical assignment for the position. The classification of a position should not be based solely on the examples of duties performed.)*

Helps erect wooden and steel scaffolding in and around buildings, scrapes and wire brushes structural steel, wire fences and other metal objects; applies metal primer and paint, using a brush or spray gun; clears roads of dirt, branches, rocks, mud and other obstructions after heavy rains; fills chuck holes with rock; repairs and patches road surfaces with oil, bitumuls or concrete; clears gutters, drains and outlets of obstructions such as rubbish, branches and rocks; lifts containers onto truck, empties contents in truck and returns containers to proper places; assists in erecting concrete forms and mixing and pouring concrete; repairs and patches concrete sidewalks; paints and repairs guard rails and signs; assists in repairing wooden bridges; clears irrigation ditches and removes obstructions such as rocks, mud and weeds and assists a carpenter in repairing wooden irrigation flumes; drills holes in concrete floors with jackhammer; saturates ground areas with solution to kill termites; sprays attics and under pinnings of houses with wood preservative; tears out termite-infested wood from

porches, steps, doors, floorings, window sashes, joists and ceilings; paints all new woodwork with wood preservative; assists a carpenter in repairing leaky roofs with roofing cement and replaces areas with mineral surface paper; replaces burnt out light bulbs; under the supervision of an electrician, repairs light sockets, switches and electrical outlets and replaces fuses; assists a carpenter in hanging doors, replacing window panes, window screen frames, clothes line poles, flooring and door jambs; under the supervision of a plumber, replaces faucet and shower valves, washers, sink and basin traps, hose bibbs and tank bulbs; clears clogged toilets, sinks and basin drain pipes; overhauls, cleans and repairs stoves and burners; assists a painter in preparing surfaces for painting; services motorized equipment by checking and filling gasoline tanks, checking and filling oil in crank case, checking and filling water in batteries, checking air pressure in tires, filling water in radiators and repairing flat tires; washes and greases cars; checks mufflers, springs, brakes, and exhaust pipes and reports findings to a mechanic; assists a carpenter in carrying building materials, supplies and equipment to and from job sites; digs post holes and repairs fences in forest reserve areas; operates a passenger type power mower in cutting grass on public grounds; as lead man, baits, sets and checks rat trap lines for the eradication of rats; operates a pickup truck to transport a work crew, materials, supplies and/or equipment to and from job sites; operates a buster, concrete mixer or similar equipment as a regular work assignment; occasionally assists a plumber in cutting, reaming and threading pipe or a mechanic in cleaning mechanical equipment and shop tools; and performs continuous heavy physical labor in refuse collection as the major work assignment.

### **Minimum Qualification Requirements**

**Experience and Training:** One (1) year of manual unskilled and semi-skilled work experience in general construction and/or maintenance; or any equivalent combination of training and experience.

**Knowledge of:** Common hand tools and equipment used in manual unskilled and semi-skilled work in general construction and/or maintenance; and common methods, procedures, and materials used in general construction and maintenance work, including safety practices.

**Ability to:** Use common hand tools and equipment typical of the class; understand and carry out oral and written instructions; and perform heavy lifting, moving, digging or other manual work typical of the class.

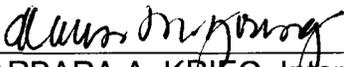
**Physical and Medical Requirements**

Applicants must be able to perform the essential functions of the position effectively and safely, with or without reasonable accommodation.

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This is an amendment to the specifications for the class GENERAL LABORER II which were approved on December 13, 1984.

DATE APPROVED: 3/27/2012

  
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BARBARA A. KRIEG, Interim Director  
Department of Human Resources Development

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Specifications for the Class:

GENERAL LABORER III

**Distinguishing Characteristics**

This class reflects a working supervisor responsible for supervising a work crew and participating in the performance of a variety of repetitive, unskilled and semi-skilled manual work tasks in connection with the construction, maintenance or repair of roads, grounds, buildings, and equipment.

This class differs from General Laborer II in that the General Laborer III, in addition to performing a variety of semi-skilled manual work tasks as the major work assignment, supervises the work of a crew in performing a variety of unskilled and semi-skilled manual work tasks.

**Examples of Duties** *(Positions may not be assigned all of the duties listed, nor do the examples necessarily include all of the duties that may be assigned. The omission of specific statements does not preclude the assignment of such duties if they are a logical assignment for the position. The classification of a position should not be based solely on the examples of duties performed.)*

Plans work schedule, assigns work to crew; supervises and participates in cleaning ditches, gutters, culverts, siphons, manholes, and drainage systems; supervises and participates in cutting grass, weeding, mowing lawns, and cleaning sidewalks, highway shoulders, medial strips or other roadside areas; supervises and participates in trimming overhanging branches of trees on roads; supervises and participates in making minor repairs to buildings such as removing rotted and termite infested boards; supervises and participates in collecting and disposing rubbish; supervises and participates in digging trenches and leveling sidewalk areas; supervises and participates in repairing and patching broken pavement, curbs and highway shoulders; maintains drainage ditches and siphons for proper drainage; supervises others in repairing guard rails, traffic signs, markers and wooden bridges; supervises and participates in widening, repairing and resurfacing wearing surfaces of highways; keeps records of work activities of subordinates and prepares periodic time and equipment reports; patrols the assigned section of highway during storms, watches for hazardous conditions such as mud, boulders and trees and other obstructions on pavement and removes same; marks danger areas when necessary; confers with superiors concerning the progress of work assignments and the work performance of subordinates; may keep inventory of supplies and equipment used; may keep time

records; may submit written reports of activities; and may operate a pickup truck to transport a work crew, materials, supplies and/or equipment to and from job sites.

**Minimum Qualification Requirements**

Experience and Training: Three (3) years of manual unskilled and semi-skilled work experience in general construction and/or maintenance; or any equivalent combination of training and experience.

Knowledge of: Common hand tools and equipment used in manual unskilled and semi-skilled work in general construction and maintenance; common methods, procedures and materials used in general construction and maintenance work, including safety practices.

Ability to: Operate and maintain simple construction and maintenance tools and equipment, deal effectively with subordinates and obtain good results from workers supervised; give and receive both oral and written instructions; plan, lay out, assign and review the work of other laborers; perform heavy lifting, moving, digging or other manual work typical of the class.

**Physical and Medical Requirements**

Applicants must be able to perform the essential functions of the position effectively and safely, with or without reasonable accommodation.

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This is an amendment to the specifications for the class GENERAL LABORER III, which were approved on December 13, 1984.

DATE APPROVED: 3/27/2012

  
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BARBARA A. KRIEG, Interim Director  
Department of Human Resources Development

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Class Specifications  
for the Class:

TRUCK DRIVER-LABORER

Duties Summary:

Operates medium and heavy trucks as a regular work assignment, and performs operational maintenance; performs manual, unskilled and semi-skilled work in the general construction and maintenance of roads and adjacent areas; and performs other related duties as assigned.

Distinguishing Characteristics:

This class differs from classes in the Truck Driver series in that the Truck Driver-Laborer is regularly assigned to operate medium (factory rated capacity of 1-1/2 tons and over, but less than 5 tons), and heavy (factory rated capacity of 5 tons and over) trucks, but spends a major portion of the work time in performing manual, unskilled and semi-skilled work; whereas classes in the Truck Driver series are responsible for operating and maintaining trucks as a major work assignment and may perform manual work as an auxiliary or sporadic assignment.

This class differs from the class General Laborer II in the Truck Driver-Laborer, although spending a major portion of time performing manual, unskilled and semi-skilled work, is regularly assigned to operate medium and heavy trucks on a continuing basis; whereas the General Laborer II performs manual work which includes tasks that require some manipulative skill, but does not include the operation of medium and heavy trucks on a regular or continuing basis.

Examples of Duties:

Operates dump trucks to haul rocks, gravel, dirt and other material; operates a tank truck to haul water to landscaped areas; operates water pumps and waters plants and grass with hose or spray attachments; plants trees, shrubs and grass along landscaped areas of the highway; prunes trees and shrubs; cultivates and weeds landscaped areas; cleans ditches and culverts; cuts grass along highways; assists in building or repairing stonewalls, guard rails and patching pavement; performs a variety of manual, unskilled and semi-skilled work in the general construction and maintenance of roads, buildings, structures and equipment; keeps records of supplies and materials used in maintaining landscaped areas such as insecticides and fertilizers; may supervise a helper assisting in the maintenance of landscaped areas.

Knowledge, Skills and Abilities Required:

Knowledge of: Common hand tools and equipment used in manual, unskilled and semi-skilled work; common methods, procedures and materials used in general construction and maintenance work; method of operating motorized equipment representative of the class; the capacity and uses of motorized equipment representative of the class; laws, ordinances, rules and regulations governing the operation of motor vehicles on streets and highways; hazards and safety precautions applicable to the operation of motorized equipment representative of the class.

Ability to: Operate motorized equipment representative of the class skillfully and safely; understand and follow oral and written instructions; perform minor maintenance work on equipment representative of the class; perform lifting, carrying or other manual work typical of the class; operate simple machinery; understand and observe traffic laws and rules; learn a variety of semi-skilled work tasks; operate simple machinery.

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This is an amendment (format change only) to the class specification for the class TRUCK DRIVER-LABORER approved on December 3, 1985.

DATE APPROVED: 4/23/91

SHARON Y. MIYASHIRO  
Director of Personnel Services

State of Hawaii  
DEPARTMENT OF HUMAN RESOURCES DEVELOPMENT  
SALARY SCHEDULE

Effective Date: 07/01/2023

Bargaining Unit: 01 Blue Collar, Non-Supervisor

		A			A			A			A
BC01	ANN	47,580	BC09	ANN	64,668	WS01	ANN	49,308	WS09	ANN	68,616
	MON	3,965		MON	5,389		MON	4,109		MON	5,718
	8HR	183.04		8HR	248.72		8HR	189.68		8HR	263.92
	HRLY	22.88		HRLY	31.09		HRLY	23.71		HRLY	32.99
BC02	ANN	48,228	BC10	ANN	67,116	WS02	ANN	51,588	WS10	ANN	71,052
	MON	4,019		MON	5,593		MON	4,299		MON	5,921
	8HR	185.52		8HR	258.16		8HR	198.40		8HR	273.28
	HRLY	23.19		HRLY	32.27		HRLY	24.80		HRLY	34.16
BC03	ANN	49,596	BC11	ANN	69,564	WS03	ANN	53,088	WS11	ANN	73,812
	MON	4,133		MON	5,797		MON	4,424		MON	6,151
	8HR	190.72		8HR	267.52		8HR	204.16		8HR	283.92
	HRLY	23.84		HRLY	33.44		HRLY	25.52		HRLY	35.49
BC04	ANN	51,588	BC12	ANN	72,240	WS04	ANN	55,224	WS12	ANN	76,500
	MON	4,299		MON	6,020		MON	4,602		MON	6,375
	8HR	198.40		8HR	277.84		8HR	212.40		8HR	294.24
	HRLY	24.80		HRLY	34.73		HRLY	26.55		HRLY	36.78
BC05	ANN	53,652	BC13	ANN	74,868	WS05	ANN	57,468	WS13	ANN	79,392
	MON	4,471		MON	6,239		MON	4,789		MON	6,616
	8HR	206.32		8HR	287.92		8HR	221.04		8HR	305.36
	HRLY	25.79		HRLY	35.99		HRLY	27.63		HRLY	38.17
BC06	ANN	55,800	BC14	ANN	77,724	WS06	ANN	59,760	WS14	ANN	82,332
	MON	4,650		MON	6,477		MON	4,980		MON	6,861
	8HR	214.64		8HR	298.96		8HR	229.84		8HR	316.64
	HRLY	26.83		HRLY	37.37		HRLY	28.73		HRLY	39.58
BC07	ANN	58,032	BC15	ANN	80,640	WS07	ANN	62,148	WS15	ANN	85,476
	MON	4,836		MON	6,720		MON	5,179		MON	7,123
	8HR	223.20		8HR	310.16		8HR	239.04		8HR	328.72
	HRLY	27.90		HRLY	38.77		HRLY	29.88		HRLY	41.09
BC08	ANN	60,408				WS08	ANN	64,620			
	MON	5,034					MON	5,385			
	8HR	232.32					8HR	248.56			
	HRLY	29.04					HRLY	31.07			

State of Hawaii  
DEPARTMENT OF HUMAN RESOURCES DEVELOPMENT  
SALARY SCHEDULE

Effective Date: 07/01/2024

Bargaining Unit: 01 Blue Collar, Non-Supervisor

		A			A			A			A
BC01	ANN	49,956	BC09	ANN	67,896	WS01	ANN	51,768	WS09	ANN	72,048
	MON	4,163		MON	5,658		MON	4,314		MON	6,004
	8HR	192.16		8HR	261.12		8HR	199.12		8HR	277.12
	HRLY	24.02		HRLY	32.64		HRLY	24.89		HRLY	34.64
BC02	ANN	50,640	BC10	ANN	70,476	WS02	ANN	54,168	WS10	ANN	74,604
	MON	4,220		MON	5,873		MON	4,514		MON	6,217
	8HR	194.80		8HR	271.04		8HR	208.32		8HR	286.96
	HRLY	24.35		HRLY	33.88		HRLY	26.04		HRLY	35.87
BC03	ANN	52,080	BC11	ANN	73,044	WS03	ANN	55,740	WS11	ANN	77,508
	MON	4,340		MON	6,087		MON	4,645		MON	6,459
	8HR	200.32		8HR	280.96		8HR	214.40		8HR	298.08
	HRLY	25.04		HRLY	35.12		HRLY	26.80		HRLY	37.26
BC04	ANN	54,168	BC12	ANN	75,852	WS04	ANN	57,984	WS12	ANN	80,328
	MON	4,514		MON	6,321		MON	4,832		MON	6,694
	8HR	208.32		8HR	291.76		8HR	223.04		8HR	308.96
	HRLY	26.04		HRLY	36.47		HRLY	27.88		HRLY	38.62
BC05	ANN	56,340	BC13	ANN	78,612	WS05	ANN	60,336	WS13	ANN	83,364
	MON	4,695		MON	6,551		MON	5,028		MON	6,947
	8HR	216.72		8HR	302.32		8HR	232.08		8HR	320.64
	HRLY	27.09		HRLY	37.79		HRLY	29.01		HRLY	40.08
BC06	ANN	58,596	BC14	ANN	81,612	WS06	ANN	62,748	WS14	ANN	86,448
	MON	4,883		MON	6,801		MON	5,229		MON	7,204
	8HR	225.36		8HR	313.92		8HR	241.36		8HR	332.48
	HRLY	28.17		HRLY	39.24		HRLY	30.17		HRLY	41.56
BC07	ANN	60,936	BC15	ANN	84,672	WS07	ANN	65,256	WS15	ANN	89,748
	MON	5,078		MON	7,056		MON	5,438		MON	7,479
	8HR	234.40		8HR	325.68		8HR	250.96		8HR	345.20
	HRLY	29.30		HRLY	40.71		HRLY	31.37		HRLY	43.15
BC08	ANN	63,432				WS08	ANN	67,848			
	MON	5,286					MON	5,654			
	8HR	244.00					8HR	260.96			
	HRLY	30.50					HRLY	32.62			

**DESCRIPTION OF AREAS**

SUBDIVISION	ISLAND	ZONE	SECTION	PLAT	LINKS
Kalawahine Streamside Subdivision in Papakolea	1	2	4	043	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o24043.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o24043.pdf</a>
Waimanalo Residence Lots	1	4	1	016	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o41016.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o41016.pdf</a>
Waimanalo Residence Lots	1	4	1	019	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o41019.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o41019.pdf</a>
Waimanalo Residence Lots	1	4	1	020	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o41020.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o41020.pdf</a>
Waimanalo Residence Lots	1	4	1	021	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o41021.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o41021.pdf</a>
Waimanalo Residence Lots	1	4	1	029	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o41029.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o41029.pdf</a>
Waimanalo Residence Lots	1	4	1	030	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o41030.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o41030.pdf</a>
Waimanalo Residence Lots	1	4	1	031	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o41031.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o41031.pdf</a>
Waimanalo Residence Lots	1	4	1	036	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o41036.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o41036.pdf</a>
Waimanalo Residence Lots	1	4	1	037	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o41037.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o41037.pdf</a>
Waimanalo Residence Lots	1	4	1	038	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o41038.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o41038.pdf</a>
Kumuhau Subdivision, Waimanalo	1	4	1	040	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o41040.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o41040.pdf</a>
Kakaina Subdivision, Waimanalo	1	4	1	041	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o41041.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o41041.pdf</a>
Princess Kahanu Subdivision, Nanakuli	1	8	7	042	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o87042.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o87042.pdf</a>
Princess Kahanu Subdivision, Nanakuli	1	8	7	043	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o87043.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o87043.pdf</a>
Nanakuli Residence Lots	1	8	9	002	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o89002.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o89002.pdf</a>
Nanakuli Residence Lots	1	8	9	003	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o89003.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o89003.pdf</a>
Nanakuli Residence Lots	1	8	9	004	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o89004.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o89004.pdf</a>
Nanakuli Residence Lots	1	8	9	005	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o89005.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o89005.pdf</a>
Nanakuli Residence Lots	1	8	9	006	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o89006.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o89006.pdf</a>
Nanakuli Residence Lots	1	8	9	009	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o89009.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o89009.pdf</a>
Nanakuli Residence Lots	1	8	9	010	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o89010.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o89010.pdf</a>
Nanakuli Residence Lots	1	8	9	011	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o89011.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o89011.pdf</a>
Nanakuli Residence Lots	1	8	9	012	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o89012.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o89012.pdf</a>
Nanakuli Residence Lots	1	8	9	013	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o89013.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o89013.pdf</a>
Nanakuli Residence Lots	1	8	9	014	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o89014.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o89014.pdf</a>
Nanakuli Residence Lots	1	8	9	015	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o89015.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o89015.pdf</a>
Nanakuli Residence Lots	1	8	9	017	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o89017.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o89017.pdf</a>
Nanakuli Residence Lots	1	8	9	'016	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o89016.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o89016.pdf</a>
Kauluokahai Subdivision, Kapolei	1	9	1	110	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o91017.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o91017.pdf</a>
Maluohai Subdivision, Kapolei	1	9	1	119	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o91119.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o91119.pdf</a>
Maluohai Subdivision, Kapolei	1	9	1	120	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o91120.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o91120.pdf</a>
Kaupea Subdivision, Kapolei	1	9	1	139	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o91139.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o91139.pdf</a>
Kaupea Subdivision, Kapolei	1	9	1	140	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o91140.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o91140.pdf</a>
Kanehili Subdivision, Kapolei	1	9	1	152	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o91152.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o91152.pdf</a>
Kanehili Subdivision, Kapolei	1	9	1	153	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o91153.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o91153.pdf</a>
Waiana'e Residence Lots	1	8	5	036	<a href="http://qpublic9.qpublic.net/hi_honolulu_plats/o85036.pdf">http://qpublic9.qpublic.net/hi_honolulu_plats/o85036.pdf</a>



carmanah®

SPEEDCHECK MANAGER/TRAFFIC ANALYZER CONFIGURATION GUIDE

SpeedCheck®

For the SPEEDCHECK-12/15/18



**SPEEDCHECK-12**

**SPEEDCHECK-15/18**

85405\_GUIDE\_SpeedCheck-Manager\_RevE

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## 1.0 Software Installation

### 1.1 Introduction

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SpeedCheck Manager is designed for use with SpeedCheck devices manufactured after January of 2002. Field upgrades are available for all units manufactured before that date. The latest version of the software can be found here: [support.carmanah.com](http://support.carmanah.com). Navigate to the software section and fill out the form to download the software. The software can also be included with the install / Bluetooth dongle programming kit.

**Note before installing - previous DeviceManager or DisplayManager users:** the installer will preserve your previous data files and Scheduler settings. The installer will prompt you to make a backup copy of your files if you so desire. All files in the My Documents\SpeedCheck folder will be moved to the new directory location of:

- Windows 7, 10 & 11 – C:\Users\Public\Documents\Carmanah Technologies\SpeedCheck Manager\Data Files

The legacy Excel based TrafficAnalyzer has been replaced with a version which does not require Excel, known as SpeedCheck Traffic Analyzer. The legacy data has been saved in the Data Files folder in a folder named “Old Data Files”. SpeedCheck Manager / Traffic Analyzer must be installed with administrative privileges (right click the installer and click “run as administrator”).

#### SpeedCheck Manager/Traffic Analyzer Overview

SpeedCheck Manager – runs on a personal computer (PC) enabling the user to set up the various functions of the SpeedCheck display or flasher including event scheduling and downloading vehicle speed data. This software was previously known as DisplayManager or DeviceManager.

SpeedCheck Traffic Analyzer – runs on a PC enabling the user to process the raw data and provide visual aids for analysis of the traffic speed data gathered by the SpeedCheck display. This software was previously known as TrafficAnalyzer.

Note: Using a Palm device to program and download data: The Palm E2 and TX are not compatible with the latest firmware and software. Palm is no longer selling new PDA devices and is no longer support by Carmanah.

#### System Requirements

- PC running Windows 7 or later
- Microsoft .NET 4.5.2 or newer. The latest version of .NET can be found here: <https://dotnet.microsoft.com/download/dotnet-framework>

### 1.2 Installation and Configuration

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1. The installer must have Administration rights to move forward with the installation.
2. Confirm you have the USB flash drive or digital download of the software.
3. Run the installer executable and follow the prompts on the screen to complete the installation.
4. Confirm you now have desktop icons for SpeedCheck Manager and SpeedCheck Traffic Analyzer.

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## 2.0 SpeedCheck Manager (PC)

### 2.1 Communication

---

The SpeedCheck Manager application provides communication between a Windows-based PC and SpeedCheck radar feedback/advisory signs and flashers.

SpeedCheck Manager is designed to communicate directly with a sign or flasher via Bluetooth, direct serial connection (Cable), or remotely via cellular (Network).

- A USB Bluetooth dongle is shipped with each order, which is to be used for PCs that do not have native Bluetooth radio. Some native Bluetooth modules may not be compatible with SpeedCheck Manager – in these instances use a USB Bluetooth dongle. See [Section 5.0](#).
- Serial connections require that your PC has a RS-232 serial port available. Alternatively, a serial-to-USB adapter can be used instead. The serial connection requires a custom cable that is installed into the SpeedCheck controller located inside the system.

### 2.2 Operation

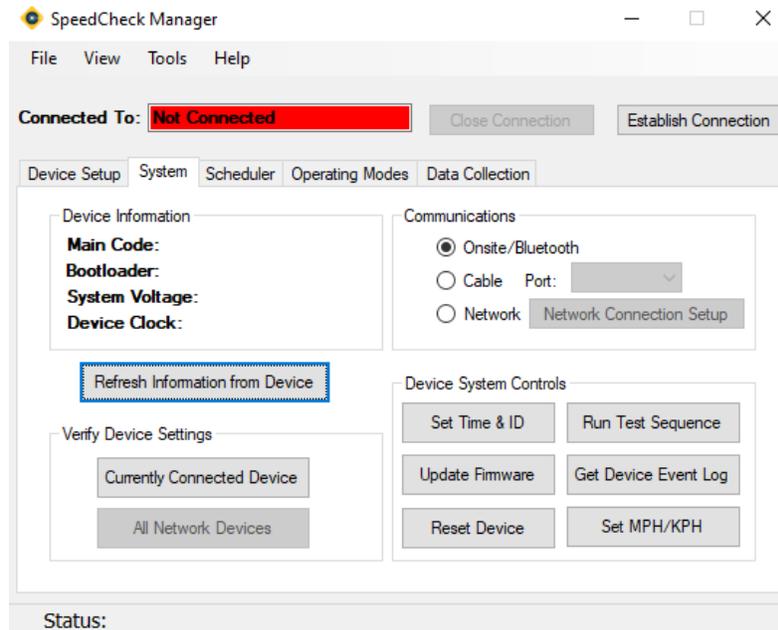
---

SpeedCheck Manager allows the setting of communication and operation parameters of the SpeedCheck system. There are six basic steps in using SpeedCheck Manager:

1. Select the communication method (Bluetooth, Cable, Network).
2. Establish a connection with the system.
3. Set the system's internal clock/calendar and provide an alphanumeric name for the system (Set Time & ID).
4. Select whether one set or two sets of speed settings will be used, or if the Scheduler is to be used (Device Setup/Operating Modes/Scheduler).
5. Enter the desired parameters under Operating Modes/Scheduler based on step 4.
6. Apply the settings to program the sign.

## 2.3 System Tab

Upon starting SpeedCheck Manager the software will show the System tab below:



You will note that several tabs are displayed which allow setting of various options. Which tabs show will be based on system configuration:

- Scheduler only shows when selected as an operating mode under Device Setup, if enabled at the factory by Carmanah.
- Data Collection only shows if enabled at the factory by Carmanah.

Both Scheduler and Data Collection were optional add-ons previously and are now shipped as standard features by Carmanah starting in 2020 Q1.

The Scheduler tab allows for creating and editing schedules without being connected to a system. Schedules can then be sent to the system once a connection is established.

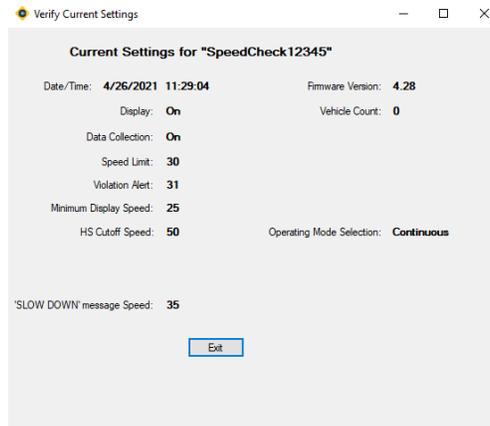
All other tabs require a connection to be established before changes can be made.

### Refresh Information From Device

Refreshes the screen for any updates to the currently connected system.

## Currently Connected Device

Provides a snapshot of the settings from the currently connected system.



## Software Version

The version number of SpeedCheck Manager can be found by click on **Help** → **About SpeedCheck Manager**.



## 2.4 Communications

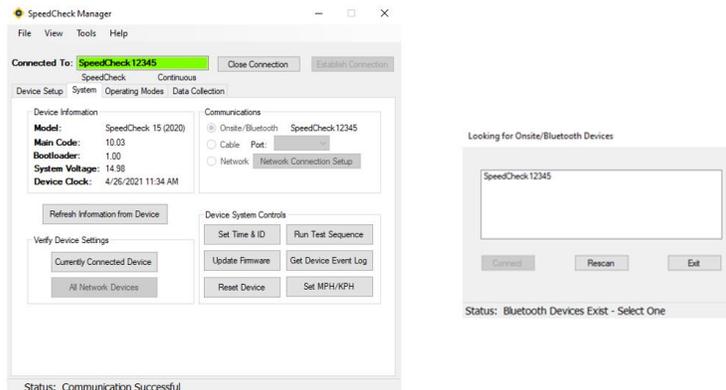
A communications method must be chosen before establishing a connection. Each communication method requires its own unique hardware setup.

- Bluetooth – Local wireless connectivity; requires a PC with internal or external Bluetooth capabilities. You must be within range (less than 100 feet, and the closer the better) of the system to send and receive data when using Bluetooth.
- Cable – Local wired connectivity; requires an RS-232 serial port connection or serial-to-USB adapter. A custom cable from Carmanah is also required to connect to the system.
- Network – Remote wireless connectivity; requires each system to have the following:
  - Cellular connectivity configured with an active cellular modem
  - Ethernet connectivity configured with a serial-to-Ethernet converter
    - See [support.carmanah.com](http://support.carmanah.com) for documentation on Ethernet connectivity
  - Internet access to connect to the system via a PC

## Bluetooth Connection Setup

The Bluetooth option allows you to scan for the system and connect to via the Establish Connection button. SpeedCheck systems by default will appear as “SpeedCheck#####” to distinguish from other Bluetooth enabled devices.

1. Insert the USB Bluetooth dongle into your PC (as required) or ensure the integrated Bluetooth is enabled.
2. Open SpeedCheck Manager.
3. Click on the Onsite/Bluetooth radio button, if it is not already selected.
4. Click on Establish Connection.
5. Bluetooth devices within range will appear in the window. Choose the correct system and click Connect.
  - a. If you don't know which system you are connected to, click on Run Test Sequence afterwards and look at the display LEDs to verify (if applicable). SpeedCheck Manager should now reflect that it is connected to the system.
  - b. Updated programmable control boards will require pairing the Bluetooth connection. Please refer to the SpeedCheck user manual at [support.carmanah.com](http://support.carmanah.com) for more information.
6. **The default password for all systems starting 2023 Q1 is “speedcheck”.**



## Serial Connection Setup (Cable)

The wired serial option allows the system to be connected using a custom supplied cable from Carmanah. The cable features an RS-232 serial connector that plugs into a PC supporting this port. Most modern PC's typically do not feature a serial port so a serial-to-USB adapter would be required instead.

