DISTANCE-RC BEACON V3.1

MANUAL REVISION 4.0

INTRODUCTION

The Distance-RC beacon is a small device that can aid you in locating lost/downed RC crafts. The beacon works by sending out tones in UHF band. There are three tones being transmitted every couple of seconds, each tone is transmitted with a different output power (from high to low power). These tones can be picked up with an ordinary PMR-446 walkie-talkie or any other receiver capable of receiving between 400 and 470 MHz.

Because of the varying signal strength of the tones you will be able to pick up more tones when you get closer to the beacon (or the stronger the signal is). Based on this principle you can narrow down the location of the beacon. Besides locating based on proximity to the beacon you can also narrow down the location of the beacon with the use of directional antennas.

With directional antennas, such as the yagi, you can determine the location of the beacon by aiming the antenna. Because of the directionality of directional antennas, you will receive a stronger signal if you aim the antenna right towards the signal source and a lesser signal whey you aim away. Then you can narrow down the location of the beacon by determining in what direction the signal is the strongest.

To save energy and to make sure that your beacon will not interfere with your RC system the beacon is in standby modus on startup. After a specified delay time the beacon will start transmitting.

WHAT WILL YOU GET?

You will receive one finished beacon with battery and wire antenna.
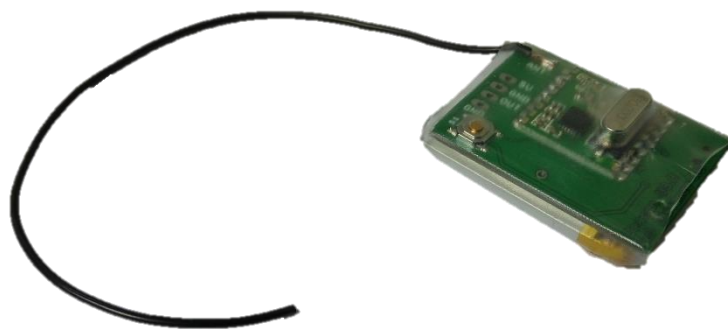
QUICK START GUIDE

The beacon is plug & play on arrival, because you can specify the frequency and delay you want on purchasing the beacon. You can use the switch on the side of the beacon to turn it on. The LED should blink once indicating that your beacon has powered up and is now in standby mode.

With your receiver (walky-talky) on the same frequency as the one you specified with your order, press the (test) button on the beacon. A set of three test-tones should now be audible. After turning on, the beacon is in standby mode for the programmed duration you requested on your order.

After the standby time has passed, the beacon will start transmitting tones continuously. These can be used to pinpoint its location.

The beacon will keep transmitting more than 12 hours on a single charge. When in standby the battery can last for more than 2 weeks. After prolonged usage it is recommended to charge the battery.

Charging is done by connecting it to a computer or smartphone charger using a micro-USB cable. If you turn the beacon ON during charging, the led will fade on and off. After your programmed delay time is over, the beacon will start transmitting tones, even when charging (led will not fade anymore, LED blinks when tones are send). Charging takes up to 2 hours maximum.

If you wish to use the external output, solder the red wire of a 3.3V compatible buzzer/LED[1] to the pad marked '3V3', and the black wire to the pad marked 'OUT'. The output frequency and duration can be configured in the attached software.

LOCATING THE BEACON

If you want to locate the beacon, make sure the set delay-time has passed. Tune your walky-talky to the same frequency as the beacon. Point the yagi antenna level to the ground, in the general direction of the aircraft.

Point the antenna in different directions, until you hear the highest amount of tones. The aircraft will be in that direction. While moving in this direction, repeat this process until all three tones are audible, wherever you are pointing the antenna.

[1] When using a LED, make sure to include a current limiting resistor.

You are now very close to the beacon, within about 40 meters. If possible, unscrew your antenna. The receiver is less sensitive without the antenna. Walk around until you hear all three tones again. Your distance to the beacon will be less than 3 meters.

IN-FLIGHT CHARGING

The beacon can be charged in-flight, to make sure the battery is always full if the aircraft goes down. This can be done by connecting 5V from the RC receiver to the power input of the beacon.

