Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

CYW943907AEVAL1F

Evaluation Kit User Guide

Doc. No. 002-18703 Rev. **

Cypress Semiconductor
198 Champion Court
San Jose, CA95134-1709
Phone (USA): 800.858.1810
Phone (Intnl): +1.408.943.2600
www.cypress.com

Copyrights

© Cypress Semiconductor Corporation, 2017. This document is the property of Cypress Semiconductor Corporation and its subsidiaries, including Spansion LLC (“Cypress”). This document, including any software or firmware included or referenced in this document (“Software”), is owned by Cypress under the intellectual property laws and treaties of the United States and other countries worldwide. Cypress reserves all rights under such laws and treaties and does not, except as specifically stated in this paragraph, grant any license under its patents, copyrights, trademarks, or other intellectual property rights. If the Software is not accompanied by a license agreement and you do not otherwise have a written agreement with Cypress governing the use of the Software, then Cypress hereby grants you a personal, non-exclusive, nontransferable license (without the right to sublicense) (1) under its copyright rights in the Software (a) for Software provided in source code form, to modify and reproduce the Software solely for use with Cypress hardware products, only internally within your organization, and (b) to distribute the Software in binary code form externally to end users (either directly or indirectly through resellers and distributors), solely for use on Cypress hardware product units, and (2) under those claims of Cypress’s patents that are infringed by the Software (as provided by Cypress, unmodified) to make, use, distribute, and import the Software solely for use with Cypress hardware products. Any other use, reproduction, modification, translation, or compilation of the Software is prohibited.

TO THE EXTENT PERMITTED BY APPLICABLE LAW, CYPRESS MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARD TO THIS DOCUMENT OR ANY SOFTWARE OR ACCOMPANYING HARDWARE, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. To the extent permitted by applicable law, Cypress reserves the right to make changes to this document without further notice. Cypress does not assume any liability arising out of the application or use of any product or circuit described in this document. Any information provided in this document, including any sample design information or programming code, is provided only for reference purposes. It is the responsibility of the user of this document to properly design, program, and test the functionality and safety of any application made of this information and any resulting product. Cypress products are not designed, intended, or authorized for use as critical components in systems designed or intended for the operation of weapons, weapons systems, nuclear installations, life-support devices or systems, other medical devices or systems (including resuscitation equipment and surgical implants), pollution control or hazardous substances management, or other uses where the failure of the device or system could cause personal injury, death, or property damage (“Unintended Uses”). A critical component is any component of a device or system whose failure to perform can be reasonably expected to cause the failure of the device or system, or to affect its safety or effectiveness. Cypress is not liable, in whole or in part, and you shall and hereby do release Cypress from any claim, damage, or other liability arising from or related to all Unintended Uses of Cypress products. You shall indemnify and hold Cypress harmless from and against all claims, costs, damages, and other liabilities, including claims for personal injury or death, arising from or related to any Unintended Uses of Cypress products.

Cypress, the Cypress logo, Spansion, the Spansion logo, and combinations thereof, WICED, PSoC, CapSense, EZ-USB, F-RAM, and Traveo are trademarks or registered trademarks of Cypress in the United States and other countries. For a more complete list of Cypress trademarks, visit cypress.com. Other names and brands may be claimed as property of their respective owners.

Contents

Safety Information **5**

1. Introduction **6**

1.1 CYW943907AEVAL1F EVK Contents 6
1.2 CYW943907AEVAL1F Board Details 8
1.3 WICED Studio Development System Overview 9
1.4 WICED Studio Code Examples 10
1.5 Kit Code Examples 12
1.6 Getting Started 12
1.7 IOT Resources and Technical Support 12
1.8 Additional Learning Resources 12
1.9 Document Conventions 13
1.10 Acronyms 13

2. Software Installation **14**

2.1 Before You Begin 14
2.2 Install Software 14

3. Kit Operation **18**

3.1 Theory of Operation 18
3.2 On-board programmer/Debugger and Serial interface Chip 18
3.3 CYW943907AEVAL1F Kit Connection 19
3.3.1 Verifying Driver Installation 19
3.3.2 Troubleshooting 20
3.3.3 External Power Supply 20
3.4 Building, Programming, and Debugging CYW943907AEVAL1F EVK 21
3.4.1 Building and Programming a Project for CYW943907AEVAL1F in WICED Studio IDE 21
3.4.2 Troubleshooting 24
3.4.3 Debugging a Project using Breakpoints 25

4. Hardware **29**

4.1 Bootstrap 29
4.2 User Switches 30
4.3 LED 30
4.4 Reset Control 31
4.5 Ethernet 32
4.6 Micro SD Connector/Slot 34
4.7 JTAG Connector 35
4.7.1 On-board Programmer/Debugger and Serial Interface Chip 35
4.7.2 External JTAG 35

4.8 Connectors 36
4.8.1 WICED Header 36
4.8.2 Arduino-Compatible Headers 38
4.9 UART Port Configuration on CYW943907AEVAL1F Kit 39
4.10 External ADC 39
4.11 PWM 40

5. Code Examples 42

5.1 Using Code Examples 42
5.2 GPIO 42
5.2.1 Project Description 42
5.2.2 Hardware Connections 42
5.2.3 Verify Output 43
5.3 Config_join_ping 43
5.3.1 Project Description 43
5.3.2 Hardware Connections 43
5.3.3 Flow Chart 44
5.3.4 Verify Output 45
5.4 Adc_measure 47
5.4.1 Project Description 47
5.4.2 Hardware Connections 47
5.4.3 Flow Chart 48
5.4.4 Access Point Credentials 49
5.4.5 Verify Output 49
5.5 Publish_subscribe_aws 50
5.5.1 Project Description 50
5.5.2 Hardware Connections 51
5.5.3 Flow Chart 51
5.5.4 Verify Output 52

Revision History 59

Document Revision History 59

Safety Information

The CYW943907AEVAL1F EVK is intended for use as a development platform for hardware or software in a laboratory environment. The board is an open-system design, which does not include a shielded enclosure. Due to this reason, the board may cause interference with other electrical or electronic devices in close proximity. In a domestic environment, this product may cause radio interference. In such cases, take adequate preventive measures. Also, do not use this board near any medical equipment or RF devices.

Attaching additional wiring to this product or modifying the product operation from the factory default may affect its performance and cause interference with other apparatus in the immediate vicinity. If such interference is detected, suitable mitigating measures must be taken.

	The CYW943907AEVAL1F contains electrostatic discharge (ESD)-sensitive devices. Electrostatic charges readily accumulate on the human body and any equipment, and can discharge without detection. Permanent damage may occur on devices subjected to high-energy discharges. Proper ESD precautions are recommended to avoid performance degradation or loss of functionality. Store unused CYW943907AEVAL1F in the protective shipping package.

	End-of-Life/Product Recycling This kit has an end-of-life cycle of five years from the year of manufacturing mentioned on the back of the box. Contact your nearest recycler for discarding the kit.

General Safety Instructions

ESD Protection

ESD can damage boards and associated components. Cypress recommends that the user perform procedures only at an ESD workstation. If an ESD workstation is not available, use appropriate ESD protection by wearing an antistatic wrist strap attached to the chassis ground (any unpainted metal surface) on the board when handling parts.

Handling Boards

CYW943907AEVAL1F boards are sensitive to ESD. Hold the board only by its edges. After removing the board from its box, place it on a grounded, static-free surface. Use a conductive foam pad if available. Do not slide the board over any surface. Any physical action on CYW943907AEVAL1F such as changing wires, jumper settings, or measuring voltages can cause stress on the CYW943907AEVAL1F printed circuit board assembly (PCBA). You must ensure that the PCBA has proper support on the bottom side to avoid stress on the PCBA when the EVK is in operation.

1. Introduction

Thank you for your interest in the CYW943907AEVAL1F Evaluation Kit (EVK). The CYW943907AEVAL1F EVK enables customers to evaluate and develop single-chip Wi-Fi applications using CYW43907 devices.

The CYW943907AEVAL1F EVK uses WICED™ Studio 5.0 (or later) to develop and debug your CYW43907 project. CYW943907AEVAL1F EVK offers footprint-compatibility with Arduino shields. In addition, the kit features an RJ-45 Ethernet connector, a Micro-SD-card slot, and onboard programmer/debugger and serial bridge chip. The CYW943907AEVAL1F EVK supports only 3.3 V as the operating voltage.

Older revisions of the same kit were named BCM943907AEVAL1F_2 and BCM943907AEVAL1F. CYW43907 and BCM43907 refer to the same device.

WICED Studio 5.0 (or later) supports application development using a WICED development board (CYW943907AEVAL1F). The development system is compatible with the Windows, OS X, and Linux operating systems. This document provides instructions for utilizing peripherals, such as I2C or SPI, in WICED sample applications using the WICED Studio Integrated Development Environment (IDE).

Note: This document applies to WICED Studio 5.0 (or later).

The CYW943907AEVAL1F EVK is available through the Cypress Online Store or through our distributors.

