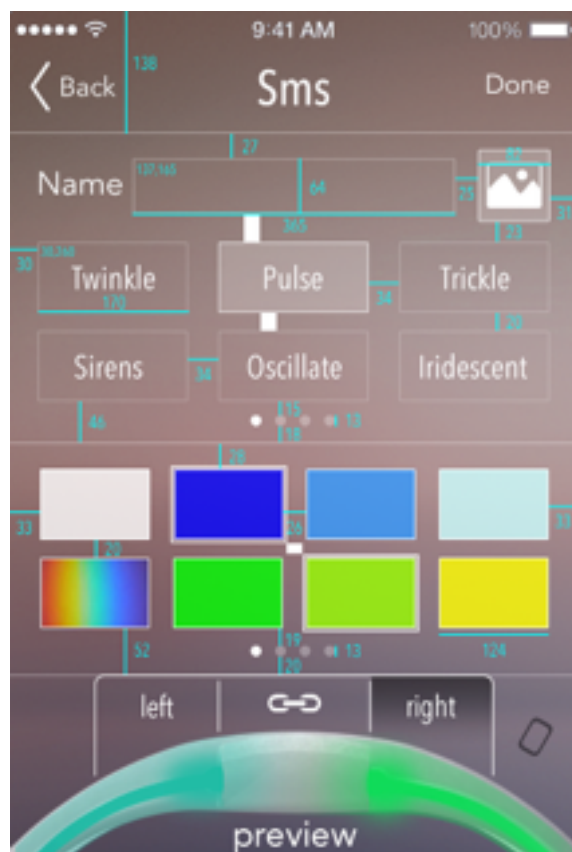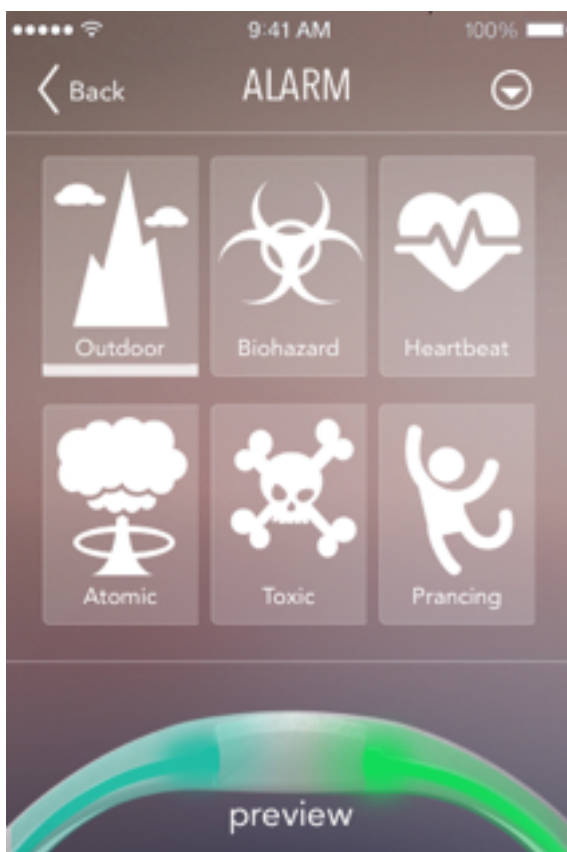