ALL TRAFFIC
SOLUTIONS

™

SpeedSentry Radar Speed Display

SpeedSentry Radar Speed Display

Shield Radar Speed Display Introduction

Speedsentry Factory Recertified Radar Speed Display

The SPEEDsentry is a portable and flexible radar speed display sign ideal anywhere traffic calming is essential. Drivers receive instant feedback based on their speed from the 12" display. The sign provides easy mounting and programming, and it offers a wide variety of options to suit your needs. The Speedsentry can be powered by a sealed lead acid battery for portable applications, and can be augmented with solar changing or AC power for permanent applications.

Radar Speed Display Quick Starts

Speedsentry Factory Recertified Quick Start

Unpack the Speedsentry

Remove the unit, batteries, and charger kit from the boxes.

Install handle

Place 1/4" fender washers onto 1/4-20 phillips screws, and insert the screws into handle. Tighten with a Philips screwdriver.
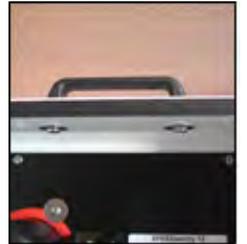
Install Mounting Hardware to Aluminum Pole

Use the U-bolts to secure it to an aluminum pole. Make sure the projecting screws on the mounting plate face traffic.

Install Mounting Hardware to U-Channel or Square Pole

Use the carriage bolts, washers and nuts to secure it to a U-channel or square pole with the nuts on the traffic side of the plate. Make sure the projecting bolts on the mounting plate face traffic.

Attach the Speedsentry to the Mounting Plate

Place the four large wing nuts inside the unit so they are within reach when the unit is opened. With the display facing traffic, hoist the unit onto the mounting plate sliding it onto the four protruding bolts. While holding the unit in place, open the front and place a washer and wing nut on each screw inside the unit and tighten to secure. Tighten the top left nut forst, and this will hold the unit in place while the other nuts are put on. Do not mount the unit with the battery installed.

Attach battery cable

To install the battery cable, attach the black wire of the battery cable to the negative (black) terminal and the red or white wire of the battery cable to the positive (red) terminal. Use the supplied hardware.

Install battery

Place the battery on the door's shelf. Replace the battery strap, and tighten the wing nuts on the strap to secure. Connect battery cable plug to the receptacle in the unit. The unit will run a 70-second diagnostic test.

Program the Unit - 2 Button Control

Make sure the power is on. Press the Speed Limit button to set the speed. The speed limit will display on the unit's display. The first press will display the current setting, and each successive press will increment the speed limit by 5 MPH. Press the display mode until you see the cS display, which is constant with the violator strobe, or the c, which is constant without the strobe. On the new outside controls, the button on the left controls the speed limit and the button on the right controls the display mode. The buttons become inactive 5 minutes after power is applied to prevent tampering. There are

Speedsentry Controls
Outside Unit

Speedsentry Controls, inside unit

more display options covered in the manual. See
Speedsentry On-Board Controls for more information on
the settings available on the unit.

Program the Unit - 2 Button Control

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more display options covered in the manual. See
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Speedsentry Controls

Outside Unit

Speedsentry Controls, inside unit

Program the Unit - 4 Button Control with LCD

Turn the power on with the Power button. Step through the
settings with the Settings button. Change settings with the
up and down arrows. To get started, set the speed limit, set
the radar to always on, the display to always on and the
violator strobe to the speed limit.

Install "Your Speed" Sign

With the supplied wrench, remove bolts and washers on the left and right side of the "Your Speed" sign. Rotate the sign so the words "YOUR SPEED" face traffic. Reattach the bolts and tighten to secure. Do not loosen the center screw as this is the rotating hardware.

Ready to go

The SPEEDsentry is installed and ready for use.

Quick Start: Setting up a Speed Display with Smart Apps

Log in to SmartApps website

Open remote management at apps.alltrafficsolutions.com. Log in
with your user name and password.

