

ZIGBEE 3.0 TRAINING

K32W041AM

GETTING STARTED – INSTALLATION

FORREST SUN



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Agenda

- **Objectives**

- Describes the installation process to make use of the ZigBee 3.0 Application Notes

- **Audience**

- Developers

- **Pre-requisites**

- None

- **Reference Material**

- JN-AN-1260 ZigBee 3.0 Getting Started

- **Duration**

- 30 minutes

- **Contents**

- Install MCUXpresso
- Install SDK
- Install ZB3.0 configuration tool
- Install Python3.8
- Install DK6 FlashProgrammer
- Install Gawk(optional)
- Install BeyondStudio(optional)

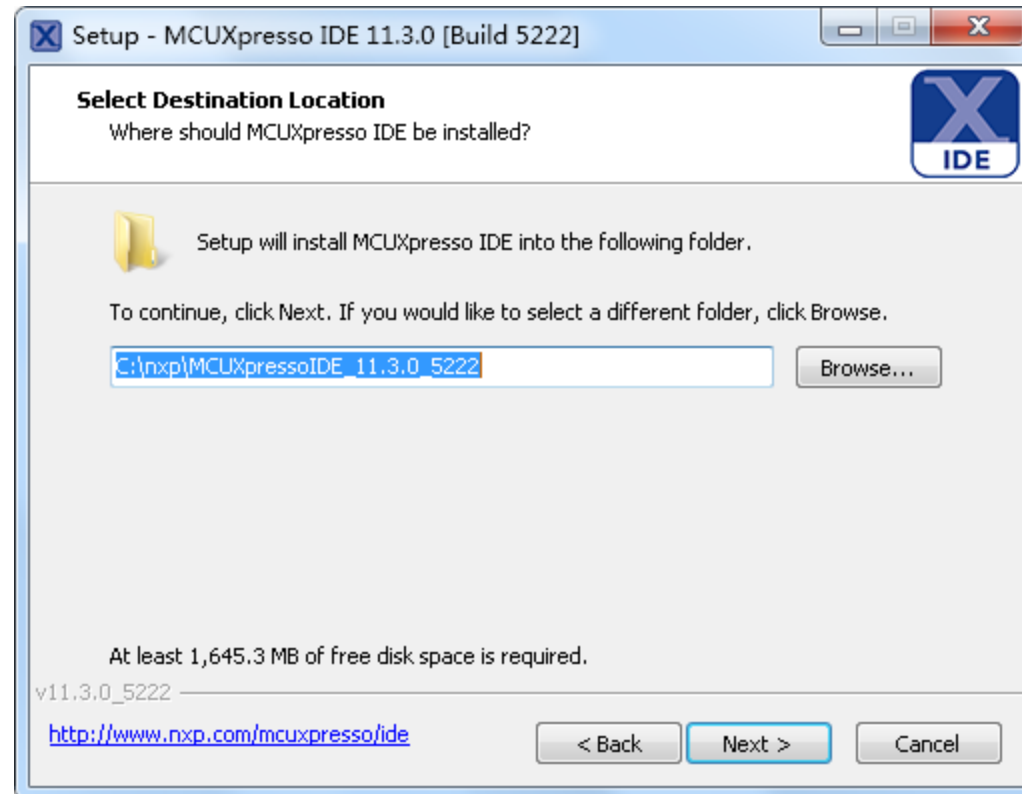


MCUXPRESSO



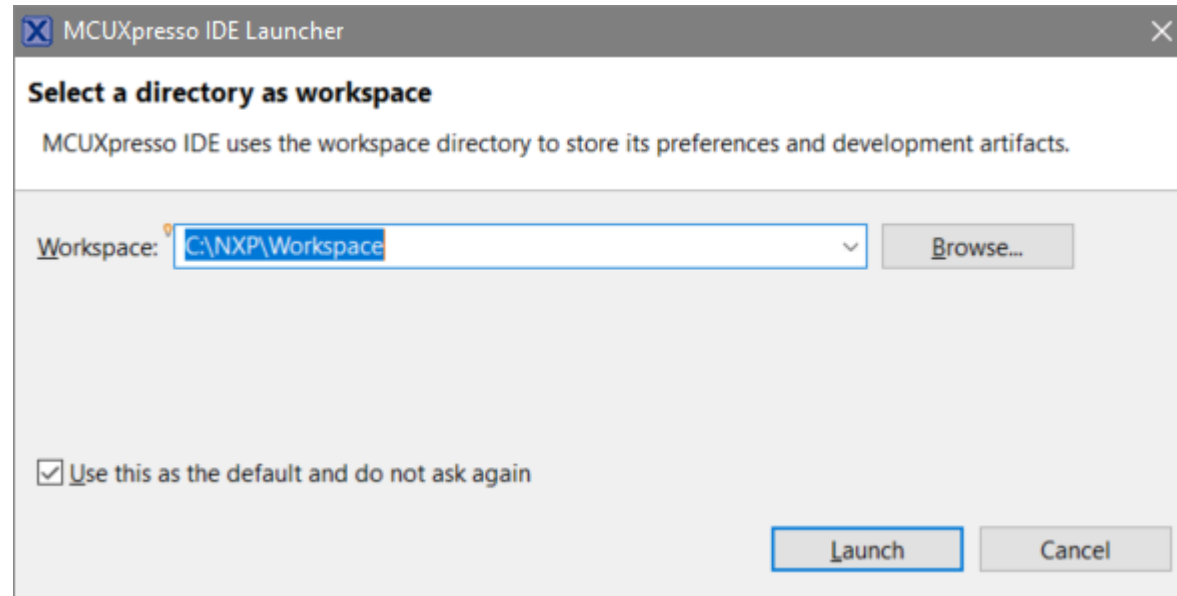
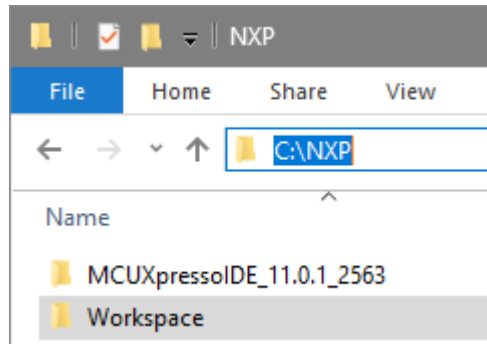
MCUXpresso – Installation

- MCUXpresso should be installed using the default settings
 - Will install to **C:\NXP\MCUXpressoIDE_11.3.0_5222**
 - Do not run until the Workspace folder has been created (next slide)



