Embedded IDE Link™ Release Notes

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Embedded IDE Link™ Release Notes

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Contents

Summary by Version

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

Version (Release)	New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Latest Version V4.1 (R2010a)	Yes Details	No	Bug Reports	Printable Release Notes: PDF Current product documentation
New Product V4.0 (R2009b)	Yes Details	Yes Summary	Bug Reports	No

Using Release Notes

Use release notes when upgrading to a newer version to learn about:

- New features
- Changes
- Potential impact on your existing files and practices

Review the release notes for other MathWorks™ products required for this product (for example, MATLAB® or Simulink®). Determine if enhancements, bugs, or compatibility considerations in other products impact you.

If you are upgrading from a software version other than the most recent one, review the current release notes and all interim versions. For example, when you upgrade from V1.0 to V1.2, review the release notes for V1.1 and V1.2.

What Is in the Release Notes

New Features and Changes

- New functionality

- Changes to existing functionality

Version Compatibility Considerations

When a new feature or change introduces a reported incompatibility between versions, the **Compatibility Considerations** subsection explains the impact.

Compatibility issues reported after the product release appear under Bug Reports at The MathWorks™ Web site. Bug fixes can sometimes result in incompatibilities, so review the fixed bugs in Bug Reports for any compatibility impact.

Fixed Bugs and Known Problems

The MathWorks offers a user-searchable Bug Reports database so you can view Bug Reports. The development team updates this database at release time and as more information becomes available. Bug Reports include provisions for any known workarounds or file replacements. Information is available for bugs existing in or fixed in Release 14SP2 or later. Information is not available for all bugs in earlier releases.

Access Bug Reports using your MathWorks Account.

Version 4.1 (R2010a) Embedded IDE Link

This table summarizes what is new in V4.1 (R2010a):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	No	Bug Reports	Printable Release Notes: PDF Current product documentation

New features and changes introduced in this version are

- "Embedded IDE Link Software Runs on Linux" on page 4

- "Support for Eclipse IDE for C/C++ Developers Package" on page 4

- "New Demos for Using Embedded IDE Link with Eclipse" on page 4

- "Automatically Create and Use Makefiles" on page 5

- "New Demo for Using Makefiles" on page 5

- "Support for Top-Model Processor-in-the-Loop" on page 5

- "Optimizations for Fixed-point Code on ARM Processors" on page 6

- "Optimizations for 32-bit to 16-bit Data Type Conversions with Saturation for Blackfin Processors" on page 6

- "Support for Analog Devices™ VisualDSP++ 5.0 with Update 6" on page 6

- "New Configuration Utility for Analog Devices™ VisualDSP++" on page 6

- "Support for Texas Instruments' Code Composer Studio 3.3 with SR12" on page 7

- "Demo: Project Generator Tutorial for IAR Embedded Workbench and TI MSP430 Platform" on page 7

- "New and Updated Demos " on page 7

- "Changes to the Stack Size Parameter" on page 7

Embedded IDE Link Software Runs on Linux

You can run the Embedded IDE Link™ product on a 32-bit x86 compatible workstation running Linux®. For more information, see the System Requirements for Embedded IDE Link at www.mathworks.com/products/ide-link/requirements.html.

If you use the Embedded IDE Link product on a Linux development workstation:

- For the Eclipse™ and MULTI® IDEs, all of the main features in the Embedded IDE Link product are available .

- For the Code Composer Studio™, TASKING®, and VisualDSP++® IDEs, you can create models and run all simulations in the Embedded IDE Link product. However, you cannot generate code or automate code generation.

Support for Eclipse IDE for C/C++ Developers Package

You can now use the Embedded IDE Link product with the Eclipse IDE for C/C++ Developers package and GNU development tools. Works on development workstations running Linux, MontaVista® Linux 6, and Windows®. For more information, see the *Embedded IDE Link User's Guide* .

Note Ensure you have the correct versions of the Eclipse packages and GNU build tools before you use Embedded IDE Link software with the Eclipse IDE. Follow the instructions in the "Getting Started" topic.

