

PARKING LOGIX™ OPENSOURCE™ INSTALLATION GUIDE



OpenSpace™ Installation Guide

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OPENSOURCE™ OVERVIEW

The OpenSpace™ Parking Solution is designed to alert passing motorists of available parking spaces in your (nearby) facility.

The system works in both single level and multilevel facilities and is comprised of the following:

- » Wireless vehicle detection devices (sensor-enabled speed humps) which count vehicles as they enter and leave the facility and move between levels
- » One or more wireless repeaters to extend the range of the wireless communications between the OpenSpace VMS and the sensor-enabled OpenSpace Counting Solution
- » One or more Variable Messaging Signs (OpenSpace VMS) to indicate to motorists how many parking spaces are currently available in the facility and on each level

With a full range of features including user-friendly software, low power consumption, vandal resistance, and universal mounting brackets, the OpenSpace Parking Availability Indicator is the most simple, accurate and cost effective parking space counting system.

Components

- » OpenSpace Speed Humps
- » OpenSpace VMS – Variable Messaging Sign
- » OpenSpace Pro – Software pre-installed on Windows Tablet or Laptop
- » Windows Tablet or Laptop – Uses the pre-loaded OpenSpace Pro application to control the sign remotely via Bluetooth
- » OpenSpace Repeater – (*Optional, as required*) Extends the range of the wireless communications between the OpenSpace VMS and the sensor-enabled OpenSpace Counting Solution
- » (*Optional*) Solar panel for VMS
- » (*Optional*) Solar panel(s) for Repeater(s)

INSTALLING THE OPENSOURCE COUNTING SOLUTIONS

Your OpenSpace System includes at least two OpenSpace Counting Solutions (1 ingress and 1 egress). Depending on your requirements you will have received either the OpenSpace Pods or the OpenSpace Speed Humps.

OpenSpace Pods

The OpenSpace Pod is a one-piece sensor-enabled hump for parking counting. The embedded sensor detects and counts vehicles as they drive over the hump while entering or leaving a parking facility.



Figure 1: OpenSpace Pod

OpenSpace Speed Humps

The OpenSpace Speed Hump is a sensor-enabled speed hump for parking lots. It includes an embedded sensor which detects and counts vehicles as they drive over the humps while entering and leaving a parking facility. These humps require some assembly as each consists of three middle sections (one of which contains a sensor) and two end caps.

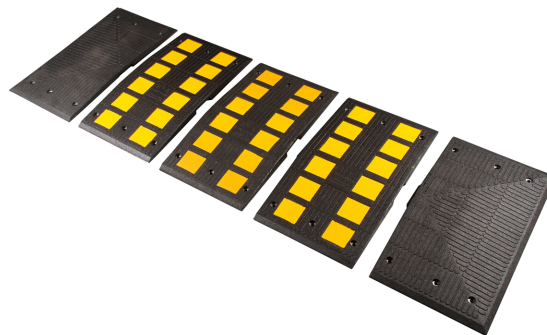


Figure 2: The OpenSpace Speed Hump sections

The sensors are marked to indicate whether they are to be used for incoming (IN) or outgoing (OUT) traffic. When you install the humps, make sure that the sections with an incoming (IN) sensor are installed at the entrance(s) to your facility and the sections with an outgoing (OUT) sensor are installed at the exit(s).

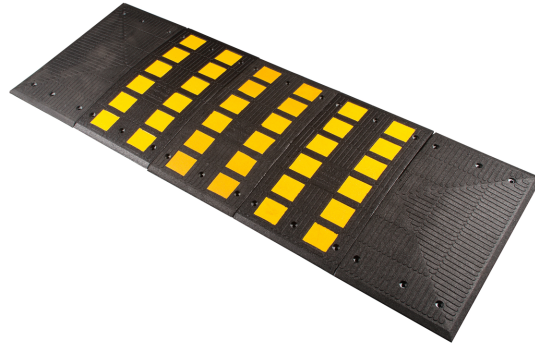


Figure 3: The OpenSpace Speed Hump assembled

Things to Consider Before Placing the Humps:

