

# Evaluation Board Getting Started

TLE984x\_EVB\_1.x

TLE9845\_EVB\_1.x



# Agenda

1

TLE984x Evalboard overview

2

Product Information links

3

Toolchain installation

4

Getting Started

# Agenda

1

TLE984x Evalboard overview

2

Product Information links

3

Toolchain installation

4

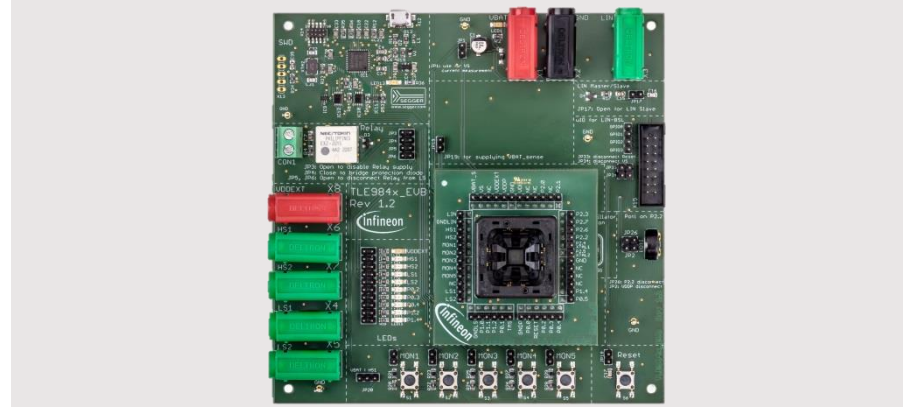
Getting Started

# Infineon® Embedded Power IC: TLE984xQX Evaluation Boards



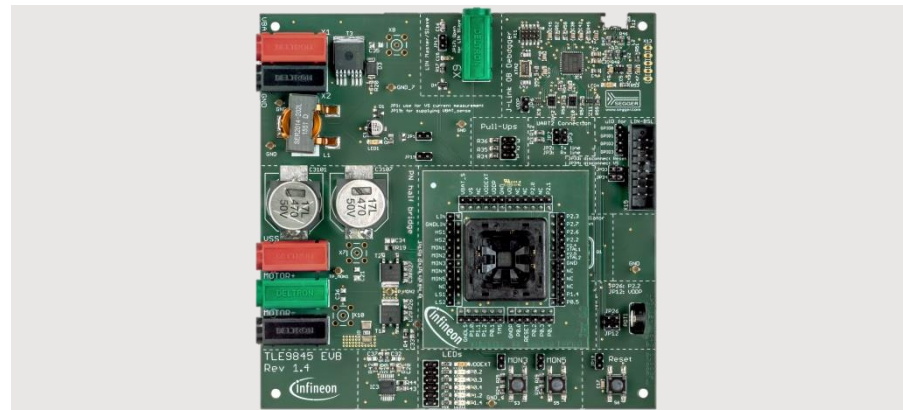
## TLE984xQX Evaluation Board with Socket

- › Double-Relay, for DC-Motor connection
- › onboard Segger J-Link Debugger
- › Debug connector SWD
- › Micro-USB-connection for Debugger also usable for UART (virtual COM port)
- › Debug LEDs
- › 5 MON buttons
- › Potentiometer, e.g. for ADC test
- › uIO Stick connector
- › TLE984X EVALBOARD **SP001297468**



## TLE9845QX Evaluation Board with Socket

- › PN-MOS half Bridge
- › **Lowside** Shunt with external operational amplifier
- › J-Link OB-Debugger with Serial COM Port
- › LIN Interface
- › TLE9845 Evalboard: **SP001509298**



# Agenda

1

TLE984x Evalboard overview

2

Product Information links

3

Toolchain installation

4

Getting Started

# Product Information links

Link	Description
<a href="http://www.infineon.com/embeddedpower">www.infineon.com/embeddedpower</a>	Infineon® Embedded Power IC overview Page
<a href="#">TLE984xQX Overview</a>	TLE984xQX Overview Page with general information
<a href="#">TLE984xQX Documents</a>	Datasheets and User Manuals for TLE9842QX, TLE9844QX, TLE9842-2QX, TLE9843-2QX, TLE9844-2QX, TLE9845QX
<a href="#">Evalboard overview</a>	Development Tools: Kits and Boards for all Infineon® Embedded Power ICs
<a href="#">TLE984x Evaluation Board</a>	Information about TLE984x_EVB_V1.2
<a href="#">TLE9845 Evaluation Board</a>	Information about TLE9845_EVB_V1.4

