

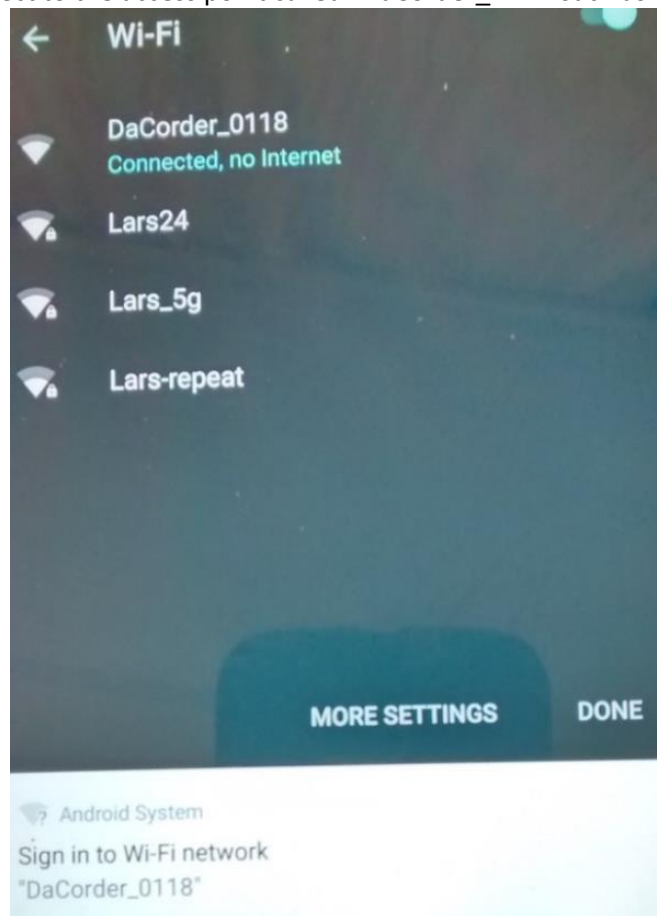
DaCorder 1.0 FAQ

Updated March 3 2018

How do I configure DaCorder?

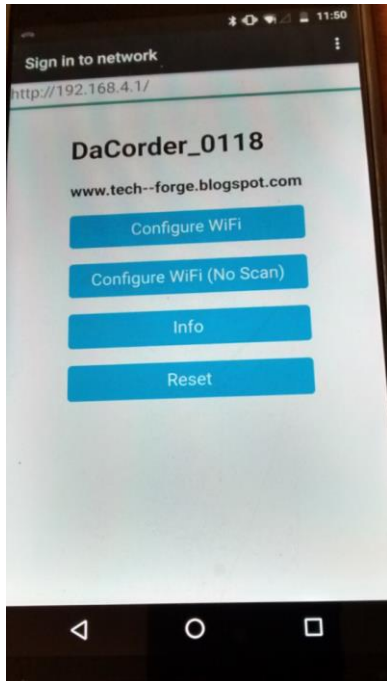
We have tried to make it as simple and low cost as possible. There is no soldering, program downloading or switches to add complexity. Please keep in mind this is a small, slow microcontroller, so count to 10 before you assume it is not working.

As soon as you apply power by putting batteries into the holder, DaCorder boots up into a configuration mode. This means it is a WiFi access point and hosts a web page for configuration. You can use a WiFi tablet or phone to connect to the access point called "DaCorder_xxxx" such as below:

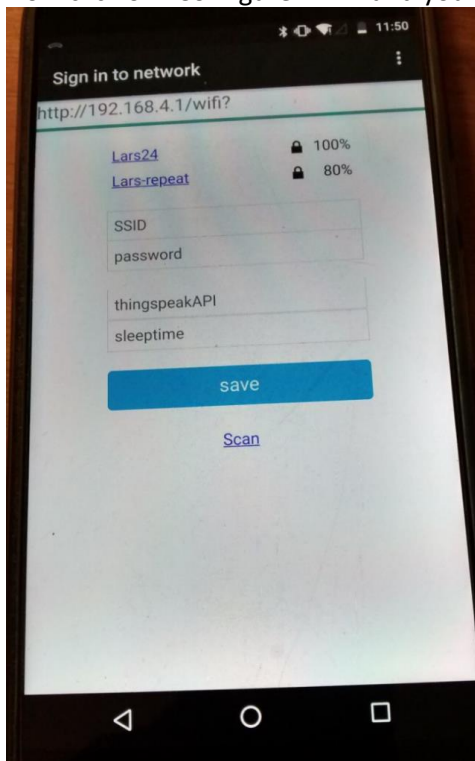


When you sign in to the WiFi access point, you may be automatically directed to the DaCorder configuration screen. (If not, use a browser to navigate to <http://192.168.4.1>)

