FTF 2016
TECHNOLOGY FORUM

# KINETIS EXPERT CONFIGURATION TOOLS

## FTF-DES-N1958

GREG HEMSTREET
ERICH STYGER

# Kinetis SDK Technical Overview

## Agenda:

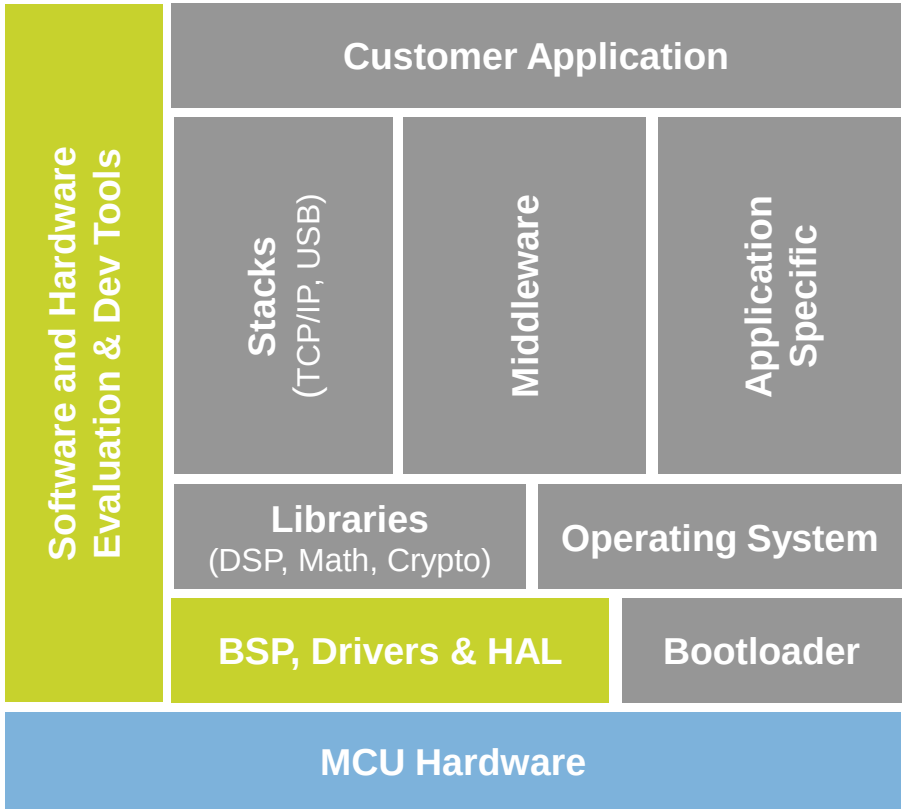
- Kinetis Expert Tools Overview
- Kinetis Expert Tool Details
  - Configurations…
  - Power Estimation tool demo
  - Pins tool demo
  - Clocks tool demo
  - SDK Builder demo
- Question & Answer

# KINETIS EXPERT OVERVIEW

# Kinetis Expert (KEx) System Configuration Tools

Learn more at: http://kex.nxp.com

Integrated configuration and development tools for Kinetis MCUs.




**Kinetis Expert** is a suite of evaluation and configuration tools that helps guide users from first evaluation to production software development. The tools are available in online and desktop editions.

**SDK Builder** packages custom SDKs based on user selections of MCU, evaluation board, and optional software components.

**Project Generator** creates new or clones existing SDK projects.

**Power Estimation** tool provides energy and battery-life estimates based on a user's application model

**Power Analyzer** measures and displays energy consumption data

**Pins**, **Clocks**, and **Peripherals** tools generate initialization C code for custom board support.

# Design considerations

Suite of tools
- Next generation of Processor Expert technologies
- Extensible – new tools can be added, when available
- Configures the SDK for use with standard and custom boards
- Supports rapid embedded application development

Cloud Solution (kex.nxp.com)
- No installer, no updates, always available
- Ability to create and share configurations

Desktop Solution
- Mostly connected application
- New processors updated automatically
- Same User Interface as online tools

Configuration tools for:
- Kinetis microcontrollers
- LPC microcontrollers*
- C-M cores on i.MX processors**
- Other processors*

* Limited coverage in 2016
** Not all tools apply

# Kinetis Expert (KEx) System Configuration Tools


– Customize your SDK. Get only what you need.

– Create or clone an SDK application for the IDE of your choosing.

– Model your application's power modes. Get energy usage, battery-life, and design recommendations.

– Desktop application to analyze energy consumption data provided by an energy monitoring circuit embedded in the evaluation boards.

– Assign signals to pins and generate initialization code

– Setup the system clocks and generate initialization code

– Configure peripheral modes and generate initialization code

# Kinetis SDK v2 – Toolchain Support

Learn more at: www.nxp.com/KSDK

IAR SYSTEMS


ARM® KEIL®
Microcontroller Tools

atollic

GNU Compiler Collection (GCC)

SOMNIUM DRT
Device-aware Resequencing Tools
NXP Edition

(Kinetis Design Studio project importer)

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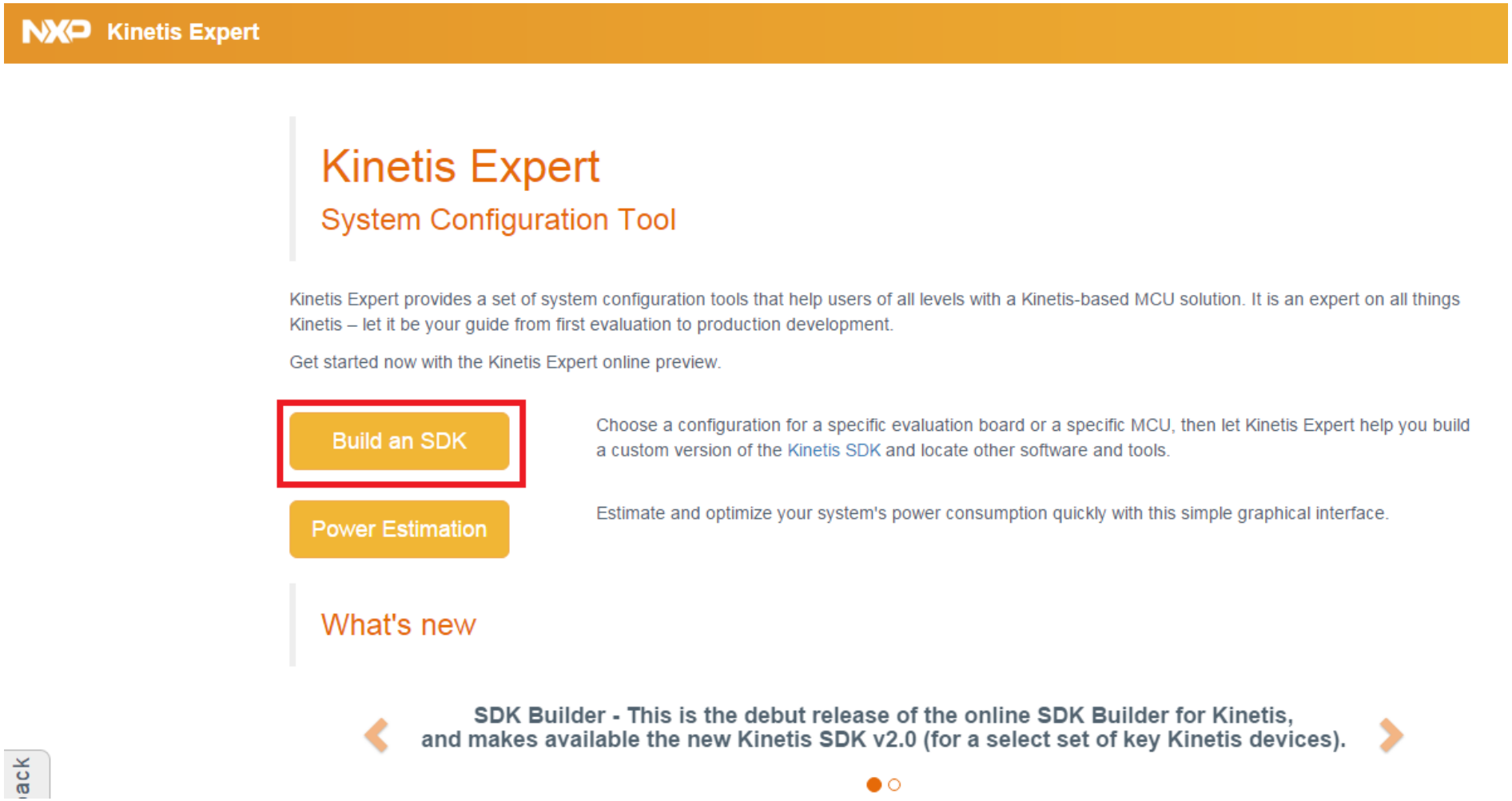
# KINETIS EXPERT ONLINE SYSTEM