# Agenda

1

TLE984x Evalboard overview

2

Product Information links

3

Toolchain installation

4

Getting Started

# Toolchain installation: 1/4

Infineon **IFXConfigWizard**

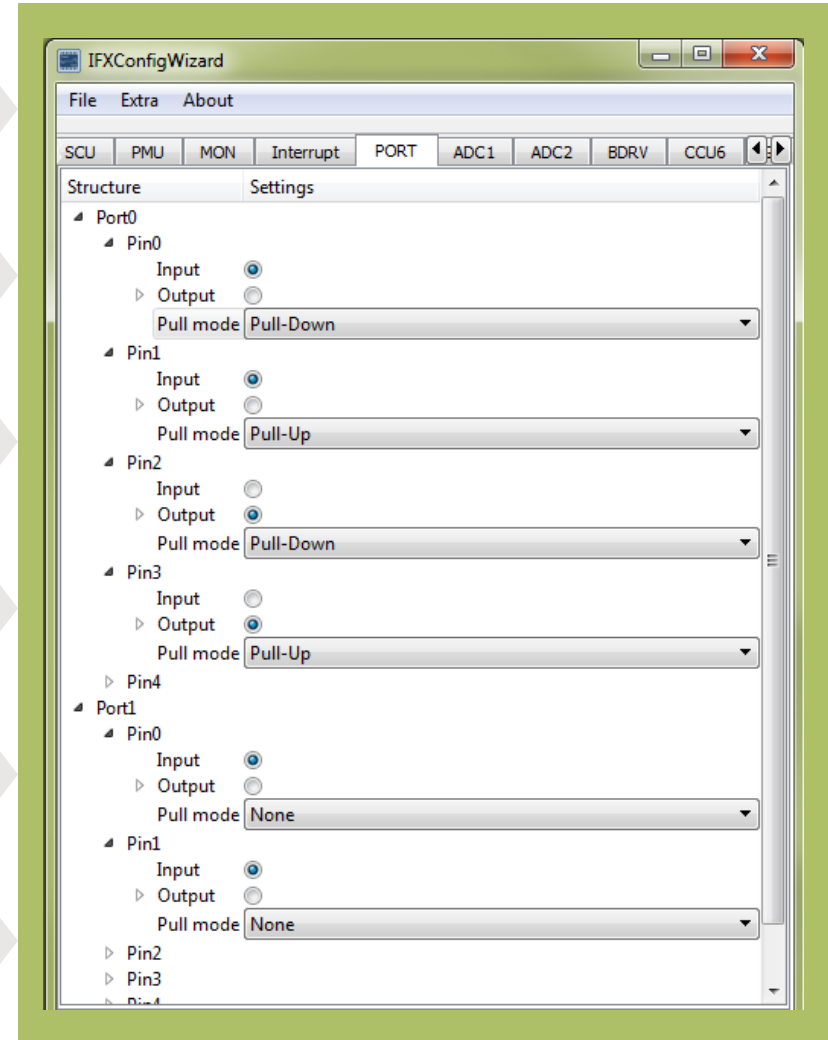
Configuration of chip modules

Infineon homepage: [IFXConfigWizard](http://www.infineon.com)

Latest version: V1.8.6

Device description for  
TLE986x/TLE987x included

TLE984x supported with Keil  $\mu$ Vision 5





# Toolchain installation: 2/4

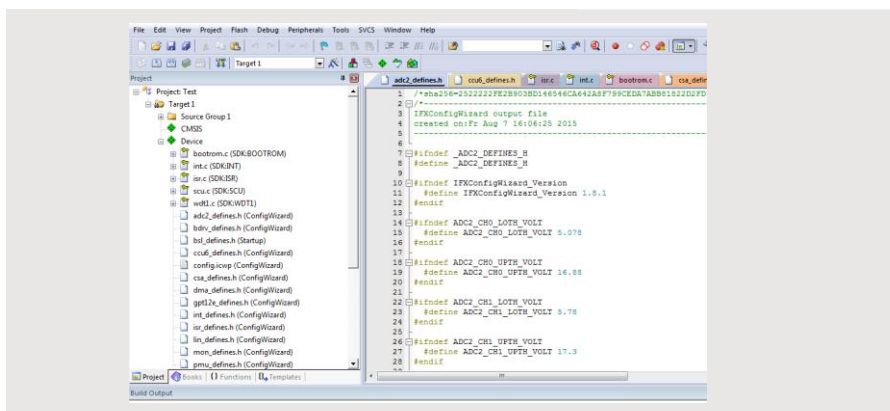
## Keil $\mu$ Vision5

- › Code Editor & Online Debugger
- › Evaluation version can handle up to 32K

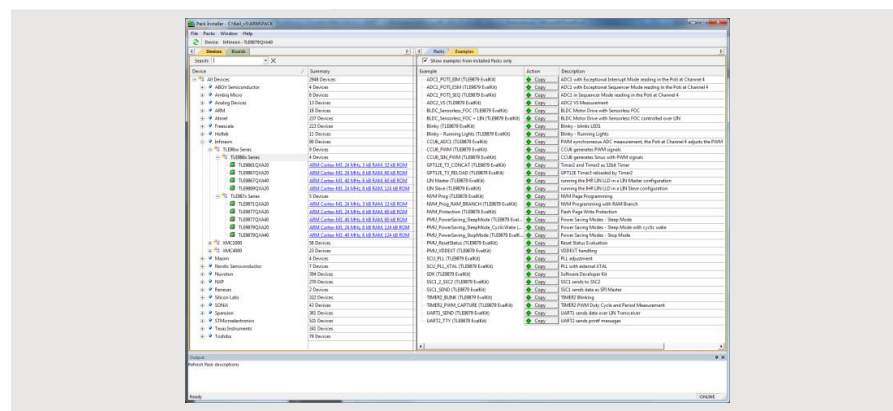
- › Download from: <https://www.keil.com/download>



