

M5302A PXIe LVDS Digital IO Module Software Drivers

The M5302x software drivers are designed to work on M5302A PXIe LVDS Digital IO modules.

This document contains information about the new and modified features in the M5302x software drivers.

Related Documents

Refer to the product documentation listed below for information about the features and functionalities offered by this product.

Document name	Location
Available on the machine where SW is installed	
M5302x C++ API Help	<root-dir>\Program Files\Keysight\M5302x\Help\html\index.html
M5302x HVI Add-on Help	<root-dir>\Program Files\Keysight\M5302x\Help\Keysight_KtM5302xHvi_Fx45.chm
M5302x IVI.Net Help	<root-dir>\Program Files\Keysight\M5302x\Help\Keysight_KtM5302x_Fx45.chm
M5302x IVI-C Help	<root-dir>\Program Files\Keysight\M5302x\Help\KtM5302x.chm
M5302x Python API Help	<root-dir>\Program Files\Keysight\M5302x\python\html\index.html
M5302A User Guide (incl. SFP Help)	<root-dir>\Program Files\Keysight\M5302x\Help\SFP.pdf
M5302A PXIe Digital IO Modules BSP Help	Accessible within the KF9000B PathWave FPGA environment
Available on Keysight.com	
M5302A PXIe LVDS Digital IO Modules Startup Guide	https://www.keysight.com/find/M5302A-TechSupport/
M5302A PXIe LVDS Digital IO Modules Security Manual	
KS2201A PathWave Test Sync Executive User Manual	https://www.keysight.com/in/en/support/KS2201A/pathwave-test-syncexecutive.html
KF9000B PathWave FPGA User Documentation	https://www.keysight.com/in/en/support/KF9000B/pathwave-fpga.html
IO Libraries Suite Downloads	https://www.keysight.com/in/en/lib/software-detail/computer-software/io-libraries-suite-downloads-2175637.html
M9046A Chassis Firmware	https://www.keysight.com/in/en/lib/software-detail/instrument-firmware-software/m9046a-chassis-firmware.html
High-performance Reference Clock Source Drivers	https://www.keysight.com/in/en/lib/software-detail/instrument-firmware-software/m9546a-high-performance-reference-clock-source-drivers.html
M9032A PXIe System Sync Module Drivers	https://www.keysight.com/in/en/lib/software-detail/driver/m9032a-pxie-system-sync-module-drivers-.html
M9033A PXIe System Sync Module Drivers	https://www.keysight.com/in/en/lib/software-detail/driver/m9033a-pxie-system-sync-module-drivers.html

Version 1.8.50002.0

Released date	10 th February 2025
Operating system	Microsoft Windows 10, 64-bit Microsoft Windows 11, 64-bit
HVI Core	4.10.11
HVI Engine	2.6.1
FPGA version	5.14.11 (tandem)* 5.15.31 (non-tandem)*
PathWave Test Sync Executive version	2024 (version 4.10.11) released on 5 th December 2024
PathWave FPGA version	2022 Update 1.0 released on 30 th January 2023
Vivado version supported in PathWave FPGA	2021.1
IO Libraries Suite version	2024 Update 2 (version 21.1.17) released on 20 th November 2024
M9046A PXIe Chassis Firmware version	2024A released on 13 th August 2024
PXIe Chassis Family Drivers version	1.7.1036.1 released on 16 th July 2024
High-performance Reference Clock Source Drivers version	1.1.293.1 released on 11 th December 2024
M9032A PXIe System Sync Module Drivers version	1.2.80.0 (FW ver. 0.1.272.0) released on 10 th December 2024
M9033A PXIe System Sync Module Drivers version	1.2.80.0 (FW ver. 4.1.272.0) released on 10 th December 2024
M5302x SW Setup file name	M5302xSetup1.8.50002.0_win.exe
Licenses supported	KF9000B (PathWave FPGA) KF9001C (PathWave FPGA Run-Time) KS2201A (PathWave Test Sync Executive Development License)

* Tandem is the two-stage image configuration. Non-tandem is the single-stage image configuration.

Changes and Enhancements

- Fixed minor defects

Known Limitations

- Errors are returned if your script attempts to access a non-existent address in the sandbox register and consequently, causes the sandbox region to enter into a bad state.

