Problems in Battery's when we are prototyping the projects

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Hi Courtney, I did some research on entire battery consumption and current drop methods and few processes.

Problems

1) When we are working with Microcontrollers like node MCU and esp32 and Arduino Uno, we must make sure they will not work when they have limited powers, such as low power draw connections

2)Microcontrollers not working off a 5v external power supply

[NodeMCU not working off 5v external power supply : esp8266 (reddit.com)](reddit.com)

3) power banks switch off automatically in 10 min

SOLUTIONS

solution1:

Because of low power draws it will happen we must make sure we must create a create small circuit that will draw required amount of power from the battery's

In theory, you could add a resistor between the ground and VCC.

You'll have to check the power draw and ensure the resistor is okay.

Possibly a led + resistor might up the draw enough.

Led connected to 3v3 and Gnd with 500 ohms to 1k resistors or one 480 ohms resistor will help to draw the current

Solutions 2:

References will give you answers

1) [esp8266 - Problems with Powering Led Project Through Vin Pin - Arduino Stack Exchange](#)
2) [NodeMCU not working off 5v external power supply : esp8266 (reddit.com)](#)

Problem 3 solutions:

Because of the low power draw nowadays, the intelligent power banks have an inbuilt hardware unit that will make the power bank in power saving mode when there is no requirement. So, we must do a simple add-on hardware setup which draws the required power and make the power bank in on condition
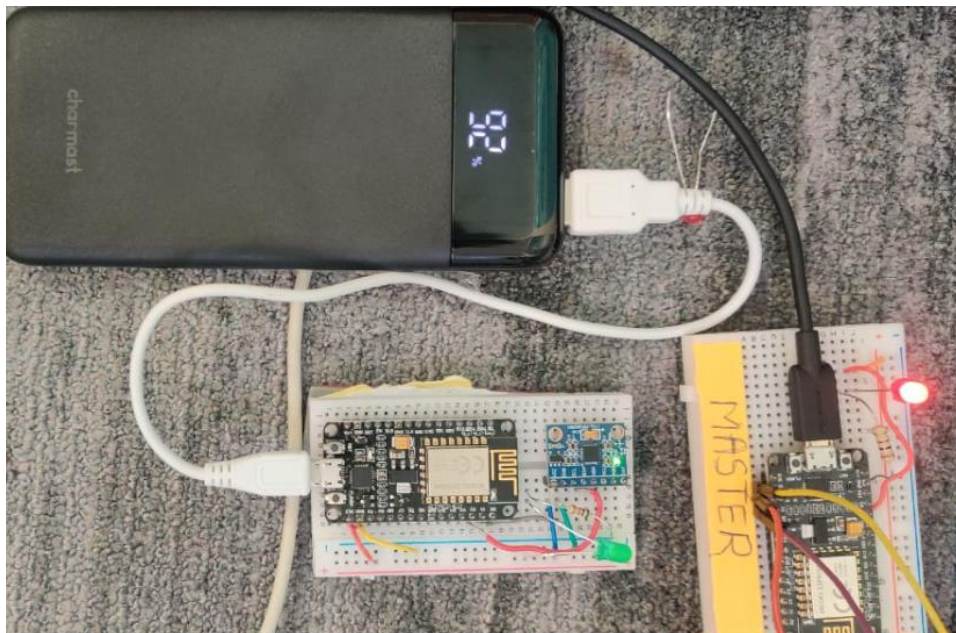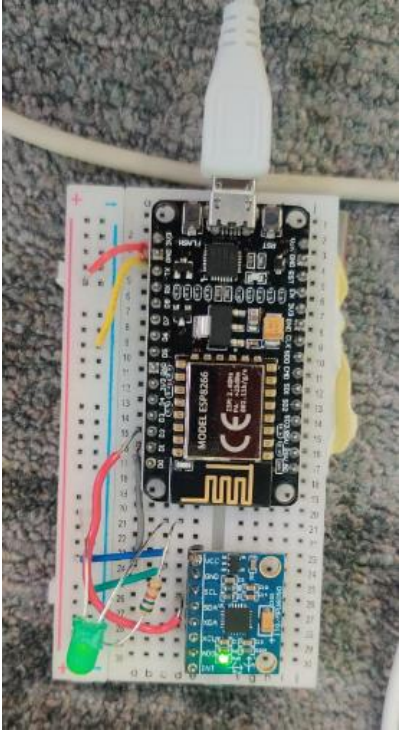
Process 1 enabling some **deep sleep** mode to the circuit

