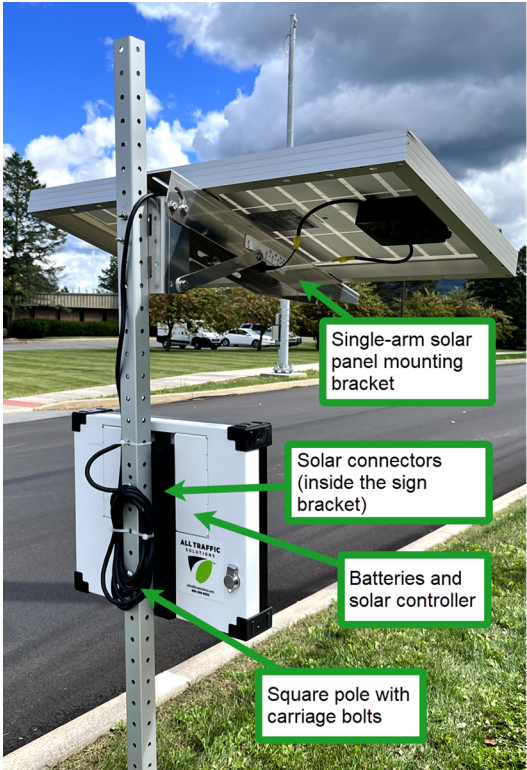


Thank you for purchasing an ATS sign with the Integrated Solar Option and the Single-Arm Solar Panel Mounting Bracket. This guide will show you how to set up and install your new Integrated Solar sign and pole mounting bracket on a pole. The Integrated Solar Option, which is powered by solar technologies and one or more lithium batteries, is available for SpeedAlert 18 Radar Message Signs, InstAlert 18 Variable Message Signs, and Shield 12 or Shield 15 Radar Speed Signs. See the figures below and *The Integrated Solar Option* on the next page.



[Figure 1] Pole mounted SpeedAlert 18 with the Integrated Solar Option



[Figure 2] Integrated Solar Option components and Single-Arm Solar Panel Mounting Bracket

What's included

Upon receiving your shipment, check to ensure that you have all of the items ordered. If you notice any damage or missing items, contact ATS [Technical Customer Support](#) immediately.

Sign with the Integrated Solar Option (Pole Mounted)	The required tools
Includes the following: <ul style="list-style-type: none">» An ATS SpeedAlert 18 Radar Message Sign, an InstAlert 18 Variable Message Sign, or a Shield 12 or Shield 15 Radar Speed Sign with the Integrated Solar Option,» For speed signs, a Your Speed faceplate,» A sign mounting bracket and fasteners,	<ul style="list-style-type: none">» To attach the bracing arms to the pole bracket and adjust the nuts and bolts, you'll need a 1/2" wrench and socket wrench with a 1/2" socket.

Sign with the Integrated Solar Option (Pole Mounted)	The required tools
<ul style="list-style-type: none"> » One or two lithium batteries, depending on your order, » The Single-Arm Solar Panel Mounting Bracket, including mounting arm, with attached bracing arms, pole bracket, two panel clamps, and two 5/16" nut and bolt sets, » A 50-watt to 100-watt solar panel and wiring harness, » An optional external AC charger, » This setup guide. <p>All setup and quick start guides are also posted to the ATS Technical Customer Support page and if you have a TrafficCloud subscription, you can access additional guides on the ATS Start-Up page.</p> <p>For complete details, consult the bill of materials supplied with your delivery.</p>	<ul style="list-style-type: none"> » To attach the mounting bracket and panel to the pole, you'll need a power drill or socket wrench with a 5/16" socket, 5/16" flathead screwdriver, and step ladder. » A compass app and smart phone or compass. » Internet access.

Before you go on the road

If you have a TrafficCloud Web subscription, the first thing you'll need to do to get started using your signs with TrafficCloud is to create at least one Site for each sign remotely, in advance, from your office. With TrafficCloud, you configure a sign's Site for everything from speed to messaging (if equipped), reports, alerts and more. Sites are the key to generating traffic reports, because TrafficCloud organizes traffic data for reports by Site. If necessary, you can also perform these steps after you install a sign at a physical location. See "Creating a Site" in the *Getting Started with TrafficCloud Guide* for your sign.

