DepthVista

DepthVista Build Manual

Version 1.1

e-con Systems

11/10/2022

e-con Systems

Think Camera. Think e-con.

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Contents

Introduction to DepthVista

The DepthVista application is a source reader application to view streaming from e-con Systems See3CAM_TOF_25CUG_CHLCC_H01R1 camera.

This document describes the step-by-step procedure to build DepthVista on the host PC.

Prerequisites

The prerequisites are as follows:

- DepthVista source code.
- CMake (version 3.5 and above).
- Visual Studio (VS 2017).
- DepthVistaSDK.

Description

DepthVista has USB interface controller with USB Type-C connector to interface with the host PC. It is a ready-to-manufacture camera board with all the necessary firmware built-in and is compatible with the UVC version 1.0 standard. You can integrate this camera into the products, and this helps to cut short the time-to-market.

DepthVista is a UVC compatible and will work with the standard drivers available with Windows and Linux OS. There is no need for any additional driver installation. So, video streaming through UVC is possible without any special drivers on OSes that have built-in support for UVC standards.

Table 1: DepthVista supported Format, Resolutions, and Frame Rates

S.No	Format	Camera Mode	Resolution	Frame Rate (fps) USB 3.2 Gen 1
1	UYVY	RGB Mode	2.3MP (1920 x 1200)	30
			FHD (1920 x 1080)	30
			HD (1280 x 720)	60
			VGA (640 x 480)	60
2	Y16	TOF Mode	Depth (640 x 480)	30

	(RAW 12-bit)		IR (640 x 480)	30
			Depth + IR (640 x 960)	30
3		RGB-D Mode	1280 x 600 (RGB-D)	30
			1443 X 960 (RGB-D)	30

TOF camera in DepthVista can be used in two depth modes as follows:

- **Far Mode**: Effective depth range is between 1000 mm to 6500 mm.
- **Near Mode**: Effective depth range is between 200 mm to 1200 mm.

The TOF camera controls of DepthVista are as follows:

- TOF Data Mode
- TOF Depth Range
- TOF Mask
- TOF Gain

The RGB camera controls of DepthVista are as follows:

- Brightness
- Contrast
- Saturation
- Gamma
- Gain
- Sharpness
- White Balance
- Exposure
- Power line frequency

Installing Qt

DepthVista is built with Qt as UI. This section will cover the installation of Qt step by step.

1. Download the installer for Qt 5.14.2 from the link below

http://download.qt.io/archive/qt/5.14/5.14.2/qt-opensource-windows-x86-5.14.2.exe

2. Double Click on the qt-opensource-windows-x86-5.14.2.exe. The installer launch screen will be as shown below. Click **Next.**

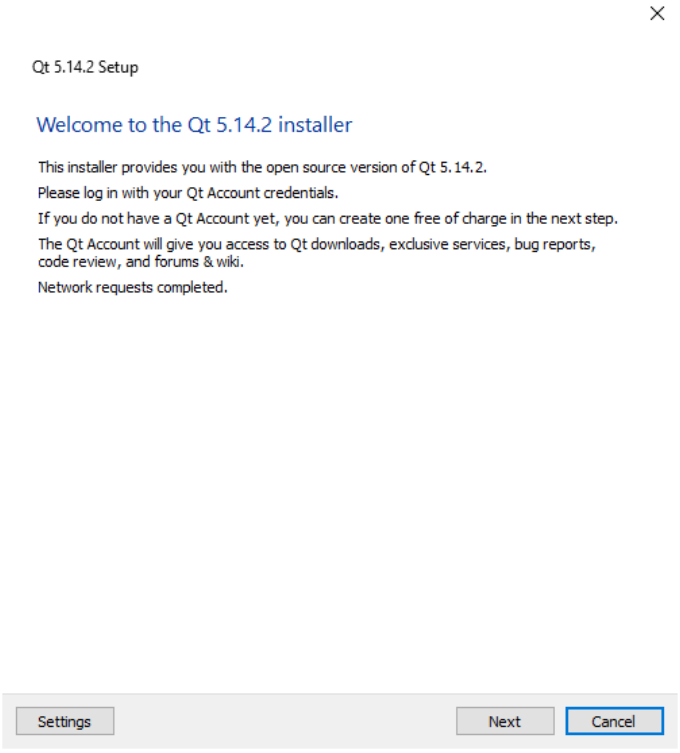


Fig 1: Qt installer, welcome screen.

3. Then the **Qt Account login** screen will appear. Enter your credentials and then click **Next.**

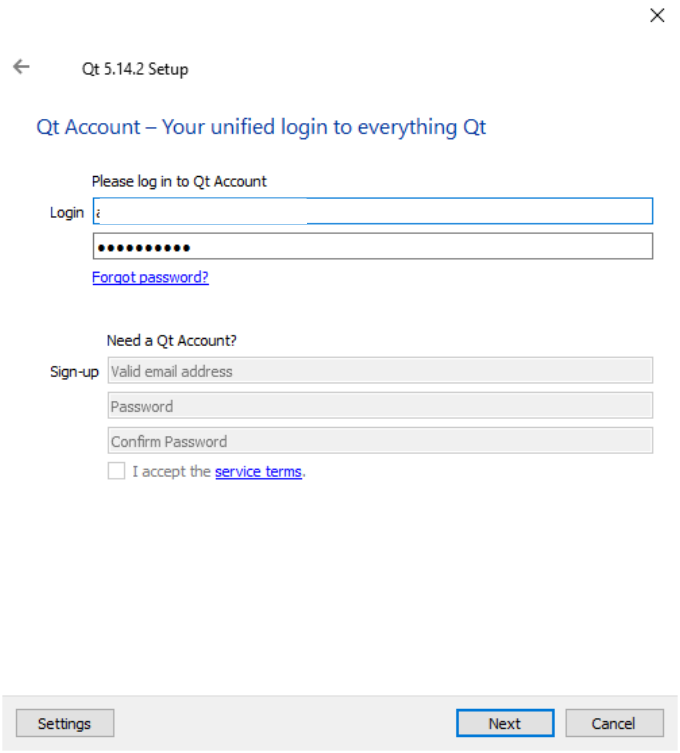


Figure 2: Qt installer, Account Login screen.

4. Then the **Qt open-source usage obligations** screen will appear. Approve the Obligations and click **Next.**

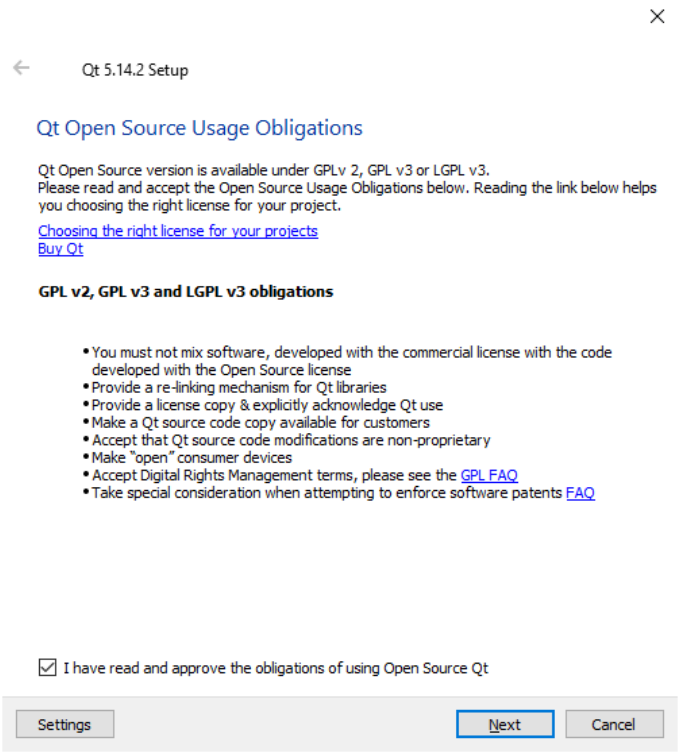


Figure 3: Qt installer, Qt Open-Source Usage Obligations screen.

5. Then the setup screen will appear as shown below, click **Next.**

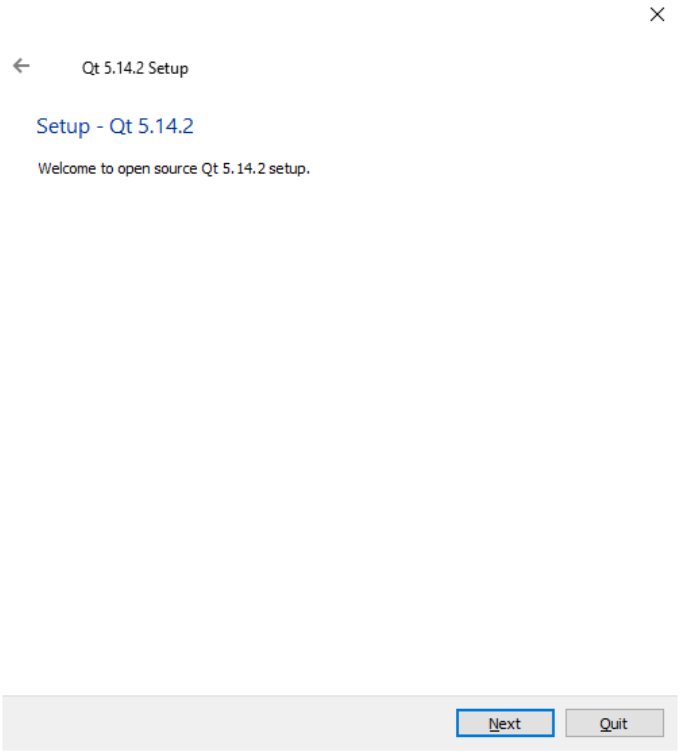


Figure 4: Qt installer, Setup screen.

6. The next screen appearing will be **Installation Folder** screen. Select the desired location and then click **Next.**

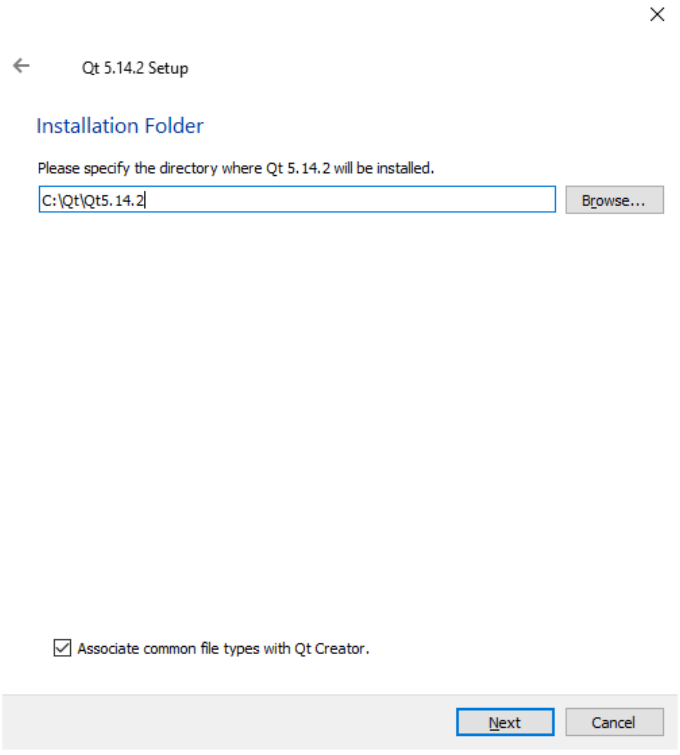


Figure 5: Qt installer, Installation Location screen.

