



AMW106-A02 Wi-Fi Shield Reference Guide



AMW106-A02
'Mantis'

Disclaimer

While the information provided in this document is believed to be accurate, it is under development and ACKme Networks reserves the right to make changes without further notice to the product described herein to improve reliability, function, or design, and makes no guarantee or warranty concerning the accuracy of said information, nor shall it be responsible for any loss or damage of whatever nature resulting from the use of, or reliance upon, such information. ACKme Networks makes no warranties of any kind, whether express, implied or arising by custom or course of trade or performance, and specifically disclaims the implied warranties of title, non-infringement, merchantability, or fitness for a particular purpose.

No part of this document may be copied, reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photographic, or otherwise, or used as the basis for manufacture or sale of any items without the prior written consent of ACKme Networks.

Trademarks

ACKme Networks and the ACKme Networks logo are trademarks of ACKme Networks. WICED™ is a trademark of Broadcom Corporation, Inc. Other trademarks in this document belong to their respective owners.

© 2014-2015 ACKme Networks Inc.

All rights reserved.

Document Number: ARG-MW106-A02

Release Date: September 3, 2015

Contact

<http://ack.me/contact>

About this User Guide

This guide provides information and instructions for the AMW106-based Mantis Wi-Fi shield and associated WiConnect libraries available for use with 3rd party development platforms.

Further information about the WiConnect serial API and WiConnect libraries is available online at:

<http://wiconnect.ack.me>

Organization

This document is organized into the following sections:

- [Introduction, Section 1](#)
- [Feature Identification, Section 2](#)
- [Getting Started, Section 3](#)
- [Using Mantis with Arduino, Section 4](#)
- [Using Mantis with Nucleo, Section 5](#)
- [Using Mantis with a Computer, Section 6](#)
- [Ordering Information, Section 7](#)
- [Revision History & Glossary, Section 8](#)
- [Appendix A – Setting up a Terminal Emulator](#)
- [Appendix B – Mantis Wi-Fi Shield Schematics](#)

Contents

1	Introduction	1
1.1	Platform Support	2
2	Feature Identification	3
3	Getting Started.....	5
3.1	Platform Overview.....	5
4	Using Mantis with Arduino	6
4.1	Using the Arduino Library.....	6
4.2	Arduino References	6
5	Using Mantis with Nucleo	7
5.1	Using the WiConnect mbed™ Library	7
5.1.1	Verifying Operation and Programming of the Nucleo Board	7
5.1.2	Installing the AMW106-A02 Mantis and Verifying Wi-Fi Operation	11
5.1.3	Using the WiConnect Example Apps	13
5.1.4	STM32 Nucleo References.....	15
6	Using Mantis with a Computer	15
6.1	Getting Help.....	15
6.2	System Indicator LEDs	16
6.3	Scanning for Wi-Fi Networks	16
6.4	Joining a Wi-Fi Network.....	17
6.4.1	Web Setup	17
6.4.2	Script Setup.....	18
6.4.1	Manual Setup.....	18
6.5	Want more?.....	19
7	Ordering Information.....	20
8	Revision History & Glossary	21
8.1	Revision History	21
8.2	Glossary	21
APPENDIX A -	Configuring a Terminal Application	22
APPENDIX B -	Mantis Wi-Fi Shield Schematics.....	25

1 Introduction

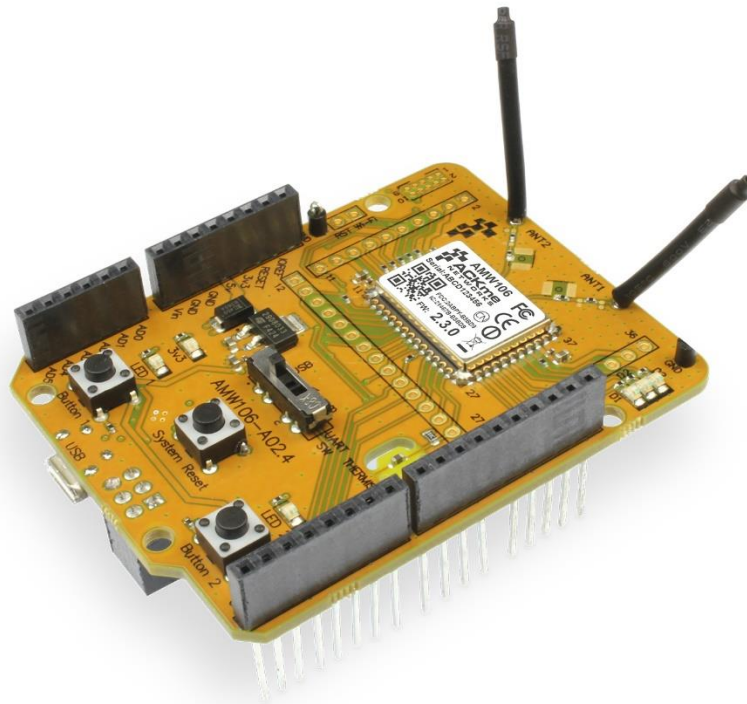
The AMW106 'Numbat' module is a fully certified small form factor, low power Wi-Fi networking module perfectly suited to deeply embedded applications requiring medium/high data throughput in medium to high volume.

The module runs WiConnect firmware, ACKme Networks easy-to-use and reliable serial Wi-Fi networking application that includes an embedded TCP/IP networking stack with SSL/TLS/HTTPS security together with an extensive array of features that vastly simplify development of connected devices.

Evaluation of WiConnect and the AMW106 module using the AMW106-A02 'Mantis' Wi-Fi shield, shown in Figure 1, is available with 3.3V tolerant Arduino compatible boards listed below.

- Arduino
- STM32 Nucleo

Figure 1. AMW106-A02 'Mantis' Evaluation Board



1.1 Platform Support

ACKme provides software to support each platform available to evaluate Mantis.

Arduino

An Arduino library for use with WiConnect is available on the ACKme Bitbucket repository. Documentation for the Arduino library is provided as part of the online WiConnect reference guide. Links to the library and documentation are shown below:

Arduino Library: https://bitbucket.org/ackme/ackme_wiconnect_library

Documentation: <http://wiconnect.ack.me/arduino/>

Nucleo

ACKme provides an online open source WiConnect mbed™ library for use with the STM32 Nucleo and Mantis Wi-Fi shield. The mbed library together with the examples provided, makes it very easy to create connected applications.

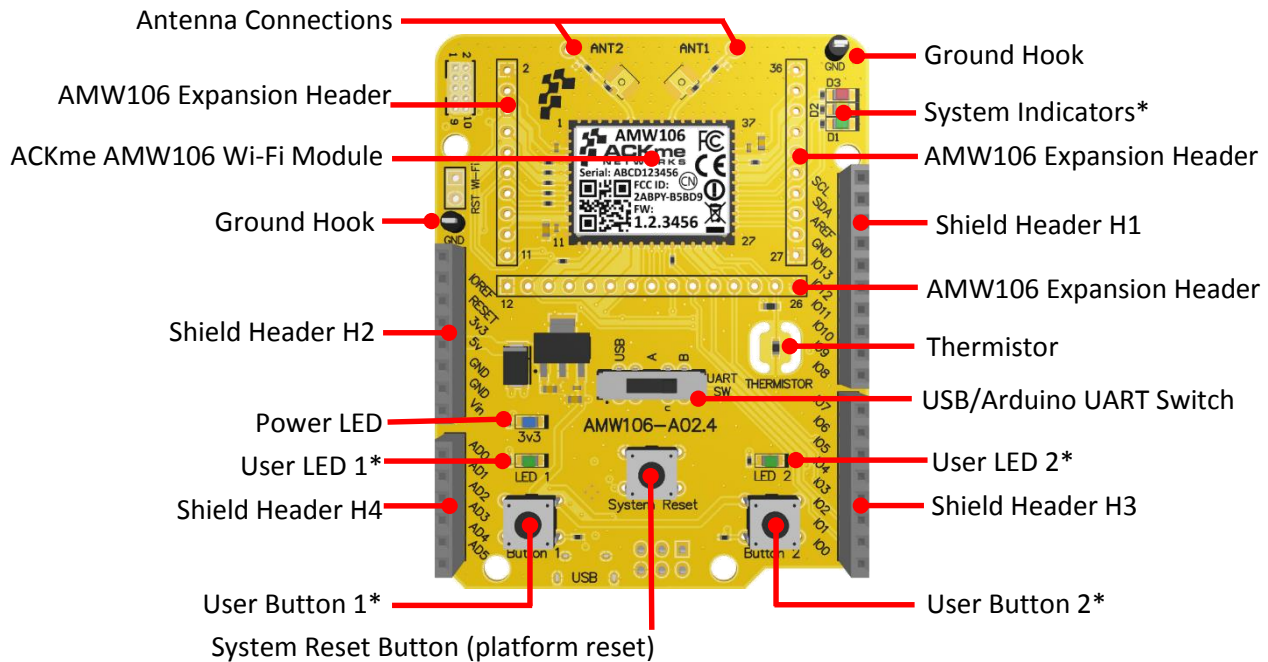
The WiConnect mbed library and examples are available on the mbed website at:

<http://developer.mbed.org/teams/ACKme/>

2 Feature Identification

The Mantis evaluation board, shown in Figure 2, comes complete with a surface mount AMW106 ‘Numbat’ module. Each pin on the module is connected to the expansion header (not populated), a number of module pins also connect to the Wi-Fi shield headers. Schematics for the board are provided in Appendix B.

