adafruit learning system

Adafruit CC3000 WiFi

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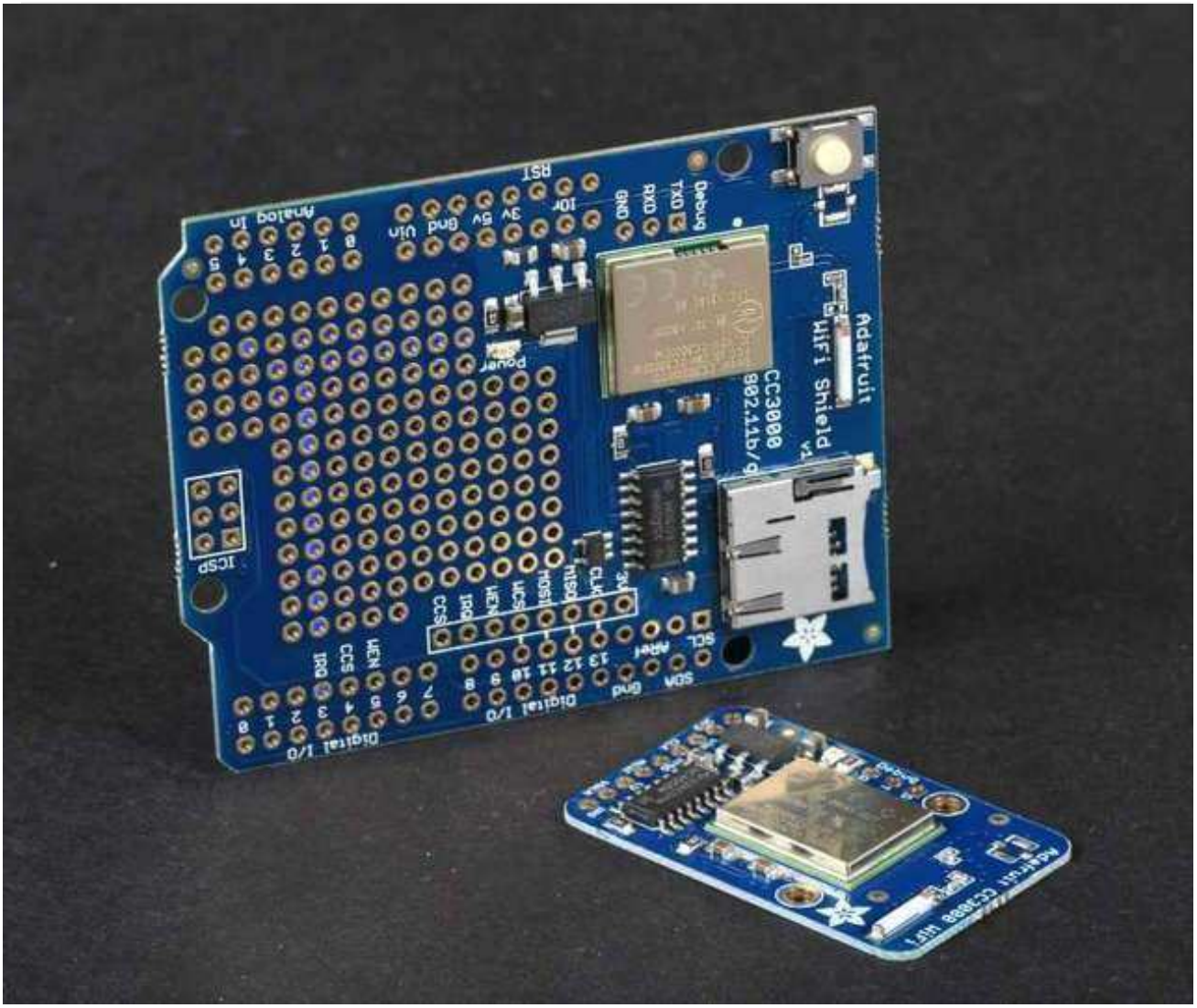
Guide Contents

Overview



The CC3000 WiFi module from Texas Instruments is a small silver package which finally brings easy-to-use, affordable WiFi functionality to your Arduino projects.

It uses SPI for communication (not UART!) so you can push data as fast as you want or as slow as you want. It has a proper interrupt system with IRQ pin so you can have asynchronous connections. It supports 802.11b/g, open/WEP/WPA/WPA2 security, TKIP & AES. A built in TCP/IP stack with a "BSD socket" interface supports TCP and UDP in both client and server mode, with up to 4 concurrent socket connections.

> The CC3000 does not support "AP" mode, it can connect to an access point but it cannot be an access point.

The CC3000 is available from Adafruit As a Breakout Board, and as an Arduino Shield.

Both the shield and the breakout board have an onboard 3.3V regulator that can handle the 350mA peak current, and a level shifter to allow 3 or 5V logic level. The antenna layout is identical to TI's suggested layout and we're using the same components, trace arrangement, and antenna so the board maintains its FCC emitter compliance (you'll still need to perform FCC validation for a finished product, but the WiFi part is taken care of). Even though it's got an onboard antenna we were pretty surprised at the range, as good as a smartphone's.

The shield also features a MicroSD socket, and a reset button.

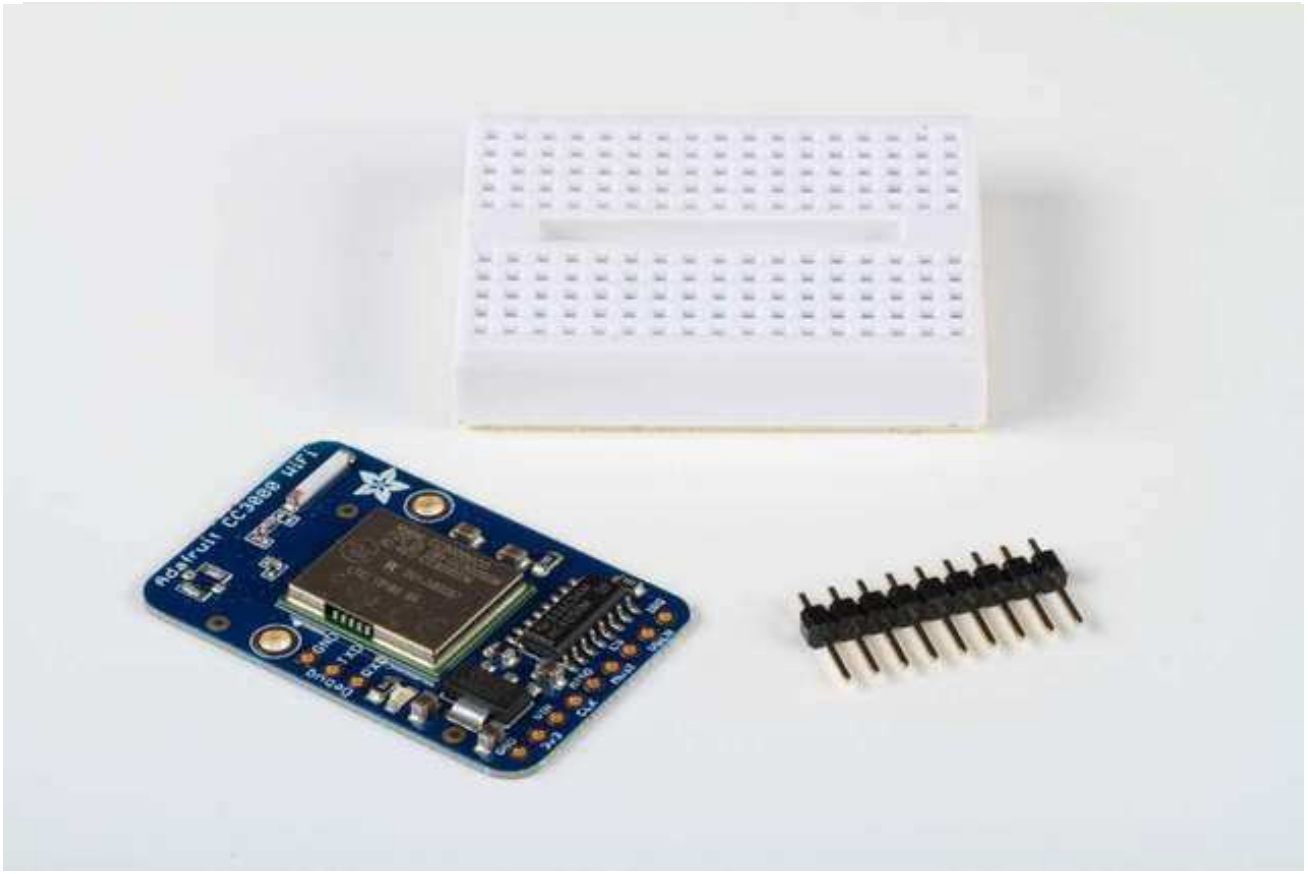
AND, the shield supports the Arduino SPI passthrough header pins, so it's compatible with the Mega & Leonardo, right out of the box - no rewiring necessary!

The shield and breakout are only for use with Arduino Uno, Leonardo/Micro & Mega only at this time. We'll try to get the code ported to the Due at some point but no ETA!

Assembly and Wiring

Check out the next couple of pages for detailed instructions for setting up your CC3000 shield or breakout board!

