MCUXCTRN

MCUXpresso Configuration Tools v.13 Release Notes

Rev. 3 — 16 January 2023 **Release notes**

Document information

Information	Content
Keywords	MCUXpresso Config Tools
Abstract	MCUXpresso Configuration Tools set is a suite of evaluation and configuration tools that help you from initial evaluation to production software development.

1 Overview

Release notes include information about new features, last-minute changes, bug fixes, incompatible elements, or other sections that may not be included in other documents for MCUXpresso Configuration Tools.

MCUXpresso Configuration Tools is a suite of tools that help users of all levels with a Cortex-M-based MCU solution.

It is an expert on all things MCU and can guide you from first evaluation to production development.

Read release notes before using MCUXpresso Configuration Tools.

Features:

- Available as Web and Desktop application
- MCUXpresso SDK v2 support
- Multicore support
- Localized for English and Simplified Chinese
- Mostly Connected: On-Demand device data download
- Integrates with any compiler and IDE
- Project Cloner allows you to clone existing SDK example projects (requires MCUXpresso SDK 2.x package) for the selected toolchain
- Supports the following toolchains: IAR Embedded Workbench, Keil MDK uVision, ARM GCC
- Supports English and Chinese (simplified) languages, based on locale settings. Refer to the User Guide for details

2 Available tools

The following tools are currently available:

- PLU tool
  - Configures programmable logic unit peripheral on specific MCUs
  - Integrated with the Peripherals tool
  - Direct look-up table and connections configuration
  - Schematic design with synthesis and mapping to look-up tables (Windows OS only)
  - Verilog synthesis and mapping to look-up tables (Windows OS only)
- Device Configuration tool
  The tool supports DCD (Device Configuration Data) command configuration. The DCD is configuration information contained in the program image (external to the ROM) used by the ROM to configure various on-chip peripherals.
  The Device Configuration tool features:
  - Create and edit DCD-command sequence intended for pre-initialization of devices at boot time
  - Easy editing with context-sensitive suggestions
  - Instant content validation
  - Import/export in various formats (C array, binary)
  - Overview of the resulting state of registers post-initialization
- Trusted Execution Environment Configuration tool

The Trusted Execution Environment (TEE) tool facilitates the protection and isolation of the sensitive parts of the code.
Features:
- Graphical display of memory layout and resulting access to memory regions
- Configuration of access policies for memory areas, bus masters, and peripherals
- Configuration of pin and interrupt masking and security, and general features related to the ARMv8 core security
- Configuration of MPU
- Validation of settings
- Generation of configuration files (C code or ROM preset data)

- Peripherals tool
  - Configuration of initialization for SDK drivers
  - User-friendly user interface allowing you to inspect and modify settings
  - Smart configuration component selection along the SDK drivers used in a toolchain project
  - Instant validation of basic constraints and configuration issues
  - Generation of initialization source code using SDK function calls
  - Multiple function groups support for initialization alternatives
- Pins tool
  Pins tool is used for pin routing configuration, validation, and code generation, including pin functional/electrical properties, and runtime configurations.
  The Pins tool features:
  - Muxing and pin configuration with consistency checking
  - ANSI-C initialization code
  - Graphical processor package view
  - Multiple configuration blocks/functions
  - Easy-to-use device configuration
  - Selection of Pins and Peripherals
  - Package with IP blocks
  - Routed pins with electrical characteristics
  - Registers with configured and reset values
  - Power Groups with assigned voltage levels
  - Source code for C/C++ applications
  - Documented and easy to understand source code
- Clocks tool
  The Clocks tool allows you to easily configure the initialization of the system clock (core, system, bus, peripheral clocks) and generate a C code with clock initialization functions and configuration structures.
  The Clocks tool features:
  - Inspection and configuration of clock-path elements from the clock source to the core/peripherals
  - Validation of clock elements setting and calculation of the resulting output clock frequencies
  - Generation of a configuration code using KSDK 2.0
  - Table view of clock elements with their parameters for settings modification and output display
  - Diagram view to navigate and display important settings and frequencies

  - User assistance for clock-element settings that fulfill given output requirements
- Memory Validation tool
  - Support for the SEMC registers init component and FCB is added.