7. The next screen appearing will be **components selection** screen. Select all the components as shown below and click **Next.**

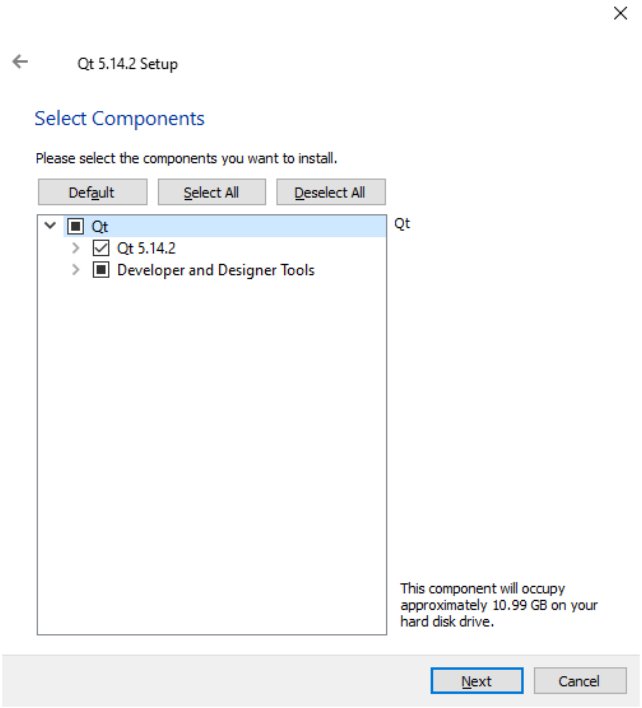


Figure 6: Qt installer, Select components screen.

8. The next screen appearing will be **License Agreement** screen. Read the agreements and select the agree as shown below and click **Next.**

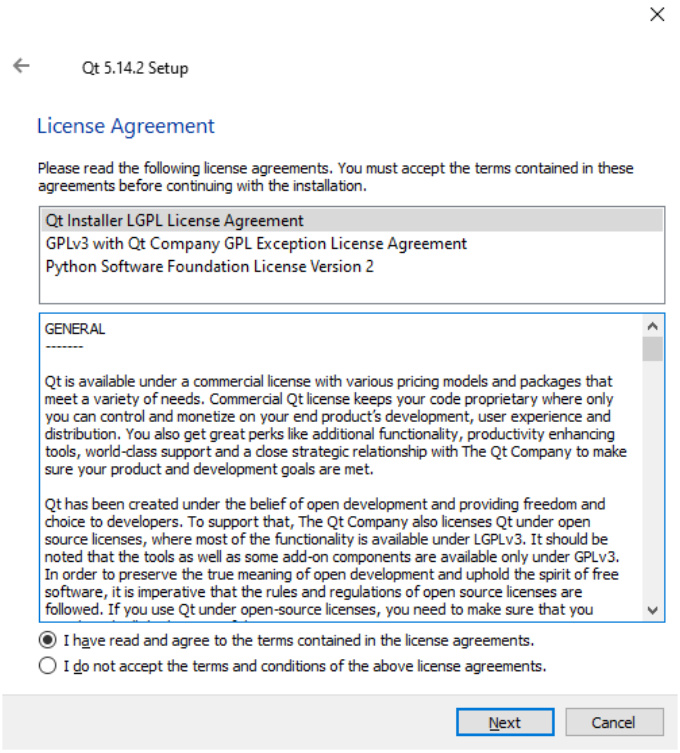


Figure 7: Qt installer, License Agreement screen.

9. The next screen appearing will be the **Choose Start Menu Folder**. Enter the desired name and then click **Next.**

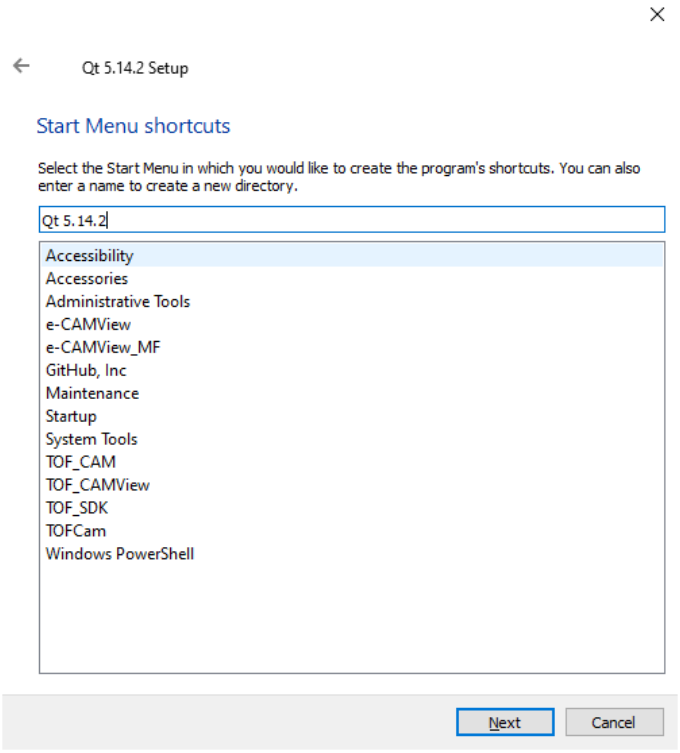


Figure 8: Qt installer, Start menu folder screen.

10. Then the **ready to install** screen will appear as shown below. Click **Install.**

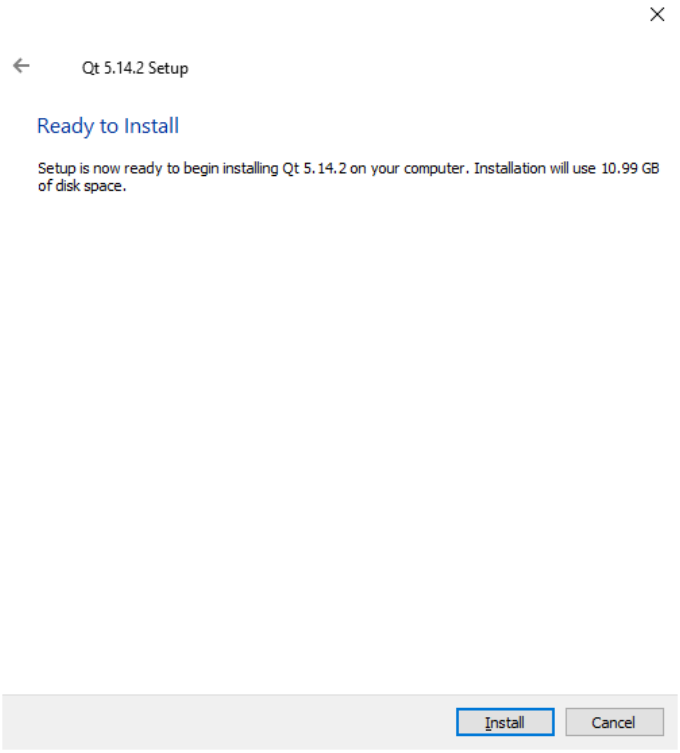


Figure 9: Qt installer, Ready to install screen.

11. Once you click Install button, installation will start and the screen looks as shown below. This might take time, please be patient.

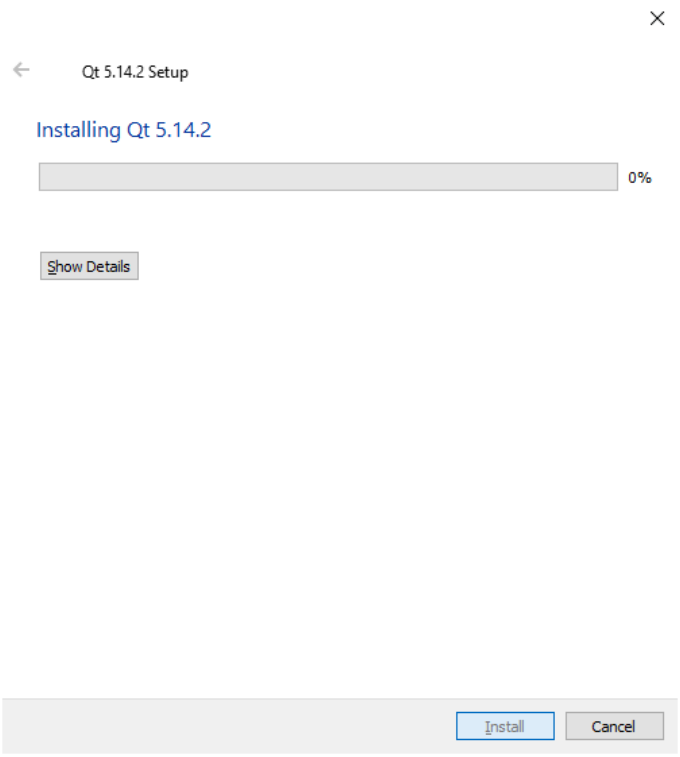


Figure 10: Qt installer, Installation process screen.

Installing PCL All in one Installer

DepthVista requires some PCL libraries for specified function. This section will cover the installation of PCL step by step.

1. Download the installer for PCL 1.9.1 (64 bit) from the link below

https://github.com/PointCloudLibrary/pcl/releases/download/pcl-1.9.1/PCL-1.9.1-AllInOne-msvc2017-win64.exe

2. Double Click the PCL-1.9.1-AllInOne-msvc2019-win64.exe. The installer launch screen will be as shown below. Click **Next.**

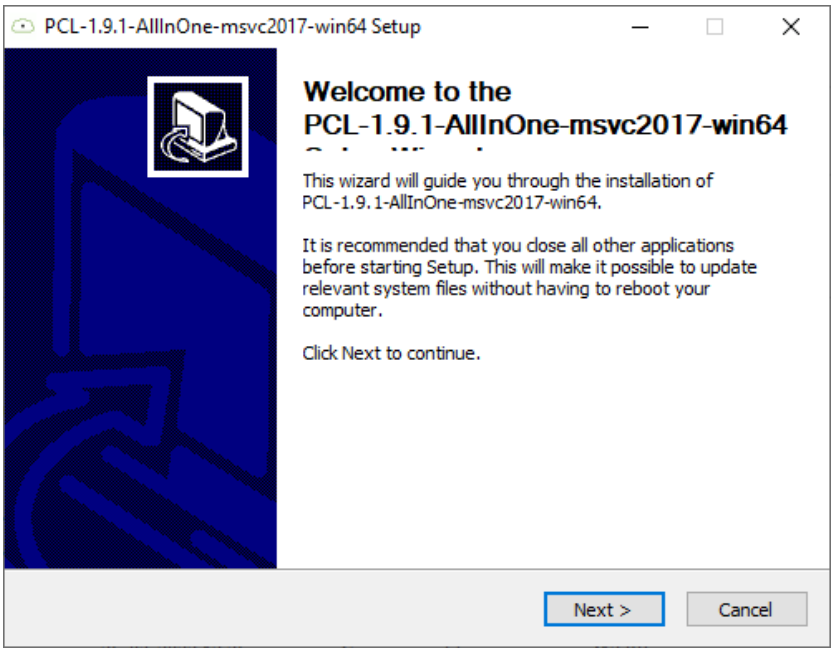


Figure 11: PCL installer, welcome screen.

