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Sh12 and Sh15 Shield Radar Speed Display

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Shield Radar Speed Display Introduction

Shield Radar Speed Display

The Shield Radar Speed Display 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 LED display. The sign provides easy mounting and programming, and it offers a wide variety of options to suit your needs including full traffic data collection capability. The SHIELD is extremely portable weighing under 12 pounds including mounting bracket for the 12" display unit. The SHIELD provides the ultimate in portable traffic calming convenience and streamlined appearance.

The Shield 12 and Shield 15 are similar. The Shield 12 has a 12" high display, suggested for roads up to 40 MPH. The Shield 15 has a 15" display suggested for roads up to 50 MPH. For 18" display requirements, use the SpeedAlert 18 Radar Message Sign, which can display speeds, messages and dependent messages. The SpeedAlert 24 has the same functionality and 24" digit display.

The Shield has the following hardware options:
•   Data Logging for all units with radar: Track vehicle speeds and record approximate total vehicle counts and counts by speed range. Download data remotely with SmartApps using the cellular link, or locally with a USB cable or via a Bluetooth wireless connection
•   Pictures: All units have a camera installed. Pictures are taken upon speed thresholds, tampering or periodically and can be downloaded locally or remotely. To use the pictures option you must enable the Pictures Hardware.
•   Violator strobe option:: Flashing strobe integrated into display to attract attention of violators
•   Metric display, two digit on 12" units and including hundreds digit on SHIELD 15 and 18.
•   "YOUR SPEED" full wrap sign.
•   Violator horn speed-dependent alert for workers or pedestrians near the sign, warning of vehicles traveling at excessive speed in their vicinity
•   Speed-dependent relay contact closure.

The Shield has several control options
•   SmartApps remote communication allowing for remote monitoring, automatic data collection and image viewing, alerts including tamper and mapping unit locations in your community.
•   ATS Mobile App for Android using Bluetooth wireless communication
•   PC Web-based interface with Bluetooth or USB communication

Radar Speed Display Quick Starts

Quick Start - Shield 12 and 15

Power, setup and deploy a Shield 12 or Shield 15

Unpack the unit

Remove the unit and charger kit from the boxes. Any extra batteries will also be in the box, along with an Android device if purchased.

Charge the battery

Remove the batteries from the battery compartment on the back of the Shield (See next step). The battery will arrive partially charged and needs to be fully charged before use. Plug battery into charger and plug charger into wall outlet. Light on charger is red while charging and changes to green when charging is nearly complete.

Install charged battery

Remove one battery cover by removing thumb screws. Charge the battery, and then plug battery into connector on Shield. Tuck the connector into the space in the top of the battery compartment. Slide the battery into the compartment and replace cover. Use the correct short thumb screws. Do not use the thumb screws supplied for the Your Speed sign, as they are too long. Make sure the removal tape loop is accessible - put the other side of the battery in the compartment first.

Position "YOUR SPEED" Sign

With the supplied torx wrench, remove 2 bolts at the top edge of the "Your Speed" sign. Slide the sign up and replace the bolts into the holes on the bottom edge of the sign. The thumb screws can be used in place of the torx screws if there is no concern of tampering.

Program the Unit

Turn on the power. Wait through the boot-up routine. Set the speed limit by pressing the speed limit button until the desired speed displays on the front display. The first press will display the current speed setting, and additional presses will increment the speed limit at 5 MPH per step. Set the display mode by pressing the mode button until the display mode shows on the front digits of the unit. Select cS - constant display with violator strobe - to start. See Sheild Display Settings for display modes.

Fasten Mounting Bracket to Existing Pole

Remove the mounting bracket from the unit by unlocking it and lifting it out of the unit. Attach the bracket to a pole with carriage bolts, nuts and washers (included), U-bolts or bands. Put the nuts on the bracket side of the pole so they are covered up by the unit when it is locked in place to prevent tampering. Using the lower slot, adjust the bracket so the bracket is level from side to side.

Mount unit

Set the top of the unit onto the tab at the top of the mounting bracket. Rotate the unit down and push the locking pin into place. To remove, unlock the pin, rotate the unit away from the bottom of the mounting bracket and lift it off the top tab.

Ready to go

Your Shield is installed and ready for use. The unit will begin to display speeds of passing vehicles.

