

# **Embedded Target for Motorola® HC12Release Notes**

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## Summary by Version

This table provides quick access to what's new in each version. For clarification, see "About Release Notes" on page 1.

Version (Release)	New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
<b>Latest Version V1.1.4 (R2006a)</b>	No	No	Bug Reports at Web site	Printable Release Notes: PDF  V1.1.4 product documentation
V1.1.3 (R14SP3)	No	No	Bug Reports at Web site	No
V1.1.2 (R14SP2)	No	No	No bug fixes	No
V1.1.1 (R14SP1)	Yes Details	No	Fixed bugs	No
V1.1 (R14)	Yes Details	Yes Summary	Fixed bugs	No
<b>New Product V1.0 (R13)</b>	Yes Details	No	No bug fixes	No

### About Release Notes

Use release notes when upgrading to a newer version to learn about new features and changes, and the potential impact on your existing files and practices. Release notes are also beneficial if you use or support multiple versions.

If you are not upgrading from the most recent previous version, review release notes for all interim versions, not just for the version you are installing. For example, when upgrading from V1.0 to V1.2, review the New Features and Changes, Version Compatibility Considerations, and Bug Reports for V1.1 and V1.2.

## **New Features and Changes**

These include

- New functionality
- Changes to existing functionality
- Changes to system requirements (complete system requirements for the current version are at the MathWorks Web site)
- Any version compatibility considerations associated with each new feature or change

## **Version Compatibility Considerations**

When a new feature or change introduces a known incompatibility between versions, its description includes a **Compatibility Considerations** subsection that details the impact. For a list of all new features and changes that have compatibility impact, see the “Compatibility Summary for Embedded Target for Motorola HC12” on page 15.

Compatibility issues that become known after the product has been released are added to Bug Reports at the MathWorks Web site. Because bug fixes can sometimes result in incompatibilities, also review fixed bugs in Bug Reports for any compatibility impact.

## **Fixed Bugs and Known Problems**

MathWorks Bug Reports is a user-searchable database of known problems, workarounds, and fixes. The MathWorks updates the Bug Reports database as new problems and resolutions become known, so check it as needed for the latest information.

Access Bug Reports at the MathWorks Web site using your MathWorks Account. If you are not logged in to your MathWorks Account when you link to Bug Reports, you are prompted to log in or create an account. You then can view bug fixes and known problems for R14SP2 and more recent releases.

## **Related Documentation at Web Site**

**Printable Release Notes (PDF).** You can print release notes from the PDF version, located at the MathWorks Web site. The PDF version does not support links to other documents or to the Web site, such as to Bug Reports. Use the browser-based version of release notes for access to all information.

**Product Documentation.** At the MathWorks Web site, you can access complete product documentation for the current version and some previous versions, as noted in the summary table.

## Version 1.1.4 (R2006a) Embedded Target for Motorola HC12

This table summarizes what's new in V1.1.4 (R2006a):

<b>New Features and Changes</b>	<b>Version Compatibility Considerations</b>	<b>Fixed Bugs and Known Problems</b>	<b>Related Documentation at Web Site</b>
No	No	Bug Reports at Web site	Printable Release Notes: PDF  V1.1.4 product documentation



## Version 1.1.3 (R14SP3) Embedded Target for Motorola HC12

This table summarizes what's new in V1.1.3 (R14SP3):

<b>New Features and Changes</b>	<b>Version Compatibility Considerations</b>	<b>Fixed Bugs and Known Problems</b>	<b>Related Documentation at Web Site</b>
No	No	Bug Reports at Web site	No

## Version 1.1.2 (R14SP2) Embedded Target for Motorola HC12

This table summarizes what's new in V1.1.2 (R14SP2):

<b>New Features and Changes</b>	<b>Version Compatibility Considerations</b>	<b>Fixed Bugs and Known Problems</b>	<b>Related Documentation at Web Site</b>
No	No	No bug fixes	No

## Version 1.1.1 (R14SP1) Embedded Target for Motorola HC12

This table summarizes what's new in V1.1.1 (R14SP1):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	No	Fixed bugs	No

New features and changes introduced in this version are described here:

### CodeWarrior Version 3.1 for HC12 Supported

The Embedded Target for Motorola HC12 now supports Metrowerks CodeWarrior for HC12 version 3.1.

