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\MCUxpressolDE_11.3.0_5222
 - Do not run until the Workspace folder has been created (next slide)

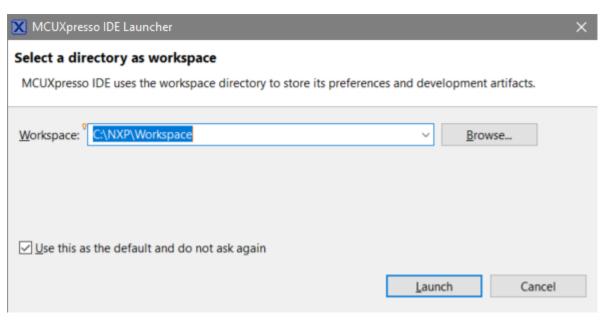
Setup - MCUXpresso IDE 11.3.0 [Build 5222]
Select Destination Location Where should MCUXpresso IDE be installed?
Setup will install MCUXpresso IDE into the following folder.
To continue, click Next. If you would like to select a different folder, click Browse.
C:\nxp\MCUXpressoIDE_11.3.0_5222 Browse
At least 1,645.3 MB of free disk space is required.
v11.3.0_5222
http://www.nxp.com/mcuxpresso/ide <back next=""> Cancel</back>



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

11	📜 👳 N	IXP	
File	Home	Share	View
$\leftarrow \ \rightarrow$	× ↑	C:\NXP	
Name		^	
📕 MC	UXpressolD	E_11.0.1_2	563
📜 Woi	rkspace		









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

Step 1

Select Development Board

Click Select Development Board

Search by Name





Choose K32W041AMDK6



Step 3 K32W041AMDK6 Build MCUXpresso SDK v2.6.2 • Additional Details

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 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

pe filter text	Installation	⇔ • ⇔
General	Manage SDK usage within MCUXpresso IDE	
C/C++	SDK locations	
Help	SDK locations SDK Drag&Drop install location	
Install/Update	O Workspace O Common 'mcuxpresso' folder O User d	lefined folde
Java		
Library Hover	User defined folder C:\NXP	Browse
MCUXpresso Config Tools	SDK search roots:	
MCUXpresso IDE		New
Debug Options (Advanced)	1	146.11
Debug Options (Miscellaneous)		Remove
Debug Probe Discovery		Up
Default Tool settings		<u>Q</u> P
> Editor Awareness		Down
FreeRTOS TAD	SDK refresh policy on startup	
General	Refresh and recreate part info	
J-Link Options	Other options	
LinkServer Options	Always unzip SDK zipped files when installing	
LPC-Link Options	Do not ask for unzipping SDK on import	
MCU settings Paths and Directories	Do not ask for confirmation on SDK Drag and Drop instal	
PEMicro Options		11
Ouickstart Panel	Make missing SDK reference persistent	22
✓ SDK Handling	Do not ask user action for missing SDK reference in proje	
Components	Enable SDK/manifest versions switch (needs an IDE restar	rt)
Installation	Automatically delete wrong/incompatible SDKs	
Misc	Restore Defaults	Apply

Cance

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

► Computer ►	Primary (C:) NXP				👘 Installed SDKs 🛛 🔲 Properties 🚦	Problems 📃 Console 🔬	🖲 Terminal 📑 Ima	ige Info 🛛 🙀 Debugger Console 🛛 🎱 🍪 🗮 🗖 🗖
Include in libra	ary ▼ Share with ▼ Burn New folde	r			🕅 Installed SDKs			
	Name	Date modified	Туре	Size	To install an SDK, simply drag and drop a	n SDK (zip file/folder) into t	he 'Installed SDKs' vie	w. [User defined folder]
p	MCUXpressoIDE_11.2.1_4149	MCUXpressoIDE_11.2.1_4149 2/18/2021 10:21 AM File folder			Installed SDKs Available Boards Avai	lable Devices		
oads	SDKPackages	2/18/2021 3:04 PM	File folder		Name	SDK Version	Manifest Version	Location
Places	퉬 workspace	2/18/2021 3:06 PM	File folder		SDK_2.x_JN5189DK6	2.6.2 (Stage 1007 2020	3.5.0	(User>\JN5189DK6
					SDK_2.x_K32W041AMDK6	2.6.2 (Stage 1007 2020	3.5.0	User>\K32W041AMDK6
					SDK 2.x K32W061DK6	2.6.2 (Stage 998 2020)	3.5.0	(書 <user>\K32W061DK6</user>

