Steps for Migrating from KW45x41x8xAxx (1 MB) to KW45x41x5xAxx (512 kB)Rev. 2 — 27 October 2023Application note

Document information

| Information | Content |
|-------------|---|
| Keywords | AN14077, IAR IDE, KW45B41Z, MCUXpresso, flash memory, linker file |
| Abstract | This document describes the initial steps require to migrate from 1 MB flash to 512 kB flash. The document explains the KW45B41Z demonstrator package and the software configuration of the X-KW45BZ41 board. |



1 Introduction

This document describes the initial steps require to migrate from 1 MB flash to 512 kB flash. The document explains the KW45B41Z demonstrator package and the software configuration of the X-KW45BZ41 board.

Note: It is important to know which KW45 variant you have. This information helps to configure the software to use the flash properly.

2 Working with SDK example projects

The following sections explain the steps to download and run the software examples.

2.1 Getting the SDK

NXP provides code examples to get you started. For more information, see the MCUXpresso SDK Builder page.

- 1. Access the MCUXpresso SDK Builder.
- 2. Log in with your NXP account and click "Select Board/Processor" on the left menu. Select the "KW45B41Z-EVK", as shown in Figure 1.

| # SDK Dashboard | Select Development Board | | |
|---------------------------------------|--|-------------------|--|
| BUILD SDK Select Board / Processor | Search for your board or kit to get started. | | Selection Details |
| Middleware (3) | Search for Hardware | | Select a Board, Kit or Processor from the available Xit |
| * Teolchain (Off) | ka#5 | (S) Q. | SDK |
| (OF) ADMINISTRATION | Select a Board, Kit, or Processor HVP-XV46F1500I (MKV46F2558xx16) | * | Matched Hardware Platforms |
| · Neescators | HVP-KV58F (MKV58F1M0xxx24) | | Found 600 HW solutions that match your criteria. |
| Preferences | KW38-ER-RD (MKW38A512xx4) | | (Boards: 659), Kits: 69), Processors: 633) |
| DOWINLOADS | KW45B41Z-EVK (KW45B41Z83xxxA) | Controlled access | Filtering Criteria - Reset all |
| MCUXpresse IDE | MAPS-KS22 (MKS22FN256xx12) | | Required Middleware |
| MCUXpresso Config Tools | TWR-K21D50M (MK21DN512Axxx5) | | Middleware filtering not applied |
| B Office data | TWR-K21F120M (MK21FN1M0Accc12) | | Required Example Projects |
| MCUREresse | TWR-K22F120M (MK22FN512xx12) | | Example Project filtering not applied |
| Secure Provisioning Tool | TWR-K24F120M (MK24FN256xx12) | | Required Toolchains |
| INTERNAL | TWR-K600100M (MK600N512xx10) | | Toolchains filtering not applied |
| i Deployed Releases | TWR-K64F120M (MK64FN1M0xx12) | | Processor Parametric Filtering |
| ? Hardware in Releases | TWR-K65F180M (MK65FN2M0xx18) | | Processor Parametric Filtering not applied |
| HE Analytics | TWR-K80E150M (MK80EN256mc15) | | |

Figure 1. Select development board

3. Click "Build MCUXpresso SDK" on the right menu.

| Search for your board or kit to get started. | Selection Details |
|--|--|
| Search for Hardware | KW45B41Z-EVK O KW45B41Z-EVA O Bluetooth Low Energy |
| Select a Board, Kit, or Processor | Actions |
| ▼ Boards | (+) Add to Filtering Criteria |
| ✓ Kinetis | Evplore calentias with Disc tool |
| KW45B41Z-EVK (KW45B41Z83xxxA) | Explore beredulor with Prins tool |
| ✓ Kits | Explore selection with Clocks tool |
| Kinetis | 20 40 F |
| KW45B41ZEVK with A8964 (KW45B41Z83xxxA) | V2.12.5 * Build MCOXpresso SDK |
| Processors | Matched Hardware Platforms |
| Kinetis | Found (1991) HW solutions that match your criteria. |
| • W | (Boards: 156), Kits: 104, Processors: 531)) |
| ▼ KW4x | |
| KW45B41Z52xxxA | Filtering Criteria - Reset all |
| KW45B41Z53xxxA | Required Hardware |

Figure 2. Build MCUXpresso SDK

- 4. Select the "Host OS" that you are working on and the "Toolchain/IDE" you want to develop. For this case, click "All". This option selects all the toolchains and middleware.
- 5. Click "Download SDK".