IN DEEP SLEEP MODE WHAT HAPPENING IS

If you see the attached image and the time stamp of it

```
15:15:31.546 -> {11ʃʃ|ʃ1ʃ|☐☐↑☐ʃ↑$ʃ☐c|ʃʃ☐ʃ☐ʃrʃbʃ☐cʃp~ʃNʃ$onʃʃʃ☐c☐pʃʃ#$`☐r1pʃnʃ☐☐☐↑^
15:15:31.627 -> Going into deep sleep for 20 seconds
15:15:51.509 -> {11ʃʃ|ʃ1ʃ|☐☐↑↑ʃ↑$ʃ↑#|ʃʃ☐ʃ☐rʃʃ☐ʃ↑Bʃʃonʃdnoʃʃʃ↑b☐pʃʃ1{1r$pʃoʃ☐☐↑↑
15:15:51.605 -> Going into deep sleep for 20 seconds
15:16:11.445 -> s11ʃ☐ʃc☐ʃo↑↑↑ʃ☐ʃ1ʃ☐pʃ|ʃʃ☐ʃ☐rʃʃ>ʃ☐BʃʃNNʃdooʃʃʃ↑c☐pʃʃc1`☐s1pʃNʃ☐☐↑
15:16:11.564 -> Going into deep sleep for 20 seconds
```

At 15:15:31.627: you see our controller is going to deep sleep for 20 seconds and after twenty seconds

With time stamp adding 20 seconds to this 15:15:31.627 is 15:15:51.509

At 15:15:51.509: if you see in the image, you are getting garbage data so the micro controller is resetting and the baud rate is failing, and we are getting the garbage so I feel this process is having a flaw or something fishy

It keeps repeating and sending garbage after every 20 seconds

Sleeping for 20 seconds sending garbage.

PROCESS NUMBER 2

CREATING A LOW POWER CONSUMPTION LATCH CIRCUIT

Reference article : Extreme Power Saving (0µA) with Any Microcontroller: Latching Power Circuit | Random Nerd Tutorials

Here is the image I designed for you to better understand.

Step 1 is here we have a latch; the latch is something which is used to turn on and off the micro controller.

But to make it work we should trigger the latch. To trigger the latch pin, we must use some sensor or switch manually which will not be good for our case.

So what I'm thinking is here we have to use an extra sensor or switch or any thing to trigger the latch
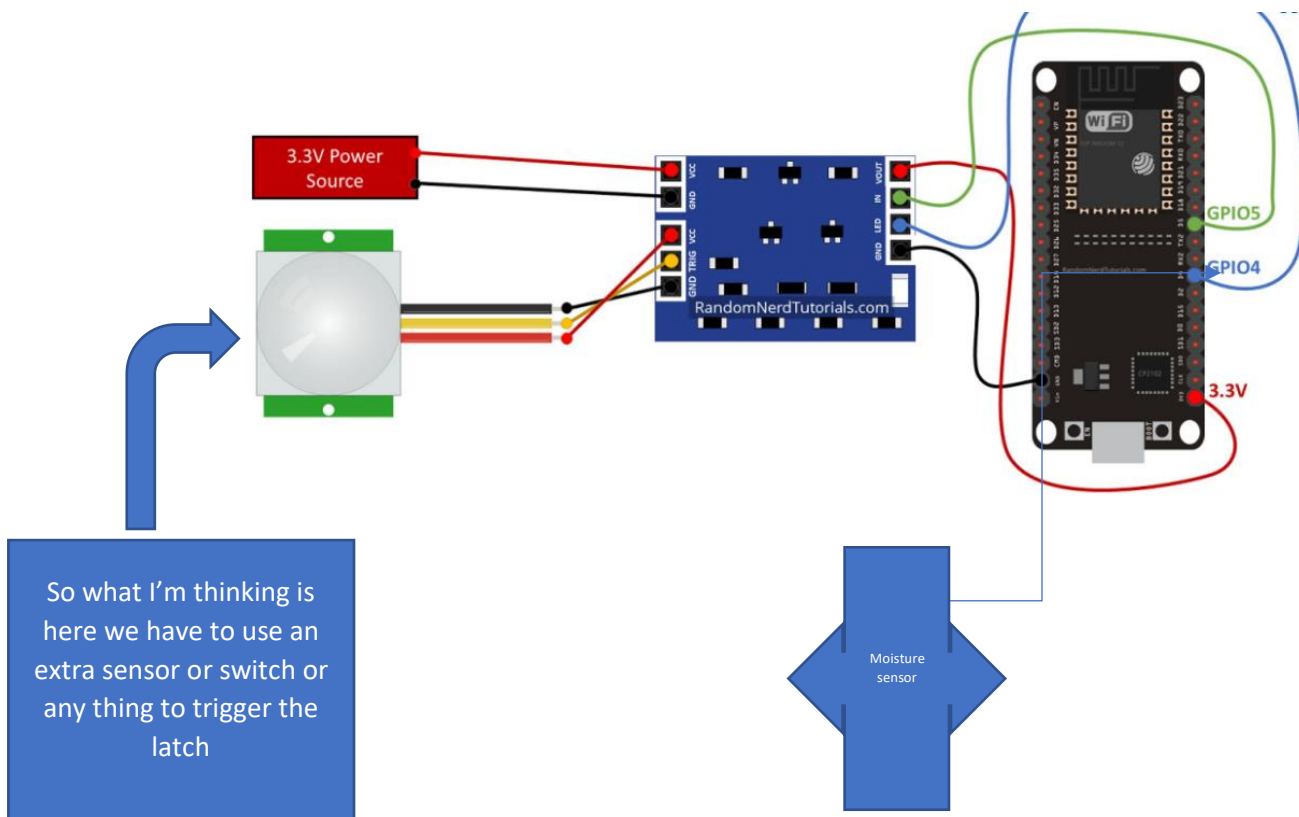
Whenever we trigger the latch, it will give power supply and make the node to take data from sensor and after certain time it should again give low to trigger for 30 seconds and then the micro controller will be off so this hardware trigger will not work for our case.

