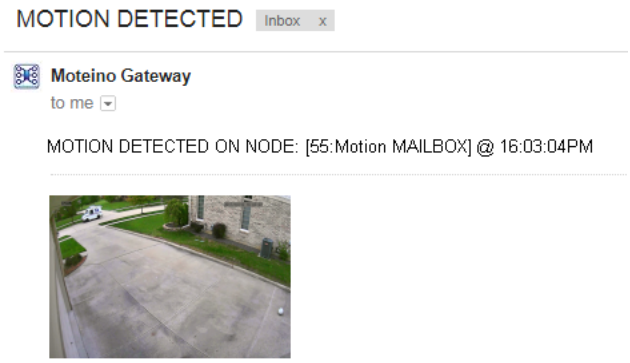
(https://lowpowerlab.com/)

Gateway app IP Camera snapshots (https://lowpowerlab.com/2017/10/11/gateway-app-ip-camera-snapshots/)

Posted on **October 11, 2017 (https://lowpowerlab.com/2017/10/11/gateway-app-ip-camera-snapshots/)**
Wouldn't it be cool to take a snapshot of your driveway when the garage is opening, or a snapshot of the mailbox when someone opens it, or a front door image when someone rings your door bell?

If you have an **IP Camera** on your home network, it most likely has an HTTP endpoint which can serve a static snapshot on demand.

There is now support for a variety of such events in the Gateway app (lowpowerlab.com/guide/gateway/). I've added some examples for the doorbell when it **RING**s, mailbox and motion motes when they report **MOTION**, and garage mote when it **OPEN**s. The snapshots get attached to an email that is sent to yourself, so you instantly get an image of the event. Here is a sample email received when my mailbox (https://lowpowerlab.com/2015/02/03/mailbox-notifier-upgrade-3/) (essentially a MotionMote (https://lowpowerlab.com/guide/motionmote/)) reports motion:



(https://lowpowerlab.com/wp-content/uploads/2017/10/SnapshotEmail.png)

It's the mail delivery so no issues:

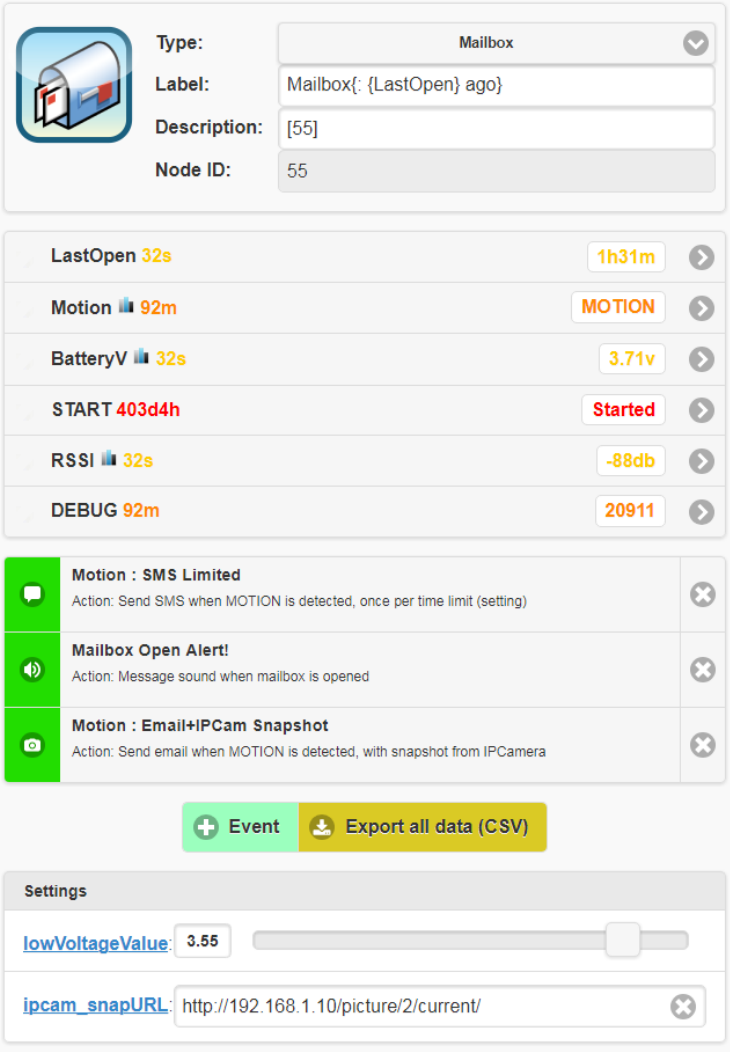
(https://lowpowerlab.com/wp-content/uploads/2017/10/IMG_chn0_TIMER_MNG_20171010160303_002.jpg)

In my case this camera mainly monitors the driveway, so I can have my GarageMote also send me an email when the garage is opened, here's a sample:

(https://lowpowerlab.com/wp-content/uploads/2017/10/GarageOpeningSnapshot.jpg)

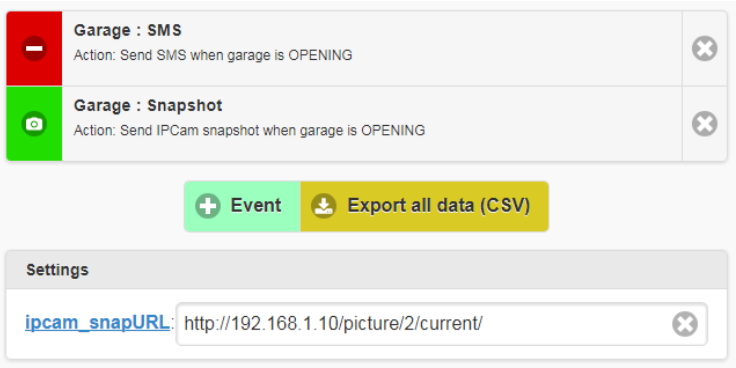
This changeset (https://github.com/LowPowerLab/RaspberryPi-Gateway/commit/fe971b32fcb8531d94746a4d750b0cf556a28560) includes a new setting called **ipcam_snapURL** that is overriden in the nodes which have such snapshot events. That way different nodes can request snapshots from different IP cameras. Otherwise the value is inherited from the general settings. If you merge this changeset locally, don't forget to change the IP camera URL in the general settings, which should correspond to your IP camera's snapshot URL – this should return an image, not a webpage or text/html page, or the attachment will be corrupted. Then, all nodes that override (ie inherit) this setting will display it in the node settings, where you can customize it for that node.

Here is a look at a sample mailbox node which includes the new event and URL setting:



(https://lowpowerlab.com/wp-content/uploads/2017/10/MailboxNodeDetails.png)

And here's the event and setting for the garage node:



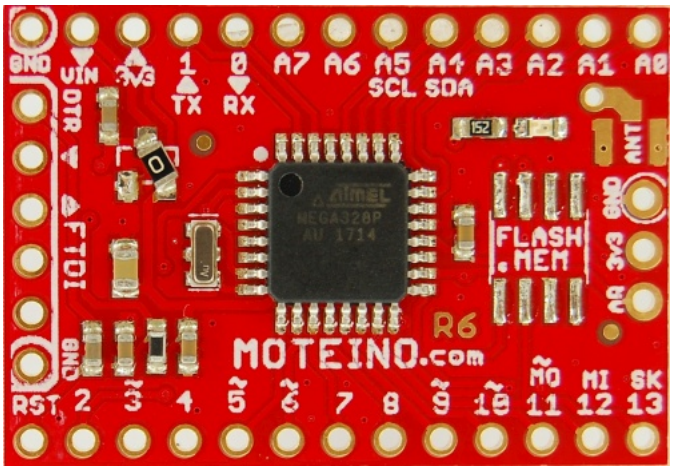
(https://lowpowerlab.com/wp-content/uploads/2017/10/GarageNodeDetails.png)

You can mix and match to create other events based on the given samples. If you create your own variants, I recommend using the **userMetrics** folder to add new custom code, so the main app files remain unchanged and thus upgrading to new releases is easier in the future. Enjoy!

