TLE9844-2QX Appkit Getting Started

September 2018

Agenda

1. TLE9844-2QX Appkit overview
2. Product information and available documentation
3. How to install the toolchain
4. Set up your example project step by step

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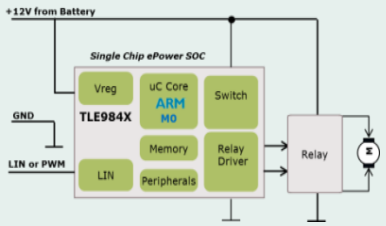
Infineon Embedded Power ICs
TLE9844-2QX Application Kit

Infineon Embedded Power ICs Product Portfolio based on ARM® Cortex® M processor

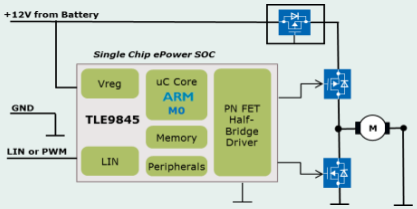
Smart Relay IC DC Motor



TLE9842/3/4

- Window Lift
- Sunroof
- Wiper

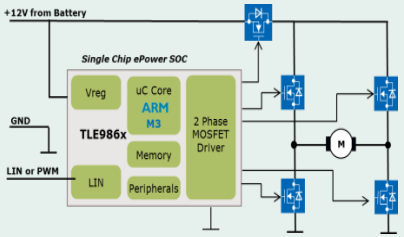
Smart Half Bridge



TLE9845

- HVAC Fan
- Engine Cooling Fan
- Fuel Pump
- Water Pump

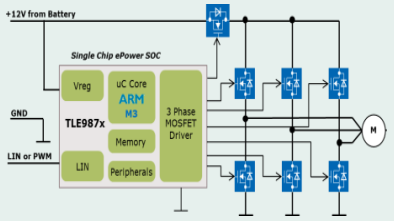
Smart H-Bridge Driver



TLE986x

- Window Lift
- Sunroof
- Wiper
- Power Folding Roof
- Power Sliding Door
- Power trunk/ tailgate

Smart BLDC Driver IC



TLE987x

- Fuel Pump
- HVAC Fan
- Engine Cooling Fan
- Water Pump
- Oil Pump
- Sunroof
- Wiper

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TLE9844-2QX Appkit

- The TLE9844-2QX is part of our Embedded Power products and belongs to the relay driver IC family. The TLE9844-2QX Appkit is designed to evaluate relay driven DC Motor applications. The two layers PCB is space and cost optimized to demonstrate an application near solution.

Target Applications

- Automotive Body & Comfort applications such as sunroof and window lift

Summary of Features

- Automotive qualified relay driver IC (TLE9844-2QX) with integrated high-side switches
- 2-channel relay
- Onboard debug interface

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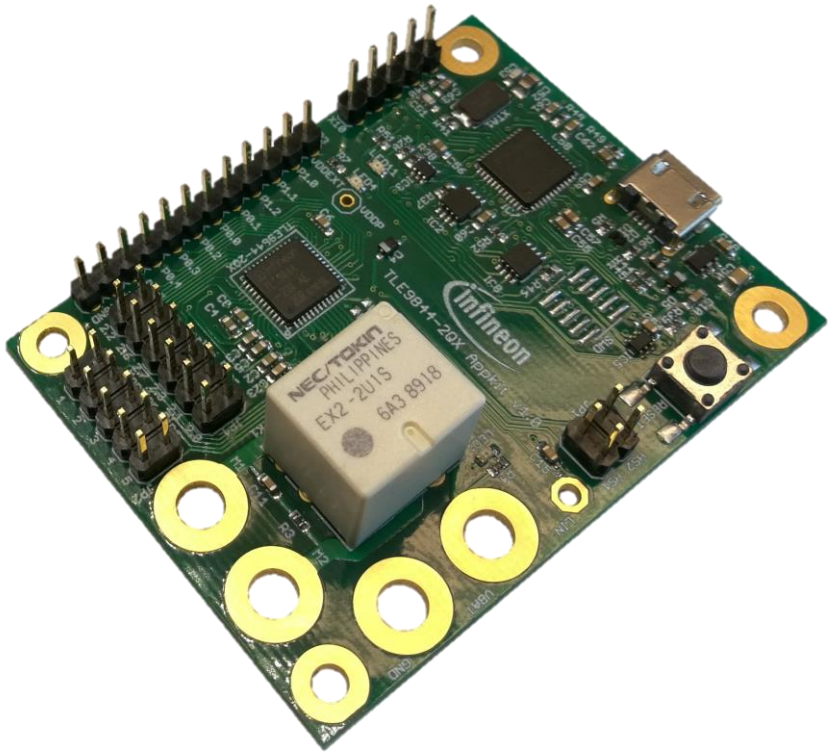
Infineon Embedded Power IC: TLE9844-2QX Application Board

TLE9844-2QX Application Kit

- Voltage supply: typ. 12 V
- Motor current: max. 20 A
- Infineon Relay Driver IC (ARM® Cortex® M0 MCU)
- J-Link OB-Debugger with Serial COM Port
- LIN Interface