1. Connect the serial cable to the PC.
2. Open SpeedCheck Manager.
3. Click on the Cable radio button, if it is not already selected.
4. Select the applicable available port.
5. If you are unsure which port to use, you can reference the Windows Device Manager applet to confirm which port number has been assigned by Windows.
6. Click on Establish Connection.
7. SpeedCheck Manager should now reflect that it is connected to the system.

## Remote Connection Setup (Network)

The remote connection option utilizes a cellular modem or serial-to-Ethernet converter (with Internet access) to connect to individual systems without leaving your office as if you were on site using the Bluetooth or serial option.

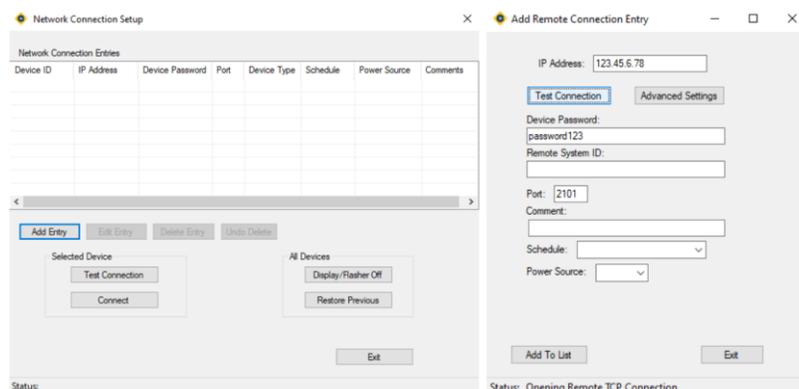
This option requires a cellular modem or serial-to-Ethernet converter installed at each system with a dedicated IP address and an Internet connection on the PC which will program the system remotely via SpeedCheck Manager. The system must be in an area with cellular coverage to send and receive data for the cellular option.

Resources required:

- SpeedCheck system
- Active cellular modem with a known dedicated IP address or DNS; or serial-to-Ethernet converter
- Windows based PC with SpeedCheck Manager and Internet connectivity

Each modem has a unique IP address. The Device ID as set in SpeedCheck Manager must also be unique and descriptive so you can identify each system.

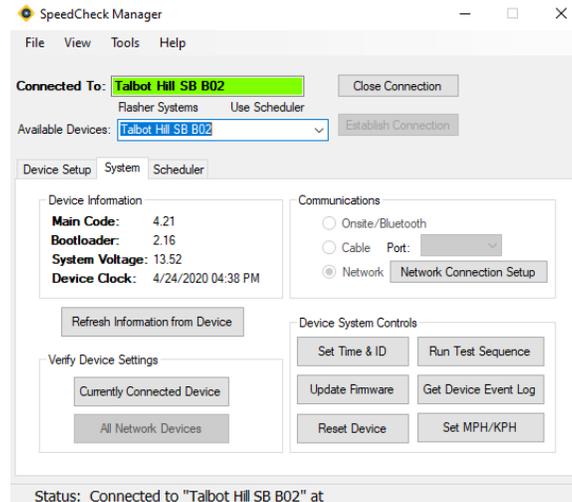
1. The cellular modem must be activated and configured with a valid dedicated IP address. Make sure the sign is powered on for at least two minutes before trying to connect.
2. Open SpeedCheck Manager.
3. Click on the Network radio button, if it is not already selected.
4. Click on Network Connection Setup.
5. Click on Add Entry.
6. Enter the IP address of the cellular modem.
7. If a password has been established for this particular system enter the password under Device Password.
8. Click on Test Connection. A successful connection will respond with "Remote System has responded with XXXXXX (name of system)".
9. Click Add to List to add the system.
10. Repeat this process for all other cellular-based systems.



Add, edit, or delete additional entries via the Network Connection Setup screen.

## Connecting to a Cellular or Networked System

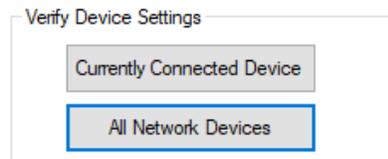
Once on the Network Connection Setup screen, choose the system you wish to connect to and click the Connect button. Alternatively, you can connect directly from the System tab and choose from a system under the Available Devices drop-down menu.



## All Networked Devices

You can quickly view all of the networked systems that have been entered via the following sequence:

- System tab → Verify Device Settings section → All Network Devices



This will attempt to connect to each system in your list. Once connected, each system will be populated with the current status for each column. Right-clicking on one of the columns will give you the ability to further choose which columns to display.

Device ID	IP Address	Comm Status	Power Source	System Voltage	Device Date	Device Time	Device Type	Output A	Output B	Operating Mode	Current Timetable	Current Operating Mode	Firmware Version	Comme...
	123.45.6...	Connecting...												

Last Refresh Time was 4/24/2020 4:46:51 PM

Buttons: Cancel, Refresh,  Enable Auto-Refresh, Print

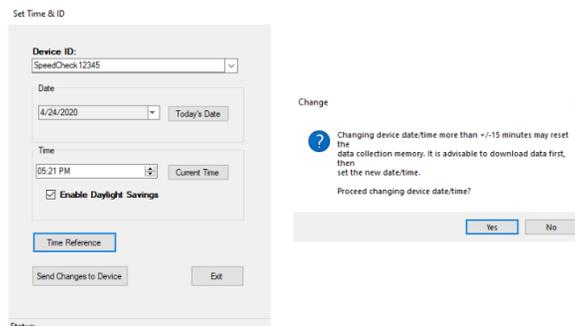
## 2.5 Device System Controls

- **Set Time & ID** – Allows you to enter a name for the sign location and set the internal date and time. The ID field allows for up to 24 alphanumeric characters. Be as specific as possible to distinguish between other signs nearby and when connecting remotely.
- **Run Test Sequence** – Initiates a display digit roll-up test (displaying in succession the numbers 01, 12, 23, 34, etc.) to test the operation, correct position, and connection of both the left and right display boards.
- **Update Firmware** – The SpeedCheck Manager comes packaged with the latest version of firmware available at the time when it is downloaded/installed. This feature allows you to update individual signs to the latest firmware version.
  - It is **not recommended** to update legacy systems running firmware version 3.47 or older to the latest firmware. A new hardware revision in 2021, known as the updated programmable control board, requires a firmware version (starting with 10.05) that is not compatible on older versions of hardware. Contact Carmanah for more information.
- **Get Device Event Log** – Opens a menu to show historical system logs.
- **Reset Device** – Performs a soft reset on the system and runs the test sequence. Wait for the system to completely reset before communicating with it. This can take up to 60 seconds.
- **Set MPH/KPH** – Used for the following scenarios:
  - Legacy programmable controller – uses current radar programming or converts the incoming data from the radar to mph or kph. This is only to be used for systems that may be inadvertently set to the incorrect unit of speed. It is recommended to leave the setting in Radar Default mode, otherwise the system may report inaccurate speeds.
  - Updated programmable controller – selects the appropriate unit of speed. Choose the correct unit based on your installation location. The updated programmable controller is easily identified as they do not require coin cell batteries. See page 12 for a visual representation.

### Set Time & ID

The Set Time & ID screen allows naming of the system location (24 alphanumeric characters), and internal clock/calendar. Adjusting the time may reset the data collection memory. If data collection is enabled, it is advised to download the current data first before adjusting the system date/time. Set the Device ID string to a recognizable name such as an intersection or landmark for the installation for later identification. For example, “2<sup>nd</sup> and Main St.” or “North Park Elementary NB”.

Time Reference will only show if you have the GPS “TimeKeeper” option installed. This button performs a time reference test via the GPS which takes up to two minutes.



## Update Firmware

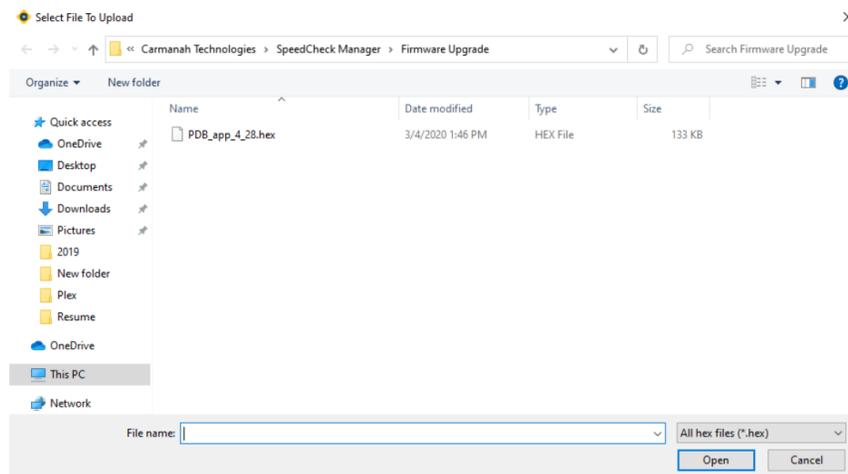
SpeedCheck Manager will automatically navigate to the folder with the latest firmware available, based on the software version. This means that newer versions of software may contain newer releases of firmware. The software looks for any .hex files available to use and will display accordingly.

Select the appropriate file and click Open and then Upload Firmware. This process can take up to 60 seconds to complete. After successfully uploading the new firmware, the sign will perform a soft reset and display roll-up. The date and time will need to be reset so it is recommended to download any radar data from the system first.

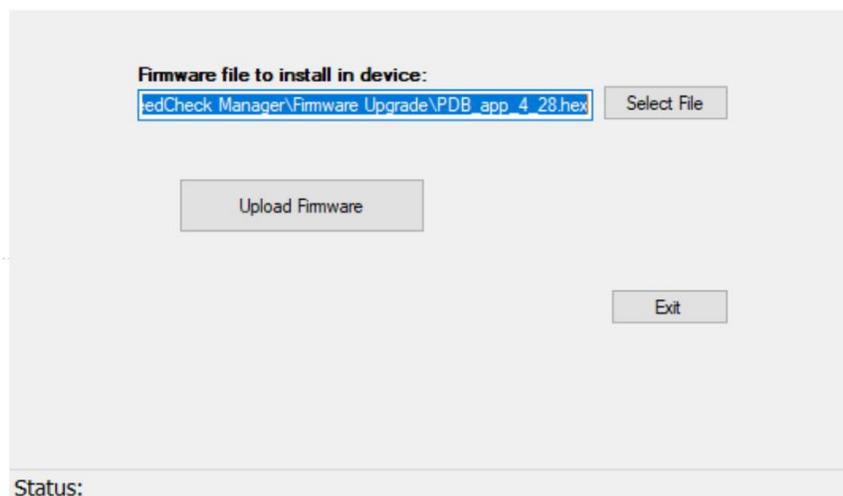
Note – if an operating schedule was active at the time of the firmware update process, that schedule will remain active. If the Scheduler feature was not in use the operating modes will remain as they were set under the Operating Modes tab prior to the firmware update.

Carmanah cannot guarantee firmware compatibility with legacy hardware. It is **not recommended** to upgrade any firmware version 3.47 or older.

Updated programmable controllers running firmware version 10.05 or newer are on a new hardware platform and are not compatible with legacy firmware versions 4.28 or older.



### Install New Firmware



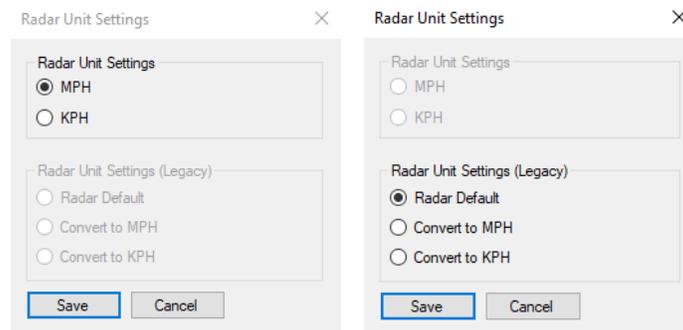
## Set MPH/KPH

SpeedCheck Manager will detect the firmware loaded into the system and restrict your options for this setting based on your hardware.

- **Updated Programmable Controller** – The controller will read back the current setting within the radar. User must select MPH or KPH under Radar Unit Settings for their application. This is normally preprogrammed based on your local requirements. This is for versions of the SpeedCheck controller that don't have coin cells but are Bluetooth programmable. Go to [support.carmanah.com](http://support.carmanah.com) for more information on the difference between controller revisions.
- **Legacy Programmable Controller** – Defaults to Radar Default. This means the controller interprets what the radar is set to already and passes this data through (no conversion is done).
  - Convert to MPH – the controller will take the data from the radar and apply a conversion to mph.
  - Convert to KPH – the controller will take the data from the radar and apply a conversion to kph.

This feature should be left in Radar Default unless the radar is inadvertently factory programmed to the incorrect unit of speed for your application. For example, if you notice that speeds are being detected at a much higher number than expected it can be assumed the radar is programmed for a kph application. Simply multiply the expected speed by 1.6 to confirm. In this example you can select **Convert to MPH** to rectify the issue.

Do not adjust this setting unless you are certain the radar is incorrectly set to the wrong unit of speed.



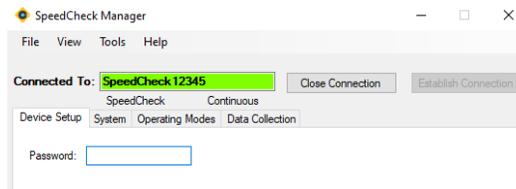
*Legacy Programmable Controller*



*Updated Programmable Controller*

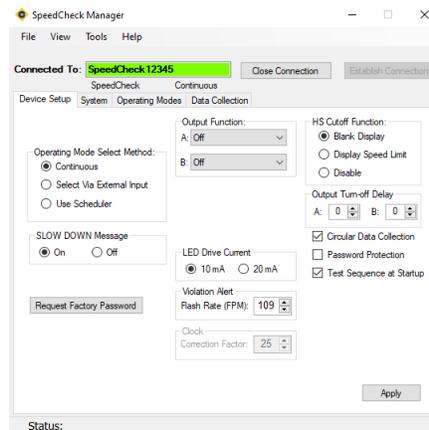
## 2.6 Device Setup Tab

The Device Setup tab is used to gain access to change the basic operating modes. The first time you access this tab after opening the software and connecting to the system will require the password “**unlock**”.



### Device Setup After Password Entered

After entering the password, you will see a screen similar to the one below. The available modes will change based on your system type and configuration.



### Operating Mode Select Method

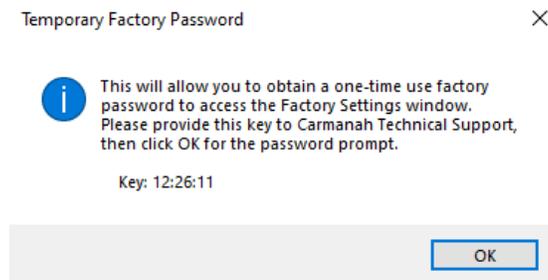
- **Continuous** – will provide one set of speeds on the Operating Modes tab to control operation of the system. The standard operating mode for most systems.
- **Select Via External Input** – will provide two sets of speeds on the Operating Modes tab to control operation of the system. One set is for normal operation and one set is for when an external input triggers the system, such as a time switch for a school zone application. **Mode 1** settings are for if the input to the system is open (not in use) and **Mode 2** settings are for if the input to the system is closed (in use). Additional hardware and cabling required for this feature. See [Section 2.7](#).
- **Use Scheduler** – this mode is used to create a schedule for when and how the system should function. Using this feature will no longer show the Operating Modes tab which will not be used for this application. Option will only be available if enabled at the factory by Carmanah. Starting 2020 Q1, this was feature was made standard on all orders at no additional charge.

### SLOW DOWN Message

- Option to turn on or off the Slow Down message after the speed limit has been exceeded. This is based on the Slow Down setting in the Scheduler or Operating Modes tab. Option will only be available if enabled at the factory by Carmanah for orders that contain LED boards with the slow down message.

## Request Factory Password

- Used to gain a one-time access into advanced factory settings. Contact Carmanah for more information. You must be on site with the six-digit date key to provide to Carmanah over the phone. This is required if you have a system with the Slow Down option installed but it is not available under the Device Setup tab.

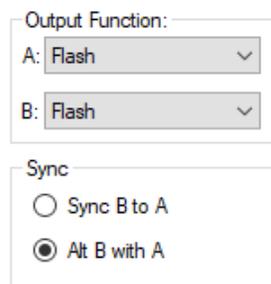


## Output Function

- For the A and B auxiliary outputs (flashing beacons, strobe, camera).
  - Off** – will turn off the selected output.
  - Continuous** – will provide a constant 12VDC signal to the selected output when the corresponding output activation speed is reached or exceeded.
  - Flash** – will provide a 50% duty cycle 12VDC signal (0.5s on, 0.5s off) to the selected output when the corresponding output activation speed is reached or exceeded.
  - Fast** – will provide a 12VDC signal which follows the display digit flashing rate to the selected output when the corresponding output activation speed is reached or exceeded.
  - Strobe** – will provide a 12VDC pulse to activate an external strobe device when the corresponding out activation speed is reached or exceeded.

## Sync

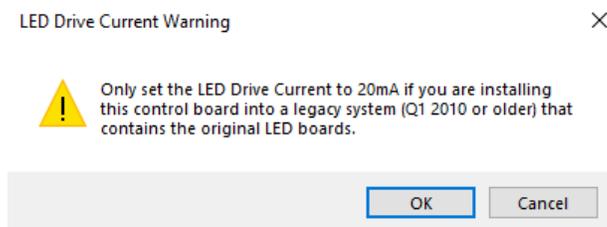
- Used to set Output A and Output B to either alternate or sync (unison) with each other. Option will only be available if Output A and B are set to either Flash or Fast.



**LED Drive Current** – User-selectable LED drive current for legacy systems running original LED boards. Contact Carmanah for clarification. This needs to be adjusted only if the following conditions are met:

- SpeedCheck controller is Bluetooth capable but does not have replaceable coin cell batteries (updated programmable controller).
- Serial number of system is 14550 or lower, manufactured in April 2010 or earlier, and contains original LED display boards.

Older legacy systems that meet the conditions above should have the drive current set to 20mA. Newer systems contain more efficient LED display boards and can run at a lower intensity (10mA) to achieve the same brightness. Running the system at the wrong intensity setting result in a dimmer looking display or higher than anticipated power draw.



### Violation Alert – Flash Rate (FPM)

- User selectable flash rate for the display digits. Default is set to 109 flashes per minute (fpm) which is triggered when the violation alert speed threshold has been met or exceeded. The valid range is between 30-150 fpm. The sign does not vary the flash rate as speed increases or decreases while above the violation alert speed. Requires firmware version 10.05 or later and the updated programmable control board. See [support.carmanah.com](http://support.carmanah.com) for more information on the updated programmable controller.

### Time Zone

- Select your time zone. Option will only be available if the GPS TimeKeeper option was purchased. Output Function B (flashing beacon) will not be available if the GPS TimeKeeper option is enabled.

### Clock Correction Factor

- The clock correction factor is used to improve the accuracy of the internal clock. Once per week, at 12:05 am on Sunday, the sign will apply this correction factor. The clock will always have some error due to temperature and other external affects. To determine the correction to apply, determine the amount of time gained or lost over the course of a week and add/subtract that amount of time to the current correction factor.

### HS (High Speed) Cutoff Function

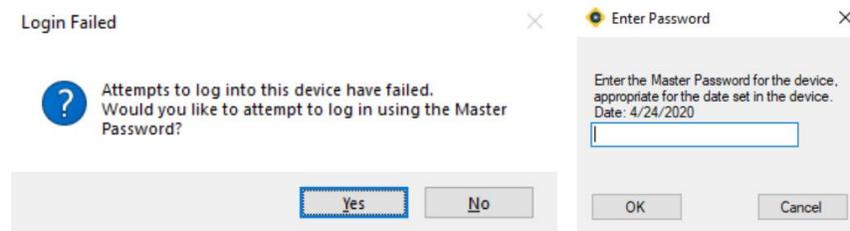
- **Blank Display** – will stop displaying speeds at or above the high speed cutoff value.
- **Display Speed Limit** – will display the speed limit at or above the high speed cutoff value.
- **Disable** – will continue display speeds up to the maximum value (99).

### Circular Data Collection

- Prevents the data memory from filling to a point where it stops connecting data. When nearly full (98% at 240,000 data points), the circular data option overwrites the oldest data records.

## Password Protection

- Enables the ability to assign a password to the system.
- Once this setting has been enabled you will be prompted to enter your selected password. You will then require this password each time you connect to the system. A network (cellular/Ethernet) accessed system only requires the password be entered the first time a connection is made, if not entered on the Network Connection Setup screen. Passwords are case sensitive and can be up to 12 characters long, restricted to ASCII codes 0 – 127.
- If you have forgotten the system password, you can enter an incorrect value five continuous times before the option for a Master Password will become available. Contact Carmanah when on site with the date that SpeedCheck Manager gives you as per below:



You will then be required to enter a new password for the system once you have gained access using the Master Password.

## Test Sequence at Startup

- Enables the LED display rollup sequence when the sign is first powered on. This feature is helpful to confirm the LED segments are coming on properly.

Press the **Apply** button once done making all changes to send the update to the system.

---

## 2.7 Operating Modes Tab

---

The Operating Modes tab shows various parameters set for system operation. A connection with the system must be established to see and change the settings. Some settings are visible only if the appropriate options are selected in the Device Setup tab ([Section 2.6](#)) or factory programmed by Carmanah.

This tab will show up to two columns of parameters. If you select **Continuous** in the Device Setup tab, there will only be one column of parameters available. If **External Input** is selected, a second column of parameters will be available. **Mode 1** settings are for if the input to the system is open (not in use) and **Mode 2** settings are for if the input to the system is closed (in use). Additional hardware and cabling required for this feature. If **Scheduler** is selected, the Operating Modes tab will not be available.

The following parameters can be set from a range of 0-99 (or On/Off):

### Display

- On or off.
- For radar-based systems, off will not show speeds on the LED display boards but will still collect vehicle speed data. This feature is useful if you wish to collect vehicle speed data without drivers being aware the system is in use.

### Data Collection

- On or off.
- For radar-based systems, collects vehicle speed data.
- Must be factory enabled by Carmanah. Starting 2020 Q1 this feature was made standard on all orders at no additional charge.

### Speed Limit

- Sets the speed limit entered into the speed sample data file for later reference. This needs to be set whether data collection is used or not.

### Violation Alert Speed

- Sets the speed at which the LED display boards begin flashing to alert drivers that they are exceeding the speed limit.

### SLOW DOWN Speed

- If installed and enabled, sets the speed at which the Slow Down message is activated. If you enable this without the Slow Down option install the LED display boards will flash "88" at and above this speed.

### High Speed Cutoff

- Sets the maximum speed displayed by the LED display boards. This is recommended to be set to a low enough value above the speed limit to discourage drivers using it to detect excessive speeds.

### Minimum Display Speed

- Sets the minimum speed displayed by the LED display boards. The lowest recommended speed is 5 mph or 8 kph.

### Output A Speed

- If enabled, sets the speed at which auxiliary Output A is to provide 12VDC for external devices.
- 0 = always on, 199 = disabled.

### Output B Speed

- If enabled, sets the speed at which auxiliary Output B is to provide 12VDC for external devices.
- 0 = always on, 199 = disabled.

### Output A/B – On or Off

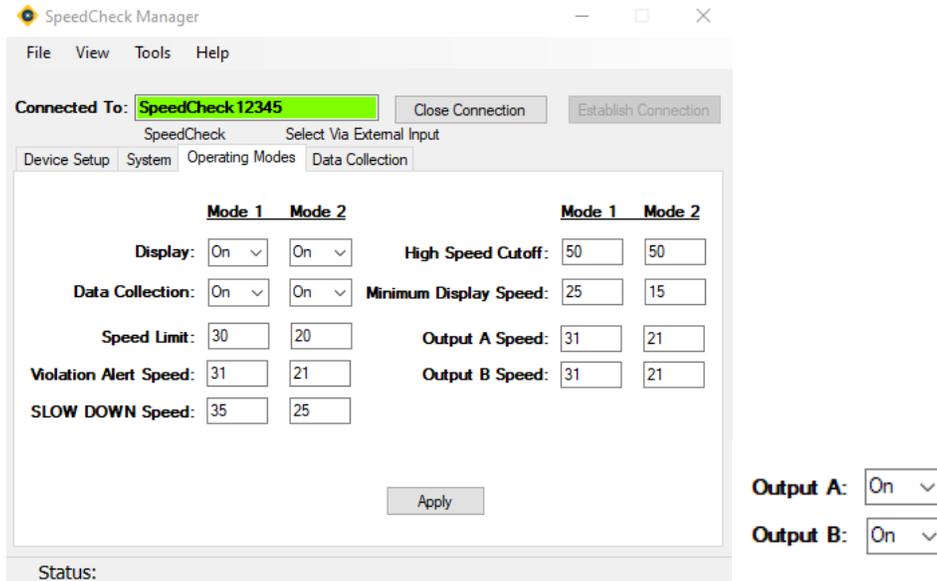
- Turns auxiliary Output A and Output B on or off.
- For flasher or strobe equipped systems only.

### Mode 1

- If enabled, these are the parameters when the **external input is not activated**.
  - For example, when using a time switch this would be the speed settings **during non-school hours**.

### Mode 2

- If enabled, these are the parameters when the **external input is activated**.
  - For example, when using a time switch this would be the speed settings **during school hours**.



The screenshot shows the SpeedCheck Manager software interface. The window title is "SpeedCheck Manager". The menu bar includes "File", "View", "Tools", and "Help". The "Connected To:" field shows "SpeedCheck 12345" with "Close Connection" and "Establish Connection" buttons. Below this, there are tabs for "Device Setup", "System", "Operating Modes", and "Data Collection". The "Operating Modes" tab is active, showing configuration options for Mode 1 and Mode 2. The options include:

	Mode 1	Mode 2	Mode 1	Mode 2
Display:	On	On	High Speed Cutoff:	50
Data Collection:	On	On	Minimum Display Speed:	25
Speed Limit:	30	20	Output A Speed:	31
Violation Alert Speed:	31	21	Output B Speed:	31
SLOW DOWN Speed:	35	25		

At the bottom of the configuration area is an "Apply" button. To the right of the configuration area, there are two "Output" controls: "Output A: On" and "Output B: On", each with a dropdown arrow.

Press the **Apply** button once done making all changes to send the update to the system.

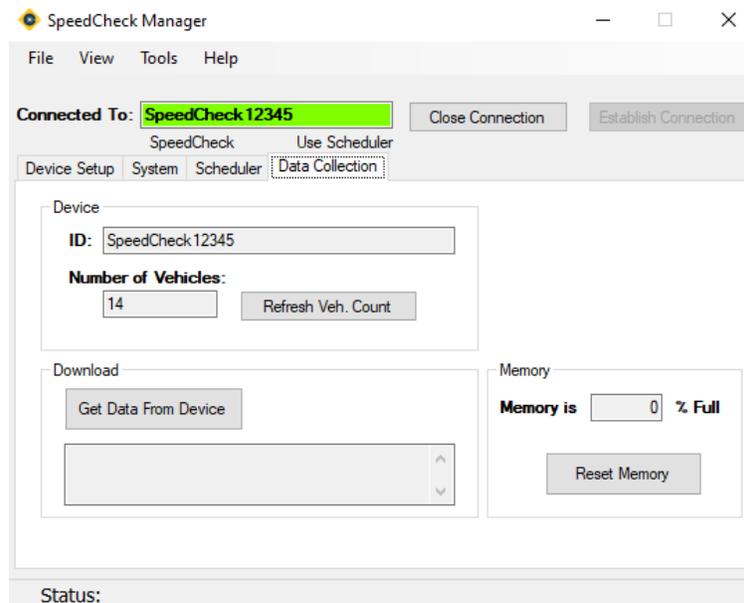
## 2.8 Data Collection Tab

The Data Collection tab allows for the following features:

- System ID naming
- Current vehicle count report
- Refresh vehicle count
  - Will update the current vehicle count since the screen was accessed
- Memory usage report
- Memory reset
- Download system data

This tab will only be available if enabled at the factory by Carmanah.

The data downloaded from the system will be able to be imported into SpeedCheck Traffic Analyzer for a more in-depth graphical analysis. See [Section 4.0](#) for more information.

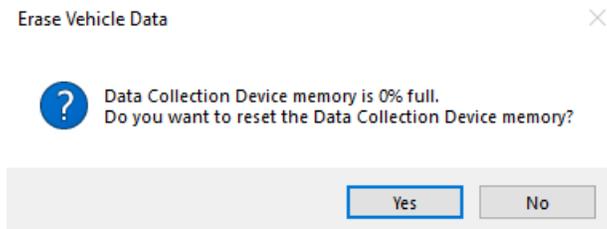


**Circular Data Collection** (see page 15), when activated, prevents the data memory from filling to a point where it stops collecting data. When nearly full (98% at 240,000 data points) the oldest data will begin to be overwritten.

