



Gimbal™ Proximity Beacon
Series 22™
Model 900-0007-000
User Manual

360-0077-000 Revision A

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United States

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Revision History

Revision	Date	Description
A	March 20, 2017	Initial Release

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Intended Use

What is the Gimbal™ Proximity Beacon Series 22™?

The Gimbal™ Proximity Beacon Series 22™ (the 'Beacon') is a small, battery-powered device that transmits a Bluetooth Smart/low-energy (BLE) signal that can be detected by other devices (e.g., smartphones or other devices capable of receiving the signal). This signal enables identifying the Beacon as well as other telemetry information to the receiving device (e.g., battery level and temperature).

The Beacon works by periodically waking up, transmitting this signal via short-range radio (Bluetooth Smart/LE) and then returning to a low-power state. The Beacon has no user interface (UI), cellular or GPS capabilities. The Beacon's identity is encoded within the signal it transmits and includes a sub-segment device type.

Important safety instructions for your Beacon



WARNING - CHOKING HAZARD: Small parts. Not for children under 3 years of age. This product comes with AA alkaline batteries.



CAUTION – Do not connect improperly, charge or dispose of in fire. Battery may explore or leak.

If the battery leaks:

- Do not allow the leaking fluid to come in contact with skin or clothing. If contact has already occurred, flush the affected area immediately with clean water and seek medical advice.
- Do not allow the leaking fluid to come in contact with eyes. If contact has already occurred, DO NOT rub; rinse with clean water immediately and seek medical advice. Take extra precautions to keep a leaking battery away from fire, as there is a danger of ignition or explosion.
- Vapor generated from burning batteries may irritate eyes, skin, and throat. If inhalation occurs, move to a well-ventilated area immediately and seek medical advice.

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Specifications

General	Dimensions (L x W x H)	3.4 in x 3.0 in x 1.0 in (86 mm x 77 mm x 25 mm)
	Weight	6oz (172g) including batteries
	Color / Enclosure	White; opens by depressing both tabs simultaneously
	Temperature Sensor	Can sense temperatures from -4° F to 140° F (-20° C to 60° C) with an accuracy from +/- 3.6° - 7.7° F (2° - 4° C) depending on temperature; temperature is sensed/transmitted every 30 seconds; app requires use of the Gimbal SDK in order to receive temperature data
	Antenna	Omni-directional (default) or Directional; Software selectable
	Buttons / LEDs	Internal power switch; External Power/Battery Status Button with LED Feedback
	Terms / Warranty / Pricing	Terms https://manager.gimbal.com/beacon-supply-agreement Warranty https://manager.gimbal.com/beacon-warranty Pricing https://store.gimbal.com
Transmission	Beacon Transmission Type	Bluetooth® Smart (AKA Bluetooth 4.0 Low Energy); 2.4GHz Channels 37 (2402MHz), 38 (2426 MHz), and 39 (2480 MHz); non-connectable advertisements. Compatible with iBeacon™ technology. Note: These advertising channels are allocated in different parts of the 2.4GHz spectrum and are designed to coexist with 802.11 / Wi-Fi
	Transmission Interval	Configurable via Gimbal Manager/Gimbal Beacon Manager App
	Transmission Power	Configurable via Gimbal Manager/Gimbal Beacon Manager App -20 dBm (Low) and 0 dBm (Full Power)
	Transmission	Typically up to ~160 ft (~50 Meters) though can often be seen at further distances in ideal, clear line-of-sight conditions at full transmit power
Mounting Options	Double-Sided Adhesive Tape	Tape: 2.5 in x 1.5 double-sided swatch (included); Manufacturer recommends a clean, dry and well unified bonding surface for optimum adhesion.
	Physical Security Screw	Quantity 1, 4-40 x 5/16" long (1/16" HEX Drive, 18-8 Stainless Steel Button-Head Socket Cap) screw included inside back housing; Difficult to open the device when installed
Battery	Battery Type	4 - AA Alkaline (pre-installed, ready to activate); user replaceable
	Battery Operating Temperature	Varta/powerone: -4° F to 130° F (-20°C to 54°C)
	Battery Disposal	http://www.varta-microbattery.com/applications/mb_data/documents/material_safety_data_sheets/MSDS_03_Primary_Alkaline_Cylindrical_Series_p_en.pdf
	Battery Data Sheet	http://www.varta-microbattery.com/applications/mb_data/documents/data_sheets/DS4106.pdf
	Battery Life	Typical battery life of 48 months transmitting every 100ms running 24 hours/day
	Battery Level Measurement	Measured when the Beacon is first powered and every 6 hours thereafter; app requires use of the Gimbal SDK in order to receive battery level data from the Beacon
Environmental	Operational Temperature	-40° F to 140° F (-40° C to 60° C) (Note: lower and upper temperature ranges may be limited by battery type; see above)
	Humidity Survival	95% RH non-condensing
	Compliance Statement	RoHS/REACH Compliant