Now you should see a screen such as below:



Now click on "Configure WiFi" and you should see similar to below:

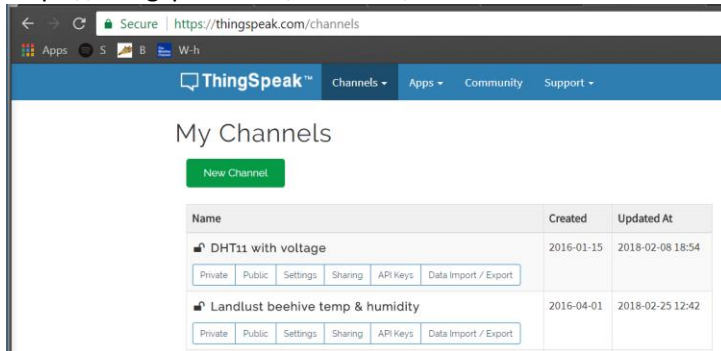


This screen shows there are two WiFi access points the DaCorder could connect to, and the strength of signal to the DaCorder. (In your case you should see your WiFi router specified.) Click on it to have that router fill in the "SSID" field. The "password" field is where you need to enter the WiFi router password. See the security FAQ question later for any concerns.

The “thingspeakAPI” field is your API channel, similar to “L1XBAVHSC85O06UX”
“sleeptime” is the interval period in minutes. Per day would be $60*24=1440$.
Click save, and you are done. It will reboot with the parameters saved in flash and you should see your first measurement posted on Thingspeak within a minute.

How do I setup a ThingSpeak API key?

ThingSpeak is not associated with DaCorder in any way. Go to thingspeak.com and setup a free account. Under the channels tab, you can click on “New Channel” You can see an example channel by going to <https://thingspeak.com/channels/104914>



Create a new channel with a name you specify and the three fields below. The same order of fields is required since DaCorder will store in this order. Leave only the 3 fields checked.

New Channel

Name

Description

Field 1

Field 2

Field 3

Field 4

Click on “Save Channel” and it will take to a screen such as below.

My Dacorder

Channel ID: 435229
Author: steenl
Access: Private

Private View Public View Channel Settings Sharing API Keys Data Import / Export

Add Visualizations Data Export

Channel Stats

Created: [less than a minute ago](#)
Updated: [less than a minute ago](#)
Entries: 0

Click on “API Keys” and that will show you the Write API Key which needs to be configured on the DaCorder field. You can always regenerate a new API key if desired.

My Dacorder

Channel ID: 435229
Author: steenl
Access: Private

Private View Public View Channel Settings Sharing API Keys

Write API Key

Key HV2877U15GQPY7S0

Generate New Write API Key

You can use the Thingspeak website to view and export your sensor data, and there is a nice app as well.

What is the WiFi range?

Keep in mind wifi requires sufficient signal strength in both directions. From your wifi router (DSL or cable box) and the Dacorder. Max range for data transfer measured so far is 140 feet (~46 meters) with two wooden walls separation. If you want to check your range, one option is to use the android app “Wifi Analyzer” and if your cell phone measures lower than -85dBm then you will likely be within range for DaCorder.

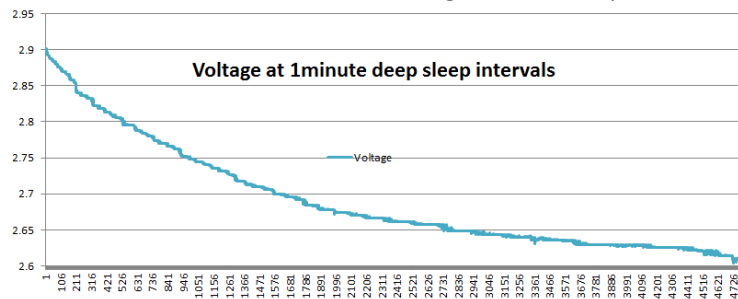


What about battery life?