## Downloading Data

The process for downloading stored speed data from a sign is the same whether your connection is via Bluetooth, serial cable, or network (cellular/Ethernet). Click on the **Data Collection** tab and then click on **Get Data From Sign**.

After the data is downloaded you will choose whether to reset your memory or not.



The data will be stored into a CSV file saved in this directory (Windows 7 and 10):

- C:\Users\Public\Documents\Carmanah Technologies\SpeedCheck Manager\Data Files

Files are automatically named and timestamped for proper identification.

## Data Accuracy

It is important to note that while using radar devices to detect vehicle speeds is very accurate, the use of this method for absolute vehicle counting is **not recommended**. This is simply due to the fact that radar detection works by the reflection of high frequency signals off of moving targets. Those targets (vehicles) each have unique size, shape, and reflection characteristics. Thus, a small car behind a truck will likely be missed in the count, and two like-sized cars travelling close together could be “dithered” – the radar cannot tell which target is measuring at that particular time. Occasional missed counts and multiple counts can result in errors in the total. However, the **speed values will remain accurate**, typically within +/- 1mph. For this reason we recommend that the speed data can be use as presented, but the vehicle counts should be considered relative in nature and should be supplemented by a hard data collection method like a road tube system if vehicle count accuracy is absolutely critical.

---

## 2.9 Scheduler Tab

---

This Scheduler tab allows for selection and editing of the following parameters:

- Operating Modes
- Daily Timetables
- Schedules
- Exceptions
- Manage Groups
- Send Schedule
- Read Schedule

Unique schedules for each system can be created, managed, and saved for future use using this tab. A nearly unlimited number of different schedules can be created in advance without being connected to a system.

This option will only be available if enabled at the factory by Carmanah and selected as the Operating Mode in the Device Setup tab. Starting 2020 Q1 this was feature was made standard on all orders at no additional charge.

### **Operating Modes**

- List of speed thresholds at which various options are triggered.

### **Daily Timetables**

- Selections of Operating Modes to be used at predetermined times during the day.

### **Schedules**

- Weekly programs of Daily Timetables.

### **Exceptions**

- Used to amend schedule for holidays, special events, or a range of dates such as school closures.

### **Manage Groups**

- Allows for assigning schedules to a group of systems and sending a saved schedule to a system or a group of systems via a cellular connection.

### **Send All Schedules**

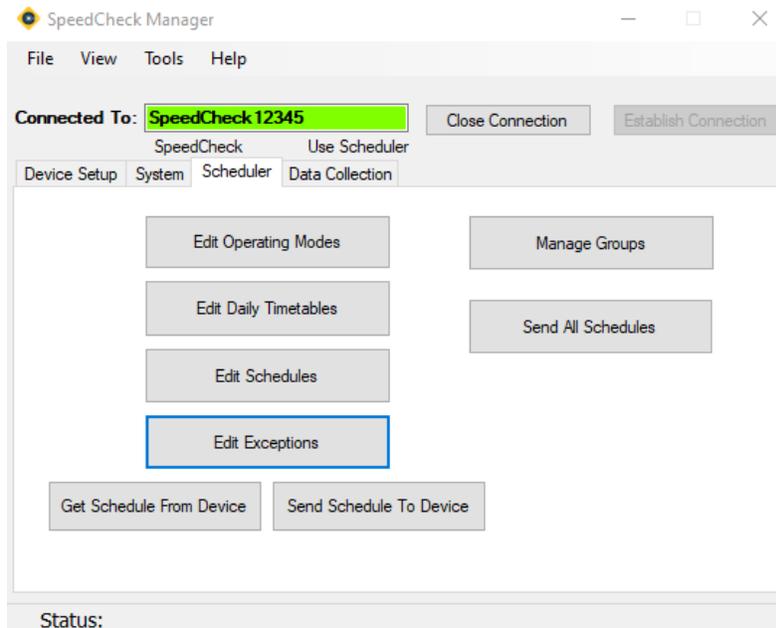
- Used to send schedules selected in Manage Groups to each system listed under the group or subgroup using that schedule.

### **Get Schedule From Sign**

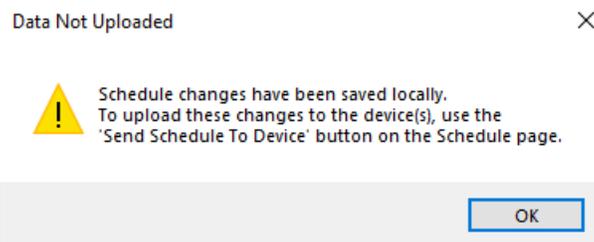
- Used to download the schedule from a system to confirm what is currently programmed. A TXT file will automatically open up with the downloaded schedule.

## Send Schedule To Sign

- Used to send a saved schedule to a system. Connect to the system and return to this screen and click on **Send Schedule To Sign** to choose the correct schedule from the list.



Making changes to the Operating Modes, Daily Timetables, or Schedules does not automatically send those saved changes to a system. After saving changes you will see a message reminding you to connect to the system and then send the changed schedule.



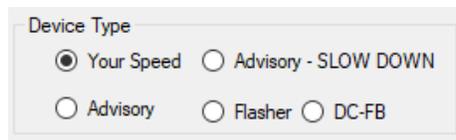
## Edit Operating Modes

You may configure nearly an unlimited number of **Operating Modes**. Each mode can be programmed with your choice of settings depending on the options purchased and selections in the Device Setup tab. Certain options not selected will have an impact on what is available to select. Click **Add Mode** to create a new operating mode.

Right-click on a mode name to rename, copy, or delete the mode. The **All Off** mode is available by default for your convenience; it cannot be renamed, copied, or deleted.

Each mode created must identify the **Device Type**:

- **Your Speed**: the most common system. Displays the speed reported by the radar with an optional slow down message.
- **Advisory**: displays the speed limit as a static number (radar disabled).
- **Advisory – SLOW DOWN**: displays the speed limit as a static number with slow down message when the speed limit is exceeded (radar enabled).
- **Flasher**: flashing beacon system only (radar optional).
- **DC-FB**: Device Controller-Flashing Beacon, external time switch and flasher controller for beacons.



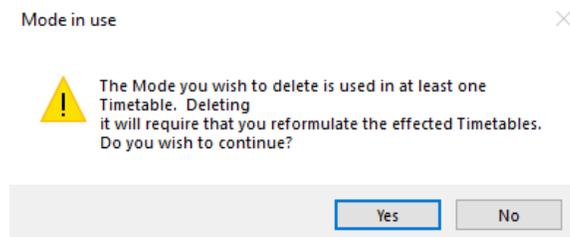
Device Type

Your Speed    Advisory - SLOW DOWN

Advisory    Flasher    DC-FB

Any selected mode can be duplicated to make entering similar modes easier. Remember to rename the duplicated mode with a unique name. Check all settings carefully.

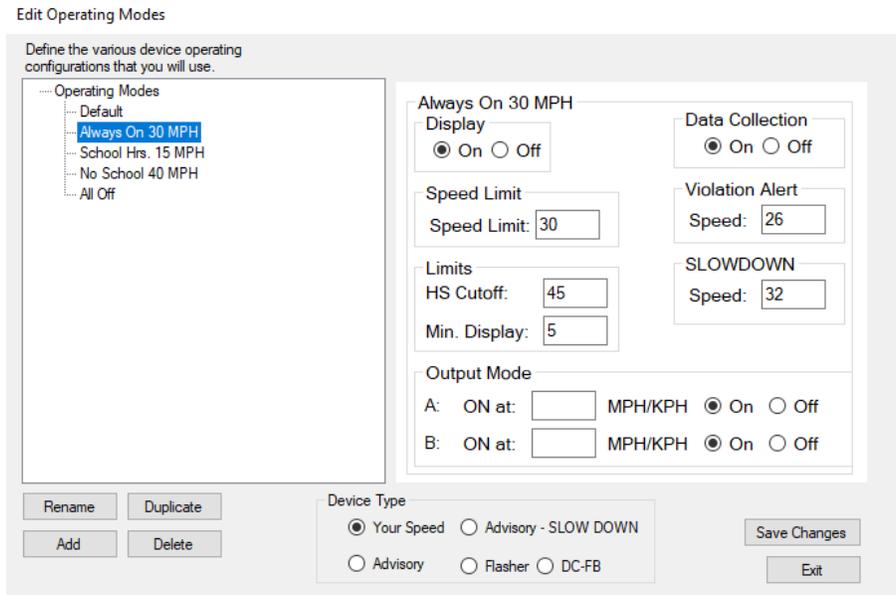
Since Operating Modes, Timetables, and Schedules are all intertwined, deleting or renaming a mode that is used in a timetable will cause that timetable to not work.



Mode in use

 The Mode you wish to delete is used in at least one Timetable. Deleting it will require that you reformulate the effected Timetables. Do you wish to continue?

Refer to [Section 2.7](#) for a description of the different Operating Modes parameters.

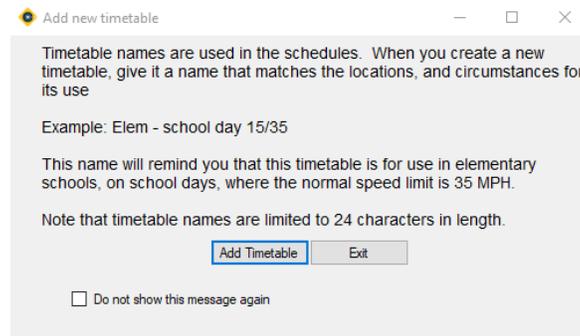


Remember, you must click the **Save Changes** button before proceeding to the next screen.

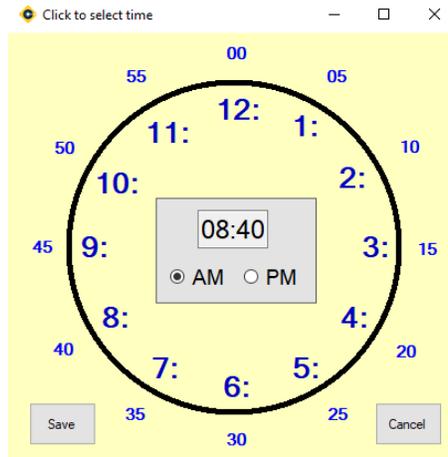
## Edit Daily Timetables

You may configure nearly an unlimited number of **Daily Timetables** based on single or multiple start and stop times. Each of the timetables can be set to a previously defined Operating Mode to control operation of the display.

Timetables should be named to make them easily identifiable. To create a new timetable, click on the **Add** button.

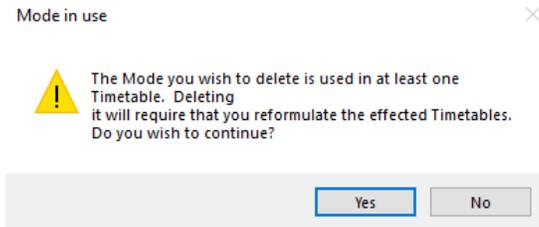


To enter or change a time, click on the Time drop-down menu and a clock window will pop up. Enter the time required, AM or PM, and click Save. The associated numbers can be clicked on or the time can be manually entered in the text box.

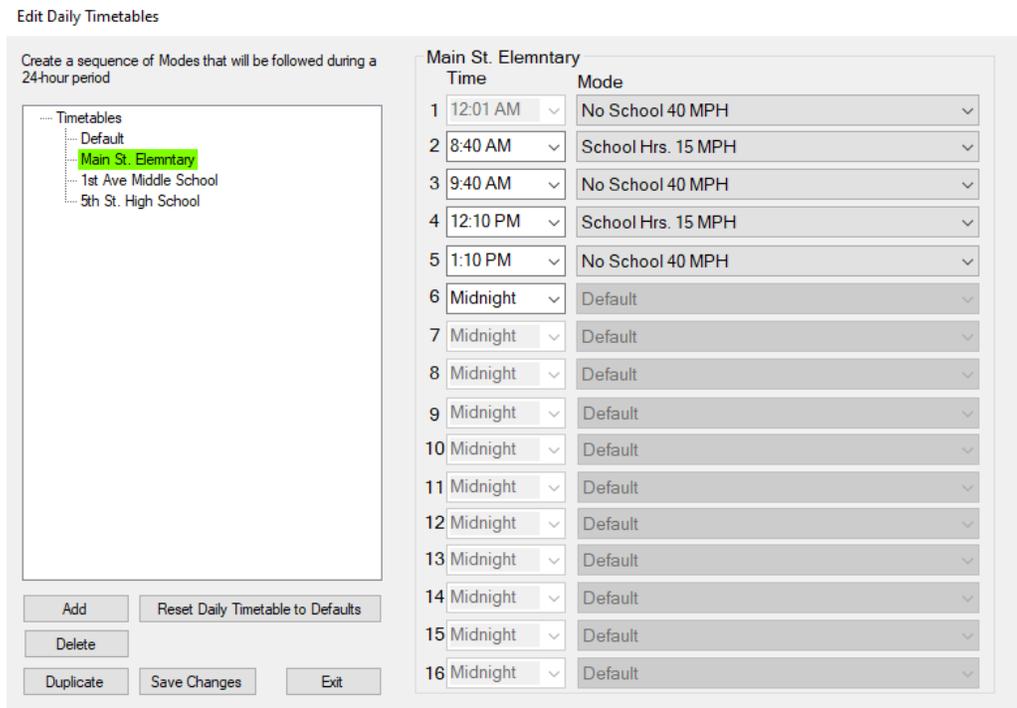


To rename, duplicate, or delete a timetable, right-click on the name or choose the menu option. The **All Off** timetable may not be renamed, copied, or deleted. Reset a selected timetable by click on the **Reset** button.

Since Operating Modes, Timetables, and Schedules are all intertwined, deleting or rename a mode that is used in a timetable will cause that timetable not to work.



These sample timetables illustrate different mode changes:



One sample would be the sign uses the following modes:

- 12:01 AM to 8:40 AM – No School 40 MPH
- 8:40 AM to 9:40 AM – School Hrs. 15 MPH
- 9:40 AM to 12:10 PM – No School 40 MPH
- 12:10 PM to 1:10 PM – School Hrs. 15 MPH
- 1:10 PM to Midnight (12:00 AM) – No School 40 MPH

This system will run the normal non-school hours settings at all times other than the specific start and dismissal time periods.

All timetables automatically start with 12:01 AM and end with midnight (12:00 AM).

Edit Daily Timetables

Create a sequence of Modes that will be followed during a 24-hour period

----- Timetables

- Default
- No School Day
- Main St. Elementary**
- 1st Ave Middle School
- 5th St. High School

**Main St. Elementary**

Time	Mode
1 12:01 AM	No School 40 MPH
2 8:40 AM	School Hrs. 15 MPH
3 9:40 AM	No School 40 MPH
4 12:10 PM	School Hrs. 15 MPH
5 1:10 PM	No School 40 MPH
6 Midnight	Default
7 Midnight	Default
8 Midnight	Default
9 Midnight	Default
10 Midnight	Default
11 Midnight	Default
12 Midnight	Default
13 Midnight	Default
14 Midnight	Default
15 Midnight	Default
16 Midnight	Default

Another sample is the sign uses the following mode:

- 12:01 AM to Midnight (12:00 AM) – No School 40 MPH

This system will run the normal non-school hours settings at all times. This can be used for a weekend, holiday, or any other non-scheduled school day. You can also restrict specific times you would not want the system (radar/beacons) to be operational on these particular days.

Remember, you must click the **Save Changes** button before proceeding to the next screen.

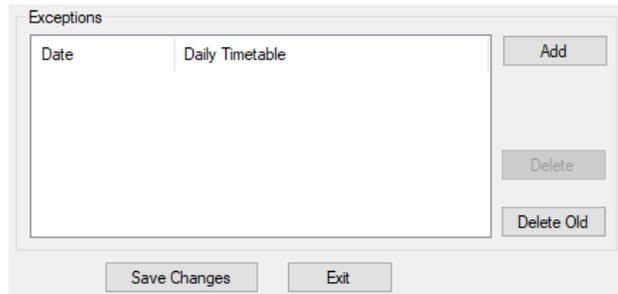


## Adding Exceptions

The **Exceptions** list is an additional way to attach non-recurring event days, such as holidays, to selected schedules using a different operating mode or timetable. Since a single exception date will likely be used in multiple schedules (i.e. Veterans Day), exception lists can be created and then added to the schedules that they apply to.

There are two ways to create or access exceptions:

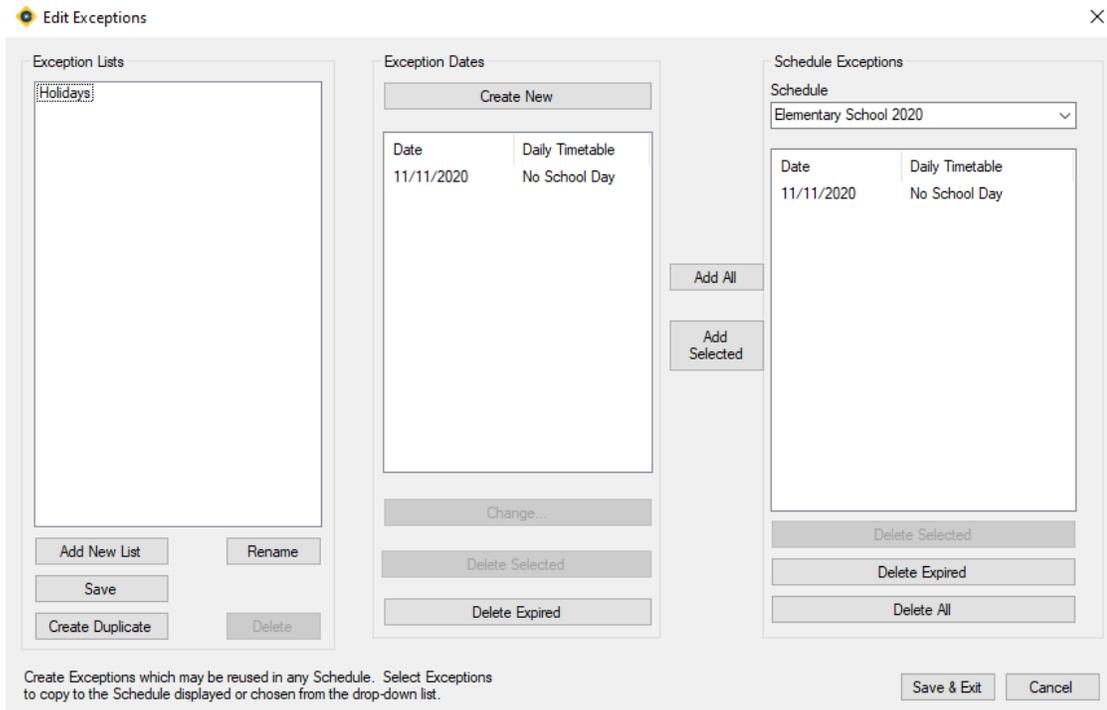
1. When creating a schedule (Edit Schedule) – click on the **Add** button in the Exceptions box. The exceptions created will apply to the current schedule.



Date	Daily Timetable

Buttons: Add, Delete, Delete Old, Save Changes, Exit

2. When creating an exception (Edit Exceptions).



**Exception Lists**

- Holidays

Buttons: Add New List, Rename, Save, Create Duplicate, Delete

**Exception Dates**

Date	Daily Timetable
11/11/2020	No School Day

Buttons: Create New, Change..., Delete Selected, Delete Expired

**Schedule Exceptions**

Schedule: Elementary School 2020

Date	Daily Timetable
11/11/2020	No School Day

Buttons: Add All, Add Selected, Delete Selected, Delete Expired, Delete All

Footer: Create Exceptions which may be reused in any Schedule. Select Exceptions to copy to the Schedule displayed or chosen from the drop-down list. Buttons: Save & Exit, Cancel

### Creating an Exception List

1. Click the **Add New List** button and name it appropriately (i.e. Holidays).
2. Click the **Create New** button and use the calendar to select your date range. Then choose a timetable from the drop-down menu.
3. Continue adding any additional dates or events as required. Additional lists can be created as well to segregate the event types. Any list can be copied to help make new lists faster to create.

Add Exception Date

Exception Start Date:  Use the following daily timetable:

Exception End Date:

▼

Default

No School Day

Main St. Elementary

1st Ave Middle School

5th St. High School

### Add Exceptions to a Schedule

1. Select the exception date(s) you wish to add to a schedule. You can CTRL + left-click or SHIFT + left-click to select multiple dates.
2. Choose the correct schedule from the drop-down menu of available schedules.
3. Add the exceptions by using the **Add Selected** or **Add All** buttons.
4. Click **Save & Exit**.

Edit Exceptions ×

**Exception Lists**

Holidays

**Exception Dates**

Date	Daily Timetable
11/11/2020	No School Day
12/19/2020	No School Day
12/20/2020	No School Day
12/21/2020	No School Day
12/22/2020	No School Day
12/23/2020	No School Day
12/24/2020	No School Day
12/25/2020	No School Day
12/26/2020	No School Day
12/27/2020	No School Day
12/28/2020	No School Day
12/29/2020	No School Day
12/30/2020	No School Day

**Schedule Exceptions**

Schedule:

Date	Daily Timetable
11/11/2020	No School Day
12/19/2020	No School Day
12/20/2020	No School Day
12/21/2020	No School Day
12/22/2020	No School Day
12/23/2020	No School Day
12/24/2020	No School Day
12/25/2020	No School Day
12/26/2020	No School Day
12/27/2020	No School Day
12/28/2020	No School Day
12/29/2020	No School Day
12/30/2020	No School Day
12/31/2020	No School Day

Create Exceptions which may be reused in any Schedule. Select Exceptions to copy to the Schedule displayed or chosen from the drop-down list.

**Delete Expired** will delete any exception that has expired as of the current date.

**Deleted Selected** will delete only the exceptions highlighted.

**Change** allows individual or multiple exceptions to be changed. Individual allows changes of date and daily timetable. Multiple allows only changes to the daily timetable.

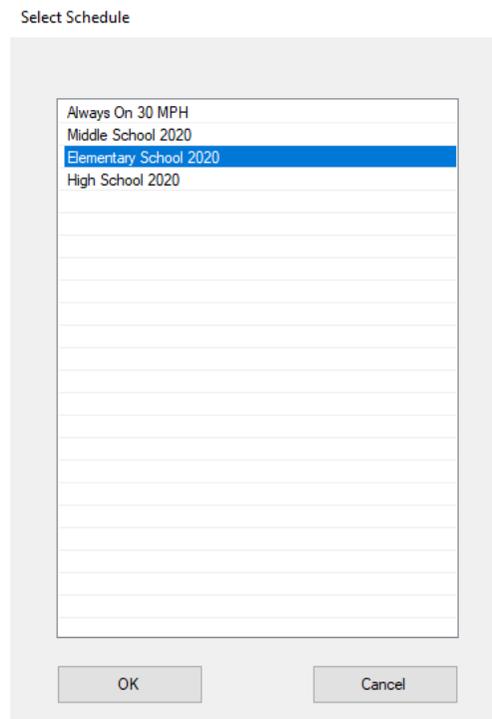
**Save & Exit** will save the schedule and exception selections you have made and return to the Scheduler tab.

The **Operating Mode**, **Timetable**, and **Schedule** selections are saved in SpeedCheck Manager for later uploading to your SpeedCheck system.

## Send Schedule To Sign

Once you have completed entering in your operating mode(s), timetable(s), schedule(s), and applicable exception(s), you are ready to upload the schedule to your SpeedCheck system.

1. Connect to the system in SpeedCheck Manager.
2. Select the Scheduler tab.
3. Selected **Send Schedule To Sign**.
4. Choose from the appropriate schedule.



Because each schedule is comprised of multiple components (operating modes, timetables, schedules, exceptions), carefully plan, name, and check each schedule before uploading to each system. Once the schedule has been sent you will see the status change at the bottom of the window. Confirm it states the schedule was sent successfully.

Status: Schedule Sent Successfully

## Get Schedule From Sign

When connected to a system operating a schedule, you can download the schedule information already loaded into the system. The downloaded schedule can be saved as a text file or webpage for future reference.

```
SpeedCheck12345 -- Downloaded Schedule

Modes:

      Name      Display  Speed  Violation  Minimum  Cutoff  Output  Output  Data  Slowdown
      No School 40 MPH   ON     40      45       5       55     OFF   OFF   ON     50
      School Hrs. 15 MPH   ON     15      17       5       35     OFF   OFF   ON     20

Timetables:

Main St. Elementary
00:01 No School 40 MPH   08:40 School Hrs. 15 MPH   09:40 No School 40 MPH   12:10 School Hrs. 15 MPH   13:10 No School 40 MPH   00:00 No School 40 MPH

No School Day
00:01 No School 40 MPH   00:00 No School 40 MPH

Schedule:

Monday:  Main St. Elementary
Tuesday: Main St. Elementary
Wednesday: Main St. Elementary
Thursday: Main St. Elementary
Friday:  Main St. Elementary
Saturday: No School Day
Sunday:  No School Day

Exceptions:
11/11/2020 No School Day
12/21/2020 No School Day
12/22/2020 No School Day
12/23/2020 No School Day
12/24/2020 No School Day
12/25/2020 No School Day
12/28/2020 No School Day
12/29/2020 No School Day
12/30/2020 No School Day
12/31/2020 No School Day
1/1/2021 No School Day
```

## Manage Groups

The **Manage Groups** tool requires Internet access and an active cellular modem in each SpeedCheck system.

Manage Groups is used to send schedule information to multiple systems. If you have a large number of systems with the same schedule, then using this tool will save you time. Each system must first be individually set up with an IP address, device ID, current time and date, and other user defined functions. Depending on how many systems you have, it may be easier to send schedules one at a time to each system.

Before using Manage Groups you must do the following:

1. Connect to each system and then add them to the Network Connection Entry list (see [Section 2.4](#)).
2. Create modes, timetables, and schedules for the system.
3. Determine which systems can operate on the same schedule as this will become your group.

The process of Manage Groups is as follows:

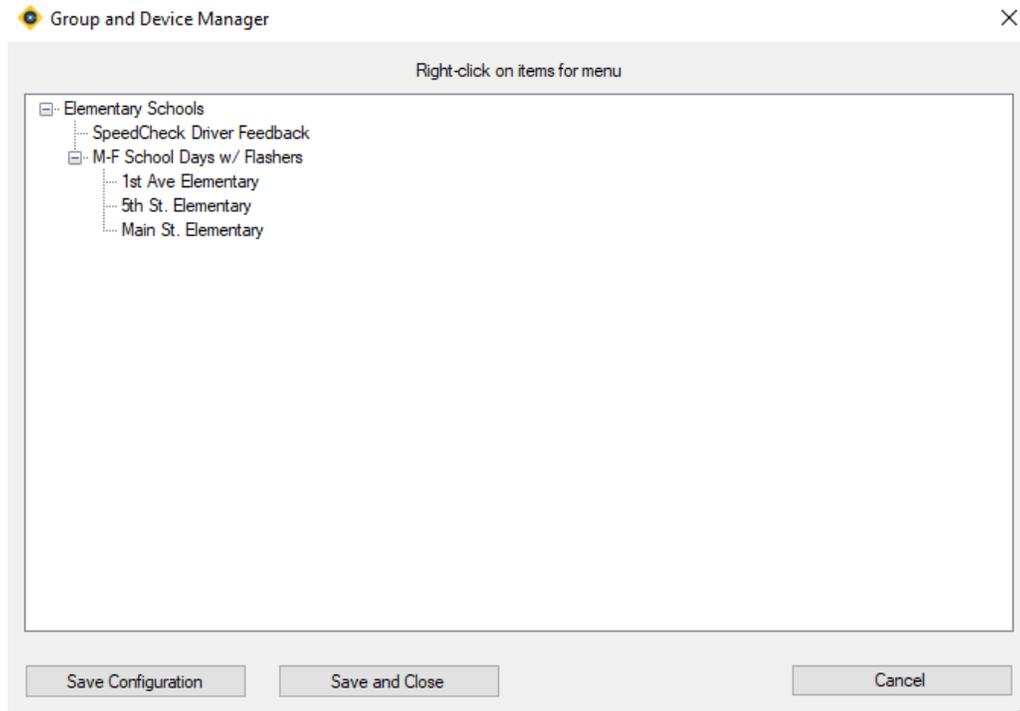
1. Delete any unused groups (i.e. flashers).
2. Create major groups by system type (right-click for menu).
3. Create sub-groups for all systems that will be using the same schedule.
4. Add the schedule which the group of systems will use.
5. Add the systems to the group.
6. Click **Send All Schedules** to send the selected schedule to all systems assigned to the group.

Clicking on Manage Groups will display the common system types as groups:

- Changeable Speed Limit (Variable Speed Limit)
- Driver Feedback (SpeedCheck, most common)
- Flashers (beacons)

Right-click on the system type that you are not using and delete. Once unused groups are deleted, right-click on the system and rename as required (i.e. School Zones). Right-click and choose **Add Group**, select the system type, then assign the group a name. The best way to organize your systems is to group all similar ones together.

