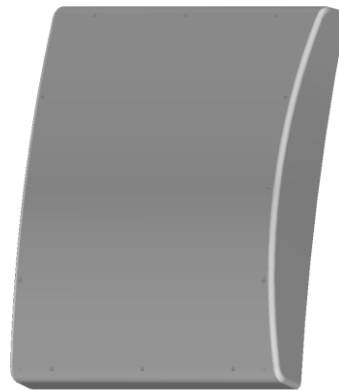


SmartPass Lane Beacon & Signal Beacon

User Guide

16-0205-003 Rev X1 08/2026

TransCore's SmartPass Lane Beacon and SmartPass Signal Beacon work in conjunction with the SmartPass mobile application to reliably determine a vehicle's lane of travel as it moves through a toll zone — supporting accurate transaction assignment and reducing reliance on traditional roadside hardware. Universal Bluetooth® Low Energy compatibility (BLE) allows for frictionless integration across mobile and Internet of Things (IoT) ecosystems.



This guide provides site planning, installing, testing, and general operating instructions. This information is intended for use by authorized TransCore dealers, installers, and service personnel.

Information in this document is subject to change and does not represent a commitment on the part of TransCore, LP.

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WARNING TO USERS IN THE UNITED STATES
FEDERAL COMMUNICATIONS COMMISSION
(FCC)

FCC RADIO FREQUENCY INTERFERENCE
STATEMENT 47 CFR §15.105(A)

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate RF energy and may cause harmful interference to radio communications if not installed and used in accordance with the instruction manual. Operating this equipment in a residential area is likely to cause harmful interference, in which case, depending on the laws in effect, the user may be required to correct the interference at their own expense.

NO UNAUTHORIZED MODIFICATIONS
47 CFR §15.21



CAUTION: This equipment may not be modified, altered, or changed in any way without permission. Unauthorized modification may void the equipment authorization from the FCC and will void the warranty.

**TRANSCORE,
LP USA**

**AVERTISSEMENT À L'ATTENTION DES
UTILISATEURS AUX ÉTATS-UNIS**

**FEDERAL COMMUNICATIONS COMMISSION
(FCC)**

**DÉCLARATION 47 CFR §15.105(A) DE LA FCC
SUR LES INTERFÉRENCES DES FRÉQUENCES
RADIO**

REMARQUE : Cet appareil a été testé et déclaré conforme à la catégorie d'un appareil numérique de classe A en accord avec la partie 15 des directives de la FCC. Ces normes visent à assurer une protection raisonnable contre les interférences nuisibles lorsque l'appareil est utilisé dans un environnement commercial. Cet appareil génère, utilise et peut émettre de l'énergie RF et peut être à l'origine d'interférences nuisibles aux communications radio s'il n'est pas installé et utilisé en suivant les directives du manuel d'instructions. Si cet appareil est utilisé dans une zone résidentielle, il est probable qu'il cause des interférences nuisibles. Dans ce cas, l'utilisateur pourrait être amené à remédier aux interférences à ses propres frais, selon les lois du pays en vigueur.

**AUCUNE MODIFICATION NON
AUTORISÉE 47 CFR
§15.21**



MISE EN GARDE

MISE EN GARDE : *Il est interdit de modifier, d'altérer ou d'apporter des changements à cet appareil de quelque manière que ce soit sans autorisation. Toute modification non autorisée peut annuler l'autorisation d'utilisation accordée par la FCC et annulera la garantie.*

**TRANSCORE,
LP ÉTATS-UNI**

WARNING TO USERS IN CANADA

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

AVERTISSEMENT AUX UTILISATEURS AU CANADA

Cet appareil contient des émetteurs(s)/récepteurs exemptés de licence qui sont conformes à l'EXEMPTION de RSS(s) d'Innovation, Science et Développement économique Canada). L'opération est soumise aux deux conditions suivantes:

1. l'appareil ne doit pas produire de brouillage.
2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

RADIO FREQUENCY HEALTH LIMITS

LIMITES D'EXPOSITION AUX RADIOFRÉQUENCES

FCC (Federal Communication Commission)

WARNING: The radiated output power of this device is below the FCC radio frequency exposure limits. Nevertheless, this device should be used in such a manner that the potential for human contact during normal operation is minimized. This device has been evaluated for and shown compliant with the FCC RF Exposure limits under mobile exposure conditions (antennas are greater than **20 cm** from a person's body). For details on device installation, please refer to the installation section in this user-manual.

Industry Canada (Innovation, Science and Economic Development Canada)

RF Radiation Exposure Statement:

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of **20 cm** between the radiator and your body.

Déclaration d'exposition aux radiations:

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

Licensing Requirements

The SmartPass Lane Beacon and SmartPass Signal Beacon models are end-user license exempt devices certified under FCC Part 15.247 and IC RSS-247. As such, the end-user of these products is not required to file for a site license from the FCC (US) or IC (Canada). For other countries, refer to the local laws and frequency control agencies.

Once installed by a professional installer, the end user cannot make changes to the configuration (transmit power, etc.) of the unit.

PRELIMINARY

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PRELIMINARY

Chapter 1 Introduction

System Guide Organization

Information and instructions for the SmartPass Lane Beacon and SmartPass Signal Beacon models are presented in this user guide.

System Description

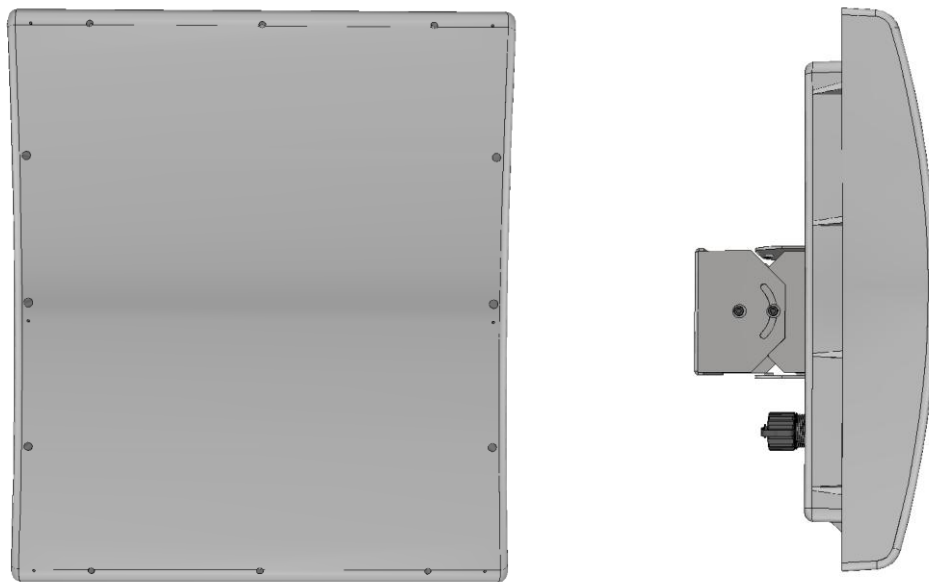
The SmartPass Lane Beacon and SmartPass Signal Beacon work in conjunction with the SmartPass mobile application to reliably determine a vehicle's lane of travel as it moves through a toll zone.

When a vehicle approaches the toll area, the Signal Beacon transmits a wake-up signal to compatible mobile devices. This activates the SmartPass application in the background and keeps it active throughout the transaction window. The Lane Beacon continuously broadcasts advertising data across up to three (3) lanes. During this period, the SmartPass mobile application determines the user's lane position, location, account identity, and records the corresponding transaction data for backend processing.

SmartPass Lane and SmartPass Signal Beacons

The SmartPass Lane and Signal Beacons consists of an input/output (I/O) module, radio frequency (RF) transmitter, and an integral non-user replaceable patch antenna. These components are contained in a highly reliable, compact, and easy-to-install environmentally sealed package. [Figure 1](#) shows the front and side views of a SmartPass Lane or Signal Beacon.

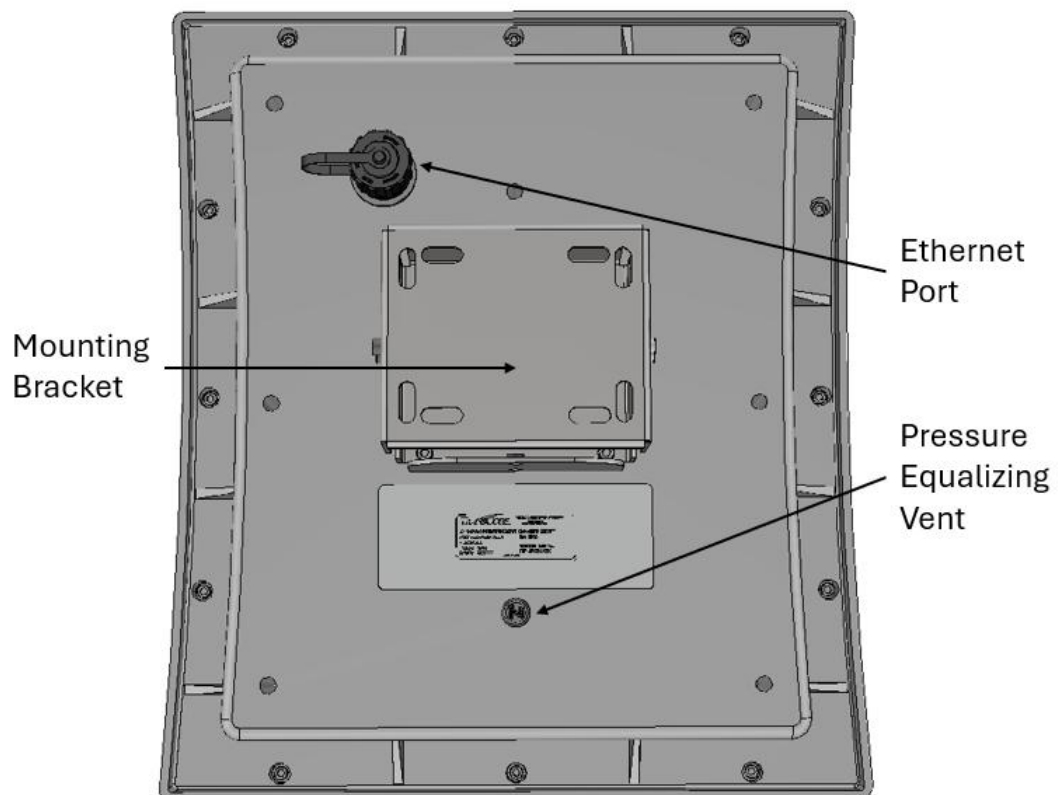
Note: *A dedicated electrical power supply must be present at the site and available to the Lane and Signal Beacons at all times.*



FRONT VIEW

SIDE VIEW

Figure 1 – SmartPass Lane and Signal Beacon Front, Side view



Mounting
Bracket

Ethernet
Port

Pressure
Equalizing
Vent

Figure 2 – SmartPass Lane and Signal Beacon back view

How It Works

The SmartPass Lane and Signal Beacons are Bluetooth® Low Energy (BLE) non-connectable devices in broadcasting mode. The beacons generate a SmartPass BLE signal in the 2400-2483.5 MHz frequency band. This BLE signal is advertised through the integrated antenna.