## Main Window



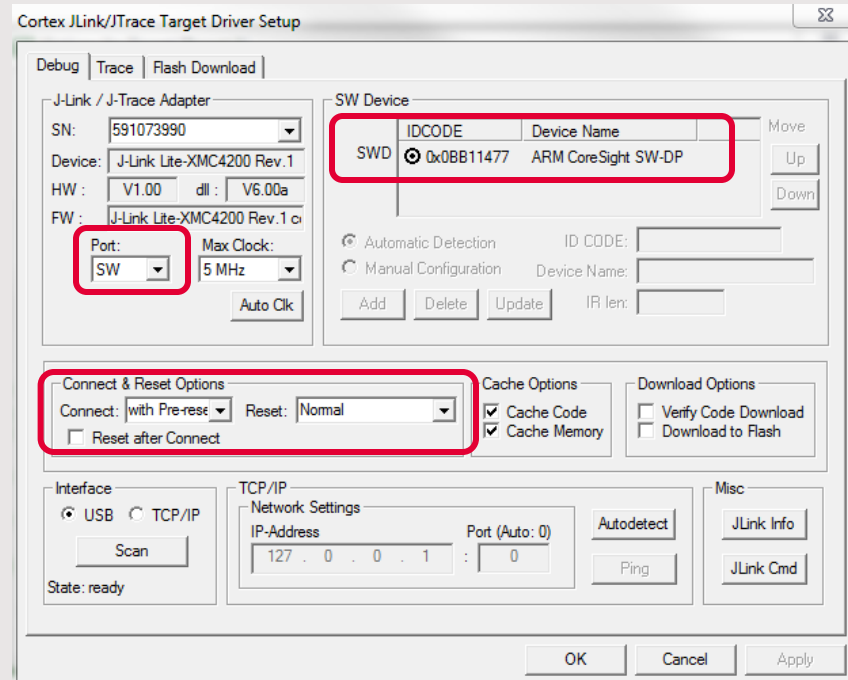
## Pack Installer



# Toolchain installation: 3/4

## Segger JLINK-Lite driver:

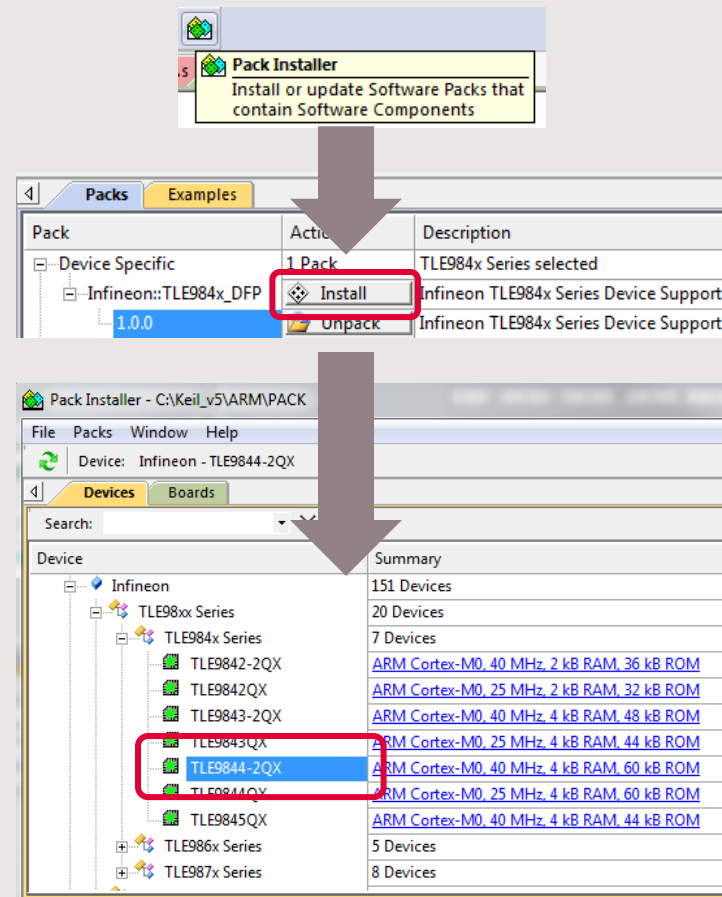
- › Driver for “on-board” or “stand-alone” debugger
- › Install driver from:  
<https://www.segger.com/jlink-software.html>
- › TLE984x support is included from V5.10 upwards



# Toolchain installation: 4/4

## PACK-file TLE984x for µVision5:

- › Device database for all TLE984x variants
- › Device support for flashing/erasing TLE984x
- › SFR description for register debugging
- › Device description for TLE984x for Config Wizard (XML)
- › Includes SDK (Software Development Kit)
- › Code examples included



# Agenda

1

TLE984x Evalboard overview

2

Product Information links

3

Toolchain installation

4

Getting Started

# Getting Started: Infineon ePower SDK

## Keil $\mu$ Vision5 Template

- › Creating new project with Infineon SDK
- › Writing code

## Infineon Config Wizard

- › Initialize modules
- › Timers
- › GPIOs

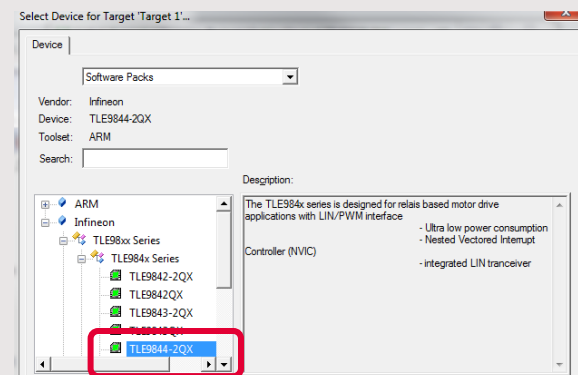
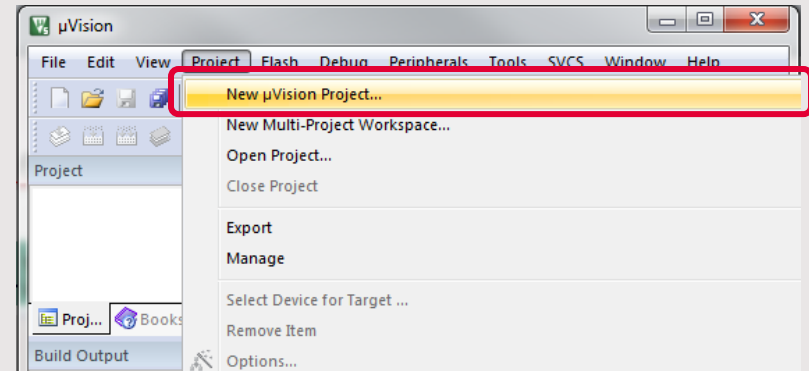
## J-Link Configuration