New Demos for Using Embedded IDE Link with Eclipse

New demos for using Embedded IDE Link with the Eclipse IDE:

- Getting Started — Automation Interface Tutorial

- Getting Started — Project Generator Tutorial

- Control Applications — Verifying the Fixed-Point Fuel Control System

- Workflows — Getting Started with Application Development

Automatically Create and Use Makefiles

You can configure Embedded IDE Link to automatically generate makefiles, and build applications using makefiles with the following toolchain and processor combinations:

Toolchains	Processor Families/Target OSs	Development Platforms
Analog Devices™ VisualDSP++®	Blackfin™, SHARC™, and TigerSHARC™	Windows
Green Hills® MULTI®	ARM®, Analog Devices™ Blackfin®, PowerPC®, and NEC® V850	Linux, Windows
GNU development tools	Linux	Linux
GNU development tools	ARM	MontaVista Linux
MinGW development tools	Windows	Windows
Texas Instruments™ Code Composer Studio	Texas Instruments C2000™, C5500™, and C6000™	Windows

For more information, see "Generating Makefiles" in the *Embedded IDE Link User's Guide*.

New Demo for Using Makefiles

This release provides a new Makefile Generator tutorial which you can use to learn about the makefile generator in Embedded IDE Link software.

Support for Top-Model Processor-in-the-Loop

Embedded IDE Link software now supports the Top-Model Processor-in-the-Loop (PIL) feature. Use top-model PIL if you want to:

• Verify code generated for a top model (standalone code interface).

- Load test vectors or stimulus inputs from the MATLAB workspace.

- Switch the entire model between normal and Software-in-the-Loop (SIL) or PIL simulation modes.

For more information, see "Using the Top-Model PIL Approach" in the *Embedded IDE Link User's Guide.*

Optimizations for Fixed-point Code on ARM Processors

Effective this release, Embedded IDE Link software provides ARM fixed-point intrinsics that the MontaVista Linux compiler uses to generate optimized fixed-point code for ARM processors.

Optimizations for 32-bit to 16-bit Data Type Conversions with Saturation for Blackfin Processors

Embedded IDE Link software now provides target function libraries that optimize 32-bit to 16-bit data type conversions with saturation for Blackfin Processors.

Support for Analog Devices VisualDSP++ 5.0 with Update 6

Embedded IDE Link software now supports Analog Devices VisualDSP++ version 5.0 with Update 6.

New Configuration Utility for Analog Devices VisualDSP++

Use the new configuration utility, adivdspsetup, to install an EmbeddedEmbedded IDE Link plug-in in the appropriate folder for Analog Devices VisualDSP++. For more information, see "Getting Started" in the *Embedded IDE Link User's Guide for Use with Analog Devices VisualDSP++.*

Support for Texas Instruments' Code Composer Studio 3.3 with SR12

Embedded IDE Link software now supports Texas Instruments' Code Composer Studio™ with Service Release 12 (SR12).

Demo: Project Generator Tutorial for IAR Embedded Workbench and TI MSP430 Platform

This release provides a new tutorial that demonstrates the Project Generator component of Embedded IDE Link. The tutorial uses a simple Simulink model to show you how to generate a working algorithmic project and execute it on the TI MSP430™ F2013™ processor. For more information, see the Project Generator Tutorial demo.

New and Updated Demos

- Optimizing Embedded Code via Target Function Library
- Getting Started with Application Development

Changes to the Stack Size Parameter

The Real-Time Workshop® product (RTW) has changed the way it performs stack analysis and control. For more information, see "Improved Stack Analysis and Control"in the RTW release notes.

In Embedded IDE Link models, when you set the **System target file** parameter on the **Real-Time Workshop** pane to idelink_ert.tlc or idelink_grt.tlc, the software sets the **Maximum stack size** parameter on the **Optimization** pane to Inherit from target and makes it non-editable. In that case, the **Maximum stack size** parameter compares the value of (**System stack size**/2) with 200,000 bytes and uses the smaller of the two values.

