

## DATA SHEET

# ARUBA LOCATION SERVICES

Powered by Aruba Beacons

The flagship product of the Aruba Location Services product line is Aruba Beacons. When Aruba Beacons are used in conjunction with the Meridian mobile app platform, they enable public-facing enterprises to infuse their mobile apps with innovative, location-based services.

Aruba Beacons leverage Bluetooth Low-Energy (BLE) technology, also known as Bluetooth 4.0, to provide indoor location data for mobile devices. This data is critical for indoor wayfinding, proximity-aware push notifications, and other types of location services in mobile apps.

## ARUBA BEACONS

Small, low-power wireless transmitters, Aruba Beacons broadcast 2.4-GHz radio signals at regular intervals. Beacons can be heard and interpreted by iOS and Android devices that are also equipped with Meridian-powered mobile apps from Aruba, a Hewlett Packard Enterprise company.

Aruba Beacons come in two physical formats. Aruba USB Beacons plug into a Wi-Fi access point (AP) or other USB-enabled device while standalone Aruba 4-year battery-powered Beacons can be placed anywhere within a venue.

When a mobile device with a Meridian-powered app is within range of Aruba Beacons, guests can receive personalized, proximity-aware push notifications based on their opt-in preferences and see a glowing blue dot that shows their real-time location on a venue's map.

## ARUBA BEACONS CONTENT AND ACTIONS

Aruba USB Beacons and Aruba Battery-Powered Beacons can be configured for either location-based wayfinding or for proximity-aware notifications so that corresponding actions are triggered on a venue's Meridian-powered mobile app.



Aruba Battery-Powered Beacon

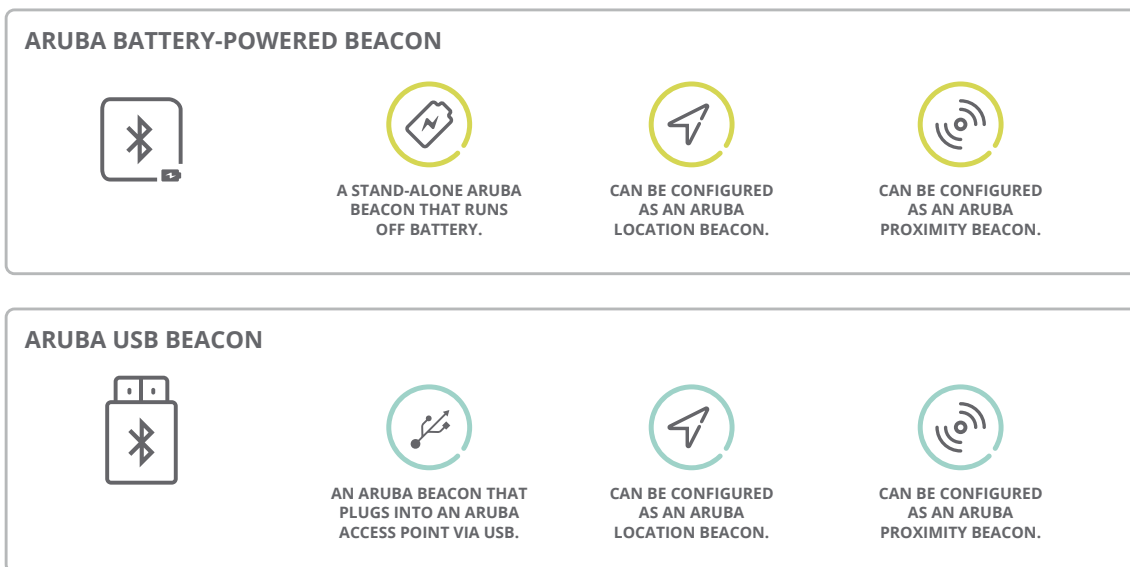
## HOW ARUBA BEACONS WORK

1. Without previous pairing, BLE-compatible mobile devices receive a signal from the Aruba Beacon.
2. The distance between the Aruba Beacon and mobile device is calculated based on the received signal-strength, which in turn provides location information.
3. Identification information from Aruba Beacons allows a device's BLE-enabled mobile app to receive push notifications and provide wayfinding.



