

# RadBeacon Gateway User Manual



**RIGADO**

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## Introduction

RadBeacon Gateways are part of Rigado’s connectivity solutions that offer powerful and cost-effective edge network infrastructure for large-scale, low-power wireless deployments. RadBeacon gateways provide a multi-radio platform for Bluetooth based location technologies.

### Revision History

Version	Description	Date
V0.1	Initial Draft	2022-07-27

# 1 Gateway Hardware

## 1.1 Specifications

Processor		
i.MX6UL (G3)	528MHz, 32bit ARM® Cortex™-A7	
Memory		
Memory (Volatile)	128 MB DDR3L SDRAM @ 400MHz, x16	
Memory (Bulk Storage)	64MB QSPI NOR Flash (512Mbit)	
Bluetooth		
	<b>Silicon Labs EFR32BG22</b>	
Bluetooth Version	5 (Bluetooth Low Energy)	
LE Connections	TBC	
Frequency	2.402 to 2.480 GHz	
Modulations	GFSK at 125kbps, 1Mbps, and 2Mbps data rates	
Transmit Power	6dBm	
Receiver Sensitivity	-106 to -96dBm, depending on modulation	
Ethernet		
10/100 Base-T RJ-45 connector with PoE Support		
USB		
USB 2.0, Type-A Host connector		
Dimensions		
RBG-1000C Enclosure	Length	127 mm
	Width	127 mm
	Height	30 mm
Weight		
RBG-1000C	Unit	164 g
	Packaging	97 g
Accessories	3.5dBi Puck Antenna (ea.)	82 g
	2dBi Dipole Antenna (ea.)	13 g
	Mounting Kit	46 g
Hardware		
Power supply	Barrel Jack (5.5mm x 2.1mm) 4.5 to 5.5VDC, 2.0A max	Ethernet connector (RJ-45) 36-57V (IEEE 802.3af)
Temperature Range	0 to +60°C standard, -20 to +75°C extended	
Certifications		
RBG-1000C	IN PROCESS: FCC / ISED / CE-RED / UKCA	

## 1.2 Electrical Specifications

### 1.2.1 Operating Conditions

Symbol	Parameter	Min.	Typ.	Max.	Unit
V <sub>AUX</sub>	Operating supply voltage at barrel jack	4.5	5.0	5.5	V
V <sub>POE</sub>	Operating supply voltage at Ethernet connector (PoE)	36	48	57	V
T <sub>A</sub>	Operating ambient temperature	0	25	60	°C
T <sub>A</sub>	Extended operating temperature range <sup>1</sup>	-20	25	75	°C

### 1.2.2 USB Connector Power

Symbol	Parameter	Min.	Typ.	Max.	Unit
V <sub>USB</sub>	Operating output voltage at USB connector for loads up to 500mA <sup>2</sup>	4.5	4.8	5.5	V

### 1.2.3 Power Consumption

Symbol	Parameter	Min.	Typ.	Max.	Unit
P <sub>POE</sub>	Power consumption <sup>3</sup> referenced at PoE input	1.6	2.0	5.1	W

### 1.2.4 Absolute Maximum Ratings<sup>4</sup>

Symbol	Parameter	Min.	Max.	Unit
V <sub>AUX_MAX</sub>	Voltage at barrel jack <sup>5</sup>	-5	12	V
V <sub>POE_MAX</sub>	Voltage at Ethernet connector (for PoE)	-0.3	60	V
T <sub>S</sub>	Storage temperature	-20	60	°C

1. Warning: operating over the extended range may result in reduced performance. Prolonged use at temperatures above the standard ambient operating range may cause the enclosure plastics to soften.
2. USB is an output only – do not attempt to power the unit via the USB connector
3. Power consumption is dependent upon the application including beacon activity in the environment. Typical consumption listed for an RBG-1000C gateway powered over Ethernet, without USB load, scanning on all 5 radios in an environment with 200 BLE advertisements/sec.
4. Do NOT operate the unit under these conditions.
5. The unit will NOT operate over this voltage range. Prolonged exposure to these conditions is NOT recommended.

### 1.3 Interfaces

Interface features are described throughout this section, including power and data connectivity, and button and LED location and behavior.

