



MPACT LOCATION & ANALYTICS

Hardware Installation Guide

**MB1000 ATLS-T1B
MB2000 MPact-INDR1
MB3000 MPact-USB1
MB4000 MPact-OUTR1
GE-MB1000-01-WR
GE-MB2001-01-WR
GE-MB4001-01-WR
GE-MB5000-01-WR
GE-MB6000-01-WR Badge
GE-MB6000-CHRGR**



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Appendix A Customer Support

ABOUT THIS GUIDE

This guide supports the following product families, parts and regulatory models:

PRODUCT FAMILY	PART NAME	REGULATORY MODEL
MB 1000	MPACT-T1B10-000-WR	ATLS-T1B
MB 1000	MPACT-T1B20-000-WR	ATLS-T1B
MB 1000	GE-MB1000-01-WR	MPACT- INDR2
MB 1000	GE-MB1000-TAPE	MPACT- INDR2
MB 1000	GE-MB1000-01-ACC	MPACT- INDR2
MB 2000	MPACT-MB2000-01-WR	MPACT-INDR1
MB 2000	GE-MB2001-01-WR	MPACT-INDR1
MB 2000	GE-MB2001-01-KIT	MPACT-INDR1
MB 2000	GE-MB2001-01-ACC	MPACT-INDR1
MB 2000	GE-MB-WALL-TAPE	-
MB 3000	MPACT-MB3000-01-WR	MPACT-USB1
MB 4000	MPACT-MB4000-01-WR	MPACT-OUTR1
MB 4000	MPACT-MB4001-01-WR	MPACT-OUTR1
MB 4000	GE-MB4000-01-WR	MPACT-OUTR1
MB5000	GE-MB5000-01-WR	MPACT-HUBFXD
MB5000	GE-MB-WALL-TAPE	-
MB6000	GE-MB6000-01-WR	MPACT-BRDGM
MB6000	GE-MB6000-CHRGR	MPACT-CRDLE
MB6000	GE-MB6000-01-ACC	MPACT-BRDGM
MB6000	GE-MB6000CABLE-US	MPACT-CRDLE
MB6000	GE-MB6000CABLE-EU	MPACT-CRDLE

This chapter is organized into the following sections:

- *[Using the Documentation](#)*
- *[Zebra Technologies Corporation \("Zebra"\) End-User Software License Agreement](#)*

Using the Documentation

The following sections provide information about the document and notational conventions used in the guides, and provides a list of related documentation.

Document Conventions

The following conventions are used in this manual to draw your attention to important information:



NOTE: Indicates tips or special requirements.



CAUTION: Indicates conditions that can cause equipment damage or data loss.



WARNING! Indicates a condition or procedure that could result in personal injury or equipment damage.

Revision History

This guide has the following release and revision milestone history: July

<i>Release</i>	<i>Date</i>	<i>Change</i>
Revision A	July, 2015	Initial release of document with new MPact beacons added.
Revision A (new baseline)	February, 2016	Outdoor beacon added. New Zebra template utilized.
Regulatory Draft	July 2016	GE version beacons and accessories added.

Notational Conventions

The following notational conventions are used in this document:

- Italics are used to highlight specific items in the general text, and to identify chapters and sections in this and related documents
- Bullets (•) indicate:
 - lists of alternatives
 - lists of required steps that are not necessarily sequential
 - action items
- Sequential lists (those describing step-by-step procedures) appear as numbered lists

Related Documentation

MPact Location and Analytics documentation includes the following:

- *MPact Location & Analytics Deployment Guide*
- *MPact Location & Analytics Server Reference Guide*
- *MPact Location & Analytics Android Toolbox User Guide*
- *MPact Location & Analytics iOS Toolbox User Guide*
- *MPact Location & Analytics Client Software Development Kit*
- *MPact Location & Analytics Server API Reference Guide*
- *MPact Location & Analytics Hardware Installation Guide*

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CHAPTER 1 MPACT BLUETOOTH® SMART BEACON OVERVIEW

MPact utilizes Bluetooth® Smart beacons in various modes to unify Wi-Fi and Bluetooth® Smart Technology to capture analytics, accuracy and insight.

Beacon placements can be adjusted within a deployment floor plan, and depending on the mode selected, their battery life can be tracked over time. Administrators can cursor over a beacon on a site's floor plan to assess the beacon's remaining battery life. This guide covers a variety of indoor, outdoor and USB type beacons, mounting options, and operational instructions for each beacon type.

This guide includes the following:

- *Beacon Hardware Specifications and Installation*
 - *MB1000 Beacon Part Number: MPACT-T1B20-000-WR*
 - *MB1000 Beacon Part Number: MPACT-T1B10-000-WR*
 - *MPACT-INDR1: MPACT-MB2000-01-WR, GE-MB2001-01-WR MPACT-INDR2: GE-MB1000-01-WR*
 - *Beacon Battery Replacement*
 - *USB Beacon Part Number: MPACT-MB3000-01-WR*
 - *Beacon Part Numbers: MPACT-MB4000-01-WR, MPACT-MB4001-01-WR, GE-MB4000-01-WR and GE-MB4001-01-WR*
 - *Beacon Part Number: GE-MB1000-01-WR*
 - *Beacon Part Number: GE-MB2001-01-WR*
 - *Initializing a GE-MB5000-01-WR Hub*
 - *Beacon Part Number: GE-MB6000-01-WR Badge*
 - *Cradle Charger: MPACT-MB6000-CHRG*

1.1 Product and Part Compatibility Matrix

This guide supports the following product families, parts and regulatory models:

PRODUCT FAMILY	PART NAME	REGULATORY MODEL
MB 1000	MPACT-T1B10-000-WR	ATLS-T1B
MB 1000	MPACT-T1B20-000-WR	ATLS-T1B
MB 1000	GE-MB1000-01-WR	MPACT- INDR2
MB 1000	GE-MB1000-TAPE	MPACT- INDR2
MB 1000	GE-MB1000- 01-ACC	MPACT- INDR2
MB 2000	MPACT-MB2000-01-WR	MPACT-INDR1
MB 2000	GE-MB2001-01-WR	MPACT-INDR1
MB 2000	GE-MB2001-01-KIT	MPACT-INDR1
MB 2000	GE-MB2001-01-ACC	MPACT-INDR1
MB 2000	GE-MB-WALL-TAPE	-
MB 3000	MPACT-MB3000-01-WR	MPACT-USB1
MB 4000	MPACT-MB4000-01-WR	MPACT-OUTR1
MB 4000	MPACT-MB4001-01-WR	MPACT-OUTR1
MB 4000	GE-MB4000-01-WR	MPACT-OUTR1
MB5000	GE-MB5000-01-WR	MPACT-HUBFXD
MB5000	GE-MB-WALL-TAPE	-
MB6000	GE-MB6000-01-WR	MPACT-BRDGM
MB6000	GE-MB6000-CHRGR	MPACT-CRDLE
MB6000	GE-MB6000-01-ACC	MPACT-BRDGM
MB6000	GE-MB6000CABLE-US	MPACT-CRDLE
MB6000	GE-MB6000CABLE-EU	MPACT-CRDLE

Figure 1-1 Product and Part Compatibility

CHAPTER 2 BEACON HARDWARE SPECIFICATIONS AND INSTALLATION

The following setup processes must be completed as a prerequisite to installing beacon hardware:

- *MPact Server Installation and Setup* - see the *MPact Location & Analytics Deployment Guide*
- *MPact Toolbox and Beacon Installation* - see the *MPact Toolbox User Guides*

The guides are available at www.zebra.com/support.