- › Connect device
- › Program flash
- › Using debug window

# Getting Started: Infineon ePower SDK Keil $\mu$ Vision5 Template

## 1) Create new Project

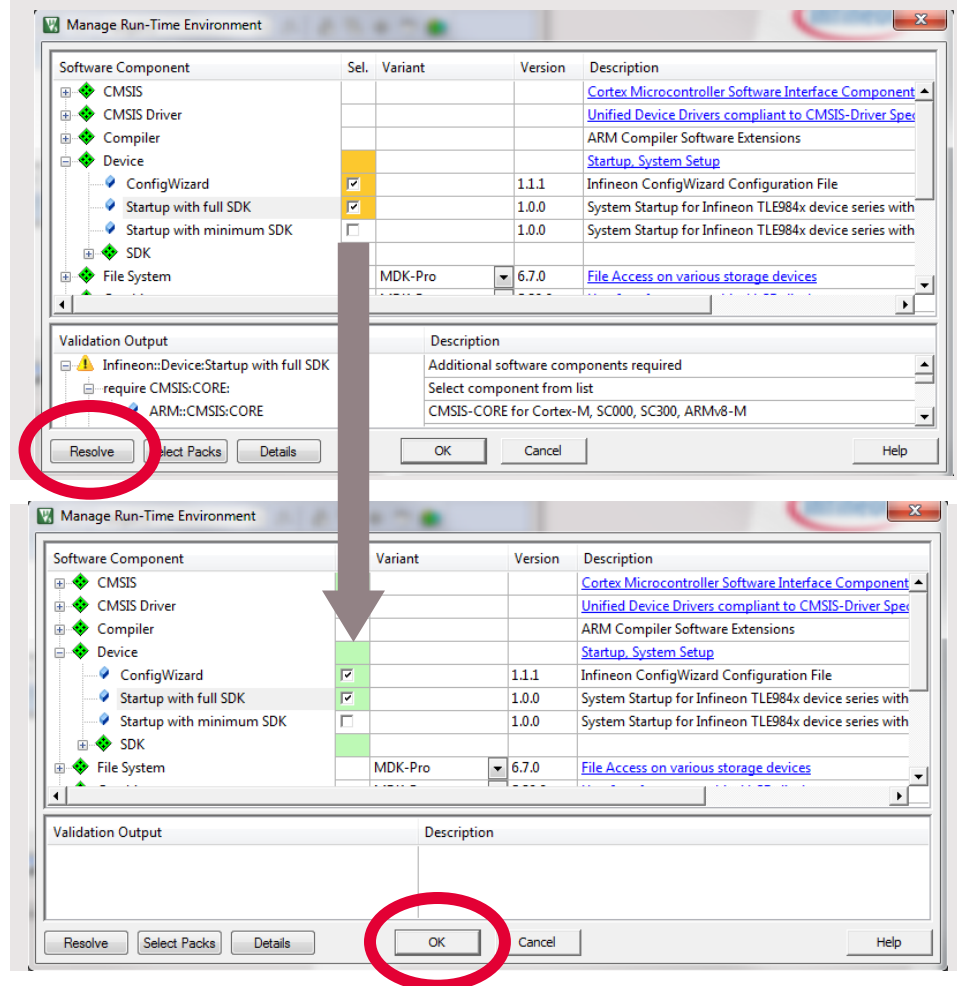
- › Open Keil mdk
- › Go to ->Project  
->new  $\mu$ Vision Project
- › Name project:  
("TIMER2\_BLINK")
- › Select Device
  - › i.e. TLE9844-2QX



# Getting Started: Infineon ePower SDK Keil µVision5 Template

## 2) Configuration of Run-Time Environment

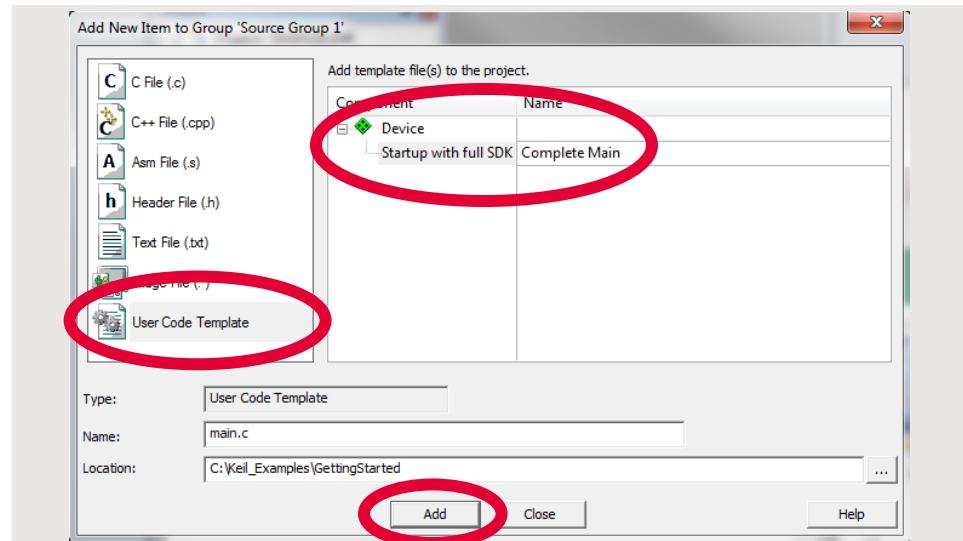
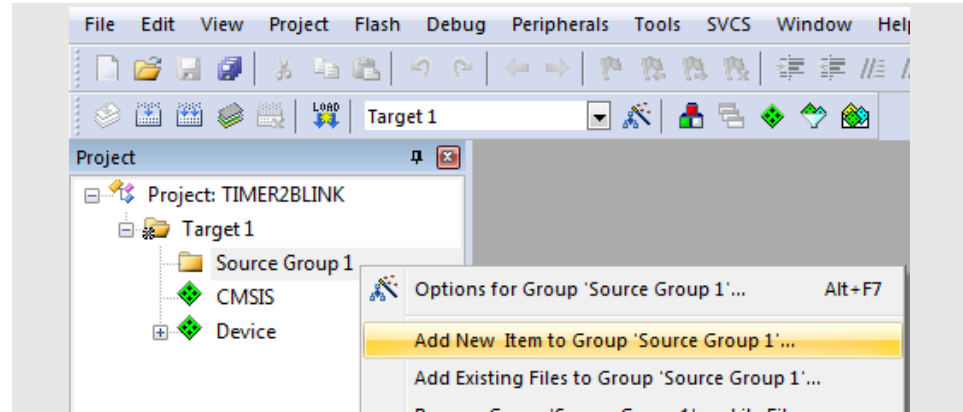
- › Expand: "Device"
- › Check: Config Wizard
- › Check: Startup with full SDK
- › "Sel." window background is **orange**
- › Press: "Resolve"
- › "Sel." window background is now **green**
- › Continue with "OK"



# Getting Started: Infineon ePower SDK Keil µVision5 Template

## 3) Using easy "Main" template

- › Expand: "Target 1"
- › Right click on:  
"Source Group 1"
- › Choose "Add New Item to  
Group 'Source Group 1'"
- › Choose "User Code  
Template"
- › Expand "Device"
- › Choose:  
"Startup with full SDK"
- › Continue with "Add"

