

# Intel® Serial IO Driver

## User Guide and Release Note

---

*April 2023*

*Revision 1.1v3*

**Intel Confidential**



INFORMATION IN THIS DOCUMENT IS PROVIDED IN CONNECTION WITH INTEL PRODUCTS. NO LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE, TO ANY INTELLECTUAL PROPERTY RIGHTS IS GRANTED BY THIS DOCUMENT. EXCEPT AS PROVIDED IN INTEL'S TERMS AND CONDITIONS OF SALE FOR SUCH PRODUCTS, INTEL ASSUMES NO LIABILITY WHATSOEVER AND INTEL DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY, RELATING TO SALE AND/OR USE OF INTEL PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

A "Mission Critical Application" is any application in which failure of the Intel Product could result, directly or indirectly, in personal injury or death. SHOULD YOU PURCHASE OR USE INTEL'S PRODUCTS FOR ANY SUCH MISSION CRITICAL APPLICATION, YOU SHALL INDEMNIFY AND HOLD INTEL AND ITS SUBSIDIARIES, SUBCONTRACTORS AND AFFILIATES, AND THE DIRECTORS, OFFICERS, AND EMPLOYEES OF EACH, HARMLESS AGAINST ALL CLAIMS COSTS, DAMAGES, AND EXPENSES AND REASONABLE ATTORNEYS' FEES ARISING OUT OF, DIRECTLY OR INDIRECTLY, ANY CLAIM OF PRODUCT LIABILITY, PERSONAL INJURY, OR DEATH ARISING IN ANY WAY OUT OF SUCH MISSION CRITICAL APPLICATION, WHETHER OR NOT INTEL OR ITS SUBCONTRACTOR WAS NEGLIGENT IN THE DESIGN, MANUFACTURE, OR WARNING OF THE INTEL PRODUCT OR ANY OF ITS PARTS.

Intel may make changes to specifications and product descriptions at any time, without notice. Designers must not rely on the absence or characteristics of any features or instructions marked "reserved" or "undefined". Intel reserves these for future definition and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to them. The information here is subject to change without notice. Do not finalize a design with this information.

The products described in this document may contain design defects or errors known as errata which may cause the product to deviate from published specifications. Current characterized errata are available on request.

Contact your local Intel sales office or your distributor to obtain the latest specifications and before placing your product order.

Copies of documents which have an order number and are referenced in this document, or other Intel literature, may be obtained by calling 1-800-548-4725, or go to: <http://www.intel.com/design/literature.htm%20>

All products, computer systems, dates, and figures specified are preliminary based on current expectations, and are subject to change without notice.

This document contains information on products in the design phase of development. Do not finalize a design with this information. Revised information will be published when the product is available. Verify with your local sales office that you have the latest datasheet before finalizing a design.

Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See [www.intel.com/products/processor\\_number](http://www.intel.com/products/processor_number) for details.

Code names featured are used internally within Intel to identify products that are in development and not yet publicly announced for release. Customers, licensees and other third parties are not authorized by Intel to use code names in advertising, promotion or marketing of any product or services and any such use of Intel's internal code names is at the sole risk of the user.

Intel and the Intel logo are trademarks of Intel Corporation in the U.S. and/or other countries.

\*Other names and brands may be claimed as the property of others.

Copyright © 2023, Intel Corporation. All rights reserved.



# Contents

1	Introduction .....	5
	1.1 Purpose and Scope of Document.....	5
	1.2 Acronyms and Terminology .....	5
	1.3 Reference Documents.....	6
2	Release Kit Summary .....	7
	2.1 Release Kit Details .....	7
	2.2 Kit Contents .....	7
3	Driver Installation .....	8
	3.1 Driver Installation via Installer .....	8
	3.2 Silent Driver Installation via Installer.....	13
	3.3 Manual Installation via INF File .....	17
	3.4 Checking the Driver Version .....	18
	3.5 Uninstalling the Driver via Control Panel .....	21
4	Closed Issues .....	24
5	Known Issues.....	25

## Figures

Figure 1. Welcome Screen .....	9
Figure 2. License Agreement .....	10
Figure 3. Driver installs destination folder location .....	11
Figure 4. Driver components .....	12
Figure 5. Setup Completion.....	13
Figure 6. Installer Help Information .....	14
Figure 7. Serial IO Driver - INF files .....	17
Figure 8. Intel® Serial IO GPIO Driver Version .....	18
Figure 9. Intel® Serial IO I2C Driver Version .....	19
Figure 10. Intel® Serial IO UART Driver Version .....	20
Figure 11. Control Panel – Uninstall a program .....	21
Figure 12. Control Panel – Programs List .....	21
Figure 13. Welcome to the Uninstallation Program .....	22
Figure 14. Uninstall Setup Completion .....	23



## Revision History

---

Document Number	Revision Number	Description	Revision Date
N/A	0.5	Initial Release – WW42'2021	October 2021
N/A	0.5v2	WW02'2022	January 2022
N/A	0.5v3	WW13'2022	March 2022
N/A	0.8	WW25'2022	June 2022
N/A	1.0	Production Version Release	July 2022
N/A	1.1	HF1 Release	October 2022
N/A	1.1v2	HF1 Release	October 2022
N/A	1.1v3	HF1 Release	April 2023

§



# 1 Introduction

---

## 1.1 Purpose and Scope of Document

This document provides installation instructions and general usage of the driver as well as release information, such as release kit summary, important notes, resolved issues and known issues. This document is intended to help OEM and ODM customers setup their platform as they prepare for validation and debug.