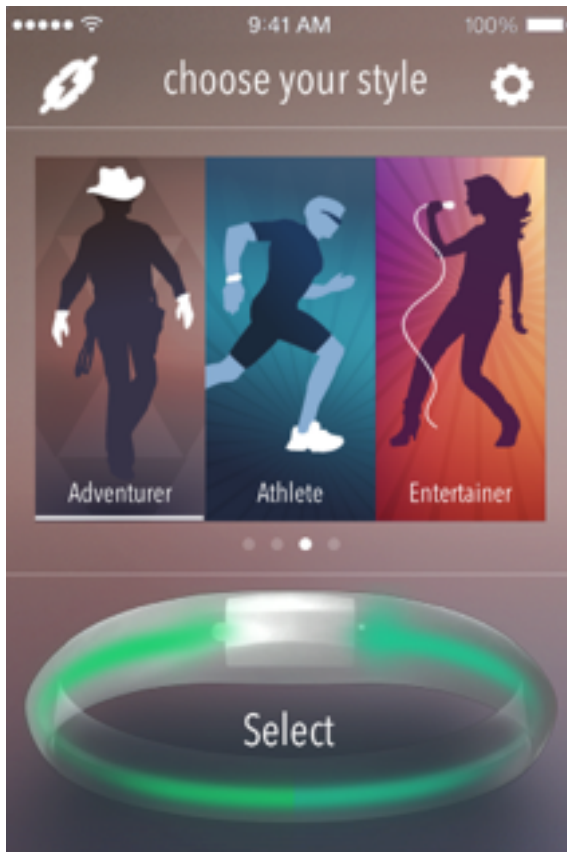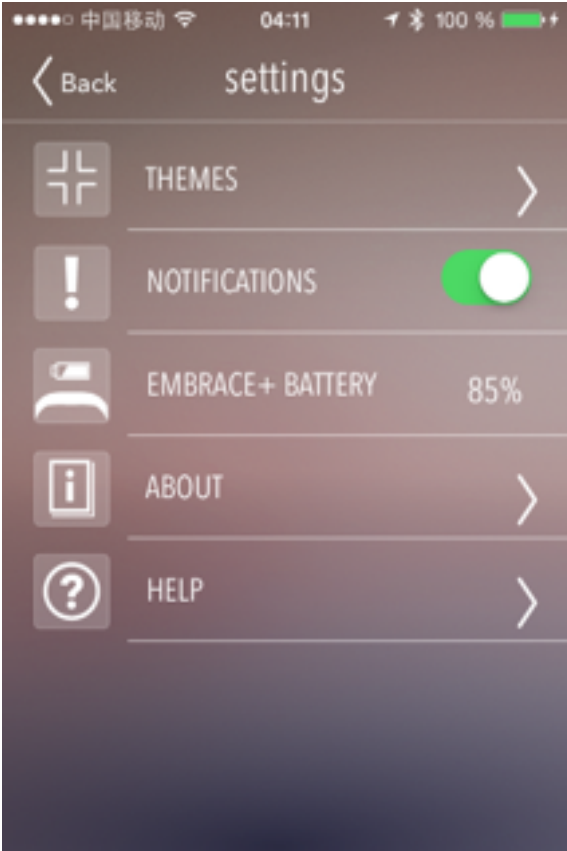# Feature Documentaton