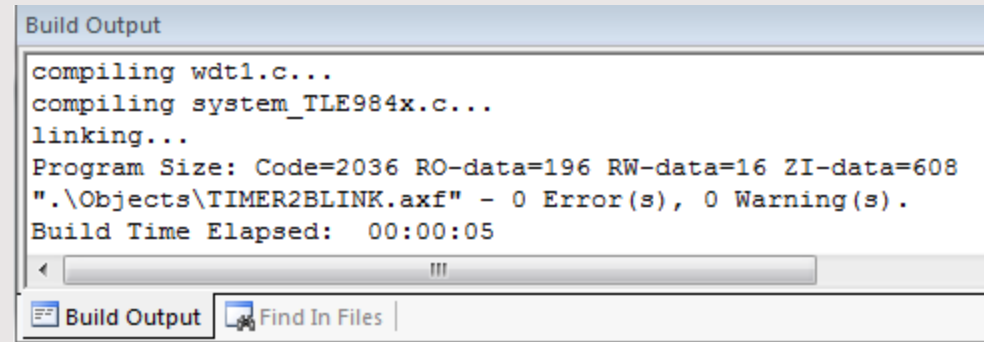
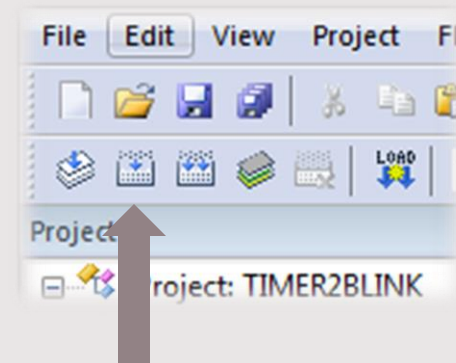




# Getting Started: Infineon ePower SDK Keil $\mu$ Vision5 Template

## 4) Compile Project

- › Compile Project:
  - › Press "Build" Button or press "F7"
- › Project "Build Output" window shows  
0 Error(s) , 0 Warning(s)

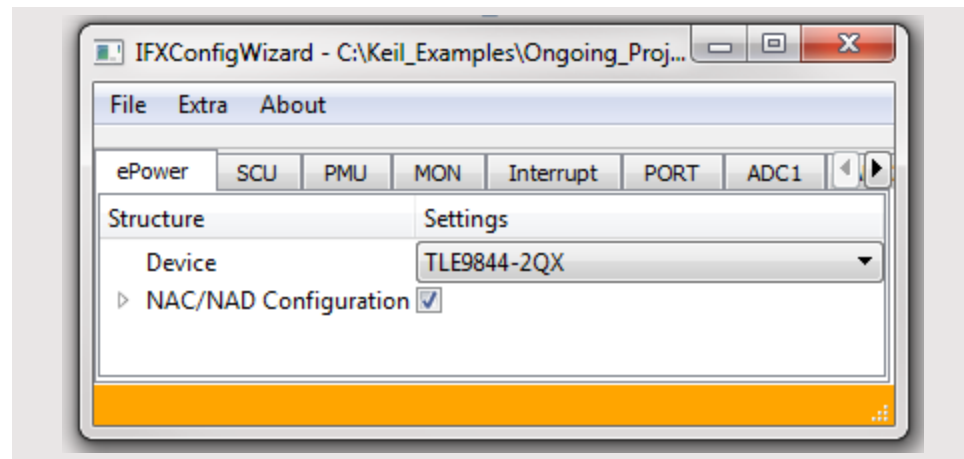
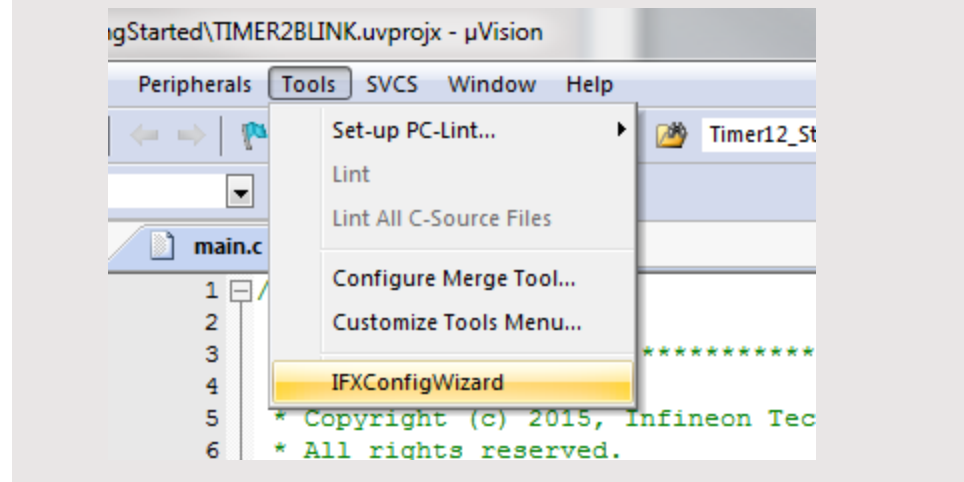