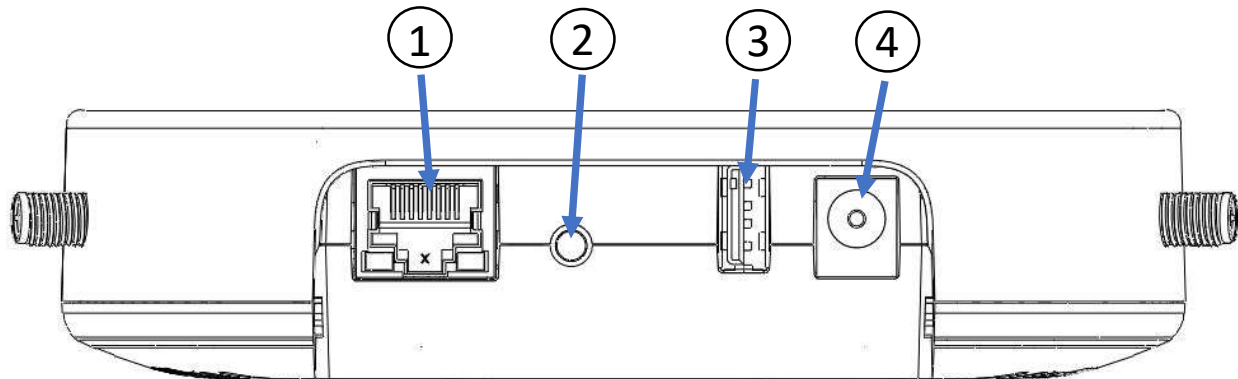


Figure 1 – RadBeacon Gateway – Back View

#### 1.3.1 Ethernet with Power over Ethernet support

The Gateway is equipped with a single 10/100 Base-T Ethernet connector. For configurations supporting PoE (802.3af), the Gateway will operate when powered by either a PoE switch (end-span) or injector (mid-span).

#### 1.3.2 Reset Button

The reset button provides both soft and hard reset capabilities, depending on the length of the press. The timing is described in the following table:

Reset Action	Time	Behavior
Quick Press	< 2 seconds	Soft Reboot
Short Press	2-4 seconds	Network Reset
Long Press	10-15 seconds	Hard Reset
Very Long Press	> 30 seconds	Factory Reset

#### 1.3.3 USB

A USB 2.0 Type-A connector on the Gateway board provides access to a High Speed (up to 480Mbps) USB host.

#### 1.3.4 Barrel Jack

The Gateway provides a 5.5mm x 2.1mm barrel jack for 5V DC input. Any AC/DC wall adapter used to power the gateway must be rated up to 2A. Please note that actual current consumption is dependent upon the software deployed on the Gateway.