### Fixed Bugs

#### Code Generation for the ADC Block

Two issues concerning code generation for the ADC block are corrected:

- Previously, generated code for the microcontroller would never enter the conversion wait loop, thus making the program not wait for the conversion to complete. The conversion will now run to completion.
- Previously, generated code for the microcontroller would set the ATD0CTL4/ATD1CTL4 register to 0x85 regardless of the resolution chosen by the user. ATD0CTL4/ATD1CTL4 is now set properly to the correct value: 0x85 = 8-bit resolution 0x05 = 10-bit resolution

## Version 1.1 (R14) Embedded Target for Motorola HC12

This table summarizes what's new in V1.1 (R14):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	Yes—Details labeled as <b>Compatibility Considerations</b> , below. See also Summary.	Fixed bugs	No

New features and changes introduced in this version are described here:

### CodeWarrior Version 3.0 for HC12 Supported

The Embedded Target for Motorola HC12 now supports Metrowerks CodeWarrior for HC12 version 3.0.

### New Target Options User Interface

You can now view and edit code generation options for the Embedded Target for Motorola HC12 via the Simulink Model Explorer or the **Configuration Parameters** dialog box. The Model Explorer provides centralized access to all elements of a Simulink® model or Stateflow® chart. These elements include *configuration sets* that specify model parameters such as solver options, code generation options, and other choices. The **Configuration Parameters** dialog box provides a compact view of the model's active configuration set.

A configuration set includes code generation options that affect the Real-Time Workshop in general, and options that are specific to a given target, such as the Embedded Target for Motorola HC12. Configuration sets can be particularly useful in embedded systems development. By defining multiple configuration sets in a model, you can easily re-target code generation from that model. For example, one configuration set might specify the ERT target with external mode support enabled for rapid prototyping, while another configuration set might specify the Embedded Target for Motorola HC12 to generate production code for deployment of the application. Activation of

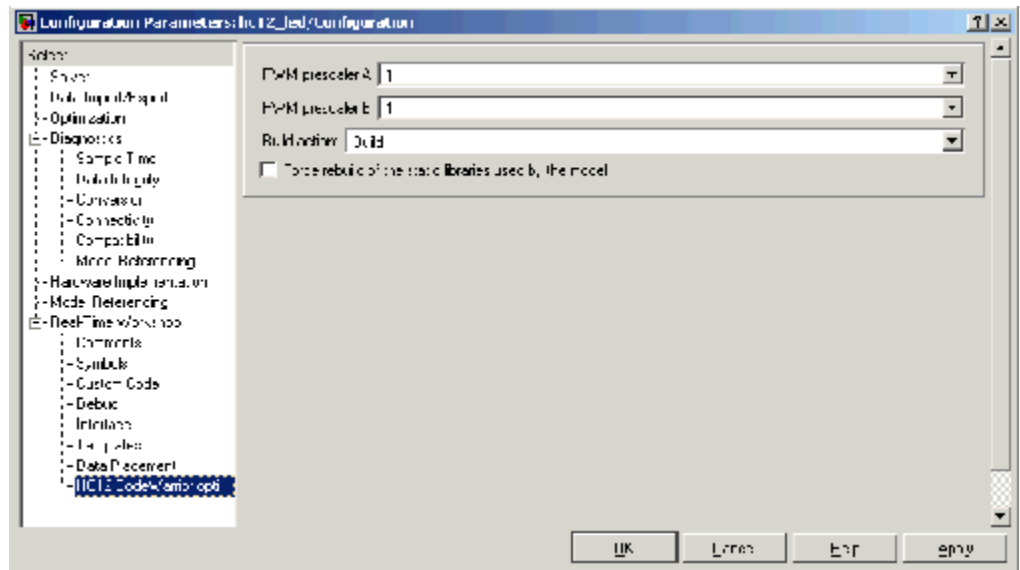
either configuration set fully reconfigures the model for the appropriate type of code generation.

## Appearance of Target Options

In previous releases, target options were displayed in the **Simulation Parameters** dialog. Target options, organized into functional groups, were displayed under control of the **Category** menu in the Real-Time Workshop pane.

In this release, Model Explorer and **Configuration Parameters** dialog views of target options preserves the previous organization of options into categories. However, the **Category** menu has been replaced by tabbed and list selection mechanisms.

The figure below shows the Embedded Target for Motorola HC12 options displayed in the **Configuration Parameters** dialog view.



## Fixed Bugs

### Incorrect Library Reuse Message During Build Process Fixed

When the **Force rebuild of the static libraries used by this model option** is selected, the build process rebuilds libraries such as the Real-Time Workshop library, `rtwlib.lib`. However, an erroneous message was displayed that indicated that the build process was reusing an existing library, for example:

```
### Reusing stored rtw library file
C:\WINNT\Profiles\XXXXX-1.000\LOCALS-1\Temp\hc12\rtwintlib.lib
1 file(s) copied.
```

This problem has been fixed.

## Change in Options Settings for Existing Models

### Compatibility Considerations

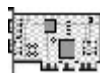
When you open an existing model saved in a previous release, the build process may change the values of some of the code generation options. These changes occur only in cases where an option that is not supported by the target was configured incorrectly.