When a vehicle approaches the toll area, the Signal Beacon transmits a wake-up signal to compatible mobile devices. This activates the SmartPass application in the background and keeps it active throughout the transaction window. The Lane Beacon continuously broadcasts advertising data across all lanes. During this period, the SmartPass mobile application determines the user's lane position, location, account identity, and records the corresponding transaction data for backend processing.

Chapter 2 Developing the Site Plan

This chapter discusses site plan development for installing the SmartPass Lane and Signal Beacons.

Overview

Developing a site plan provides the foundation for the site's system design. When developing a site plan, important factors to consider are the site layout, traffic flow, and location of other equipment on the gantry.

These factors provide relevant information regarding each site's physical and electromagnetic environment and the conditions under which the system must perform.

Basic Beacon Setup

For optimum performance the beacons should be installed 17ft to 23ft above the roadway. The SmartPass Signal Beacon is installed at 80 degrees with an unobstructed view into oncoming traffic. The SmartPass Lane Beacon is installed at 0 degrees with an unobstructed view of the traffic below, centered over the lane of interest. The Ethernet connector of the Signal Beacon should be at the bottom. The connector of the Lane Beacon shall be oriented downstream of oncoming traffic.

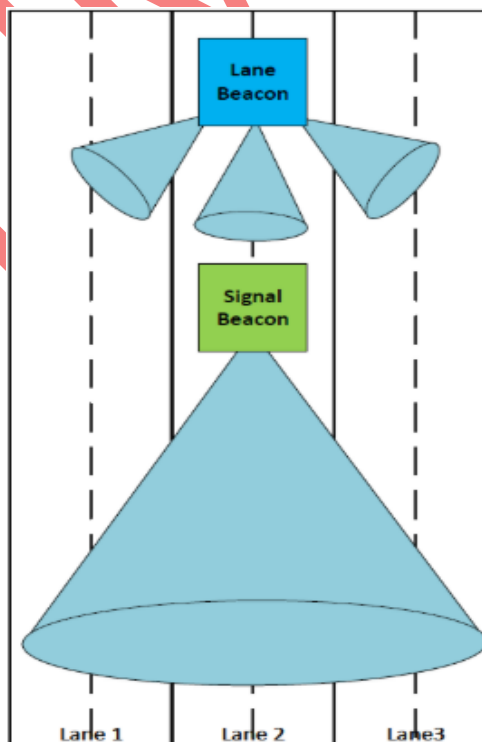


Figure 3 – SmartPass Lane and Signal Overhead Beacon Installation

Before Starting Installation

Confirm the following:

- All construction is complete; electrical and communication cables are of appropriate length and in place.
- A dedicated power supply of the appropriate voltage is present.
- Placement of the beacons follows the site plan.
- The beacons are in the correct positions.

Note: The Lane and Signal Beacons have a pressure equalizing vent. Ensure that this vent is not obstructed.

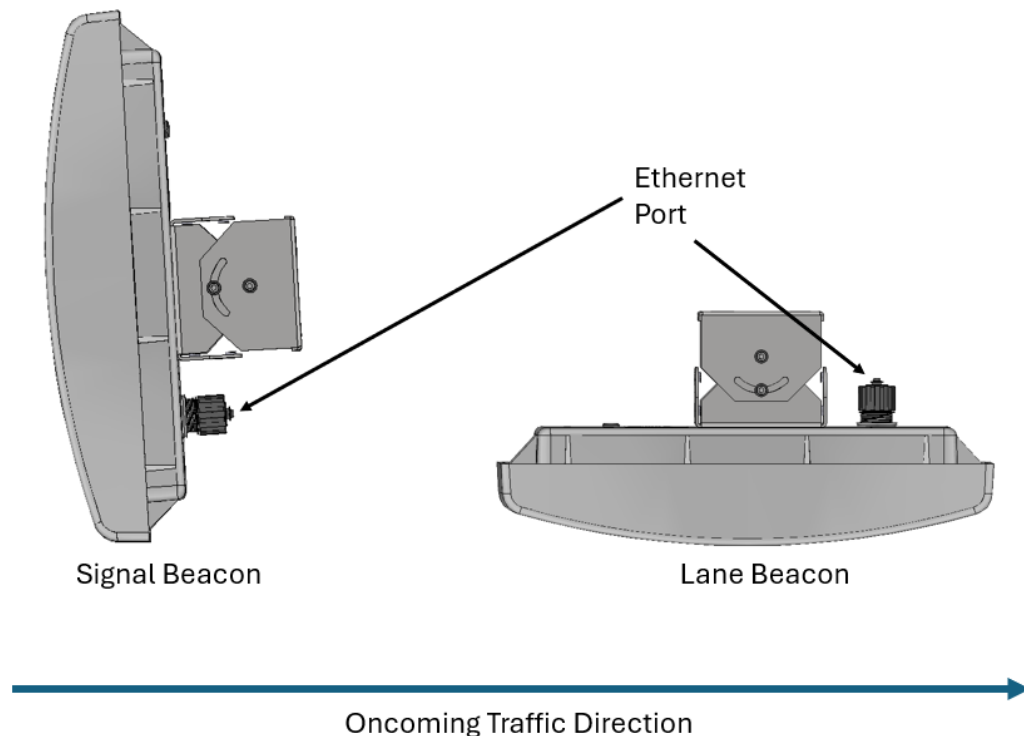


Figure 4 – SmartPass Lane and Signal Beacon Orientation

Unobstructed Line of Sight

For optimum functionality, install the SmartPass Lane and Signal Beacons so that when the vehicle enters their RF field, the beacons are directly facing the vehicle, and the line of sight is clear between the beacons and the vehicle. If a fence or barrier is between beacons and the vehicle, the SmartPass system cannot function reliably.

Note: Metallized coatings on some vehicle windshields and windows shield the RF energy emitted by the SmartPass Lane and Signal Beacons. Metallized windshields may degrade system performance and require additional system level identification methods to be exercised outside of the BLE functionality.

Site Layout, Mounting Requirements, and Traffic Flow

The following site layout and traffic flow considerations are critical when determining SmartPass Lane and Signal Beacons installation locations:

- The Lane and Signal Beacons RF zones
- Other Lane and Signal Beacon units in the area
- Lane configurations
- Reflection, refraction, and diffraction of RF signals
- Existing signal interference at the site

The SmartPass Lane and Signal Beacon RF Zone

The SmartPass Lane and Signal Beacons must be able to wake the SmartPass mobile app and to keep it active within a specified area, called the RF zone, without interfering with other Lane and Signal Beacons at the site. The following are some of the factors that affect the size and shape of the RF zone:

- Mounting method used
- Mounting location
- Height from the ground and mounting angle
- RF output power attenuation
- Other sources of interference and reflection

The SmartPass Lane and Signal beacons must be positioned to allow the RF signal to travel to the vehicles within the designated range and be placed in an area where it is not likely to be bumped out of alignment. If the antenna becomes misaligned or some nearby structure is added or removed, system operation can be seriously affected.

Other SmartPass Beacons in the Area

Sites with more than one Signal and Lane Beacon in proximity should have them configured with the recommended lane and directional assignments. Other Lane or Signal Beacons in proximity should have at least a 10 ft distance separation.

Lane and Signal beacons may not operate accurately if they directly face each other or are positioned back-to-back.

Lane Configurations

Overhead Beacon Installation Configuration

Plaza configurations involving lane discrimination for four or five lanes are recommended to be set up as illustrated in Figure 5 and Figure 6.