TLE9844-2QX_Appkit:
SP002235152



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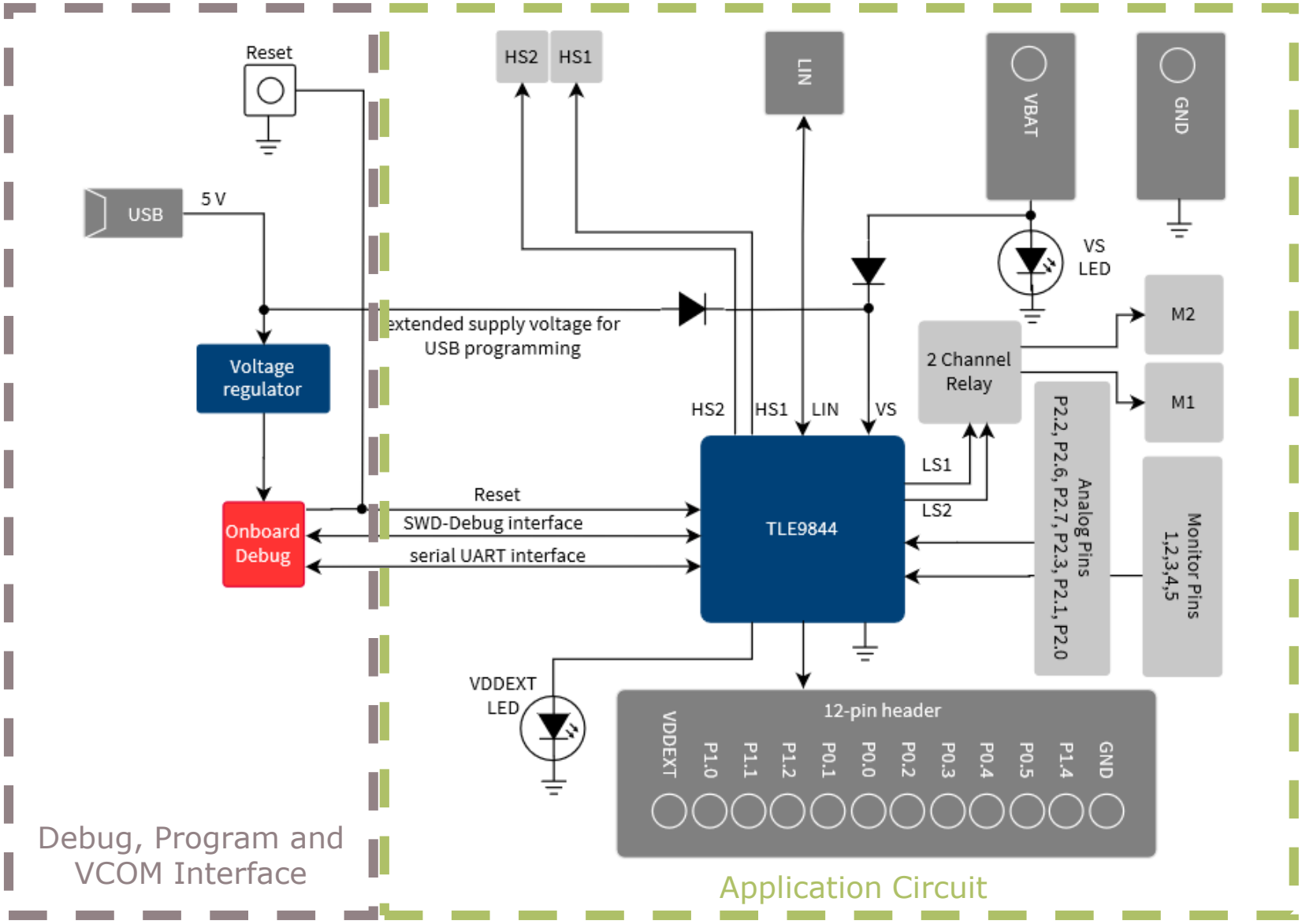
Block diagram



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Support for Relay Driver IC with Integrated ARM® Cortex® M0

Collaterals and Brochures	› Product Brief › Selection Guides › Product Presentations	› Link to family page
Technical Material	› Datasheets › Application Notes › Getting Started › PCB Design Data › User Manuals › Layout Hints	› Link to Documents
Evaluation Boards	› Evaluation Boards › Application Kits	› Link to board pages
Software & Tools	› Config Wizard › Keil µVision5 › Software Examples	› Link to Software & Tools
Videos	› Technical Videos	› Link to Videos

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TLE9844-2QX Application Kit: Documentation

- User Manual for TLE9844-2QX
- Application Note with Application Hints
- Datasheet