3. Then the **license agreement** screen will appear once you click next in the welcome screen. Click **I Agree.**

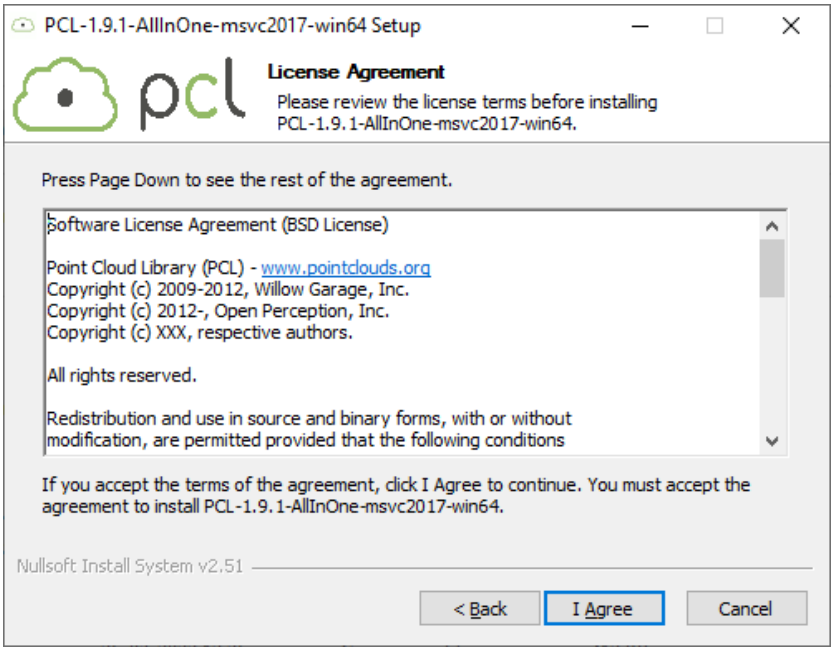


Figure 12: PCL installer, License Agreement screen.

4. The next screen appearing will be **Install Options** screen. Select Add PCL to system PATH for current user as shown in the figure and then click **Next.**

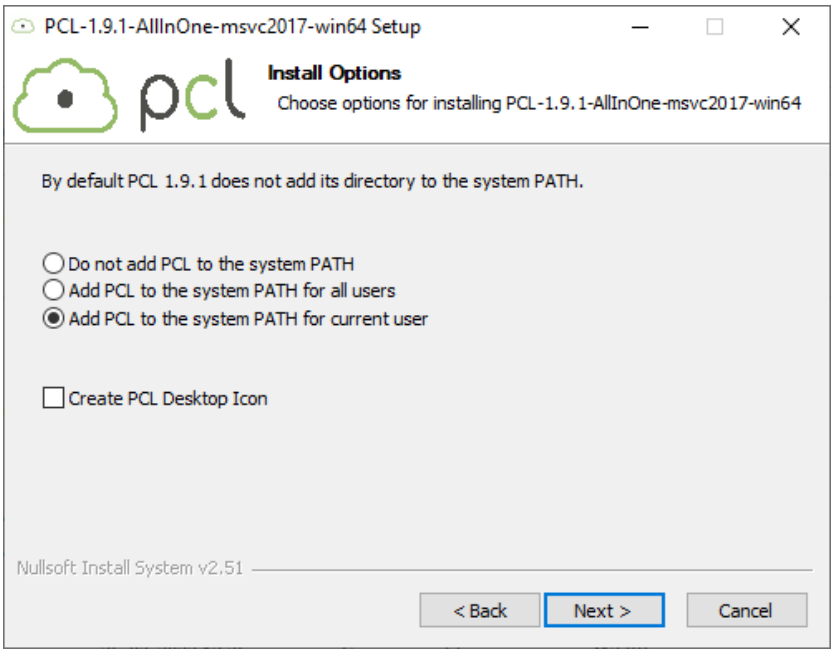


Figure 13: PCL installer, Install options screen.

5. The next screen appearing will be **Choose install path** screen. We recommend to use the default location created by the installer. Click **Next.**

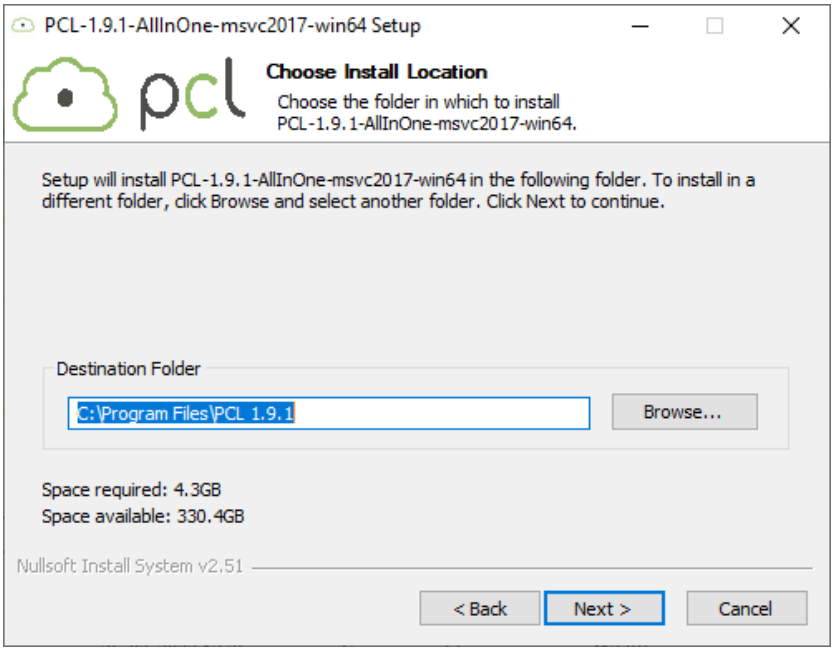


Figure 14: PCL installer, choose install location screen.

6. The next screen appearing will be the **Choose Start Menu Folder**. Enter the desired name and then click **Next.**

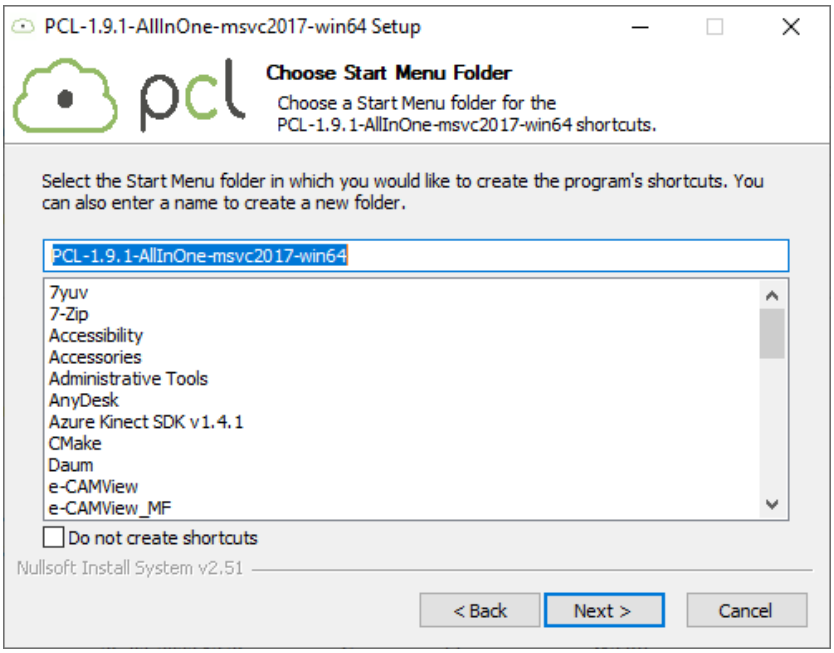


Figure 15: PCL installer, choose start menu folder screen.

7. The next screen appearing will be **Choose components** screen. Select both the PCL and 3rd Party Libraries as shown below and then click **Install.**

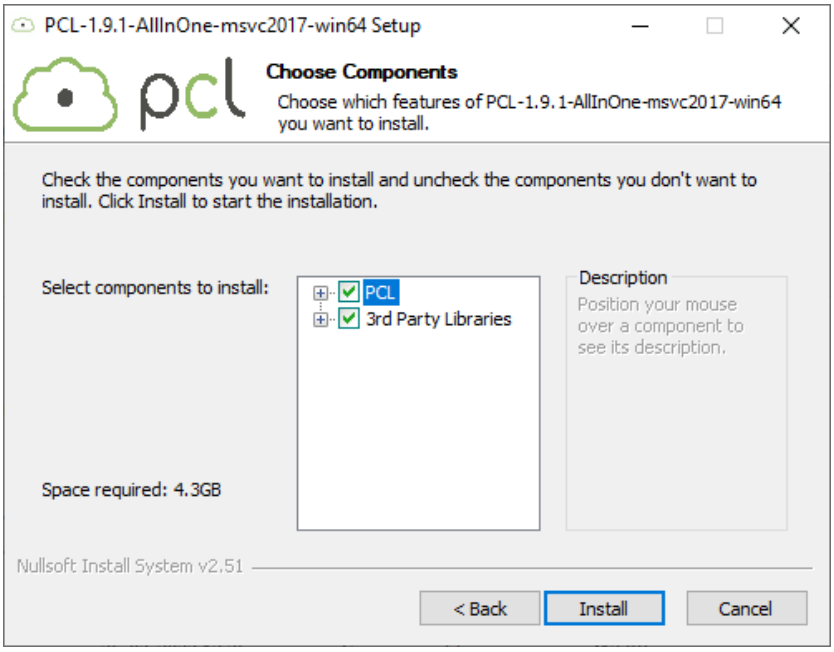


Figure 16: PCL installer, choose components screen.

8. Once you click Install button, installation will start and the screen looks as shown below.

Note: Please don't install PrimeSense during this process. And there is no need for restarting your PC for re configuring OpenNI 2.2 SDK.