- » In the case of multi-level facilities you also need to place humps between levels (for example: the entrance to level 2 from any other level and the exit from level 2 to any other level).
- » The system is most accurate if cars drive directly over the humps. Wider lanes may require lane delineators (or traffic cones) in order to funnel the traffic if there are no curbs.
- » The sensors cannot detect the direction of traffic passing over the humps therefore be sure to place the humps to avoid traffic passing over the sensors in the incorrect direction .
- » The accuracy of the sensors can be compromised if cars spend long times idling over the humps. If this occurs often in your facility, you may need to reset the sign more often.

We recommend, therefore, that you place the humps in areas where traffic flows freely. For example: In gated facilities they should be placed immediately after the entry and exit gates.

- » Truck-mounted snowplows may tear the humps from the ground and damage the sensors permanently. Please contact your snow removal service to make sure that the humps are cleaned off with a regular shovel.
- » The OpenSpace Counting Solutions need a clear line of sight to communicate with the OpenSpace VMS and can do so over distances of up to 50 ft. However, you may require repeaters in the following situations:
 - If the VMS is more than 50 ft from the humps.
 - If there is no clear line of sight from the VMS to the humps (e.g. if the humps are located on a different level of the parking facility from the VMS).

Included Components

The following OpenSpace Counting Solution components are included with OpenSpace:

- » OpenSpace Pods (*default*)
- » OpenSpace Speed Humps (*optional*): unit sections (3 middle sections and 2 end caps per hump)
- » Lag bolts 3/8" diameter, 4" long - 6 per section or pod (included)
- » Plastic shields (anchors) for 9/16" holes - 6 per section or pod (included)

Required Installation Tools

You need the following tools in order to complete the installation of the OpenSpace Counting Solutions:

- » Chalk
- » Measuring tape
- » Heavy duty hammer drill
- » Drill bits - carbide tip, 9/16" diameter, 10-12" long



TIP: Equipping 2 or more workers with drills and higher quality bits can speed up installation time significantly.

- » Shield installation tool for installing the plastic shields
- » Hammer
- » Sledge hammer (for final adjustment)
- » 11/16" drive socket with an extension and power tool
- » Street broom
- » Utility knife
- » Crow bars, goose-neck wrecking bars
- » Portable blower for cleaning installation holes
- » Gloves, safety glasses, traffic cones, drums or barricades for securing the site

Required Manpower (Crew)

- » 2-4 installers (depending on the solution installed)

Installing the Humps

A typical installation involves drilling holes and bolting the humps on to the surface. If drilling holes in the surface is a problem it is possible to install the humps using an adhesive. For more details on installing the humps with an adhesive, see *Appendix: Installing the OpenSpace Counting Solution using Adhesives* on page 28.



NOTE: Make sure that the humps with incoming sensors (Labeled IN) are installed in the entrance lane(s) to your facility and humps with outgoing sensors (Labeled OUT) are installed in the exit lane(s).

To install the humps:

1. Determine the location of the humps and sweep the surface clean of dust and debris.



CAUTION: For optimal results we recommend that you place the OpenSpace Pods in line with the flow of traffic and the OpenSpace Speed Humps perpendicular to the flow of traffic.

2. Use chalk to mark the center lines (parallel and perpendicular to the direction of the vehicles) and border lines on the surface.

3. In the case of the OpenSpace Speed Humps, assemble and position the units, starting from the center line (parallel to the direction of the vehicles).



NOTE: Make sure the units are tight and well aligned before moving on to step 4.

4. Drill 9/16" diameter holes into the surface, through the existing holes of the placed units. The holes should be 3 1/2" - 4" deep in order to accommodate the plastic shields that are 3" long.



TIP: Drilling 9/16" holes may be easier if you drill smaller holes prior to using the 9/16" bits.

5. After each hole is drilled, insert a plastic shield securely into the asphalt.



NOTE: Make sure the holes are clear of dust and debris before installing the shields. (A portable blower is useful for this purpose.)