Intel® Serial IO Drivers supports the following operating system and platform:

### Operating System:

- Windows\* 11 Operating System (64-bit Client version): 22H2

### Hardware Requirement:

- Intel® 600 Series Chipset Family Platform Controller Hub (PCH)
- Intel® 600 Series Chipset Family On-Package Platform Controller Hub (PCH)
- Intel® 700 Series Chipset Family Platform Controller Hub (PCH)
- Intel® 700 Series Chipset Family On-Package Platform Controller Hub (PCH)

## 1.2 Acronyms and Terminology

Term	Description
ACPI	Advanced Configuration and Power Interface
AOAC	Always On Always Connected
DMA	Direct Memory Addressing
GPIO	General Purpose IO
I2C	Inter-Integrated Circuit, generically referred to as "two-wire interface"
LPSS	Low Power Sub System (old name for Intel® Serial IO, no longer used)
LTR	Latency Tolerance Reporting
MMIO	Memory Mapped I/O
PIO	Programmed I/O



Term	Description
SPI	Serial Peripheral Interfaces Bus. A synchronous serial data link standard that operates in full duplex mode.
UART	Universal asynchronous receiver/transmitter

## 1.3 Reference Documents

Document	Location
Intel® 600 Series Chipset Family and Intel® 700 Series Chipset Family Platform Controller Hub (PCH) External Design Specification – Volumes 1 and 2 of 2	RDC: 619362 621483
Intel® 600 Series Chipset Family and Intel® 700 Series Chipset Family On-Package Platform Controller Hub (PCH) External Design Specification – Volumes 1 and 2 of 2	RDC: 626817 630094
Raptor Lake-PX Platform Controller Hub (PCH) External Design Specification – Volumes 1 and 2 of 2	RDC: 647867 655283
Alder Lake and Raptor Lake Platform Runtime D3 (RTD3) Hardware and Software Recommendations Design Guide	CDI/IBL: 595664
Alder Lake and Raptor Lake Platform Controller Hub (PCH) BIOS Specification	CDI/IBL: 630603



## 2 Release Kit Summary

---

### 2.1 Release Kit Details

**Kit Name:** Intel(R) Serial IO Driver

**Version:**

- Serial IO Driver – 30.100.2237.26
  - ialpss2\_gpio2\_ADL
  - ialpss2\_i2c\_ADL
  - ialpss2\_spi\_ADL
  - ialpss2\_uart2\_ADL

### 2.2 Kit Contents

The contents of this release kit include:

- Intel® Serial IO Unpacked Driver folder – \production\Windows10-x64\0\Drivers\WU
  - Driver INF files
  - Driver CAT files
  - Driver SYS files
- SetupSerialIO.exe
- Intel Software License Agreement
- Readme file
- WiXLicenseNote

**Note:** Drivers will not be installed for controllers that are not enabled by BIOS.



## **3      *Driver Installation***

---

**Note:** A supported Operating System must be installed prior to the installation of the Intel® Serial IO Driver.

There are 3 different methods to install the Intel® Serial Driver for this release:

1. Driver Installation via Installer
2. Silent Driver Installation via Installer
3. Manual driver installation via INF

### **3.1      Driver Installation via Installer**

Follow the steps listed below for driver installation via installer:

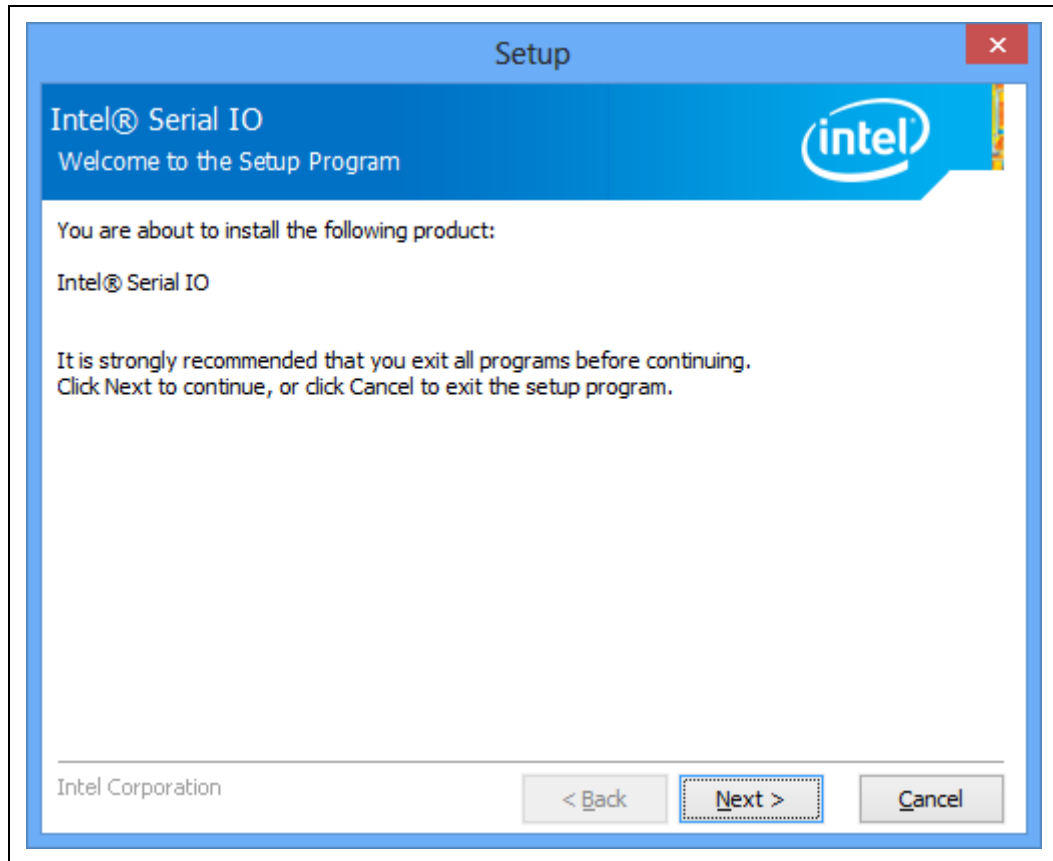
1. Copy and unzip the Intel® Serial IO Driver onto the Platform under test.
2. Locate the "SetupSerialIO.exe" file.
3. Right click on the executable and select 'Run as administrator' option from the menu to start the installer and then click on 'Yes' button in User Account Control pop-up window.





4. You should see welcome screen with component details as shown in Figure 1. Click 'Next >' button to continue the installation.