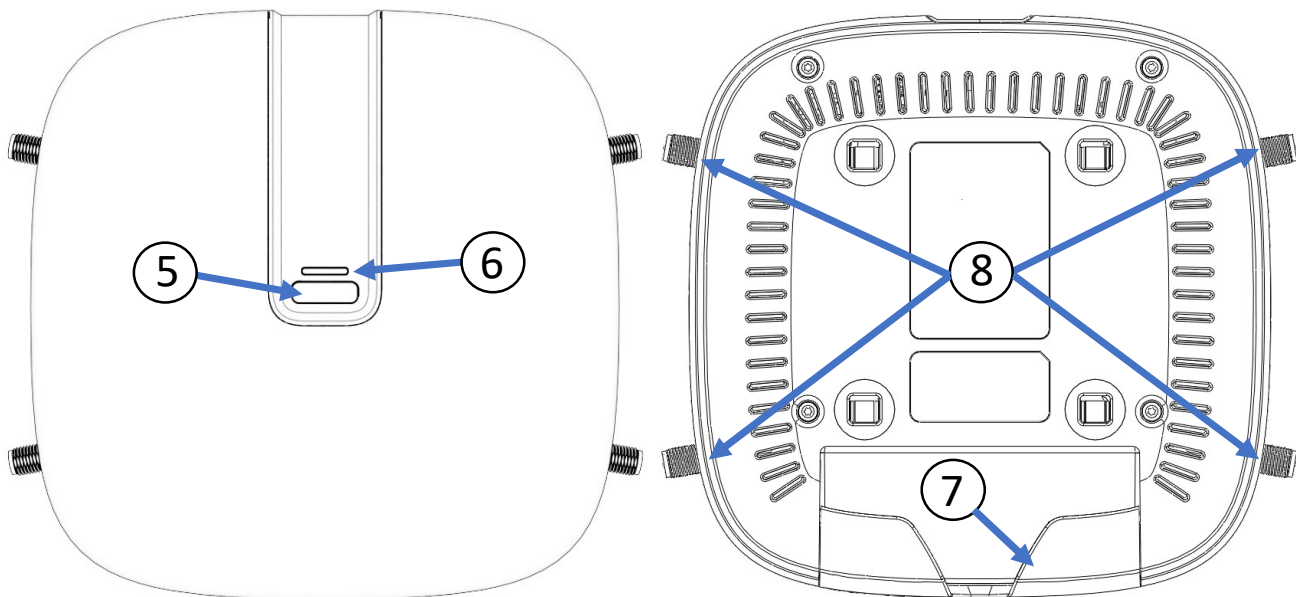


Figure 2 – RadBeacon Gateway – Top and Bottom View

### **1.3.5 Front Button**

A front facing button is located on the face of the Gateway. This button is not enabled on the default Gateway configuration.

### **1.3.6 Multi-color LED**

A multi-color (red/green/blue) LED located near the user button provides a means of visual indication for the user.

### **1.3.7 Cable Cover**

The back of the unit has a snap-in cover for improved cable management. This allows for hidden cable routing when the unit is installed on a wall or ceiling. The cable cover is removable.

### **1.3.8 Antenna Connectors**

Four RP-SMA type connectors are visible -- two on each side of the unit -- where approved 2.4GHz antennas attach.

## 2 Mechanical Information

### 2.1 RBG-1000C Dimensions



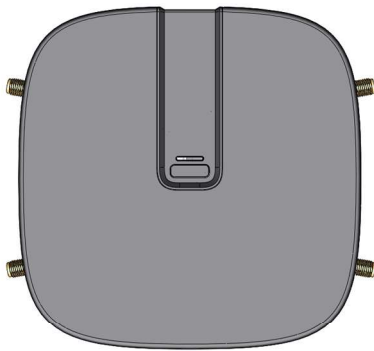


## 3 Installation

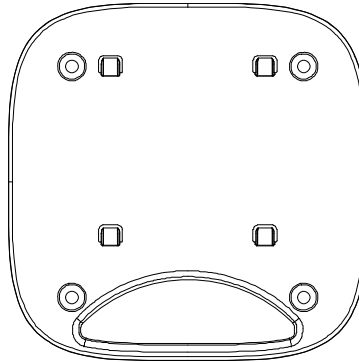
### 3.1 Equipment

Each RadBeacon Gateway Box includes the following equipment.

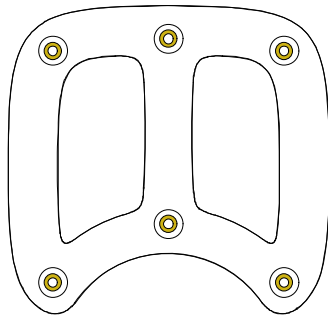
- 1 x RadBeacon Gateway
- 1 x Ceiling Mount Kit (**optional**):
  - 1 x mounting bracket
  - 1 x ceiling backer plate
  - 4 x M3 x 50 mm Length, Pan Head, Phillips #1, Machine Screw



RadBeacon Gateway



Mounting Bracket



Ceiling Backer Plate



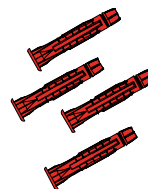
Ceiling Mount Screws  
M3 x 50 mm Phillips (x4)

Additional accessories required for wall mounting (**not included**):

- 4 x Screw, Pan Head Phillips Sheet Metal #6/18x1.25"
- 4 x Drywall Anchor, #6 Screw, 1-1/4" Length



Wall Mount Screws  
#6 x 1-1/4" Phillips (x4)



Drywall Anchors (x4)

### 3.2 Mounting Tools

To use the optional Wall/Ceiling Mount kit, the following tools are required (**not included**):

- Phillips screwdriver
- Drill and drill bit - 3/16" for wall, or 1/8" (3-4 mm) for ceiling mounting
- Drywall saw or keyhole saw for 1" cable pass-through hole

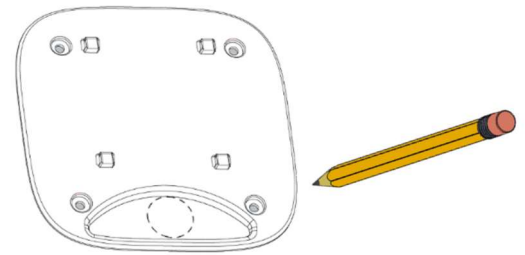
### 3.3 Mounting Instructions

Rigado recommends mounting the Gateway on a wall or ceiling, at least 6ft (2m) off the ground. If mounting on a wall, position the unit so that the connectors (USB, Ethernet, etc.) are facing down. This will ensure the mounting bracket attachment mechanism is secure against incidental removal.