MCUXpresso – Workspace Folder

- Create a **C:\NXP\Workspace** folder
- Run MCUXpresso
 - When prompted use the **Browse** button to select the created Workspace folder
 - (Optional) Tick the checkbox to avoid future Workspace prompts

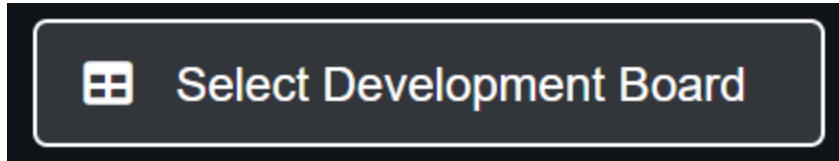


SDK



SDK Download from <https://kex-stage.nxp.com/>

Step 1



Click *Select Development Board*

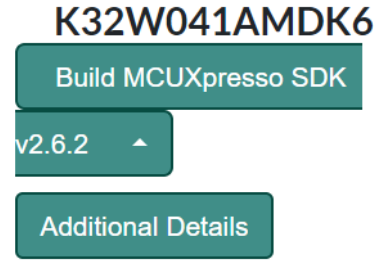
Step 2

Search by Name



Choose *K32W041AMDK6*

Step 3



Choose the correct version v2.6.3 then click *Build MCUXpresso SDK*

Step 4

SDK Builder

Generate a downloadable SDK archive for use with desktop MCUXpresso Tools.

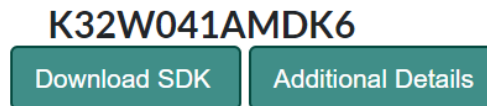
Developer Environment Settings

Selections here will impact files and examples projects included in the SDK and Generated Projects



Click *Select All*

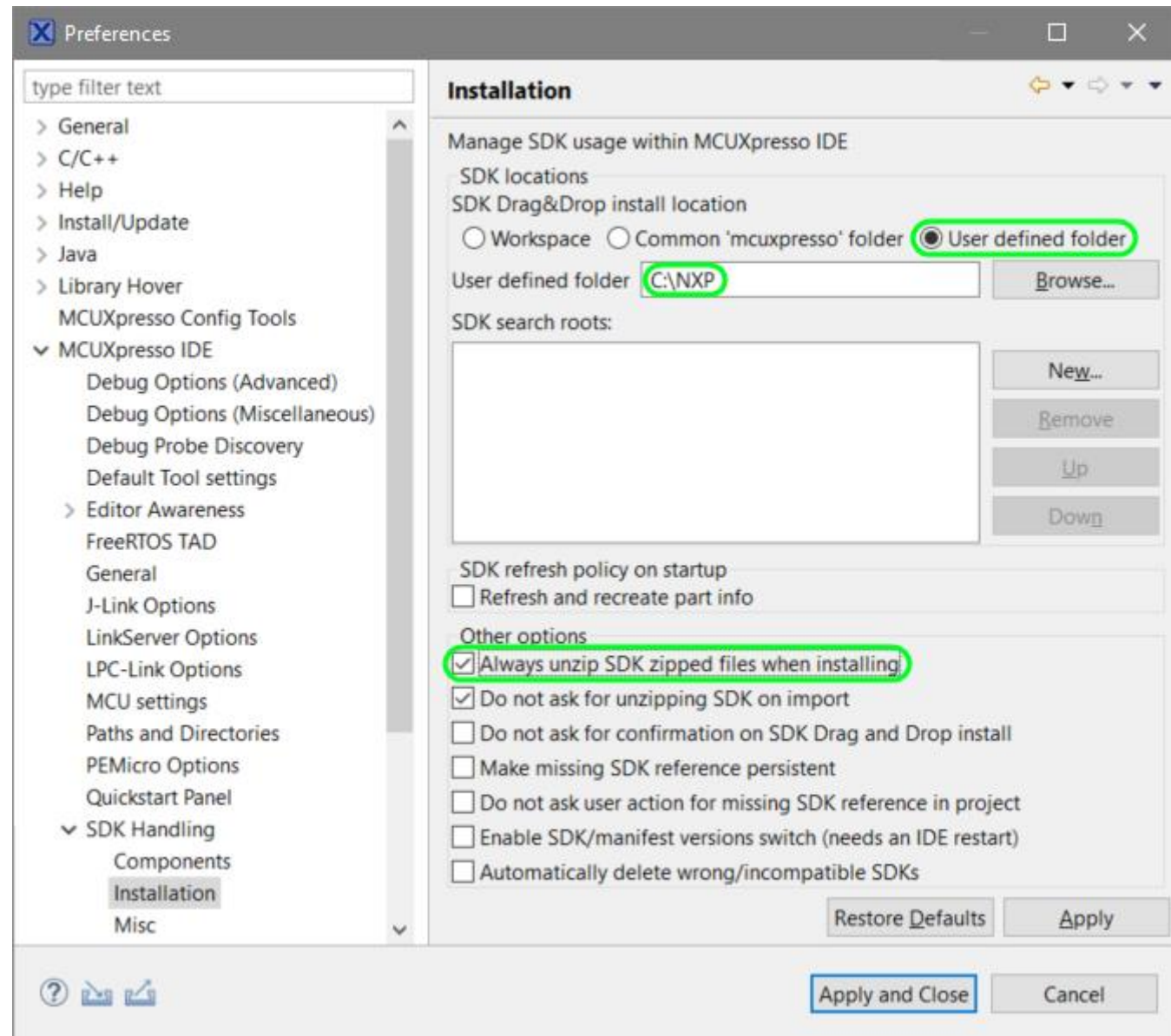
Step 5



Click *Download SDK* to get *SDK_2.6.3_K32W041AMDK6.zip*

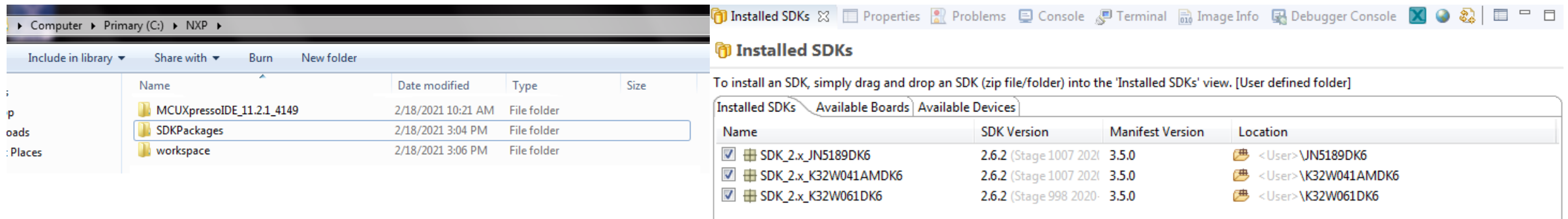
SDK – MCUXpresso SDK Installation Preferences