1.1 CYW943907AEVAL1F EVK Contents

The CYW943907AEVAL1F EVK includes the following:

- One CYW943907AEVAL1F Evaluation Board with assembled Arduino headers
- One USB 2.0 Type-A to Micro-B cable

Figure 1-1. CYW943907AEVAL1F Kit Contents

Inspect the contents of the kit. If you find any part missing, contact your nearest Cypress sales office for assistance: www.cypress.com/support.

Hardware Not Included With the Kit

The CYW943907AEVAL1F EVK does not come with all the hardware needed to perform the demonstrations documented in this guide.

The following hardware is not included with this kit:

- RJ-45 Ethernet cable
- SD-Card
- External power supply
- Dual external antenna
- Potentiometer
- Jumper Wires

1.2 CYW943907AEVAL1F Board Details

The CYW943907AEVAL1F board consists of the blocks shown in Figure 1-2 and Figure 1-3.

1. Reset Switch (SW2)
2. RJ45 Connector (J14)
3. Micro USB (Programming and Debugging) (J5)
4. 5-12V Power Input (J8)
5. WICED Header (J6)
6. Arduino Header (J13)
7. User Switch 1 (SW3)
8. User Switch 2 (SW1)
9. Arduino Header (J9)
10. PCB Antenna-Main (ANT1)
11. Connector for External Antenna 1 (J1)
12. CYW43907 Type 1GC Module (Murata) (U14)
13. PCB Antenna-Diversity (ANT0)
14. Connector for External Antenna 0 (J2)
15. On-board /External JTAG Switch (SW4)
16. External JTAG Header (J3)
17. Arduino Header (J10)
18. Arduino Header (J12)
19. External PHY chip(U12) – BCM5241
20. External ADC Chip (U3)
21. µSD Connector/slot (J7)

Figure 1-2. CYW943907AEVAL1F Evaluation Board

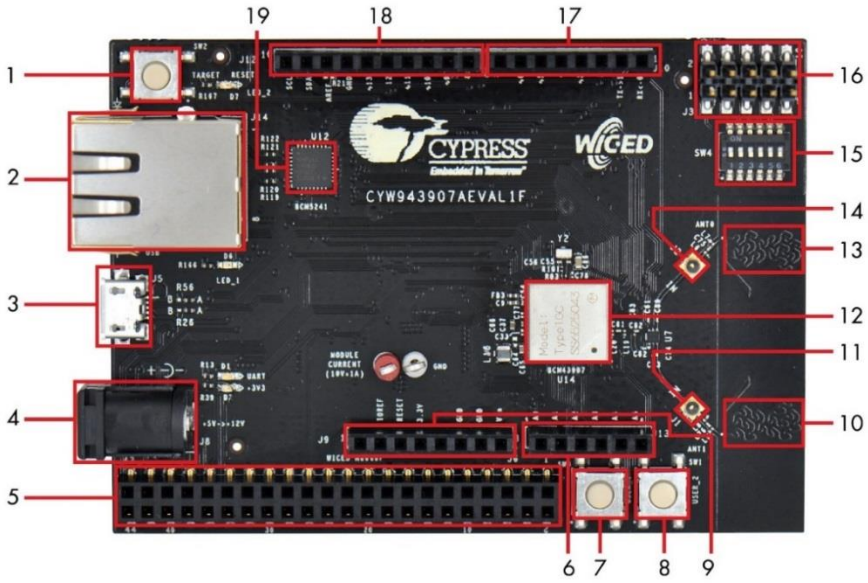
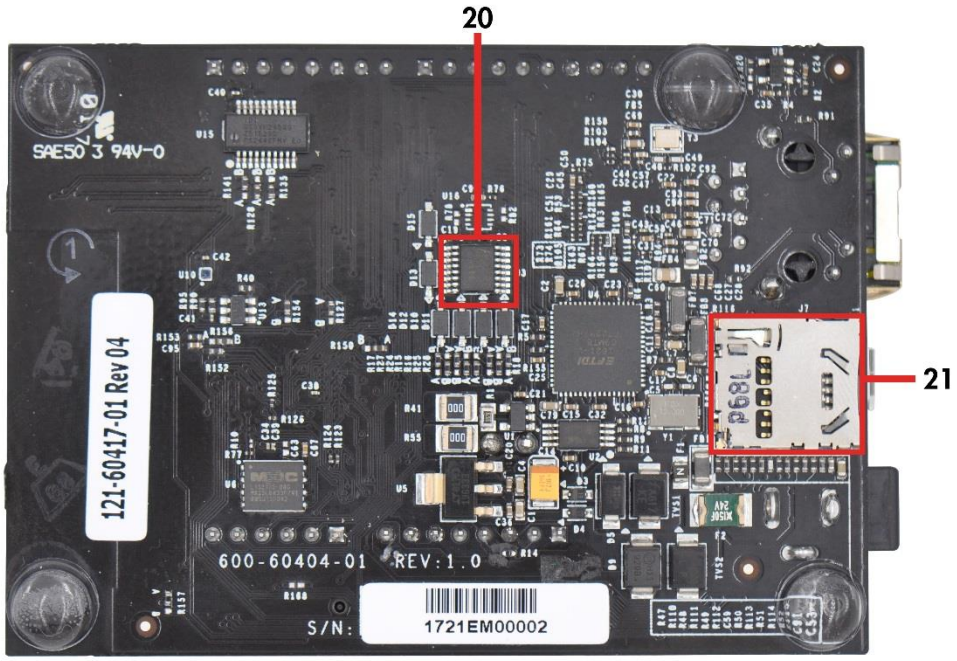


Figure 1-3. CYW943907AEVAL1F Evaluation Board (Back View)



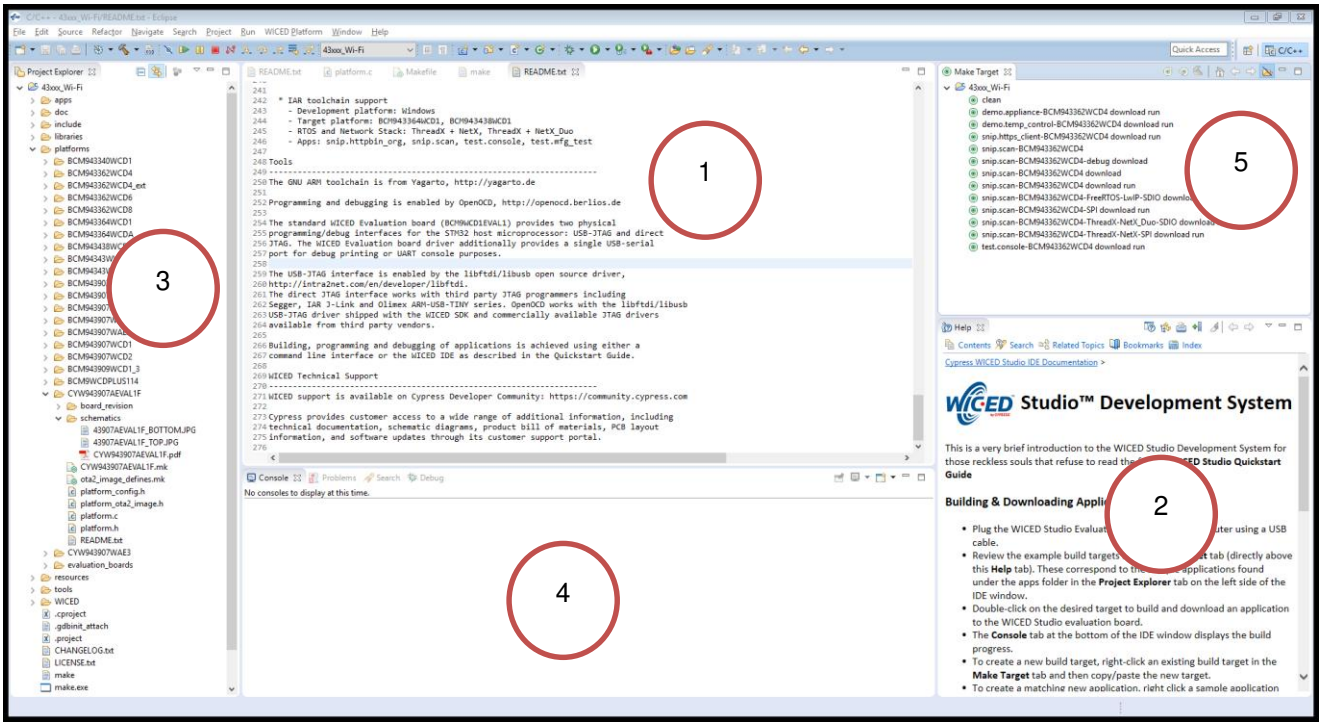
1.3 WICED Studio Development System Overview

WICED Studio 5.0 (or later) supports application development using the WICED Evaluation Board (CYW943907AEVAL1F EVK). Tabs and their location in the WICED IDE are as shown in Figure 1-4.

Figure 1-4 illustrates the following:

1. Edit your application firmware.
2. Help Window that contains instructions on building and downloading applications.
3. Explore existing applications/firmware and library of the Software Development Kit (SDK).
4. View Build messages in the Console window.
5. Create and edit Make Targets for the platform to build your Application/Project.