TLE9844-2QX Application Kit User's Manual

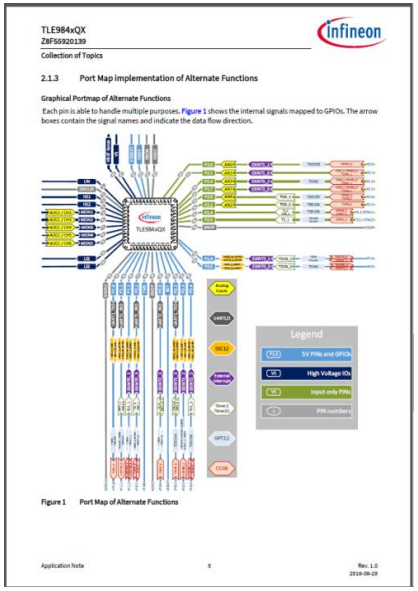
Product Family: TLE984xQX

Figure 1 TLE9844-2QX Application Kit 2-Channel Relay

About this document

Scope and purpose

Intended audience

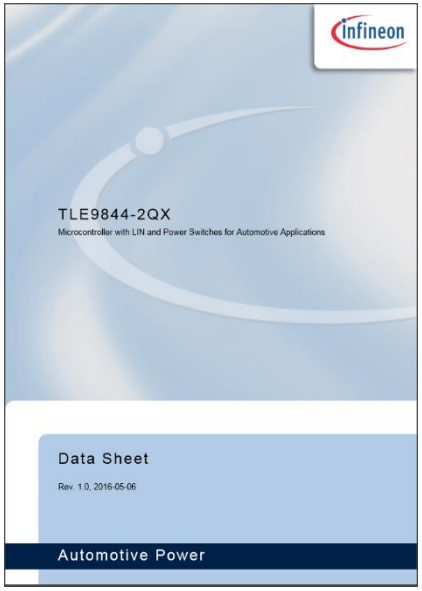

TLE984xQX

Collection of Topics

2.1.3 Port Map implementation of Alternate Functions

Graphical Portmap of Alternate Functions

Figure 1 Port Map of Alternate Functions



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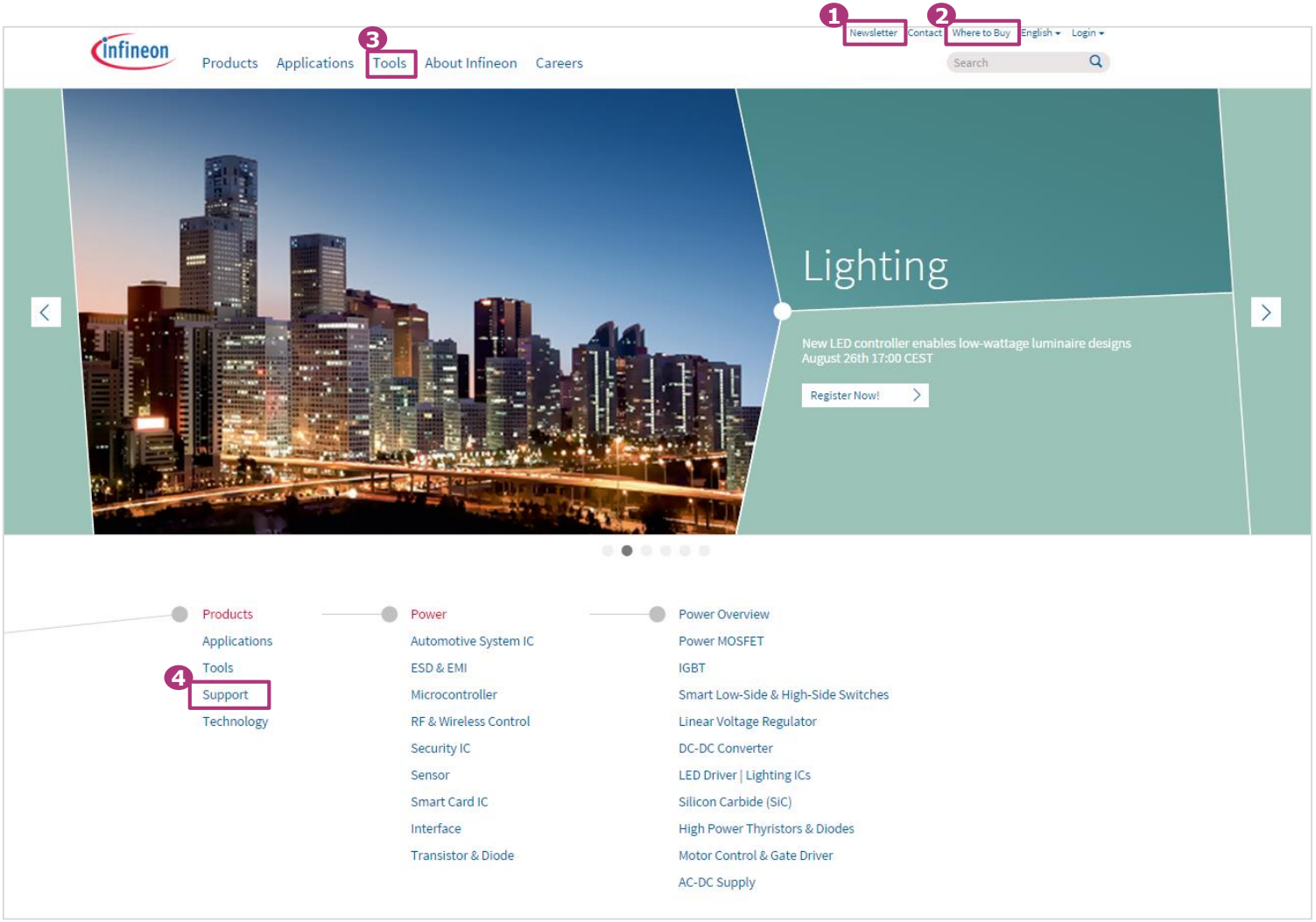
Online tools and services



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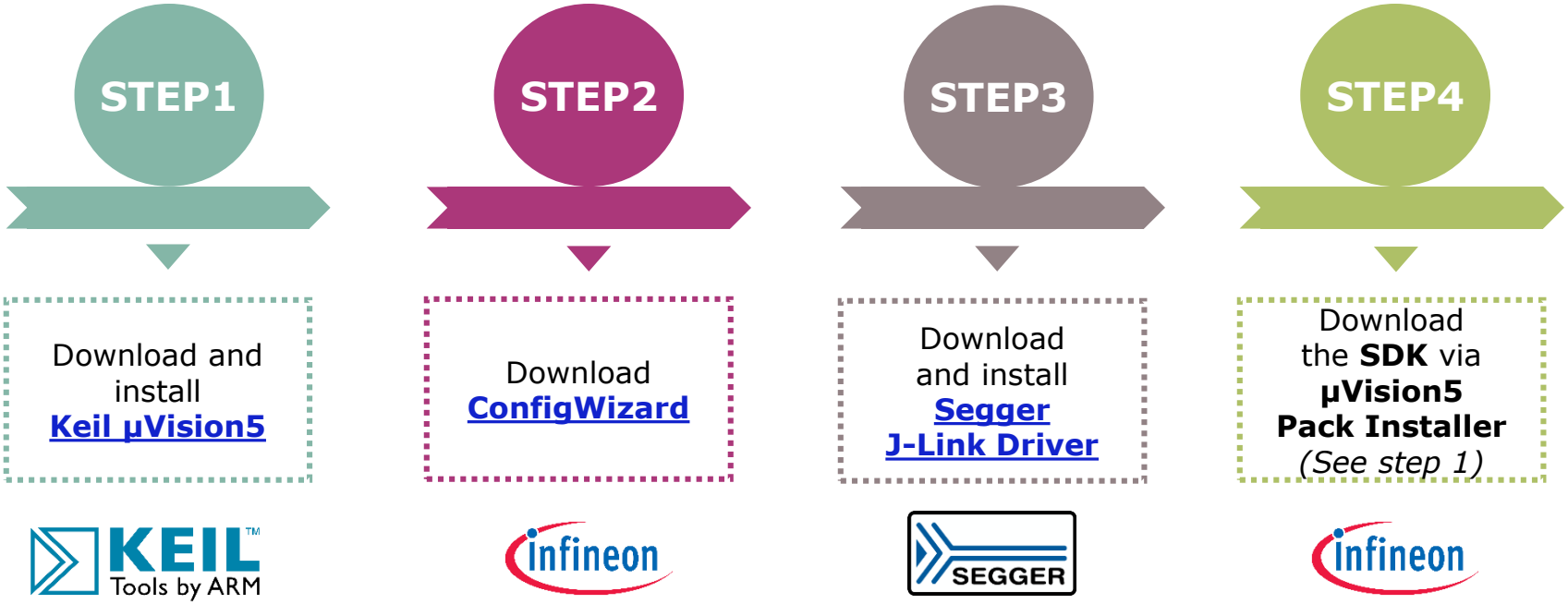
Toolchain installation: General Overview

Infineon Embedded Power ICs are supported by a complete development tool chain provided by Infineon and third party vendors. The tool chain includes compilers, debuggers, evaluation boards, LIN low level drivers and configuration tools as well as variety of example software code.



ARM Keil µVision is an integrated development environment which consists of code editor, compiler and debugger.

Infineon provides the ConfigWizard which is designed for configuration of chip modules. ConfigWizard supports easy configuring of Embedded Power peripherals.

SEGGER J-Link is a widely used driver for "on-board" or "stand-alone" debugger.

The Embedded Power Software Development Kit (SDK) is a low level driver library which can be downloaded within "Keil µVision" via the "Pack Installer".

