Motor Control Development Toolbox

Installation Quick-Start

An Embedded Target for the MC9S12ZVMx Family of Processors

Version 1.4.0

Target Based Automatic Code Generation Tools
For MATLAB™/Simulink™/Stateflow™ Models working with Simulink Coder ™ and Embedded Coder®

Motor Control Development Toolbox Installation Quick-Start is for use with the Motor Control Development Toolbox, an embedded target and block set library for MATLAB/Simulink/Stateflow Modeling.

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1 Installation

Installing the Motor Control Development Toolbox is your first step to getting up and running on the target processor.

1.1 Minimum Platform Requirements

The minimum recommended PC platform is Windows 7 or 10 with a minimum CPU Speed of 2.0 GHz and Minimum of 4GB of RAM.

1.2 Installation Steps

1. Run the MLTBX file downloaded from www.nxp.com/mbdt
2. Register and Install license file
3. Set the Target Compiler Environment Variables
4. Setup the MATLAB path for Motor Control Development Toolbox
5. Setup the Compiler for MATLAB
6. Setup the MCU for MCD Toolbox

1.2.1 Run the MLTBX file

Install the Motor Control Development Toolbox by running MLTBX file; this will activate the installer. It is best if this is NOT installed on a network drive.

1.2.2 License Registration & Installation

The Motor Control Development Toolbox for MC9S12ZVMx is available free of charge, however, a license is required. If you need to get a license it can be obtained from by following the path outlined below. If you encounter issues getting a license please submit a ticket at http://www.nxp.com/support/sales-and-support:SUPPORTHOME describing the issue.

Please perform the following steps to obtain your license:

1. Go to www.nxp.com/mctoolbox and click on 'Get License'.
2. Once you have logged in, the 'Product Information' page for Motor Control Toolbox appears. Select 'Motor Control Toolbox for MATLAB/Simulink MBD supporting MC9S12ZVMx' to bring up the Software Terms and Conditions page.
3. Click "I Agree" to consent to the software license agreement.
4. If you need to download the tool, click on the linked file name. Otherwise, click on "License Keys" tab.
5. Verify the correct tool is identified and click on "Generate".
6. Enter your Disk Serial Number as the Host ID. If you do not know your Disk Serial Number, go to 'Locating the Host ID' in the document Motor Control Toolbox License Installation to learn how to locate your Disk Serial Number, which is needed to generate your license.
7. Enter a name for your license. (Optional)

8. Click "Generate"
9. Either click on "Save All" or copy and paste the file into a text editor and save the file as 'license.lic' to the folder "...\lic"
10. Your installation of the license is now complete.

1.2.3 Setting up the Target Compilers

The target compiler used by Motor Control Development Toolbox must to be configured. Ensure a system environment variable called <COMPILER_STRING>_TOOL is defined to value as shown below:

CS_TOOL = C:/Cosmic
CW_TOOL = C:/Freescale/CW MCU v11.1

Note: Once Environmental variables are setup you will need to restart MATLAB in order for the environment to see these.

1.2.4 Setting the Path for Motor Control Development Toolbox

In order for MALAB to recognize the Motor Control Development Toolbox, the path needs to be setup in the MATLAB environment. This is done by navigating the MATLAB Current Directory to the MC Toolbox/mctbx_9s12zvm installation directory and running the "mctbx_path" script:

```
>> mcd_s12zvm_path
Treating 'C:\MCToolbox\mctbx_9s12zvm' as MCD Toolbox installation
root.
MCD Toolbox path prepended.
Successful.
>>
```


1.2.5 Setting up the Compiler for MATLAB

In order to run SIL or PIL MATLAB needs a PC compiler defined so that it can use it to compile the C code on the PC. If you are using 32-bit MATLAB the LCC compiler that comes with MATLAB is what needs to be selected. The following is an example of how to setup you compiler or mex setup.

```
>> mex -setup

Would you like mex to locate installed compilers [y]/n? y

Select a compiler:
[1] Lcc-win32 C 2.4.1 in C:\PROGRA~1\MATLAB\R2013a\sys\lcc

[0] None

Compiler: 1

Please verify your choices:

Compiler: Lcc-win32 C 2.4.1
Location: C:\PROGRA~1\MATLAB\R2013a\sys\lcc

Are these correct [y]/n? y
```

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```
Done . . .
```

For 64-bit MATLAB you will need to download and install the Microsoft SDK which will be used as the PC compiler. Please follow the procedure below.

1. Install the Microsoft SDK for the compiler:
   http://www.microsoft.com/en-us/download/details.aspx?id=8279
2. Change you mex setup (by typing mex –setup in the command window) in MATLAB to use the Microsoft SDK vs. the LCC (32-bit only) compiler.
3. If you encounter issues installing the Microsoft SDK please use the following link to help solve installation issues: http://www.mathworks.com/MATLABcentral/answers/95039-why-does-the-sdk-7-1-installation-fail-with-an-installation-failed-message-on-my-windows-system

1.2.6 Setting up the MCU for MCD Toolbox

To prepare the MCU to accept download requests from the MCD Toolbox a boot loader needs to be loaded into flash memory by a programmer/debugger tool. Once this is done the MCD Toolbox will be able to download the application code generated from the model to perform PIL operations or to execute in stand-alone. The s-record file that needs to be manually programmed into the MCU is S12ZVM.rbf. This s-record contains the code for the boot loader that communicates with the MCD Toolbox. It is located in the MCD Toolbox installation directory under: ...\tools\BootLoader\RBF_Files. Once the boot loader is programmed and the MCU is reset, it is ready to receive application code from the Toolbox. The boot loader will stay resident until erased by the user.

If the user prefers to program the application code generated by toolbox with a separate programmer or debugger then the boot loader is not required. To perform PIL operation, however, the boot loader is required.