Figure 1-4. WICED IDE



1.4 WICED Studio Code Examples

WICED Studio includes libraries and code examples supporting both Bluetooth and Wi-Fi platforms. Selecting the 43xxx_Wi-fi Filter will show only Wi-Fi platform related files in the project explorer as shown in Figure 1-5.

Application examples can speed up the design process by serving as templates for development. Code examples are located under the `apps` category (in the Project explorer window), as shown in Figure 1-6. Code examples under `apps` are further grouped into `demo`, `snip`, `test`, `waf` (WICED Application Framework), and `wwd` (WICED Wi-Fi Driver Application) directories.

The `demo` directory contains applications that combine various WICED features into a single application. The `snip` directory contains application snippets that demonstrate how to use various WICED libraries and API functions. The `test` directory contains applications that are used for simple test and utility. The `waf` directory contains applications that are part of WICED Application framework, for instance, the bootloader. The `wwd` directory contains applications that are developed using the low level `wwd` API calls and do not rely on higher level WICED APIs. Located within each subdirectory in the apps folder is a `README.txt` that lists and summarizes the applications located within the folder. It should also be noted that not all applications are supported in all platforms. The snip directory contains a `README.txt` with a matrix on what applications are supported in what platforms. For more details on the WICED software stack and APIs, review the Application notes and documents available in the doc folder *<WICED SDK installation folder>/WICED-Studio-5.0/43xxx_Wi-Fi/doc*. WICED-QSG204 available in the same path is a good document to start with.

Figure 1-5. Filter for Wi-Fi Code Example in WICED Studio

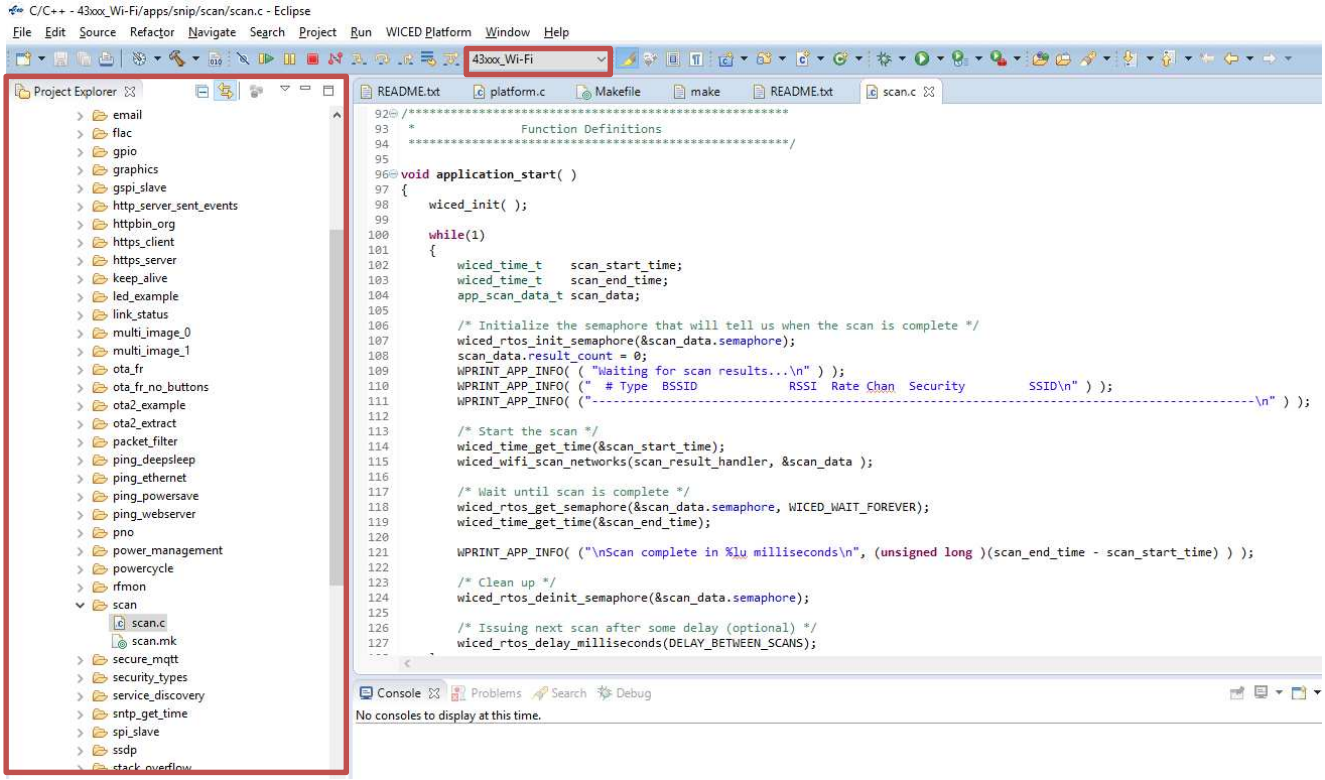
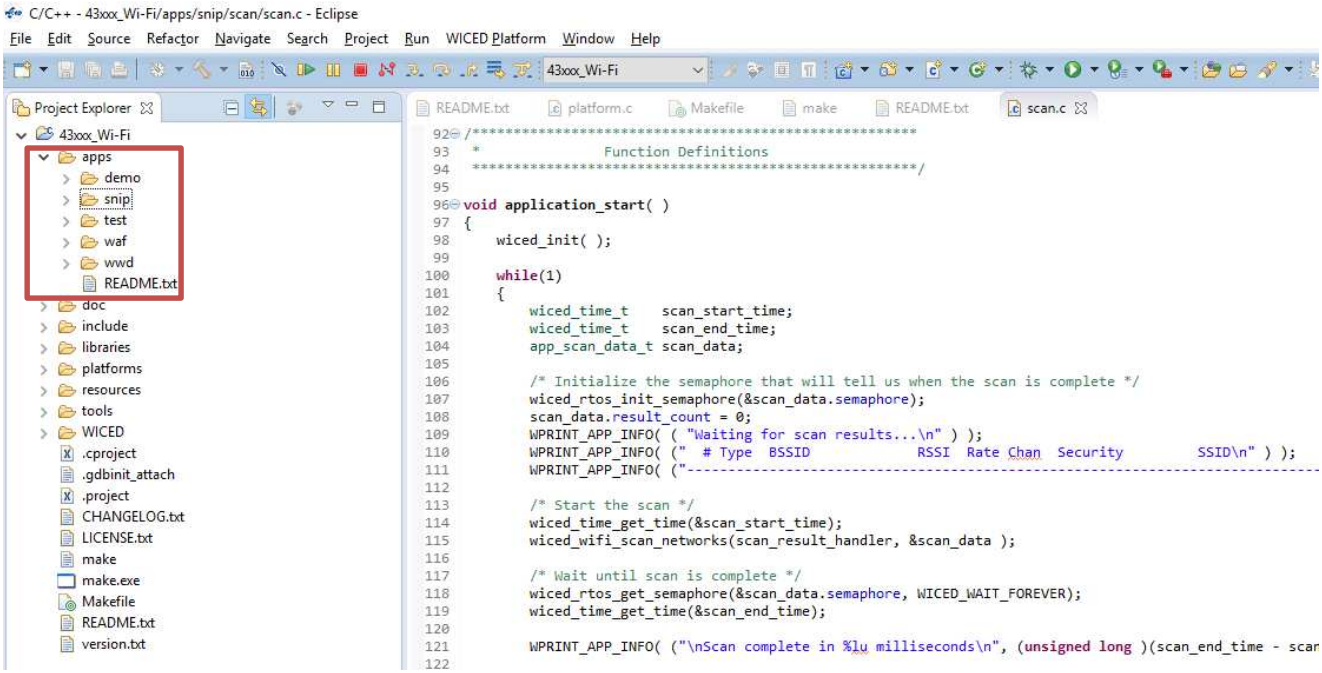


Figure 1-6. Code Examples under *apps* Category



1.5 Kit Code Examples

In addition to the examples available in WICED Studio, this EVK includes a few additional code examples, which can be used to quickly evaluate CYW43907 using this kit. These examples are described in the Code Examples chapter.

1.6 Getting Started

To learn quickly about CYW943907AEVAL1F EVK, refer to the CYW943907AEVAL1F Quick Start Guide inside the kit box.

This user guide will help you get acquainted with CYW943907AEVAL1F EVK:

- The Software Installation chapter describes the installation of the kit software. This includes extracting the required files for WICED Studio 5.0 (or later).
- The Kit Operation chapter describes the major sections of the kit such as the on-board programmer/debugger chip, reset control, headers, programming and debugging of the kit, SD card interface, and Ethernet interface.
- The Hardware chapter describes the CYW943907AEVAL1F EVK hardware and its different blocks.
- The Code Examples chapter describes code examples that will help you understand how to get started with WLAN basic examples.

1.7 IOT Resources and Technical Support

Cypress provides a wealth of data at www.cypress.com/internet-things-iot to help you to select the right IoT device for your design, and quickly and effectively integrate the device into your design. Cypress provides customer access to a wide range of information, including technical documentation, schematic diagrams, product bill of materials, PCB layout information, and software updates. Customers can acquire technical documentation and software from the Cypress Support Community website (https://community.cypress.com).