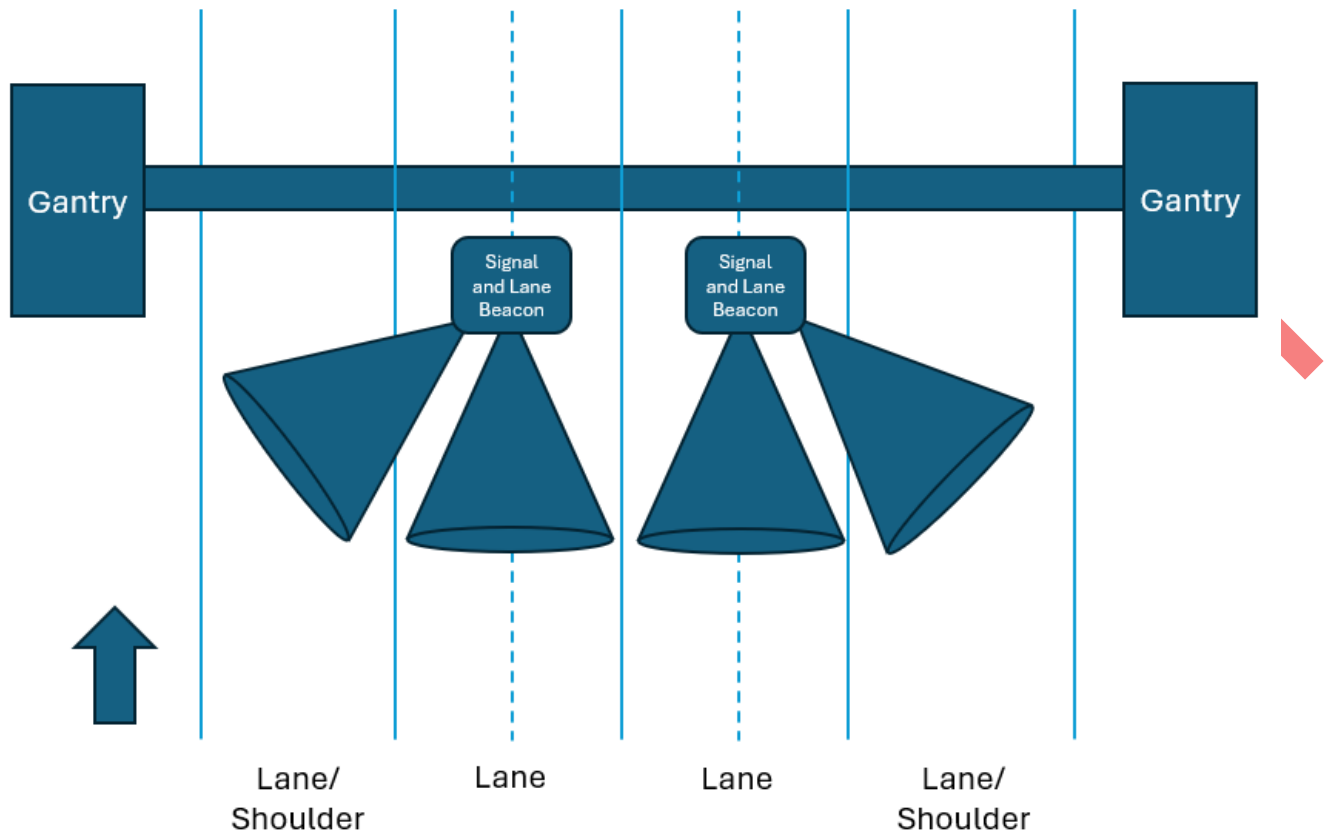


Figure 5 – SmartPass Lane and Signal Beacon Set-Up, 4 Lane Configurations

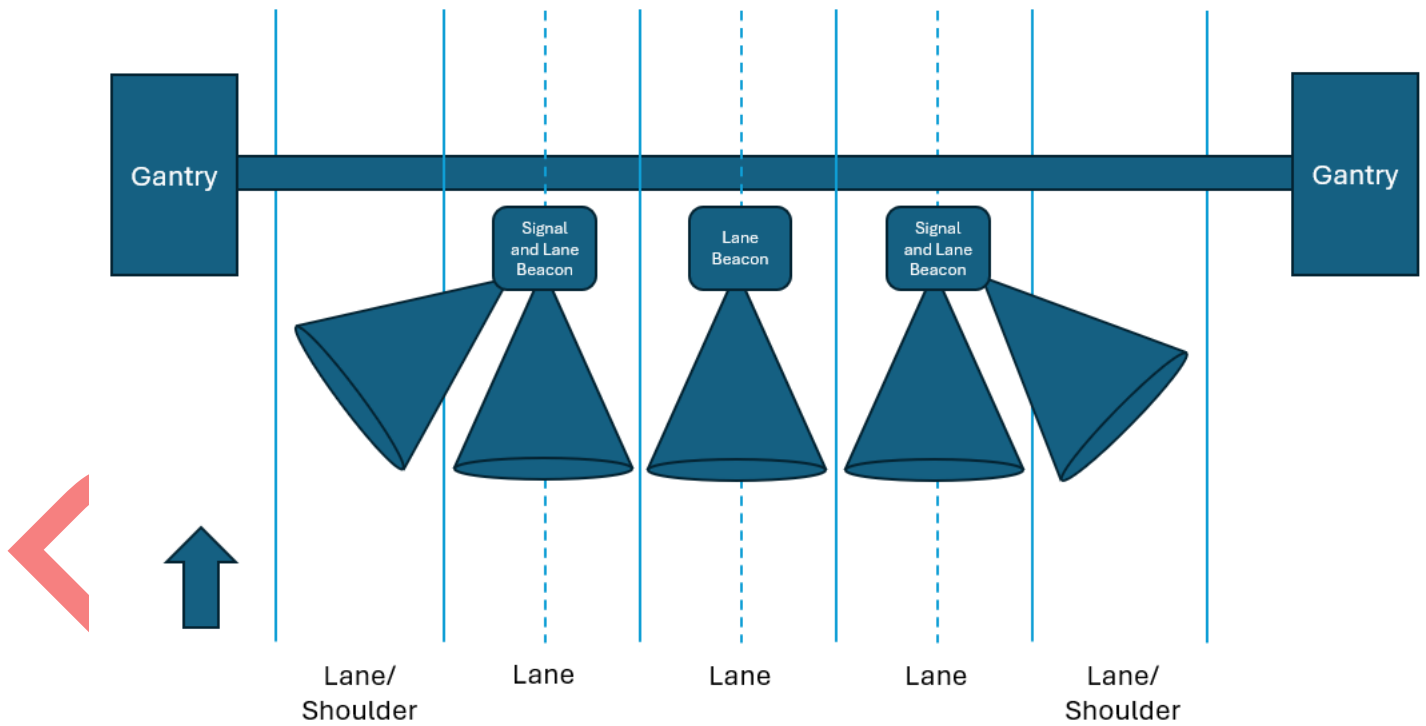


Figure 6 – SmartPass Lane and Signal Beacon Set-Up, 5 Lane Configurations

Reflection, Refraction, and Diffraction of RF Signals

RF signals can be reflected, refracted, or diffracted by metal objects, walls, and even wet pavement or ice. Any of these factors can alter or degrade system performance. When designing your site plan, you must consider permanent structures and transient factors in the vicinity that may affect RF signals being generated by the SmartPass Lane and Signal Beacons. Permanent structures include buildings, chain link fences, guard sheds, and gates. Transient factors include passing traffic and local weather conditions, such as rain or snow. Symptoms of reflection, refraction, and diffraction include incorrect transactions with vehicles that are out of the desired RF zone or vehicles being incorrectly classified from another lane.

The most common RF reflectors are metallic surfaces. RF signals may also be partially reflected by nonconducting materials such as dirt, wood, ice, asphalt, and concrete. When nonconducting materials in the system environment become wet, they increase reflection of RF signals.

The SmartPass Lane and Signal beacon mounting location, aiming, and range control adjustment can reduce interference from RF reflections. When these actions cannot adequately control reflections, other techniques such as shielding, absorbing, range sensitivity adjustment, or barriers can also be used.

Existing Interference

Interference from RF and electrical sources can degrade system performance and must also be considered in the site design. Fluorescent lights, neon signs, nearby radio stations, or power lines can interfere with the optimal operation of the system. The magnetic impulse noise from relays that control gate opening and closing can also disrupt the RF signal.

Existing interference at the site may be shielded, removed, or positioned further from the SmartPass Lane and Signal Beacons. Other Lane or Signal Beacons in proximity should have at least a 10 ft distance separation.

Electrical and Communications Requirements

All construction work at the site must be completed before installing the SmartPass Lane and Signal Beacons. Electrical and communications cables should be installed according to all applicable local and federal building code requirements. Specific instructions for positioning and installing the SmartPass Lane and Signal Beacons are discussed in Figure 4, Figure 12, and Figure 13.

Junction Box

If required, use a watertight junction box that meets applicable local and national building codes for connecting power and communications wiring. The junction box houses the terminal strip for power and communications connections. TransCore recommends a NEMA Type-4 junction box with a back-mounting panel.

Power and Communications Cables

The Lane and Signal Beacons include sealed circular RJ45 connectors for power and communications. The connectors feature a bayonet-style coupling mechanism conforming to IEC 61076-3-106, providing a secure and reliable connection for use in harsh environments. The shielded RJ45 Jack and Plug meet EIA/TIA-568B.2 cat. 5e specifications. IP67 sealing performance is achieved when the connector halves are fully mated or when the connector is properly covered.

Note: End users or installers are responsible for selecting and providing a suitable mating connector.

Cable length for power and communications depends on the physical characteristics of the SmartPass Lane and Signal Beacons installation site. However, the maximum cable length shall not exceed 328 feet (100 meters).

Electrical Power – Power Over Ethernet (PoE)

The SmartPass Lane and Signal Beacons are powered through the Ethernet data cable via Power Over Ethernet (PoE). The SmartPass Lane and Signal Beacons have been designed to IEEE 802.3bt using a PoE supply (i.e. PoE capable switch or PoE injector with at least a Type 3 Class 5 rating). With a PoE supply the power current is kept separate from the data source. The power supply enters the Ethernet cable via the PoE switch or injector and is delivered to the SmartPass Lane and Signal Beacons by the Ethernet port on the units. A 4-pair Cat 5 or better cable equipped with an IP67-rated circular industrial RJ45 connector with a length no longer than 328 feet (100 meters) needs to be used to power the Beacons.

Table 1 – Power Supply Requirements

Supply	(RF On) Maximum Power at 68°F (20°C)
44 to 57 VDC	4 watts (W)

Power circuits are protected internally against power surges.

Host Communications

Your site design must include communications between the SmartPass Lane and Signal Beacons and a host computer. The SmartPass Lane and Signal Beacons communicates with the host computer through the Ethernet interface. The host computer should be no more than 328 ft (100 meters) from the SmartPass Lane or Signal Beacons - the cabling length must be no more than 100m.

Note: A 4-pair Cat 5 or better cable equipped with an IP67-rated circular industrial RJ45 connector with a length no longer than 328 feet (100 meters) should be used for communications and to power the beacons. The cable should be terminated with an RJ45 connector at the Beacon.

Table 2 – Communications Interfaces and Conductor Requirements

Colored Wire	Pin	Source	Destination
Green/White	1	TX+	RX+
Green	2	TX-	RX-
Orange/White	3	RX+	TX+
Blue	4	NC	NC
Blue/White	5	NC	NC
Orange	6	RX-	TX-
Brown/White	7	NC	NC
Brown	8	NC	NC

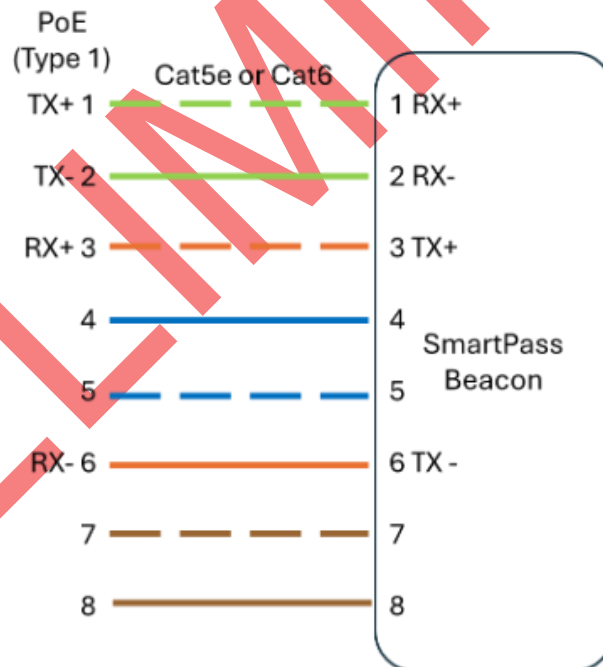


Figure 7 – RJ45 Pinout Diagram

Chapter 3 Installing the SmartPass Lane and Signal Beacons

This chapter lists the materials needed and presents the procedures to install SmartPass Lane and Signal Beacons.

Installation Process

In this section, unless specifically stated, “Beacon” applies both to the SmartPass Lane and Signal Beacons.

After you have developed the site plan and identified the location to install the Beacons, you are ready to install the equipment. Installation involves the following tasks:

- Mounting the beacons, on an overhead gantry structure
- Connecting the Beacon communications and power

Materials Supplied by TransCore

You need the following materials to install the Beacons. TransCore supplies some of the materials; other materials must be obtained from other sources.

Contents of Shipping Carton

Ensure that you have received all parts before beginning your installation. Your SmartPass Lane and Signal Beacons are packaged with the following materials:

- One Lane or Signal Beacon
- One mounting bracket and the mounting hardware

Required accessories

These may be obtained from other sources.

- Power/communications shielded Ethernet Cat 5 or better cable equipped with an IP67-rated circular industrial RJ45 connector on the Beacon side
- PoE injector or PoE capable switch

Connecting the SmartPass Lane and Signal Beacons Power Supply

PoE power is supplied through the Ethernet connection (RJ45). For the power supply, use a PoE capable switch or PoE injector with at least a Type 3 Class 5 rating. A single 4-pair, Cat 5 or better cable equipped with an IP67-rated circular industrial RJ45 connector on the Beacon side is all that is needed to power the reader. The cable must be no longer than 328 feet (100 meters).