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Toolchain installation: 1/4

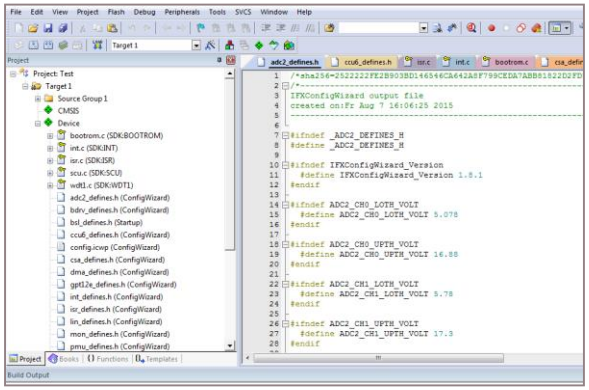


Keil µVision5

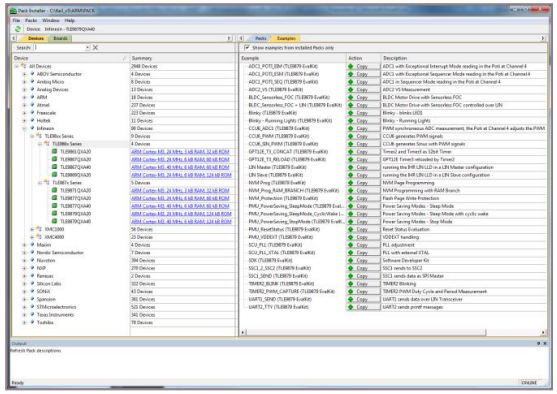
- Code Editor & Online Debugger
- Evaluation version can handle up to 32K

Download from: https://www.keil.com/demo/eval/arm.htm

Main Window



Pack Installer



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Toolchain installation: 2/4

Infineon **ConfigWizard**

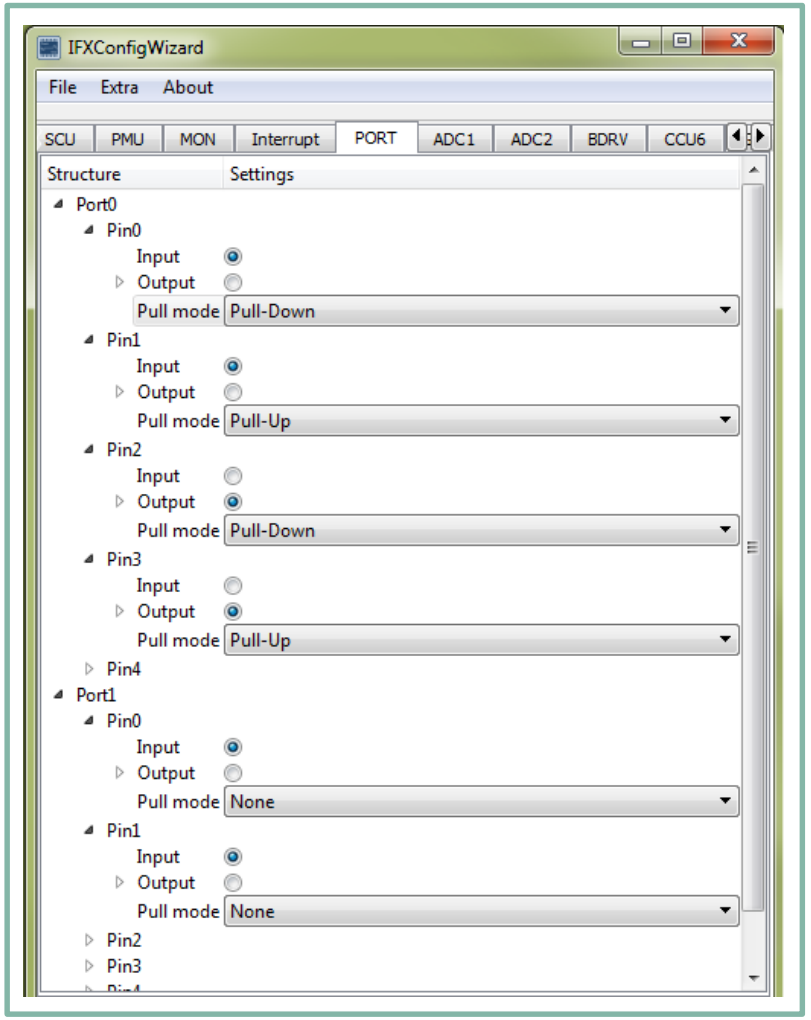
Configuration of chip modules

Infineon homepage: ConfigWizard

Latest version: V1.8.7

Device description for TLE984x included

TLE984x supported with Keil µVision 5



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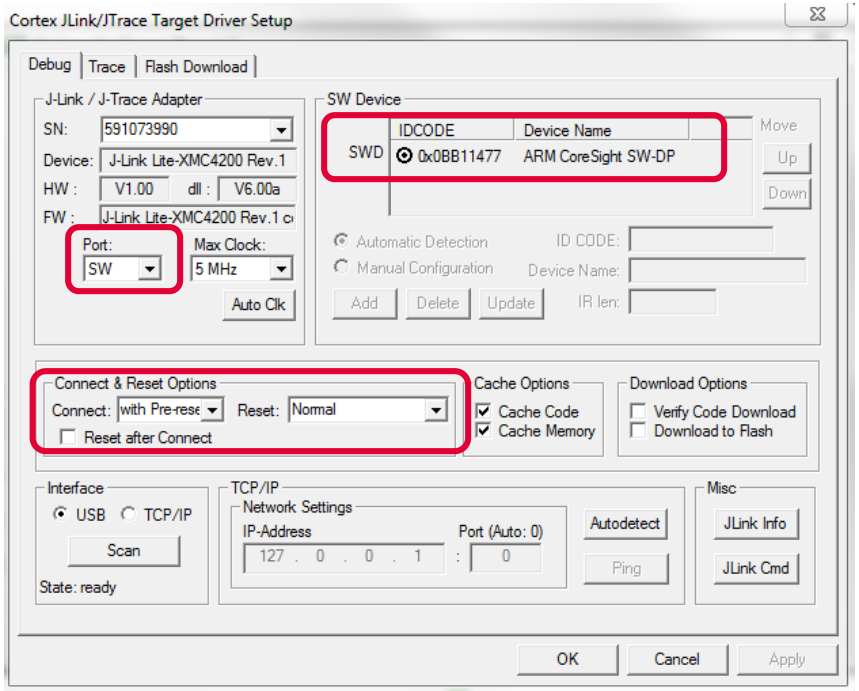
Toolchain installation: 3/4

Segger J-LINK-Lite driver:

- Driver for 'on-board' or 'stand-alone' debugger
- Install driver from: https://www.segger.com/downloads/jlink/JLink_Windows.exe
- TLE9844-2QX support is included from V5.10 upwards



