

## Abstract

WICED™ Studio provides a complete development environment to allow one to quickly create an IoT solution utilizing Cypress' world-class Wi-Fi and Bluetooth/BLE connectivity technologies. The following document provides details on the many supported features and modes, as well as any limitations associated with supported hardware development platforms.

## Table of Contents

<b>Abstract</b> .....	<b>1</b>
<b>WICED™ Studio Development Package</b> .....	<b>2</b>
<b>RTOS Support</b> .....	<b>2</b>
<b>Platform Board Support Package Features</b> .....	<b>3</b>
<b>WICED™ APIs</b> .....	<b>4</b>
<b>Functional Support</b> .....	<b>4</b>
<b>Core Wi-Fi Technologies</b> .....	<b>5</b>
Wi-Fi Standards.....	5
Wi-Fi Firmware Offloads.....	5
Additional Wi-Fi FW Features .....	6
<b>Core Bluetooth/BLE Technologies</b> .....	<b>7</b>
Bluetooth Standards .....	7
<b>Features, Profiles and Protocols</b> .....	<b>7</b>
Wi-Fi/IP Protocols .....	7
Bluetooth/BLE Features and Profiles.....	8
<b>Demo Projects</b> .....	<b>9</b>
Wi-Fi Demo Projects .....	10
BT/BLE Demo Projects .....	10
<b>Security</b> .....	<b>11</b>
<b>Technical Support</b> .....	<b>12</b>
<b>Learning Resources</b> .....	<b>13</b>
<b>SW Licensing</b> .....	<b>13</b>
<b>Worldwide Sales and Design Support</b> .....	<b>14</b>
<b>Products</b> .....	<b>14</b>

## WICED™ Studio Development Package

Cypress's WICED™ (Wireless Internet Connectivity for Embedded Devices) Studio is a software development platform allowing rapid IoT application development. WICED Studio is a comprehensive environment supporting Wi-Fi, Bluetooth Classic (BT) and Bluetooth Low Energy (BLE). WICED Studio provides the flexibility to use MCUs from both Cypress and 3<sup>rd</sup> parties while integrating with various Wi-Fi, BT, BLE devices and modules.

WICED Studio provides all the tools necessary to develop, build, program and debug IoT applications that utilize Cypress wireless technology.

Cypress provides a steady release cadence for WICED Studio enabling new features, fixes, and improvements. Cypress tests and supports these releases and its features with the MCUs and platforms defined in this document in order to provide easy migration from one version to the next. If customers chose to create solutions and/or platforms that are not defined in this document, testing and technical support of these platforms is the responsibility of the customer.

To find answers to questions while using the features and platforms mentioned in this document, Cypress has an active professional community managed by Cypress engineers at [community.cypress.com](http://community.cypress.com). If an answer to a question does not already exist, it can be posted on the forum. For support on items not listed in the document, please contact one of our Cypress Ecosystem Partners at [community.cypress.com/community/partners](http://community.cypress.com/community/partners) for development and production support.

WICED Studio solution includes the following features and capabilities:

- A cross-platform installer supporting Windows, Linux and macOS environments
- An Eclipse-based IDE with integrated programming and debugging support
- Integrated GNU compiler/linker tools
- Includes [royalty free](#) ThreadX library and support for FreeRTOS
- Integrated support for several Cypress and 3<sup>rd</sup> party development kits where the core WICED™ applications may run on Cypress or 3<sup>rd</sup> party MCUs
- A rich set of WICED™ connectivity APIs that allow for simplified programming of Wi-Fi and BT/BLE connectivity
- Integrated support for various cloud services to help connect IoT devices to the cloud quickly
- An extensive set of *snip* applications that serve as examples of how to utilize the Wi-Fi and BT/BLE APIs
- More complex *demo* applications that utilize various APIs and *snips* to create a more complete solution

## RTOS Support

WICED™ Studio supports both the FreeRTOS and ThreadX RTOS environments. Though most functionality is supported in both environments, there are some differences that developers should be aware of.