Set up the location in the server where the sign will be placed

Set up a location on the *Setup-Locations* tab. Click new
location, fill in the requested information and *Save*.
Road/Group lets you group multiple addresses on one
road or in a neighborhood together.
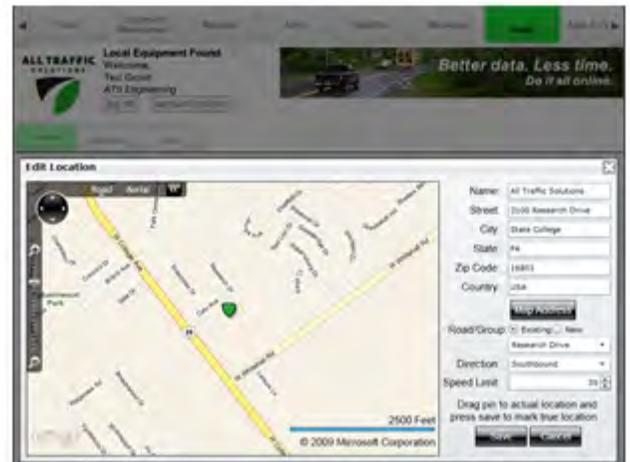
Move sign to server location

Go to the *Equipment Management* tab and click *Move* for the
sign that requires the settings change.

Set Move location and update settings

In the move dialog, select the new location that was created, and select *Pending Move*. Check *Assign new settings* and enter the desired display settings. Click *Apply Changes*.
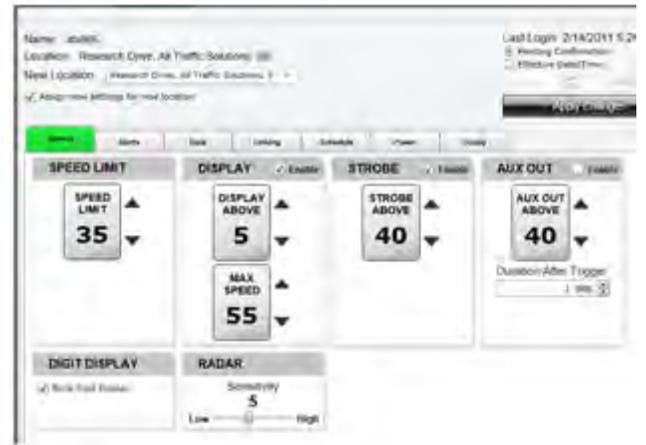
Mount the sign and tell the server that it has "Moved"

Mount the sign at the designated location in the field and turn it on. Initiate the Move Sign function by holding the speed limit and display settings buttons on the unit at the same time. This will make the sign call in, get the new settings and start to assign recorded data to this location.

Power

Pole Mount with SLA Battery - Speedsentry 12

Sealed Lead Acid Power for pole mount Speedsentry speed displays

Attach Battery Leads

To prepare the battery for installation, first attach the black wire of the battery cable to the negative (black) terminal. Then attach the red or white wire of the battery cable to the red (positive) terminal. Do not reverse polarity. The fuse is a 10A, 32V 3AG time delay. Replace only with a 10A, 32V 3AG time delay fuse.

Install Battery into Speedsentry

Hook up the battery after you secure the unit to the mounting plate. Open the Speedsentry, place the battery on the shelf, and install the battery bracket. Connect the battery cable to the receptacle in the unit. The unit will now return to the settings from the last time the power was removed.

Connect Solar, if applicable

If the unit has solar, install the panel per the step below and connect the solar panel harness to the connector on the bottom of the unit.

Start Up

Every time you connect the Speedsentry's battery and press power, the display performs a startup test. It flashes the lights and strobe on the display and runs through a brightness cycle. The display shows patterns rather than specific numbers. This test takes about 15 seconds. Wait for this test to complete before performing other functions on the Speedsentry.
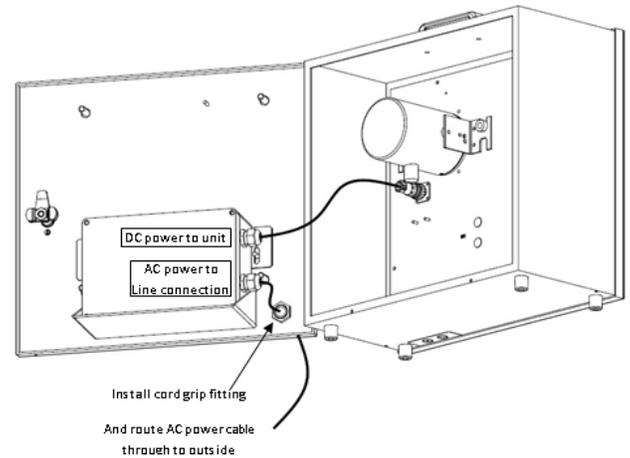
AC Power - SpeedSentry 12