Steps for Migrating from KW45x41x8xAxx (1 MB) to KW45x41x5xAxx (512 kB)

| | Build SDK for KW45B412-EVK Construction for a functional data by MCL2Spresso Tools. Construction for a functional data by SDT and Generate Progets Hunton Res 2 A functional data by SDT and Generate Progets Function Res 2 A functional data by SDT and Generate Progets Social data by SDT and | | | | | | | |
|-------------------------|--|--|---------------|---|---------------------------------|--|--|--|
| | | Name | Category | Description | Dependencies | | | |
| | \checkmark | CMSIS DSP Library | CMSIS DSP Lib | CMSIS DSP Software Library | ^ | | | |
| | \checkmark | EdgeLock SE050 Plug and Trust Middleware | Middleware | Secure subsystem library - SSS APIs | | | | |
| | \checkmark | GenFSK | Middleware | GenFSK stack and examples | | | | |
| | ~ | LIN Stack | Middleware | LIN Stack middleware | | | | |
| | \checkmark | mbedTLS | Middleware | mbedTLS SSL/TLS library | | | | |
| | \checkmark | multicore | Middleware | Multicore Software Development Kit | | | | |
| | | Wireless BLE stack | Middleware | BLE | Wireless Connectivity Framework | | | |
| | \checkmark | FreeRTOS | | Real-time operating system for microcontrollers from Amazon | | | | |
| | | | | DOWNLGAD SDK | | | | |
| Figure 3. Select the to | olo | chain and dow | nload the | SDK package | | | | |

2.2 MCUXpresso software setup

Depending on the KW45 flash, change the linker file; It can be 1 MB flash or 512 kB flash. To change the linker file, click "Project > Properties > MCU settings" and modify the flash size.