Figure 2. AMW106-A02 Features – TOP VIEW



* User configurable

Figure 3. AMW106-A02 Features – BOTTOM VIEW

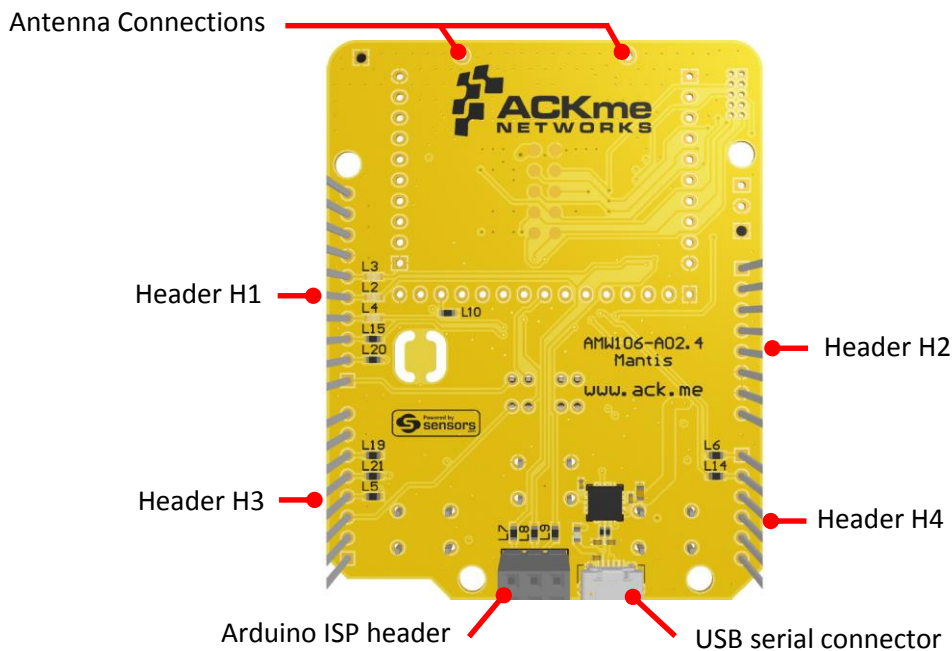
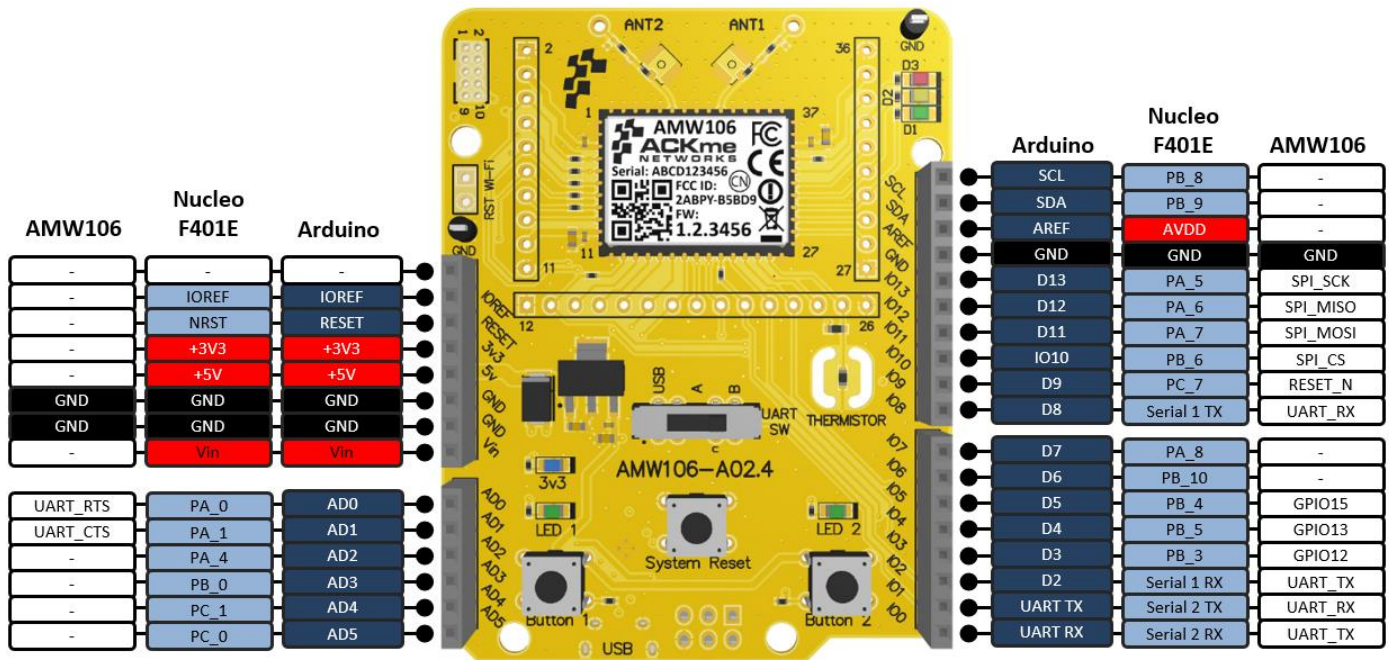


Figure 4. AMW106-A02 Shield Connections for Arduino & Nucleo



Shield connections for the Mantis board are shown in Figure 4.

There are two serial configurations available for communication between Mantis and the host microcontroller platform. Config A provides a single direct UART connection, and Config B provides a direct UART connection and also enables an additional console connection.

To select the required configuration, use the UART switch (marked UART SW in Figure 4 above).

You can also test the Mantis board by connecting directly to a computer via the USB port (a host microcontroller platform is not required in this case). Use a serial terminal program on the computer to run WiConnect commands as described on the WiConnect Getting Started page at http://wiconnect.ack.me/getting_started. Switch the UART switch to **USB**.

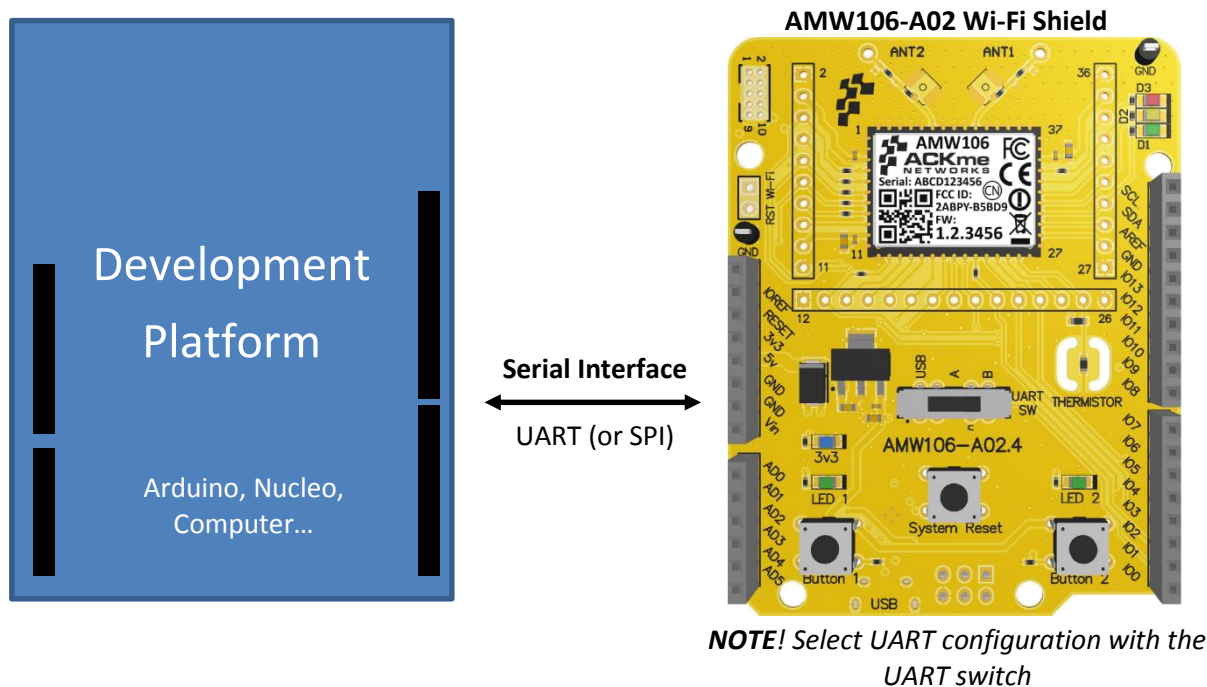
3 Getting Started

Referring to Figure 5, there are two important decisions you need to make in order to get started with your shiny new Mantis board.