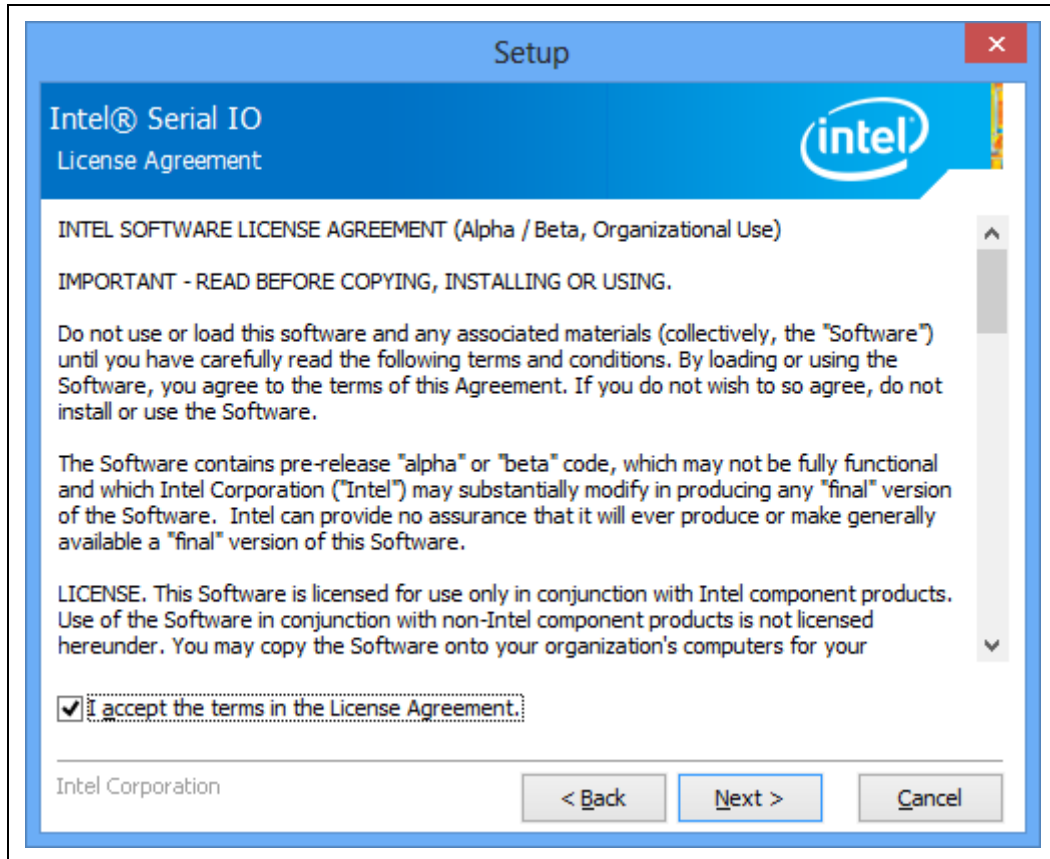
**Figure 1. Welcome Screen**





5. Next, you should see license agreement screen as shown in Figure 2. Please review the license agreement and if you accept the license terms then check the check-box on "I accept the terms in the license Agreement" and click on the "Next >" button to continue the installation.

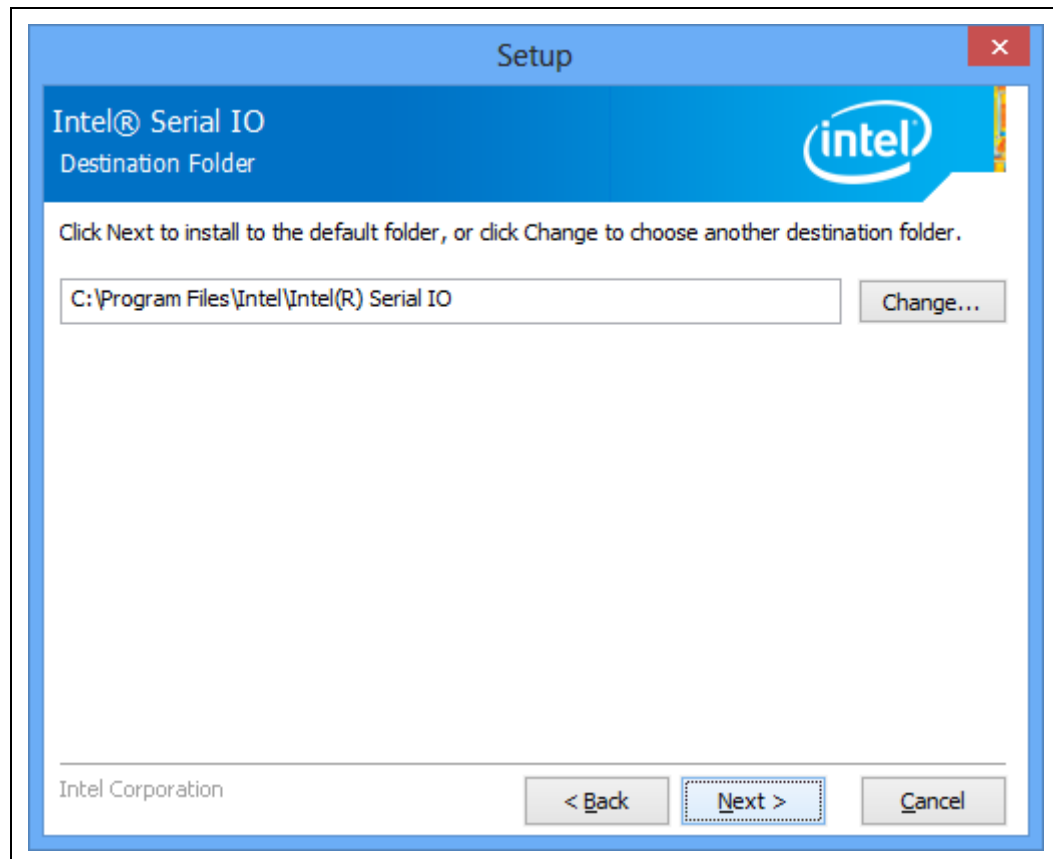
**Figure 2. License Agreement**





6. Next, you can select the folder location where the driver will be installed. By default, the driver will be installed in c:\program Files\Intel\Intel(R) Serial IO. Click on "Next >" button to continue installation.