| Idvarding under service ser | Properties for kw45b41zevk_v | wireless_uart_bm | | | | | | | | |
|---|--|-----------------------------|--------------------------------------|-----------------|--------------------------|--------------------------------|---|-------------|--|--|
| Second State St | | MCU settings | | | | | ¢ | ▼ <> ▼ 8 | | |
| Sindicinamed Biologi MCU setting: Statings Tool Chain Sditor > SDK MCUS Preinstalled SDR: Plasse click above an SDR: Sorter Statings Tool Chain Sditor MCU from installed SDR: Plasse click above an SDR: Sorter Statings Tool Chain Sditor MCU from installed SDR: Plasse click above an SDR: Sorter Statings Tool Chain Sditor MCU from installed SDR: Plasse click above an SDR: Sorter Statings Tool Chain Sditor MCU from installed SDR: Plasse click above an SDR: Sorter Statings Tool Chain Sditor MCU from installed SDR: Plasse click above an SDR: Sorter Statings Tool Chain Sditor Not Kinds Not Kinds NV KWASB41283xxxA SVA NV KWASB41283xxA SVA NV KWASB41283xxXA SVA NV KWASB41283xxA SVA <th>> Resource Builders ✔ C/C++ Build Build Variables</th> <td>Avai</td> <td>lable parts</td> <td></td> <td></td> <td></td> <td></td> <td></td> | > Resource Builders ✔ C/C++ Build Build Variables | Avai | lable parts | | | | | | | |
| Settings Tol Chain Editor > CC 4- General MCU/press Config Tools Project Natures Project References > Run/Debug Settings Task Tags > Kur/Debug Settings Task Tags > Validation Target architecture: > Default LinkSever Flash Driver > Preserve memory configuration > Preserve memory configuration > Preserve memory configuration > Preserve Flash Driver > Preserve Flash Driver > Preserve Flash Driver > Bash Mark RAM & Dacoton State Driver > RAM SRAM RAM & Dacoton State Driver Pash PROGRAM Flash Driver Preserve Flash Driver Pash PROGRAM Flash Driver Preserve Flash Driver Preserve Flash Driver Pash Mark RAM Doc2000000 do 110-00 RAM SRAM Split Driver Pash Mark RAM Doc2000000 do 110-00 RAM SRAM Split Driver <td< td=""><th>Environment Logging MCU settings</th><td>✓ SDK MCUs MCUs from ins</td><td>talled SDKs. Pleas</td><td>e click above o</td><td>MCUs fro part supp</td><td>stalled MCUs om preinstalle</td><td>ed LPC and generi</td><td>ic Cortex-M</td></td<> | Environment Logging MCU settings | ✓ SDK MCUs MCUs from ins | talled SDKs. Pleas | e click above o | MCUs fro part supp | stalled MCUs om preinstalle | ed LPC and generi | ic Cortex-M | | |
| MCUXpresso Config Tools Project References > Run/Debug Settings Task Tags > Validation > Validation > Validation Preserve memory configuration Preserve memory configuration Preserve memory configuration Preserve memory configuration Perserve memory configuration Preserve memory configuration Perserve memory configuration Preserve memory configuration Validation Stree Red Flash Add RAM Spit Isin Delete Retree Default Add Flash Add Flash Add Flash Add Flash Add Flash Add Flash Add F | Settings Tool Chain Editor > C/C++ General | SDKs. | 1Z83xxxA | tain additional | Target | lxxx | | ^ | | |
| Project References > Raw/Debug Settings Task Tags Validation VCMAk VCMSSKX VCSS56c MCXN95XX VC1116c LC111bcx LC111 | MCUXpresso Config Tools Project Natures | > K32W061 | | | > LPC > LPC | > LPC1102 > LPC112x | | | | |
| Veildation Veildatin Veildation Veildation Veildation Veildation | Project References > Run/Debug Settings | ✓ KW4x KW45E | 41Z83xxxA | | > LPC | 11Axx 11E6x | | | | |
| I arget architecture: cortex-m33 Preserve memory configuration Preserve project configuration Default LinkServer Flash Driver Flash 0x0 Pash 0x60000 KW45B412B3xxxAP* Default LinkServer Flash Driver From and alias Location Size Type Name Alias Location Size Driver Flash PROGRAM Plash Oxfe000 RAM RAM RAM Rak Restore Defaults Apply Cortex Apply and Close Apply and Close Cancel | > Validation | > LPC55S6x > MCXN5XX | (| | > LPC > LPC | 11U6x 11Uxx | | | | |
| Target architecture: cortex-m33 Preserve memory configuration Preserve project configuration Memory details (KW45B41283xxxA)* Browse Type Name Alias Location Size Driver Flash PROGRAM Flash PROD Plash PROD Plash Oxfe000 KW45841.c Preserve Flash PROD Pash PROD Pash Oxfe000 Add Flash Add RAM Spit Join Delete Import Merge Export Generate Refresh MCU Cache Restore Defaults Apply | | | | | > LPC | 11xx | | * | | |
| Image: Proof Proo | | Memory detai | ls (KW45B41Z83 erver Flash Driver | xxxA)* | Location | Size | Driver | Browse | | |
| Flash NVM_region Flash2 0xf6000 0x8000 KW45B41.c Image: State of the state o | | Flash | PROGRAM | Flash | 0x0 | 0xf6000 | KW45B41.c | 1 1 1 | | |
| Flash PROD_DATA Flash3 Oxfe000 Ox2000 KW45B41.c RAM SRAM RAM RAM Ox2000000 Ox400 1MB flash RAM rpmsg_sh RAM3 Ox499c8800 Ox1800 1MB flash Add Flash Add RAM Split Join Delete Import Merge Export Refresh MCU Cache Restore Defaults Apply Import Apply and Close Cancel | | Flash | NVM_region | Flash2 | 0xf6000 | 0x8000 | KW45B41.c | ₽1 | | |
| RAM SRAM RAM 0x20000400 0x1bc00 1MB flash RAM RAM_VECT RAM2 0x2000000 0x400 1MB flash RAM rpmsg_sh RAM3 0x489c8800 0x1800 1MB flash Add Flash Add RAM Split Join Delete Import Merge Export Generate Refresh MCU Cache Restore Defaults Apply Apply and Close Cancel 4 KWA55 Lipkor filo 1 MB flash Kancel Kancel Kancel | | Flash | PROD_DATA | Flash3 | 0xfe000 | 0x2000 | KW45B41.c | | | |
| Add Flash Add RAM Split Join Delete Import Merge Export Generate Refresh MCU Cache Restore Defaults Apply C Apply and Close Cancel | | RAM | SRAM | RAM | 0x20000400 | 0x1bc00 | 1.0000000000000000000000000000000000000 | _ | | |
| Add Flash Add RAM Split Join Delete Import Merge Export Generate Refresh MCU Cache Restore Defaults Apply 2 Apply and Close Cancel | | RAM RAM | RAM_VECT rpmsg_sh | RAM2 RAM3 | 0x20000000 0x489c8800 | 0x400 0x1800 | 1MB fla | ash | | |
| Refresh MCU Cache Restore Defaults Apply (?) Apply and Close Cancel Apply and Close Cancel | | Add Flash | Add RAM Sp | lit Join De | elete Import. | Merge | Export Ger | nerate | | |
| Restore Defaults Apply ? Apply and Close Cancel | | | | | | | Refresh M | ICU Cache | | |
| Image: Cancel Image: Cancel | | - fin | | | | Res | tore Defaults | Apply | | |
| ro 4 KW45 linker file 1 MB flash | (?) | | | | | Apply | and Close | Cancel | | |
| IE 9. NV93 UUNELUE LUD UASU | | | | | | | | | | |