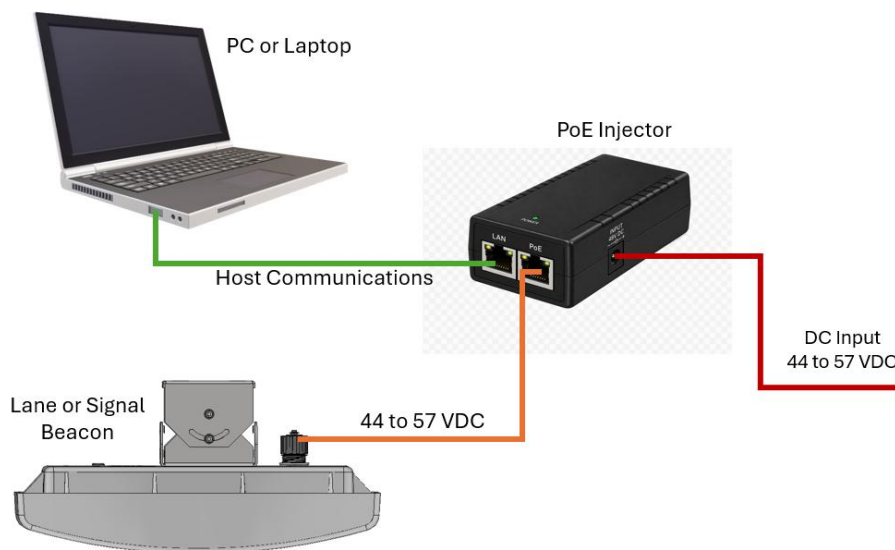


Figure 8 – Lane and Signal Beacon with PoE Injector for Power and Communications

Connecting the SmartPass Lane and Signal Beacons Communications

The SmartPass Lane and Signal Beacons communicate with the host computer through Ethernet. This section describes the procedures and materials required for connecting the communications link to a host computer.

Required Materials

You need the following materials to connect the communications cable to the PC:

- Computer (PC or laptop) with Ethernet port. If there is not a built-in Ethernet port a USB to Ethernet port adapter can be used
- SmartPass Beacon Service Host installed and running on a PC
- If the PC cannot provide Power over Ethernet, a PoE capable switch or injector
- Power/communications Ethernet Cat 5 or better cable equipped with an IP67-rated circular industrial RJ45 connector on the Beacon side

Mounting the SmartPass Lane and Signal Beacons

This section lists procedures and materials required for mounting the Lane and Signal Beacons on an overhead gantry structure.

The beacons should be installed 17ft ft (5.18 meters) to 23 ft (7.01 meters) above the roadway. The SmartPass Signal Beacon is installed at 80 degrees with an unobstructed view into oncoming traffic. The SmartPass Lane Beacon is installed at 0 degrees with an unobstructed view of the traffic below, centered over the lane of interest. The Ethernet connector of the Signal Beacon should be at the bottom. The connector of the Lane Beacon shall be oriented downstream of oncoming traffic. See Chapter 2 for more information.

Note: *The Lane and Signal Beacons have a pressure equalizing vent. Ensure that this vent is not obstructed.*

Mounting the Lane and Signal Beacons on an Overhead Gantry

The beacons should be installed 17ft ft (5.18 meters) to 23 ft (7.01 meters) above the roadway. The SmartPass Signal Beacon is installed at 80 degrees with an unobstructed view into oncoming traffic. The SmartPass Lane Beacon is installed at 0 degrees with an unobstructed view of the traffic below, centered over the lane of interest. The Ethernet connector of the Signal Beacon should be at the bottom. The connector of the Lane Beacon shall be oriented downstream of oncoming traffic. See Chapter 2 for more information. The overhead gantry must be installed according to local building codes.

Required Materials to Be Supplied by Customer

You need the following materials to mount the Lane and Signal Beacons on an overhead gantry:

- A 5/32-inch Allen wrench to assemble and adjust the mounting brackets

Procedures

To mount the Lane and Signal Beacons to an overhead gantry

1. Unpack the Lane or Signal Beacon. A factory-mounted bracket (Figure 9 and Figure 10) is attached to the back of the Beacon.

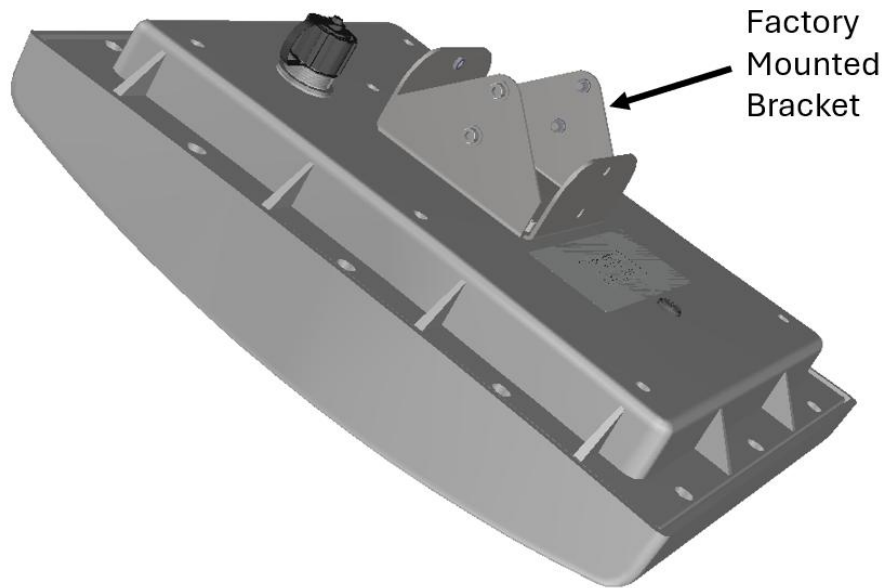
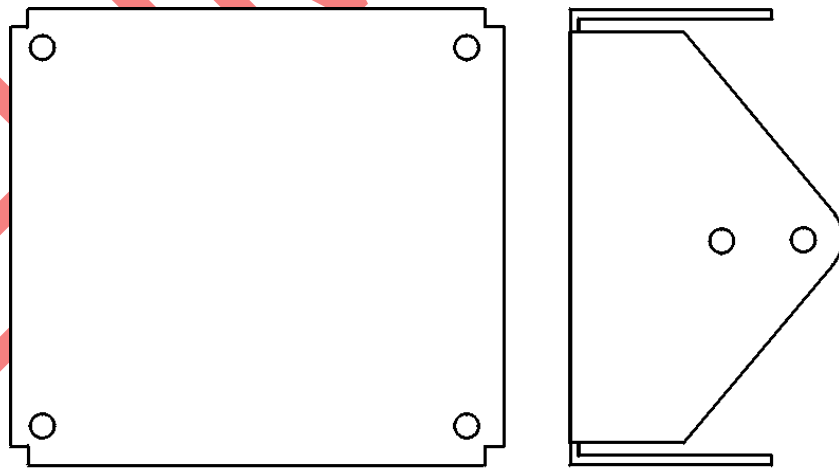


Figure 9 – Beacon with Factory Mounted Bracket



HWL0018

Figure 10 – Factory Mounted Bracket

2. A gantry mount bracket assembly (Figure 11) is bubble-wrapped separately and contains a plastic bag with four Allen screws and washers.

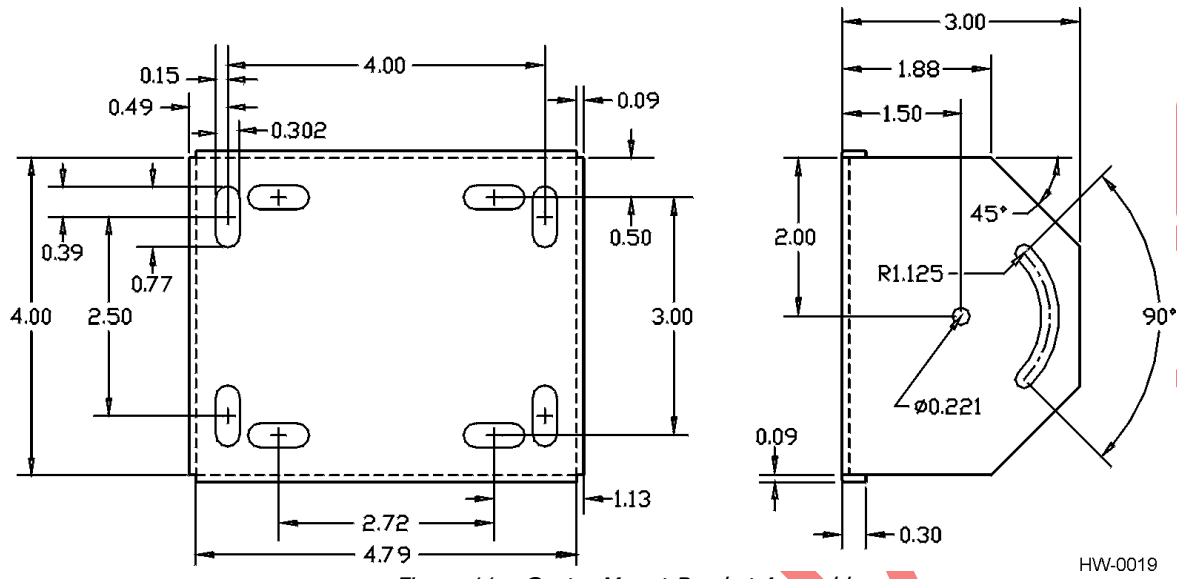


Figure 11 – Gantry Mount Bracket Assembly

3. Properly attach the gantry mount bracket assembly to the gantry 17ft ft (5.18 meters) to 23 ft (7.01 meters) above the roadway. The SmartPass Signal Beacon is installed at 80 degrees with an unobstructed view into oncoming traffic. The SmartPass Lane Beacon is installed at 0 degrees with an unobstructed view of the traffic below, centered over the lane of interest.
4. Using the four Allen screws and washers, attach the Beacon to the gantry mount bracket as shown in Figure 12 and Figure 13. Tighten the screws slightly so that the Signal Beacon can be adjusted up or down and the Lane Beacon can be adjusted front or back, but not so slightly the mounting assembly slips.