For assistance, go to: www.cypress.com/support, or contact our customer support at +1(800) 541-4736 Ext. 2 (in the USA), or +1 (408) 943-2600 Ext. 2 (International).

1.8 Additional Learning Resources

Visit CYW943907AEVAL1F EVK and CYW43907 for additional learning resources including datasheets and application notes.

1.9 Document Conventions

Table 1-1. Document Conventions for Guides

Convention	Usage
Courier New	Displays file locations, user entered text, and source code: C:\ ...cd\icc\
Italics	Displays file names and reference documentation.
[**Bracketed, Bold**]	Displays keyboard commands in procedures: [**Enter**] or [**Ctrl**] [**C**]
File > Open	Represents menu paths: File > Open > New Project
Bold	Displays commands, menu paths and icon names in procedures: Click the **File** icon and then click **Open**.
Times New Roman	Displays an equation: 2 + 2 = 4
Text in gray boxes	Describes Cautions or unique functionality of the product.

1.10 Acronyms

Table 1-2. List of Acronyms used in this Document

Acronym	Definition
SPI	Serial Peripheral Interface
EVK	Evaluation Kit
SDK	Software Development Kit
WICED	Wireless Internet Connectivity for Embedded Devices
JTAG	Joint Test Action Group
I^2C	Inter-Integrated Circuit
MQTT	Message Queue Telemetry Transport
POR	Power-on-Reset
PMU	Power Management Unit
VTRIM	Voltage Trimming
LPO	Low Power Oscillator
GPIO	General Purpose Input Output
UART	Universal Asynchronous Receiver/Transmitter
AWS	Amazon Web Services
IDE	Integrated Development Environment
WLAN	Wireless Local Area Network

2. Software Installation

This chapter describes the steps to install the software tools and packages on a PC for using the CYW943907AEVAL1F EVK. This includes the WICED IDE in which the projects will be built and used for programming.

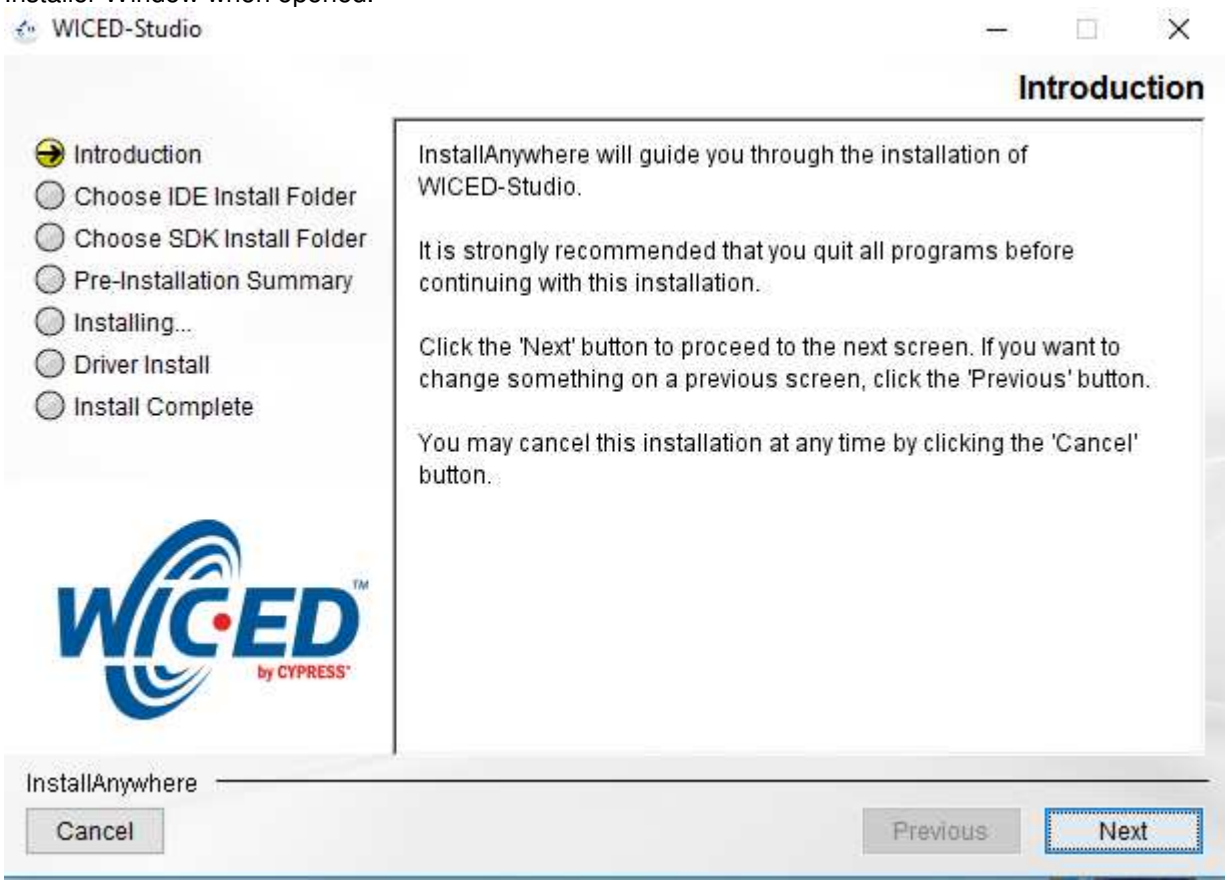
2.1 Before You Begin

All Cypress software installations require administrator privileges. Ensure that you have the required privileges on the system for successful installation. Before you install the kit software, close any other Cypress software that is currently running. Ensure you have installed WICED Studio 5.0 (or later).

2.2 Install Software

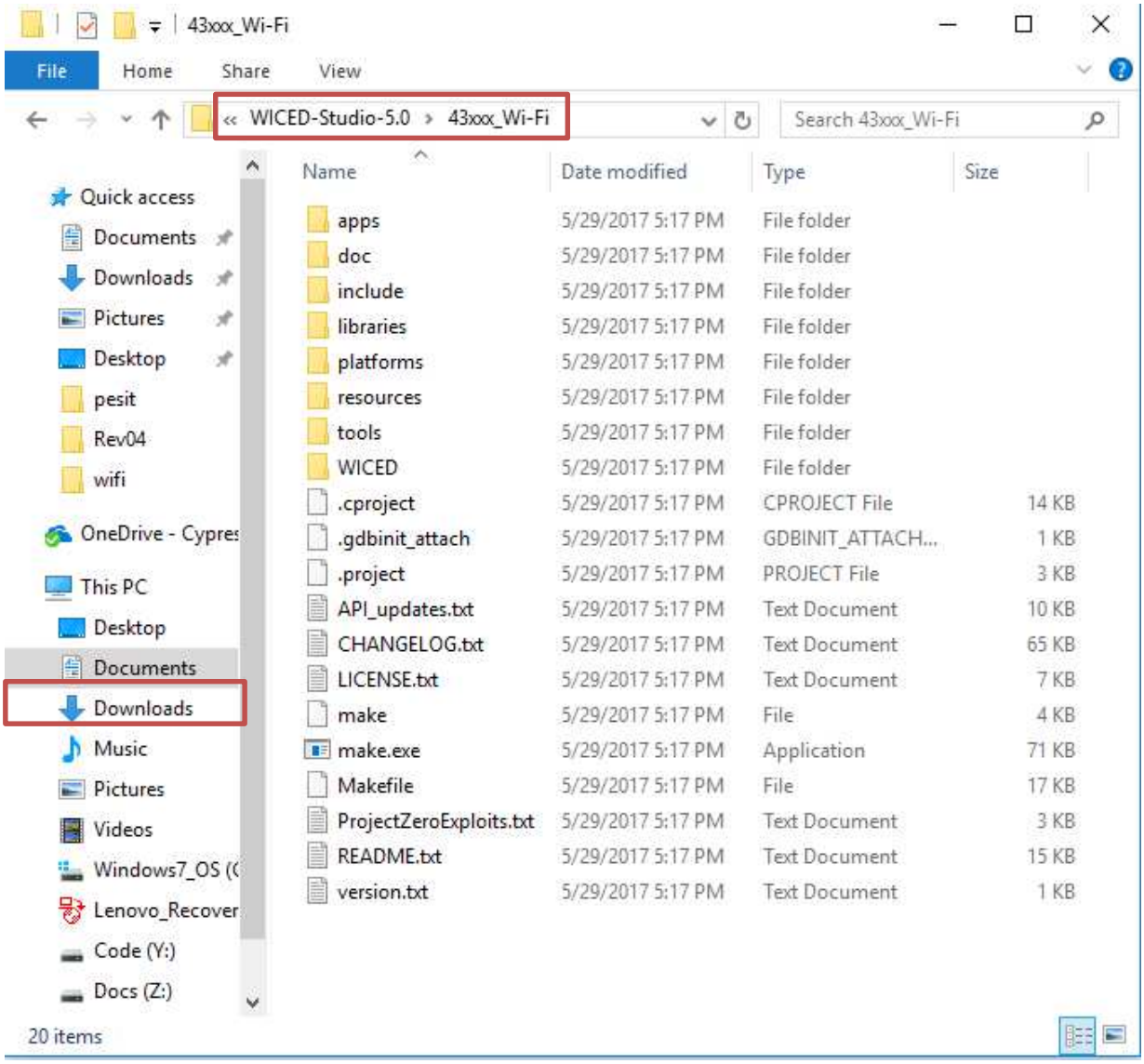
Follow these steps to install the CYW943907AEVAL1F Evaluation Kit software:

1. Download and install WICED Studio 5.0 (or later) from this web page. Following is a screenshot of the Installer Window when opened.