Firstly, you need to choose which serial interface to use to communicate with Mantis. At the current time, WiConnect does not support SPI (but it will soon!), so we've made the first decision for you – you will be using a UART serial interface.

Secondly, you'll need to decide which development platform Mantis will be plugged into. Select the UART configuration with the UART switch.

Figure 5. Serial communication with Mantis



3.1 Platform Overview

To help you choose a platform that suits your needs, we have provided a summary of the various options available.

Arduino

A software library for the Arduino platform is available on github, references are provided in Section 1.1. Documentation is available at <http://wiconnect.ack.me/arduino>.

STM32 Nucleo

The STM32 Nucleo platform, described in Section 4, provides a seamless development path using the WiConnect mbed library provided as full source on the mbed website at <http://developer.mbed.org/teams/ACKme>

4 Using Mantis with Arduino



The Mantis board is designed to work seamlessly with the Arduino development board. Check that the correct UART is configured on the Mantis board for use with Arduino.

Use the UART Switch to select **Config A**.

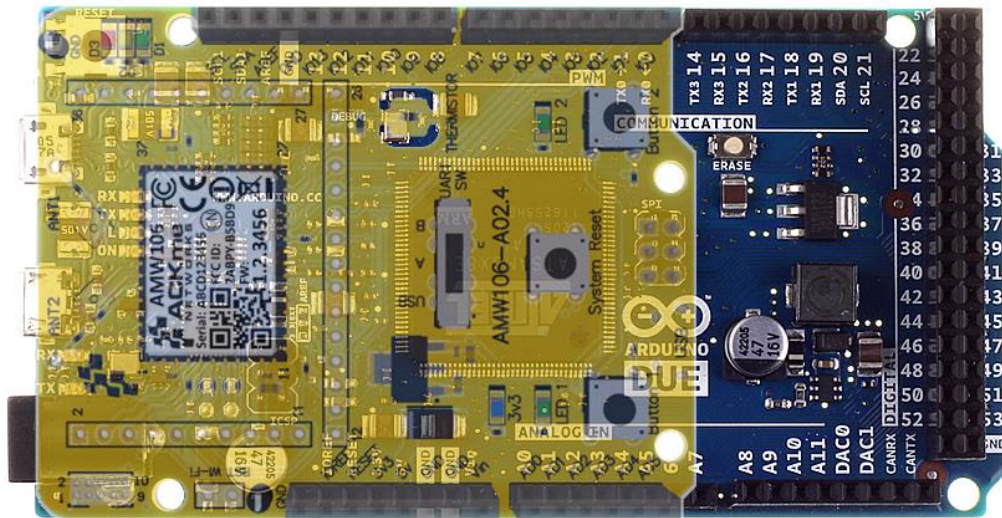


Figure 6. Mantis plugged into Arduino Due

4.1 Using the Arduino Library

Information about the WiConnect Arduino library is available online at <http://wiconnect.ack.me/arduino>.

Information about the WiConnect API and serial command interface is available at <http://wiconnect.ack.me>.

4.2 Arduino References

- Arduino website:
<http://arduino.cc/>

5 Using Mantis with Nucleo



The Mantis board is designed to work seamlessly with an STM32F401 Nucleo development board. Before plugging the Mantis board into the Nucleo, it is necessary to check that the correct UART is configured on the Mantis board.

Use the USB switch to select Config B.

5.1 Using the WiConnect mbed™ Library

ACKme provides a WiConnect library for the STM32 Nucleo that runs on the STM32 MCU and controls WiConnect running on the Numbat Wi-Fi module. The library is a programming API for the WiConnect serial command set.

Information about the WiConnect mbed library is available on the WiConnect wiki at <http://wiconnect.ack.me/mbed>.

Information about the WiConnect API and serial command interface is available at <http://wiconnect.ack.me>.

5.1.1 Verifying Operation and Programming of the Nucleo Board

The procedures in this section verify that key features of the Nucleo board work, and that you can successfully program the board. For this section the AMW106-A02 (Mantis) Wi-Fi shield should NOT be installed on the Nucleo board.

Set up the Nucleo (standalone, without Mantis)

These instructions are for a standalone STM32F401 Nucleo on Windows. The instructions may vary slightly for other Nucleo boards and other operating systems.

- Plug in the Nucleo USB cable to supply power and a serial connection, and verify the ST-Link (programming interface) drivers are loaded. Drivers are available here: <https://developer.mbed.org/teams/st/wiki/ST-Link-Driver>
- Download, install and run the ST-Link software that enables programming of the Nucleo: <http://www.st.com/web/en/catalog/tools/PF258168>
- Connect to the Nucleo board by selecting **Target** → **Connect**. If the ST-Link utility displays an error, check the installation and operation of the drivers, and the USB connection between the Nucleo board and your computer. After successful connection, the ST-Link display looks similar to Figure 7 :

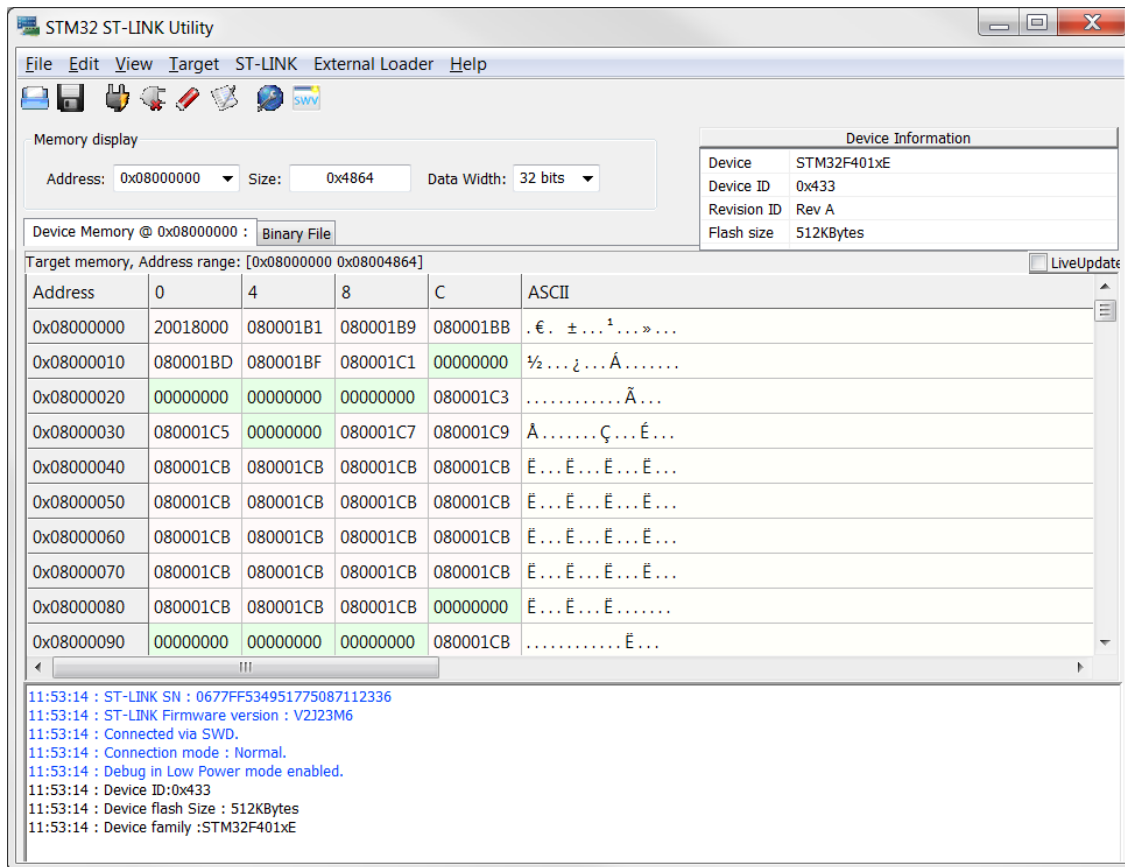


Figure 7. Nucleo ST-LINK Utility display after successful connection

Connect a Terminal Emulator to the Nucleo board

Open a terminal emulator, such as TeraTerm, and create a serial connection to the Nucleo board with the following serial and terminal settings:

- Serial:
 - Baud: 115200
 - Data: 8 bit
 - Parity: none
 - Stop: 1 bit
 - Flow control: none
- Terminal type:
 - VT100



Note! The terminal does not display any messages or respond to character entry until the board is programmed.

Set up an mbed account

The mbed site provides a compiler for ARM processors, including the ARM in the STM32 on your Nucleo board. It also offers access to the WiConnect mbed™ library, ACKme demo apps, and a large community of programmers sharing programs and information. With an mbed account you can use the compiler, store your code in online repositories, and share code with others.