AC Power for Speed Displays

> **CAUTION: High voltages present in AC Supply. Follow all applicable electrical codes when connecting the SPEEDsentry to the power line. Ground enclosure according to all applicable codes. Disconnect AC power before installation. Service should only be done by qualified personnel.**

AC Power connections for Speedsentry SS12

- Mount the SPEEDsentry in the desired location.
- Disconnect AC power to the power supply line.
- Drill a .875" diameter hole for the provided cord grip fitting in the SPEEDsentry enclosure where desired. See image for recommended location (placing the hole in the back lid of the unit will allow the front of the unit to swing open).
- Place the provided cord grip fitting into the drilled hole and secure by tightening the nut on the inside.
- Bring AC line through fitting to the outside of the unit. Tighten the cord grip fitting around the cable.
- Make the AC Connections:
- **Black wire to Line/Hot**
- **White wire to Neutral**
- **Green wire to Ground** using preferred method (twist-on wire connectors are provided).
- Also provided is a small weatherproof box to further protect this connection. If preferred, this box can also be mounted inside the SpeedSentry.
- Plug the SPEEDsentry DC power connector from the AC power supply into the SPEEDsentry power input receptacle below and to the left of the radar . (Note that this DC plug can be disconnected and the SPEEDsentry can then be operated with a battery connected to the power input receptacle.)
- Apply AC power.
- The SPEEDsentry is ready for use. Configure according to the SPEEDsentry instructions.
- When power is removed and reapplied, the Speedsentry will return to the same operating mode as when power was removed.

DC power to unit

AC power to Line connection

Install cord grip fitting
And route AC power cable through to outside

Pole mounted Solar with SLA (Sealed Lead Acid) Battery - SpeedSentry

Mounting solar panels on pole and connecting SpeedSentry, Shield and SpeedAlert signs.

Solar Panel

- The solar panels work with the solar controller located in the system's battery compartment or in the trailer's battery box. The controller continually recharges the batteries up to full whenever sufficient sunlight generates a charging current. It prevents overcharging the batteries and draining the batteries during low-light periods.
- Appropriate panel size for solar assist depends on display sign model, traffic volume, geographic location, battery capacity and operating times. Actual performance depends on application and mounting location. Contact All Traffic Solutions for help in selecting an appropriately sized panel and battery combination.
- Place panels in direct sunlight and tilt them toward toward true south to maximize their effectiveness. To calculate the best angle of tilt in the winter when there are the least sun hours, take your latitude, multiply by 0.89, and add 24 degrees. The result is the angle from the horizontal at which the panel should be tilted.
- Mount the speed display unit so the display remains out of direct sunlight whenever possible for optimal viewing.
- ATS uses Sealed Lead Acid batteries for solar systems, as charging lithium batteries in extreme hot or cold temperatures can damage the battery.
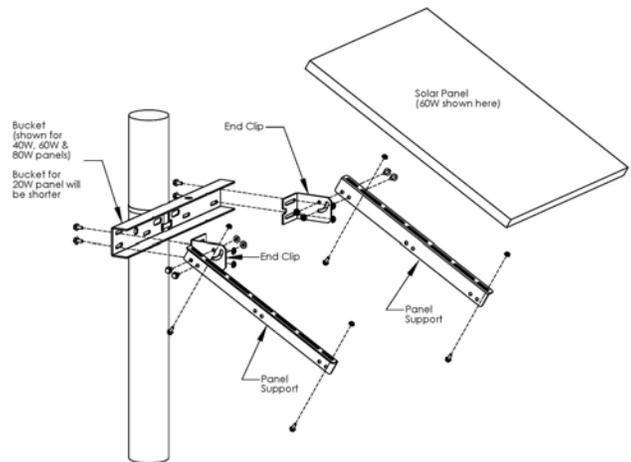
Mounting the Solar Panel to a pole

Notes:
- Solar panels will all mount similarly, though actual bolt positioning on the Panel Supports may vary.
- Bracket shown banded to a standard 4.5" diameter pole. Bracket can also be mounted with U-bolts (not provided).