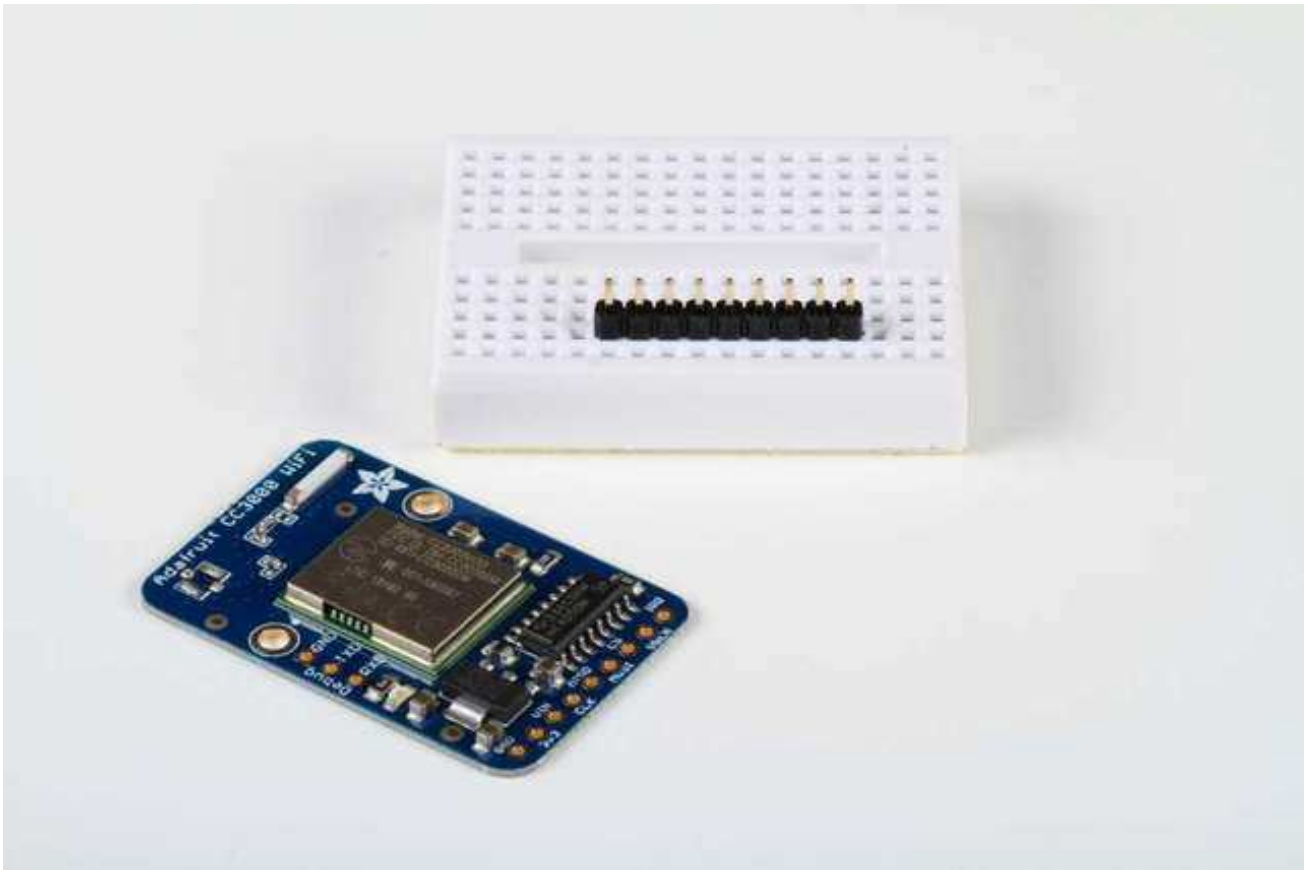
CC3000 Breakout



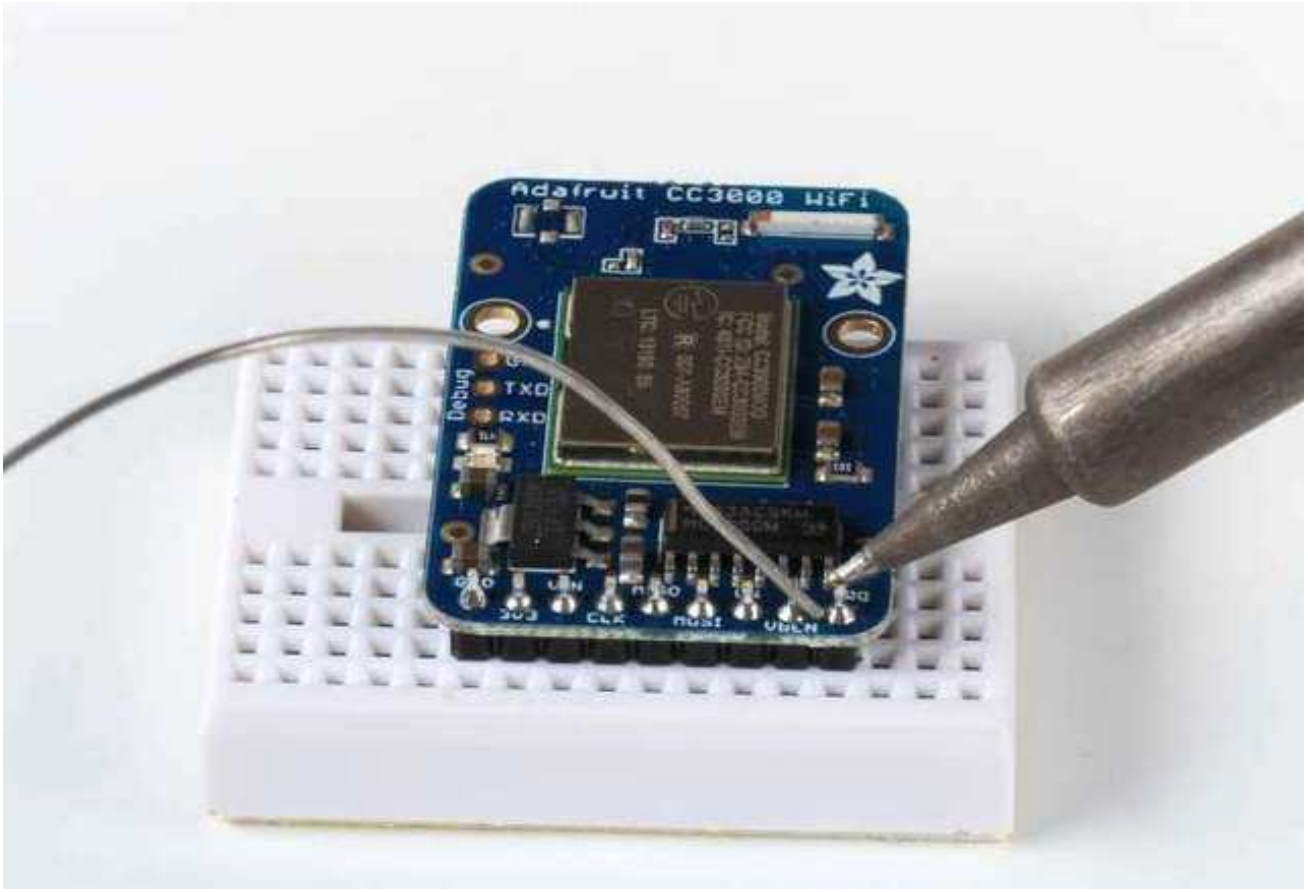
Assembly

The CC3000 breakout board ships with a strip of header pins. Snip off a 9-pin section and solder it to the 9 holes on the side of the board.

The easiest way to do this is to first insert the header pins into a breadboard, to hold them securely while you solder.



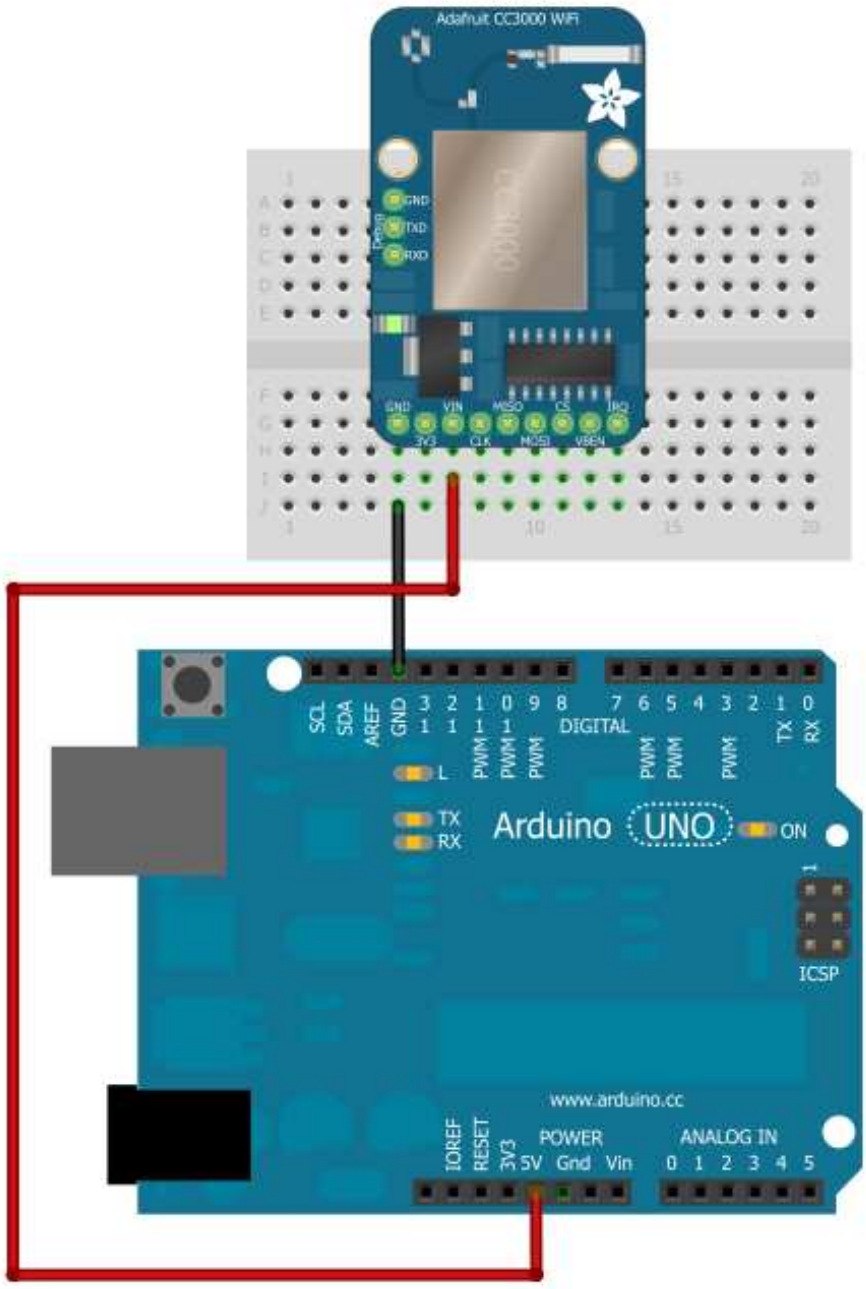
Set the breakout board over the pins, and carefully solder each pin (see our Guide To Excellent Soldering (http://adafru.it/aTk) for instructions and tips on getting the best results).



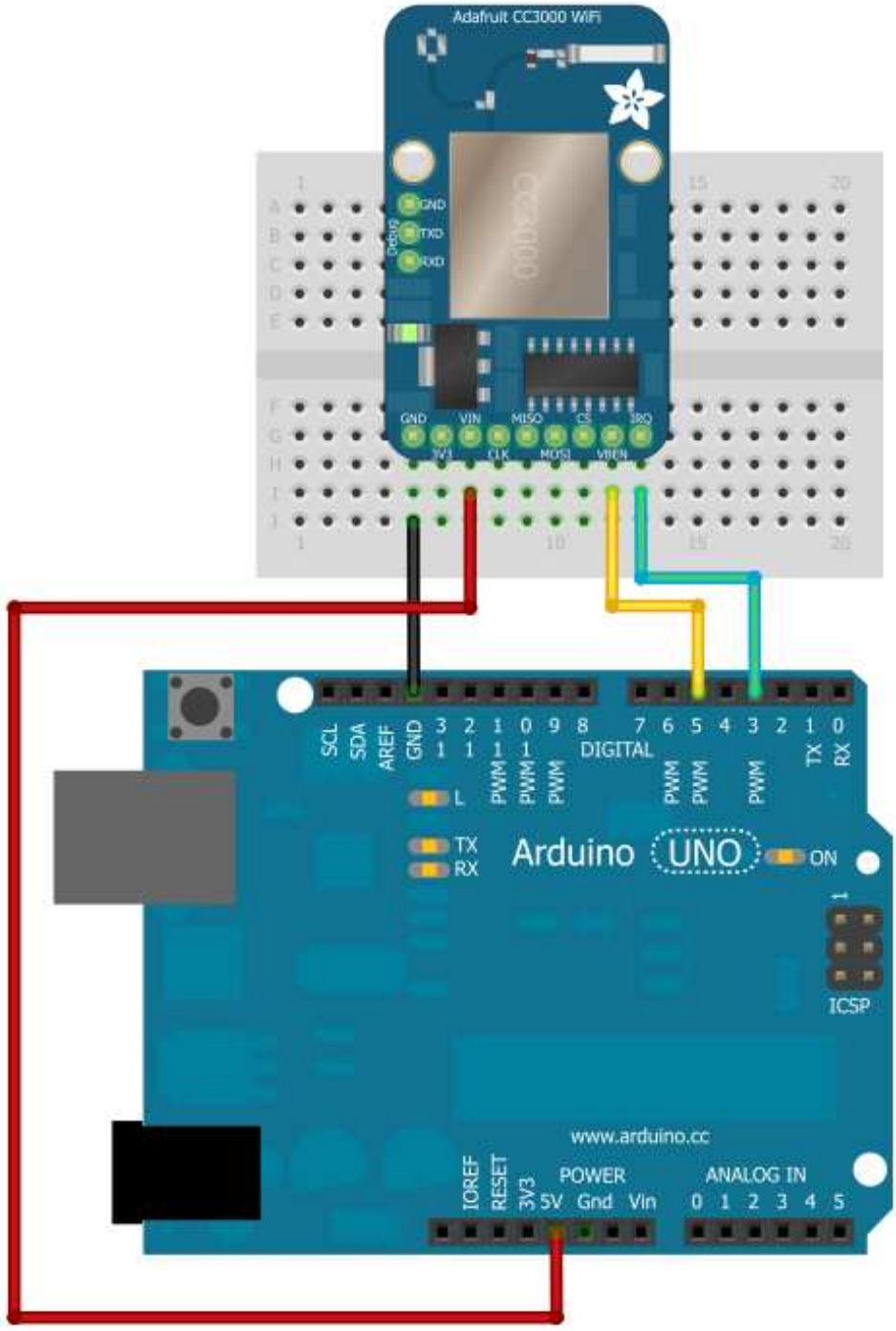
Wiring

Use jumper wires to attach the CC3000 breakout board to your arduino:

Connect GND to one of the Arduino GND pins:
Connect Vin to Arduino +5V



Next, connect the enable and interrupt lines:
VBEN to Digital 5
IRQ to Digital 3

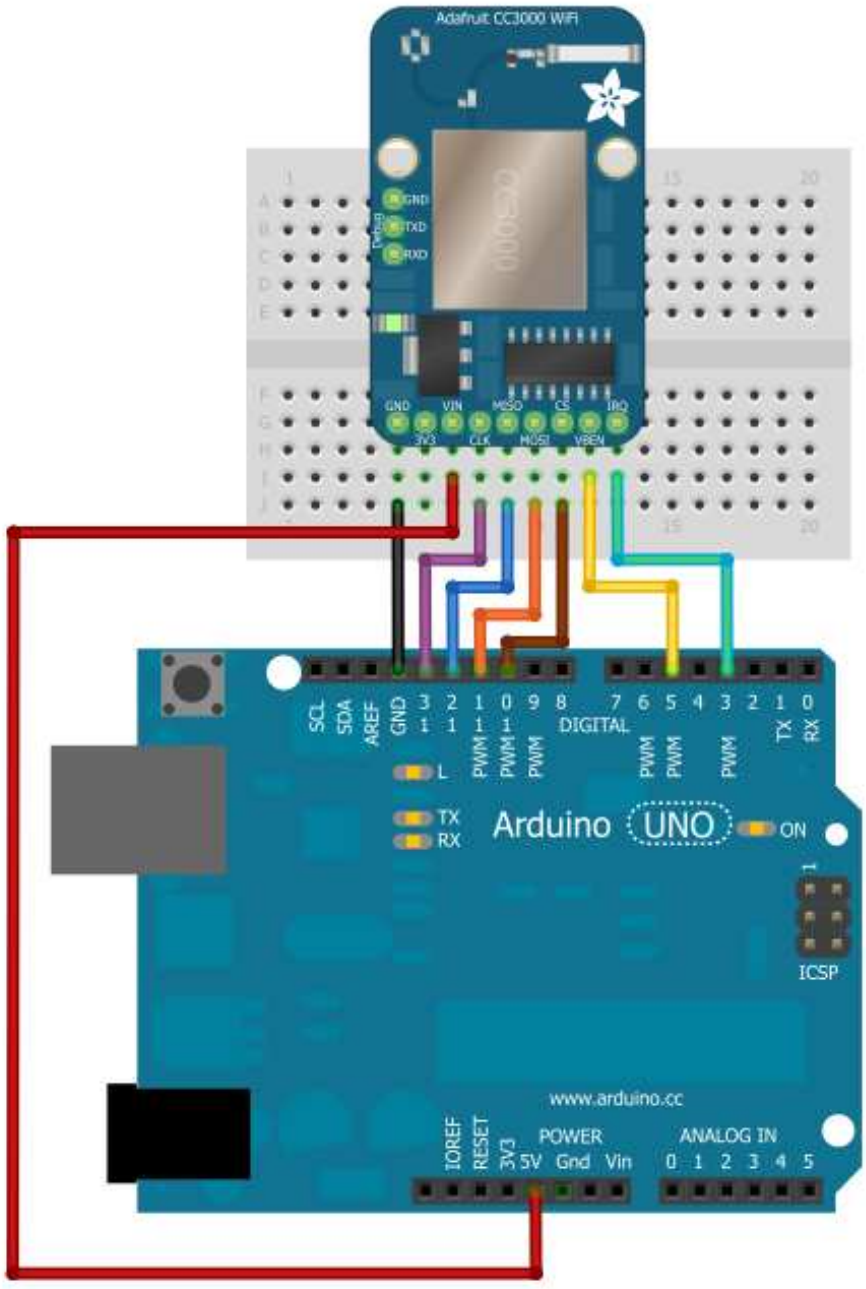


Now, connect SPI:

- CLK to Digital 13
- MISO to Digital 12
- MOSI to Digital 11
- CS to Digital 10

If you're using a Mega, we'll need to connect to the hardware SPI pins

- CLK to Digital 52
- MISO to Digital 50
- MOSI to Digital 51
- CS to Digital 10

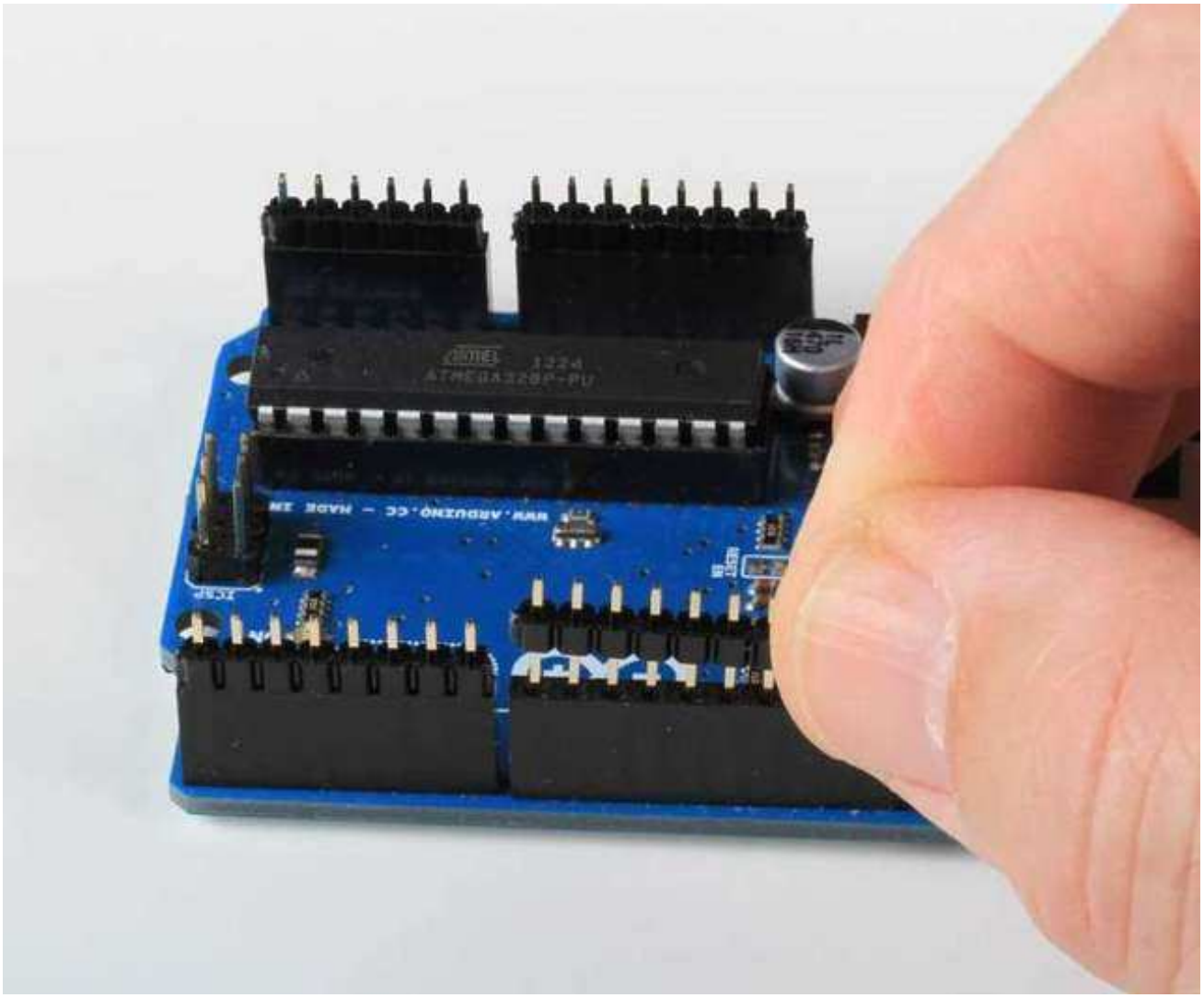


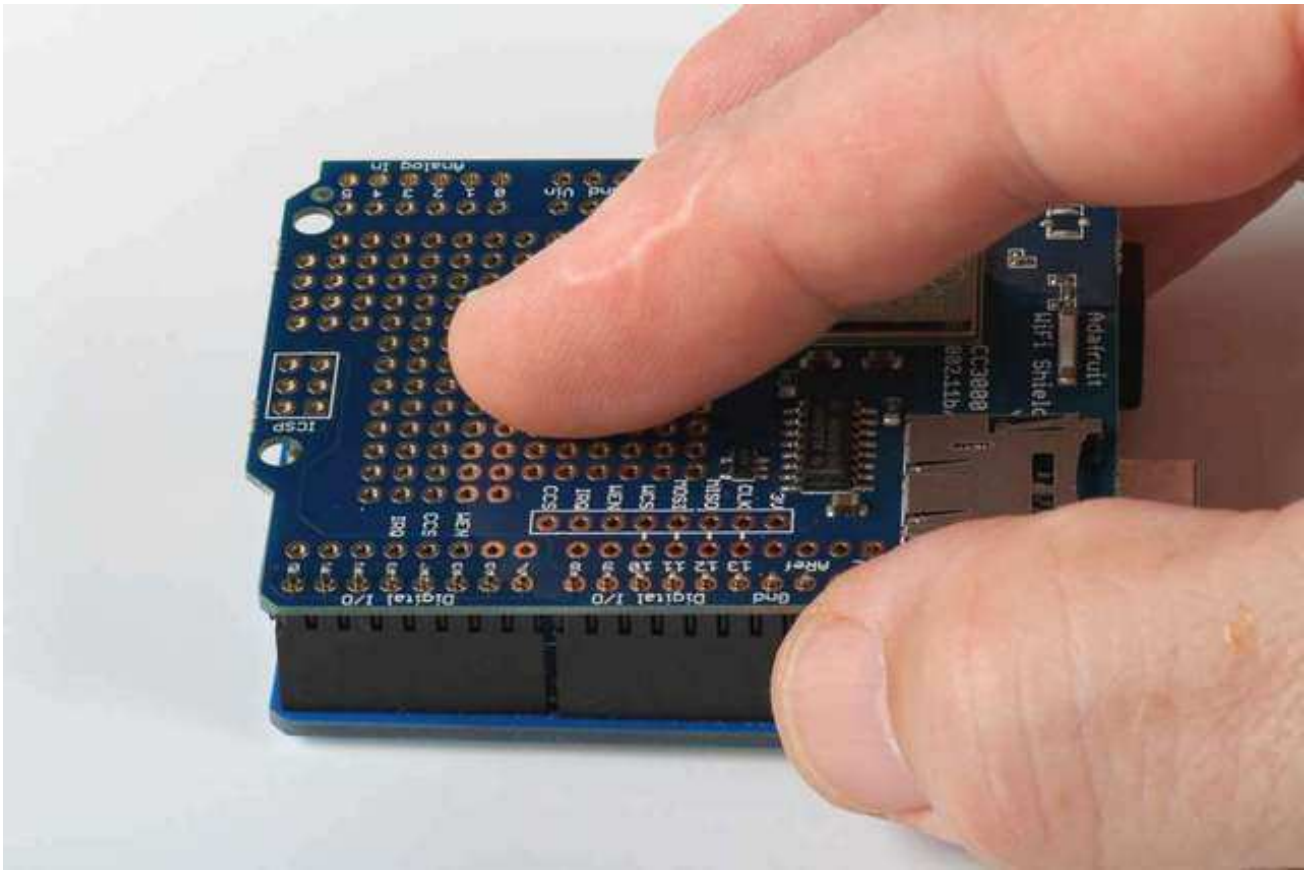
3.3v is an output from the breakout board's voltage regulator - we won't be connecting anything to it in this tutorial.

Assembly

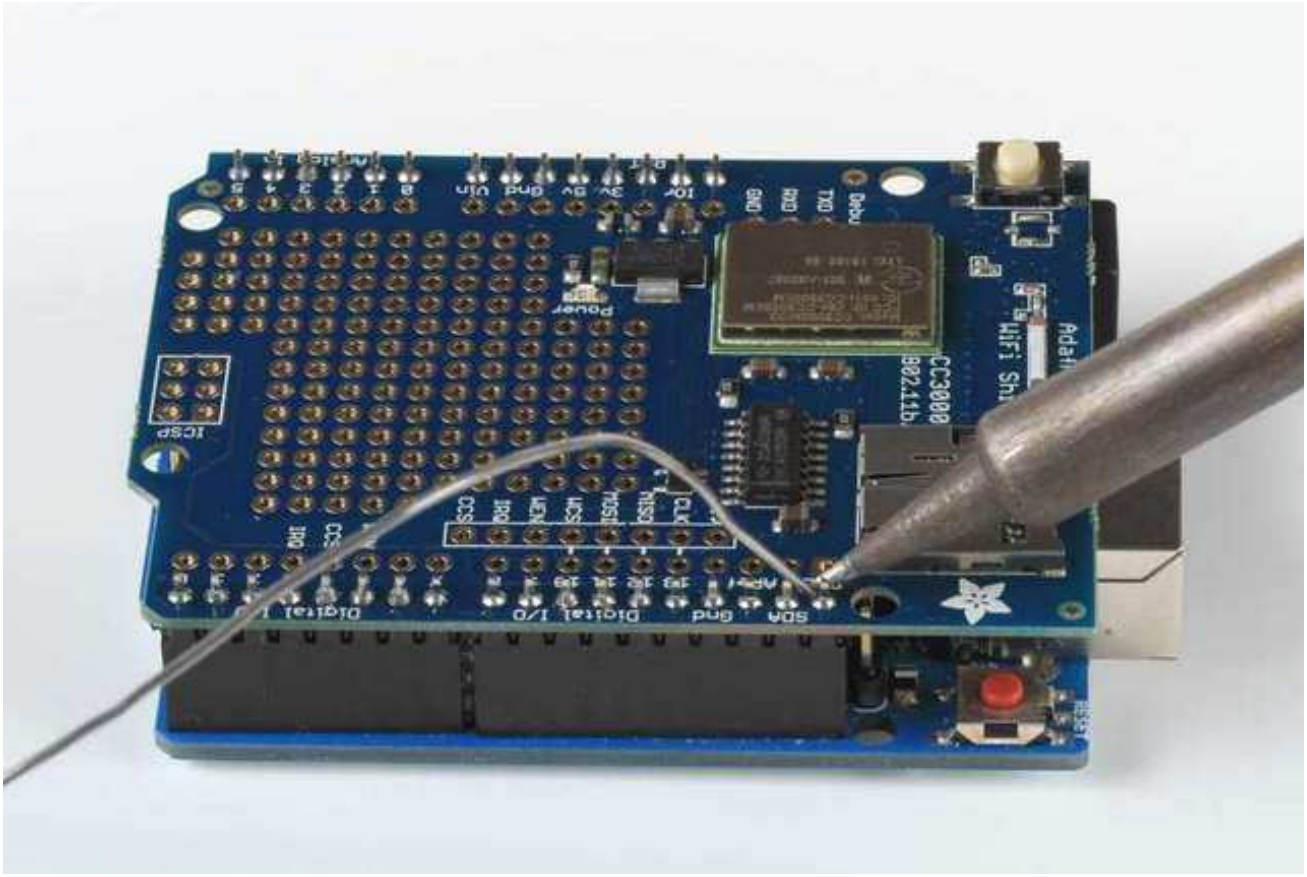
The CC3000 Shield ships with a strip of header pins.