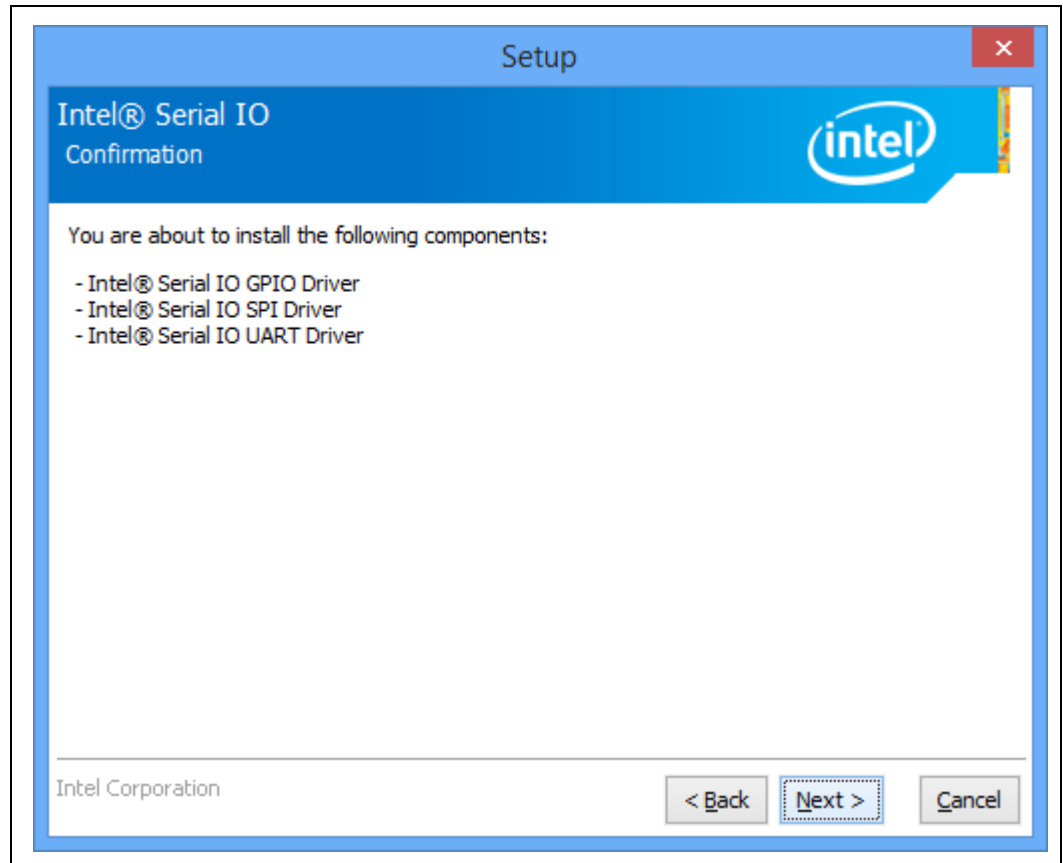
**Figure 3. Driver installs destination folder location**





7. Next, a list of driver components that will be installed by the installer is displayed. Click on 'Next >' button to continue.

**Figure 4. Driver components**



**Note:** Drivers will not be installed for controllers that are not enabled by BIOS.



8. After successful installation, you should see setup completion screen as shown in Figure 5. Click on 'Finish' button to complete the installation.

**Figure 5. Setup Completion**



## 3.2 Silent Driver Installation via Installer

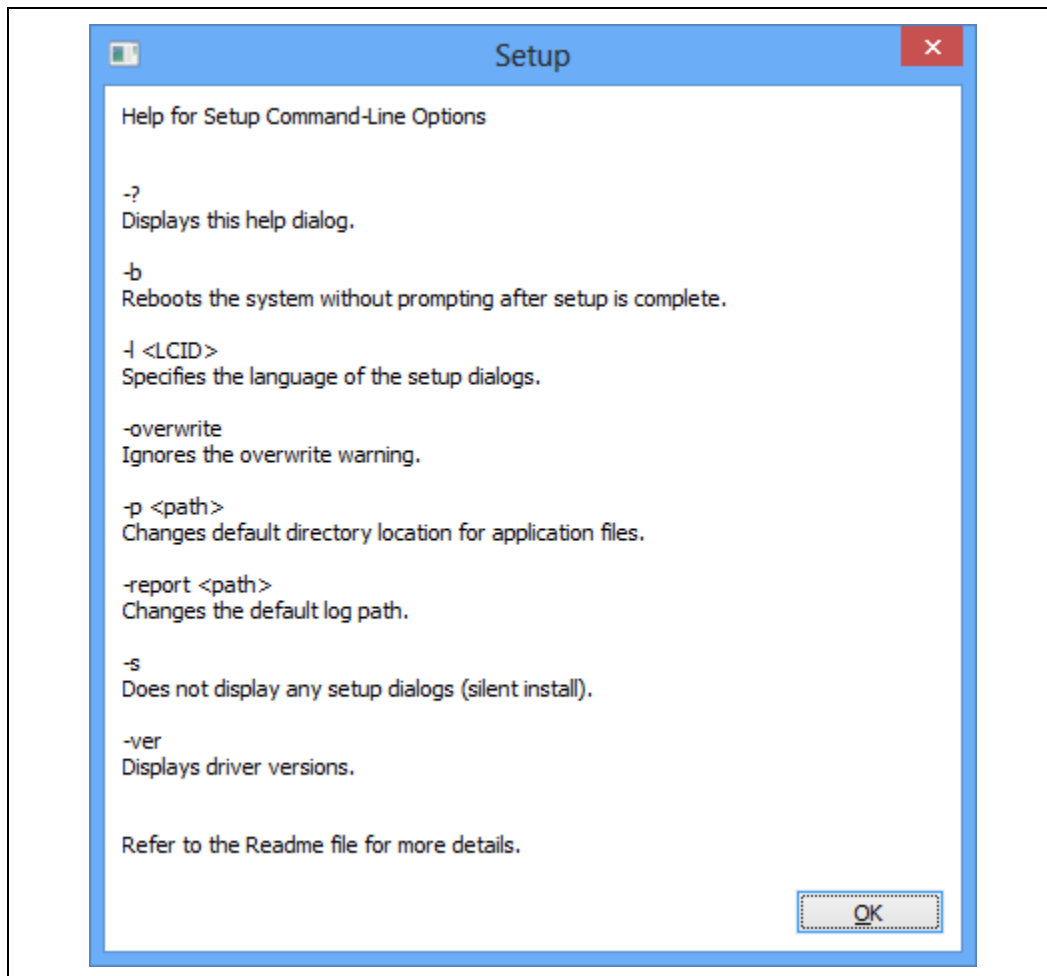
Follow the steps listed below for silent driver installation via installer:

1. Copy and unzip the Intel® Serial IO Driver onto the Platform under test.
2. Open a Command Prompt (cmd.exe) with administrator rights (ie. Run as administrator). Click on 'Yes' button in User Account Control pop-up window.
3. Change the directory to where you unzipped the driver in Step 1 and then change to the "Driver\_Installer" directory.
4. To see all available options for the Installer, run command "SetupSerialIO.exe -?" You should see a window pop-up similar to Figure 6. For the "-I <LCID>" option



which specifies the language of the setup dialogs, the LCID list is shown in below table. Click OK to continue.

**Figure 6. Installer Help Information**



**Note:** The "-report <path>" option allows users to change where the installation log file is saved. Otherwise, Intel driver installation log files are stored in the general location of 'C:\Users\ "User name" \Intel\Logs'.



LCID	Language
0401	Arabic
0804	Chinese (Simplified)
0404	Chinese (Traditional)
0405	Czech
0406	Danish
0407	German
0408	Greek
0409	English (USA)
040A	Spanish
040B	Finnish
040C	French
040D	Hebrew
040E	Hungarian
0410	Italian

LCID	Language
0411	Japanese
0412	Korean
0413	Dutch
0414	Norwegian
0415	Polish
0416	Portuguese (Brazil)
0816	Portuguese (Standard)
0419	Russian
041B	Slovak
0424	Slovenian
041D	Swedish
041E	Thai
041F	Turkish

- Run command "SetupSerialIO.exe -b -s" to start the silent installation. (Where as x represents the particular version number.) This process should take about 1 min to complete. When silent installation is complete, the system will automatically reboot.
- After the system has booted, you can refer to section 0 to check the driver version.

Other silent installation examples are:

- > SetupSerialIO.exe -s -overwrite -report C:\Temp
- > SetupSerialIO.exe -s -l 0404



For the installation, a full listing of return values can be found in the following table. The 'Result Code' value can be found at the end of the installation log file.

Result Code	Description
0	Success
3010	Reboot required
1602	User exited
1641	Reboot initiated
1603	Install failure



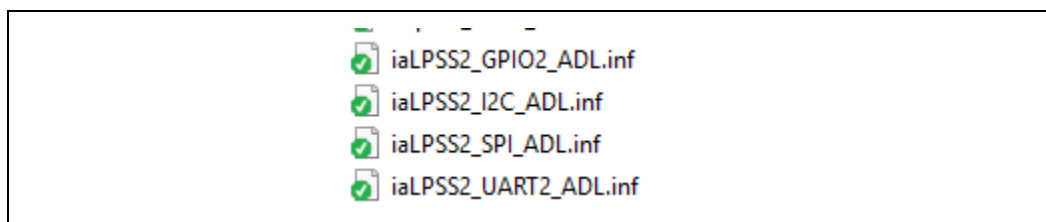


### 3.3 Manual Installation via INF File

Follow the steps listed below for driver installation via INF file:

1. Copy and unzip the Intel® Serial IO Driver onto the Platform under test.
2. Locate the INF files. See Figure 7.
  - a. iaLPSS2\_GPIO2\_ADL.inf
  - b. iaLPSS2\_I2C\_ADL.inf
  - c. iaLPSS2\_SPI\_ADL.inf
  - d. iaLPSS2\_UART2\_ADL.inf

**Figure 7. Serial IO Driver - INF files**



3. Right click on the INF file and select 'Install' option from the menu to start the installation and then click on 'Yes' button in pop-up window.
4. After the installation of all the drivers, reboot the system



### 3.4 Checking the Driver Version

To check the Intel® Serial IO Driver version, follow the below instructions:

1. Open Device Manager.
2. Double click on the device you want.
3. Select the "Driver" tab and the Driver Version will be listed.