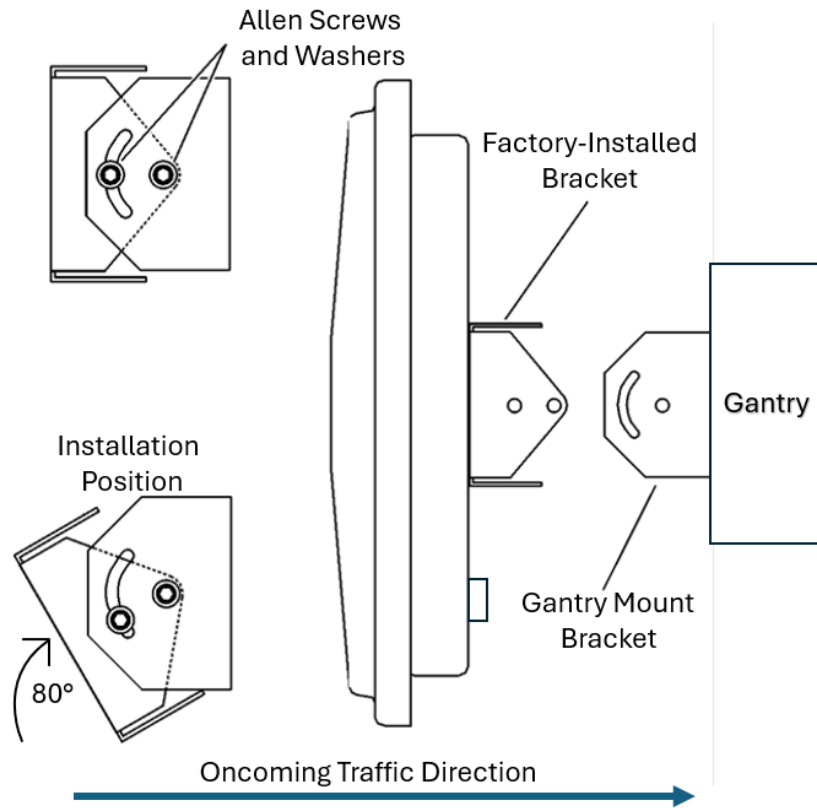


Figure 12 – Signal Beacon – Overhead Gantry Mount

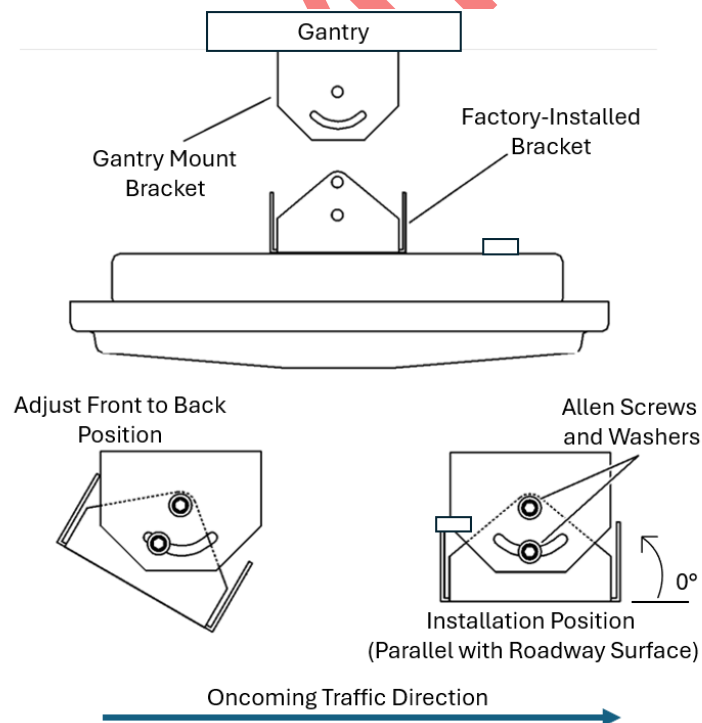


Figure 13 – Lane Beacon – Overhead Gantry Mount

5. Adjust the assembly by pointing the SmartPass Signal Beacon into oncoming traffic with an unobstructed view at 80 degrees. The SmartPass Lane Beacon is installed at 0 degrees with an unobstructed view of the traffic below, centered over the lane of interest to the middle of the area where vehicles will be. Tighten all screws and connect the circular industrial RJ45 connector from the Power/communications Ethernet cable.



Caution

To ensure reliable Beacon operation, TransCore strongly advises following the National Electric Code for lightning protection for the locale where the SmartPass Lane and Signal Beacons are installed.

After mounting the Beacons, you must connect it to a dedicated PoE supply.

The RF Zone

The area where the SmartPass Lane and Signal Beacons can wake the SmartPass mobile app and keep it active is called the RF zone. The antenna pattern, or RF zone, of the Signal Beacon would look roughly like a pear-shaped balloon if you were able to see it. The antenna pattern, or RF zone, of the Lane Beacon would look roughly like three separate pear-shaped balloons. The main lobe is centered at the Lane Beacon boresight direction. The sidelobes are offset roughly $\pm 30^\circ$ from the main lobe.

If two Lane or Signal Beacons are installed near each other, TransCore recommends that you fine-tune each Beacon for the ideal RF zone before connecting it permanently. A minimum of 10 ft distance separation between the two adjacent beacons is required for correct operation.

Chapter 4 Configuring the SmartPass Lane and Signal Beacons

This chapter provides information on how to configure the SmartPass Lane and Signal Beacons.

This chapter presents three options to configure the SmartPass Lane and Signal Beacons. The **SmartPass Beacon Service Host**, the **SmartPass Beacon Service – Web Interface**, and the **SmartPass Beacon Host – Windows Application**.

SmartPass Beacon Service Host

The Beacon Service Host provides a convenient interface for the user to configure the service as the service expects several parameters in a particular format. The user can install and configure the service from the Windows Control Panel, but most users will find the Beacon Service Host easier to use. The Beacon Service Host will query the service to determine the parameters and populate the user interface.

The Beacon Service Host manages the installation and configuration of the Beacon Service. The Beacon Service Host must be run as with admin/elevated privileges as the Beacon Service Host installs the Beacon Service so it can be started when the OS starts.

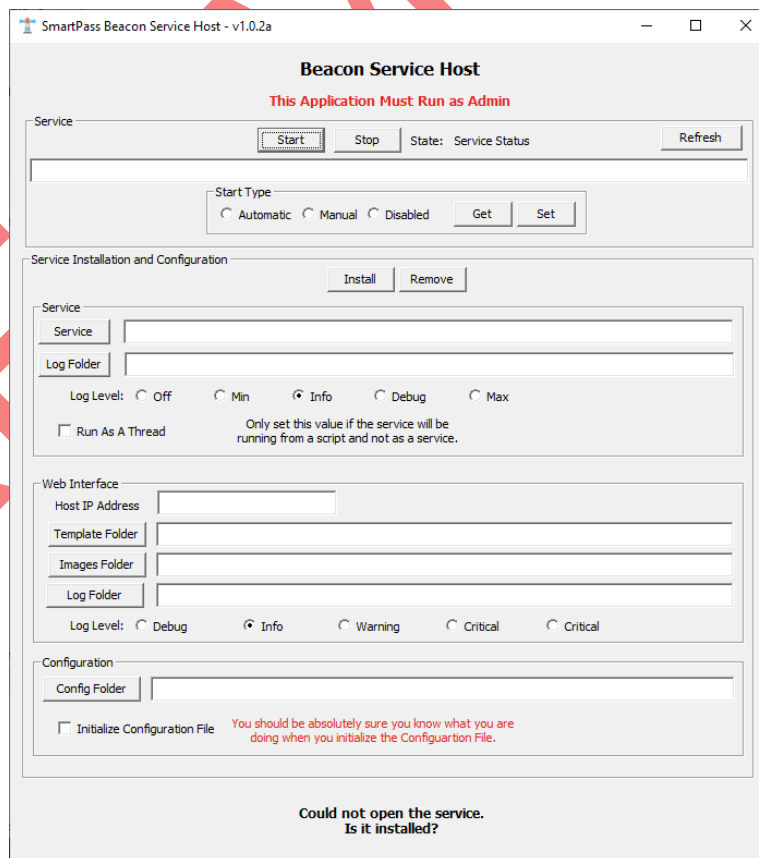


Figure 14 – SmartPass Beacon Service Host Main Window

The Beacon Service Host contains the following sections:

- Service
- Service Installation and Configuration
- Web Interface
- Configuration

Service

This area of the Beacon Service Host allows the user to control the service, retrieve service parameters and set service parameters.

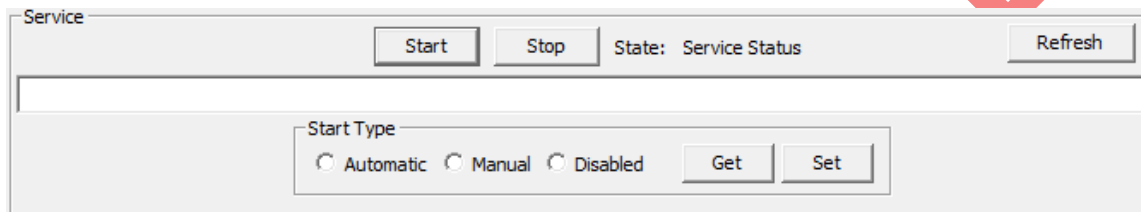


Figure 15 – Service Parameters Section

Buttons

- **Start** – Starts the service
- **Stop** – Stops the service
- **Refresh** – Retrieves the status of the service and updates the service parameters including the Start Type and the values in the Service Installation and Configuration group box.
- **Get** – Gets the Start Type
- **Set** – Sets the Start Type.
- **Start Types**
 - **Automatic** - The service will start automatically when the system is started. A system that is running in an automatic, unattended mode should specify 'Automatic' start type.
 - **Manual** - The service will not be started when the system starts but can be started manually. The user can manually start the service by pressing the **Start** button.
 - **Disabled** - The service is disabled and cannot be started.

Service Installation and Configuration

This area of the Beacon Service Host allows the user to set the executable and the parameters for the service. If the service has already been configured, the **Refresh** button will populate the values.

Service Installation and Configuration – Service

Service

Service

Log Folder

Log Level: ☐ Off ☐ Min ☒ Info ☐ Debug ☐ Max

☐ Run As A Thread

Only set this value if the service will be running from a script and not as a service.

Figure 16 – Service Section

This area of the Beacon Service Host allows the user to select the Service executable, the Log Folder, the logging level for the service and select if the service will be running as a thread. The **Run as a Thread** value should only be checked if the executable is going to run from a script instead of service. Setting this value is very unusual and only used for testing.

Buttons

- **Service** – Opens a dialog that allows the user to select the service executable.
- **Log Folder** – Opens a dialog that allows the user to select the folder the logs will be written.
- **Log Level** – Allows the user to select the logging level of the service. Debug messages help when determining the cause of a problem. If the service is running as expected, the logging level should be set to **Off**.
- **Run As a Thread** – This value should only be selected if the service is running as a thread instead of a service. This setting is only used for testing and should not be checked

Service Installation and Configuration – Web Interface

Web Interface

Host IP Address

Template Folder

Images Folder

Log Folder

Log Level: ☐ Debug ☒ Info ☐ Warning ☐ Critical ☐ Critical

Figure 17 – Web Interface Section

The Beacon Service provides a web interface that allows the user to command and control individual Beacons. The web interface is described in great detail below.

This area of the Beacon Service Host allows the user to configure the web service. The installation of the Beacon Service includes folders that contain templates and images. These folders must be specified to the service and serve these components correctly.

The web services hosted by the Beacon Service uses web sockets through TCP port 5410 to provide an interface to the user. In some cases, TCP port 5410 is blocked by firewalls. Be sure to verify this port is not blocked.

The Beacon Service requires the IP address of the machine the service is running to effectively serve the web sockets to clients.

Buttons

- **Web IP Address** – The IP Address of the machine the service is running
- **Template Folder** – Opens a dialog that allows the user to specify the folder containing the templates for the web service.
- **Images Folder** – Opens a dialog that allows the user to specify the folder containing the images for the web service.
- **Log Folder** – Opens a dialog that allows the user to select the folder the Beacon Service will place the web service logs.
- **Log Level** - Allows the user to select the logging level of the web service. If the service is running as expected, the logging level should be set to **Info**.