- In MCUXpresso select **Window > Preferences** from the menu bar
 - Expand and select MCUXpresso **IDE > SDK Handling > Installation**
 - Select the User defined folder radio button
 - Use the Browse button to select **C:\NXP**
 - Check **Always unzip SDK zipped files when installing**
 - Click **Apply and Close**



SDK – Installation

- Rename the SDK ZIP file to **K32W041AMDK6.zip**
 - The installation folder will be given the same name as the ZIP file
 - Makefiles in Zigbee application notes include the path to the SDK installation
- Select the Installed SDKs tab in the lower central pane of MCUXpresso
 - Drag and drop the SDK ZIP file into this pane
 - After clicking through the prompts the newly installed SDK will be shown in this pane



The screenshot displays the MCUXpresso IDE interface. On the left, a file explorer shows the directory structure: 'Computer > Primary (C:) > NXP'. The 'SDKPackages' folder is selected. On the right, the 'Installed SDKs' pane is active, showing a table of installed SDKs. The table has columns for Name, SDK Version, Manifest Version, and Location. Three SDKs are listed, all with a checked checkbox in the first column.

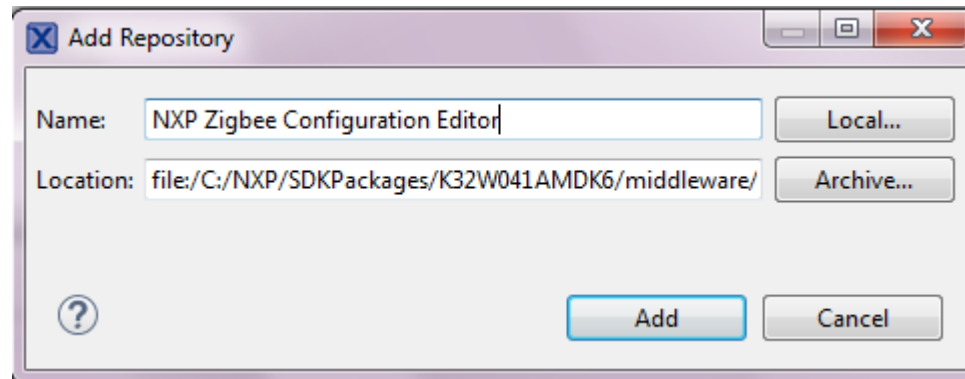
Name	SDK Version	Manifest Version	Location
<input checked="" type="checkbox"/> SDK_2.x_JN5189DK6	2.6.2 (Stage 1007 2020-08-11)	3.5.0	<User>\JN5189DK6
<input checked="" type="checkbox"/> SDK_2.x_K32W041AMDK6	2.6.2 (Stage 1007 2020-08-11)	3.5.0	<User>\K32W041AMDK6
<input checked="" type="checkbox"/> SDK_2.x_K32W061DK6	2.6.2 (Stage 998 2020-08-11)	3.5.0	<User>\K32W061DK6

ZIGBEE 3.0 CONFIGURATION EDITOR



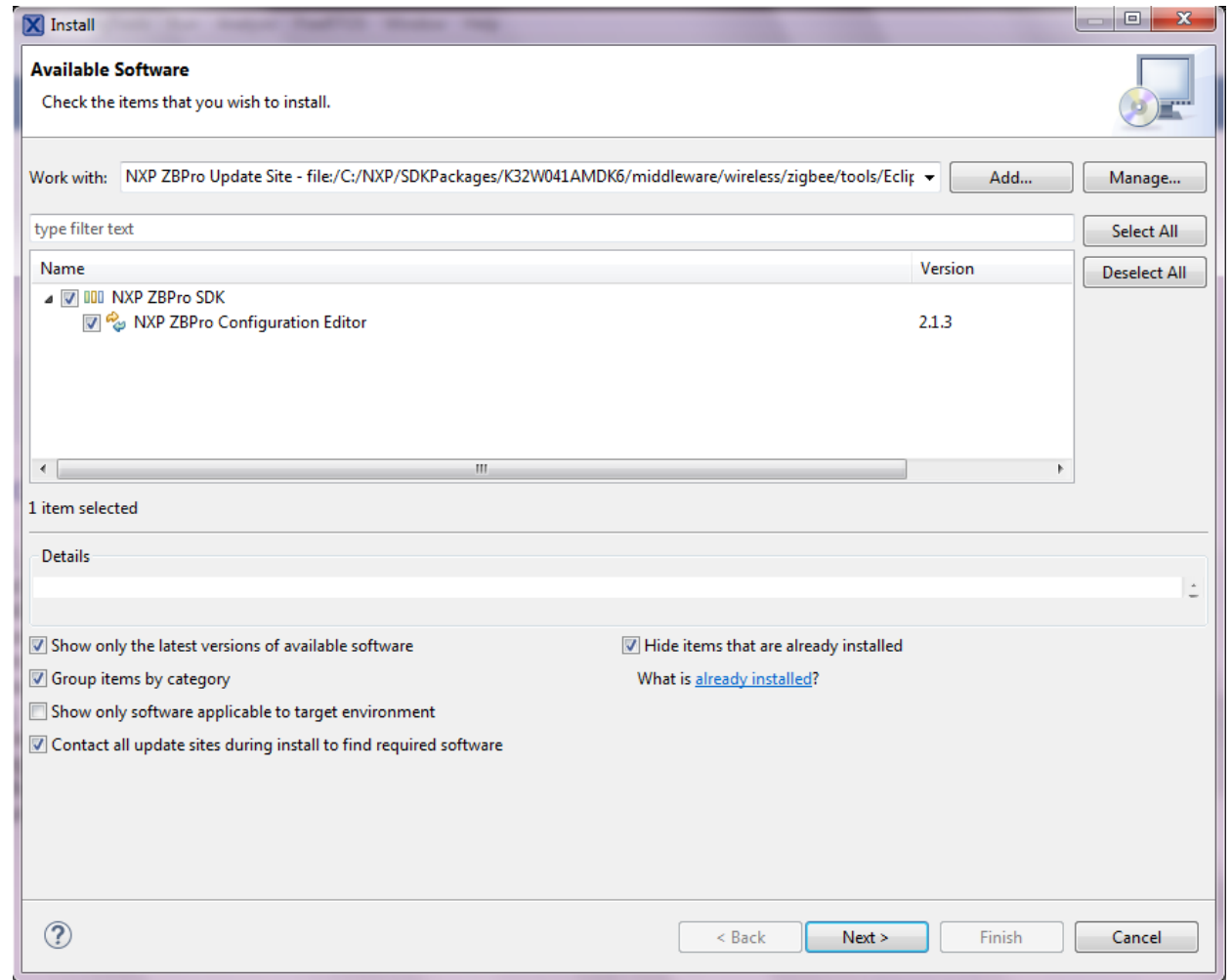
ZigBee 3.0 Configuration Editor – Installation (1)