1. UI Definition

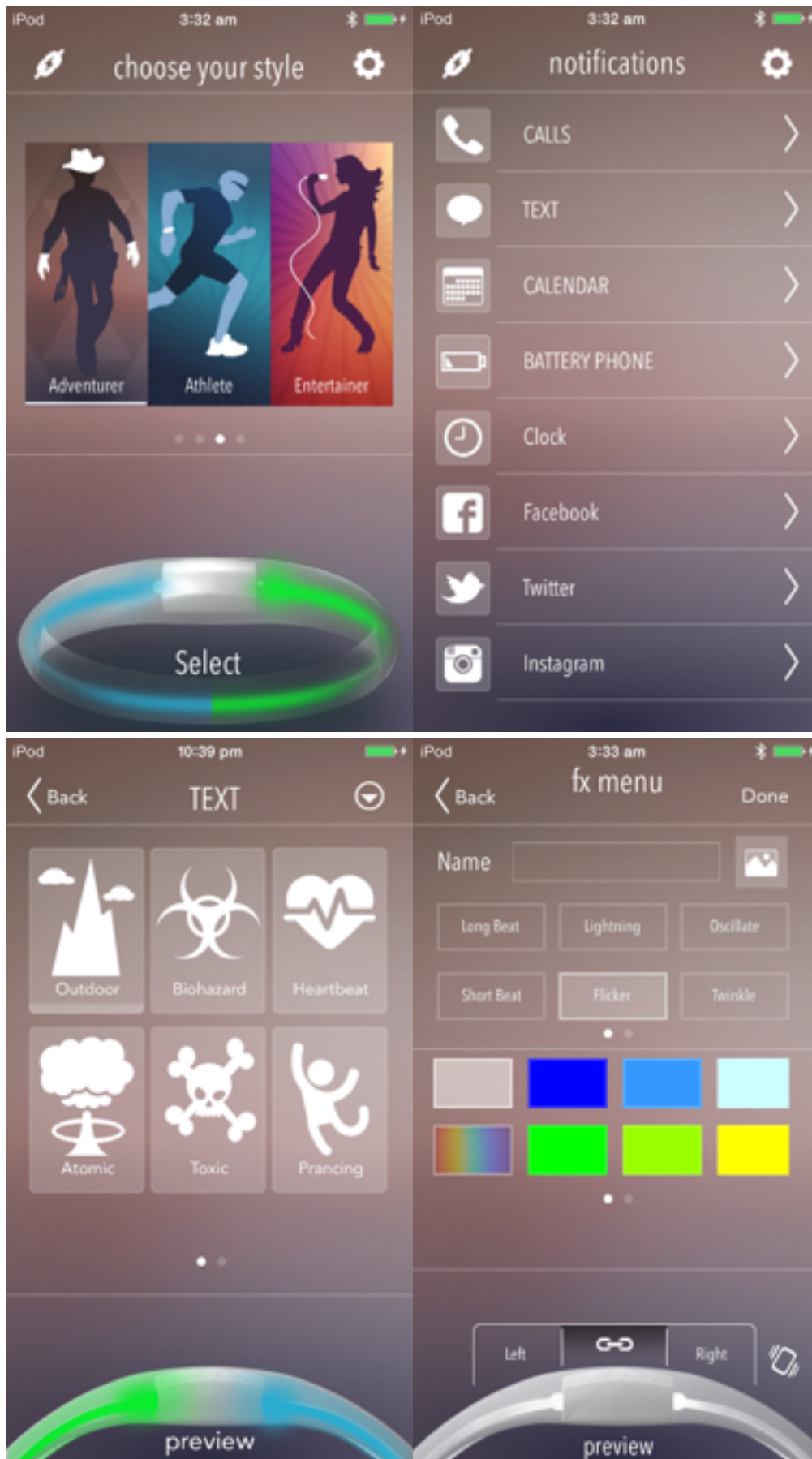### 1.1 iPhone / 3.5 inch (portrait: 640 x 960 px)

1.1.2 Settings

1.1.2 Clock: Timer / Alert / Grandpa Clock

1.2 iPhone / 4inch (portrait: 640 x 1136px)

2. App Definitions

2.1 AppId's

| Notification	AppId (english!)	Info
CALL		
- unknown caller		
- known caller		
- caller ID		
TEXT		
- Sms		
- iMessage		
EMail		
Calendar		
Phone Out of Range		
Low Battery (Phone)		
Facebook	com.facebook.Facebook	
Twitter	com.atebits.Tweetie2	
Instagram		
- like		
Tumblr	com.tumblr.tumblr	
- like		
- reblog		
Pinterest	pinterest	
- like		
Skype	com.skype.skype	
LinkedIn	com.linkedin.LinkedIn	
- connect		
- invite		
- message		
Alarm / Timer / Grandfather Clock		
Scrabble		

2.2. LED Colors

- the app sends the Colors as an index of the Color table
- the Firmware can have up to 255 Color definitions

Nr	Name	Hex	Color
0	Transparent / Black	(LED OFF)	X
1	White	0xFFFFFF	
2	Silver	0x999999	
3	Pink - Light	0xFF99FF	
4	Pink	0xFF00FF	
5	Purple	0x9900FF	
6	Pink - Red	0xFF0066	
7	Red	0xFF0000	
8	Red - Blood	0xFF3333	
9	Yellow	0xFFFF00	
10	Green - Acid	0x99FF00	
11	Green	0x00FF00	
12	Orange	0xFF9900	
13	Gold	0xFFCC33	
14	Blue - Sky	0xCCFFFF	
15	Blue - Light	0x3399FF	
16	Blue	0x0000FF	