Lozier® Shelves

Beacon brackets for the MPACT-T1B20-000-WR and MPACT-T1B10-000-WR are used with the following Lozier products:

- TL Shelf
- DL Shelf
- HL Shelf
- Standard Base Deck

2.1 MB1000 Beacon Part Number: MPACT-T1B20-000-WR

As a prerequisite, the following hardware items are required to mount the tie-wrap style beacon housing to a pole or similar structure:

- Beacon (tie-wrap style housing), part number - MPACT-T1B20-000-WR. (When ordering, use part number: MPACT-T1B20-250-WR (box of 25).
- Plastic tie wraps for attaching each beacon housing to the shelf

2.1.1 Installing the Tie-Wrap Style Beacon

Tie-wrap beacon housings are designed to attach to vertical or horizontal poles or similar mounting surfaces. In [Figure 2-1](#), there are openings on the back of the beacon housing allowing a tie wrap through the openings and wrapped around a pole or similar structure.

Notice the up arrow located on the middle of the beacon housing. This arrow indicates the optimal orientation for the beacon to function properly. Additionally, the smooth front of the beacon should face outward toward the aisle where client devices are expected to engage (dwell).

[Figure 2-1](#) shows a beacon with the mylar strip attached to the left-hand side of the housing.

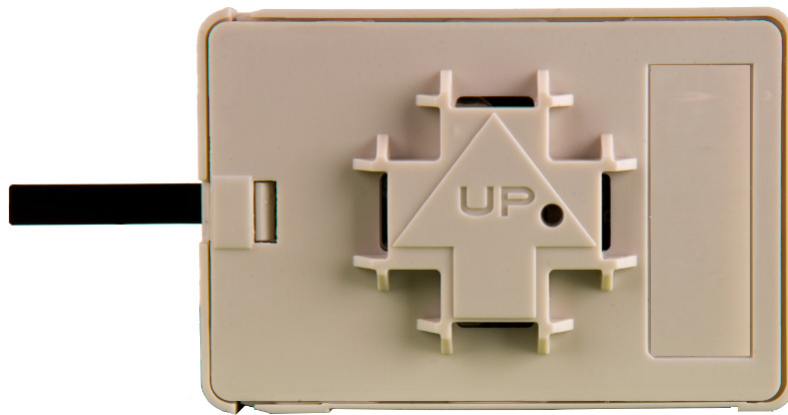


Figure 2-1 Tie Wrap Style Beacon - Part Number - MPACT-T1B20-000-WR



NOTE: When installing numerous beacons, group beacons by category and activate them prior to scanning the barcodes and associating them with positions in the Toolbox.

From MPact the Toolbox, select a site floor plan and an unassigned position for the beacon. Refer to the *MPact Location & Analytics Deployment Guide* for information on how to install and deploy the beacon from the Toolbox.

To mount the tie wrap beacon to a pole or similar structure:

- Mount the beacon to a pole or similar structure using the plastic tie wrap. Tie can be placed vertically or horizontally but the arrow should still point up.

To activate a beacon part number - MPACT-T1B20-000-WR:

- Activate one or more beacons by pulling the mylar strip off the beacon housing.



CAUTION: After pulling off the last mylar strip, you have 20 seconds to associate the beacon in either offline or online mode using the Toolbox application.

2.2 MB1000 Beacon Part Number: MPACT-T1B10-000-WR

As a prerequisite, the following hardware items are required to mount beacon brackets to a Lozier style shelf:

- [Lozier® Shelves](#)
- Beacon: Part number - MPACT-T1B10-000-WR
 - When ordering, use the following part number: MPACT-T1B10-250-WR (box of 25)
- Bracket mount, one of the following:
 - MPACT Metal Lozier Bracket: Part number MPACT-A1010-004-WR
 - MPACT Plastic Lozier Bracket: Part number MPACT-A1010-001-WR
- Phillips head screw driver for mounting the bracket (metal brackets only) to the Lozier shelf

2.2.1 Mounting and Installing the Universal Style Beacon

Figure 2-2 shows a *universal* style beacon. While there is no up arrow on this beacon's housing, the beacon should be oriented similar to the tie wrap style of beacon housing, see [MB1000 Beacon Part Number: MPACT-T1B20-000-WR](#).

Notice the up arrow located on the middle of the beacon housing. This arrow indicates the optimal orientation for the beacon to function properly. Additionally, the smooth front of the beacon should face outward toward the aisle where client devices are expected to engage (dwell).



Figure 2-2 Universal Style Beacon - Part Number - MPACT-T1B10-000-WR



NOTE: When installing numerous beacons, group beacons by category configurations and activate the beacons prior to scanning the barcodes and associating them with positions in the Toolbox.

From the MPact Toolbox, select a site floor plan and an unassigned position for the beacon. Refer to the *MPact Location & Analytics Deployment Guide* for information on how to install and deploy the beacon from the Toolbox.

The guides are available at www.zebra.com/support.

2 - 4 MPact Location & Analytics Hardware Installation Guide

To mount the universal style beacon to [Lozier® Shelves](#):

1. Mount the universal beacon shelf-bracket on the shelf:
 - *Metal brackets*: Fit in place and tighten onto the shelving unit using a phillips-head screw driver.
 - *Plastic brackets*: Fit in place and snap onto the shelving unit.
2. Fit the beacon's universal style housing into the bracket (mylar strip pointing up) and turn the beacon housing clockwise 90 degrees.

The barcode label should face up toward the ceiling and the smooth front of the beacon should face out toward the aisle where the mobile client is expected to engage.

There are two styles of bracket mounts from which to choose, either metal or plastic for Beacon:
Part number - MPACT-T1B10-000-WR.

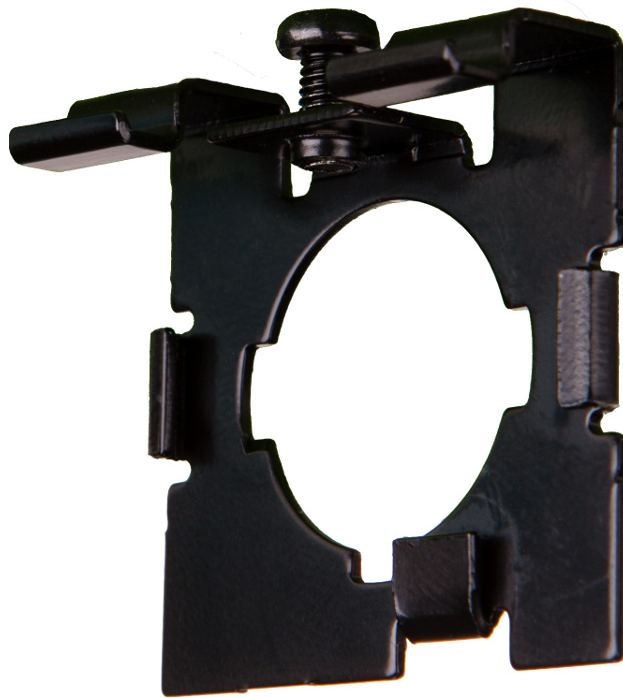


Figure 2-3 Universal Style Metal Bracket - Part Number MPACT-A1010-004-WR

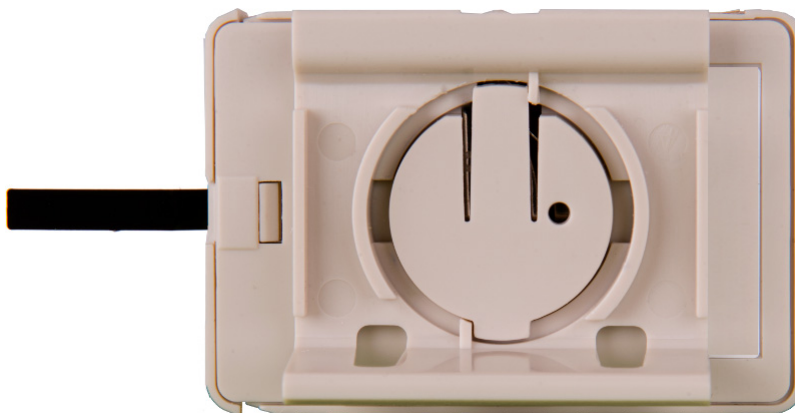


Figure 2-4 Universal Style Plastic Bracket with Beacon- Bracket Part Number MPACT-A1010-001-WR

Activate one or MPACT-T1B10-000-WR model beacons by pulling the mylar strip off the beacon housing.