Sub-groups can be used to organize systems into unique groups. All systems under a sub-group will use the same schedule.



Using schools as an example, many schools would most likely have the same school hours so they could share the same timetables. All systems in a group must use the same schedule. You can have multiple sub-groups as required that use different schedules. Rather than send schedules to signs one at a time, Manage Groups will send the selected schedule to all signs listed under that subgroup schedule.

### Send All Schedules

This command will send the schedules selected in Manage Groups to each sign listed under the group or sub-group using that schedule. Options for sending schedules are select all signs, select by schedule, or click on individual signs.

The **Send All Schedules** will automatically connect to each system and do the following:

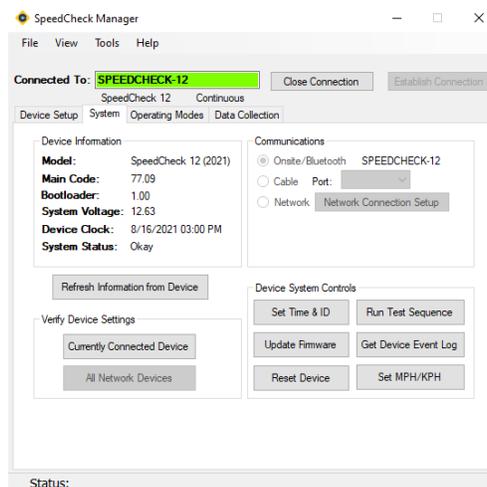
1. Send the appropriate schedule.
2. Disconnect from the system.
3. Repeat the process for all remaining systems in the Network Connection Setup screen.

Passwords are not required for each system when using Send All Schedules, since the passwords are stored in the Network Connection Setup data.

## 3.0 SPEEDCHECK-12 Specific Features & Settings

SPEEDCHECK-12 has support for the mobile app and PC versions of SpeedCheck Manager. There are four main functions of the PC software version that are not currently supported by the mobile app:

- Changing the Operating Mode (Continuous or Scheduler)
- Creating and uploading schedules
- Retrieving vehicle speed data
- Evaluating vehicle speed data with SpeedCheck Traffic Analyzer (bundled with PC version of SpeedCheck Manager)



SpeedCheck Manager will detect when you're connected to a SPEEDCHECK-12 sign and will expose and restrict certain applicable features and settings. The primary feature additions are as follows:

- System Status (System tab)
- Strobe On/Off (Operating Modes & Scheduler tabs)
- Strobe Speed (Operating Modes & Scheduler tabs)

Other features applicable to SPEEDCHECK-15/18 systems will either be grayed out or no longer exposed when connected to a SPEEDCHECK-12 system.

**NOTE**

SpeedCheck Manager (PC) version 3.0.2.3 or newer is required for operation with SPEEDCHECK-12 radar speed signs. Starting with this release all models (SPEEDCHECK-12/15/18) are supported. Download the latest version at [support.carmanah.com](https://support.carmanah.com).

**NOTE**

SPEEDCHECK-12 firmware versions are different than SPEEDCHECK-15/18 and are not interchangeable.

**NOTE**

SpeedCheck Manager mobile is available free of charge on the Apple App Store and Google Play Store for compatible devices.

## 4.0 SpeedCheck Traffic Analyzer

### 4.1 Introduction

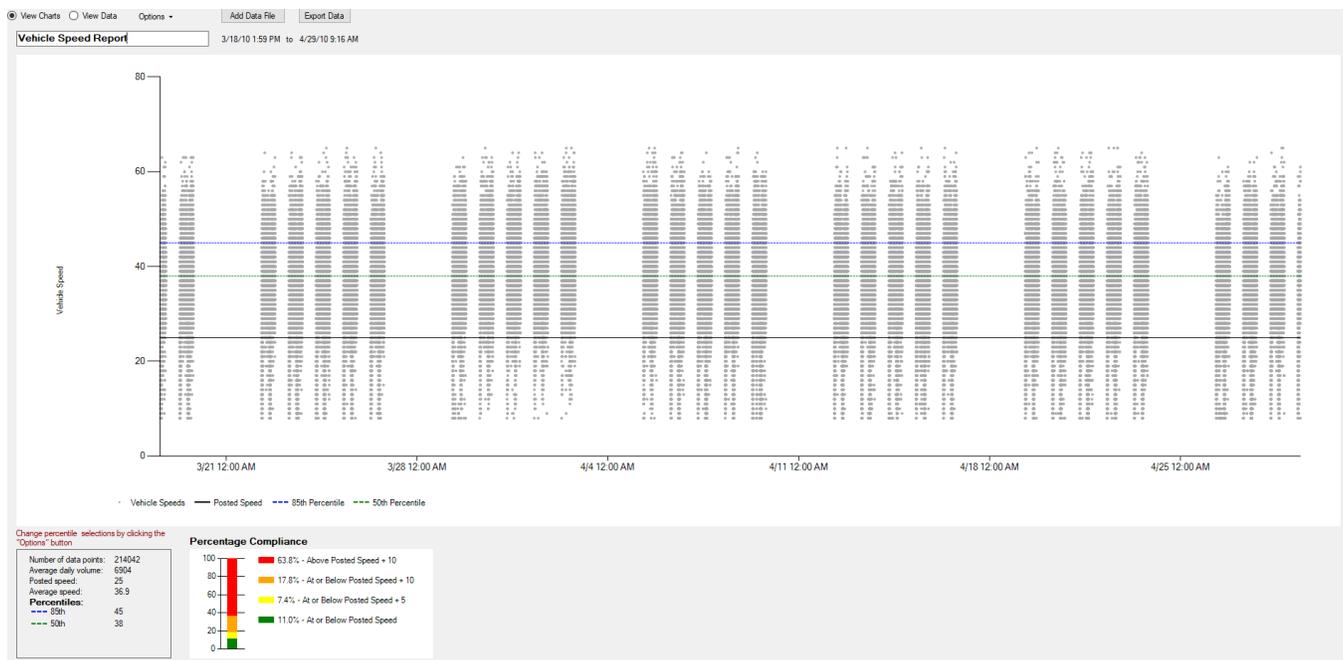
SpeedCheck Traffic Analyzer allows viewing, manipulation, charting, and printing of speed data downloaded from radar enabled SpeedCheck systems. The data is a useful tool in studying speed problems, speed reduction programs, or speed trends over time. SpeedCheck Traffic Analyzer is a standalone program that provides charting, statistical analysis, combining of data files, windowing data to particular days or hours of operation, and removal of speed data outside the areas of study.

Refer to [Section 2.8](#) to download the data for the system you are looking to analyze.

To view your data, open SpeedCheck Traffic Analyzer. Once open the application will automatically look for saved data files via SpeedCheck Manager. The directory these files are location is as follows:

- Windows 7 & 10 – C:\Users\Public\Public Documents\SpeedCheck\Data Files

Select the data file you wish to analyze and click **Open**.



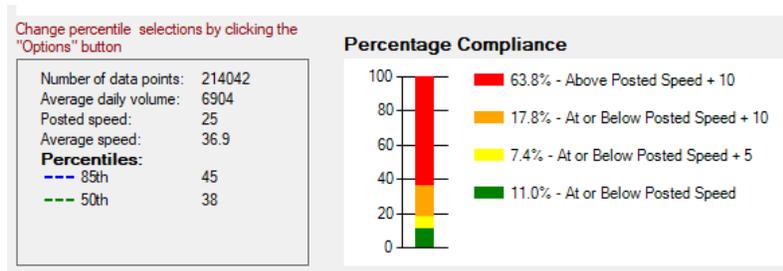
## 4.2 Operation

### Compliance

The bar chart will show vehicles that are:

- Above the posted speed limit plus excessive speeding (red bar).
- At or below posted speed limit plus excessive speeding (orange bar).
- At or below posted speed limit plus minor speeding (yellow bar).
- At or below the posted speed limit (green bar).

The posted speed limit, minor speeding, and major speeding thresholds can all be changed to suit your specific needs. This is covered in the **Chart Options** menu.



- **Number of data points** – numerical value of data points collected by SpeedCheck Manager. Refer to [Section 2.8](#) regarding data accuracy.
- **Average daily volume** – the average daily volume based on the total number of data points and database range.
- **Posted speed** – the speed limit as set in **Chart Options**.
- **Average speed** – the average speed across all data points.
- **Percentiles** – the default percentiles are 85<sup>th</sup> and 50<sup>th</sup>:
  - 85<sup>th</sup> percentile – the speed at or below which 85% of the data points collected fall under.
  - 50<sup>th</sup> percentile – the median speed; half of the data points collected are below this value and half of the data points collected are above.

### View Charts

Provides a scatter plot chart of the raw data imported from SpeedCheck Manager. The entire range of the data will be displayed initially, but this can be filtered out further under the **Options** menu to suit your specific needs.

### View Data

Provides a spreadsheet style view of the raw data imported from SpeedCheck Manager. The entire range of the data will be displayed initially, but this can be filtered out further under the **Options** menu to suit your specific needs.

## Chart Options

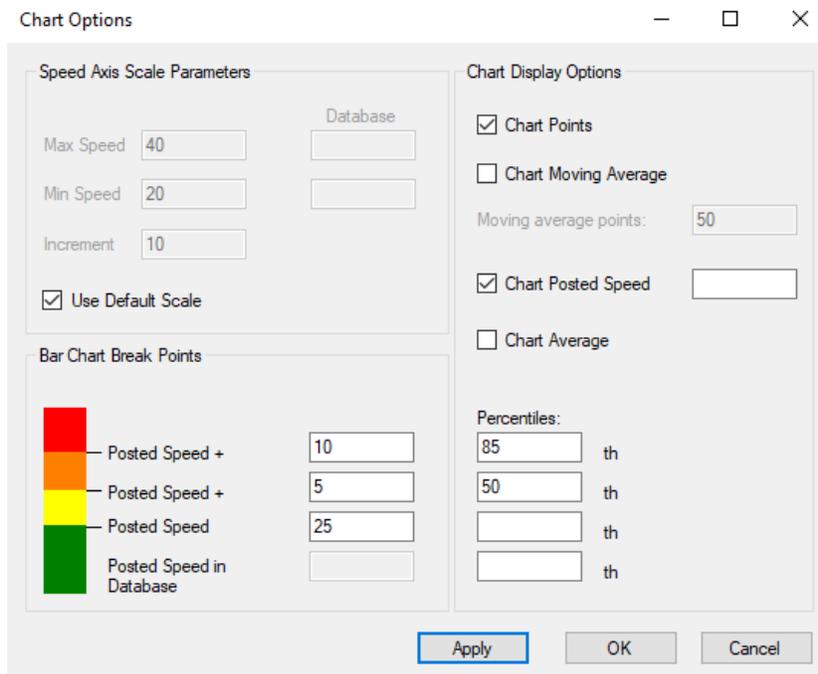
### Speed Axis Scale Parameters

Sets the parameters for the vertical axis of the graph. Uncheck **Use Default Scale** to input your own parameters.

### Chart Display Options

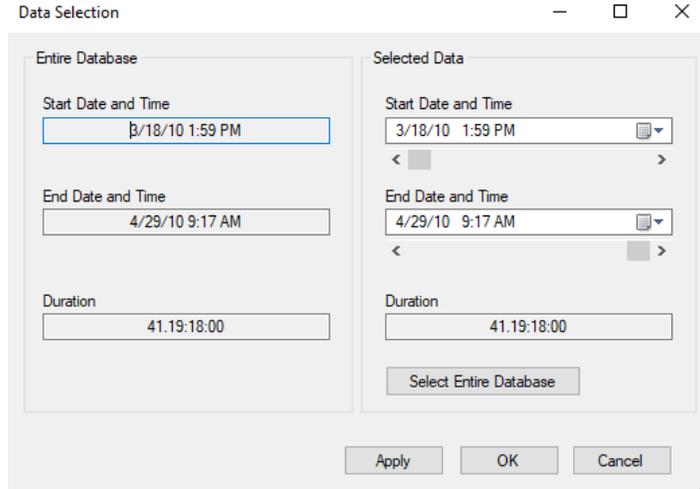
- **Chart Points** – is used to turn on or off the display of individual data points. Leaving the default setting of Chart Points unchecked results in faster screen drawing, faster viewing of only the moving average and statistical quantities without displaying the data.
- **Chart Moving Average** – is used to enable the moving average line which shows the average of the most recent data points. The number value input here will set the number of data points used for the moving average. More points will provide an average over a longer time frame, whereas fewer provides will provide a line that follows the individual data points more closely. If no number is input here, the chart will use a moving average of 10% of the displayed data.
- **Chart Posted Speed** – is used to turn on or off the display line that indicates the posted speed limit. The number value entered here sets the Posted Speed line.
- **Chart Average** – is used to turn on or off the display line that indicates the average of all of the displayed points.
- **Percentile** – is used to set the display line that indicates the percentage of all of the display points, most commonly the 85<sup>th</sup> percentile. Additional percentile lines can be added by entering the number in the spaces provided. Blank entries will not be displayed.

A moving average is an average of the preceding N-values in the data set. The default N is 50, meaning each point on the moving average line is the average of the preceding 50 points. The value of N can be changed in the Chart Options menu.



## Data Selection

The **Data Selection** menu allows you to change the data start and end points. The dates and times can be adjusted to suit your specific needs.

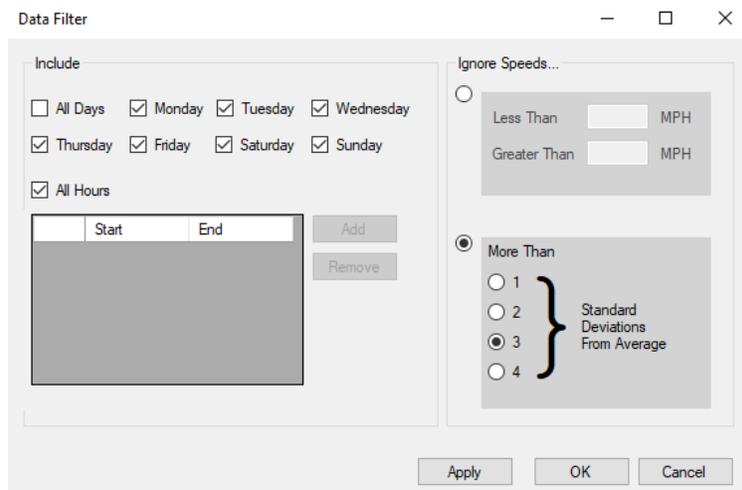


## Data Filter

The **Data Filter** menu allows you to use the data filtering and windowing options. You may select which days of the week to include in the analysis and which hours of the day to include. Optionally you may exclude speeds greater than or less than specific thresholds outside your range of interest or exclude speeds that are more than one to four standard deviations from the average. The default setting is to remove data points greater than three standard deviations from the mean.

Standard deviation is a statistical term that indicates variability from an average (mean) data level in a particular data set. Assuming the data conforms to a bell curve distribution, below is the breakdown of the coverage:

- One standard deviation on each side of the average will include 68% of all data in the set.
- Two standard deviations on each side of the average will include 95% of all data in the set.
- Three standard deviations on each side of the average will include 99.6% of all data in the set.
- Four standard deviations on each side of the average will include 99.8% of all data in the set.



## Sample Filtered Data



## Add Data File

This will allow you to merge additional data sets into one complete report. You will have three choices on how the data gets merged in the case of duplicated data (data points with same timestamp recording the same speed)

Merging Data...

Some of the dates in the selected data file overlap with data that is already loaded. How would you like to handle the overlapping data?

Use existing data for overlap period  
 Use imported data for overlap period  
 Use overlap data from both files

OK Cancel

## Export Data

This will allow you to export the data (all data or filtered data) into a CSV file. You can also export the current View Chart view into a PDF file under **File → Export to PDF**.

Exporting Data...

You can export all of the data points loaded into this program or you can export the data with the filters applied. Which data set would you like to export?

Export all data to CSV  
 Export filtered data to CSV

OK Cancel

## 5.0 Troubleshooting

Refer to the SpeedCheck user manual found at [support.carmanah.com](http://support.carmanah.com) for more information.

## 6.0 File Names

Software and firmware files used by SpeedCheck Manager include the following:

- SpeedCheck<xxxx>.hex is the SpeedCheck firmware program that resides in the display sign, controlling all functions of the system and any options purchased with it. The SpeedCheck product can be updated with this firmware file through SpeedCheck Manager (see [Section 2.5](#)).
- <sign\_name> <mm-dd-yy> <hh:mm>.csv is the SpeedCheck vehicle speed data file as it appears on your PC after downloading. This file will be saved in:
  - Windows 7, 10 & 11 – C:\Users\Public\Documents\Carmanah Technologies\SpeedCheck Manager\Data Files

The data file name will have a trailing two-digit file number representing the time of day the data files was downloaded. For example, “Fifth & Main Sep-26-08 15;44.csv”.



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Web: [carmanah.com](http://carmanah.com)



# SPEEDCHECK®

## RADAR SPEED SIGN USER MANUAL

---



**SPEEDCHECK-15/18**

85495\_MANUAL\_TRA\_SPEEDCHECK-15-18\_REVE1

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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.

## 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.

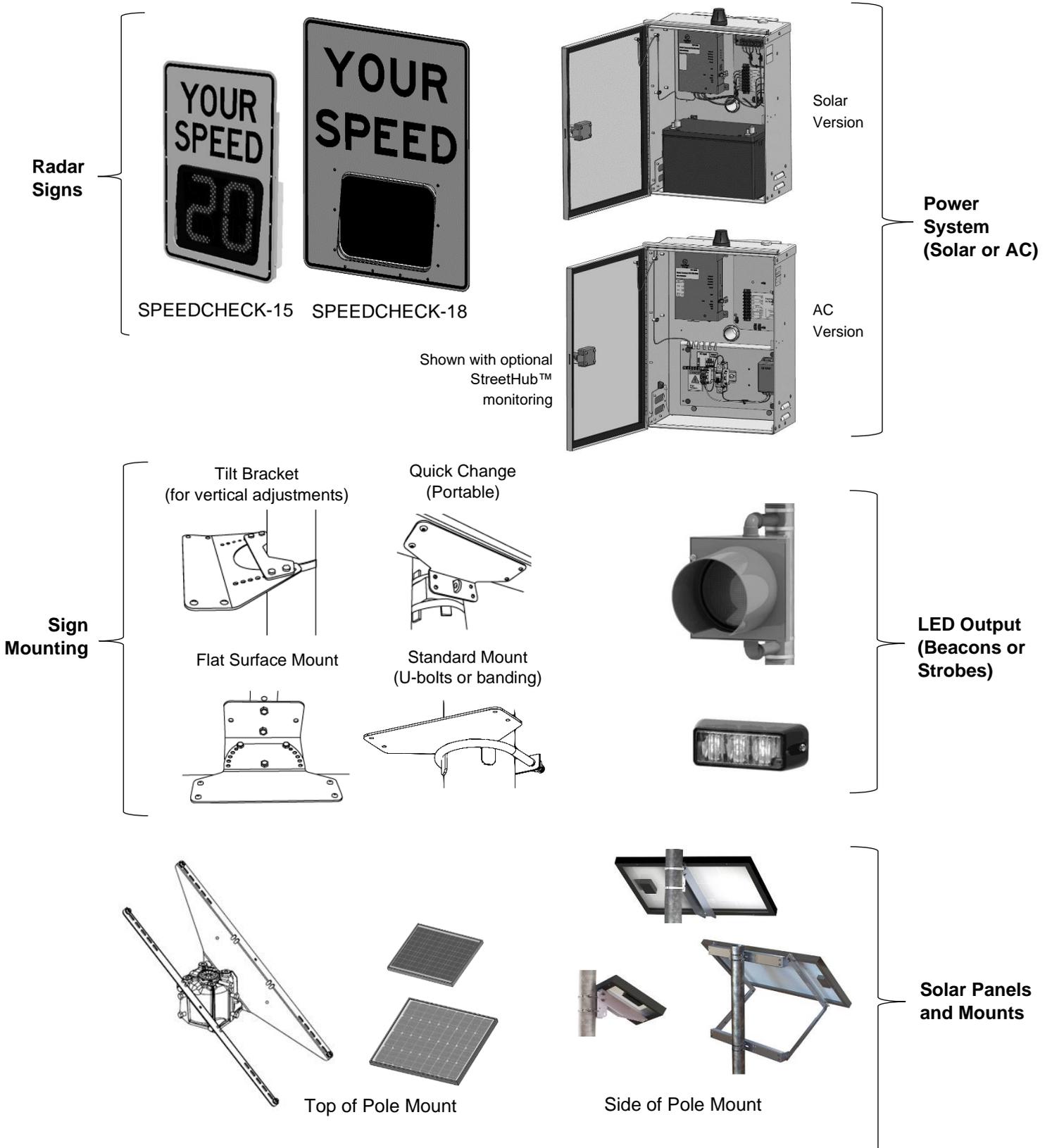


The specifications of the products and components described in this manual are subject to change without notice.



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

## 1.4 System Components

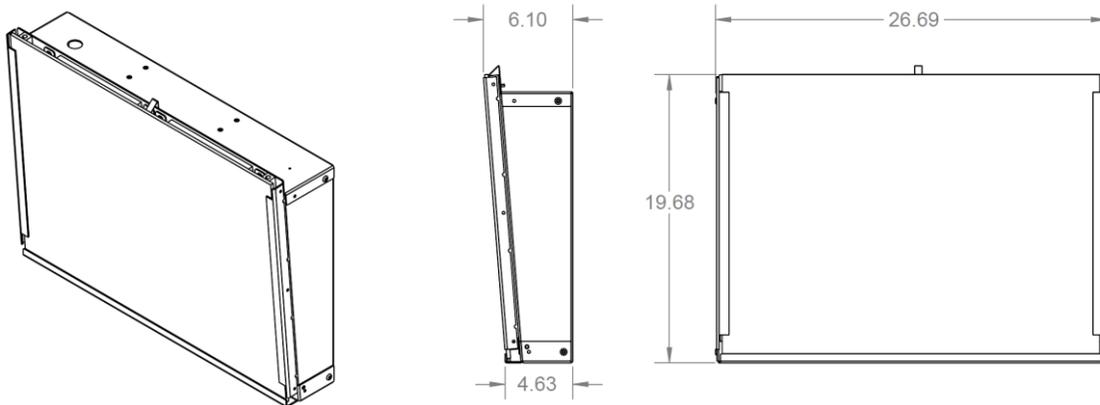


## 2.0 System Overview

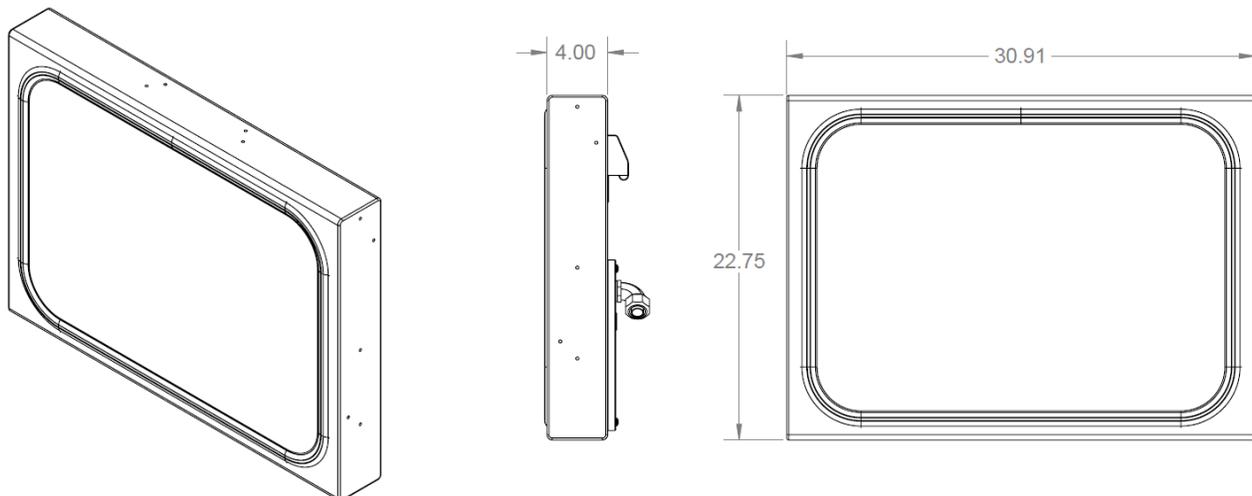
### 2.1 SPEEDCHECK-15/18 Display Sign Enclosure Dimensions

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 display signs are available with a variety of options:

<b>Model</b>	<b>Beacons</b>	<b>Strobes</b>	<b>StreetHub™ Remote Monitoring</b>
SPEEDCHECK-15 (AC Internal)	Optional	Optional	N/A
SPEEDCHECK-15 (AC/Solar Power Cabinet)	Optional	Optional	Optional
SPEEDCHECK-18 (AC/Solar Power Cabinet)	Optional	N/A	Optional

**NOTE**

Beacons cannot be combined with strobes in the same system.

