TRIDIUM®
Connecting minds and machines

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PRELIMINARY DRAFT - FOR REVIEW ONLY

NaviCare® Beacon
MOUNTING AND WIRING INSTRUCTIONS

This document covers the mounting and wiring of the NaviCare® Beacon module. It assumes that you are an engineer, technician, or service person who is performing control system installation. Instructions in this document apply to these products:
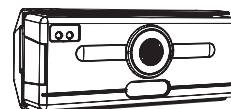
Model	Description
HR-BAH-PBM000	NaviCare® Beacon module
WPM-US	15Vdc wall power supply (optional)

Note   Not covered in this document is the NaviCare software installation and configuration required for a fully functioning unit. Refer to the *NaviCare® BioMed Configuration Station User Guide* for this information.

These are the main topics included in this document:

Also included in this document are several appendixes, as follows:

Product Description

The Beacon module is part of the NaviCare® Bed as Hub Solution, which provides integrated control, supervision, and network management solutions for wireless patient medical data collection systems.

The Beacon module is installed with a NaviCare® Wall Hub, and emits synchronized Ultrasonic and 802.15.4 wireless RF signals for use in determining distance of nearby medical devices. The Beacon module is powered by 15Vdc, which can be supplied from the Wall Hub using a two-conductor, 13.12 foot (4m) cable connected between the two devices. This cable is included with the Beacon module. If needed, two Beacon modules can be installed and powered by the same Wall Hub. The Beacon module can also be powered by a 15Vdc wall power supply.

PRELIMINARY DRAFT - FOR REVIEW ONLY

Packaging and Features

The Beacon module features a snap-together plastic housing and is attached to the wall or ceiling with a mounting bracket that allows mounting in one of three positions. The Beacon features a 40KHz ultrasonic transmitter as well as Jennic 801.15.4 wireless RF communications, and is powered by 15Vdc from the Wall Hub or from an optional 15Vdc wall power supply.

Figure 1   Beacon module features, connectors, and buttons.
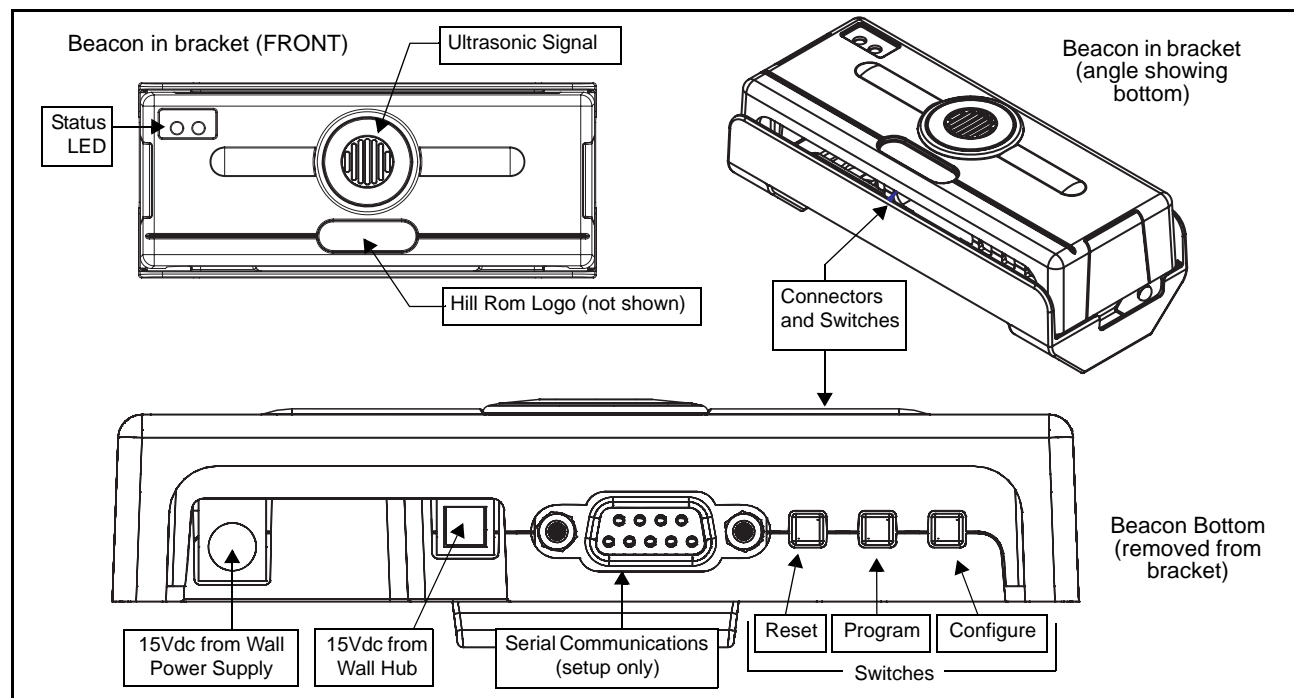
Table 1   Beacon and Beacon features and options.