CAUTION: After pulling off the last mylar strip, you have 20 seconds to associate the beacon in either offline or online mode using the Toolbox application.

2.2.2 Beacon Battery Replacement

When a beacon's battery life is less than 20%, the beacon should be prioritized for immediate replacement. The beacon's battery is located within a battery tray in the beacon's housing.

This section includes procedures for replacing batteries for the following part numbers:

- *Replacing MB1000 Battery: MPACT-T1B20-000-WR and MPACT-T1B10-000-WR*

2.2.2.1 Replacing MB1000 Battery: MPACT-T1B20-000-WR and MPACT-T1B10-000-WR

MPACT-T1B20-000-WR and MPACT-T1B10-000-WR beacon battery:

1. Remove the beacon from the shelving unit.
2. With the bottom of the beacon facing up, gently lift each corner of the beacon's battery tray.

Figure 2-5 shows the beacon battery housing for part number MPACT-T1B20-000-WR and MPACT-T1B10-000-WR and MPACT-T1B10-000-WR. In this example, the battery tray is on the right and the corners of the battery tray are marked in red. When gently lifting each tray corner, slightly push the each corner out to dislodge corners of the tray.

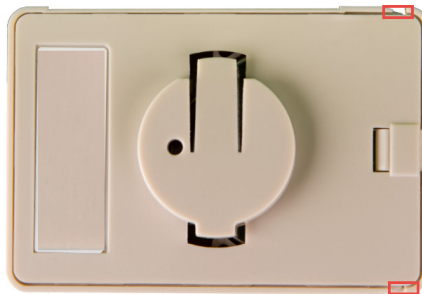


Figure 2-5 Beacon Battery Housing Example: MPACT-T1B20-000-WR and MPACT-T1B20-000-WR and MPACT-T1B10-000-WR

3. With both tray corners dislodged, gently slide the battery tray open, being careful not to drop the tray.

Figure 2-6 shows an open battery housing. In this example, the battery tray is a separate piece, along with the battery, on the right-hand side.

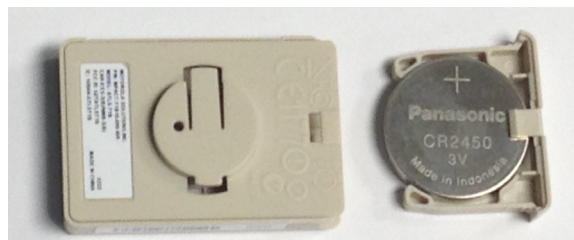


Figure 2-6 Battery Tray: MPACT-T1B20-000-WR and MPACT-T1B20-000-WR and MPACT-T1B10-000-WR

4. Remove the old battery, dispose properly, and replace with a Panasonic CR2450 model battery.



NOTE: Pay attention to the position of the + on the battery. Installing the battery backwards may damage the Beacon

5. Close the tray, ensuring the latch is secure.

2.3 MPACT-INDR1: MPACT-MB2000-01-WR, GE-MB2001-01-WR MPACT-INDR2: GE-MB1000-01-WR

As a prerequisite, the following hardware is required to wall mount a beacon:

- Beacon: Part numbers - MPACT-MB2000-01-WR and GE-MB2001-01-WR
 - When ordering, use the following part number: MPACT-MB2000-01-WR (box of 25)
- Bracket mount kit see [Figure 2-7](#) (included with part number MPACT-MB2000-01-WR):
 - Metal bracket
 - Two 1inch Phillips head tap screws, and two 1inch plastic wall inserts

2.3.1 Mounting and Installing the Indoor Style (MPACT-MB2000-01-WR) Beacon

1. From the MPact Toolbox, select a site floor plan and an unassigned position for the beacon. Refer to the *MPact Location & Analytics Deployment Guide* for information on how to install and deploy the beacon from the Toolbox.
To mount the universal style beacon to a wall:
 - .a Mount the beacon wall bracket with the provided screws and plastic wall inserts.
 - .b Press the beacon's housing onto the bracket as shown in [Figure 2-7](#).



NOTE: The barcode label should face up toward the ceiling and the smooth front of the beacon should face out toward the aisle where clients are expected to engage (dwell).



NOTE: When installing numerous beacons, group beacons by category configurations and activate the beacons prior to scanning the barcodes and associating them with positions in the Toolbox.

There is one style of bracket mount included with the Indoor Style Beacon: Part number - MPACT-MB2000-01-WR.

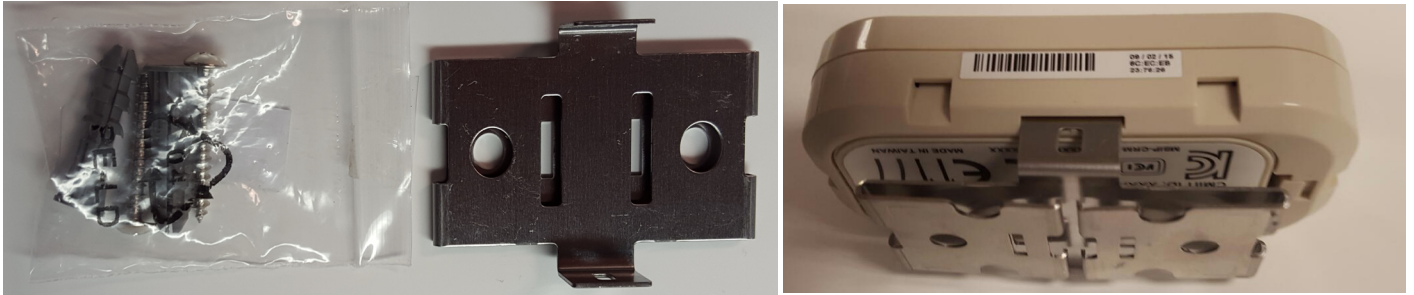


Figure 2-7 Metal Beacon Wall Mount Bracket: MPACT-MB2000-01-WR



NOTE: Ensure the beacon is positioned correctly, Once the beacon is mounted on the bracket it will be difficult to remove.

2. Activate one or more MPACT-MB2000-01-WR beacons by pulling the mylar strip out from inside the beacon housing.



CAUTION: After pulling off the last mylar strip, you have 20 seconds to associate the beacon in either offline or online mode using the Toolbox application.

Phillips head screw driver for mounting the bracket (metal brackets only) to a wall



Figure 2-8 Indoor Style Beacon - MPACT-MB2000-01-WR

2.3.2 Mounting and Installing a GE-MB2001-01-WR (TBD)

To mount a GE- MB2001-01-WR model beacon:

Figure 2-9 *GE-MB2001-01-WR Cover and Wall Mount*

2.4 Beacon Operating Modes

Refer to the following for beacon operating modes for MPACT-MB2000-01-WR, GE-MB2000-01-WR and GE-MB1000-01-WR model beacons:

Mode	Definition
<i>Sleep</i>	The beacon is not transmitting or accepting client connections.
<i>Configuration</i>	The beacon accepts connections from clients. Clients can configure the device when connected.
<i>Broadcast</i>	The beacon is transmitting packets that conform to one of the supported beacon formats (iBeacon, MPact, Battery Save and SecureCast).

Refer to the following for Indoor Style Beacon operating modes:

Mode	Sleep	Configuration	Broadcast	LED Behavior
0-2 seconds	No action	No action	No action	
2+ -5	Broadcast	Broadcast	Broadcast	Slow flash when button flashes 300 ms on / 300ms off.
5+ - 10	Move to configuration	Remain in configuration	Move to configuration	Fast flash – 100ms /on & off
+ 10	Sleep	Sleep	Sleep	Solid light

2.5 Beacon Battery Replacement

When a beacon's battery life is less than 20%, the beacon should be prioritized for immediate replacement. The beacon's battery is located within a battery tray in the beacon's housing.