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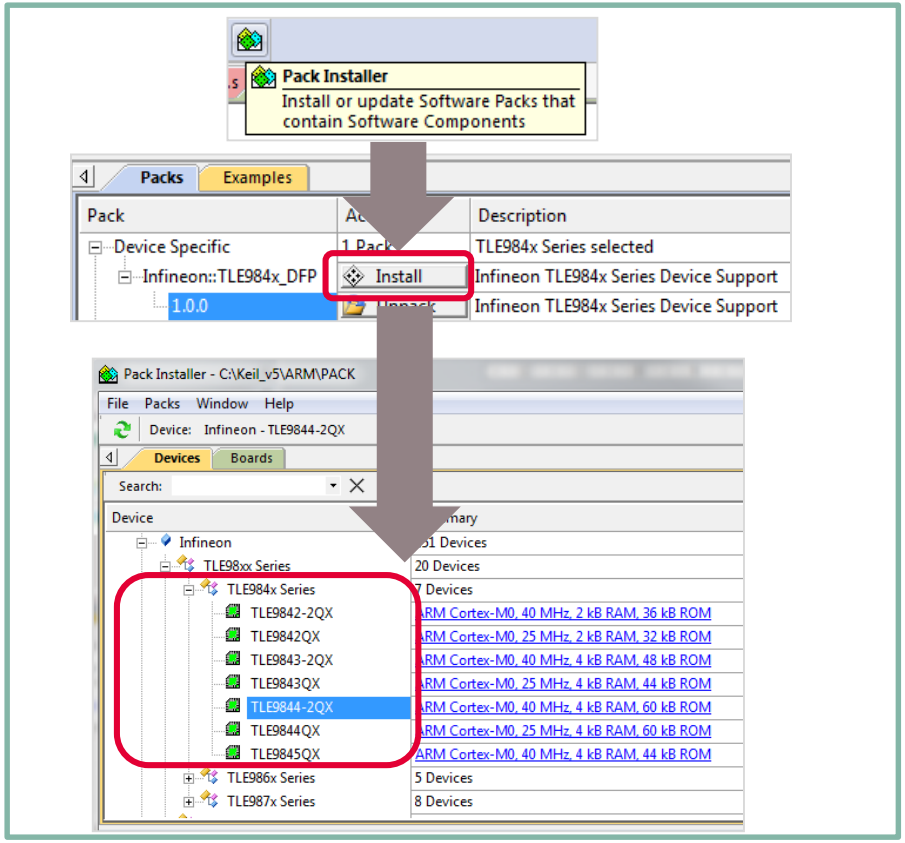
Toolchain installation: 4/4

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



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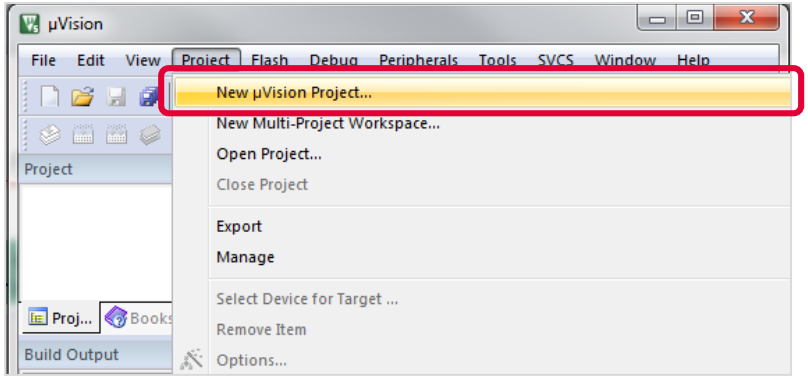
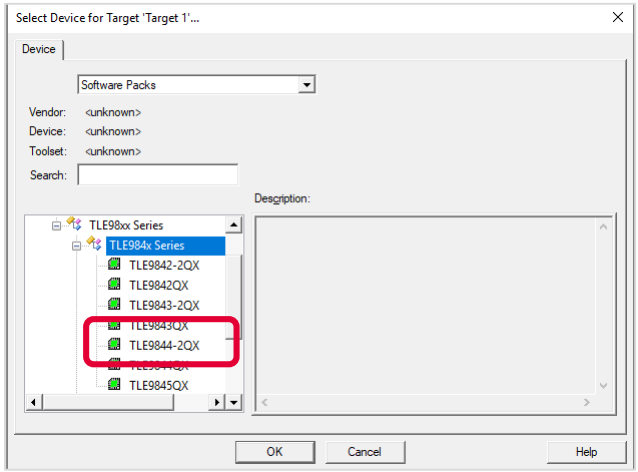
Getting Started: How to create a new project

1) Create a new Project

- Open Keil mdk
- Go to → Project
  → new µVision Project
- Name project: ('relay_click')
- Select Device:
  - Infineon
    - TLE98xx Series
      - TLE984x Series
        - TLE9844-2QX





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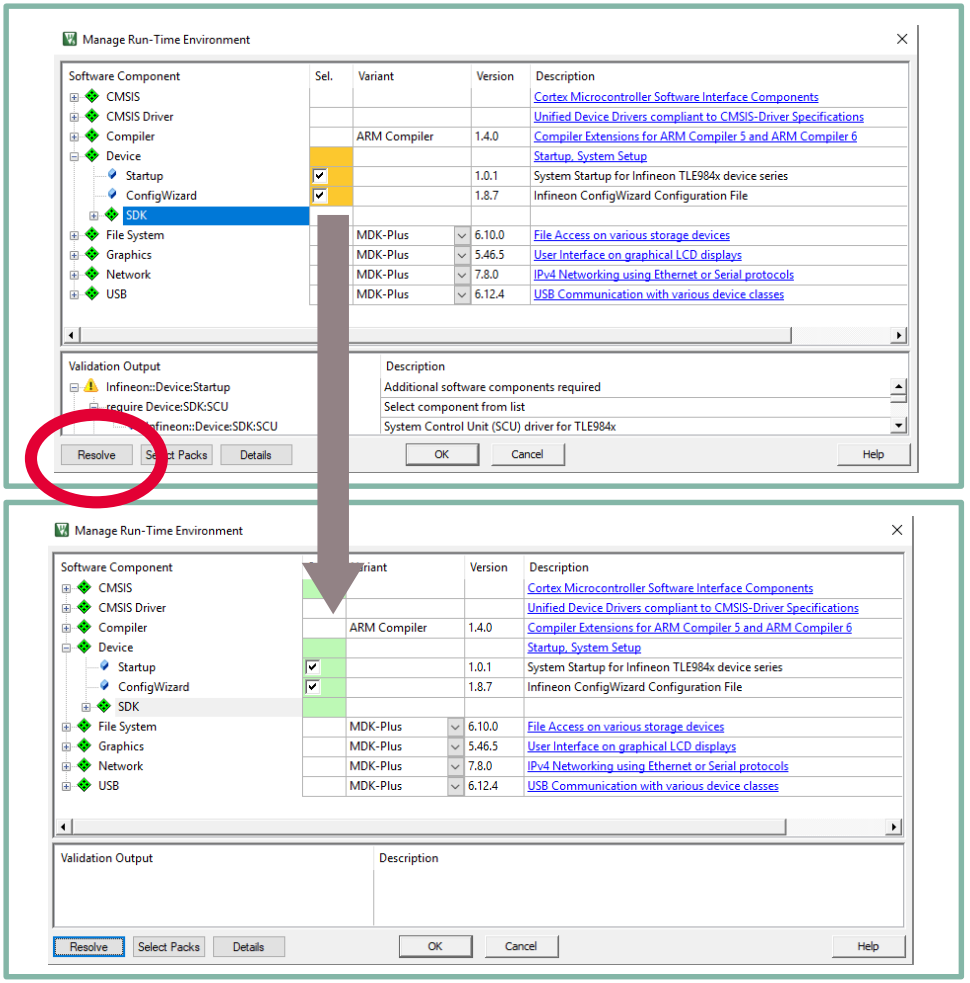
Getting Started: How to configure your run-time environment