Workaround:

- o To recover from the bad state, perform a power cycle on the module.
- While Output Safety is enabled, M5302A module inadvertently generates an HVI input trigger.
- Unexpected instrument error may be seen when 2nd stage binary files, which are located at *C:\Program Files\Keysight\M5302x\fpga* by default, are not loaded at system boot-up.

Workaround:

- o Perform a power cycle of the system
- o If issue persists, reinstall the M5302x software
- o If issue still persists, contact Keysight Support
- System Link connector is not enabled.

Version 1.7.50803.0

Released date	9 th December 2024
Operating system	Microsoft Windows 10, 64-bit Microsoft Windows 11, 64-bit
HVI Core	4.10.7
HVI Engine	2.6.1
FPGA version	5.14.11 (tandem)* 5.15.31 (non-tandem)*
PathWave Test Sync Executive version	2024 (version 4.10.11) released on 5 th December 2024
PathWave FPGA version	2022 Update 1.0 released on 30 th January 2023
Vivado version supported in PathWave FPGA	2021.1
IO Libraries Suite version	2024 Update 1 (version 21.0.47) released on 03 rd September 2024
M9046A PXIe Chassis Firmware version	2024A released on 13 th August 2024
PXIe Chassis Family Drivers version	1.7.1036.1 released on 16 th July 2024
High-performance Reference Clock Source Drivers version	1.1.288.1 released on 21 st February 2024
M9032A PXIe System Sync Module Drivers version	1.1.457.0 (FW ver. 0.1.266.0) released on 21 st February 2024
M9033A PXIe System Sync Module Drivers version	1.1.457.0 (FW ver. 4.1.266.0) released on 21 st February 2024
M5302x SW Setup file name	M5302xSetup1.7.50803.0_win.exe
Licenses supported	KF9000B (PathWave FPGA) KF9001C (PathWave FPGA Run-Time) KS2201A (PathWave Test Sync Executive Development License)

* Tandem is the two-stage image configuration. Non-tandem is the single-stage image configuration.

Changes and Enhancements

- Updated KDI version to 3.6.24
- Removed intermediate images of the versions 1.2 and earlier from the FPGA Update catalogue
- Fixed minor defects
- Made minor modifications to the product documentation

Known Limitations

- Errors are returned if your script attempts to access a non-existent address in the sandbox register and consequently, causes the sandbox region to enter into a bad state.

Workaround:

- o To recover from the bad state, perform a power cycle on the module.
- While Output Safety is enabled, M5302A module inadvertently generates an HVI input trigger.
- Unexpected instrument error may be seen when 2nd stage binary files, which are located at *C:\Program Files\Keysight\M5302x\fpga* by default, are not loaded at system boot-up.

Workaround:

- o Perform a power cycle of the system
- o If issue persists, reinstall the M5302x software
- o If issue still persists, contact Keysight Support
- System Link connector is not enabled.

Version 1.6.50301.0

Released date	22 nd May 2024
Operating system	Microsoft Windows 10, 64-bit Microsoft Windows 11, 64-bit
HVI Core	3.33.6
HVI Engine	2.2.6
FPGA version	5.12.12
PathWave Test Sync Executive version	2023C (version 3.33.6) released on 16 th February, 2024
PathWave FPGA version	2022 Update 1.0 released on 30 th January 2023
Vivado version supported in PathWave FPGA	2021.1
IO Libraries Suite version	2024 (version 18.4.30319.0) released on 25 th March 2024
M9046A PXIe Chassis Firmware version	2023A released on 3 rd January 2023
PXIe Chassis Family Drivers version	1.7.1032.1 released on 17 th February, 2024
High-performance Reference Clock Source Drivers version	1.1.288.1 released on 21 st February 2024
M9032A PXIe System Sync Module Drivers version	1.1.457.0 (FW ver. 0.1.266.0) released on 21 st February 2024
M9033A PXIe System Sync Module Drivers version	1.1.457.0 (FW ver. 4.1.266.0) released on 21 st February 2024
M5302x SW Setup file name	M5302xSetup1.6.50301.0_win.exe
Licenses supported	KF9000B (PathWave FPGA) KF9001C (PathWave FPGA Run-Time) KS2201A (PathWave Test Sync Executive Development License)