- This plug-in provides a GUI to edit the ZigBee 3.0 Configuration settings
 - In MCUXPresso select **Help > Install New Software** from the menu bar
 - In the **Install** window that opens click the **Add** button in the upper right
 - In the **Add Repository** window that opens
 - Enter **NXP ZigBee Configuration Editor** in the **Name** edit box
 - Click the **Local** button and navigate to the folder below then click the **Select Folder** button:
C:\NXP\SDKPackages\<SDK>\middleware\wireless\zigbee\tools\Eclipse_plugins\com.nxp.sdk.update_site
 - Click the **Add** button in the **Add Repository** window



ZigBee 3.0 Configuration Editor – Installation (2)

- Back in the Install window:
 - Check the box next to NXP ZBPro SDK
 - Click the Next button to proceed with the installation
 - Click through the following windows
 - Accept the licence agreement when prompted
 - There may be a warning about unsigned content
 - MCUXpresso will need to be restarted to complete the plug-in installation
 - Latest version is 2.1.3

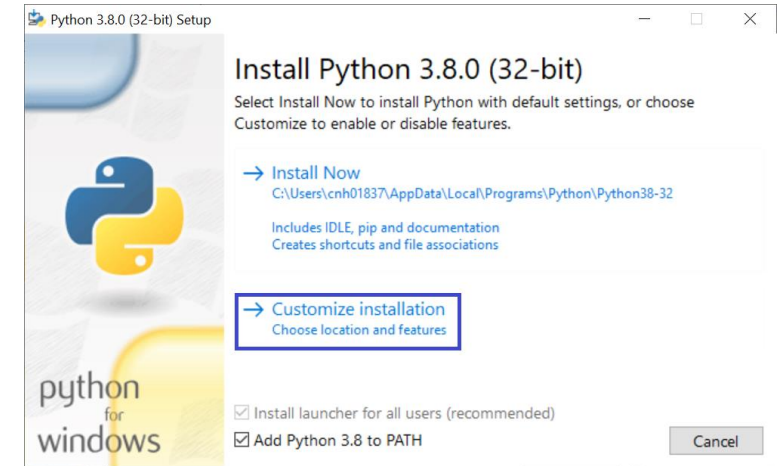


PYTHON 3.8



Python 3.x - Installation

- Python 3.x is used to create an image signature during compilation
- Recommend the use of Python 3.8.0 from: <https://www.python.org/downloads/release/python-380/>
- Recommend to Select *customize installation*
- Select the option to add Python to the system's PATH environment variable during installation
- After installation a cryptography package must be installed using the command:
 - C:\Python38\Scripts>**pip install pycryptodome**

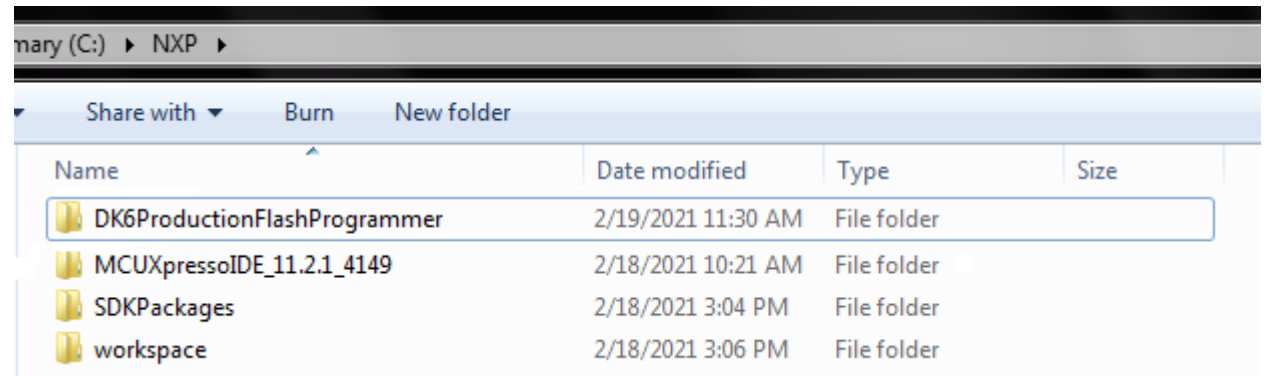
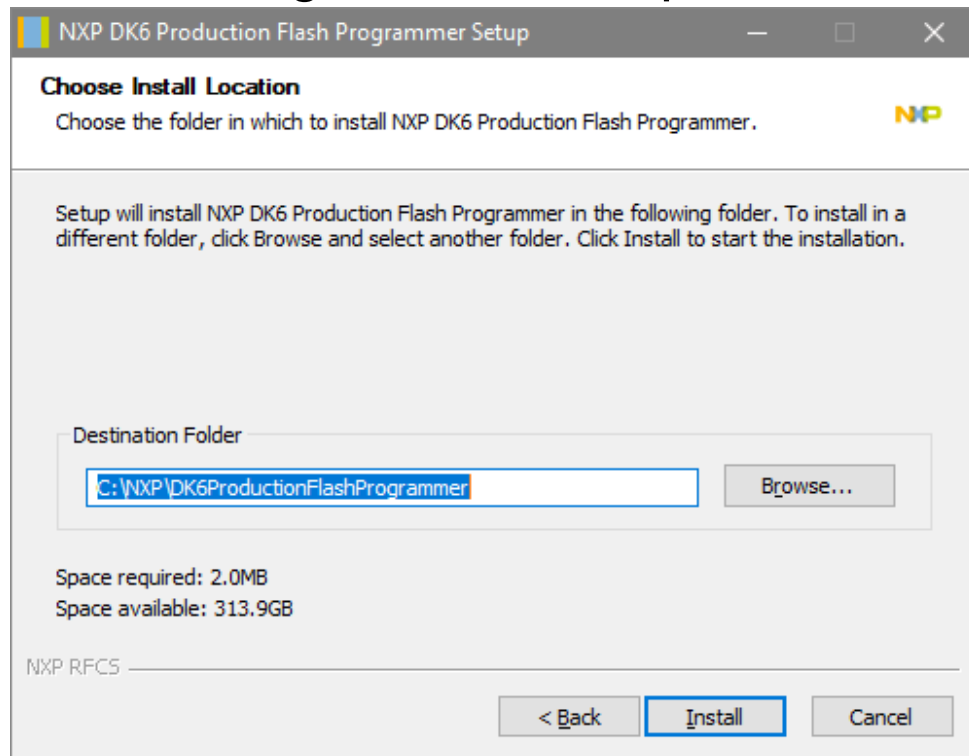