Steps for Migrating from KW45x41x8xAxx (1 MB) to KW45x41x5xAxx (512 kB)

| type filter text | MCU settings | \Diamond | • <> • 8 |
|--|--|---|-------------------|
| > Resource Builders V C/C++ Build Build Variables | Available parts | | |
| Environment Logging MCU settings Settings Tagl Chair Editor | SDK MCUs MCUs from installed SDKs. Please click above or visit mcuxpresso.nxp.com to obtain additional SDKs. | Preinstalled MCUs MCUs from preinstalled LPC and generic part support Target | c Cortex-M |
| C/C++ General MCUXpresso Config Tools Project Natures Project References Run/Debug Settings Task Tags Validation | NXP KW45B41283xxxA > K32W061 > KW3x \varkstyle{KW45B41283xxxA} \varkstyle{KW45B41283xxxA} > LPC5556x > MCXN5XX > MCXN5XX | CTNxxx LPC1102 LPC112x LPC112x LPC114xx LPC11Exx LPC11Exx LPC1106x LPC1106x LPC1106x LPC1110x | |
| | Target architecture: | cortex-m33 | rowse |
| | Type Name Alias Lo. Flash PROGRAM Flash 0x/ Flash NVM_region Flash2 0x/ Flash PROD_DATA Flash3 0x/ | Size Driver 0 0x76000 KW45B41.c 76000 0x8000 KW45B41.c 7e000 0x2000 KW45B41.c | ŷ ₽ |
| | RAM SRAM RAM 0x2 RAM RAM_VECT RAM2 0x2 RAM rpmsg_sh RAM3 0x4 | 20000400 0x1bc00 20000000 0x400 489c8800 0x1800 512 kB | 3 flash |
| | Add Flash Add RAM Split Join Delete | Import Merge Export Gen Refresh M | erate CU Cache |
| | | Restore Defaults | Apply |
| | | | |

2.3 Running the Hello World

To run the "Hello World" example with the MCUXpresso IDE, perform the following steps:

1. Open the MCUXpresso IDE and create or reuse one of your workspaces.

| MCUXpresso IDE Launcher | × |
|---|---|
| Select a directory as workspace | |
| MCUXpresso IDE uses the workspace directory to store its preferences and development artifacts. | |
| Workspace: \Documents\MCUXpressoIDE_11.4.1_6260\workspace_KW45 V Browse | |
| | |
| Use this as the default and do not ask again | |
| Recent Workspaces | |
| Launch Cancel | |

Figure 6. Select your MCUXpresso workspace

2. Select the Installed SDKs tab. Drag and drop the SDK zip file downloaded in the previous step.

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Steps for Migrating from KW45x41x8xAxx (1 MB) to KW45x41x5xAxx (512 kB)

| 询 Installed SDKs | | | |
|---|-----------------------------------|-----------------------|----------------------------------|
| To install an SDK, simply drag and drop | an SDK (zip file/folder) into the | Installed SDKs' view. | [Common 'mcuxpresso' folder] |
| Installed SDKs Available Boards Ava | ilable Devices | | |
| Name | SDK Version | Manifest Version | Location |
| SDK_2.x_FRDM-KL25Z | 2.2.0 | 3.0.0 | Common>\SDK_2_2_0_FRDM-KL25Z.zip |
| SDK_2.x_FRDM-KL43Z | 2.8.0 (366 2020-07-21) | 3.6.0 | Common>\SDK_2_8_0_FRDM-KL43Z |
| Grade SDK_2.x_FRDM-KW36 | 2.2.9 | 3.1.0 | Common>\SDK_2_9_FRDM-KW36.zip |
| General SDK_2.x_FRDM-KW38 | 2.6.13 (515 2021-10-18 | 3.5.0 | Common>\SDK_2_6_13_FRDM-KW38.zip |
| SDK_2.x_FRDM-KW41Z | 2.2.3 | 3.0.0 | Common>\SDK_2_2_3_FRDM-KW41Z.zip |
| GRAND SDK_2.x_KW45B41Z-EVK | 2.10.1 (525 2021-11-03 | 3.8.0 | Common>\SDK_2_10_1_KW45B41Z-EVK |
| GDK_2.x_QN9030 | 2.6.4 (502 2021-08-13) | 3.5.0 | Common>\SDK_2_6_4_QN9030.zip |
| SDK_2.x_QN908XCDK | 2.2.6 | 3.0.0 | Common>\SDK_2_2_6_QN908XCDK.zip |
| SDK_2.x_QN9090DK6 | 2.6.4 (502 2021-08-13) | 3.5.0 | Common>\SDK_2_6_4_QN9090DK6.zip |