While charging the beacon uses about 350mA. Make sure that the BEC (and flight battery) can supply this current while also powering the servo's and receiver. This is **very** important. If you are using a BEC which is not rated for this current, it will result in RX brownouts and loss of control.

Plug a servo connector (as shown above) into the flight receiver. Solder the power wire (Red, 5V) to the pad on the beacon, marked with '5V'. Next solder the middle black/brown wire (GND) to the pad marked 'GND' on the beacon. The yellow/white signal wire does not need to be connected to the beacon. When soldering take care to not heat up or puncture the battery.
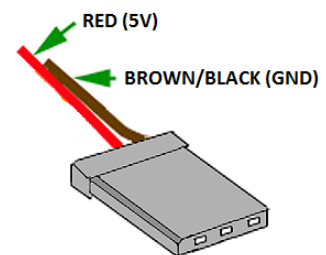
When flying, the beacon will always be charged by the flight battery, and shut off charging automatically when the beacons internal battery is fully charged. Keep in mind that charging also continues when the beacon is switched off, and 5V power is present.

USING THE EXTERNAL OUTPUT

The Beacon V3 features an external output, to which a LED or buzzer can be connected to make locating your plane easier.

CHOOSING AN APPROPRIATE BUZZER OR LED

The attached device must be compatible with a 3.3 volt output, and draw less than 100mA. However, a lower current draw is preferred to improve battery life.

The buzzer must be an active 3.3V buzzer. Some buzzers feature an extra input to connect to a servo channel, these are not suitable for use with the beacon. Suitable buzzers are available locally, or on Ebay and Aliexpress.

Using an LED with a color of your choice is possible. Make sure to place a current limiting resistor in series with the LED, otherwise damage to the beacon and LED will occur. The appropriate resistor value can be calculated here:
https://www.digikey.com/en/resources/conversion-calculators/conversion-calculator-led-series-resistor
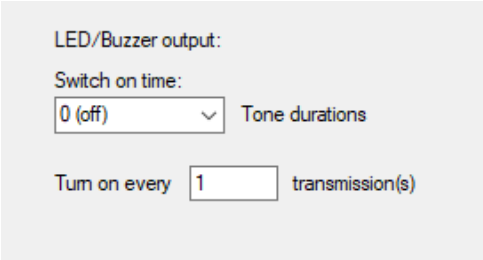
CONNECTING TO THE EXTERNAL OUTPUT

The positive (red) wire of the buzzer or LED must be soldered to the pad on the beacon marked '3V3'. The negative (black) wire of the buzzer/LED must be soldered to the pad marked 'OUT'. Take care to not heat or puncture the LiPo battery, which is placed below the pads. After soldering the beacon can be configured as explained below.

SOFTWARE CONFIGURATION

For an in-depth guide to connecting the beacon and configuring it, please refer to the chapter 'Programming the Beacon'. Make sure you are using the most recent version of the software available on our website: www.distance-rc.com

After connecting the beacon, the output settings are visible in the center of the 'configuration' tab, as shown below. By default, the output is switched off. If the 'Switch on time' is set to 1, the output will only be enabled while the first of three tones are transmitting, etcetera.

The 'turn on every X transmissions' setting can be used to conserve power, by only switching on the output every X sets of tones. After writing your settings to the beacon, the output will be enabled.

LED/Buzzer output:

Switch on time:

0 (off) ⌄   Tone durations

Turn on every 1   transmission(s)

PROGRAMMING THE BEACON

Although the beacon arrives to you programmed to your specifications you might want to experiment with different settings. To do this you have two options:

1. Programming with the built-in button
2. Programming via the computer using a micro-USB cable.

PROGRAMMING VIA THE BUTTON

The beacon can be programmed using the button in a certain sequence. This is not as intuitive as programming it with the computer, but easier to do when you're at the field. For the programming procedure, use the following chart:
http://distance-rc.com/store/download/Beaconprogprocess.pdf

PROGRAMMING VIA THE COMPUTER

Programming the beacon via the computer opens up a couple of additional options to program and enables you to update the software on your beacon.

To program the beacon you will need to download the free software, which is available here: http://distance-rc.com/store/download/BeaconSoftware_V3.1.zip

Install the file 'Drivers.exe' before connecting the beacon.