Avoiding Linker Errors Related to Stack Size

If RTW estimates the stack size is large enough, it redefines global variables and buffers from model_output and model_step functions as local variables. This optimization typically increases execution speed, and might also increase the size of the generated code. If the generated code does not fit in the

memory allocated for code, the linker generates an error message during the build process. You can avoid this error by performing either or both of the following steps:

- Decrease the stack size for your model. Press **Ctrl+E** to open the **Configuration Parameters** dialog box for your model. Then select **Real-Time Workshop** > **Embedded IDE Link** and decrease the **System stack size (MAUs)** value.

- Open the target preferences block in your model and, under the **Section** tab, assign the `.text` or `program` section to a placement that has more memory.

Version 4.0 (R2009b) Embedded IDE Link

This table summarizes what is new in V4.0 (R2009b):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	Yes—Details labeled as **Compatibility Considerations**, below. See also Summary.	Bug Reports	No

New features and changes introduced in this version are

- "New Embedded IDE Link Product" on page 10

- "Unified Idle Task, Memory Allocate, and Memory Copy Blocks" on page 10

- "Enhanced Target Preference and Custom Board Blocks" on page 11

- "Support for Analog Devices™ Blackfin 52x Processor Family" on page 11

- "Support for Update 5 of Analog Devices™ VisualDSP++ (VisualDSP++ 5.0.5)" on page 11

- "Support for Free-running ARM with Green Hills® MULTI" on page 11

- "Support for Green Hills® MULTI 5.0.5 and 5.1.2" on page 11

- "Improved Handling of Asynchronous Hardware Interrupts for Blackfin Processors" on page 11

- "Removed "Inline run-time library functions" From Configuration Parameters" on page 12

- "Embedded IDE Link Build Directory and Target Preferences" on page 12

- "Limitation: XDS100 Emulator Does Not Support RTDX" on page 13

- "Limitation: Simulink Does Not Support Custom Scheduler Priorities for Embedded IDE Link Platforms" on page 13

New Embedded IDE Link Product

As of R2009b, the following products have been merged into a new product, Embedded IDE Link

- Embedded IDE Link CC

- Embedded IDE Link MU

- Embedded IDE Link TS

- Embedded IDE Link VS

Compatibility Considerations

The merged product structure has changed the **Start** menu functionality. To access Embedded IDE Link TS features that used to be in the **Start** menu, enter taskingutils in the Command Window or double-click Launch TASKING Utilities in the Simulink block library. This opens the Embedded IDE Link Utilities for Use with TASKING dialog box. For more information, see "Accessing Utilities for TASKING" in the documentation.

You must use a clean build directory and the latest values for the target preference fields when setting up your product for use with Altium® TASKING. To avoid problems when upgrading from a previous version, use either a new build directory, or clean up your existing build directory that you use to build models. A previous installation of the Embedded IDE Link product could cause a compatibility issue if the target preferences are not reset. To avoid problems, click **Reset to Default** in the Embedded IDE Link Target Preferences dialog box before setting up your installation.

Note Resetting your target preferences overwrites any previously saved entries for the current MATLAB release.

Unified Idle Task, Memory Allocate, and Memory Copy Blocks

Unified the Idle Task, Memory Allocate, and Memory Copy blocks to work with Texas Instruments' Code Composer Studio, Green Hills MULTI, and Analog Devices VisualDSP++.

Enhanced Target Preference and Custom Board Blocks

Improved the responsiveness of the dialog boxes for the Target Preferences blocks and Custom Board blocks.

Support for Analog Devices Blackfin 52x Processor Family

Added support for the Analog Devices Blackfin 52x family of processors.

Support for Update 5 of Analog Devices VisualDSP++ (VisualDSP++ 5.0.5)

Added support for Update 5 of Analog Devices VisualDSP++ (VisualDSP++ 5.0.5). Installing Update 5 significantly improves the performance of code you generate for embedded applications on Blackfin.

Support for Free-running ARM with Green Hills MULTI

Added support for free-running ARM processors with the Green Hills MULTI IDE.

Support for Green Hills MULTI 5.0.5 and 5.1.2

Added support for Green Hills MULTI 5.0.5 and 5.1.2.