If you don't have a Web subscription, you can set up the sign in advance or while you're on location, using the onboard buttons on the sign. You can also set up a Site with TrafficCloud Sign Manager for Windows, over a USB or Bluetooth connection, and perform basic sign setup with the TrafficCloud Mobile app for Android over Bluetooth. See *Step 3: Configure the sign manually (optional)* on the facing page.

The Integrated Solar Option

All of the components of the solar charging system, with the exception of the solar panel, have been incorporated inside the sign, for a convenient and compact design. See *[Figure 2] on the previous page*.

The solar controller and batteries are installed securely inside the battery compartments of the sign. The solar controller receives power from the solar panel and conditions it for charging the batteries. The integrated solar option has been designed for use with lithium batteries only and sized appropriately for use with the solar panel provided with your sign.

Under normal use, the sign's batteries should be fully maintained by the solar panel. However, if the batteries do become depleted, it's best to turn the sign off and leave it in full Sun until it's recharged. Alternatively, you can use the optional charger to recharge the batteries more quickly. See *Step 8: If you need to recharge the sign* on page 11.

In the Integrated Solar Option, typically two batteries are connected directly together, forming the equivalent of a single large, balanced battery. In the case of the Shield 12, only one battery is included, and the other compartment is used for the solar controller.

Single-Arm Solar Panel Mounting Bracket

It's best to prepare in advance and perform the following steps in your shop, before you take the solar panel and sign to the roadside:


- » *Step 4: Attach the bracing arms to the pole bracket* on page 5,
- » *Step 5: Attach the mounting arm to the solar panel* on page 7, and
- » *Step 6: Aim the solar panel* on page 9.

As the installer, ensure the following:

- » The installation complies with any local municipal building codes and regulations,
- » The installation site has unobstructed sunlight,
- » The pole, ideally a round pole 4-inches in diameter, is tall enough to allow installing the solar panel and the sign out of reach of vandals.

Viewing this document online



NOTE: If you are reading this document online and have a medium- to large-screen monitor, it's best viewed in Adobe® Reader or Adobe Acrobat Pro, using the preset two-page view , rather than directly in a Web browser.

Step 1: Choose a location

- Choose a location where you can position the solar panel on a pole with an unobstructed view of the sky, aimed to Solar South or Solar North, depending on your hemisphere, and angled toward the Sun. See "Creating a Site" in the *Getting Started with TraffiCloud* for your sign and *Step 6: Aim the solar panel* on page 9.

Step 2: Install the Your Speed sign attachment

To save packing space, the Your Speed sign attachment ships in the transport position.

To set the sign attachment in the deployed position:

- A. Remove the 3/4" torx bolts (wrench included) and washers from the Your Speed sign and set them aside. If there is no concern about tampering, you can use the 3/4" long thumb screws in place of the torx bolts.
- B. Reposition the Your Speed sign above the display.
- C. Place a washer over each hole in the sign bracket and push the torx bolts through the holes in the Your Speed sign and the sign brackets and frame, as shown in the example at right.
- D. Reinstall the fasteners to finish installing the Your Speed sign.

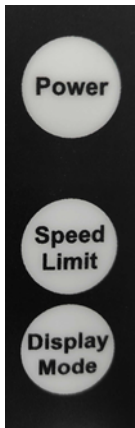


Step 3: Configure the sign manually (optional)



NOTE: TraffiCloud subscribers should use this step only to power on the sign, and instead configure the sign online in advance, assigning a Site and setting the sign display options. See the *Getting Started with TraffiCloud* guide for your sign.

If you will NOT be using a TraffiCloud Web subscription or the TraffiCloud Mobile app for Android over Bluetooth to configure your sign, alternatively, you can use the sign **Speed Limit** and **Display Mode** buttons, and TraffiCloud Sign Manager for Windows, over a USB or Bluetooth connection.



To configure the sign manually:

- Turn the sign on by pressing the **Power** button on the back, inside the mounting channel. The sign will go through start-up and self-check sequences. Once the self-check is complete, the sign is fully operational. A green LED on the top-left corner flashes every 10 seconds to indicate when the sign is powered on.
- Set the speed limit by pressing the **Speed Limit** button until the desired value displays. The first press displays the current speed limit.
- Verify or set the display mode on the sign. The default is **Constant** for the Shield and **Single Message Mode** for message-enabled signs.
- To change the mode, press the **Display Mode** (or **Display Settings**) button until the desired mode displays on the sign. For details about display modes, see the applicable figures and table below for your sign.