2) Configuration of Run-Time Environment

- Expand: ‘Device’
  - Check: Startup
  - Check: Config Wizard
- ‘Sel.’ window background is **orange**
- Press: ‘Resolve’
- ‘Sel.’ window background is now **green**
- Expand ‘SDK’ and activate ‘LS’ Module





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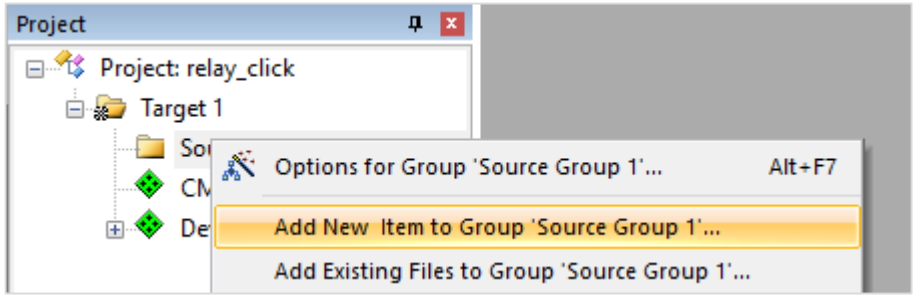
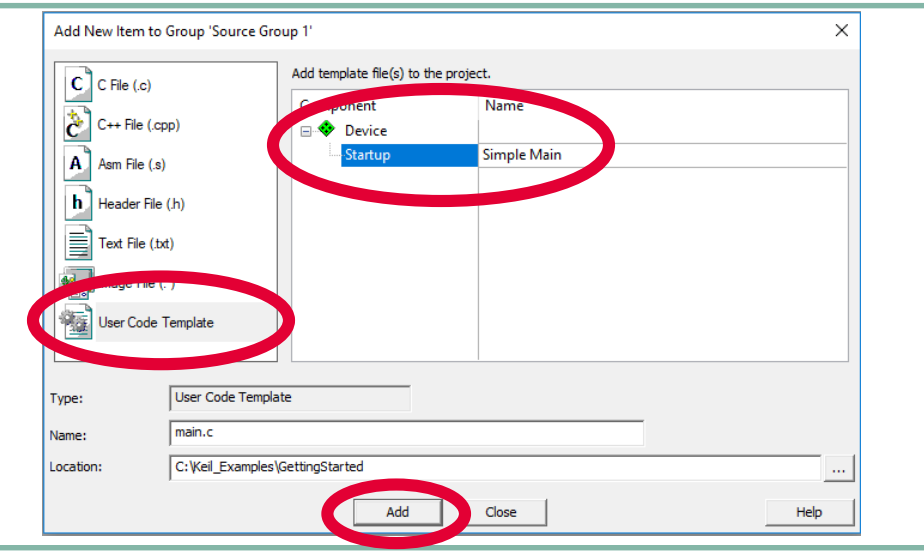
Getting Started: Use standard templates

3) Using easy 'Main' template

1. Expand: ‘Target 1’
2. Right click on:
   ‘Source Group 1’
3. Choose: Add New Item to Group ‘Source Group 1’
4. Choose ‘User Code Template’
5. Expand ‘Device’
6. Choose:
   ‘Startup’
7. Continue with ‘Add’





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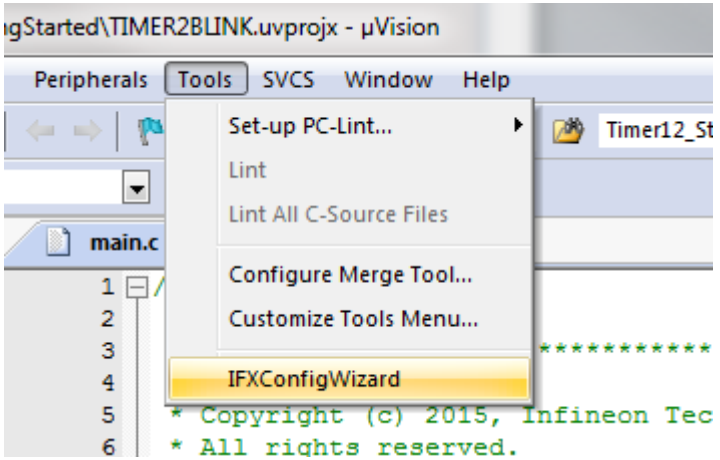
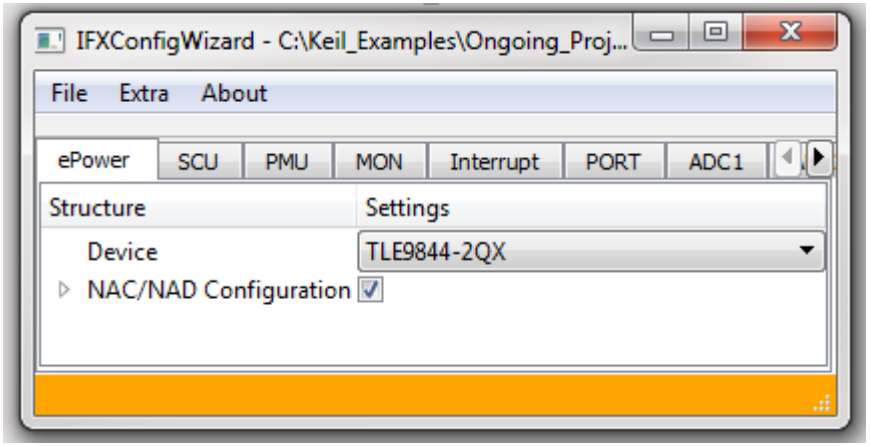
Getting Started: How to use the Config Wizard

4a) Using Config Wizard

- Open Config Wizard by choosing:
  'Tools → Config Wizard'
- Config Wizard will open in a separate window
- **orange** status bar indicates a new project
- **red** status bar indicates unsaved changes
- **white** status bar indicates saved project