Posted in **IoT Gateway (https://lowpowerlab.com/category/iot-gateway/)**

Introducing the no-LDO 8Mhz Moteino (https://lowpowerlab.com/2017/09/15/introducing-the-no-ldo-8mhz-moteino/)

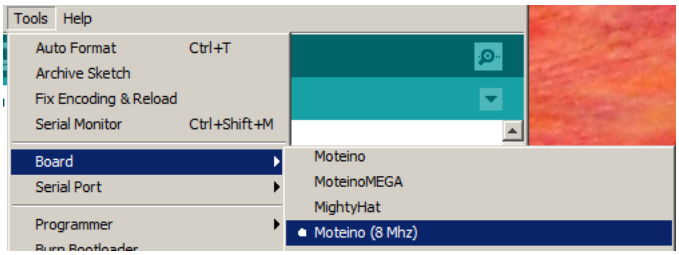
Posted on **September 15, 2017 (https://lowpowerlab.com/2017/09/15/introducing-the-no-ldo-8mhz-moteino/)**



(https://lowpowerlab.com/wp-content/uploads/2017/09/MoteinoR6_8mhz.jpg)

From popular demand, there is now a Moteino 8Mhz variant (https://lowpowerlab.com/shop/product/159) which has the following differences to the regular Moteino:

- no LDO linear regulator
- the VIN and 3v3 pins are connected via a **0ohm** resistor (including FTDI header VIN)
- must be powered from 3.6v or less when RFM radio and/or FLASH-MEM are installed onboard, otherwise without radio/external flash the board will work up to 5V
- 16mhz resonator is still installed but not used with the 8Mhz fuses. This means you can still change the fuses yourself and use it if you'd like, but this will only be safe down to about 3V
- The fuses are: **LOW**: 0xD2, **HI**: 0xDC, **EXTENDED**: 0xFE
- even more ultra low power – 2uA less current than the regular Moteino
- Runs DualOptiboot compiled for 8mhz
- 57600baud upload programming speed (vs. 115200)
- you will need to install the latest Moteino definition (v1.3 or newer) (https://lowpowerlab.github.io/MoteinoCore/package_LowPowerLab_index.json) in your Arduino IDE Board Manager to gain the new **Moteino (8Mhz)** target board:

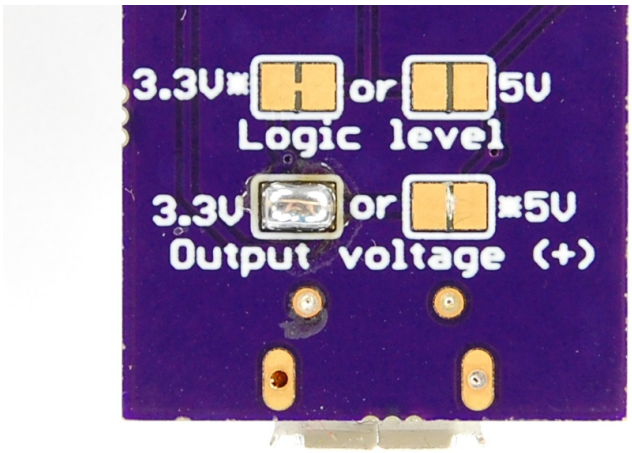


(https://lowpowerlab.com/wp-content/uploads/2017/09/Moteino_8Mhz_IDE.png)

For the latest updates and specs on this board, always check the official Moteino guide (https://lowpowerlab.com/guide/moteino/moteino-8mhz/).

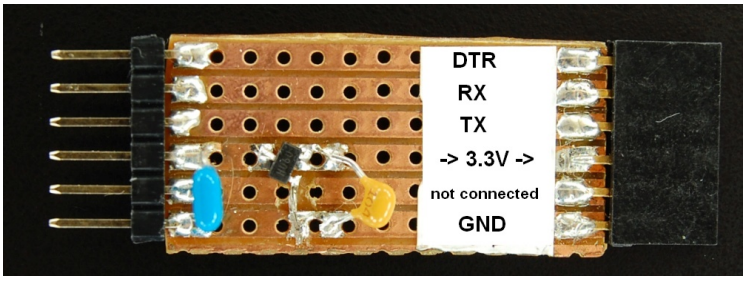
To program this Moteino the FTDI-Adapter offered in the shop can be modified to pass a safe 3.3V to the 8Mhz LDO-less Moteino – cut the ***5V Output Voltage** jumper and solder the **3.3V** one:

Note that this mod will make the FTDI-Adapter regulate power, but it can only supply about 50mA to the Moteino, if you draw more power, the adapter might drop and reconnect to your computer



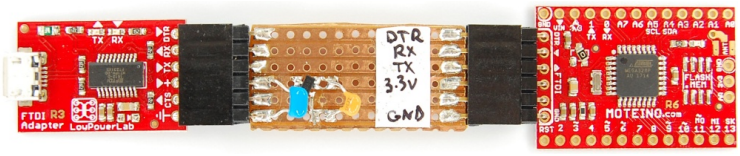
(https://lowpowerlab.com/wp-content/uploads/2017/09/MoteinoR6_8mhz_ftdimod.jpg)

Alternatively, you can build a dedicated adapter that takes the 5V from the USB and regulates it to 3.3v, here's such an example which uses the LDO from the Moteino itself (MCP1703) along with a 1uF and 0.1uF caps, all other connections are passed through and assumed to be 3.3v levels:



(https://lowpowerlab.com/wp-content/uploads/2017/09/MoteinoR6_8mhz_ldoadapter.jpg)

You would then use it in between your stock unmodified FTDI-Adapter (or equivalent board, providing 5V VIN power and 3.3V TX/RX/DTR signals), and the no-LDO Moteino which requires 3.3V when radio/flash are present:



(https://lowpowerlab.com/wp-content/uploads/2017/09/MoteinoR6_8mhz_ldoadapter_withFTDI.jpg)

These types of Moteinos are ideal for ultra low power coin cell and other micro power powered nodes – power them from 3.6V or less. Of course, when you have such tiny power supplies, you must choose your transceiver carefully, as you likely cannot transmit at full 20dBm power from a tiny coincell. The W/CW 13dBm radios running the auto-power-dial

RFM69_ATC library extension would be recommended for running on coin cells or small solar cells.

I can't wait to see what you guys will make with these!

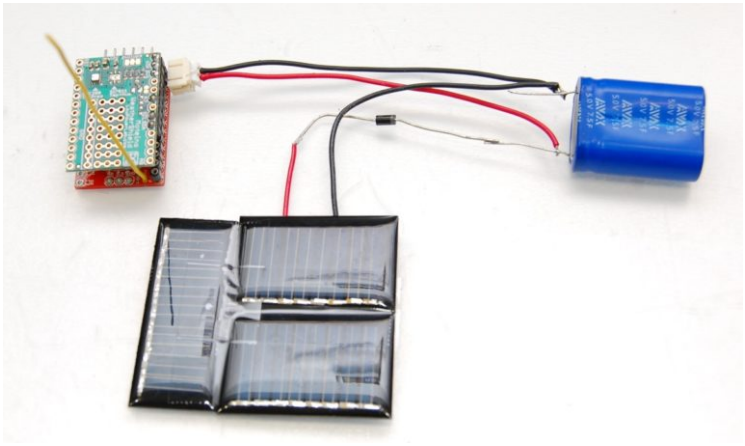
Posted in **Moteino (https://lowpowerlab.com/category/moteino/)**, **New products (https://lowpowerlab.com/category/new-products/)**

WeatherShield + supercapacitor + tiny solar cell (https://lowpowerlab.com/2017/09/15/weathershield-supercapacitor-tiny-solar-cell/)

Posted on **September 15, 2017 (https://lowpowerlab.com/2017/09/15/weathershield-supercapacitor-tiny-solar-cell/)**

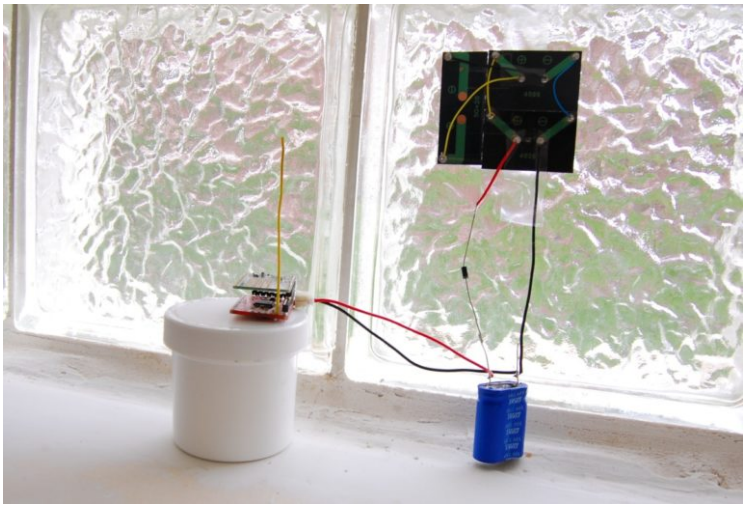
There were some interesting discussions in the Low Power Techniques forum (https://lowpowerlab.com/forum/low-power-techniques/) about solar power, running motes on super capacitors (https://lowpowerlab.com/forum/projects/a-solar-supercap-powered-moteino/), and running motes without batteries. I had some tiny solar cells I got long ago from ebay, and I wondered if these could run a low power stock Moteino+WeatherShield (https://github.com/LowPowerLab/RFM69/blob/master/Examples/WeatherNode/WeatherNode.ino) node, without any assistance.