Figure 7. Drag and drop the SDK zip file

3. After completion of SDK installation, select the "Import SDK example(s)" option from the Quickstart Panel.

| U Quickstart Panel 🖾 🗱 Variables 💁 Breakpoints | - 1 | |
|---|-----|---|
| | | |
| MCUXpresso IDE - Quickstart Pane Project: kw45b41zevk_led_blinky [Debug] | 1 | |
| Create or import a project | | |
| New project Import SDK example(s) Import project(s) from file system | | |
| ✓ Build your project | | |
| Build Clean | | |
| - Debug your project 🛛 🗈 - 🔝 - | • | |
| Terminate, Build and Debug | | |
| ★ Miscellaneous | | |
| Edit project settings | | ~ |
| < | > | |
| 😂 kw45b41zevk_led_blinky | | |
| igure 8. Select the "Import SDK example(s)" option | | |

4. Search for the KW45B41Z-EVK board and click the Next button.

Steps for Migrating from KW45x41x8xAxx (1 MB) to KW45x41x5xAxx (512 kB)

| SDK Import Wizard | | x |
|--|--|---|
| Importing project(s) for device | e: KW45B41Z83xxxA using board: KW45B41Z-EVK | |
| Board and/or Dev | ice selection page | |
| - SDK MCUs | Available boards | 1 the the last |
| MCUs from installed SDKs. | Please select an available board for your project. | |
| Please click above or visit | Supported boards for device: KW45B41Z83xxxA | |
| Additional SDKs. NXP KW45841283xxA > KL4x > KV4x KW45841283xxA KW45841283xxA MKV415512xx04 > QN909x | Kw45b41zerk | |
| Selected Device: KW45B41Z8 | 3xxxA using board: KW45B41Z-EVK | SDKs for selected MCU |
| Target Core: cm33 Description: Ultra-low pow with CAN-FD. | er, Highly Secure, Bluetooth LE 5.2 Wireless MCU | Name SDK Versi_ Manifest _ Location ⊕ SDK,2x,KW45B41Z-E 2.10.1 (525) 3.8.0 |
| 0 | | < Back Next > Finish Cancel |
| 9. Search and select the KW | 45B41Z-EVK board | |

 Select the example project. For this case, select the "hello_world" example. Select "UART" as the SDK Debug Console under Project Options.

6. The hello world.c file is displayed.

Steps for Migrating from KW45x41x8xAxx (1 MB) to KW45x41x5xAxx (512 kB)

| | Project E., 22 22 Registers 🏶 Faults % Periphera., 🧮 🗆 | R hello world.c 22 | |
|---------------------------------------|--|---|--|
| | □ S V = 4 M + 8 | -1°/- | |
| | v 64 kw45b41zevk bello world «Debug» | 2 Copyright (c) 2013 - 2015, Freescale Semiconductor, Inc. | |
| | > | 3 Copyright 2016-2017 NOP | |
| | Binarier | 4 ~ All rights reserved. | |
| | > @ lashalar | 6 # SDDY_Licence_Identifies: DSD_2-Clause | |
| | > B CMSIS | 7 %/ | |
| | / Change | 8 | |
| | board . | 9 #include "fsl_device_registers.h" | |
| |) Component | 10 #include "fsl_debug_console.h" | |
| | / W device | 11 #include "pin_mux.h" | |
| | > Les drivers | 12 #include "clock config.h" | |
| | > ter kw45041zevik | 13 Winclude - Doard.h- | |
| | v 🖾 source | | |
| | > Lei hello_world.c | 16 * Definitions | |
| | > 🐸 startup | 17 // // | |
| | > 🐸 utilities | 18 | |
| | > 🗁 Debug | 19 | |
| | > 🗁 doc | 20%/************************************ | |
| | kw45b41zevk_hello_world LinkServer Debug.launch | 21 * Prototypes | |
| | | | |
| | | | |
| | | 25 * Code | |
| | | 26 | |
| | | 27#/*! | |
| | | 28 * @brief Main function | |
| | | 29 */ | |
| | | 30 int main(void) | |
| | | 22 char chi | |
| | | 33 | |
| | | 34 /* Init board hardware. */ | |
| | | 35 BOARD_InitPins(); | |
| | | 36 BOARD_BootClockRUN(); | |
| | | <pre>37 BOARD_InitDebugConsole();</pre> | |
| | | | |
| | | 39 PRINTP(netro world, (r/n); 40 | |
| | | 41 while (1) | |
| | | | |
| | U Quickstart Panel 😫 🚥 Variables 🍫 Breakpoints 🦈 🗖 | 🕅 Installed SDKs 🕮 🗇 Properties 😰 Problems 🗳 Console 🚜 Terminal 📓 Image Info 🚯 Debugger Console ਨ Offline Peripherals 🛛 🗃 🍛 😂 💷 | |
| | ^ | | |
| | | | |
| | | | |
| Elaure 11. Project file | is displayed | | |
| · · · · · · · · · · · · · · · · · · · | | | |
| | | | |