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

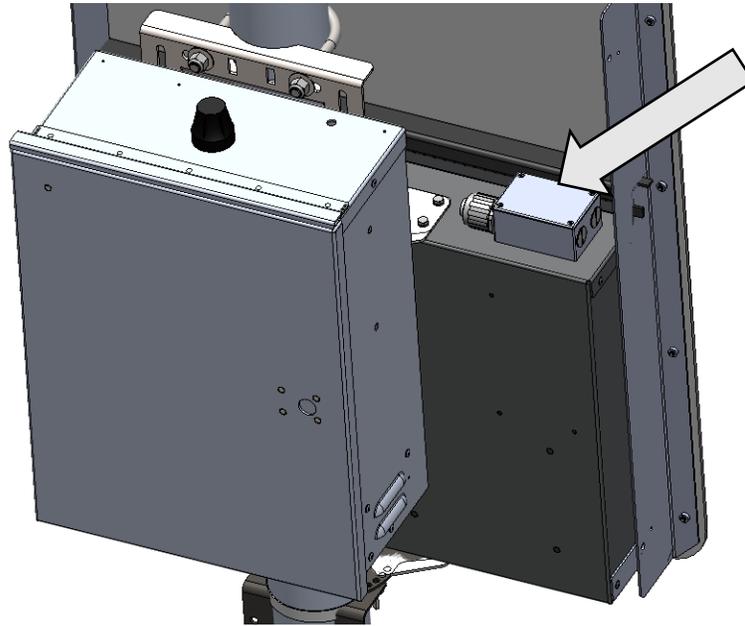
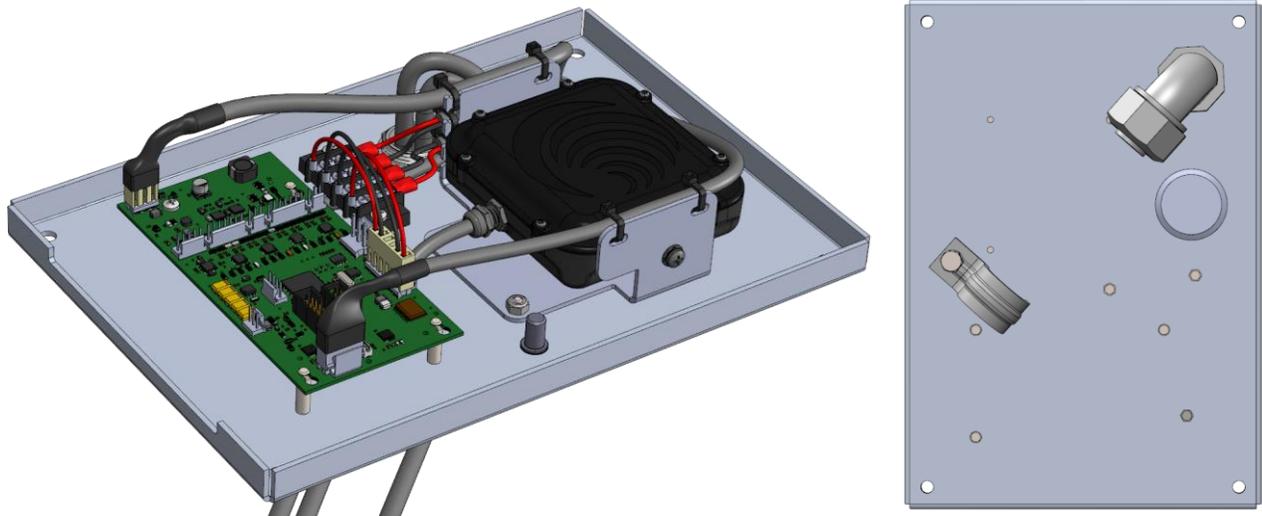
- a. AC input wires connect in junction box, located on the sign chassis (see image on following page)
- b. Optional 12V circular LED beacons with internal driver connect in junction box (red/black two conductor cable)
- c. Optional strobes prewired to the controller

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

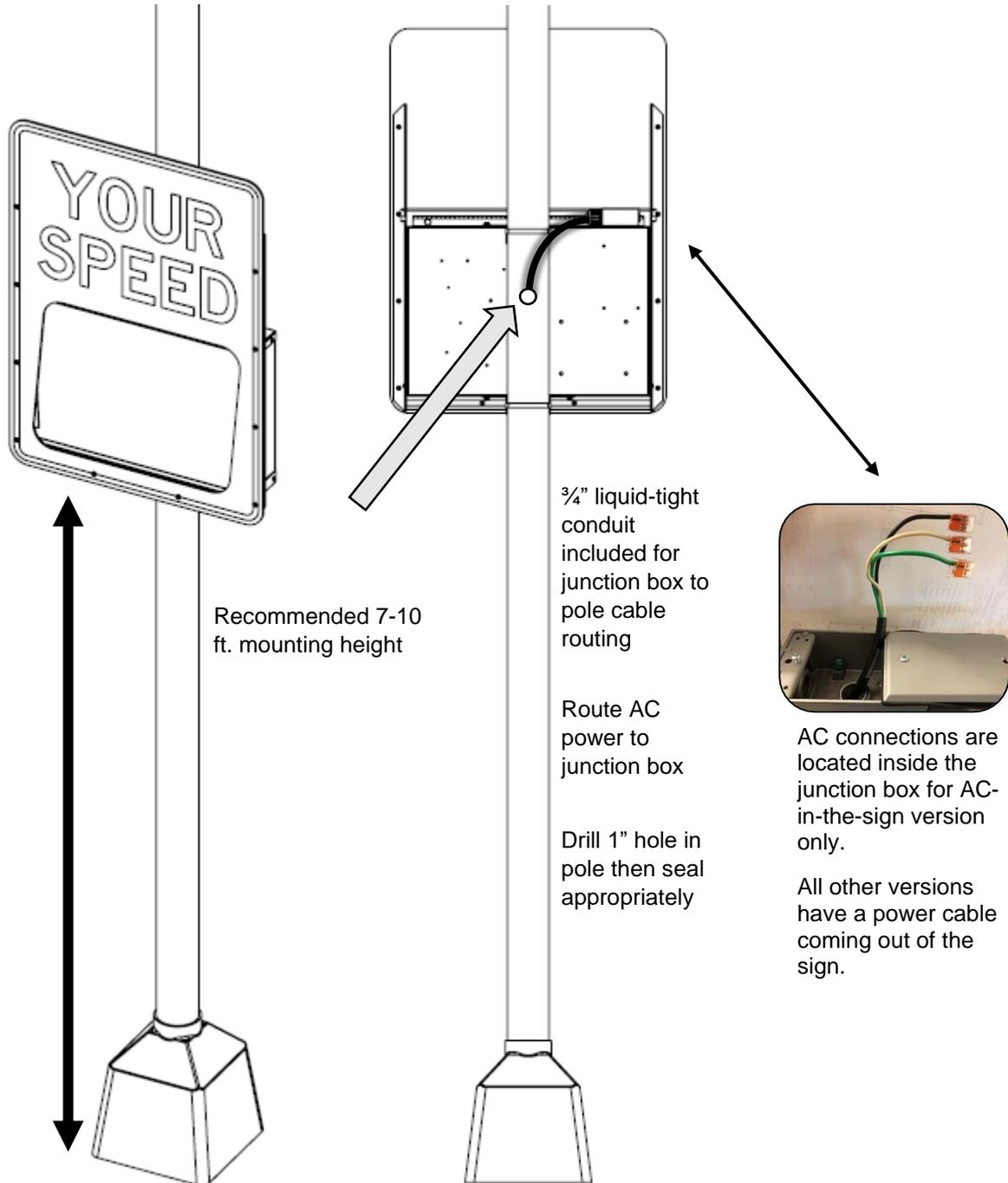
- a. Two conductor red/black DC power cable coiled up as it exits the junction box conduit fitting
- b. Optional 12V circular LED beacons with internal driver connect in junction box. For SPEEDCHECK-18, optional beacon versions ship with standard load cables pre-attached to a four-position terminal block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

### 3. SPEEDCHECK-15 or 18 with AC/DC power supply in cabinet

- a. SPEEDCHECK-15 – two conductor red/black DC power cable coiled up as it exits the junction box conduit fitting
- b. SPEEDCHECK-18 – two conductor red/black DC power cable coiled up as it exits the back panel conduit fitting
- 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

**SPEEDCHECK-15 Junction Box:****SPEEDCHECK-18 Rear Panel:**

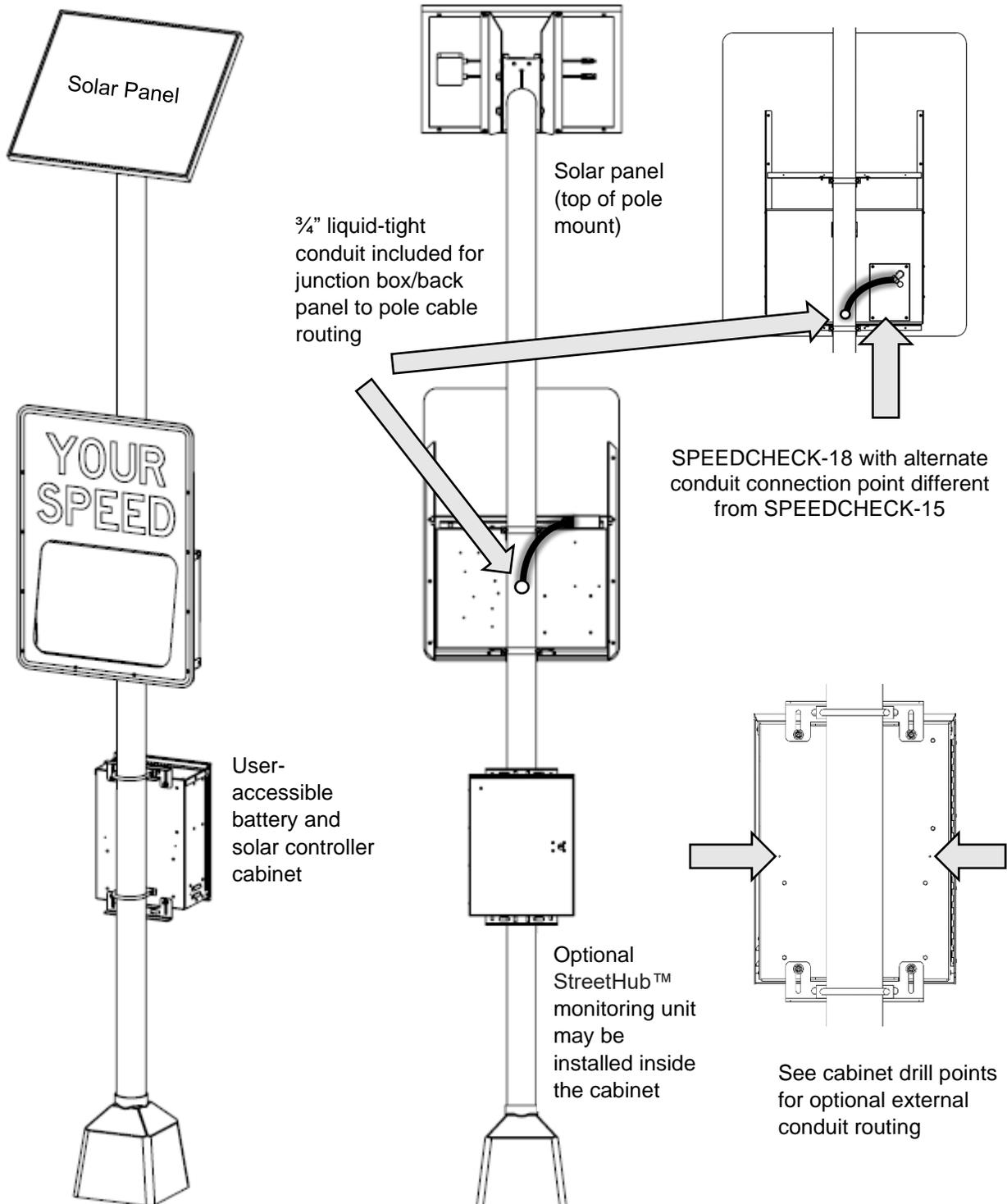
## 2.3 Typical Configurations – SPEEDCHECK-15 with AC Power Routed to Sign



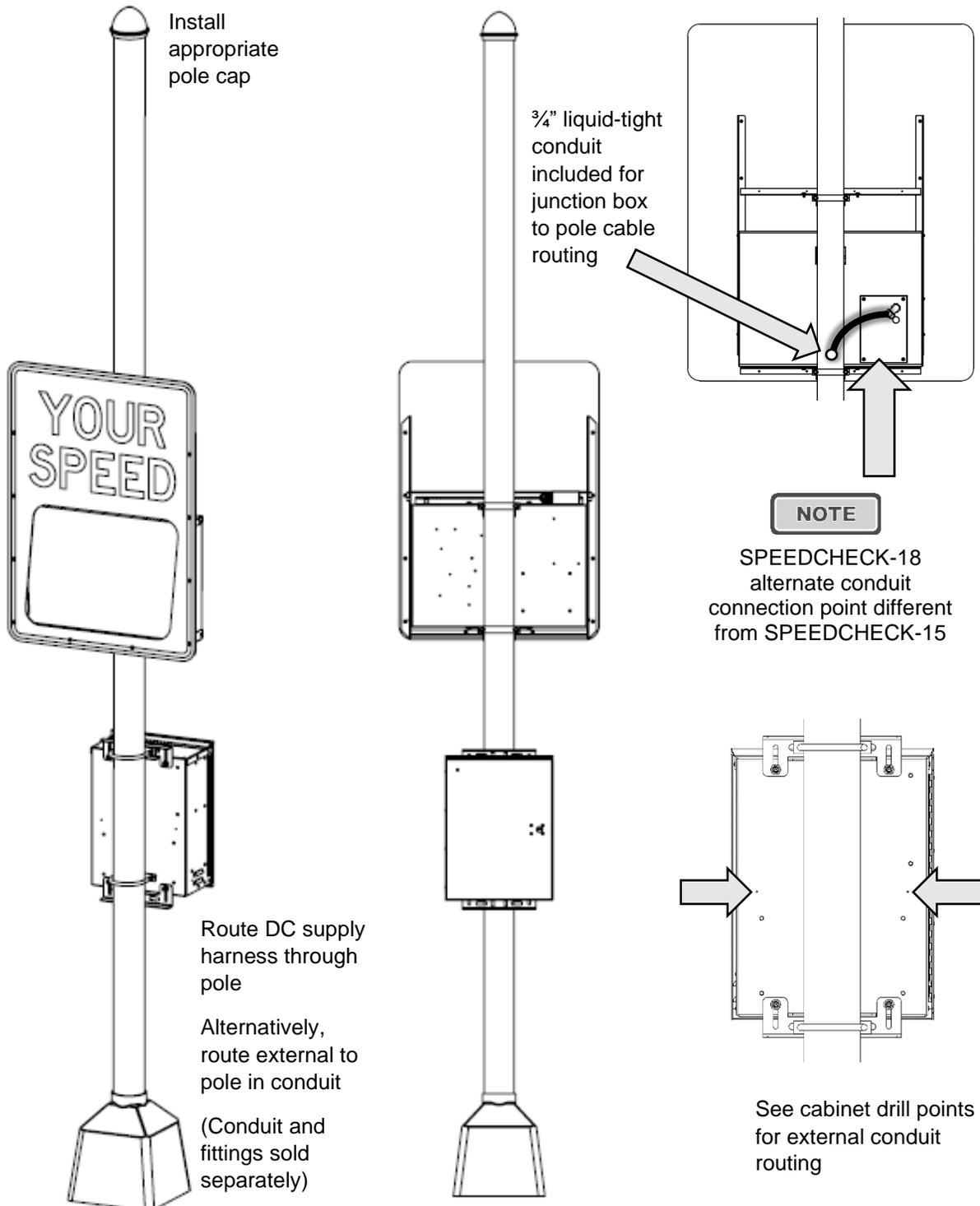
**NOTE**

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

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

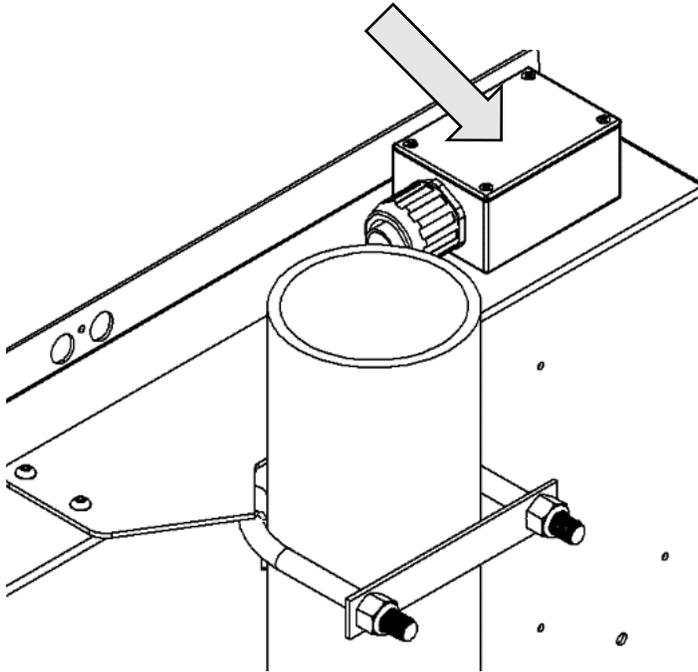


## 2.5 Typical Configurations – SPEEDCHECK-15/18 with AC Power from Cabinet



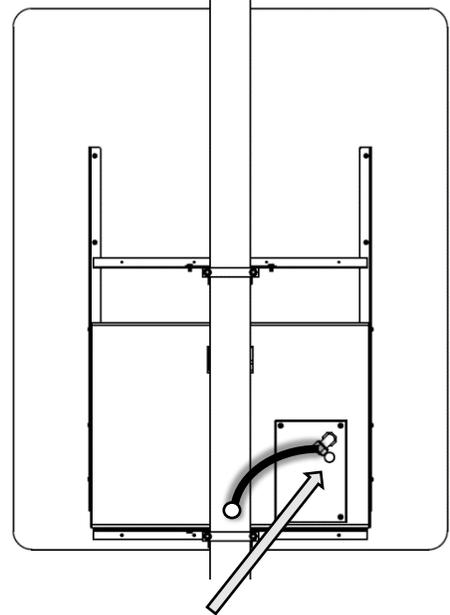
## 2.6 Typical Configurations – SPEEDCHECK-15/18 – External Beacons

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 4.14](#) for more information on circular beacon installation.



*SPEEDCHECK-15 Junction Box*

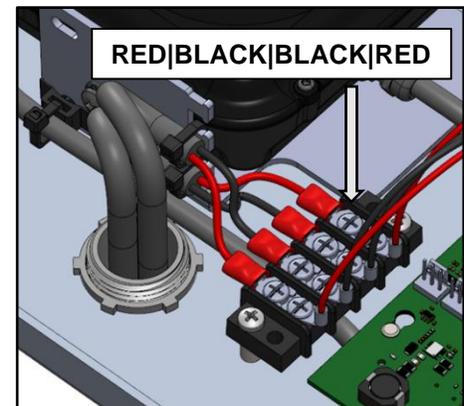
SPEEDCHECK-18 alternate point of connection for external beacons:



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*

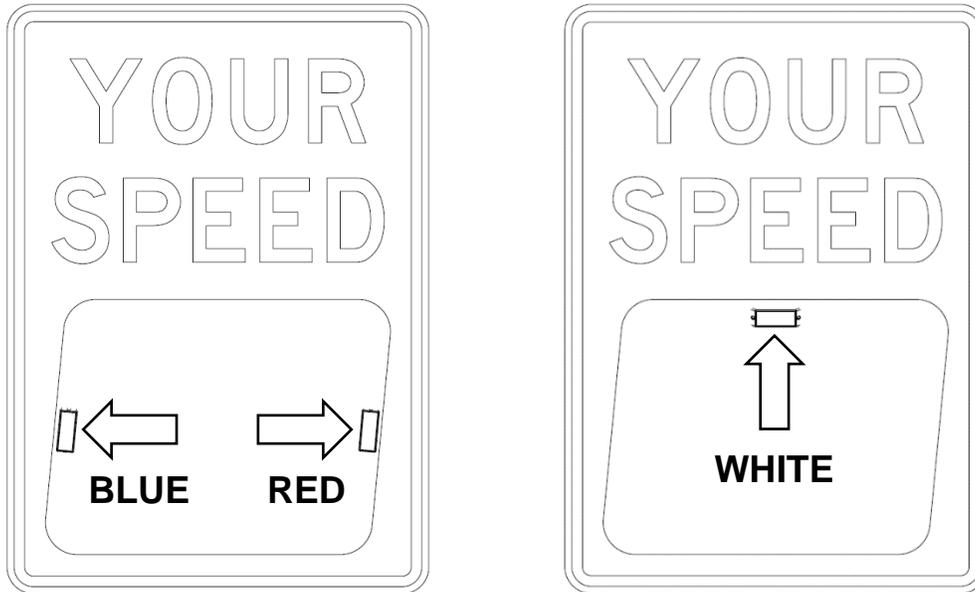


*SPEEDCHECK-18 Beacon cables are factory installed to terminal block.*

## 2.7 Typical Configurations – SPEEDCHECK-15 – Strobe Flashers

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

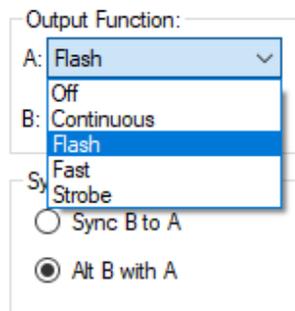
1. Dual strobe (Blue and Red)
2. Single strobe (White)



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 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:

- 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 (SPEEDCHECK-15 only, contact Carmanah)

#### Solar-powered 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

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

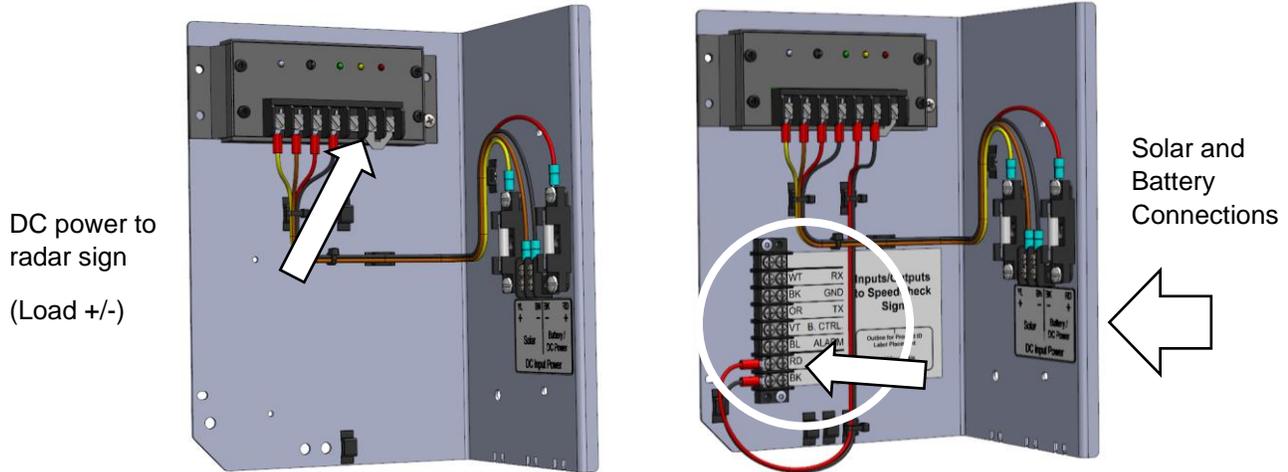
### 3.4 Banding Recommendations

**NOTE**

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

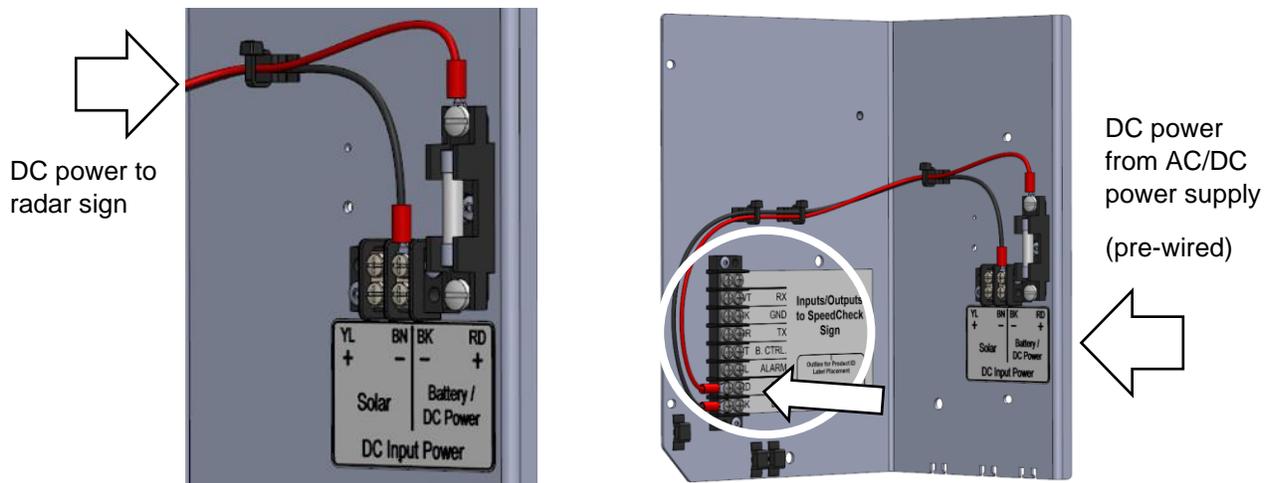
<b>90 MPH Wind Loading</b>	
<b>3/4" x 0.030" band</b>	Single wrap provides adequate strength for 90 MPH wind loading.
<b>5/8" x 0.030" band</b>	Single wrap provides adequate strength for 90 MPH wind loading.
<b>1/2" x 0.030" band</b>	Single wrap provides adequate strength for 90 MPH wind loading. However, 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.



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

### 3.6 Controller

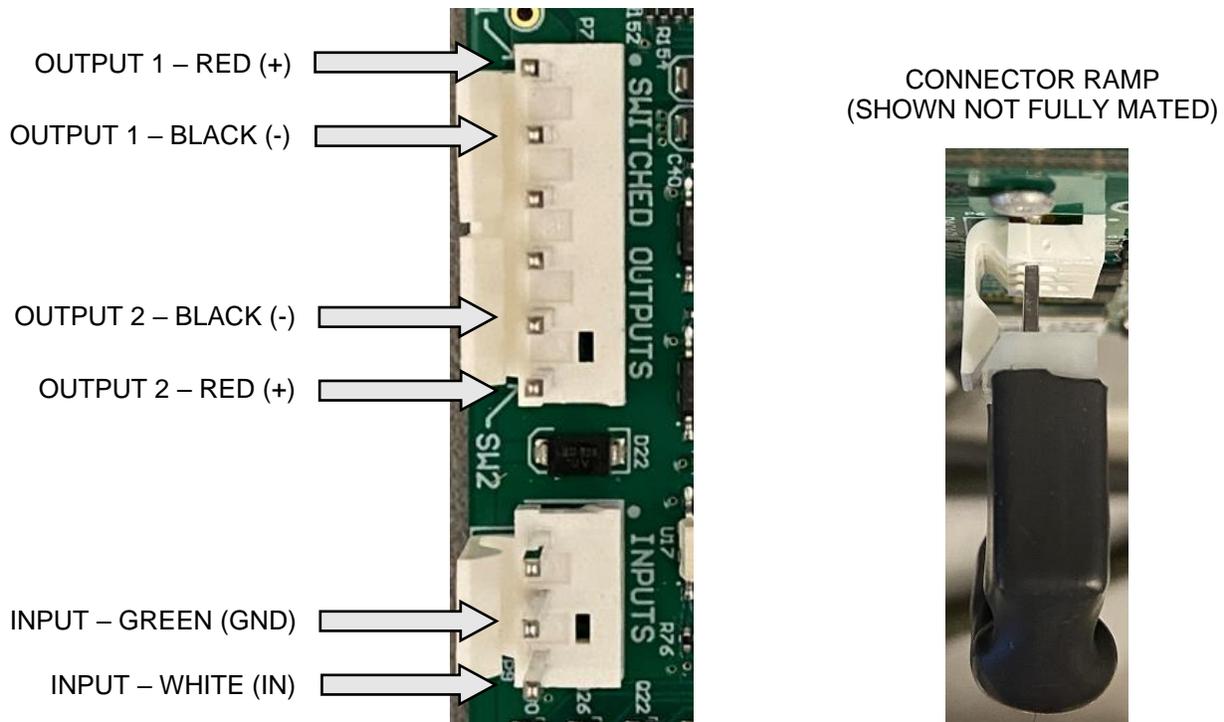
There are several different hardware variations of the SpeedCheck controller. See [Sections 3.7 – 3.9](#) to find the one that matches your system configuration.

Before accessing the controller, be sure power has been disconnected to the system.

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. Route input cables through the SPEEDCHECK-15 junction box or SPEEDCHECK-18 back panel.

No voltage should be applied to the input connections. The input is activated by shorting the input pins.



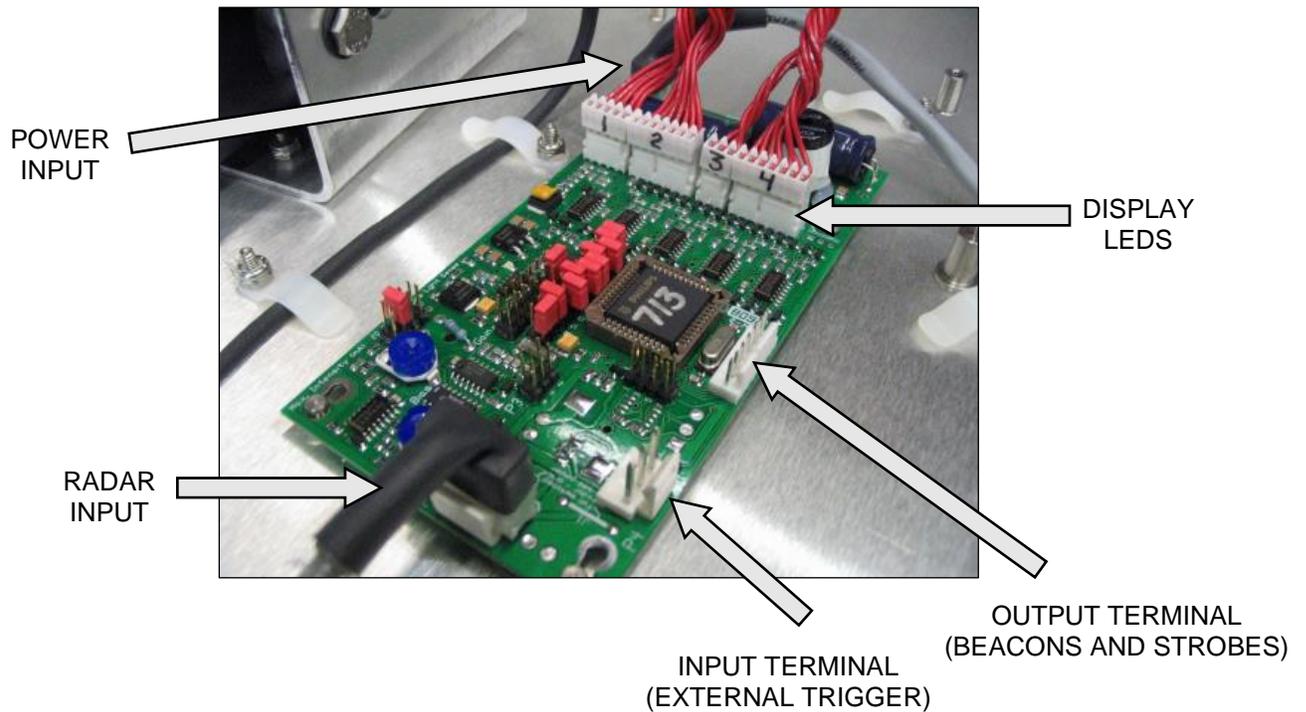
THE CONTROLLER CAN BE DAMAGED IF VOLTAGE IS APPLIED TO THE INPUT.