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*.
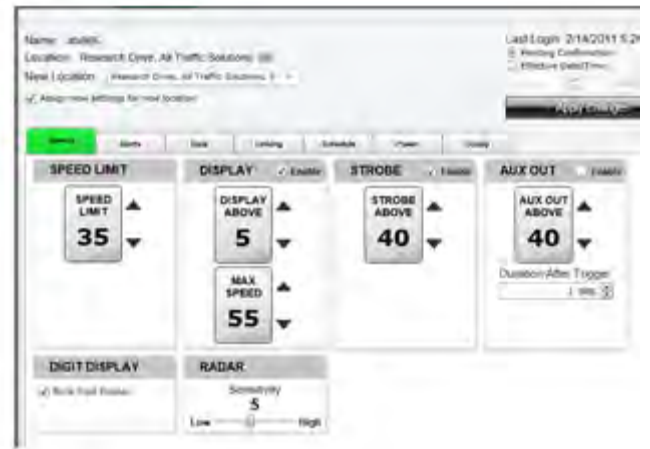
Mount the sign and tell the server that it has "Moved"

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 Lithium Battery - Shield 12 & 15

Installing Lithium batteries in Shield 12, Shield 15, SpeedAlert 18 and instALERT 18

Charge the battery

Remove the batteries from the battery compartment on the back of the unit (See next steps). The battery will arrive partially charged and needs to be fully charged before use. Plug battery into charger and plug charger into wall outlet. Some batteries charge directly from the same connector as in the unit, and others have a specific charging connector. Use the connector that mates with the charger. Light on charger is red while charging and changes to green when charging is nearly complete. The SA18 can use either the 10Ah or 16Ah LFP battery.

Unlock the mounting bracket lock and lift the bracket away from the unit by raising it at the bottom and sliding the bracket's tab out of the slot in the Shield at the top.

Remove one battery cover by removing thumb screws. Plug battery into connector on Shield. Tuck the connector into the space in the top of the battery compartment as the battery is slid into the compartment. Make sure the tape removal loop is towards the center of the unit for easy removal of the battery.

Slide the battery into the compartment and replace cover. Install the optional second battery in the opposite battery compartment in the same manner. Use only the supplied screws to hold on the covers. Longer screws will damage the unit. Do not use the similar, but longer thumb screws supplied to hold the YOUR SPEED sign in place.

Start Up

Every time you connect the Shield'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 Shield.

Pole mounted Solar with SLA (Sealed Lead Acid) Battery - Shield 12 & 15, SpeedAlert 18, instALERT 18

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.
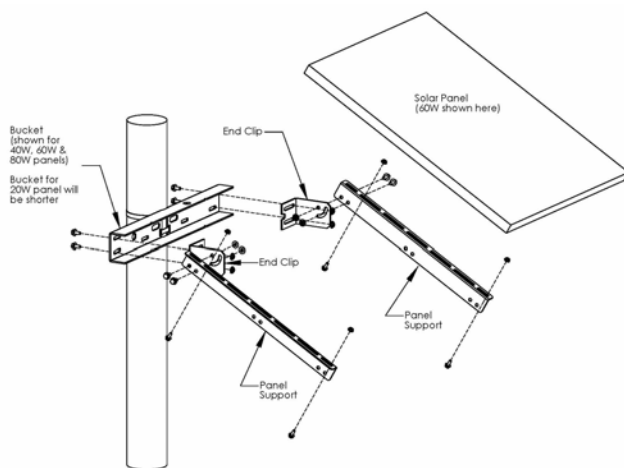
Mounting the Solar Panel to a pole

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.

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

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

7. Tie power cord to pole with nylon ties and connect to the solar panel connector on the battery box.

*Hex Head Machine Screw

Shield 12, Shield 15 and SpeedAlert 18 Solar Battery Box Mount

IMPORTANT: Do not use the internal lithium battery when connecting Shield or SpeedAlert unit to the lead acid battery in the solar cabinet. This could drain the lithium battery very low and cause permanent damage.

1. **Remove all internal lithium batteries from the unit that will be used.**

2. Install solar panel on pole using instructions above. Make sure the power cord coming from the solar panel will reach the preferred location of the solar cabinet.

