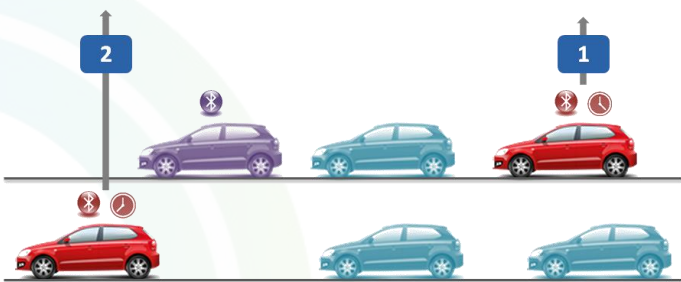# BLUETOOTH beacon

OEM

Bluetooth beacons are the ideal solution for travel time measurements. This solution is non-intrusive, proven and provides travel times for a fraction of the cost of competing solutions.

Using the latest technological developments, Karrus has designed a powerful, reliable and energy-efficient beacon that can be used with any Linux system. The beacon is easy to install with a mounting kit adapted to different field situations. The beacon can be remotely installed as far as 50m from the access point.

OPERATION

The Bluetooth beacons are arranged along the road to be monitored. The number of beacons to install depends on the volume of traffic, the desired accuracy and the expected responsiveness during abrupt changes in traffic.

When a vehicle equipped with a Bluetooth device passes near a beacon, the beacon collects and time stamps the anonymized MAC address, the class of the equipment and the power of the radio signal. The processing, on a central server, of the data collected during the successive passages of the vehicle near the different beacons makes it possible to calculate its Individual Travel Time (ITT). The statistic of these ITT makes it possible to periodically evaluate the mean travel times on the different sections.

INSTALLATION

The outdoor beacon is in a polyester case resistant to external aggressions.

A modular mounting kit allows its installation on a wall or on a mast.

An RJ45 socket is accessible on the underside for wiring towards the access point.

The outdoor beacon is equipped with an omnidirectional antenna involving few installation constraints. The beacon is ideally installed at a height between 1 and 5 meters with direct visibility of the traffic.

Each tag has a unique identifier on 4 hexadecimal characters engraved on the front panel.

CONNECTION

Outdoor beacons are connected via a single RJ45 connector accessible on the underside. CAT5e, CAT6 or equivalent cables can be used for the wiring.

A module is used in the cabinet to wire the antenna and the access point. This module has one input in USB for the access point and one RJ45 input to wire the remote antenna.

BLUETOOTH

Standard	2.0+EDR Class1, compatible Bluetooth low energy.
Chipset	Cambridge Silicon Radio CSR8311-A08.
Antenna	RP-SMA connector. Omnidirectional 5 dBi. Directional option.
Range	Theoretical: 100 meters. Practical on roads: 45m.

WIFI (option)

Standard	IEEE 802.11 a/b/g/n.
Chipset	Atheros AR9220.
Antenna	RP-SMA connector. Omnidirectional 5 dBi. Directional option.
Range	Theoretical: 100 meters. Practical on roads: 45m.

SYSTEM

Operating system	Linux on access point.
Synchronization	NTP. GPS (option).
VPN	OpenVPN.
Configuration	Web browser.

ENVIRONMENT

Size	85 x 55 x 100 mm.
Mounting	Modular mounting kit for wall with and mast.
Operating temperature	-40°C to 80°C.
Protection rating	IP66.

Related products and services: time travel server, beacon network design, data analysis, production of traffic indicators.

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