

Model-Based Design Toolbox RADAR

Quick Start Guide

**Automatic Code Generation for Radar processors
Version 1.0.0**

Target Based Automatic Code Generation Tools
For MATLAB™ models working with MATLAB Coder™ and Embedded Coder®

Model-Based Design Toolbox RADAR
Quick Start Guide

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1 Installation

Installing the Model-Based Design Toolbox is the first step in setting up and running automatic C code generation from MATLAB for NXP's embedded target processors and development boards.

The Model-Based Design Toolbox for RADAR supports code generation for:

- ARM Cortex-A53 core
- NXP SPT accelerator
- NXP LAX accelerator

1.1 System Requirements

For a flawless development experience, the minimum recommended PC platform is:

- *Windows® 10 OS*
- At least 4 GB of RAM
- At least 6 GB of free disk space.
- Internet connectivity for web downloads.

1.2 Installation Steps

NXP's Model-Based Design Toolbox is delivered as MATLAB Toolbox Package that can be installed offline or online from MathWorks Add-ons. This document shows how to install the offline/online package.

For the offline package, to have the toolbox installed and configured properly the following actions should be executed, assuming you have already downloaded the file:

1. Run the MATLAB toolbox package file *.mltbx.
2. Configure the external tools dependencies, such as the S32 Design Studio and Radar SDK.
3. Set up the MATLAB path for the Model-Based Design Toolbox and generate the right toolchain setting for the user MATLAB environment.

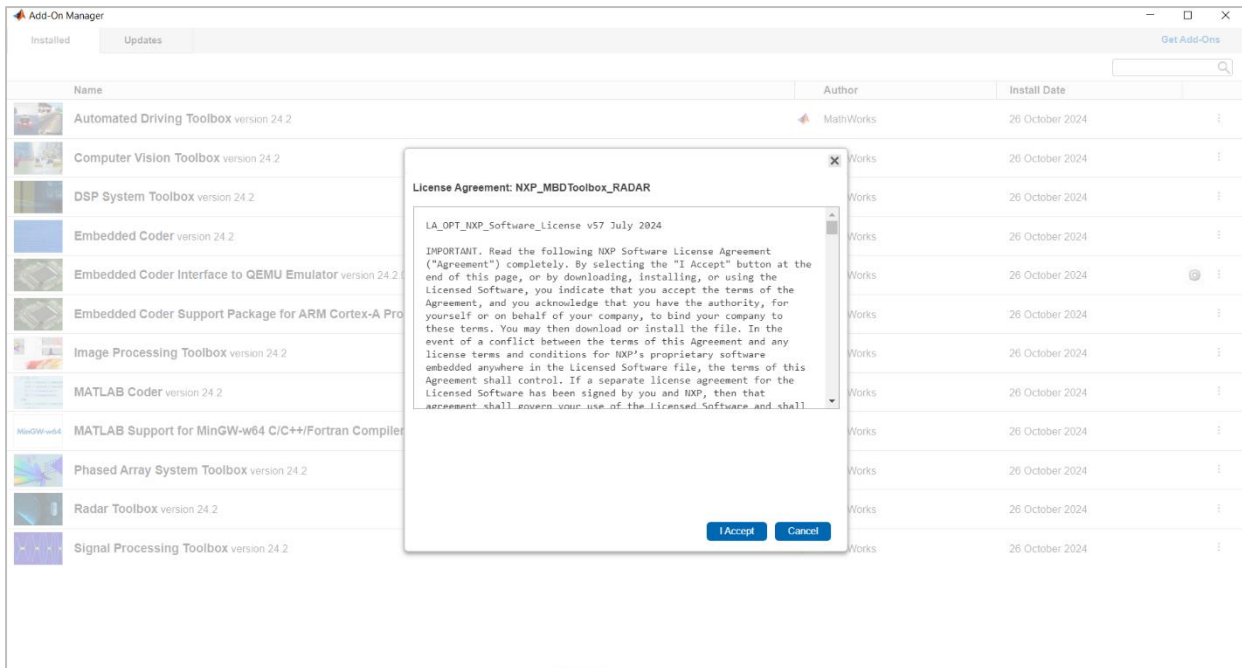
Each of these actions is explained in the following sub-chapters.

1.2.1 Run Add-on installer (offline)

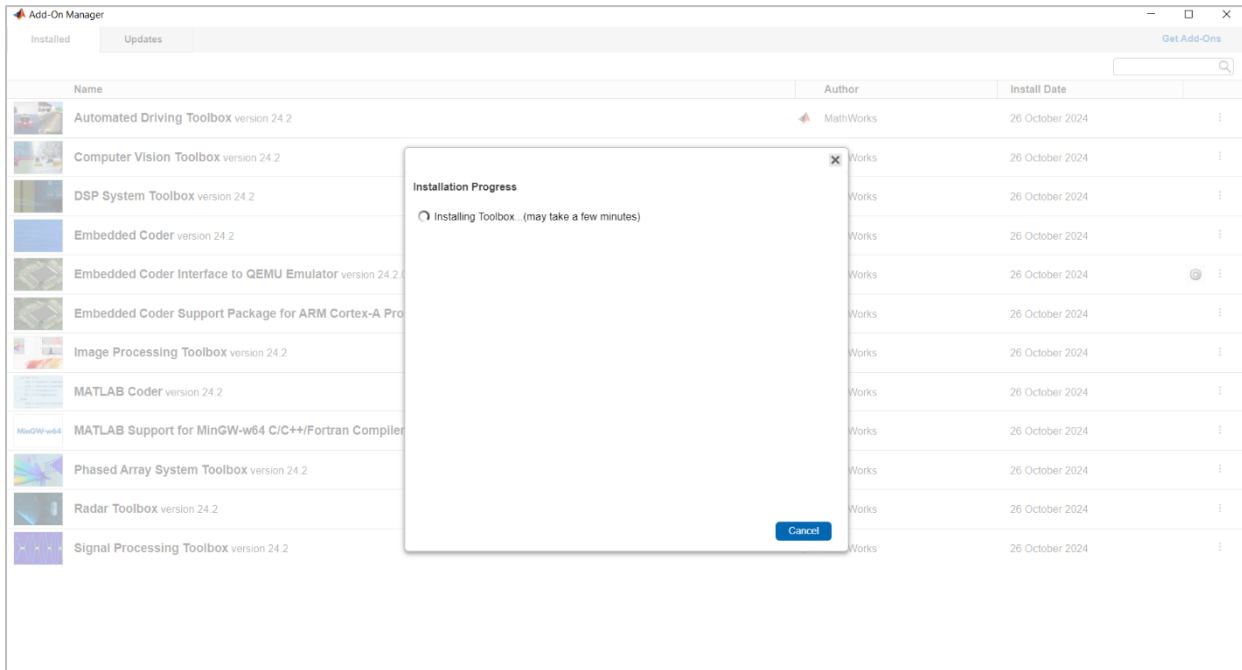
Install the NXP's Model-Based Design Toolbox by double-clicking the *.mltbx file. This will activate the MATLAB Add-ons installer that will automatically start the installation process.

After the MATLAB opens, you will be prompted with the following options:

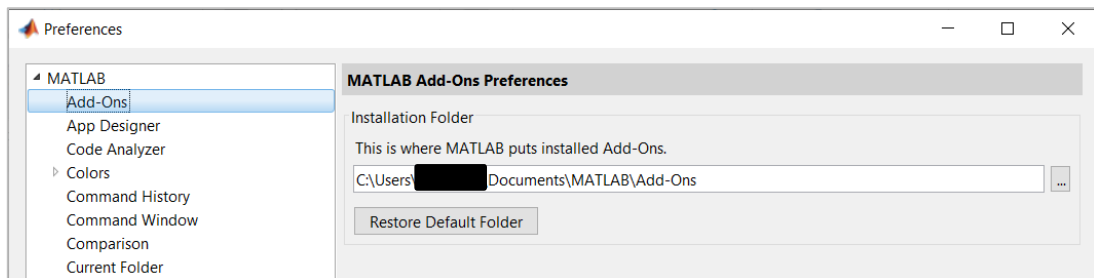
1. Indicate acceptance of the NXP Software License Agreement by selecting “I Accept” to proceed.



- The rest of the process is silent and under MATLAB control. All the files will be automatically copied into the default Add-Ons folder within MATLAB.

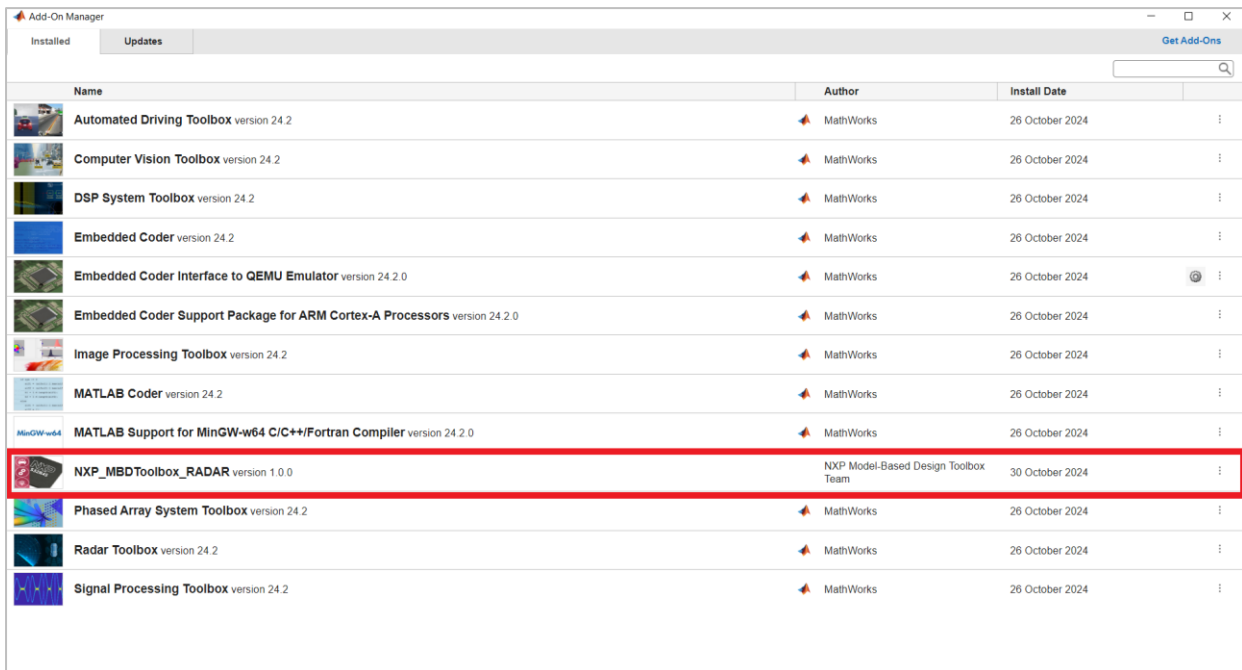


The default Add-Ons Installation Folder can be changed from MATLAB Preferences.



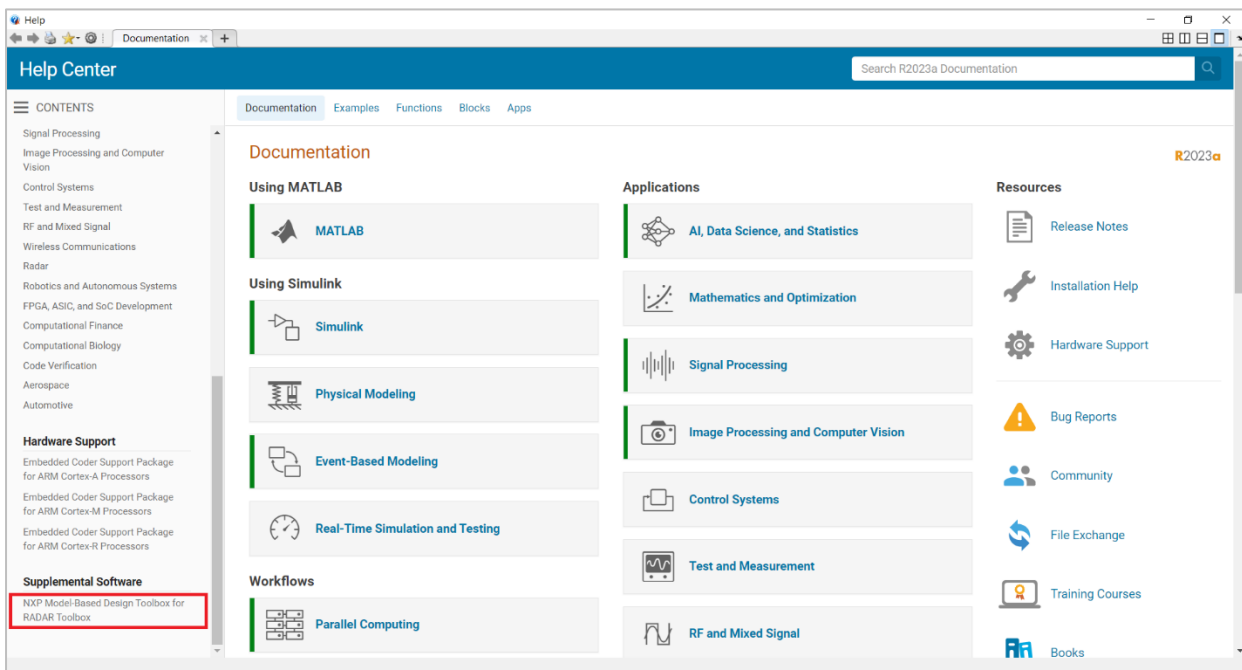
Note: *It is recommended to install the MATLAB and NXP Toolbox in a location that does not contain special characters, empty spaces, or mapped drives.*

