

# APPLICATION NOTE

## Confidex Runestone™ and Confidex Viking™



Confidex Viking™ Bluetooth® Low-Energy (BLE) Industrial beacons track the location of assets and people, with optional sensors for capturing environmental data. Confidex Viking™ beacons are joining passive RFID in the asset management and tracking space. It is a new way to track that comes with tradeoffs in battery life and cost against improved functionality. Confidex designed the Viking product family to be a modular BLE beacon family that raises the bar for industrial, indoor and outdoor, asset tracking to gain real time location and conditioning visibility.

Confidex Viking™ beacons are designed with security in mind and have integrated secure NFC interface with unique passwords for configuration. They do not allow changing of configuration through the Bluetooth interface. Confidex Viking™ beacons are turned on/off through the NFC interface, which prevents malicious off-turning of the beacons in public environments.

Confidex Viking™ beacons in the Starting Kit are delivered turned off, and they can be activated and operated with Confidex Runestone™ mobile application for Android mobile phones.

### CONFIDEX RUNESTONE™ MOBILE APP

#### General information

Confidex Runestone™ mobile app is a specific application used to operate the Confidex Viking™ Classic BLE Beacons with Confidex standard firmware. Operation with customer specific firmware needs be evaluated together with Confidex. By using the Confidex Runestone™ App the user can turn the Confidex Viking™ beacons on/off, see the status, set parameters, and

configure some of the Confidex Viking™ beacons parameters.

#### Supported phone models

Confidex Runestone™ app is developed generally for Android mobile phones but only few phone models are tested and supported. Confidex does not guarantee the operation on all possible different Android mobile phones.

The Android mobile phone needs to have NFC read/write functionality. At the time of writing these instructions, only some Samsung and OnePlus mobile phones are tested. This does not prevent users to install the Confidex Runestone™ App to other phone models and test whether the mobile application is working correct.

#### Download and installation

The latest version of Confidex Runestone™ App can be downloaded and installed from the Google Play. After installation of the Confidex Runestone™ App on Android mobile phone the application activates by touching the logo of Confidex Runestone™ App on the Android mobile phone.

#### NFC operation

Confidex Runestone™ app operates over the NFC air interface. Therefore, the user needs to ensure that NFC functionality in the mobile phone is turned on. It is typically found at Settings -> Connections -> NFC and Payment.

### OPERATING CONFIDEX RUNESTONE™ APP

#### Description

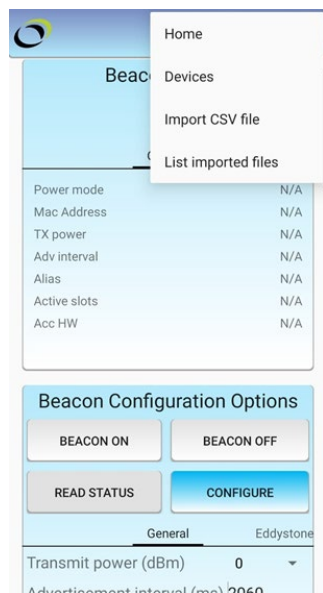
Confidex Runestone™ app is divided into two main views: **Beacon Status** view and **Devices** view. The status view consists of two segments, **Beacon Status** field and **Beacon Configuration Options** field, which contains the selection of operations that are performed when beacon is scanned with NFC of the mobile phone. The view from Status to Device can be changed by the buttons on the top bar or swiping horizontally.

#### Identity file

The installed Confidex Runestone™ app is empty by default of the beacon identities and therefore does not operate without first uploading the identities.

To be able to read the Confidex Viking™ Beacons, the identities of the beacons need first be imported into the Confidex Runestone™ app. Confidex is providing the identities in a general .csv format identity file for Confidex Viking™ Beacons from general identity space or in a customer specific .csv file for customer specific Confidex Viking™ Beacons. The identity file contains all the needed identity data of the beacons enabling operation of the Confidex Runestone™ App.

The following steps describe the process to import the .csv file:



“Three dots” button opens a drop-down menu where you can navigate to Devices and Home view, Import CSV file, or List imported files.

Tapping Runestone icon shows app version info.