Aruba USB Beacon

## UNDERSTANDING THE TWO FORMS OF ARUBA BEACONS



### Aruba Beacons for location and indoor wayfinding

BLE-enabled mobile devices can receive signals from more than one Aruba Beacon at the same time. If multiple signals are within range, devices can calculate the distance to each Aruba Beacon and use this data to identify the device location.

This can be used to show a mobile app user's indoor location with a glowing blue dot, and lets them search for directions to nearby products and services. For example, in a crowded stadium, the guest experience is vastly improved by making it easier to find their seats and concessions.

And in large retail environments, shopper abandonment is dramatically reduced when customers can use their mobile devices as self-service tools to quickly find the products they want without waiting for someone to assist them.

### Aruba Beacons for proximity-aware mobile engagement

Aruba Beacons only broadcast small amounts of data, so Meridian-powered mobile apps must fetch relevant content for them.

When a device's operating system detects an Aruba Beacon signal, it wakes up the mobile app and communicates with the Meridian Editor content management system (CMS) to fetch the appropriate information. This only occurs if guests opt-in and have their BLE radio on.

Push notifications are an effective way to engage guests who opt-in through their mobile devices and who are in close proximity to an Aruba Beacon. For example, a retail customer who is near an Aruba Beacon in the fragrance section of a department store can receive a push notification for "10% off fragrances today."

Venues can easily manage the campaigns associated with each Aruba Beacon within the Meridian Editor. You can even integrate customer loyalty programs to automate and personalize push notifications triggered by an Aruba Beacon. This occurs automatically without requiring guests to update their mobile app.

As a result, guests who opt-in get more personalized and context-specific communications based on their loyalty program preferences and real-time location in a venue. Retailers and other location-based businesses can upsell products and services and increase share-of-wallet with relevant promotions.

## Beacon Analytics

The Meridian Editor houses aggregate analytics data for Aruba Beacons being used for proximity-based campaigns. Venues can easily see the trigger counts (how many times a campaign was sent) as well as the dwell times (the average time a visitor spent in the vicinity of a Proximity Beacon) for specific campaigns by the day or by the hour.

This type of data is very useful for venues that want to understand visitor behavior and measure the success of their campaigns. For example, an airport may use this data to better understand how long travelers wait to get through security lines. A retailer may use this data to measure the success of a seasonal or promotional campaign and use it to adjust inventory placement accordingly.

## MANAGING ARUBA BEACONS

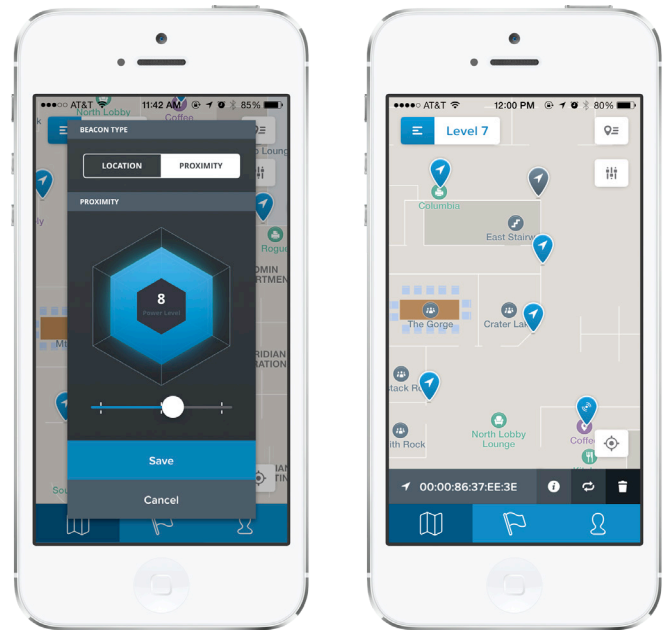
### Monitor the air with Aruba Wi-Fi

Most standalone beacons today lack backend management tools and the few that do cannot scale. This makes it incredibly difficult for enterprise businesses to configure and manage backend hardware, settings, and battery life when dozens of beacons are deployed.