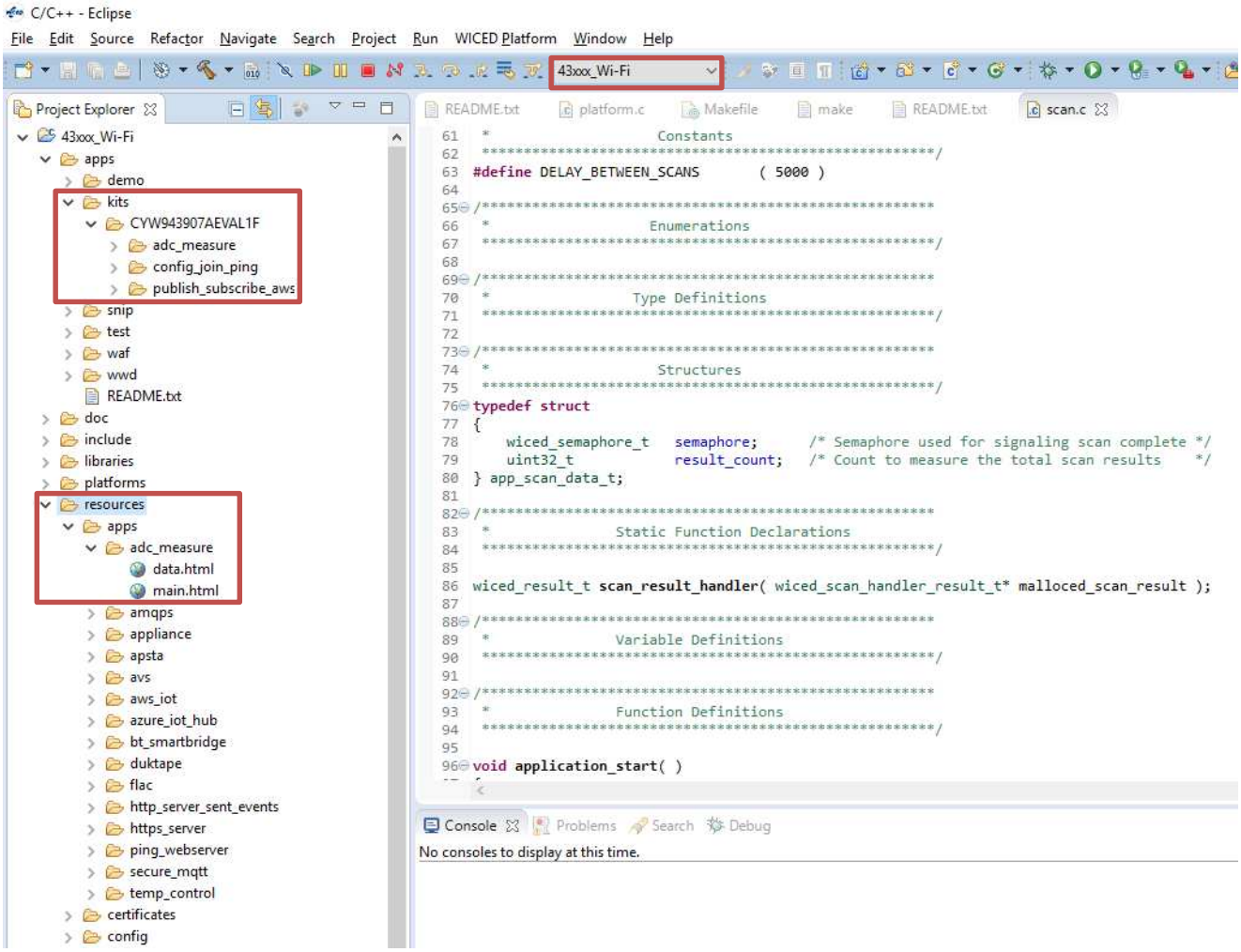
2. Select two Folders, one for the IDE and the other for the SDK. The folder for the SDK contains the Framework for developing Wi-Fi applications.
3. As a last step in installation, installer will ask to select between Wi-Fi and Bluetooth platform. Select **43xxx_Wi-Fi** as default.
4. Download the CY943907AEVAL1F_KitPackage.zip software from here. The software is available as a zip file.
5. Locate the WICED Wi-Fi-SDK directory in your PC. The default location is *C:\Users\<user name>\Documents\WICED-Studio-5.0\43xxx_Wi-Fi*, as shown in Figure 2-1. However, it may be in a different location depending on the path you choose when installing WICED Studio.

Figure 2-1. WICED SDK Directory



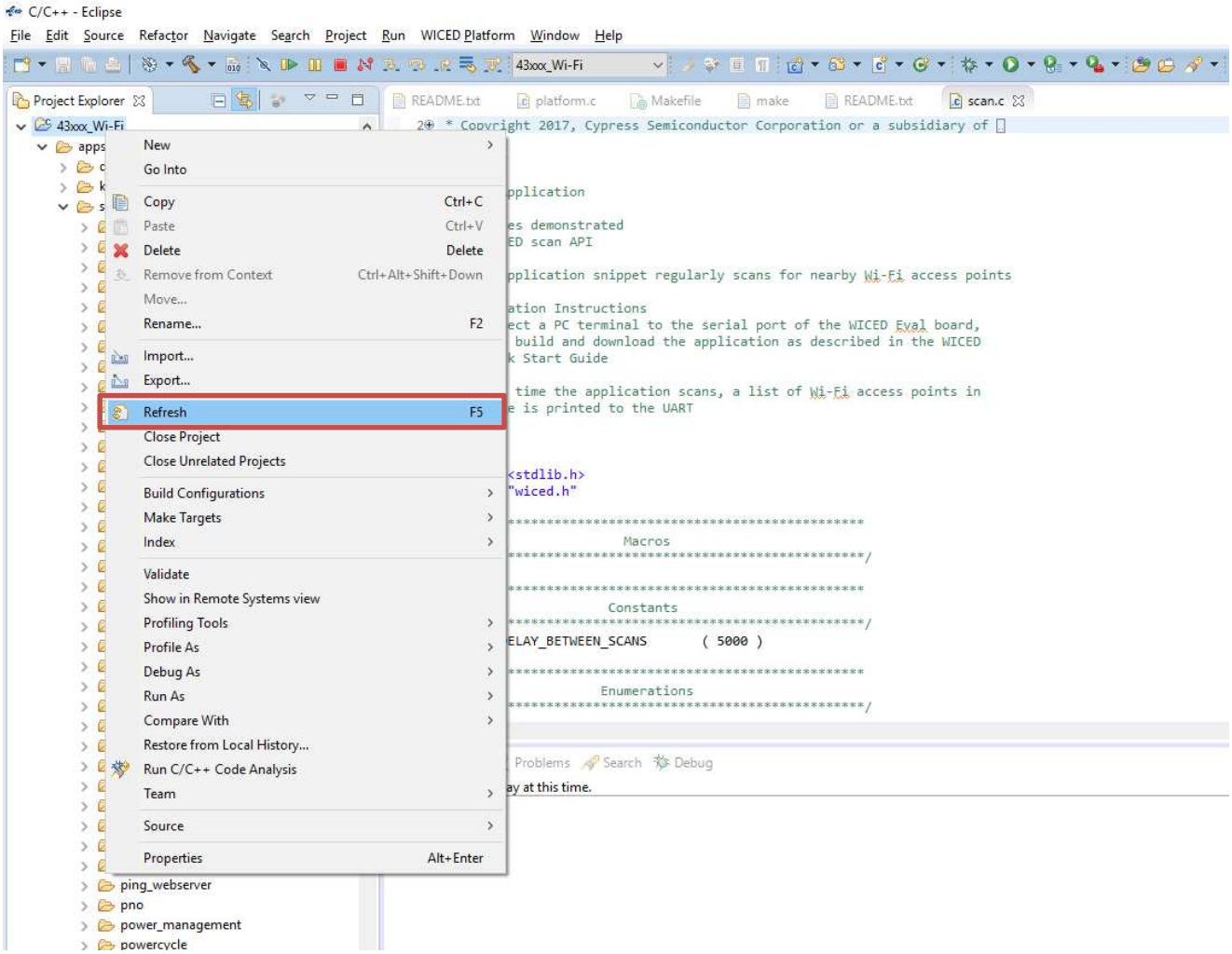
6. Copy the *CY943907AEVAL1F_KitPackage.zip* file and extract to a temporary location such as “temp”. The zip file will extract two directories called “apps” and “resources” inside the *temp/CYW943907AEVAL1F_KitPackage/* directory. Select both of them, Copy (**CTRL+C**) and paste (**CTRL+V**) into *C:\Users\<user name>\Documents\WICED-Studio-5.0\43xxx_Wi-Fi.* Choose the option to merge with existing folders.
   Alternately, copy the *CY943907AEVAL1F_KitPackage.zip* to the location specified above and use the **Extract Here** option if you have 7-Zip or other unzip utility. The zip file should be merged to the existing folders. If WICED Studio 5.0 (or later) is opened with *43xxx_Wi-Fi* as the WICED Filter (Figure 1-5), then the new folders appear as shown in Figure 2-2.