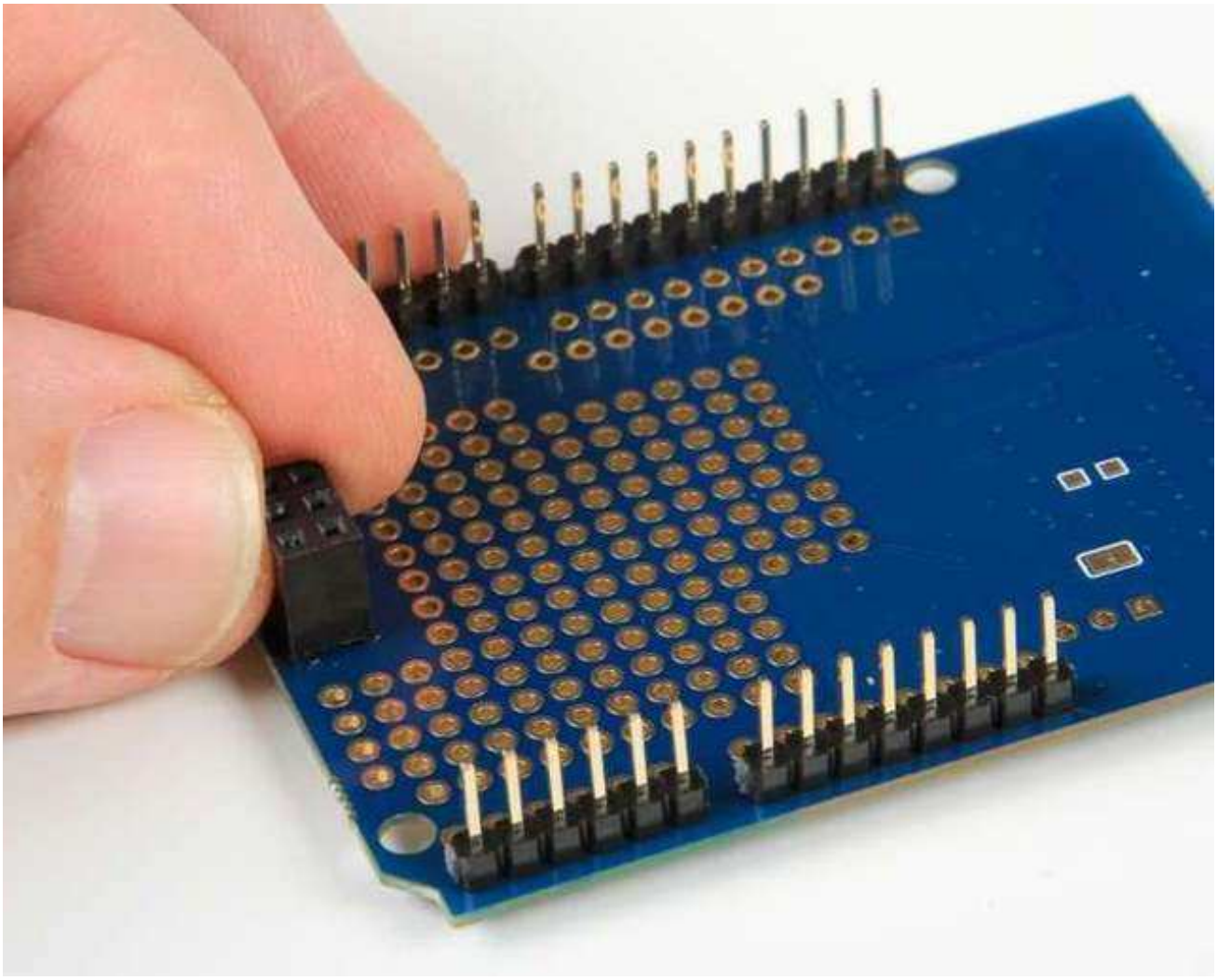
Break off 6, 8, or 10-pin sections and insert them into the header sockets of your Arduino


ATMEGA328P-PU
WWW.ARDUINO.CC - MADE IN



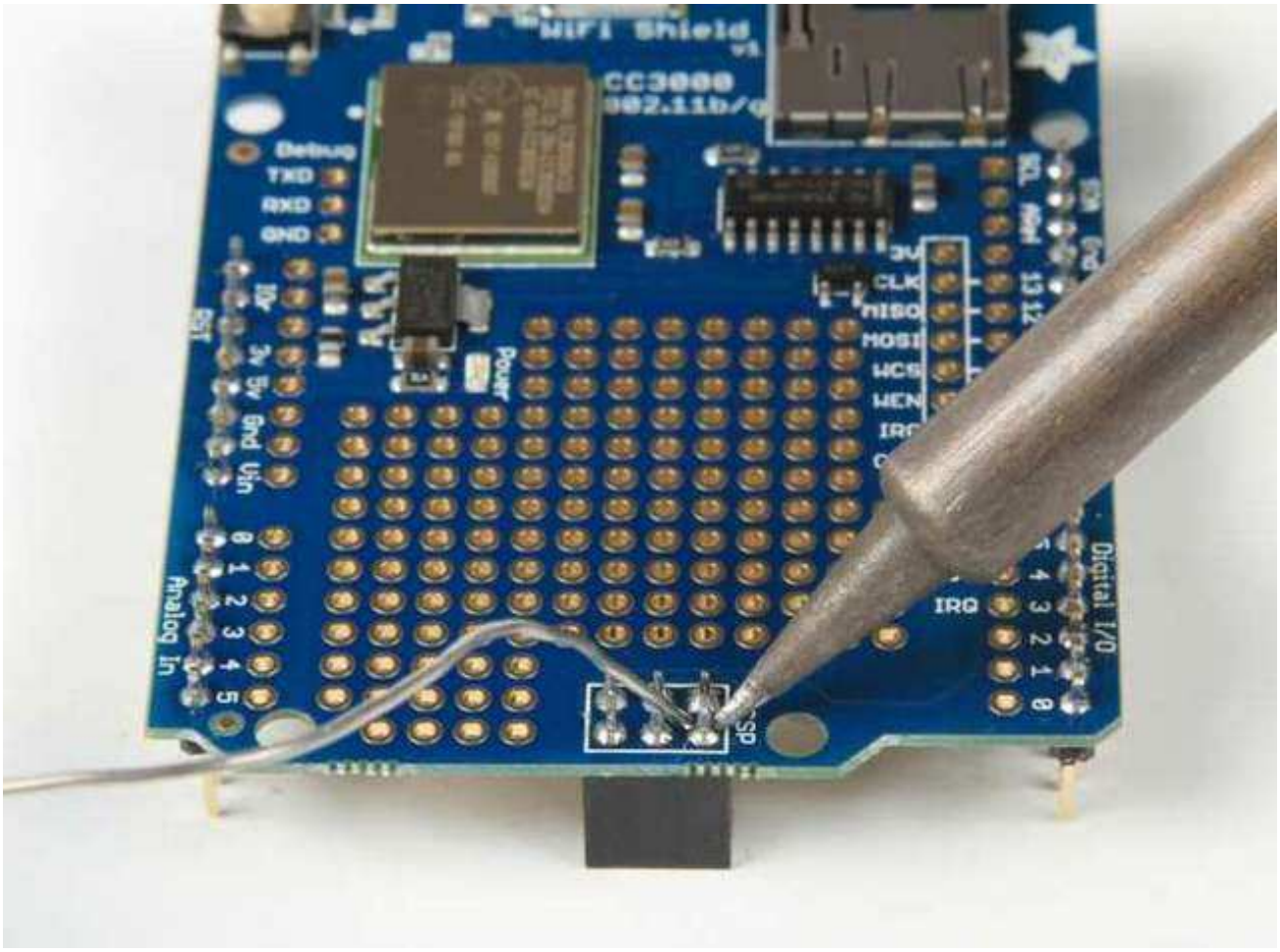
Place the shield over the pins, and carefully solder each one in place (see our Guide To Excellent Soldering (http://adafru.it/aTk) for instructions and tips on getting the best results).





The shield also comes with a 2X3 pin female header socket. This will plug into the 2X3 ICSP pin header on your Arduino, to bring SPI up to the shield. This allows you to use the shield with an Arduino Mega or Leonardo without having to cut traces or solder jumper wires for SPI.

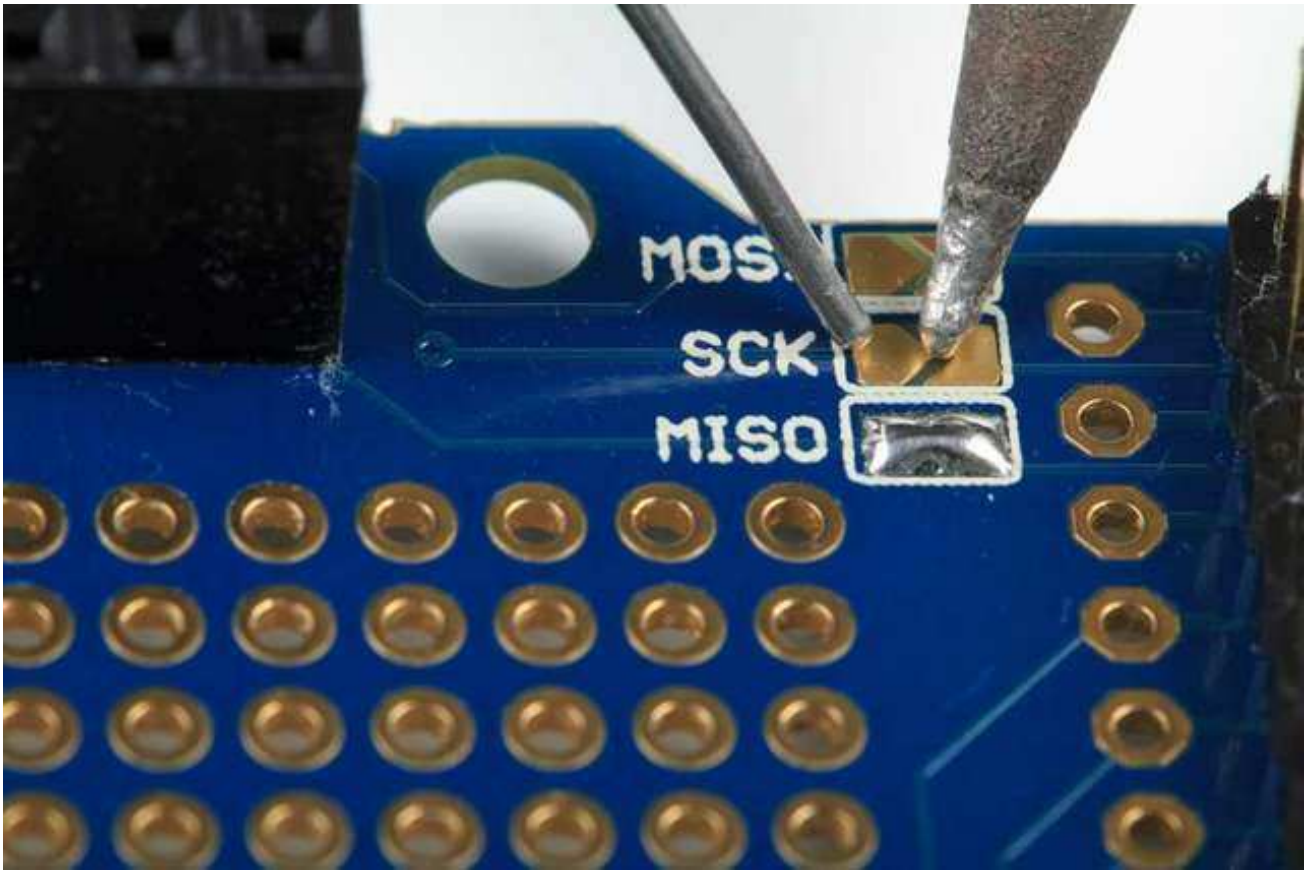
Set the socket header into the holes on the shield, then flip the shield over and solder the pins. The height of the header block matches the height of the rest of the shield header pins, so the block should be perfectly positioned for soldering!



