

Embedded Target for Motorola MPC555 Release Notes

The “Embedded Target for Motorola MPC555 2.0 Release Notes” on page 1-1 describe the changes introduced in the latest version of the Embedded Target for Motorola MPC555. The following topics are discussed in these Release Notes:

- “New Features” on page 1-2
- “Upgrading From An Earlier Release” on page 1-5
- “Known Software and Documentation Problems” on page 1-7

If you are upgrading from a release earlier than Version 1.1, you should also see “Embedded Target for Motorola MPC555 1.1 Release Notes” on page 2-1.

Printing the Release Notes

If you would like to print the Release Notes, you can link to a PDF version.



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New Features

This section introduces the new features and enhancements added in the Embedded Target for Motorola MPC555 2.0.

Serial Download

You can now download over CAN or serial.

Support for MPC5xx

There is now support for more processor variants:

MPC555, MPC561 (no Flash features), MPC562 (no Flash features), MPC563 and MPC564, MPC565 and MPC566.

You can easily switch processors using the Target Preferences settings, and Model Resource Configuration settings.

There is new support for some additional capabilities of some processor variants, as follows.

Additional capabilities of MPC565 & 566:

- 3rd TouCAN module
- 3rd TPU module
- MIOS14 support providing 4 more PWM channels
- QADC Enhanced support - different module with different features to MPC555 version

Additional capabilities of MPC561, 562, 563 and 564:

- 3rd TouCAN module
- MIOS14 support providing 4 more PWM channels

No QADC support currently, but hopefully coming soon.

CAN Driver Enhancements

A number of enhancements have been incorporated into the TouCAN Transmit and TouCAN Receive blocks. These enhancements include the ability to select different modes of operation depending on the requirements for each message.

The benefits include higher utilization of the available CAN bandwidth and reduced loading on the MPC555 microcontroller.

The default mode for transmission of CAN messages now uses 3 hardware buffers in conjunction with an interrupt driven priority queue; this mode of operation guarantees that messages will be transmitted in order of priority, without no inter-message delay.

A dedicated buffer transmission mode allows messages to be transmitted with no interrupt servicing overhead.

A FIFO buffer transmission mode, with very fast interrupt servicing is well suited for data acquisition purposes.

For receipt of CAN messages, an additional mode has been added that uses a FIFO buffer. This mode of operation is suitable if a number of messages with different CAN identifiers should be received via a single hardware buffer. This allows more efficient use of the limited number of hardware buffers on the MPC555 TouCAN module.

Task Execution Profiling

This is a new feature that allows execution profiling data to be recorded, uploaded and displayed in the form of a MATLAB graphic and as an HTML report. Execution profiling data can be collected over serial or CAN. See the demo model `mpc555rt_multitasking`.

Temporary Task Overruns Now Permitted by the Scheduler

It is now possible for task overruns in the base rate or one of the sub- rates to occur without causing a failure. The benefit is that if it occasionally takes longer than the normally allowed time to complete a task, this is now possible without having to increase the sample time. The overrun behavior is configurable and is illustrated by the new demo model `mpc555rt_multitasking`.

Program Prepare Downloads at Application Specific Bit Rates

Program prepare downloads now work with an application running CAN at any of the bit rates supported by the Embedded Target Download tool. Also, the

application may be running at a non-default (20MHz) frequency - in this case, you will see a warning if the chosen bit rate is not suitable for program prepare downloading. This will occur if the boot code, running at 20MHz, cannot achieve the CAN bit rate used by the application.

Support for Vision Probe in Single Step 7.7.3

We now support version 7.7.3 of SingleStep for use with the WindRiver Vision Probe. We also continue to support version 7.6.2. Current versions of SingleStep for MPC555 no longer support the Macraiger Systems Wiggler. The standard BDM device is now the WindRiver Vision Probe.

There is also now support for Diab 5.1.2.

Support for Codewarrior 8

We now support version 8.0 of the Codewarrior toolchain.

Improved Resource Checking

There are enhancements to resource configuration to help you avoid device driver conflicts — for example, if you choose the same PWM channel for two different blocks you will be warned.

New Pass Through Mechanism

There is a new pass through implementation that reduces code overheads and can be easily applied to any target. See the demo model `mpc555_fuelsys_project` for the new implementation. In general it is now advised not to use the old pass through feature within any of the driver blocks and in a future release the pass through feature will be completely removed. The old pass through mechanism still works but will generate a warning because it is being deprecated.

Upgrading From An Earlier Release

New Boot Code

You must install the latest version of the boot code.

In all cases, if you try to download an application to a target running an out-of-date boot code, you will see a boot code mismatch error message. This message instructs you to use the boot code installation **Start** menu option to install new boot code. The following instructions describe the available options if you have out-of-date boot code currently running on the target

Upgrading from Release 13 or Release 12.1

If you have a BDM available you can download the new boot code over CAN or serial. Use the **Start** menu boot code installer and click **Yes** when asked if connected by BDM. The download should complete successfully.

If you have CAN but no BDM you cannot use the **Start** menu option to use the Download Control Panel. Instead you can use the upgrade model, `can_bootcode_upgrade.mdl`.

Upgrading from R13SP1

If you have a BDM available you can download the new boot code over CAN or serial, as for Release 13.

If you have CAN but no BDM you can use the **Start** menu option. Answer "No" when asked if connected by BDM. The download should complete successfully over CAN. You *do not* need to use the `can_bootcode_upgrade` model.

If you don't have BDM or CAN, it is not possible to upgrade.