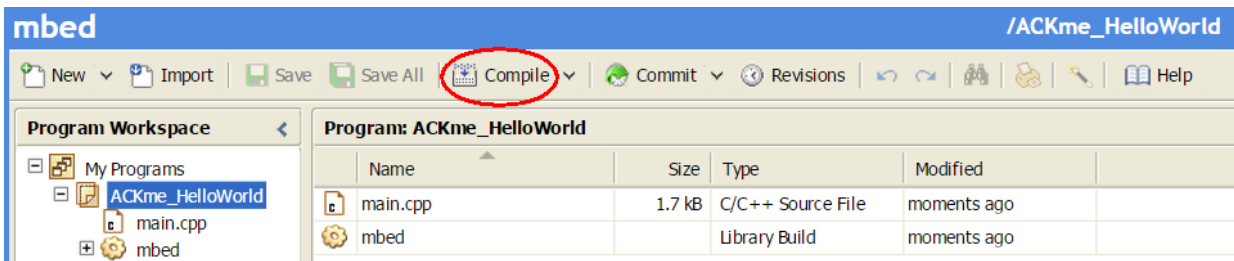
- Go to <http://developer.mbed.org>
- Create an account, following the instructions on-site.

Compile the ACKme_HelloWorld app

The ACKme_HelloWorld app verifies the operation of key features of the Nucleo board, without the ACKme shield installed. It blinks the Nucleo board user LED, and increases the blink rate when you press the User button. It prints to a serial terminal connected to the USB port, and echoes characters entered at the terminal.

- Go the mbed platforms page (<https://developer.mbed.org/platforms>) and add the Nucleo platform to your compiler.
 - For example, in the case of the Nucleo F401RE board, go to page: <https://developer.mbed.org/platforms/ST-Nucleo-F401RE/>
 - Click the **Add to your mbed Compiler** button
- Click on **Compiler**, in the top right hand corner of the mbed home or platforms page, to open the mbed online compiler in your browser.
- Click on **Import**. The Import Wizard appears. Select the Programs tab. In the Search box enter 'ACKme_HelloWorld'. In the search results, double click the app, or select it and click Import, to import it into your Program Workspace.

- Click **Compile**. The app compiles, reporting any errors and warnings. When the compile is completed successfully, your browser automatically downloads the resulting bin file.

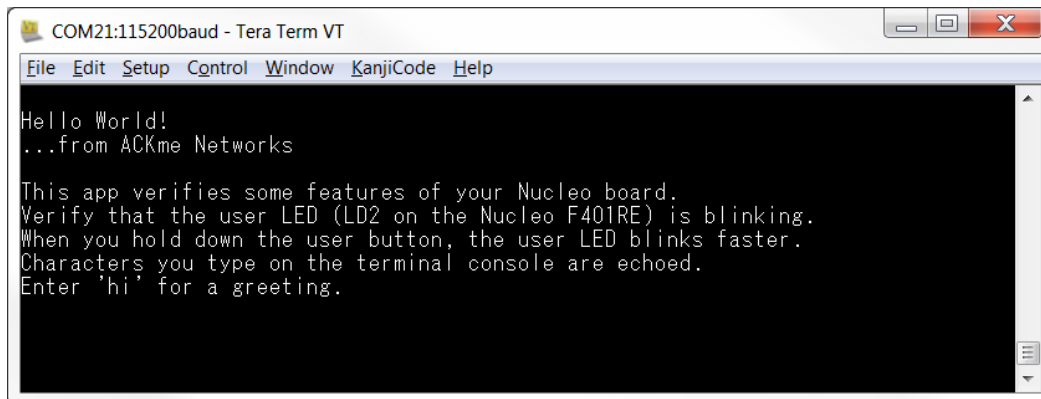


Program the Nucleo board with the compiled binary file

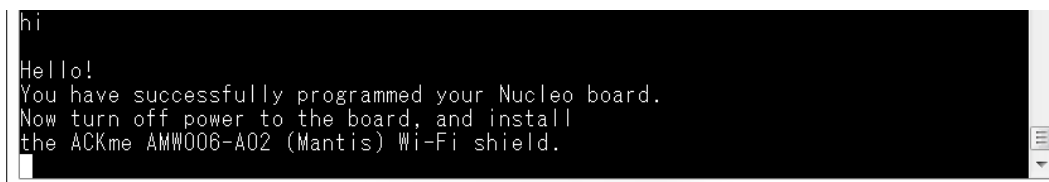
- Drag and drop the downloaded bin file onto the ST-Link GUI (or use the **File** → **Open** menu)
- On the GUI, press Ctrl+P to program the board (or use the equivalent menu option or icons)

Verify operation of the app

- Once the download completes, switch to the terminal window. You may have to press the reset button on the Nucleo board to restart the Hello World app.
- The terminal outputs text like this:



- Type 'hi' followed by Enter to see the following terminal output:



5.1.2 Installing the AMW106-A02 Mantis and Verifying Wi-Fi Operation

The procedures in this section verify that the AMW106-A02 (Mantis) Wi-Fi shield is operating correctly. The **wiconnect-web_setup_example** provides a simple, quick way to save the SSID and password of your local wireless network on the Mantis. If you can successfully run the web setup using the Mantis soft Access Point, and then join your local network, Wi-Fi is working.

Install the AMW106-A02 Mantis shield

Plug the Mantis shield into the Nucleo board.

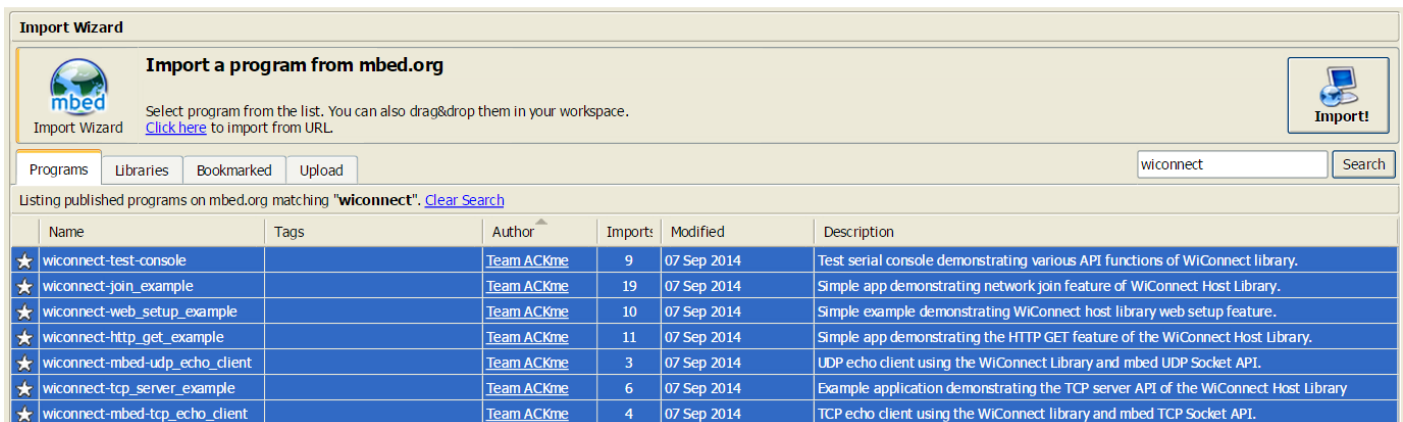
Note! The System Reset button on the Mantis shield is wired to the Nucleo reset button, so you can use it to reset the Nucleo board.



Import the WiConnect Example Apps

In the mbed site online compiler:

- Click on **Import**
- In the Import Wizard dialog, select the **Programs** tab
- Enter 'wiconnect' into the search box
- Click on author to order results alphabetically by author
- Highlight all wiconnect-* examples (shift-click to select all)
- Click the **Import** icon in the top right hand corner and wait for all files to import into your online compiler Program Workspace.



The screenshot shows the 'Import Wizard' interface on the mbed website. It displays a search for 'wiconnect' and lists several programs. The 'wiconnect-web_setup_example' is highlighted.