To solve this challenge, venues can leverage their Aruba Wi-Fi infrastructure to effortlessly manage them. Newer Aruba APs – the 300, 310, 320, and 330 series – have BLE built into them; for older Aruba APs, USB Beacons simply plug in to the USB port so that they are able to monitor other Aruba Beacons within range and send relevant management data back to the Meridian Editor.

This enables venues to efficiently manage the content on their Meridian-powered mobile apps as well as Aruba Beacons – all from one user-friendly, cloud-based location. Edits made to the Meridian Editor are instantly applied to Aruba Beacons within the venue.

Instead of having to manually check and track settings and battery levels in a spreadsheet or calendar, you can rely on the Aruba USB Beacons and the Aruba Wi-Fi infrastructure to do the heavy lifting.



The Aruba Beacons app lets venues manage and configure Aruba Beacons on the go.

### Mobile app management tools

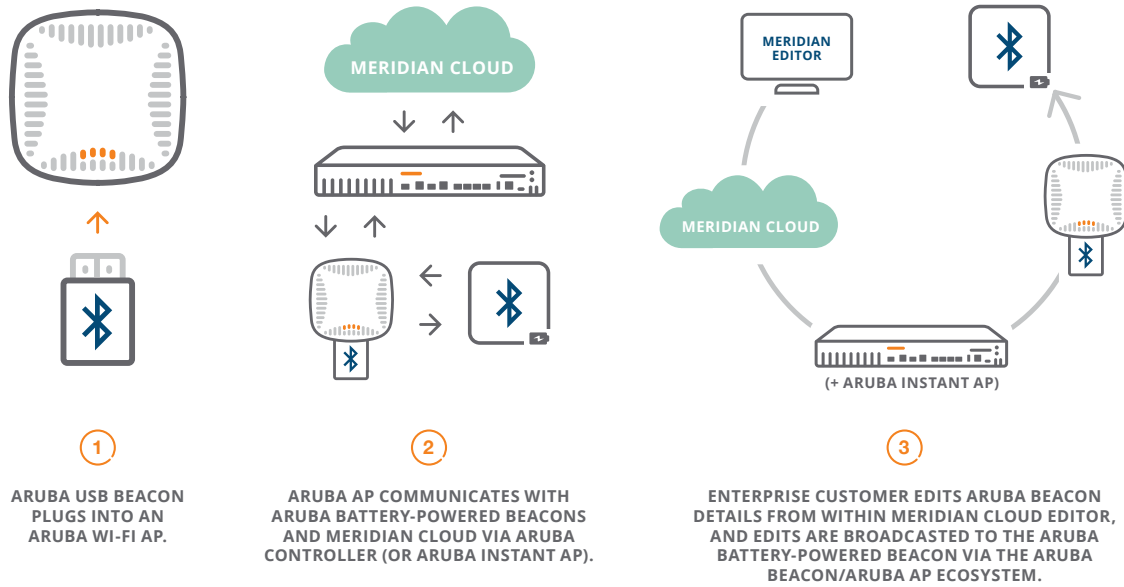
An Aruba Beacons management tool — the Aruba Beacons mobile app — pulls venue-specific content from the Meridian Editor and allows you to walk through your venue property and configure and install Aruba Beacons using a mobile device.

This step is required to associate the physical location of an Aruba Beacon with a beacon placemark on a digital map. A venue operator simply logs into the Beacons App using their Meridian Editor credentials to automatically see their venue's maps.

To assign Aruba Beacons to these digital maps, the Aruba Beacons app scans and loads data from nearby Aruba Beacons so venue operators can identify and configure them and save the information to the Beacons app and Meridian Editor simultaneously.