Figure 2-2. Setup Package in WICED Studio 5.0 (or later)



7. The *CY943907AEVAL1F_KitPackage.zip* package contains three code examples which add to the existing set of examples available in WICED Studio 5.0 or later. Unzipping creates the kits directory under apps, and *adc_measure* in the *resources\apps* directory.
   After unzipping, if the projects are not visible in WICED Studio 5.0 (or later), then right-click the top most folder (*43xxx_Wi-Fi*) and click **Refresh**, as shown in Figure 2-3.

Figure 2-3. **Refresh** Top Folder



3. Kit Operation

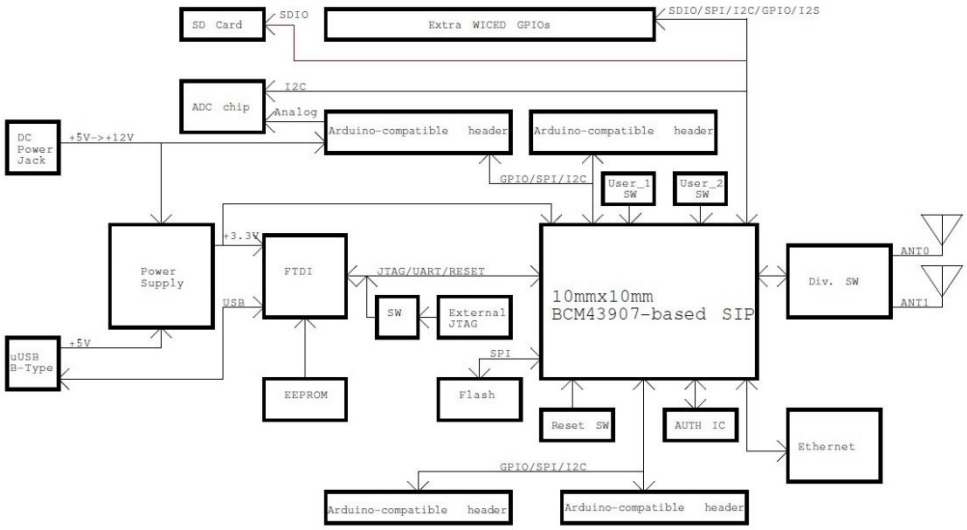
This chapter introduces you to the CYW943907AEVAL1F EVK and the features that will be used as part of Kit operation. Features such as Wi-Fi connection and programming/debugging are discussed in this chapter. The chapter also describes the USB-UART that can be used to communicate with the CYW43907 device on this EVK.

3.1 Theory of Operation

Figure 3-1 illustrates the block diagram of the CYW943907AEVAL1F EVK. This board contains BCM943907/CYW43907 based SiP which is a Type1GC Wireless module. This module is an embedded network controller solution from Murata. This board also contains a USB-Serial interface / JTAG programmer / debugger.

This board features Arduino form-factor compatible headers, which enables Arduino shields to be plugged on top, extending its capabilities. This board also features two user switches, two user LEDs, an RJ-45 connector for Ethernet, and a reset switch for the wireless module.

Figure 3-1. Block Diagram of CYW943907AEVAL1F EVK



3.2 On-board programmer/Debugger and Serial interface Chip

An FT-2232-HQ chip is used for onboard programming, debugging and USB-Serial functionality. It connects to the computer over a USB interface and connects to the CYW43907 based SiP module over JTAG and UART pins. Alternately, you can use the External JTAG connector (J3) along with switch **SW4** (in all closed positions) in order to use JTAG from connectors such as Olimex.

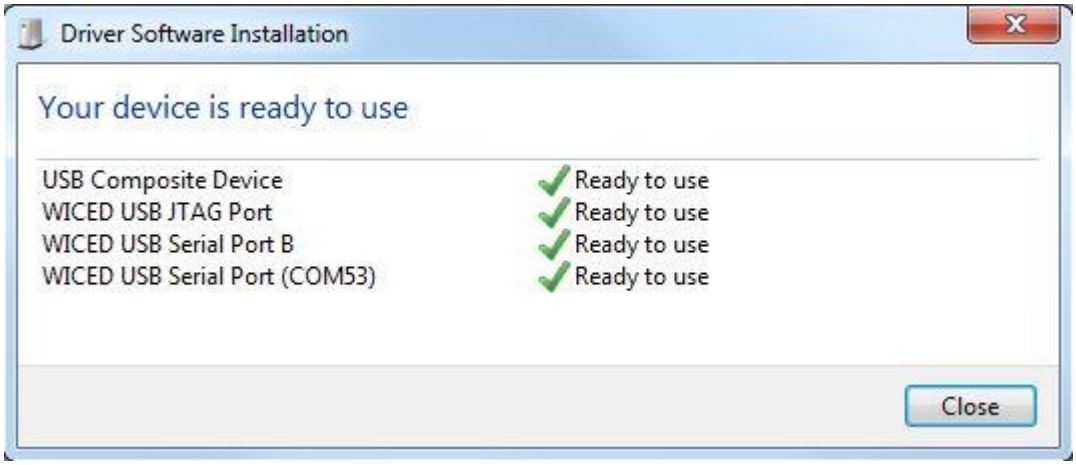
3.3 CYW943907AEVAL1F Kit Connection

The CYW943907AEVAL1F EVK can be powered by the following options:

- External power supply
- USB

When using external power supply, you should use a 5 V – 12 V, 2A power supply with 2.1 mm DC Jack (center pin positive). When powered from USB, there are two logical USB devices: a USB-JTAG device and a USB-UART device. Drivers for the CYW943907AEVAL1F EVK are automatically installed during the WICED SDK installation process. When you connect the kit for first time to your PC, it will initiate the driver search as shown in Figure 3-2.

Figure 3-2. Driver Software Installation



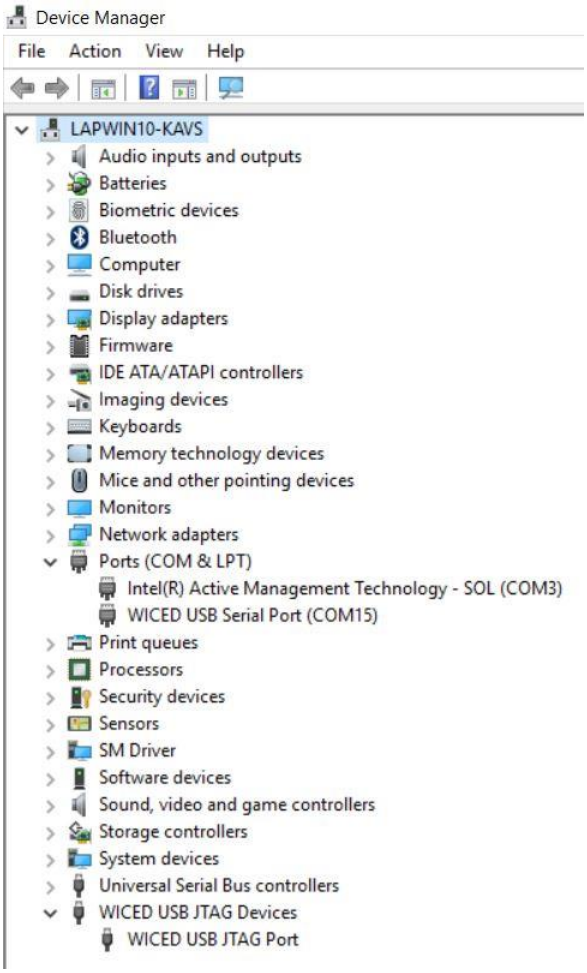
3.3.1 Verifying Driver Installation

To verify the successful completion of driver installation, perform these steps:

1. Right-click **My Computer** > **Properties**.
2. In the System Properties window, select **Device Manager**.
   a. The WICED USB Serial Port is listed under **Ports (COM & LPT)** as shown in Figure 3-3.
   b. The WICED USB JTAG Port is listed under **WICED USB JTAG Devices** as shown in Figure 3-3.

In Figure 3-3, the Device Manager window identifies the WICED USB Serial COM port as COMXX. The assigned port number varies between systems. If the device displays two WICED USB Serial Ports (WICED USB Serial port and WICED USB JTAG Port) instead of one, then follow the link mentioned in this post.

Figure 3-3. Verifying Device Driver Installation



3.3.2 Troubleshooting

If an error occurred during the automatic driver installation process, the driver may be manually installed from the following directory: *<WICED-SDK>\Drivers\Windows\wiced_uart*.