Installation Steps

1. Lay solar panel face down on a protective surface and attach panel supports with supplied hardware **(HHMS* ¼-20 x .75 (qty4), lock washer ¼ (qty4), washer ¼ (qty8), nut ¼-20 (qty4))** and finger tighten.

2. Attach end clips to bucket using supplied hardware **(HHMS 5/16-20 x .75 (qty4), lock washer 5/16 (qty4), washer 5/16 (qty8), nut 5/16-18 (qty4))** and finger tighten.

3. Attach panel supports to end clip with supplied hardware **(HHMS 5/16-20 x .75 (qty4), lock washer 5/16 (qty4), washer 5/16 (qty8), nut 5/16-18 (qty4))** and finger tighten.

4. Attach bucket to pole using U-bolt or banding.

5. Adjust the tilt angle to the recommended angle above.

6. Tighten all hardware until the lock washer is flat.

Bucket (shown for 40W, 60W & 80W panels)
Bucket for 20W panel will be shorter
End Clip
End Clip
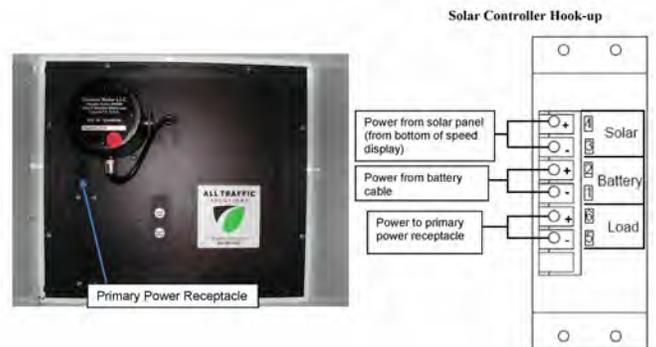Solar Panel (60W shown here)
Panel Support
Panel Support

7. Tie power cord to pole with nylon ties and connect to
the solar panel connector on the battery box.
*Hex Head Machine Screw

Speedsentry SS12 solar panel and battery connections

For solar configured Speedsentry units, the enclosure will come equipped with a solar controller for regulating the voltage from the solar panel. Install the battery following the power instructions but attach the battery cable to the wire harness that hangs freely off of the solar controller. The cable from the solar panel is attached to the receptacle on the bottom of the speed display enclosure. The plug from the load terminals of the solar controller connects to the receptacle on the SpeedSentry.

Primary Power Receptacle

Solar Controller Hook-up

Power from solar panel (from bottom of speed display) — Solar
Power from battery cable — Battery
Power to primary power receptacle — Load

Deployment

Setup - Speedsentry Speed Display

This section covers the setup and installation of the SPEEDsentry unit, including the attaching the handle, identifying a proper location, mounting the unit, and positioning the "YOUR SPEED" sign.

Attaching the Handle

To attach the handle to the unit for easy carrying, use the included molded plastic handle, 2 washers, 2 small screws, and a Phillips screwdriver. Remove the plugs from the holes on the top of the unit. Align the handle with the predrilled holes on top of the unit. Add fender washers to 1/4-20 screws and tighten both through hole into handle from inside the unit.

Identify Location

The SPEEDsentry mounts to a pole, a vehicle hitch, or a trailer. Pole-mounting options include a 4" aluminum pole, a U-channel pole, square pole and other available poles.
Choose a location near enough to the road to allow the SPEEDsentry to face oncoming traffic as directly as possible. Pointing the unit with a smaller angle ensures greater accuracy of the radar. Mount the unit at a height of 6' to 8' to the center of the display, if possible, for optimal performance. Avoid mounting the unit with direct sunlight on the face whenever possible. No matter the mounting option you choose, make sure the location prevents the unit from interfering with traffic.
NOTE: These same considerations also apply if you use a ATS-5 trailer.