# Kinetis Expert Tools – kex.nxp.com

- Get your SDK, use the KEx tools online or as Desktop applications…
- Leverages NXP common web services
  - Signon authentication system connected with our export compliance system and licensing mechanisms.
  - Notifications for software updates
- Available in English and Chinese for localized use
- Supports multiple “Configurations”, each configuration is the collection of data input from the set of tools
  - With validation between tools; consistent with the Kinetis SDK APIs.
  - Configurations can be named, show basic SoC / board information and offer optional software options.
  - Configurations can be downloaded from the online tools to desktop tools (and reuploaded) using a .mex file format.
- KSDK 2.0 is distributed via Kinetis Expert Tool (KEX)
  - Offers ability to customize download options by toolchain, RTOS, and specific device
  - Configurations stored in web interface for downloads
  - Downloads automatically generated
  - A monolithic download with all supported boards/devices is no longer offered

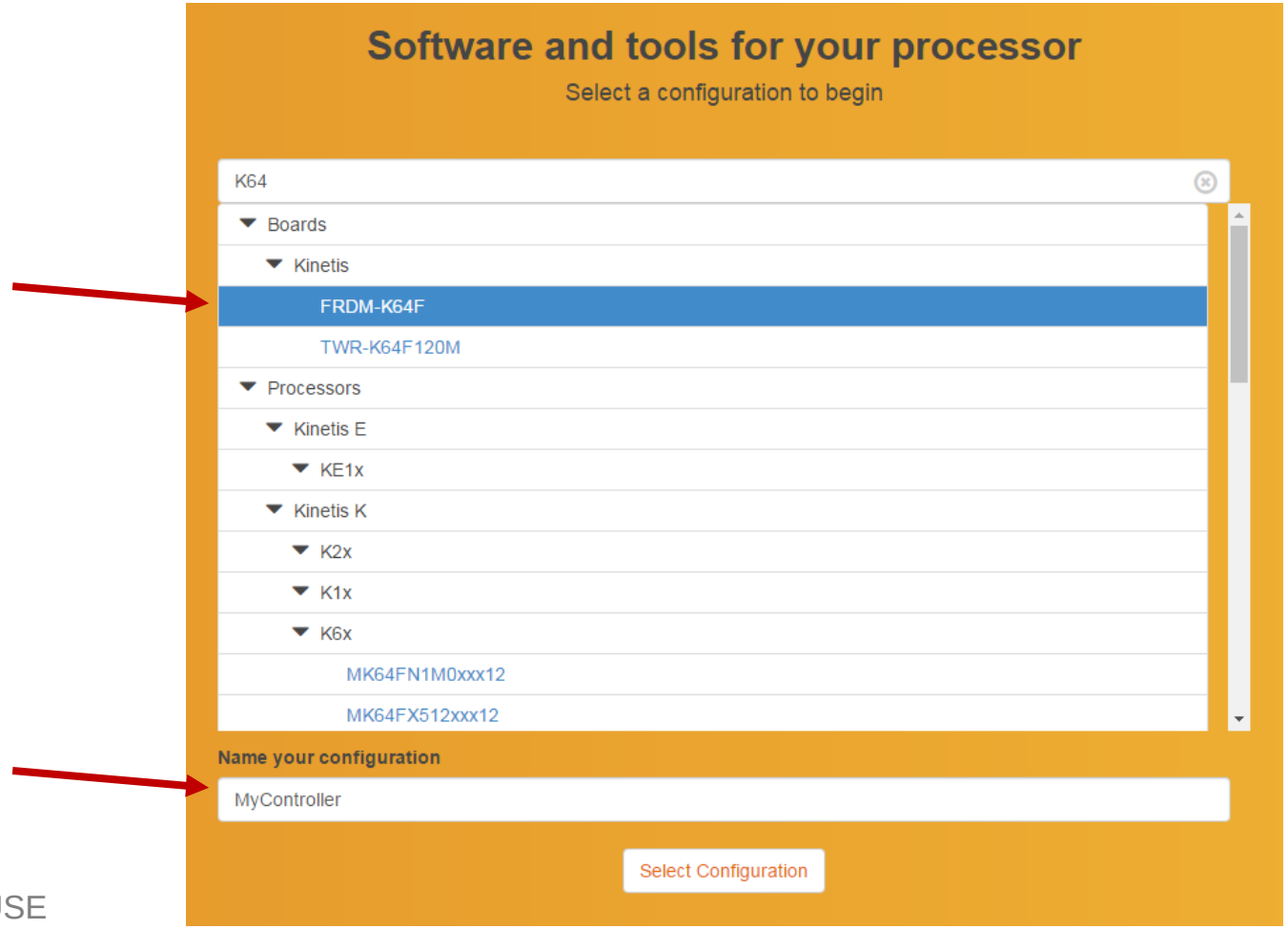
# Kinetis Expert Tool – kex.nxp.com

- Start with “Build an SDK”



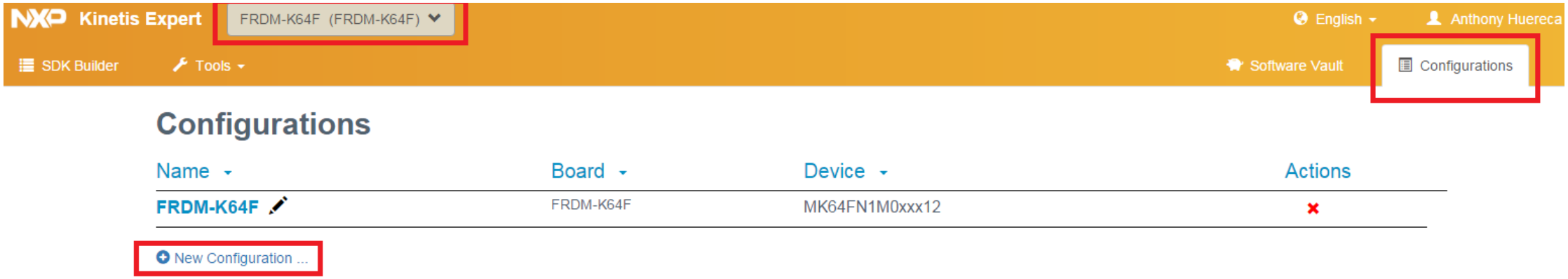
# Kinetis Expert Tool – Create new configuration

- After logging in, select the board or device
- Optionally rename the configuration



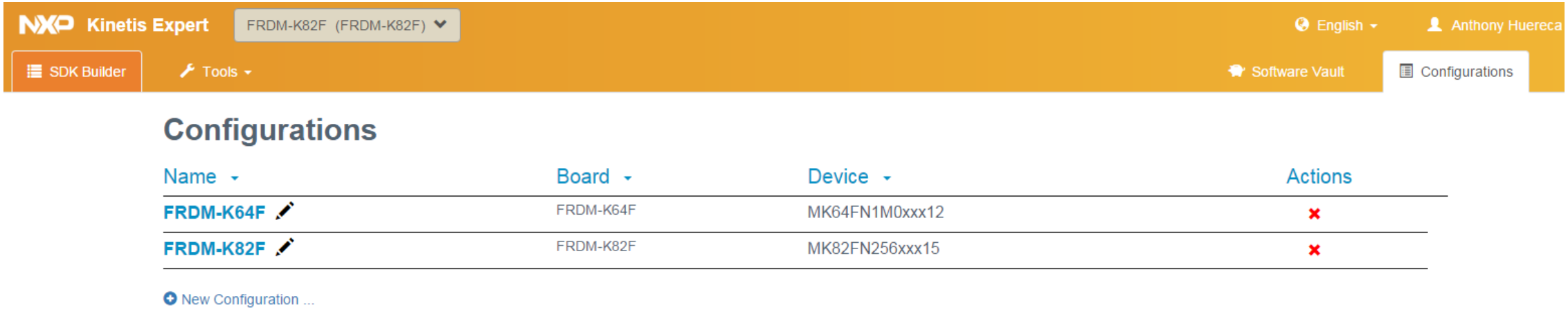
# Kinetis Expert Tool – Multiple Configurations