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Certifications and Safety	Country Supported	Please visit https://manager.gimbal.com/supported-countries for the list of countries supported by Gimbal
	Safety	General Safety Requirements: UL 60950-1; Canada, Identical to UL 60950: CAN/CSA-22.2 No. 60950-1 European Norm (Per IEC 60950-1 2nd Ed): EN 60950-1 The Beacon is not FDA certified. Any use by customer in an environment requiring such certification is at customer's risk and Customer is responsible for any liability resulting from such use.



Using Your Beacon

Unpacking your Beacon

Each Series 22 Beacon comes with double-sided adhesive tape that can be used for mounting purposes. Other mounting accessories are not included. It's advisable to leave your Beacon in its box and powered off until ready to use. When ready to use, remove your Beacon from its unit box and its protective bubble wrap sleeve.

Activating your Beacon

1. To activate your Beacon, you will need your Beacon's Activation Code/Factory ID. It has the format similar to XXXX-XXXXX consisting of numbers and letters and can be found:
 - a. on the exterior label of the Beacon's box ("Activation Code"), or
 - b. within the interior of the Beacon on a label between the two sets of batteries
2. Once found, visit <https://manager.gimbal.com/> on the web and create a Gimbal Developer Account if necessary
3. Login to your account and navigate to 'Beacons' -> 'Activate' (or visit <https://manager.gimbal.com/transmitters/new> directly)
4. Enter a name for your Beacon in the field provided, your Beacon's Activation Code/Factory ID from Step 1 in the 'Factory ID' field, then press the 'Activate Beacon' button. Additional fields that may appear are optional for more advanced users.

Your Beacon is now associated with your Gimbal Developer Account and ready for use. Repeat step 4 to activate additional Beacons on your account.

Note: If you've ordered Series 22 Beacons in bulk, we can provide you with a shipping manifest that allows for bulk activation of your Beacons in Gimbal Manager. Contact Gimbal Support through Gimbal Manager on the web for further details.

Powering on your Beacon

After removing your Beacon from its unit box and sleeve, open the Beacon by pressing the two latches on opposite sides of the Beacon simultaneously with one hand while holding the front part of the Beacon with the other hand. Once you've opened your Beacon, flip the small power switch located between the two sets of batteries from the 'Off' position to the 'On' position.

Once you've powered on your Beacon, you'll notice a green light flashing on the exterior of the Beacon for approximately 10 seconds. This lets you know that the Beacon is functioning normally. Once the Beacon finishes its startup cycle, the light will turn solid

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to indicate battery status for 3 seconds (green indicates good; red indicates batteries need to be replaced) before the light turns off and the Beacon enters its normal transmission state. Close the Beacon by latching the front and back housing together until it clicks and your Beacon is ready to use.

Note: An optional physical security screw is provided which when installed, makes it difficult to open the Beacon. It can be found mounted on the inside of the Beacon's bottom housing in a smaller holder. To use, carefully remove the screw from its holder, close the Beacon, and insert the screw in the holder found in one of the Beacon's closure tabs using a Hex screwdriver until snug.

Verifying Beacon state

To check whether your Series 22 Beacon is operating normally, simply press the button on the front of the Beacon.

- A Green light indicates that your Beacon is on and functioning normally
- A Red light indicates that your Beacon is on but needs its batteries replaced
- No light indicates that your Beacon is off. Either the power switch is off or the batteries need to be replaced.

To see your Beacon from a mobile application, download the Gimbal Beacon Manager application from the App StoreSM on an iOS[®] device and login using the same Gimbal Developer Account (and organization, if configured) which you have used to activate your Beacon. Once logged in, you will see all of your Beacons that are powered on and near your device under the My Beacons tab.