Keep this angle small to maximize radar accuracy

SPEEDsentry

Radar Pick-up Window (12 degrees)
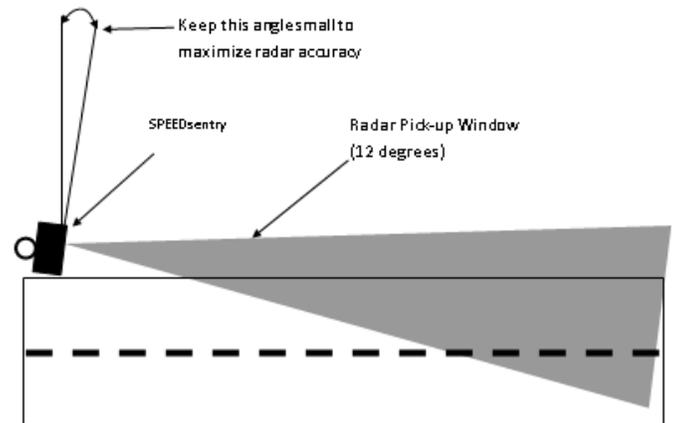
Fasten Mounting Bracket

The mounting bracket allows multiple options for attachment to a pole. Holes in the mounting bracket accommodate U-bolts (included), carriage bolts (included), and metal bands (not included).
NOTE: The SS12 is NCHRP 350 accepted when mounted to a 4" aluminum pole with a breakaway base using the supplied U bolts with the SPEEDsentry mounted at least 5' above the ground to the bottom of the unit and with a 26Ah battery installed. (Acceptance letter SS-135)

Attach to Aluminum Pole

To mount the bracket to an aluminum pole, you need 2 U-bolts with nuts and the mounting plate. Remove the nuts from the U-bolts. Place the mounting plate against the pole so the protruding screws point toward traffic. Place one U-bolt behind the pole and thread the ends through the holes in the plate. Use the nuts to secure the bolt in place. Repeat with the second U-bolt.

NOTE: Do not over tighten the mounting bolts because it bends the plate and you will not be able to mount the unit. If the plate bends, remove it from the pole, turn it around, and tighten the U-bolts to straighten the plate. Then reverse and reinstall.

Attach to U-Channel or Square Pole

To mount the bracket to a U-channel pole, you need 2 carriage bolts, washers, nuts, and mounting plate. Place the mounting plate against the pole so the protruding screws point toward traffic. Thread the bolt through the hole in the pole and through the plate. Secure with washer and nut. Repeat with the 2nd bolt. Using the arced slot allows adjustment to keep the Speedsentry parallel to the road.

Other Mounting Options

The SPEEDsentry comes with hardware to install the unit to a 4" aluminum pole and a U-channel pole. The aluminum mounting bracket can be drilled with more holes to accommodate your specific hardware. If you use hardware other than what is provided, make sure its installed length extends no more than 1" from the surface of the mounting bracket on the SPEEDsentry mounting side. Otherwise, the hardware interferes with hanging the unit on the mounting plate.

Hang the Unit

Open the unit and place the four mounting wing nuts and washer from the mounting plate inside on the bottom so they are accessible, and close the unit. With the display facing traffic, hoist the unit to the mounting plate and align the holes with the bolts. Settle the unit onto the screws and against the plate. While holding the unit against the plate, open the door. Thread a wing nut and washer onto each screw and tighten to secure.

NOTE: Never install the battery before hanging the unit.

Mounting on the Trailer

The SPEEDsentry only mounts on the ATS-5 Trailer with the bumper pole mount option for the Speed Dependent Messaging system.

Rotating the "YOUR SPEED" Sign into position

With the supplied tamper proof Torx wrench, remove bolts and washers on the left and right side of the "YOUR SPEED" sign. Do not loosen the center bolt. Rotate the "YOUR SPEED" up. Return the washers and the bolts to the holes and tighten with the Torx wrench to secure the sign. Reverse steps to rotate the sign back down for storage. The provided thumb screws can also be used to mount the sign. The Torx screws are tamper proof, but the thumb screws are not.