Changes and Enhancements

- Enhanced M5302x SW driver installer to include PathWave License Manager
- Added support for Python version 3.12
- Enhanced FPGA update process by setting “initialize=0” driver option by default
- Added check for drivers to detect unused flash bits and hardware versions
- Downgrading M5302x SW driver version automatically downgrades Python to the supported version

- Fixed issue with AXIe unresponsiveness when driver tries to access a non-existing address in Sandbox
- Included error reporting for Fast Data Sharing (FDS) when transmitted bits are less than shared bits
- Fixed minor defects

Known Limitations

- Errors are returned if your script attempts to access a non-existent address in the sandbox register and consequently, causes the sandbox region to enter into a bad state.

Workaround:

- o To recover from the bad state, perform a power cycle on the module.
- While Output Safety is enabled, M5302A module inadvertently generates an HVI input trigger.
- Unexpected instrument error may be seen when 2nd stage binary files, which are located at *C:\Program Files\Keysight\M5302x\fpga* by default, are not loaded at system boot-up.

Workaround:

- o Perform a power cycle of the system
- o If issue persists, reinstall the M5302x software
- o If issue still persists, contact Keysight Support
- System Link connector is not enabled.

Version 1.5.50501.0

Released date	21 st February 2024
Operating system	Microsoft Windows 10, 64-bit Microsoft Windows 11, 64-bit
HVI Core	3.33.4
HVI Engine	2.2.6
FPGA version	5.11.6
PathWave Test Sync Executive version	2023C (version 3.33.6) released on 16 th February, 2024
PathWave FPGA version	2022 Update 1.0 released on 30 th January 2023
Vivado version supported in PathWave FPGA	2021.1
IO Libraries Suite version	2023 Update 1 (version 18.3.29517.2) released on 24 th July 2023
M9046A PXIe Chassis Firmware version	2023A released on 3 rd January 2023
PXIe Chassis Family Drivers version	1.7.925.1 released on 15 th November, 2023
High-performance Reference Clock Source Drivers version	1.1.288.1 released on 21 st February 2024
M9032A PXIe System Sync Module Drivers version	1.1.457.0 (FW ver. 0.1.266.0) released on 21 st February 2024
M9033A PXIe System Sync Module Drivers version	1.1.457.0 (FW ver. 4.1.266.0) released on 21 st February 2024
M5302x SW Setup file name	M5302xSetup1.5.50501.0_win.exe
Licenses supported	KF9000B (PathWave FPGA) KF9001C (PathWave FPGA Run-Time) KS2201A (PathWave Test Sync Executive Development License)

Changes and Enhancements

- Added support for Windows 11 (64-bit) on External Controllers
- Added support for Python version 3.11
- Enhanced mechanism to manage module's run logs
- Fixed minor defects

Known Limitations

- Errors are returned if your script attempts to access a non-existent address in the sandbox register and consequently, causes the sandbox region to enter into a bad state.

Workaround:

- o To recover from the bad state, perform a power cycle on the module.
- While Output Safety is enabled, M5302A module inadvertently generates an HVI input trigger.
- Unexpected instrument error may be seen when 2nd stage binary files, which are located at *C:\Program Files\Keysight\M5302x\fpga* by default, are not loaded at system boot-up.

Workaround:

- o Perform a power cycle of the system
- o If issue persists, reinstall the M5302x software
- o If issue still persists, contact Keysight Support
- System Link connector is not enabled.