(Optional) Create, assign and apply a new configuration to your Beacon

Gimbal™ Proximity Beacon Series 22™ are designed to never need configuration when used in conjunction with the Gimbal SDK as integrated into your mobile application. In fact, more than 95% of our Beacons that have been deployed as of this writing have never been reconfigured. However, should you want to adjust certain settings, you may do so.

Note: Presently, an iPhone[®] 4S or newer is required for this step. Formal support for iPad[®] and other operating systems may be available in the future.

1. Visit <https://manager.gimbal.com/> and login with the Gimbal Developer Account (and organization, if configured) used to activate your Beacon
2. Navigate to 'Beacon Configurations' and select the configuration you want to use or create a new Beacon Configuration
3. Navigate to 'Beacons' and find the Beacon name or ID you wish to configure



Using Your Beacon, continued

4. Assign the new configuration to that Beacon by clicking 'Edit', choosing 'Configuration', selecting the desired configuration, and clicking 'Save'. Your desired configuration should now show up in the 'Assigned Configuration' column

Note: At this point, you have assigned a configuration to your Beacon in Gimbal Manager on the web but you still need to apply the configuration to your Beacon.

Once your Beacon shows a different 'Assigned Configuration' vs. its 'Applied Configuration' in Gimbal Manager on the web, you're ready to apply the configuration to your Beacon.

1. Ensure that the Beacon you wish to apply the configuration to is powered off
2. Launch the Gimbal Beacon Manager on your phone and if you haven't logged in previously, login using the same Gimbal Developer Account (and organization, if configured) you activated your Beacon against
3. In the Gimbal Beacon Manager app, choose the 'Configure' from the pull down menu. Make sure that the application stays visible on the screen during the configuration process.
4. Power on the Beacon by switching the internal switch from 'Off' to 'On'. Once you've done so, you'll notice a green light flashing on the exterior of the Beacon for approximately 10 seconds. Not only does this indicate that the Beacon is powering on, while the green light is slow-flashing, it is ready to be connected to and configured by the Gimbal Beacon Manager application.
5. Within a few seconds, the Gimbal Beacon Manager application will detect the Beacon and connect to it. This will be indicated on the Beacon by a fast flashing green light as well as in the Gimbal Beacon Manager application. If Gimbal Beacon Manager does not connect to the Beacon within 10 seconds, please power off and power on the Beacon again. If you continue to experience problems, please contact Gimbal support for assistance.
6. Follow the on-screen instructions in the Gimbal Beacon Manager application to apply any firmware and/or configuration updates. Once complete, disconnect from the Beacon in the Gimbal Beacon Manager application.
7. Your Beacon will automatically exit configuration mode indicated by the status light going solid (green if batteries are good, red if batteries need to be replaced), and then after 3 seconds, the light will turn off as the Beacon enters its normal operational state

Note: If you wish to reconfigure a Beacon that is powered on, you may do so by simply holding the exterior button for 3 seconds until you see the light start to flash slowly.

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Using Your Beacon, continued

Installing your Beacon

The Beacon is easy to install and comes with double-sided adhesive tape that is designed to adhere to most clean, even surfaces. To install:

1. Open the Beacon and set the top housing (the side with the batteries) aside – we will be working with the bottom housing first
2. Remove the paper backing from one side of the double-sided tape and apply it securely to the bottom housing of the Beacon as shown in the Figure 1 example below



Figure 1: Bottom housing with double-sided tape applied

3. Remove the remaining paper backing from the tape and then securely apply the bottom housing to the surface you wish to install it on as shown in the Figure 2 below. Make sure the bottom housing is secured before you install the top housing. (Optional) Remove the physical security screw included in the bottom housing - see step #4 for details.

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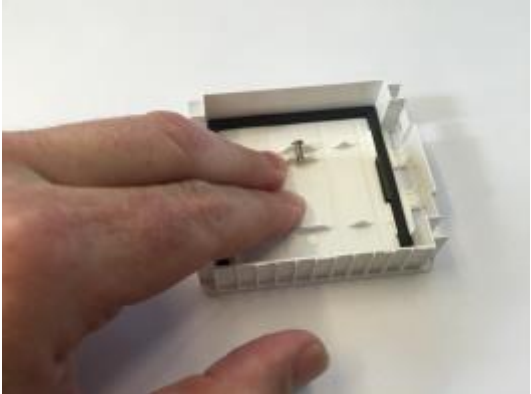


Figure 2: Bottom housing installed

Using Your Beacon, continued

4. Gently place the top housing on top of the bottom housing until it snaps closed as shown in Figure 3 below. Your Beacon is now installed. (Optional) Lock the tab by screwing the included physical security screw into the threaded hole on the appropriate beacon closure tab.