# Getting Started: Infineon ePower SDK

## Keil µVision5 Template

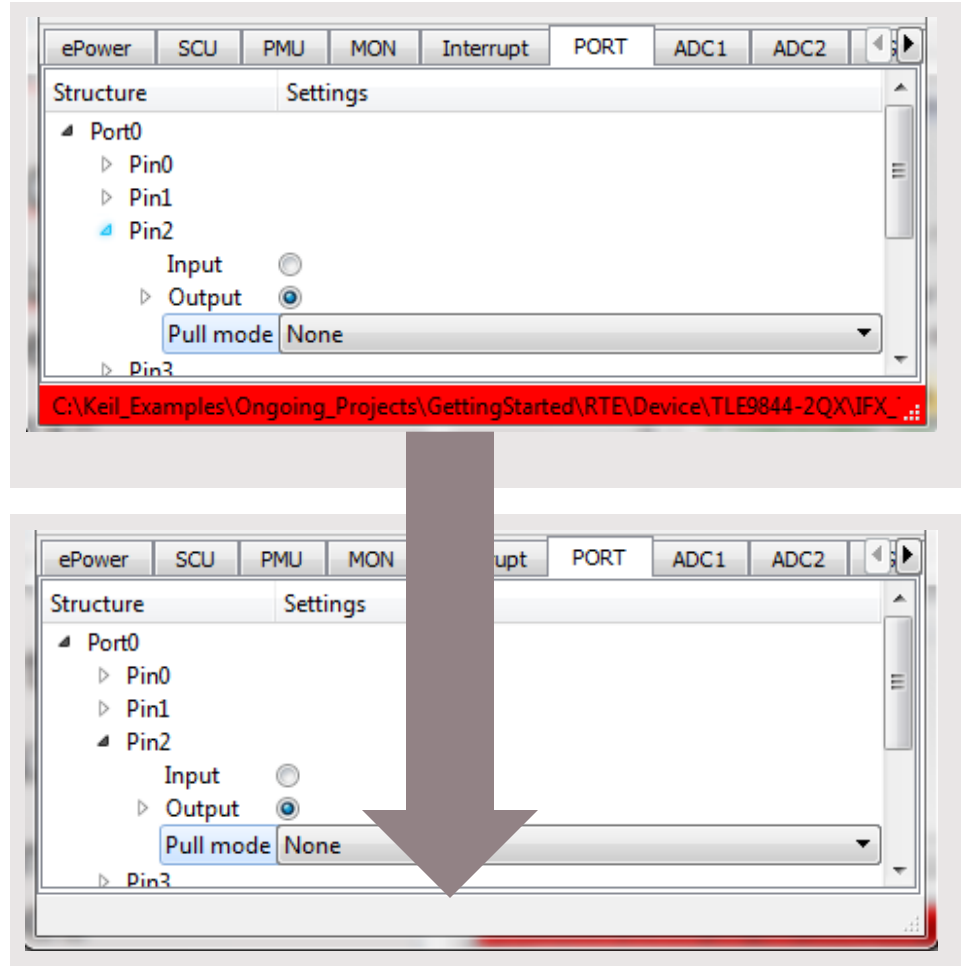
### 5) Using IFXConfigWizard

- › Open IFXConfigWizard by choosing:  
"Tools->IFXConfigWizard"
- › IFXConfigWizard will open in a separate window
- › **orange** status bar indicates an new project
- › **red** status bar indicates unsaved changes
- › **white** status bar indicates saved project



## 5) Using IFXConfigWizard: Port Configuration

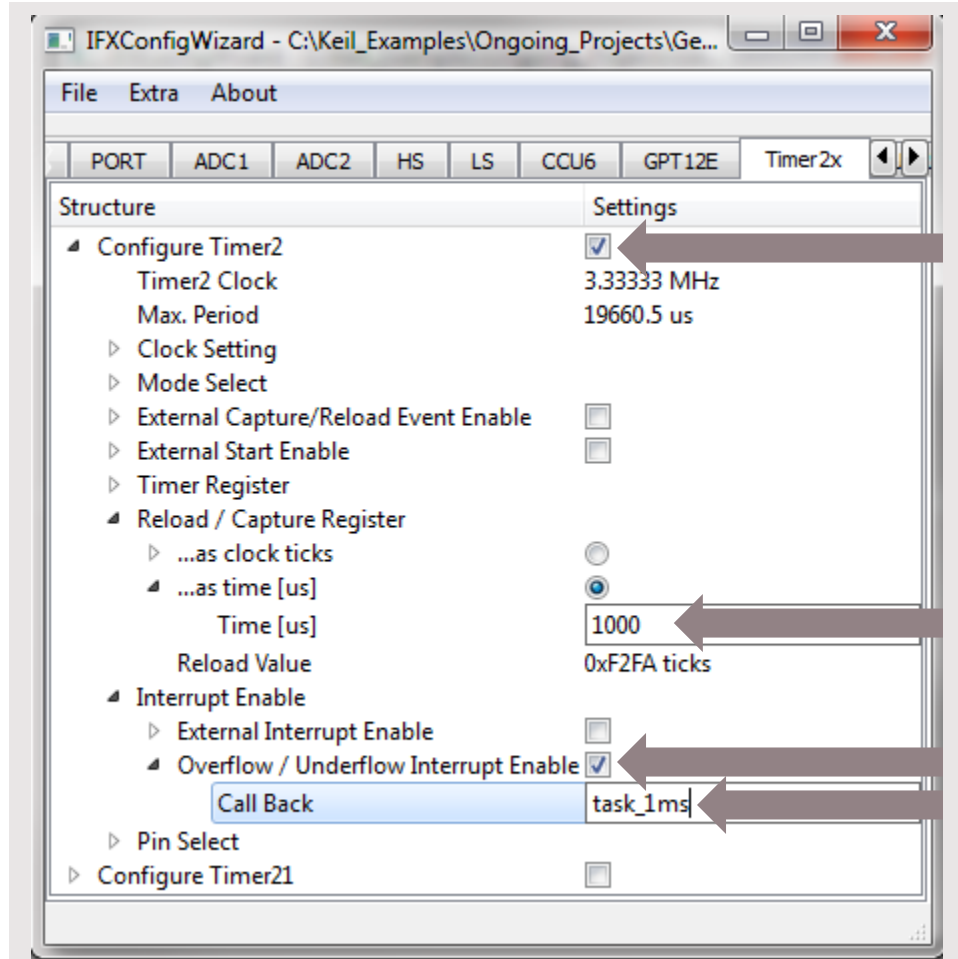
- › Select: "PORT" Chapter
- › Expand "Port0"
- › Expand "PIN2"
- › Configure pin to "Output" mode
- › Save with "File" -> "Save Project"
- › After Saving, status bar turns to **white** color



# Getting Started: Infineon ePower SDK Keil µVision5 Template

## 5) Using IFXConfigWizard: Timer2 Configuration

- › Open "Timer 2x" section
- › Enable "Configure Timer" checkbox
- › Go to "Reload / Capture Register"
  - › Enter 1000 µs
- › Go to "Interrupt Enable"
  - › Enable Overflow Interrupt
  - › Type "task\_1ms" in "Call Back" line
- › Press "Enter" and "Save"



# Getting Started: Infineon ePower SDK Keil µVision5 Template

## 6) Finish Code in "main.c"

- › Go to Keil MDK
- › Start Timer2 before the "while(1)" loop
- › Write function definition of Interrupt call back
- › Use API function "PORT\_ChangePin()"
- › "Save" and "Build" project