6. Drive the shields down with the shield installation tool until the flange of the shield is flush with the installation surface.
7. Insert a lag bolt with a washer and bolt down each unit. Do not over tighten.

INSTALLING THE OPENSOURCE VMS

Your OpenSpace System includes at least one OpenSpace VMS sign. The OpenSpace VMS sign communicates wirelessly with the OpenSpace Counting Solution humps to display to drivers a real-time count of the number of spaces available in a parking facility.



Figure 4: The OpenSpace VMS

If you have a multi-level parking facility you may have also received a multi-level VMS as part of your OpenSpace System. As this is usually a custom option, this document does not provide instructions on how to install this type of sign.

There are several methods and hardware options available for the installation of the OpenSpace VMS sign. However, it is typically mounted with a universal mounting bracket that comes standard with the sign.

Choosing a Position for the Sign

Where you should position the sign varies with the application for which the OpenSpace VMS sign is being used. The following guidelines, however, should generally be adhered to:

- » Choose a position where the sign is easily visible from passing or incoming vehicles. Give consideration to how the location may develop with time. For example:
 - Will any trees grow directly in the line of vision?
 - Is it likely that road traffic signs will be erected in a position that could obstruct the field of view?
 - For solar-powered signs, are the solar panels likely to be blocked by any trees or other structures?
- » The structure that the sign is mounted to should be stable and firm. Avoid structures that are likely to be affected by wind or rain. The suggested pole type for installation is either a 4-inch diameter circular metallic pole or a 4-inch × 4-inch wooden pole. For Telespar poles, we strongly recommend that you use the 2-inch variety.
- » The recommended height of the lower edge of the sign is approximately 7 feet above the surface of the road.

Mounting the Sign

The OpenSpace VMS sign and optional solar panel should optimally be mounted on a 12-foot to 14-foot pole. You can install the sign using either of the following methods and hardware options:

- » Standard Pole Banding Mounting
- » Universal Mounting Bracket System

Using the Universal Mounting Bracket System

The OpenSpace VMS sign comes with a Universal Mounting Bracket System that allows you to quickly and easily mount the sign to virtually any type of pole or surface in a secure manner.

There are two parts to the bracket: one for the sign (the sign bracket) and the other (the pole bracket) for the pole. The sign bracket needs to be attached to the back of the sign. Attach the pole bracket to the pole or structure where you want to mount the sign. This allows you to easily slide the sign onto the pole bracket where it can be locked into place with the included key. You can just as easily remove it from the bracket once it is unlocked.

The quick mount and dismount feature of this bracket allows you to easily move the sign from one location to another with relative ease and convenience.

Installing the Sign Bracket

To install the Sign Bracket:

- » Attach the Sign Bracket to the backside of the sign using the included hardware.



Figure 5: Attaching the sign bracket.



Figure 6: Backside of sign bracket attached.

Installing the Pole Bracket

The Pole Bracket can be secured to any type of standard pole or Telespar type pole by a choice of banding straps, lag screws, or bolts and nuts.



TIP: We recommend that you install the bracket on a 2-inch Telespar pole.



Figure 7: Pole bracket mounted to a circular pole



Figure 8: Pole bracket mounted to a 2-inch Telespar pole

To install the Pole Bracket on a Telespar Pole:

- » Use the supplied 2.5-inch stainless steel security bolts and nuts to secure the Pole Bracket to the 2-inch Telespar pole.



NOTE: It is very important that the head of the bolt be placed on the Telespar pole (see *Figure 9: on the next page*) and that the nuts be placed on the inside part of the bracket (see *Figure 10: on the next page*).