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)

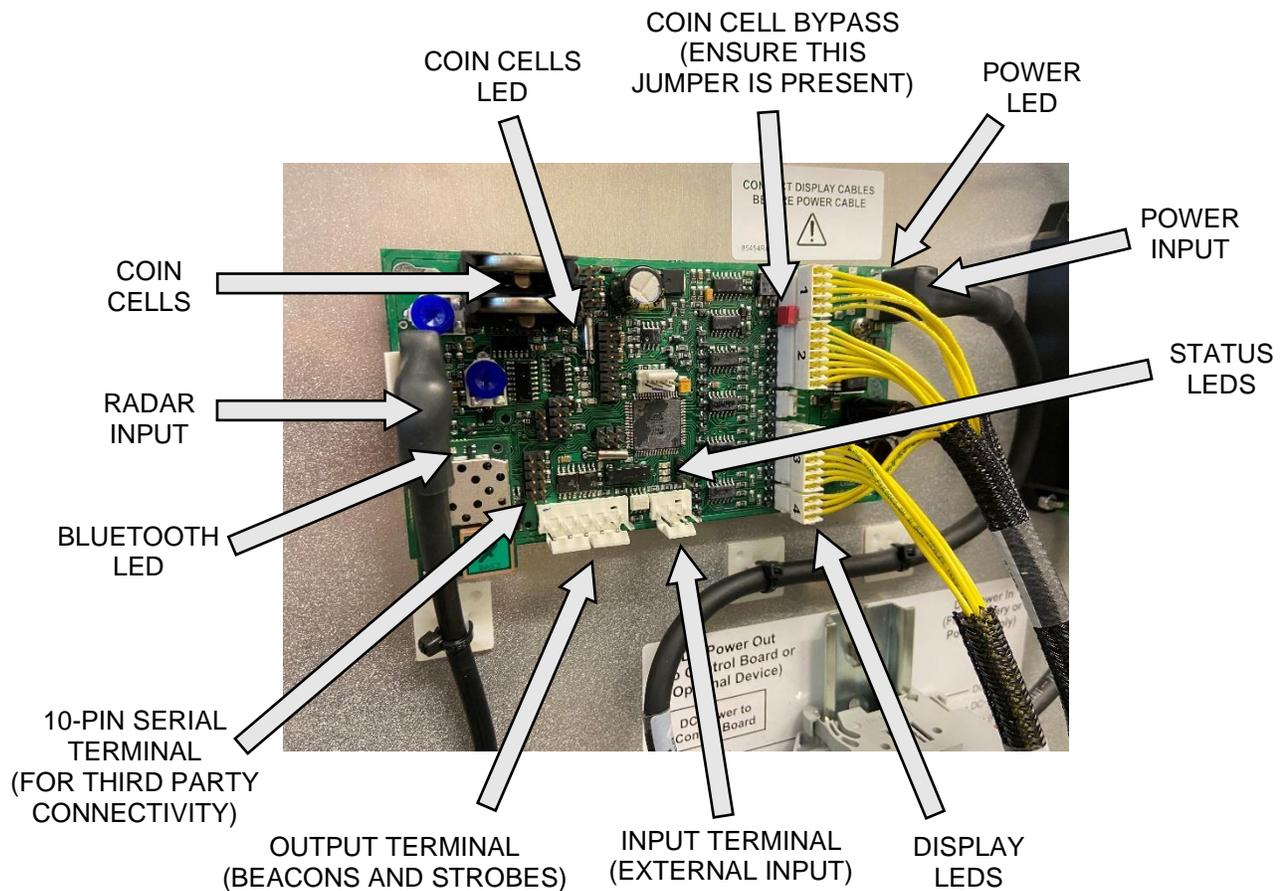
The controller below is no longer available from Carmanah and is replaced by the updated programmable board. The various settings and parameters are controlled by several DIP switches. Contact Carmanah for information on adjusting the settings.

**NOTE**

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

### 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

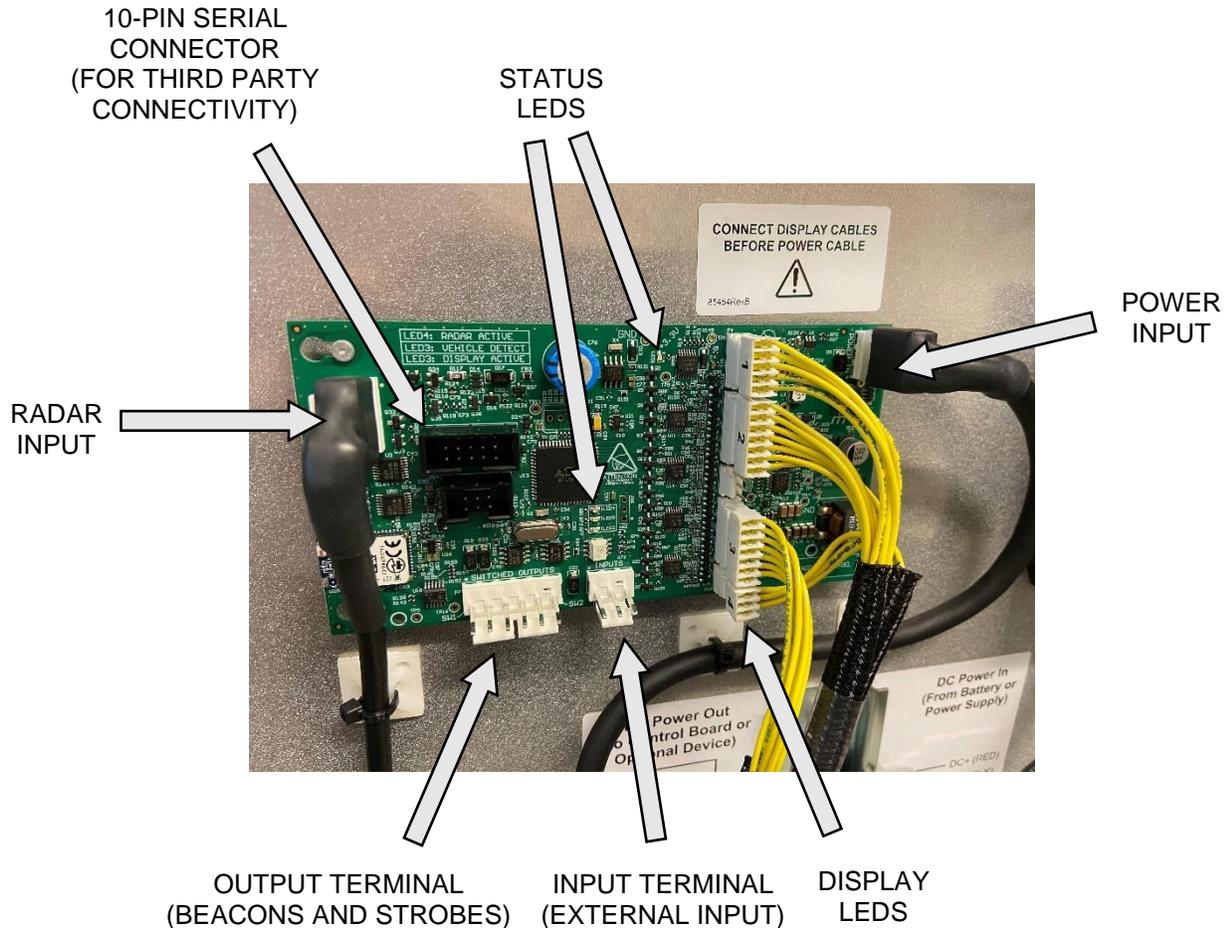
**NOTE** Momentarily shorting the two bottom pins on the 10-pin serial connector will perform a reset.

**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.



#### Status LEDs:

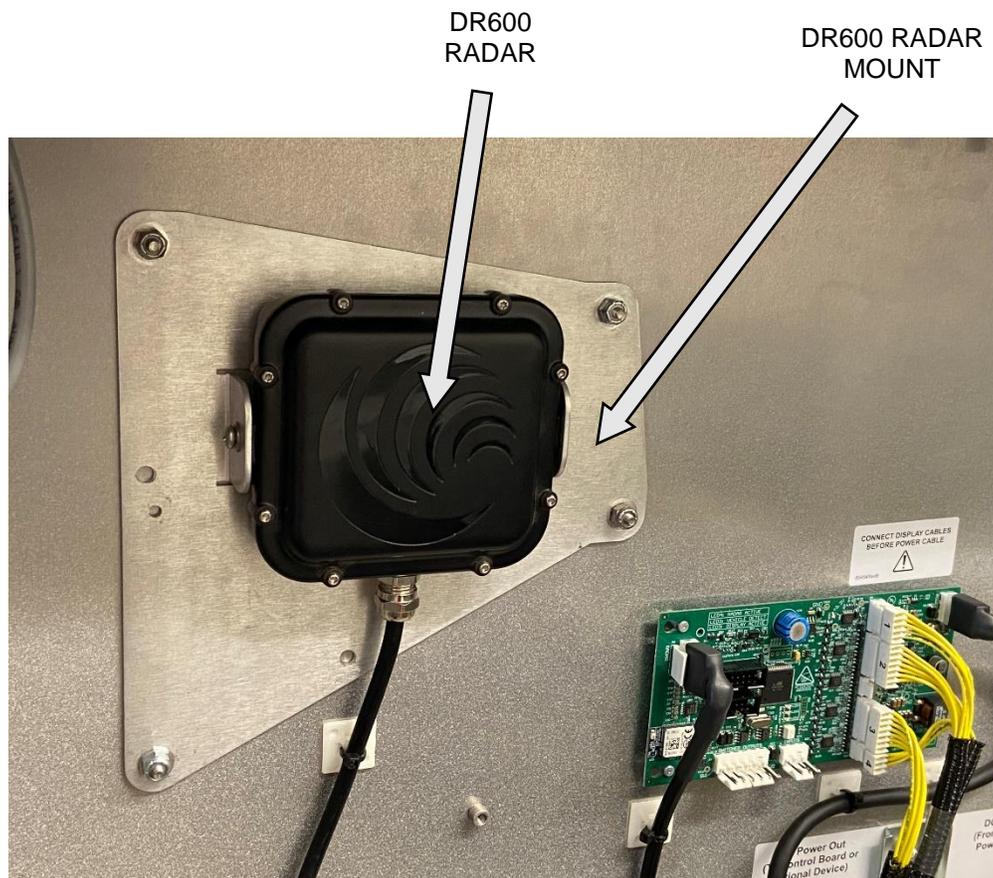
- LED1 = input power; this will illuminate when power is applied
- LED2 = display active; this will illuminate when the display is powered and operational
- LED3 = vehicle detect; this will intermittently illuminate when a vehicle has been detected
- LED4 = radar active; this will illuminate when the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

**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 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**

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.

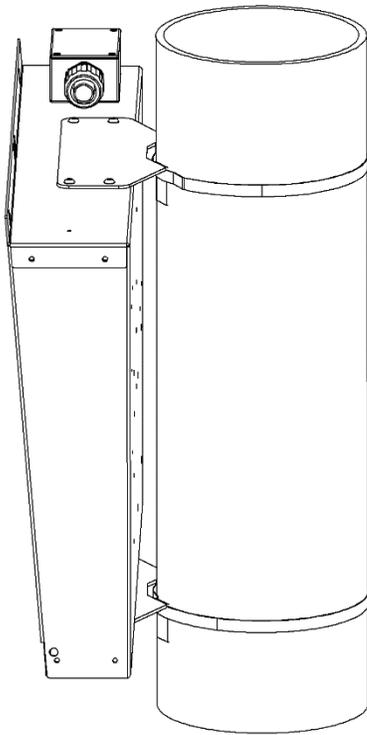


Ensure proper safety practices are observed and hazardous voltages sources are de-energized before beginning work.

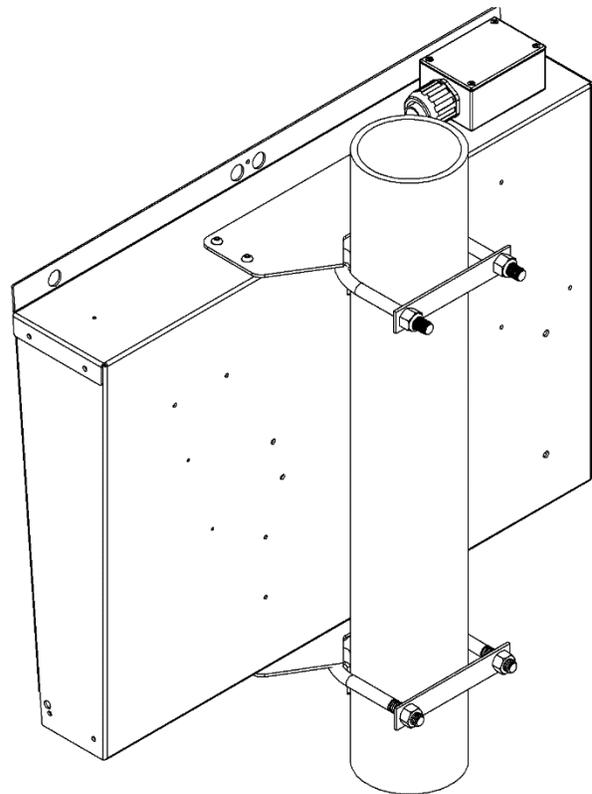
1. Mark desired positions of cabinet and pole-mounted elements on pole.
2. Drill cable exit/entry points for pole-mounted elements as needed.
3. Fish AC input cable to cabinet or sign (depending on version).
4. Fish DC harness between power supply cabinet and SpeedCheck sign (if required).
5. Fish solar 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 validated, 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*



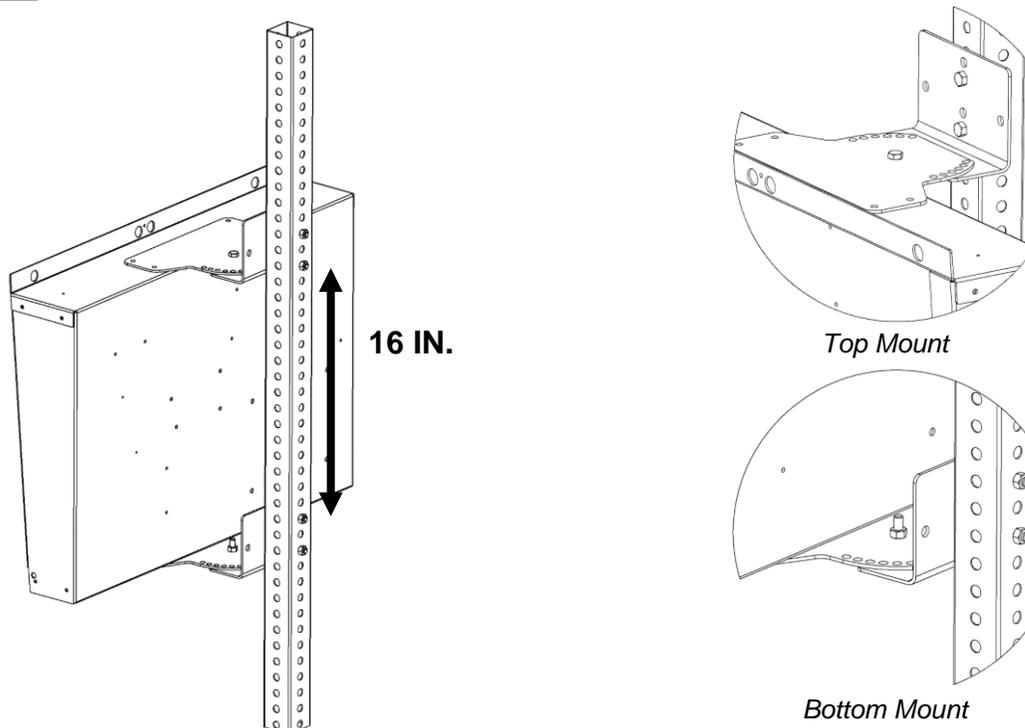
*4-6 Inch Round Pole Mount With U-Bolts*

### 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 2<sup>nd</sup> and 4<sup>th</sup> holes from the top of the bracket, and the lower “L” bracket uses the 1<sup>st</sup> and 3<sup>rd</sup> 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 validated, 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 angled top version  
shown)*



*Top Bracket Hanger*



*Installed Top Bracket*



*Lower Housing Mounting Bracket*



*Installed Bottom Bracket*

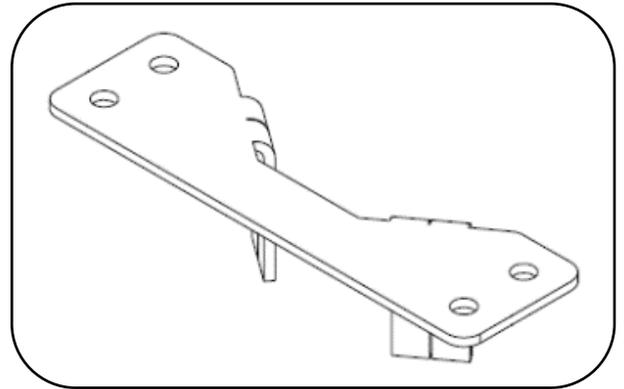
## 4.5 Tilt Mount

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*

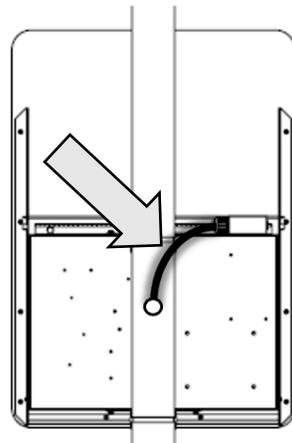
## 4.6 Conduit Routing

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

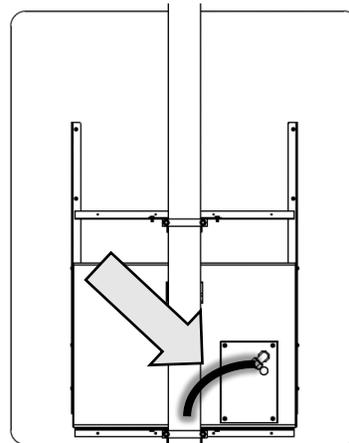
- SPEEDCHECK-15 junction box to the pole
- SPEEDCHECK-18 rear panel to the pole

**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.

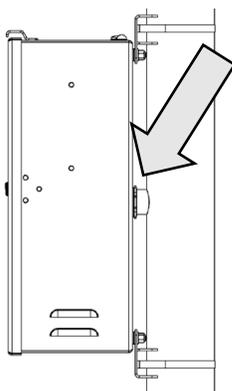


SPEEDCHECK-15

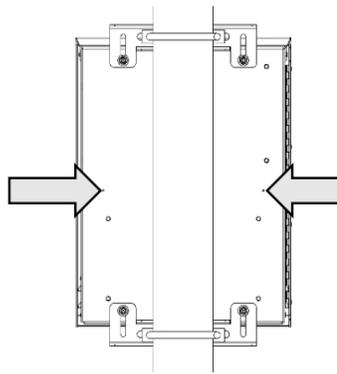


SPEEDCHECK-18

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



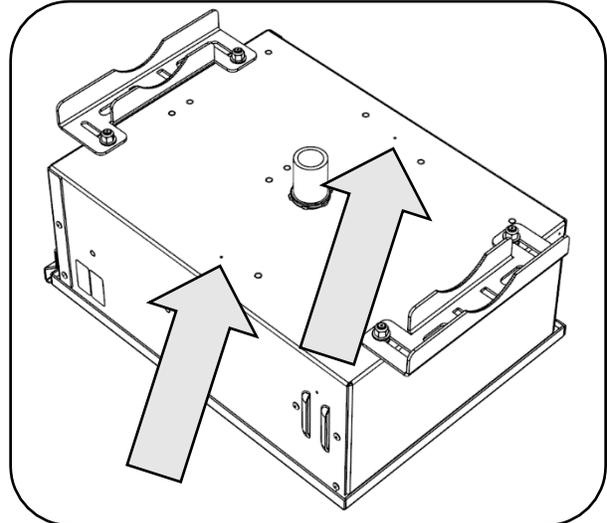
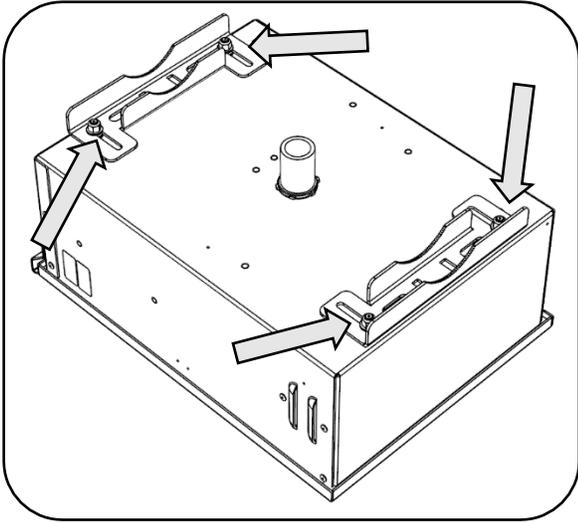
Hole Plug Installed

## 4.7 Cabinet Installation

**NOTE**

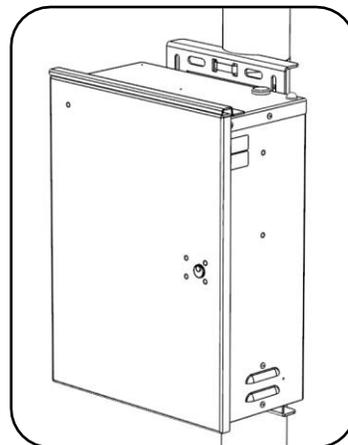
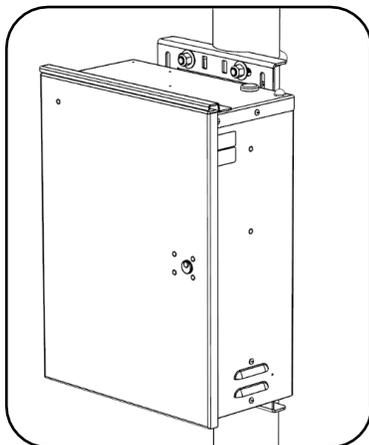
Before mounting the cabinet to the pole, all wiring internal to the pole (power, LED, optional StreetHub™ serial and ground cables) should be fished.

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.

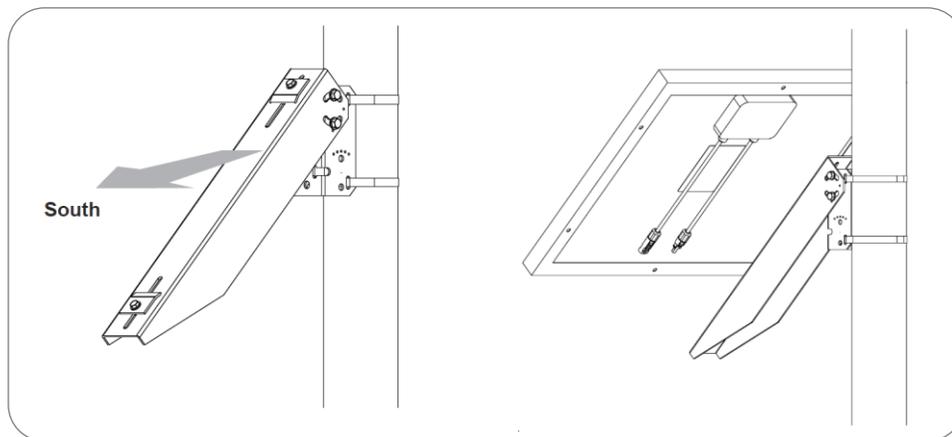
## 4.8 Solar Panel Mount Options

There are two options for mounting the solar panel:

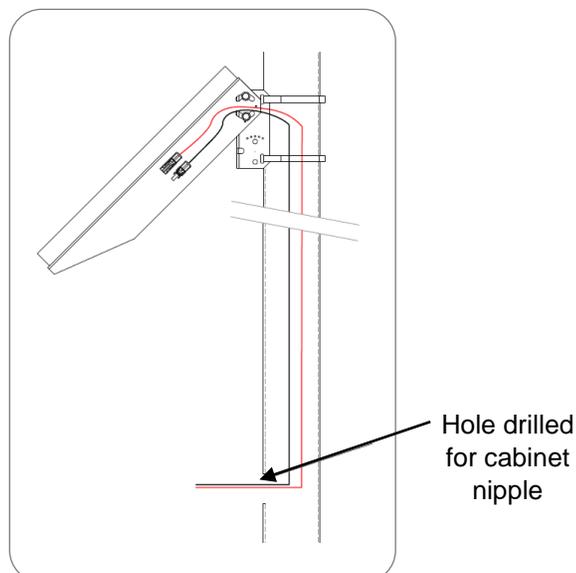
- Side of Pole – Adjustable tilt angle. Set it for 45° unless Carmanah has conducted solar simulations that resulted in a recommendation for a different panel tilt angle.
- Top of Pole – Fixed at a 45° angle with supplied bird deterrent
  - Galvanized Mount
  - Cast Mount

## 4.9 Solar Panel Mounting – Side of Pole

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).

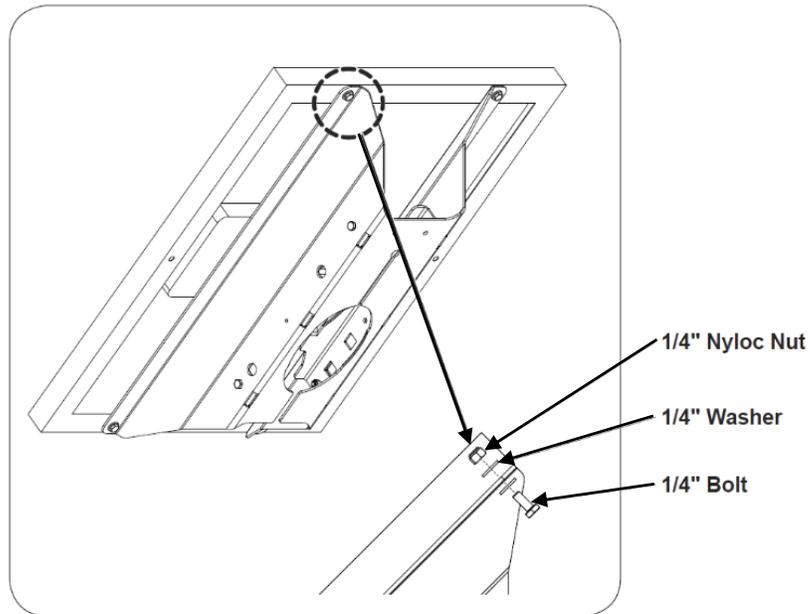


2. Route supplied solar panel wires down pole and through hole for cabinet conduit nipple.

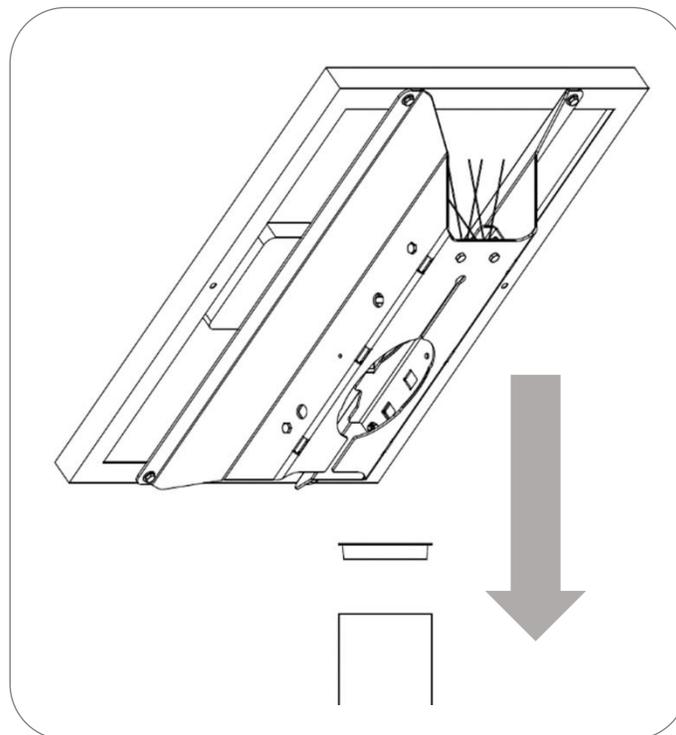


## 4.10 Solar Panel Mounting – Top of Pole (Galvanized Mount)

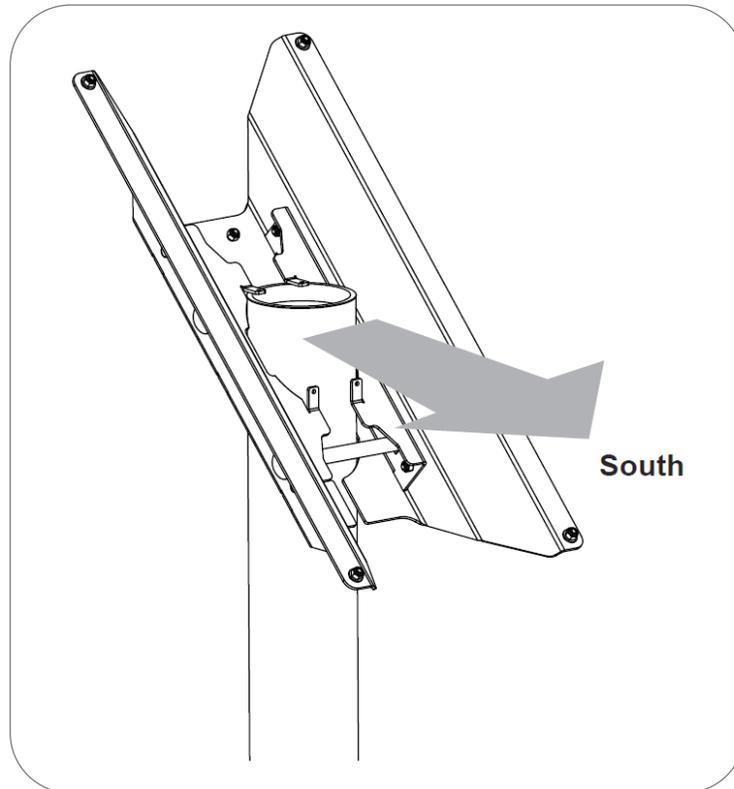
1. Attach solar panel to top of pole mount using supplied 1/4" bolts, washers and locknuts. Leave nuts finger tight. **DO NOT FULLY TIGHTEN** at this stage.