Model	Description	Ports / Notes
HR-BAH-PBM000	Beaconing device with Ultrasonic transmitter and Jennic 802.15.4 wireless RF communications.	1 - RS-232 Serial, DB-9 male (used for configuration only)
WPM-US	15Vdc wall power supply (optional)	

Technical Specifications

Platform
- Jennic 802.15.4 wireless
- 40KHz ultrasonic transmitter
- Standard RS-232 port

Physical
- Plastic snap-together enclosure and mounting bracket. Can be mounted in one of three positions: perpendicular to mounting surface and 45 degrees off-axis either direction.
- Dimensions: 5.10" (129.5mm) wide x 2.18" (55.2mm) high x 1.79" (45.4mm) deep.
- Weight: Net 4 oz. (114 g)

Environment
- Operating temperature range: 32°F to 122°F (0°C to 50°C).

PRELIMINARY DRAFT - FOR REVIEW ONLY

- Relative humidity range: 5% to 80%, non-condensing.
- Storage temperature range: -4°F to 122°F (-20°C to 50°C).

Equipment Ratings

Electrical
- Input voltage range: 10Vdc to 16Vdc
- Current consumption: 50mA maximum

Preparation

Unpack the Beacon and inspect the package contents for damaged or missing components. If damaged, notify the appropriate carrier at once and return any damaged components for immediate repair or replacement. See "Returning a Defective Unit" on page 10.

- Included in this Package
- Material and Tools Required

Included in this Package

Included in the package you should find the following items:

- a Beacon module.
- a two-conductor Beacon power cable, 13.12 ft. (4m), for connection from the Wall Hub to the Beacon module.
- a hardware bag containing the following items:
  – Mounting screws and wall anchors.
- These *Beacon Mounting and Wiring Instructions*, Part Number 11xxxx

Material and Tools Required

The following supplies and tools are typically required for installation:

- Suitable tools and fasteners for mounting unit to wall, as well as routing external wiring to knockouts in unit, including wiring clamps.
- Small flat-blade screwdriver: used for removing Beacon module from mounting bracket.

Note **This product is intended for indoor use only. The unit should not be exposed to ambient conditions outside of the range of 32ºF (0ºC) to 122ºF (50ºC), or relative humidity outside the range of 5% to 90%, non-condensing. Refer to the "Environment" section for further details on mechanical and storage specifications.**

Related Documentation

For more information on configuring and using the Beacon module, consult the following documents:

- *NaviCare® Wall Hub Mounting and Wiring Instructions*
- *NaviCare® BioMed Configuration Station User Guide*

PRELIMINARY DRAFT - FOR REVIEW ONLY

Precautions

This document uses the following warning and caution conventions:

⚠ Caution   Cautions remind the reader to be careful. They alert readers to situations where there is a chance that the reader might perform an action that cannot be undone, might receive unexpected results, or might lose data. Cautions contain an explanation of why the action is potentially problematic.

⚠ Warning   **Warnings alert the reader to proceed with extreme care. They alert readers to situations where there is a chance that the reader might do something that can result in personal injury or equipment damage. Warnings contain an explanation of why the action is potentially dangerous.**

Safety Precautions

The following items are warnings of a general nature relating to the installation and start-up of the Beacon module. Be sure to heed these warnings to prevent personal injury or equipment damage.