If the CYW943907AEVAL1F EVK does not appear in the Device Manager, verify that the +3V3 LED is turned ON and check the USB cable.

3.3.3 External Power Supply

The CYW943907AEVAL1F EVK can be supplied using an external power supply (5V-12V, 2A), using a 2.5 mm DC Jack with center pin positive. When using external power supply and also connecting a USB cable (for programming/debugging or USB-UART), the voltage on the external power supply should be greater than that of the USB supply, if not the kit will be actually sourcing its power from USB rather than the external power supply.

3.4 Building, Programming, and Debugging CYW943907AEVAL1F EVK

3.4.1 Building and Programming a Project for CYW943907AEVAL1F in WICED Studio IDE

To build and program a project for CYW943907AEVAL1F EVK, perform the following steps:

1. To open the WICED IDE on Windows PC, go to **Start** > **All Programs** > **Cypress** > **WICED-Studio**.
2. Select **43xxx_Wi-Fi** in the WICED Target selector drop-down box as shown in Figure 1-5. Building a project requires a corresponding make target, located in the Make Target window. All Applications should go under the **apps** directory. The make target path will contain the directory hierarchy starting from **apps** with directory names separated by a period. The project name is followed by a hyphen and then the platform name. Finally, the actions to be performed after the build are specified such as download and run. For example, to build, download, and run the application scan which exists in *apps**snip**scan*, create the following make target:

   ```
   snip.scan-CYW943907AEVAL1F download run
   ```

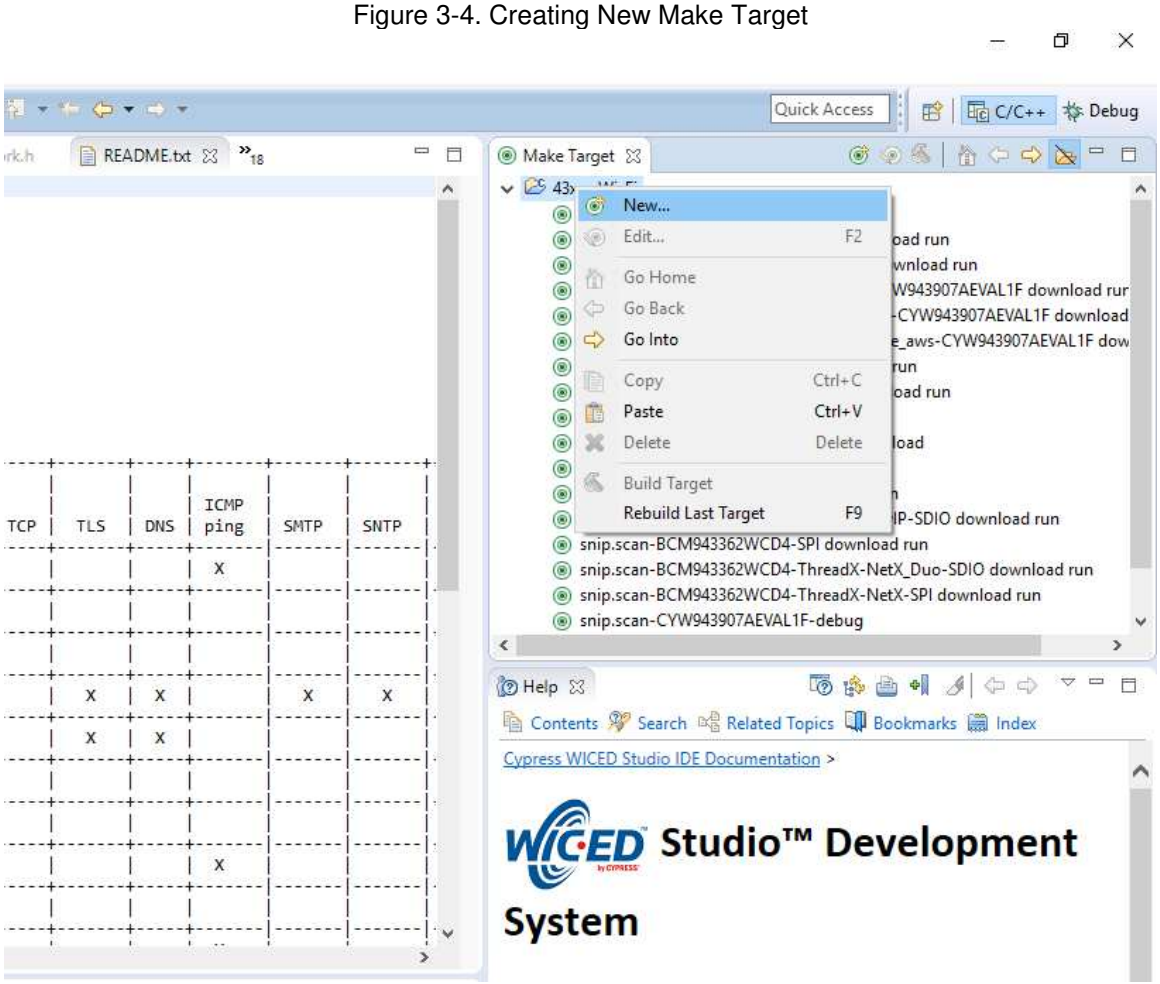
   This project will periodically scan for Wi-Fi access points and will list them using the serial to USB connection on the kit.

Note: By default, kit comes pre-programmed with the same `snip.scan` example.

Perform these steps to create the make target, build, program, and test application scan:

3. Right-click **43xxx_Wi-Fi** in Make Target window as shown in Figure 3-4 and click **New…**

Figure 3-4. Creating New Make Target



4. Enter `snip.scan-CYW943907AEVAL1F download run` in the **Target name** field and click the **OK** button
Note: The list of all commands that can be provided in the Make target is listed in *<WICED-SDK installation directory>/ 43xxx_Wi-Fi/Makefile*.

   `snip.scan-CYW943907AEVAL1F download run` indicates the following:

   `snip` = directory inside **apps** folder

   `scan` = Sub-directory and name of the application to be built. For example, to build the console application under *test* directory in *apps*, then use `test.console` instead of `snip.scan`.

   `CYW943907AEVAL1F` = Board/platform name

   `download` = Indicates download to target

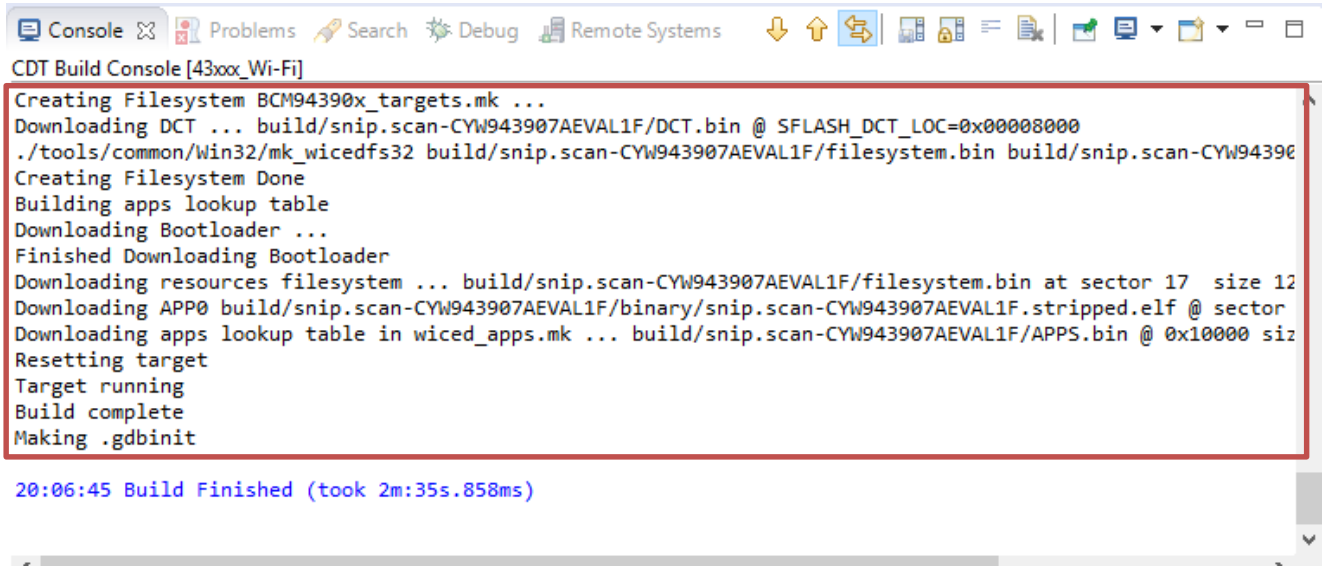
   `run` = Resets the target and starts execution

5. Double-click (alternately, right-click and select **Build Target**) the `Clean` Make Target to remove any output from the previous build. It is recommended to do Make clean when any new files are added or removed to the corresponding Target.