3. Attach solar cabinet to pole using ¾" width banding.

4. Connect solar cable to connector on bottom of box.
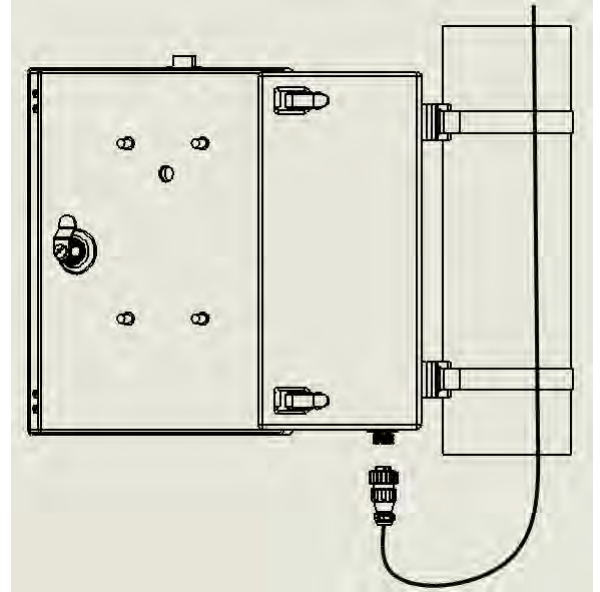
Install Battery into Box

1. Attach Sealed Lead Acid battery cable to the battery, connecting the black lead to the black terminal and the white lead to the red terminal with the included hardware. Place SLA battery inside cabinet, and slide all the way to the left.

2. Place aluminum plate over the battery and attach with the long screws.

3. Attach the black plastic circular plug coming from the battery to the circular receptacle connected to the battery terminals on the solar controller.

4. Make sure that the green charging light on the solar charge controller comes on.

5. Close cabinet door and use key to turn lock. Close two draw latch clamps on the side of the box.

Unit Connector

Battery

Plate

Solar Panel Connector
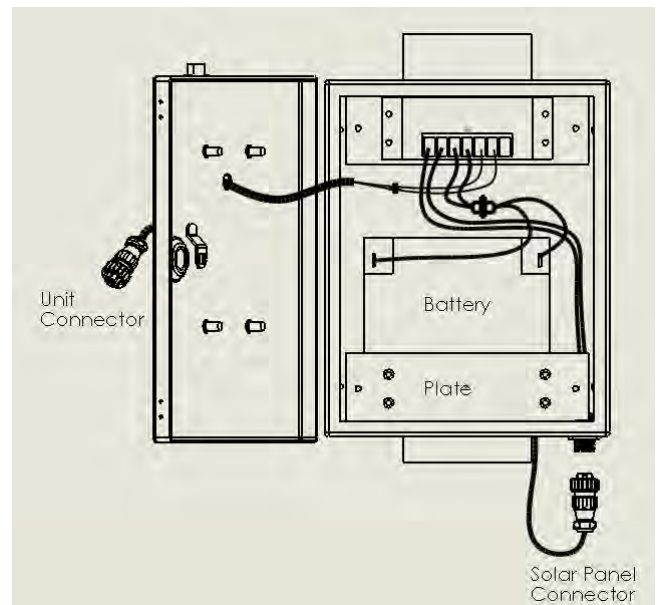
Attach Unit to Solar Battery Box

1. Attach exterior power connector to the auxiliary power connector on the Shield, SpeedAlert or instALERT unit.
2. Make sure the unit powers on. Change any settings using the units on-board controls if necessary.
3. Push any power cable slack back into the cabinet and attach Shield unit to mounting bracket and lock in place with push lock.

The mounting bracket for the unit can also be placed directly on the pole, so the battery box and unit are mounted separately. If this is done, the cable coming out of the door of the solar cabinet can be moved to the hole in the bottom of the solar cabinet. Make sure the cable from the battery box will reach the unit in the desired location. Put the plug from the hole in the bottom in the front door hole, and reinstall the screws that held the mounting bracket.