Feature	FreeRTOS	ThreadX
RTOS, network stack, peripheral stack source code	All portions of the RTOS and accompanying Board Support Package (BSP) and peripheral stack are provided in source form.	The core RTOS, NetX stack, USB-X, etc. are all provide in binary form. To gain access to source code for these components, a separate license agreement with Express Logic must be executed
USB stack support	Not supported	Supported via USB-X, binary only
Ethernet interface support	Not supported	Supported

Table 1: RTOS Environment Feature Support

## Platform Board Support Package Features

WICED™ Studio includes support for several Cypress kits/platforms. These platforms are tested and supported by Cypress via platform configuration files that define the pin usage, clocks, available interfaces, memory configurations, etc. Derivative board configurations are created and tested by customers and Cypress Ecosystem Partners. WICED Studio provides the flexibility to utilize different combinations of 3<sup>rd</sup> Party MCUs and Cypress Connectivity Devices, as shown in Table 2. Platform support and testing for these different configurations are the responsibility of customers and Cypress Ecosystem Partners.

The following platforms are tested with each WICED™ Studio release.

Chipset	Platform	WICED/Host MCU	Flash/RAM
<b>CYW20706A2</b>	CYW920706WCDEVAL	CYW20706A2	No on-chip-flash/~100K of app RAM.
<b>CYW43340</b>	BCM943340WCD1	STM32F417	Flash: 1MB External + 1MB Internal RAM: 192KB
<b>CYW43362</b>	BCM943362WCD4	STM32F205	Flash: 1MB Internal RAM: 128KB
<b>CYW4343W</b>	BCM94343WWCD1	STM32F411	Flash: 1MB External + 512KB Internal RAM: 128KB
<b>CYW43364</b>	BCM943364WCD1	STM32F411	Flash: 1MB External + 512KB Internal RAM: 128KB
<b>CYW43907</b>	CYW943907AEVAL1F	CYW43907	Flash: 8MB External RAM: 2MB Internal
<b>CYW54907</b>	CYW954907AEVAL1F	CYW54907	Flash: 8MB External RAM: 2MB

Table 2: List of Platforms Tested During WICED Releases

Because of differences in peripheral support, memory configurations, and other platform capabilities, some features are only available on certain hardware platforms as described in table 3 below:

Feature w/ Links	Supported Platforms	Notes
OTA	All WiFi Platforms	Allows for OTA update of WICED applications; cannot update BT and Wi-Fi firmware  Reference Documents: \${INSTALLDIR}\43xxx_Wi-Fi\doc\WICED-OTA.pdf
	All BT Platforms	Reference Documents: \${INSTALLDIR}\doc\WICED-Firmware-Upgrade-Library.pdf \${INSTALLDIR}\doc\WICED-Secure-Over-the-Air-Firmware-Upgrade.pdf
OTA2	CYW954907AEVAL1F, CYW943907AEVAL1F, CYW920706WCDEVAL	OTA2 supports update of the entire WICED image  Reference Documents: \${INSTALLDIR}\43xxx_Wi-Fi\doc\WICED-OTA2.pdf
USB host and device	CYW954907AEVAL1F, CYW943907AEVAL1F	Supported in ThreadX RTOS only
Advanced Host Power Management	CYW954907AEVAL1F, CYW943907AEVAL1F	Reference Document: \${INSTALLDIR}\43xxx_Wi-Fi\doc\WICED-Powersave-App-Note.pdf
Secure Boot Mechanism	CYW954907AEVAL1F, CYW943907AEVAL1F	CYW43907  Reference Document: \${INSTALLDIR}\43xxx_Wi-Fi\doc\WICED-OTA2.pdf

Table 3: List of Features Available by Hardware Platform

## WICED™ APIs

WICED™ APIs are designed to reduce the number of steps needed to create connections over Wi-Fi and/or Bluetooth. Developers do not need to be experts in connectivity technologies, as the APIs will program many of the settings for the types of connections that the developer is trying to create. The result is that functionality that often takes dozens of commands and domain-specific knowledge can be done with a small handful of WICED APIs.