1. Use the mounting bracket as a template to mark hole locations on the wall or ceiling.

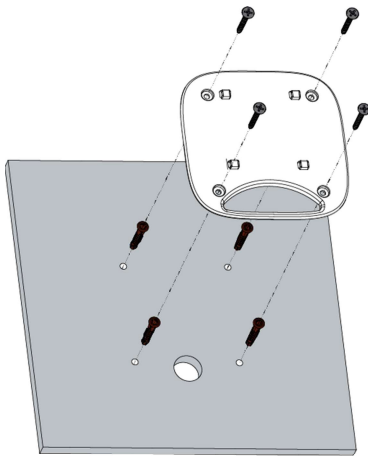
- a. For wall mount, use a 3/16" (5 mm) drill bit.
- b. For a ceiling tile, use a 1/8" (3-4 mm) drill bit.

If a hole is needed for cable routing, also mark this in the appropriate cable opening space in the mounting bracket.



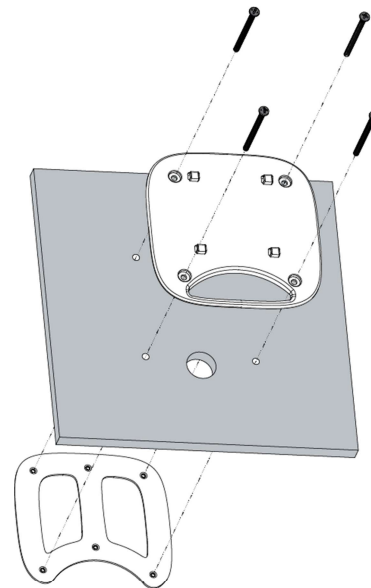
2. Attach the mounting bracket to the surface using the appropriate method:

#### Wall Mounting



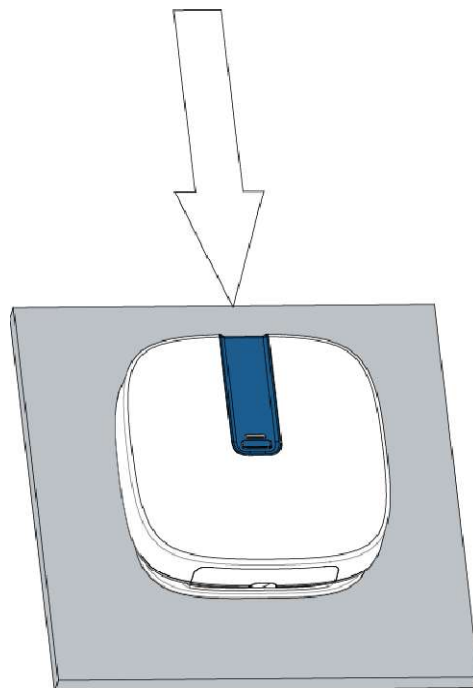
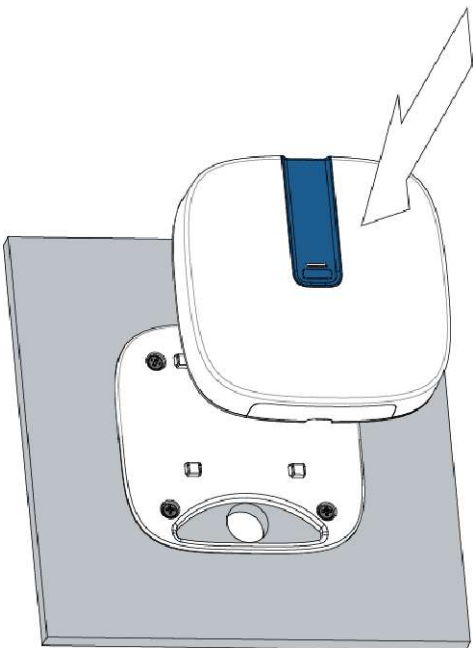
Push the provided drywall anchors into the drilled holes, then place the mounting bracket snugly against the wall. Using a screwdriver, screw the wall mount screws into the drywall anchors.