Once the identity of each Aruba Beacon is in the Aruba Beacons app, venue operators can simply drag the beacon placemark to its physical location on the digital map. When updates or changes occur in the Aruba Beacons app, the Meridian Editor is also updated automatically.

## HOW ARUBA WI-FI ACCESS POINTS MANAGE ARUBA BEACONS



### No Aruba Wi-Fi? No Problem.

The Aruba Sensor, a small, dual-band 802.11n client radio that also has a BLE radio built into it, makes remote Aruba Beacon management capabilities available to any venue, regardless of their wireless network vendor.

The Aruba Sensor plugs directly into a venue's AC outlet, hears other Aruba Beacons within a 25-meter range, and automatically sends their data to the Meridian cloud server over a venue's existing Wi-Fi connection.

The screenshot shows the Meridian Editor interface. On the left is a navigation menu with options like BEACONS, CAMPAIGNS, VIEWER, STATUS, ACCOUNT, REPORTS, SETTINGS, and LANGUAGES. The main area displays a floor plan map with several blue beacon icons. On the right, the 'Beacons' panel is active, showing filters for 'Level 7' and a table of beacon data.

MAC	TYPE	BAT	MAJOR	MINOR	POWER
D03972D5749A	[Beacon Icon]	[Battery Icon]	26005	10093	13
78A504152A9A	[Beacon Icon]	[Battery Icon]	26005	10092	14
78A50415207F	[Beacon Icon]	[Battery Icon]	26005	10094	0
D03972D57972	[Beacon Icon]	[Battery Icon]	26005	10090	14
0000D08B24DD	[Beacon Icon]	[Battery Icon]	26005	10069	9
000065AB78A5	[Beacon Icon]	[Battery Icon]	26005	10038	16
0000AAA2CFAE	[Beacon Icon]	[Battery Icon]	26005	10051	13
0000C5D424DD	[Beacon Icon]	[Battery Icon]	26005	10059	8

Beacon data updated over Aruba Wi-Fi (or via the Aruba Sensor) is managed within the cloud-based Meridian Editor.

## BLE BEACON TERMINOLOGY

- **Classic Bluetooth** – Provides continuous transmission for wireless headsets and hands-free calling as well as for data file and video transmission between classic Bluetooth devices.
- **Bluetooth 4.0** – Bluetooth 4.0 BLE protocol allows low-volume data transmissions over brief bursts instead of a continuous transmission.
- **BLE Smart devices** – Devices that gather and send basic information to more capable devices using less energy than the previous standard. They are single-mode devices and cannot communicate with classic Bluetooth devices.
- **BLE Smart Ready devices** – Devices that can connect can communicate with BLE devices and classic Bluetooth devices. As long as the Bluetooth hardware in the device works with the latest Bluetooth specs, it's considered Bluetooth Smart Ready.
- **Beacon** – A small Bluetooth Smart device that broadcasts a small amount of data at regular intervals.
- **iBeacon** – The Apple-invented term “iBeacon” refers not to a piece of hardware purchased from Apple, but rather a well-defined protocol that any Bluetooth Smart device can support. Apple and iBeacon are trademarks of Apple Inc.
- **Location services** – Location services allow location-based apps and web sites – maps, camera, Safari, and other third-party apps – to use information from cellular, Wi-Fi, GPS networks, and iBeacons to determine your approximate location.

## SPECIFICATIONS

### Aruba Beacons

#### Key features

- Broadcast data packets based on Bluetooth LE (4.0)
- Compatible with all Bluetooth 4.0 (BLE) devices
- Compatible with Apple iBeacon standard
- Configurable parameters
  - Device name
  - Transmission power level for proximity beacons

#### BLE data packets

- Every Aruba Beacon ID is 20 bytes long and contains three values:
  - ProximityUUID: Universally Unique Identifier shared among related beacons
  - Major number: 16-bit integer value
  - Minor number: 16-bit integer value

#### Range

- Aruba Beacon signals can be read from as far away as 200 feet, and proximity can be detected down to a few inches away.
- Maximum signal range depends on the physical environment.
- Aruba Beacons operate on the same type of radio waves as 2.4-GHz Wi-Fi routers. As a result, the signal can be diffracted, interfered or absorbed by materials in the space such as metal, wood or water.