DK6 PROGRAMMER



DK6 Programmer - Installation

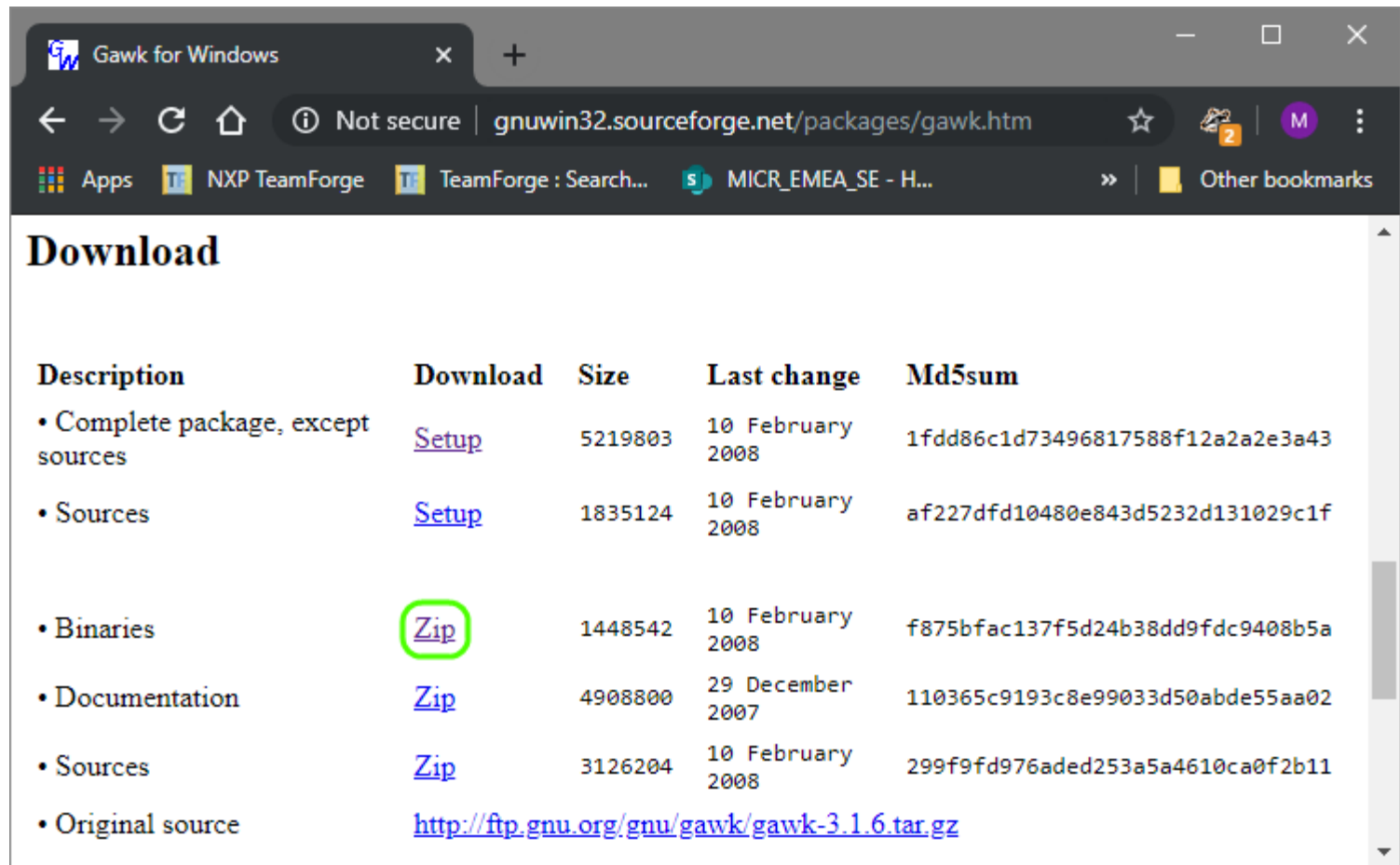
- The DK6 Production Flash Programmer [JN-SW-4407] is a command line programmer
 - Included in SDK zip `C:/NXP/SDKPackages/K32W041AMDK6/tools`
 - Install using the default options



GAWK (OPTIONAL)

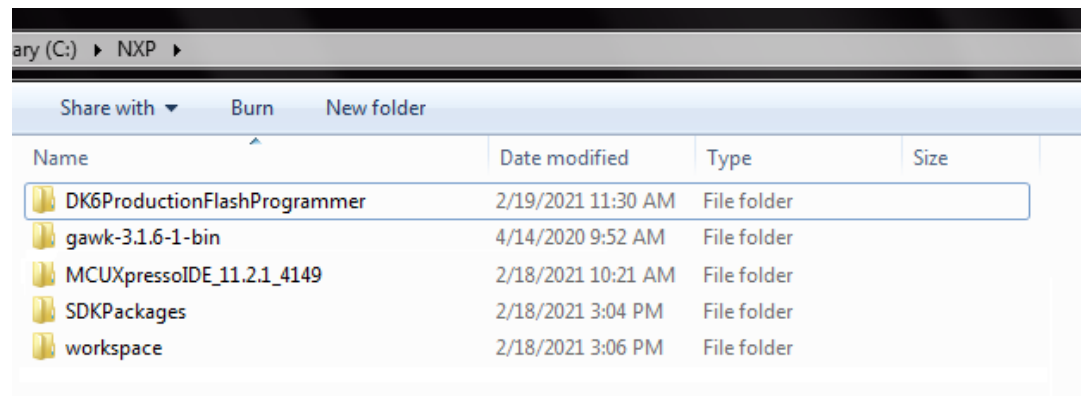
Gawk – Installation

- Used to create a detailed memory map during compilation
 - This compilation step is skipped if Gawk is not present
 - Download the binaries ZIP file from <http://gnuwin32.sourceforge.net/packages/gawk.htm>
 - Extract to **C:\NXP\gawk-3.1.6-1-bin** (retaining the ZIP file name as the folder name)



The screenshot shows a web browser window with the address bar displaying gnuwin32.sourceforge.net/packages/gawk.htm. The page title is "Download". Below the title is a table with columns: Description, Download, Size, Last change, and Md5sum.