Figure 3: Top housing installed



CAUTION: When the Beacon is closed, the top and bottom housings are NOT flush. An example of a properly closed Beacon is shown in Figure 4 below. This is designed so that in the case of an uneven surface, the Beacon can still be opened properly to replace batteries when it becomes necessary.

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Figure 4: Properly closed Beacon is NOT flush

DO NOT apply excessive pressure while closing the Beacon or after it has been installed as doing so can damage the Beacon

Replacing the batteries in your Beacon

The Beacon has four (4) AA alkaline batteries that will typically power the Beacon for approximately 48 months but depends on configuration and environment. To test the batteries, make sure the Beacon is powered on and press the external button. If it lights 'Green', the batteries are good. If it lights 'Red', the batteries need to be replaced.

Alternately, you can see the latest battery status for you Beacon within you Gimbal Manager Account.

1. Visit <https://manager.gimbal.com/> and login with the Gimbal Developer Account (and organization, if configured) you activated your Beacon against
2. Navigate to 'Beacons' and find the Beacon name or ID you wish to check battery status for

To replace the batteries:

1. Switch the power switch to the 'Off' position
2. Remove and properly dispose of the old batteries
3. Install four (4) new AA alkaline batteries
4. Switch the power switch to the 'On' position

Note: It's important when replacing the batteries to only use new, matched batteries of the same type. Using mixed batteries may cause problems with the Beacon.

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Troubleshooting Tips

For troubleshooting tips and Frequently Asked Questions, please visit <https://manager.gimbal.com/>, login with your Gimbal Developer Account and click on 'Support'.

Additional specifications are available online in the Gimbal store at: <http://store.gimbal.com/>

Status Light Modes

Light Color / Button State	Status Indicated	Notes
No Light (before button press)	None	The status light's default state is off.
No Light (after button press)	Beacon is not powered / not functioning properly.	Either the internal power switch is set to off, batteries are not installed, or installed batteries need to be replaced.
Slow Flashing Green Light (no button press)	Beacon is powering on and in configuration mode (lasts ~10 seconds)	When initially powered on, the green light flashes slowly. You can optionally connect to the Beacon in this state using the Gimbal Beacon Manager application to configure the Beacon.
Fast Flashing Green Light (before button press)	Beacon has been connected to by Gimbal Beacon Manager app (lasts for as long as the connection is established)	While connected, the light will continue to fast flash green. Once you disconnect with the Gimbal Beacon Manager application, it will automatically return to its normal operational state.
Solid Green Light (before button press)	Beacon has good batteries and is working properly (lasts for ~3 seconds)	Either the Beacon has just finished powering on or has just finished being configured.
Solid Green Light (after button press)	Beacon has good batteries, is powered on, and working properly (lasts for ~3 seconds)	Pushing the button gives you a quick status anytime you want to know whether your Beacon is on and working properly.
Long Button Press (longer than 3 seconds)	None. Works in any light state as long as the Beacon is powered on.	This allows you to reboot the Beacon without opening the Beacon and switching the power off/on. It is useful for re-entering configuration mode when the Beacon is closed.

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<p>Amber or Red Light (after button press)</p>	<p>Batteries are low and need to be replaced.</p>	<p>The amber and red lights look visually similar. If you see an indication other than a green light, it's time to replace the Beacon's batteries.</p>
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Regulatory Information