⚠ Warning
- **A 15Vdc circuit powers the Beacon. Disconnect power before installation or servicing to prevent electrical shock or equipment damage.**

- **Make all connections in accordance with national and local electrical codes. Use copper conductors only.**

- **To reduce the risk of fire or electrical shock, install in a controlled environment relatively free of contaminants.**

- **This device is only intended for use as a monitoring and control device. To prevent data loss or equipment damage, do not use it for any other purpose.**

- **The Beacon contains no user serviceable parts. Do not disassemble the Beacon module.**

Static Discharge Precautions

Static charges produce voltages high enough to damage electronic components. The microprocessors and associated circuitry within a Beacon module are sensitive to static discharge. Follow these precautions when installing, servicing, or operating the system:

⚠ Caution
- **Work in a static-free area**.

- **Discharge any static electricity you may have accumulated. Discharge static electricity by touching a known, securely grounded object.**

- **Do not handle printed circuit boards (PCBs) without proper protection against static discharge. Use a wrist strap when handling PCBs. The wrist strap clamp must be secured to earth ground.**

PRELIMINARY DRAFT - FOR REVIEW ONLY

Mounting and Dimensions

The Beacon module is designed for wall or ceiling mounting. Dimensions are provided in Figure 2 below.

Note Locate the Beacon within the reach of the power cable that attaches between the Wall Hub and Beacon, or within reach of the optional wall power supply. See Figure 5 on page 7 for an example diagram.

Figure 2 **Beacon module dimensions in inches and (mm).**
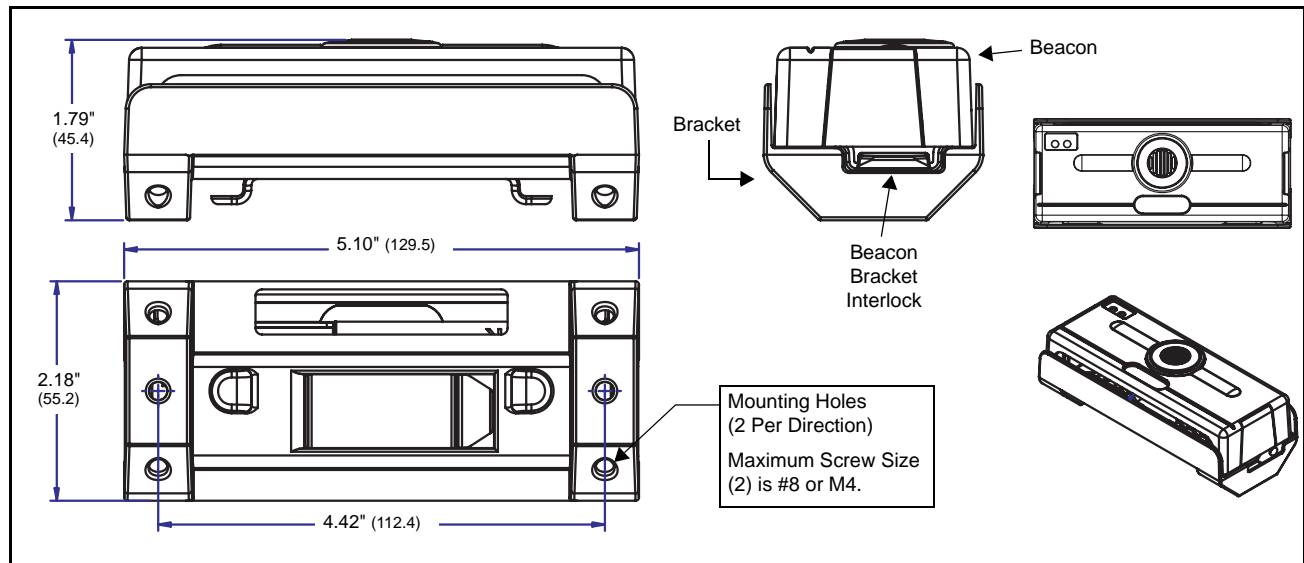
Caution Ultrasonic transmitter on front of Beacon must have unobstructed view of room.