2.3. Effect Loop

the length of the effect loop is flexible. The App can define the length of each effect through the parameter: **Loop-Count**
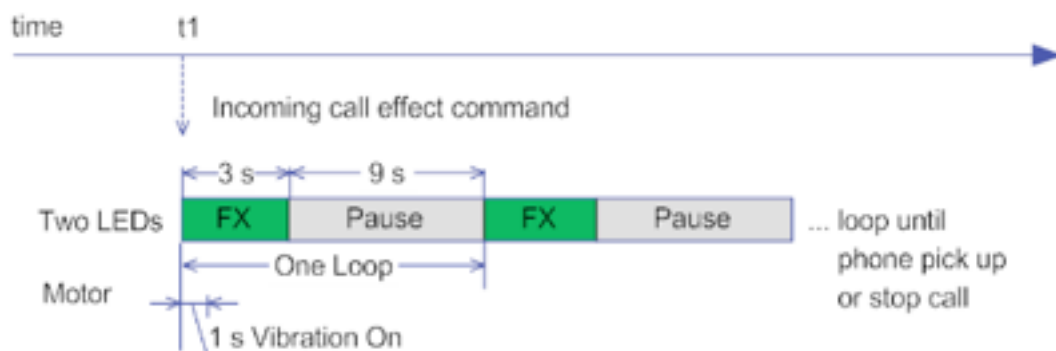
2.4. Effect Attributes
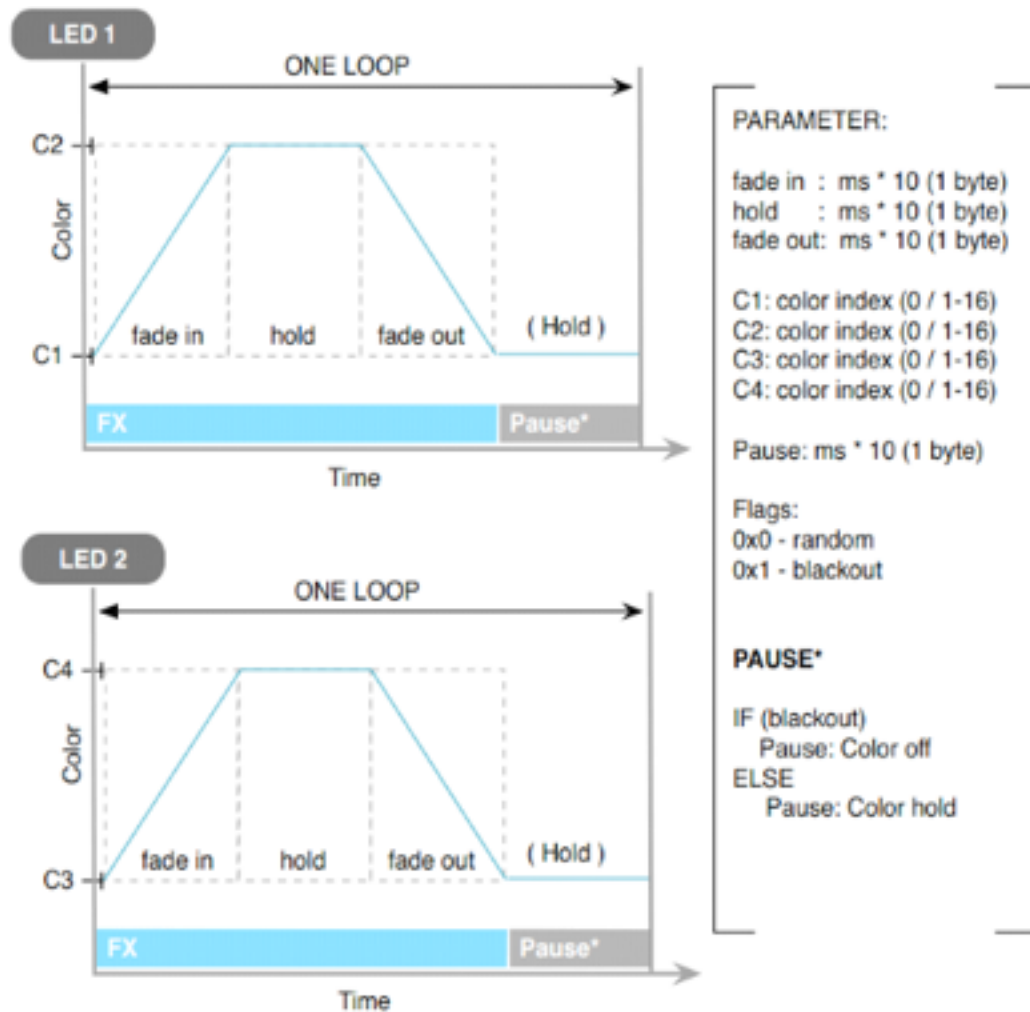
these are the parameters that the App sends to the Firmware