Connect Power to Unit

Mounted Unit
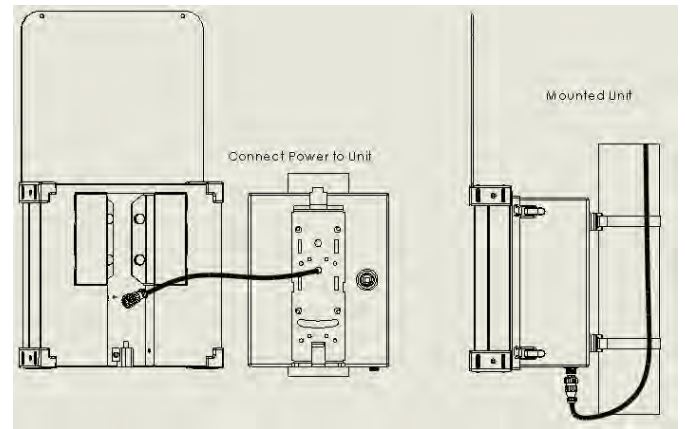
AC Power - Shield 12, 15 and SpeedAlert 18

Shield AC Supply

The unit's 120VAC supply is attached to the back of the unit.. The power is connected to the unit using the alternate power connector above the on-board controls. **CAUTION: High voltages present in AC Supply. Follow all applicable electrical codes when connecting the unit to the power line. Ground enclosure according to all applicable codes. Disconnect AC power before installation. Service should only be done by qualified personnel.**
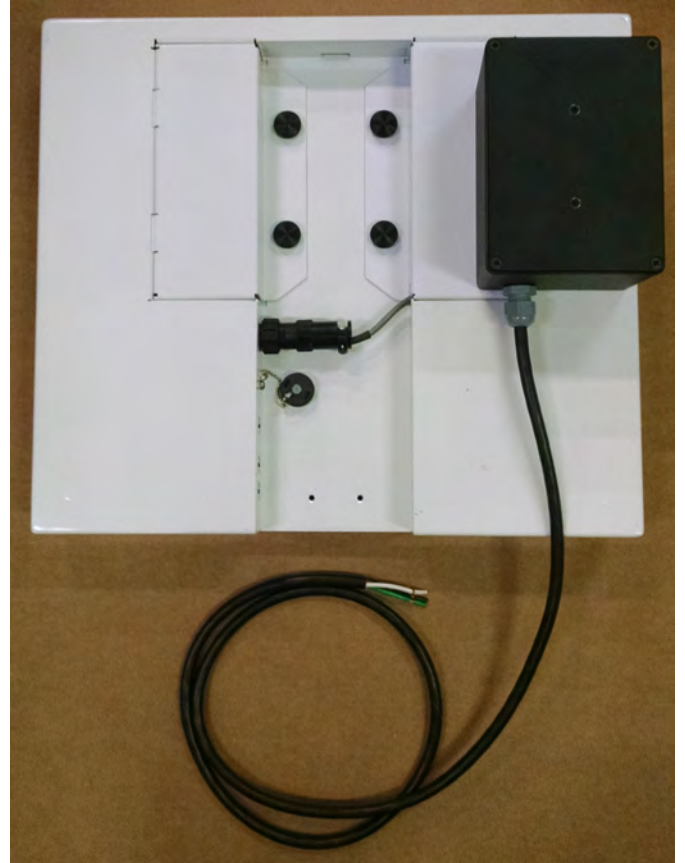
Mount the Display

Mount the display per the mounting instructions.

Connect power to the AC supply.

Connect line, neutral and ground to the AC supply. Either use the supplied cord exiting the power supply, or use alternate wiring. If alternate wiring is used, be sure to use the white and black leads and connector on the supplied cord as a pigtail so the special power supply connector can be retained. Clip these leads with sufficient length to enable them to be connected to supply lines with wire nuts.
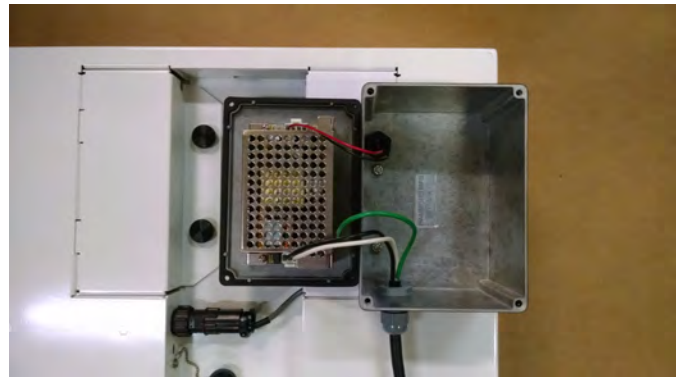
ATS-5 Trailer Power for SpeedAlert, instALERT or Shield

Trailer Power system and connecting units to trailer power

Power the SpeedAlert 18 and Select Mode

Turn the SpeedAlert on with the switch. The display will come on to the same mode it was in when turned off.

