ModusToolbox 101 Lesson 1-1: Introduction to ModusToolbox

Hi. My name is Alan Hawse. Welcome to Cypress Academy, ModusToolbox 101.

This is the first video of many that will provide you simple, fundamental lessons in developing ultra-low-power, connected IoT solutions using our new ModusToolbox software environment.

Modus toolbox allows you to build projects with the PSoC 6 MCUs.

So, what is ModusToolbox? Simple, it's a fully featured set of tools that brings together the ease of use of PSoC with the best in class wireless of WICED. It's about time, eh? Yes, I've been waiting for this a long time as well and I'm super excited.

Modus toolbox simplifies your life by giving you a familiar integrated development environment based on Eclipse, that works both on Windows, macOS, and Linux while also providing a powerful suite of tools for system setup, application-specific configurators for BLE, for CapSense, and USB as well as the other MCU peripherals that you know and love from PSoC Creator.

Now, let's look at what's available in ModusToolbox.

ModusToolbox is a unified software environment for PSoC MCUs. We've made things so that:

#1: You can choose to use the Cypress ModusToolbox IDE based on Eclipse or, if you like, you can mix and match it with your own preferred development environment and tools. In fact, I've seen some of the Cypress people use Visual Studio code.

#2: ModusToolbox has our drivers, middleware and code examples in the SDK such that they all have Makefiles build out of the box facilitating your easy migration into other build tools and build automation systems.

#3: Cypress silicon specific configuration tools are all written as stand-alone applications based on Qt that allow them to be leveraged outside of our ModusToolbox IDE.

#4: Our entire environment works across multiple host platforms including Windows, macOS, and Linux. For all you Linux guys that have been sending me hate mails all these years about Windows, this toolbox is for you because it works great on Linux.

#5: Cypress has embraced 'social code' and we're making all of our code examples widely available on GitHub so that you can download them into your system easily.

#6: We've moved the whole platform to leverage open-source software such as OpenOCD and CMSIS-DAP which allow you to integrate it with other debuggers more easily.

ModusToolbox has robust cross-platform debugging capability. We provide debug connections to our devices via the Miniprog4, Kitprog3 which is our on-board debugging tool, as well as Segger J-Link.

Kitprog3 evolves our debug protocol with the adoption of CMSIS-DAP as well as CMSIS-DAP with USB Bulk endpoints which increase the speed.

In this video series I'll show you what ModusToolbox can do for your next IoT design. We will cover the basics of ModusToolbox; the how-tos, the dos and don'ts, and where things currently are working, and even better, all of this is going to finally be in one design environment so that you can make PSoC 6 and wireless connections all at the same time!

For this chapter, I will build all the projects on PSoC 6 Wi-Fi BT Prototyping Kit and that kit has the "fun" name CY8CPROTO-062-4343W. This kit has a lot of stuff on it. Here are a few of the highlights:

#1: It has a dual ARM core PSoC 62 MCU with 2MB flash, 1MB SRAM, and dedicated Secure Digital High Capacity I/Os.

#2: It has a Murata 1DX WiFi/BT combo module based on the CYW4343W. Yes, you heard that right – it has WiFi and Bluetooth in the same module.

#3: It has an onboard programmer and debugger that we call KitProg3.

#4: It has a USB peripheral port for the PSoC6.

#5: It has PDM-PCM digital microphone interface.

#6: It has an external QSPI 512 mega-bit flash that is connected to the PSoC 6 SMIF port.

#7: It has a Digilent Pmod interface.

#8: It has a µSD card interface, it has a thermistor, it has CapSense sliders, and it's got CapSense buttons. It has user LEDs as well as a mechanical button.

That's a bunch of stuff all there on one dev kit.

In addition, this kit has been designed with snap-away form-factor, allowing you to separate the different components and features that come with this kit into a form factor that works for you.

As we go along, I'll add references to the application notes and all the other documentation. I believe, and Cypress believes in you having the documents that you need to do your job.

As always, if you have any questions, please post them in the ModusToolbox community on cypress.com and we'll help each other out. If you have a personal note or just want to chat, please feel free to email me at alan_hawse@cypress.com or tweet me @askiotexpert.

Alright, let's get started and make something awesome…