For the experiment I added this 7.5F low-ESR supercap (http://www.mouser.com/Search/ProductDetail.aspx?qs=xIT89idmjZkhn0E0LyhRQQ%3D%3D) to charge from the solar cell during the day, and keep the mote going at night. To avoid discharge I added a shottky diode from the cell to the cap. The solar cell is actually composed of three tiny cells wired in parallel, the combined capacity is around 0.7W. Here's the "schematic":



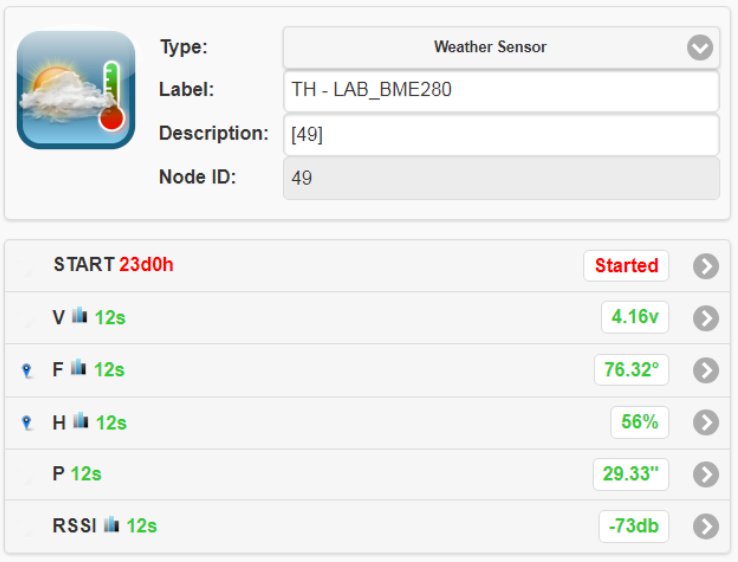
(https://lowpowerlab.com/wp-content/uploads/2017/09/DSC_1332.jpg)

I initially charged the cap from a 5V source to get it going, and then I attached the cell to a basement blurred glass block window which hardly gets a ton of light:



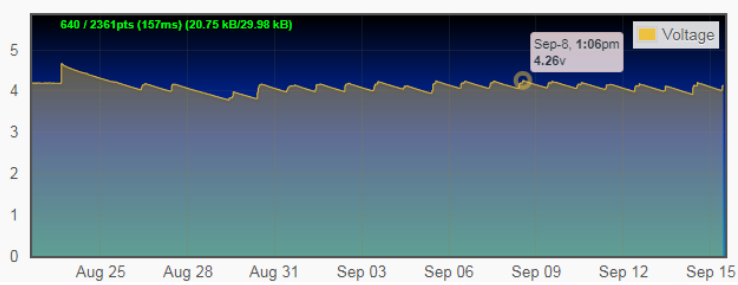
(https://lowpowerlab.com/wp-content/uploads/2017/09/DSC_1329.jpg)

Note that the shottky does drop 0.2V from the actual capacitor voltage. Even so this worked surprisingly well. Here is the new node in my Gateway UI (https://lowpowerlab.com/guide/gateway/):



(https://lowpowerlab.com/wp-content/uploads/2017/09/WShield_SolarCellProject_NodeDetails.png)

The node transmits temp/hum/pressure/voltage data every minute. Below is a look at a few weeks of the voltage readings. The solar cell charges every day to about 4.25v (actual voltage is ~4.45V b/c of the diode) and discharges to just below 4V.



(https://lowpowerlab.com/wp-content/uploads/2017/09/WShield_SolarCell_Voltage.png)Quite encouraging, I was pretty sure this would work since the WeatherShield and Moteino sleep at under 7uA, I just wasn't sure how these old small cells would behave with the supercap. I recon if this node would be placed outside and facing direct sunlight, the charge voltage and overnight dips would be even higher values.

This would also work with a LiPo battery instead of the super cap. Of course, if this was placed outside in the freezing cold, those cheap LiPos from china can die in the cold (https://lowpowerlab.com/2015/02/03/chinese-lithium-cells-freezing/). But at just $6.50, the supercap is a nobrainer, much safer and resilient to the cold, and shows how low power is not that complicated.

Posted in **IoT Gateway (https://lowpowerlab.com/category/iot-gateway/)**, **Moteino (https://lowpowerlab.com/category/moteino/)**, **WeatherShield (https://lowpowerlab.com/category/weathershield/)**

Gateway app Updated to v8.10 (https://lowpowerlab.com/2017/09/15/gateway-app-updated-to-v8-10/)

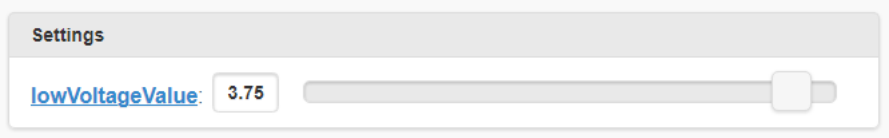
Posted on **September 15, 2017 (https://lowpowerlab.com/2017/09/15/gateway-app-updated-to-v8-10/)**
The Pi Gateway (https://lowpowerlab.com/guide/gateway/) software is now at **v8.10**, this release is mainly a new feature release and also it fixes some issues. You can view a list of all the changes in the official release notes (https://github.com/LowPowerLab/RaspberryPi-Gateway/releases/tag/v8.10). Here are some quick highlights:

Node/overridable Settings

If you'd like a particular global setting (from settings.json5) to be overridable in a node (for instance minimum voltage for battery powered nodes) you can now do so in metrics.js by using the new `settings` section under `exports.motes`, note that the included settings must match the name in **settings.json5** or they will be ignored. **Example from** `exports.motes.MotionMote`**:**

```
MotionMote: {
  label   : 'Motion Sensor',
  icon    : 'icon_motion.png',
  settings: { lowVoltageValue: '' }, //blank will make it inherit from global settings.json lowVoltageValue
},
```

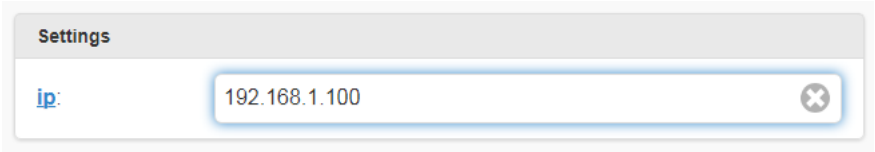
(https://user-images.githubusercontent.com/3129069/30081421-1b712398-9255-11e7-8726-34a54b19aef3.png)Then on nodes of that type, the setting can now be set a custom value:



(https://user-images.githubusercontent.com/3129069/30082558-3f59f13c-9259-11e7-9fd6-e32b682c1940.png)

Wifi RadioThermostat CT50 IP setting support

Specific code for the CT50 was updated to support a new IP setting in the UI. This allows the user to override and set the IP of a thermostat on the node page, thus enabling having multiple thermostats with different IPs in the app:



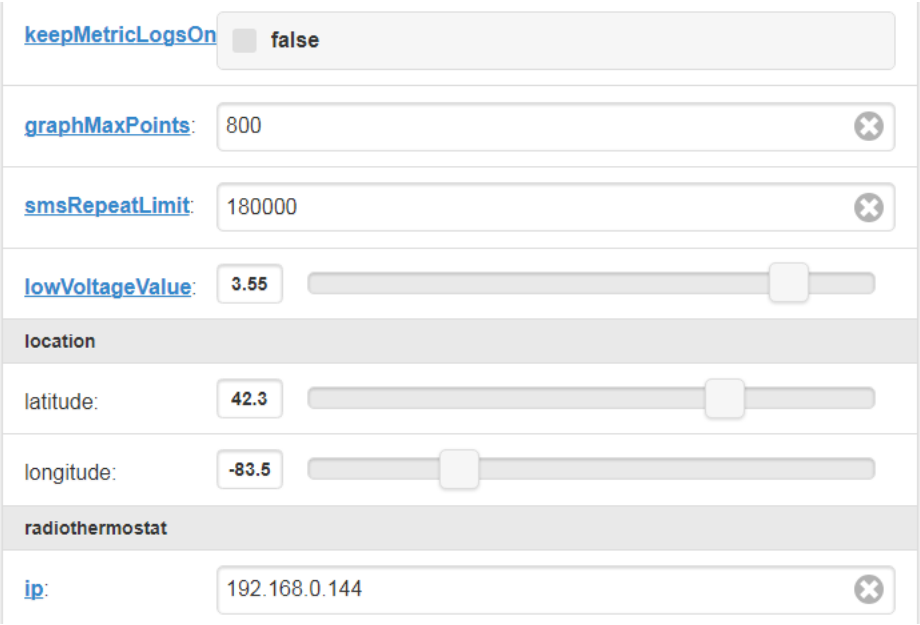
(https://user-images.githubusercontent.com/3129069/30082786-febbdb76-9259-11e7-9cda-f3f77221d28f.png)