The WICED™ Studio environment includes documentation for the APIs that are derived directly from the WICED™ Studio source code. As new APIs are created or as existing APIs are augmented, the documentation stays synchronized.

## Functional Support

The WICED™ Studio provides functionalities in several different areas including:

- Core Wi-Fi Technologies
- Core Bluetooth/BLE Technologies
- Bluetooth/BLE Protocols and Profiles
- IP Connectivity Protocols
- Kit/Platform Support

This technical brief provides in-depth details on the functionality offered in these areas.

## Core Wi-Fi Technologies

### Wi-Fi Standards

The Wi-Fi cores and chipsets supported in the WICED™ Studio are compliant to a number of Wi-Fi Alliance specifications. Cypress performs internal Wi-Fi pre-certification testing against the following specifications on all WICED™ releases:

- Wi-Fi CERTIFIED n
  - Both 2.4 and 5GHz bands
- Wi-Fi CERTIFIED ac in 5GHz
- Wi-Fi Direct®
- Wi-Fi Protected Setup™
- WMM® (Wi-Fi Multimedia™)

In addition to these active Wi-Fi programs, interoperability testing with legacy Wi-Fi CERTIFIED a and Wi-Fi CERTIFIED b/g devices are covered in our interop test lab.

Table 4 details which WICED supported chipsets are tested against which Wi-Fi certification program.

Certification	Wi-Fi Chipsets
Wi-Fi CERTIFIED n – 2.4GHz	CYW43340, CYW43362, CYW43364, CYW43903, CYW43907
Wi-Fi CERTIFIED n – 5GHz	CYW43340, CYW43903, CYW43907
Wi-Fi CERTIFIED ac	CYW54907
Wi-Fi Direct®	CYW43362, CYW43907, CYW54907
Wi-Fi Protected Setup™	CYW43340, CYW43364, CYW43903, CYW43907
WMM® (Wi-Fi Multimedia™)	CYW43340, CYW43362, CYW43364, CYW43903, CYW43907

Table 4: List of Chipsets and Associated Wi-Fi Certification Program

### Wi-Fi Firmware Offloads

Each Wi-Fi core supported by WICED™ contains an ARM core that implements the Media Access Control (MAC) layer. Additionally, the firmware that runs on the embedded ARM implements several *host offloads*. Host offloads implement functionality that allow for the host MCU to either process fewer packets or allow the system to stay in a lower power state for longer periods of time. Both ultimately result in decreasing overall system power.

### Preferred Network Offload (PNO)

PNO allows the Wi-Fi FW to monitor and join Wi-Fi networks automatically. WPA-Personal security negotiation and roaming between APs on the network are supported.

### TCP Keepalive Packets

The Wi-Fi FW can be programmed to generate arbitrary TCP packets to a target IP address at a specified interval. Because IoT devices often operate in low power modes with infrequent traffic being sent or received, the TCP Keepalive feature is needed to prevent Wi-Fi access points and routers from timing out an IoT device's connection because of inactivity.

### Packet Filtering

The Wi-Fi device can be programmed to only pass up packets that match a set of filters passed to the FW from the host. Packets that don't match the active filters are discarded. Typically, a sleeping host would program a set of packet filters that match the expected traffic and decide whether to ignore and go into a low power state or wake up the device on if a matching packet is received.

**Address Resolution Protocol (ARP) Offload**

IP networks often have many ARP packets, which are used for IP address discovery. Many of these are layer-2 Wi-Fi broadcast packets, that would normally require processing on the MCU host. The ARP offload functionality allows for the Wi-Fi FW to both filter ARP packets as well as automatically respond to ARP packets directed at the WICED™ IoT device.