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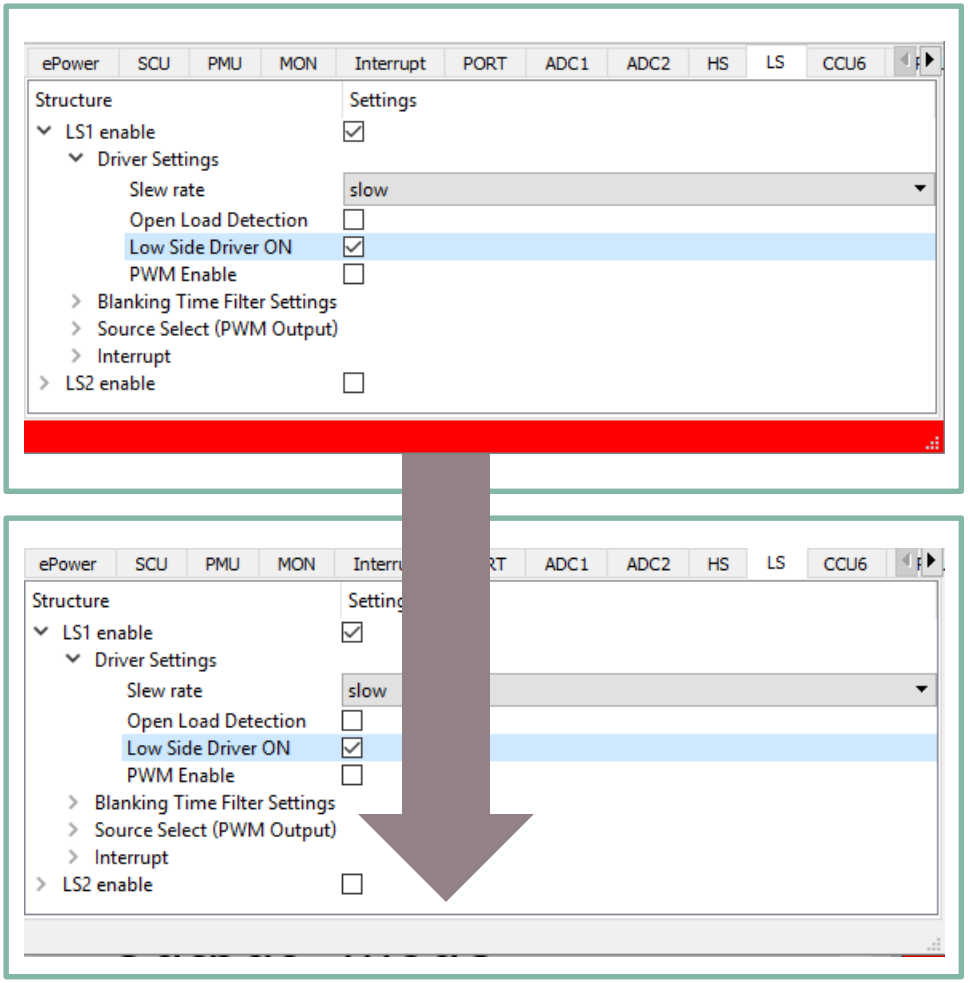
Getting Started: How to configure the individual ports

4b) Using Config Wizard: Low Side Switch Configuration

- Select: ‘LS’ Chapter
- Enable ‘LS1’
- Expand ‘LS1’
- Expand ‘Driver Settings’
- Check Low Side Driver ON
- Save with ‘File’ -> ‘Save Project’
- After Saving, status bar turns to **white** color



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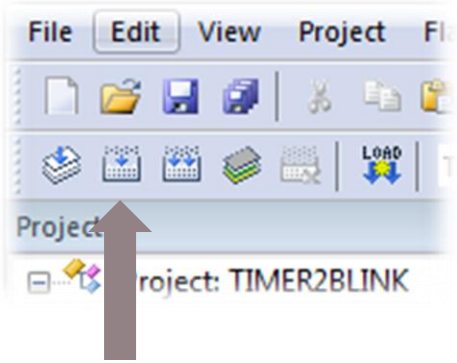
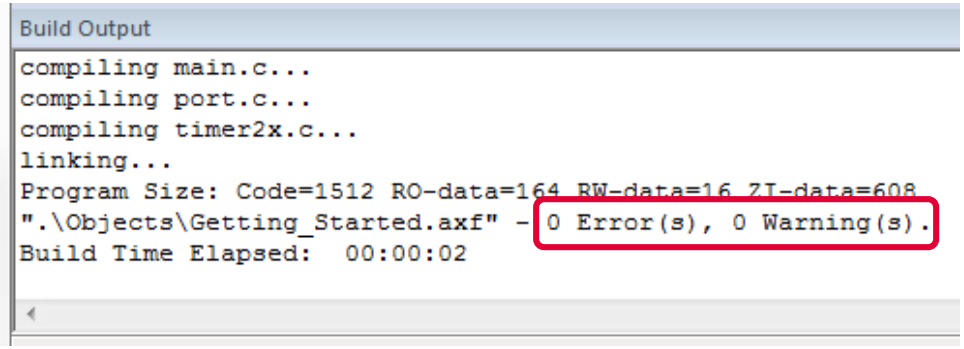
Getting Started: How to compile your projects

4) Compile Project

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





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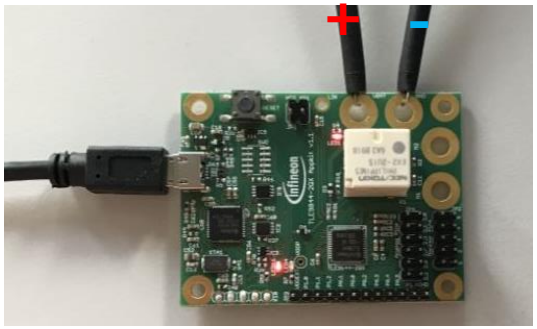
Getting Started: Power up your board and connect the debugger

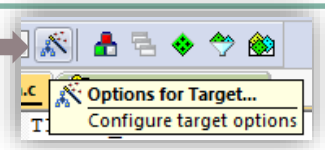
6) Power up Evaluation board

- Connect micro USB cable
- Supply board via 12V power supply (VBAT, GND)
- Debug LED and VBAT LED light up