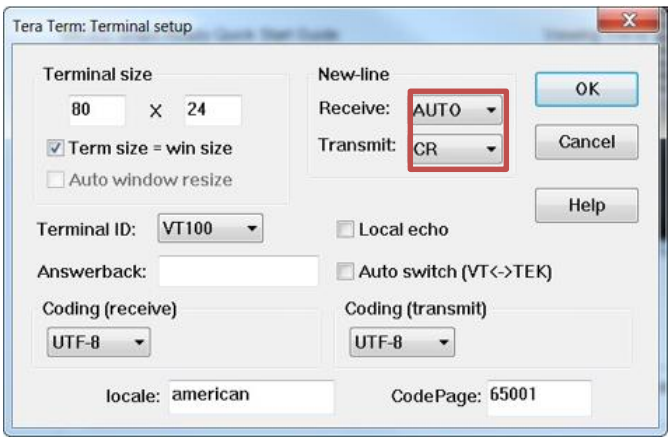
Note: Ensure that you have connected CYW943907AEVAL1F EVK to the same PC via USB prior to executing the build target.

6. Double-click (alternatively right-click and select **Build Target**) the `snip.scan`-CYW943907AEVAL1F `download run` make target to build and download it to the CYW943907AEVAL1F EVK.
   The project is built and programmed into the CYW943907AEVAL1F EVK, as shown in Figure 3-5.

Figure 3-5. Successful Build and Program

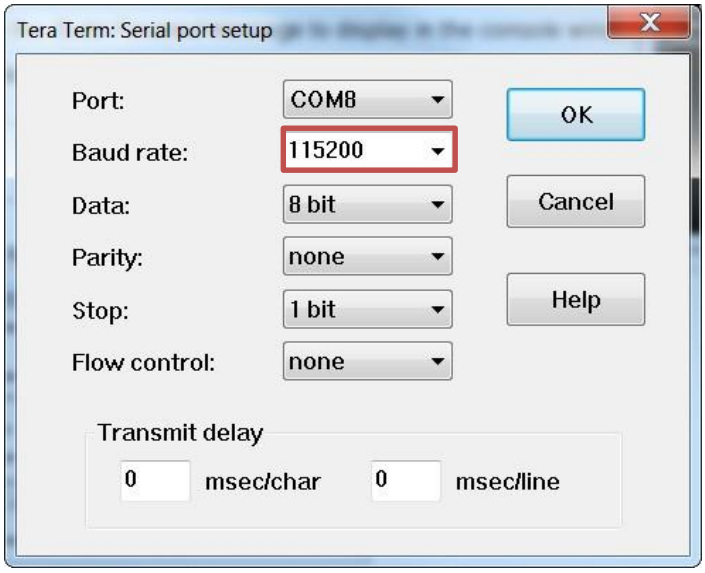


7. To view output messages with a terminal emulation program (such as Tera Term), follow these steps:
   a. Start the terminal emulation program.
   b. Set the Terminal ID to **VT100** and New-Line **Receive** to **AUTO**. Other settings should be left at the default settings.



c. In the Terminal Emulator, initiate a connection with the Serial port number from the Device Manager on the PC as shown in Figure 3-3.

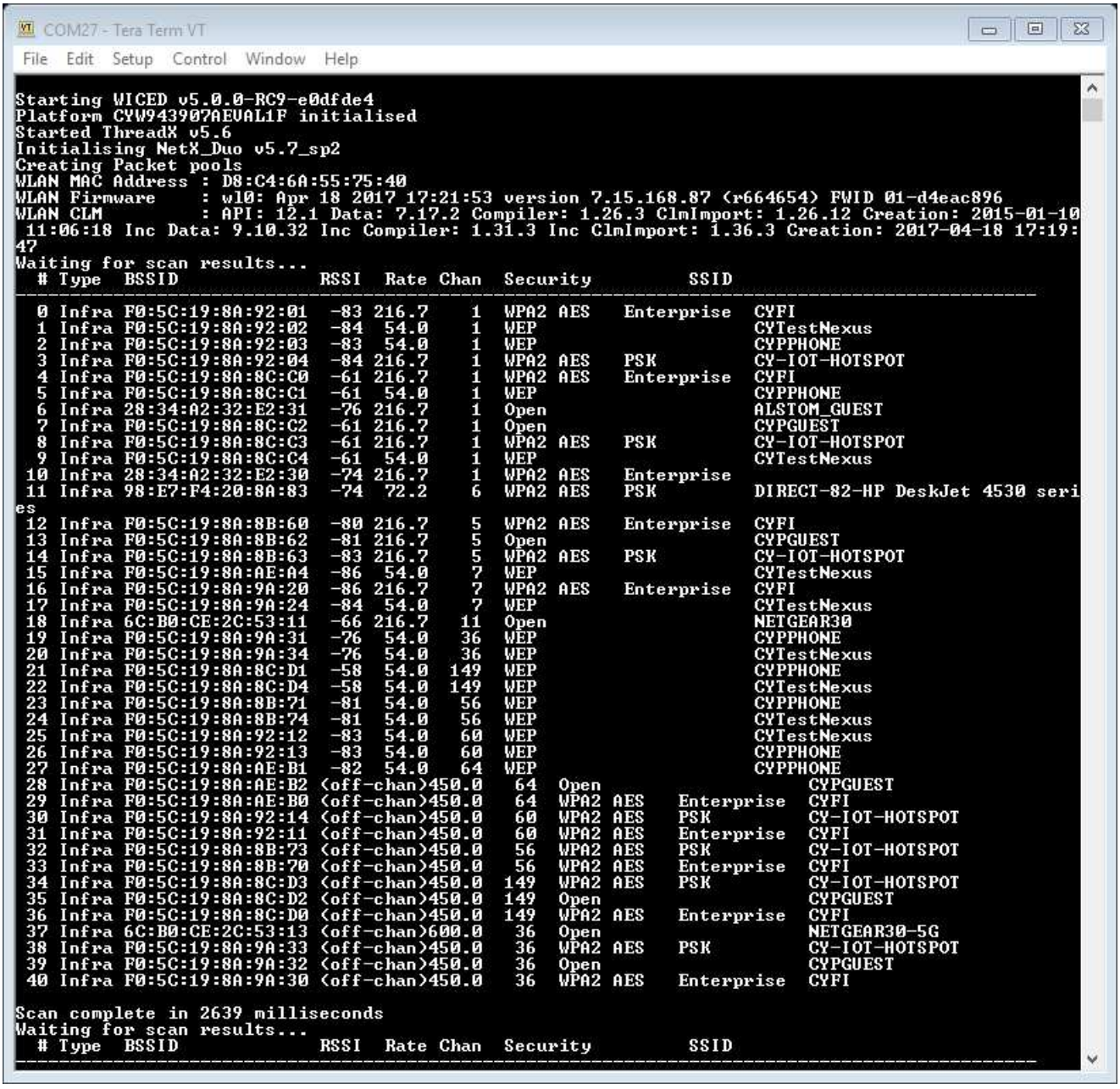
Note: Exact Port number will vary with the corresponding PC port.



d. Press the **Reset** button (see Figure 1-1) on the CYW943907AEVAL1F EVK to view the application start-up messages.

8. The output of the Terminal Emulation program should be similar to what is shown in Figure 3-6.

Figure 3-6. Console Output



3.4.2 Troubleshooting

If a `download_dct` error message is displayed despite connecting the board, follow the steps outlined in this post.

3.4.3 Debugging a Project using Breakpoints

After programming a project, it is possible to debug it in CYW943907AEVAL1F EVK using the built in debugger.

Note that the scan example used in Building and Programming a Project for CYW943907AEVAL1F in WICED Studio IDE section is also used here. Steps outlined in Building and Programming a Project for CYW943907AEVAL1F in WICED Studio IDE should be first followed with a slight change (adding `-debug` to the Make Target command and removing run). Instead of

```
snip.scan-CYW943907AEVAL1F download run
```

The following make command should be used:

```
snip.scan-CYW943907AEVAL1F-debug download
```

If `-debug` is not added then it will be built for release. The important difference between the debug and release configurations is optimization. Debug is built with no optimization and release is built with optimization. It is possible to debug without using `-debug` as well, but with many variables and lines optimized away, many breakpoints might not get hit.

It should be noted that Breakpoints must be placed after starting a debug session in WICED Studio 5.0 or later. If there are any breakpoints that were created prior to the start of debug session, their properties must be changed to be enabled for all Threads.

Perform these steps to debug the project:

1. Execute the make target described above to download the project to the device.
2. Click the arrow next to the **Debug** icon as shown in Figure 3-7 and select *43xxx-Wi-Fi_Debug_Windows*. The Confirm Perspective Switch dialog appears; click the **Yes** button. The Debug session starts and halts in the `start_GCC.s` file.

Note:

- The Confirm Perspective Switch dialog is not displayed if you have previously selected the **Remember my decision checkbox** in the Confirm Perspective Switch dialog.
- If any MakeFile/Build error occurs, then clean (using the *Clean* make target), re-build, and download to the CYW943907AEVAL1F EVK again. The Debug session starts and halts in the `start_GCC.s` file.
- In the Debug Perspective, the Project explorer window goes away by default. To view the source files, switch back to the “C/C++” perspective.
- To switch between perspectives use the “C/C++” or “Debug” icon at the top right corner of screen.