

IMXWNR

i.MX Windows 10 IoT Release Notes

Rev. W1.2.0 — 20 September 2022

Release notes

Document information

Information	Content
Keywords	i.MX, Windows 10 IoT
Abstract	This document contains important information about the package contents, supported features, known issues and limitations in this release.



1 Overview

This document contains important information about the package contents, supported features, known issues and limitations in this release. This release is an engineering release for Windows 10 IoT and supports SoC in the i.MX 8 families.

1.1 References

For more information about Windows 10 IoT Enterprise, see [Microsoft online documentation](#).

The following quick start guides available on the [NXP website](#) contain basic information on the board and setting it up:

- [i.MX 8M Quad Evaluation Kit Quick Start Guide](#)
- [i.MX 8M Mini Evaluation Kit Quick Start Guide](#)
- [i.MX 8M Nano Evaluation Kit Quick Start Guide](#)
- [i.MX 8M Plus Evaluation Kit Quick Start Guide](#)

Documentation is available online at [nxp.com](#)

1.2 BSP change history

This chapter lists changes in releases including new features and defect fixes.

- 1/2022: W0.9.0
Private preview release for i.MX 8M platform.
 - **Supported boards:** The existing BSP with support for the MCIMX8M-EVK NXP board.
- 3/2022: W0.9.1
Public preview release for i.MX 8M platform.
 - **Fixes:**
 - **eMMC driver:** eMMC tuning parameters add to the Dsdt-Sdhc.asl.
 - **BSP deployment:** Removed invalid characters from make-winpe-enterprise.cmd.
- 4/2022: W1.0.0
Public release for i.MX 8M and i.MX 8M Mini platforms.
 - **Supported boards:** MCIMX8M-EVK evaluation kit 8MMINILPD4-EVK evaluation kit
 - **New features:**
 - **VPU driver:** Supported codecs HEVC, VP9, H.264, VP8. MPEG-2 and MPEG-4 codecs supported on i.MX 8M only.
 - **Fixes:**
 - **UART driver:** The UART driver failure during uninstallation in the Device manager has been fixed.
 - **I2C driver:** The issue in iMXI2cRead function (when ReadBufferSize == 1) in UEFI has been fixed.
 - **buildme 64.sh:** The script has been updated. Updates in UEFI source code were included in firmware.bin only if firmware was built with -c parameter (clean build).
 - **PCIe:** PCIe ATU (Address Translation Unit) setup for PCIe BAR memory mapped registers in UEFI drivers has been fixed. After this fix, the system works as expected in UEFI and relevant Storage drivers appear in Windows.
- 6/2022: W1.1.0

Public release for i.MX 8M Nano and i.MX 8M Plus platforms.

– **Supported boards:**

- MCIMX8M-EVK evaluation kit
- 8MMINILPD4-EVK evaluation kit
- 8MNANOD4-EVK evaluation kit
- 8MPLUSLPD4-EVK evaluation kit

– **New features:**

- **Camera driver:** OV5640 camera in J1502 connector has been supported on i.MX 8M EVK board.
- **FlexCAN driver:** FlexCAN device has been supported on i.MX 8M Plus EVK by the imxcan.sys driver.
- **I2C driver:** I2C expander (PCA6416) has been supported in iMX8BoardInit module and options `SelectCAN1InsteadOfI2C5` and `SelectCAN2InsteadOfPDMStream3` allow configuring corresponding selectors on the Base Board.
- **GPU driver:** GPU driver has been updated to v1.1.
- **Debug drivers:** WinDbg over Ethernet has been supported. WinDbg over ethernet requires the `kd_8003_1fc9.dll` library which is not distributed as a part of the BSP. To get this library, contact Microsoft.
- **ENET driver:** HW checksum offload has been supported in the NDIS miniport driver.

– **Fixes:**

- **Audio driver:** A failure during uninstallation in the Device manager has been fixed.
- **Display driver:** IMX-LVDS-HDMI and IMX-MIPI-HDMI converters: If a native HDMI display resolution exceeds the upper limit, the fixed maximum available resolution is set instead. 1920x1080@60 Hz in case of IMX-MIPI-HDMI and 1280x720@60 Hz in case of IMX-LVDS-HDMI.
- **SD driver:** Configuration “fixed device” has been changed to “removable device”, which allows you to safely remove the SD card by the "Eject" option.