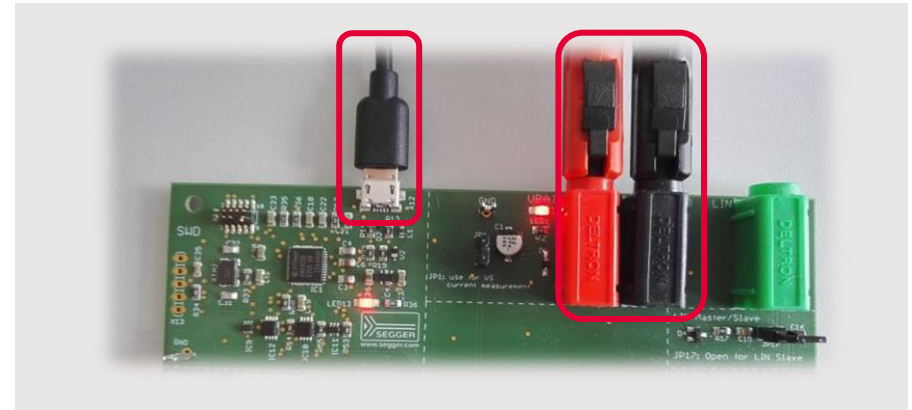
```
119  /*****  
120  ** place your application code here  
121  *****/  
122  TIMER2_Start();  
123  /*****  
124  ** main endless loop  
125  *****/  
126  /*lint -e716 info while(1) ... */ \  
127  /*lint -e9036 Supressing MISRA 2012 Rule 14.4  
128  while (1)  
129  /*lint -e9036 */  
130  /*lint -e716 */  
131  {
```

```
146  /*****  
147  ** Private Function Defi  
148  *****/  
149  void task_lms(void)  
150  {  
151  PORT_ChangePin(0x02, PORT_ACTION_TOGGLE);  
152  }  
153
```

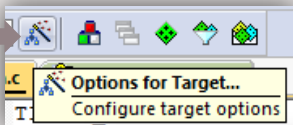
# Getting Started: Infineon ePower SDK Keil µVision5 Template

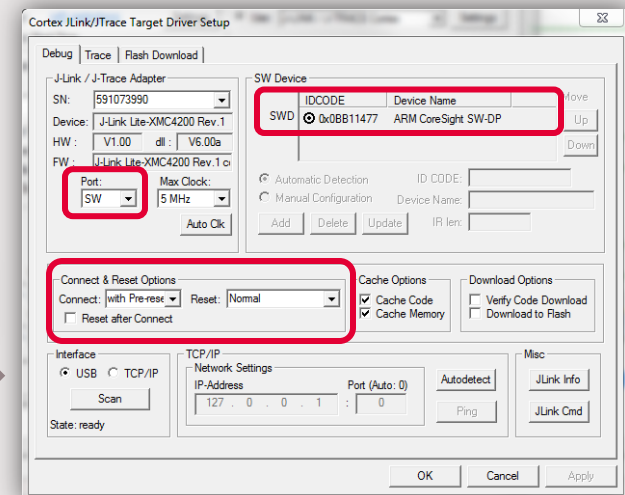
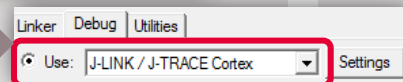
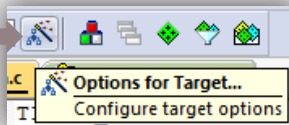
## 7) Power up Evaluationboard

- › Connect micro USB cable
- › Supply board via banana jacks (VBAT, GND)
- › Debug LED and VBAT LED light up



## 8) Connect Debugger

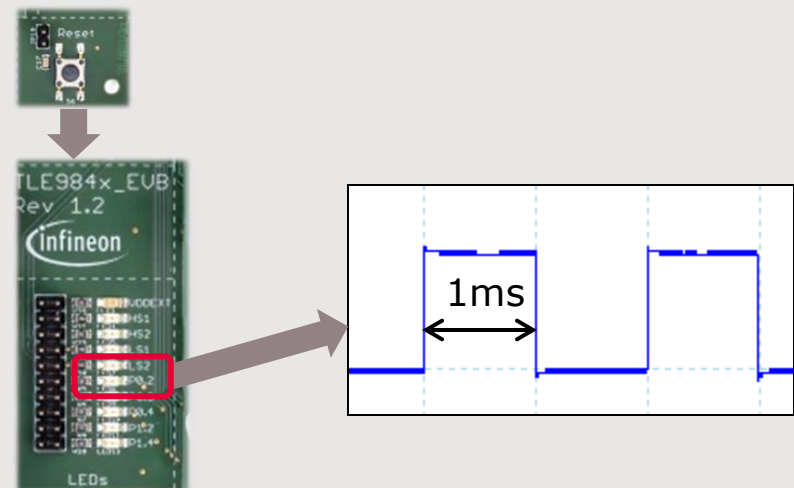
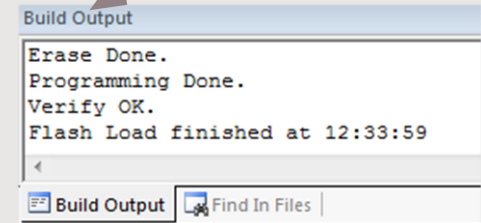
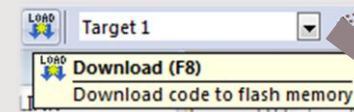
- › Go to 
- › Choose:
  - › Debug->use: J-Link
  - › Go to Settings
- › SWD connection established when "IDCODE" is visible