- If a new device or board is desired, then need to create a new configuration
- Go to the Configurations tab, and click on “New Configuration…”
  - Or use drop-down box at top of the screen



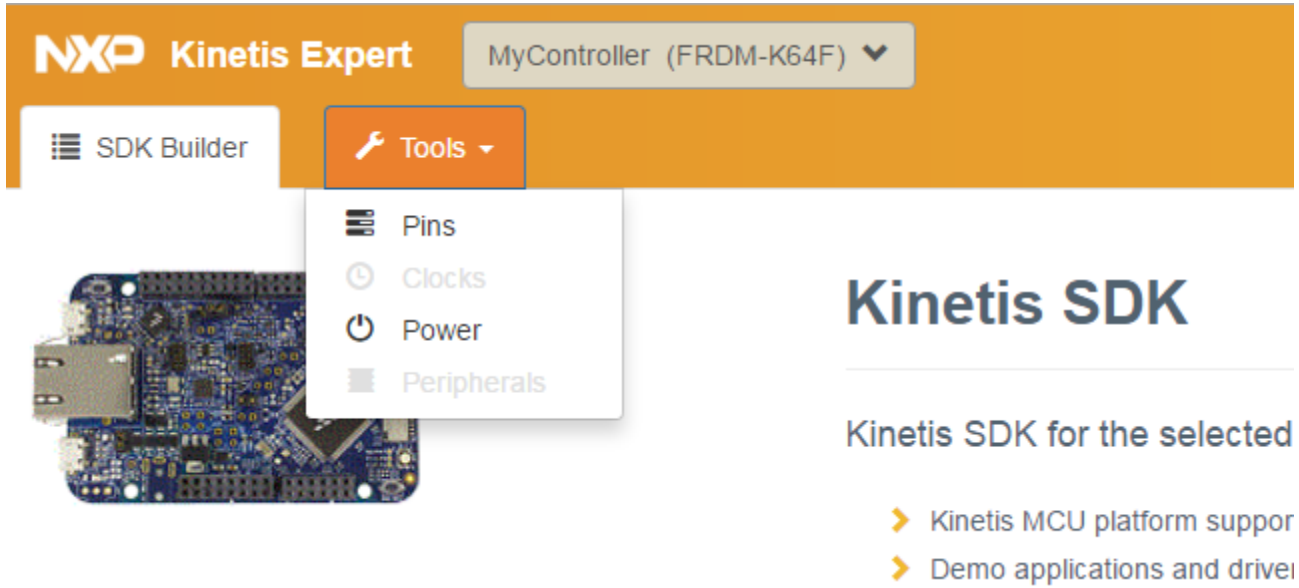
# Kinetis Expert Tool – Multiple Configurations

- Switch between boards/devices on the Configurations tab or via drop down box



# Configuration Tools

- Tools menu selects unique configuration tools



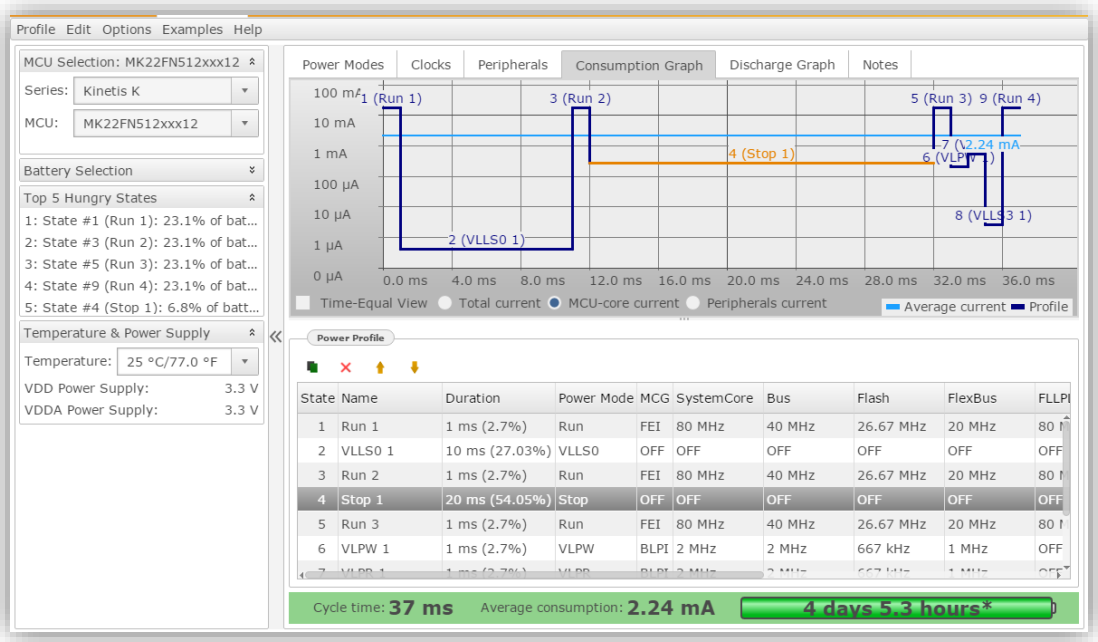

- Not every tool supports every device/board configuration… if the tool is dimmed, it is not yet available… but we're working on it!