Service Installation and Configuration – Configuration

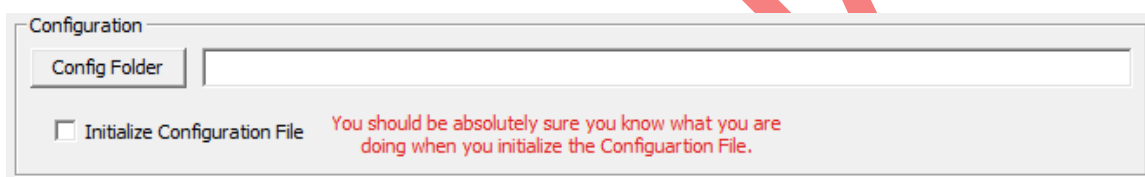


Figure 18 – Configuration Section

The Beacon Service uses a particular configuration file to specify the Beacons that are managed. This folder contains an XML file that describes each of the beacons. The Configuration interface specifies the folder where the XML configuration file is stored.

Buttons

- **Config Folder** – Opens a dialog that allows the user to specify the folder containing the XML configuration file.
- **Initialize Configuration File** – If this checkbox is selected, the Beacon Service will initialize the XML configuration file. The user should be very careful that this checkbox is only checked when the service is started the first time as this checkbox will remove any configuration. This checkbox is used to initialize the system.

SmartPass Beacon Service – Web Interface

The Beacon Service configures and maintains the iBeacons and Lane Beacons. The Beacon Service provides a web interface using web sockets on TCP port 5410. The Beacon Service provides a command and control (C&C) interface to the Beacons and also provides a timestamp to the Lane Beacons.

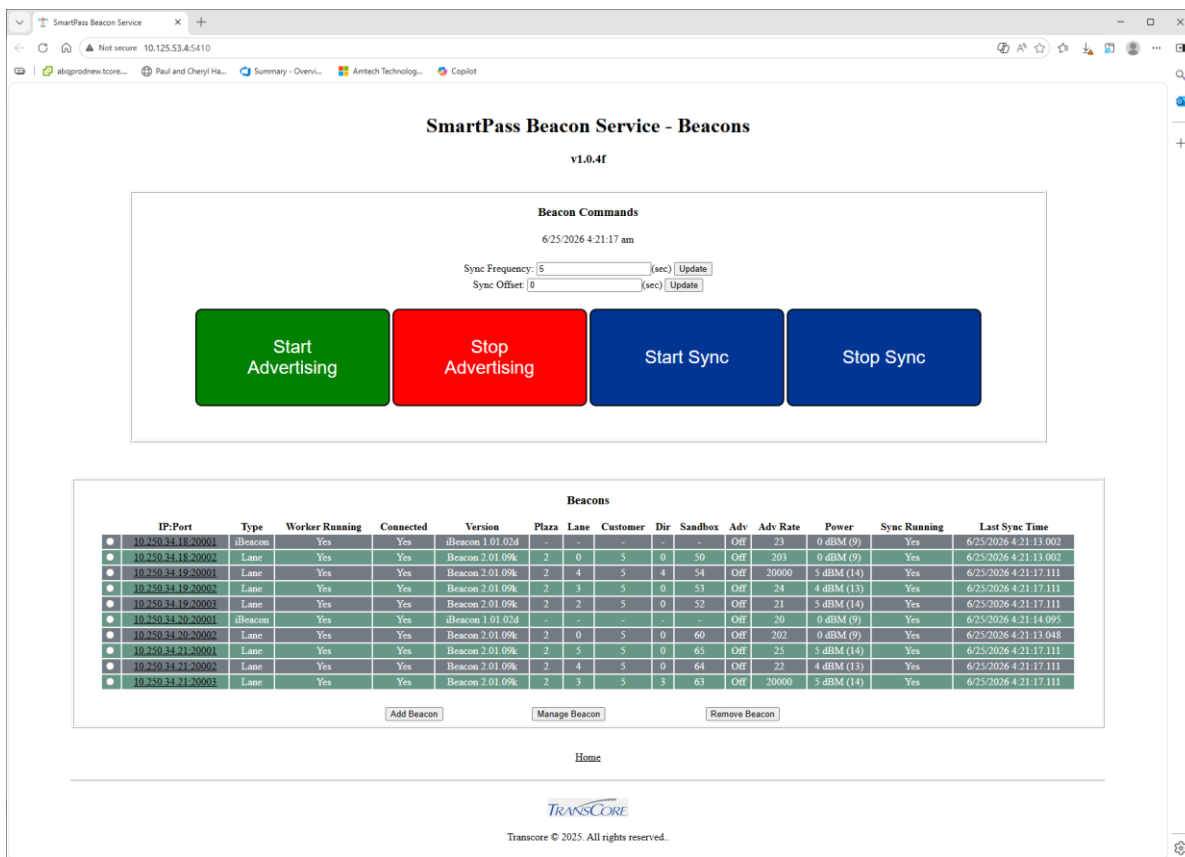


Figure 19 – SmartPass Beacon Service – Main Window

The web interface consists of several sections which are described below.

Web Interface Title and Version

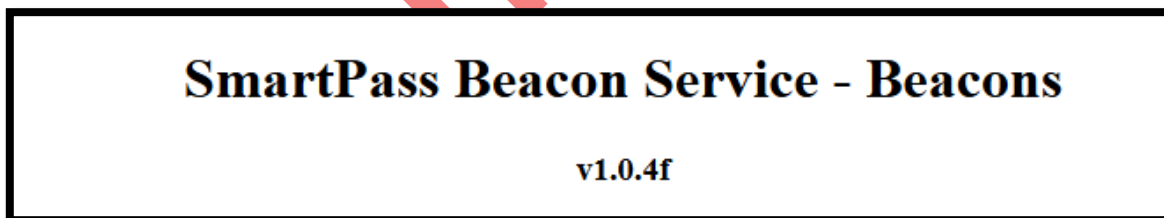


Figure 20 – Title and Version

The heading for the Beacon Service Web Interface provides the version of the Beacon Service. This version can be provided to support if there are questions or issues.

Web Interface Start/Stop Advertising and Timestamp Sync

Beacon Commands

6/25/2026 4:21:49 am

Sync Frequency: (sec)

Sync Offset: (sec)

Start Advertising

Stop Advertising

Start Sync

Stop Sync

Figure 21 – Beacon Commands Section

The **Sync Frequency** and **Offset** manage how often and if a timestamp offset is sent to Beacons. The Beacons do not have a real-time clock and require a timestamp to be sent from time to time to maintain an accurate timestamp. The machine that is running the Beacon Service must have a clock that is using the same time-reference that other devices at the lane are using to record the vehicle transit.

This interface performs the following:

- **Local Timestamp** – The Web Interface displays a timestamp that is local to the machine running the Beacon Service. The best way to indicate the associated web sockets are functioning and connected is the fact that the timestamp updates every second. If the timestamp does not update, there is a problem with the web socket connection to TCP port 5410.
- **Sync Frequency** – The number of seconds a timestamp update will be sent to the Beacons. The typical value is every 5-20 seconds.
- **Sync Frequency Update** – Pressing this button will send the Sync Frequency value to the Beacon Service.
- **Sync Offset** – The number of seconds the timestamp will be skewed when sending a timestamp update to the Beacons. This value should always be '0' and is only used to verify the devices that act on timestamp are performing as expected.
- **Sync Offset Update** – Pressing this button will send the Sync Offset value to the Beacon Service.

Buttons

The Beacon Commands buttons will send specific commands to all Beacons that are connected. There are two sets of functions:

- **Start/Stop Advertising** - These buttons allow for advertising to be stopped and started across all beacons at the same time. This function is used for testing in a geographically restricted area. As the phones are required to leave a SmartPass area to send the SmartPass Read, advertising can be stopped to simulate the phone leaving the SmartPass area.
- **Start/Stop Timestamp Sync** – These buttons allow for the timestamp sync to be started or stopped. It is very unusual to stop sending the timestamp to the Beacons. **Note:** *Stopping the Timestamp Sync should only be used by Engineering staff for testing and qualification.*

Web Interface Beacon Management

Beacons														
IP:Port	Type	Worker Running	Connected	Version	Plaza	Lane	Customer	Dir	Sandbox	Adv	Adv Rate	Power	Sync Running	Last Sync Time
10.250.34.18.20001	iBeacon	Yes	Yes	iBeacon 1.01.02d	-	-	-	-	-	Off	23	0 dBm (9)	Yes	6/25/2026 4:22:08.236
10.250.34.18.20002	Lane	Yes	Yes	Beacon 2.01.09k	2	0	5	0	50	Off	203	0 dBm (9)	Yes	6/25/2026 4:22:08.236
10.250.34.19.20001	Lane	Yes	Yes	Beacon 2.01.09k	2	4	5	4	54	Off	20000	5 dBm (14)	Yes	6/25/2026 4:22:12.221
10.250.34.19.20002	Lane	Yes	Yes	Beacon 2.01.09k	2	3	5	0	53	Off	24	4 dBm (13)	Yes	6/25/2026 4:22:12.221
10.250.34.19.20003	Lane	Yes	Yes	Beacon 2.01.09k	2	2	5	0	52	Off	21	5 dBm (14)	Yes	6/25/2026 4:22:12.221
10.250.34.20.20001	iBeacon	Yes	Yes	iBeacon 1.01.02d	-	-	-	-	-	Off	20	0 dBm (9)	Yes	6/25/2026 4:22:09.033
10.250.34.20.20002	Lane	Yes	Yes	Beacon 2.01.09k	2	0	5	0	60	Off	202	0 dBm (9)	Yes	6/25/2026 4:22:08.080
10.250.34.21.20001	Lane	Yes	Yes	Beacon 2.01.09k	2	5	5	0	65	Off	25	5 dBm (14)	Yes	6/25/2026 4:22:12.142
10.250.34.21.20002	Lane	Yes	Yes	Beacon 2.01.09k	2	4	5	0	64	Off	22	4 dBm (13)	Yes	6/25/2026 4:22:12.142
10.250.34.21.20003	Lane	Yes	Yes	Beacon 2.01.09k	2	3	5	3	63	Off	20000	5 dBm (14)	Yes	6/25/2026 4:22:12.142

Figure 22 – Beacon Management Section

The Beacon Management interface provides the ability to add, manage and remove Beacons. The Beacon Management table displays the Beacons that are defined and provides the following information:

- **IP: Port** – The IP Address and TCP Port number associated with this Beacon.
- **Type** – The Beacon type.
- **Working Running** – The worker is a thread that manages the interface between the Beacon Service and the Beacon. This value is a confidence check that the thread is running. This value should be 'Yes'.
- **Connected** – This value specifies the connection state between the Beacon worker thread and the Beacon. This value should be 'Yes'.
- **Version** – The type and version of the Beacon. The Beacon type in the version string should match the type declared when the Beacon is added.
- **Plaza** – The plaza value that will be advertised by the Beacon. *This value only applies to Lane Beacons.*
- **Lane** – The lane value that will be advertised by the Beacon. *This value only applies to Lane Beacons.*
- **Customer** – The customer value that will be advertised by the Beacon. *This value only applies to Lane Beacons.*
- **Dir** – The direction value that will be advertised by the Beacon. *This value only applies to Lane Beacons.*
- **Sandbox** – The sandbox value that will be advertised by the Beacon. *This value only applies to Lane Beacons.*
- **Adv** – The state of advertising of the Beacon. This value can be managed by the 'Start Advertising' and 'Stop Advertising' buttons described above.
- **Adv Rate** – The rate the Beacon is advertising. This value is in milliseconds.
- **Power** – The power level of the Beacon advertisement.
- **Sync Running** – The state of the sync logic associated with this Beacon. This value can be managed by the 'Start Sync' and 'Stop Sync' buttons described above.
- **Last Sync Time** – The local time, the last time sync was sent to the Beacon. If the time sync is running. This time should be no later than the current local time plus the sync frequency.