Trailer Power for Message Signs - Older signs

Older signs have the,message sign power cord irouted into the battery compartment. It is plugged into the mating receptacle to turn the power on or off. Line up the word *insert* on the plug with the triangle on the receptacle. Insert the plug and turn to lock.

instALERT Power Plug
in Battery Enclosure

Trailer Batteries

The trailer system voltage is 12VDC. The standard power supply is one pair of 235 Amp Hour deep cycle 6V batteries in series for 12VDC operation. With the proper battery power cable, a second pair of 235 Amp Hour batteries can be connected in parallel with the first pair. A 20A slow blow fuse is installed between the batteries and the load. Using batteries, cables or chargers not supplied by All Traffic Solutions will void the product warranty. The battery power level can be determined by looking at the power level displayed on the message sign start up, on ATS Mobile or using the SmartApps either locally or remotely.
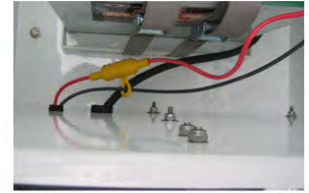
Trailer Battery Charging

To charge the trailer batteries, connect a 120VAC supply to the external AC plug on the battery enclosure. The red light on the charger indicates charging in process, and the green light indicates a full charge.

Charger plug, 120VAC only

ATS-5 Trailer Wiring Diagram

ATS Compact Trailer Wiring Diagram

SPEEDsentry

SPEEDsentry internal Connector

| 1 | + |
| 4 | |

SPEEDsentry external "batteries" connector on enclosure

| + | | | |
| 1 | 2 | 3 | 4 |

| 1 | 2 | 3 | 4 |

Connector for SS on upper mount assembly

Solar Panel

2 wire cable

Grey cable

Power switch (SPEEDsentry)

2 wire cable

SunSaver Solar Controller

Solar   Battery   Load

Battery Charger

10A automatic

Two parallel outputs

instALERT

Receptacle in

Fuse: 20A
Slow Blow

120 VAC male receptacle for charger input power

| + | | + |
| -- | | -- |

| + | | + |
| -- | | -- |

Battery Pair B   Battery Pair A

The ATS trailer is a **12 VDC** system, comprising up to 2 pairs of 6VDC batteries in series.

The switch only controls the SPEEDsentry. The instALERT is simply plugged into the receptacle.

Deployment

Setup - Shield 12 and Shield 15 Speed Display

This section covers the setup and installation of the SPEEDsentry SHIELD 12 & 15 unit, including identifying a proper location, mounting the unit, and positioning the "YOUR SPEED" sign.

Slide the "YOUR SPEED" Sign into position

With the supplied tamper proof Torx wrench, remove the two bolts and washers on the top edge of the "YOUR SPEED" sign. Slide the "YOUR SPEED" up. Return the washers and the bolts to the holes in the bottom of the sign and tighten with the Torx wrench to secure the sign. Reverse steps to slide the sign back down for storage.

You also can use the provided thumb screws 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.


Identify Location

The Shield 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 Shield 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)
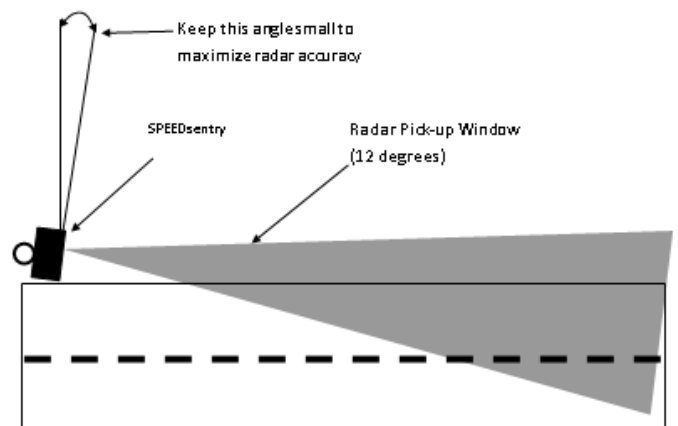
Fasten Mounting Bracket

The mounting bracket allows multiple options for attaching it. The 12" and 15" SPEEDsentry SHIELDs mount to U-channel and square poles, and almost any other pole or on the ATS-5 trailer. Holes in the mounting bracket accommodate carriage bolts (included), U-bolts, or metal bands (not included).

