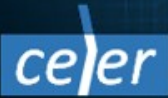
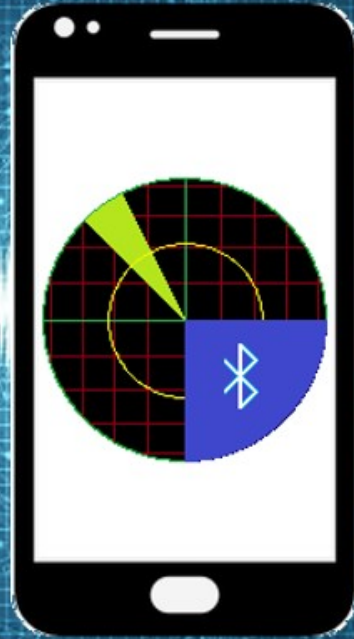




*Locate and track
your beacons*



Beacon Radar V1.14 Users Guide

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Introduction

The Beacon Radar is an Android application, compatible with mobile phones, tablets and TV boxes. It can be used to detect BLE beacon devices, monitor the temperature and estimate the approximate distance between the Android device and the beacon.



A BLE beacon is a device, usually the size of a watch or pen drive, capable of transmitting periodically a certain advertisement message over Bluetooth with minimal power consumption. The typical range of the signal is around 10 – 30m, while long range devices can reach up to 1km. Depending on the signal strength and transmission frequency the beacon can work autonomously for several years, without recharging the internal battery. Some beacons rely on USB port power instead of battery.

A typical use case consists of a beacon attached to a person, a pet or some object, like a bag or vehicle. The Radar can be used to detect when the beacon gets close. For example, it can help you pick up your baggage at the airport, locate your car in the parking lot, among other common uses.

Many beacons are equipped with a temperature sensor. The Radar can be used to monitor the temperature if this kind of sensor is available.



There is a freeware version “**Radar Lite**”. If you like the application consider supporting the developers by upgrading to “**Radar Pro**”, which has additional features. The differences between both versions are explained in this document.

Specifications








The Beacon Radar application is compatible with Android 4.3 (Jelly Bean) or later. It is recommended to use at least Android 5.0 (Lollipop) because of known OS limitations in the previous versions.

When the application is installed or launched for the first time the permission for location tracking will be requested. This permission is necessary to enable the beacon tracking. It is not used to track the handset location.



There are several standard beacon protocols and many proprietary. The Beacon Radar application supports the protocols described in the following table. If the BLE device uses a different protocol it might be detected by the Radar if the option “*Detect unknown BLE devices*” is enabled in the settings.

| Protocol | Description |
|--|---|
|  iBeacon | <p>iBeacon is the protocol implemented by Apple in 2013. Currently it’s one of the most widely used beacon protocols, supported by many BLE equipment manufacturers. Each iBeacon device has a unique numerical identifier named UUID.</p> <p>Beacon+ and MkiBeacon protocols, which are extensions for iBeacon, are also supported.</p> |
|  Eddystone | <p>Eddystone is the protocol introduced by Google in 2015. It can be used to advertise a link to a website (URL) and/or a telemetry frame (TLM), which can include a temperature sensor. The information can be encrypted.</p> |
|  AltBeacon | <p>AltBeacon is an open source standard authored by Radius Networks in 2014. It is mainly used in proximity beacons. The protocol is similar to iBeacon, except that it’s an open standard.</p> |
|  RuuviTag | <p>RUUVi covers several protocols used for sensor monitoring (temperature, humidity, air pressure, acceleration and so on). Beacon Radar supports RAWv1 and RAWv2, which are the main RUUVi protocols in use nowadays. The Encrypted Environmental Data protocol, also known as RuuviTag Data Format 8, is detected as well.</p> |
|  BeaconX | <p>BeaconX is a proprietary protocol used by Moko Technology (MOKOSmart™) in their BeaconX and BeaconX Pro devices. Can include H&T frame for the corresponding humidity and temperature sensors.</p> |

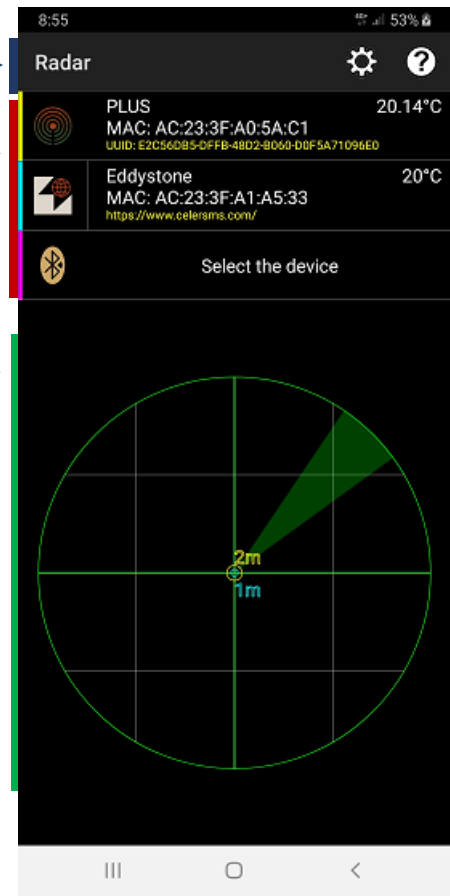
User Interface

The main User Interface consists of 3 sections:

- The **action bar** contains the buttons to access:
 - The application settings
 - The about box
- The selected **devices**
- The **radar** widget

The **radar** widget is inactive if there is no device selected or Bluetooth is disabled or not available.