New Setting Types

This enables more user friendly settings. Supported types are jQuery mobile HTML5 defaults (http://demos.jquerymobile.com/1.1.2/docs/forms/textinputs/), and examples of how to use these are found in the `settings.json5` file:

- checkbox – for true/false settings
- number
- email
- password – obsoletes setting.password:true/false
- range – min, max
- default (no type) is text

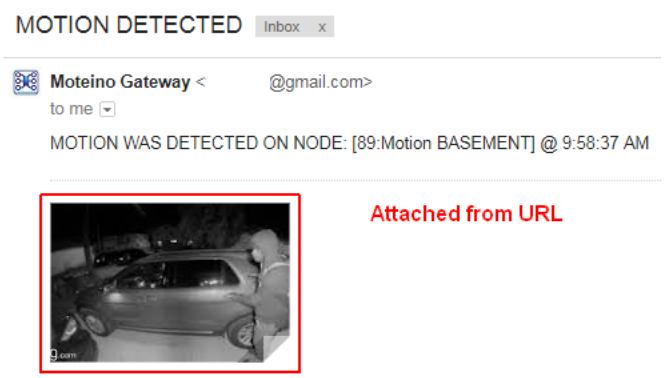
A few examples using new types:



(https://user-images.githubusercontent.com/3129069/30081630-e631256a-9255-11e7-9193-fe2a524051c3.png)

Email attachments

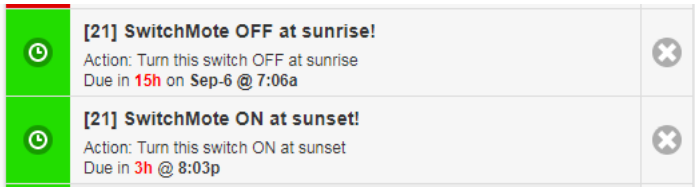
The sendEmail function in gateway.js has a new parameter where you can pass the URL of an attachment to include in sent emails: `global.sendEmail = function(SUBJECT, BODY, **ATTACHMENTS**).` **Example email with attachment:**



(https://user-images.githubusercontent.com/3129069/30081951-11c6008c-9257-11e7-84bf-6177f5876209.png)

Scheduled events time remaining & datetime

Scheduled events now show time remaining until they will run, and the datetime when that happens:



(https://user-images.githubusercontent.com/3129069/30082202-f75b1060-9257-11e7-94c8-4cb2e8627138.png)

Sunset/sunrise API for events

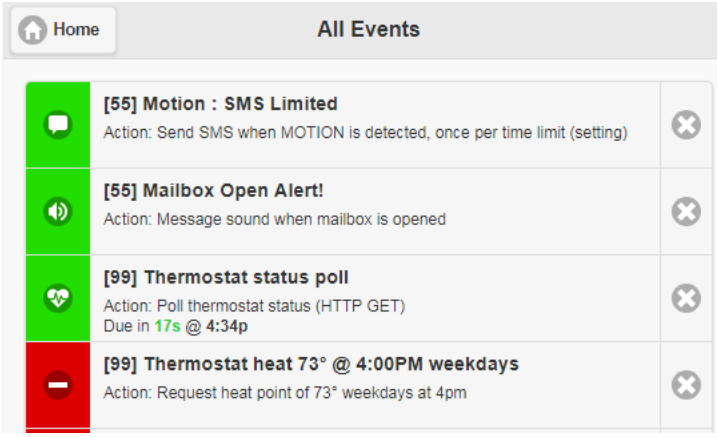
Based on suncalc (https://github.com/mourner/suncalc), this node API allows creating events that run at various times during the day based on calculation of the sun position. A few examples are:

- sunrise
- sunset
- solarNoon
- goldenHour
- dusk
- dawn

To calculate these events, the latitude/longitude coordinates can be provided on the general settings page:

(https://user-images.githubusercontent.com/3129069/30499718-a5fe9154-9a29-11e7-9ec5-dc4c8e4e98f8.png)

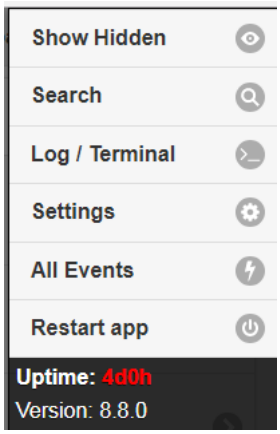
New All-Events page which shows all scheduled and disabled events:



(https://user-images.githubusercontent.com/3129069/30082233-1427d3b8-9258-11e7-85d8-86e70be88cb9.png)

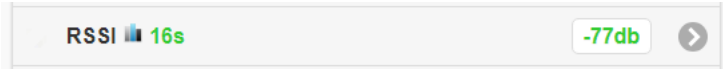
Modified main menu:

- removed the Exit item (redundant)
- added app version:

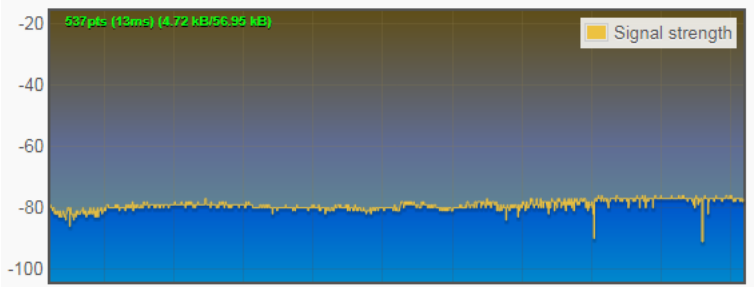


(https://user-images.githubusercontent.com/3129069/30082139-b73cdbbc-9257-11e7-9ffb-f4ee174c390a.png)

RSSI is now a metric and logged/graphed by default:



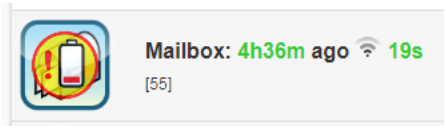
(https://user-images.githubusercontent.com/3129069/30082336-72e316a6-9258-11e7-9ccb-6b075bf2246b.png)



(https://user-images.githubusercontent.com/3129069/30082368-8b589382-9258-11e7-8f8d-99bae7774649.png)

Low Battery Voltage

Warning icon now blinks in/out over the node icon:



(https://user-images.githubusercontent.com/3129069/30082594-652de346-9259-11e7-96db-7d5c2ed2f7f6.png)

As always, when you update:

- make sure to back up your data before you do an upgrade to ensure there is no loss in case something goes wrong
- make sure to read the release notes (https://github.com/LowPowerLab/RaspberryPi-Gateway/releases/tag/v8.10) so you don't miss important update actions you need to take
- report any issues in this forum (https://lowpowerlab.com/forum/pi-gateway/) or submit a PR in the Github repository (https://github.com/LowPowerLab/raspberrypi-gateway)

Posted in **Home automation (https://lowpowerlab.com/category/home-automation/)**, **IoT Gateway (https://lowpowerlab.com/category/iot-gateway/)**, **Updates (https://lowpowerlab.com/category/updates/)**

Simple monopole antenna testing (https://lowpowerlab.com/2017/08/17/simple-monopole-antenna-testing/)