**Offload Support Table**

Although all FW offloads are supported in all Wi-Fi chipsets, the number of filters can vary depending on the Wi-Fi chipsets. Table 5 details the FW offloads that are supported by chipset:

Offload	Chipset	Limits
Preferred Network Offload	CYW43340, CYW43362	4 networks
	CYW43364, CYW43903, CYW43907, CYW54907	8 networks
TCP Keepalive Packets	CYW43340, CYW43362	2 keepalives
	CYW43364, CYW43903, CYW43907, CYW54907	4 keepalives
Packet Filtering	CYW43340, CYW43362	2 filters
	CYW43364, CYW43903, CYW43907, CYW54907	4 filters
ARP Offload	All	2 maximum monitored addresses

Table 5: List of Supported FW Offloads by Chipset

**Additional Wi-Fi FW Features**

Table 6 lists additional Wi-Fi FW features that are utilized by demo and snip apps and can be used for customer features:

Feature	Description	Supported Platforms
AP/STA mode	Allows for the Wi-Fi device to instantiate multiple interfaces, one that acts as an Access Point (AP) and one that acts as a Wi-Fi station device (STA). These can be on the same channel or different channels utilizing the virtual simultaneous dual band (VSDB) feature	CYW943907AEVAL1F, CYW954907AEVAL1F, BCM943364WCD1, BCM94343WWCD1
Wi-Fi Direct	Allows for peer to peer communication between Wi-Fi devices without the need for an access point	CYW943907AEVAL1F, CYW954907AEVAL1F, BCM943364WCD1, BCM94343WWCD1
WMM (Wireless Multimedia)	WMM is an 802.11 quality of service (QoS) implementation developed by WiFi based on a subset of the draft 802.11e standard supplement	CYW943907AEVAL1F, CYW954907AEVAL1F, BCM943364WCD1, BCM94343WWCD1

Table 6: List of Additional Wi-Fi Features Available by Hardware Platform

## Core Bluetooth/BLE Technologies

### Bluetooth Standards

All Bluetooth/BLE cores and chipsets supported in the WICED™ Studio support a base set of Bluetooth functionalities:

- BR and EDR data rates
- Bluetooth Low Energy (BLE)

Additionally, each chip supports one of several Bluetooth SIG specification revisions. The major features that are supported in each specification are listed below:

- Bluetooth 4.2
  - LE Secure Connections
  - LE Privacy 1.2
  - Data Length Extension
- Bluetooth 5.0
  - 2Mbps data rate
  - SAM
  - LE Channel Selection
  - High Duty Cycle Non-Connectable Advertisement

\* Chips/cores that support a later Bluetooth specification also include the supported features of previous specifications.

\* Refer to the Table 7 for details on the features supported for each device.

Table 7 details supported Bluetooth/BLE chipsets and the Bluetooth SIG specification:

Chipset	Bluetooth SIG Specification	Specification Features
CY20706A2	BT 4.2	4.2 Features: LE Secure connections, DPLE, LE Privacy 1.2
CYW4343W	BT 4.2	LE Secure connections
CYW43340	BT 4.0	4.0 Features: Bluetooth Low Energy

Table 7: List of Bluetooth Specification Support by Chipset and Support Features

## Features, Profiles and Protocols

In addition to the core Bluetooth/BLE and Wi-Fi FW functionality, WICED™ Studio provides a proven Bluetooth/BLE stack and a comprehensive set of IoT protocols for Wi-Fi.

Each of the profiles and protocols provided in WICED™ Studio are validated in our System Validation Test (SVT) labs.

### Wi-Fi/IP Protocols

Protocol	Description	Wi-Fi Chipsets
TCP/UDP/IP	TCP/IP/UDP is the foundation of all of the IoT protocols. A stack is provided both for the ThreadX and FreeRTOS environments supporting both IPv4 and IPv6 networks.	All
HTTP/HTTPS	Both client and server support, HTTP2 specification	All
MQTT	MQTT is tested against Amazon Cloud services as well as the test.mosquito.org service	All
COAP	The COAP protocol is tested against the Exocite IoT hub	All

AMQP	WICED AMQP (Advanced Message Queuing Protocol) client library.	All
------	--	-----

Table 8: Wi-Fi/IP Supported Protocols

### Bluetooth/BLE Features and Profiles

Table 9 lists the profiles that are actively supported in WICED Studio for BT and BLE chipsets.