Mounting the Beacon requires removal of the Beacon module from the Beacon mounting bracket. After the mounting bracket is securely mounted, and the Beacon power cable is connected, the Beacon module is inserted back into the mounting bracket.

For more details on mounting tasks, see the following subsections:

- "Remove Beacon module from mounting bracket," page 5
- "Fasten the Beacon mounting bracket to the wall or ceiling," page 6
- "Connect Beacon power cable," page 7

Remove Beacon module from mounting bracket

You must remove the Beacon module from the mounting bracket before mounting. The Beacon module is secured to the mounting bracket by a locking tab.
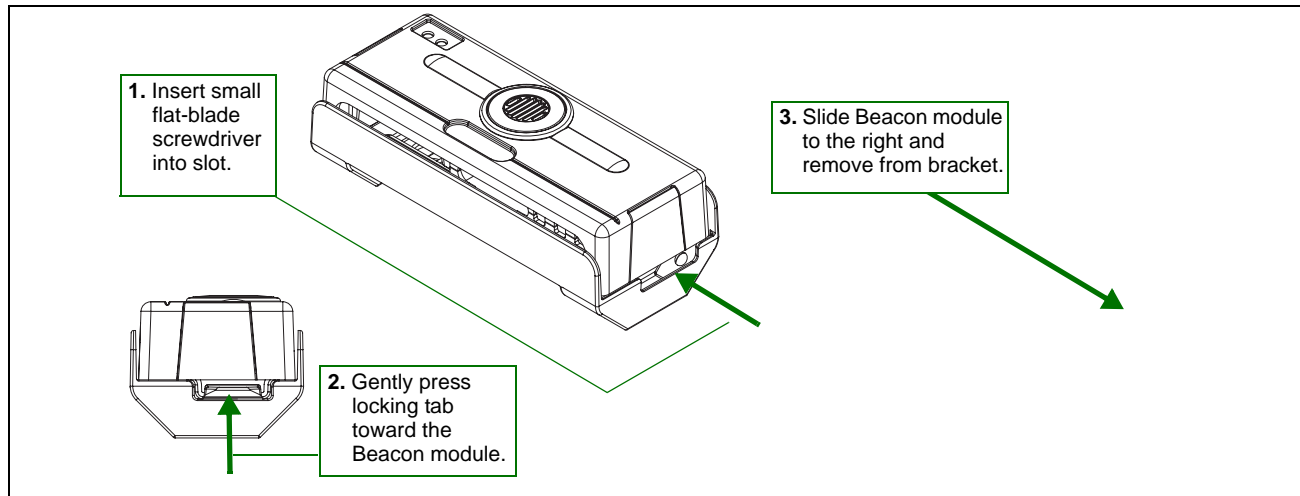
Warning **A 15Vdc circuit powers the Beacon. Disconnect power before installation or servicing to prevent electrical shock or equipment damage.**

Fasten the Beacon mounting bracket to the wall or ceiling

Figure 3   Removing Beacon module from mounting bracket.

1. Insert small flat-blade screwdriver into slot.

3. Slide Beacon module to the right and remove from bracket.

2. Gently press locking tab toward the Beacon module.

Procedure 1   Removing the Beacon module from mounting bracket.

Step 1   If the unit is powered, first remove power.

Step 2   Insert flat-blade screwdriver in the right-side slot between Beacon module and mounting bracket.

Step 3   Gently press locking tab forward toward the Beacon module.

**Step 4**   Remove Beacon module from bracket by sliding module to the right.

Note   To replace the Beacon module, insert into the right side of bracket and slide left until tab lock engages.

Fasten the Beacon mounting bracket to the wall or ceiling

After removing Beacon module from mounting bracket, mount the bracket to the wall or ceiling using two fasteners. There are three pairs of mounting holes on the mounting bracket, allowing the Beacon to be positioned in one of three angles. The Beacon can be mounted perpendicular to the mounting surface, or can be mounted 45 degrees off-axis either direction. See Figure 2 on page 5 for mounting dimensions.