NOTE: To reduce the risk of tampering, the buttons deactivate five minutes after you power on the sign. To reactivate them, long press the **Power** button again.

SpeedAlert and InstAlert Display Modes

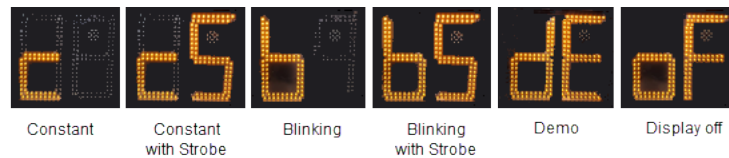
As mentioned, optionally you can use the sign's onboard buttons to configure speed limit and display options. Here are the **Display Modes** available with the SpeedAlert and InstAlert:



Display Mode	Description
MSG MODE	Single Message mode: Selects from the messages saved in the sign to display.
ALL MSGS	All Messages mode: Displays all of the messages saved in the sign in sequence.
DEP MSG	Dependent Messages mode For SpeedAlerts, displays a series of messages, with the content depending on how fast the approaching vehicle is traveling. For InstAlerts, can be used as a timer, to display different messages based on the value of the internal timer. Often used for New Year's countdowns or casual race information. The timer is controlled with TrafficCloud Sign Manager.
SPEED DISP	Speed Display mode (Radar signs only): Displays the speeds of the approaching vehicle.
DISPLAY OFF	Display Off mode: Turns off but the display but the sign is still active and gathering sign status for InstAlerts, and traffic and other data for SpeedAlerts, if subscribed. Also, referred to as "stealth mode".
SP LMT SIGN	Speed Limit Sign mode: Sets the Speed Limit to display.

Shield Display Modes

Here are the sign modes available with the Shield if you use the **Display Mode** button on the sign:



Shield modes	Description
c	Constant: The Shield continuously displays vehicle speeds as each vehicle passes, changing the speed display as the vehicle speed changes. Constant is the default (recommended) setting.
cS	Constant with strobe: The same as constant, however vehicles exceeding the Speed Limit set in the sign by 1 mph (or kph) trigger the Violator Alert strobe (if equipped). TrafficCloud subscribers typically set the strobe option to 10-15 mph above the Speed Limit set in the sign.
b	Blinking: The Shield blinks slowly, displaying changing speeds as the vehicle passes. TrafficCloud subscribers typically set the blink option to 10 mph above the Speed Limit set in the sign.
bS	Blinking with strobe: The Shield blinks constantly, and the Violator Alert strobe (if equipped) flashes when the sign detects a vehicle exceeding the Speed Limit by 1 mph (or kph). TrafficCloud subscribers can set the blinking and strobe options separately, with blinking typically set at 10 mph above the speed limit, and the strobe at 10-15 mph above the Speed Limit set in the sign.
dE	Demo: The Shield displays a simulation of vehicle approach speeds, from higher to lower, temporarily ignoring actual traffic readings.
oF	Display Off: The Shield collects traffic and status data, but the display is turned off. This mode, also referred to as "stealth mode", is recommended for performing traffic studies at a Site.