Buttons

The Web Interface provides the following buttons to manage the Beacons:

- **Add Beacon** – Add a Beacon to the configuration. This button will present a web page to the user that will allow the addition of a Beacon. The Add Beacon web page is described below.
- **Manage Beacon** – Manage or edit an existing Beacon. This button will present a web page to the user that will allow Beacon details to be edited. The Manage Beacon web page is described below.
- **Remove Beacon** – Remove an existing Beacon. This button will present a web page to the user that will allow a Beacon to be removed from the configuration. The Remove Beacon web page is described below.

Web Interface – Add Beacon

Figure 23 – SmartPass Beacon Service – Add Beacon

The Add Beacon interface allows the user to add a Beacon to the configuration. This interface is displayed when the 'Add Beacon' is pressed on the main interface. As soon as the Beacon is added, the Beacon Service will attempt to connect to the Beacon. The status of the Worker Thread and Connection state will be reflected in the Beacon Table as described above. After adding the Beacon, verify these values are 'Yes' and 'Yes'.

The Add Beacon interface contains the following values:

- **IP Address** – The IP Address of the Signal or Lane Beacon device. The IP Address of the device is assigned when the device is configured. The IP Address is usually specified in an Installation Playbook (or something similar).
- **Port** – The TCP Port associated with the particular iBeacon or Lane Beacon. The typical port values are 20000, 20001 and 20002.
- **Beacon Type** – The type of beacon for this connection.
- **Add Beacon** – Pressing this button attempts to add the Beacon to the configuration.
- **Reset** – Pressing this button resets the values in the Add Beacon interface to initial value.
***Note:** This button is rarely used when adding a Beacon.*

Web Interface – Manage Beacon

The Manage Beacon interface allows the user to manage or edit a Beacon in the configuration. This interface is displayed when a radio button beside a Beacon is selected and the '**Manage Beacon**' is pressed on the main interface. The interface is also displayed when the hyperlink associated with the *IP Address* and *Port* is pressed in the main interface.

A different Manage Beacon interface will be displayed based on the type of Beacon that is selected. These interfaces are described below.

Web Interface – Manage Beacon: iBeacon (Signal Beacon)

This interface that manages an iBeacon contains the following values and functions:

- **IP Address** – The IP Address of the iBeacon
- **Port** – The TCP Port of the iBeacon
- **Beacon Type** – The Beacon type. This value should be '*iBeacon*'.
- **Firmware Version** – The firmware version running on the Beacon.
- **Worker Running** – The state of the worker thread associated with this Beacon.
- **Connected** – The connection state between the worker thread and the Beacon.
- **Advertising Rate** – The advertising rate in milliseconds on the Beacon.
- **Advertising Rate Update Button** – Sends the updated advertising rate to the Beacon.
- **Advertising** – The advertising state of the Beacon.
- **Advertising Start Advertising Button** – Commands the Beacon to start the advertising.
- **Advertising Stop Advertising Button** – Commands the Beacon to stop advertising.
- **Power** – The power level of the Beacon.
- **Power Update Button** – Sends the updated power value to the Beacon.
- **Update Beacon** – Sends the updated values to the Beacon.
- **Reset Button** – Resets the values to the initial values displayed on the web page.

Typical iBeacon Values

The iBeacons are usually configured with the following values:

- **Advertising Rate** – 20-25 ms
- **Advertising** – Yes
- **Power** – 0 to 3 dBm.

Note: This is the internal setting for the RF generation circuitry. This is not the output power from either the Lane or Signal Beacon. 3 dBm is the maximum power output of the RF generation circuitry. This power is either attenuated or amplified internally in hardware as required by the design.

Web Interface – Manage Beacon: Lane Beacon

SmartPass Beacon Service - Manage Beacon

Manage Beacon

IP Address	10.250.34.18	
Port	20002	
Beacon Type	Lane	
Firmware Version	Beacon 2.01.09k	
Worker Running	Yes	
Connected	Yes	
Plaza (0-65535)	2	Update
Lane (0-255)	0	Update
Customer (0-65535)	5	Update
Direction (0-255)	0	Update
Sandbox (0-255)	50	Update
Sync Running	Yes	
Last Sync Timestamp	6/25/2026 4:24:33.237	Send Sync Start Sync Stop Sync
Advertising Rate (20-20000ms)	203	Update
Advertising	No	Start Advertising Stop Advertising
Power	0 dBm (9) (9)	Update
Update Beacon Reset Values		

Home

TransCore

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Figure 24 – Manage Added Beacon

This interface that manages a Beacon contains the following values and functions:

- **IP Address** – The IP Address of the Lane Beacon.
- **Port** – The TCP port of the Lane Beacon.
- **Beacon Type** – The Beacon type. This value should be 'Lane Beacon'.
- **Firmware Version** – The firmware version running on the Beacon.
- **Worker Running** – The state of the worker thread associated with this Beacon.
- **Connected** – The connection state between the worker thread and the Beacon.
- **Plaza** – The plaza value advertised by the Beacon.
- **Lane** – The lane value advertised by the Beacon.
- **Customer** – The customer value advertised by the Beacon.
- **Direction** – The direction value advertised by the Beacon.
- **Sandbox** – The sandbox value advertised by the Beacon.
- **Sync Running** – The state of the sync logic associated with the Beacon.
- **Last Sync Timestamp** – The local timestamp of the last timestamp sync was sent to the Beacon.
- **Send Sync Button** – Commands the Beacon Service to send a timestamp to the Beacon.
- **Start Sync Button** – Commands the Beacon Service to start sending the timestamp sync to the Beacon.
- **Stop Sync Button** – Commands the Beacon Service to stop sending the timestamp sync to the Beacon.

- **Advertising Rate** – The advertising rate in milliseconds on the Beacon.
- **Advertising Rate Update Button** – Sends the updated advertising rate to the Beacon.
- **Advertising** – The advertising state of the Beacon.
- **Advertising Start Advertising Button** – Commands the Beacon to start advertising.
- **Advertising Stop Advertising Button** – Commands the Beacon to stop advertising.
- **Power** – The power level of the Beacon.
- **Power Update Button** – Sends the updated power value to the Beacon.
- **Update Button** – Sends the updated values to the Beacon.
- **Reset Button** – Resets the values to the initial values displayed on the web page.

Typical Lane Beacon Values

The Lane Beacons are usually configured with the following values:

- **Advertising Rate** – Lane 0 (**Signal Beacon**): 200ms, non-0 Lane: 20-25ms
- **Advertising** – Yes
- **Power** – Lane 0 (**Signal Beacon**): 0 to 3 dBm. Non-0 Lane: 0 to 5 dBm.

Note: This is the internal setting for the RF generation circuitry. This is not the output power from either the Lane or Signal Beacon. For the SmartPass Signal Beacon, 3 dBm is the maximum power output of the RF generation circuitry. This power is amplified internally in hardware as required by the design. For the SmartPass Lane Beacon, 5 dBm is the maximum power output of the RF generation circuitry. This power is attenuated internally in hardware as required by the design.

Web Interface – Remove Beacon

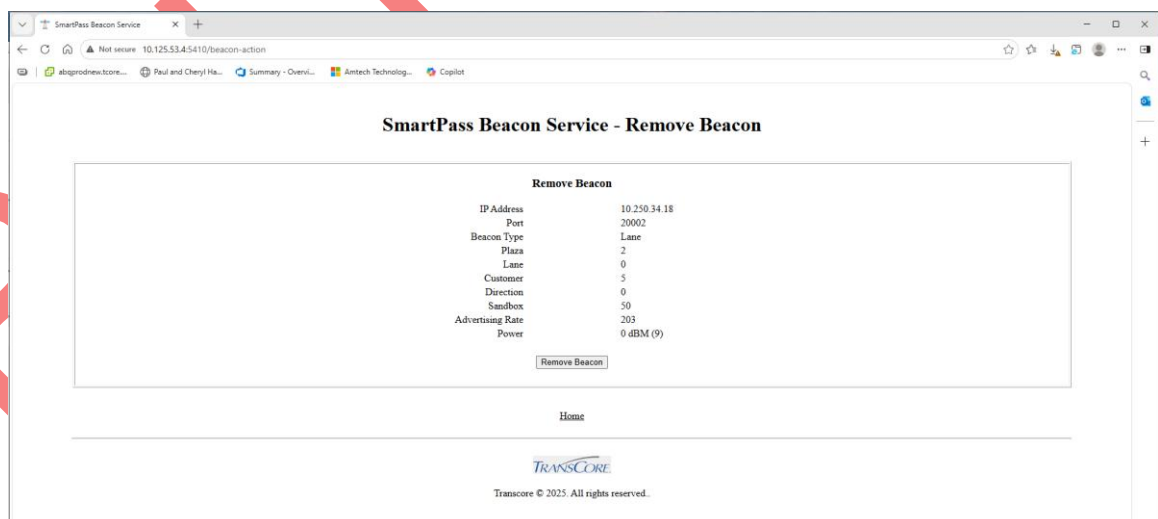


Figure 25 – Remove Beacon Section

This interface provides a method to remove a Beacon. The user is presented with the values associated with the Beacon and a button to 'Remove Beacon'. The user will be presented with an 'Are you sure?' dialogue after pressing the 'Remove Beacon' button just to be absolutely sure before removing a beacon.

SmartPass Beacon Host – Windows Application

The Beacon Host is a standalone Windows application that can manage the iBeacons, Lane Beacons and Beacon Sniffer. The Beacon Host provides a command-and-control interface to the Beacons and provides a timestamp to the Lane Beacons. The Beacon Host is a substitute for the Beacon Service when the Beacon Service is not running or not available.

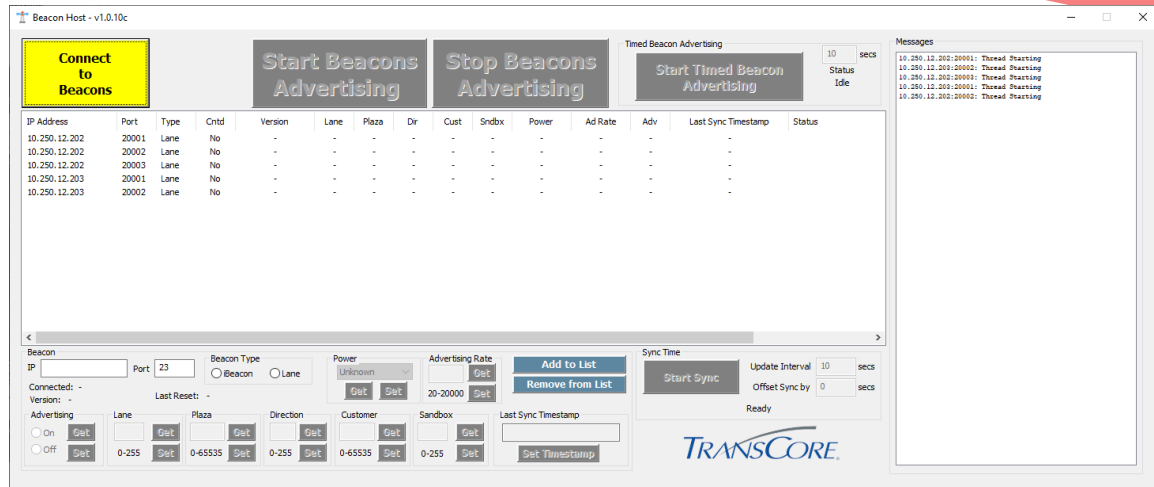


Figure 26 – Windows Application – Main Menu

The Beacon Host provides all the functionality of the Beacon Service and the Beacon Service Web Interface and also includes a scrolling list box that displays messages and responses to and from the Beacons.