# Kinetis Expert Power Estimation Tool

Learn more at: www.nxp.com/kinetis/powertool

Estimate and optimize your system's power consumption

Helps you design for efficient use of energy

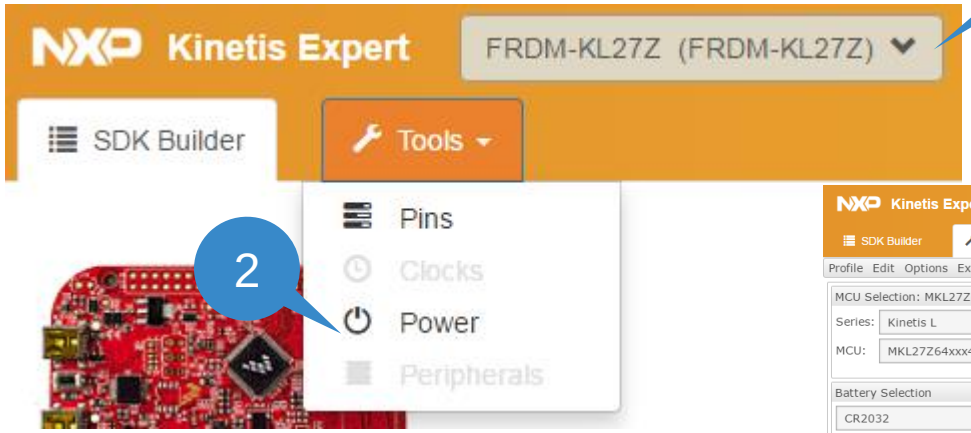


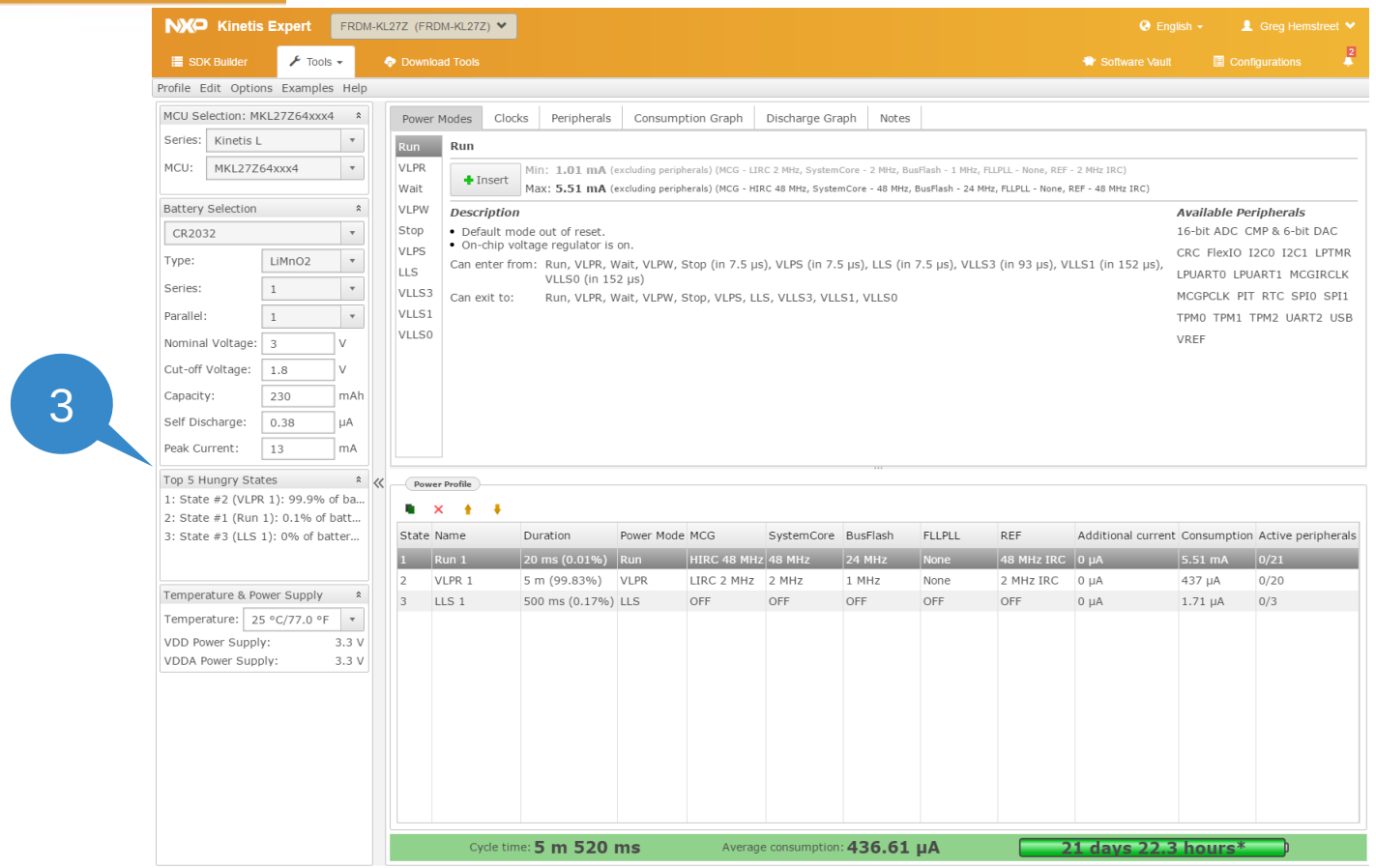

## Product Features

- Part of the Kinetis Expert suite of system configuration tools
- Online and Desktop versions available now
- Models application states and estimates the power profile
- Provides immediate energy consumption & battery life estimations
- Generates consumption and battery discharge graphs
- Provides ability to save & load profiles and generate reports
- Local and online versions to be available
- English & limited Chinese language support
- Backed by real power measurement data
- Quickly evaluate which Kinetis MCU fits your use-case and power budget
- Accelerates learning curve for advanced power management features
- Ideal tool for developing wearable and other battery-operated applications.