1. Tap on the **three dots** on the upper right. This opens a drop-down menu seen on the right.
2. Choose **Import CSV file**.
3. Navigate to **Downloads** (or another folder to which you have stored the CSV file) and choose your file. Now Confidex Runestone™ app will import the file. (Note that your device might have two different Downloads folders)
4. A message will pop up saying “Process successfully done”. Now press the **red exclamation mark** for the app to finish importing. The application will then reload configuration. You can also find **Reload configuration** option in the drop-down menu.

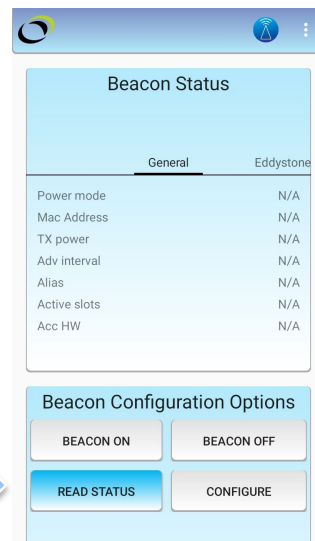
NOTE: Confidex Runestone™ app does not work without the imported .csv file.

The list of all imported files is shown when selecting the **List Imported Files** option.

### Operating Confidex Runestone™ app

Confidex Viking™ Beacons can be operated with the Confidex Runestone™ app by choosing the option from the **Beacon Status View** and then scanning a beacon with the mobile phone NFC antenna. **Make sure the device’s NFC functionality is turned on. It is typically found at Settings -> Connections -> NFC and Payment.**

Confidex Viking™ beacons can be turned on or off by choosing either **BEACON ON** or **BEACON OFF** buttons from **Beacon Configuration Options** field. When selecting the button, its color turns blue. After chosen your option, scan the Confidex Viking™ beacon with NFC to turn the beacon on or off. **Power mode** setting in the middle segment will be changed to “On” or “Off”.



Switch beacon power mode on

Double-tap activates continuous beacon on -operations.



Switch beacon power mode off

Double-tap activates continuous beacon off -operations.

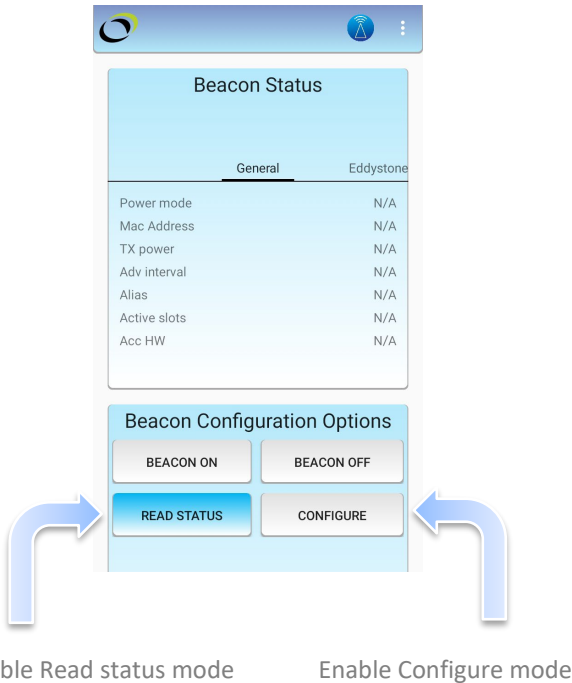
After scanning a Confidex Viking™ beacon the **Beacon Status** segment view shows the following information listed in the table below. Information will stay on screen after moving the Beacon away from the NFC antenna and will stay there until another beacon is scanned or the app restarted. Swipe horizontally to access information under other tabs.

FIELD	INFO TYPE	DESCRIPTION
<b>Power Mode</b>	ON / OFF	Indicates beacon power setting mode.
<b>MAC Address</b>	6-byte HEX	Device MAC address
<b>TX power</b>	[dBm]	Transmit power
<b>Calibrated TX power</b>	[dBm]	Calibrated transmit power
<b>Adv. Interval</b>	[ms]	Eddystone™ frame advertisement interval
<b>Alias</b>	ASCII	Beacon’s assigned name in Runestone
<b>Active Slots</b>	1 – 5 slots	List of active advertisement slots (UID, TLM, URL)
<b>Acc HW</b>	Yes/No	Yes/No, whether beacon has accelerometer hardware

Another two selectable options in the Beacon Status view are **Read Status** and **Configure**.