Version 1.4.50601.0

Released date	25 th October, 2023
Operating system	Microsoft Windows 10, 64-bit
HVI Core	3.23.1
HVI Engine	2.2.6
FPGA version	5.10.8
PathWave Test Sync Executive version	2023B (version 3.27.4)
PathWave FPGA version	2022 Update 1.0 released on 30 th January 2023
IO Libraries Suite version	2023 Update 1 (version 18.3.29517.2) released on 24 th July 2023
M9046A Chassis Firmware version	2023A (driver ver. 1.7.913.1) released on 3 rd January 2023
High-performance Reference Clock Source Drivers version	1.1.282.1 released on 31 st May, 2023
M9032A PXIe System Sync Module Drivers version	1.1.300.0
M9033A PXIe System Sync Module Drivers version	1.1.300.0
M5302x SW Setup file name	M5302xSetup1.4.50601.0_win.exe
Licenses supported	KF9000B (PathWave FPGA) KF9001C (PathWave FPGA Run-Time) KS2201A (PathWave Test Sync Executive Development License)

Changes and Enhancements

- Added FPGA_Instruction_PortX() API to the M5302x SW.
- Added support for Fast Data Sharing (FDS) Error Reporting and Connector.
- Added support for FDS 16-bit addressing.
- Added support for .NET framework version 4.8.
- Enhanced clock alignment and management mechanism in the SW.
- Enhanced SW to display correct slot number even when Stage 2 image is not loaded.
- Changed an attribute for the opening driver 'options' string from "Reset" to "DriverReset".
- Fixed minor defects.

Known Limitations

- While Output Safety is enabled, M5302A module inadvertently generates an HVI input trigger.
- Unexpected instrument error may be seen when 2nd stage binary files, which are located at *C:\Program Files\Keysight\M5302x\fga* by default, are not loaded at system boot-up.

Workaround:

- o Perform a power cycle of the system
 - o If issue persists, reinstall the M5302x software
 - o If issue still persists, contact Keysight Support
- System Link connector is not enabled.

Version 1.3.51002.0

Released date	31 st May, 2023
Operating system	Microsoft Windows 10, 64-bit
HVI Core	3.17.0
HVI Engine	2.2.6
FPGA version	5.9.42
PathWave Test Sync Executive version	2023 (version 3.19.4) released on 31 st May, 2023
PathWave FPGA version	2022 Update 1.0 released on 30 th January 2023
IO Libraries Suite version	2023 (version 18.3.29324.3) released on 26 th May 2023
M9046A Chassis Firmware version	1.7.913.1 released on 12 th May 2023
High-performance Reference Clock Source Drivers version	1.1.282.1 released on 31 st May, 2023
M9032A PXIe System Sync Module Drivers version	1.1.225.0 released on 31 st May, 2023
M9033A PXIe System Sync Module Drivers version	1.1.225.0 released on 31 st May, 2023
M5302x SW Setup file name	M5302xSetup1.3.51002.0_win.exe
Licenses supported	KF9000B (PathWave FPGA) KF9001C (PathWave FPGA Run-Time) KS2201A (PathWave Test Sync Executive Development License)

Changes and Enhancements

- Integrated PathWave Test Sync Executive 2023, which enables functionalities, such as Multi Host mode, KDI Driver Remoting, and methods, such as SyncFor(), SyncWhile() and SyncFPGADataSharing().
- Integrated PathWave FPGA 2022 Update 2.0, which enables features, such as KF9001C Process License, ICAP (Faster Sandbox Programming) and Configurable FDS Tx Read Latency.
- Fixed minor defects.

Known Limitations

- While Output Safety is enabled, M5302A module inadvertently generates an HVI input trigger.
- Unexpected behavior from the read8() and write8() methods in the FPGA Sandbox.
- Unexpected interrupts or error message prompts may be seen when performing FPGA updates via the SFP.
Workaround: Ignore the interrupts or error prompts to continue with the firmware update.
- Parsing *kdi.yaml* file, which contains inline comments by default, causes *kdiUrl* to not be identified correctly.
Workaround:
 - o Remove the inline comments from the *kdi.yaml* file
 - o Use the *kdiUrl* instrument driver option
- Using TSE service with KDI returns error: "Permission denied" when client application with simple user privileges attempts to write to the Remote API log files.
Workaround: Manually change permissions to the Remote API log files to allow users to have full control.
- During SW version update, selecting FPGA firmware update may return error code: "Segmentation Violation".
Workaround: Connect to Instrument using Advanced Option "Initialize=0" and manually perform Firmware update using the SFP.
- Unexpected instrument error may be seen when 2nd stage binary files, which are located at *C:\Program Files\Keysight\M5302x\fgpa* by default, are not loaded at system boot-up.
Workaround:
 - o Perform a power cycle of the system
 - o If issue persists, reinstall the M5302x software
- System Link connector is not enabled.