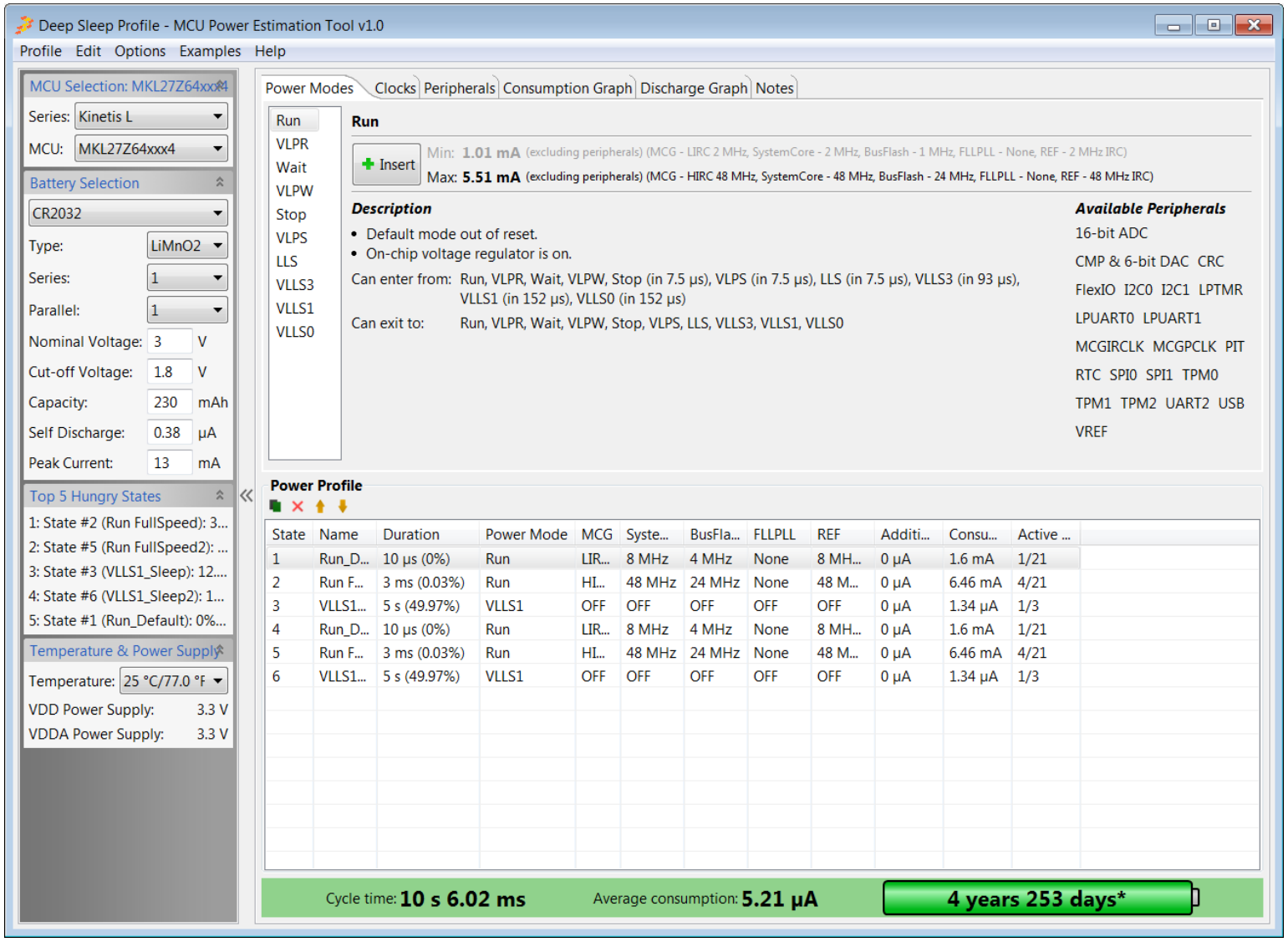
# Power Estimation Tool Demo

1. Create a Configuration for FRDM-K64F
2. Choose the Pins tool
3. Let the browser load the rich user interface…



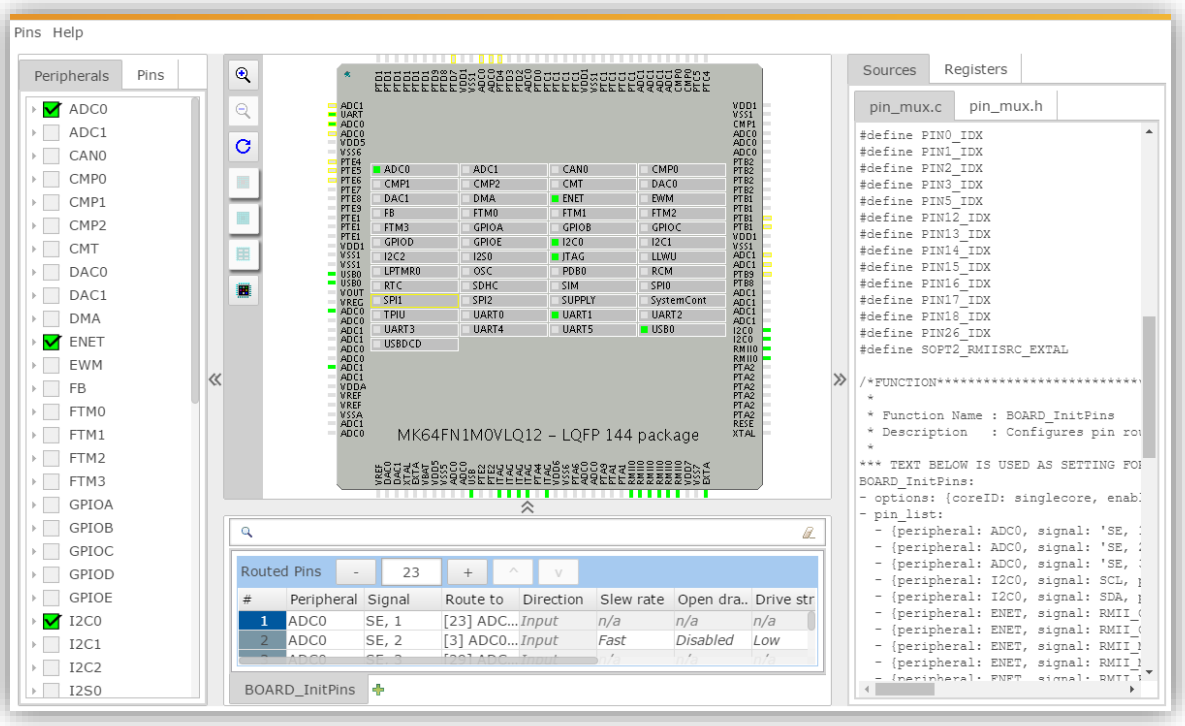



# Power Estimation – Desktop version….



# Kinetis Expert Pins Tool

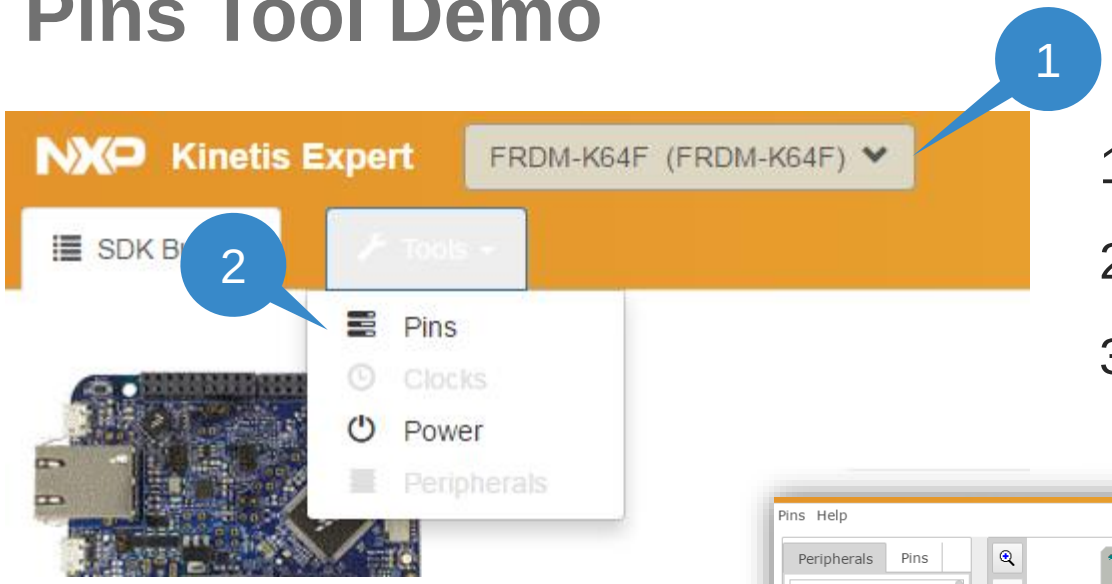
Easy-to-use muxing and pin assignments for Kinetis MCU's



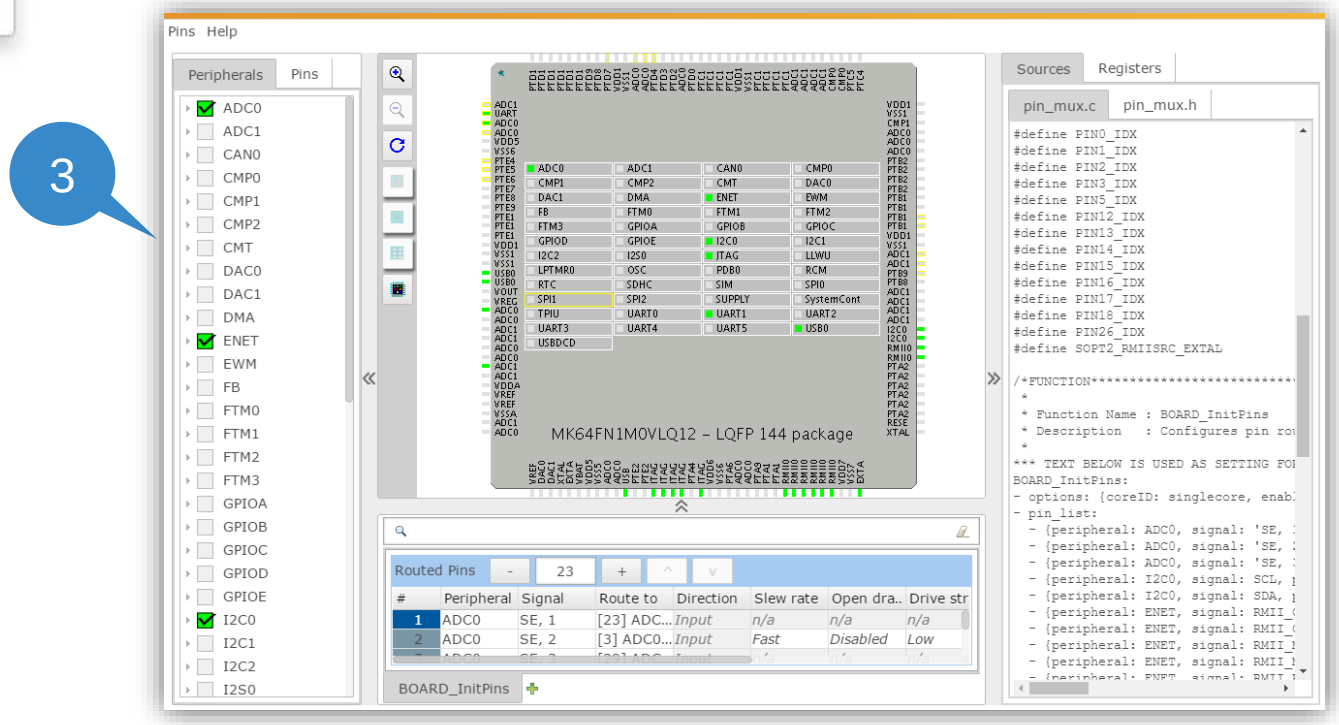

## Product Features:

- Part of the Kinetis Expert suite of system configuration tools
- Online and Desktop editions released in May 2016
- Muxing and pin configuration with consistency checking
- ANSI-C configuration code
- Kinetis SDK support
- Graphical processor package view
- Multiple configuration blocks/functions
- Wizard for optimized assignments of functionality to available pins
  - Selection of Pins and Peripherals
  - Package with IP blocks
  - Routed pins with electrical characteristics
  - Registers with configured and reset values
  - Source code for C/C++ applications
- Documented and easy to understand source code
- Report generation
- Integrates with any compiler and IDE