3 System requirements

- One of the following Host Operating systems:
  - Microsoft(R) Windows(R) 10 (64-bit version)
  - Ubuntu 22.04 LTS
  - Mac OS X operating system (12)
- 4 GB RAM or more
- Display with resolution 1024 x 768 or more
- Internet connection for dynamic download of processor database

System Requirements for the Web Version:

- Internet browser with JavaScript enabled
- Required versions of web browser: Chrome 38+
- Internet connection for dynamic download of processor database
- Display with resolution 1024 x 768 or more

4 Known issues and limitations

- General
  - Cut, Paste, and Delete commands may not work properly when selected from the Edit menu.
  - [Safari] Web version of the tool might freeze when using the Safari browser. Recommended workaround: Use another browser or the desktop version.
  - [MacOS] Some of the main tool menu items are shown in English even if the locale is set to Chinese.
  - [MacOS, Windows] The 'Always Overwrite Files Without Asking' option does not work, a dialogue asking for overwriting files appears even if the option is on.
  - After switching to the Dark theme, the view does not use Dark colors. In most cases, one or more restarts of the application fix the issue permanently.
  - Html documentation. Search and Contents menus do not work in Firefox version 68 and later. The workaround is to use a different browser or to set `privacy.file_unique_origin=false` in Firefox about:config page, then restart the browser
- Creation of projects from the SDK package (see File | New)
  - Creation of a project based on SDK for multicore examples with trust zone is not supported, only examples with a maximum of two projects can be cloned.
  - Standalone multicore applications created for Keil or the ArmGcc toolchain could not be built due to an incorrect link between different build configurations, such as `flexspi_nor_debug` in the first and `debug` in the second.
- Pins tool
  - Tooltips in the Target processor view and drop-down menus are not supported in the web version.
  - Package view blinks in the web version.
  - [Ubuntu] Horizontal scrollbars in the Peripheral and Pins view and in the Routed pins table are missing on some Linux systems.

  - [Ubuntu] Checkbox of the selected row is not visible in the Pins view. It still can be clicked and the routing dialog pops-up.
- Clocks tool
  - When multiple outputs have frequency locks and an error is found, the error is reported for all the locks that are fed from the same clock source.
- Peripherals tool
  - Pins and Clocks tool must be enabled if the peripherals tools is used, otherwise some configuration components have limited functionality.
  - Only certain drivers and processors are supported, see the MCUXpresso Config Tools website for more details.
  - When the core of a functional group on multicore MCU is changed, the component instance might get a conflicting automatic name and report an error. This issue can be solved by temporarily using a different custom name and then switching back to the automatic name. [MCUXCON-8269]
- TEE tool
  - SAU is not displayed under the SAC tab for an i.MX93 project on open. Workaround: close and open the Security Access Configuration tab again. [MCUXCON-10657]
- Memory Validation tool
  - Apply to DCD option is available only for processors with Memory validation support.
- PLU tool
  - The tool is supported only on the LPC804 and LPC55xx families.
  - Schematic and verilog modes are available only on Windows OS.
  - Imported files have to be UTF-8 formatted.
  - Verilog file must not contain escaped identifiers.
  - GUI of component instance can be drawn only partially when the mode is changed and the **Keep current mode** button is pressed. Close and open configuration view of the PLU component instance to fix the GUI [MCUXCON-10006].
  - The selection box to which index the Flip-flop must be mapped might not appear every time. Click any LUT symbol in the diagram and then on the flip-flop [MCUXCON-10122].
- Kinetis specific issues:
  - UART/FTM modulation functionality is covered by not clear special signals of the System Integration Module.
  - [MKM34] Potential errors in the Route to selection are not correct for multipath connections.
- Desktop installer:
  - The tool will not work when the installation path contains the following characters "! @#$%^&". It is a Java limitation and mentioned characters are invalid for Java
  - [Ubuntu/Debian] For reinstalling the tool using dpkg, first uninstall the tool and then install again.