Figure 4   Mounting bracket options.

Beacon can mount in one of three positions.

Top

Wiring access hole

Bottom
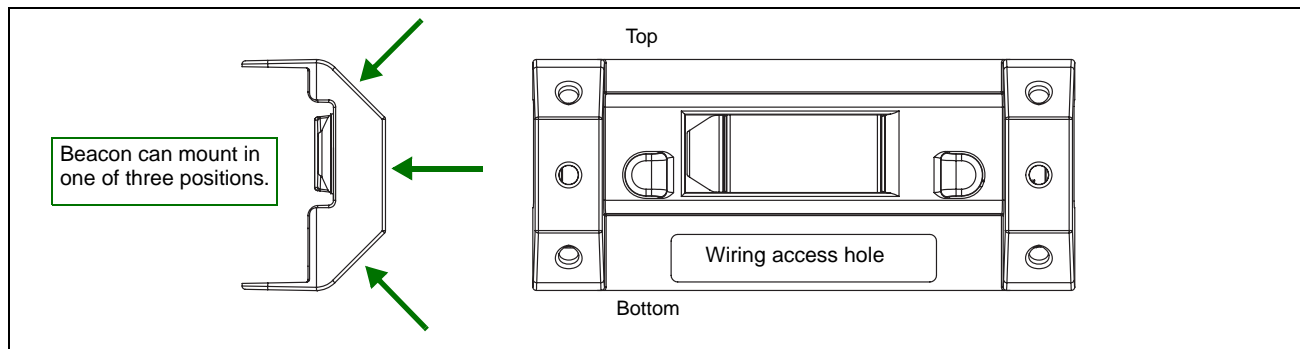
After securing the bracket to the wall or ceiling, wire power from Wall Hub to back of Beacon mounting bracket. See the next section "Connect Beacon power cable."
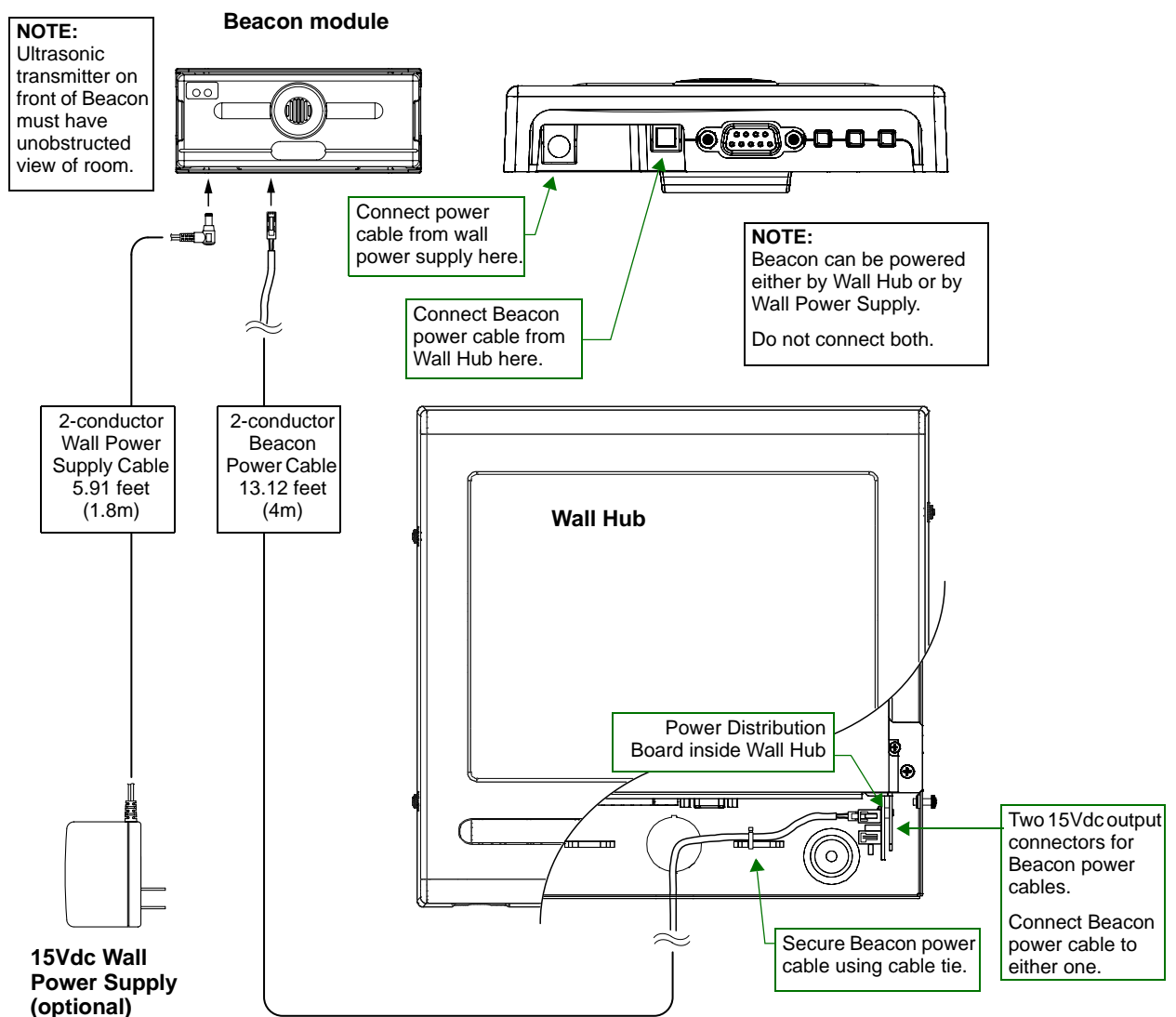
Connect Beacon power cable