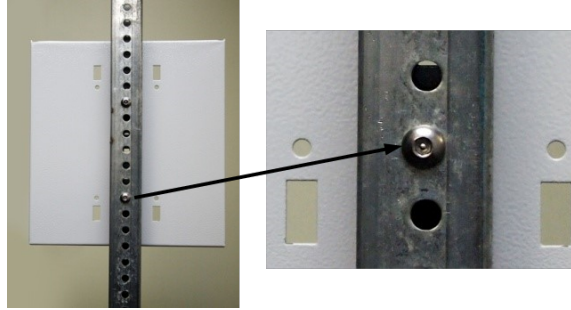


Figure 9: Pole bracket with bolts on the Telespar pole

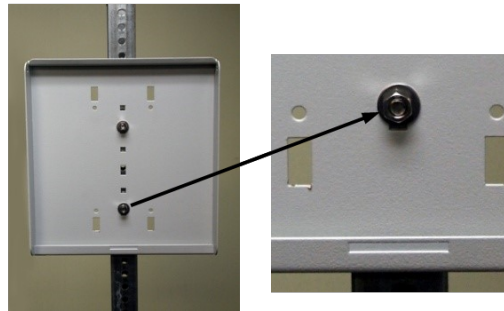
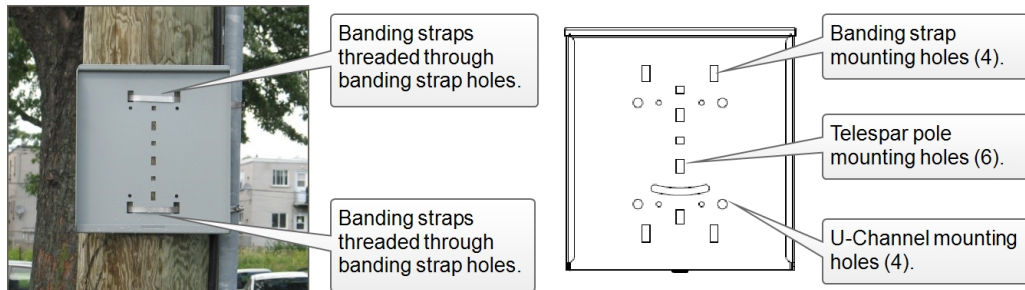


Figure 10: Pole bracket with nuts placed on the inside of the sign bracket

To install the Pole Bracket using the supplied banding straps:

1. Thread the banding straps through the banding strap holes as shown.



NOTE: The banding straps included are long enough for use with a 5-inch pole. If you want to use a larger pole, you will need to obtain longer banding straps.

2. Use additional screws and/or bolts to further prevent theft and vandalism.



Mounting and Dismounting the Sign

Once you have installed the mounting brackets, you can easily mount the OpenSpace VMS sign by sliding it down onto the Pole Bracket. Once mounted, you should lock the sign into place.

To mount the sign:

1. Position the sign above the bracket.



2. Slide the sign down the bracket.



3. Use the supplied key to lock the sign in place.



To dismount the sign:

1. Unlock the sign.
2. Slide the sign up and off of the Pole Bracket.

Using the Standard Pole Banding Mounting

The OpenSpace VMS sign comes with a Standard Pole Banding Mounting system. As this is a standard type of mounting it requires no special knowledge to easily install the sign.



NOTE: The banding straps included are long enough for use with a 5-inch pole. If you want to use a larger pole, you will need to obtain longer banding straps.

To install the sign using the standard pole banding mounting system:

1. Attach the supplied banding brackets to the top and bottom of the rear of the sign with the supplied tamper-proof, M6 security screws as shown below.



Figure 11: Attaching the banding bracket to the sign



Figure 12: Standard banding brackets mounted directly to a sign with M6 tamper-proof screws

2. Insert the stainless steel banding strap into the bracket and fasten the sign to the pole.
3. Tighten the strap with a nut driver until secure. See *Figure 13: below*.



Figure 13: Sign Secured to a Pole with Banding Strap

Installing the Antenna

Your OpenSpace VMS sign comes with an antenna that needs to be mounted externally as opposed to on the sign itself. The antenna comes with a mounting bracket which you can use to mount the antenna externally.

To install the antenna:

1. Attach the antenna to the bracket.
2. Mount the antenna and bracket.
3. Connect the antenna cable from the sign to the antenna.

Assembling the Antenna and Bracket

Use the included washer and antenna mounting nut to attach the antenna to the mounting bracket.