Step 4: Attach the bracing arms to the pole bracket

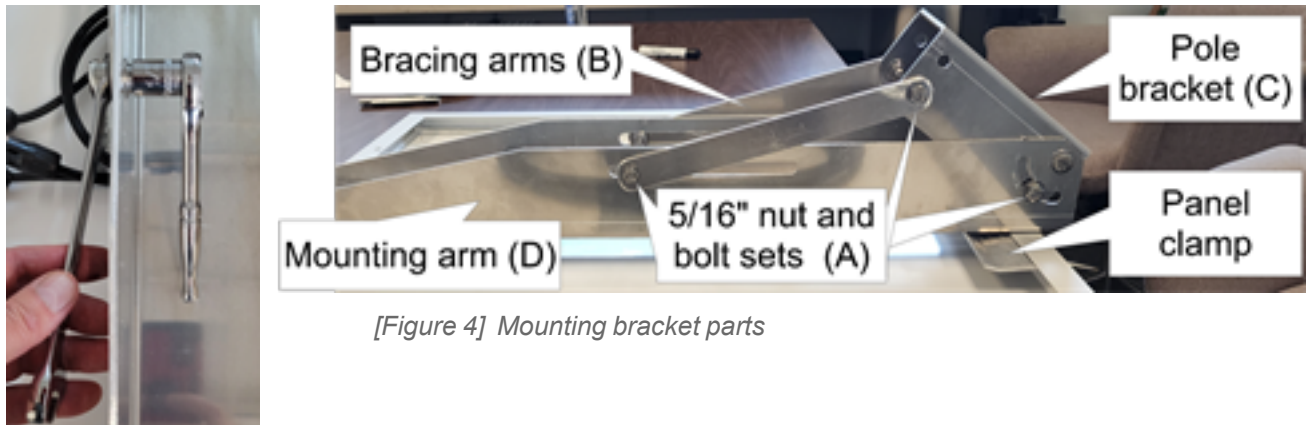
Use the instructions in this step for details about completing the attachment of the bracing arms between the mounting arm and the pole bracket, as shown in *[Figure 4] on the next page*.

- A. Place the mounting arm assembly on a flat, protected surface. Here's how it looks when shipped:



[Figure 3] Mounting arm assembly, as shipped

- B. Loosen all of the nut and bolt sets (A). The nuts and bolts fasten the bracing arms (B) and pole bracket (C) to the mounting arm (D), and the panel clamps to the mounting arm. Loosen each nut and bolt set until just a few threads are showing at the end of each bolt.



[Figure 4] Mounting bracket parts

[Figure 5] Using 1/2\"/>

- C. Lift one of the bracing arms and the pole bracket and attach the two together using one of the additional nut and bolt sets included with the mounting assembly, as shown [Figure 4] above and [Figure 6] below.



[Figure 6] Exploded view of the nuts and bolts



NOTE: Leave the pole bracket, mounting bracket, and bracing arms loosely connected (see [Figure 7] on the facing page) until you are ready to aim the panel. See *Step 6: Aim the solar panel* on page 9.



[Figure 7] Leave the nuts and bolts loosely connected

- D. Repeat for the other bracing arm and side of the mounting bracket.

Step 5: Attach the mounting arm to the solar panel

Use the instructions in this step for details about attaching the mounting arm to the solar panel, and for installing the banding straps.



Mounting arm orientation: For 50-watt solar panels, install the arm vertically (from top to bottom), as shown in *[Figure 11] on the next page*. For larger solar panels, you'll need to secure the mounting arm to the solar panel horizontally, and use the included longer panel clamps.

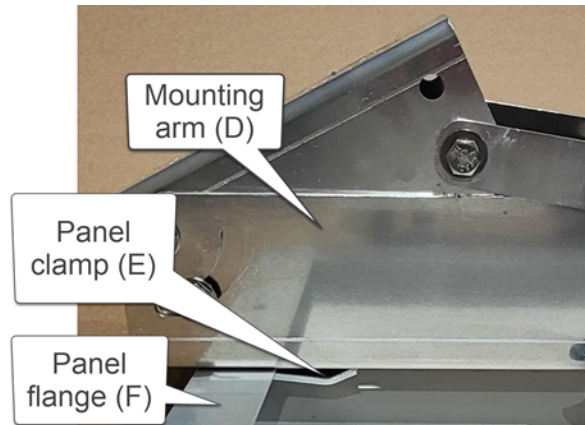


[Figure 8] Larger solar panel



[Figure 9] Large panel clamp

- A. Place the solar panel face down on a flat, protected surface.
- B. Center the mounting arm assembly (D) on the back of the panel and position one of the panel clamps (E) under the panel flange (F). Make sure the panel and mounting arm are perpendicular to each other.



[Figure 10] Mounting arm, clamp, and flange

- C. Place the clamp (E) under the flange (F), and insert a 5/16" bolt with a flat washer through the long slot in the center of the mounting arm.
- D. Mount the flat washer and lock washer onto the bolt. Finger-tighten the nut onto the bolt.
- E. Repeat the previous steps to attach the other end of the mounting bracket to the panel with the second panel clamp.

Install the banding straps on the pole bracket

- A. Insert the stainless steel banding straps through the slots on the back of the pole bracket, as shown in *[Figure 11]* below.
- B. If you'll be installing the solar panel over the top of the post, finger-tighten the banding strap couplings together.