5 New features

Version 13

- Disable view content for specific NPI is supported
- Clone single secondary boot role example project is supported

- Product outgoing license is changed to LA_OPT_NXP_Software_License
- Pins tool
  - A customized function name for the de-initialization function is supported.
  - Customization of the de-deinitialization function name is supported.
  - Allow the usage of the expansion board file referencing single-row Arduino header with Freedom and LPC headers that are compatible.
  - Pins messages driven by functional properties and pin mode
  - Show external signal tab by default
  - Zephyr Pins configuration in Config Tools
- Peripherals tool
  - The "Default" option in the peripherals component clock selection is added.
- TEE tool
  - Support for i.MX RT1180 and i.MX 93 processor families is added.
  - Optional generation of hardened code for the device where it is supported is availablee (enabled by SDK, for example LPC55S6x MCU at this moment).
  - SAU, MPU, and Access Templates tabs have been moved to the top-level tab strip and are now MCU-wide
  - XRDC memory regions now allow overlaps
  - EAL configuration is implemented for XRDC MRC
  - "This domain only" filter option added for the Memory Attribution Map view; it is always on for the Access Overview view
- Memory Validation tool
  - Re-enable support
  - Drop GDB support and re-use download mode option
  - Change target connection method for Memory validation tool for MCUs
  - Sync Memory validation tool with register init component

Version 12.1

- PLU tool
  - Integrated into MCUXpresso Config tools
  - Redesigned to interact with the Peripherals tool PLU register init component
- Pins tool
  - The Deinit function now sets the routing and direction to its default state. It also tries to route the original peripheral signal to its default pin.

Version 12.0

- The product is based on Eclipse 2021-12
- Enabled EcmaScript 6 script engine
- Supported Override outpath of files generated by tools
- Project cloner
  - Added support for SDK 2.12
- TEE tool
  - i.MX 8ULP applications processor family is now supported:
    - Implemented basic XRDC configuration (MRC, MSC, and PAC)
    - Additionally implemented Process Identifier, TSM, and SP4SM configuration

    - Hybrid templates updated for XRDCs MRC that can be edited by the user and selected by the code region
  - Fixes for the KW45 family:
    - Fixed the bug where LK1 bit in TRDC_CR is not set when all the GVLD bits are set
    - Fixed the bug where setting a lock in Access Templates does not work
    - Fixed the bug where setting ID bypass of a master does not set the bit in its MDA register in the Registers view
  - Fixes for LPC55S and RT5xxS/6xxS families:
    - Fixed the bug where the NSC region is not shown correctly
  - Other minor improvements and fixes
- Pins tool
  - Added the command to create a function with default routing of pins and signals
  - Created the External User Signals view
  - Added an option to change pins labels in the package view
- Peripherals tool
  - Fixed the problem with "*/" in the string setting or the instance's comment
  - Components may add an instance of another component if required by the component
  - Migration does not change the initialization order
- Clocks tool
  - Added an option to override locked values to the Import registers dialog
  - Improved behavior of changing global configurations elements in the Functional group properties dialog
- Minor improvements and fixes
  - Added support for MEX files in comparison to the Update code dialog

Version 11.0

- The product is based on Eclipse 2021-06
- Updated Open JDK 11
- Remove Nashorn engine warning from logs
- Added a new view - Config tools Snippets, collecting code templates from tools
  - Support snippet code **Copy to clipboard** via toolbar action
  - Accessible from the Views menu in the Peripherals tool
  - Integration to MCUXpresso IDE:
    - Easy access from the Views menu in the Development perspective
    - Insert selected snippet code into an active editor via double-click or toolbar action
    - Show the warning in the view, when snippets are from a different project, that the one related to the active editor
- Project cloner
  - Added support for SDK 2.11
- Peripherals tool
  - Migration to a newer version of the configuration component
    - Added the dialog to migrate multiple components to a newer version
    - Added the mechanism which will open the dialog after loading the MEX file when the toolchain project contains a different version (Toolchain mode only)