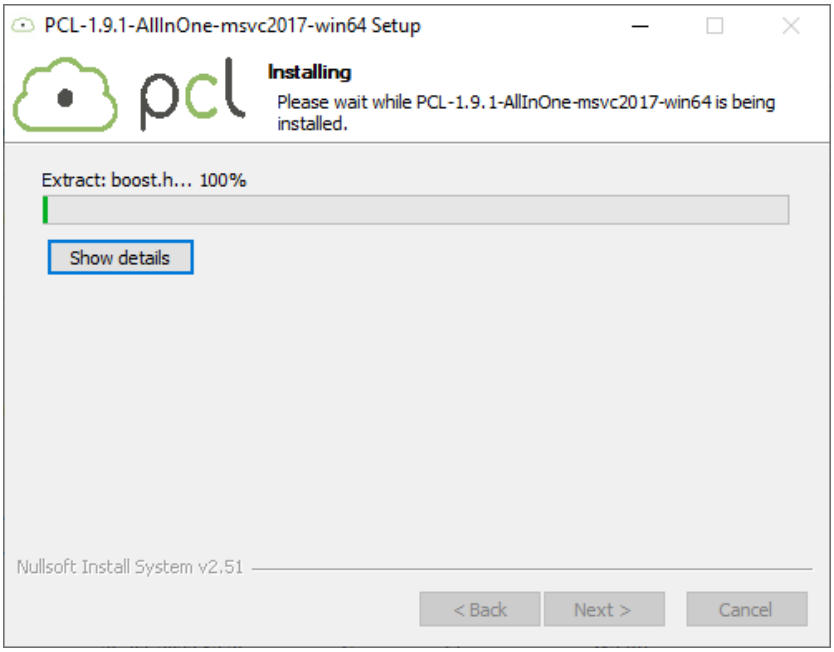


Figure 17: PCL installer, Installation process screen.

9. Once the installation process is over, the completed screen will appear as shown below. Click **Finish**.

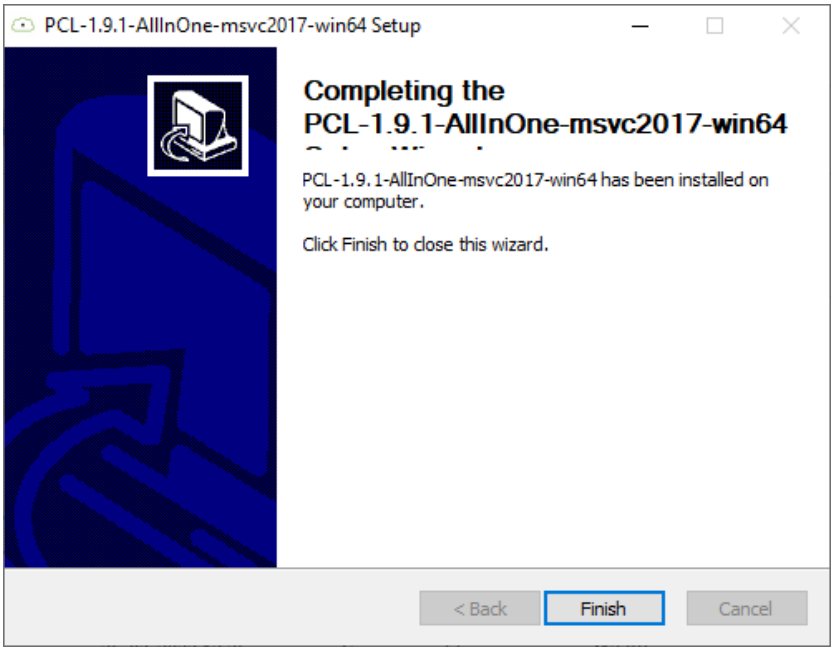


Figure 18: PCL installer, Installation completed screen.

Building DepthVista Application

DepthVista application is used to stream the See3CAM_TOF_25CUG_CHLCC_H01R1 Camera. It has various features to access UVC controls and UVC Extension controls to configure the camera settings.

Getting DepthVistaSDK

DepthVista Source can be obtained by either of the following ways.

From .zip file from GitHub

- Download the DepthVista project as a .zip file

By cloning from GitHub

- Clone the repository using the following Command Prompt.

```
git clone https://github.com/econsystems/DepthVista.git
```

Extract the given package, it will contain **Source** folder.

Preparing .sln file from CMakeLists.txt

1. Open the CMake GUI, and browse the location of the source code and the location in which the binaries to be built as shown below. It is preferred to make a new folder **build** inside the package for the binaries to be build. Then click **Configure**.

Note: While browsing source file, please mention the directory in which the CMakeLists.txt is present. CMakeLists.txt will be present inside **<ExtractedPath>/Source** in the given package.

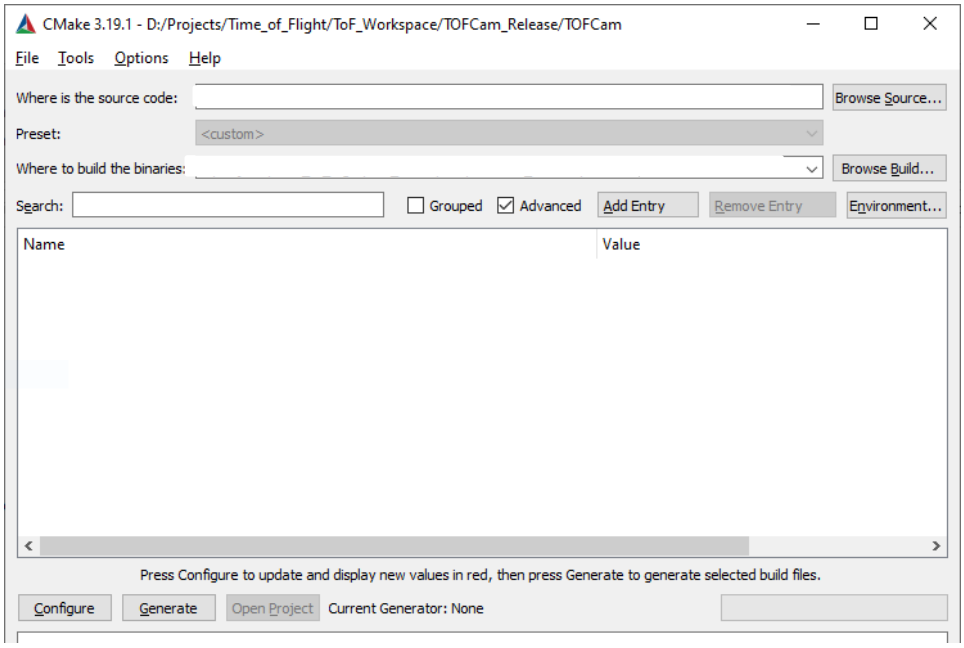


Figure 19: CMake source directory and build directory selection.

2. Once you click configure button another window will open as shown below. Select the required configuration and then click **Finish.**

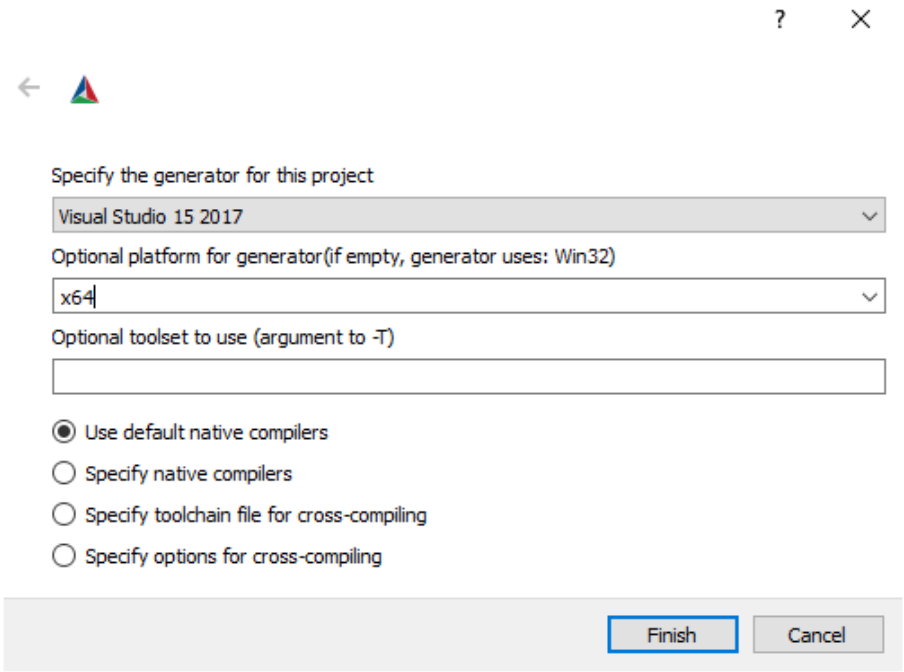


Figure 20: CMake configuration selection.

3. Once you click **Finish** button, configuration will take place. Once configuration is completed successfully, you will get a message telling **Configuration Done** as shown below.

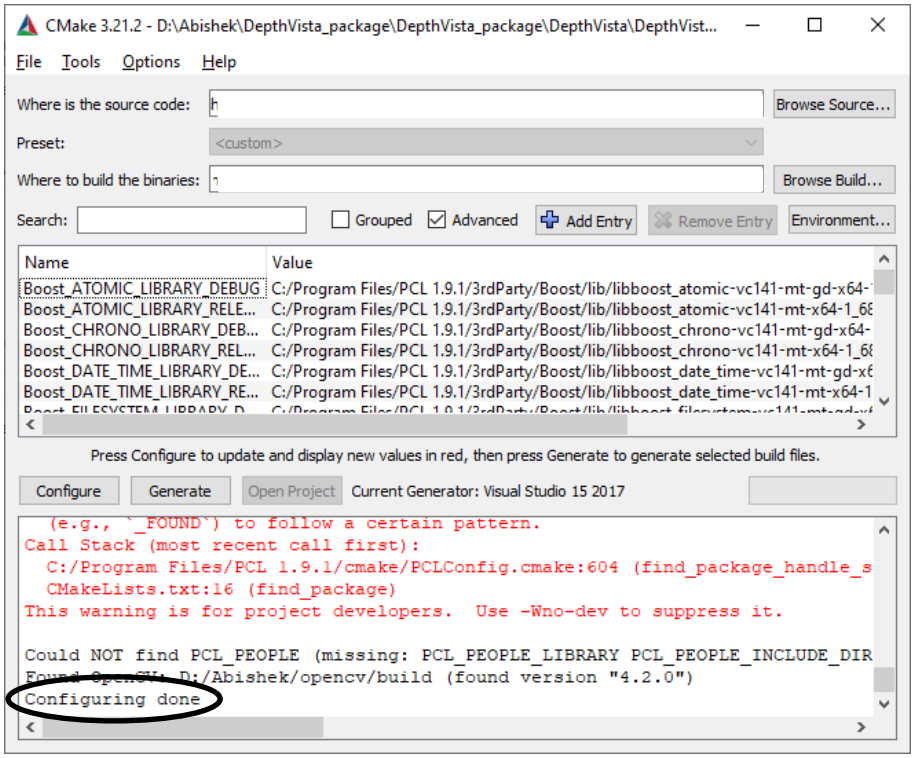


Figure 21: Configuration Done message.

4. Once configuration is Done, click **Generate.** When generation process is completed successfully, you will get a message telling **Generating Done** as shown below.