By default, SPI through the ICSP header is not connected. To enable the ICSP header connections, you'll have to connect three solder jumpers on the bottom of the CC3000 shield.

> Soldering these jumpers is required if you are using the shield with a Mega or Leonardo, but is not required for use with an UNO!

Simply melt a blob of solder, connecting the pads, on each of the three solder jumpers (keep your solder inside the white boxes - don't let the solder cross between boxes!)



And that's it! Your CC3000 Shield is ready to use. Move on to the next tutorial page to get started!


WiFi Shield
CC3000
802.11b/
MISO
MOSI
MEN
IRQ
CS
TX
RX

Connections

Pinouts

The CC3000 is (electrically) fairly simple to use. The module requires an SPI connection, including a clock (CLK), data in from a microcontroller (MOSI) and data out to the microcontroller (MISO). It also uses a chip-select line (CS) for SPI to indicate when a data transfer as started

Along with the SPI interface, there is a power-enable type pin called **VBAT_EN** which we use to start the module properly and also an **IRQ** pin, which is the interrupt from the CC3000. The IRQ pin is required to communicate and must be tied to an interrupt-in pin on the Arduino. On the Mega/UNO, we suggest #2 or #3

On the CC3000 shield, we use the following pin connections

- SCK - #13
- MISO #12
- MOSI #11
- CS for CC3000 #10
- VBAT_EN #5
- CS for SD Card #4
- IRQ #3

On the breakout, be aware that the MISO (data out from module) pin does not go 'high impedance' when CS is driven high. Check the shield for how we use a 74AHC125 to manually tri-state this pin when it's shared with an SD card.

Optional Antenna

If you have a shield or breakout with a uFL connector (instead of an on-board ceramic antenna) you can use a uFL to RP-SMA (http://adafru.it/852) or uFL to SMA (http://adafru.it/851) (less common) adapter and then connect to any 2.4 GHz antenna (http://adafru.it/945). This is handy when you want to place the module in a box but have the antenna on the outside, or when you need a signal boost

Please note that when using an external antenna, the module is no longer FCC-compliant, so if you want to sell the product with FCC certification, it must be retested.

Using the CC3000

Download the Library

We will start by downloading the Adafruit CC3000 Library, available from our GitHub repository (http://adafru.it/cFn).

You can download the latest ZIP file by clicking the button below.

Download the latest Adafruit_CC3000 library

http://adafru.it/cHe

Rename the uncompressed folder **Adafruit_CC3000**. Check that the **Adafruit_CC3000** folder contains **Adafruit_CC3000.cpp** and **Adafruit_CC3000.h;** also **ccspi.cpp, ccspi.h,** an **examples** folder, and a **utility** folder

Place the **Adafruit_CC3000** library folder your ***sketchbookfolder*/libraries/** folder. You may need to create the libraries subfolder if its your first library. Restart the IDE. You can figure out your ***sketchbookfolder*** by opening up the Preferences tab in the Arduino IDE.

If you're not familiar with installing Arduino libraries, please visit our tutorial: All About Arduino Libraries (http://adafru.it/aYM)!

Sample Sketches

The Adafruit CC3000 Library contains several example sketches, demonstrating different capabilities of the CC3000 along with some useful programming techniques.

To run the sample sketches, you'll have to edit them to include the SSID and password of your access point.

```
#define WLAN_SSID       "myNetwork"       // cannot be longer than 32 characters!
#define WLAN_PASS       "myPassword"
```

Also, make sure that the right wireless security scheme is selected (unsecured, WEP, WPA, or WPA2)

```
// Security can be WLAN_SEC_UNSEC, WLAN_SEC_WEP, WLAN_SEC_WPA or WLAN_SEC_WPA2
#define WLAN_SECURITY   WLAN_SEC_WPA2
```

WEP with HEX Passphrases

If you are using WEP security, and your passphrase is a series of HEX digits, you can't simply

enter it as a literal string. Instead you have to define is as an actual binary sequence. For example, if your passphrase is 8899aabbccdd, you would define it as follows:

```
// #define WLAN_PASS       "8899aabbccdd"  //don't do it this way!
//do it this way:
const char WLAN_PASS[] = {0x88, 0x99, 0xaa, 0xbb, 0xcc, 0xdd, 0x00};
```

> Remember to append 0x00 to the declaration, after the passphrase, as shown in the example!

buildtest

buildtest

The **buildtest** sketch does a full test of core WiFi connectivity:

- Initialization
- SSID Scan
- Access Point connection
- DHCP address assignment
- DNS lookup of www.adafruit.com (http://adafru.it/aK0)
- Ping www.adafruit.com (http://adafru.it/aK0)
- Disconnect

It's a good idea to run this sketch when first setting up the module. It will let you know that everything is working correctly.

Before you run the sketch, edit it to replace the dummy SSID and password with your own:

```
#define WLAN_SSID       "yourNetwork"        // cannot be longer than 32 characters!
#define WLAN_PASS       "yourPassword"
```

If you're using WEP, the password should look like this:

const char WLAN_PASS[] = {0x1A, 0x2B, 0x3C, 0x4D, 0x5E, 0x00};

Since it's a collection of bytes not 'passphrase' style key

Also, make sure that the right wireless security scheme is selected (unsecured, WEP, WPA, or WPA2)

```
// Security can be WLAN_SEC_UNSEC, WLAN_SEC_WEP, WLAN_SEC_WPA or WLAN_SEC_WPA2
#define WLAN_SECURITY   WLAN_SEC_WPA2
```

Here's a sample of the Serial Monitor output of buildtest. You should see something similar:

```
Hello, CC3000!

RX Buffer : 131 bytes
TX Buffer : 131 bytes
Free RAM: 1237

Initialising the CC3000 ...
Firmware V. : 1.19
MAC Address : 0x08 0x00 0x28 0x01 0xA8 0x8A
```

```
Started AP/SSID scan


Networks found: 3
================================================
SSID Name    : Extreme
RSSI         : 58
Security Mode: 3

SSID Name    : Express
RSSI         : 59
Security Mode: 3

SSID Name    : fios63
RSSI         : 57
Security Mode: 3

================================================

Deleting old connection profiles

Attempting to connect to fios63
Started AP/SSID scan




Connecting to fios63...Waiting to connect...Connected!
Request DHCP

IP Addr: 192.168.1.23
Netmask: 255.255.255.0
Gateway: 192.168.1.1
DHCPsrv: 192.168.1.1
DNSserv: 192.168.1.1
www.adafruit.com -> 207.58.139.247

Pinging 207.58.139.247...5 replies
Ping successful!


Closing the connection
```

Make sure you can see and recognize all of the access points around, connect to the access point, get a good connection with DHCP, can do a DNS lookup on www.adafruit.com (http://adafru.it/aK0) and ping it successfully. If all this works, then your

hardware is known good!

WebClient

WebClient

The WebClient sketch does a test of the TCP client capability:

- Initialization
- Optional SSID Scan (uncomment code section to enable)
- Access Point connection
- DHCP address assignment
- DNS lookup of www.adafruit.com (http://adafru.it/aK0)
- Optional Ping of www.adafruit.com (http://adafru.it/aK0) (uncomment code section to enable)
- Connect to website and print out webpage contents
- Disconnect

The sketch connects to www.adafruit.com (http://adafru.it/aK0) and opens a special webpage (http://adafru.it/cFo) we have prepared for this example. It reads the contents of the page and prints that out to the Serial Monitor.

Before you run the sketch, edit it to replace the dummy SSID and password with your own:

```
#define WLAN_SSID       "yourNetwork"       // cannot be longer than 32 characters!
#define WLAN_PASS       "yourPassword"
```

Also, make sure that the right wireless security scheme is selected (unsecured, WEP, WPA, or WPA2)

```
// Security can be WLAN_SEC_UNSEC, WLAN_SEC_WEP, WLAN_SEC_WPA or WLAN_SEC_WPA2
#define WLAN_SECURITY   WLAN_SEC_WPA2
```

Here's a sample of the Serial Monitor output of WebClient. You should see something similar:

```
Hello, CC3000!

Free RAM: 1157

Initializing...
Started AP/SSID scan



Connecting to fios63...Waiting to connect...Connected!
```

```
Request DHCP

IP Addr: 192.168.1.23
Netmask: 255.255.255.0
Gateway: 192.168.1.1
DHCPsrv: 192.168.1.1
DNSserv: 192.168.1.1
www.adafruit.com -> 207.58.139.247

Connect to 207.58.139.247:80
-------------------------------------
HTTP/1.1 200 OK
Date: Thu, 12 Sep 2013 11:04:02 GMT
Server: Apache
Access-Control-Allow-Origin: http://learn.adafruit.com
Access-Control-Allow-Headers: Origin, X-Requested-With, Content-Type, Accept, Accept-Encoding, Au
Access-Control-Allow-Methods: GET, POST, OPTIONS
Access-Control-Allow-Credentials: true
Access-Control-Max-Age: 1728000
Last-Modified: Thu, 27 Jun 2013 14:13:27 GMT
Accept-Ranges: bytes
Content-Length: 74
Connection: close
Content-Type: text/html

This is a test of the CC3000 module!
If you can read this, its working :)
-------------------------------------


Disconnecting
```

Once you get this working, you can change the webpage you want to access to any kind of webpage on the Internet

ntpTest

ntpTest

The ntpTest sketch does a test of the library's SNTP (Simple Network Time Protocol) client:

- Initialization
- SSID Scan
- Access Point connection
- DHCP address assignment
- SNTP time synchronization
- Extract and print current time and date

The sntp client performs a time synchronization with servers from us.pool.ntp.org and pool.ntp.org. You can also optionally provide it the addresses of one or two of your own time servers. The ntpTest sketch tries time.nist.gov first, before falling back to one of the pool servers.

The client also breaks out the synchronized network time into a structure containing current date and time fields. The sketch formats and prints this information to the Serial Monitor.

> To avoid unnecessary loading of NTP servers, please perform the time synchronization as infrequently as possible. Once per day or longer should be plenty to maintain reasonably accurate time.

Before you run the sketch, edit it to replace the dummy SSID and password with your own:

```
#define WLAN_SSID       "yourNetwork"        // cannot be longer than 32 characters!
#define WLAN_PASS       "yourPassword"
```

Also, make sure that the right wireless security scheme is selected (unsecured, WEP, WPA, or WPA2)

```
// Security can be WLAN_SEC_UNSEC, WLAN_SEC_WEP, WLAN_SEC_WPA or WLAN_SEC_WPA2
#define WLAN_SECURITY   WLAN_SEC_WPA2
```

Here's a sample of the Serial Monitor output of ntpTest. You should see something similar:

```
    Hello, CC3000!

Free RAM: 843

Initialising the CC3000 ...
```

```
Firmware V. : 1.19

Deleting old connection profiles

Attempting to connect to fios63
Started AP/SSID scan




Connecting to fios63...Waiting to connect...Connected!
Request DHCP
UpdateNTPTime
Current local time is:
7:18:52.65445
Thursday, September 12, 2013
Day of year: 255


Closing the connection
```

InternetTime

InternetTime

The InternetTime sketch is a simplifies version of the ntpTest sketch. It does not use the library's SNTP client, but directly queries an NTP time server from pool.ntp.org to get the current "UNIX time" (seconds since 1/1/1970, UTC (GMT)).

The sketch then uses the Arduino's internal timer to keep relative time. The clock is re-synchronized roughly once per day. This minimizes NTP server misuse/abuse.

The RTClib library (a separate download, and not used here) contains functions to convert UNIX time to other formats if needed.

> To avoid unnecessary loading of NTP servers, please perform the time synchronization as infrequently as possible. Once per day or longer should be plenty to maintain reasonably accurate time.

Before you run the sketch, edit it to replace the dummy SSID and password with your own:

```
#define WLAN_SSID       "yourNetwork"       // cannot be longer than 32 characters!
#define WLAN_PASS       "yourPassword"
```

Also, make sure that the right wireless security scheme is selected (unsecured, WEP, WPA, or WPA2)

```
// Security can be WLAN_SEC_UNSEC, WLAN_SEC_WEP, WLAN_SEC_WPA or WLAN_SEC_WPA2
#define WLAN_SECURITY   WLAN_SEC_WPA2
```

Here's a sample of the Serial Monitor output of InternetTime. You should see something similar:

```
Hello, CC3000!

RX Buffer : 131 bytes
TX Buffer : 131 bytes

Initialising the CC3000 ...
Firmware V. : 1.19
MAC Address : 0x08 0x00 0x28 0x01 0xA8 0x8A
```

```
Deleting old connection profiles

Attempting to connect to fios63
Started AP/SSID scan




Connecting to fios63...Waiting to connect...Connected!
Request DHCP

IP Addr: 192.168.1.23
Netmask: 255.255.255.0
Gateway: 192.168.1.1
DHCPsrv: 192.168.1.1
DNSserv: 192.168.1.1
Locating time server...
Attempting connection...
Connect to 62.116.162.126:123
connected!
Issuing request...
Awaiting response...OK
Current UNIX time: 1378987424 (seconds since 1/1/1970 UTC)
Current UNIX time: 1378987439 (seconds since 1/1/1970 UTC)
Current UNIX time: 1378987454 (seconds since 1/1/1970 UTC)
Current UNIX time: 1378987469 (seconds since 1/1/1970 UTC)
... etc ...
```

GeoLocation

GeoLocation

This example sketch queries the freegeoip.net service to get the local approximate geographic location based on IP address.

