

Production flash programming Freescale's DSC with CodeWarrior version 8.3 for DSC

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1 Abstract

Once a product design is finished and the firmware for the Freescale Digital Signal Controller is completed, the Code Warrior for DSC, version 8.3, Integrated Development Environment has produced a file that contains all the information needed to program production devices. This file is called an .ELF file. This .ELF file is already linked, and so it may be loaded into products in the factory using a version of CodeWarrior with the minimal, or no charge, license. Therefore, multiple programming stations may be set up with no software expense. Only the installation of CodeWarrior that produces the .ELF file from the source and object code needs to be equipped with a license large enough to cover the linking of the .ELF file. This application note shows how to set up such device programming work stations with no software expense, other than the operating system of the computer used.

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2 Introduction

This application note details how to create production device flashing station for Freescale's DSC devices. Further, it method frees the customer from having to purchase additional licenses for Code Warrior, since any version of Code Warrior 8.3 for DSC may be used with this method.

The key to the method illustrated is the bypass of the linking stage in the IDE. It is the linking stage that is licensed based on program size. Since no linking will be performed at the factory programming station, this method will work with any version of Code Warrior 8.3 for DSC.

This application note is particularly useful for devices in which target memory size is over the limit set by some of the available licenses for CodeWarrior 8.3 for DSC. For devices with small enough memories linking is possible with any of the editions of CodeWarrior 8.3 for DSC, including the free editions.

NOTE

Registration is still required to obtain a free edition of CodeWarrior 8.3 for DSC.

However, even for the smaller devices just mentioned, avoiding the linking step at the production programming station can save programming time when using CodeWarrior to program devcies; so this note will still be of possible interest in those cases.

These are the tasks required to ready the production work station for programming Freescale DSC devices from the .ELF file without having to relink:

1. The .ELF file must be produced on an edition of CodeWarrior 8.3 for DSC adequately licensed for the target memory size.
2. This .ELF file is then conveyed to the programming work station, along with the rest of the project directory around it that was used to create it.
3. One of the no cost editions of the Freescale CodeWarrior 8.3 for DSC is installed on the programming work station.
4. Options are set in the programming work station's CodeWarrior 8.3 for DSC to never build.
5. The programming work station is then able to program devices by simply opening the project which includes the ready-built .ELF file by double-clicking on the .mcp file (or opening the .mcp file using the file menu of CodeWarrior 8.3 for DSC).

A step-by-step, illustrated procedure follows.

3 Programming steps

3.1 Produce the final .ELF file on the engineering work station

It is beyond the scope of this application note to cover all the topics required to develop a final CodeWarrior project for a production DSC product.

It will be noted here, however, that such work is performed typically on engineering work stations equipped with an edition of CodeWarrior for DSC version 8.3 sufficiently licensed, at a cost, for the program size of the target Freescale DSC device. For example, MC56F8367 has a large enough memory

so that it requires a license with a cost associated with it to link some projects, if using enough memory and produce .ELF files.

It will also be noted here that such projects are developed with the CodeWarrior IDE options set to “do everything” when the green debug arrow is hit. This means, generate source code, compile, assemble, link, load, and go. These are in fact the default options for CodeWarrior, and many customers do not realize that they can or must be changed. We will show in step (3.2) how they can (and why they must) be changed.

Once the project is complete, there will be the final .ELF file in the project directory. This directory should then be backed up and transferred to the programming work station. (It is **not** required to include in this transfer the .c files, .h files, nor the .asm files if the customer wishes to prevent these from being exposed to the factory. Of course, they should **all** be included in the backup operation.)

3.2 Convey the final project directory to the programming work station

This step involves copying the final project directory to the production work station. It is not required to contain all the source files (*.c, *.h, *.asm). The most important files that must be included are the .mcp file and the .ELF file. It is not required to have CodeWarrior installed for this step. It will be installed in the next step.

3.3 Install the Special Edition of CodeWarrior 8.3 for DSC on the factory programming work station

The Special Edition of CodeWarrior 8.3 for DSC may be found on the www.freescale.com web site. While registration may be required to obtain this edition, there is no cost associated with this edition. It will not link programs greater than a certain size. However, since no linking will be performed at the factory programming work station, this will not be an issue. There is no need to use a more expensive edition of CodeWarrior 8.3 for DSC.