#### Ceiling Mounting



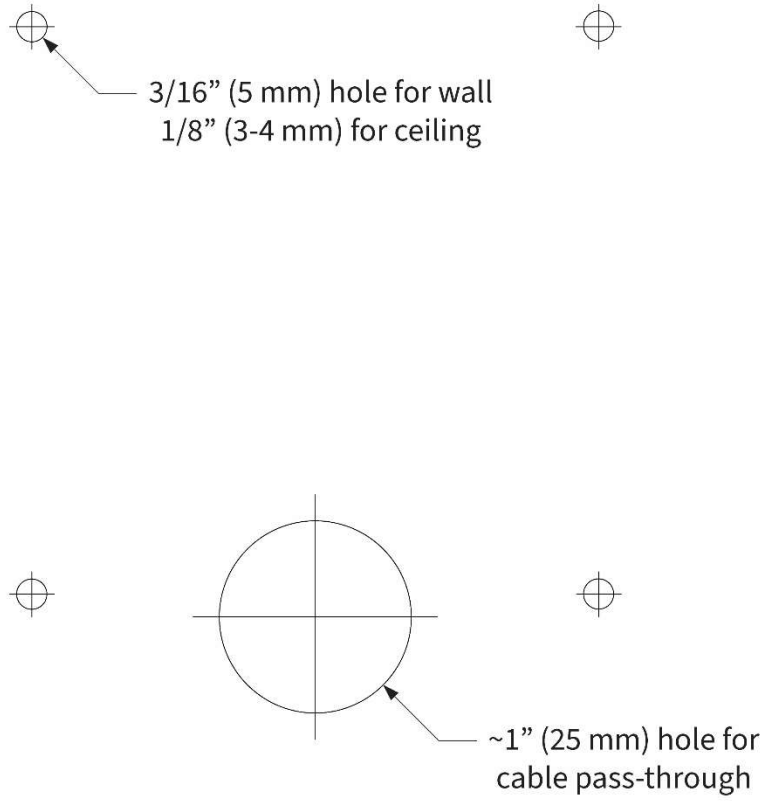
Place one ceiling mount screw through a mounting bracket screw hole, and push through the corresponding drilled ceiling hole. Use this screw to guide placement of the ceiling backer plate to the opposite side, then use the screwdriver to screw in this and the remaining ceiling mount screws.

3. Once the mounting bracket is installed, line up the four hooks of the mounting bracket with the corresponding holes on the back of the Gateway and press the two together. To lock in place, slide the Gateway over towards the cabling hole until it clicks into place.