NOTE: During operation in the Speed Limit Sign mode, replace the "YOUR SPEED" sign with a "SPEED LIMIT" sign to prevent confusion. More information on this mode is provided in the operation section.

NOTE: During operation in "stealth mode" with data collection on but with the display off the "your speed" sign can be removed. Note how the hardware is assembled on the center screw for so you can reassemble it correctly.

Controls and Settings

Control and Interface Options Explained

Control Options for all ATS Signs

There are multiple ways to control each ATS Sign. This chapter provides an introduction to the various methods and where to find instructions for each method.

On-Board Controls

All signs have some version of on-board controls so that the most basic sign settings can be adjusted without any interface device. On speed displays the speed limit and display mode can be set. On message signs, the display mode and message can be selected. These controls are covered in each sign specific manual.

PC with Bluetooth or USB Connection

A PC can be used to change any settings on the sign. The standard method, included with all signs, uses the provided USB cable to connect to the signs. Optional wireless bluetooth communication is available for all units to simplify this connection. The software used on the PC is a local version of the ATS web-based SmartApps interface. **The first time you use this interface, you must be connected to the internet so that the SmartApps website can be opened and a local version of the web page installed on your PC.** This allows for use whether there is an internet connection available or not. The web-based software connects to the unit with ATS Assist software which must be installed on the computer that will be connected to the sign.

For details on PC controls, see the PC with Local SmartApps Control Manual.

ATS Mobile

ATS Mobile is an app for Android devices. It will work on most android devices, whether a phone or tablet. ATS Mobile communicates with the sign using bluetooth wireless technology. It also talks to the ATS servers using wifi or cellular connections so that your traffic data and messages are stored, managed and backed up on the server. With ATS Mobile you can change just about any setting on the signs and download traffic data. A standard set of reports is available to analyze traffic data collected using ATS Mobile on the SmartApps website if subscribed to SmartApps or if the unit has the traffic data option.

For complete information on ATS Mobile, see the ATS Mobile for Android Instructions.

SmartApps Web-Based Remote Communication

SmartApps is the All Traffic Solutions web-based interface used to manage all ATS products and a department's traffic safety program. The subscription SmartApps service provides online web-based remote equipment management through the sign's included cellular connection. The service includes mapping of equipment and data locations, remote alerts, imaging and reporting on collected data. A limited version of the SmartApps interface is used for a PC connected locally to the sign with a USB cable or Bluetooth, one of the options mentioned above. All equipment can be upgraded to the SmartApps remote service. Call All Traffic Solutions for more information.

For complete information on SmartApps, see the SmartApps Web-Based Management Instructions.

PDA - Archive

Older signs and some Factory Recertified signs can be controlled using a Windows based PDA and the Pocket ATS Software. Most settings on the sign can be controlled using Pocket ATS Software. When traffic data is collected with the PDA it must be synced to a PC and analyzed using a client based version of ATS software.

For complete information on Pocket ATS, see the Pocket ATS for PDA with Windows Mobile Instructions.

Client Based PC Software - Archive

For legacy units (most before October 2010) there is software that must be installed on a PC. Using this software, sign settings can be modified and traffic data can be analyzed. The PC is connected to the sign with a USB or serial cable. There is no bluetooth wireless option for the client based software Contact ATS with questions regarding this legacy software.

On-Board Controls

Speedsentry 12 On-Board Controls

The Speedsentry on board controls set the speed limit and display mode.

On older units, the Speedsentry 12 on-board controls are located inside the unit. Open the enclosure with locking T handle and locate the control panel. On newer units, the controls are located on the outside of the unit.

Anti-Tamper Lockout: To prevent unwanted tampering, the control buttons on the outside of the unit will not operate 5 minutes after applying power to the Speedsentry. To restore control to the buttons, simply remove power from the Speedsentry and re-apply power.