Description	Download	Size	Last change	Md5sum
• Complete package, except sources	Setup	5219803	10 February 2008	1fdd86c1d73496817588f12a2a2e3a43
• Sources	Setup	1835124	10 February 2008	af227dfd10480e843d5232d131029c1f
• Binaries	Zip	1448542	10 February 2008	f875bfac137f5d24b38dd9fdc9408b5a
• Documentation	Zip	4908800	29 December 2007	110365c9193c8e99033d50abde55aa02
• Sources	Zip	3126204	10 February 2008	299f9fd976aded253a5a4610ca0f2b11
• Original source	http://ftp.gnu.org/gnu/gawk/gawk-3.1.6.tar.gz			



The screenshot shows a Windows File Explorer window with the address bar displaying "C:\NXP". The window contains a table of files and folders:

Name	Date modified	Type	Size
DK6ProductionFlashProgrammer	2/19/2021 11:30 AM	File folder	
gawk-3.1.6-1-bin	4/14/2020 9:52 AM	File folder	
MCUXpressoIDE_11.2.1_4149	2/18/2021 10:21 AM	File folder	
SDKPackages	2/18/2021 3:04 PM	File folder	
workspace	2/18/2021 3:06 PM	File folder	



BEYOND STUDIO (OPTIONAL)



BeyondStudio – Installation

- Go to <https://www.nxp.com/pages/jn516x-zigbee-home-automation:ZIGBEE-HOME-AUTOMATION>

Home Automation Software

ZigBee PRO with the Home Automation profile is available for the JN5169 and JN5168 microcontrollers. The protocol, profile and associated support software are supplied in the following Software Developer's Kit (SDK):

- [JN516x ZigBee Home Automation SDK](#)

The above SDK must be installed on top of the [BeyondStudio for NXP toolchain \(JN-SW-4141\)](#). Installation instructions are provided in the [BeyondStudio for NXP Installation and User Guide \(JN-UG-3098\)](#).

ZigBee Home Automation demonstration applications are provided and described in Application Notes (see below).

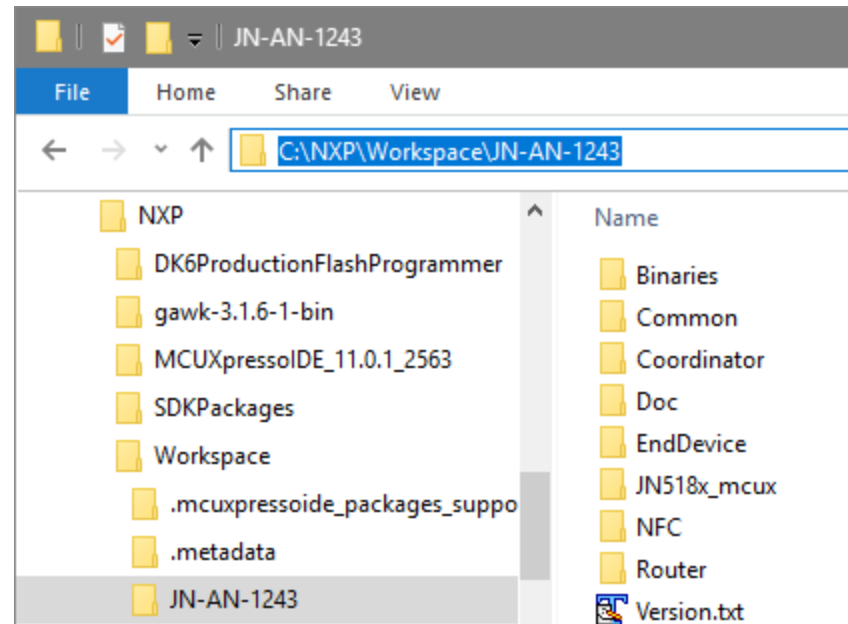
These demonstrations can be programmed into and run on the boards of the JN516x-EK001 or JN516x-EK004 Evaluation Kit.

APPLICATION NOTES



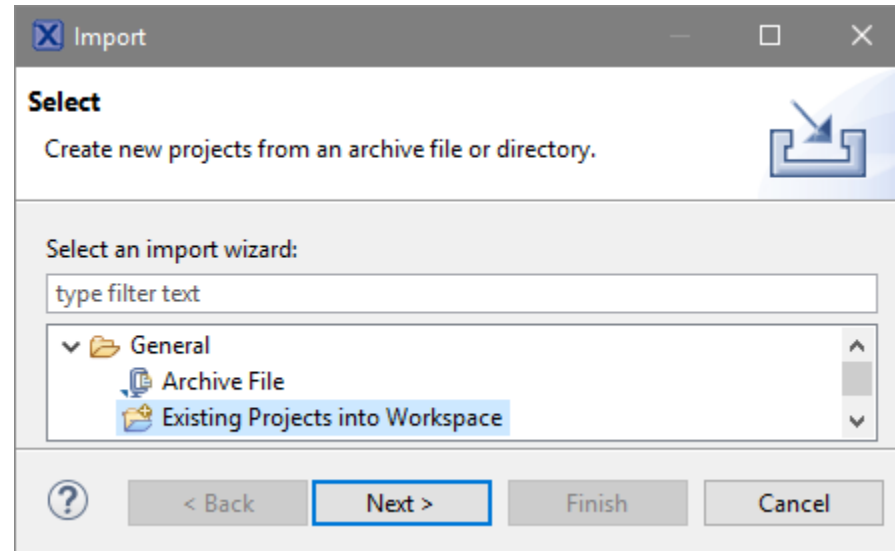
Application Notes - Installation

- Unzip the Application Note directly into the Workspace folder
 - The ZIP file includes a containing folder