[Figure 11] Assembled panel and mounting bracket with banding straps

Step 6: Aim the solar panel

The solar panel mounting bracket allows for full adjustment to best position the solar panel towards the Sun. It is optimal to position your solar panel towards due Solar South (not magnetic South), if you are in the northern hemisphere and towards due Solar North (not magnetic North) if you are in the southern hemisphere.

Regardless of whether you are in the northern or southern hemisphere, Solar North/South is the position of the sun in the sky at exactly the midpoint between sunrise and sunset.



[Figure 12] The solar panel angle gauge

To set the solar panel angle:

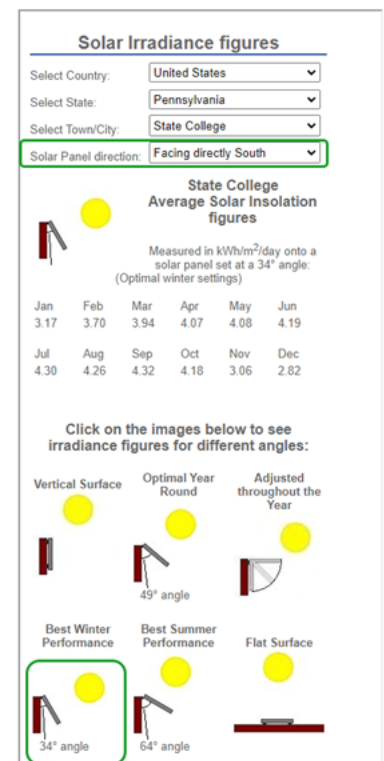
- Determine the latitude of the planned site. You can easily obtain latitude using mapping software or by doing an internet search for "latitude *your_city*" where *your_city* is the name of the city or region where the panel is being installed.
- Once you have the latitude of the site, you can determine the solar panel tilt angle. The tilt is intended to absorb as much direct sunlight as possible. To determine the number of degrees for the angle, do either of the following:
 - Add 15 degrees to the latitude of the site. For example, if the latitude of the site is 41 degrees then the solar panel should be installed at an angle 56 degrees below horizontal.
 - Go to the *Solar Electricity Handbook* website to determine your optimum angle here:

<http://www.solarelectricityhandbook.com/solar-irradiance.html>

Under Solar Irradiance figures on the Web page, select your country, state, city and solar panel angle (**Facing Directly South**), and then click the **Best Winter Performance** option (bottom left in the figure). For State College, Pennsylvania, the recommended angle is 34 degrees. Subtract 34 degrees from 90 degrees to determine your bracket angle setting (56 degrees).

The optimum tilt angle for solar panels varies from winter to summer as Earth tilts on its axis, but we recommend setting our solar panels for the best winter performance.

- Slide the bracing arms on the bracket to set the angle from horizontal until the lower bolts align with the planned tilt angle shown on the gauge (see [Figure 12] above). Exact precision for the angle setting is not necessary for adequate solar panel efficiency to power the sign and battery.



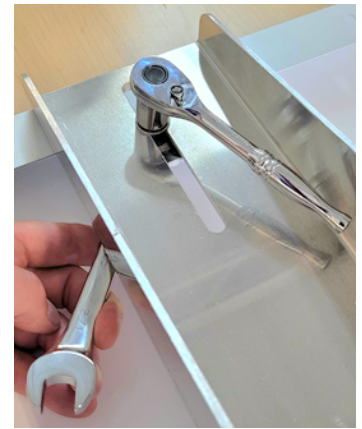
D. Now you can tighten all of the nuts and bolts with the 1/2" wrenches, as shown.

To aim the panel to True South or True North:

- Use a compass app (or Google Maps) to aim the panel towards True South or True North, as required.



[Figure 13] Aiming the panel to True South with a compass app



Step 7: Mounting instructions

Use the instructions in this section to mount your Integrated solar option and sign on a pole.



CAUTION: To reduce the risk of vandalism, the sign should be 7 to 10 feet above the roadway and the solar panel higher than 10 feet.