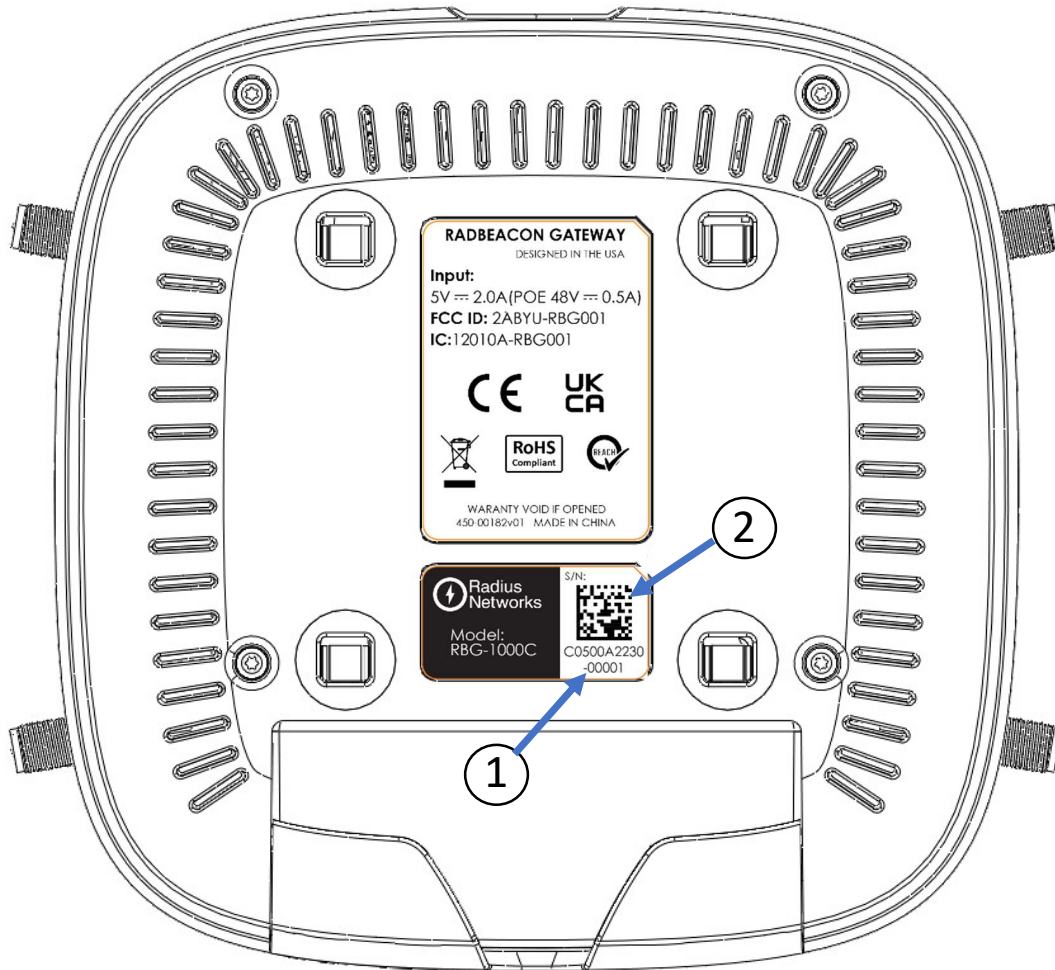
### 3.4 Hole Drilling Template

This template is at scale and can be printed for use.



## 4 Gateway Setup

Before the Gateway is permanently installed, refer to the mounted side of the enclosure to record the unit Serial Number (1) or scan the 2D barcode (2), as shown below.



## 5 Regulatory Information

### 5.1 Authorized Countries and Territories

Each of the specific RadBeacon Gateway models are authorized for use in the following countries:

Region	RBG-1000B	RBG-1000C
United States	✓	Planned
Canada	✓	Planned
CE Certification (EU Region)	✓	Planned
<i>Anguilla</i>	✓	Planned
<i>Belgium</i>	✓	Planned
<i>Bosnia &amp; Herzegovina</i>	✓	Planned
<i>Bulgaria</i>	✓	Planned
<i>Comoros</i>	✓	Planned
<i>Croatia</i>	✓	Planned
<i>Cyprus</i>	✓	Planned
<i>Czechia</i>	✓	Planned
<i>Denmark</i>	✓	Planned
<i>Estonia</i>	✓	Planned
<i>Finland</i>	✓	Planned
<i>France</i>	✓	Planned
<i>Georgia</i>	✓	Planned
<i>Germany</i>	✓	Planned
<i>Greece</i>	✓	Planned
<i>Guadeloupe</i>	✓	Planned
<i>Hong Kong</i>	✓	Planned
<i>Iceland</i>	✓	Planned
<i>Ireland</i>	✓	Planned
<i>Italy</i>	✓	Planned
<i>Kosovo</i>	✓	Planned
<i>Latvia</i>	✓	Planned
<i>Lithuania</i>	✓	Planned
<i>Luxembourg</i>	✓	Planned
<i>Macedonia</i>	✓	Planned
<i>Malta</i>	✓	Planned
<i>Martinique</i>	✓	Planned
<i>Montenegro</i>	✓	Planned
<i>Myanmar</i>	✓	Planned
<i>Netherlands</i>	✓	Planned
<i>Norway</i>	✓	Planned
<i>Poland</i>	✓	Planned
<i>Portugal</i>	✓	Planned
<i>Romania</i>	✓	Planned
<i>Saint Barthelemy</i>	✓	Planned
<i>Saint Martin</i>	✓	Planned
<i>Slovakia</i>	✓	Planned

<i>Slovenia</i>	✓	Planned
<i>Spain</i>	✓	Planned
<i>Sweden</i>	✓	Planned
<i>Switzerland</i>	✓	Planned
<i>Turks and Caicos</i>	✓	Planned
Australia	✓	Planned
Brazil		
China		
Costa Rica		
India		
Israel		
Japan		
Malaysia		
New Zealand	✓	Planned
Nigeria		
Philippines		
Qatar		
Singapore		
South Africa		
Taiwan		
Thailand		
Turkey	✓	
United Arab Emirates		
United Kingdom	✓	Planned
Vietnam		

## 5.2 FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and the receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

## 5.3 IC Statement

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.