Combined with code in the ntpTest or InternetTime sketches, this can give absolute position and time, extremely useful for seasonal calculations like sun position, insolation, day length, etc. One could always add a GPS module or just plug in values from your GPS or phone, but for applications where extreme accuracy isn't required, this has the luxury of coming 'free' with the CC3000 already in use.

> Positional accuracy depends on the freegeoip.net database, in turn based on data collected by maxmind.com. No guarantees this will work for every location. This software is provided as-is.

Position should be polled only once, at startup, or very infrequently if making a mobile network-hopping thing, so as not to overwhelm the kindly-provided free geolocation service.

Before you run the sketch, edit it to replace the dummy SSID and password with your own:

```
#define WLAN_SSID       "yourNetwork"   // cannot be longer than 32 characters!
#define WLAN_PASS       "yourPassword"
```

Also, make sure that the right wireless security scheme is selected (unsecured, WEP, WPA, or WPA2)

```
// Security can be WLAN_SEC_UNSEC, WLAN_SEC_WEP, WLAN_SEC_WPA or WLAN_SEC_WPA2
#define WLAN_SECURITY   WLAN_SEC_WPA2
```

Here's a sample of the Serial Monitor output of GeoLocation. You should see something similar:

```
Hello, CC3000!
Free RAM: 837
Initializing...OK.
Connecting to network...Started AP/SSID scan


Connecting to Turlingdrome...Waiting to connect...connected!
```

```
Requesting address from DHCP server...OK

IP Addr: 192.168.0.4
Netmask: 255.255.255.0
Gateway: 192.168.0.1
DHCPsrv: 192.168.0.1
DNSserv: 192.168.0.1

Getting server IP address...192.151.154.154
Connecting to geo server...
Connect to 192.151.154.154:80
connected.
Requesting data...
Reading response...OK

Disconnecting

RESULTS:
  Country: United States
  Region: California
  City: Richmond
  Longitude: -122.35
  Latitude: 37.94
```

SmartConfig

SmartConfig is the special functionality in the CC3000 that allows setting the SSID and password settings without having to type or re-program the module. Any iOS/Android device can be used to set the configuration - solving the annoying deployment problem of how to set the connection details for a new device.

SmartConfigCreate and SmartConfigReconnect

These two SmartConfig sketches should be used together to demonstrate how the SmartConfig app can be used on your smartphone to pass connection details to your CC3000.

SmartConfigCreate

This sketch will initialise the CC3000, erasing any previous connection details stored on the device. It will then enter SmartConfig mode with a 60 second timeout where it waits for configuration data to arrive from the SmartPhone.

If a connection was successfully established, the connection details will be stored in the non-volatile memory of the CC3000, and the module will be configured to automatically reconnect to this network on startup (meaning you don't need to run the SmartConfig app unless your AP details change or you erase the stored connection details on the module).

There's no need to edit the sketch to add your SSID and password - the SmartConfig app does that for you!

SmartConfigReconnect

This sketch shows how to use the CC3000 in 'reconnect' mode, and avoid erasing all stored connection profiles, which is unfortunately necessary with other sketches where manual config data is provided.

- Initializates the CC3000 with a special SmartConfig flag so it doesn't erase the profile data
- Access Point connection (based on saved AP details)
- DHCP address assignment
- Disconnect

SmartConfig is still in beta testing! It might not work on all networks!

Using the SmartConfigCreate Sketch

Step One: Install the SmartConfig App

Before you can use SmartConfig to provide your AP connection details, you need to install the SmartConfig app:

- For **iOS devices** simply search for the TI WiFi SmartConfig app (http://adafru.it/cQ3) from the app store.

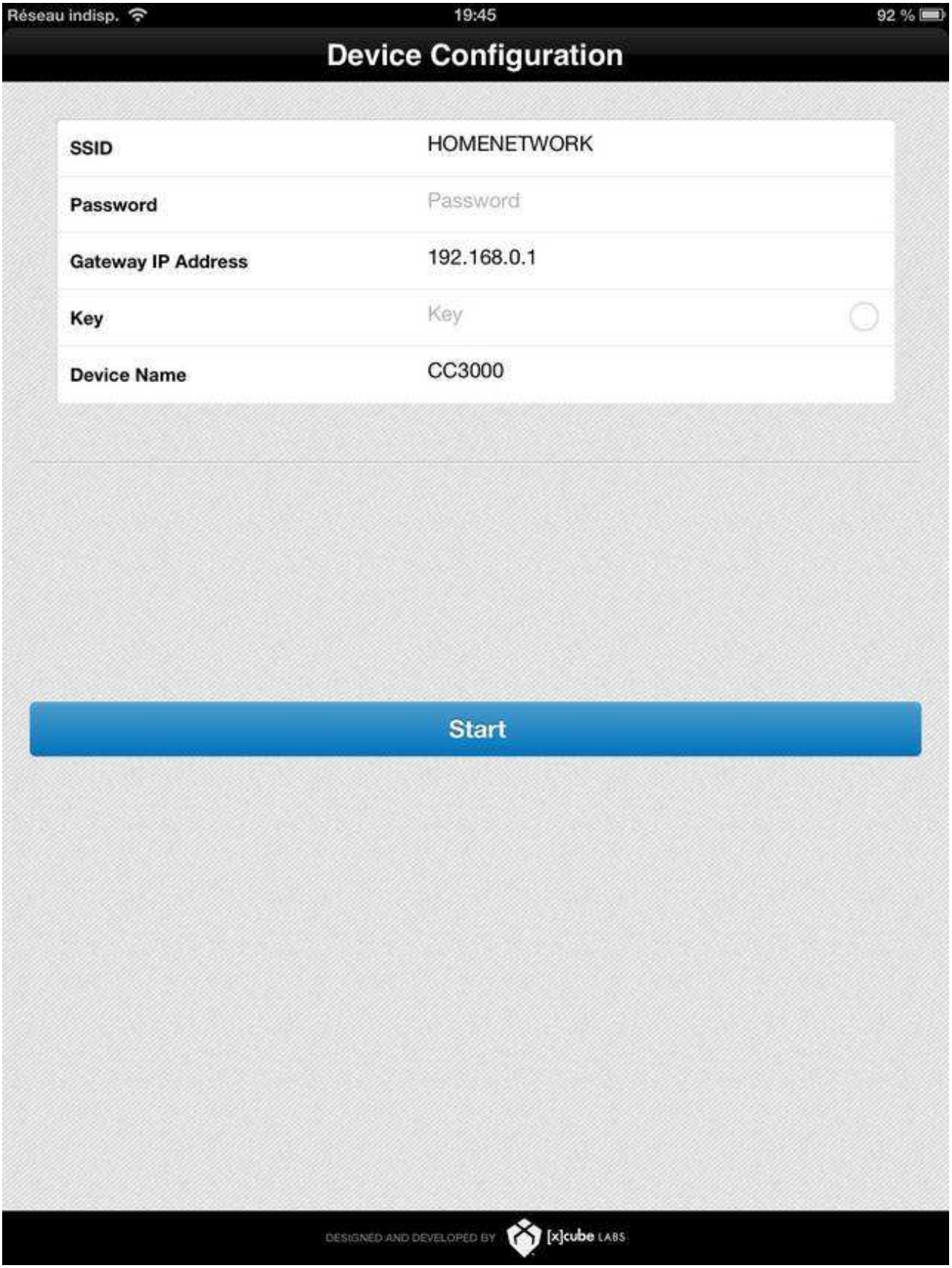
- For **Android devices**, you can download the app directly from TI's CC3000 Wiki (http://adafru.it/cQ4)

Step Two: Configure the SmartConfig App on your Phone

Once you've installed the SmartConfig app, you need to connect to the AP that the CC3000 will be using (HOMENETWORK in the images below), and then load the app.

You should see a screen similar to the following, with the AP's **SSID**, **Gateway IP Address** and **Device Name** fields already populated:

> This tutorial will use an iPad to provide the SmartConfig details, but the process is basically the same on Android.



Add the password for your Access Point, but **don't click the START button yet!**

Don't change the Key or DeviceName fields!

Step Three: Open and Run 'SmartConfigCreate'

- In the **File > Examples > Adafruit_CC3000** menu select the **SmartConfigCreate** sketch.
- Run the sketch and open the Serial Monitor via **Tools > Serial Monitor**.
- You should see something similar to the following text:

```
Hello, CC3000!

RX Buffer : 131 bytes
TX Buffer : 131 bytes
Free RAM: 595

Initialising the CC3000 ...
Firmware V. : 1.24
MAC Address : 0x08 0x00 0x28 0x01 0xA8 0x1F
Waiting for a SmartConfig connection (~60s) ...
```

Step Four: Start the SmartConfig app on your Phone

Before the Android sketch times out, click to '**Start**' button in your TI app, and watch the serial monitor window of your sketch. After about 30 seconds you should see something similar to the following:

```
Got smart config data
Saved connection details and connected to AP!
Request DHCP

IP Addr: 192.168.0.103
Netmask: 255.255.255.0
Gateway: 192.168.0.1
DHCPsrv: 192.168.0.1
DNSserv: 192.168.0.1

To use these connection details be sure to use
'.begin(false, true)' with your Adafruit_CC3000
code instead of the default '.begin()' values!

Closing the connection
```

Step Five: Stop the SmartConfig App on the Phone

If everything worked out and you successfully connected to your AP, the connection details were also stored in non-volatile memory on the CC3000 module. You can now use the **SmartConfigReconnect** sketch to test the connection details, specifically paying attention to the extra flags in the **Adafruit_CC3000.begin()** function compared to other sketches..

Did the sketch timeout before connecting?

- Be sure to click '**Stat**' in the SmartPhone app as soon as the '**Waiting for SmartConfig connection (~60s) ...**' message pops up. The SmartConfig device will timeout after 60 seconds, so you may need to run the sketch again and be a bit quicker with your fingers.
- Make sure that the iPad or SmartPhone is connected to the same AP that you want the CC3000 to connect to!
- Check your password in case there is a typo

Using the SmartConfigReconnect Sketch

The SmartConfigReconnect sketch shows how to use (and retain) the connection details that were written to the device in the example above.

The key to using and maintaining the connection details is to pass an optional flag to the Adafruit_CC3000 classes **.begin()** function to tell the driver **NOT** to delete existing connections, and to stay in auto connect mode:

```
/* !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!! */
/* !!! Note the additional arguments in .begin that tell the   !!! */
/* !!! app NOT to deleted previously stored connection details !!! */
/* !!! and reconnected using the connection details in memory! !!! */
/* !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!! */
if (!cc3000.begin(false, true))
{
  Serial.println(F("Unable to re-connect!? Did you run the SmartConfigCreate"));
  Serial.println(F("sketch to store your connection details?"));
  while(1);
}
```

The first flag should always be **false**, and is used to indicate that we are going to perform a firmware update. The second flag should always be **true** when using SmartConfig data, and puts the CC3000 in an auto-reconnect mode and maintains existing connection details in non-volatile memory.

If you were able to successfully connect using the **SmartConfigCreate** sketch, SmartConfigReconnect should give you something similar to the following output:

```
Hello, CC3000!

Trying to reconnect using SmartConfig values ...
Reconnected!

Requesting DHCP

IP Addr: 192.168.0.103
Netmask: 255.255.255.0
Gateway: 192.168.0.1
DHCPsrv: 192.168.0.1
DNSserv: 192.168.0.1

Closing the connection
```

Any time you don't provide the extra flags to the .begin method, all connection details will be erased and auto-reconnect mode will be disabled! Unfortunately, this is necessary when providing manual connection details, so be careful using non SmartConfig* sketches if you don't want to lose your connection details.