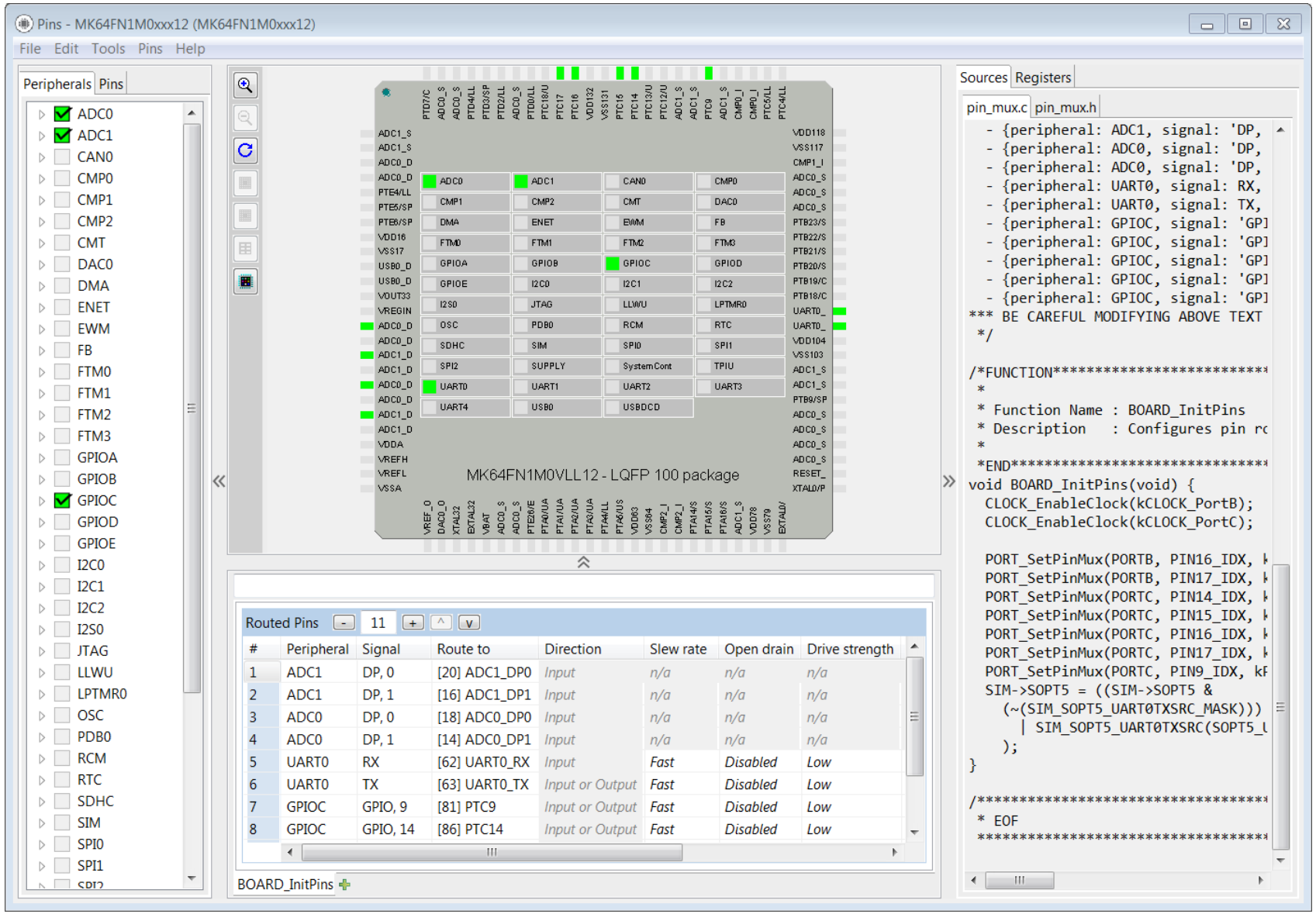
# Pins Tool Demo




1. Create a Configuration for FRDM-K64F
2. Choose the Pins tool
3. Let the browser load the rich user interface…



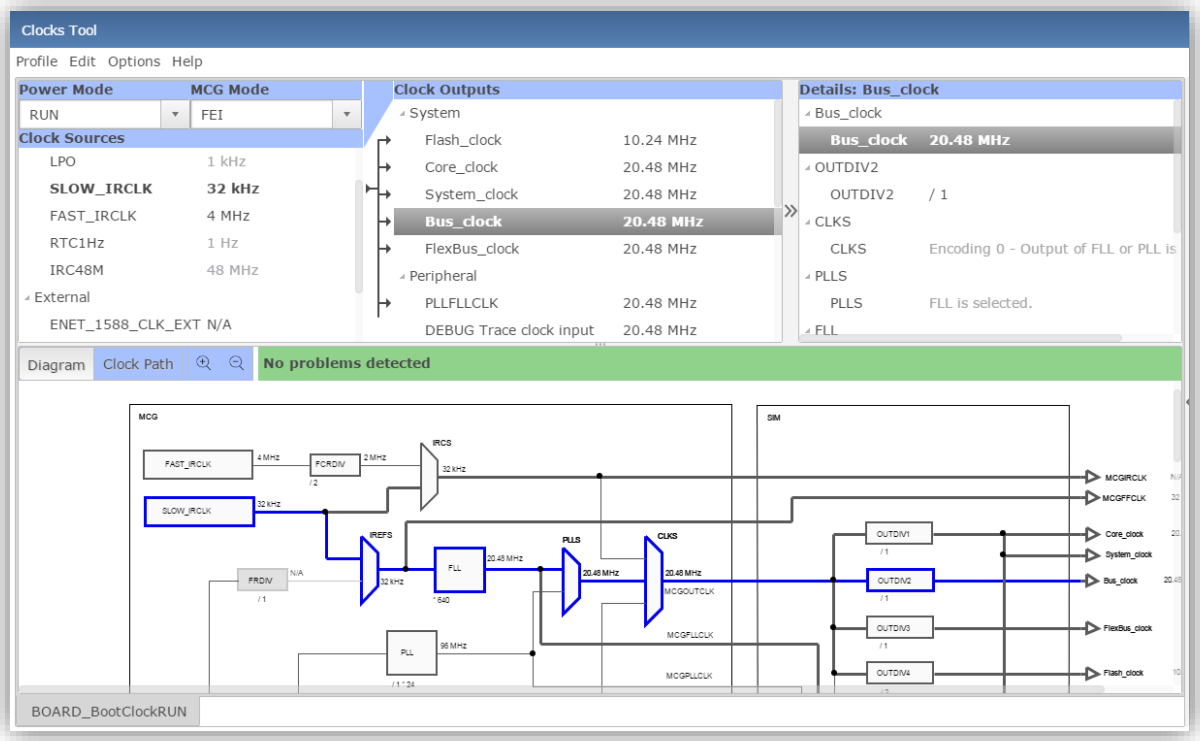
# Pins Tool – Desktop version….