**Figure 8. Intel® Serial IO GPIO Driver Version**

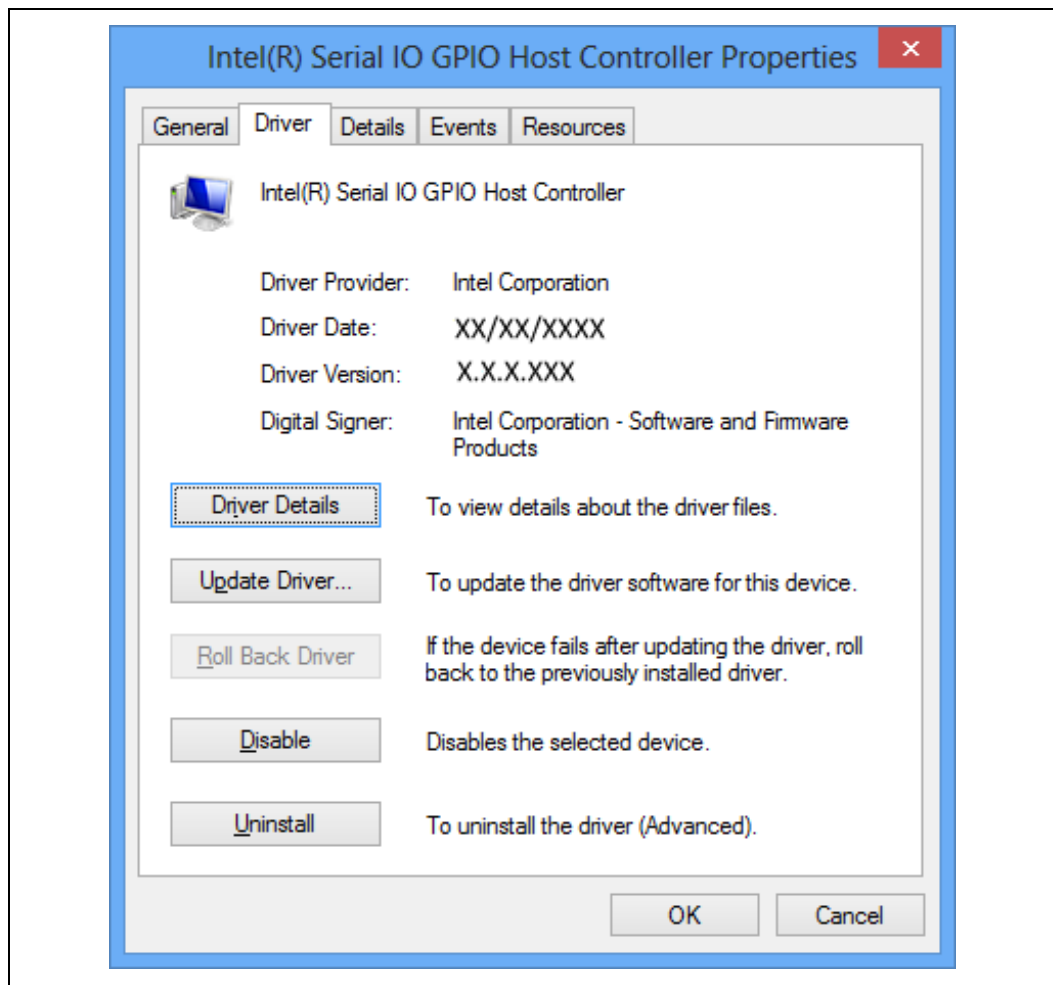




Figure 9. Intel® Serial IO I2C Driver Version

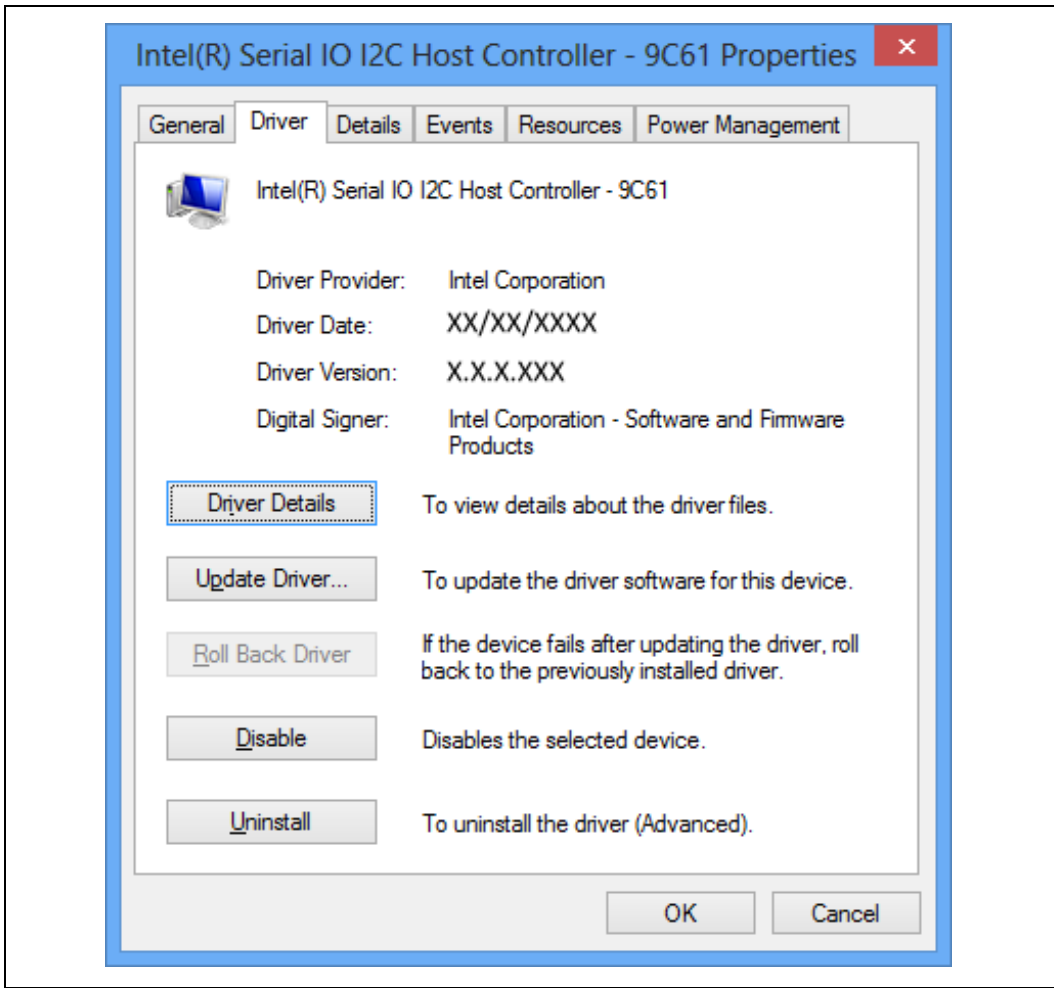
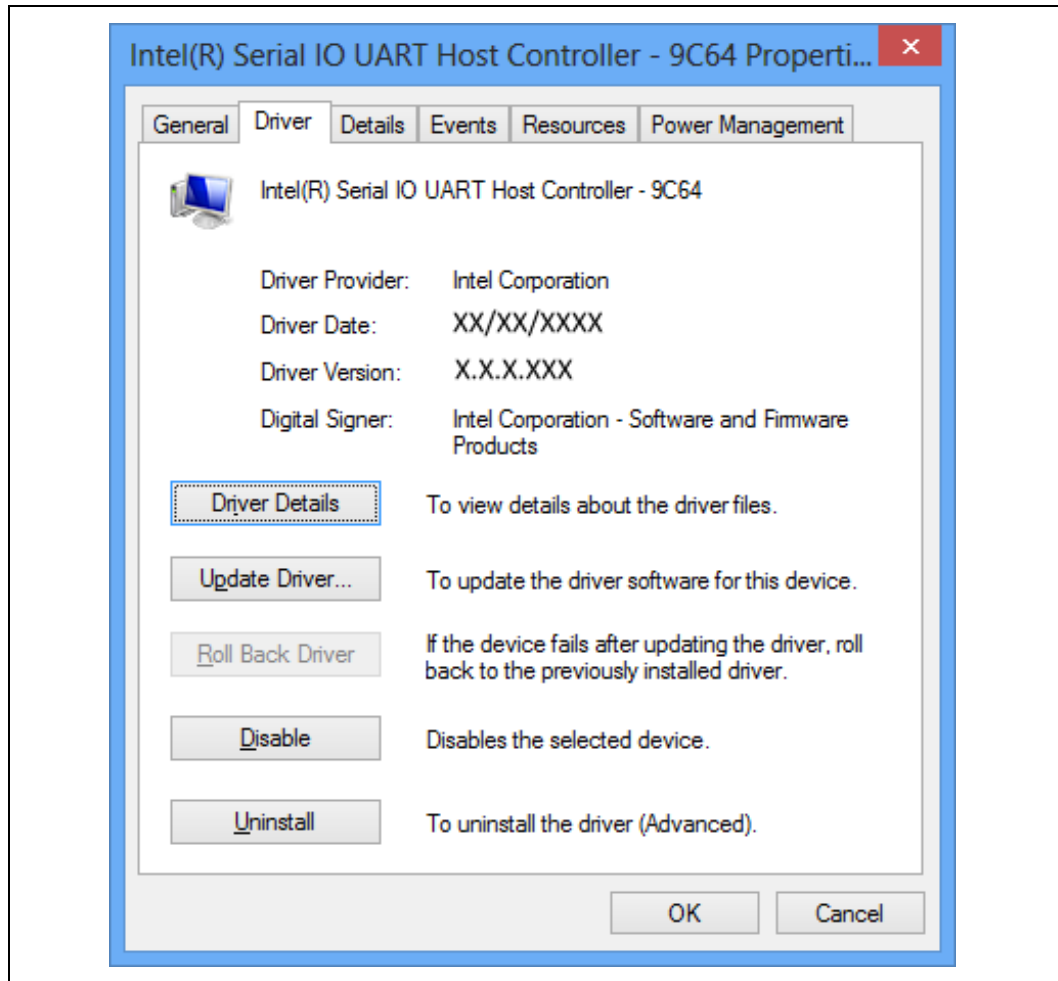