This section includes procedures for replacing batteries for the following:

- [Replacing Battery: MPACT-MB2000-01-WR and GE-MB2001-01-WR](#)

2.5.1 Replacing Battery: MPACT-MB2000-01-WR and GE-MB2001-01-WR

To replace a beacon's battery in part number MPACT-MB2000-01-WR and GE-MB2001-01-WR:

1. Remove the beacon from the shelving unit (see information on the appropriate beacon part number).
2. With the bottom of the beacon facing up, use your finger nail to gently lift the clip up to remove the back off the beacon's battery enclosure.
3. Remove the old batteries and dispose of properly and replace it with two new 2AA batteries.



NOTE: Pay attention to the polarity (+ and -) of the batteries. Installing the batteries incorrectly may damage the Beacon.



Figure 2-10 Open Battery Enclosure: MPACT-MB2000-01-WR

4. Close the battery enclosure, ensuring the clip is secure.

2.6 USB Beacon Part Number: MPACT-MB3000-01-WR

A USB powered interface is required to power the USB Beacon. No additional hardware is required.

2.6.1 Installing the USB Style Beacon

To activate a MPACT-MB3000-01-WR model beacon:

1. Insert the beacon into any standard USB power source. The beacon moves into connect mode automatically after insertion.

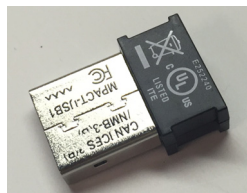


Figure 2-11 USB Style Beacon - MPACT-MB3000-01-WR

When installing numerous beacons, group beacons by category configurations and activate the beacons prior to scanning the barcodes and associating them with positions in the Toolbox.



NOTE: The USB beacon barcode is not on the beacon itself but on the on its plastic packaging.

2. After inserting the beacon(s) into any standard USB power source, associate the beacon in either offline or online mode in the Toolbox application.
3. From the MPact Toolbox, select a site floor plan and an unassigned position for the beacon. Refer to the *MPact Location & Analytics Deployment Guide* for information on how to install and deploy the beacon from the Toolbox. The guides are available at www.zebra.com/support.

2.7 Beacon Part Numbers: MPACT-MB4000-01-WR, MPACT-MB4001-01-WR, GE-MB4000-01-WR and GE-MB4001-01-WR

As a prerequisite, the following hardware items are required to mount a beacon.

- Beacon: Part numbers - MPACT-MB4000-01-WR
 - Two No. 6 gauge or M3.5 screws (not included) for use on the intended surface
 - Phillips head screw driver compatible with No. 6 gauge screws for mounting the Outdoor Style beacon

2.7.1 Antennae Positions

The following are antennae positions for the MPACT-MB4000-01-WR Outdoor Beacon:

- MPACT-MB4000-01-WR and GE-MB4000-01-WR orients its antenna down at a 20 degree angle
- MPACT-MB4001-01-WR orients its antenna down to the side at a 20 degree angle

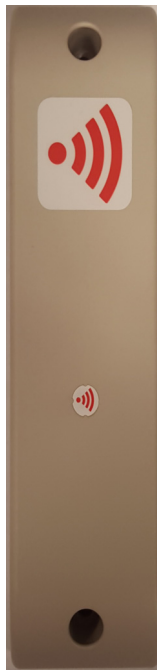


Figure 2-12 Antennae Positions for the MPACT-MB4000-01-WR Beacon

Figure 2-13 *Antennae Positions for the GE-MB4000-01-WR Beacon (TBD)*

2.7.2 Mounting and Installing the Outdoor Style Beacon

1. From the MPact Toolbox, select a site floor plan and an unassigned position for the beacon. Refer to the *MPact Location & Analytics Deployment Guide* for information on how to install and deploy the beacon from the Toolbox.
To prepare the Outdoor style beacon for mounting:
 - .a Prepare a surface with 3M VHB double-sided tape. See *section 2.7.2.1 Preparing Surface for Mounting with 3M VHB Double-sided tape*: on page 2-12.
 - Or
 - .b Prepare to mount the Outdoor style beacon with two No. 6 gauge or M3.5 screws (not included).



NOTE: If the surface is clean and smooth, the 3M VHB tape should be used to mount the beacon. However, is wood, brick or some other surface that is not smooth and clean, the 3M tape will not adhere to the surface. Use the appropriate screws for mounting (not included). When using screws to mount to a surface, do not expose the 3M VHB tape.

2.7.2.1 Preparing Surface for Mounting with 3M VHB Double-sided tape:

To prepare a surface before mounting the Outdoor style beacon to a wall with 3M VHB double-sided tape:

Clean the surface with a 50:50 mixture of isopropyl alcohol (*IPA*) and water before applying 3M™ VHB™ tape.

Some surfaces may require additional preparation such as the following:

- Use degreasers or solvent-based cleaner to remove heavy oil or grease from a surface followed by cleaning with IPA/water
- Scrape the surface, followed by cleaning with IPA/water to remove heavy dirt or oxidation and increases surface area to improve adhesion.
- Prime the surface to improve initial and ultimate adhesion to many materials such as plastics and paints..
- Seal porous and fibered materials such as wood, particleboard, and concrete to provide a unified surface.

After preparing the surface the Outdoor Style beacon is now ready to be mounted.

2.7.2.2 Mounting Outdoor Style Beacon

To mount a Outdoor Style beacon with 3M™ VHB™ tape:

1. Peel the plastic off from 3M™ VHB™ tape.
2. Press the backside of the Outdoor Style beacon firmly to a smooth clean mounting surface.

To mount a Outdoor Style beacon with No. 6 gauge or M3.5 screws:

1. Press the backside of the beacon to the mounting surface.
2. Insert screws into the screw holes as shown in [Figure 2-15](#) on page 2-13.



NOTE: Zebra recommends not removing the plastic backside of the 3M tape when mounting the beacon with screws.

3. Hand tighten the screws to firmly secure the beacon.



NOTE: Ensure the beacon is positioned correctly. Once the beacon is mounted it should difficult to remove.



Figure 2-14 Back of Outdoor Style Beacon Outdoor Beacon



Figure 2-15 Top of Outdoor Style Beacon - MPACT-MB4000-01-WR



NOTE: On MPACT-MB4000-01-WR model outdoor beacons, the red antenna pattern indicates that the antenna is pointing down.



NOTE: When installing numerous beacons, group beacons by category configurations and activate the beacons prior to scanning the barcodes and associating them with positions in the Toolbox.

2.7.2.3 Activating Outdoor Style Beacon

To activate a MPACT-MB4000-01-WR or GE-MB1000-01-WR model beacon:

1. Swipe your finger across the capacitive switch several times to wake the beacon out of shipping mode into broadcast mode. The light becomes solid and then turns off.



Figure 2-16 Activating Outdoor Style Beacon - MPACT-MB4000-01-WR

To put the beacon part number - MPACT-MB4000-01-WR into connect mode:

1. Press your finger on the capacitive switch for about five seconds. The LED will flash slowly. Refer to the table below for information about operating modes.



NOTE: When installing numerous beacons, group beacons by category configurations and activate the beacons prior to scanning the barcodes and associating them with positions in the Toolbox.

The barcode label should face up toward the ceiling and the smooth front of the beacon should face out to where the mobile client is expected to engage.

Mode	Shipping	Sleep	Configuration	Broadcast	LED Behavior
0-2 seconds	No action	No action	No action	No action	
2+ -7	Broadcast	Broadcast	Broadcast	Broadcast	Solid light
7+ - 12		Move to configuration	Remain in configuration	Move to configuration	Slow flash when button flashes 300 ms on / 300ms off.
+ 12		Sleep	Sleep	Sleep	Fast flash – 100ms /on & off

2.8 Beacon Part Number: GE-MB1000-01-WR

A GE-MB1000-01-WR beacon is a smaller beacon designed to be affixed to assets.