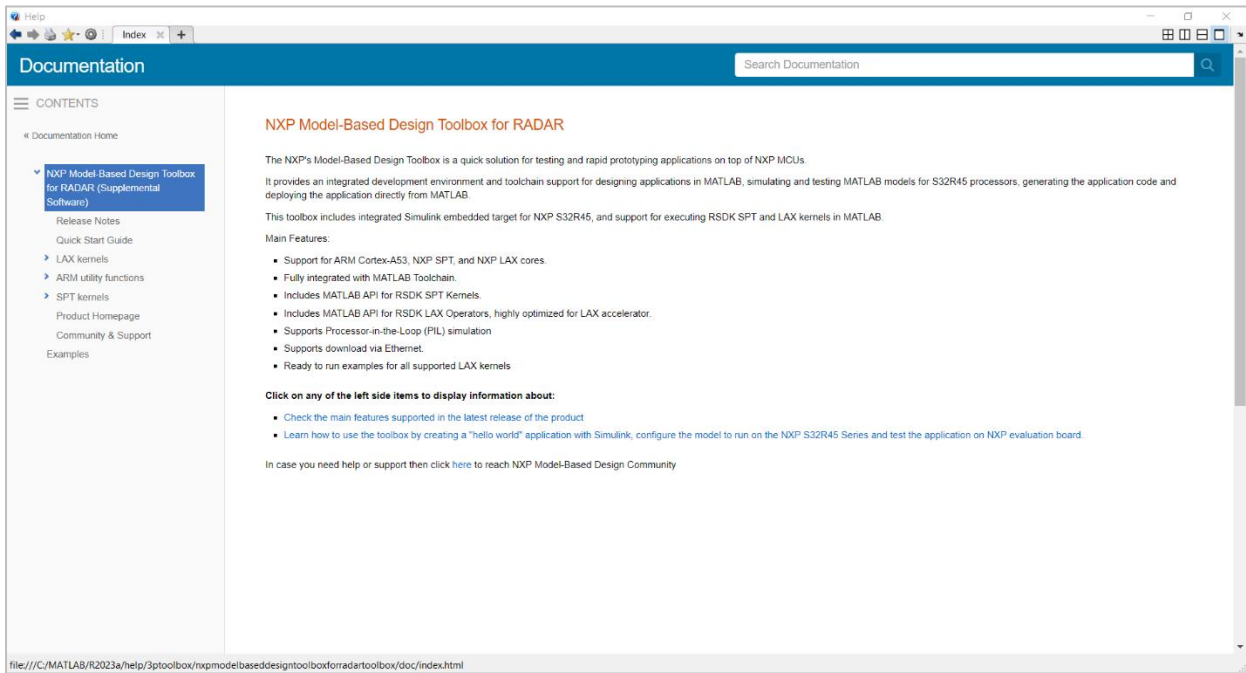
3. After several minutes, the NXP's Model-Based Design Toolbox should be visible as a new Add-on.



Name	Author	Install Date
Automated Driving Toolbox version 24.2	MathWorks	26 October 2024
Computer Vision Toolbox version 24.2	MathWorks	26 October 2024
DSP System Toolbox version 24.2	MathWorks	26 October 2024
Embedded Coder version 24.2	MathWorks	26 October 2024
Embedded Coder Interface to QEMU Emulator version 24.2.0	MathWorks	26 October 2024
Embedded Coder Support Package for ARM Cortex-A Processors version 24.2.0	MathWorks	26 October 2024
Image Processing Toolbox version 24.2	MathWorks	26 October 2024
MATLAB Coder version 24.2	MathWorks	26 October 2024
MATLAB Support for MinGW-w64 C/C++/Fortran Compiler version 24.2.0	MathWorks	26 October 2024
NXP_MBDToolbox_RADAR version 1.0.0	NXP Model-Based Design Toolbox Team	30 October 2024
Phased Array System Toolbox version 24.2	MathWorks	26 October 2024
Radar Toolbox version 24.2	MathWorks	26 October 2024
Signal Processing Toolbox version 24.2	MathWorks	26 October 2024

4. NXP's Model-Based Design Toolbox documentation, help, and examples are fully integrated with the MATLAB development environment. Get more details by accessing the standard Help and **Supplemental Software** section.

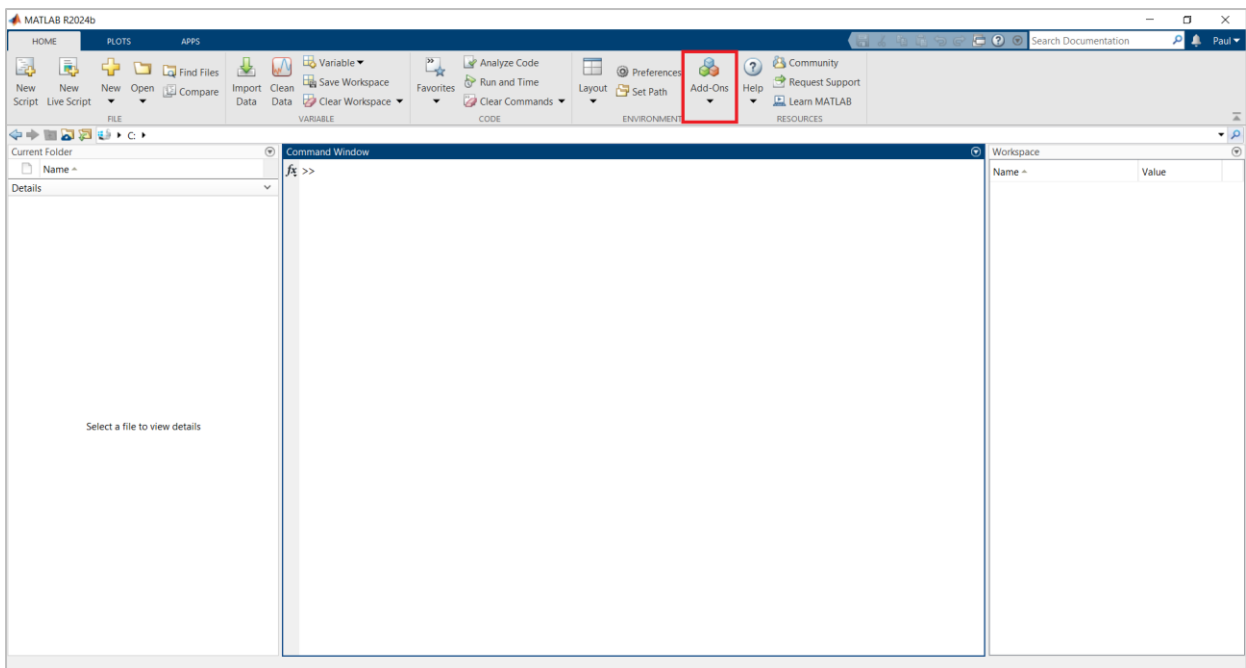




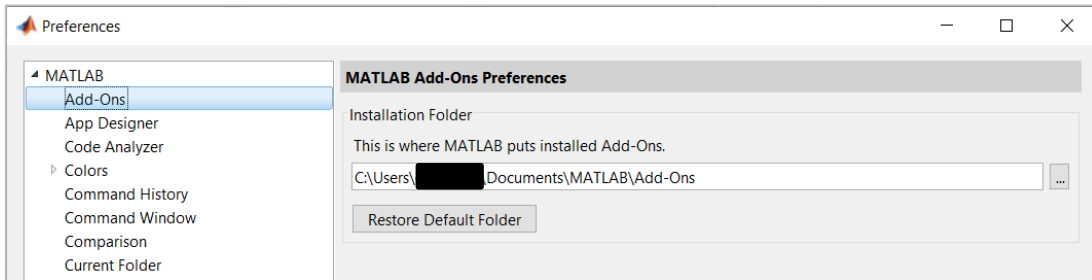
1.2.2 Install NXP Support Package for RADAR (online)

This package will guide you through the download, installation, and activation process of the MBDT for RADAR online package.

1. Go to MATLAB Add-Ons

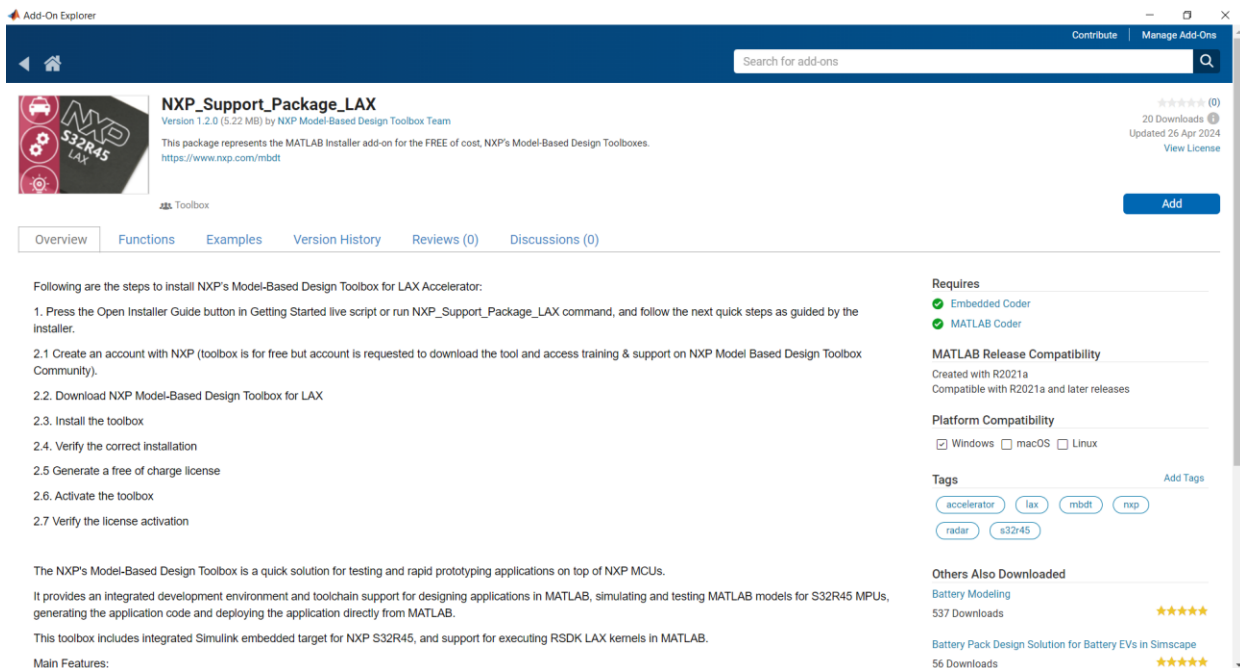


The default Add-Ons Installation Folder can be changed from MATLAB Preferences.

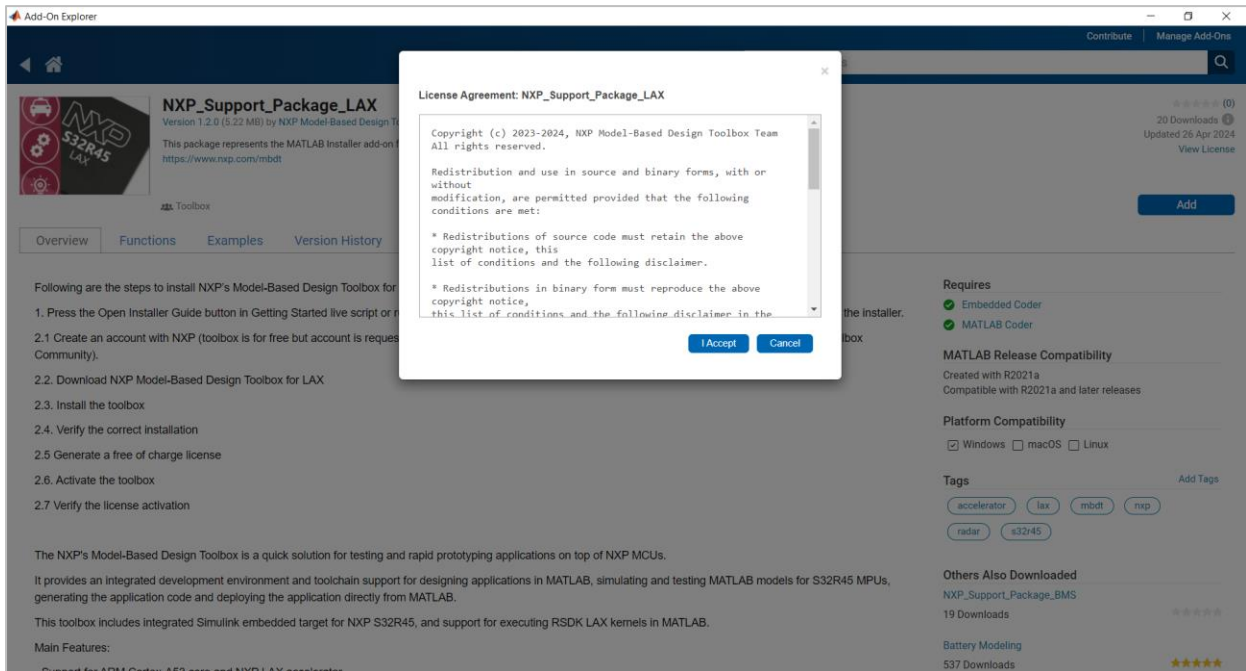


Note: It is recommended to install the MATLAB and NXP Toolbox in a location that does not contain special characters, empty spaces, or mapped drives.