For U-Channel Pole: To mount the bracket to a U-channel or square 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 other bolt.

Other Options: 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 Shield mounting side. Otherwise, the hardware interferes with hanging the unit on the mounting plate.

NOTE: The Sh12 and Sh15 is NCHRP 350 accepted when banded to a 4" aluminum pole with a breakaway base with the Shield mounted at least 5' above the ground to the bottom of the unit and with the Li Ion battery installed. (Acceptance letter SS-135 addendum)

Hang the Unit

To mount the unit, hook the tab from the mounting plate into the slot in the top of the SHIELD unit. Rotate the unit until the unit is up against the mounting plate on the bottom. Push the locking pin into the mounting bracket hole to secure the unit.

Using the Trailer

15" Shield: The Shield 15 unit mounts to the trailer using tamper proof hardware. In most cases the unit will come pre-mounted unless otherwise specified. In the case that the unit needs to be dismounted, remove the standard pole mounting bracket, disconnect the power cable, and unscrew the 4 tamper proof screws attaching the unit to the trailer using the supplied torx key.

NOTE: Always disconnect the power cord before removing the SPEEDsentry from the trailer.

The Shield 12 does not have a trailer mount option.

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

Shield 12 and 15 on board controls set the speed limit and display mode.

The Shield 12 and 15 on-board controls are located under the mounting bracket. Remove the mounting bracket and locate the control panel.

The **Power** button turns the unit on or places it in standby. If the unit will be stored for a period, disconnect the battery or it will get drained over time.

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.

Display Modes

The Display Mode button scrolls through the display options:

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 Shield 12 or 15 is powered on it will go through a startup routine and display 88. The power button in the Shield 12 & 15 controls power to the front digit display and the radar sensor. The unit never powers off, but instead powers down to a very low power standby or sleep state. The unit does not lose data when it is in standby mode or when the power is disconnected. When not using the Shield 12 or 15, disconnect the battery to conserve power.

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. For more information see the SmartApps Web-Based Management Manual.

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.
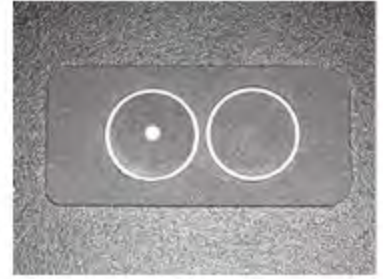
Display Modes

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
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 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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SOLUTIONS

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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.

Options

Options available for all Shield Radar Speed Displays, instALERT Variable Message Signs and SpeedAlert Radar Message Signs

TraffiCloud Remote Management System - Includes

- Data Logging for all units with radar
     Track vehicle speeds and record approximate total vehicle counts and counts by speed range
     Download data remotely with SmartApps using the cellular link, or locally with a USB cable or via a
Bluetooth wireless connection
- Pictures: All units have a camera installed. Pictures are taken upon thresholds you set, and can be downloaded locally or remotely. To use the pictures option you must enable the Pictures Hardware.
- Speed Dependent Messaging: Standard in SpeedAlert units or combine a speed display and an instALERT Variable Message Sign. Provides speed dependent messages specific to the vehicle's speed.
- Speed-dependent relay contact closure
- Tamper alarm with remote alerts

Speed Displays and Radar Message Signs:
- Violator strobe option (speed displays only): Flashing strobe integrated into display to attract attention of violators
- Metric display, two digit on 12" units and including hundreds digit on SHIELD 15.
- "YOUR SPEED" full wrap sign.
- Violator horn speed-dependent alert for workers or pedestrians near the sign, warning of vehicles traveling at excessive speed in their vicinity

Message signs:
- POWERcase rugged portable power supplies: PC 36 with 36 Amp Hour battery, 120 VAC battery charger, 12VDC inverter for in-vehicle charging; or PC 26 with 26 Amp Hour battery and 120 VAC battery charger
- Portable post to mount display anywhere
- Hitch mount to mount display to a vehicle

Contact ATS for more information on any of these options. All units can be upgraded and in some cases traded-in on new equipment