To mount the solar panel on the pole:

- If you are installing the solar panel and Single-Arm Solar Panel Mounting Bracket on a round pole, open the banding straps, wrap them around the pole at the preferred height, and tighten them enough to hold the panel in place, leaving some slack for the next step. A power drill or screwdriver and hex bit work best to tighten the straps.
If you are installing the solar panel and Single-Arm Solar Panel Mounting Bracket on a U-shaped or square pole, pass carriage bolts through the back side of the pole so that the nuts are on the inside, and tighten them enough to hold the panel in place, leaving some slack for the next step.
- Recheck your orientation towards True South or True North, depending on your hemisphere, and make sure the panel is properly aimed.
- Tighten the banding straps the rest of the way.



To install the sign mounting bracket:

- If you are mounting the sign on a round pole, thread two stainless steel banding straps (not included) through the sign mounting bracket, and then tighten the bracket and straps around the pole. Thread the ends of the banding straps together and then tighten them onto the pole.
- If you are mounting the sign on a U-shaped or square pole, bolt the sign mounting bracket to the pole using the supplied carriage bolts or U bolts, and wing nuts.

The wing nuts will be secured inside the back of the sign to prevent tampering.

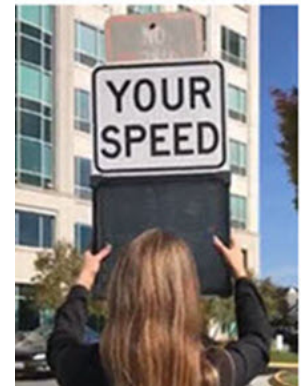


To mount the sign:

Before you mount the sign, make sure that it's turned on. See *Step 3: Configure the sign manually (optional)* on page 3.

- Set the top channel on the back of the sign onto the tab at the top of the mounting bracket.
- Rotate the sign down until it's flush with the bracket.
- Push the locking pin up to lock the sign into place.
- Strap the excess cable to the pole.

The panel will now power your sign.



Step 8: If you need to recharge the sign

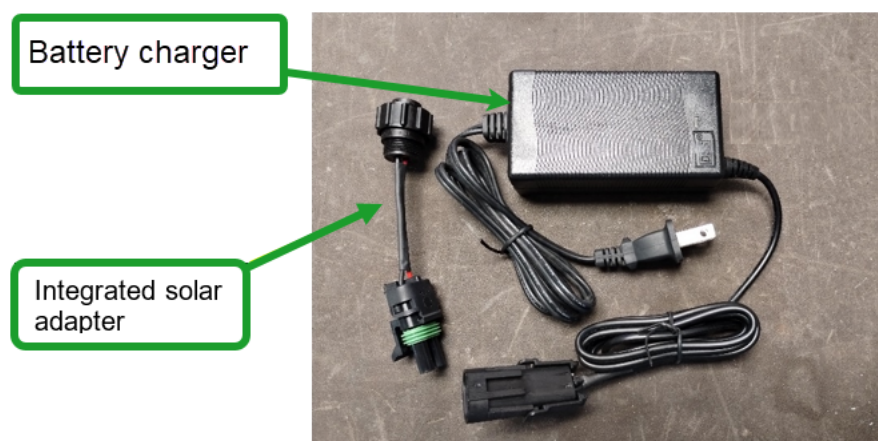
If you purchased the optional charger (see *[Figure 14] below*) with the Integrated Solar Option, take the trailer or sign into a protected environment, plug the charger into a standard 120-VAC outlet, and connect the charging end to the sign's solar connector cable.



WARNING: RISK OF ELECTRIC SHOCK AND EQUIPMENT DAMAGE. The charger is not intended for outdoor use. Only charge the system in a protected environment, such as a garage.



WARNING: RISK OF FIRE. Do NOT attempt to individually charge the paired batteries included with the Integrated Solar Option. You should never mix unequally charged batteries in the same system.



[Figure 14] Battery charger and integrated solar adapter

The charger may take a couple of minutes to recognize the batteries, due to the presence of the solar controller. Do not be alarmed if it does not start charging right away.

Depending on the size of the batteries it may take up to 24 hours to fully charge the batteries.

Getting help

We are here to help! If you have any concerns while using your new system, please feel free to call our customer success specialists at 1-800-366-6602, option 2, or email us at support@alltrafficsolutions.com. For documentation for your ATS Trailer and signs, if you have a TrafficCloud subscription, go to the *ATS Start-Up Guides* page. For non-subscribers, go to All Traffic Solutions [Technical Customer Support](#).