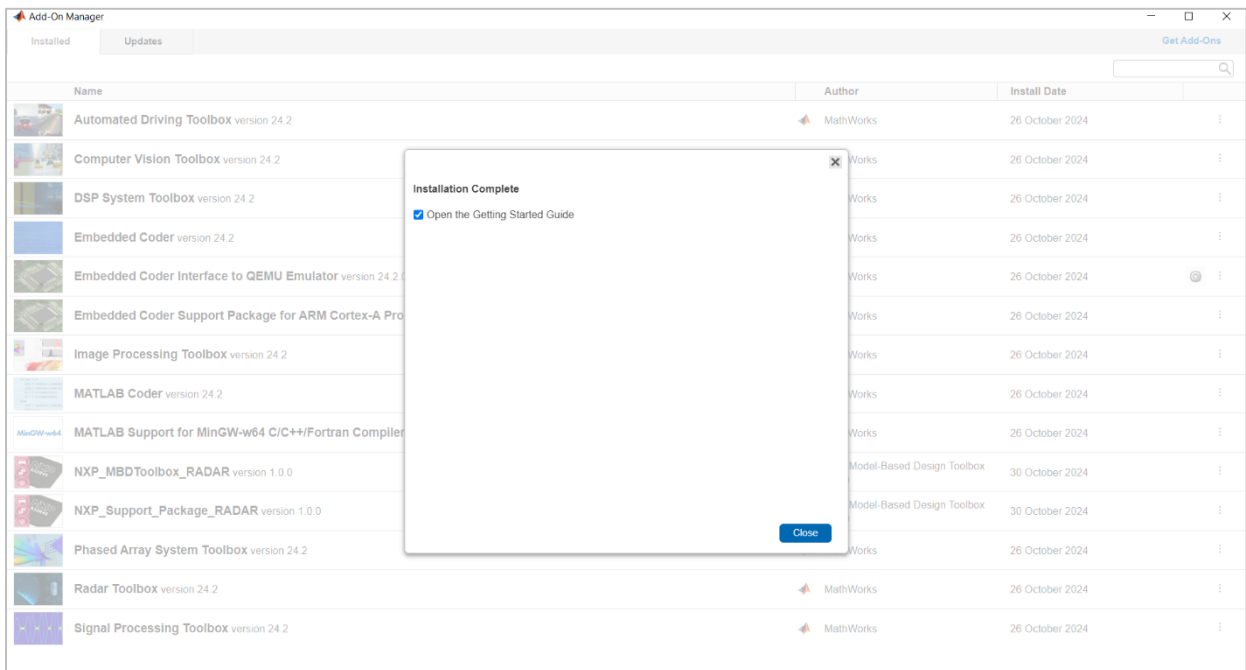
2. Search for the “NXP Support Package RADAR”
3. Install the “NXP Support Package RADAR” by pressing the **Add** button.



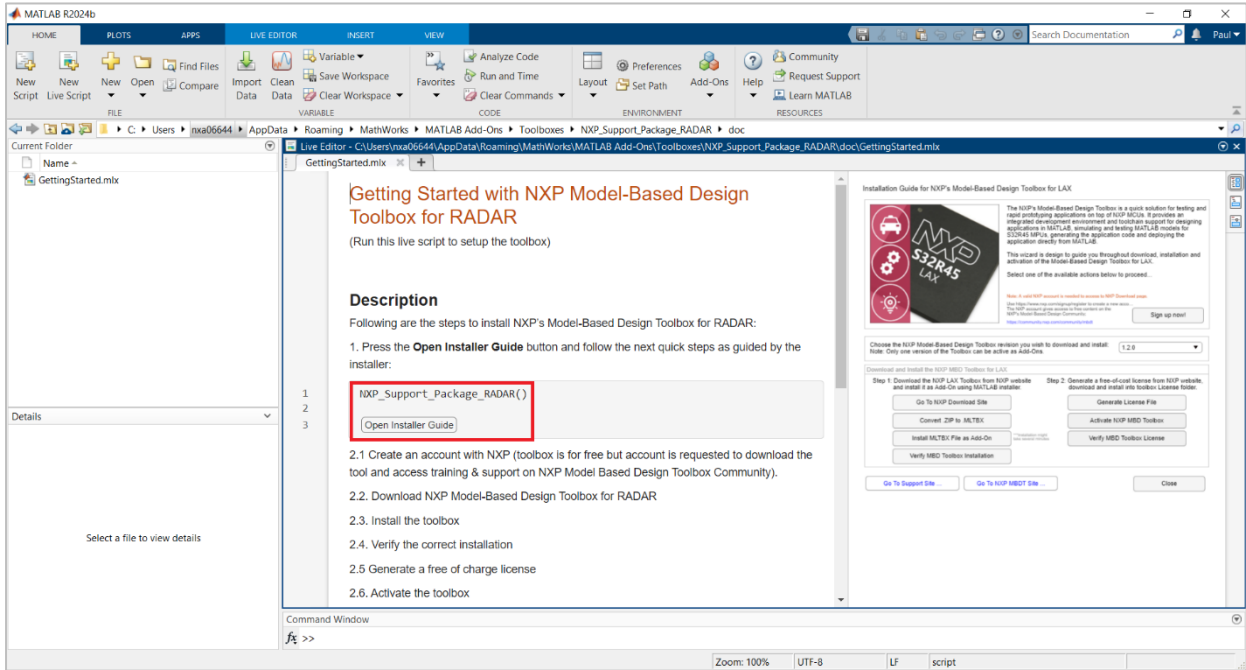
4. Read the License Agreement and press **I Accept**.



5. Once the process is successful, press the **Close** button.



6. Press the **Open Installer Guide** button on the newly opened **Getting Started** page.



7. The **Toolbox Installation Guide** will be opened.

1.2.3 Install NXP Model-Based Design Toolbox for RADAR

NXP Toolbox Installation Guide is a graphical user interface guide that helps to download and install the Model-Based Design Toolbox and generate and install the license from the NXP website.



NXP's Model-Based Design Toolbox for RADAR: Installation Guide

Installation Guide for NXP's Model-Based Design Toolbox for RADAR

The NXP's Model-Based Design Toolbox is a quick solution for testing and rapid prototyping applications on top of NXP MCUs. It provides an integrated development environment and toolchain support for designing applications in MATLAB, simulating and testing MATLAB models for S32R45 processors, generating the application code and deploying the application directly from MATLAB.

This wizard is design to guide you throughout download, installation and activation of the Model-Based Design Toolbox for RADAR.

Select one of the available actions below to proceed...

Note: A valid NXP account is needed to access to NXP Download page.
Use <https://www.nxp.com/signup/register> to create a new acco...
The NXP account gives access to free content on the NXP's Model-Based Design Community:
<https://community.nxp.com/community/mbdt>

Sign up now!

Choose the NXP Model-Based Design Toolbox revision you wish to download and install: 1.0.0

Note: Only one version of the Toolbox can be active as Add-Ons.

Download and Install the NXP MBD Toolbox for RADAR

Step 1: Download the NXP MBDT for RADAR from NXP website and install it as Add-On using MATLAB installer.

Step 2: Generate a free-of-cost license from NXP website, download and install into toolbox License folder.

Go To NXP Download Site

Convert .ZIP to .MLTBX

Install MLTBX File as Add-On

Verify MBD Toolbox Installation

Generate License File

Activate NXP MBD Toolbox

Verify MBD Toolbox License

***Installation might take several minutes

Go To Support Site ...

Go To NXP MBDT Site ...

Close

1. Press **Go to NXP Download Site** Button. In the newly opened window, Review the Terms and Conditions as you scroll down, and press the **I Agree** Button.

Note: If the page is not displayed as below, please go to the location presented in chapter 1.2.4 License activation, section 4, Select **Automotive SW – S32R45 Standard Software -> Model-Based Design Toolbox for RADAR**, and select the latest release available.

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[COMPANY](#)

[NXP](#) > [Design](#) > [Software Terms and Conditions](#)

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Software Terms and Conditions

Model-Based Design Toolbox for LAX 1.1.0

Please read the following agreement and click "I AGREE" at the bottom before downloading your software.

LA_OPT_NXP_Software_License v53 December 2023

IMPORTANT. Read the following NXP Software License Agreement ("Agreement") completely. By selecting the "I Accept" button at the end of this page, or by downloading, installing, or using the Licensed Software, you indicate that you accept the terms of the Agreement, and you acknowledge that you have the authority, for yourself or on behalf of your company, to bind your company to these terms. You may then download or install the file. In the event of a conflict between the terms of this Agreement and any license terms and conditions for NXP's proprietary software embedded anywhere in the Licensed Software file, the terms of this Agreement shall control. If a separate license agreement for the Licensed Software has been signed by you and NXP, then that agreement shall govern your use of the Licensed Software and shall supersede this Agreement.

[NXP SOFTWARE LICENSE AGREEMENT](#)

This is a legal agreement between your employer, of which you are an authorized representative, or, if you have no

[I Agree](#)
[Cancel](#)

2. Download the **SW32_MBDT_RADAR_1.0.0_D2410.mltbx** file.

Note: The downloaded file has the **.zip** extension instead of **.mltbx**. The next step helps to convert to the right format.

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Model-Based Design Toolbox for LAX 1.1.0

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[Notes](#)

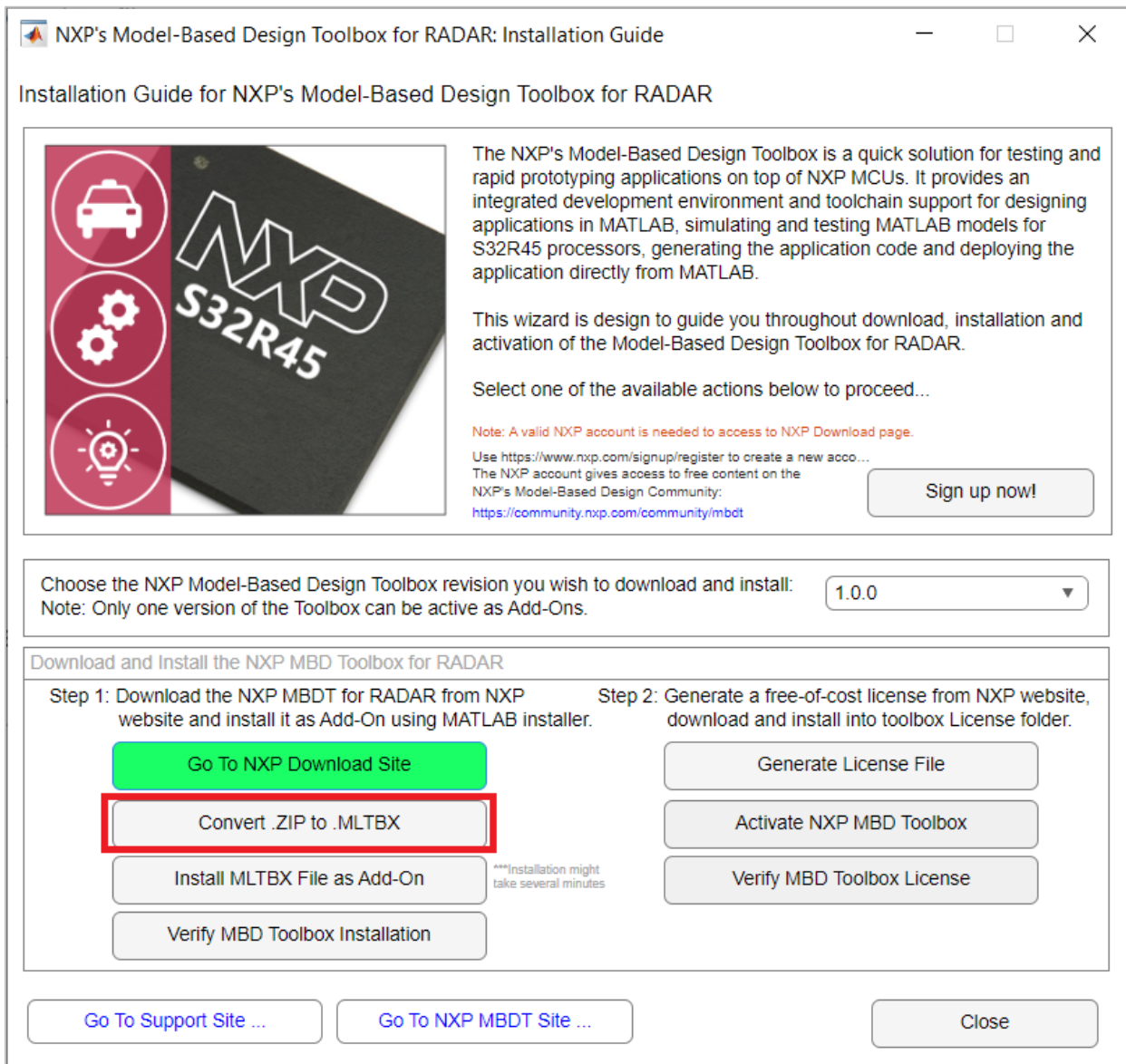
[Download Help](#)