After mounting the bracket, but *before* re-installing the Beacon module, install Beacon power cable from Wall Hub (or optional wall power supply) to Beacon mounting bracket.

⚠		
Warning	•	**Input voltage is 15Vdc. Disconnect AC power to the Wall Hub (or optional wall power supply) before installation to prevent electrical shock or equipment damage.**
	•	**Beacon can be powered by 15Vdc from either the Wall Hub or the optional wall power supply (not both). Do not connect 15Vdc from both devices.**

Figure 5   **Wiring Beacon power cable from Wall Hub to Beacon module.**

Beacon module

NOTE: Ultrasonic transmitter on front of Beacon must have unobstructed view of room.

Connect power cable from wall power supply here.

Connect Beacon power cable from Wall Hub here.

NOTE: Beacon can be powered either by Wall Hub or by Wall Power Supply.

Do not connect both.

2-conductor Wall Power Supply Cable 5.91 feet (1.8m)

2-conductor Beacon Power Cable 13.12 feet (4m)

Wall Hub

Power Distribution Board inside Wall Hub

Two 15Vdc output connectors for Beacon power cables.

Connect Beacon power cable to either one.

Secure Beacon power cable using cable tie.

15Vdc Wall Power Supply (optional)

PRELIMINARY DRAFT - FOR REVIEW ONLY

Procedure 2 **Wiring power cable to Beacon mounting bracket.**

Step 1	Turn off power to Wall Hub (or optional 15Vdc wall power supply).
Step 2	If Beacon is powered by Wall Hub, connect one end of Beacon power cable to Wall Hub 15Vdc power output connector on Wall hub power distribution board. Secure with a cable tie inside Wall Hub (see bottom of Figure 5).
Step 3	Feed other end of Beacon power cable (or wall power supply cable) through wiring access hole at bottom of Beacon bracket (see Figure 4 on page 6).
Step 4	Connect Beacon power cable (or wall power supply cable) to Beacon power jack (see Figure 5).
Step 5	Insert Beacon module into right side of mounting bracket and slide module to the left until tab lock engages.
Step 6	Verify connections.

Wiring Details

See Figure 1 on page 2 to locate connectors and other components on the Beacon module.