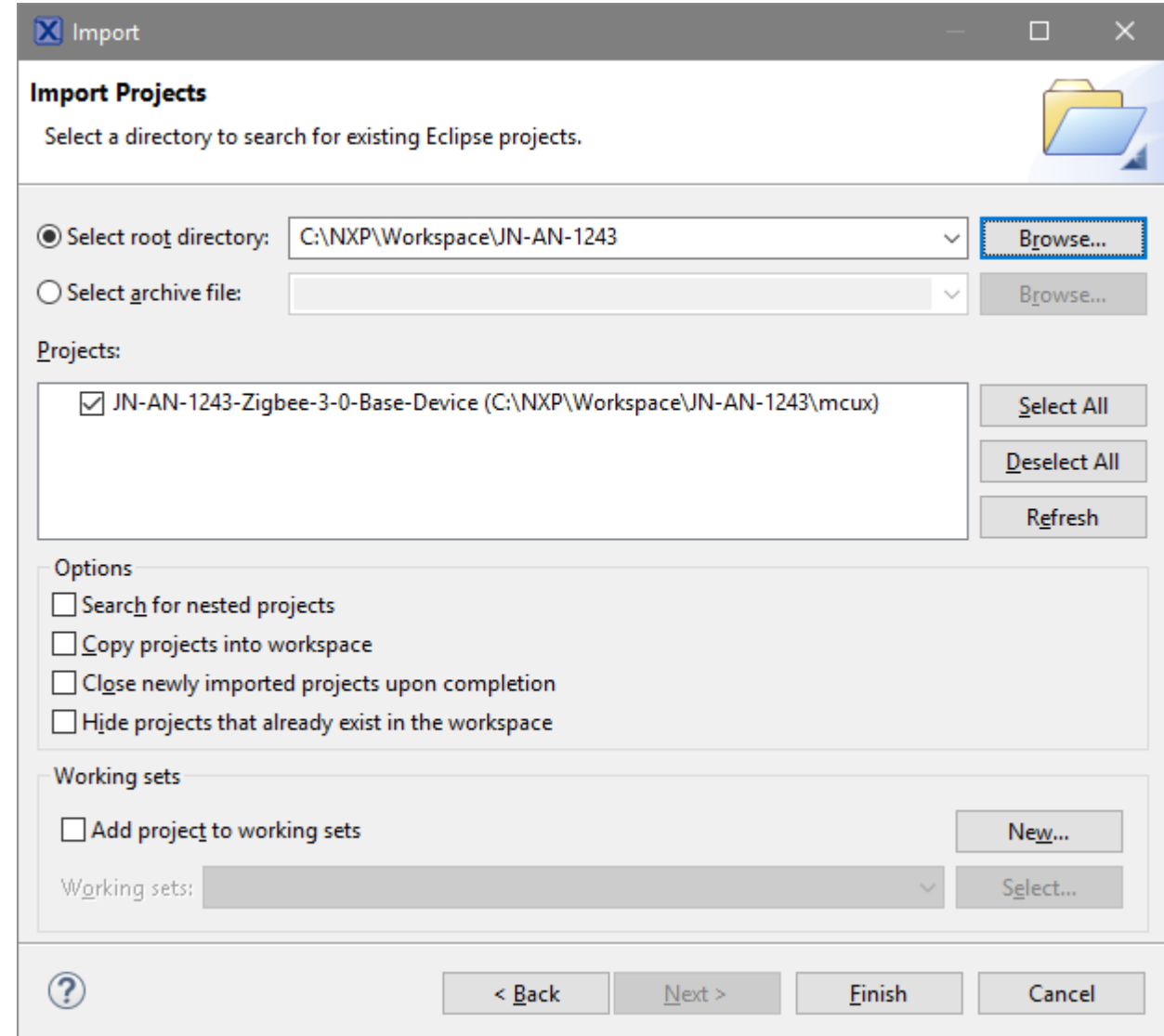
Application Notes – Import (1)

- In MCUXpresso select **File > Import** on the menu bar
 - Select **General > Existing Projects into Workspace** in the **Import** window



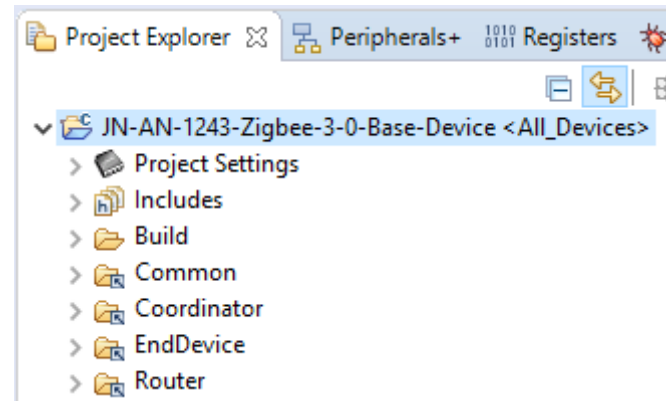
Application Notes – Import (2)

- In the second **Import** window:
 - Use the **Browse** button to select the path to the Application Note folder
 - Ensure the check box is ticked next to the Application Note project
 - Do not tick any of **Options** check boxes
 - The files are already in the correct locations
 - Click the **Finish** button to complete the import



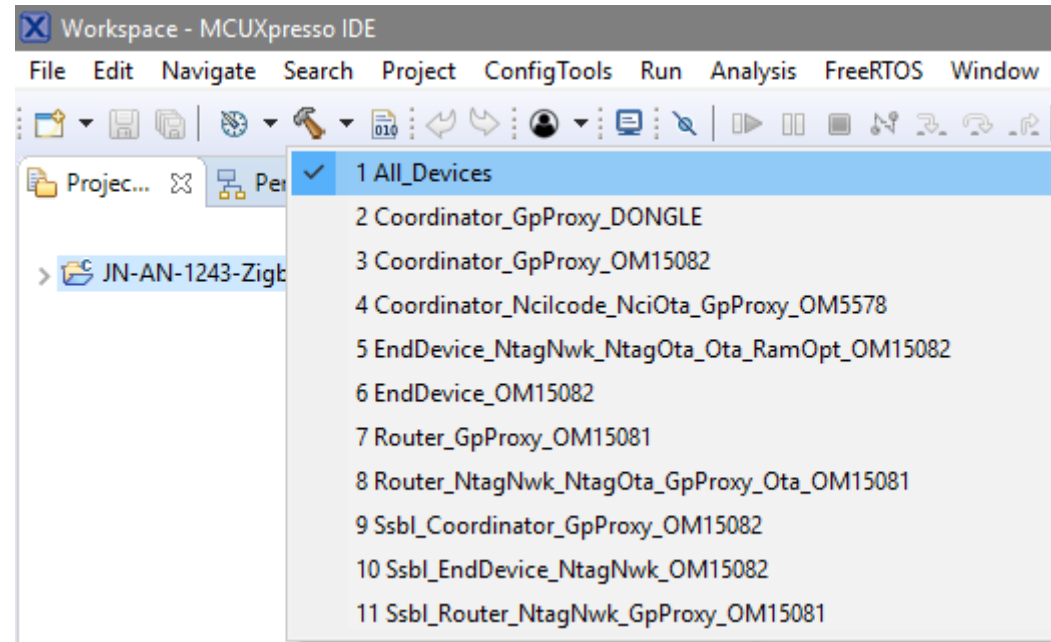
Application Notes – Import (3)

- The newly imported project is listed in the **Project Explorer** pane on the upper right of MCUXpresso