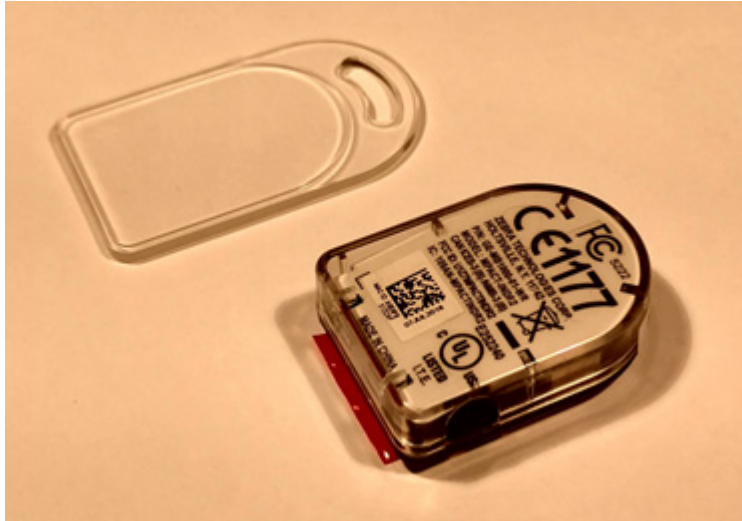


Figure 2-17 GE-MB1000-01-WR and Mounting Accessory

The above image depicts a GE-MB1000-01-WR asset beacon and the mounting accessory (GE-MB1000-01-ACC) used to attach the asset beacon to an object lacking a flat mounting surface or space. On the side of the asset beacon is a switch used to place the device in different operating modes. The following image is a rear view of the asset beacon displaying the adhesive strip used to attach the asset beacon to any flat surface or to the mounting accessory.

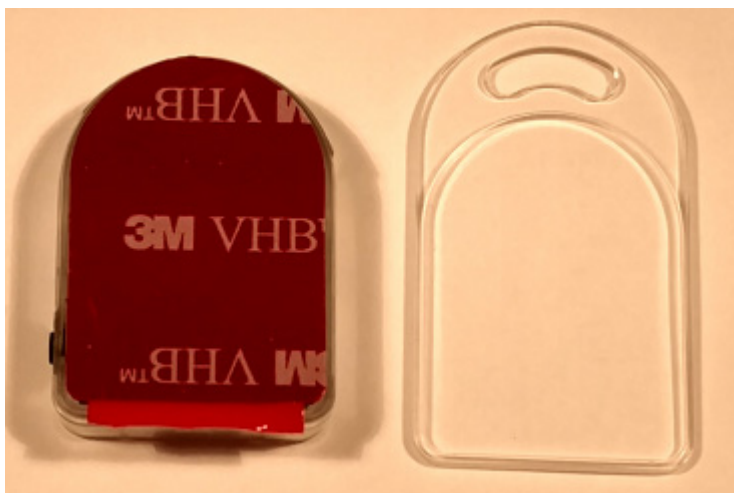


Figure 2-18 GE-MB1000-01-WR and Adhesive Strip

As a prerequisite, to mounting a GE-MB1000-01-WR model asset beacon, adhere to the following:

- The asset beacon should ideally be mounted on any flat, smooth, dry surface.
- There should be no structures immediately in front or to the sides that would block signals from this unit.
- Before peeling the cover off the mounting tape, hold the asset beacon in its intended mounting location and ensure it will fit as desired.

The following image is a view of the asset beacon attached to a laboratory device. The antenna pattern is omni-directional and the unit operates sufficiently in any vertical orientation. The preferred orientation is as shown:



Figure 2-19 GE-MB1000-01-WR Preferred Orientation

To mount a GE-MB1000-01-WR model asset beacon:

1. Peel the tape from the adhesive pads on the rear of the asset beacon and press the unit to the mounting surface.



NOTE: Once adhered to a surface, it's very difficult to remove. The asset beacon's adhesive pads need replacement if moved to a new location. If the surface is clean and smooth, 3M VHB tape should be used to mount the asset beacon. However, if it is wood, brick or some other surface that's not smooth and clean, the 3M tape will not adhere to the surface. In this situation, use the mounting accessory and a tie wrap, or other mounting device.

2. Initialize the unit per the operating instruction.

2.8.1 Preparing a Surface for Mounting with 3M VHB Double-Sided Tape

To prepare a surface before mounting the GE-MB1000-01 asset beacon style to any surface with 3M VHB double-sided tape: Clean the surface with a 50:50 mixture of *isopropyl alcohol* (IPA) and water before applying the 3M™ VHB™ tape. Some surfaces could require additional preparation, such as the following:

- Use de greasers or solvent-based cleaner to remove heavy oil or grease from a surface followed by cleaning with IPA/water
- Scrape the surface, followed by cleaning with IPA and water to remove heavy dirt or oxidation and increase the surface area to improve adhesion
- Prime the surface to improve initial and ultimate adhesion to materials such as plastics and paints
- Seal porous and fibered materials such as wood, particleboard and concrete to provide a unified surface

Once the mounting surface is adequately prepared, the asset beacon is ready to be mounted.

2.8.2 Mounting a GE-MB1000-01-ACC Asset Beacon using a Beacon Accessory

A GE-MB1000-01-WR can be mounted on other objects using the GE-MB1000-01-ACC beacon accessory. The following image is a hand tool with the asset beacon attached to the mounting accessory. The accessory is ordered separately from GE-MB1000-

01 asset beacon. The beacon is attached to the mounting plastic using the adhesive strip, then a tie wrap is used to connect the mounting plastic to the hand tool.



Figure 2-20 GE-MB1000-01-ACC Beacon Accessory

To mount the asset beacon using the GE-MB1000-01-ACC beacon accessory:



NOTE: The beacon can also be mounted using a lanyard or zip tie.

1. Peel the tape from the adhesive pads on the rear of the asset beacon and press the unit to the mounting surface on the accessory GE-MB1000-01-ACC. The adhesive is immediately bonding and reaches full adhesion within an hour.



Figure 2-21 GE-MB1000-01-ACC Beacon Accessory



NOTE: Once adhered to a surface, its very difficult to remove. The beacon's adhesive pads will need to be replaced if it is moved to a new location. The part number for replacement tape is GE-MB1000-TAPE.

- Once adhered to the beacon accessory, it can be attached to other items using a lanyard or zip tie placed through the slot in the surfboard.

2.8.3 GE-MB1000-01-WR Operating Modes

Refer to the following for operating modes for GE-MB1000-01-WR asset beacon operating modes:

Mode	Definition
<i>Sleep</i>	The beacon is not transmitting or accepting client connections.
<i>Configuration</i>	The beacon accepts connections from clients. Clients can configure the device when connected.
<i>Broadcast</i>	The beacon is transmitting packets that conform to one of the supported beacon formats (iBeacon, MPact, Battery Save and SecureCast).

The GE-MB1000-01-WR is delivered in *shipping* mode. To initiate beacon operation, press the button three times quickly. The LED flashes several times and the beacon begins to broadcast. Using the table below, hold the button for the length of time shown to change modes. The LED displays a different light pattern depending on the mode it is entering.

Current Operation Mode / Button Press	Sleep	Configuration	Broadcast	LED Behavior
0-2 seconds	No action	No action	No action	
2+ -5	Moves to Broadcast mode	Moves to Broadcast mode	Moves to Broadcast mode	Slow Flash
5+ - 10	Moves to Configuration mode	Moves to Configuration mode	Moves to Configuration mode	Fast Flash
+ 10	Moves to Sleep mode	Moves to Sleep mode	Moves to Sleep mode	Solid LED



NOTE: Pressing a button 3 times *quickly*, means pressing 3 times the button within a 2 second span. If the intended operation does not take effect, wait approximately 5 seconds and repeat the intended operation.