# Getting Started: Infineon ePower SDK Keil $\mu$ Vision5 Template

## 9) Download and run code

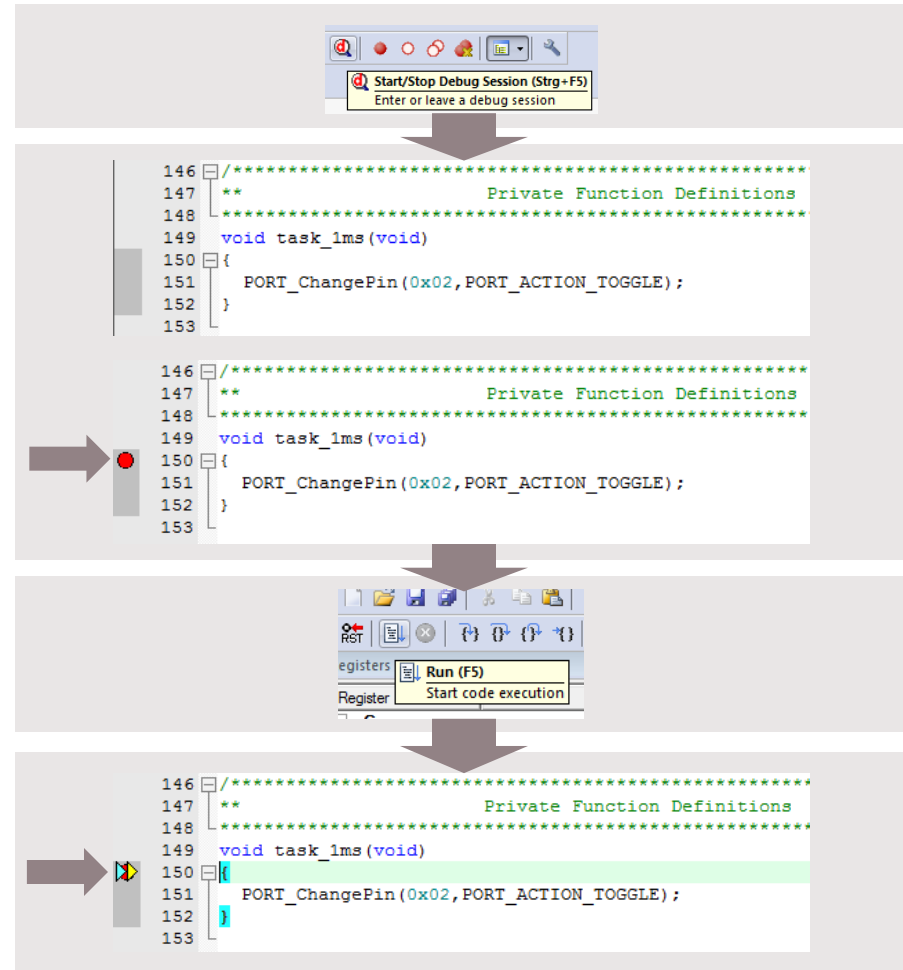
- › Press: "Load"- button or Press: "F8"
- › "Flash Load finished" is shown in "Build Output" window
- › Press: "Reset" button on Evaluation Board
- › LED on Port "P0.2" will light up
- › Port toggle every 1ms



# Getting Started: Infineon ePower SDK Keil µVision5 Template

## 10) Use Runtime Debug

- › Enter "Debug Session"
- › Left click at the dark grey area left of the code, to place a "breakpoint"
- › Hit "Run" or press "F5" to start execution
- › Code execution stops at breakpoint
- › In this example:
  - › Every time "Run" is pressed: "P0.2" toggles

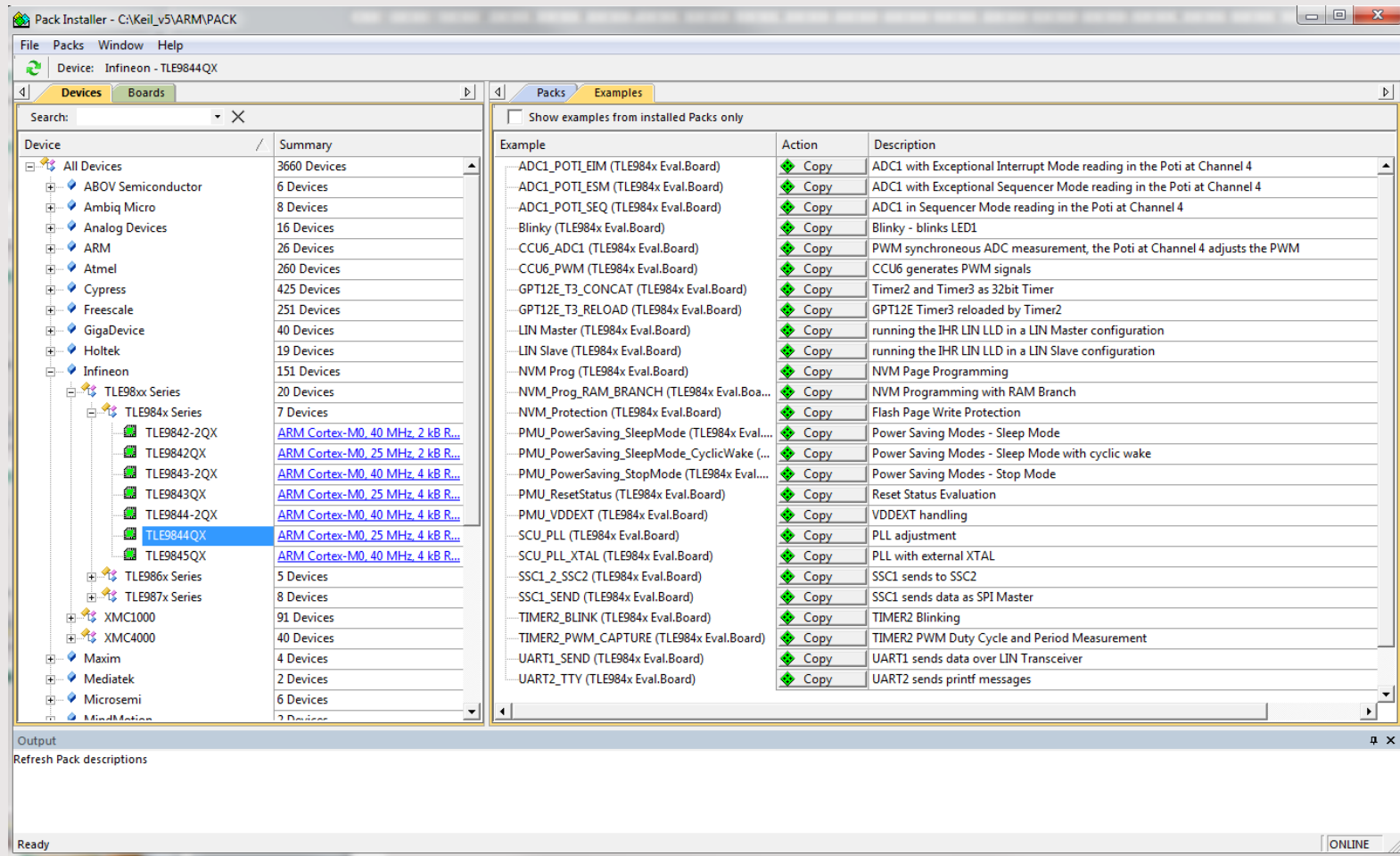




# Getting Started: Infineon ePower SDK Example Code



## Infineon Example Code available in "Pack Installer"





Part of your life. Part of tomorrow.