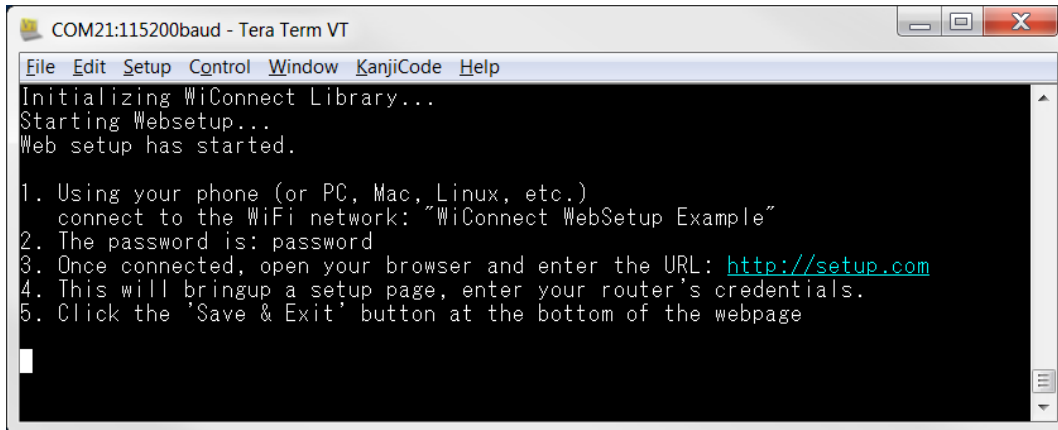
Name	Tags	Author	Imports	Modified	Description
★ wiconnect-test-console		Team ACKme	9	07 Sep 2014	Test serial console demonstrating various API functions of WiConnect library.
★ wiconnect-join_example		Team ACKme	19	07 Sep 2014	Simple app demonstrating network join feature of WiConnect Host Library.
★ wiconnect-web_setup_example		Team ACKme	10	07 Sep 2014	Simple example demonstrating WiConnect host library web setup feature.
★ wiconnect-http_get_example		Team ACKme	11	07 Sep 2014	Simple app demonstrating the HTTP GET feature of the WiConnect Host Library.
★ wiconnect-mbed-udp_echo_client		Team ACKme	3	07 Sep 2014	UDP echo client using the WiConnect Library and mbed UDP Socket API.
★ wiconnect-tcp_server_example		Team ACKme	6	07 Sep 2014	Example application demonstrating the TCP server API of the WiConnect Host Library
★ wiconnect-mbed-tcp_echo_client		Team ACKme	4	07 Sep 2014	TCP echo client using the WiConnect library and mbed TCP Socket API.

Compile the wiconnect-web_setup example

- Select the root of the **wiconnect-web_setup_example**
- Click **Compile** and wait for the bin file to be created and downloaded
- Follow the instructions above in the procedure step **Program the Nucleo board with the compiled binary file**

Run Web Setup

- **Note:** A terminal connection to the Nucleo board is not required to use the WiConnect Web Setup app. The app runs an Access Point and web server on the Mantis board.
- If you open a terminal connection to the Nucleo board, as described above in **Connect a Terminal Emulator to the Nucleo board**, the terminal display is similar to the following.

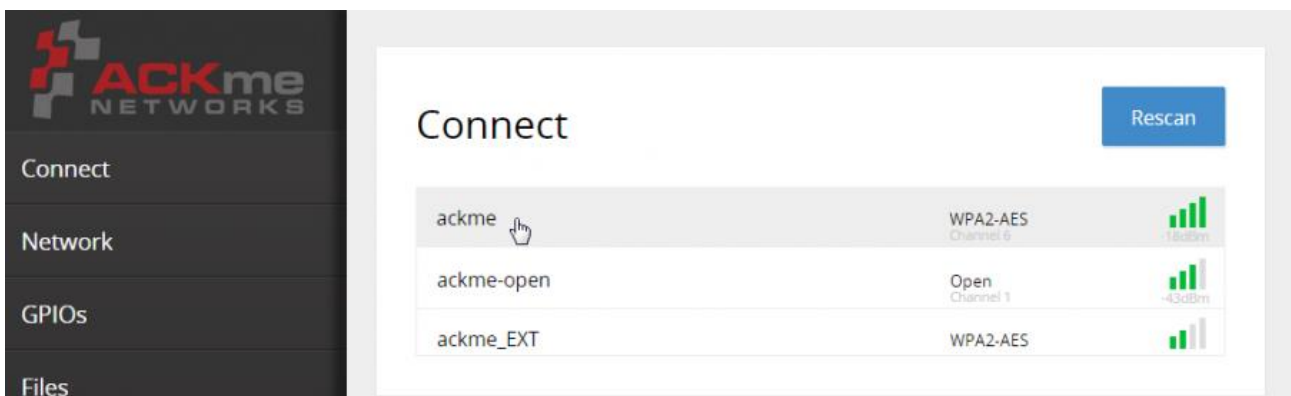


```

COM21:115200baud - Tera Term VT
File Edit Setup Control Window KanjiCode Help
Initializing WiConnect Library...
Starting Websetup...
Web setup has started.

1. Using your phone (or PC, Mac, Linux, etc.)
   connect to the WiFi network: "WiConnect WebSetup Example"
2. The password is: password
3. Once connected, open your browser and enter the URL: http://setup.com
4. This will bringup a setup page, enter your router's credentials.
5. Click the 'Save & Exit' button at the bottom of the webpage
  
```

- A red flashing LED on the Mantis indicates the softAP is running.
- Connect your computer or phone to the Wi-Fi network “WiConnect WebSetup Example”. Enter the password “password”.
- Open a web browser and navigate to **setup.com**. The setup web server page displays a scan dialog, then setup page similar to the page shown below:



- **Note:** for security reasons, the soft AP and web server time out after a few minutes. Press the Mantis System Reset button to bring them back up, then reconnect to the network and open setup.com again.
- A scan populates the list of Available Networks. To scan again, click **Search for Networks**.
- In the Available Networks list, click the network you wish to join, then enter the Passphrase or Key.
- Click **Save & Exit** to save the network SSID and passphrase to the Mantis flash memory.
- The module now automatically joins the chosen network whenever you issue a command that requires network access.

5.1.3 Using the WiConnect Example Apps

Before using any of the WiConnect Example Apps, verify success with the procedures outlined above.

Follow the procedure described in **Import the wiconnect example apps** above to import WiConnect example applications into your mbed Program Workspace. For each example, examine the code, compile the app and program the Nucleo as desired. The available apps are described in the following table.

WiConnect Example App	Description	Notes
wiconnect-http_get_example	Simple app demonstrating the HTTP GET feature of the WiConnect Host Library	Requires connection to the internet, e.g. prior web setup. Issues an http get request for the ack.me home page and displays the html on the terminal. Requirements: terminal, Internet Access
wiconnect-join_example	Simple app demonstrating the network join feature of WiConnect Host Library	You can modify this example to use the network SSID and password of your local wireless network. Requirements: terminal, local network
wiconnect-mbed-tcp_echo_client	TCP echo client using the WiConnect library and mbed TCP Socket API	Edit the following defines in main.cpp: <pre>#define NETWORK_SSID "?" #define NETWORK_PASSWORD "?" #define ECHO_SERVER_ADDRESS "?" #define ECHO_SERVER_PORT ?</pre> Run the supplied python script <code>tcp_echo_server.py</code> on a host accessible from the network specified. Modify the script if necessary to match the port specified. Requirements: terminal, local network access, host with python running TCP server python script
wiconnect-mbed-udp_echo_client	UDP echo client using the WiConnect Library and mbed UDP Socket API	Edit the following defines in main.cpp: <pre>#define NETWORK_SSID "?" #define NETWORK_PASSWORD "?" #define ECHO_SERVER_ADDRESS "?" #define ECHO_SERVER_PORT ?</pre> Run the supplied python script <code>tcp_echo_server.py</code> on a host accessible from the network specified. Modify the script if necessary to match the port specified. Requirements: terminal, local network, host with python running TCP server python script.
wiconnect-tcp_server_example	Example application demonstrating the TCP server API of the	Edit the following defines in example.cpp: <pre>#define TCP_SERVER_PORT ? #define TCP_SERVER_MAX_CLIENTS ?</pre>

	WiConnect Host Library	<pre>#define NETWORK_SSID "?" #define NETWORK_PASSWORD "?"</pre> <p>Run the supplied <code>tcp_client.py</code> script on a host accessible from the network specified. Edit the script <code>ECHO_SERVER_ADDRESS</code> and <code>ECHO_PORT</code> to match the port setting in <code>example.cpp</code> and the reported ip address of the Mantis module.</p> <p>Requirements: terminal, local network, host with python</p>
wiconnect-test-console	Test serial console demonstrating various API functions of WiConnect library.	<p>Terminal displays:</p> <pre>Initializing WiConnect... [INFO] WiConnect test app ready...</pre> <p>Enter help to see available commands.</p> <pre>> help</pre> <p>Requirements: terminal</p>
wiconnect-web_setup_example	Simple example demonstrating WiConnect host library web setup feature.	Described above.