Communications Wiring

The Beacon uses an RS-232 DB9 serial port located on the bottom of the module for configuration only. Refer to the *NaviCare® BioMed Configuration Station User Guide* for instructions on how to connect serial communications and configure the Beacon module.

Power Wiring

The Beacon is powered by the Wall Hub's 15Vdc power supply or by the optional 15Vdc wall power supply. The acceptable range for DC input is from 10Vdc to 16Vdc.

Note The Wall Hub has an On/Off switch located on the power distribution board, near the two connectors to power Beacon modules. This switch **must be ON for the Wall Hub to operate**—it does not switch power to Beacon modules. To remove 15Vdc power to *only* a Beacon, you can unplug the Beacon power cable from the connector on the Wall Hub's power distribution board (see Figure 5 on page 7).

Power Up and Initial Checkout

Following all mounting and wiring, perform the following:

Procedure 3 **Initial power up and checkout**

Step 1	Apply power to the Beacon by energizing the circuit powering the Wall Hub (or optional wall power supply).
Step 2	Verify that the green Status LED on the Beacon module illuminates.

PRELIMINARY DRAFT - FOR REVIEW ONLY

About LEDs

The Beacon provides a single Status LED which is located on the upper left corner of the front of the module. The status LED should remain lit whenever the Beacon is *powered*, or else blinking during a communications burst. If the status LED *does not light* while power is applied, contact System Engineering for technical support.

Maintaining the Beacon

This section provides information on the following topics:

- Cleaning
- Replacement Parts
- Returning a Defective Unit

Cleaning

Special care must be taken when cleaning a Beacon module to prevent damage to the unit.

⚠️

Caution   Follow these instructions to avoid damage to the Beacon module:

- Do not spray any cleaning solution directly onto the component. Doing so can cause excess solution to leak into and damage the component. Spray the cleaner only to lightly dampen a cloth and use the cloth to clean the component.
- Do not use harsh cleaners, solvents, or detergents. Doing so may damage the component.
- Use a soft lint-free cloth to clean the enclosures of all components.
- Spray a mild household disinfectant cleaner on the cloth to help remove stubborn soil and stains.
- In the unlikely event that a Beacon module or cable is contaminated internally by liquids or fluids, do not attempt to clean the component. Contact your Tridium representative for replacement parts.

Replacement Parts

There are no user serviceable or replacement parts in the Beacon. Do not disassemble the Beacon module. A new unit is the only replacement option.

New Replacement Unit

To replace an entire unit, order and install a *new* Beacon. If the faulty Beacon is *still in warranty*, you can receive credit by returning it to Tridium. Be sure to contact Tridium for a return authorization (RA) number before shipping an item for return credit. See for more details.

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Note   Before ordering a new Beacon, it is strongly recommended that you contact your normal technical support resource to eliminate the possibility of a software issue or mis-configuration problem.

PRELIMINARY DRAFT - FOR REVIEW ONLY

Returning a Defective Unit

Note If the defective unit is under warranty, please follow return instructions provided in this section. If the unit is *out of warranty*, please discard any replaced part.

- Do not return an out-of-warranty Beacon or Beacon to Tridium.

For proper credit on an in-warranty unit, ship the defective unit or part to Tridium within 30 days.

Prior to returning the item, contact one of the following Tridium offices to obtain a return authorization (RA) number and other instructions. Please provide:

- Product model • Serial number • Nature of the defect • Purchase order number to secure RMA

United States

Phone: 804-254-7086, ext. 11

Email for RMA:
rma@tridium.com

Return to:
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Tridium, Inc.
2256 Dabney Road, Suite C
Richmond, VA 23230
Attn: Return Department RA# _____
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Certifications

Federal Communications Commission (FCC)

Changes or modifications not expressly approved by Tridium, Inc. could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This device complies with Part 18 of the FCC Rules. This device may interfere with other devices using an ultrasonic transmitter. If this occurs, re-orient or relocate the device to correct the interference.

Responsible Party:

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Tridium, Inc.
3951 Westerre Parkway, Suite 350
Richmond, Virginia 23233
United States of America
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Phone: 804-747-4771