Figure 14: Antenna and mounting bracket

To assemble the antenna and bracket:

1. Insert the antenna into the mounting bracket.
2. Secure the antenna with the included washer and antenna mounting nut.

Mounting the Antenna

Depending on the requirements of your location, you can mount the antenna and bracket in any of the following configurations:

- » On a wall with the appropriate bolts or screws.
- » On a 2-inch mast or pole, using the included U-bolts.

- » On a 4-inch wood or metal pole with a banding strap (*see following image*).



Figure 15: Antenna and bracket mounted with a banding strap

Connecting the Antenna Cable to the Antenna

To connect the antenna cable to the antenna:

- » Screw the antenna cable on to the bottom of the antenna as shown in the following image.



Power Options for your Sign

The OpenSpace VMS sign is offered in several powering models. Depending on what model you have purchased, powering the sign will vary. The available power options are as follows:

- » AC powered
- » Solar powered (uses one or more 4-cell lithium batteries for backup)
- » Battery powered (includes one or more rechargeable 4-cell lithium batteries)



NOTE: The warranty on the batteries is limited to 1 year — please contact Technical Support for more details (see *Contacting Technical Support* on page 29).

AC Power

The OpenSpace VMS sign is equipped to accept 100-240 volts of AC power. For these signs (standard model), the regulated power supply comes already pre-wired, and your sign is ready to operate once it is mounted and wired to the incoming power supply. The Line (BLACK) and Neutral (WHITE) wires of the incoming power supply should be connected to the marked terminals. The Ground wire should be connected to the GREEN/YELLOW terminal (see *Figure 17: below*).



Figure 16: AC power supply terminal block

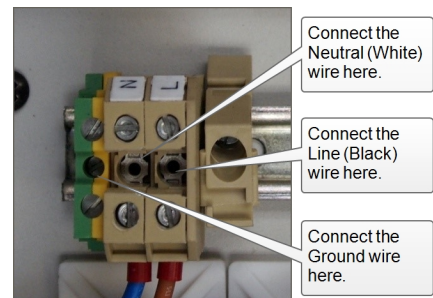


Figure 17: Close-up view of AC power connectors



WARNING: ELECTRICAL SHOCK HAZARD. To avoid serious injury or even death, all electrical wiring should be performed by a qualified and professional electrician in accordance with local electrical codes. Mishandling of electrical wiring may also result in damage to the unit and may void product warranty.



WARNING: Should you need to drill holes in the sign for the AC power wiring, drill from the inside/out as opposed to outside/in. This is to reduce the possibility of metal filings damaging the internal components of the sign.



WARNING: It is vitally important, whenever you close the sign, that you close and lock *all* of the latches properly to avoid water infiltration as this could damage the sign and void your warranty.

Battery Power

Battery powered signs come with one or more 4-cell Lithium batteries. In most instances, the batteries will be shipped already installed in the sign. At times, though, due to some shipping restrictions on Lithium batteries, they may be shipped separately. Once the batteries are received, remove them from the shipping packaging.



WARNING: Lithium batteries come with a protective black wrap on the outside of the unit that *should never* be removed; doing so damages the batteries and creates a potential hazard. The Lithium batteries supplied with the OpenSpace VMS sign are stable and safe when handled and used properly. Do not bend the batteries or attempt to puncture them with sharp objects as this could cause a fire and/or explosion.

Charge the batteries fully before the initial use. The supplied battery charger is equipped with a charge indicator. When the light on the charger is RED (with the battery plugged into both the battery and an AC power outlet) the battery is charging. Once the light turns GREEN, the battery is now fully charged and is ready for use.



Figure 18: Batteries inserted and connected



NOTE: This image is for illustrative purposes and the number of batteries in your sign may be different from that shown.

Installing the Battery

The battery should be placed with care into the battery holder inside the sign.



WARNING: Before closing the door of the sign, *always* make sure that the battery holder is closed and locked into place. Failure to do so may result in damage to the battery bracket and enclosure.

