IoT Bridges

Receiver LED Blink Indications, Button Press Action Details, Watch Dog Details

ZEBRA

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Receiver LED Indications and Button Press Details

Figure 1 Button and LED Locations

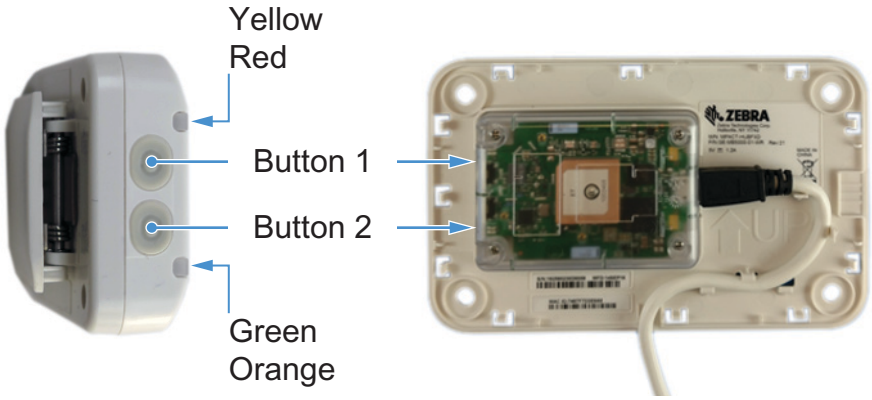

Figure 2 Green and Yellow LED On

Figure 3 Green and Red LED On

Figure 4 Orange LED On

Table 1 LED Colors

LED #	Color	Color
1	Orange	
2	Green	
3	Red	
4	Yellow	

Table 2 Blink Characteristics

Blink	Details
QUICK_BLINK	100ms on, 100ms off
SLOW_BLINK	300ms on, 300ms off

Table 3 Receiver Types

Model	Details
MB6000	Badge (B) (MR)
MB5000	Hub (H) (FR)

Table 4 LED by Function

LED #	LED Color	Blink	#Times	Function	Receiver
1,2,3,4	All	Quick	Continuous	Quick blink of all LEDs to indicate firmware download in progress. Quick blink is turned off once firmware download is complete.	B, H
3,4	Red, Yellow	Quick	3	BLE Firmware download failed.	B, H
1,2	Orange, Green	Quick	3	Indicate BLE firmware download Start	B, H

Table 4 LED by Function

1,4	Orange, Yellow	Quick	3	BLE firmware download completed and BLE chip reboot completed	B, H
3	Red	Slow	3	Receiver bootstrap configuration file (badge_config.json) parsing error.	B, H
3	Red	Slow	4	Receiver bootstrap configuration file (badge_config.json) not found in server.	B, H
3	Red	Slow	5	Generic error returned by server when receiver tries to pull bootstrap configuration file	B, H
3	Red	Slow	6	Failed to connect to network (mpact_init) to pull bootstrap configuration	B, H
3	Red	Slow	7	During bootstrap error in reading/writing to DCT	B, H
1,2,3,4	All LEDs	Turned On		Receiver WIFI MAC address is invalid	B, H
4	Yellow	Turned On		Receiver turns the LED to indicate network connection initialization	B, H
4	Yellow	Turned Off		Receiver turns the LED once network connection initialization has completed either with error or success	B, H
1	Orange	500ms delay between blinks	2	Pattern to indicate receiver start	B, H
2	Green	500ms delay between blinks	2	Pattern to indicate Gateway connectivity success	B, H
3	Red	500ms delay between blinks	5	Pattern to indicate Gateway connectivity failure	B, H
2	Green	500ms delay between blinks	Continuous	Receiver battery charging in progress. LED blinking stopped when charging is complete.	B
3	Red	Turned On		Charging Error. Charging in progress green LED turned off	B
4	Yellow	Blink for 500ms	Every 30secs	Low Battery Indication	B
4	Yellow	Blinking stopped		Low Battery indicating blink stopped when voltage > 3.4v	B

Table 4 LED by Function

1,2,3,4	All	Quick	5	Quick blink of all LEDs to indicate that battery voltage is too low operate. (1000mv, 3100mv] . Unit turned off.	B
1,2,3,4	All	Quick	5	Quick blink of all LEDs to indicate the unit is not in charger and if battery temperature is not in range [2c,43c]. Unit turned off	B
2	Green	Turned On		Green LED turned on when unit is in charger to indicate fully charged battery	B
1	Orange	Quick	2	Button 1 pressed	B, H
2	Green	Quick	2	Button 2 pressed	B, H
3	Red	Quick	2	Button 1 hold time >= 10000ms	B, H
1	Orange	Quick	2	Button 2 held down [10000ms, 20000ms) [Unit restarted]	B,H
1,2,3,4	All	Quick	5	Button 2 held down [20000ms, 30000ms) [For units with battery, the fuel gauge is shutdown and unit is powered off]	B
1	Orange	Quick	5	Button 2 held down [30000ms, 40000ms) WIFI Configuration in DCT is erased. Unit is rebooted	B, H
4	Yellow	Quick	2	Button 2 held down >= 40000ms	4