The LAX Toolbox is delivered as a MATLAB MLTBX file. Your browser might download it as a zip file. Rename the file to *.mltbx to make it compatible with MATLAB Add-on Installer

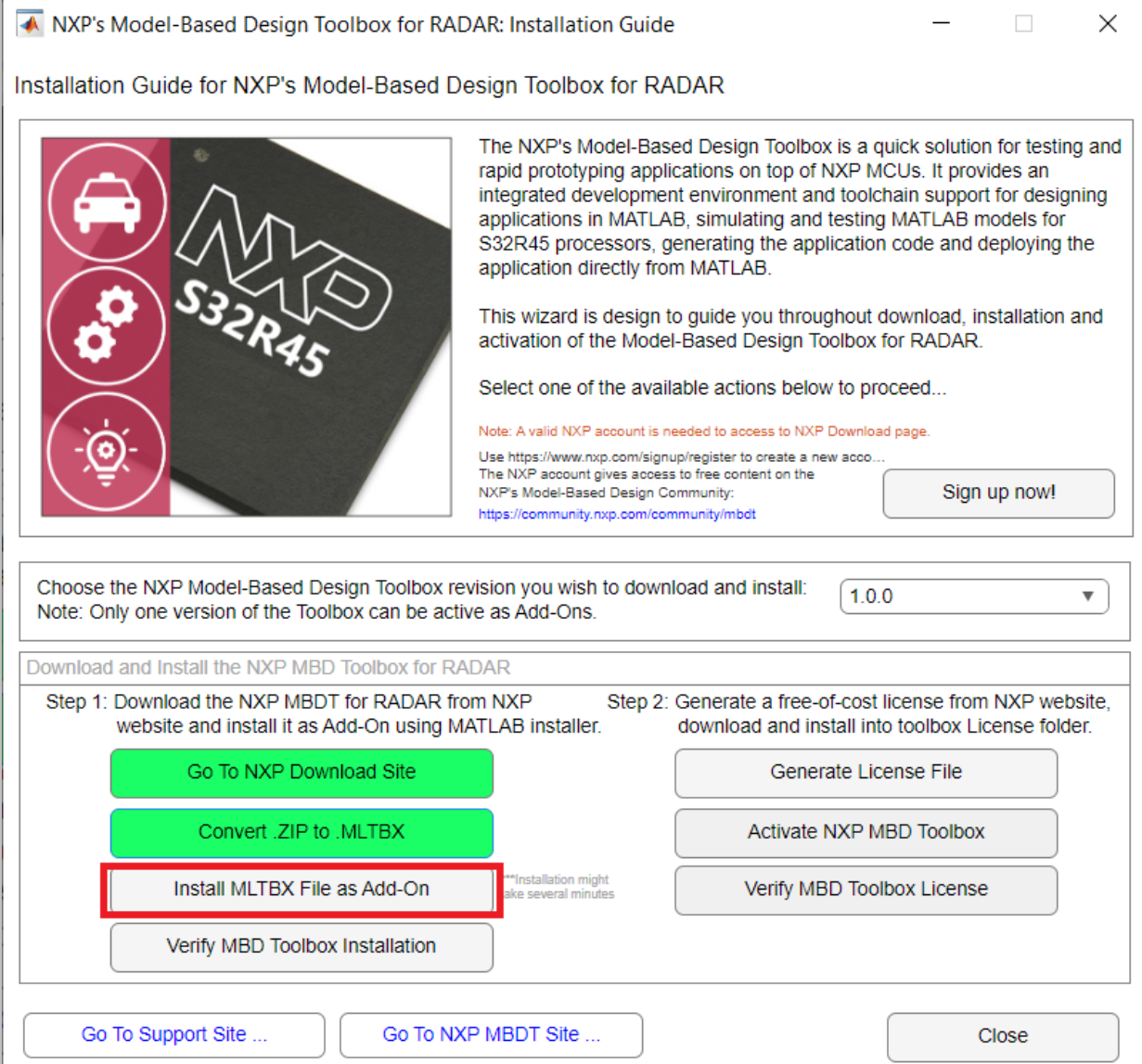
[Show All Files](#)
4 Files

	File Description	File Size	File Name
+	Model_Based_Design_Toolbox_LAX_Quick_Start_Guide	2.9 MB	Model_Based_Design_Toolbox_LAX_Quick_Start_Guide.pdf
+	Model_Based_Design_Toolbox_LAX_Release_Notes	510.5 KB	Model_Based_Design_Toolbox_LAX_Release_Notes.pdf
+	NXP_MBDToolbox_LAX_1.1.0_20231127	25.2 MB	NXP_MBDToolbox_LAX_1.1.0.RTM_20231127.mltbx
+	Software_Content_Register_MBDT_LAX	1.1 KB	Software_Content_Register_MBDT_LAX.txt

- Go back to **NXP Toolbox Installation Guide** and press the **Convert .ZIP to .MLTBX** button. In the newly opened Browsing window, select the file downloaded and press **Open**.



- Go back to **NXP Toolbox Installation Guide** and select the **Install MLTBX File as Add-On** button. In the newly opened window, browse for the MLTBX file and press **Open**.



The image shows a window titled "NXP's Model-Based Design Toolbox for RADAR: Installation Guide". The window contains an introduction to the toolbox, a "Sign up now!" button, a version selector set to "1.0.0", and two columns of installation steps. The "Install MLTBX File as Add-On" button in Step 1 is highlighted with a red rectangle. Below the steps are links to support and NXP sites, and a "Close" button.

NXP's Model-Based Design Toolbox for RADAR: Installation Guide

Installation Guide for NXP's Model-Based Design Toolbox for RADAR

The NXP's Model-Based Design Toolbox is a quick solution for testing and rapid prototyping applications on top of NXP MCUs. It provides an integrated development environment and toolchain support for designing applications in MATLAB, simulating and testing MATLAB models for S32R45 processors, generating the application code and deploying the application directly from MATLAB.

This wizard is design to guide you throughout download, installation and activation of the Model-Based Design Toolbox for RADAR.

Select one of the available actions below to proceed...

Note: A valid NXP account is needed to access to NXP Download page.

Use <https://www.nxp.com/signup/register> to create a new acco...

The NXP account gives access to free content on the NXP's Model-Based Design Community:

<https://community.nxp.com/community/mbdt>

Sign up now!

Choose the NXP Model-Based Design Toolbox revision you wish to download and install:
Note: Only one version of the Toolbox can be active as Add-Ons.

1.0.0

Download and Install the NXP MBD Toolbox for RADAR

Step 1: Download the NXP MBDT for RADAR from NXP website and install it as Add-On using MATLAB installer.

Step 2: Generate a free-of-cost license from NXP website, download and install into toolbox License folder.

Go To NXP Download Site

Convert .ZIP to .MLTBX

Install MLTBX File as Add-On Installation might take several minutes

Verify MBD Toolbox Installation

Generate License File

Activate NXP MBD Toolbox

Verify MBD Toolbox License

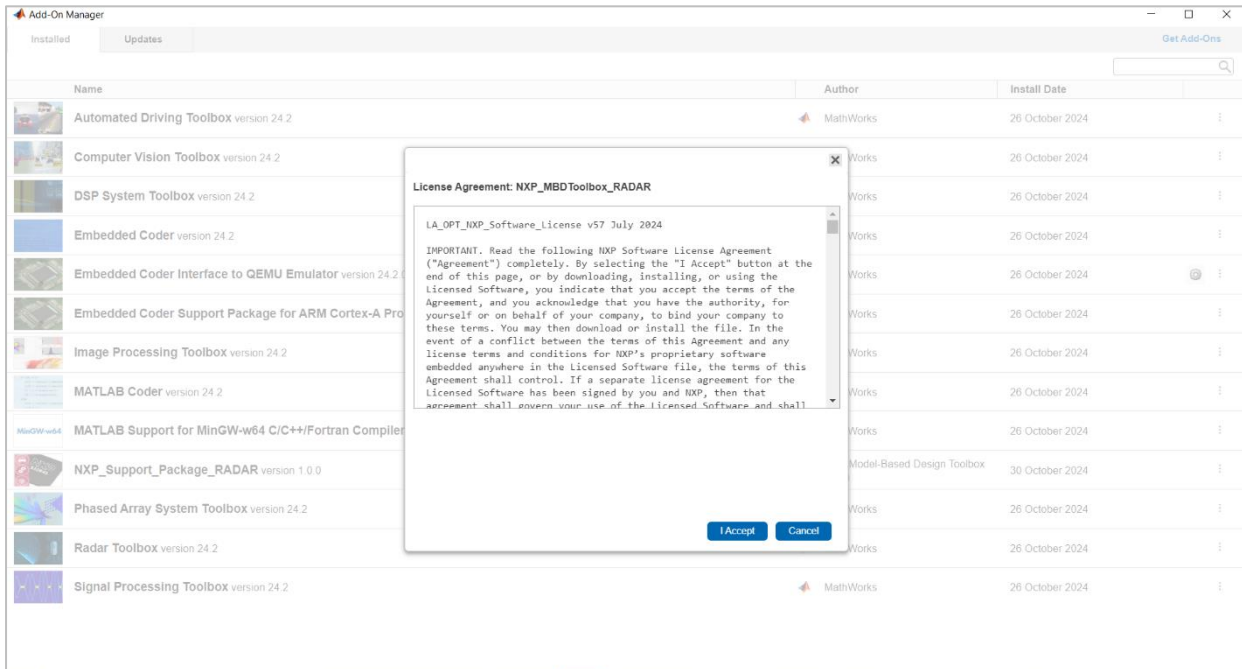
Go To Support Site ...

Go To NXP MBDT Site ...

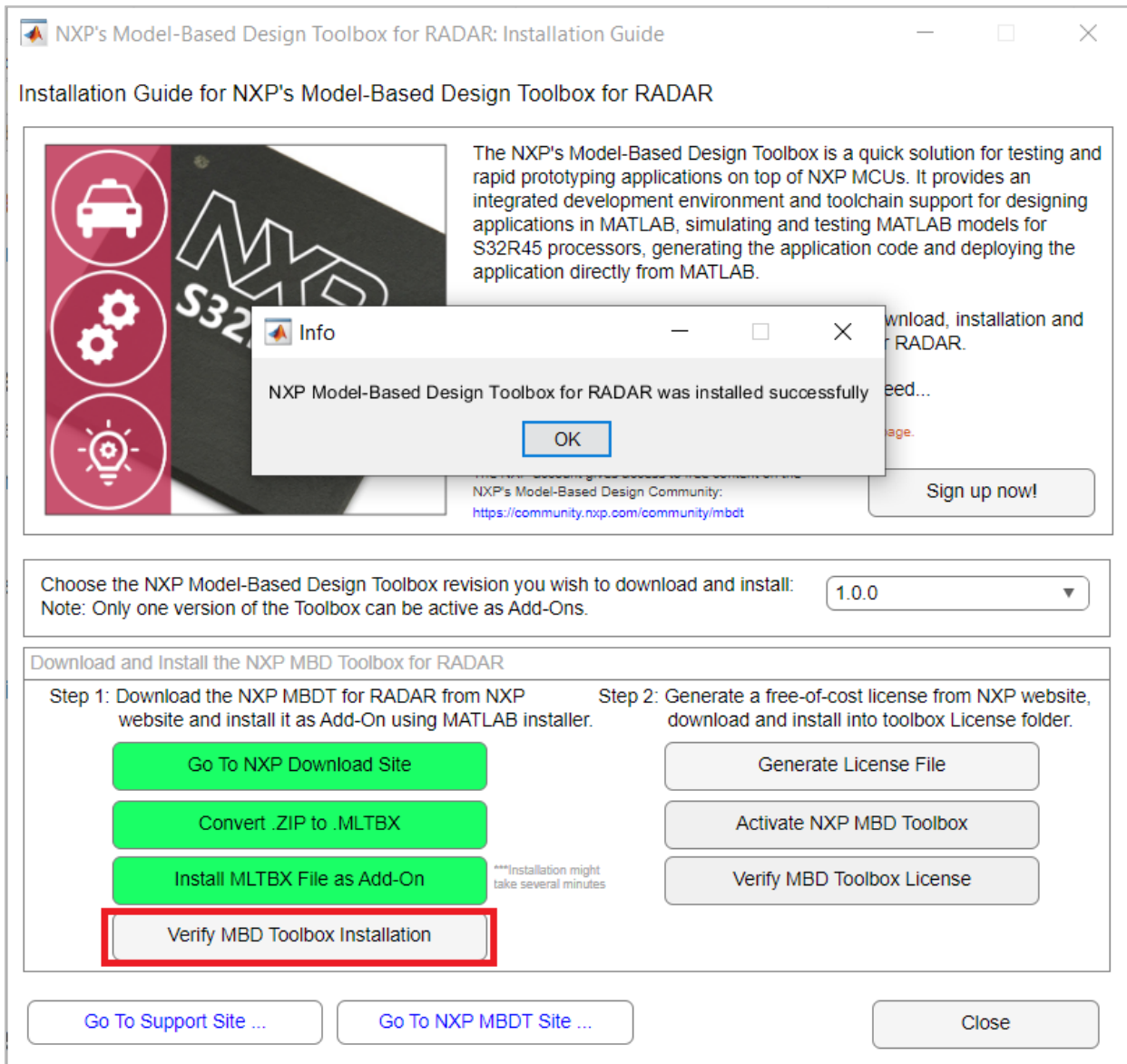
Close

5. In the MATLAB Add-On Manager, Review the Terms and Conditions as you scroll down, and press the **I Accept** Button. This action starts MBDT for RADAR toolbox installation process.