This really depends on your battery quality and the interval DaCorder samples, so set the interval as long as possible for your purpose. Deep sleep consumes about 20uA. Below are some quick measurement data.

- On one minute sampling intervals freshly charged NiMH batteries can last up to 4823 samples before data corruption or logging stops working.
- Using the cheapest batteries I could find on 1hr intervals, more than 430 samples , or 18 days.

Over time the battery voltage drops as energy is used. When the batteries report about 2.6V, inaccurate values are logged and eventually DaCorder will stop making any recording until batteries are replaced. Configuration is stored in flash, so no new configuration is required.



What security concerns are there? Can it be hacked?

When DaCorder is configured, you enter a WiFi password that is stored in flash. Each time DaCorder wakes, a new WiFi connection is established based on that WiFi password. However the challenge/response connection mechanism used by the WiFi router does not use the clear text password, but a hash based on the password. While this challenge/response connection establishment could be hacked, it seems this kind of hack could be done for other WiFi devices as well, so it seems a low risk.

The flash device could be hacked for the WiFi password by removing and reading the flash device, but DaCorder uses a compiled binary so the password is not in clear text, so it would be very difficult.

Is the case water-proof?

No guarantees are made on water resistance, but common sense can be used in mounting to beehive or other areas.

What happens if WiFi access to the internet drops?

DaCorder code makes an effort to connect through the WiFi router to post data. If WiFi connection is made but if not successful in posting data, will go back to deep sleep and try again at the next interval. The data for that sample is effectively lost.

What happens on WiFi power outage?

If DaCorder cannot make a WiFi connection to the WiFi router it enters configuration mode. This consumes power draining the battery, so on a power outage, you could have the battery drain within 24hours. As a result, if no configuration to DaCorder is made within 3minutes, then DaCorder enters a deep sleep for 24hours before attempting again. This 3minute on, 24hour off cycle repeats until WiFi router connection is re-established at which time original configuration of data logging resumes.

How do I reset DaCorder?

Simply cycling batteries will not reset DaCorder configuration of WiFi when a WiFi router is available to accept WiFi connections. To force DaCorder into configuration mode, you can either move out of range of the WiFi router currently configured on DaCorder, or power down the WiFi router until DaCorder configuration mode has been entered.

Do I need anything setup on the wifi router?

You should not need to unless you are blocking the HTTP port 80 for communication. DaCorder uses 2.4GHz, not the newer 5GHz WiFi.

How do I get alerts?

You can configure the thingspeak channel to tweet on battery low status, hitting a certain temperature, or other event. This is done with the "React" app. Below example checks channel every 30 minutes and if equal to 7 degrees, tweets an alert.

Apps / React / Edit

React Name

Condition Type

Test Frequency

Condition

field

Action

then tweet

using Twitter account

Options Run action only the first time the condition is met
 Run action each time condition is met

Why only degree C, not F?

Dacorder is hoped to be an international device, and post processing (conversion to F) is certainly easy to do. This may be a future expansion to configure as a degC or degF device.

What is the accuracy of temp/humidity?

The DHT11 used to measure temp/humidity based on <https://learn.adafruit.com/dht/overview> is:

- Good for 20-80% humidity readings with 5% accuracy
- Good for 0-50°C temperature readings $\pm 2^\circ\text{C}$ accuracy

While there are much better sensors out there, DHT11 is a simple low-cost solution. If higher accuracy is needed, one option is to sample more often and interpolate.

Why is DaCorder not open source code and/or hardware?

There are a few reasons. Primarily I want to make DaCorder simple and low cost to people where even trying something for \$10 is expensive. Adding hardware and programming hooks and supporting/debugging questions seems to go counter to this goal. This hopefully will cross the adoption "chasm" that has not succeeded in some other efforts. There are plenty of smart people posting instructables and hacks on how to put something like this together, but you need the programming infrastructure. Any profit after assembly/shipping/etc costs I plan to put toward other similar remote sensing solutions such as beehive weight, soil moisture tracking, and remote control. Ideas/comments welcome!

Why cannot DaCorder do X?

If current DaCorder is successful I hope to expand to other sensors such as beehive weight monitoring. Please drop a line if you have good ideas!