2.8.4 Cleaning a GE-MB1000-01-WR Asset Beacon

Cleaning frequency is discretionary in respect to the environments the GE-MB1000-01-WR and the GE-MB2001-01-ACC are deployed. They may be cleaned as frequently as required.

2.9 Beacon Part Number: GE-MB2001-01-WR

As a prerequisite, to mounting a GE-MB2001-01-WR model beacon, adhere to the following:

- Do not install the cover on the unit until the beacon has been initialized and configuration verified.
- Ensure the planned installation location matches your physical deployment plans.
- Beacon mounting heights may vary, but should be about 5' from the floor.
- Ensure the intended deployment location has WiFi coverage.

To mount a GE-MB2001-01-WR model beacon using the GE-MB2001-01-ACC:

1. Before peeling the cover off the GE-MB2001-01-ACC mounting system tape, hold the wall plate portion of the accessory in its intended mounting location and mark the spot on the wall. You can use masking tape to mark the bottom of the unit.
2. Peel the tape from the adhesive pads on the rear of the beacon and press the to the wall.
3. Snap the beacon (GE-MB2001-01-WR) into the accessory wall plate.

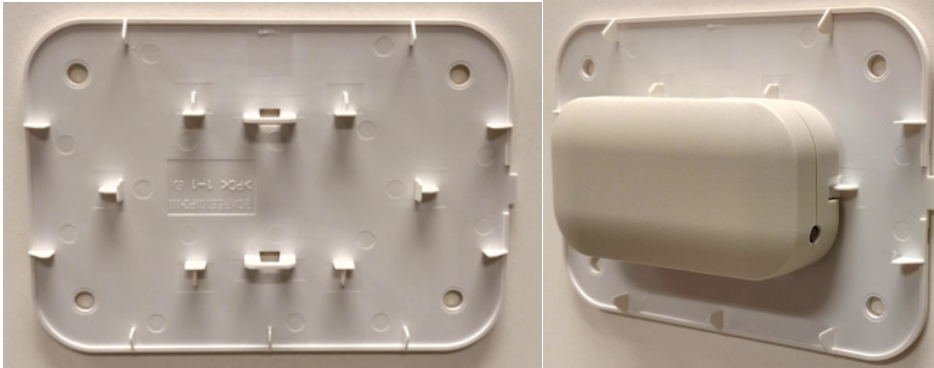


Figure 2-22 GE-MB2001-01-WR Wall Mount



NOTE: If the surface is clean and smooth, use the 3M VHB tape to mount the beacon. However, if wood, brick or other non-smooth surface is utilized, the 3M tape will not adhere to the surface. Use appropriately sized screws for mounting (not included).

4. Place and snap the cover on the unit while ensuring logos are correctly oriented.



Figure 2-23 GE-MB2001-01-WR Beacon Cover



NOTE: Once adhered to a surface, its very difficult to remove. The beacon's adhesive pads will need to be replaced if it is moved to a new location.

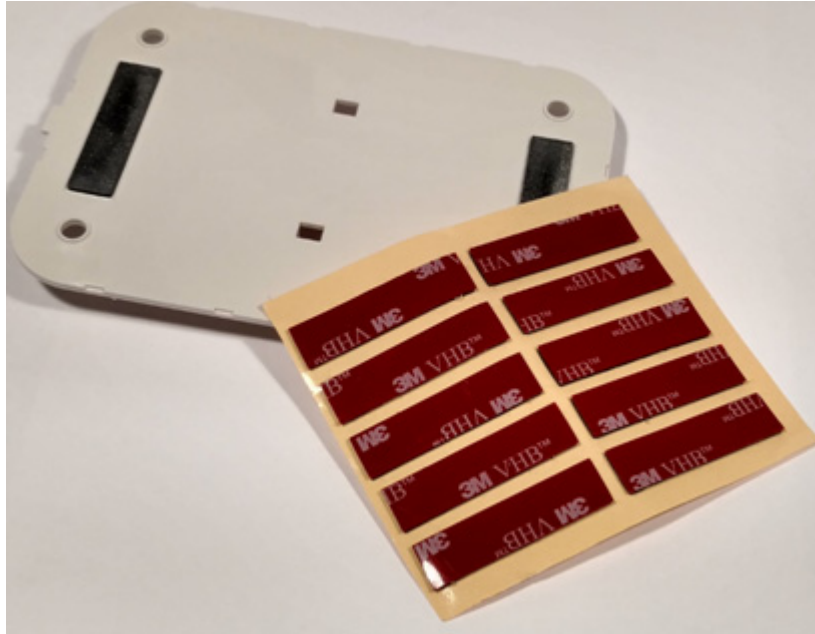


Figure 2-24 GE-MB2001-01-WR Beacon Replacement Adhesive

2.10 Initializing a GE-MB5000-01-WR Hub

A GE-MB5000-01-WR (or hub) scans for Bluetooth smart beacon emissions. The hub filters based on its scanning configuration for known devices and forwards scan results to its defined administration (posting) server.

The hub ships with a default software load, but without its configuration. When the hub is initialized for the first time it conducts an internal scan diagnostic but is unable to properly provision itself.

Consequently, the hub needs to be provisioned with both an initial configuration and a scanning configuration before it can filter beacons and forward relevant scanning information.

To provide the hub its initial and scanning configurations:

1. Initialize the GE-MB5000-01-WR hub.

The hub scans for its initial configuration and displays a Wifi error stating the hub has not been configured.

The hub has a fixed SSID of `mpact_init` and a preset password of `mpact123`.

When unable to provision itself the hub connects to 192.168.100.1 (a fixed location) and downloads its initial configuration file (`badge_config.json`).



NOTE: The 192.168.100.1 location must be reachable from the hub's connected Access Point `mpact_init` SSID to receive its required `badge_config.json` file.

The hub obtains its `badge_config.json` file and self-configures its initial configuration. Once completed, the hub connects to its posting server to obtain its scanning configuration.

The scanning configuration is required to define the hub's scan interval and beacon profile determining how beacon data is forwarded, based on the beacon's UUID and Major values, and posted to the server for administration.