• 8/2022: W1.2.0

– **Supported boards:**

- MCIMX8M-EVK evaluation kit
- 8MMINILPD4-EVK evaluation kit
- 8MNANOD4-EVK evaluation kit
- 8MPLUSLPD4-EVK evaluation kit

– **New features:**

– **General**

- [Visual Studio 2019](#) has been supported, but version 2017 is no longer supported.
- Firmware update: `buildme64.sh` switch `–cap` added to build Firmware capsule. Capsule update working from Uefi shell with capsule stored on SD card: `fs0: CapsuleApp.efi fs3: FirmwareCapsuleIMX.cap`
- `make-winpe-enterprise.cmd` parameters have been updated, see [User's Guide](#) for details.
- i.MX 8M CPU frequency changed from 1 GHz to 1.5 GHz

– **GPU driver:**

- GPU driver has been updated to v1.3.
- GPU driver added for i.MX 8M Plus and i.MX 8M Nano SOCs.

- GPU driver support for video processing has been added for i.MX 8M.
- **Camera driver:**
 - OV5640 camera has been supported for all EVK boards.
 - OV10635 camera has been supported for all EVK boards.
 - YUV422 YUY2 and YUV420 NV12 camera color formats have been supported. The i.MX 8M EVK does not support YUV420 NV12 format.
- **Display driver:**
 - Windows driver with fixed display mode supported for LVDS display interface for i.MX 8M Plus.
 - Windows driver with fixed display mode supported for MIPI-DSI display interface for i.MX 8M Nano.
- **VPU driver:**
 - VPU decoder has been supported for i.MX 8M Quad, i.MX 8M Mini, and i.MX 8M Plus EVK boards.
- **Fixes:**
 - **WM8960 driver:** I2C is correctly released when the WM8960 device is removed.

2 BSP supported features

The following table displays the features supported in this BSP release. If no board is explicitly mentioned, the feature is shared across all boards listed in Supported Hardware in the Release contents section; otherwise, the feature is only supported on the boards listed.

Table 1. Supported boards

Board name	Board revision	Schema revision	BSP name
MCIMX8M-EVK	700-29615 REV A3	SCH-29615 REV B4	MX8M_EVK
8MMINILPD4-EVK	700-31407 REV A3	SCH-3140 REV C4	MX8M_MINI_EVK
	700-47712REV X2	SCH-47712 REV A2	
8MNANOD4-EVK	700-31407 REV A3 (base board)	SCH 31407 REV C3 (base board)	MX8M_NANO_EVK
	700-45699 REV X3 (cpu board)	SCH-45699 REV A1 (cpu board)	
8MPLUSLPD4-EVK	700-46370 REV B (base board)	SCH-46370 REV B1 (base board)	MX8M_PLUS_EVK
	700-46368 REV A (cpu board)	SCH-46368 REV A3 (cpu board)	

Table 2. Supported features

Feature	Supported board	Comment
Boot Image		

Table 2. Supported features...continued

Feature	Supported board	Comment
U-Boot	All i.MX	<ul style="list-style-type: none"> Clock, Anaport regulator, ENET, UART, MMC/SD, eMMC4.3/4.4/4.5.
OP-TEE	All i.MX	<ul style="list-style-type: none"> OP-TEE OS is required on the boot partition with the TEE file for OP-TEE enablement.
Machine-specific layer		
Interrupt	All i.MX	<ul style="list-style-type: none"> GIC
Clock	All i.MX	<ul style="list-style-type: none"> Controls the system frequency and clock tree distribution.
Timer	All i.MX	<ul style="list-style-type: none"> System timer tick and broadcast timer support.
GPIO	All i.MX	<ul style="list-style-type: none"> GPIO is initialized in earlier phase according to hardware design.
IOMUX	All i.MX	<ul style="list-style-type: none"> Provides the interfaces for I/O configuration.
DMA engine		
SDMA	i.MX 8M	<ul style="list-style-type: none"> SDMA HAL.
Character device drivers		
UART	All i.MX	<ul style="list-style-type: none"> i.MX 8 supports Cortex-A53 processor through UART0 and Cortex-M4 processor through UART2.
Networking drivers		
ENET	All i.MX	<ul style="list-style-type: none"> i.MX 8 supports Atheros AR8031 PHY with 10/100/1000 bps mode
PCIe	All i.MX	<ul style="list-style-type: none"> i.MX 8 supports M.2 interface.
Sound drivers		
WM8524 codec	i.MX 8M/Mini/Nano	<ul style="list-style-type: none"> Supports playback
WM8960 codec	i.MX 8M Plus	<ul style="list-style-type: none"> Supports playback.
USB drivers		
USB Host	All i.MX	<ul style="list-style-type: none"> Supports USB-A and USB-C connectors.
Display/GPU		
HDMI/Display Port	i.MX 8M	<ul style="list-style-type: none"> i.MX 8M supports HDMI display.