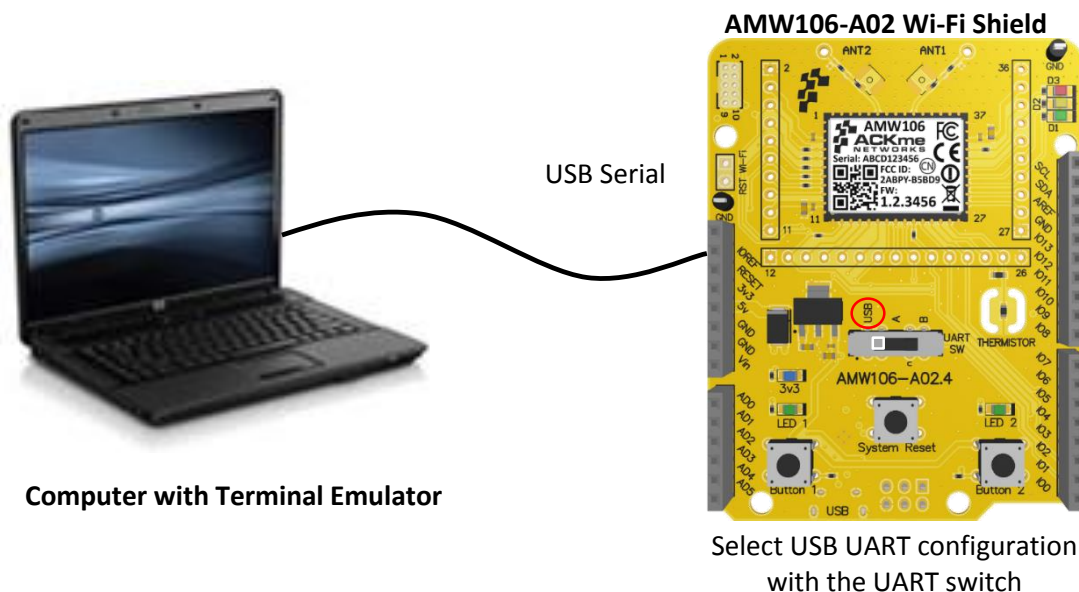
5.1.4 STM32 Nucleo References

- STM32 Nucleo Page on mbed:
<http://developer.mbed.org/platforms/ST-Nucleo-F401RE/>
- Nucleo User Manual:
http://www.st.com/web/en/resource/technical/document/user_manual/DM00105823.pdf
- Nucleo Software Tools Manual:
http://www.st.com/st-web-ui/static/active/en/resource/technical/document/user_manual/DM00105928.pdf

6 Using Mantis with a Computer

To get started with WiConnect, select USB with the UART switch and connect a USB cable between the AMW106-A02 evaluation board and the USB port of the computer. Open a terminal emulator as described in Appendix A. The USB cable provides the evaluation board with power and a serial UART connection to the computer.

With the board connected to the computer, verify the power LED is illuminated. If the power LED is NOT illuminated, try re-plugging the USB cable, or try a different USB cable.



Note! Be sure to use a quality USB cable. Inferior cables may result in reduced or intermittent operation of the evaluation board.

6.1 Getting Help

WiConnect provides extensive help for each command and variable. To obtain a list of help options, type the `help` command.

```
> help
```

Using Mantis with a Computer, Section 6

```
The following help options are available ...
help all      -> Print a list of all Commands and Variables
help commands -> Print a list of Commands
help variables -> Print a list of Variables
help <command> -> Print help for a specific Command
help <variable> -> Print help for a specific Variable
```

Additional help is available online at <http://wiconnect.ack.me>

To obtain help for a particular command or variable, type `help <command>` or `help <variable>`.

To obtain help for the `wlan_scan` variable, type `help wlan_scan`.

```
> help wlan_scan
Usage   : wlan_scan [-v] [<channel> [ssid]]
Shortcut: scan
Brief   : Initiate a Wi-Fi scan and return results; optionally specify
a channel and AP SSID to scan for. For verbose scans, -v must be the first argument
```

6.2 System Indicator LEDs

The Mantis Wi-Fi shield comes with three system indicator LEDs and two user LEDs. The LED functions are configurable, using the WiConnect peripheral commands and variables. See <http://wiconnect.ack.me> for more details., in particular the variables `system.indicator.gpio` and `system.indicator.state`.

By default the system indicator LEDs are configured as follows:

LED	Function	Behavior	
Red	Soft AP Indicator	Off	Soft AP off
		Fast blink	Soft AP error
		Medium blink	Soft AP active
		Slow blink	Client connected
Yellow	Network Indicator	Fast blink	No IP address
		Medium blink	DHCP in progress
		Slow blink	DHCP successful, IP address obtained
Green	WLAN indicator	Off	Wi-Fi off
		Fast blink	Error
		Medium blink	Connecting to AP
		Slow blink	Joined to AP

Blink rates are as follows: Fast blink: 4Hz, Medium blink: 1Hz, Slow blink: 0.5 Hz

6.3 Scanning for Wi-Fi Networks

To scan for Wi-Fi networks in range, use the `wlan_scan` command. Each AP in range is listed on a separate line.

```
> wlan_scan -v
!3 networks found
! # Ch RSSI MAC BSSID          Rate Security  Mode Len Network (SSID)
# 0 06 -27 84:1B:5E:29:9D:F7 450.0 WPA2-Mixed  Inf  17 YOUR_NETWORK_NAME
# 1 11 -73 2C:B0:5D:31:6F:6A 300.0 WPA2-AES    Inf   6 button
# 2 11 -73 EC:1A:59:36:5B:6C 144.4 WPA2-Mixed  Inf   5 ACKme
```

6.4 Joining a Wi-Fi Network

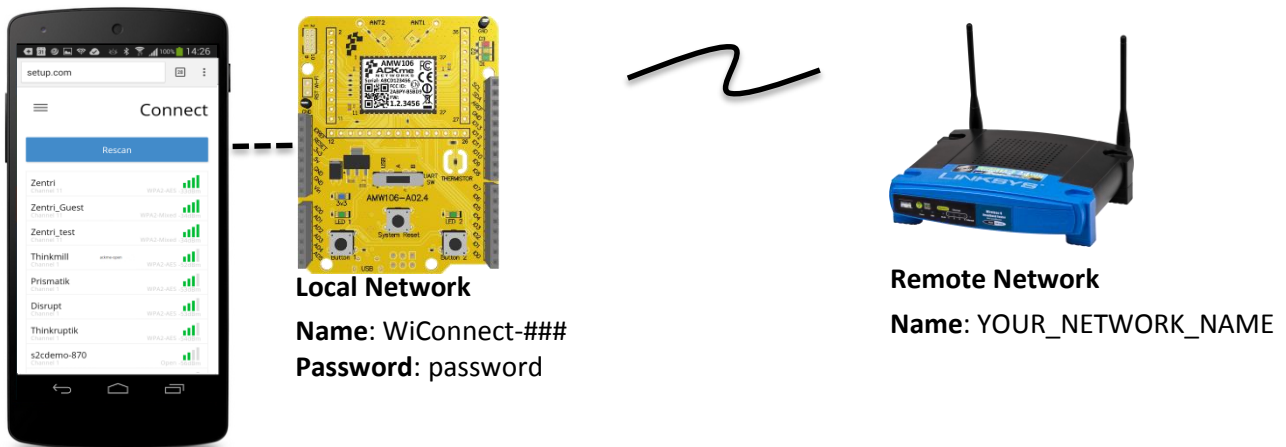
Several methods are available to configure and join the AMW106 module to a Wi-Fi network.

6.4.1 Web Setup

WiConnect provides the option to use a web browser running on a network client (such as a smartphone, tablet or computer) to select the remote Wi-Fi network the AMW106 module should join, and to enter a password for the remote network.

When web setup is used, it is helpful to think of the network client as the keyboard and display for the module as shown in Figure 8.

Figure 8. Web setup using a network client



To start web setup mode, enter the command `setup web`. WiConnect starts the local network and web server as indicated by the final message: `In progress`.

```
> setup web
[Disassociated]
IPv4 address: 10.10.10.1
Web setup started with the SSID: WiConnect-F1A
In progress
```

Open the Wi-Fi settings on your smartphone, tablet or computer and join the network called `WiConnect-###` (where `###` are the last 3 digits of the Wi-Fi module MAC address). The password for the network is simply: `password`. The local network name and password, and the web address may be customised to suit your needs, see the online [WiConnect Reference Manual](#) for further information.

After joining the local network, open a web browser on the network client and go to setup.com. The WiConnect web page appears (see Figure 8), and a scan begins for Wi-Fi access points in range. Select the remote network you wish to join, enter the network password then select **Save & Exit** and follow the prompts.