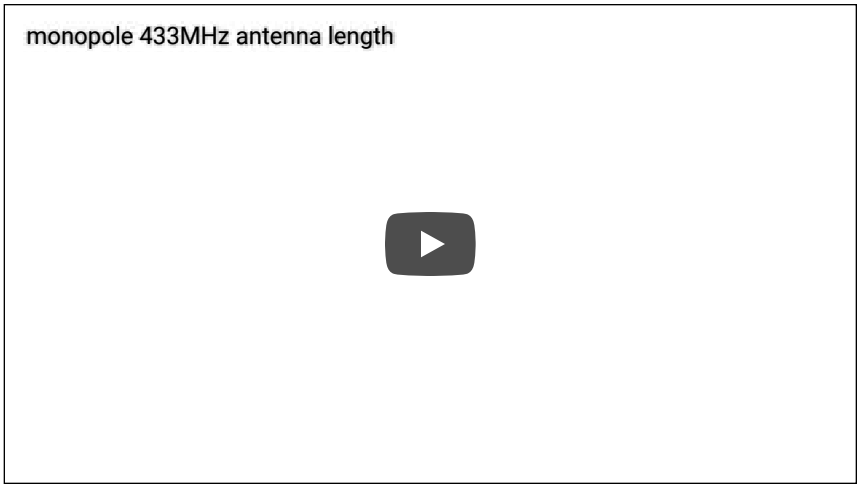
Posted on **August 17, 2017 (https://lowpowerlab.com/2017/08/17/simple-monopole-antenna-testing/)**
As outlined in the RF Best Practices guide (https://lowpowerlab.com/guide/rf-best-practices/quarter-wave-vertical/), the **Monopole Antenna** is formed by a **quarter wavelength** vertical piece of wire, plus a "launchpad" ground around its base, and is a very good cost-to-performance ratio antenna. The quarter wavelength refers to the wavelength of the frequency at which the radio is transmitting/receiving. As an example, the for 433mhz the wavelength is 0.69m and the quarter wave is then ~172.5mm. This is a theoretical figure at which the signal would have maximum resonance (https://lowpowerlab.com/guide/rf-best-practices/antennas/) in the antenna, but in real life the signal from a radio goes through various passive components (matching networks), RF switches, and other PCB traces which influence this signal, and hence the signal might resonate better at slightly different physical dimensions of the antenna.

In the video below, Marcel illustrates how you can test a simple monopole antenna by starting with a given length and then trimming the antenna length to determine which length yields the longest range. Since the radio can transmit at a maximum of 20dBm, a 30dB attenuator was added and also the transmit power was diminished in software (with this function (https://github.com/LowPowerLab/RFM69/blob/928de01a2b0ffc21d0dff935694641c04d6b9041/RFM69.h#L115)) to reduce the total output to around -26dBm – that is many many times (-30dB = **1000 times** reduction) less powerful than 20dBm (dB scale is logarithmic not linear – see this page (https://lowpowerlab.com/guide/rf-best-practices/decibels/) for more on that). This allows testing the antenna at very small range without having to walk very far away to see the signal drop. The monopole is omnidirectional in the horizontal plane (https://lowpowerlab.com/guide/rf-best-practices/radiation-patterns/) (ie it emits the signal in all directions at the same intensity).

(https://lowpowerlab.com/wp-content/uploads/2017/08/MonopoleTest.jpg)

Of course, this type of test could be done in the lab with a VNA (Vector Network Analyzer). But for such a cheap and simple antenna, this test shows how easy it is to do it yourself without investing an eye watering amount of cash in such exotic equipment.

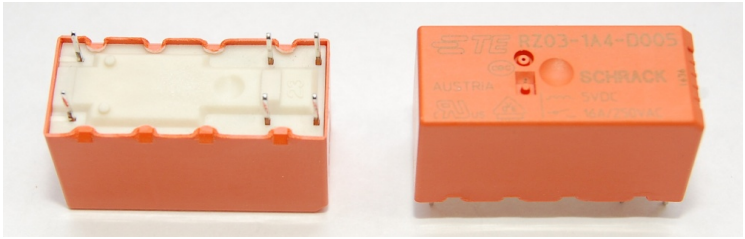
You can do your own testing in a similar manner, and you can even use the Node and Gateway examples (https://github.com/LowPowerLab/RFM69/tree/master/Examples) for this purpose, and simply add the `setPowerLevel(0)` call in `setup()` (and disable `RFM69_ATC`) to reduce signal power, or use an attenuator like Marcel did. Be sure to check out this page (http://www.marcelpost.com/wiki/index.php/Low-cost_antenna_shootout_70cm) where Marcel has used the same technique to test several antenna types, with some interesting results – this might help you decide to upgrade from the virtually *free* monopole to a dipole.



Posted in **Radio/RF (https://lowpowerlab.com/category/radiorf/)** | **Leave a reply (https://lowpowerlab.com/2017/08/17/simple-monopole-antenna-testing/#respond)**

SwitchMote with single 16A relay (https://lowpowerlab.com/2017/07/17/switchmote-with-single-16a-relay/)

Posted on **July 17, 2017 (https://lowpowerlab.com/2017/07/17/switchmote-with-single-16a-relay/)**
SwitchMote (http://lowpowerlab.com/shop/product/128) and SwitchMote PSU (https://lowpowerlab.com/shop/product/127) are now available with a single 16A relay, instead of dual 10A relays. I realize this is most often the case that a second relay is not really necessary, except when replacing dual gang switches with a single gang SwitchMote, so I found this higher rating relay which can be soldered as shown in the guide. I also added the option to get it with a single 10A relay since most light applications now use either CFLs or LEDs and 16 amps are not really necessary for such small loads.

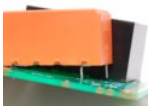


(https://lowpowerlab.com/wp-content/uploads/2017/07/DSC_1128.jpg)

This new 16A relay requires removing two of the leads to make it fit the SwitchMote PCB, this is also added to the guide (https://lowpowerlab.com/guide/switchmote/assembly-2x10a/):

(https://lowpowerlab.com/wp-content/uploads/2016/09/DSC_1118.jpg)

(https://lowpowerlab.com/wp-content/uploads/2016/09/DSC_1119.jpg)



(https://lowpowerlab.com/wp-content/uploads/2016/09/DSC_1123.jpg)

(https://lowpowerlab.com/wp-content/uploads/201

Worth noting here that the dual relay SwitchMote (a.k.a. 2x10A) is now the official kit that deprecates the older single 5A relay SwitchMote – that one has been discontinued and will only be available by special order.

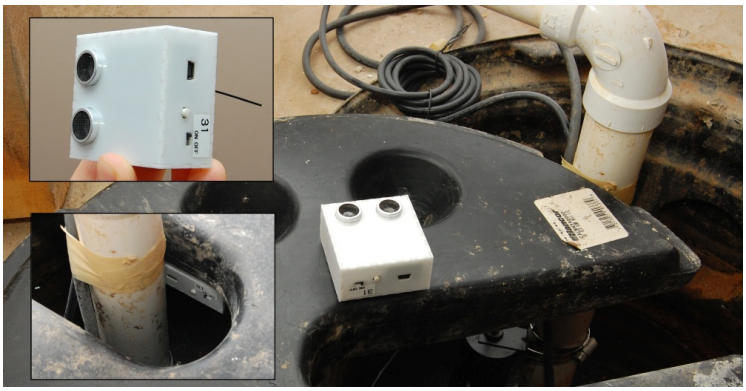
Posted in **SwitchMote (https://lowpowerlab.com/category/switchmote/)**, **Updates (https://lowpowerlab.com/category/updates/)**

Sump Pump Watchdog hack (https://lowpowerlab.com/2017/07/17/sump-pump-watchdog-hack/)

Posted on **July 17, 2017 (https://lowpowerlab.com/2017/07/17/sump-pump-watchdog-hack/)**

The sump pump is a device that works hard to keep your home dry but is prone to failure, and if you have any valuables in your basement or crawlspace, even a light flood can cause a lot of damage and potential health problems (mold!). It tends to fail in a big storm when it gets really busy pumping water away from around your home (worse if you lose power too). Heard a few horror stories and not having some kind of backup or monitoring it is the perfect recipe for a disaster waiting to happen.

My trusty SonarMote (https://lowpowerlab.com/guide/sonarmote/) is of course an independent sensor which alerts me when the water reaches an unsafe level in the sump well. It's mounted on the bottom of the sump well lid and it measures the distance to the water surface. My gateway app graphs that level and also provides a means to alert me via SMS or email.