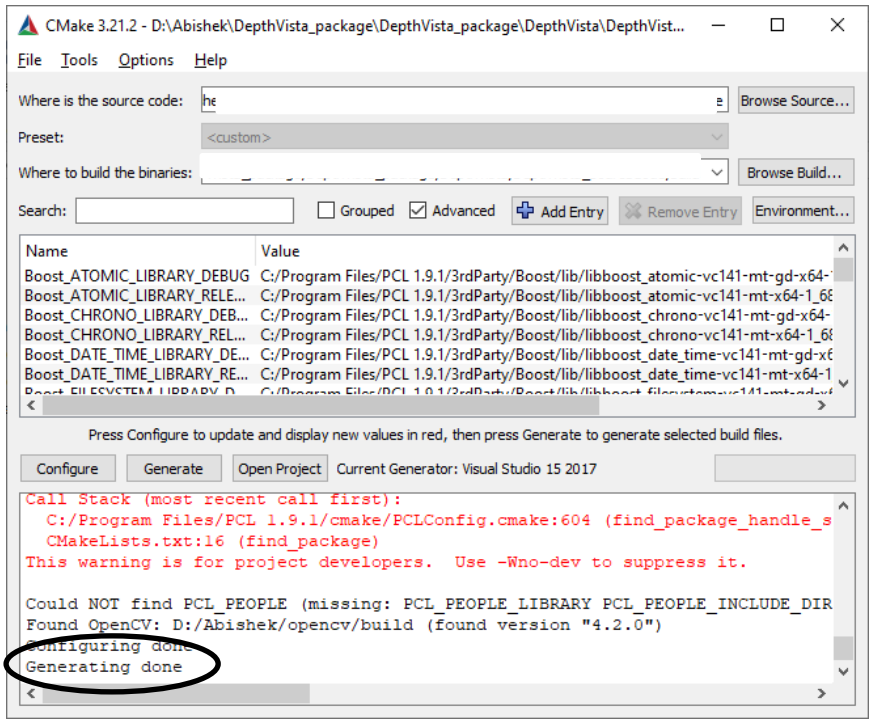
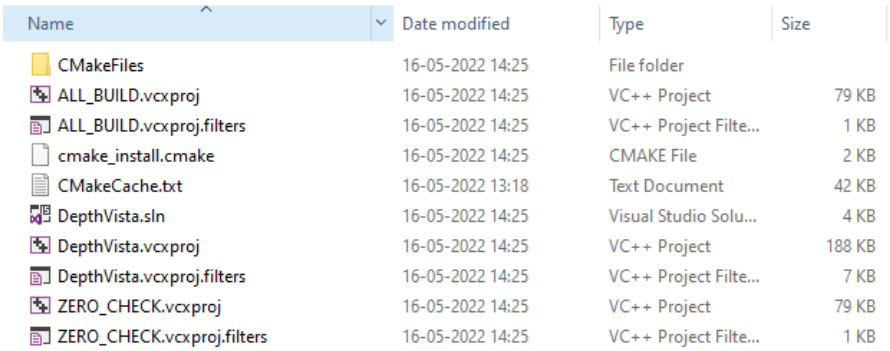


Figure 22: Generating Done message.

Now **DepthVista.sln** file will be generated in folder that you have mentioned for building binaries. The folder will look as shown below.



Name	Date modified	Type	Size
CMakeFiles	16-05-2022 14:25	File folder	
ALL_BUILD.vcxproj	16-05-2022 14:25	VC++ Project	79 KB
ALL_BUILD.vcxproj.filters	16-05-2022 14:25	VC++ Project Filte...	1 KB
cmake_install.cmake	16-05-2022 14:25	CMAKE File	2 KB
CMakeCache.txt	16-05-2022 13:18	Text Document	42 KB
DepthVista.sln	16-05-2022 14:25	Visual Studio Solu...	4 KB
DepthVista.vcxproj	16-05-2022 14:25	VC++ Project	188 KB
DepthVista.vcxproj.filters	16-05-2022 14:25	VC++ Project Filte...	7 KB
ZERO_CHECK.vcxproj	16-05-2022 14:25	VC++ Project	79 KB
ZERO_CHECK.vcxproj.filters	16-05-2022 14:25	VC++ Project Filte...	1 KB

Figure 23: Solution Dir.

Building DepthVista Application

1. Open DepthVista Project in Visual Studio:

    - Open the new instance of visual studio.
    - Click **File->Open->Project/Solution** as shown below

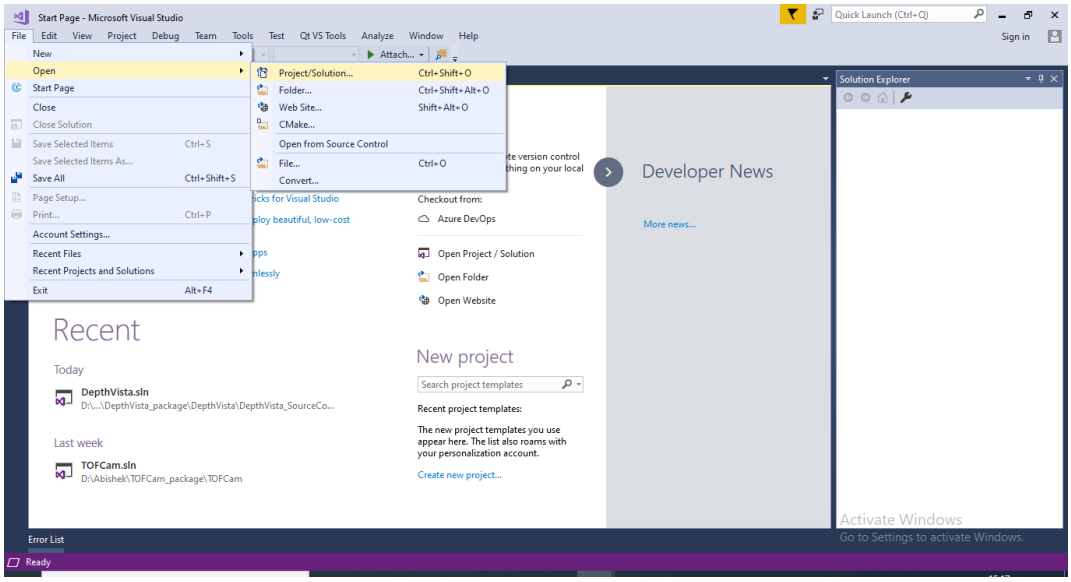


Figure 24: Opening solution file in visual studio.

- Browse the DepthVista project and select **DepthVista.sln.**

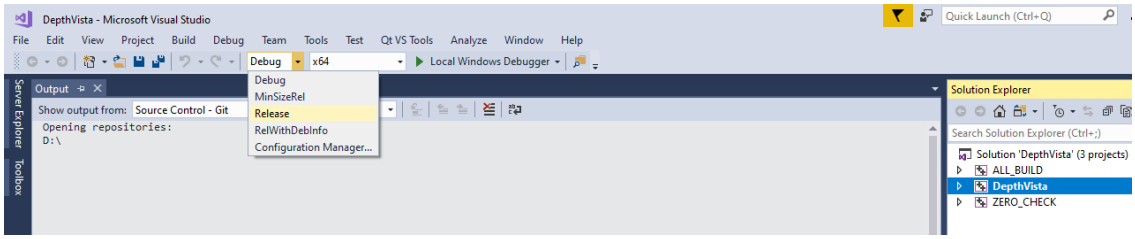


Figure 25: Choosing Solution configuration.

2. Configuring DepthVista project:

- Right click on the DepthVista and select **Properties** as shown below.

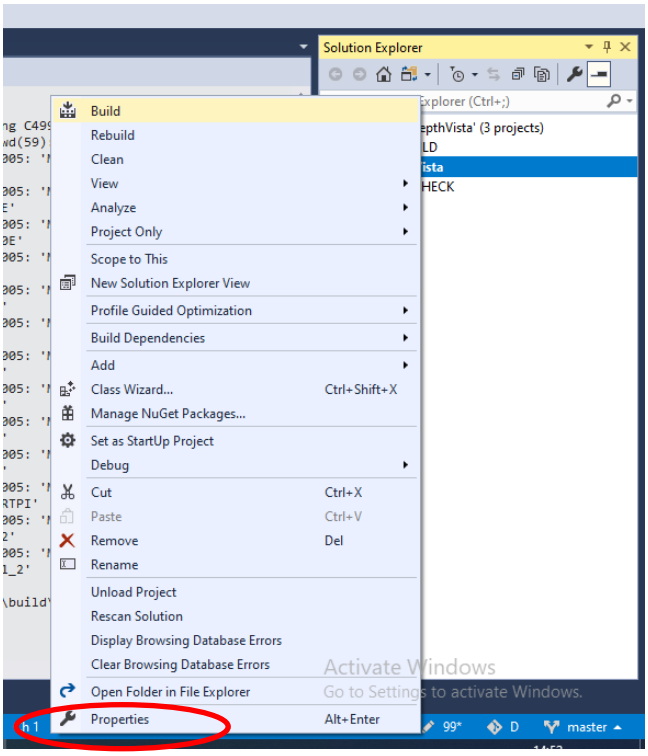


Figure 26: Opening properties page.

- Then the properties window will open as shown below.

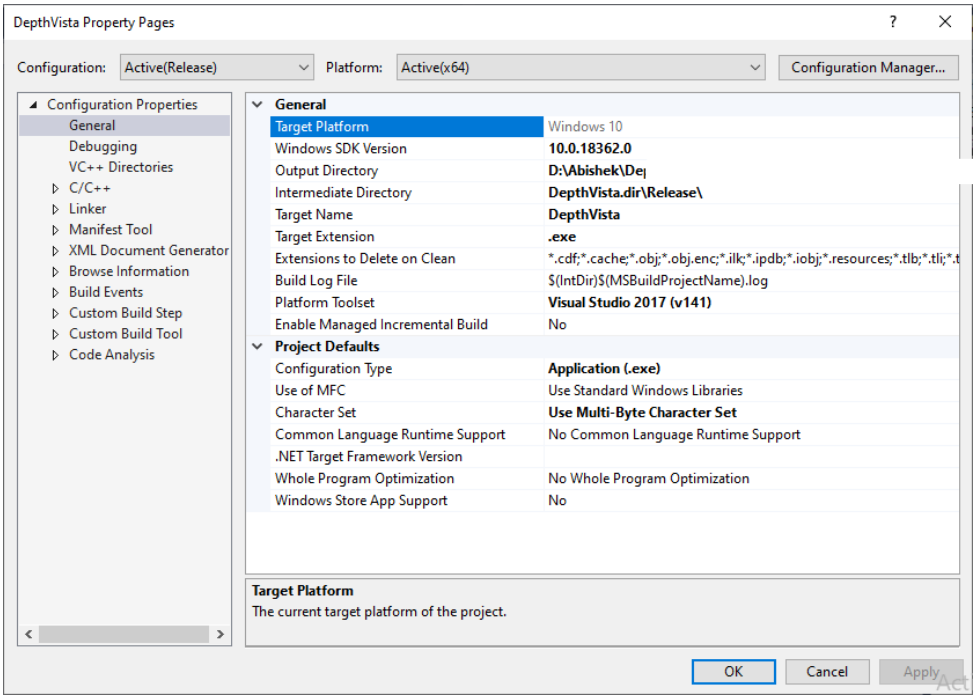


Figure 27: Visual Studio Property page.