If there is no device selected let's click "Select the device" to display the list of nearby devices. Detecting and listing nearby devices can take some time, especially if the devices are not close or the advertisement frequency is low. For example, some beacons advertise every 5 sec or more. Detecting a specific device may require multiple advertisement cycles. So, don't get disappointed if the device is not displayed immediately.



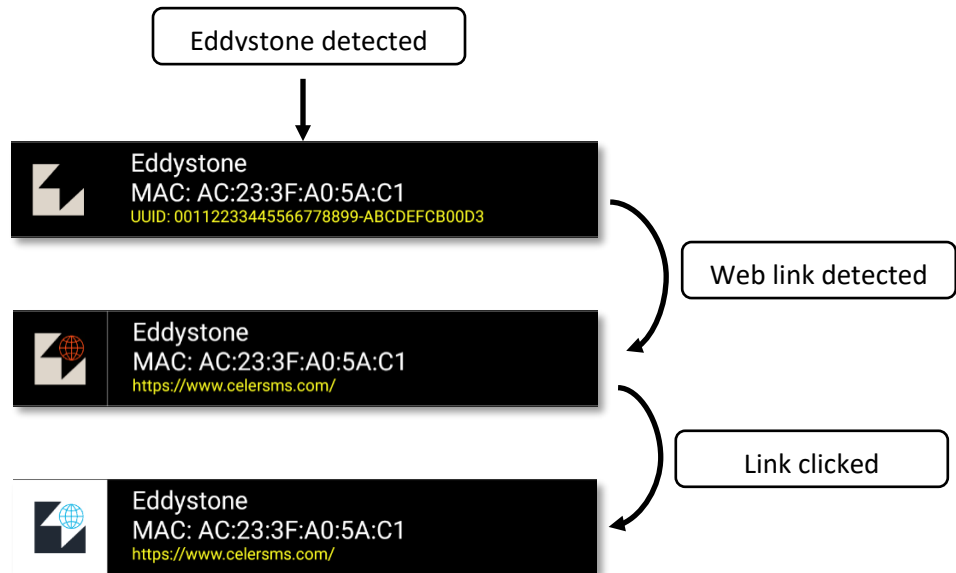
Radar Lite allows selecting a single device at a time, while **Radar Pro** allows tracking up to 6 devices simultaneously.

The **device** button can be clicked again anytime to select another device. If you want to keep the currently selected device just press the "< Back" button to cancel the selection. This is useful if the device button was clicked accidentally and you don't intend to select another device.

If the **radar** widget is active it can be touched to start scanning the selected devices continuously. Each scan cycle takes approximately 10 seconds. Touching the widget again stops the scan. While scanning is in progress an animation will be displayed and the screen will remain active. If the application is closed or switched to the background the scanning process will be interrupted to save battery power.

While scanning is in progress the **device** buttons will display any updates, if available. For example, if the beacon is equipped with a temperature sensor the current temperature will be updated continuously.

If the beacon device is an Eddystone with a web link it can take some time to capture the link. This is so because the link is not always broadcasted in every advertisement cycle. As soon as the link is received it will be displayed. The beacon icon on the left side will change to a clickable button to allow opening the link in the web browser, for example:



Note: Don't open the link if you don't trust it. A beacon can contain a link to any kind of website. For safety, the Radar will request an explicit confirmation before opening the link.

The **Eddystone** and **RuuviTag** beacons can optionally support encryption. If a beacon uses encryption the Radar will display a lock icon next to the beacon name, for example:



If the beacon is transmitting encrypted metrics (e.g. temperature) the metrics will be hidden, but the beacon can still be used for proximity detection.

Settings

Currently the following settings are available:

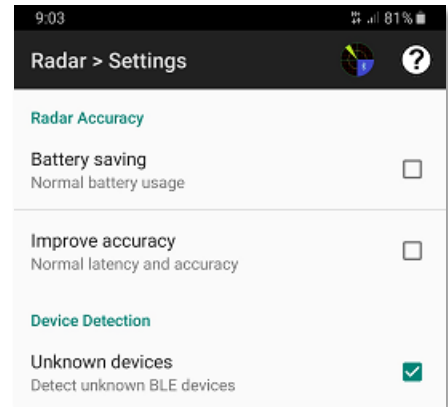
Radar Accuracy

These options are available in Android 5.0 and later.

If “**Battery saving**” is enabled the Radar will run in energy saving mode. Battery usage will be reduced, but the accuracy and responsiveness of the radar will be significantly reduced as well. It is not recommended to activate this option unless it’s really necessary.

If “**Improve accuracy**” is enabled the Radar will run in low latency mode. The accuracy and responsiveness will improve, but the battery usage will increase.

It’s recommended to keep both options unchecked to let the Radar balance between accuracy and battery usage.



Device detection

This option is enabled by default. If it’s enabled, the list of nearby devices will include unknown BLE devices. An unknown device is a BLE device, which doesn’t use any of the beacon protocols supported by the Radar. For example, a wireless speaker or a padlock can appear as an unknown device.

Activating this feature can be useful to track some BLE devices, which are not beacons or use some proprietary or unsupported beacon protocols.

After modifying the settings you can go back to the main screen by clicking the Radar button on the action bar or pressing “< Back”.