Once the settings are successfully saved, WiConnect prints `Web Setup Mode exited` to the terminal. Check that the settings were successfully saved using `get wlan.ssid` and `get wlan.passkey`.

```
Web Setup Mode exited
> get wlan.ssid
YOUR_NETWORK_NAME
```



```
> get wlan.passkey
YOUR_NETWORK_PASSWORD
```

6.4.2 Script Setup

If you prefer instead to enter configuration details for the Wi-Fi network, WiConnect provides a default setup script to step you through the process. The setup script is provided as a file called `default_setup.script` on the WiConnect file system. The setup script may be customised as required.

```
> setup cmd
> Enter Wi-Fi network name:
set wlan.ssid YOUR_NETWORK_NAME
Set OK
> Enter Wi-Fi network password:
set wlan.passkey YOUR_NETWORK_PASSWORD
Set OK
>
set wlan.auto_join.enabled true
Set OK
> Saving settings
save
Saved
Success
>
network_up
[2014-05-17 | 11:48:31: Associating to YOUR_NETWORK_NAME]
In progress
> Security type from probe: WPA2-Mixed
Obtaining IPv4 address via DHCP
IPv4 address: 192.168.0.31
[2014-05-17 | 11:48:41: Associated]
> Exiting Cmd Setup Mode
```

6.4.1 Manual Setup

It is straightforward to manually enter the name and password for the network using the `wlan.ssid` and `wlan.passkey` variables too. Be sure to save afterwards, or the values will be lost when the module reboots. Any subsequent command requiring network access, such as an ICMP (Internet Control Message Protocol) ping, automatically results in the module attempting to join the network.

```
> set wlan.ssid YOUR_NETWORK_NAME
Set OK
> set wlan.passkey YOUR_NETWORK_PASSWORD
Set OK
> save
Saved
Success
> ping -g
[Associating to YOUR_NETWORK_NAME]
Security type from probe: WPA2-Mixed
Obtaining IPv4 address via DHCP
IPv4 address: 192.168.0.31
[Associated]
Ping reply in 25ms
```

The `network up -s` command provides a shortcut to the process, by scanning for wireless Access Points, offering a choice of networks to join and automatically saving the `ssid` and `passkey`:

```
> network_up -s
Scanning for networks...
! 3 networks found
! # Ch RSSI MAC (BSSID)      Network (SSID)
# 0 1  -40 4C:55:CC:10:2E:50 ABC
# 1 1  -32 9C:D6:43:28:50:A0 myAP
# 2 6  -77 30:85:A9:E7:9C:B0 DEF

Type the number # that matches your Network: 1
Type the password for your Network      : secretpassword
[Associating to myAP]
> In progress
> Security type from probe: WPA2-AES
Obtaining IPv4 address via DHCP
IPv4 address: 10.5.6.94
[Associated]
```

6.5 Want more?


The WiConnect Reference Guide, available online at <http://wiconnect.ack.me>, provides detailed information about all WiConnect features, commands and variables, versions and release notes.

A number of simple and more sophisticated example applications are also provided to help you get the most out of WiConnect and the AMW106-A02 Wi-Fi shield.

7 Ordering Information

Table 4 provides ordering information for AMW106 evaluation boards.

Table 1. Ordering Information

Part Number	Picture	Description
AMW106-A02		Wi-Fi Shield with onboard ACKme AMW106 'Numbat' module

8 Revision History & Glossary

8.1 Revision History

Table 2: Document Revision History

Revision	Date	Change Description
ARG-MW106-A02-100R	2015-09-03	Initial version - Updated for AMW106 from ARG-MW006-A02 Reference Guide

8.2 Glossary

In most cases, acronyms and abbreviations are defined on first use. A comprehensive list of acronyms and other terms used in ACKme Networks documents are provided on the ACKme Networks website at <http://ack.me/FAQs/Glossary>.

APPENDIX A - Configuring a Terminal Application

The following instructions describe how to obtain and install a serial terminal application for use on computers running a Windows® or OS X operations system. ACKme recommends using PuTTY for Windows® systems and CoolTerm for OS X systems, however other equivalent applications may work equally well. The instructions refer specifically to the Nucleo platform, setup for other platforms will vary.

Plug the evaluation board into the computer using a USB cable before continuing.

Verify USB-Serial Driver Installation

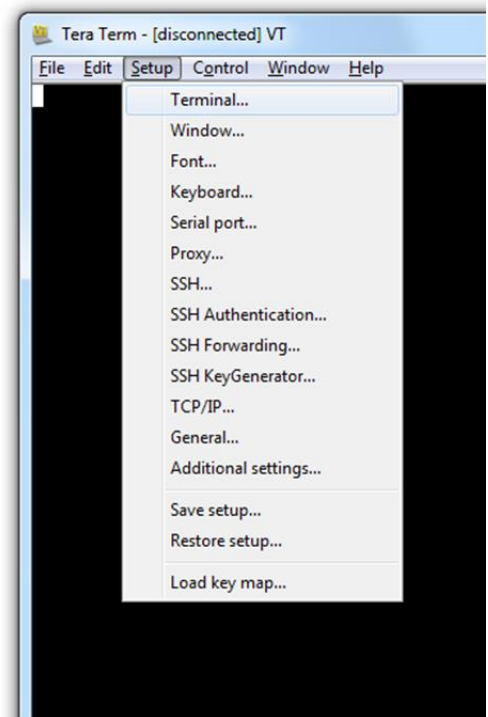
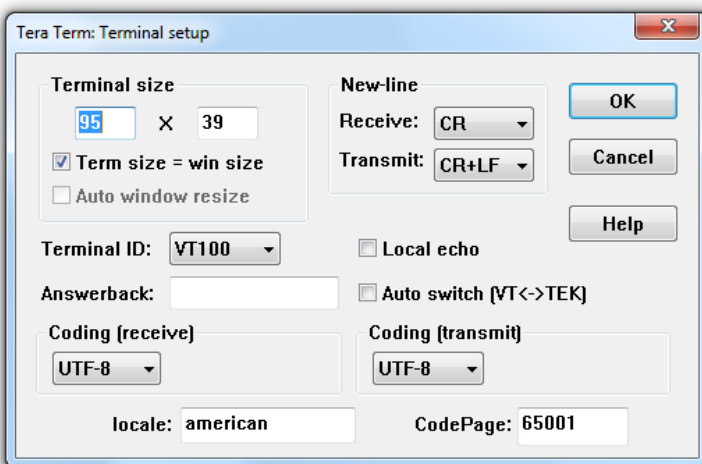
The Nucleo USB ST-Link drivers are available here:

<https://developer.mbed.org/teams/st/wiki/ST-Link-Driver>

Set Up Tera Term for Windows®

Tera Term is available as a free download from <http://tssh2.sourceforge.jp> and from the resources section of the [ACKme website](#). Download and install Tera Term now if you have not already done so. The following procedure describes how to establish a UART serial connection between Tera Term and the evaluation board.

1. Start the Tera Term application and click on the **Setup** tab. A dropdown appears providing options to configure Tera Term as shown in the screen capture on the right. Select **Terminal**.
2. Terminal Setup. In the **New-line** section of the **Setup Terminal** dialog box (see the screen capture below), ensure that:



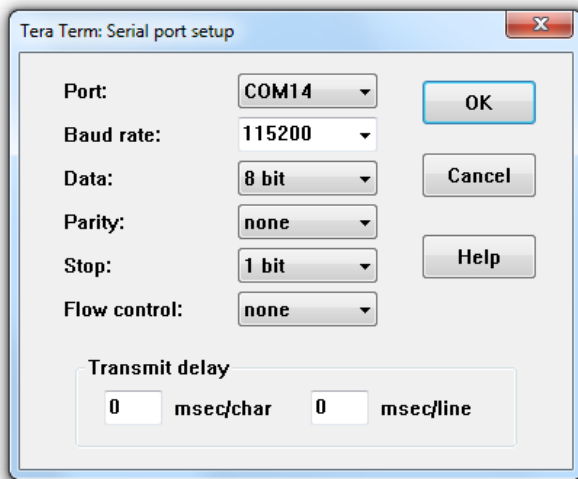
- **Receive:** is set to **CR**
- **Transmit:** is set to **CR+LF**

Close the **Terminal Setup** dialog box by selecting **OK**.

3. Serial Port Setup. Select the **Setup** tab again from the main window, then select **Serial port**. A **Setup serial port** dialog box appears. Ensure the settings in the dialog box match the settings shown in the following

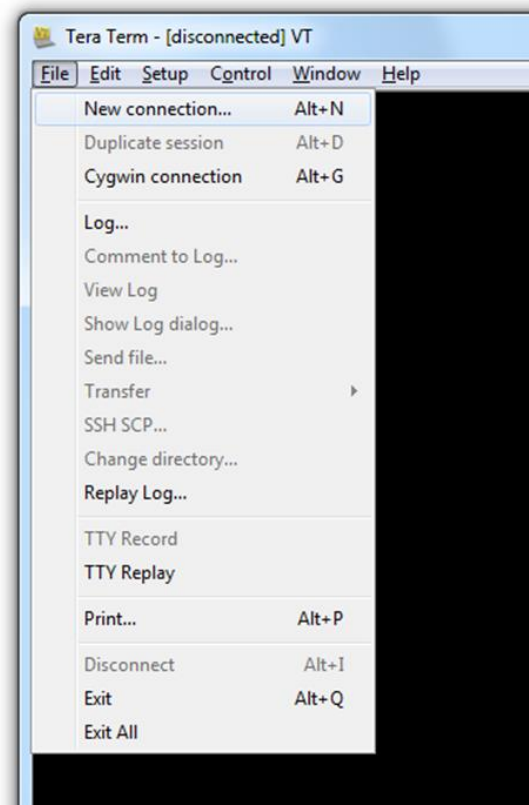
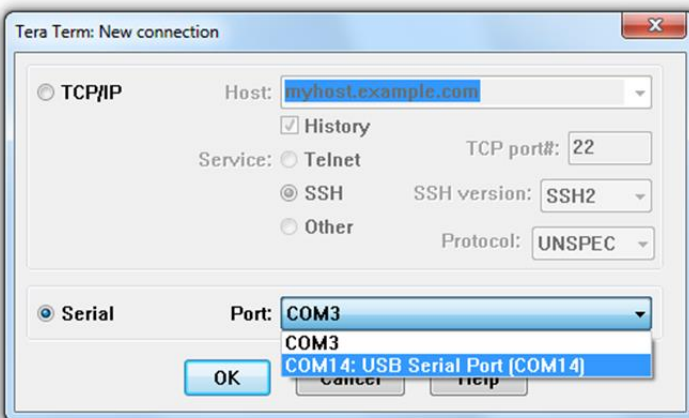
APPENDIX A - Configuring a Terminal Application

screen capture. The COM **Port** shown in the example (COM14) will almost certainly be different for your evaluation board, be sure to choose the COM port that matches your board.