- Go to **Character Set,** change it to **Use Unicode Character Set** as shown below.

Note: If you are using Visual Studio 2019, Character Set will be present in **Advanced->Character Set.**

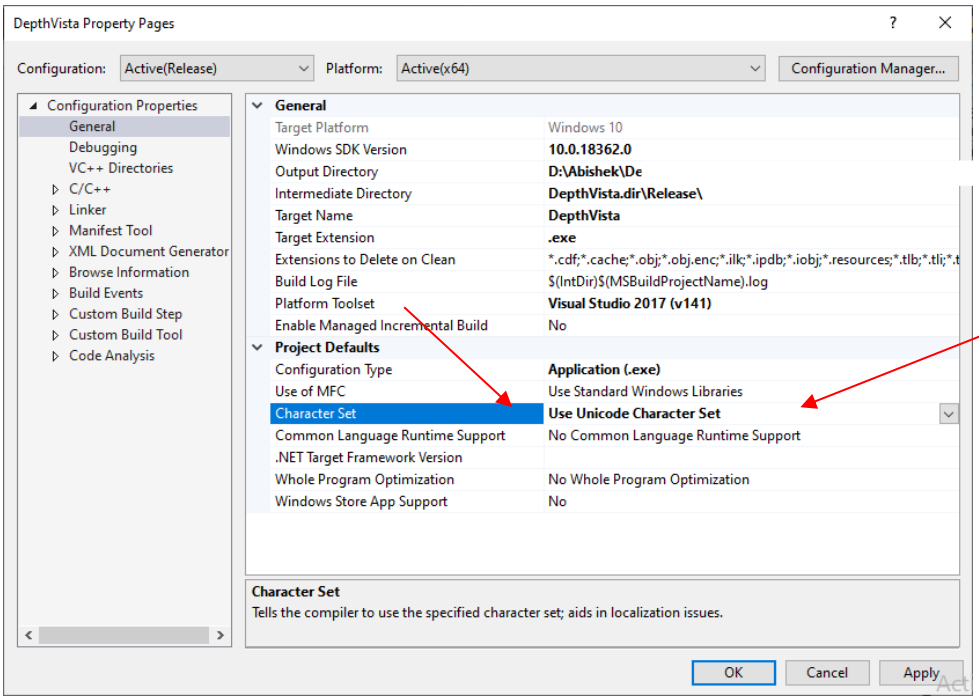


Figure 28: Changing character set.

- Go to **C++->General->Additional Include Directories** and select **edit** as shown below.

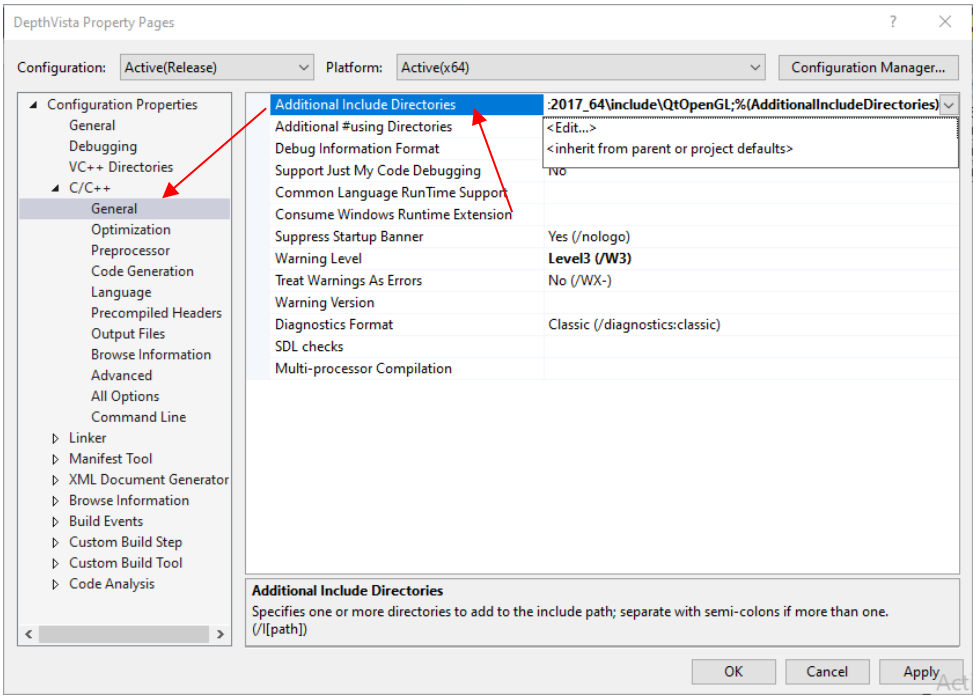


Figure 29: Adding Additional Include Directories.

- Enter the following directory **<ExtractedPath>\SDK\Windows\Include** as shown below. Then Click **OK.**

Note: You can also use Visual studio Macros in Additional Include Directories.

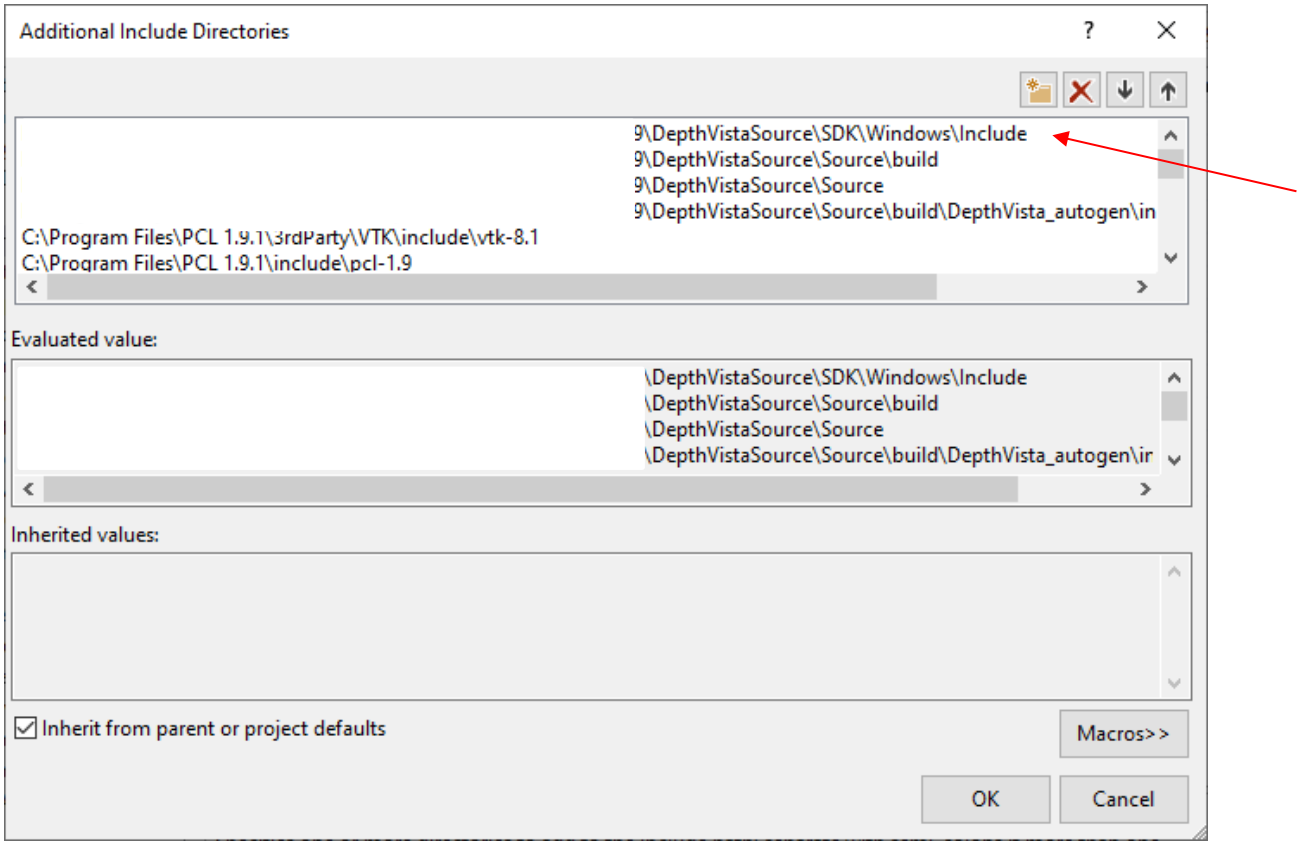


Figure 30: Adding Additional Include Directories.

- Go to **Linker->General->Additional Library Directories** and select **edit** as shown below.

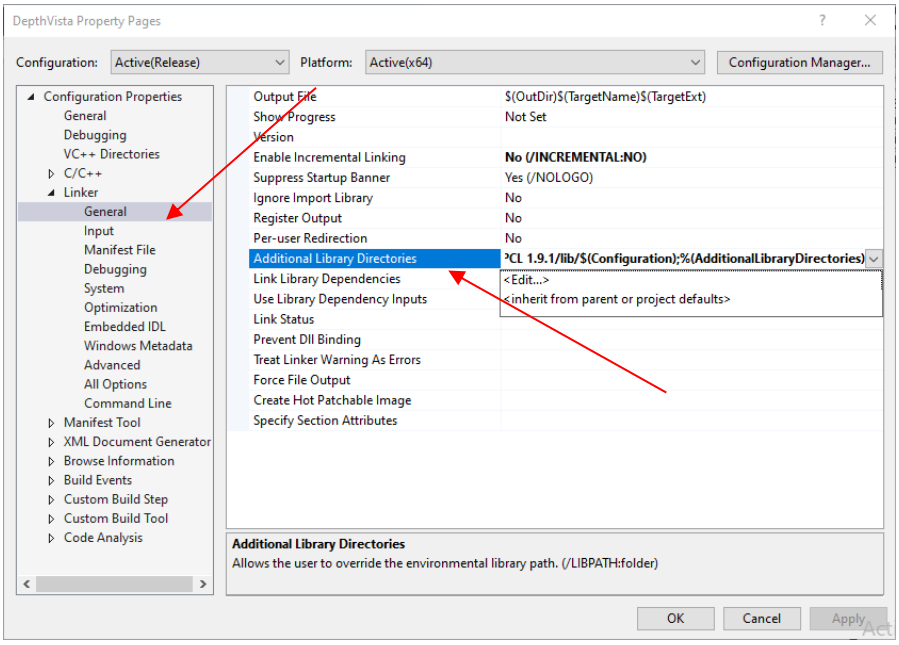


Figure 31: Adding Additional Library Directories.