Version 1.2.11402.0

Released date	10 th April, 2023
Operating system	Microsoft Windows 10, 64-bit
HVI Core	2.7.0
HVI Engine	1.7.2
FPGA version	5.8.117.0
PathWave Test Sync Executive version	2022 (version 2.7.7) released on 1 st July 2022
PathWave FPGA version	2022 released on 15 th July 2022
IO Libraries Suite version	2022 Update 2 released on 30 th June 2022
M9046A Chassis Firmware version	2022B released on 31 st May 2022
M9546A High-performance Reference Clock Source Drivers version	1.1.174.1 released on 12 th September 2022
M9032A PXIe System Sync Module Drivers version	1.1.50.0 released on 1 st August 2022
M9033A PXIe System Sync Module Drivers version	1.1.50.0 released on 1 st August 2022
M5302x SW Setup file name	M5302xSetup1.2.11402.0_win.exe
Licenses supported	KF9000B (PathWave FPGA) KF9001B (PathWave FPGA Run-Time) KS2201A (PathWave Test Sync Executive Development License)

Changes

- Removed unused CCL5 components from the software installer.

Known Limitations

- Python returns errors when a previous version of the software is installed on the machine, where a higher version already exists.
Workaround: Remove the installed version of the software. Then, perform a clean installation of the desired version.
- System Link connector is not enabled.

Version 1.2.10802.0

Released date:	14 October, 2022
Operating system:	Microsoft Windows 10, 64-bit
HVI Core:	2.7.0
HVI Engine:	1.7.2
FPGA version	5.8.117.0
PathWave Test Sync Executive version	2022 (version 2.7.7) released on 1st July 2022
PathWave FPGA version	2022 released on 15th July 2022
Setup file name:	M5302xSetup1.2.10802.0_win.exe

Enhancements

- Fixed issue with compilation of BSP Example template.
- Fixed some minor defects.

Known Limitations

- System Link connector is not enabled.

Version 1.2.10604

Released date:	29 July, 2022
Operating system:	Microsoft Windows 10, 64-bit
HVI Core:	2.7.0
HVI Engine:	1.7.2
FPGA version	5.8.115
PathWave Test Sync Executive version	2022 (version 2.7.7) released on 1st July 2022
PathWave FPGA version	2021 Update 2.0 released on 28th Feb. 2022
Setup file name:	M5302xSetup1.2.10604.0_win.exe

Enhancements

- Supports Fast data sharing (FDS) across instruments' FPGA sandboxes using PXIe DSTARB / DSTARC and M903x System Sync Modules (SSM) together.
- Ability to support a much larger system of modules with a single controller.
- Updates the FPGA of all M5302A modules when installing the new driver.

Known Limitations

- System Link connector is not enabled.

Version 1.1.12704

Released date:	17 March, 2021
Operating system:	Microsoft Windows 10, 64-bit
HVI Core:	1.15.8
HVI Engine:	1.7.1
FPGA version	5.8.93
PathWave Test Sync Executive version	2021
PathWave FPGA version	2021 Update 2.0 released on 28th Feb. 2022
Setup file name:	M5302xSetup1.1.12704.0_win.exe

Enhancements

- Removed support of the -PWP and -HV2 hardware options, which have been replaced with KF9001B and KS2201A, respectively.
- The front panel LED will turn 'Blue' when the FPGA has been fully loaded and 'Green' if the driver is connected to the module.
- Updated LabVIEW drivers.

Known Limitations

- System Link connector is not enabled.

Version 1.0.11601

Released date:	5 April, 2021
Operating system:	Microsoft Windows 10, 64-bit
HVI Core:	1.4.11
HVI Engine:	0.17.32
FPGA version	5.7.30
PathWave Test Sync Executive version	2021
PathWave FPGA version	2021 Update 2.0 released on 28th Feb. 2022
Setup file name:	M5302xSetup1.0.11601.0_win.exe

Enhancements

- Initial release of the software.

Known Limitations

- System Link connector is not enabled.
- The front panel LED is not currently set, so it will always be off. This feature will be enabled in a future release.