The following options are forced to the values specified below:

- **Generate an example main program:** deselected
- **Suppress error status in real-time model data structure:** selected
- **Create Simulink (S-Function) block:** deselected
- **MAT-file logging:** deselected

### Icon Change for Master Block

The icon for the Master block has changed, as shown below.



Master

### **Compatibility Considerations**

Existing models will reflect this change of appearance, but will continue to operate as they did previously. there has been no functional change in the operation of the Master block.

## Version 1.0 (R13) Embedded Target for Motorola HC12

This table summarizes what's new in V1.0 (R13):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	No	None	No

New features and changes introduced in this version are described here:

### Support for RAM and Flash Memory Models

The EVB912DP256 provides 12K RAM and 256K flash memories. The 16-bit addressing architecture allows direct access to only 64K of contiguous memory. The memory segmentation model of the EVB912DP256 uses a PPAGE (byte) register to page in 16k memory pages.

The Embedded Target for Motorola HC12 supports several memory models by providing special CodeWarrior project stationery. You can select the desired memory model from an option menu before generating code. The following memory models are supported:

- Small memory model for RAM allows access to the entire 12K of RAM.
- Small memory model for flash allows direct access of up to 64K bytes of flash memory.
- Banked memory model supports access of the entire 256K bytes of flash on the EVB912DP256board. The banked memory model can extend beyond 256K bytes for boards that include additional memory.

### Modifiable Project Stationery

The Embedded Target for Motorola HC12 uses special CodeWarrior project stationery. This project stationery can be modified, extended, or replaced with your own CodeWarrior project.



Using the CodeWarrior IDE, you can modify settings of the project stationery. Project settings allow you to customize instructions provided to the assembler, compiler, linker, and debugger. You can add your own custom C code to the project stationery.

During code generation, project stationery is replicated and placed beneath your current working directory. The build process automatically invokes CodeWarrior and opens the project stationery. After the project is compiled and linked, a click on the CodeWarrior IDE start button lets you download and run your application to the EVB912DP256, via the ICD12 Background Debugging Module (BDM).

## **Extensible Device Driver Library**

The Embedded Target for Motorola HC12 provides a library of sample I/O device drivers. The library includes the following blocks:

- ADC Input (analog-to-digital converter)
- Digital Input
- Digital Output
- Master Block
- PWM Output (Pulse Width Modulation)

You can use these device drivers as is, or modify, extend, or replace them for your needs. The drivers are fully documented to help you modify them to your requirements. The driver blocks are based on a driver paradigm that is easy to understand and replicate. With minimum effort, you can modify device drivers and extend the device driver block library to support drivers that you may have already implemented in production applications.

The Master block is a special block that is required in every model used for code generation with the Embedded Target for Motorola HC12. The functions of the Master block are summarized in the next two sections.

## Computation of Accurate, Hardware-Achievable Sample Time

The `hc12_closest_st` function is provided to help you set a sample time for your model that is achievable via the on-chip Clock Reset Generator (CRG). This feature lets you simulate your model using the same step size that will be used when generated code is deployed on the target hardware.

## Resource Management via the Master Block

A *resource collision* in a model is a circumstance in which two or more device driver blocks are configured to use the same hardware resource. For example, a Digital Output device driver block might be configured to use PORTB as the output channel. If copies of this block are added to the model, each copy would be contending for use of PORTB, resulting in a resource collision.

The Master block maintains a *resource database* that helps guard against resource collisions. As device driver blocks are added to a model, they register resource usage with the Master block. If a resource that is already in use is requested, a resource collision error is reported via a dialog box, and the conflicting blocks are highlighted in the model. You can then correct this error by selecting an alternate resource for the block, or by eliminating one of the conflicting blocks.

## Report Generation

The Embedded Target for Motorola HC12 generates an extended version of the HTML code generation report supported by the Real-Time Workshop Embedded Coder. The HTML report includes detailed information on code size for RAM and ROM. This information is obtained by post-processing the map file generated by CodeWarrior during compilation.

## Compatibility Summary for Embedded Target for Motorola HC12

This table summarizes new features and changes that might cause incompatibilities when you upgrade from an earlier version, or when you use files on multiple versions. Details are provided in the description of the new feature or change.

<b>Version (Release)</b>	<b>New Features and Changes with Version Compatibility Impact</b>
<b>Latest Version V1.1.4 (R2006a)</b>	None
V1.1.3 (R14SP3)	None
V1.1.2 (R14SP2)	None
V1.1.1 (R14SP1)	None
V1.1 (R14)	See the <b>Compatibility Considerations</b> subheading for each of these new features or changes: <ul style="list-style-type: none"> <li>• “Change in Options Settings for Existing Models” on page 10</li> <li>• “Icon Change for Master Block” on page 10</li> </ul>
<b>New Product V1.0 (R13)</b>	None