Note: Installation might take several minutes.



- Once the installation is complete, go back to **NXP Toolbox Installation Guide** and press the **Verify MBD Toolbox Installation** button.



1.2.4 Generate and Activate NXP Model-Based Design Toolbox for RADAR license

The following steps guide you on how to achieve the license for MBDT for RADAR toolbox.

1. Press the Generate License File button in the **NXP Toolbox Installation Guide**.

The NXP's Model-Based Design Toolbox is a quick solution for testing and rapid prototyping applications on top of NXP MCUs. It provides an integrated development environment and toolchain support for designing applications in MATLAB, simulating and testing MATLAB models for S32R45 processors, generating the application code and deploying the application directly from MATLAB.

This wizard is design to guide you throughout download, installation and activation of the Model-Based Design Toolbox for RADAR.

Select one of the available actions below to proceed...

Note: A valid NXP account is needed to access to NXP Download page.

Use <https://www.nxp.com/signup/register> to create a new acco...

The NXP account gives access to free content on the NXP's Model-Based Design Community:

<https://community.nxp.com/community/mbdt>

Sign up now!

Choose the NXP Model-Based Design Toolbox revision you wish to download and install:
Note: Only one version of the Toolbox can be active as Add-Ons.

1.0.0

Download and install the NXP MBD Toolbox for RADAR

Step 1: Download the NXP MBDT for RADAR from NXP website and install it as Add-On using MATLAB installer.

Go To NXP Download Site

Convert .ZIP to .MLTBX

Install MLTBX File as Add-On

Verify MBD Toolbox Installation

***Installation might take several minutes

Step 2: Generate a free-of-cost license from NXP website, download and install into toolbox License folder.

Generate License File

Activate NXP MBD Toolbox

Verify MBD Toolbox License

Go To Support Site ...

Go To NXP MBDT Site ...

Close

Model-Based Design Toolbox RADAR
Quick Start Guide

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2. In the newly opened webpage, select the checkbox as shown below, and press the generate button.

Note: If a similar webpage as shown below is not being displayed, please go to the same page as described in the previous section, bullet 2, where the next tab “License keys”.

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License Information

Model-Based Design Toolbox for LAX 1.1.0

Generate

Item Description

S32R45 Standard Software

Order Number

SW32R4-STD SW-D_66371677

Purchase Order Number

Total Number of Licenses:

100

Activation Code

☐

License Applicable to Product(s):

Version

Description

1.1.0

Model-Based Design Toolbox for LAX 1.1.0 (View EULA)

100 Available

Generate

3. Select Disk Serial Number and type the host id number. Give a name to the license and press the Generate button.

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Generate Licenses

Instructions for finding your host ID details are available [here](#).

Please do not use spaces in the **Name** field (for node-locked licenses) or **Host Description** field (for floating licenses). These fields are available to add brief text notes to your license.

	Number of Licenses Available
License Applicable to Product(s):	
<div><div>Version</div><div>Description</div><div>1.1.0</div><div>Model-Based Design Toolbox for LAX 1.1.0</div></div>	100

Node Host ID

Disk Serial Number

A1B2-C3D4

Name

my_license

Node Host ID

Name

Node Host ID

Name

Node Host ID

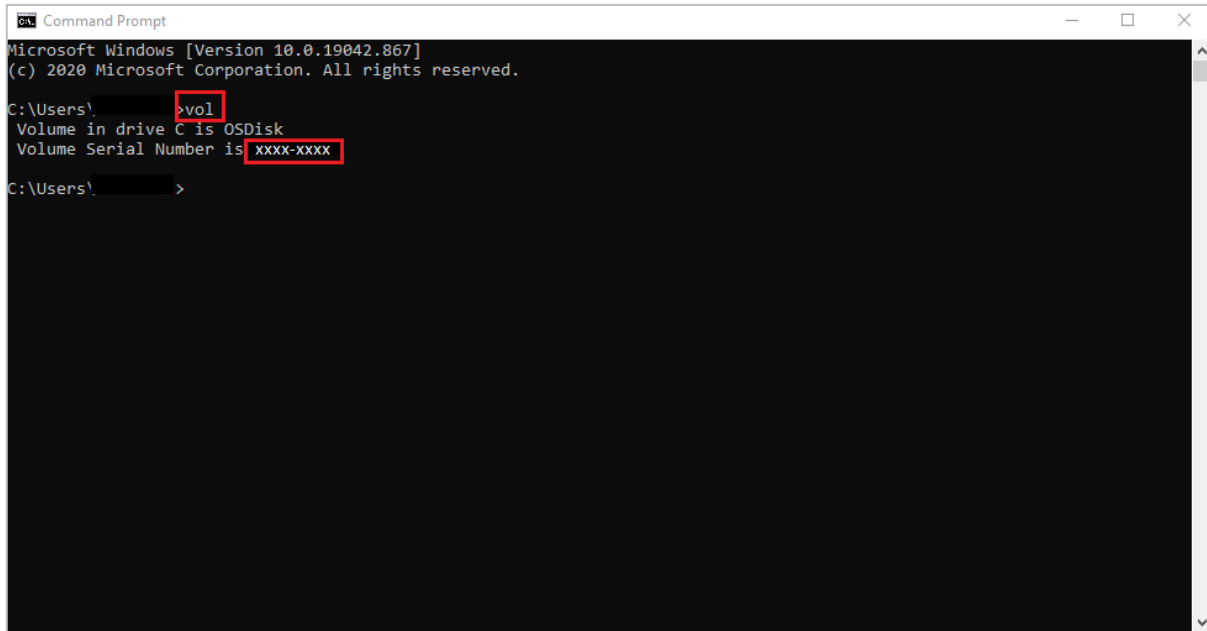
Name

Node Host ID

Name

Generate

4. To find the host ID for your hard drive, please open a Windows Command Prompt and execute the “vol” command.

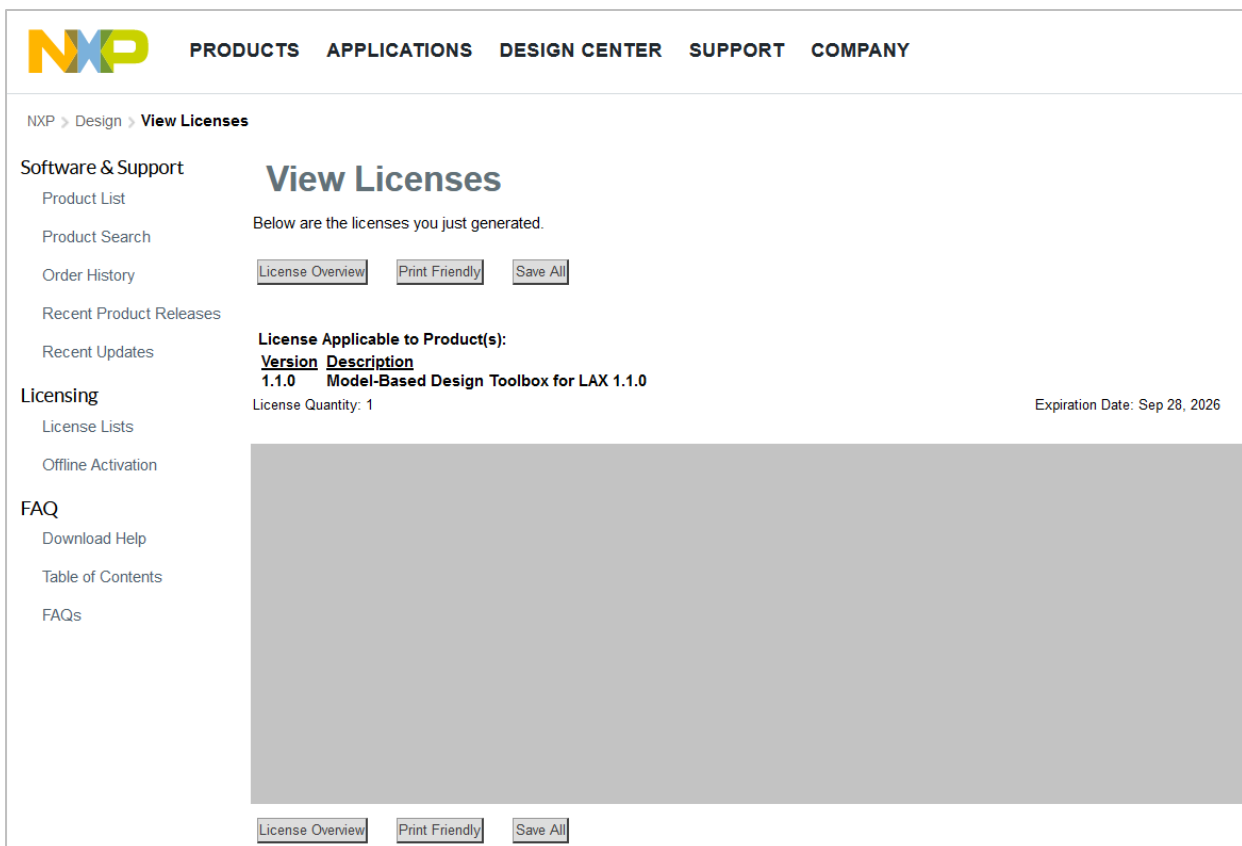


```
Microsoft Windows [Version 10.0.19042.867]
(c) 2020 Microsoft Corporation. All rights reserved.

C:\Users\>vol
Volume in drive C is OSDisk
Volume Serial Number is XXXX-XXXX

C:\Users\>
```

5. Now that the license has been successfully generated, press the Save all button.



The screenshot shows the NXP Design Center interface. The top navigation bar includes the NXP logo and links for PRODUCTS, APPLICATIONS, DESIGN CENTER, SUPPORT, and COMPANY. The breadcrumb trail indicates the user is in 'View Licenses' under the 'Design' section.

Software & Support

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View Licenses

Below are the licenses you just generated.

[License Overview](#) [Print Friendly](#) [Save All](#)

License Applicable to Product(s):	
Version	Description
1.1.0	Model-Based Design Toolbox for LAX 1.1.0

License Quantity: 1 Expiration Date: Sep 28, 2026

[License Overview](#) [Print Friendly](#) [Save All](#)

6. Back to **NXP Toolbox Installation Guide**, press the **Activate NXP MBD Toolbox** button. In the newly opened window, browse for the downloaded license.dat or license.lic file, and press Open.



The image shows a screenshot of a software installation window titled "NXP's Model-Based Design Toolbox for RADAR: Installation Guide". The window has a standard Windows-style title bar with minimize, maximize, and close buttons. The main content area is divided into several sections. At the top, there's a header "Installation Guide for NXP's Model-Based Design Toolbox for RADAR". Below this, on the left, is a graphic with three circular icons (a car, gears, and a lightbulb) and a black box with "NXP S32R45" text. To the right of this graphic, there's descriptive text about the toolbox and a "Sign up now!" button. Below that, a section asks the user to "Choose the NXP Model-Based Design Toolbox revision you wish to download and install:" with a dropdown menu showing "1.0.0". The main part of the window is titled "Download and Install the NXP MBD Toolbox for RADAR" and is split into two columns for "Step 1" and "Step 2". Step 1 includes buttons for "Go To NXP Download Site", "Convert .ZIP to .MLTBX", "Install MLTBX File as Add-On", and "Verify MBD Toolbox Installation". Step 2 includes buttons for "Generate License File", "Activate NXP MBD Toolbox", and "Verify MBD Toolbox License". At the bottom, there are three buttons: "Go To Support Site ...", "Go To NXP MBDT Site ...", and "Close".

NXP's Model-Based Design Toolbox for RADAR: Installation Guide

Installation Guide for NXP's Model-Based Design Toolbox for RADAR

The NXP's Model-Based Design Toolbox is a quick solution for testing and rapid prototyping applications on top of NXP MCUs. It provides an integrated development environment and toolchain support for designing applications in MATLAB, simulating and testing MATLAB models for S32R45 processors, generating the application code and deploying the application directly from MATLAB.

This wizard is design to guide you throughout download, installation and activation of the Model-Based Design Toolbox for RADAR.

Select one of the available actions below to proceed...

Note: A valid NXP account is needed to access to NXP Download page.
Use <https://www.nxp.com/signup/register> to create a new acco...
The NXP account gives access to free content on the NXP's Model-Based Design Community:
<https://community.nxp.com/community/mbdt>

Sign up now!

Choose the NXP Model-Based Design Toolbox revision you wish to download and install:
Note: Only one version of the Toolbox can be active as Add-Ons.

1.0.0

Download and Install the NXP MBD Toolbox for RADAR

Step 1: Download the NXP MBDT for RADAR from NXP website and install it as Add-On using MATLAB installer.

Step 2: Generate a free-of-cost license from NXP website, download and install into toolbox License folder.