When the serial port has been correctly setup, close the **Serial port** setup dialog box by selecting **OK**.

4. **New Connection.** From the Tera Term application menu, setup a new connection with the evaluation board by selecting **File | New connection** (or by pressing **Alt + N**) as shown in the screen capture on the right. A New connection dialog box appears as shown in the following screen capture. Check the **Serial** radio button, then click the **Port:** dropdown menu and select the COM port that matches your evaluation board. The COM port description for the evaluation board includes the text **COMxx: USB Serial Port (COMxx)**.



Once the correct COM port has been selected, close the **New connection** dialog box by selecting **OK**.

5. **Testing the connection.** If Tera Term was able to connect successfully, the text in the application title bar indicates which COM port is connected, and the baud rate of the connection. For the example documented

APPENDIX A - Configuring a Terminal Application

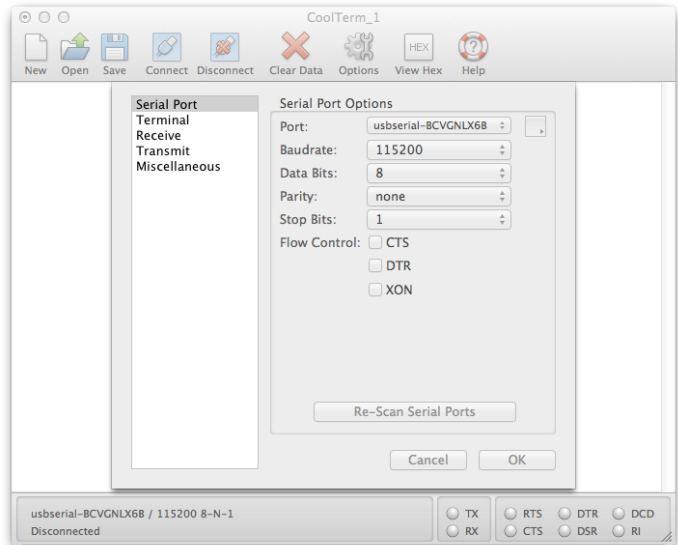
above, Tera Term displays 'COM14:115200baud'. The Tera Term screen remains blank unless the Nucleo is programmed to send characters to the terminal.

Set Up CoolTerm for OS X

CoolTerm is available as a free download from <http://freeware.the-meiers.org/CoolTermMac.zip>. Download and install CoolTerm now if you have not already done so.

The following procedure describes how to establish a UART serial interface between CoolTerm and the evaluation board.

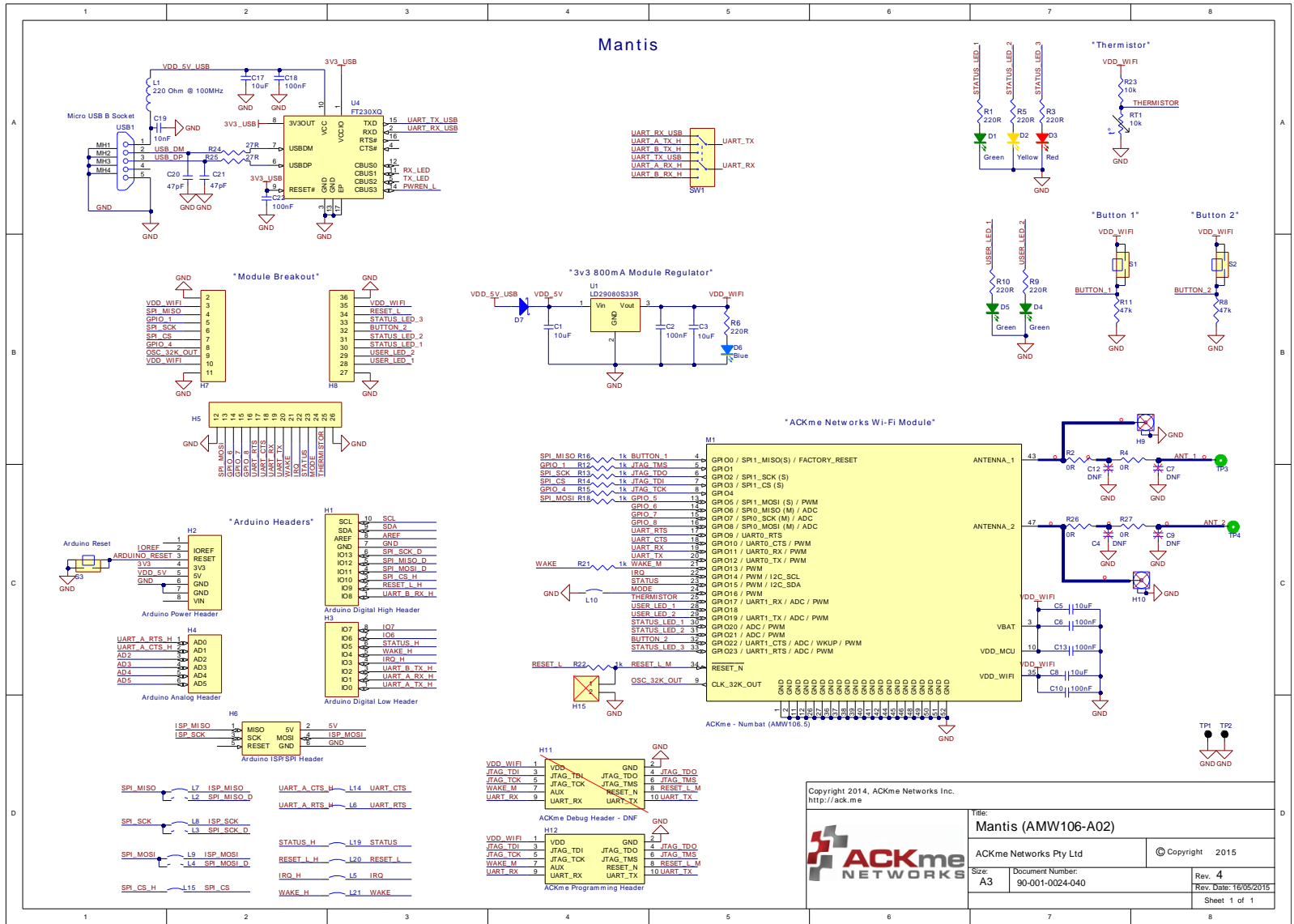
1. Start the CoolTerm application and click the **Options** menu icon. The CoolTerm Configuration window opens. Set the Serial Port configuration options as follows:
 - Port: **usbserial-XXXXXXXX**
 - Baudrate: **115200**
 - Data bits: **8**
 - Parity: **none**
 - Stop bits: **1**
 - Flow control : Deselect all options
2. Click **OK**.
3. Click the **Connect** menu icon. The CoolTerm application connects to the evaluation board.



The Tera Term screen remains blank unless the Nucleo is programmed to send characters to the terminal.

APPENDIX B - Mantis Wi-Fi Shield Schematics

The schematic on this page is for Mantis version 4 - AMW106-A02.4. Schematics for other board revisions are available at <http://ack.me/resources/show>



Further Information

For information about WiConnect and the WiConnect serial API

- <http://wiconnect.ack.me>

For information about the WiConnect Arduino library

- <http://wiconnect.ack.me/arduino>

For information about the WiConnect mbed library

- <http://wiconnect.ack.me/mbed>

For AMW106-A03 schematics and related documentation

- <http://ack.me/resources/show>

ACKme reserves the right to make changes without further notice to any products or data herein to improve reliability, function, or design. Information furnished by ACKme is believed to be accurate and reliable. However, ACKme does not assume any liability arising out of the application or use of this information, nor the application or use of any product described herein, neither does it convey any license under its patent rights nor the rights of others.

ACKme Networks

US Headquarters

20 North Santa Cruz Ave
Los Gatos CA 95030

© 2014-2015 ACKme Networks Inc.

ARG-MW106-A02-100R • AMW106-A02 Wi-Fi Shield Reference Guide
September 3, 2015

Contact Information

+1 (408) 402 8160

<http://ack.me/contact>