Attribute	Value	Decription
fadeIn	0 - 255	the duration of the first color tween
hold	0 - 255	
fadeOut	0 - 255	
C1	0 - 16	
C2	0 - 16	
C3	0 - 16	
C4	0 - 16	
FLAGS		
	0 / 1	0x0: random color
	0 / 1	0x1: blackout (on = switch off LED while pause, else hold color)
	0 / 1	0x2: silent off / on (on = no vibration)

2.5. Themes and Preset Effects (FX)

- when the user first start the app he chooses a theme (preset style)
- there are 9 Themes and 24 Custom FX that are used in the themes

2.5.1 Themes

Theme	Custom FX
Business	Meeting, Nirvana, After Work, Chat, Discreet, Workout
Fashionista	Fabulous, Heartbeat, Sweet Life, Chat, Night Fever, Holy
Vampire	Heartbeat, Night Fever, Bloodrush, Electrifying, Fugitive, Strobe
Clubber	Nerdcore, Electrifying, Heartbeat, Night Fever, Punk, Strobe
Student	Chat, Discreet, Meeting, Fabulous, Night Fever, Strobe
Magician	Fabulous, Nirvana, Electrifying, Psychedelic, Heartbeat, Atomic
Adventurer	Outdoor, Atomic, Biohazard, Toxic, Heartbeat, Prancing
Athlete	After Work, Workout, Heartbeat, Outdoor, Electrifying, Toxic
Entertainer	Fabulous, Strobe, Night Fever, Prancing, Punk, Rasta

2.5.2 Preset FX

- there are 24 Preset Effects, that are used for the default Themes

	Name	Effect Attributes												
		loop	in	hold	out	pause	RND	BO	SIL	C1	C2	C3	C4	total Time
		1 - n	ms*10	ms*10	ms*10	ms*10	0/1	0/1	0/1	1-255	1-255	1-255	1-255	Sec
1	After Work	1	150	0	150	0	0	0	0	0	16	16	0	**3s**
2	Atomic	1	200	0	200	0	0	0	0	12	9	9	12	**4s**
3	Bio Hazard	6	50	0	0	0	0	0	0	10	0	10	0	**3s**
4	Bloodrush	8	20	0	20	0	0	0	0	7	6	6	7	**3.2s**
5	Chat	5	60	0	0	0	0	0	0	9	0	9	0	**3s**
6	Discreet	3	100	0	0	0	0	0	0	14	0	14	0	**3s**
7	Electrifying	10	10	0	10	0	0	0	0	14	15	15	14	**2s**
8	Fabulous	3	100	0	100	0	0	0	0	13	3	3	13	**3s**
9	Fugitive	10	30	0	30	0	0	0	0	7	16	16	7	**3s**
10	Heartbeat	7	40	0	0	0	0	0	0	8	0	8	0	**2.8s**
11	Holy	1	200	0	200	0	0	0	0	15	1	1	15	**4s**
12	Meeting	1	200	0	0	0	0	0	0	16	0	16	0	**2s**
13	Nerdcore	30	10	0	0	0	0	0	0	5	0	7	0	**3s**

	Name	Effect Attributes												
14	Night Fever	6	50	0	0	0	0	0	0	4	0	5	0	**3s**
15	Nirvana	1	150	0	150	0	0	0	0	15	0	0	15	**3s**
16	Outdoor	1	100	0	100	0	0	0	0	11	15	15	11	**2s**
17	Prancing	6	50	0	0	0	**1**	0	0	-	-	-	-	**3s**
18	Psychedelic	2	200	0	0	0	**1**	0	0	-	-	-	-	**4s**
19	Punk	10	20	0	0	0	0	0	0	12	5	7	15	**2s**
20	Rasta	2	150	0	0	0	0	0	0	7	11	9	7	**3s**
21	Strobe	30	10	0	0	0	0	0	0	1	0	1	0	**3s**
22	Sweet Life	2	100	0	100	0	0	0	0	4	9	9	4	**4s**
23	Toxic	1	150	0	150	0	0	0	0	11	9	9	11	**3s**
24	Workout	4	80	0	0	0	0	0	0	16	5	12	7	**3.2s**