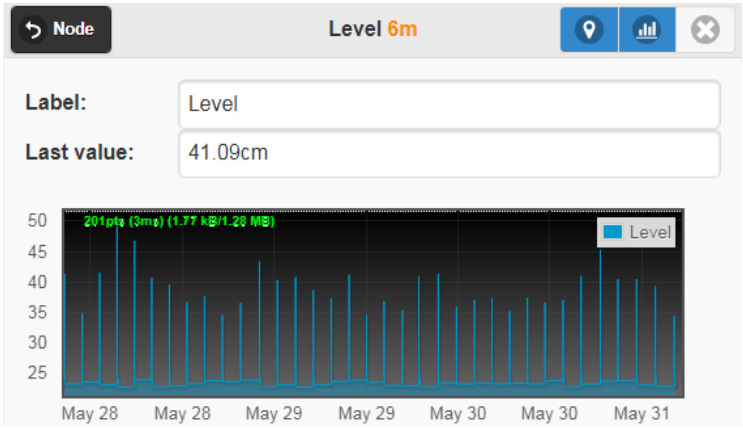


(https://lowpowerlab.com/wp-content/uploads/2017/07/SonarMote_Install.jpg)

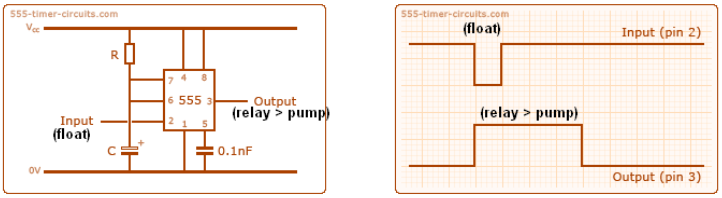
This year the pump's mechanical float decided to get stuck again and then fail, so I had to either buy a whole new pump, or find an alternative to the float part. Turns out there's a device called **The Basement Watchdog**. It's very simple in its operation – has its own float, which triggers a circuit that activates a 120v outlet for a fixed amount of time, cheap and perfect.

(https://lowpowerlab.com/wp-content/uploads/2017/07/BasementWatchdog.jpg)

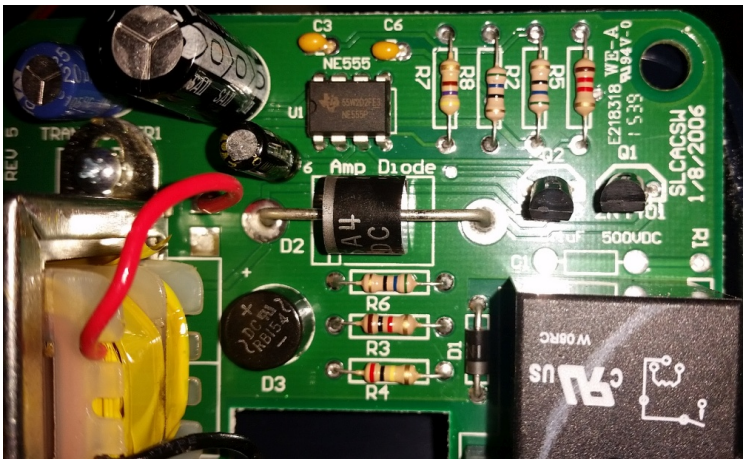
As soon as I installed this, I noticed my SonarMote measurement graph was messed up. That's because the device would tend to empty out the well very sporadically and for a short delay, and the level would only vary by very little, not very visually helpful.



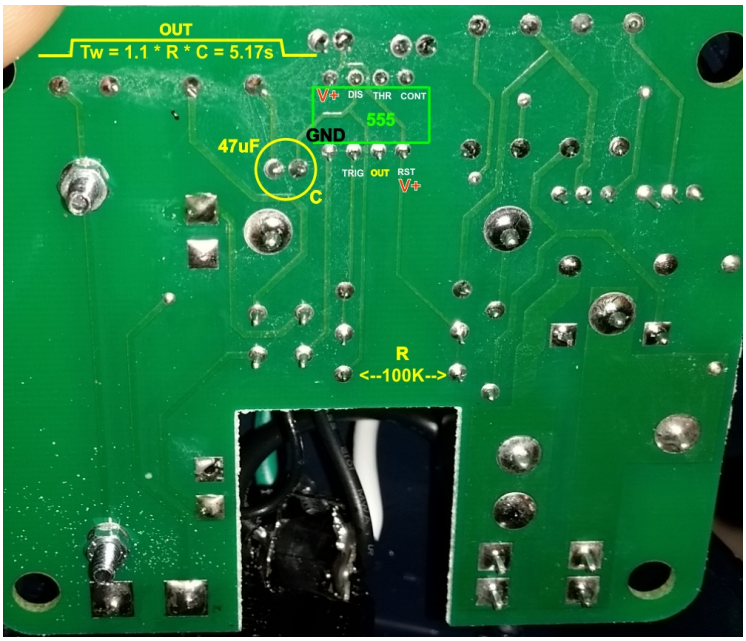
(https://lowpowerlab.com/wp-content/uploads/2017/07/Watchdog_Graph.png)I wondered how hard can it be to hack the Watchdog to make it stay on for longer and pump more water. Unsurprisingly the circuit is based on the TI ne555 (http://www.ti.com/lit/ds/symlink/ne555.pdf) timer chip which after a little investigation is obviously running in monostable configuration (http://www.555-timer-circuits.com/operating-modes.html). Here's a nice video walkthrough (https://www.youtube.com/watch?v=8PSCF4dVmK4&spfreload=10) that explains this mode in more detail if you're not familiar with the 555 timer. In a nutshell there is a trigger (the float) which activates the 555 timer output to go HIGH (activates relay and turns pump ON) for a fixed amount of time (configured by a resistor and capacitor RC discharge circuit), after which it goes LOW (and switches off the pump).



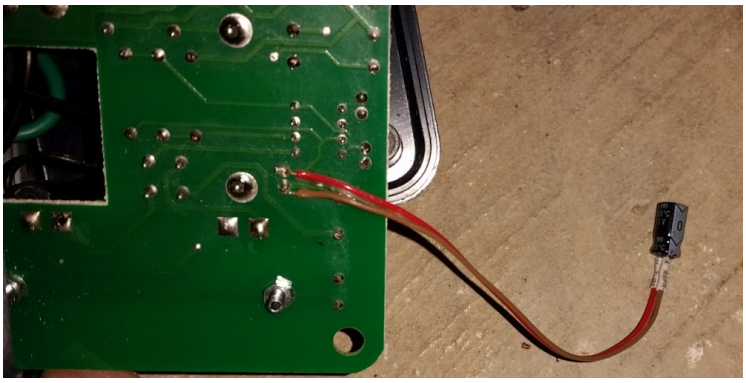
(https://lowpowerlab.com/wp-content/uploads/2017/07/555-monostable.png)In my Watchdog, the timer is determined by a 100K resistor and 47uF capacitor. The 555 monostable timer formula is **Tw=1.1*R*C** which results in a ~5 second activation of the pump, which is way too low and explains the unappealing graphs I've been getting:



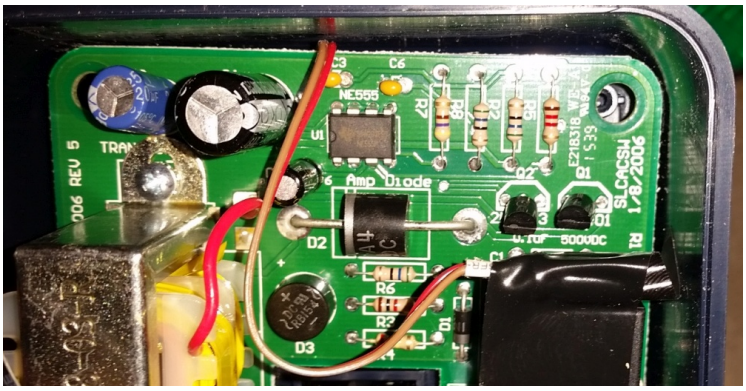
(https://lowpowerlab.com/wp-content/uploads/2017/07/WatchDog_PCB.jpg)



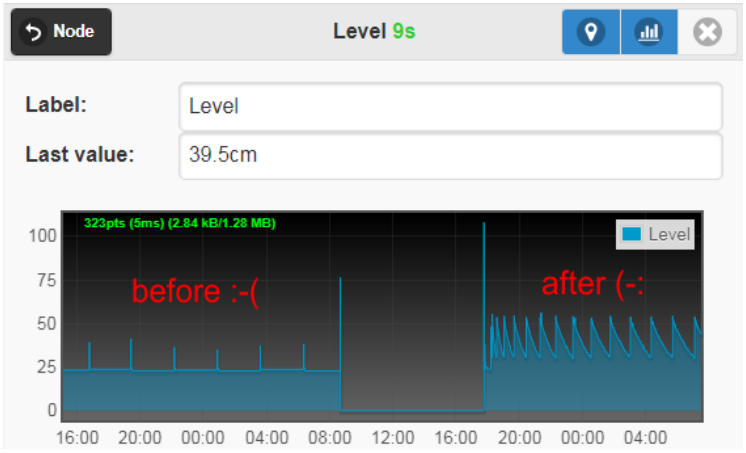
(https://lowpowerlab.com/wp-content/uploads/2017/07/conn.jpg)To change this output time there are 2 options – desolder the resistor and solder a larger value (a bit messy and risking to damage the circuit), or solder a parallel capacitor to the existing one. I chose to solder another capacitor since capacitors in parallel combine their capacitance and required no desoldering. So adding 2 wires to the existing cap and using another cap at the other end makes it easy to change the cap overall value or even use a variable capacitor. If you wanted to change the resistor instead, you could add a potentiometer and case-mount to to allow changing the timing any time later, but I thought that's overkill, I just needed a bit longer delay. So here's the **220uF** capacitor I added and taped to the relay to prevent any movement/shorts:



(https://lowpowerlab.com/wp-content/uploads/2017/07/WatchDog_CapAdded.jpg)

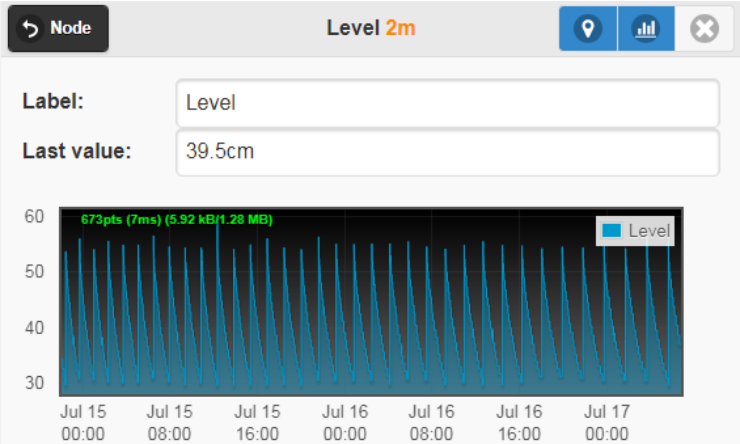


(https://lowpowerlab.com/wp-content/uploads/2017/07/WatchDog_CapTaped.jpg)Simple enough, the result was an increase to ~30 seconds which empties out the well almost completely and yields nice graphs again, I don't anticipate having to ever touch this again:



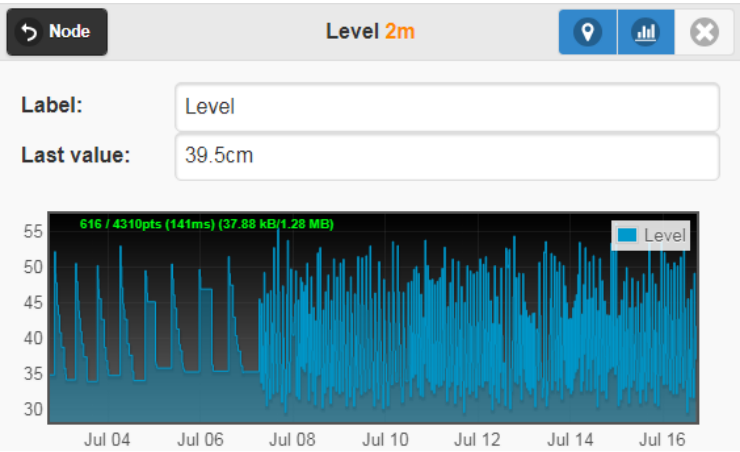
(https://lowpowerlab.com/wp-content/uploads/2017/07/Watchdog_Graph_fixed.png)

This is the graph for one day, from empty to trigger point:



(https://lowpowerlab.com/wp-content/uploads/2017/07/Watchdog_Graph_fixed2.png)

This is also helpful to see weather patterns, here's a dry period followed by a few days of heavy rain:

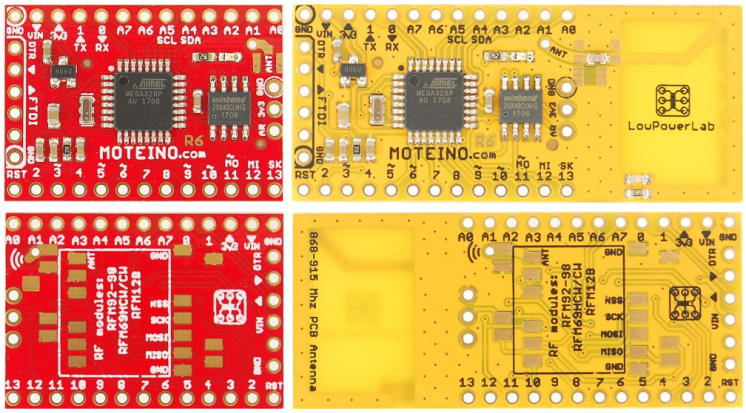


(https://lowpowerlab.com/wp-content/uploads/2017/07/Watchdog_Graph_fixed3.png)

Posted in **SonarMote (https://lowpowerlab.com/category/sonarmote/)**

Moteino R6 released (https://lowpowerlab.com/2017/05/26/moteino-r6-released/)

Posted on **May 26, 2017 (https://lowpowerlab.com/2017/05/26/moteino-r6-released/)**

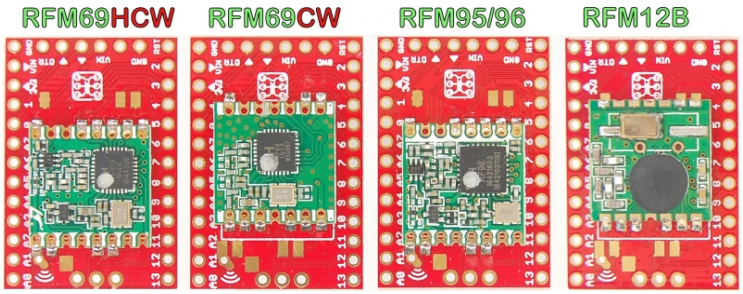


After Moteino R4 has been the long running champion of its lineup, and R5 has had a brief period of glory, Moteino (https://lowpowerlab.com/shop/product/99) has now been shipping for the past week at revision **R6!**

Wait, what happened to R5 which was never announced you ask?
Well R5 was mainly a transceiver layout change from R4, it also added a **u.FL** RF connector (which is now offered in the shop (https://lowpowerlab.com/shop/category/75)) and SMA connector "helper" pads, and few other minor layout changes, nothing too significant and otherwise identical to R4. Customers were now getting HCW and LoRa radios on the same Moteino PCB instead of separate PCBs for HW and LoRa.

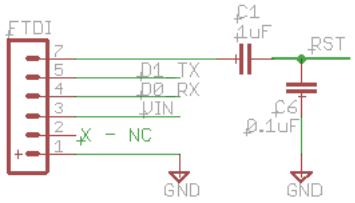
However in **R6** there are more important changes:

- CW transceiver layout has been added in addition to the RFM69/LoRa layout, which means that the whole spectrum of RFM69 and LoRa radios are supported. Note that W and HW, while still in the shop, are no longer available as an option for MoteinoR6 – they are replaced by CW and HCW (which are 100% equivalent from a software and features perspective, but smaller!)
- supported transceivers: RFM69CW, RFM69HCW, RFM95/96/LoRa
- in addition to this, RFM12B is now also usable (though not sold) with Moteino R6 because of the new CW pads. Note that the RFM12B library (https://github.com/LowPowerLab/RFM12b) is still usable but no longer actively developed or supported



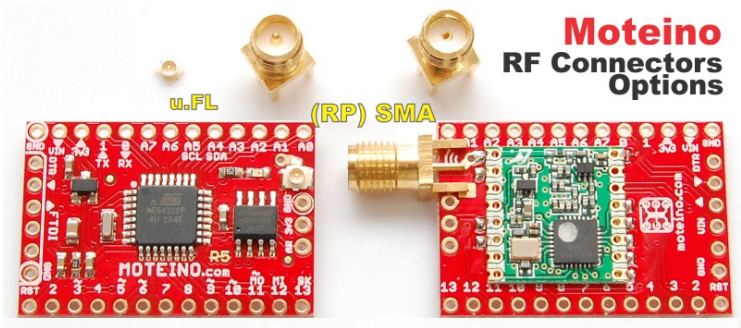
(https://lowpowerlab.com/wp-content/uploads/2016/09/DSC_0909_variants.jpg)

- a delay cap was added to DTR to avoid situations where the Moteino never wakes from an ultra low power state – this has been mentioned and discussed in the forum (https://lowpowerlab.com/forum/moteino/moteino-will-not-run-until-reset-has-been-jumped-with-ground/msg19441/#msg19441)



