Getting Started with TI-RTOS

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This datasheet provides the following information:

- Software and hardware supported in this workshop
- Links to target boards in TI eStore
- Workshop agenda

Software Versions

Workshop solutions are tested with the CCS and SDK versions listed below.

Code Composer Studio (CCS)	Version 9.10
Software Development Kit	
MSP432P401R	3.20.00.06
MSP432P4111	3.20.00.06
MSP432E401Y	3.20.00.10
CC1352	3.20.00.68
CC3220	3.20.00.06

Download the software development kit via the CCS version of TI Resource\Explorer (TI-REX) or via TI-REX online at http://dev.ti.com/tirex/explore

Target Processors and Boards

Current and future supported targets for this workshop are listed below along with links to purchase the proper target boards. The processors listed in bold are the processors actually on the target hardware.

Family	Supported Targets	Target Board & Link to TI eSTore
MSP432P4xx	MSP432P401M **MSP432P401R** MSP432P401V MSP432P401Y MSP432P411V MSP432P411Y	MSP-EXP432P401R LaunchPad™ ($19.99) https://www.ti.com/store/ti/en/p/product/?p=MSP-EXP432P401R
MSP432P4x11	MSP432P4011 **MSP432P4111**	MSP-EXP432P4111 LaunchPad™ ($29.99) https://www.ti.com/store/ti/en/p/product/?p=MSP-EXP432P4111
MSP432E4xX	**MSP432E401Y** MSP432E411Y	MSP-EXP432E401Y LaunchPad™ ($39.99) https://www.ti.com/store/ti/en/p/product/?p=MSP-EXP432E401Y
CC13xx	CC1310 CC1312R CC1350 CC1352P **CC1352R**	LAUNCHXL-CC1352R1 L LaunchPad™ ($39.99) https://www.ti.com/store/ti/en/p/product/?p=LAUNCHXL-CC1352R1
CC26xx	CC2640R2F CC2642R CC2652R CC2652RB	LAUNCHXL-CC1352R1 LaunchPad™ ($39.99) https://www.ti.com/store/ti/en/p/product/?p=LAUNCHXL-CC1352R1
CC32xx	CC3220MOD CC3220R **CC3220S** CC3220SF CC3235S CC3235SF	CC3220SF-LAUNCHXL LaunchPad™ ($49.99) https://www.ti.com/store/ti/en/p/product/?p=CC3220SF-LAUNCHXL
C2000	F28379D F28388D	Available Dec 2019 Available Dec 2019
Sitara™	AM335x AM572x	Available 1Q 2020 Available 2Q 2020
C6000	C6748 C6657	Available 1Q 2020 Available 1Q 2020

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EA EMBEDDED ADVANTAGE
WORKSHOP DATA SHEET

Workshop Agenda

Chapter 0
Workshop Intro, OOB

Embedded Advantage – Intro
TI-RTOS Workshop – Intro
Workshop Logistics
How to DO the Labs
Lab 0 – Out of Box Demo

Chapter 1
Tools/SDK Installation

What to Install
Code Composer Studio (CCS desktop)
Software Development Kit (SDK)
Workshop Files and Solutions
Verify Installation
Lab 1 – Installation

Chapter 2
Tools and Software Intro

CCS Overview
CCS Cloud IDE
Looking at the SDK
Embedded System Topology
Creating a New CCS Project
Lab 2A — Build and Debug an SDK Example

Chapter 3
Using TI's GPIO Driver

GPIO intro
Using the TI GPIO Driver
Lab 3A – Using GPIO NoRTOS Driver
Extending the GPIO Driver
Lab 3B – Extending GPIO Drivers

Chapter 4
Drivers & Interrupts

Reading Input Pins
Lab 4A – Reading GPIO input pin
Interrupts
Lab 4B – GPIO interrupt
Timer Interrupts
Lab 4C – Timer interrupt

Chapter 5
TI-RTOS Intro (Concepts)

RTOS – Library of Services
Why use an RTOS Scheduler?
TI-RTOS DNA
Linux vs RTOS – Compare/Contrast
TI-RTOS Thread Types
System Timeline & Scheduling Example
Quiz: TI-RTOS Threads

Chapter 6
TI-RTOS Mechanics

Creating a TI-RTOS Project
Lab 6A – Creating an Empty TI-RTOS Driver Project
Basic RTOS Configuration
Using IDLE
RTOS Object Viewer (ROV)
BIOS Footprint & Timing Benchmarks
Lab 6B – Using Idle

Chapter 7
Using Tasks

Task Topology and Signaling
Task API
How to Create Tasks
How to use Error Block
Scheduling Tasks
Scheduling Strategies
Lab 7A and 7B: Using Tasks

Chapter 8
TI-RTOS Instrumentation

Intro to RTOS Analyzer and UIA
Configuring UIA for your application
Benchmarking with Timestamp
Lab 8 – Using UIA and RTOS Analyzer

Chapter 9
Using Semaphores (Hwi)

Where Semaphores fit in
How PEND and POST Work
Object Creation
Lab 9 – Using Semaphores
Advanced Topic – Semaphore Modes

Chapter 10
Using Clock (Timers)

Timers – Let me count the ways
TI-RTOS System "Tick"
Creating Clock Functions
Timer Usage – Summary
Lab 10 – Using Clock Functions

Chapter 11
Using Mailbox

Passing Data between Threads
Creating and Using a Mailbox
Lab 11 – Using Mailbox

Chapter 12
Using Events

Events – Intro
Pending on Multiple Semaphores
Creating and Using Events
Posting Events with Semaphores
Lab 12 – Using Events