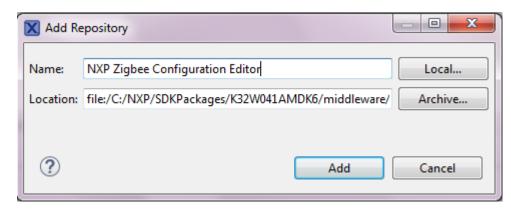


ZIGBEE 3.0 CONFIGURATION EDITOR



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

🗙 Install		- 0 ×
Available Software Check the items that you wish to install.		
Work with: NXP ZBPro Update Site - file:/C:/NXP/SDKPackages/K32W041AMDK6/middleware/wireless/zigbee/tools/Ecli	F 🔻 Add	Manage
type filter text		Select All
Name	Version	Deselect All
 ✓ IOD NXP ZBPro SDK ✓ 🤣 NXP ZBPro Configuration Editor 	21.3	
•	Þ	
1 item selected		
Details		1
Show only the latest versions of available software I Hide items that are already installed		
Image: Group items by category What is <u>already installed</u> ? Image: Show only software applicable to target environment Image: Group items and the sites during install to find required software Image: Contact all update sites during install to find required software Image: Group items and the sites during install to find required software		
(?) < Back Next >	Finish	Cancel



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: <u>https://www.python.org/downloads/release/python-380/</u>
- 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

NXP DK6 Production Flash Programmer Setup —	
Choose Install Location Choose the folder in which to install NXP DK6 Production Flash Programmer.	NP
Setup will install NXP DK6 Production Flash Programmer in the following folder. To different folder, click Browse and select another folder. Click Install to start the i	
Destination Folder C:\WXP\DK6ProductionFlashProgrammer Browner	vse
Space required: 2.0MB Space available: 313.9GB	
NXP RFCS	Cancel

(C:) ► NXP ►			
Share with 🔻 🛛 Burn 🔹 New folder			
Name	Date modified	Туре	Size
DK6ProductionFlashProgrammer	2/19/2021 11:30 AM	File folder	
MCUXpressoIDE_11.2.1_4149	2/18/2021 10:21 AM	File folder	
BKPackages	2/18/2021 3:04 PM	File folder	
鷆 workspace	2/18/2021 3:06 PM	File folder	

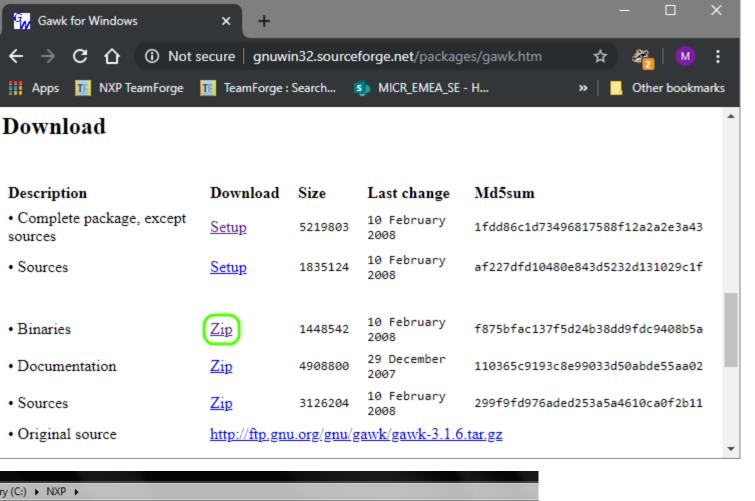


GAWK (OPTIONAL)



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 <u>http://gnuwin32.sourceforge.net</u> /packages/gawk.htm
 - Extract to
 C:\NXP\gawk-3.1.6-1-bin (retaining the ZIP file name as the folder name)



ary (C:) ► NXP ►				
Share with 🔻 🛛 Burn 🛛 New folder				
Name	Date modified	Туре	Size	
DK6ProductionFlashProgrammer	2/19/2021 11:30 AM	File folder		
퉬 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		
퉬 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.

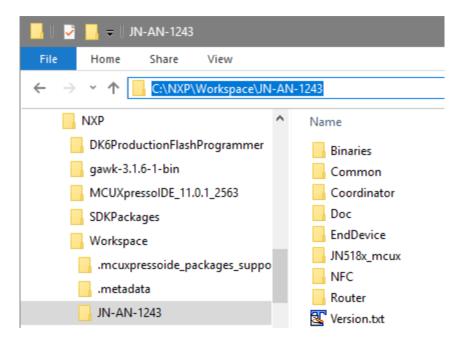


APPLICATION NOTES



Application Notes - Installation

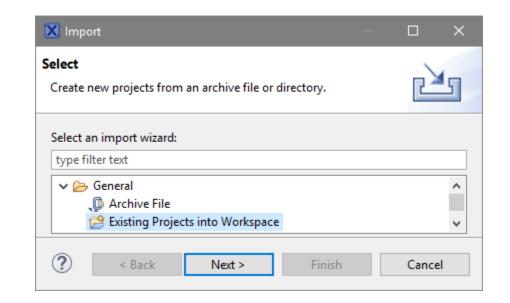
- Unzip the Application Note directly into the Workspace folder
 - The ZIP file includes a containing folder