SendTweet

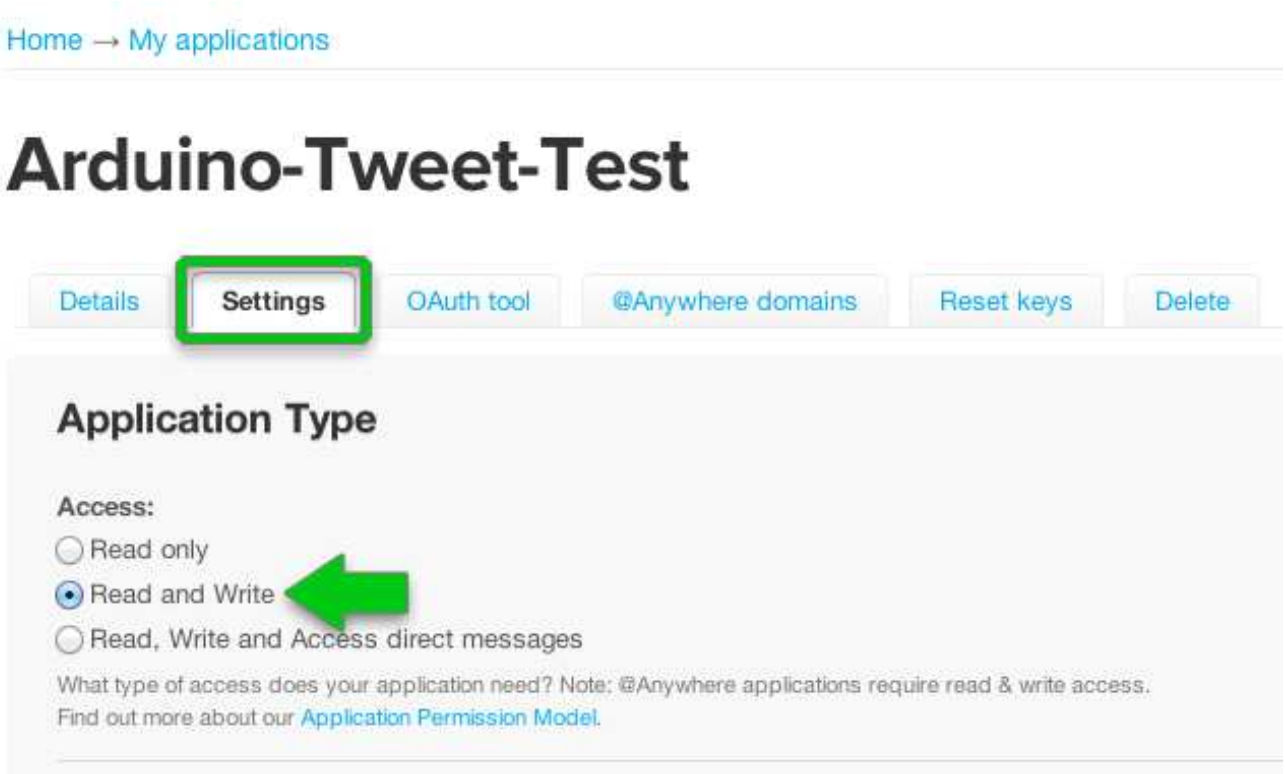
SendTweet

This example sketch sends “tweets” (Twitter messages) from an Arduino with CC3000 WiFi. Usually this requires extra proxy software running on another computer, but this sketch operates directly from the Arduino.

This is a barebones example that issues a single fixed message, but it’s easily adapted to send different information such as a periodic sensor reading.

In addition to the WiFi setup explained below, it’s necessary to set up a Twitter developer account and complete an application form before this can be used. **That procedure is explained on the Twitter Setup page of the Internet of Things Printer tutorial** (http://adafru.it/cHs)**.**

One additional configuration step is required on the Twitter developer site: from your applications “Settings” tab, set access to “Read and Write.” This is necessary so our sketch can send tweets; the printer sketch only reads tweets.



Before you run the sketch, edit it to replace the dummy SSID and password with your own:

```
#define WLAN_SSID     "yourNetwork"  // cannot be longer than 32 characters!
#define WLAN_PASS     "yourPassword"
```

Also, make sure that the right wireless security scheme is selected (unsecured, WEP, WPA, or WPA2)

```
// Security can be WLAN_SEC_UNSEC, WLAN_SEC_WEP, WLAN_SEC_WPA or WLAN_SEC_WPA2
#define WLAN_SECURITY   WLAN_SEC_WPA2
```

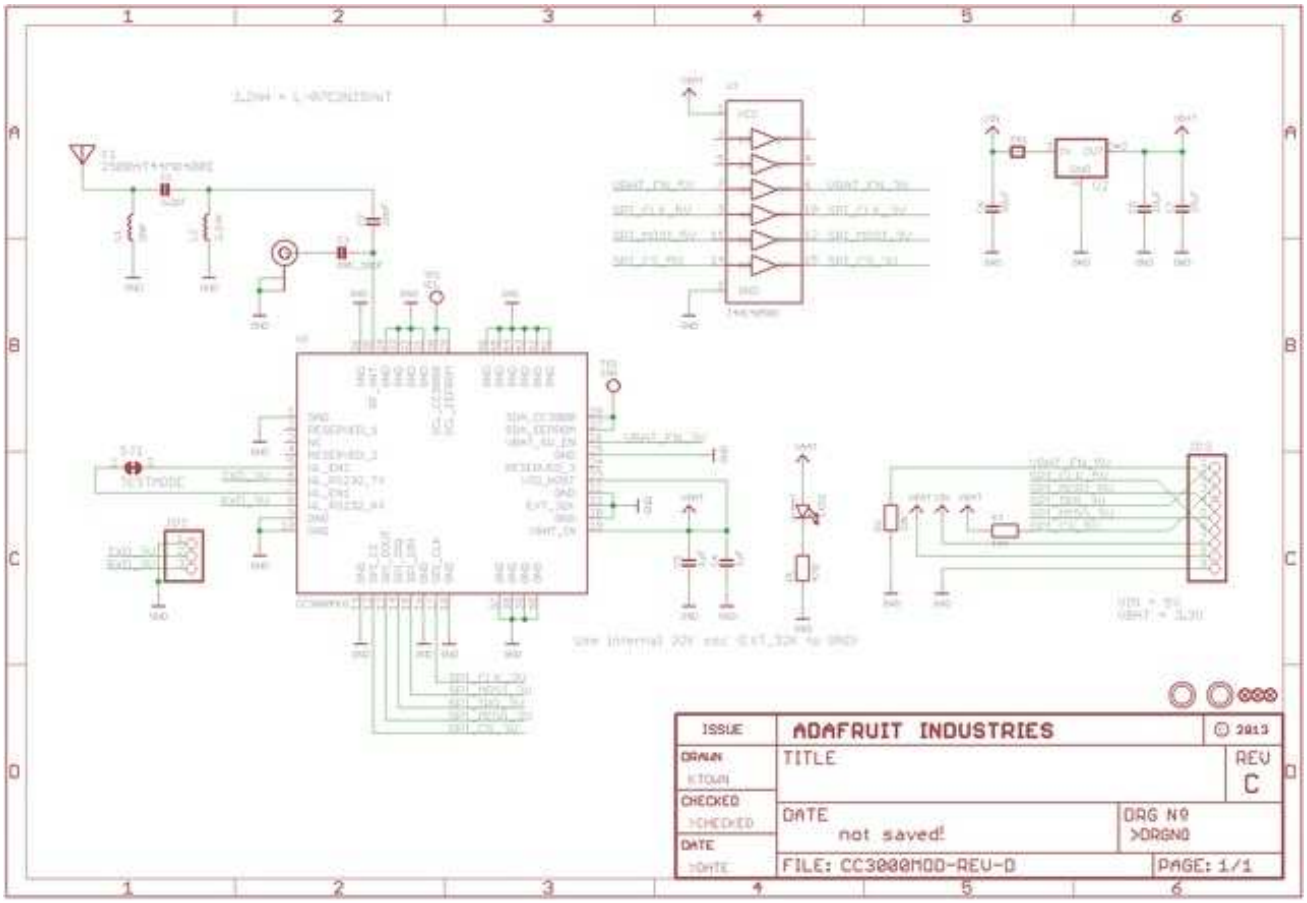
Here's a sample of the Serial Monitor output of SendTweet. You should see something similar:

```
Hello! Initializing CC3000...Firmware V. : 1.19
OK
Deleting old connection profiles...OK
Connecting to network...Started AP/SSID scan



Connecting to Turlingdrome...Waiting to connect...OK
Requesting address from DHCP server...OK
IP Addr: 192.168.0.4
Netmask: 255.255.255.0
Gateway: 192.168.0.1
DHCPsrv: 192.168.0.1
DNSserv: 192.168.0.1
Locating time server...found
Connecting to time server...
Connect to 155.101.3.115:123
connected!
Issuing request...OK
Awaiting response...success!
Locating Twitter server...OK
Connecting to server...

Connect to 199.59.150.9:80
OK
Issuing HTTP request...OK
Awaiting response...success!
Waiting ~1 hour...
```

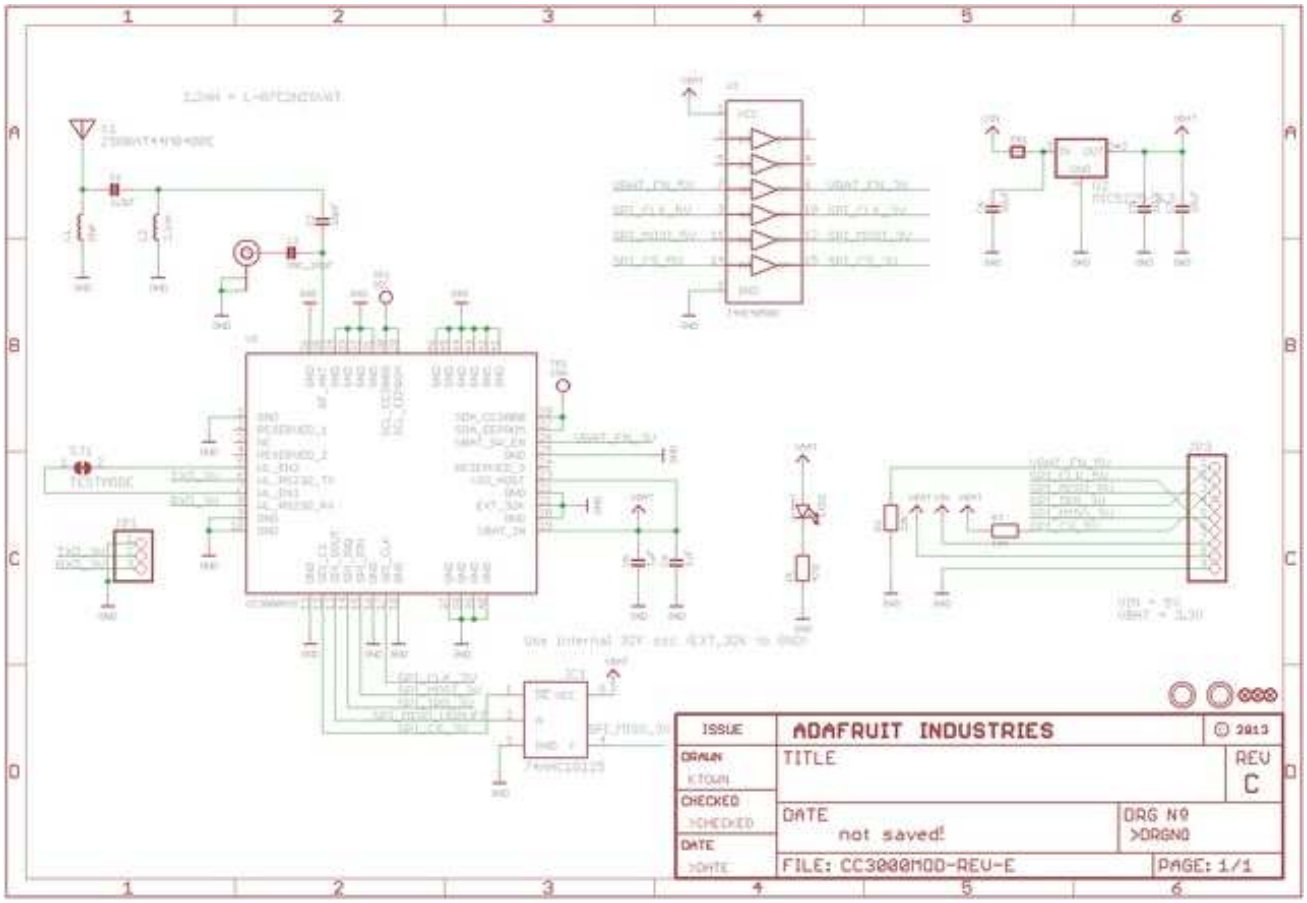
Downloads

For more information on the CC3000, check out TI's product page (http://adafru.it/cHf) and wiki microsite (http://adafru.it/cHg), its got tons and tons of information about their WiFi module