# Kinetis Expert Clocks Tool

Coming Soon

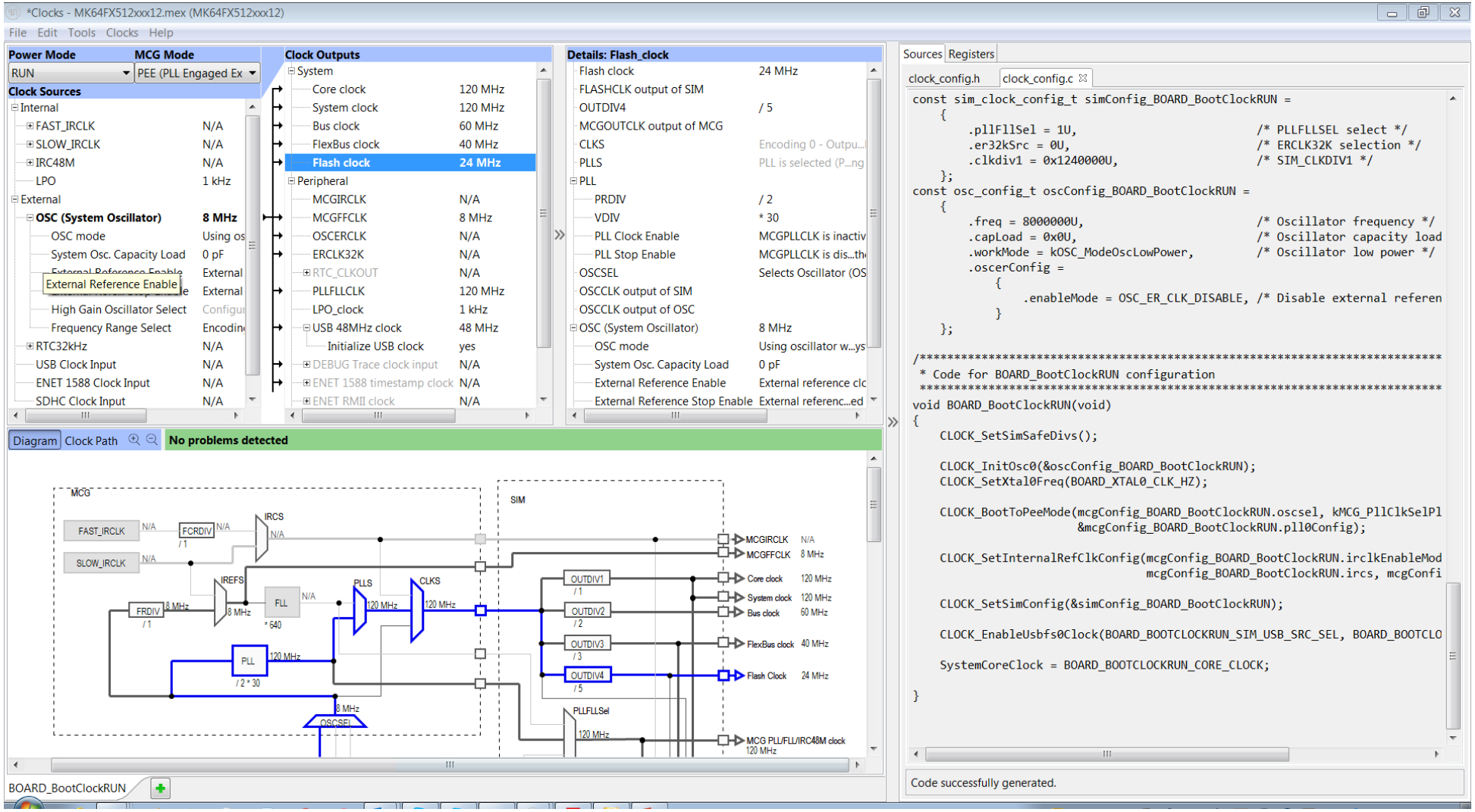
Easy-to-use clock configuration
for Kinetis MCU's




## Product Features:

- Part of the Kinetis Expert system configuration tools
- Online and Desktop editions planned for release in **July 2016**
- System clock configuration with consistency checking
- ANSI-C initialization code
- Kinetis SDK v2 support
- Graphical clock diagrams
- Multiple configuration blocks/functions
- Easy-to-use guided graphical user interface
  - Selection of Clock Sources
  - Configuration of prescalers and clock outputs
  - Details and Full Diagram views with clock path
  - Registers with configured and reset values
  - Source code for C/C++ applications
- Documented and easy to understand source code
- Report generation
- Integrates with any compiler and IDE

# Clock Tool – Desktop version….



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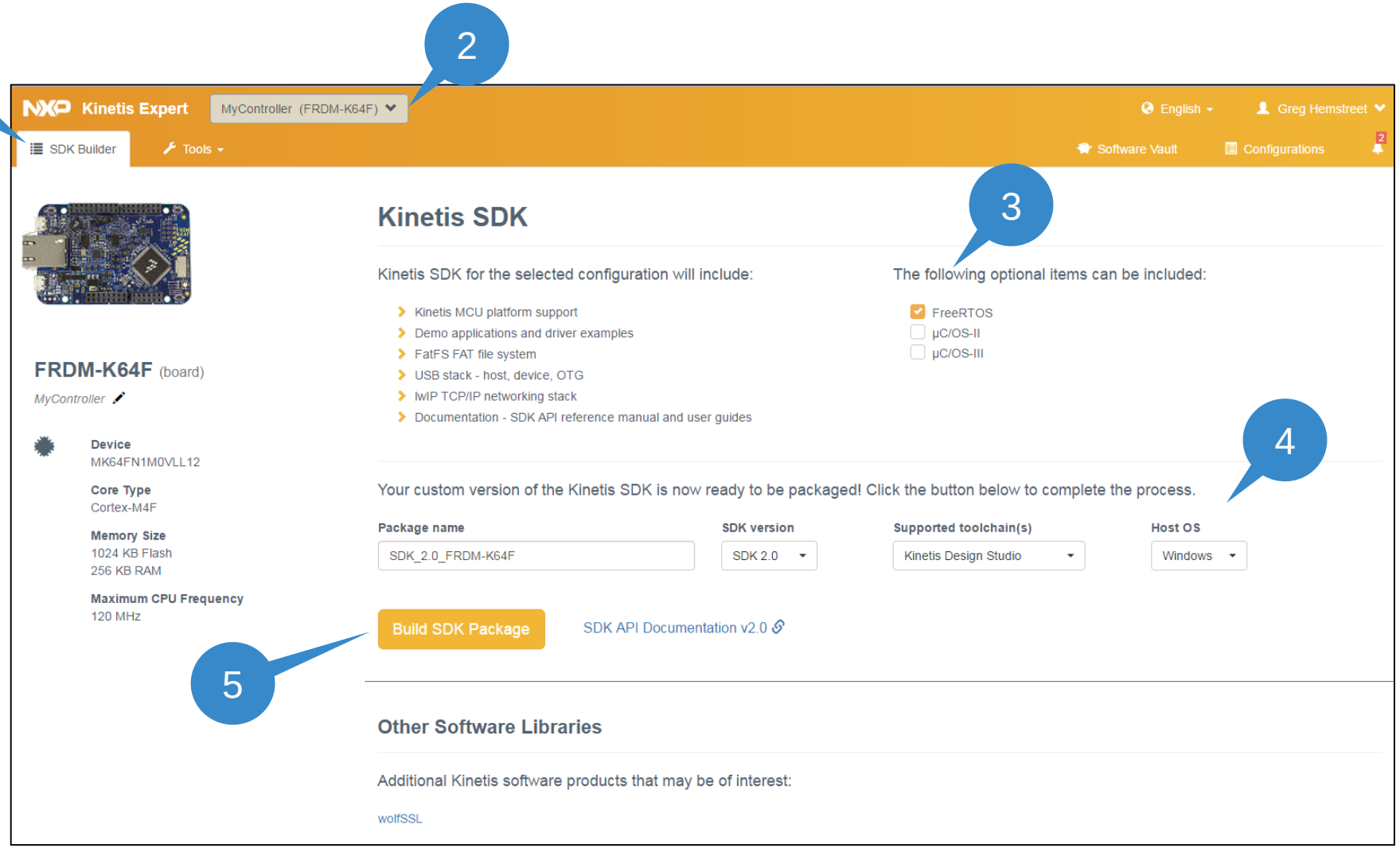
# KINETIS EXPERT
# SDK BUILDER

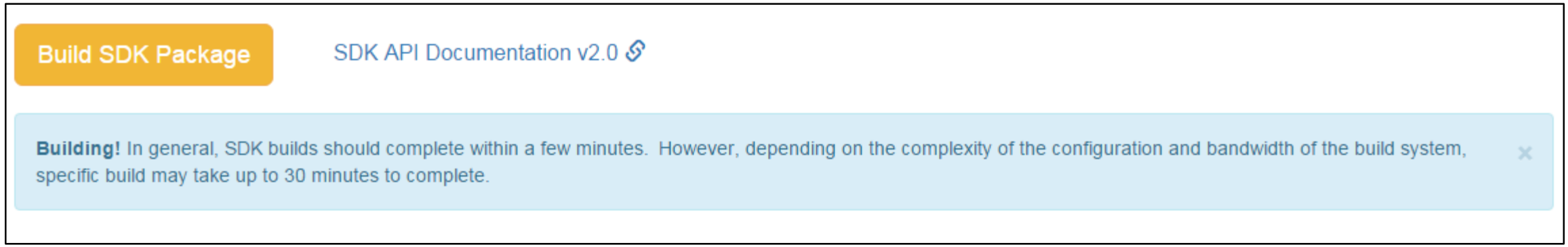
# Kinetis Expert Tool – Build SDK

1. SDK Builder page
2. Shows configuration
3. Select optional items
4. Select the configuration options for RTOS, Host OS, toolchain, SDK version, and a unique package name
5. Then click on “Build SDK Package” button