2.6. Preset Motions (for Custom FX)

fadeIn / hold / fadeOut / pause / loop / blackout / Reverse

1. Long Beat: 0 / 1s / 0 / 1s / 1x / y / n

2. Short Beat: 0 / 0.5s / 0 / 1s / 1x / y / n

3. Lightning: 0 / 0.3s / 0 / 0.7s / 3x / y / n
   Short - Long

4. Flicker: 0.3s / 0.4s / 0.3s / 1s / 2x / n / n

5. Oscillate: 0.1s / 0.2s / 0.1s / 0.2s / 5x / y / n

6. Twinkle: 0.3s / 0.3s / 0.1 / 0 / 3x / y / n

7. Sirens: 0.3s / 0.4s / 0.3s / 0 / 3x / n / y

8. Bomb: 1.5s / 0.5s / 0 / 0 / 1x / y / n

9. Pulse: 0.4s / 0 / 0.4s / 0 / 3x / y / n

10. Shimmering: 1s / 0 / 1s / 0 / 3x / y / y

11. 3 Beat: 0 / 0.6s / 0 / 0.4 / 3x / y / n

12. Shine: 1s / 2s / 1s / 0 / 1x / y / n

2.6.1 Grandfather Clock

uses "Long Beat"

2.7 Notification Silent

SETTINGS > Notifications: off = do not show any notification at all

CALL > incoming Call > silent = do not show any notification for incoming known Calls, except CallerIDs that are not silent
CALL > unknown Call > silent = do not show any notifications for unknown calls
CALL > Caller ID > silent = do not show any notification for this caller

2.8 App / Firmware Synchronisation

- the App syncs all configurations when:
    a) the app is started
    b) when a Theme is changed

3. Firmware Definitions

3.1. Notification Priority

Nr	Current Effect	Incoming Command	Behaviour
1	notification	notification	finish current loop
2	notification	preview	stop
3	preview	notification	stop
4	preview	preview	stop

3.2. Notification Queue

- the current FX is playing at least 1 loop
- when new notifications comes in current FX will finish the loop first
- while an effect is playing new notifications are stored in a queue
- is the incoming notification a call will it be placed at queue start
- has the queue more than 1 effect the current effect will be played 1 loop
- the last effect will be played in full length

3.3. Notification Exceptions

- when the app is closed device does not recognise CallerID
- the firmware will display IncomingCall instead of CallerID

4. Hardware Definitions

4.1. Hardware Components

- Battery: (name, specs?) 20 mAh ?
- Motor: (name, specs?) 16mAh ?
- LED: (name, specs?) 3mAh ?

4.2. Battery Level

- 4+ V means full power, 3.5V is considered low power
- Sleep Mode: 3.5V is low power, if the level goes below this, the FW put the device to sleep
- same is true if the device is not connected for more than 5 minutes to any phone
- the FW supports the Battery Characteristics to let the App show the Battery Level

```
100% —— 4.20V
 90% —— 4.06V
 80% —— 3.98V
 70% —— 3.92V
 60% —— 3.87V
 50% —— 3.82V
 40% —— 3.79V
 30% —— 3.77V
 20% —— 3.74V
 10% —— 3.68V
  5% —— 3.45V —> lower than 3.5V device go to sleep
  0% —— 3.00V
```

If the FW only sends 1 digit, the app needs to approximate:

```
100% —— 4.20V
 90% —— 4.0V
 80% —— 3.9V
 50% —— 3.8V
 30% —— 3.7V
 10% —— 3.6V
  5% —— 3.4V —> lower than 3.5V device go to sleep
  0% —— 3.00V
```

4.3. Hardware Notifications

	ACTION	STATE	CHANGE TO	INDICATION
1	press button 1 sec	sleep	advertising	short flicker green (#00FF00)
2	press button 1 sec	advertising	sleep	short flicker red (#FF0000)
3	battery low / empty	charging	-	2 leds red, low brightness, 1 sec on 2 sec off
4	battery charged	charge protection	-	2 leds green, low brightness, 1 sec on 2 sec off

Note: charging LED current must be less than 7mAh

4.4. Bluetooth Connection

When using a third app, it can interfere with the Embrace+ bluetooth connection to the app. Since the solution uses customized GATT protocol for the transmission of commands. If any App connects to the device that doesn't know the communication protocol, the link will be lost! This is normal phenomenon.