Go To NXP Download Site

Convert .ZIP to .MLTBX

Install MLTBX File as Add-On

Verify MBD Toolbox Installation

Generate License File

Activate NXP MBD Toolbox

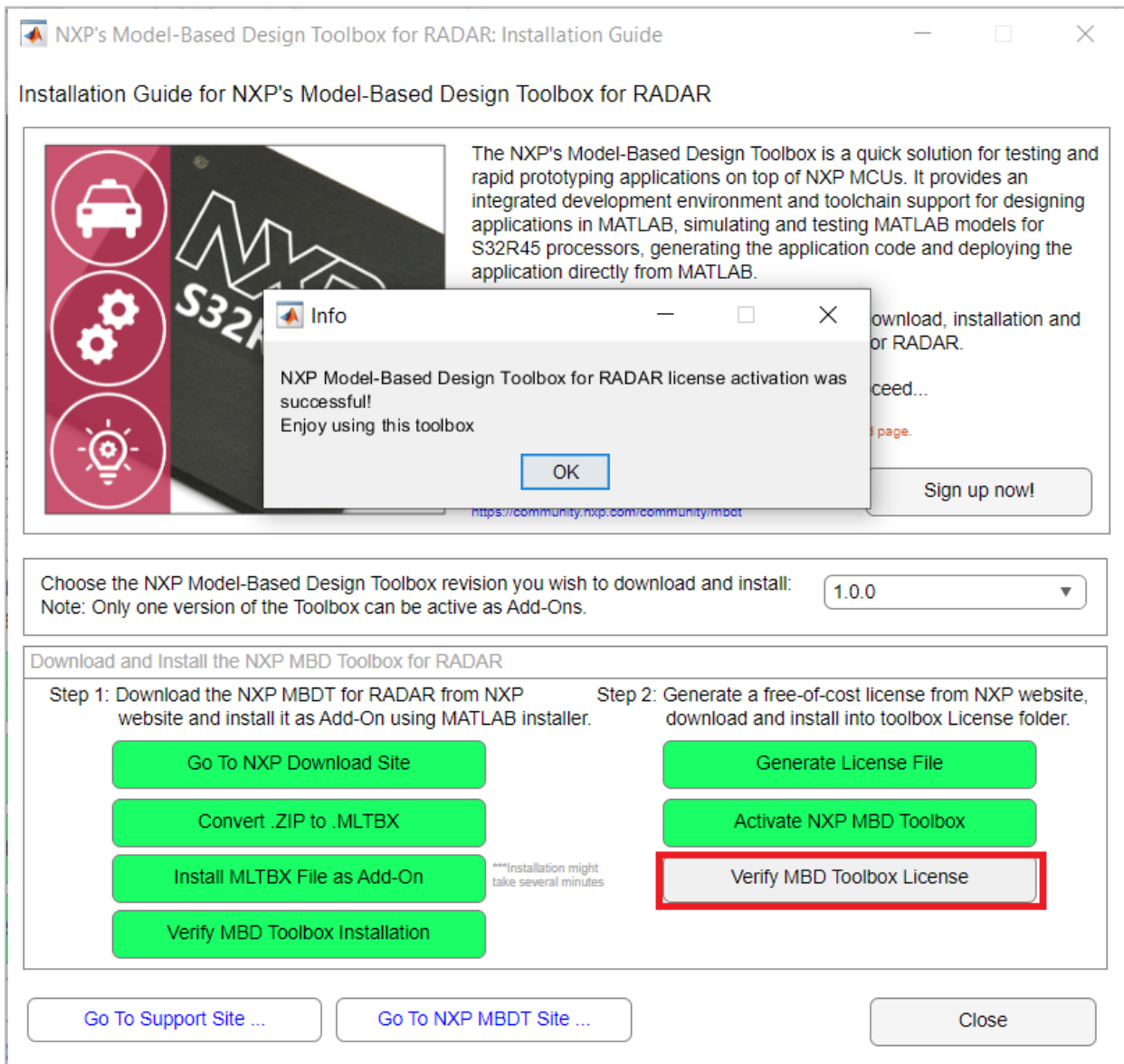
Verify MBD Toolbox License

Go To Support Site ...

Go To NXP MBDT Site ...

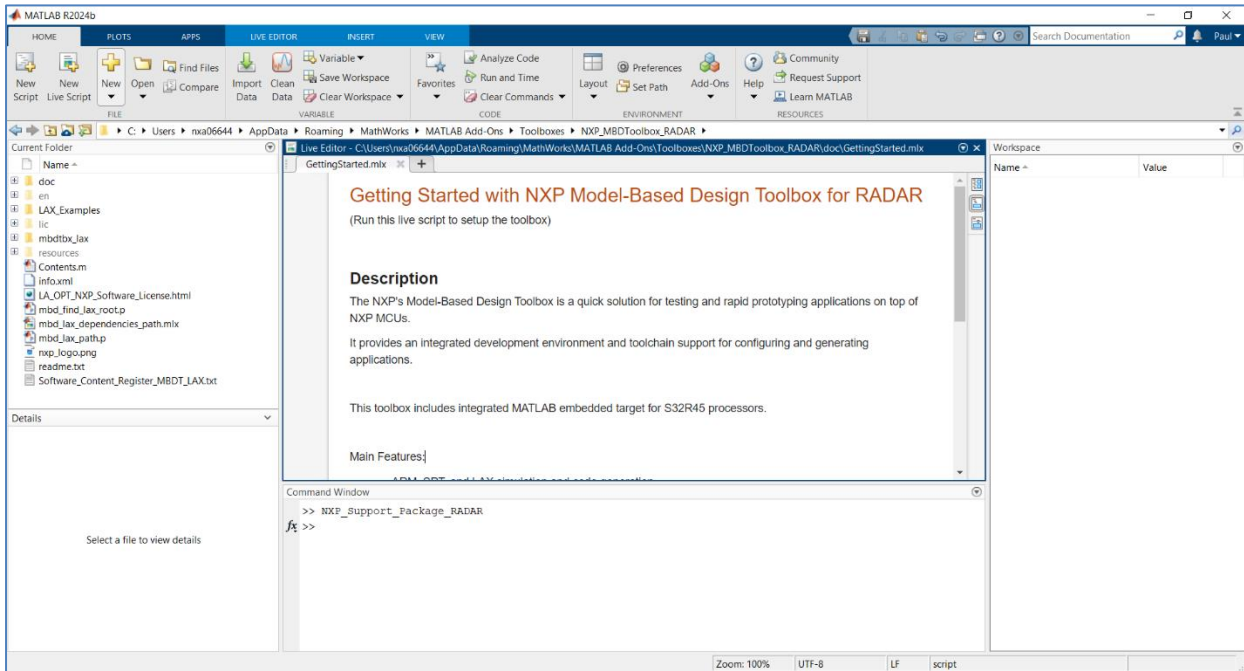
Close

7. The last step is to check the license activation status, by pressing the **Verify MBD Toolbox License** button. If everything went well, a similar popup window as below will be displayed.



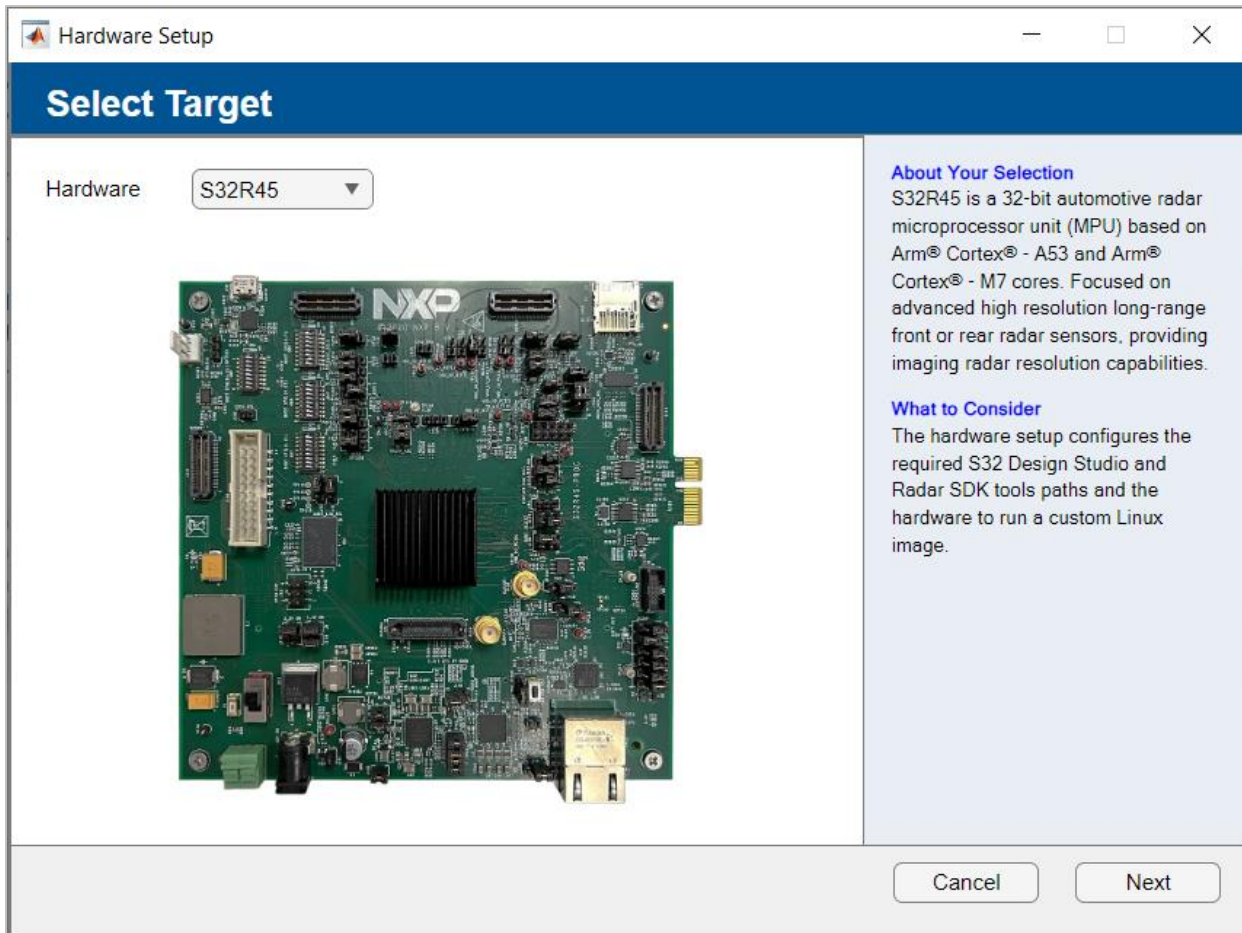
1.2.5 Model-Based Design Toolbox Configuration

After the installation has finished the *GettingStarted.mlx* is opened. To run it go to the LIVE EDITOR tab and push the Run button. Running it will open the Setup GUI that helps the user to configure the toolbox.



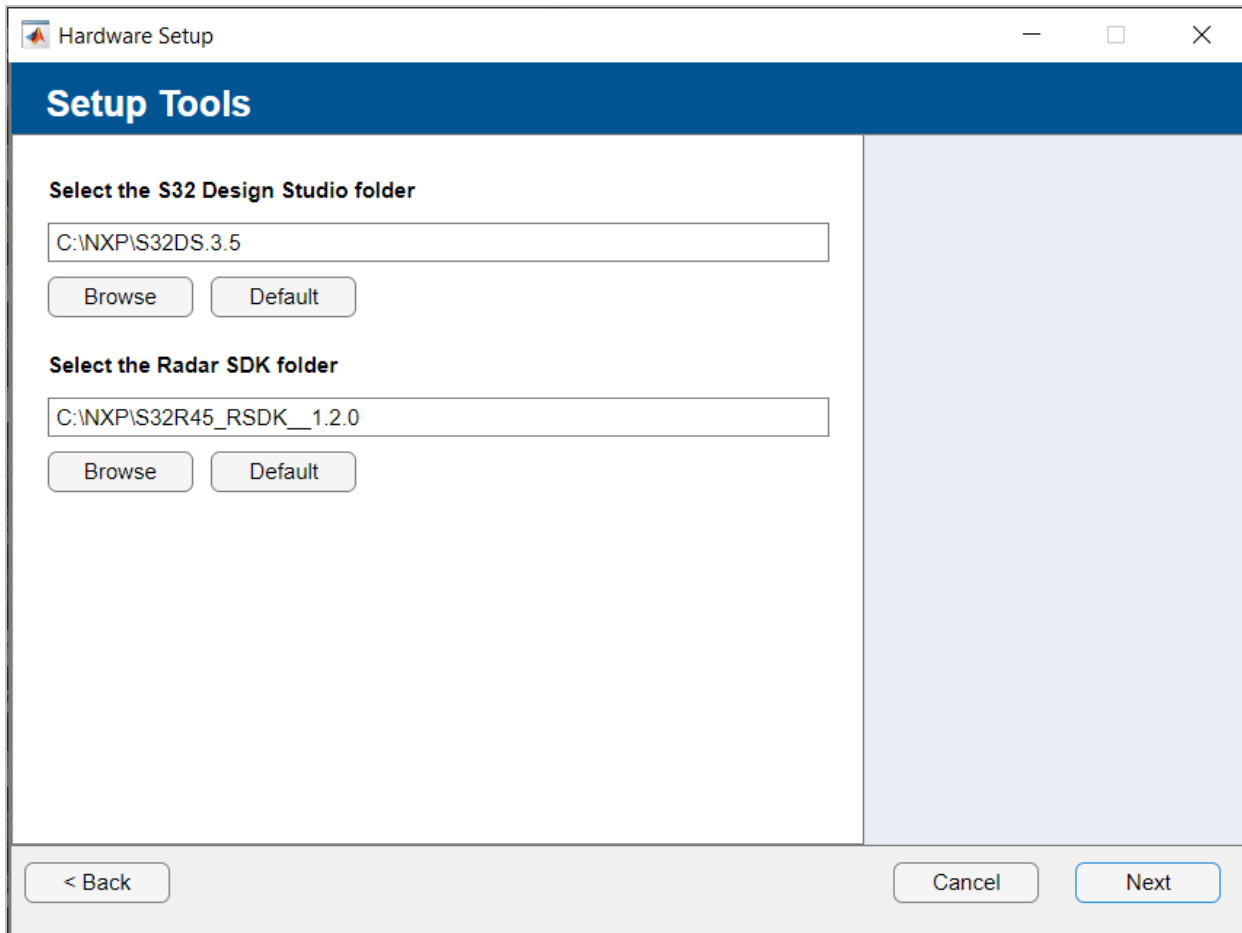
1. Select the hardware board

We are going to select S32R45 and push the Next button.