Profile or Feature	Description	Chipsets
BR/EDR	Classic BT with Enhanced Data Rate	CYW20706A2, CYW4343W, CYW43340
BLE	Bluetooth Low Energy	CYW20706A2, CYW4343W, CYW43340
BLE Mesh	Version 1.0. Sample app include sample for power on/off, battery level, light control, transition, and sensor (client and server)	CYW20706A2
Apple HomeKit	Version RC8. Sample apps for light bulb and lock. Apple MFi license required	CYW20706A2
Audio gateway profile	BT audio gateway profile version 1.5	CYW20706A2, CYW4343W, CYW43340
Handsfree profile	BT Hands-free profile version 1.5. SCO Offload - voice data routing over I2S/PCM interface. Tone generation for Out of Band ring-tone is NOT supported by the app	CYW20706A2
A2DP source	Version 1.0. Support SBC encoding	CYW20706A2, CYW4343W, CYW43340
A2DP Sink	Version 1.0. I2S bus can be master or slave	CYW20706A2, CYW4343W, CYW43340
AVRCP Target	Version 1.5 (including absolute volume)	CYW20706A2, CYW4343W, CYW43340
AVRCP Controller	Version 1.3	CYW20706A2, CYW4343W, CYW43340
PBAP client	BT Phonebook profile client version 1.3. Supported feature - download phonebook and call log (incoming, outgoing and missed calls)	CYW20706A2, CYW4343W, CYW43340
HOGP Host	HID over GATT profile, host side	CYW20706A2, CYW4343W, CYW43340
HOGP Device	HID over GATT profile, device side	CYW20706A2, CYW4343W, CYW43340
BT HID Host	HID Host version 1.1	CYW20706A2, CYW4343W, CYW43340
BT HID Device	HID Device version 1.1	CYW20706A2, CYW4343W, CYW43340
BLE GATT Client	Sample app to show vendor specific BLE client profile implementation	CYW20706A2, CYW4343W, CYW43340
BLE GATT Server	Sample app to show vendor specific BLE GATT device and service	CYW20706A2, CYW4343W, CYW43340
Voice over HOGP	mSBC audio data sent from HOGP device to HOGP host (LE voice remote and Set-top-box use case)	CYW20706A2, CYW4343W, CYW43340
Wake on LE	Wakeup host using LE command (LE voice and Set-top-box use case)	CYW20706A2, CYW4343W, CYW43340



Profile or Feature	Description	Chipsets
Serial Port Profile	Version 1.1.	CYW20706A2, CYW4343W, CYW43340
BLE Serial over GATT	Cypress proprietary service to send data over GATT service using RFCOMM protocol.	CYW20706A2, CYW4343W, CYW43340
Apple AMS	Apple Media Service	CYW20706A2, CYW4343W, CYW43340
Apple ANCS	Apple Notification Center Service	CYW20706A2, CYW4343W, CYW43340
Low Power Modes	Low power modes are supported on all chips. The appropriate sleep mode is selected by the FW when app allows sleep	CYW20706A2, CYW4343W, CYW43340
Peripherals	Sample apps to demonstrate use of HAL APIs for the peripherals such as UART, SPI, I2C, etc.	CYW20706A2

Table 9: List of Actively Supported BT/BLE Profiles

## Demo Projects

WICED™ Studio includes demo projects that give the developers examples of how to use the protocols and APIs. The demo projects are contained in one of two forms: *Snip* projects or Full Demo Projects:

1. Snip projects are meant to detail a single piece of functionality. There are dozens of snip projects included with the Studio and each has comments in the main file describing the APIs and functionality being demonstrated
2. Full demo projects bring many pieces together to create a baseline for an IoT product.

The below table(s) provide an example of a few demo projects offered in WICED Studio. For the complete list, refer to the “apps” folder in WICED Studio.