To install the battery in the battery bracket:

1. Pull on the plunger pins on either end of the upper bracket and flip open the bracket door.



2. Gently insert the battery into the lower bracket and lay the battery flat against the enclosure.
3. Gently close the battery bracket door and make sure the plunger pin locks into place.
4. Once the battery is secured in the battery bracket, connect the battery and sign power connectors. Once connected, the sign will power on.



WARNING: It is vitally important, whenever you close the sign, that you close and lock *all* of the latches properly to avoid water infiltration as this could damage the sign and void your warranty.

Solar Power

The Solar powered model of the OpenSpace VMS sign includes a solar panel and mounting bracket, one or more 4-cell lithium batteries, and a solar charger. The solar panel powers the sign when exposed to sunlight while at the same time charging the batteries to provide a power backup for night-time and cloudy day use. The solar panel is quick to install and should suffice in most installations.



Figure 19: Solar panel

Mounting the Solar Panel

You need to mount the solar panel at the highest point on the pole, optimally 10-12 feet high. Use the supplied solar panel bracket (see *Figure 20: below*) and follow the instructions provided by the manufacturer (included in the bracket's packaging).



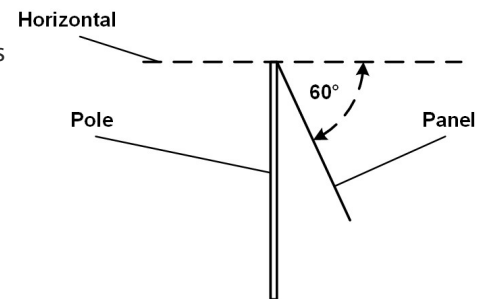
Figure 20: Solar panel mounting bracket

The two-part bracket allows for full adjustment in order to best position the 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.

The solar panel should be angled 15 degrees above the latitude of the installation site. For example, if the latitude of the installation site is 45 degrees then the solar panel should be installed at an angle of 60 degrees, as shown.

You can easily obtain the latitude of the installation site from mapping software or for free 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.



Wiring the Solar Panel to the Sign

As shown in the following images, the solar panel and the sign come pre-wired with connectors that allow for a simple installation. The red male and black female connectors from the sign need to be connected to corresponding connectors on the solar panel.



Figure 21: Solar panel wires and connectors on the back of the solar panel



Figure 22: Wires and connectors from the sign enclosure.



WARNING: To prevent damage to the solar charger, connect the solar panel to the sign *before* connecting the battery connectors to the solar charger in the sign.

To wire the solar panel to the sign:

1. Insert the connectors from the sign into the corresponding connectors from the solar panel as shown below.



2. Slide the connectors together until you hear a click and you can no longer slide them apart easily. Once connected the cables should look like the following:



3. Open the sign then connect the battery connectors for the solar charger as shown in the following image.



WARNING: Before ever doing any maintenance on a sign, it is critical that the power is first turned off. This will prevent accidental electrical shock that can be fatal and that can also damage electrical components.



WARNING: It is vitally important, whenever you close the sign, that you close and lock *all* of the latches properly to avoid water infiltration as this could damage the sign and void your warranty.

Turning the Sign On and Off

There is no ON/OFF switch supplied with the OpenSpace VMS sign. The sign immediately powers on once the power source is connected.

To turn the sign off:

Do one of the following:

- » On battery powered models, simply disconnect the battery connectors.
- » On the AC and Solar powered models, disconnect the green power connector from the controller card.

This may require the use of a mini-screwdriver.

INSTALLING THE OPENSOURCE REPEATER

The Parking Logix OpenSpace parking solution may also include, where necessary, the OpenSpace Repeater.



Figure 23: The OpenSpace Repeater

The OpenSpace Repeater extends the range of the wireless communications between the OpenSpace VMS and the sensor-enabled OpenSpace Counting Solution. The OpenSpace Counting Solutions need a clear line of sight to communicate with the OpenSpace VMS and can do so over distances of up to 50ft. However, you may require repeaters in the following situations:

- » If the VMS is more than 50ft from the speed humps.
- » If there is no clear line of sight from the VMS to the speed humps (e.g. if the speed humps are located on a different level of the parking facility from the VMS).