2. Setup the external tools

Select the needed external tools paths.



The image shows a Windows-style dialog box titled "Hardware Setup". It has a blue header bar with the text "Setup Tools". The main area is divided into two sections. The first section is titled "Select the S32 Design Studio folder" and contains a text input field with the path "C:\NXP\S32DS.3.5". Below the input field are two buttons: "Browse" and "Default". The second section is titled "Select the Radar SDK folder" and contains a text input field with the path "C:\NXP\S32R45_RSDK__1.2.0". Below this input field are also two buttons: "Browse" and "Default". At the bottom of the dialog, there are three buttons: "< Back" on the left, "Cancel" in the center, and "Next" on the right. The "Next" button is highlighted with a blue border.

Hardware Setup

Setup Tools

Select the S32 Design Studio folder

C:\NXP\S32DS.3.5

Browse Default

Select the Radar SDK folder

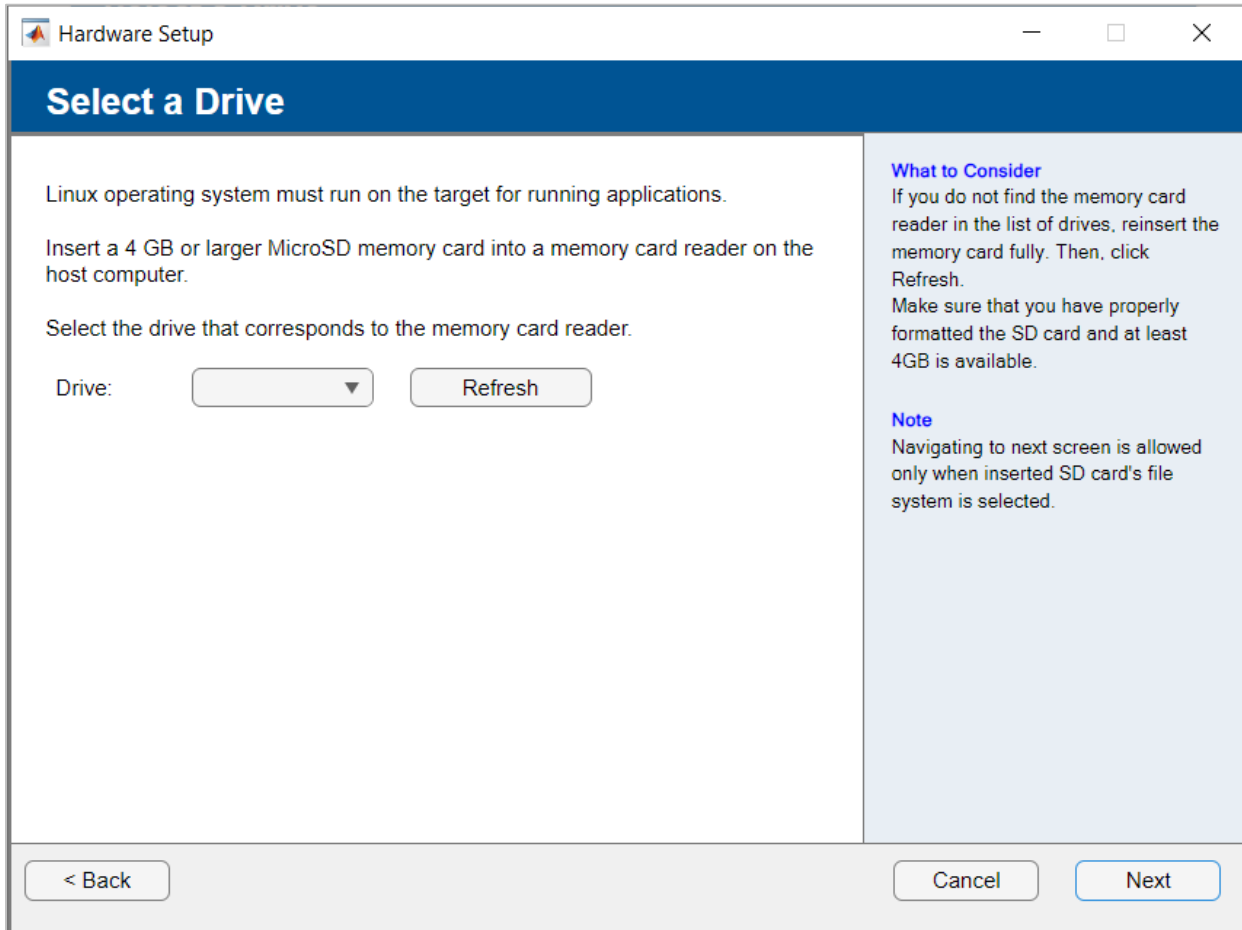
C:\NXP\S32R45_RSDK__1.2.0

Browse Default

< Back Cancel Next

3. Write Linux on microSD card

The next page helps you to write Linux on a microSD card. First, insert the microSD card, then push the Refresh button to actualize the drive list. If the microSD card is available in Windows, the list should not be empty. Select the drive from the list and push the Next button.



The screenshot shows a window titled "Hardware Setup" with a blue header bar that says "Select a Drive". The main content area is divided into two columns. The left column contains instructions: "Linux operating system must run on the target for running applications.", "Insert a 4 GB or larger MicroSD memory card into a memory card reader on the host computer.", and "Select the drive that corresponds to the memory card reader." Below this is a "Drive:" label, a dropdown menu, and a "Refresh" button. The right column has a light blue background and contains two sections: "What to Consider" with advice on reinserting the card and formatting, and a "Note" about navigating to the next screen. At the bottom of the window are three buttons: "< Back", "Cancel", and "Next".

Hardware Setup

Select a Drive

Linux operating system must run on the target for running applications.

Insert a 4 GB or larger MicroSD memory card into a memory card reader on the host computer.

Select the drive that corresponds to the memory card reader.

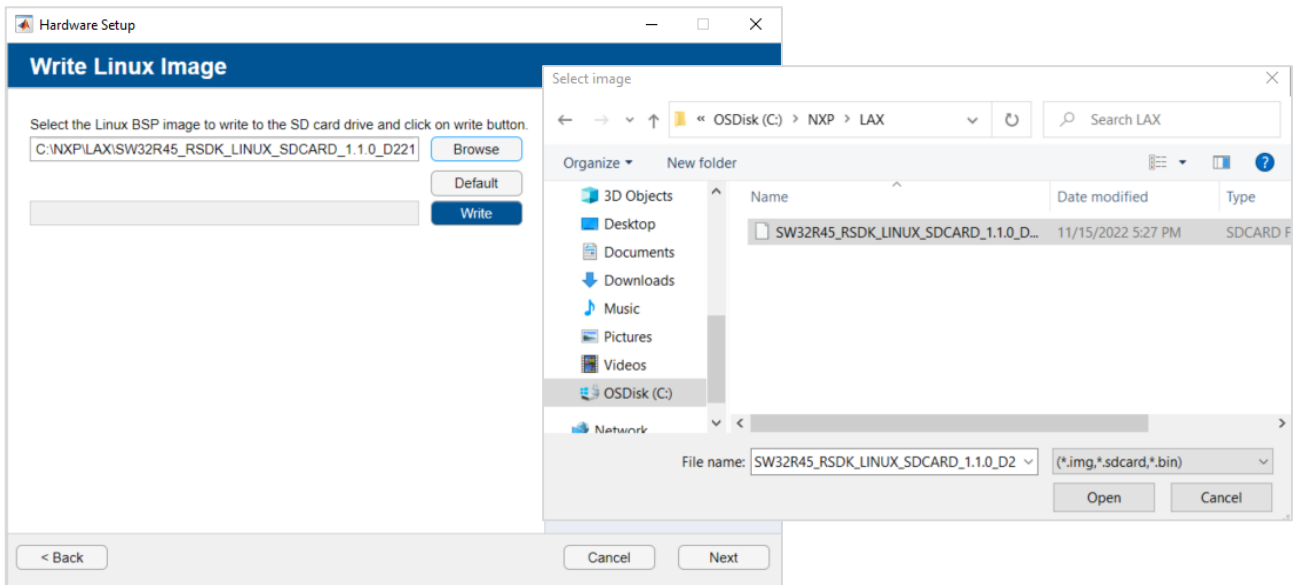
Drive:

What to Consider
If you do not find the memory card reader in the list of drives, reinsert the memory card fully. Then, click Refresh.
Make sure that you have properly formatted the SD card and at least 4GB is available.

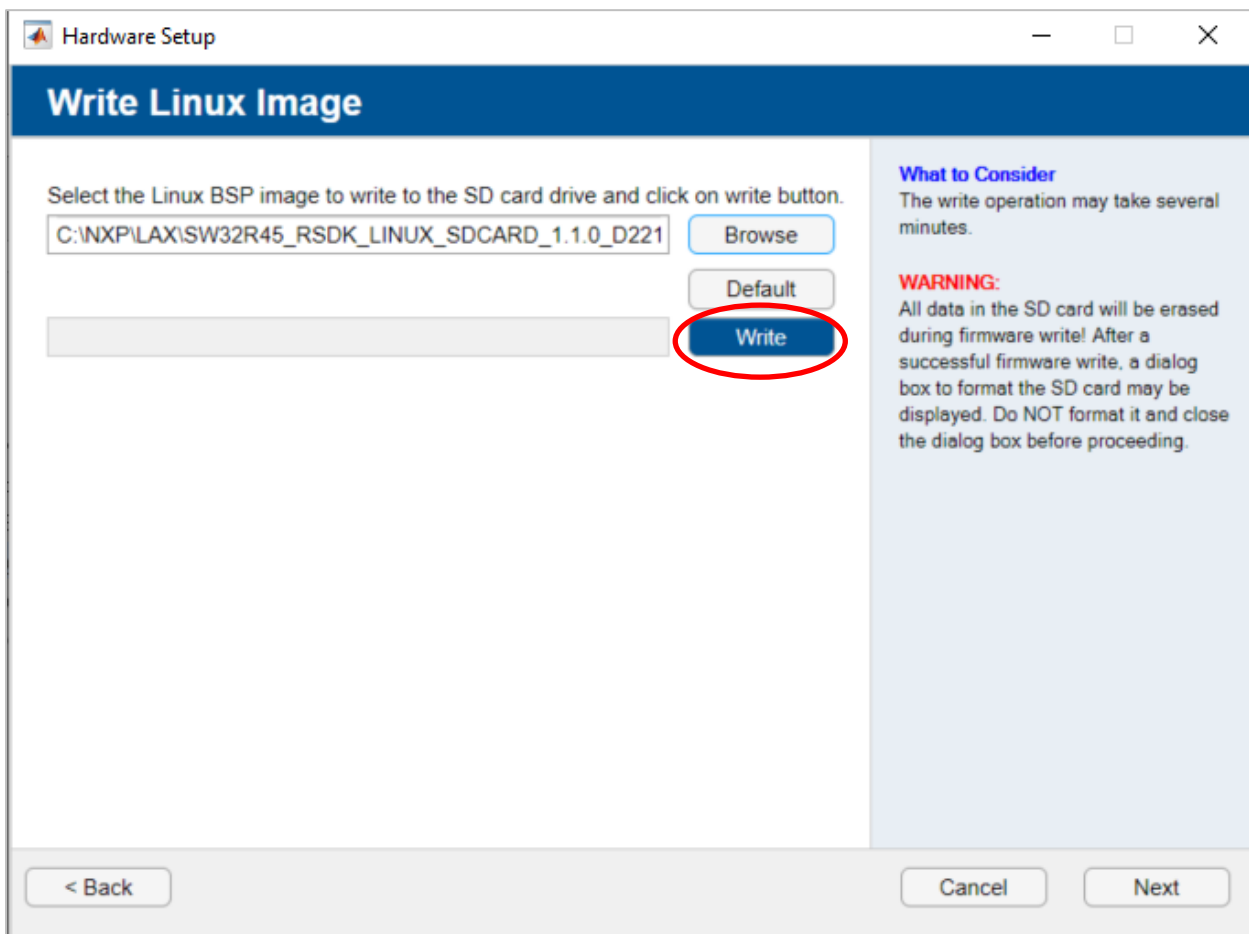
Note
Navigating to next screen is allowed only when inserted SD card's file system is selected.