The Beacon Host is usually used by Installation Engineers and Technicians to initially configure and commission a SmartPass site. When the site is functioning as configured and expected, the Engineers will install and configure the Beacon Service.

This Beacon Host contains the following values and functions:

- **Connect to Beacons Button** – Attempts to connect to every Beacon displayed in the Beacon list.
- **Start Beacons Advertising Button** – Commands all connected Beacons to start advertising.
- **Stop Beacons Advertising Button** – Commands all connected Beacons to stop advertising.
- **Start Timed Beacon Advertising Button** – Starts a thread that will command all Beacons to start advertising for the number of seconds specified.
- **Beacon Timed Advertising Seconds** – The number of seconds the Time Beacon Advertising will command the Beacons to advertise.
- **Beacon List** – The list of defined Beacons. When a Beacon is added (see '**Add to List Button**'), the Beacon will be added to the list. If a Beacon in the list is selected, the Beacon will be queried to retrieve the Beacon's configuration. The configuration will display the Beacon's configuration in the elements at the bottom of the window.
- **Messages** – Messages concerning communication between the Beacon Host and the Beacons.
- **Beacon IP Address** – IP Address of the Beacon

- **Beacon Port** – Port of the Beacon
- **Beacon Type** – Either iBeacon or Lane
- **Power Value and Get/Set Buttons** – Power the Beacon uses for Advertising
- **Advertising Rate Value and Get/Set Buttons** – Frequency the Beacons advertise.
- **Advertising Status Value and Get/Set Buttons** – Advertising status of the Beacon
- **Lane Value and Get/Set Buttons** – The lane value advertised by the Lane Beacon.
Note: This value does not apply to an iBeacon.
- **Plaza Value and Get/Set Buttons** – The plaza value advertised by the Beacon.
Note: This value does not apply to an iBeacon.
- **Direction Value and Get/Set Buttons** – The direction value advertised by the Beacon.
Note: This value does not apply to an iBeacon.
- **Customer Value and Get/Set Buttons** – The customer value advertised by the Beacon.
Note: This value does not apply to an iBeacon.
- **Sandbox Value and Get/Set Buttons** – The sandbox value advertised by the Beacon.
Note: This value does not apply to an iBeacon.
- **Last Time Sync Value and Set Timestamp Button** – The local time the last time sync was sent to the Beacon. The **Set Timestamp** commands the Beacon Host to send a timestamp to the Beacon.
- **Add to List Button** – Adds a Beacon to the list of Beacons after validating the values.
- **Remove from List Button** – Removes the selected Beacon from the list. The user is presented with an 'Are you sure?' dialog before removing the Beacon.
- **Sync Time Start/Stop Sync Button and Values** – Commands the Beacon Host to start or stop sending timestamps to the Beacons using the associated values. The Beacon Host will send the timestamp every 'Update Interval' seconds and offset the timestamp by 'Offset Sync By' seconds. The 'Offset Sync By' value should be '0' unless the system is testing a specific test that requires the timestamps to be offset.

Chapter 5 Troubleshooting and Maintenance

This chapter includes information about returning products for repair and obtaining support from TransCore.

SmartPass Lane and Signal Beacon Repair

The SmartPass Beacons are designed for whole-unit replacement and are manufactured with surface-mounted components. It requires sophisticated testing and repair equipment. All testing and repairs are performed at TransCore's factory. Please contact TransCore to obtain a Return Materials Authorization (RMA) for returning the Beacon.

Technical Support

Authorized dealers and distributors are responsible for the direct support of all customers. Authorized dealers and distributors needing support can contact Technical Support. Please be prepared to answer a series of questions that are designed to direct you to the best TransCore support resource available. These questions will relate to symptoms, configuration, and model used.

Note: End users and facility operators contacting Technical Support will be referred to the dealer responsible for the system sale.

Appendix A Glossary

A

Advertising	The BLE process of broadcasting small packets of data over the air so that nearby devices can detect the beacon.
Advertising Channels	BLE uses three primary advertising channels: 37(2402 MHz), 38 (2426 MHz), and 39 (2480 MHz).
Advertising Interval	The time between repeated BLE advertising transmissions. A shorter interval generally improves detection responsiveness, while a longer interval may reduce power consumption.
Advertising Packet	A BLE data packet transmitted by a beacon during advertising. It may contain identifiers, service data, manufacturer-specific data, or other information used by the receiving application.
Antenna	Passive device used to radiate or receive RF energy.
Antenna Gain	A measure of how strongly an antenna radiates in a particular direction relative to a reference antenna. Antenna gain affects effective radiated power and coverage pattern.
Application Trigger	A software action initiated when a compatible device detects a beacon. Examples include waking an application, logging a transaction, displaying local content, or recording proximity.

B

Backend Processing	Server-side processing that receives or interprets transaction, location, identification, or application data.
Beacon	A device that transmits identification or data packets over BLE, typically without requiring a connection to the receiving device.
Beacon Identifier	The data element or group of data elements used by an application to recognize a beacon. Examples may include UUID, Major, Minor, UID, URL, or custom manufacturer data.
BLE Beacon	A wireless device that periodically broadcasts Bluetooth Low Energy advertising data that can be detected by compatible nearby devices, such as smartphones, tablets, or BLE scanners.

Bluetooth Low Energy (BLE)

A low-power wireless communication technology introduced as Bluetooth LE and intended for devices that need efficient short-range communication, including devices that broadcast advertising packets rather than maintaining continuous high-power links.

Broadcast Mode

Operation in which a BLE device transmits information to any compatible receiver within range without establishing a dedicated connection. Bluetooth LE supports one-to-many communication using connectionless broadcasting.

Broadcaster

A BLE GAP role used by a device that sends advertising data but does not establish a connection. This role is commonly associated with simple beacon operation.

C**Calibrated Power**

A reference signal level, commonly measured or defined at a known distance such as 1 meter, used by some beacon applications to estimate proximity from measured RSSI.

Coexistence

The ability of BLE to operate acceptably in an RF environment shared with other 2.4 GHz technologies, such as Wi-Fi or other Bluetooth devices.

D**Duty Cycle**

The percentage of time a transmitter is actively transmitting. For BLE beacons, duty cycle is affected by advertising interval, packet duration, number of advertising channels, and transmit events.

F**FCC**

The U.S. Federal Communications Commission, which regulates radiofrequency devices in the United States.

Firmware

Embedded software that controls beacon hardware behavior, including advertising format, interval, transmit power, identifiers, and operating modes.

Frequency Hopping

A radio technique that changes channels over time to improve coexistence and reduce interference effects. BLE connection events use channel selection procedures described at the link layer.

H**Host**

Device, generally a computer, that is connected to the Beacon through the communications port

I**iBeacon**

Apple's beacon format that commonly uses UUID, Major, Minor, and calibrated transmit power fields to support proximity-based detection by applications.

Integrated Antenna

An antenna built into the device and not intended to be replaced by the user.

Interference

Unwanted RF energy that can reduce beacon detection performance, distort RSSI readings, or reduce practical range.

ISED

Innovation, Science and Economic Development Canada, the Canadian authority responsible for radio equipment certification and compliance requirements.

I/O or IO circuits

input/output circuits

L**Lane Beacon**

In SmartPass context, a beacon intended to broadcast advertising data associated with lane identification.

M**m****Meter****Manufacturer-Specific Data**

A field in BLE advertising data that allows a manufacturer or application provider to include custom data. Many beacon formats use manufacturer-specific data to carry beacon identifiers.

MHz**Megahertz****ms****Milliseconds****Multipath**

A propagation condition in which RF signals reach the receiver by multiple reflected paths, causing signal variation with position, orientation, and environment.

N**Non-Connectable Advertising**

A BLE advertising mode in which the beacon broadcasts data but does not accept a BLE connection from receiving devices.

P**Path Loss**

The reduction in signal strength between transmitter and receiver due to distance, antenna effects, obstruction, multipath, and environmental losses.

PC**Personal Computer****PoE, Power over Ethernet**

A power method in which the device receives operating power through an Ethernet connection rather than a separate power supply.

R

Radiated Output Power

RF power measured over the air, including the effect of the antenna and device enclosure.

Range

The practical distance over which a BLE beacon can be detected by the receiving device. Range depends on transmit power, receiver sensitivity, antenna design, installation location, enclosure, and RF environment.

RF

Radio Frequency

RF Zone

The physical area in which the SmartPass Mobile App can be woken up by the Beacon

RSSI, Received Signal Strength Indicator

A received signal strength measurement reported by the scanner or receiving device. RSSI is often used as an approximate indicator of proximity, but it is affected by antenna orientation, reflections, obstruction, receiver design, and environment.

RTC, Real-Time Clock

A timing function or clock used by embedded systems for timekeeping or synchronization.

S

Scanner

A BLE-capable device or application that listens for BLE advertising packets. A scanner may display the beacon address, RSSI, advertised name, UUID, manufacturer data, or service data.

Signal Beacon

A beacon intended to broadcast BLE advertisements that wake the SmartPass application.

T

Tx Power

Transmit power of the BLE beacon.

W

Wake-Up Signal

A BLE advertising transmission used to cause a compatible application or device to become active or begin monitoring a transaction context.

Appendix B Technical Specifications

SmartPass Lane and Signal Beacon Specifications

Communications

Frequency Range	2400 to 2483.5 MHz
Communication Port	RJ45 Ethernet Port
RF Control	Host Command
RF Range	Performance varies depending on phone configuration and environment

Hardware Features

Integrated System	All hardware and antenna housed in a single package
Case	Weatherproof enclosure. The system is sealed in a polycarbonate housing.

Power Requirements

PoE - Input Voltage	44 to 57V DC
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Physical Attributes

Size	16.5 x 14.5 x 4 in (41.9 x 36.8 x 10.2 cm)
Weight	9.65 lb (4.38 kg)

Environmental Parameters

Operating Temperature	-40°F to +131°F (-40°C to +55°C)
Humidity	95% relative
Vibration Tolerance	1 Grms, 10 to 500 Hz

Options

Training	Installation, operation, and maintenance training for TransCore authorized dealers is available through TransCore. For details, contact TransCore Sales Support
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PRELIMINARY



For more information:

Sales Support
800.923.4824

Technical Support
505.856.8007

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