- u.FL pads kept for those who want to connect a pigtail instead of straight coax or the provided monopole wire antenna
- the Trace Antenna variant reflects all these changes as well except it's connected to the onboard PCB antenna and does not require an external antenna

Here are RF connector options now possible on the Moteino, all these RF connectors are available in the shop (https://lowpowerlab.com/shop/category/75) for convenience:



Posted in **Moteino (https://lowpowerlab.com/category/moteino/)**, **New products (https://lowpowerlab.com/category/new-products/)**, **Updates (https://lowpowerlab.com/category/updates/)**

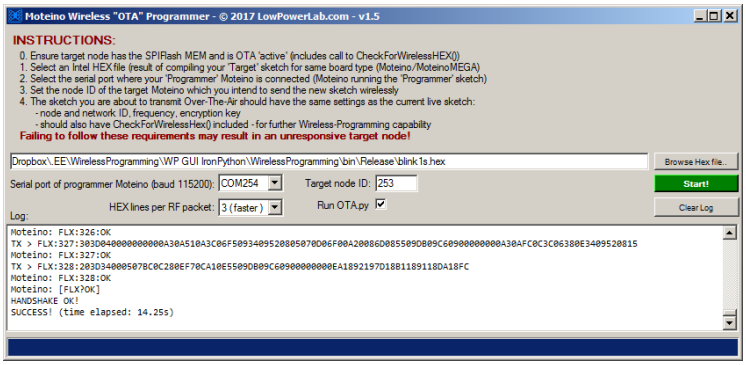
Wireless Programming updates (https://lowpowerlab.com/2017/05/26/wireless-programming-

updates/)

Posted on **May 26, 2017 (https://lowpowerlab.com/2017/05/26/wireless-programming-updates/)**
In past times (see this (https://lowpowerlab.com/2013/05/05/wireless-programming-update/)and this (https://lowpowerlab.com/2014/02/17/wireless-programming-a-switchmote-moteino/)post), wireless programming of a remote Moteino used to be done via a python script (https://github.com/LowPowerLab/WirelessProgramming/blob/master/WirelessProgramming.py). This took a compiled Moteino sketch (hex file) and passed it to a ***programmer (https://github.com/LowPowerLab/RFM69/blob/master/Examples/WirelessProgramming_OTA/Programmer/Programmer.ino)*** Moteino which would relay it to the ***target (https://github.com/LowPowerLab/RFM69/blob/master/Examples/WirelessProgramming_OTA/Target/Target.ino)*** node . Later this python app was migrated to a windows desktop app (see release (https://lowpowerlab.com/2015/12/31/wireless-programming-desktop-app/) post and upload speed update (https://lowpowerlab.com/2016/01/21/wireless-programming-just-got-50-faster/)). At which point non-windows folks were left with a somewhat out of date python script. I was asked about the status of the python app many times. So I decided to merge the python script and windows app so all platforms can use it. This was done via IronPython which can invoke a python script straight from a windows app. Hence wireless programming for Moteinos has gone through several changes:

- the firmware part which used to be a separate library (https://github.com/LowPowerLab/WirelessProgramming) and has been merged into the RFM69 library (https://github.com/LowPowerLab/RFM69/tree/master/Examples/WirelessProgramming_OTA), this is now called **RFM69_OTA.h** (vs: WirelessHEX.h) and all functions have the same name and parameters
- the windows app now can run both natively (windows code) or invoke a new updated OTA.py python app which you can control and modify if you'd like

This is the best of both worlds. The new **OTA.py (https://github.com/LowPowerLab/RFM69/blob/master/Examples/WirelessProgramming_OTA/OTA.py)** script is cross platform and independent of the windows app, just needs to be invoked with the right parameters (run `python OTA.py -h` for details). Those on windows can just use the desktop app (runs the protocol in native C# code), or can click the **"Run OTA.py"** checkbox to instead invoke the OTA.py script dynamically. The parameters are passed from the desktop app into OTA.py and the desktop app conveniently remembers your programming parameters next time you open it.



(https://lowpowerlab.com/wp-content/uploads/2017/05/WirelessProgramming1.5.png)

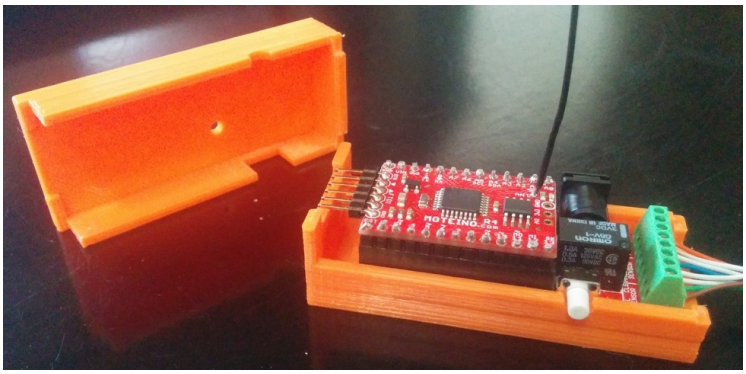
Most significantly the WirelessProgramming.exe is now 3.8MB (vs 29KB) because it bundles all the required self contained IronPython runtime to run the OTA.py script. It also requires the pythonLibs.zip file that was added in the same directory (https://github.com/LowPowerLab/RFM69/tree/master/Examples/WirelessProgramming_OTA).

Give this free tool a try and let me know if there are any issues or bugs. Enjoy!

Posted in **Wireless programming (https://lowpowerlab.com/category/moteino/wireless-programming/)** | **Leave a reply (https://lowpowerlab.com/2017/05/26/wireless-programming-updates/#respond)**

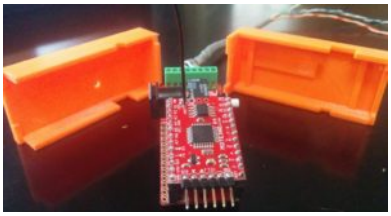
GarageMote 3D printed case (https://lowpowerlab.com/2017/04/28/garagemote-3d-printed-case/)

Posted on **April 28, 2017 (https://lowpowerlab.com/2017/04/28/garagemote-3d-printed-case/)**



(https://lowpowerlab.com/wp-content/uploads/2017/04/GarageMote_3dCase2.jpg)

Forum user [aw] has graciously shared a 3D printed case (https://lowpowerlab.com/forum/projects/3d-printed-case-and-chain-adapter-for-garagemote/) for **GarageMote (https://lowpowerlab.com/shop/product/97)**. If you have a 3D printer you can download and customize/print the model from thingiverse (http://www.thingiverse.com/thing:2279544). The model includes the option for a chain magnet snap-on which is really convenient for chain driven garage openers.

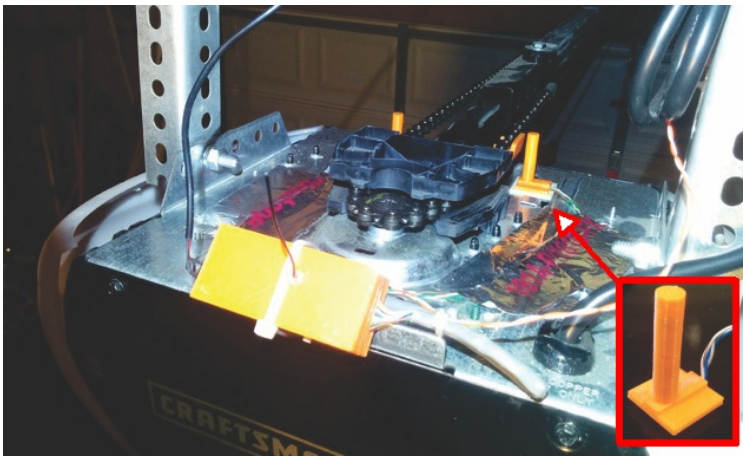


(https://lowpowerlab.com/wp-content/uploads/2017/04/GarageMote_3dCase1.jpg)

(https://lowpowerlab.com/wp-content/uploads/2017/04/GarageMote_3dCase3.jpg)

(https://lowpowerlab.com/wp-content/uploads/2017/04/GarageM

Update: a sensor pylon is now available also, which can conveniently hold the hall effect sensor for the magnet holder, a very nice addition. The kit sensor is omnipolar so it will detect the magnet in either direction.



(https://lowpowerlab.com/wp-content/uploads/2017/04/GarageMote_3dCase5.jpg)

Posted in **3D Printing (https://lowpowerlab.com/category/3d-printing/)**, **User projects (https://lowpowerlab.com/category/user-projects/)**