- Enter the following directory **<ExtractedPath>\SDK\Windows\Lib** as shown below. Then Click **OK.**

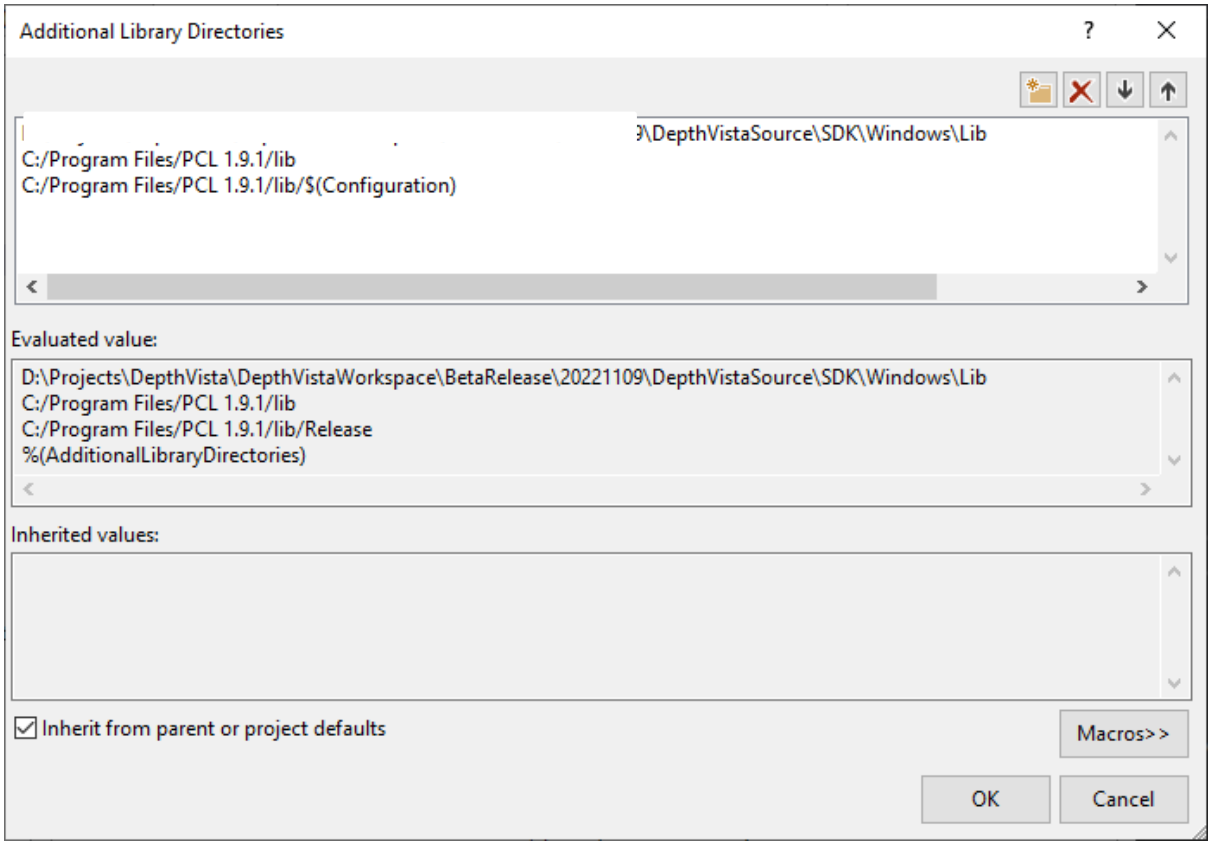


Figure 32: Adding Additional Library Directories.

- Go to **Linker->Input->Additional Dependencies** and select **edit** as shown below

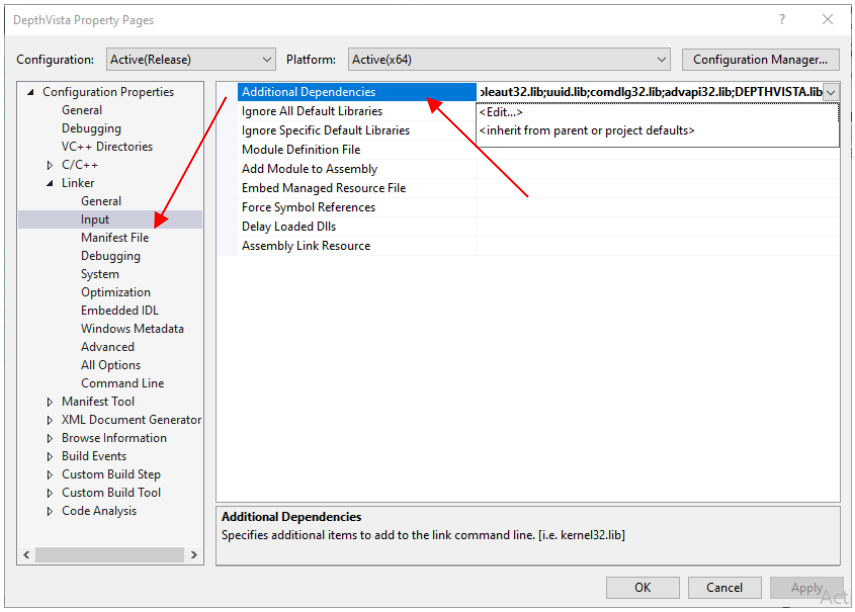


Figure 33: Adding Additional Dependencies.

- Add **DepthVistaSDK.lib** and **opencv_world420.lib** in Additional Dependencies as shown below.

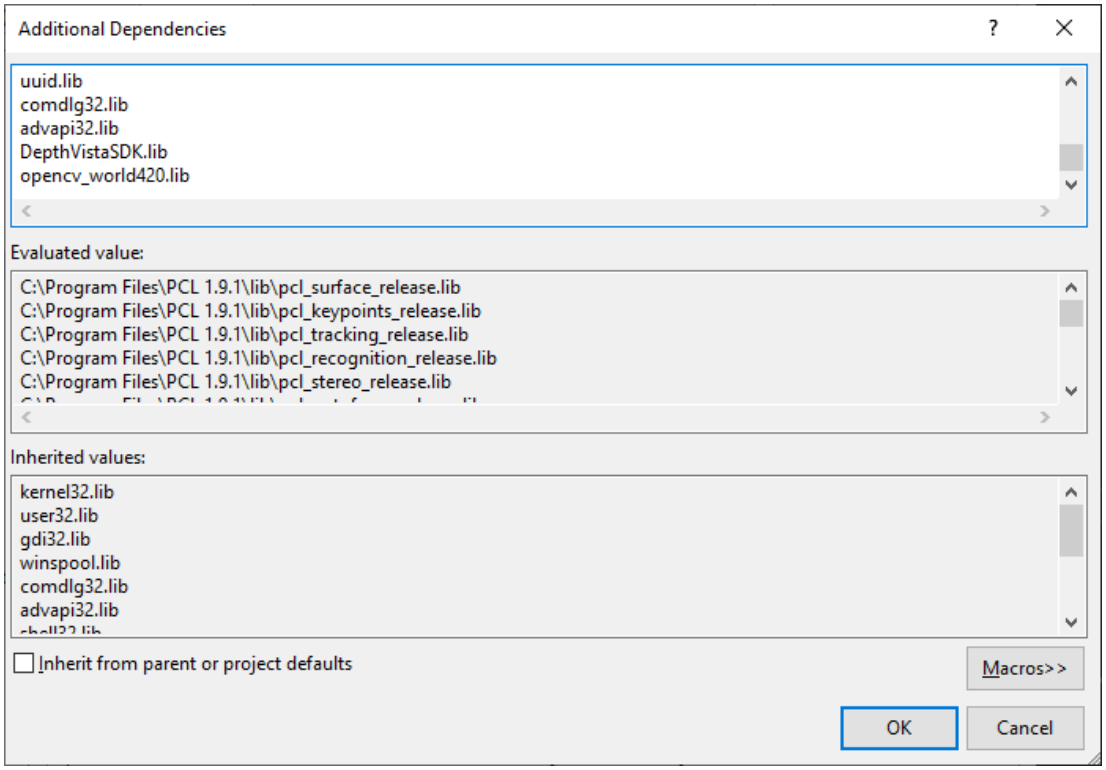


Figure 34: Adding Additional Dependencies.

- After making all the mentioned changes click **Apply** button as shown to apply the made changes in the DepthVista project.

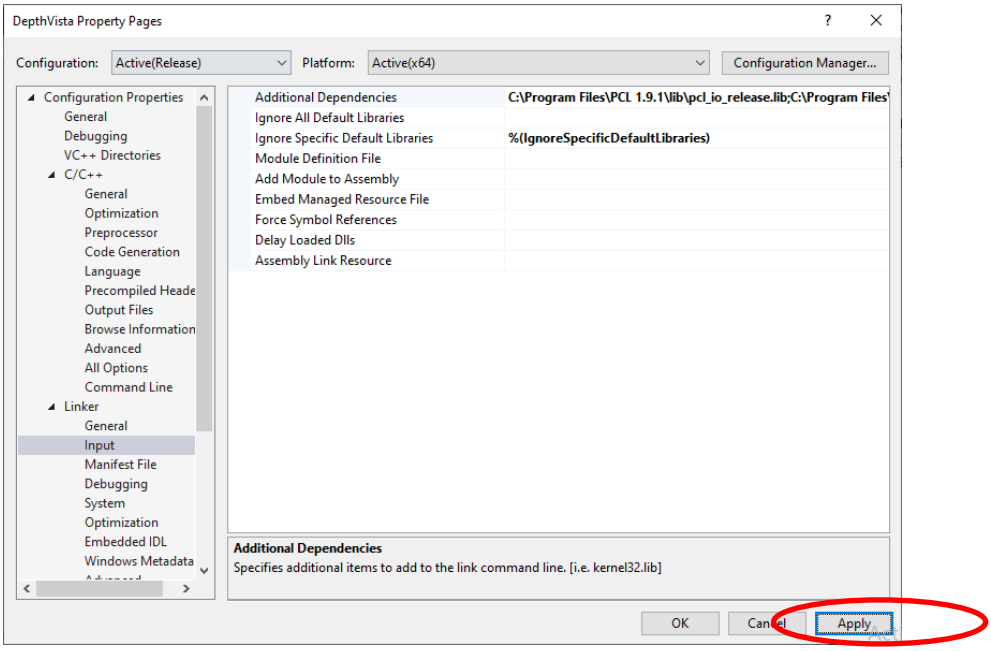


Figure 35: Applying changes to the DepthVista project.

3. Build the **DepthVista** project:

   - Right click on the DepthVista project and select Build Solution(or rebuild solution) as shown below.