Table 2. Supported features...continued

Feature	Supported board	Comment
LVDS display interface	i.MX 8M Plus	<ul style="list-style-type: none"> Single-channel mode up to 720p Dual-channel mode up to 1080p (or 1920x1200@60 Hz) Default mode set to 720p
IMX-LVDS-HDMI (LVDS to HDMI converter)	i.MX 8M Plus	<ul style="list-style-type: none"> Single-channel mode. Default resolution – see above.
MIPI-DSI display interface	i.MX 8M Mini/Nano	<ul style="list-style-type: none"> i.MX 8M Nano: supports Windows GPU driver up to 1080p (or 1920x1200@60 Hz). Default resolution set to 720p. i.MX 8M Mini: no Windows driver, only firmware support up to 1080p. Default resolution with IMX-MIPI-HDMI converter depends on the monitor native mode – 1080p in most cases.
IMX-MIPI-HDMI (MIPI-DSI to HDMI converter)	i.MX 8M Mini/Nano	<ul style="list-style-type: none"> Default resolution – see above.
GPU	i.MX 8M /Plus/Nano	<ul style="list-style-type: none"> HW acceleration for 3D rendering through D3D11 API, therefore accelerates D2D, XAML, UWP, WinUI, Windows desktop UI, and D3D11 apps.
Camera		
Camera (SoCs with CSI Bridge)	i.MX 8M/Mini	<ul style="list-style-type: none"> Video preview at 720p 30 fps YUYV.
Camera (SoCs with ISI)	i.MX 8M Plus/Nano	<ul style="list-style-type: none"> Video preview at 720p 30 fps YUYV and NV12
OV5640 camera	All i.MX	<ul style="list-style-type: none"> Second camera configurable in UEFI in <BOARD>.dsc file.
OV10635 camera	All i.MX	<ul style="list-style-type: none"> Selectable in UEFI in <BOARD>.dsc file. Requires an external 12 V PSU and a manual reset every time Windows OS is rebooted.
Video		
VPU Full Feature	i.MX 8M	<ul style="list-style-type: none"> Supported codecs HEVC, VP9, H.264, VP8, MPEG-2, and MPEG-4 codecs
VPU Limited Feature	i.MX 8 Mini/Plus	<ul style="list-style-type: none"> Supported codecs HEVC, VP9, H.264, VP8.

Table 2. Supported features...continued

Feature	Supported board	Comment
General drivers		
uSDHC	All i.MX	• Supports SD, SDXC, eMMC.
I2C	All i.MX	• Supports I2C master mode.
SPI	All i.MX	• Supports SPI master mode.
FlexCAN	i.MX 8M	• FlexCAN low-level driver.
Power management		
USB Power delivery	All i.MX	• The initial USB Power delivery contract is negotiated in Uboot. See <code>tcpc_port_config</code> structure initialization in <code>imx8mp_evk.c</code> , <code>imx8mq_evk.c</code> , <code>imx8mm_evk.c</code> , and <code>imx8mn_evk.c</code> files for actual setting of voltage and current for given board.

3 Known issues/limitations

Read through all hardware-related reference material and ensure that you have made all the necessary hardware modifications before using the software.

Table 3. Known issues/limitations

Limitation/Workaround	SoC
Boot	
Limitation: Supported boot media are SD and eMMC only. Workaround: No workaround.	All
Camera	
Limitation: Only i.MX 8MQ EVK SCH-29615 rev. B4 is supported. Earlier board revisions use different I2C for the camera. Workaround: For i.MX 8MQ EVK SCH-29615 rev. B3, choose I2C1 camera device instead of I2C2 in <code>mu_platform_nxp/NXP/<BOARD>/AcpiTables/DsdtCamera_<CONFIGURATION>.asl</code> .	i.MX 8M
Limitation: OV10635 requires an external 12V power source and cannot be reconfigured by software without a power cycle. Workaround: After powering off the board, unplug the power supply from the camera and wait a few seconds before powering the camera and EVK board again.	All
Display/GPU	
Limitation: Display driver supports HDMI monitor with native resolution. Max supported resolution is 1920x1080@60 Hz. Workaround: No	i.MX 8M
Limitation: Monitor power-off is emulated by displaying a blank image. Workaround: No	All