Under Industry Canada regulations, these radio transmitters may only operate using provided antennas approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec des antenne fournies approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.



## 5.4 CE Statement

Rigado, Inc. declares that the Radius RBG-1000C complies with the essential requirements and other relevant provisions of Radio Equipment Directive 2014/53/EU. A copy of the Declaration of Conformity is available on request.

Rigado, Inc.  
101 SW Main St., Suite 2000  
Portland, OR 97204 USA

## 5.5 RF Exposure Statement

This equipment complies with the radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and any part of the human body.

## 5.6 Non-modification Warning Statement

Changes or modifications to this equipment that are not expressly approved by Rigado could void the user's authority to operate the equipment.

## 5.7 Product Insert – Compliance Information

The following images show the regulatory insert provided within the product packaging.



**RadBeacon  
Gateway**

**Important Safety Information**  
Before installing or operating this product, please review this insert and the information made available via the Radius Networks Installation Manual.  
Unless otherwise indicated, this product is designed for indoor use only. Use in dry locations only. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus that produce heat. Only use attachments and accessories specified by the Manufacturer.

**Optimal Product Placement**  
This product uses wireless communications to operate. Do not install the product inside or near any large metal objects, or near sources of radio interference. Refer to the Radius Networks Installation Manual for details.





**Disposal Guidelines**

<p><b>For professional users in the European Union</b> If you wish to discard electrical and electronic equipment (EEE), please contact your dealer or supplier for further information.</p>	<p><b>For disposal in countries outside of the European Union</b> This symbol is only valid in the European Union (EU). If you wish to discard this product please contact your local authorities or dealer and ask for the correct method of disposal.</p>
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**Product Regulatory Information**

<p><b>UK</b> CA</p> <p><b>FC</b></p> <p><b>RoHS</b> Compliant</p>	<p>Radius Networks declares that the RBG-1000B and RBG-1000C products comply with the essential requirements and other relevant provisions of Radio Equipment Directive 2014/53/EU. A copy of the Declaration of Conformity is available on request. The RBG-1000B and RBG-1000C RadBeacon Gateways are RoHS compliant per RoHS Recast Directive 2011/65/EU, and Directive (EU) 2015/863. For additional details, including any exemption information, please contact Radius Networks.</p>
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<p><b>Model: RBG-1000C</b> FCC ID: 2ABYU-RBG001 IC: 12010A-RBG001</p>	<p><b>Model: RBG-1000B</b> Contains FCC ID: 2AA9804 Contains IC: 12208A-04</p>	<p><b>Korea:</b> R-CRM-FTE-RBG-1000B RadBeacon Gateway 모델: RBG-1000B 공모자: Radius Networks, Inc. 제조사: Rigado, Inc. 제조 일자: 2018 년 6 월 30 일 중국산 해당 무선설비는 운용중 전파혼신 가능성이 있음</p>
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<p><b>China SRRC</b> CMIIT ID: 2017DJ7203</p> <p><b>Japan:</b> 204-820196</p>	<p><b>Indonesia:</b> 76936/SDPPI/2021 3012</p> 	    <p><b>Paraguay:</b> NR: 2018-11-1-000535</p>  <p>Radius Networks, Inc. 3299 K Street NW, Suite 400, Washington, DC 20007, USA</p>
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745-00002 v0J
Page 1

Figure 3 Certification Insert (Front)

**FCC Statement**

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.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

**FCC Caution**

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

**RF Exposure Statement**

This equipment complies with the radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and any part of the human body.

**Canada (ISED) Statement**

This device contains license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's license-exempt RSS(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.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique 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; (2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Cet équipement est conforme aux limites d'exposition IC établies pour un environnement non contrôlé. L'appareil peut être utilisé dans des conditions d'exposition portables. Cet équipement doit être installé et utilisé avec une distance minimale de 20 cm entre le radiateur et le corps.

Figure 4 Certification Insert (back)