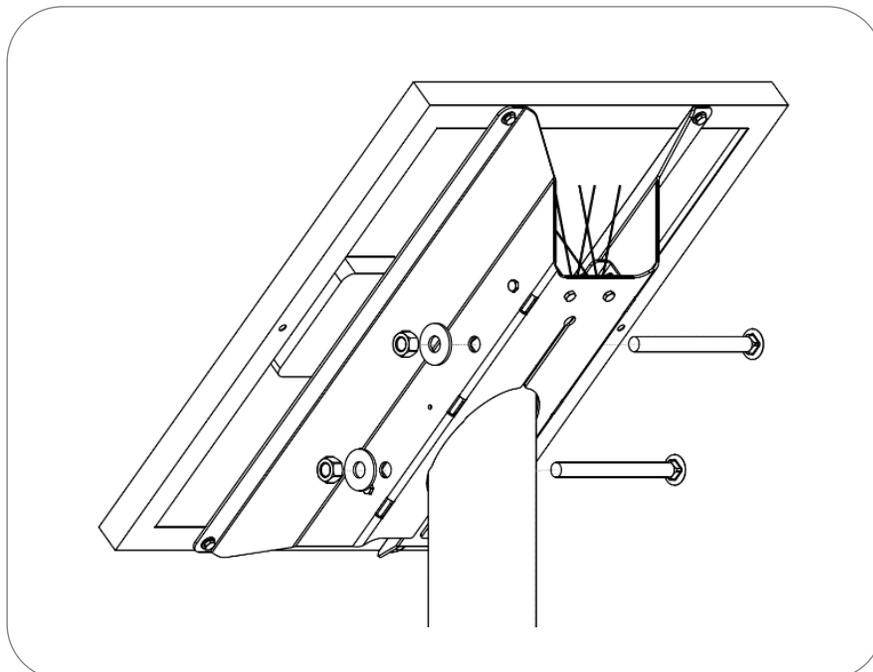
2. Insert cap into pole top and slide bracket onto the pole.



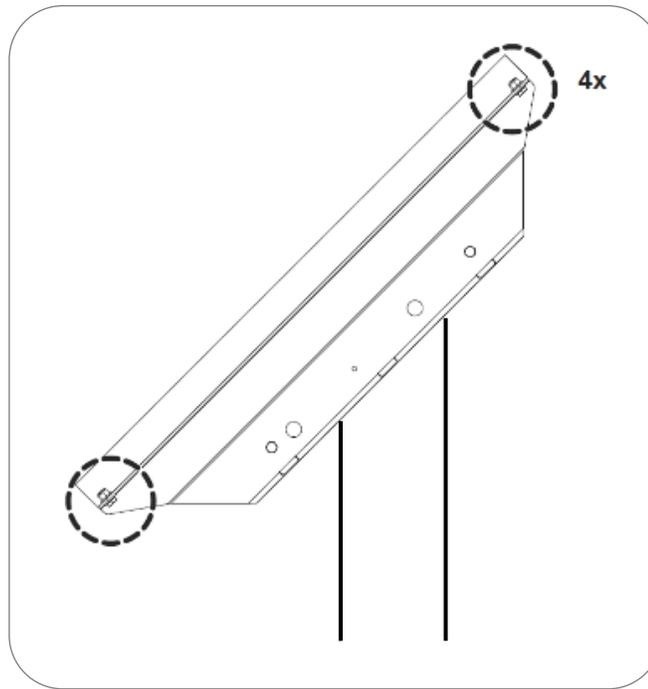
3. Make sure panel mount sits securely on the top of pole cap, as shown below (image shows solar panel removed for illustration purposes). Orient so panel faces South (in Northern Hemisphere).



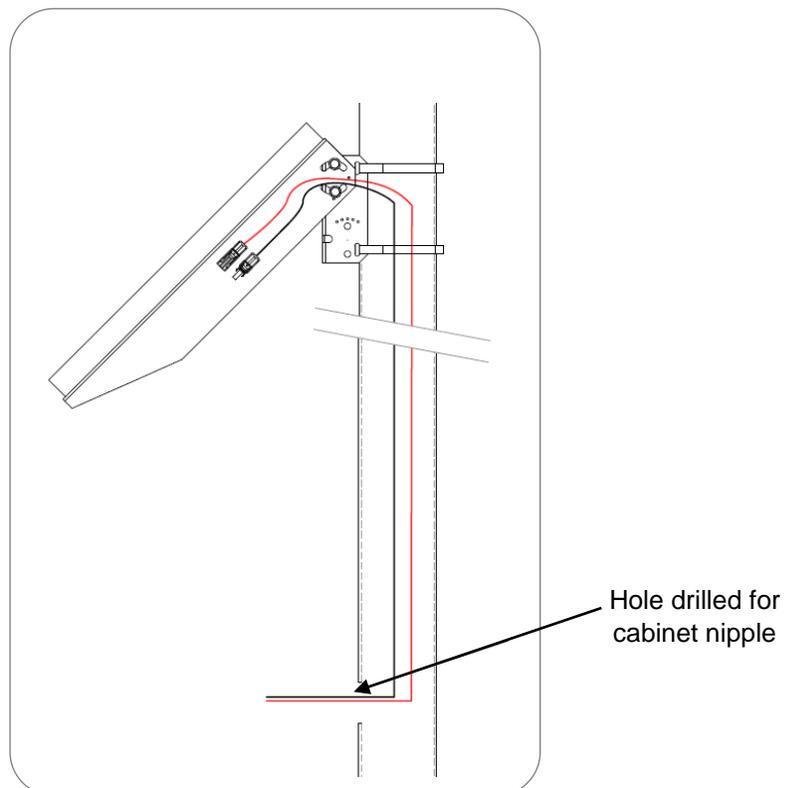
4. Install and tighten supplied 5/8" bolts and washers.



5. Tighten  $\frac{1}{4}$ " bolts and nuts securing solar panel to mount.

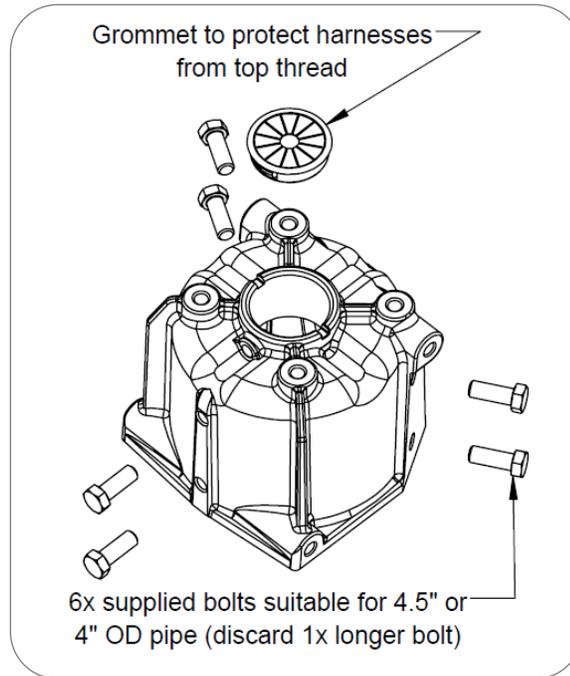


6. Route supplied solar panel wires down pole and through hole for cabinet conduit nipple (side of pole shown).

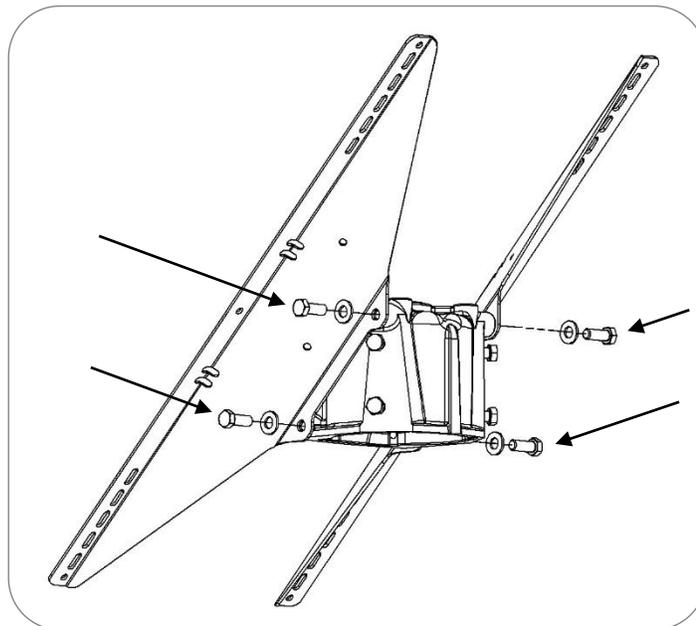


## 4.11 Solar Panel Mounting – Top of Pole (Cast Mount)

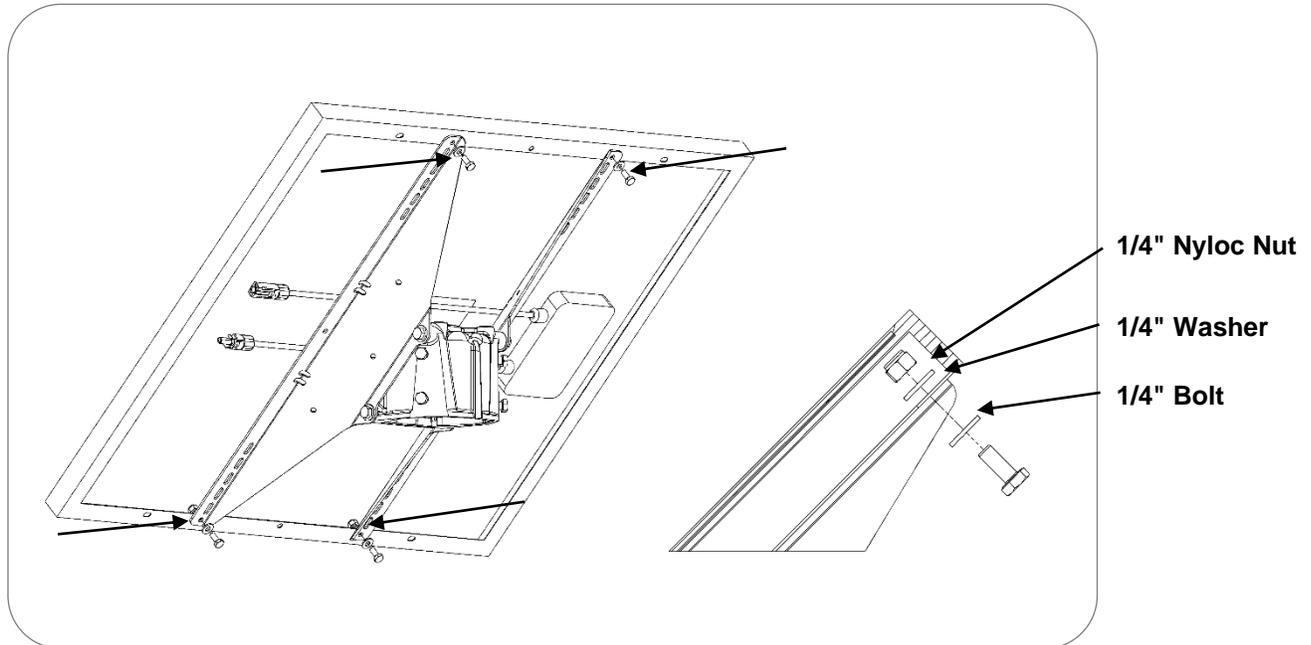
1. Install grommet and thread 6x 3/8" bolts into casting. Only thread in a couple turns so bolts do not protrude inside.



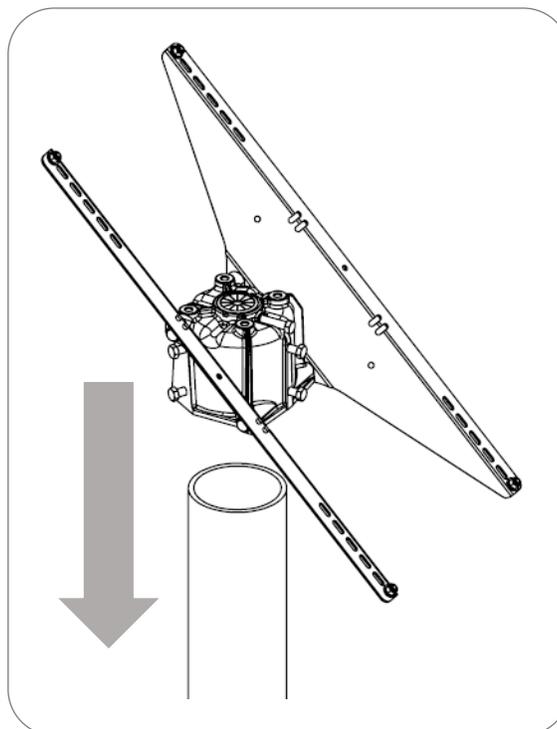
2. Attach both sheet metal brackets to solar panel using supplied 1/4" bolts, washers and locknuts. Install casting between brackets with supplied 3/8" bolts and washers. Tighten 3/8" bolts first.



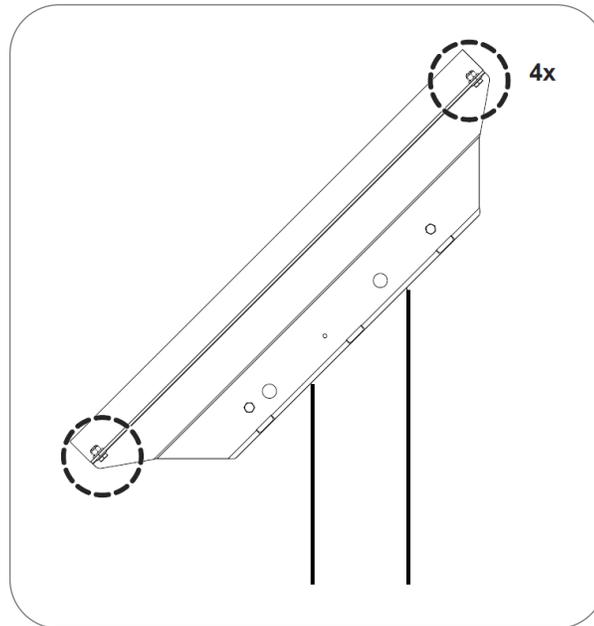
3. Attach solar panel to top of pole mount using supplied 1/4" bolts, washers and locknuts. Leave nuts finger tight. **DO NOT FULLY TIGHTEN** at this stage.



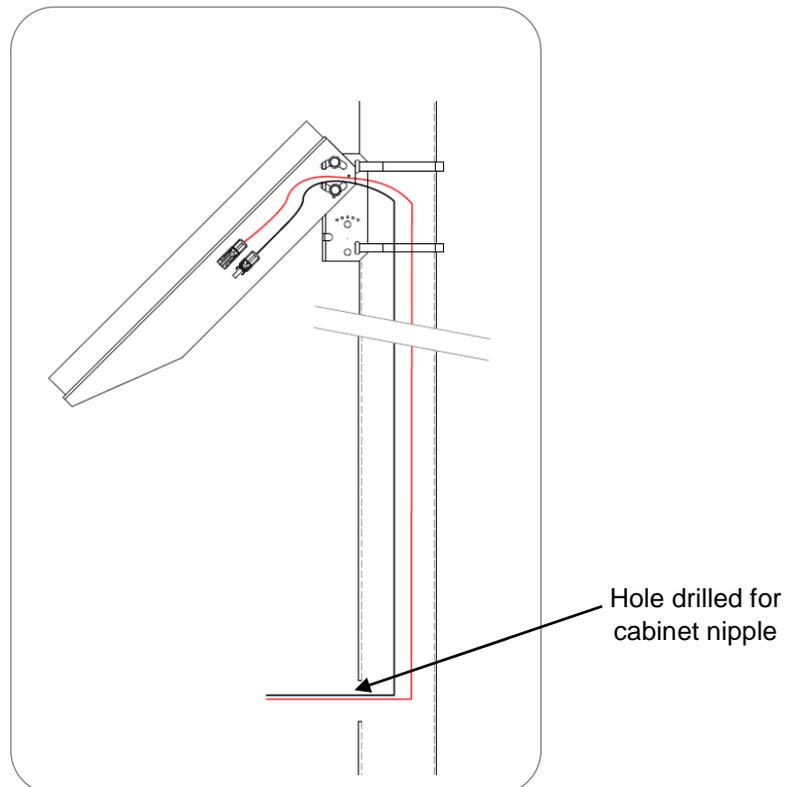
4. Slide casting over top of pole and orient so panel faces South (in Northern Hemisphere). Tighten the 6x 3/8" bolts to secure casting to pole (image shows solar panel removed for illustration purposes).



5. Tighten ¼" bolts and nuts securing solar panel to mount.



6. Route supplied solar panel wires down pole and through hole for cabinet conduit nipple (side of pole shown).



## 4.12 Solar Power System Wiring

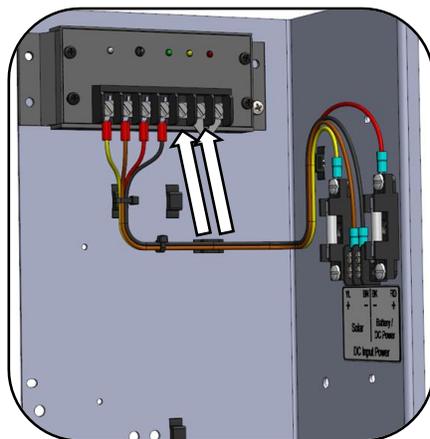
**NOTE**

**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.**

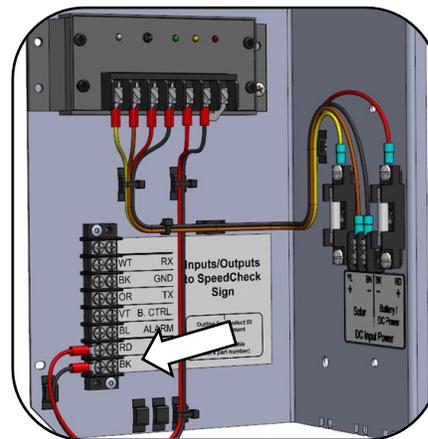
1. In-pole wiring: fish solar cable from solar panel down through hole in pole for cabinet nipple.
2. External wiring: route solar cable through a liquid tight conduit.
3. Remove battery and solar fuses from fuse holders in cabinet.
4. Connect solar positive spade terminal (red wire, yellow heat shrink) 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.



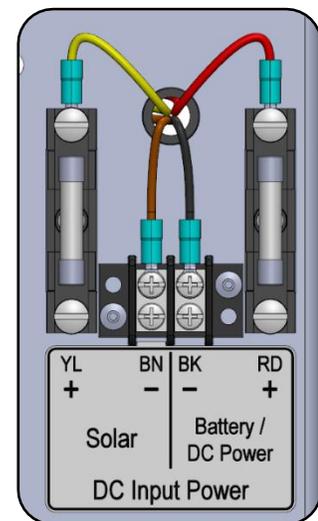
Ensure cabinet door is fully closed and latched otherwise damage may occur.



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



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



*Cabinet DC input power  
terminals*

## 4.13 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.

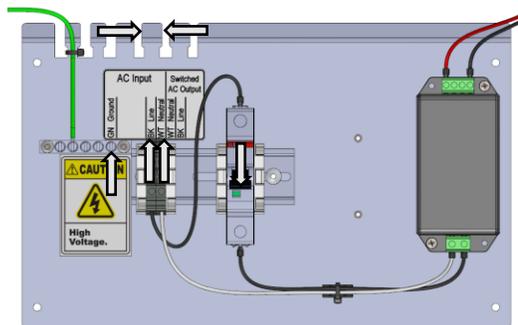


Ensure cabinet door is fully closed and latched otherwise damage may occur.

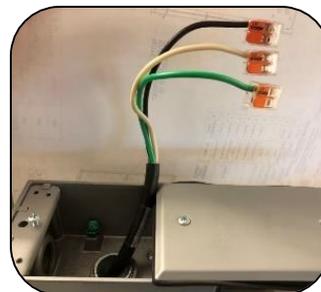
**NOTE**

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

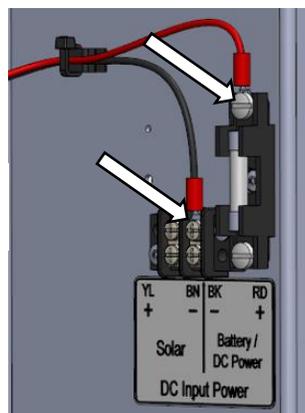
*Cabinet AC input terminals*



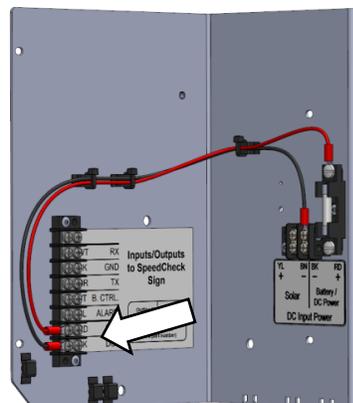
*AC-in-the-sign wiring (SPEEDCHECK-15 only)*



*DC out to radar sign*

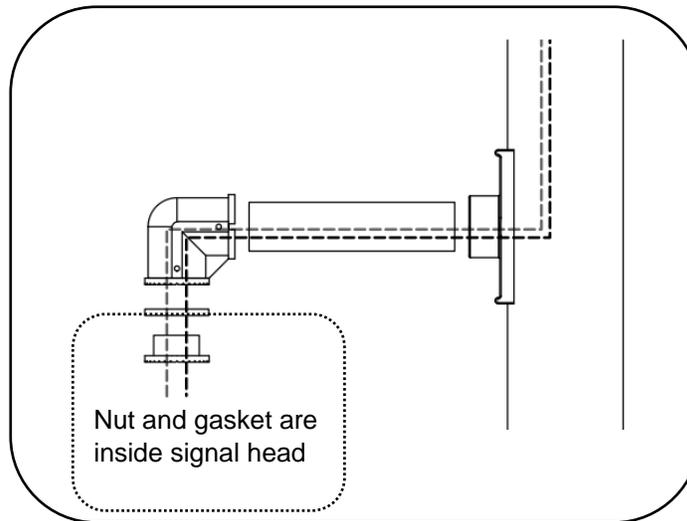


*DC out to radar sign (StreetHub™ equipped only)*



## 4.14 Circular Beacon Installation

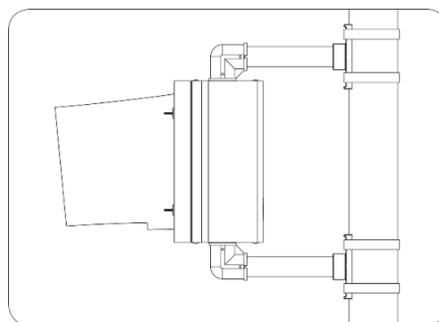
1. Thread the flashing beacon harness through the beacon arms. Then, mount the top flashing beacon arm to the pole using stainless banding or bolts (not supplied). Use the gasket on the top mounting arm to ensure water does not leak past the connection and enter the signal head from the top.



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](http://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.

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## 5.0 Display Alignment

### 5.1 Display Alignment – Overview

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#### Important Tips for Display Sign Installation

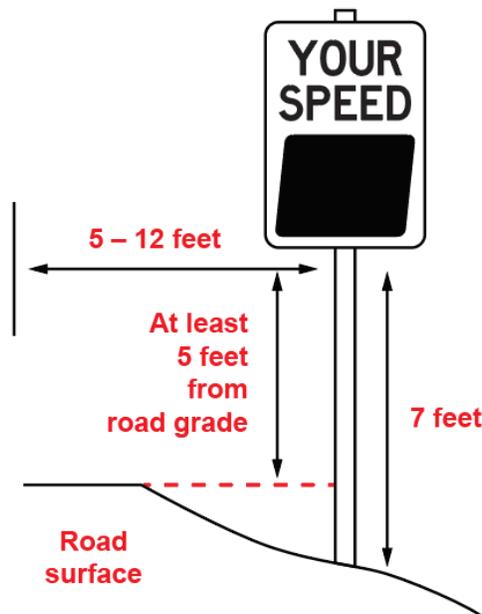
- Avoid installing the display sign immediately after a sharp curve, as the radar might not pick up approaching traffic. The sign needs to be aimed correctly at approaching traffic.
- Avoid installing on a steep incline or decline **unless using tilt brackets** (see [Section 4.5](#)) so that radar and 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 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.

## Roadside Placement

Typically, the SpeedCheck 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

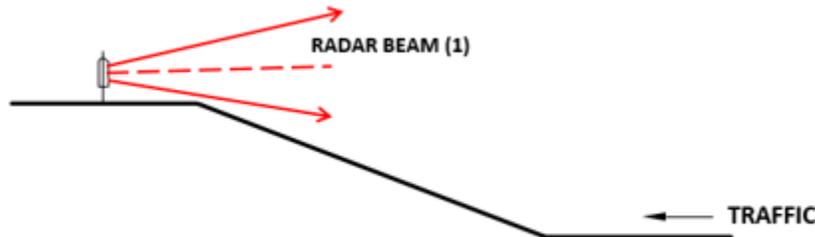
An installation in the uphill or downhill direction of a steep hill might require the display sign to be mounted with the top tilted towards oncoming vehicles to accurately aim the radar at approaching traffic. In this situation, use spacers behind the top or bottom display mounting bracket to tilt the 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)*

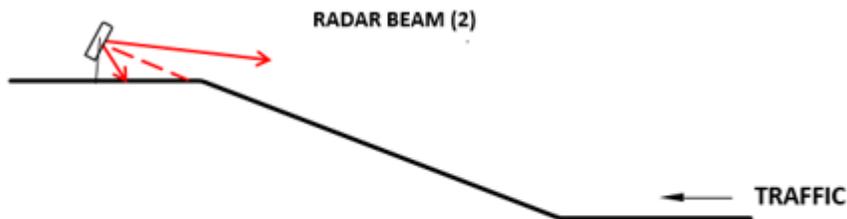
## 5.2 Display Alignment – Hill Alignment

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.



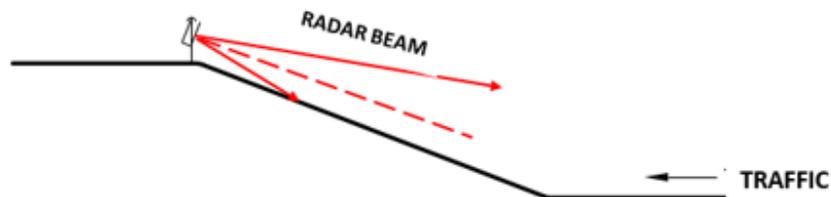
Poor Sign Alignment for Uphill Traffic Flow (1)

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.



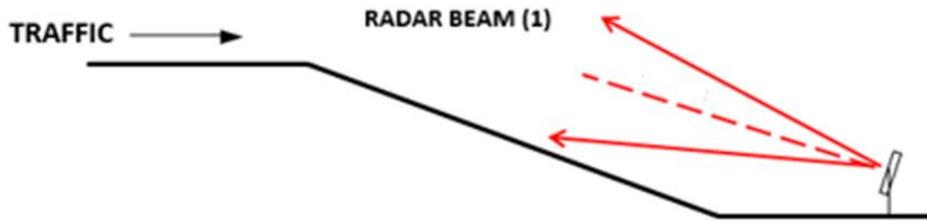
Poor Sign Alignment for Uphill Traffic Flow (2)

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.



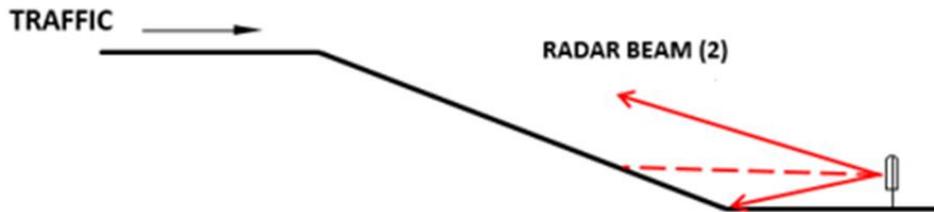
Proper Sign Alignment for Uphill Traffic Flow

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.