Improved Handling of Asynchronous Hardware Interrupts for Blackfin Processors

For Analog Devices VisualDSP++ and Green Hills MULTI, Embedded IDE Link has changed the Blackfin base rate interrupt scheme to reduce latency for asynchronous hardware interrupts of various priorities.

In previous releases, the core timer generated a high-priority base rate interrupt (higher than any of the peripheral interrupts) and it's interrupt service routine (ISR) executed the rtOneStep() function directly. As a consequence, any peripheral interrupts had to wait until the completion of the core timer ISR before they could execute.

In 9b, instead of executing the rtOneStep() function, the high priority core timer interrupt raises a low priority software interrupt and exits. The low priority software interrupt, in turn, executes rtOneStep(). Because the priority of the software interrupt is lower than the priorities of any of the peripheral interrupts, the peripheral interrupts are now able to preempt the execution of rtOneStep() and thus get serviced with a smaller latency.

Removed "Inline run-time library functions" From Configuration Parameters

Removed the **Inline run-time library functions** parameter from the **Configuration Parameters** dialog box under `Real Time Workshop > Embedded IDE Link`.

Embedded IDE Link Build Directory and Target Preferences

You must use a clean build directory and the latest values for the target preference fields when setting up your installation.

Compatibility Considerations

To avoid problems when upgrading from a previous version, use either a new build directory, or clean up your existing build directory that you use to build models with the Embedded IDE Link product.

A previous installation of the Embedded IDE Link product could cause a compatibility issue if the target preferences are not reset. To avoid problems, click **Reset to Default** in the Embedded IDE Link Target Preferences dialog box before setting up your installation.

Note Resetting your target preferences overwrites any previously saved entries for the current MATLAB release.

Limitation: XDS100 Emulator Does Not Support RTDX

The XDS100 emulator does not support RTDX™. If you connect to TI's Piccolo Series of C2802x processors using XDS100 emulator you will be unable to use the Target Support Package™ support for RTDX.

For more information, see this Texas Instruments wiki topic.

Compatibility Considerations

You cannot use

- Target Support Package C2802x blocks with RTDX

- The Real-Time Data Exchange (RTDX) Tutorial demo with C2802x processors

Limitation: Simulink Does Not Support Custom Scheduler Priorities for Embedded IDE Link Platforms

Simulink does not support custom scheduler priorities in the **Sample time properties** parameter when the **System target file** parameter is set to one of the following:

- **ccslink_ert.tlc (Description: Embedded IDE Link (ERT) code generation for TMS320(TM) DSP platforms)**

- **ccslink_grt.tlc (Description: Embedded IDE Link (GRT) code generation for TMS320(TM) DSP platforms)**

- **multilink_ert.tlc (Description: Embedded IDE Link (ERT) code generation for many supported processors)**

- **multilink_grt.tlc (Description: Embedded IDE Link (GRT) code generation for all supported platforms)**

- **vdsplink_ert.tlc (Description: Embedded IDE Link (ERT) code generation for ADI DSP platforms)**

- **vdsplink_grt.tlc (Description: Embedded IDE Link (GRT) code generation for ADI DSP platforms)**

For example, if you set **System target file** to **ccslink_ert.tlc**, Simulink ignores the custom scheduler priorities 10, 20, and 30 in the following **Sample**

time properties parameter `[[0.001,0,10];[0.01,0,20];[0.1,0,30];]` and uses the default scheduler priorities instead.

Note Note: The **Sample time properties** parameter is located in the **Configuration Parameters** > **Solver** pane under **Tasking and sample time options**. The **System target file** parameter is located in the **Configuration Parameters** > **Real Time Workshop** pane under **Target selection**.

Compatibility Summary for Embedded IDE Link

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.

Version (Release)	New Features and Changes with Version Compatibility Impact
Latest Version V4.1 (R2010a)	No
V4.0 (R2009b)	See the **Compatibility Considerations** subheading for this new feature or change: • "New Embedded IDE Link Product" on page 10 • "Embedded IDE Link Build Directory and Target Preferences" on page 12 • "Limitation: XDS100 Emulator Does Not Support RTDX" on page 13