**READ STATUS** mode is for scanning the beacon and showing the information on the **Beacon Status View** while the beacon stays unchanged. Choosing **CONFIGURE** will open fields below the button to change the beacon

settings, like power, which URL the beacon advertises, acceleration, etc.



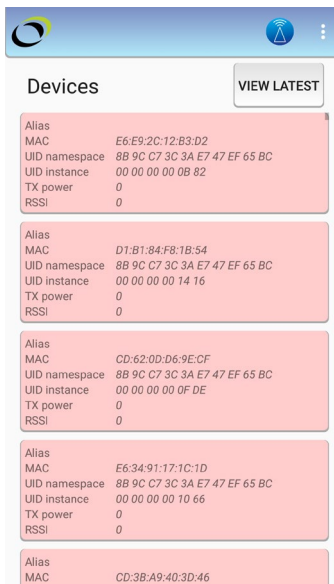
CONFIGURING CONFIDEX VIKING™ BEACONS

Configuration

Configuration can be written by choosing **CONFIGURE** button from **Beacon Configuration Options** view. This reveals parameter setting fields below the buttons. Swipe horizontally to change between setting fields.

General	Eddystone	Acceleration	Activity
Transmit power (dBm)	0		
Transmit power delta (dBm)	-5		
Advertisement interval (ms)	250		
Alias	N/A		
https://www.		URL not given	
Acc RMS period (s)	0		
Acc Min/Max period (s)	0		
Acc meter ODR (Hz)	1		
Acc meter FS (G)	2		
Activity threshold (mG)			Activity thres
Activity debounce time (s)			Activity debou
Activity keep active time (s)			Activity keep

**Devices** view reports and maintains status log of beacons that have been configured with **“Write Configuration”** operation of Confidex Viking Mobile Configure App or scanned with **“Read Status”** operation or activated or deactivated with **“Turn On”** or **“Turn Off”** operations. The picture below is an example of information maintained in status log. **Devices** view shows beacon alias, MAC address, UID namespace, UID instance, transmit power and RSSI (Received Signal Strength Indication) and whether Runestone app can hear the beacon (indicated by red or green color).



URL prefix and URL domain are selected from pre-selected list in accordance with Eddystone™ specification. (Please refer to Google Eddystone™-URL protocol frame specification.)

After the beacon configuration parameters in these fields have been set, the configuration can be updated to beacon by scanning it with the phone’s NFC antenna. After a successful scan, the configuration is upgraded, and **Beacon Status** field shows the new configuration.

GENERAL SETTINGS	DECSRIPTION
<b>Transmit power (dBm)</b>	Sets the RF transmit power.
<b>Transmit power delta (dBm)</b>	Difference between set and actual transmit power. Default value (-5) is correct.
<b>Advertisement interval (ms)</b>	Sets the time between advertisement frames.
<b>Alias</b>	Set ‘nickname’ for the beacon. This is saved only locally in the mobile phone.

EDDYSTONE SETTINGS	DECSRIPTION
<b>URL</b>	Set prefix from drop-down list and address to be advertised. Example: https:// and address: confidex.com/

ACCELERATION SETTINGS	DESCRIPTION
Acc RMS period (s)	Set accelerometer RMS sampling period.
Acc Min/Max period (s)	Set accelerometer MIN/MAX sampling period.
Acc meter ODR (Hz)	Set accelerometer sampling frequency.
Acc meter FS (G)	Set range the accelerometer measurement range.

**Activity** provides a method to measure device activity based on acceleration. When the threshold is exceeded, activity counter value starts to increase.

ACTIVITY SETTINGS	DESCRIPTION
Activity threshold (mG)	Set how much acceleration is needed to start the counter.
Activity debounce time (s)	How long the acceleration value must be above set threshold to start the counter, this is used to filter out spurious events.
Activity keep active time (s)	How long counter is kept active after acceleration values fall below the set threshold.

## COMPLIANCY

### Declaration of Conformity

EU, FCC, IC, and Japan Declaration of Conformity can be found from product page.

<http://www.confidex.com/beacons>

All Confidex Viking™ products are RoHS and REACH compliant.



## SAFETY GUIDELINES

### SAFETY

The device does not contain any serviceable components, do not disassemble the device.

Substances contained in the product and/or the battery may be harmful if handled or disposed improperly.

The product does not contain any comestible substances nor substances of nutritional value. Do not eat the product.

Dispose this product only in accordance to waste and recycling protocols