Connect a micro-USB cable to the computer, and connect it to the beacon while the unit is turned off. Then hold the button, and switch the beacon on. It is now connected to the computer.

In the user interface of the beacon software you should select the COM port of the beacon and click connect. The red cross in the top should turn to a green checkmark if the beacon is connected successfully.

The read button reads the settings from the beacon, and displays them in the software.
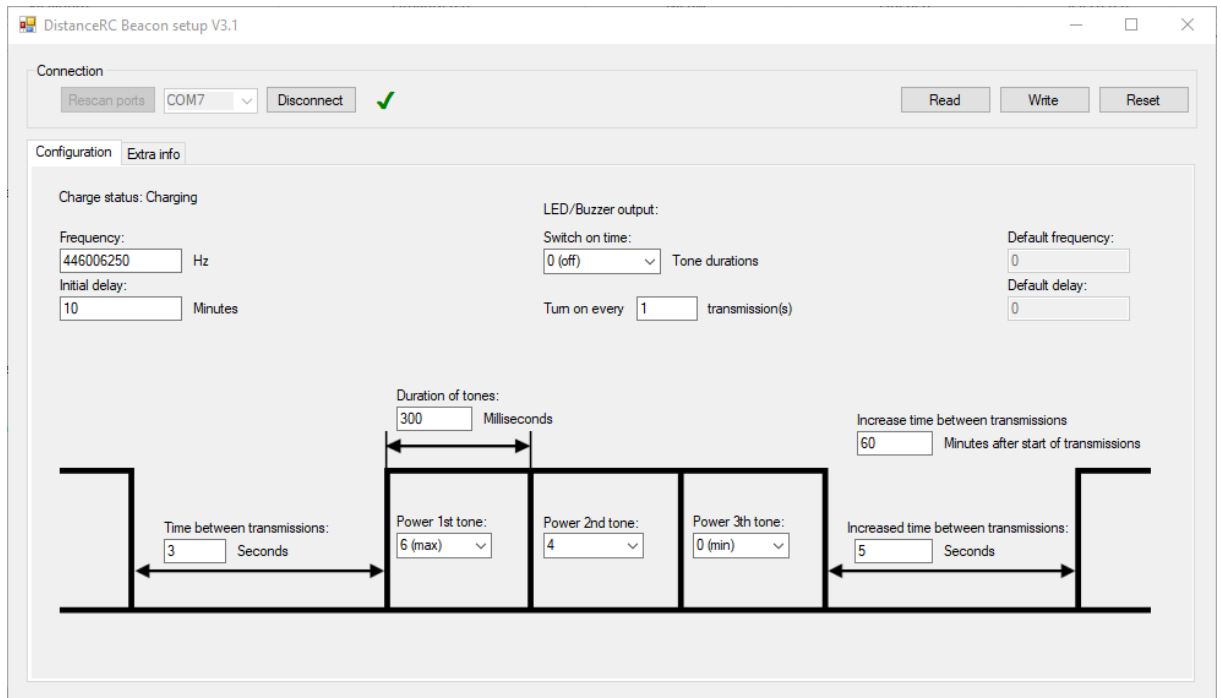
CONFIGURATION PARAMETERS

On the configuration tab the transmitting properties of the beacon can be configured. The beacon will come shipped with the factory default frequency and delay chosen when ordering.

The frequency can be set from 400 to 470MHz.

Delay can be set to anything you wish to use. If you want the beacon to start transmitting immediately when turning on, enter 0 delay.

Note that increasing the tone duration will use more power, and deplete the battery quicker.

Growing time between transmissions can be used. If the beacon has been transmitting for a chosen time ('Time increases after') which is 60 minutes in this case, the time between every set of tones will can be set to a longer interval ('Increased time between transmissions').

In this example it is set to 9 seconds. Increasing the time between transmissions after some time will greatly improve battery life, but make the beacon slightly more difficult to find.

You can set custom power levels for the tones. Level 0 is the lowest transmitting power, and 6 is the maximum level.

If you have changed the parameters you wish to change, click the 'write' button.

When you write, the settings that are in the value fields will be written to the beacon. If the data is saved successfully a message will pop up saying so.

CONTACT US

If you have any problems or questions please feel free to contact us at:

info@distance-rc.com

We will do our best to respond in a timely manner.