By seeing the article, I got an idea we can make a software trigger but I am not sure how far it will work so here is the code which I think may or may not work for our case. We can only test if we have this latch circuit shown in this link. Extreme Power Saving (0µA) with Any Microcontroller: Latching Power Circuit | Random Nerd Tutorials

```
Serial.begin(115200);

pinMode(powerLatch, OUTPUT);//moisture sensor

// pir senor

digitalWrite(powerLatch, HIGH); // triggering the power latch

after trigger we are doing task

userSchedumesh.setDebugMsgTypes( ERROR | STARTUP );  // set before init() so that you can see startup messages


mesh.init( MESH_PREFIX, MESH_PASSWORD, &userScheduler, MESH_PORT );

mesh.onReceive(&receivedCallback);

mesh.onNewConnection(&newConnectionCallback);

mesh.onChangedConnections(&changedConnectionCallback);

mesh.onNodeTimeAdjusted(&nodeTimeAdjustedCallback);

ler.addTask( taskSendMessage );

taskSendMessage.enable();

// Waits for 10 seconds

delay(30000);


// after doing the task for certain amount time we are triggering low

digitalWrite(powerLatch, LOW);
```

Even this is a very big task and we don't know how trigger happens with software and not sure we will get data if we do this.

PROCESS 3: This is far better than both the other processes and more success rate, which I went through this article:

Reference link: Smart Power Bank Keep-Alive | Zak's Electronics Blog ~* (zakkemble.net)

The company itself built an internal hardware circuit which will be decide the on and off time (duty cycle) of the power coming out from the power bank

The brain of this device is an ATtiny10 which controls the on and off cycling of the constant current sink (pulse duration and interval is adjustable via firmware).

We can directly connect to our nodes and save the current based on its internal op amps and mosfet firmware
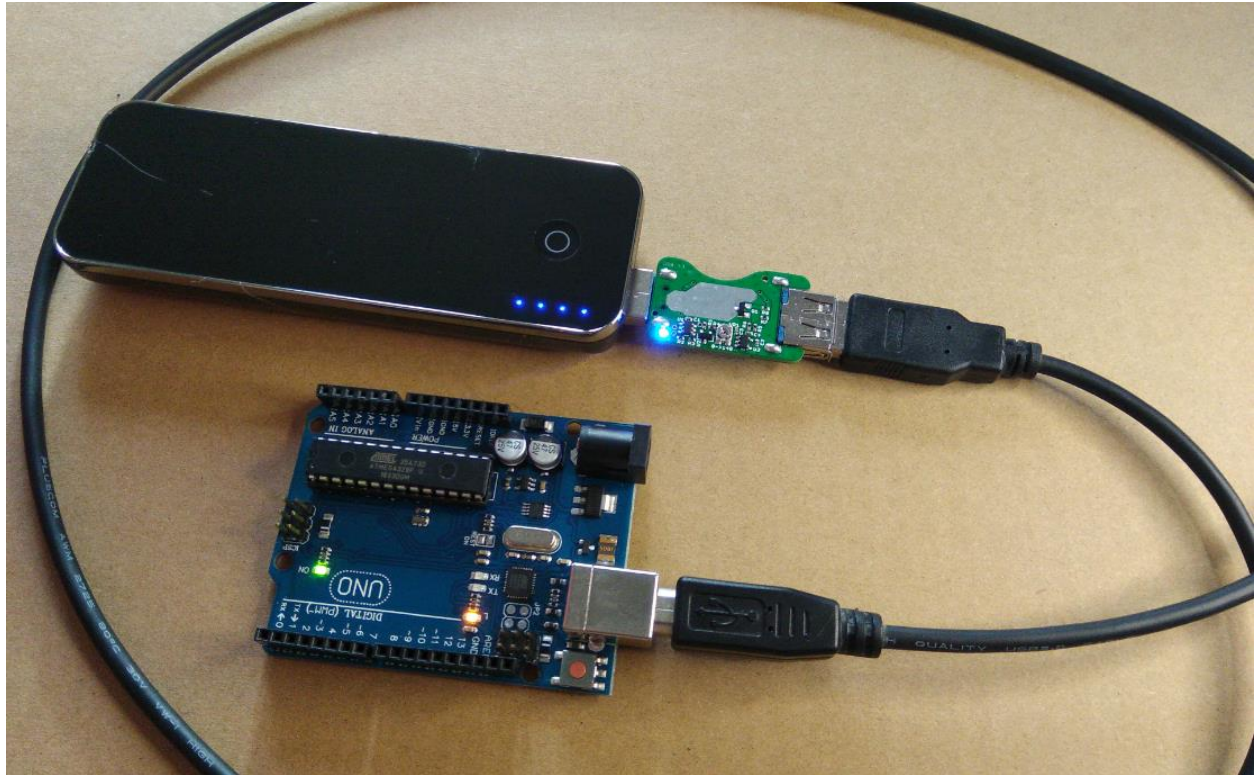
Process 4 :