To install this edition, just download it and follow the steps for installation as prompted, accepting all the defaults. There are no special choices that need to be made during the installation, unless conventions in place at the factory so dictate, such as special directory structures. These may be accommodated during the install if required.

3.4 Set the options for CodeWarrior IDE on the factory work station for no building - no linking

To access the options for the IDE (“Preferences...”) use the “Edit” menu and then “Preferences...” as shown below:

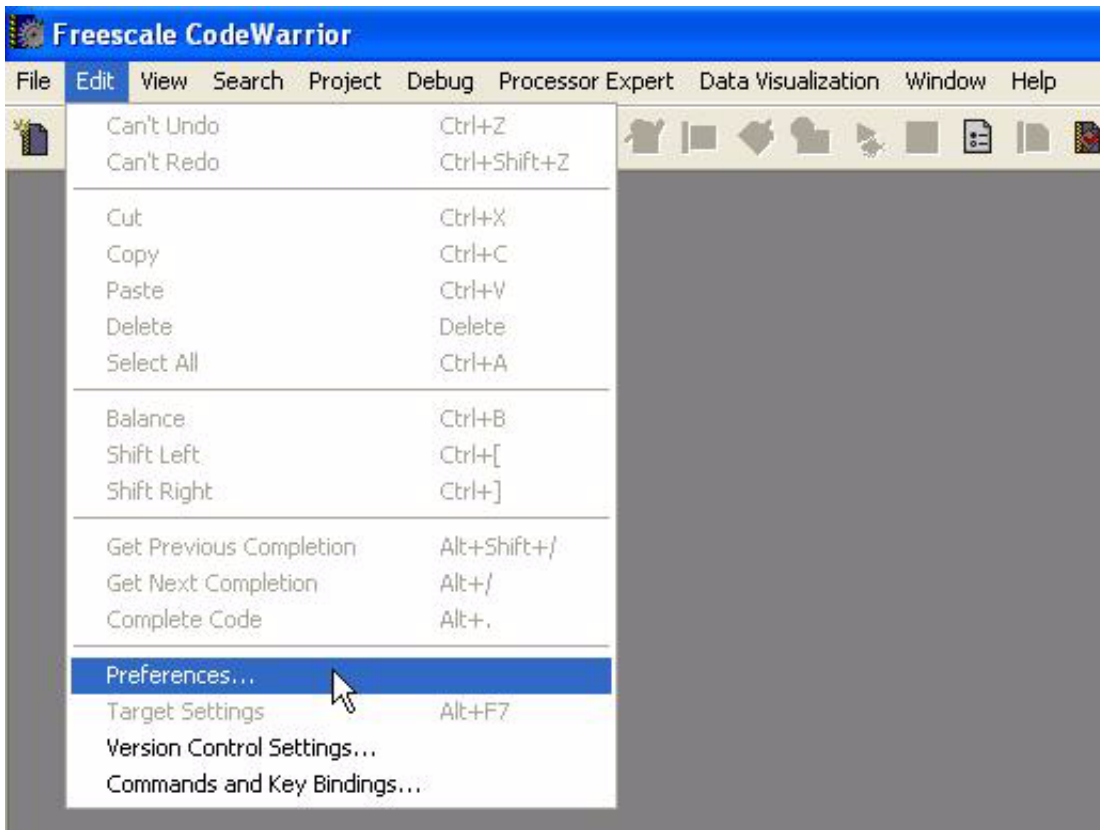


Figure 1. Accessing the IDE options

To condition the Code Warrior IDE to never build the project prior to running it, select Build Settings and proceed as in [Figure 2](#) to select the “Never” option under Settings, Build before running.