2. If you encounter issues with the setup of the hub, there's several file restoration options available.

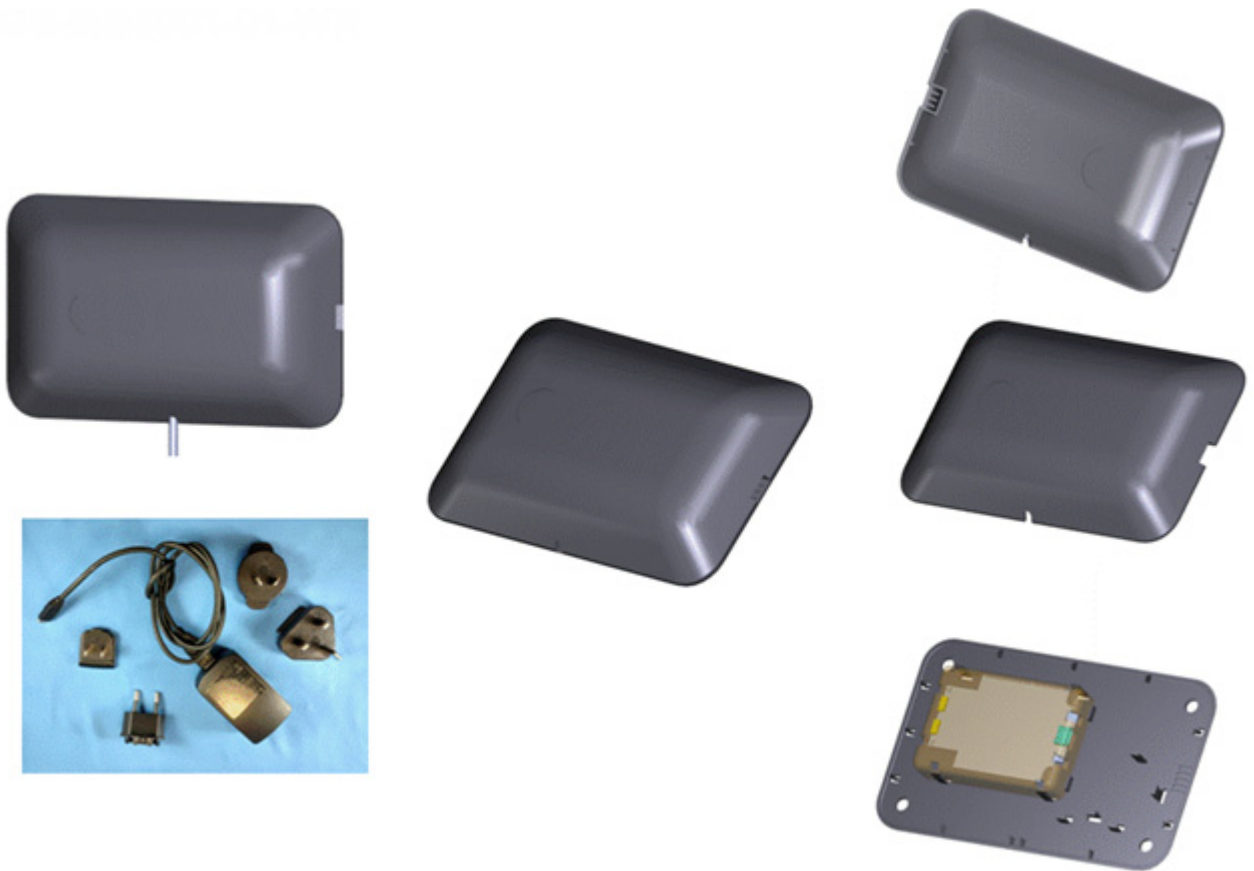


Figure 2-25 GE-MB5001-01-WR

- *Reboot the badge* - Press and hold button 2 between 10 and 20 seconds, then release. LED 1 will blink slowly twice to confirm. Any in-process configuration activity will need to be re-started.
- *Erase to factory default configuration and reboot* - Press and hold button 2 between 30 and 40 seconds, then release. LED 1 will blink slowly twice to confirm. The deletion of the initial configuration could be warranted if the configuration was not successfully applied on the first attempt. Once reverted to factory configuration, the initial config and scanning config can be re-applied.
- *Shutdown the badge* - Press and hold button 2 between 20 and 30 seconds, then release. LEDs will blink 5 times to confirm the badge shutdown. Use this process when bringing a deployed badge offline.

2.11 Beacon Part Number: GE-MB6000-01-WR Badge

A GE-MB6000-01-WR badge is a wearable beacon that's clipped to one's body, typically in the mid section or belt area.



NOTE: The clip portion of the badge is a replaceable part, GE-MB6000-01-ACC. Refer to Part No. GE-MB6000-01-ACC when ordering a replacement clip to a GE-MB6000-01-WR model badge.

To mount a GE-MB6000-01-WR model badge:

1. Clip an initialized badge to your midsection or belt area
2. If you encounter issues with the setup of the badge, there's several file restoration options available.



Figure 2-26 GE-MB6000-01-WR: LEDs and Buttons



NOTE: When the badge is facing you, the clip side facing you, button 1 is on the left top and button 2 is on the top right.

- *Reboot the badge* - Press and hold button 2 between 10 and 20 seconds, then release. LED 1 will blink slowly twice to confirm. Any in-process configuration activity will need to be re-started.
- *Erase to factory default configuration and reboot* - Press and hold button 2 between 30 and 40 seconds, then release. LED 1 will blink slowly twice to confirm. The deletion of the initial configuration could be warranted if the configuration was not successfully applied on the first attempt. Once reverted to factory configuration, the initial config and scanning config can be re-applied.
- *Shutdown the badge* - Press and hold button 2 between 20 and 30 seconds, then release. LEDs will blink 5 times to confirm the badge shutdown. Use this process when brining a deployed badge offline.

To replace a GE-MB6000-01-WR model badge clip:

1. TBD
2. TBD

2.11.1 GE-MB6000-01-WR Battery Safety Precautions

2.11.1.1 When Using a GE-MB6000-01 Battery

Misusing the battery may cause the battery to get hot, rupture or ignite causing serious injury. Be sure to follow the safety rules listed below:

- Do not place the battery in fire or heat the battery.
- Do not install the battery backwards so that the polarity is reversed.
- Do not connect the battery's positive terminal and the negative terminal to each other with any metal object (such as a wire).
- Do not carry or store batteries together with necklaces, hairpins or other metal objects
- Do not pierce a battery with nails, strike the battery with a hammer, step on the battery or subject it strong impacts or shocks.
- Do not apply solder to the battery
- Do not expose the battery to water or allow the battery to get wet or exposed to moisture.
- Do not disassemble or modify the battery. The battery contains safety and protection devices which, if damaged, may cause the battery to generate heat, rupture or ignite.
- Do not place the battery on or near fires, stoves or other high temperature locations. Do not place the battery in direct sunlight for prolonged periods. Do not store the battery in a car in hot weather, doing so may cause the battery to generate heat, rupture or ignite.
- If the battery is to be used by small children, the caregivers should explain the contents of the user's manual to the children. The caregiver should provide adequate supervision to ensure the device is used as explained in the user's manual.
- When the battery is worn out, insulate the terminals with adhesive tape or similar material before disposal.
- Immediately discontinue battery use if, while charging or storing, the battery emits an unusual smell, feels hot, changes color, shape or appears abnormal in any other way.
- Do not place batteries in microwave ovens, high-pressure containers or induction cookware.
- In the event the battery leaks, and fluid gets into one's eye, do not rub the eye. Rinse the eye with water and immediately seek medical attention. If left untreated, the battery fluid could cause permanent damage to the eye.

2.11.1.2 While Charging a GE-MB6000-01 Battery

Be sure to follow the rules listed below when charging the battery. Failure to do so may cause the battery to become hot, rupture, ignite and cause serious injury.

- When charging the battery, either use the specified battery charger or otherwise ensure the battery charging conditions specified by the vendor are closely adhered to.
- Do not attach the battery to a power supply plug or directly to a car's cigarette lighter.
- Do not place the battery in or near fire or in direct sunlight. When the battery becomes hot, its built-in safety measure are activated, preventing the battery from charging. Heating the battery can destroy its safety equipment and result in an overheat or ignition.
- Do not continue charging the battery if it does not charge within its specified charging time. Doing so may cause the battery to become hot, rupture or ignite.

2.11.1.3 Discarding a GE-MB6000-01 Battery

Do not discharge the battery using any device except its designated device. When the battery is used in devices aside from its designated device it may damage the performance of the battery and potentially reduce its useful expectancy. If the device causes an abnormal current flow it may result in the battery becoming hot, rupture or ignite resulting in serious injury.

The temperature range through which the battery should be discharged is -20°C - 60°C. Discharging the battery outside of this range may damage the battery's performance or reduce its life expectancy.

2.12 Cradle Charger: MPACT-MB6000-CHRG

The badge cradle can charge one to ten badges at a time. The AC powered charger is a wall or desk mounted cradle platform providing 5Vdc to each badge placed in individual charging slots. The charger feeds electric current through battery inside the badge. The cell inside retains the energy passing through them.