Table 5 Button 1 Press Details

Press Details	**Action Taken By Receivers With Battery (B)**	**Action Taken By Receivers Without Battery (H)**	**Internal Code**
Button1 pressed and released < 1000ms	LED1 (Orange) quick blinked 2 times Battery charger and gauge status printed in debug mode	LED1 (Orange) quick blinked 2 times No Action	1
Button1 pressed and held between [1000ms, 4999ms]	Verifies Gateway connectivity	Verifies Gateway connectivity	101
Button1 pressed and held between [5000ms, 9999ms]	No Action	No Action	102
Button1 pressed and held >= 10000ms	LED3 quick blinked 2 times No Action	LED3 quick blinked 2 times No Action	3

Table 6 Button 2 Press Details

Press Details	Action Taken By Receivers With Battery (B)	Action Taken Receivers Without Battery (H)	Internal Code
Button2 pressed and held between [1ms, 999ms]	LED2 (Green) quick blinked 2 times No Action	LED2 (Green) quick blinked 2 times No Action	2
Button2 pressed and held between [1000ms, 9999ms]	LED4 (Yellow) quick blinked 2 times Debug information printed on console. The action is cancelled by pressing button2 for [1000ms, 9999ms].	LED4 (Yellow) quick blinked 2 times Debug information printed on console. The action is cancelled by pressing button2 for [1000ms, 9999ms].	4
Button2 pressed and held between [10000ms and 19999ms]	LED1 (Orange) blinked 2 times after delay of 500ms Unit rebooted	LED1 (Orange) blinked 2 times after delay of 500ms Unit rebooted	201
Button2 pressed and held between [20000ms and 29999ms]	Quick blink all LEDs 5 times Fuel gauge is shutdown Unit is powered off	Quick blink all LEDs 5 times User can remove power supply from unit.	202
Button2 pressed and held between [30000ms, 39999ms]	WIFI configuration is erased in DCT LED1 (Orange) blinked 2 times after delay of 500ms Unit rebooted	WIFI configuration is erased in DCT LED1 (Orange) blinked 2 times after delay of 500ms Unit rebooted	203
Button2 pressed and held > 40000ms	LED4 (Yellow) quick blinked 2 times Debug information printed on console. The action is cancelled by pressing button2 for [1000ms, 9999ms].	LED4 (Yellow) quick blinked 2 times Debug information printed on console. The action is cancelled by pressing button2 for [1000ms, 9999ms].	4
Button 2 pressed and released 3 times with 4 seconds	Network interface brought down If unit is in charger LED3 (red) slow blinked continuously If charger is not attached then all LEDs quick blinked 5 times and then unit is powered off	Network interface brought down All LEDs Quick Blinked 5 times LED3 slow blinked continuously	502
Button 2 pressed and released 4 times with 4 seconds	Network interface brought down If charger attached then, LED1 slow blinked continuously If charger is not attached then WIFI DCT is erased All LEDs quick blinked 5 times Unit is powered off	Network interface brought down WIFI DCT erased All LEDs Quick Blinked 5 times LED1 slow blinked continuously	503

Watch Dogs

What are Watch Dogs?

Watch dogs are smart logic that identifies potential (or sometimes real) issues with the device or the network and pro-actively take some action (such as forcing a reboot) to “self-heal” the device and restore normal operation. Watch dogs are very common in RTLS based devices that rely on customer networks and tag traffic to work or appear to be working normally.

Table 7 Watch Dog Details

Receiver State	Actions	Receiver Types
First Time Bootstrap	Unit has not been bootstrapped before. If unit fails to connect to predefined SSID (mpact_init) (retry delay 2 min) or unit fails to pull bootstrap configuration(badge_config.json) (retry delay 2 min) the unit will keep retrying.	H
First Time Bootstrap	Unit has not been bootstrapped before. If unit fails to connect to predefined SSID (mpact_init) (retry delay 2 min) or unit fails to pull bootstrap configuration(badge_config.json) (retry delay 2 min) the unit will retry for a maximum of 3 times. After which it will shut down and power off the battery.	B
Normal Operating State	Unit has been configured before and gets rebooted for some reason. When it tries to initialize and join the network and fails five times (2 min delay between retry) then the unit is rebooted.	Both
Normal Operating State	Unit upon reboot tries to pull its configuration (receiver configuration). If configuration pull fails, retries are done after one minute delay. If receiver is unable to pull configuration even after 5 attempts then it is rebooted.	Both
Normal Operating State	Unit upon reboot tries to pull its time information from gateway. If time pull fails, retries are done after one minute delay. If receiver is unable to pull time information even after 5 attempts then it is rebooted.	Both
Normal Operating State	If 3 consecutive heartbeat posts to gateway fail then the unit is rebooted.	Both
Normal Operating State	If there is no heap space available to create a thread to process BLE Beacons then the unit is rebooted	Both
Normal Operating State	If there is no heap space available to create a thread to store data in external SRAM then the unit is rebooted	Both
Normal Operating State	If there is no heap space available to create a thread to post beacon data to gateway then the unit is rebooted	Both
Normal Operating State	When receiver runs out of heap space trying to process response for time request from gateway then it is rebooted.	Both

Table 7 Watch Dog Details

Normal Operating State	When receiver runs out of heap space trying to process response for configuration request from gateway then it is rebooted.	Both
Normal Operating State	WIFI Network check watchdog is started upon unit start. The health of the network is checked every 2 minutes. If 5 consecutive network check fails unit is rebooted.	Both
Normal Operating State	Unit registers for asynchronous link up and link down events from WICED WIFI. If link down is received by the unit then the unit tries to re-initialize the WIFI network a maximum of 5 times with a delay of 1 minute. If even after retries the network initialization fails the unit is rebooted. Note, if the unit receives link up event during its retry the normal processing is started.	Both