    - Each migration offer can be permanently rejected per the MEX file
  - Added support for revisions of the SDK components
    - Some configuration components might report the problem that the used configuration component is for a different revision than the present in the toolchain project (MCUXpresso IDE only)
  - Providing snippets in Config tools Snippets view from the **Copy to clipboard** button
  - Horizontal tables now report status in table header instead of an undescribed table row
- TEE tool
  - Added TRDC support:
  - The KW45 family is now supported
  - Implemented a toggle for access control and individual security checkers
  - Enabled unsecured memory regions to report issues on validation
  - Other minor improvements and fixes
- Pins tool
  - Added the Full pins initialization option in the Functional group properties
  - Added the De-initialization function option in Functional group properties
  - The pins view and routing dialogs are now using labels in the format "Peripheral: signal, channel"
- Clocks tool
  - Added the output enabler and advanced resolver functionality
    - The output enabler automatically enables the selected clock output
    - The advanced resolver attempts to change settings or path to the clock output if an error occurs on the clock output
    - Accessible via Clocks Diagram, Clocks Tables, and Problems View (across all tools)
    - Added the file with generated C/C++ #define of clocks registers
    - Can be enabled in Configuration Preferences
    - Added support for a custom functional group prefix

Version 10.0

- The product is based on Eclipse 2020-12
- Moved from Open JDK 8 to Open JDK 11
- Project cloner
  - Supported "create a new CodeWarrior project" for the device from DSC SDK
  - Improved path updates in the component cmake source files list, now they are replaced individually on cloning example for Arm GCC
- TEE tool
  - LPC55S3x family supported
  - Improved support for XRDC2
    - Added instance enable/disable
    - Added MDAC enable/disable
    - Implemented APC support
    - Implemented EAL support
  - A new configuration now defaults to the secure state
  - Implemented the ability to create and edit multiple functional groups
  - Minor improvements and fixes
    - Processor reset dialog offers 2 choices where available

  - Memory Attribution Map displays dash ('-') in cells representing inexistent access
  - Memory Attribution Map cells show full access rights
  - Domains Overview is hidden for MCUs without domain-based security
  - RDC memory regions are shown as absolute instead of relative
  - Address column renamed to Start Address
  - Minimum grid column size is now based on content
- Pins tool
  - Added support of expansion board adapters - expansion boards that contain additional expansion headers
  - A numbered suffix is added to function names and prefixes by default for expansion board functions
  - Processor reset dialog offers 2 choices where available
- Peripherals tool
  - Component use-cases
    - The current configuration of component instance can be stored as a use-case
    - Added component dialog supports component instance creation from a use-case
    - Component use-cases can be managed (import, export, remove, update) in the use-cases library
  - Integration with MCUXpresso IDE
    - Peripheral tool components that configure SDK components present in the SDK package of the current toolchain project inform users that the Peripherals tool component is the right one even when the project does not contain the SDK component yet
    - Added component dialog newly provides an option to offer only the Peripheral tool components that configure SDK components present in the SDK package of the current project
    - A new button that opens SDK components manager was added to the Add component dialog
  - Minor improvements and fixes
    - Processor reset offers a new possibility to reset to the predefined configuration of the processor
    - Board reset dialog informs the user that the Peripherals tool cannot be reset when such configuration is not available instead of an empty selection in the dialog
    - Tabs now also support copy and paste actions
    - Copy and paste now works with the system clipboard. Pasting into another configuration or another running Config Tools is possible
    - Links to other settings now show their current state with a description of what is wrong
    - Settings that can be collapsed are remembered when the user collapses or expands them and the tool restores the state when the view of the instance is reopened
    - When GUI of the instance's view is recreated, the selection in arrays and tabs is restored to the state where it was last time the view was open
    - Modes of the component instance, which does not configure any peripheral on the current processor, are not offered to avoid problems

Version 9.0

- The product is based on Eclipse 2020-06

- Moved from Oracle Java 8 to Open JDK 8
- Project cloner
  - Modern format Arm GCC toolchain projects in Import Toolchain and Project Cloner are supported
  - Added support for SDK 2.9
  - Detect from the project readme, that the project cannot be imported into Config Tools
- Pins tool
  - Added Expansion boards support
  - Improved presentation and usage of internal signals
    - Renamed the "Routed Pins" view to "Routing Details"
    - Renamed the column "Route to" to "Routed pin/signal" in the Routing Details view
    - Added the column "Arrow" in the Routing Details view (includes generated pins reports)
    - Added pin coordinates to the "Routed pin/signal" column in the Routing Details view (includes generated pins reports)
    - Added a filter for Pins or Signal in the Routing Details view
  - Ability to locate/highlight pin(s) in the Pins View table from other views(Routing Details, Package,...)
- Peripherals tool
  - Added component instance editing lock
  - User initialization of peripheral is supported
  - Component instance view can be duplicated
  - Added manual editing of register values
  - Order of peripheral initialization can be changed via dialog
- TEE tool
  - i.MX RT1170 MCU family is supported