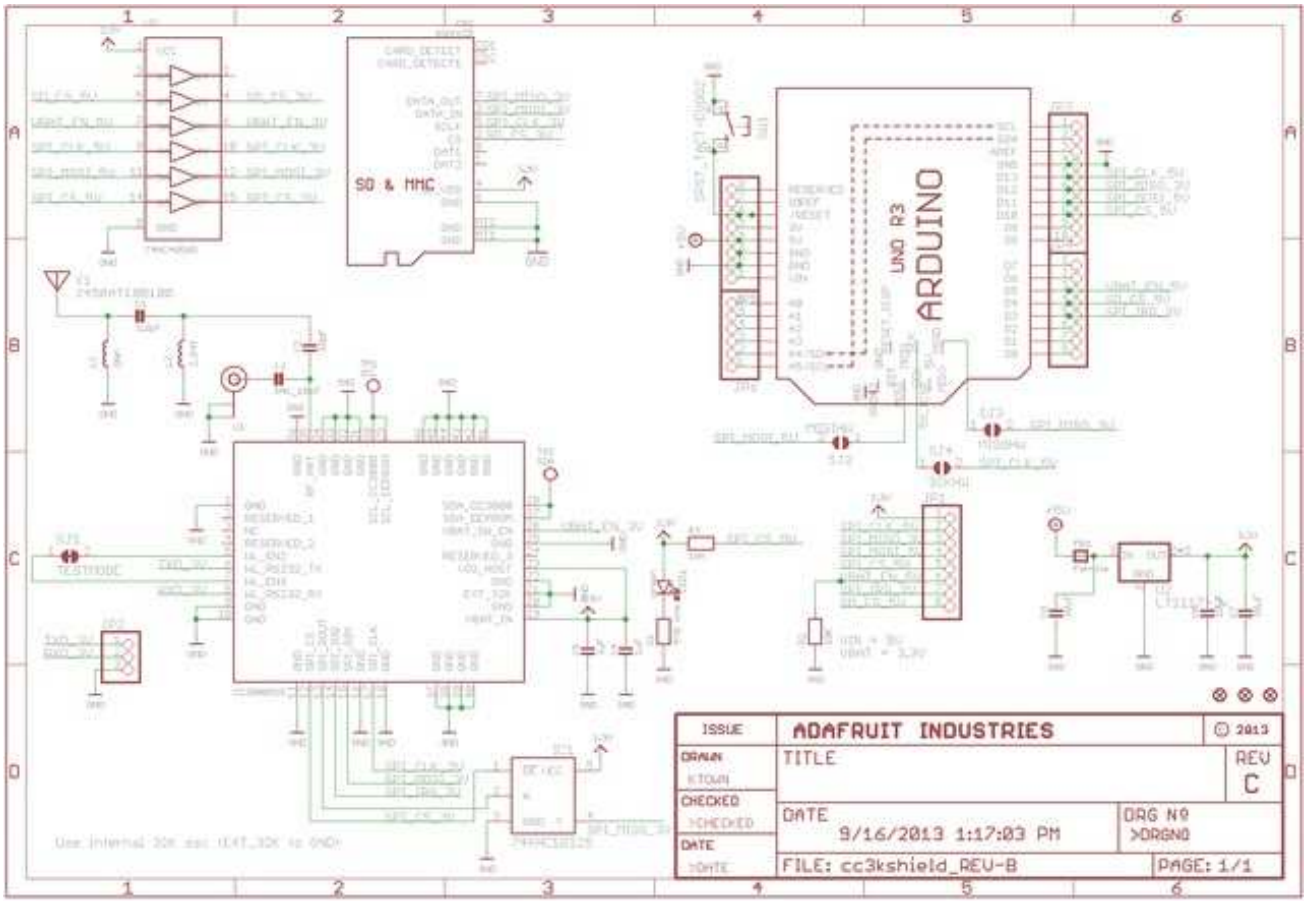
Schematic for the CC3000 breakout board v1.0 (no buffer on the MISO pin)



Schematic for v1.1 with a buffer on MISO

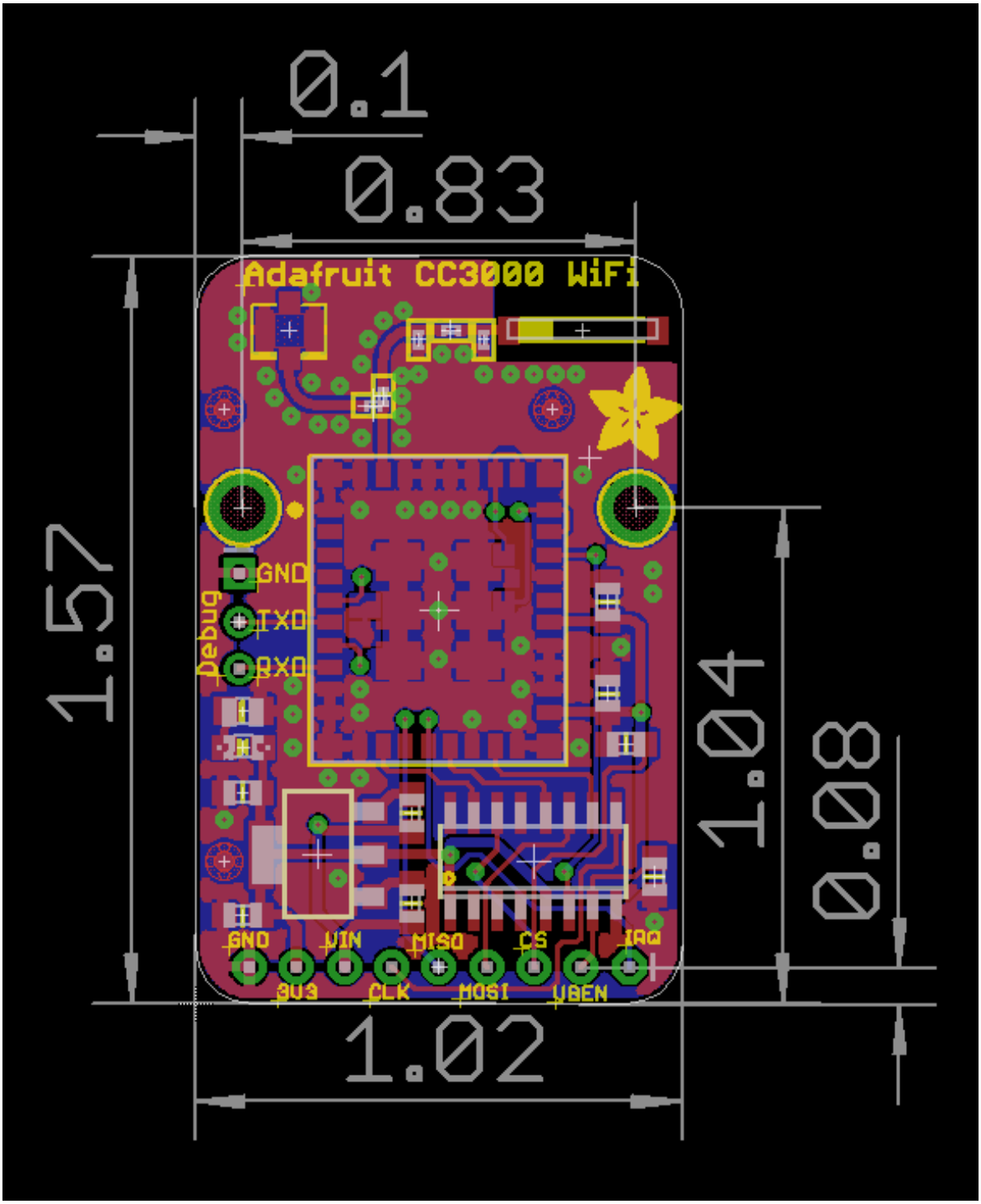


Schematic for the CC3000 shield

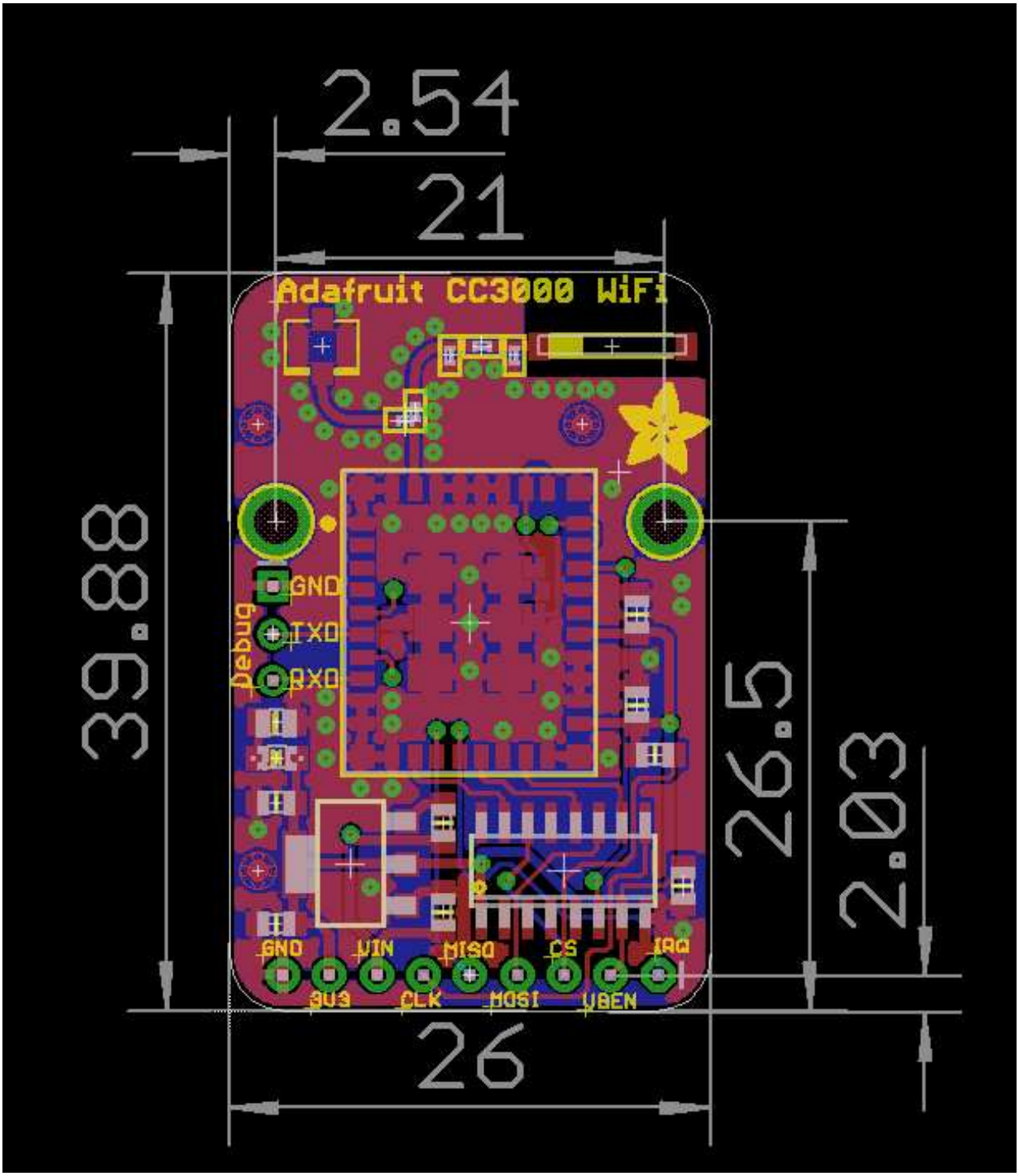


Dimensional diagram for the CC3000 breakout

inches:


0.1
0.83
Adafruit CC3000 WiFi
1.57
1.04
0.08
1.02
GND
TXD
RXD
Debug
GND
VIN
MISO
CS
IRQ
3V3
CLK
MOSI
VBEN

mm:


2.54
21
39.88
26.5
2.03
26
Adafruit CC3000 WiFi
GND
TXO
RXO
debug
GND
VIN
MISO
CS
IRQ
3V3
CLK
MOSI
VBEN

FAQ

I'm using WEP - how do I configure my HEX passphrase?
If your passphrase is a series of HEX digits, you can't simply enter it as a literal string. Instead you have to define is as an actual binary sequence.
For example, if your passphrase is 8899aabbccdd, you would define it as follows:

```
//  #define WLAN_PASS       "8899aabbccdd"  //don't do it this way!
//do it this way:
const char WLAN_PASS = {0x88, 0x99, 0xaa, 0xbb, 0xcc, 0xdd, 0x00};
```

I'm using WEP and I tried that but it still doesn't work
Make sure you have WLAN_SECURITY defined as WEP:

```
#define WLAN_SECURITY   WLAN_SEC_WEP
```

What is the gain of the ceramic antenna? How does it compare to the external antennas?
We use the Johannson 2500AT44M0400 (http://adafru.it/cVL) which has 0.5 dBi gain. Compare this to the external antennas with 2 dBi and 5dBi. Since antenna 'range' is not linear with the gain and antenna range has *a lot to do* with what else is transmitting or receiving, physical barriers, noise, etc. We can roughly say that the ceramic antenna has half the range of the 2dBi antenna, and the 5dBi antenna has double the range of the 2dBi antenna *(roughly!)*
There is no way to know the actual range you will get unless you experiment with your setup since there is so many variables, but the ceramic antenna gets about the same range we expect with an every day cellphone

(http://adafru.it/cVL)

How can I use the CC3000 with a static IP?
WiFi device IPs are dynamic 99% of the time, but it is possible to assign a static IP if your router permits it. Check out this forum post for how to go about it (http://adafru.it/clc)

I'm having difficulty seeing/connecting to my network...
If you have an '802.11n only' router please configure it to add 'b or g' support. The CC3000 is 802.11b or g only, it does not do 'n'!