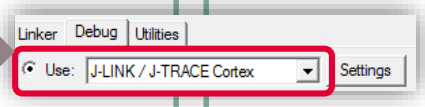


7) Connect Debugger

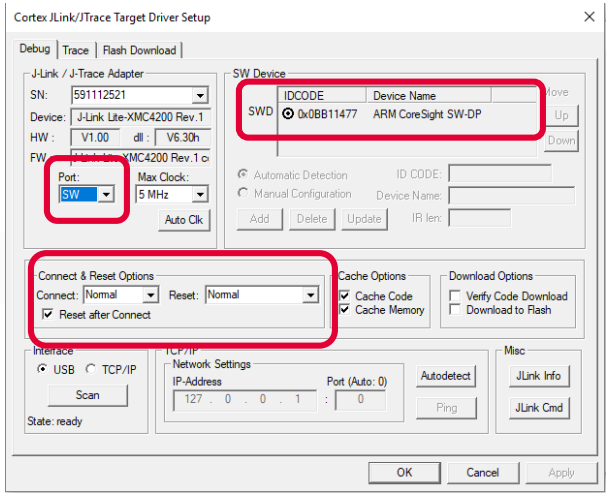
- Go to



- Choose:
  - Debug->use: J-Link



  - Go to Settings



- SWD connection established when ‘IDCODE’ is visible

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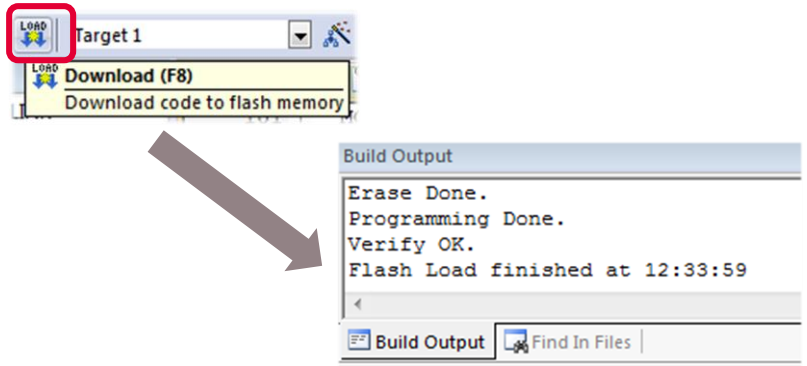
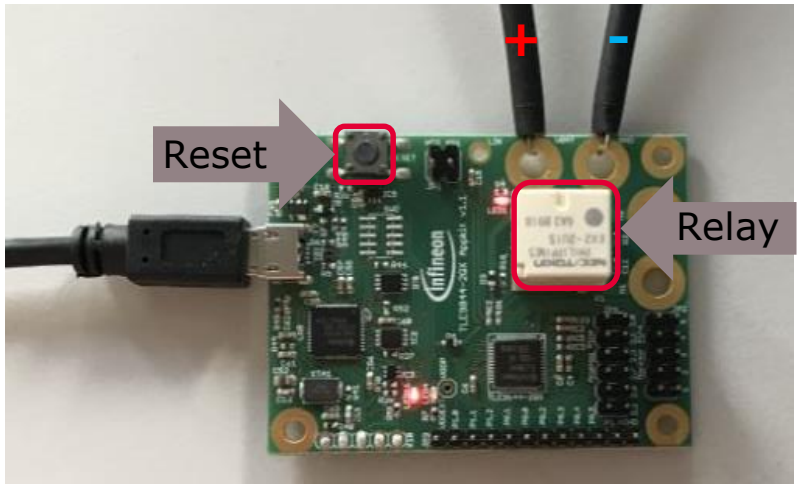
Getting Started: How to download and run your code

8) Download and run code

- Press: ‘Load’- button or Press: ‘F8’
- ‘Flash Load finished’ is shown in ‘Build Output’ window



- Press: ‘Reset’ button on Application Kit
- LS1 activate first relay coil
- Ticking noise occur



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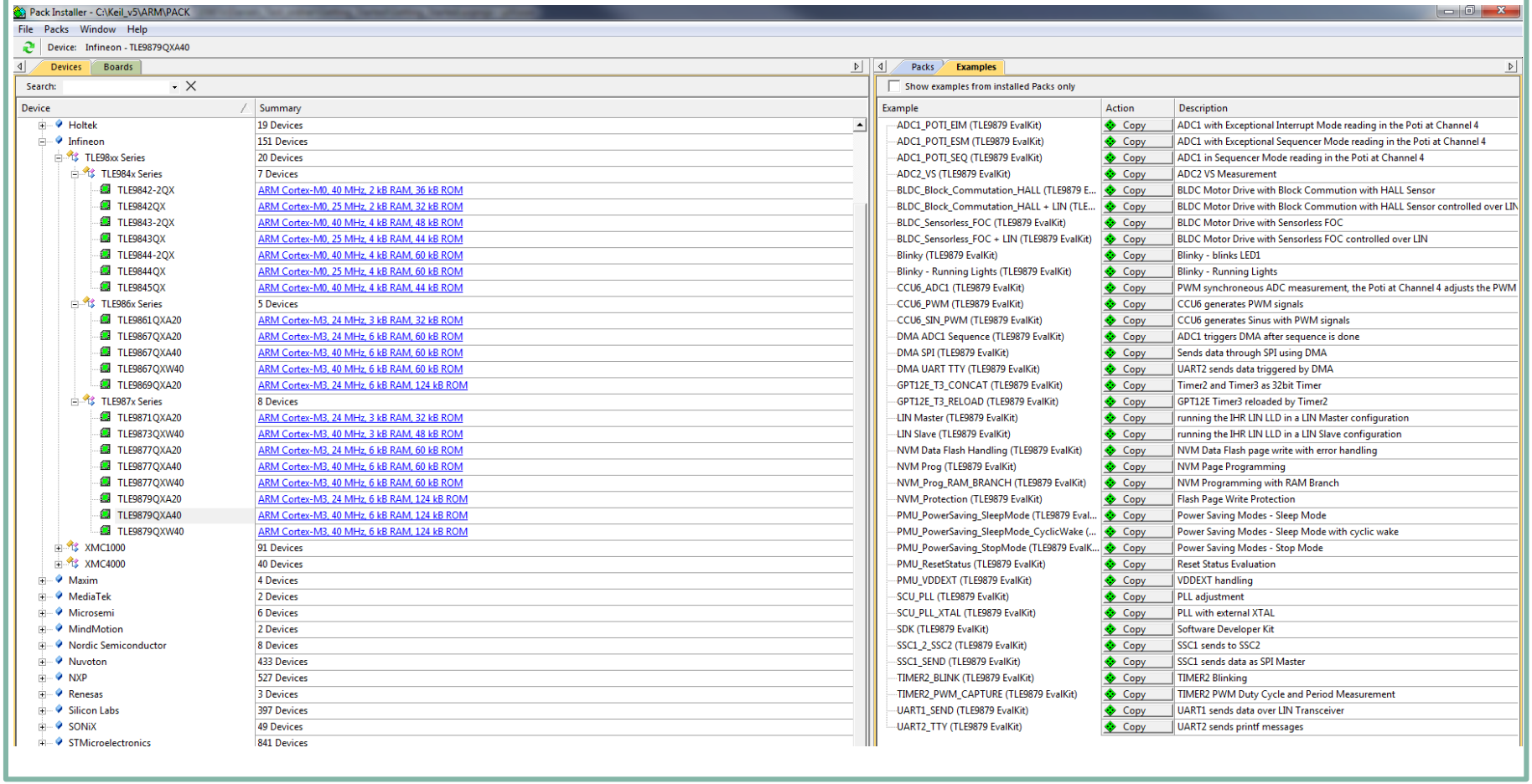
Getting Started: Available example code

Infineon Example Code available in “Pack Installer”



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