< Back

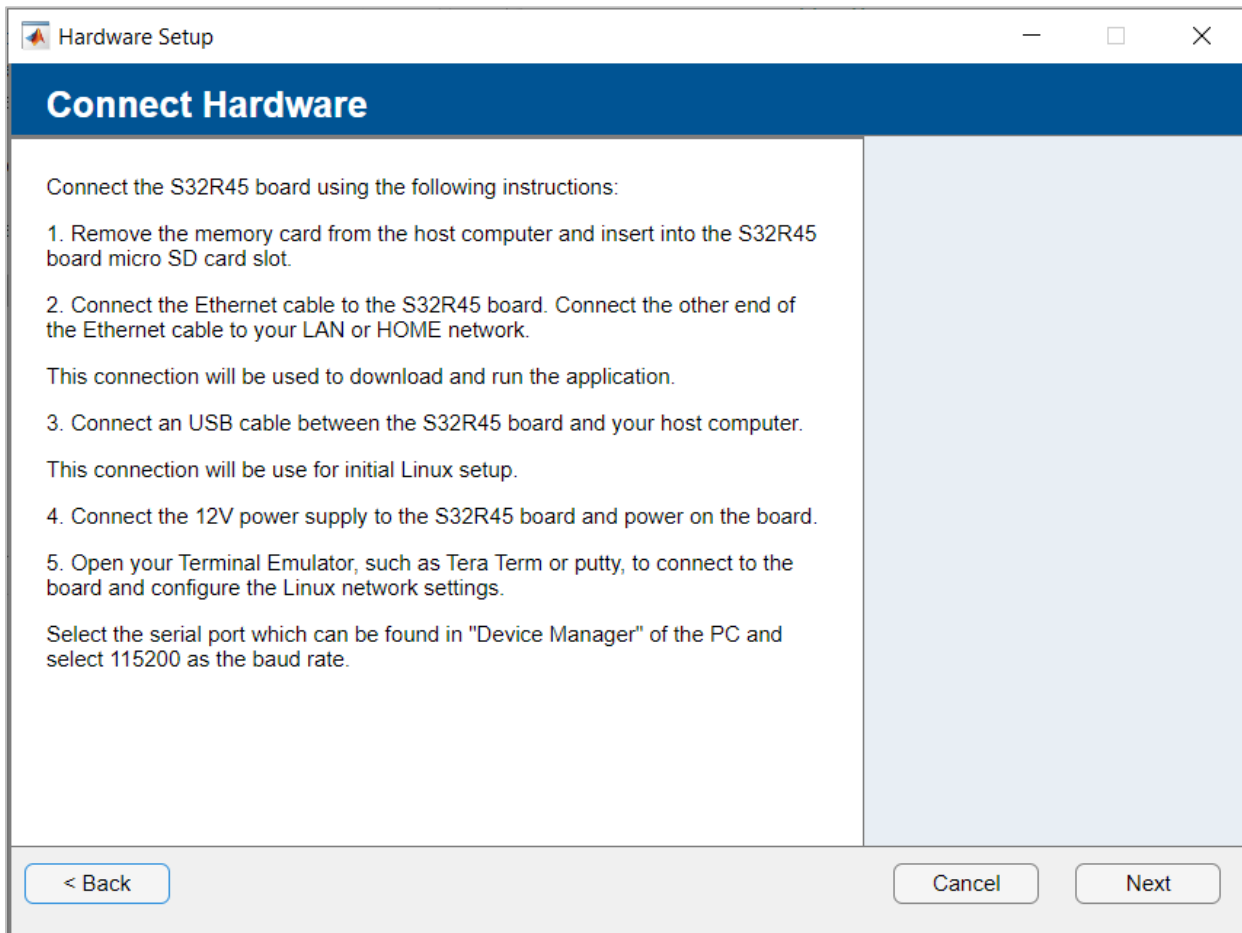
Select the Linux image using the Browse button.



Finally, push the Write button to write the Linux image.

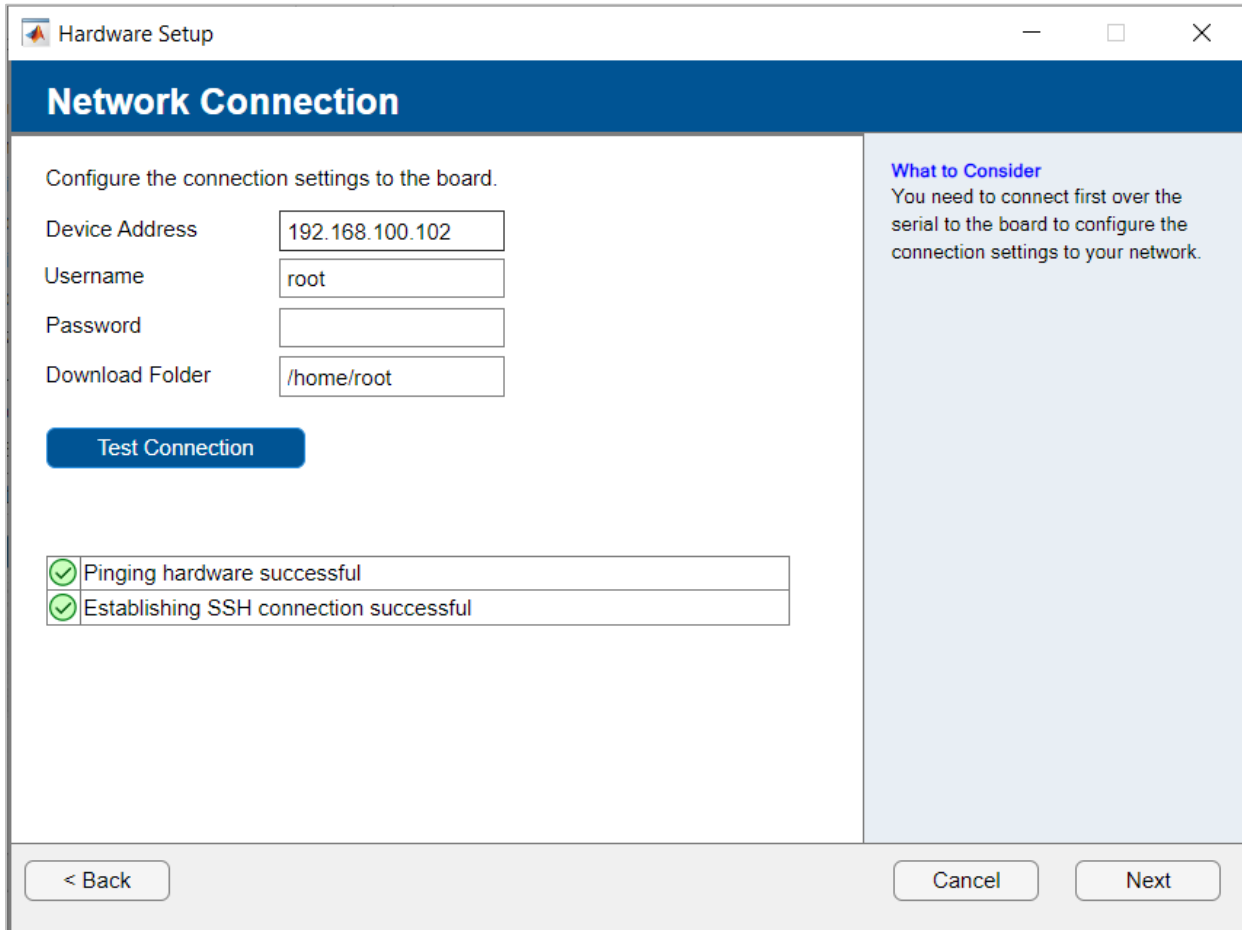


4. Get additional software



5. Setup network connection

Fill in the Device Address, Username, Password, and Download folder, and then push the Test Connection button. This tests if the device address is available and if the SSH commands can be run.



The screenshot shows a 'Hardware Setup' window with a 'Network Connection' section. It contains input fields for Device Address (192.168.100.102), Username (root), Password (empty), and Download Folder (/home/root). A 'Test Connection' button is present. Below the inputs, two status messages are shown: 'Pinging hardware successful' and 'Establishing SSH connection successful', both with green checkmarks. A 'What to Consider' sidebar on the right advises connecting first over the serial. Navigation buttons at the bottom include '< Back', 'Cancel', and 'Next'.

Network Connection	
Configure the connection settings to the board.	
Device Address	192.168.100.102
Username	root
Password	
Download Folder	/home/root
Test Connection	
✓	Pinging hardware successful
✓	Establishing SSH connection successful

What to Consider
You need to connect first over the serial to the board to configure the connection settings to your network.

< Back Cancel Next

Setup done

Congratulations! You are ready to use the Model-Based Design for RADAR toolbox.











1.2.6 Setting the Path for Model-Based Design Toolbox and Toolchain Generation

The Model-Based Design Toolbox for RADAR uses the Toolchain mechanism exposed by the MATLAB to enable automatic code generation with the Embedded Coder toolbox. By default, the toolchain is configured for the MATLAB 2023a-2024b releases. For any other MATLAB release, the user needs to execute a toolbox m-script to generate the proper settings for his/her installation environment.

This is done by changing the MATLAB Current Directory to the toolbox installation directory (e.g.: `..\MATLAB\Add-Ons\Toolboxes\NXP_MBDToolbox_RADAR\`) and running the “`mbd_lax_path.m`” script.

```
>> mbd_lax_path
Treating 'C:\MATLABAddOns\Toolboxes\NXP_MBDToolbox_RADAR\' as MBD
Toolbox installation root.
MBD Toolbox path prepended.
NXP S32 Design Studio GCC (S32R45) toolchain is already registered ...
No compatible target is currently available for NXP S32R45 - A53.
Creating one...
Creating folders for the target 'NXP S32R45 - A53' in the folder
'C:\MATLABAddOns\Toolboxes\NXP_MBDToolbox_RADAR\mbdtbx_lax\codertarget
\2023a\s32r45'...
Creating the framework for the target 'NXP S32R45 - A53'...
Registering the target 'NXP S32R45 - A53'...
Done.
Successful.
```

This mechanism requires users to install the [Embedded Coder Support Package for ARM Cortex-A Processor](#) as a prerequisite.

	Embedded Coder Support Package for ARM Cortex-R Processors version 20.1.1	 Hardware Support Package	31 March 2022	 
	Embedded Coder Support Package for ARM Cortex-M Processors version 20.1.1	 Hardware Support Package	27 January 2022	
	Embedded Coder Support Package for ARM Cortex-A Processors version 20.1.3	 Hardware Support Package	21 January 2022	

The “`mbd_lax_path.m`” script verifies the user setup dependencies and will issue instructions for a successful installation and configuration of the toolbox.

2 How to create, run and build LAX example applications

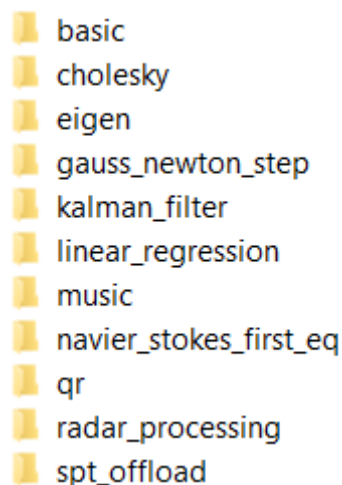
2.1.1 S32R45 Linux Setup

Before running any example on the S32R45 board for the first time, Linux must be configured to load the needed drivers. To do so, after logging into the Linux environment type the following commands. These configurations will be persistent, no need to reproduce them after each Linux reboot.

- `echo "oal_driver" >> /etc/modules`
- `echo "rsdk_lax_driver" >> /etc/modules`
- `echo "rsdk_spt_driver" >> /etc/modules`

2.1.2 Create LAX example

NXP's Model-Based Design Toolbox provides MATLAB code generation/simulation capabilities to run the examples for both A53 and LAX cores. The examples are separated into multiple folders.



Each category contains examples that can be run on the ARM core with graph functions that are running on the LAX accelerator.

Each LAX example contains a main function that will run on the ARM A53 core. The part of the code that will run on the LAX accelerator will be part of the lax graph function defined as *laxGraphName*, at it will be executed as *outputs = arm.laxRemoteExec(coreID, @laxGraphName, inputs)*.

```

function main_linear_regression()
    x = single([-6 -4 -1 0 3 5 8]);
    y = single([18 13 6 4 -1 -8 -15]);

    % plot the points
    if isempty(coder.target)
        hold on
        plot(x, y, 'x');
    end

    % y = b1*x+ b0;
    X = [x ones(size(x))];

    % Call the LAX Graph function
    b = arm.laxRemoteExec(@lax_func, X, y);

    % Plot the curve fit and the points
    if isempty(coder.target)
        plot(x, b(1)*x + b(2), 'b');
        hold('on');
        plot(x, y, 'rx');
        legend('curve fit', 'data');
    end
end

function b = lax_func(X, y) %codegen
    coder.inline('always');
    b = inv(X.*X)*X.*y;
end

```

For more information about the available MATLAB lax operators see the MATLAB LAX Operators help section within the toolbox.

2.1.3 Run LAX example

To run the LAX examples, the user must go into the example directory and run the *build_example.m* script and this will start the code generation process. The example can be run also in Simulation mode by running the main function script with the example name.

In the *build_example* script, the user can select different options, optimization levels, connectivity settings, IO, etc.

```

config = struct();
config.HardwarePart = 'S32R45';
config.Hostname = '192.168.1.2';
config.Username = 'root';
config.Password = '';
config.Deploy = true;
config.DeployPath = '~/examples/linear_regression/';
config.PutFiles = {};
config.GetFiles = {};
config.BuildConfig = 'Faster Runs';

lax_codegen('main_linear_regression.m', config);

```

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