7. Compile the example by selecting the hammer icon and select the "Debug build" option.

| | | - | - | | | | | | | |
|-----|-----------------------|--------------------------|----|--|--|--|--|--|--|--|
| • | 5 | - 🗟 🛷 🗠 🖬 🕷 🗉 | • | | | | | | | |
| 101 | 1 Debug (Debug build) | | | | | | | | | |
| | | 2 Release (Release build | d) | | | | | | | |

Figure 12. Select the "Debug build" option

8. After a successful compilation, select the "Debug" button. You can find it under the Quickstart Panel.

| | Debug your project | 🔝 🕶 🔛 🕶 🔜 🕶 |
|------------------------------------|--|-------------|
| | Debug * Debug * Terminate, Build and Debug | |
| Figure 13. Select the Debug button | 1 | |

9. The MCUXpresso discovers the connected debuggers.

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Steps for Migrating from KW45x41x8xAxx (1 MB) to KW45x41x5xAxx (512 kB)

| | X | Probes discovered | | | | - □ | × | | |
|-------------------------|---|-------------------------------|-----------------------|--------|--------------|-----------|------|--|--|
| | _ | | | | | | | | |
| (| Coi | nnect to target: KW45B4 | 1Z83xxxA | | | | | | |
| | 1 probe found. Select the probe to use: | | | | | | | | |
| 1 | Av | ailable attached prob | pes | | | | | | |
| | | Name | Serial number / I | Туре | Manufacturer | IDE Debug | Mode | | |
| (| LS | MCU-LINK on-board (r0C7 | BVDTJWFFX4MNU | LinkSe | NXP Semicon | Non-Stop | | | |
| | | | | | | | | | |
| - | | | | | | | | | |
| - | | | | | | | | | |
| - | | | | | | | | | |
| Γ | Sur | ported Probes (tick/untick to | enable/disable) | | | | | | |
| | | MCUXpresso IDE LinkServer | (inc. CMSIS-DAP) pro | obes | | | | | |
| | | P&E Micro probes | (2 | | | | | | |
| | ~ | SEGGER J-Link probes | | | | | | | |
| | Pro | be search options | | | | | | | |
| | Se | arch again | | | | | | | |
| | _ | | | | | | | | |
| | ∠ R | emember my selection (for th | nis Launch configurat | tion) | | | | | |
| | 0 | 0 | | Г | OK | Cancel | | | |
| | | | | | UN | curreet | | | |
| Figure 14. Connected of | del | buggers | | | | | | | |
| | | | | | | | | | |

10. Enter into Debug mode.

Note: In the example code, you have several step-by-step options for pause, stop, or run.