### Wi-Fi Demo Projects

Demo Project	Description	Supported Platforms
Appliance	The application mimics a very basic user interface to control a home appliance such as a washing machine or dryer.	CYW943907AEVAL1F, BCM943364WCD1
aws_iot	Demonstrates how to utilize the WICED Wi-Fi APIs, mqtt protocol and aws authentication snip app to interface to the Amazon Web Services Cloud.	CYW943907AEVAL1F, BCM943364WCD1
azure_iot_hub	Demonstrates how to utilize the WICED Wi-Fi APIs and AMQP v1.0 protocol to interface to the Microsoft Azure cloud.	CYW943907AEVAL1F, BCM943364WCD1
coap_exocite	Demonstrates how to utilize the WICED Wi-Fi APIs and the coap protocol to interface to the Exocite IoT cloud.	CYW943907AEVAL1F, BCM943364WCD1
aliyun_mns	Demonstrates how to utilize the WICED Wi-Fi APIs to interface to the Alibaba cloud.	CYW943907AEVAL1F, BCM943364WCD1
temp_control	This application measures the temperature of the WICED evaluation board and displays temperature & setpoint status on a local webpage.	CYW943907AEVAL1F, BCM943364WCD1
wifi_onboarding	Application to show how WiFi Device onboarding works. This onboarding method is applicable for WiFi-only devices and does not require any additional hardware like BLE. This method hosts a HTTPS server first and then puts the device in AP + STA mode.	CYW943907AEVAL1F, BCM943364WCD1

Table 10: List of Wi-Fi Demo Projects

### BT/BLE Demo Projects

Demo Project	Description	Supported Platforms
Hello sensor application BLE GATT Server	Hello Sensor application shows an example of a BLE vendor specific GATT device and service.	CYW920706WCDEVAL
Hello client application BLE vendor specific GATT	Hello Client application shows an example implementation of a BLE vendor specific GATT client profile	CYW920706WCDEVAL
SPP (Serial Port Profile) application	SPP application uses SPP profile library to establish, terminate, send and receive SPP data over BR/EDR. This sample supports single a single SPP connection.	CYW920706WCDEVAL

Table 11: List of BT/BLE Demo Projects

## Security

WICED Studio provides a suite of security protocols in the Cypress Enhanced Security Layer. This library handles all network authentication methods as well as providing libraries that are used by various *snip* and demo applications and can be used by customers for their application development.

Category	Feature
TLS Extension	Server name indication (SNI Extension support)
	Max fragment length Extension
	client certificate URLs Extension
	Trusted CA indication extension
	Trusted HMAC Extension
	Certificate status request
	ALPN extension
	Signature Algorithm Extension
	Certificate Revocation list
	secure renegotiation
Key Exchange Methods	RSA key Exchange
	DHE Key Exchange
	ECDHE Key Exchange
	ECDH Key Exchange
	PSK Key Exchange
	SRP key exchange - SRP-SHA, SRP-SHA-RSA, SRP-SHA-DSS
Encryption Algorithm	AES
	Blowfish
	Triple DES
	DES
	ARC4
	Camelia
	CHACHA20_POLY1305
	ARIA cipher
	SEED CBC cipher
	XTEA
Hash Algorithm	MD2, MD4 and MD5
	SHA1, SHA224, SHA256, SHA384 and SHA512
	RIPEMD-160
Certificate Format	DER
	PEM

Category	Feature
	PKCS7, PKCS8, PKCS11 and PKCS12
Supported ECC Curves	secp192r1 - 192-bits NIST curve
	secp224r1 - 224-bits NIST curve
	secp256r1 - 256-bits NIST curve
	secp384r1 - 384-bits NIST curve
	secp521r1 - 521-bits NIST curve
	secp192k1 - 192-bits Koblitz curve
	secp224k1 - 224-bits Koblitz curve
	secp256k1 - 256-bits Koblitz curve
	bp256r1 - 256-bits Brainpool curve
	bp384r1 - 384-bits Brainpool curve
	bp512r1 - 512-bits Brainpool curve
	m255 - 255-bits Curve25519
Signature Algorithms	RSA
	ECDSA
	DSA
Pre-RSNA (Robust Security Network Association)	WEP (Open/Shared)
RSNA (Robust Security Network Association)	TKIP (WPA including Mixed mode)
	CCMP (WPA2)
	BIP (for MFP/Robust Management Frame Protection)
	4-way Handshake and Group Key Handshake Protocol
Bluetooth Security Features	Cypress Bluetooth controller and WICED Bluetooth stack support all the security algorithms needed to provide a certified Bluetooth solution to the customers