Table 3. Known issues/limitations...continued

Limitation/Workaround	SoC
<p>Limitation: Display image during boot. The firmware driver detects whether IMX-MIPI-HDMI is connected to the DSI port or an IMX-LVDS-HDMI converter is connected to the LVDS0 port and sets the display interface accordingly. The resolution is set to the native mode of the connected monitor. If the native mode exceeds the upper limit, then the upper limit is set. The upper limit is 1080p for IMX-MIPI-HDMI and 720p for IMX-LVDS-HDMI. i.MX 8M Mini and Nano support only IMX-MIPI-HDMI, LVDS interface is not available.</p> <p>Workaround: The firmware sources allow overriding the default functionality. It is possible to select the Single-mode LVDS1 channel or Dual-mode LVDS interface (i.MX 8M Plus only) or change display resolution there. Firmware must be updated and recompiled.</p>	i.MX 8M Mini i.MX 8M Plus i.MX 8M Nano
<p>Limitation: Windows gpu driver: MIPI-DSI display interface with fixed resolution 1280x720@60 Hz supported.</p> <p>Workaround: It is possible to change resolution in registry (inf) parameters, see User Guide for more information.</p>	i.MX 8M Nano
<p>Limitation: Windows driver: LVDS single-mode (4 lines) and LVDS dual mode (8 lines) display interfaces supported with fixed default (maximum) resolution 1280x720@60 Hz and default port LVDS0 in single mode.</p> <p>Workaround: It is possible to change LVDS port and resolution in registry (inf) parameters, see User guide for more information.</p> <p>Note: For the LVDS1 port used together with the IMX-LVDS-HDMI converter on the EVB board, it is also necessary to update the I2C instance to I2C3 in Firmware in <code>/mu_platform_nxp/NXP/MX8M_PLUS_EVK/AcpiTables/Dsdt-Gfx.asl</code>. See comments in the file. Then recompile the Firmware.</p>	i.MX 8M Plus
<p>Limitation: MIPI-DSI display interface is not supported. When using MIPI-DSI together with IMX-MIPI-HDMI, the booting image is displayed correctly, but as soon as the Windows gpu driver is loaded, it changes to a black screen.</p> <p>Workaround 1: Firmware support for MIPI-DSI is available, so boot the Windows using LVDS display interface, uninstall GPU driver using Device Manager, reboot Windows with the display connected to MIPI-DSI display interface.</p> <p>Workaround 2: Prepare Windows installation without GPU driver. Download Windows installation binaries, unzip them. Find and delete <code>\IoTEntOnNXP\drivers\Galcore_mp_mn</code> folder. Run the <code>make-winpe-enterprise.cmd</code> to prepare the installation image. Apply the image to SD card, write firmware to the SD card. Connect the display to MIPI-DSI display interface, install Windows and reboot.</p>	i.MX 8M Plus
<p>Limitation: HDMI display interface is not supported.</p> <p>Workaround: Use the LVDS display interface instead.</p>	i.MX 8M Plus
<p>Limitation: Windows gpu/display driver not supported.</p> <p>Workaround: Display configuration supported only in Firmware (during boot)</p>	i.MX 8M Mini
<p>Limitation: Horizontal tearing could be observed in moving images, for example, in case of dragging Windows or moving objects in front of the camera because the display/GPU driver is not available on this platform. Therefore, V-Sync and double buffering are not functional.</p> <p>Workaround: No workaround.</p>	i.MX 8M Mini
<p>Limitation: The driver does not support D3D9, so WPF (Windows Present Foundation) will not be accelerated.</p> <p>Workaround: No workaround.</p>	i.MX 8M i.MX 8M Plus i.MX 8M Nano