Build an external timer circuit which takes very several hardware components like capacitors and resistors, Mossets and IC 555 timers, op-amps and calculate the hardware resistance values and design our own timer circuit which generate trigger which will take long time not sure our hardware will reset and get the data we must test this process, on the opposite side even it good to research but it is a lot of time taken if we don't have circuit schematic and also increases the size of the kit (prototype) to very large. Cost will increase as well, the cost to replace it to every node it looks something like this
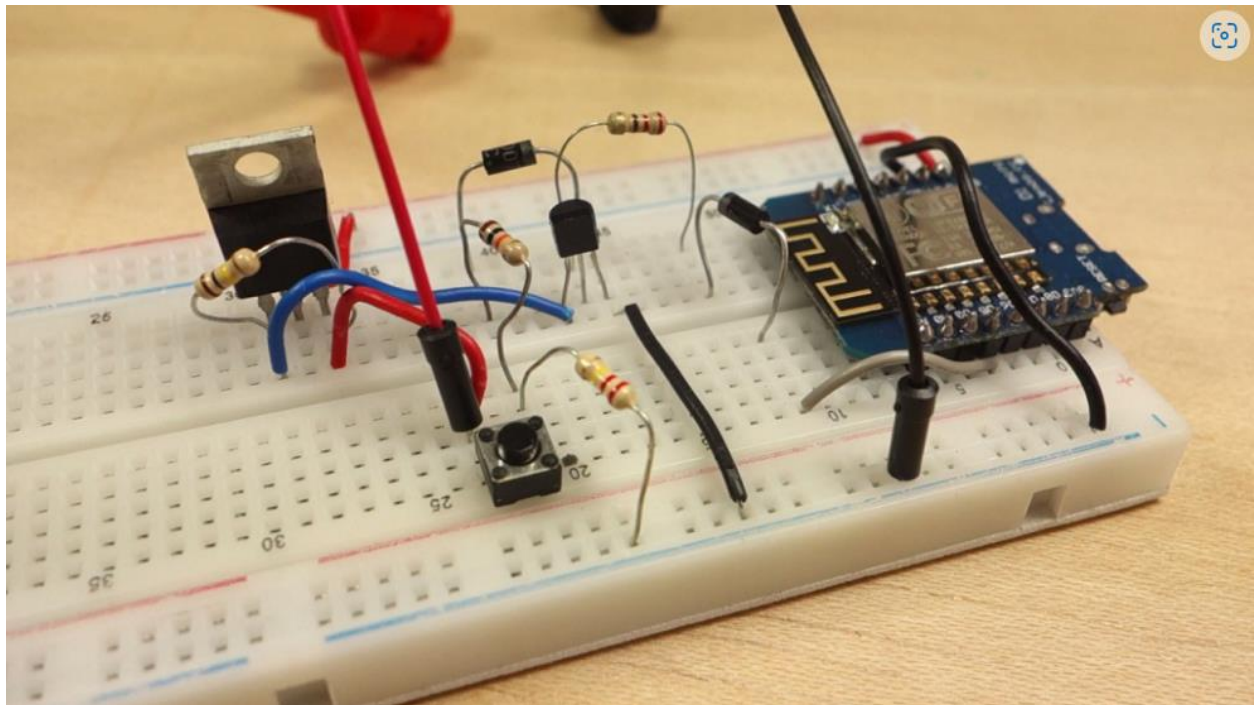
And even in place of switch we must replace it with another circuit to trigger automatically which is an additional circuit.

So based on all these processes I feel process of adding and resistor and led at starting to gnd and 3v3 will help to draw current from power bank and use it

If budget supports process 3 will be good even