Safety and wireless devices

Scientific research on wireless devices and radio frequency (“RF”) energy has been conducted worldwide for many years, and continues. In the United States, the Food and Drug Administration (FDA) and the Federal Communications Commission (FCC) set policies and procedures for wireless devices. The FDA issued a website publication on health issues related to usage of cell phones where it states, “The scientific community at large believes that the weight of the scientific evidence does not show an association between exposure to RF from cell phones and adverse health outcomes.” Still, the scientific community does recommend conducting additional research to address gaps in knowledge. That research is being conducted around the world, and the FDA continues to monitor developments in this field. You can access the FDA website at <http://www.fda.gov> (under “C” in the subject index, select Cell Phones). You can also contact the FDA toll free at (888) 463-6332 or (888) INFO-FDA. The FCC issued its own website publication stating that “there is no scientific evidence that proves that wireless telephone usage can lead to cancer or other problems, including headaches, dizziness, or memory loss.” The publication is available at <https://www.fcc.gov/engineering-technology/electromagnetic-compatibility-division/radio-frequency-safety/faq/rf-safety> or through the FCC at (888) 225-5322 or (888) CALL-FCC. The National Cancer Institute (NCI) states that concerns about the potential health effects of using cellular phones – “and specifically the suggestion that using a cell phone may increase a person’s risk of developing brain cancer – are not supported by a growing body of research on the subject.” You can access NCI’s review of the research via this cancer.gov article.

Can I minimize my RF exposure?

If you are concerned about RF, there are several simple steps you can take to minimize your RF exposure. You can minimize usage of the device near the body. You can also place more distance between your body and the source of the RF, as the exposure level drops off dramatically with distance. Wireless devices marketed in the United States are required to meet safety requirements regardless of whether they are used against the head or against the body.

Where can I obtain further information?

For further information, see the following additional resources:

U.S. Food and Drug Administration
10903 New Hampshire Avenue
Silver Spring, MD 20993
1-888-INFO-FDA (1-888-463-6332)
<http://www.fda.gov>



Regulatory Information, continued

Federal Communications Commission
445 12th Street SW
Washington, DC 20554
<http://www.fcc.gov/>

American National Standards Institute
1899 L Street NW, 11th Floor
Washington D.C., 20036
1-202-293-8020
<http://www.ansi.org/>

United States, FCC Information

The Gimbal™ Proximity Beacon Series 22™ has been approved for operation in United States of America by the Federal Communications Commission (FCC).

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation

The Gimbal™ Proximity Beacon Series 22™ has been tested to the limits for a Class B digital device, according to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. The Beacon uses and radiates radio frequency energy and if not installed and used according to instructions, may cause harmful interference to radio communications or be interfered with. There is no guarantee that interference will not occur in a particular installation.

If the Beacon does cause harmful interference to radio or television reception, which can be determined switching the Beacon's power switch to the 'off' position, try to correct the interference by taking one or more of the following actions:

- Increase the distance between the Beacon and radio or television receiver, or
- Consult the dealer where you bought your radio/TV or an experienced radio/TV technician



Regulatory Information, continued

If the Beacon is being interfered with, try the following actions:

- Make sure that the Beacon is no closer than 10 ft. (3 m) of a wireless access point, microwave oven, or 2.4 GHz cordless phone, and/or
- Increase the distance between the Beacon and any other electronic equipment by moving the Beacon

The FCC ID for the Gimbal™ Proximity Beacon Series 22™ (model 900-0007-000) is R6CGS22.

CAUTION: The Beacon should not be used in airplanes, hospitals, or locations where cellular telephones and other electronic devices are prohibited.

Canada, Industry Canada Information

The Gimbal™ Proximity Beacon Series 22™ has been approved for operation in Canada by Industry Canada (IC).

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

1. This device may not cause interference, and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

The Industry Canada certification number for the Gimbal™ Proximity Beacon Series 22™ (model 900-0007-000) is 10756A-GS22.

Japan, Ministry of Internal Affairs and Communications Information

The Gimbal™ Proximity Beacon Series 22™ has been approved for operation in Japan by the Ministry of Internal Affairs and Communications (MIC).

The MIC Type certification number for the Gimbal™ Proximity Beacon Series 22™ (model 900-0007-000) is 007-AE0043



Regulatory Information, continued

European Union (and other countries which require the CE Mark), Information

The Gimbal™ Proximity Beacon Series 22™ has been approved for operation in the European Union and other countries which require the CE Mark.

Output power: 0.76 mW @ 2402-2480.0 MHz

Gimbal, Inc. hereby declares that this product is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC and to all applicable EU directive requirements. This device complies with ICNIRP exposure levels.

The Notified Body Opinion Number (NBO) for the Gimbal™ Proximity Beacon Series 22™ (model 900-0007-000) is AN16C10848 (Notified Body Nr: 0984).

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