Version 8.1

- New DSC family processors are supported.
- Added support for opening a specific peripheral view within Config Tool.
- LPC 54xxx processor rename is supported.
- Several bugs are fixed.

Version 8.0

- Pins tool:
  - Added Expansion headers support.
  - Added muxing alt function details in the HTML report.
- TEE tool
  - Added MPU (Memory Protection Unit) support.
  - Validations of peripherals security configuration vs interrupt security configuration.
  - Validations of linker map file vs TEE configuration
  - Added the ability to generate ROM preset data instead of C code
- Peripherals tool:
  - Register initialization introduced
  - Quick fix button added next to the problematic part of a component when the fix is available
- Device Configuration tool:
  - Added support for Cut, Copy, and Paste of DCD commands

  - Improved editing with the 'Write - clear and set bits' dialog
- Memory Validation tool
  - (MCUXpresso IDE only): Added FCB Validation tool, with RT support (untested support for RT600)
- Project Cloner in the New Configuration Wizard
  - Added support for CodeWarrior examples from DSC SDK

Version 7.0.1

- Mac OS X 10.15 operating system support is added.
- TEE tool
  - Displays correctly inaccessible regions in the "Memory attribution map" view

Version 7.0

- Added the "Help | Kit/Board Information" option that displays information about currently used kit or board.
- Clickable Part number, Board, and Kit name supported. It displays information about the currently used processor, board, and kit.
- Data Manager supports clearing locally cached processors, boards, kit, and components content.
- Configuration Preferences supports custom copyright in generated sources.
- TEE tool:
  - The memory map is now interactive, cell double click opens its configuration.
  - The memory map now displays peripherals space details.
  - Added a possibility to import a memory configuration from MCUXpresso IDE project(s).
  - Memory regions in the Access overview are now grouped by memory type; all memory region aliases are displayed in a single row.
  - Pins table now contains pin labels from the Pins tool.
  - Additional validations and security setting recommendations.
- Peripherals tool:
  - The tool can now generate binary output files.
  - The component name is derived from the selected peripheral by default. It can be overwritten by the user.
  - Documentation view improvements related to navigation:
    - The header with links in documentation content
    - A selection box in the header of view.
  - Deprecated components have "(deprecated)" suffix in the add component dialog if there are still other instances of this type in the configuration.
- Pins tool:
  - Added automatic routing feature, which can be used for conflict resolution in the current functional group.
  - MCUXpresso Config Tools only:
    - Dark theme support is added to Preferences
  - MCUXpresso IDE only:
    - Added SEMC/SDRAM stress tests, with RT support.
    - Added FlexSPI/NOR Validation tool, with RT support.

Version 6.0.1

- Clocks tool
  - Improved support for RT500 family processors.
- TEE tool
  - Improved support for LPC55S6x, LPC55S2x, LPC552x processors
- Peripherals tool
  - Several bugs are fixed

Version 6.0

- Only 64bit operating systems are supported
- 'Update Code' is now possible without an assigned toolchain project
- Removed the dialog reporting changes between MEX and YAML in the source code. The changes can be reviewed using Update Code DIFF
- Added the "Help | Processor Information" menu option that displays information about the currently used processor
- Added the Device Configuration tool, supports DCD (Device Configuration Data) commands configuration.
- Added the Trusted Execution Environment (TEE) tool.
- Highlight changes implemented in generated code in the Code preview view.
- MCUXpresso IDE only:
  - Added Dark theme support
  - Added the SEMC (SDRAM) Validation tool, with RT1020 and RT1050 support.
- Project Cloner in the New Configuration Wizard
  - Added support for MCUXpresso SDK v2.6.x
- Clocks tool:
  - Run Mode and MCG Mode selection have been moved to the Clocks Diagram and Clocks Table views.
  - Added support for search by a label in the Clocks Diagram.
- Peripherals tool:
  - Added Support for 64bit (and more) values from the user.
  - The user can now migrate settings values from component already added to a configuration to another component, if mutually compatible (component redesigned, and so on).
  - Documentation view history can now be navigated.
- MCUXpresso Config Tools only
  - Added the Overview dialog on opening configuration for the first time