Figure 10. Intel® Serial IO UART Driver Version





### 3.5 Uninstalling the Driver via Control Panel

Follow the steps listed below to uninstall the driver via the Control Panel:

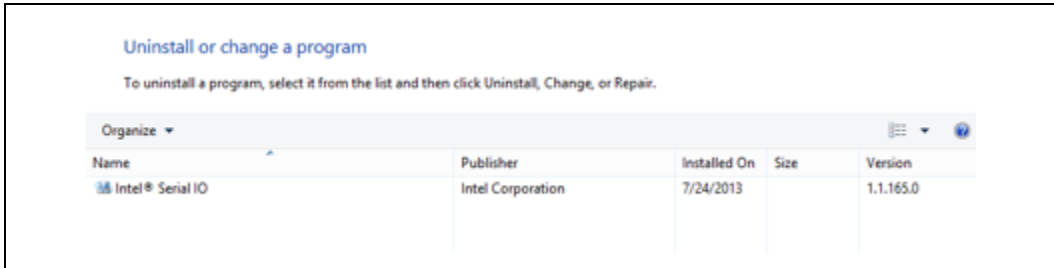
- 1. Open the Control Panel window.
- 2. If the Control Panel window is shown in 'Category' view, then select "Uninstall a program" as shown in Figure 11. Otherwise if the Control Panel window is shown in 'icon' view, then select "Programs and Features".

Figure 11. Control Panel – Uninstall a program



- 3. On the next window, select the "Intel® Serial IO Driver" (see Figure 12) from the list of programs. Then click the "Uninstall" button.