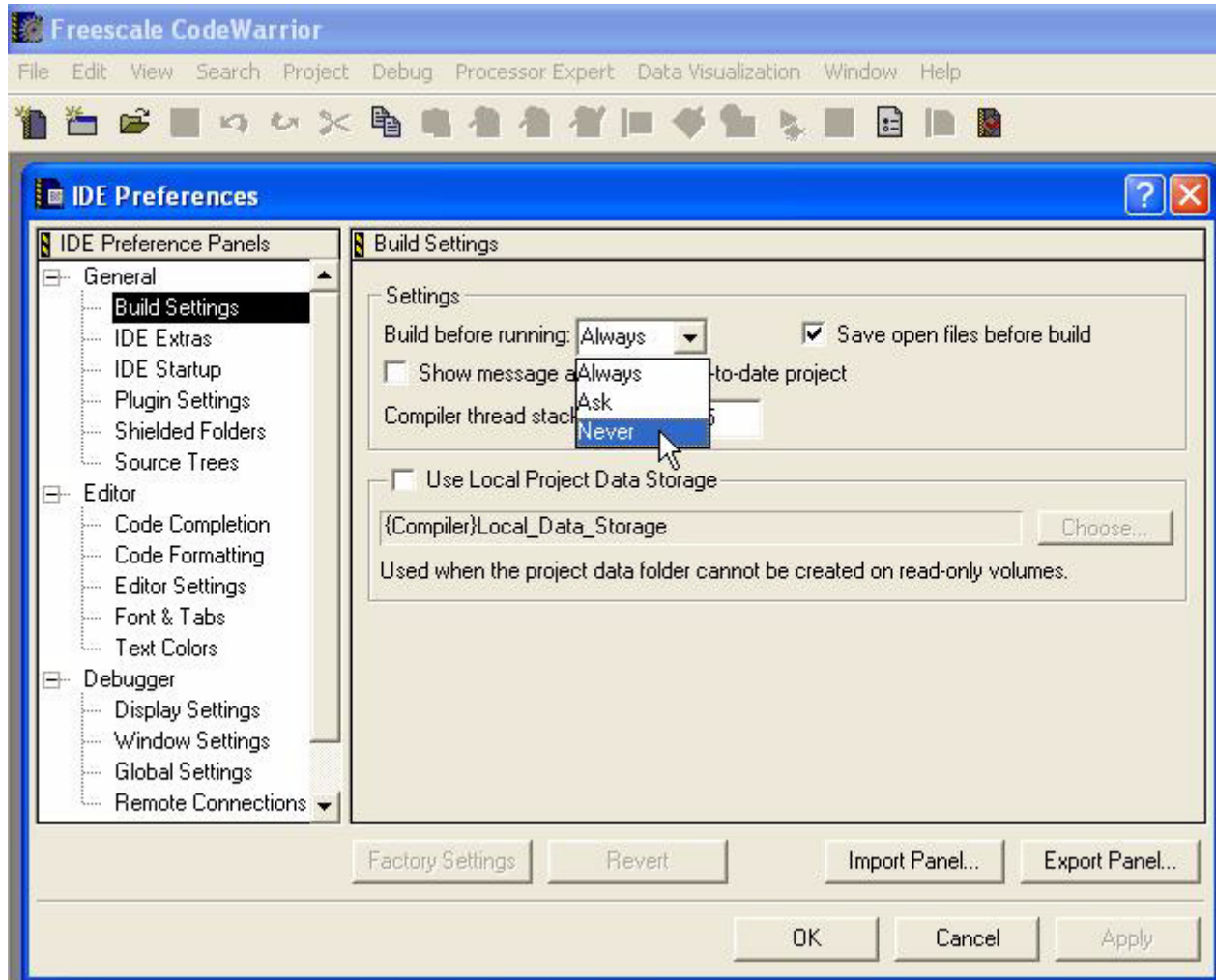


Figure 2.

IDE Preferences General Build Settings Never Build before running

This completes the configuration of the work station's CodeWarrior 8.3 for DSC IDE. Now, when the green debug arrow is hit after the project is opened, it will download the code to device without building. This means it will not link and will not pause to state that the license does not allow linking.

Based on desired project options, the code will then run, or not, depending if the break point is set to stop at the default language entry point, to stop as soon as the code is loaded, or not to stop at all. This is a choice that should have been made when the code was developed at the engineering work station and is beyond the scope of this application note.

3.5 Program devices for production at the factory programming work station

All that is required is to connect the JTAG cable to the product's JTAG header is the following:

- Open the project by double clicking on the .mcp file

Conclusion

- Hit the green debug button
- The device will be programmed.
- For other methods of factory programming, please see Application Note AN1926 available from www.freescale.com.

4 Conclusion

In conclusion, it is clear that there is no financial barrier to running a free version of CodeWarrior as a programming station in a factory setting. It is also quite simple to set up workstations for the purpose of programming Digital Signal Controllers from Freescale using the free version of CodeWarrior for DSC 8.3. Only the expense of the computers themselves, which do not need to be recent models, is involved.