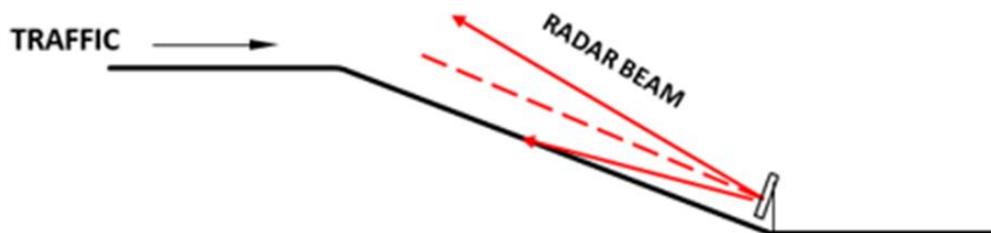
**Poor Sign Alignment for Downhill Traffic Flow (1)**

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.

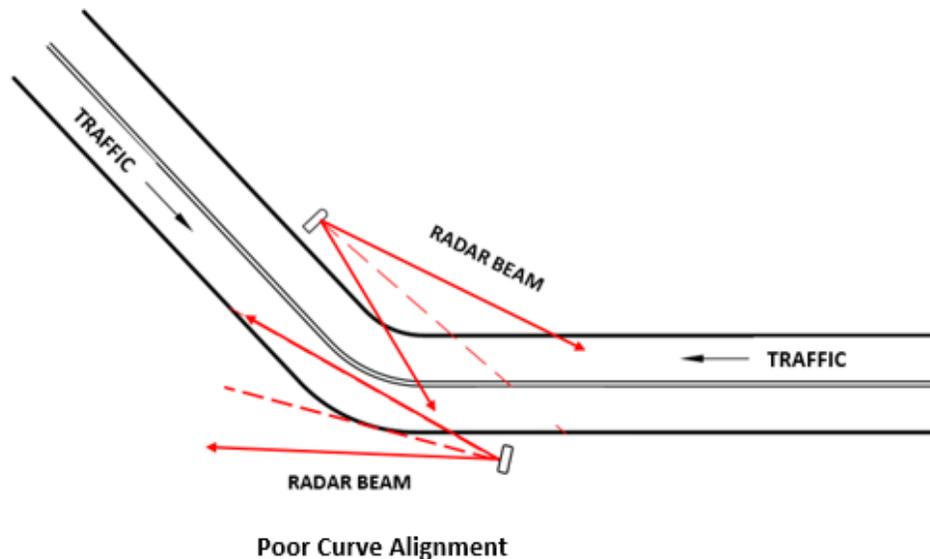


**Proper Sign Alignment for Downhill Traffic Flow**

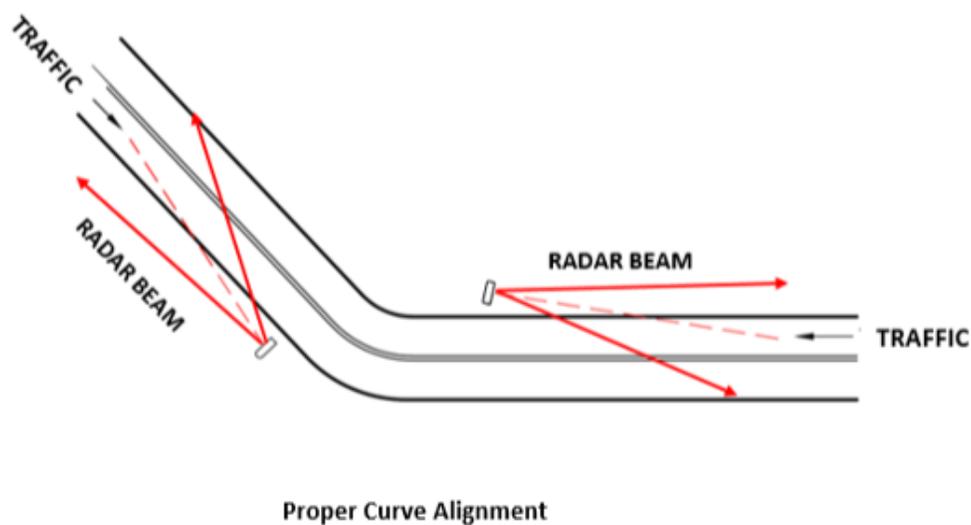
### 5.3 Display Alignment – Curve Alignment

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.

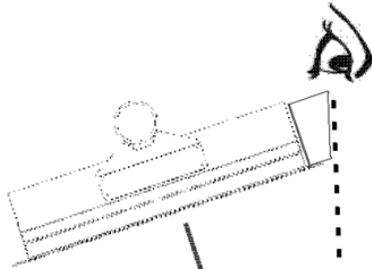


The next diagram shows the same curve configuration, but with display signs in proper locations. The radar is mostly parallel to the roadway, with a good detection range.

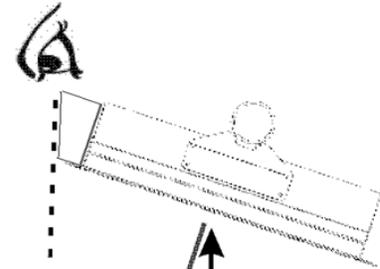


## 5.4 Display Alignment – Rotational Display Sign Alignment

Left side of roadway  
sign mounting:

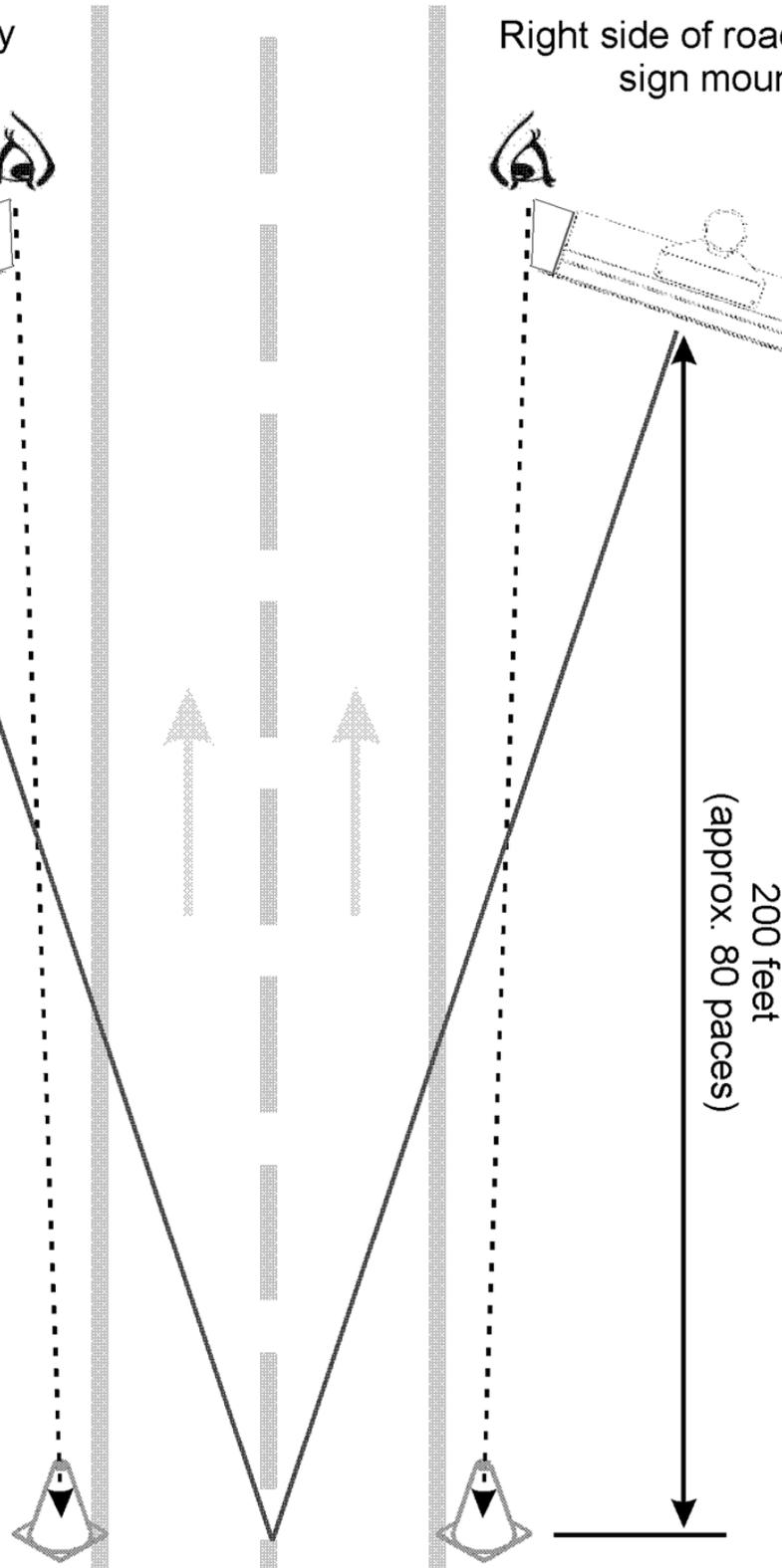


Right side of roadway  
sign mounting:



### 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.



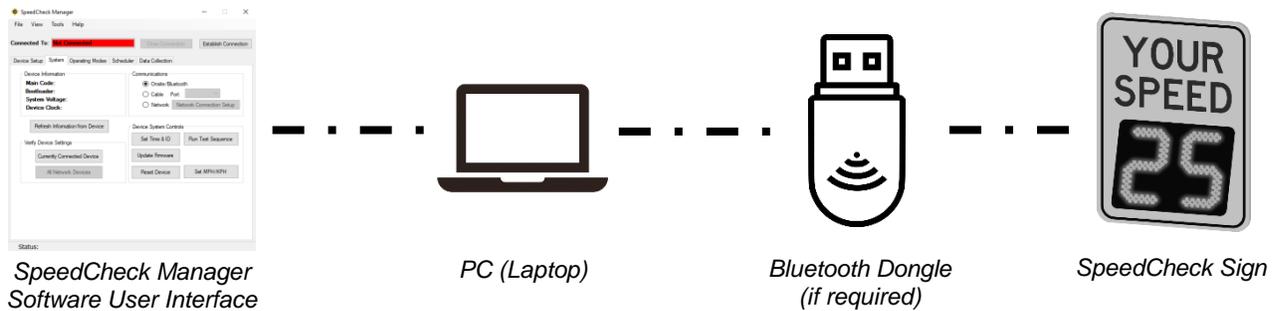
## 6.0 System Configuration

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](http://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.

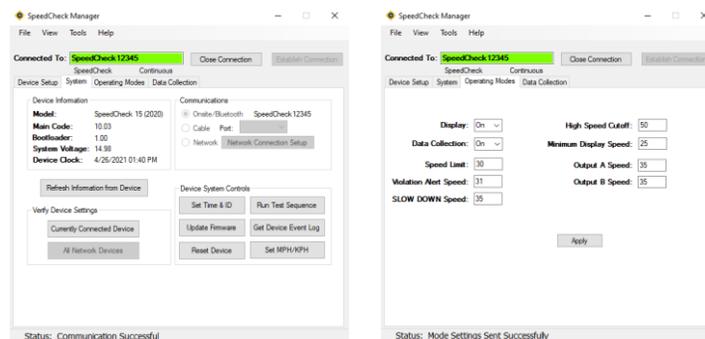
**NOTE** Updating firmware on legacy controllers running version 3.47 or older is **not recommended**.

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 is a few of the features and programming options found within SpeedCheck Manager:

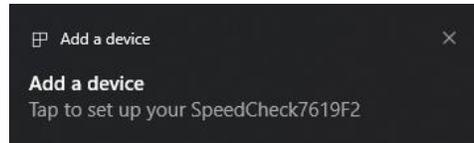
- Speed adjustments
- Radar unit of speed (MPH/KPH)
- Beacon adjustments
- Operating mode selection
- Slow Down option toggle
- System ID, date and time
- Scheduling
- Data collection
- Firmware updating



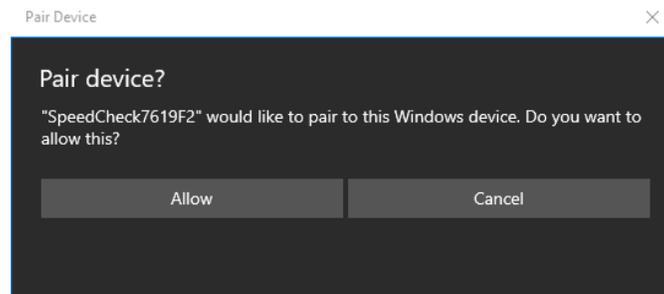
### Bluetooth Pairing (updated programmable controller only)

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

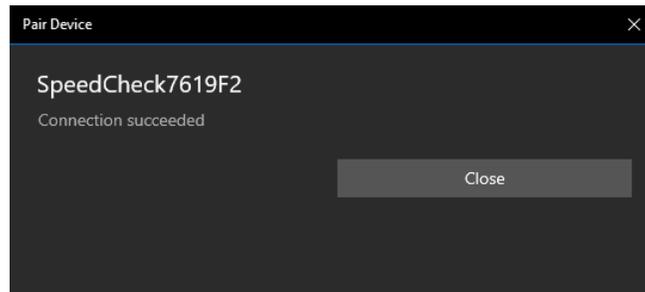
1. Open SpeedCheck Manager and click on Establish Connection.
2. Wait for the software to scan and detect nearby Bluetooth devices. Click on your radar speed sign (designated as SpeedCheckXXXXX) and click Connect.
3. Click on the dialog box in the bottom right corner to begin the pairing process.



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.

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## 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.

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## 8.0 Maintenance and Product Care

The SpeedCheck 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.

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### 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](http://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"> <li>1. Verify voltage supply connections are correct and tight.</li> <li>2. Verify fuses in the fuse blocks and inline fuse holder are of the correct rating.               <ul style="list-style-type: none"> <li>• Solar input and battery fuse: <b>15A</b></li> <li>• SpeedCheck DC supply fuse: <b>4A</b></li> <li>• SpeedCheck AC input fuse: <b>0.5A</b></li> <li>• All fuses are type (250V 3AG 1/4" x 1-1/4")</li> </ul> </li> <li>3. On programmable boards, ensure the coin cells show at least 2.7V each, if not they should be replaced.</li> </ol>
Not all vehicle speeds displayed	<ol style="list-style-type: none"> <li>1. Verify the display has correct alignment with the roadway. See <a href="#">Section 5</a> on Display Sign Alignment.</li> <li>2. Check the High Speed Cutoff setting in SpeedCheck Manager. It may be set too low for the prevailing traffic speed.</li> <li>3. Check the minimum display speed setting. It may be set too high for the prevailing traffic speed.</li> <li>4. Note that the SpeedCheck display signs are designed to detect moving vehicles, including trucks and golf carts, but will ignore people or small targets.</li> <li>5. The display may be angled slightly towards the center line of the road to focus on vehicles closer to the display. Detection range may vary depending on target size, such as a truck versus a compact car.</li> </ol>
Sign displays test sequence only upon start up	<ol style="list-style-type: none"> <li>1. Display may be set to "OFF" in the "Operating Modes" menu of the SpeedCheck Manager software.</li> <li>2. Timer or scheduler has been set to collect data but not display speeds. Set the program as desired.</li> <li>3. Radar is not sending data. Contact Carmanah for further diagnostics.</li> </ol>
No test sequence and no speeds displayed	<ol style="list-style-type: none"> <li>1. Key switch if used is in the OFF position, fully Counterclockwise (CCW).</li> <li>2. 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.</li> <li>3. 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.</li> <li>4. Power to display is OFF.</li> <li>5. Test sequence is disabled.</li> <li>6. Operating Modes settings set for "Display OFF".</li> <li>7. Timer or scheduler has scheduled the sign to be off.</li> </ol>

<p>Numbers displayed with no vehicles passing</p>	<ol style="list-style-type: none"> <li>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.</li> <li>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.</li> </ol>
<p>Speed readings are higher than expected</p>	<ol style="list-style-type: none"> <li>1. Display may be set to read KPH instead of MPH. Use SpeedCheck Manager to set the correct unit of speed. See <a href="http://support.carmanah.com">support.carmanah.com</a> for more information.</li> </ol>
<p>Detection range too short</p>	<ol style="list-style-type: none"> <li>1. Sign alignment is incorrect. See <a href="#">Section 5</a> on Display Sign Alignment.</li> <li>2. Sign has metallic or plant obstructions between display and the vehicles.</li> <li>3. Sign is aligned properly but road curve or grade is affecting detection zone.</li> <li>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.</li> <li>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.</li> <li>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.</li> </ol>
<p>Bluetooth<sup>®</sup> communications erratic or not working</p>	<ol style="list-style-type: none"> <li>1. Display not powered, or key switch set to OFF.</li> <li>2. PC laptop computer not fully charged. You may get a timeout error if there is insufficient power to maintain a wireless connection.</li> <li>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.</li> <li>4. Mismatched software and firmware are loaded on the laptop or controller board. Contact Carmanah for the latest versions.</li> </ol>
<p>Display application not downloading data properly</p>	<ol style="list-style-type: none"> <li>1. Invalid display name. Ensure display name programmed with your laptop computer is valid and does not include special characters or punctuation.</li> <li>2. PC laptop computer not fully charged. You may get a timeout error if there is insufficient power to maintain a wireless connection.</li> <li>3. Make sure display date and time is set properly with the SpeedCheck Manager Device System tab setup menu.</li> </ol>

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## 10.0 Service & Repair

### 10.1 Accessing Internal Components

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**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



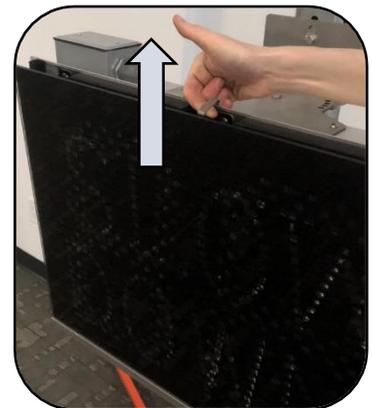
Remove the two fasteners



Tilt sign to rear



Lift up to remove



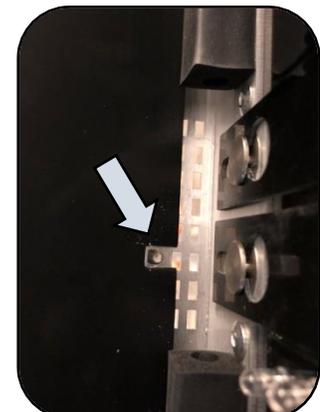
Lift window retainer clip



Optional: If present, disconnect  
strobe connectors.



Tilt the window forward and lift to  
remove



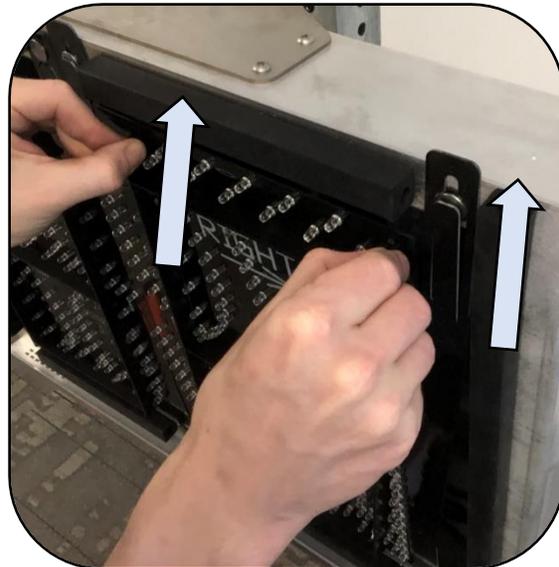
Take note of window alignment  
stud for re-installation

### 10.3 Releasing Locking Features

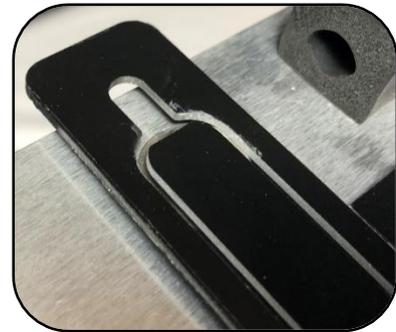
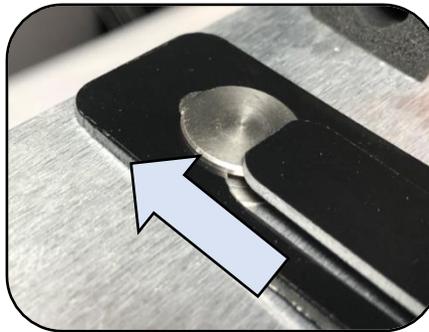
The following photos provide greater detail about how to release the display board locking features.



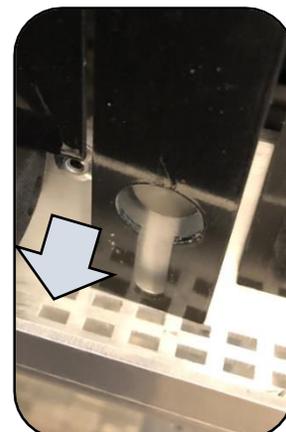
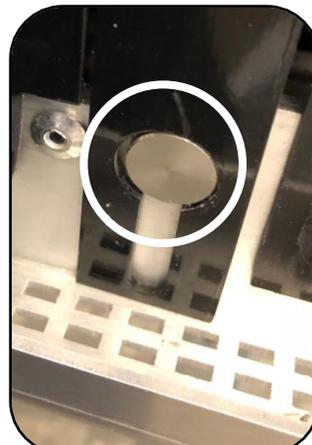
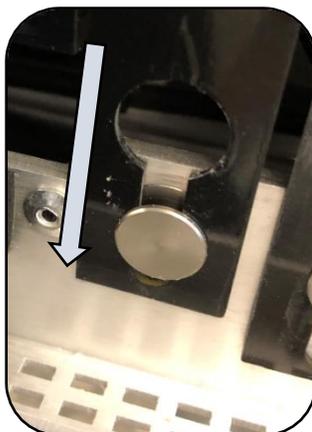
*Being very careful not to touch the LED lamps, grasp the circuit board stiffeners at the top.*



*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.*

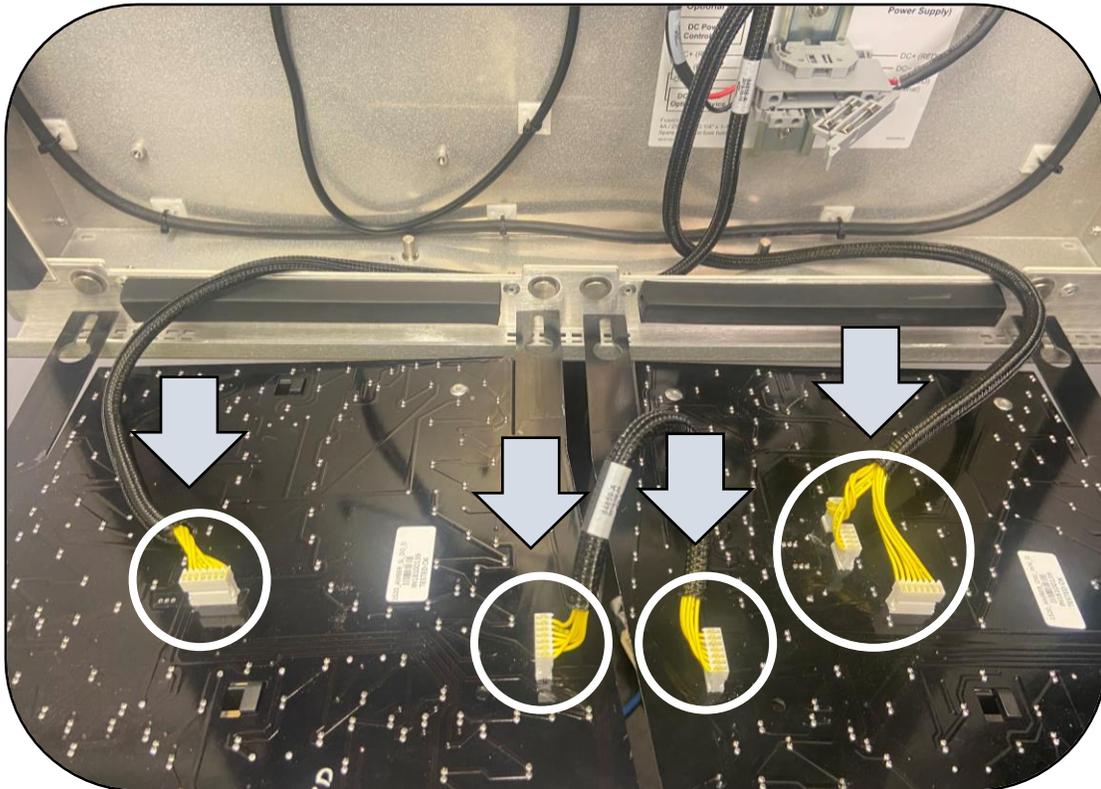
## 10.4 Removing Display Boards

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.

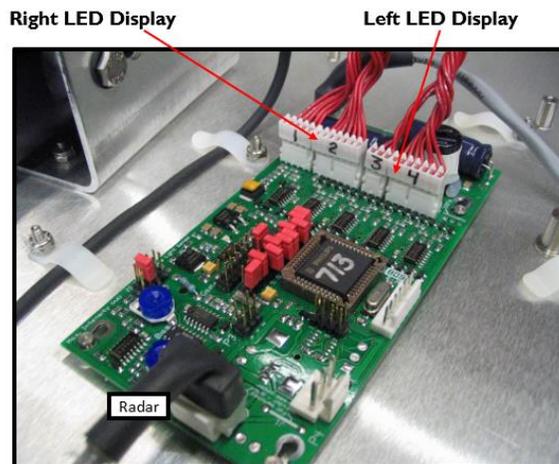


Place the display boards somewhere that they will not be in damaged. The LEDs are easily bent and misaligned. NOTHING SHOULD BE ALLOWED TO TOUCH THE INDIVIDUAL LEDs.

## 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.

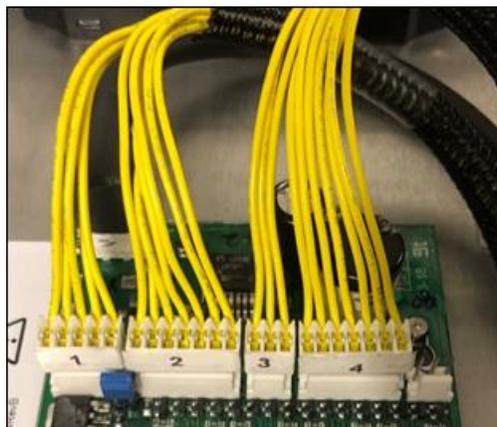


**Caution!** Do not power up display with cables disconnected. This will damage the circuit board.

## 10.6 Programmable Controller Cable Connections (without Slow Down)

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

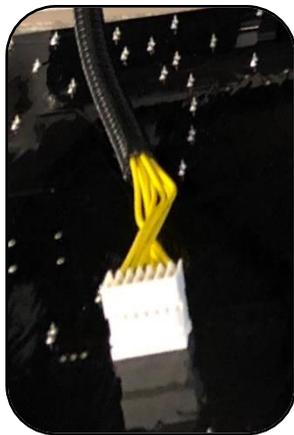
1. Connect the display cables before connecting the power cable.
  - a. The 5-pin and 7-pin connectors (1 and 2) go the right LED display.
  - b. The 3-pin and 7-pin connectors (3 and 4) go to the left LED display.



## 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.



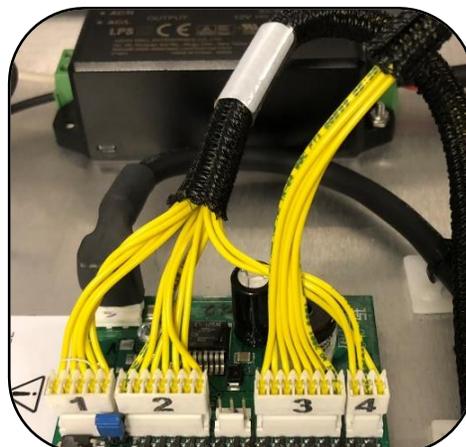
*Left Display Board Connector*



*Right Display Board Connectors*



*Slow Down Interconnect*



*SpeedCheck Controller Connectors*

## 11.0 Customer Service and Warranty

The SpeedCheck products are covered by a limited warranty for the product excluding batteries and a separate limited warranty for the batteries.

Visit [support.carmanah.com](http://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](mailto:customersupport@carmanah.com)

**Web:** [carmanah.com](http://carmanah.com)



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