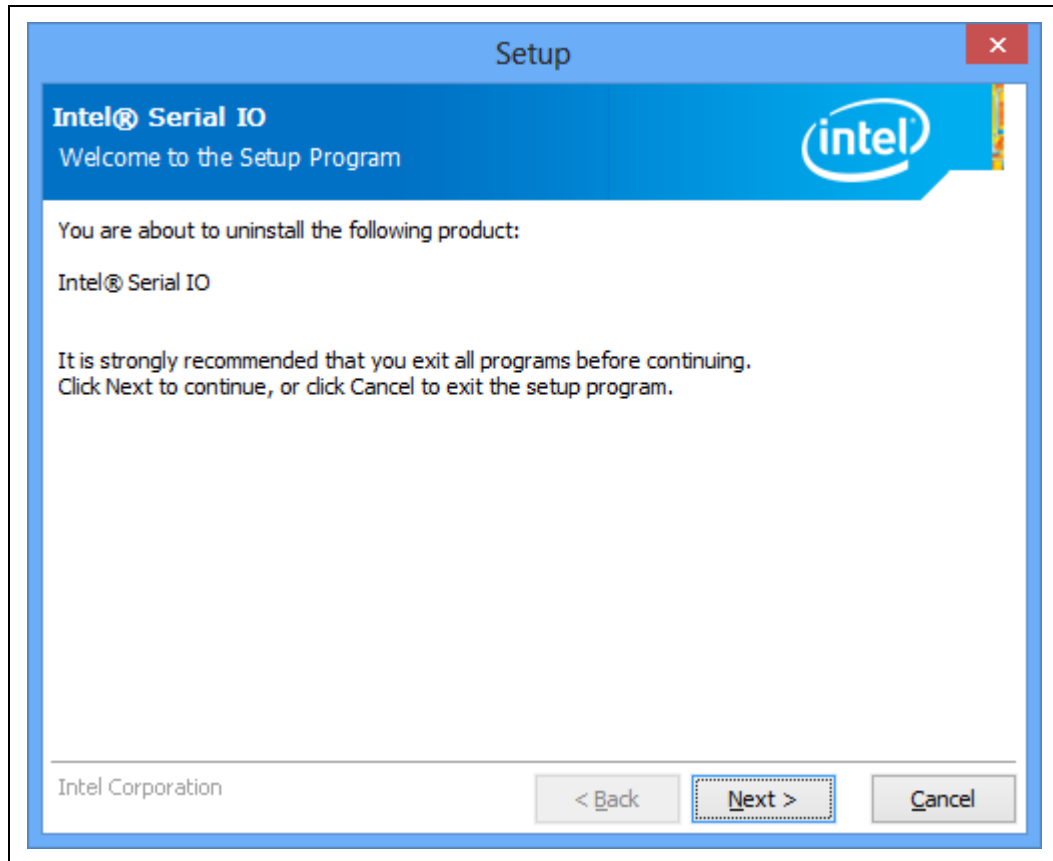
Figure 12. Control Panel – Programs List





4. You should see the Welcome to Uninstallation Program pop-up window with component details as shown in Figure 13. Click 'Next >' button to continue.

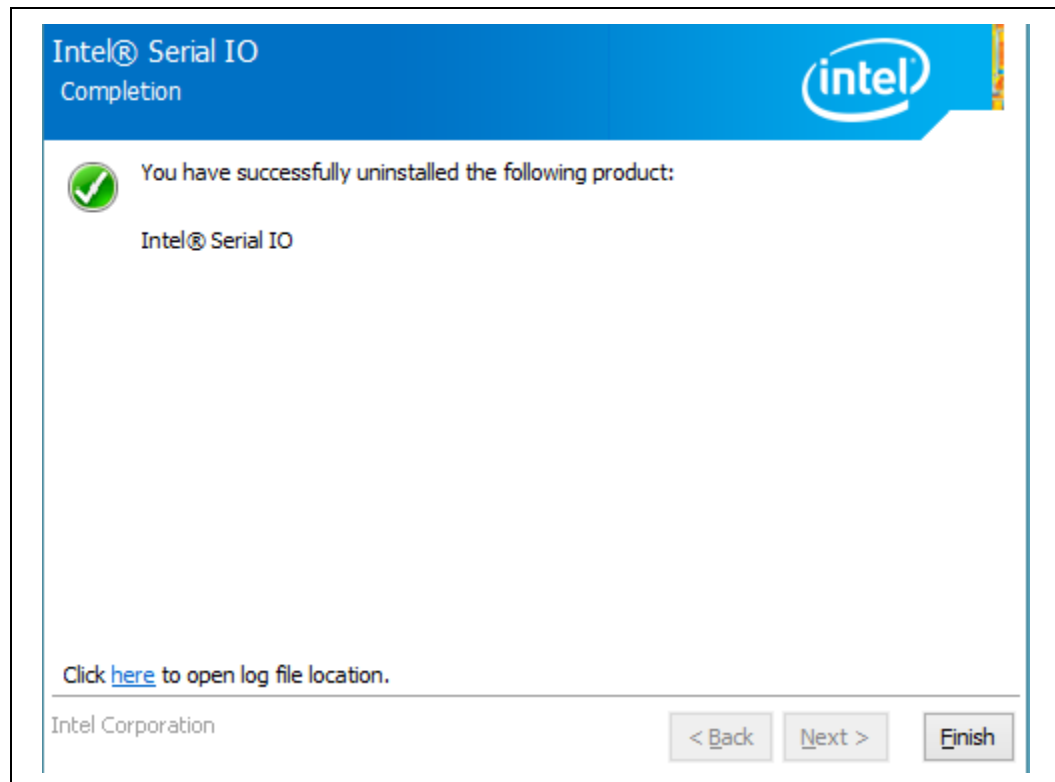
**Figure 13. Welcome to the Uninstallation Program**





5. Next, installer will perform various operations and show progress in Uninstallation Progress screen. When the uninstall process is completed, you should see screen as shown in Figure 14. Click on 'Finish' button to restart the system.

**Figure 14. Uninstall Setup Completion**



§



## 4 Closed Issues

Issue #	Description	Resolution
N/A	Installer: Added certificate signing for localization files used by the installer.	Resolved in release 30.100.2237.26v3- Installer version: 3.0.2709.7
N/A	Driver WHQL signed for Windows 10 OS.	Resolved in PV release 30.100.2237.26 v2
N/A	Driver WHQL signed for Windows 11 (22H2) OS.	Resolved in PV release 30.100.2237.26
22015409151	Installer: Updated the certificate signing which prevented the installer to be run when Windows 11 22H2 OS Smart App Control feature is enabled.	Resolved in PV release 30.100.2237.26 – installer version 3.0.2709.5
N/A	Driver WHQL signed for Windows 11 (22H2) OS.	Resolved in PV release 30.100.2221.20v2
N/A	Added support for: <ul style="list-style-type: none"><li>Intel® 600 Series Chipset Family Platform Controller Hub (PCH)</li><li>Intel® 600 Series Chipset Family On-Package Platform Controller Hub (PCH)</li><li>Intel® 700 Series Chipset Family On-Package Platform Controller Hub (PCH)</li></ul>	Resolved in release 30.100.2221.20
N/A	Added installer support	Resolved in release 30.100.2116.4v3
N/A	Updated the release note	Resolved in release 30.100.2116.4v2

S





# 5 Known Issues

---

Issue #	Description
N/A	

§