Beyond this, you install the OpenSpace Repeater in the same manner as you install the OpenSpace VMS.

Choosing a Position for the Repeaters

When choosing a position for the repeaters you should consider the following guidelines:

- » **Range of Communications:** The distance from the speed humps to the nearest sign or repeater should be no more than 15 meters (50 feet). The distance between repeaters or between the repeater and the sign should be no more than 300 meters (approximately 1000 feet).
- » **Line of sight:** Because the wireless signal can be obstructed by structures, the repeaters should be positioned such that there is a clear line of sight from the speed hump to the nearest repeater, from that repeater to the next closest, and so on, to the sign.
- » **Structure:** The structure that the repeater is mounted to should be stable and firm. Avoid structures that are likely to be affected by wind or rain. The suggested pole type for installation is either a 4-inch to 5-inch diameter circular metallic pole or a 4-inch by 4-inch wooden pole. For Telespar poles, we strongly recommend that you use the 2-inch variety.



CAUTION: Concrete structures can interfere with communication between signs or repeaters and sensors.

INSTALLING THE OPENSOURCE PRO SOFTWARE

All OpenSpace systems come with the OpenSpace Pro software pre-loaded on the provided tablet and/or laptop and can be launched from the Windows desktop. However, you can install the software on other Windows computers if necessary.

To install the OpenSpace Pro software:

1. Navigate to the location of the OpenSpace Pro installation file.
2. Double-click on the file to run the installation program.
3. If prompted by the Windows User Account Control, click **Yes**, to allow the installer to make changes to your system.

The OpenSpace Pro Setup Wizard dialog is displayed.



4. Click **Next**, then follow the onscreen instructions to complete the installation.

Once the installation is complete the following screen is displayed.



5. Click **Finish** to exit the Setup Wizard.

APPENDIX: INSTALLING THE OPENSOURCE COUNTING SOLUTION USING ADHESIVES

If drilling holes in the surface is a problem, use the following procedure to install the humps using adhesives. The recommended adhesives are as follows:

- » Loctite PL Premium Advanced Polyurethane Construction Adhesive - This adhesive requires up to 24 hours to cure. We recommend that you use one 300 ml. (10 fluid oz.) container per pod or segment.
- » Red Head Epcon A7 Adhesive - This adhesive should be used in addition to the PL Premium adhesive if you cannot leave the humps undisturbed for more than 12 hours. On average you may require one container per every 4 pods or segments.



NOTE: Make sure to follow the PL Premium recommendation that the installation surface be at a temperature of at least 5° Celsius (41° Fahrenheit).



TIP: We recommend that you try placing the humps in position temporarily, and observe the resulting flow of traffic, in order to determine the best location and orientation.

To install the OpenSpace Counting Solution using adhesives:

1. Make sure that the installation surface is dry and has been cleaned of dust, water and grease.
2. Sand down the underside of the pod or segment in order to remove any residue of the mold release or other contaminants. We recommend that you use a belt sander and a sand paper of 40-60 grit to sand down the underside of the pod or segment until there are no shiny areas.
3. When you are finished, wipe the underside of the pod or segment clean of any rubber dust.
4. Apply one container of the PL Premium adhesive to the cleaned underside of each pod or segment. The adhesive should be applied evenly.
5. If necessary, still on the underside of the pod or segment, apply a small amount of Epcon A7 Adhesive (a dot approximately 1 inch diameter) in six spots, the four corners and midway along the long side.
6. Position the hump on the designated, clean and dry surface.
7. Step on and walk across the top of the hump to make sure that it makes full and proper contact with the surface.
8. Leave the hump undisturbed for the required time period, for it to cure.



WARNING: It is very important that the hump remain undisturbed for the required period. We recommend that you install the hump at night or during a period where there is little to no traffic so that the lane in which the hump is installed can be closed off during this time.

CONTACTING TECHNICAL SUPPORT

If you have questions or comments regarding this document or OpenSpace™, please feel free to contact our technical support center by phone: 1 (877) 727-5423, or by email: support@parkinglogix.com