Speedsentry Controls
Outside Unit

Speedsentry Controls, inside unit

Control Panel

Set the speed limit by pressing the **Speed Limit** button until the desired speed displays on the front display. The first press shows the current setting, and then each press increments the speed limit by 5 MPH (KPH for metric units.) Set the display mode by pressing the **Display Mode** button until the mode displays on the front of the unit. On the new controls, the button on the left controls the speed limit and the button on the right controls the display mode.

Display Modes

The Display Mode button scrolls through the display options. The current display option displays using the digits on the front of the speed display. The first press displays the current mode, and then the each press increments through the modes. Demo activates demo mode in the last selected display mode, so if you want to demo the sign constant with strobe, select the cS mode, let it take effect (when the displayed cS goes off) and then select the dE mode. Modes are as follows:

oF: Stealth mode, used to collect baseline traffic data with no display
c: Constant display, digits display a speed with no blinking
cS: Constant display with violator strobe
b: Blinking display, digits display a speed and blink for all vehicles. Conserves power.
bS: Blinking digits with violator strobe
dE: Demo mode, sign displays a pattern of numbers to show digits when no vehicles present.

Power On / Off

When the Speedsentry 12 is powered on it will go through a startup routine and display 88. The unit does not loose data when the power is disconnected.

Move Sign Activation

When using SmartApps Remote Management, the sign can be triggered to tell the server that is has moved. To send the *move sign* signal, press both the speed limit and the display mode buttons at the same time and hold them for 15 seconds. The Shield will display a + on the digits while the outer leds will circle around the '+' to indicate that the move sign signal is being sent to the server. Remember to reactivate the buttons if they have timed out and stopped operating.
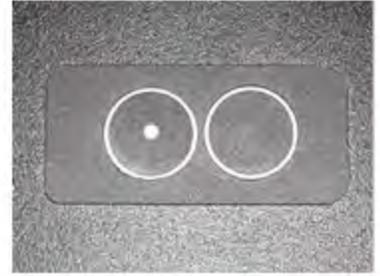
Shield 18 On-Board Controls (Pre-2010 units)

Shield 18 control panel

Button with dot: Scrolls through the display options - see next step.
Button without dot: Scrolls through the speed limit settings in 5MPH increments.
Note: After 5 minutes after powering the unit on, these buttons will automatically deactivate to prevent unwanted tampering. To reactivate the buttons the unit must be powered off and then powered back on.

Display Modes

The Display Mode button scrolls through the display options. The current display option displays using the digits on the front of the speed display. The first press displays the current mode, and then the each press increments through the modes. Demo activates demo mode in the last selected display mode, so if you want to demo the sign constant with strobe, select the cS mode, let it take effect (when the displayed cS goes off) and then select the dE mode. Modes are as follows:

oF: Stealth mode, used to collect baseline traffic data with no display
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cS: Constant display with violator strobe
b: Blinking display, digits display a speed and blink for all vehicles. Conserves power.
bS: Blinking digits with violator strobe
dE: Demo mode, sign displays a pattern of numbers to show digits when no vehicles present.

Power On / Off

When the Shield 18 is powered on it will go through a startup routine and display 88. The unit does not loose data when the power is disconnected.

Move Sign Activation

When using SmartApps Remote Management, the sign can be triggered to tell the server that is has moved. To send the move signal, press both the speed limit and the display mode buttons at the same time and hold them for 15 seconds. The Shield will display a + on the digits while the outer leds will circle around the '+' to indicate that the move sign signal is being sent to the server. Remember to reactivate the buttons if they have timed out and stopped operating.

Care and Maintenance

Warranty

All Traffic Solutions Warranty

All Traffic Solutions warrants this product to the original purchaser to be free of manufacturing defects for a period of 1 year and ATS reserves the right to repair or replace the warranted part or parts at its sole discretion. The following items are specifically not covered under warranty.