Version 5.0

- New Configuration Wizard allows specifying the default core for multicore processors.
- New Configuration Wizard tool allows creating of a hello-world project for the selected board.
- Data Manager allows an overview of the downloaded data, their versions, tool support information, update outdated, or manually download new data.
- Added an ability to import/export (Clocks) configuration from registers state. Memory dump and csv formats are supported.
- The Clock Consumers' view in the Clocks tool is improved. It shows peripheral consumers in the tree with additional information about active input frequency. Selected peripheral input is highlighted in all relevant views (Clocks Diagram, Clocks Table, and Details).
- Diagram element search is added to the Clocks Diagram toolbar.

- Project Cloner in New Configuration Wizard: Added support for MCUXpresso SDK v2.5.x
- Copy/Paste of pin(s) supported in the Routed Pins view.
- Checkbox behavior in the Peripherals View is updated. It is used to enable/disable component instance now.
- Error and/or warning indication is added into the Peripherals View.
- More filter options in the Peripherals View.
- Simplified and more effective layout of the Components View - tree representation was replaced with a grid.
- Added in-tool tutorials - eclipse Cheat Sheets integration.

Version 4.1

- The product is based on Eclipse Oxygen release 3.
- Undo/Redo is supported.
- Project Cloner moved as an option to the startup dialog and new configuration dialog.
- The Peripherals view now displays errors and warnings. It is possible to filter peripherals or configuration components by their name.
- Pin-related settings of GPIO are moved from the Peripherals tool to the Pins tool, see 'GPIO initial state' and 'GPIO interrupt' in the Routed Pins view.
- It is possible to select the configuration component version while adding a new configuration component instance to the Peripherals configuration.
- Unified import wizard. A single import source is implemented. It allows importing all supported types of C files.
- Update Project Code can now display differences in code.
- A new Global Configuration option "Generate extended information into header file" driving number of amount of C defines.
- Project Cloner: Added support for MCUXpresso SDK v2.4.x

Version 4.0

- The Peripherals tool is added.
- Project Generator replaced by Project Cloner.
- Added the ability to import configuration from the existing MEX file (for selected tools).
- If the MEX file is stored within the toolchain project, the tools report a required but missing SDK component in that project.
- The open configuration command verifies that the configuration matches with sources detected from the toolchain project.
- Added a common Functions group toolbar across all tools.
- Added an option to not generate YAML.
- Pins tool: Multiselect in the Routed pins view is now supported.
- Syntax coloring is supported in the Sources view.
- Export sources wizard is simplified.
- Several bugs are fixed and general performance is improved.
- Quick start guide is added.
- Update Project Code is introduced

Version 3.0

- Project Generator is added, a new configuration now allows SDK selection
- Rebranded to MCUXpresso Config Tools
- Newly views are dock-able, the Views menu is added.

- Sources view now displays which core a generated file belongs to (for multicore processors).
- Problems view is improved.
- Pins view package now supports PoP (package on package) and a generic package.
- Export sources are improved, multicore support is added: Generated C code is now split into individual folders by core, using a common "pin_mux.c/.h" name.

Version 2.0

- The Clocks tool is added.
- Labels and Identifiers are now supported in the Pins tool.
- Boards and Kits are now supported.
- Several bugs are fixed.

Version 1.0

- Initial version.

6 Revision history

Table 1. Revision history

Revision	Date	Description
0	22 December 2022	Initial release
1	15 July 2022	Updated for v12
2	30 September 2022	Updated for v12.1
3	16 January 2023	Updated for v13

7 Legal information

7.1 Definitions

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