Table 3. Known issues/limitations...continued

Limitation/Workaround	SoC
Limitation: The driver does not support video processing. Workaround: No workaround.	i.MX 8M Plus i.MX 8M Nano
Limitation: The GPU is not fast enough to support the Indirect Display driver for Remote Desktop. This may result in a black screen after connecting to the board using Remote Desktop. Workaround: Apply the following register value to run the older XDDM driver for Remote Desktop. <pre>reg add "HKLM\System\CurrentControlSet\Control\Terminal Server\WinStations" /v "LoadWddmIDDDriver" /t REG_DWORD /d 0x0 /f</pre>	i.MX 8M
Ethernet	
Limitation: The Ethernet QoS (ENET0, J8) device is not supported yet. The FEC (ENET1, J9) device can be used instead. Workaround: No	i.MX 8M Plus
GPIO	
Limitation: EXP_IO pins on EXP CN connector cannot be used as GPIOs because they are connected to PCA6416 I/O expander for which there is no driver implemented. Workaround: Use the GPIO pin on the EXP CN connector connected directly to the SoC's pin with GPIO functionality instead of connecting to the PCA6416 I/O expander.	i.MX 8M Mini i.MX 8M Nano i.MX 8M Plus
HAL Drivers	
Limitation: The HAL Extensions must be signed by certificates provided by Microsoft. The required certificates that are included in WDK have expired. Workaround: Download the Microsoft Kits Package from Collaborate and use the "Windows OEM HAL Extension Test Cert 2017 (TEST ONLY)" and "Windows OEM Intermediate 2017 (TEST ONLY)" found in the <code>EWDK.iso</code> file or contact Microsoft for help.	All
Power management	
Limitation: The device is unable to enter sleep and then wake up. A device that is left unattended for a longer period might hang. Workaround: Disable sleep.	All
Limitation: Thermal management is not supported. Workaround: No	i.MX 8M Mini i.MX 8M Nano i.MX 8M Plus
SDHC	
Limitation: The <code>imxusdhc.sys</code> in crashdump mode does not read HW-specific settings from ACPI so these values are hardcoded in the <code>SdhcSlotInitialize()</code> method. Workaround: Keep these values synchronized with values in <code>Dsdt-Sdhc.asl</code> ACPI table.	All

Table 3. Known issues/limitations...continued

Limitation/Workaround	SoC
Limitation: The <code>sdport.sys</code> in the recommended Windows build 19044.1288.2110060501.21h2 could cause the blue bug check screen. This could be observed when encrypting volumes with Bitlocker or running Cfmager. Workaround: Install KB5014023 or enable test signing (<code>/test_signing</code>) and patch the operating system with the <code>sdport.sys</code> included in bsp (<code>/patch_sdport</code>) as described in Installing Windows IOT Enterprise, eMMC. If test signature is not enabled, <code>/patch_sdport</code> will cause a blue screen.	All
Limitation: SDCARD insertion/removal can cause a bug check if the delay between insertion/removal is too short. Workaround: Wait a few seconds before insertion/removal.	All
UART	
Limitation: The RTS-CTS hardware flow control is not available. Workaround: No	All
UEFI	
Limitation: USB is not enabled in UEFI by default. Workaround: Add "BLD_*_CONFIG_USB" : "TRUE" into the "default profile" in "win10-iot- bsp/mu_platform_nxp/NXP/<MX8M_*>/PlatformBuild.py".	All
USB	
Limitation: Only USB HOST mode is supported. Workaround: No workaround.	All
Limitation: The size of SDRAM is limited to 3 GB due to a USB host controller issue. Workaround: There is a plan to fix this issue at Microsoft provided USB stack update. As soon as this update is available, the size of SDRAM can be increased to 6 GB in <code>\mu_platform_nxp\NXP\EVK_iMX8MP_6GB\EVK_iMX8MP_6GB.dsc</code> by modifying <code>giMX8TokenSpaceGuid.PcdBank1MemorySize</code> to <code>0x00000000C0000000</code> .	i.MX 8M Plus
VS2019 build	
Limitation: Build of <code>iMXPlatform.sln</code> fails if there are spaces in the project path. Workaround: Place the <code>imx-windows-iot</code> directory that does not have spaces in its path.	All
WSL build	
Limitation: On older versions of Windows, the OP-TEE Trusted OS build might fail inside the WSL environment if the BSP is located in the Windows file system. Workaround: Move sources to the WSL root drive (for example \$HOME).	All

4 Revision history

Table 4. Revision history

Revision number	Date	Substantive changes
W0.9.0	1/2022	Private preview release for i.MX 8M platform.
W0.9.1	3/2022	Public preview release for i.MX 8M platform.

Table 4. Revision history...continued

W1.0.0	4/2022	Public release for i.MX 8M and i.MX 8M Mini platforms.
W1.1.0	6/2022	Public release for i.MX 8M Nano and i.MX 8M Plus platforms.
W1.2.0	9/2022	Sections 1.2 and 3 are updated.

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