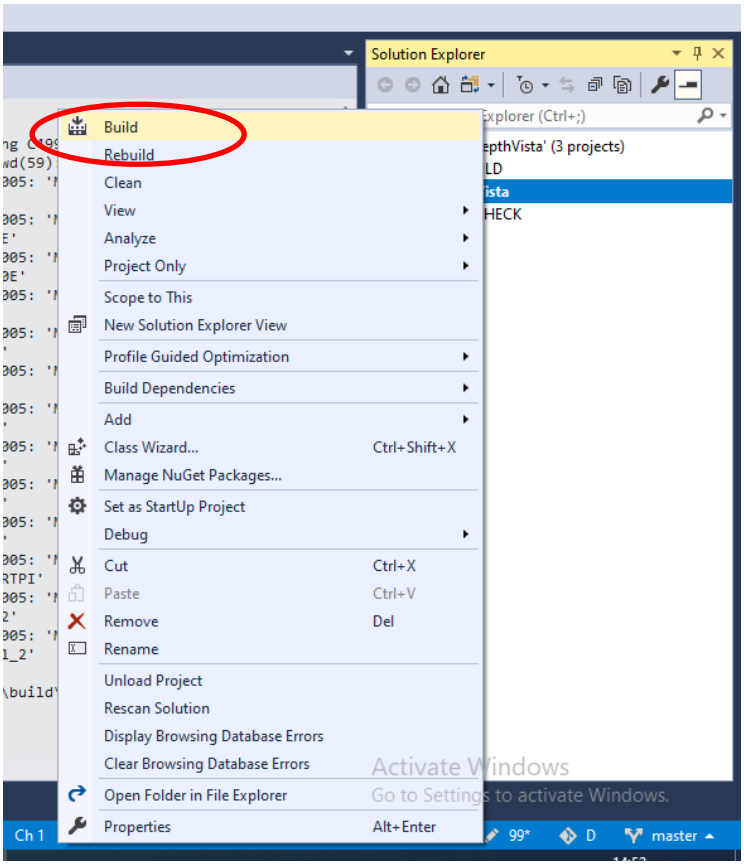


Figure 36: Building DepthVista project.

   - Build the solution.

   - Once the build is success, then you can see the message in the output tab of visual studio as shown below. It will also contain the folder in which the **DepthVista.exe** is placed. It will usually be placed in **Release** directory from Solution Directory.

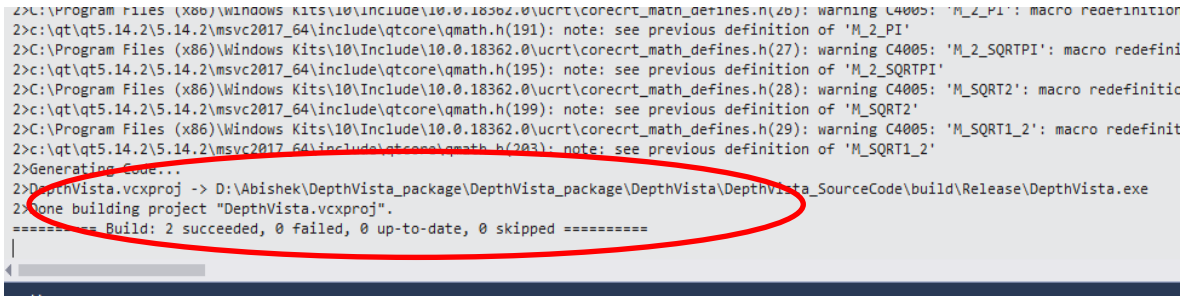


Figure 37: Message on successful build of DepthVista project.

   - After building you can find the **DepthVista.exe** in the Release folder.

Running DepthVista Application

Add runtime libraries (**DepthVistaSDK.dll** and **opencv_world420.dll**) from the provided packages to the directory containing the **DepthVista.exe** file. Place other run time libraries**(.dll)** from Qt and other dependencies near **DepthVista.exe.**

The other runtime libraries required are:

- DepthVistaSDK.dll
- opencv_world420.dll
- OpenNI2.dll
- QtCore.dll
- QtGui.dll
- QtWidgets.dll

Note: QtCore.dll, QtWidgets.dll, QtGui.dll will be present in **<QtInstallationDirectory>\Qt\Qt5.14.2\5.14.2\msvc2017_64\bin**

Note: OpenNI2.dll will be present in **<OpenNI2InstallationDirectory>\OpenNI2\Tools**

1. Run the **DepthVista.exe** application.
2. Follow the *DepthVista_Streaming_Application_User_Manual.pdf* provided in the package.

Troubleshooting

In this section, you can view the list of commonly occurring issues and their troubleshooting steps.

1. **Getting CMake Error at CMakeLists.txt mentioning**

Could not find a package configuration file provided by "Qt5" with any of the following names:

Qt5Config.cmake

qt5-config.cmake

Search for Qt5_DIR in the search box in CMake GUI window. If you find **Qt5_DIR-NOTFOUND,** add the directory containing Qt5Config.cmake to the value of Qt5-DIR. Usually Qt5Config.cmake is present in <QtInstallationDirectory>\Qt\Qt5.14.2\5.14.2\msvc2017_64\lib\cmake\Qt5

2. **Getting qt_qpa_platform_plugin not found error** while running the application.

- Click windows and search for **environmental variable** and as shown below.

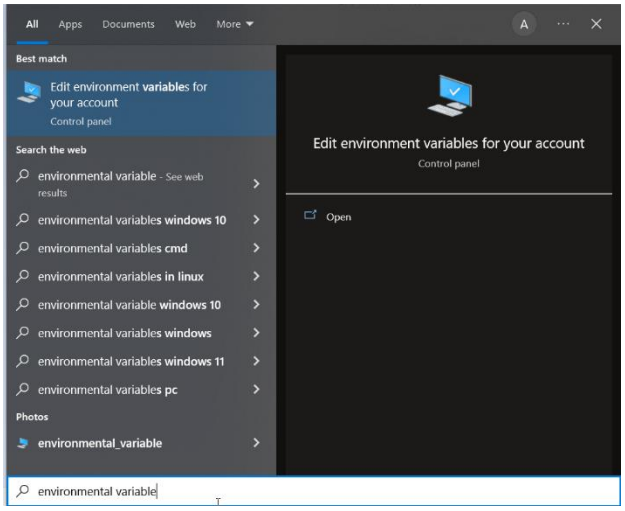


Figure 38: Search environmental variable.

- Click **Environmental Variable** in the window as shown below.

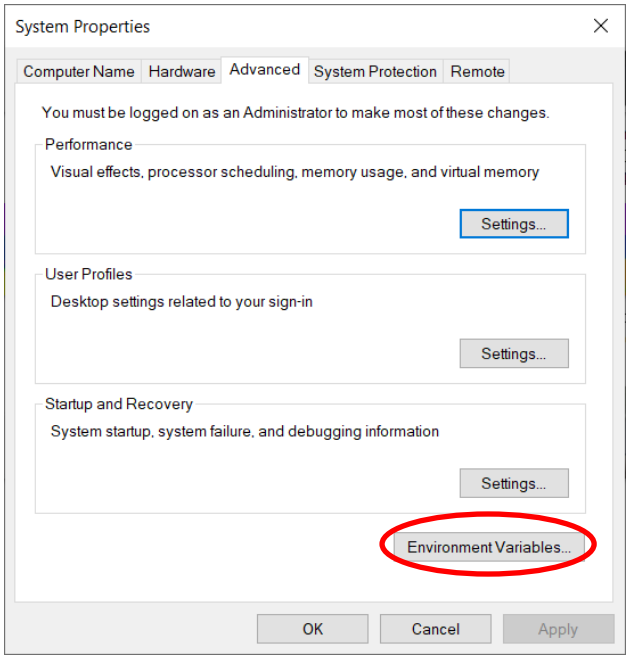


Figure 39: Opening environmental variable tab.

- A new tab will open, Click **Add** as shown below.

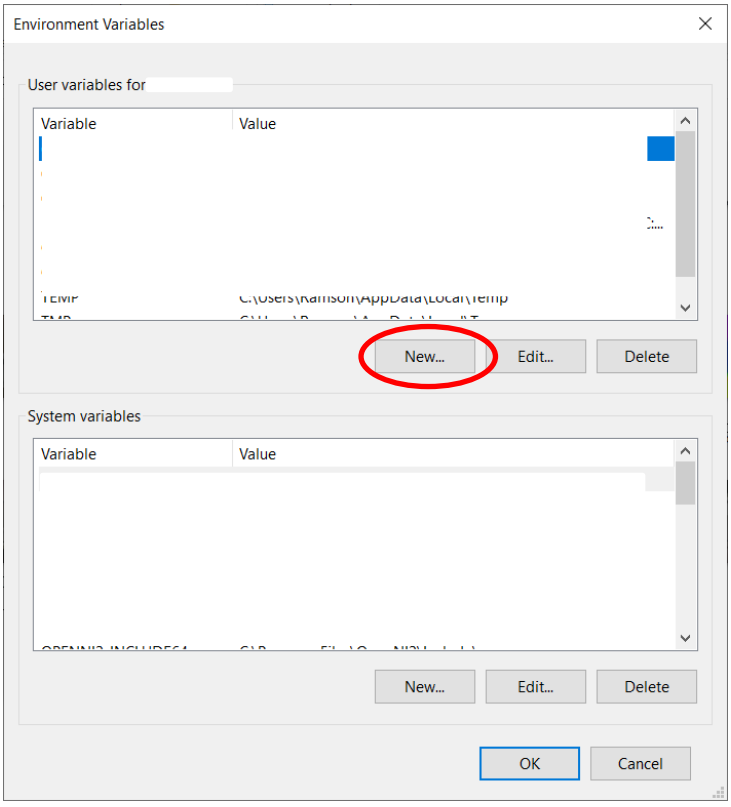


Figure 40: Adding new environmental variable.

- Add **Variable Name** and **Variable value** as shown below. Variable value should be the following path

<QtInstallationDirectory>\Qt\Qt5.14.2\5.14.2\msvc2017_64\plugins\platforms

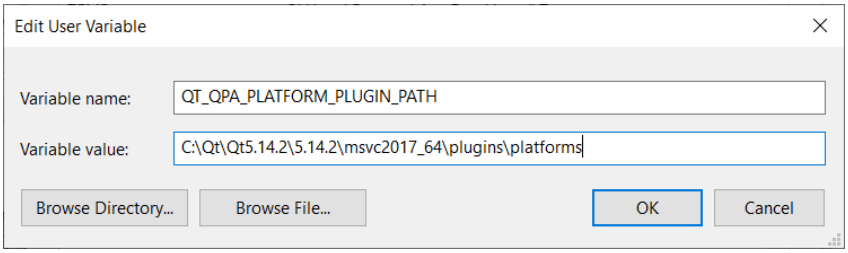


Figure 41: Adding Variable Name and Variable value.

Support

Contact Us

If you need any support on DepthVista product, please contact us using the Live Chat option available on our website - https://www.e-consystems.com/

Creating a Ticket

If you need to create a ticket for any type of issue, please visit the ticketing page on our website - https://www.e-consystems.com/create-ticket.asp

RMA

To know about our Return Material Authorization (RMA) policy, please visit the RMA Policy page on our website - https://www.e-consystems.com/RMA-Policy.asp

General Product Warranty Terms

To know about our General Product Warranty Terms, please visit the General Warranty Terms page on our website - https://www.e-consystems.com/warranty.asp

Revision History

Rev	Date	Description	Author
1.0	30 - May -2022	Initial Draft	Camera Products
1.1	10-November-2022	Changed the build steps	Camera Products