| 🗠 Project 🙁 🚟 Registers 🏘 Faults 🐕 Periphe 🦈 🗖 | 챢 Debug 🛙 |
|--|--|
| E 強 🖓 🖶 🍫 💹 🔻 🕴 | www.setup.com/setup.co |
| Kw45b41zevk_hello_world <debug></debug> | [®] kw45b41zevk_hello_world.axf [KW45B41Z83xxxA (cortex-m33)] |
| Project Settings | ✓ |
| > 💏 Binaries | main() at hello_world.c:35 0x722 |
| > 🔊 Includes | 📲 arm-none-eabi-gdb (10.1.90.20201028) |
| > 🥴 CMSIS | |
| > 🤒 board | R hallo world c 17 |
| > 🤐 component | 10 #include "fsl debug console.h" |
| > 🐸 device | 11 #include "pin_mux.h" |
| > 🐸 drivers | 12 #include "clock_config.h" |
| > 🤒 kw45b41zevk | 13 #include "board.h" |
| Source | 14 |
| > id hello_world.c | 15 / Pafinitians |
| isemihost_hardfault.c | 10 * DELITILIUNS 17 ************************************ |
| > 🤒 startup | 18 |
| > 🥝 utilities | 19 |
| > 🗁 Debug | 200/*********************************** |
| > 🗁 doc | 21 * Prototypes |
| kw45b41zevk_hello_world LinkServer Debug.launch | 22 |
| | |
| | 25 * Code |
| | 26 ************************************ |
| | 270/*1 |
| | 28 * @brief Main function |
| | 29 / |
| | |
| | 32 char ch; |
| | 33 |
| | 34 /* Init board hardware. */ |
| | • 35 BOARD_InitPins(); |
| | 36 BUARD_BOOTCLOCKKUN(); 27 BOARD_LitDokun(); |
| | board_initibeougconsole(); |
| | <pre>39 PRINTF("hello world.\r\n"):</pre> |
| | 40 |
| | 41 while (1) |
| | < |
| U Quickstart Panel 🕮 🕬 Variables 🗣 Breakpoints 🔅 🗖 | 🕅 Installed SDKs 🔲 Properties 🖹 Problems 🗟 Console 🖾 🧬 Terminal 📓 Image Info 📓 Debugger Console 🥋 Offline Peripheral |
| | kw45b41zevk_hello_world LinkServer Debug [C/C++ (NXP Semiconductors) MCU Application] |
| Import project(s) from file system | [MCUXpresso Semihosting Telnet console for 'kw45b41zevk_hello_world LinkServer Debug' started on po |

Figure 15. Debug mode

11. Open the terminal software and run the program. A print log appears.

| | COM23 - Tera Term VT |
|----------------|-------------------------------------|
| | File Edit Setup Control Window Help |
| | hello world. |
| | |
| Figure 16. Log | |

2.4 IAR EW software setup

Depending on the KW45 flash, change the linker file; It can be 1 MB flash or 512 kB flash. This file is available at the following path:

```
"SDK_2_{12}_4_KW45B41Z-EVK\boards\kw45b41zevk\wireless_examples\bluetooth\w_uart\bm\iar"
```

Note: The folder w-uart is chosen according to the demo that you use.

| Name ^ | Date modified | Туре | Size |
|----------------------|-------------------|-------------------|--------|
| 📊 Debug | 6/30/2023 9:47 AM | File folder | |
| settings | 6/29/2023 3:47 PM | File folder | |
| connectivity.icf | 5/31/2023 7:49 AM | ICF File | 21 KB |
| wireless_uart_bm.dep | 6/30/2023 9:51 AM | DEP File | 117 KB |
| wireless_uart_bm.ewd | 5/31/2023 7:49 AM | EWD File | 288 KB |
| wireless_uart_bm.ewp | 5/31/2023 7:49 AM | EWP File | 115 KB |
| wireless_uart_bm.eww | 5/31/2023 7:49 AM | IAR IDE Workspace | 1 KB |

Figure 17. Location for the linker file

Once the linker file is located, ensure to change "m flash size".

| /************************************** | FLASH ************************************ |
|--|---|
| /* Flash defines */ | |
| define symbol m flash start | $= 0 \times 00000000;$ |
| define symbol m_flash_size | = 0x100000; |
| define symbol m_flash_end | <pre>= m_flash_start + m_flash_size - 1;</pre> |
| define symbol m_sector_size | = 0x2000; |
| define symbol m_vector_table_size | = 0x400; /* define is used for warmboot stack size too */ |
| Figure 18. KW45 linker file 1 MB flash /************************************ | FLASH ************************************ |
| /* Flash defines */ | |
| define symbol m_flash_start | = 0x0000000; |
| define symbol m_flash_size | = 0x80000; |
| define symbol m_flash_end | = m_flash_start + m_flash_size - 1; |
| define symbol m_sector_size | = 0x2000; |
| <pre>define symbol m_vector_table_size</pre> | = 0x400; /* define is used for warmboot stack size too */ |

Figure 19. KW45 linker file 512 kB flash

To use the linker file, click "Project options > Linker".