Pass Through Feature Removed From TOUCAN Receive Block

This feature was removed because of the inefficiency of the generated code, even when the pass through feature was disabled. In general, you should not use the pass through feature on any of the driver blocks and in a future release

the pass through feature is planned to be completely removed (see “New Pass Through Mechanism” on page 1-4.).

If the pass through feature of the CAN Receive block has been used in a model then an error indicating disconnected lines will occur in the proximity of the CAN Receive block. This error will occur during model compilation.

Known Software and Documentation Problems

This section describes a known problem and limitation.

MPC555 Resource Configuration Block and Model Callbacks

When the MPC555 Resource Configuration block (see “MPC555 Resource Configuration” in the Embedded Target for Motorola MPC555 User’s Guide), is placed into a model, it modifies the `preloadfcn` callback of the model. If you wish to add a command to the `preloadfcn` callback of a model that already has an MPC555 Resource Configuration block, do not remove the commands that are already installed.

Instead, copy the installed `preloadfcn` callback and append your commands. Then set the `preloadfcn` to the merged command. If you corrupt the `preloadfcn`, you can retrieve the command from any model that has an MPC555 Resource Configuration block, as the `preloadfcn` will be the same for all models. You can retrieve the `preloadfcn` with the following command:

```
plf = get_param(bdroot, 'preloadfcn')
```

If the pass through feature of the CAN Receive block has been used in a model then an error indicating disconnected lines will occur in the proximity of the CAN Receive block. This error will occur during model compilation.

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New Features

This section introduces the new features and enhancements added to the Embedded Target for Motorola MPC555 since Version 1.0.1 (Release 13).

Note The Embedded Target for Motorola MPC555 Version 1.1 will be released as part of MathwWorks Service Pack CD. Version 1.0.1 was the first release of this product as part of a MathWorks release CD. Version 1.0 of this product was initially released in Web-downloadable form after Release 12.1 was released, but before Release 13.

Full CodeWarrior Support

Version 1.1 adds Full CodeWarrior support for Real Time Target mode, in addition to the existing processor-in the-loop (PIL) target support.

Time Processor Unit (TPU3) Support

Six new Time Processor Unit (TPU3) blocks have been added to support the use of the MPC555 TPU submodules:

- TPU Digital In
- TPU Digital Out
- TPU Fast Quadrature Decode
- TPU New Input Capture/Input Transition Counter
- TPU Programmable Time Accumulator
- TPU Pulse Width Modulation Out

Serial I/O Support

Serial transmit and receive blocks.

Automatic Boot Code Loading

Version 1.1 adds automatic boot code loading, with SingleStep or CodeWarrior, accessible from the MATLAB **Start** menu.

Upgrade Existing Boot Code via CAN or BDM

Note Both new users and previous users of the product must download the new bootcode provided with the latest release.

To install the new bootcode into flash memory on the target via BDM, follow the instructions under “Downloading Boot Code” in the chapter on Generating Stand-Alone Real-Time Applications in the *Embedded Target for Motorola MPC555 User’s Guide*.

You can also upgrade the bootcode over CAN (removing the need for a BDM connector). It is not possible to upgrade from a previous bootcode using the regular `candownload` utility, so if you wish to download via CAN then follow these instructions:

- 1 Open the model `can_bootcode_upgrade`.
- 2 Follow the instructions contained inside the model to download the new bootcode to the MPC555 via CAN.

Note: Once you have initially downloaded the new bootcode using the upgrade model, it will be possible to use the standard `candownload` program to download application code to RAM or flash, and bootcode to flash.

Automatic CAN Download

You can now reach the CAN Download Control Panel using the MATLAB **Start** menu, or you can open it automatically at the end of the build process.

Target Preferences Dialog

Version 1.1 includes a new Target Preferences dialog, accessible from the **Start** menu.

Automatic ASAP2 Generation

Version 1.1 provides automatic set up of correct settings for ASAP2 file generation. There is no longer any need to run the `mpc555dk_asap2` utility.

More CAN Message IDs in Vector CAN Receive

You can now specify a vector of CAN message IDs in a Vector CAN Receive block, so you can receive messages with different IDs from the same Vector Receive Block.

Automatic ODBC Data Source Configuration

Configuration of the ODBC Data Source is now automatic; previously you had to configure this manually. The ODBC Data Source is used for importing data from CANdb.

New Test Program

Version 1.1 includes a new test program, accessible from the **Start** menu, which downloads and runs on your MPC555 target hardware to verify your installation.

Two New Demos

Two new demos have been added to demonstrate the use of CANdb Message Packing and Unpacking blocks. You can generate code from `mpc555rt_candb.mdl` for real-time execution on an MPC555. If you have Vector-Informatik CAN hardware and drivers installed, you can use the companion model `mpc555rt_candbhost.mdl` to exchange CAN messages with the `mpc555rt_candb.mdl` model (running either in Simulink simulation or on hardware).

Accelerator Mode

Simulink Accelerator mode is now fully supported. Previous restrictions on models that contain CAN blocks and QADC blocks from the Embedded Target for Motorola MPC555 libraries have been removed.

Improved Compiler Support for CCP

The CAN Calibration Protocol (CCP) block is now compatible with any MEX compiler that you may choose (use the `mex -setup` command to choose your default MEX compiler). Stateflow will use the default MEX compiler at Simulation time to process the Stateflow charts that implement the CCP block. This block has been tested with LCC and MSVC 6.0.

Streamlined SingleStep Configuration

There is no longer any need for shortcuts to SingleStep. Setup is now considerably simpler. You can remove any existing shortcuts to SingleStep.

CANdb Limitation Lifted

You no longer need to place your DBASE (.dbf) files in your working directory. You can use the CAN Message Packing (CANdb) block mask to browse to DBASE files in any directory.