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)

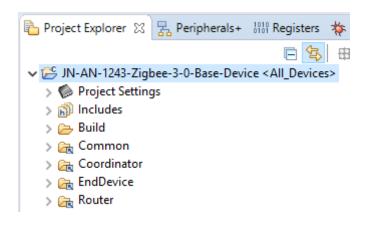
- In the second Import window:
 - Use the **Browse** button to select the path to the Application Note folder
 - Ensure the check box is ticked next to the Application Note project
 - Do not tick any of **Options** check boxes
 - The files are already in the correct locations
 - Click the **Finish**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

🔀 Import		-	
Import Projects Select a directory to search	h for existing Eclipse projects.		
 Select root directory: Select archive file: 	C:\NXP\Workspace\JN-AN-1243	*	B <u>r</u> owse B <u>r</u> owse
<u>P</u> rojects:			
JN-AN-1243-Zigb	ee-3-0-Base-Device (C:\NXP\Workspace\JN-AN-1243\mcux)		Select All
			Deselect All
			R <u>e</u> fresh
	orkspace I projects upon completion eady exist in the workspace		Ne <u>w</u> S <u>e</u> lect
?	< <u>B</u> ack <u>N</u> ext > <u>F</u> inish		Cancel



Application Notes – Import (3)

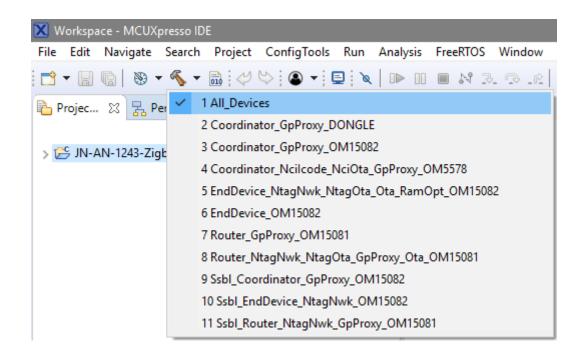
 The newly imported project is listed in the Project Explorer pane on the upper right of MCUXpresso





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





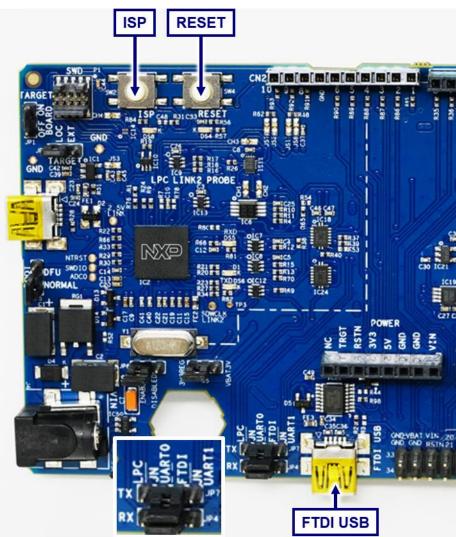
Application Notes – Compilation – Single Device

- 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)

Proj	ect ConfigTools Run	Analysis	FreeRTOS Window Help		
	Open Project Close Project		■ N 3. 9. R ₹ X 0	• 100	□ 3. 3. 10 × 2. 10 × 2. 10 × 2. 11
010	Build All	Ctrl+B			
	Build Configurations	>	Set Active	>	1 All_Devices
	Build Project		Manage		2 Coordinator_GpProxy_DONGLE
	Build Working Set Clean	>	Build by Working Set Set Active by Working Set	>	3 Coordinator_GpProxy_OM15082 4 Coordinator_Ncilcode_NciOta_GpProxy_OM5578 U Quickstart Panel ☆ (x)= Variables ● Breakpoints
	Build Automatically		Manage Working Sets		5 EndDevice_NtagNwk_NtagOta_Ota_RamOpt_OM15082
1	C/C++ Index	>			6 EndDevice_OM15082 Project: JN-AN-1243-Zigbee-3-0-Base-Device [Coordinator_GpProxy_DONGLE]
	Properties			ľ	7 Router_GpProxy_OM15081 Create or import a project
	Properties	Τ		9 Ssbl_Coord 10 Ssbl_Endl	8 Router_NtagNwk_NtagOta_GpProxy_Ota_OM15081 9 Ssbl_Coordinator_GpProxy_OM15082 10 Ssbl_EndDevice_NtagNwk_OM15082 11 Ssbl_Router_NtagNwk_GpProxy_OM15081 • Build your project
	28 PUBLIC				Build Clean

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







SECURE CONNECTIONS FOR A SMARTER WORLD