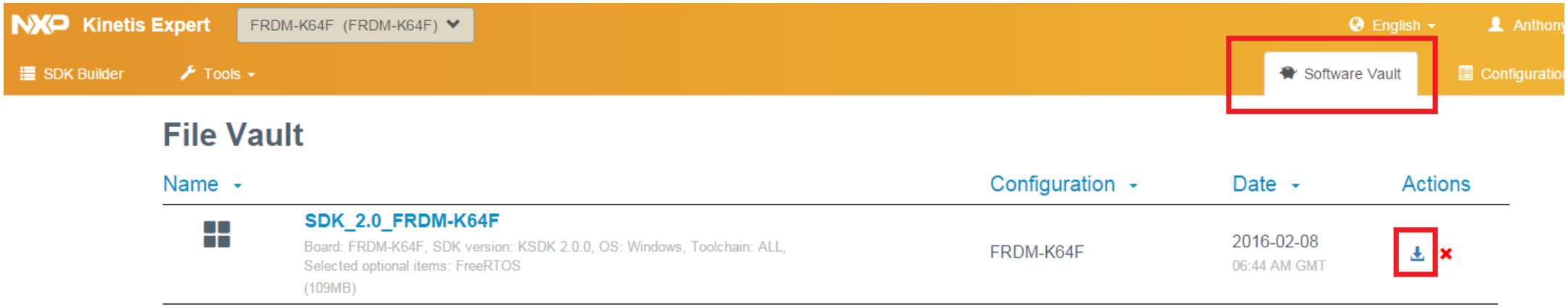
# Kinetis Expert Tool – Package Generation

- System may take some time to generate a package. Some configurations are pre-cached, but some may need to be generated
  - Generally takes about 5 minutes



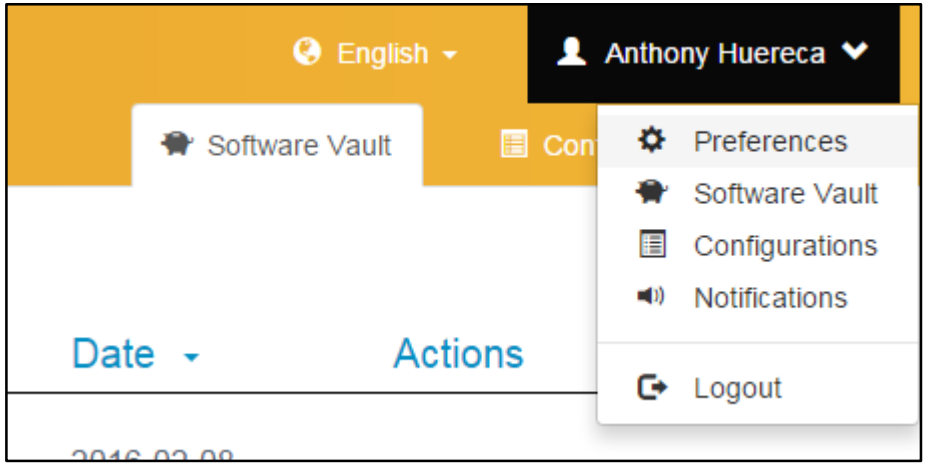
# Kinetis Expert Tool – Software Vault

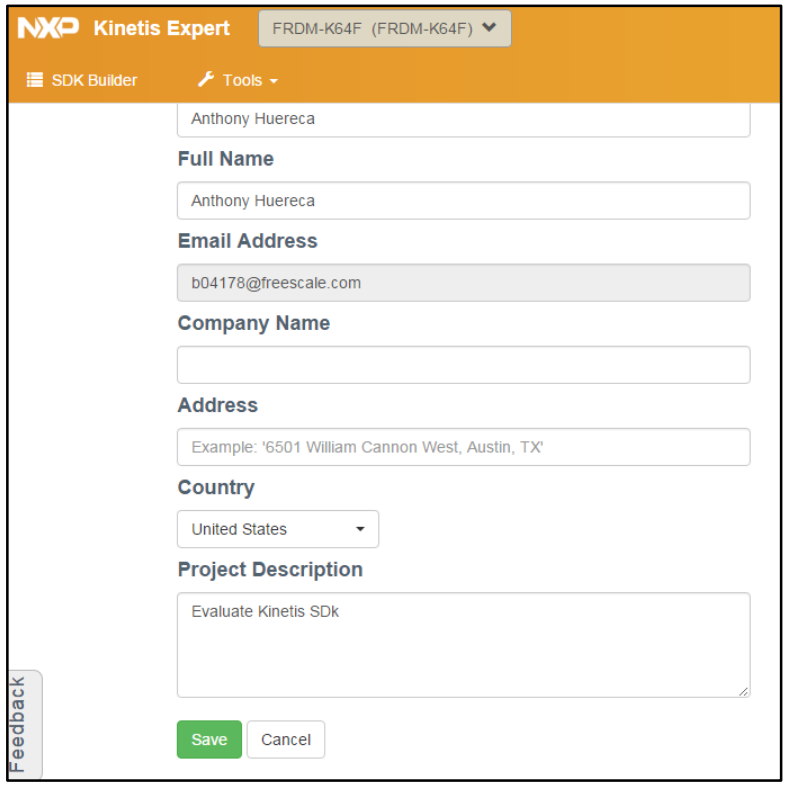
- Once package is available for download, it will be found under the “Software Vault” tab
- Download package by clicking on the Download icon.



# Kinetis Expert Tool – Download Link

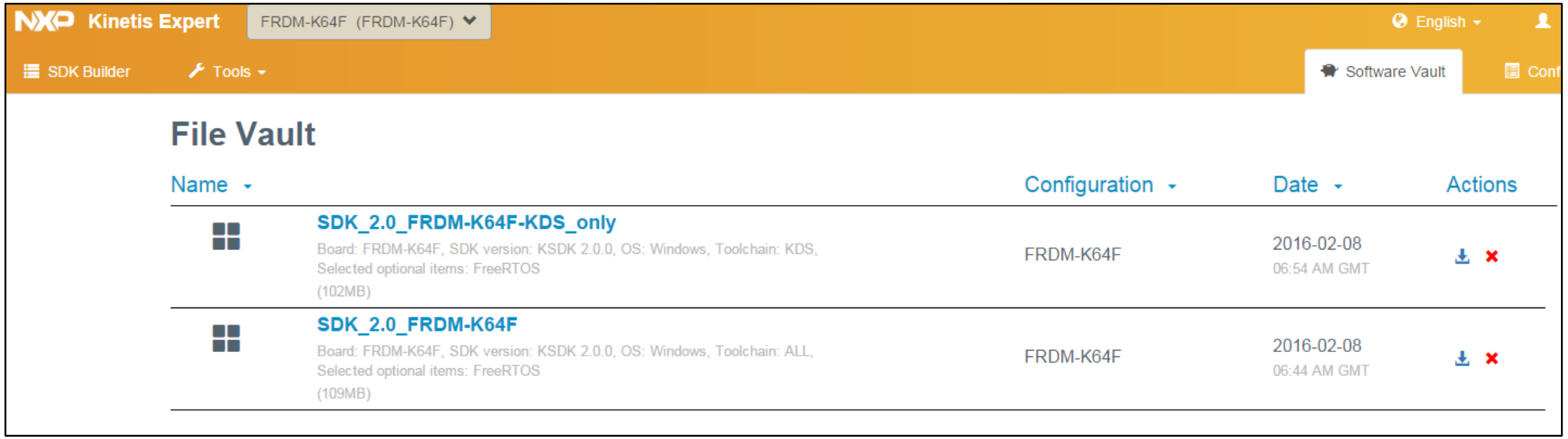
- If the download icon is grayed out, you may need to set the Project Description filed in your preferences.
  - There will be a link, or you can access it by clicking on your name in the upper right hand corner
  - Fill out Project Description and hit Save. Then go back to the Software Vault to download



# Kinetis Expert Tool – Multiple Packages

- You can go back to the SDK Builder tab to create other packages. These new packages will show up under the Software Vault
  - In this example, I've created another package that only includes KDS projects



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# QUESTIONS?

SECURE CONNECTIONS
FOR A SMARTER WORLD