Table 12: Security Protocols Handled by the Cypress Enhanced Security Layer

## Technical Support

Cypress Developer Community also hosts Forums for technical support. You can search the forum to find answer to your question. If you are unable to find the answer, you can post it on the forum. These Forums are manned by Cypress engineers to assist you with issues that you encounter while using WICED Studio with platforms and features listed in this document. For quick access, here are the links to W-Fi/Combo and Bluetooth forums respectively:

<https://community.cypress.com/community/wiced-wifi/wiced-wifi-forums>

<https://community.cypress.com/community/wiced-studio-blueooth/wiced-studio-bluetooth-forums>

If you need support beyond what is listed in this document, you can contact of our partners. List of our partners is available at <https://community.cypress.com/community/partners>.

## Learning Resources

Cypress offers a wealth of learning resources as summarized in table 13.

Information	Source
Cypress Wireless Solutions and Product Offerings	<a href="#">Wireless Product Offerings</a>
Location to buy Kits	<a href="#">Cypress Kit Store</a>
Cypress Developer Community	<a href="#">Community</a>
Getting Started and Training Videos	<a href="#">Getting Started Videos</a>
WICED Studio Download*	<a href="#">WICED Studio</a>
WiFi Devices and WiFi + Bluetooth Combo Devices Application Notes, Support Blogs, and Help Articles	<a href="#">WiFi and WiFi + Bluetooth Documentation</a>
Bluetooth Application Notes, Support Blogs, and Help Articles	<a href="#">Bluetooth Documentation</a>

Table 13: Learning Resources

\*To learn about new features, devices and platforms support since previous release and to find the list of any known issues and solutions, please refer to release notes provided with every WICED Studio release.

## SW Licensing

Express Logic ThreadX / NetX\_Duo object files & headers are licensed by Cypress from Express Logic, Inc and provided to WICED Studio users royalty free.

Refer to “\Doc\WICED-Studio-License-1.0.pdf” document in WICED Studio for SW Licensing details.

## Worldwide Sales and Design Support

Cypress maintains a worldwide network of offices, solution centers, manufacturer's representatives, and distributors. To find the office closest to you, visit us at [Cypress Locations](#).

## Products

ARM® Cortex® Microcontrollers	<a href="http://cypress.com/arm">cypress.com/arm</a>
Automotive	<a href="http://cypress.com/automotive">cypress.com/automotive</a>
Clocks & Buffers	<a href="http://cypress.com/clocks">cypress.com/clocks</a>
Interface	<a href="http://cypress.com/interface">cypress.com/interface</a>
Internet of Things	<a href="http://cypress.com/iot">cypress.com/iot</a>
Memory	<a href="http://cypress.com/memory">cypress.com/memory</a>
Microcontrollers	<a href="http://cypress.com/mcu">cypress.com/mcu</a>
PSoC	<a href="http://cypress.com/psoc">cypress.com/psoc</a>
Power Management ICs	<a href="http://cypress.com/pmic">cypress.com/pmic</a>
Touch Sensing	<a href="http://cypress.com/touch">cypress.com/touch</a>
USB Controllers	<a href="http://cypress.com/usb">cypress.com/usb</a>
Wireless Connectivity	<a href="http://cypress.com/wireless">cypress.com/wireless</a>

Cypress Semiconductor  
198 Champion Ct.  
San Jose, CA 95134-1709 USA  
[www.cypress.com](http://www.cypress.com)

© Cypress Semiconductor Corporation, 2008-2017. This document is the property of Cypress Semiconductor Corporation and its subsidiaries, including Spanion 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](http://cypress.com). Other names and brands may be claimed as property of their respective owners.