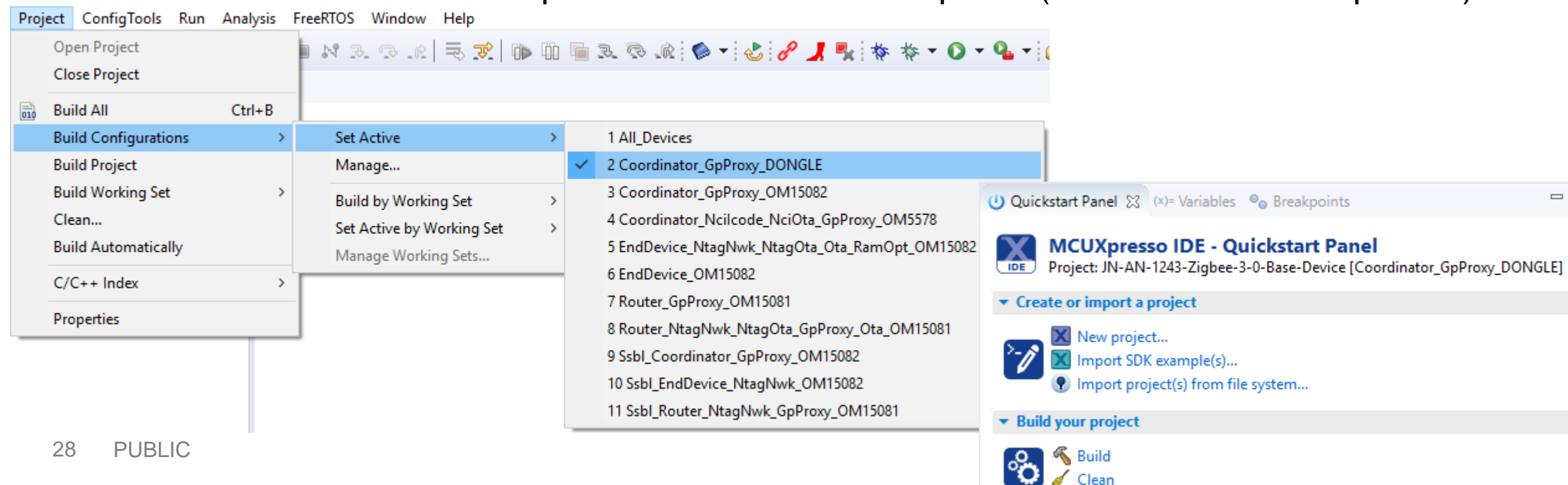
Application Notes – Compilation – All Devices

- To clean and build all devices in the Application Note
 - Click the build dropdown on the toolbar (the arrow next to the hammer icon)
 - Click the **All Devices** build configuration
 - This uses a makefile in the **mcux\Build** folder of the Application Note



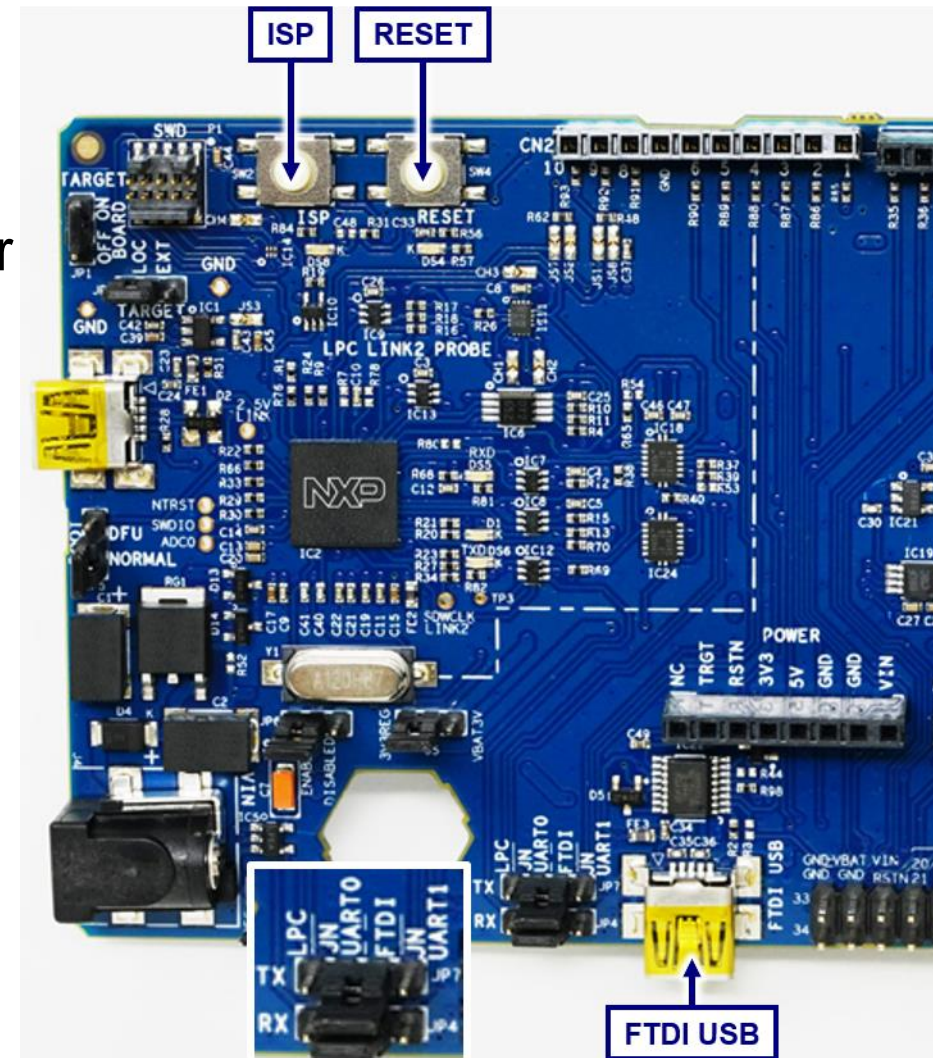
Application Notes – Compilation – Single Device

- To clean or build a single device in the Application Note
 - Select the project in the **Project Explorer**
 - Select **Project > Build Configuration > Set Active** then the required single **Build Configuration**
 - Use the **Build** and **Clean** options in the **Quickstart** panel (lower left of MCUXpresso)



Application Notes – Programming

- Compiled firmware is located in the **Binaries** folder of the Application Note
 - Windows batch (**.bat**) files that use the DK6 Programmer are located alongside the binary (**.bin**) files
- To program a binary file:
 - Connect a PC to the mini USB connector marked **FTDI USB**
 - Ensure the UART jumpers (to the left of **FTDI USB**) connect the centre two pins
 - Run the appropriate **.bat** file which will prompt for the COM port to use





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