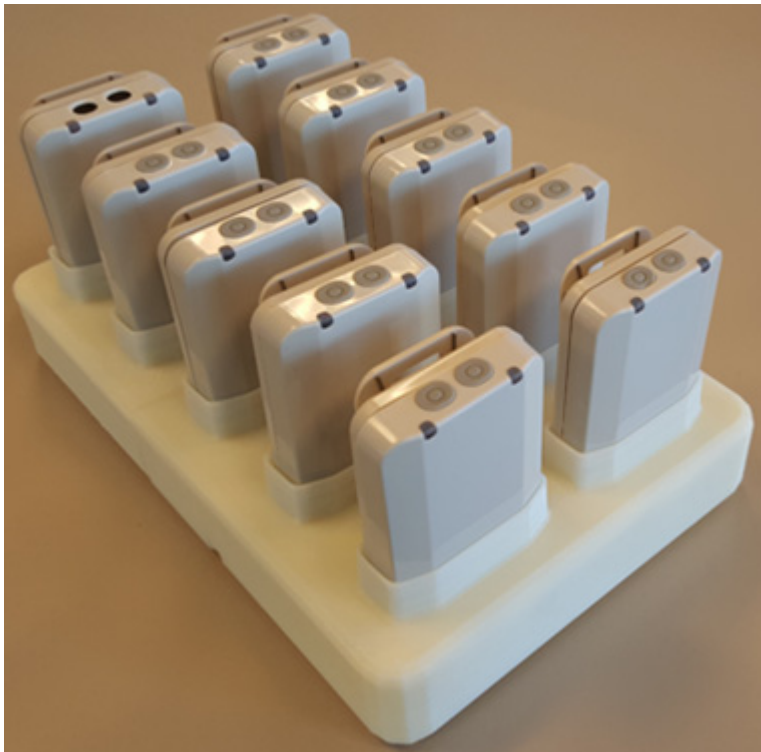


Figure 2-27 MPACT-MB6000-CHRG

Each slot has spring contacts that mate with the contacts on the badge. Badges have battery chargers and fuel gauges built into each device so the charger is a power supply platform and no battery knowledge exists in the charger itself, everything to charge and protect a lithium ion battery is built into the badge itself.

The charger's primary function is providing 5Vdc at 900 mA to each badge holder re-charge badge batteries. The charger holds badges when not in use. When badges are in the charger, they begin to charge using the 5Vdc supplied in the charger base. If there is sufficient charge detected, the badge uses the charger as a holder (without charging).

While in the charger, the badge could conduct a software or configuration update if required and a status update.

Specification	Value
<i>Charger Capacity</i>	1 - 10 badges simultaneously

<i>Voltage</i>	5Vdc +/- 5%
<i>Current</i>	Each Badge requires 900 mA during charging, total 5Vdc power is 10 Amps
<i>Power Consumption</i>	50-60 Watts
<i>Power Supply</i>	External 12 Vdc, 5 Amps max, 60 watts total, enclosed power supply
<i>Power Cord</i>	AC power cord connecting external power supply to AC power
<i>Power Supply Connector</i>	Barrel connector (2.5mm outside diameter). The plastic enclosure has built-in strain relief to prevent accidental disconnects.
<i>Power Indicator</i>	All Badges within the charger platform have LEDs indicating charging state
<i>Temperature</i>	0 to 40 degrees C (operating), -40 to 70 degrees C (storage)
<i>Humidity</i>	5 to 95% RH (operating) 85% RH (storage)
<i>Altitude</i>	8,000 ft @ 28 degrees C (operating), 30,000 ft @ 12 degrees C (storage)

The charger is designed so a DC power cable can be installed from the rear of the charger housing without removing the base. The cable and connector do not interfere with the base lying flat on any surface. The DC cord snakes through strain relief features in the housing to prevent accidental disconnects. The external power adapter DC cable terminates with a right-angle connector at the charger interface.



Figure 2-28 MPACT-MB6000-CHGRG - DC Power

2.12.1 Battery Charging Guidelines

Failure to follow these guidelines may result in fire, explosion or other hazard.

- The area in which the units are charged should be clear of debris and combustible materials or chemicals. Particular care should be taken when charging in a non commercial environment.
- To charge the battery, the battery and charger temperatures must be between 0 - 40 degrees Celsius.

- Do not use incompatible batteries and chargers. Use of an incompatible battery or charger may present a risk of fire, explosion, leakage or other hazard. If you have any questions about the compatibility of a battery or a charger, contact Zebra Support.
- Do not disassemble, open, crush, bend or deform, puncture or shred the badge or charger
- Impact from dropping the badge and charger on a hard surface could cause the battery to overheat.
- Do not short circuit a battery or allow metallic or conductive objects to contact the battery terminals.
- Do not modify, remanufacture, insert foreign objects into the battery, immerse or expose to water or other liquids, or expose to fire, explosion or other hazard.
- Do not leave or store the equipment in or near areas that might get very hot, such as in a parked vehicle or near a radiator or other heat source. Do not place battery into a microwave oven or dryer
- If you suspect damage to your equipment or battery, contact Zebra Support to arrange for inspection.

2.12.2 Cleaning the Charging Cradle

The following materials are required to clean the charging cradle:

- Alcohol wipes
- Cotton tipped applicators
- Can of compressed air

Cleaning frequency is discretionary in respect to the environments the charger and the badges are deployed. They may be cleaned as frequently as required.

2.12.2.1 Cleaning the Badge Contacts

To clean the contacts on a badge before inserting into the charging cradle:

1. Dip the cotton portion of the cotton tipped applicator in isopropyl alcohol.
2. Rub the cotton portion of the cotton tipped applicator back-and-forth across the contacts. Do not leave any cotton residue on the contacts (repeat at least three times).
3. Use a dry cotton tipped applicator to clean any moisture or residue remaining on the contacts.
4. Spray compressed air on the contact area by pointing the nozzle about ½ inch away from the surface.
5. Inspect the area for any grease or dirt, repeat this process if required.

2.12.2.2 Cleaning the Cradle Connectors

To clean the connectors within the cradle:

1. Remove DC power cable from the cradle.
2. Dip the cotton portion of the cotton tipped applicator in isopropyl alcohol.
3. Rub the cotton portion of the applicator along the connector pins. Slowly move the applicator back-and-forth on the connector to the other. Do not leave any cotton residue on the connector. All sides of the connector should also be rubbed with the cotton tipped applicator.
4. Spray compressed air in the connector area by pointing the tube/nozzle about ½ inch away from the surface.
5. Ensure there is no lint left by the cotton tipped applicator, remove any lint if found.
6. If grease or other dirt can be found on other areas of the cradle, use a lint free cloth and alcohol to remove.

7. Allow at least 10 to 30 minutes (depending on ambient temperature and humidity) for the alcohol to air dry before applying power to cradle. If the temperature is low and the humidity is high, a longer drying time is required. Warm temperatures and dry humidity require less drying time.

2.12.3 Troubleshooting

Refer to the following to troubleshoot issues with charging badges in the charger cradle:

<i>Issue</i>	<i>Solution</i>
<i>Cradle is not receiving power</i>	Ensure the power cable is connected securely to both the cradle and its AC power source
<i>The badge is not fully seated in the cradle</i>	Remove and re-insert the badge into the cradle, ensuring it is correctly seated
<i>The badge was placed in the cradle upside down</i>	Remove the badge from the cradle and re-insert in its proper orientation
<i>All badges are in the cradle correctly, the cradle is plugged in, but none of the badges are charging</i>	Unplug the cradle and plug back in again
<i>Badge battery is faulty</i>	Verify other badges charge properly. If so, contact system administrator.

APPENDIX CUSTOMER SUPPORT

If you have a problem with your equipment, contact Support for your region. Support and issue resolution is provided for products under warranty or that are covered by a services agreement. Contact information and Web self-service is available by visiting www.zebra.com/support.

When contacting Support, please provide the following information:

- *MAC ID of the unit*
- *Model number or product name*
- *Software type and version number (if known)*



NOTE: For GE-MB5000-01-WR, GE-MB6000-01-WR and GE-MB6000-CHRG, the customer will provide the serial number.

Support responds to calls by email or telephone within the time limits set forth in support agreements. If you purchased your product from a business partner, contact that business partner for support.

Customer Support Web Site

The support site, located at www.zebra.com/support provides information and online assistance including developer tools, software downloads, product manuals, support contact information and online repair requests.

Manuals

To see manuals, go to: www.zebra.com/support.



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