### Aruba Beacons app for management

#### Supported OS

- iOS 7 or newer

#### Supported devices

- iPhone 4S or newer
- iPod touch, fifth generation
- iPad, third generation or newer
- iPad mini and iPad mini with retina display

## DELIVERY OPTIONS

### Aruba 4-Year Battery-Powered Beacons

- Power
  - Two 4-year coin-cell batteries within the Beacon
  - Average power consumption: 0.22 mW (estimated)
  - Battery capacity 1,000 mAh/each: Total capacity of 2,000 mAh
  - Battery voltage: 3 volts
  - With default settings in place, the batteries can last at least two years. However, the chirp frequency can be changed to increase battery life or decrease battery life.
  - Unique on/off capabilities can be used to turn down the network when not in use and consequently keep the batteries fresh for many years.
- Mounting
  - Included with Aruba Beacons
    - > High-strength indoor/outdoor 3M adhesive for direct mounting to wall
  - Optional
    - > NMEA 66-rated outdoor case with magnetic brackets for mounting on steel beam
    - > Bracket for mounting on non-metal wall via two-screw holds

### Aruba USB Beacons

- Power
  - Charges from an Aruba access point USB port or any powered USB slot on TVs, computers, wall plugs and other devices.
- Deployment/hardware options
  - These beacons install into existing Aruba access points via USB ports for data connectivity.

## ARUBA BEACONS COMPATIBLE DEVICES AND OPERATING SYSTEMS

### Android

- New smartphones and tablets with a dual-mode Bluetooth 4.0 chip running the latest version of the Android OS are Bluetooth Smart Ready.
- Android-powered Bluetooth Smart Ready devices running the latest OS will be compatible with virtually any Bluetooth enabled product, including Aruba Beacons.

### iOS

- iOS 7 or later on the following compatible devices:
  - iPhone (fourth generation or later)
  - iPad (third generation or later)
  - iPad mini
  - iPod touch (fifth generation or later)

BLE must be turned on to work on any BLE-enabled device.

## WIRELESS RADIO SPECIFICATIONS

- Compliant with BLE standard based on BT version 4.0
- GFSK modulation @ 2.4-GHz ISM band
- Support adaptive frequency hopping (FH)
  - 3 2-MHz advertisement channels (channels 37, 38, 39)  
2,402 MHz, 2,426 MHz, 2,480 MHz
  - x32 2-MHz data channels (channels 0 to 36, from  
2,404 MHz to 2,478 MHz)
- TX power: 0 dBm max
- RX sensitivity: -94 dBm

## MECHANICAL

- Dimensions
  - 47 mm (W) x 47 mm (L) x 16 mm (H),  
1.8" (W) x 1.8" (L) x .63" (H)
  - 37.5 g/1.3 oz

## ANTENNAS

### Electrical characteristics

RFANT3216120A5T	Specification
Working frequency range	2,450 +/- 50Mhz
Gain (dBi)	2 (typical)
VSWR	2 max

## ENVIRONMENTAL

- Operating
  - Temperature: 0° C to +50° C (+32° F to +122° F)
  - Humidity: 5% to 95% non-condensing
- Storage and transportation
  - Temperature: -40° C to +70° C (-40° F to +158° F)

## REGULATORY

- FCC/Industry of Canada
- CE Marked
- R&TTE Directive 1995/5/EC
- Low Voltage Directive 72/23/EEC

For country-specific regulatory information and approvals, please see your Aruba representative.

## REGULATORY MODEL NUMBER

- BT-100