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| Category: | Factory Settings |
|-------------------------------|---|
| General Options | |
| Static Analysis | |
| Runtime Checking | Heating Discretion Checksum Encedings Extra Octions |
| C/C++ Compiler | Config Likerer level Ontiminations Advanced Ontant List |
| Assembler Output Converter | Coning Library input Optimizations Advanced Output List |
| Custom Build | Linker configuration file |
| Build Actions | ☑ Ovenide default |
| Linker | \$PROJ_DIR\$/kw45b41z8_flash.icf |
| Debugger | |
| Simulator | Edit |
| CADI | |
| CMSIS DAP | Configuration file symbol definitions: (one per line) |
| GDB Server | |
| 1-jet 1-jink/1-Trace | |
| TI Stellaris | |
| Nu-Link | |
| PE micro | |
| ST-LINK | |
| Third-Party Driver | |
| TI MSP-FET | |
| TI XDS | |
| | |
| | |
| | OK Cancel |

2.5 Running the wireless UART example

To run the wireless UART example from the KW45 SDK using the IAR IDE, perform the following steps:

- 1. Open the Wireless UART example at the following path:
 "SDK_2_12_4_KW45B41Z-EVK\boards\kw45b41zevk\wireless_examples\bluetooth\w_uart
 \bm\iar\wireless_uart_bm.eww"
- 2. Right-click on the project name and select "Options".

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Figure 21. Project options

3. To ensure that the driver is correctly selected according to the probe configuration (CMSIS DAP or J-Link), select the options under "Debugger" category.

| | Factory Settin |
|---|---------------------------------------|
| General Options Static Analysis Runtime Checking C/C++ Compiler Assembler Output Converter Custom Build Build Actions Linker Debugger Simulator CADI OMSIS DAP GDB Server I-jet J-Link/J-Trace TI Stellaris Nu-Link PE micro ST-LINK Third-Party Driver | mages Multicore Extra Options Plugins |

4. Click the start debug button, wait for the compilation process, and enter the Debug mode.

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Figure 23. Start debug button

5. Click the run button or press F5 to execute the code.



Figure 24. Run button

6. Open a Serial terminal on your PC and select the correct VCOM when the board has been connected.

| O TCP/IP | Host: myhost.exar | nple.com | ~ |
|----------|--------------------------------|-------------------------------|--------|
| | Service: Clebet | TCP port#: 22 | |
| | ● SSH | SSH version: SSH2 | \sim |
| | ○ Other | IP version: AUTO | \sim |
| Serial | Port: COM38: JLin OK Cancel | k CDC UART Port (COM3 Help | £ ~ |

Figure 25. Select the terminal port

7. The board starts as a GAP central. To use this demo with a smartphone, press "SW2" to change it to the GAP peripheral and start advertising.

| lireless | UART | sta | rtin | y as | GAP | Central, | press | the | role | switch | to | change | it. |
|-----------|------|-----|------|------|-------|----------|-------|-----|------|--------|----|--------|-----|
| Switched | role | to | GAP | Peri | phere | al. | | | | | | | |
| Advertisi | ing | - | | | | | | | | | | | |

Figure 26. Wireless UART example

8. Open the IoT Toolbox on your smartphone. The toolbox is available at the Google Play Store and Apple App Store.

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9. Open the Wireless UART application.

10. A device shows up at the scanning window. Tap on it to connect.

| ÷ | IoT Toolbox Wireless UART | | ADDRESS | STOP | |
|------------------|------------------------------|---------|---------|------|--|
| NXP_V 00:60:3 | YU 7:3A:D2:50 | | Set | РНҮ | |
| Unbond | led | -49 dBm | | | |

Figure 28. Scanning window

11. After establishing the connection, a new line appears on the Serial terminal. Type any message and press enter to send the message to your smartphone.



| | ← IoT Toolbox Wireless Console |
|-----------------------------------|--|
| | Hello World |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | Status: Connected 95% 📼 |
| | < 🖂 GIF 🎝 🔄 🛄 🦊 |
| | q ¹ w ² e ³ r ⁴ t ⁵ y ⁶ u ⁷ i ⁸ o ⁹ p |
| | asd fghjklñ |
| | 🖒 z x c v b n m 🗵 |
| | ?123 , 🙂 . 🗸 |
| e 29. Wireless UART functionality | |

3 References

Table 1 lists the resources that can be referred for more information.

| Table 1. References | | | |
|-------------------------|--|--|--|
| Resource | Link/how to access | | |
| MCUXpresso | MCUXpresso SDK Builder | | |
| KW45B41Z Evaluation Kit | Getting Started with the KW45B41Z Evaluation Kit | | |

4 Note about the source code in the document

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5 Revision history

Table 2 summarizes the revisions to this document.

Table 2. Revision history

| Revision number | Release date | Description |
|-----------------|-----------------|---|
| 2 | 27 October 2023 | Updated <u>Select the example project</u> in <u>Section 2.3</u> Added the Note/disclaimer for the code snippet |
| 1 | 6 October 2023 | Initial public release |

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