- The warranty does not cover misuse or abuse that includes using the product in ways for which it was not intended and vandalism.
- The warranty does not cover damage to the product due to incorrect installation or operation nor does it cover normal wear and tear such as frayed cords or cables, broken connectors, scratched or broken enclosures.
- This warranty does not cover batteries that are allowed to freeze.
- The warranty is void if any physical changes are made to the product by anyone but an ATS authorized service representative.
- During the warranty period, there will be no charge for parts or labor. If components require factory service, purchaser shall return failed parts to the factory or authorized service location, freight prepaid. ATS will pay to return the parts.
- If damage to the product during the warranty period is determined to be due of a non-warranted nature, ATS reserves the right to charge for damages resulting from abuse or extraordinary environmental damage to the product at rates normally charged for repairing such products not covered under warranty
- ATS is not responsible for any consequential damages and as an expressed warning, the user should be aware that harmful personal contact may be made with the product in the event of violent maneuvers, collisions, or other circumstances even though the device(s) are used according to instructions. ATS specifically disclaims any liability for injury caused by the product in all such circumstances.

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Battery Maintenance and Warnings

Battery Maintenance for Lithium Ion and Lead Acid Batteries

Lead Acid Battery Maintenance

Battery maintenance: In order to maximize the life of your batteries and their ability to hold a charge, you should follow several important steps in using and storing lead acid batteries

- Batteries should be placed on charge immediately after use regardless of the discharge status. Failure to do so will shorten the battery's life.
- The less the battery is drained before recharging, the longer the expected life of the battery. Charging the battery more often, with a lower discharge, will extend its life.
- Whenever the batteries are not in use, even if they are mostly charged, it is always recommended to fully charge the battery to maintain the charge and preserve the battery's life. If the batteries are going to be stored for an extended period of time, they should be fully charged before being stored and charged up regularly (at least monthly.) Store the battery in a cool area, not directly on concrete.
- Charge the battery in a cool location. The cooler the battery is, the better it will charge.
- During use, keep the battery as cool as possible. This will extend the battery's charge. If you have a choice between a shaded location and a direct sun location, choose the shade if practical. This is not possible if using a solar panel.
- To recharge the batteries, plug a 120V extension cord into the plug in the side of the battery box. This will charge all the enclosed batteries. The display on the installed battery charger will indicate when the batteries are fully charged. Use of any battery charger other than the unit supplied will void the warranty.
- **In the winter, it is important that the batteries are protected from freezing.** It is best to store the batteries where there is no chance of freezing. If this is not possible, keep the batteries charged while in storage. A fully charged battery can resist freezing better than one with a low charge. If the trailer is to be stored inside and the solar panel will not be able to maintain the charge on the system it is necessary to charge the batteries regularly. **Batteries that are allowed to freeze are not covered under warranty.**
- If your trailer is equipped with a solar panel, the panel should always be connected to the solar controller, which will allow the batteries to remain fully charged whenever the trailer is in transit or in storage outdoors. Keep the solar panel clean for optimal charging.
- If flooded trailer batteries are removed from the battery box, they must be stored upright.
- For flooded trailer batteries, check the battery water level when charging. If it is low, fill **using distilled water only**.
- Clean excessive corrosion on the terminals with a mixture of baking soda and water. Make sure battery terminals are tight.
- To test the charger: Measure the voltage on the batteries. Plug in the charger and the voltage should go higher.
- To test the solar panel: On a sunny day, check the voltage on the solar connection on the solar controller. It should be higher than the voltage on the batteries.

Lead Acid Battery Warnings

Lead based batteries can be dangerous. Note the following precautions:
- **Always charge batteries in a ventilated area.**
- **Never smoke or allow a spark or fire in the vicinity of a charging battery.**
- **The batteries should only be charged with the provided automatic charger to prevent overcharging. The display on the battery charger will indicate when the batteries are fully charged. Use of any**

battery charger other than the unit supplied will void the warranty.

- Do not use the charger if any of the cords or electrical connections on the charger or battery are damaged. Contact ATS for replacement of damaged parts.
- Never try to charge a battery with any physical damage.
- Be careful of shorting the terminals of the battery inadvertently with a tool, jewelry or any other conductive item. Shorting the terminals could cause the battery to explode.
- Monitor charger and battery frequently during charging to make sure both are functioning properly.
- Do not allow the batteries to freeze. Batteries that have been frozen are not covered under warranty.
- Never attempt to charge a frozen battery.