Installation Guide

Installing GraphMIC with QT, ITK and OpenCv

Required components

- **Windows 7 Operating system**
- **Visual Studio 2017 or Visual Studio 2015 compiler.**
- **CMake GUI**
- **Qt 5.11.0 with Qt Creator**
- **ITK**
- **OpenCv 3.4.2**

With a successfully execution of the Installations guide steps, you should be able to build and run the project.

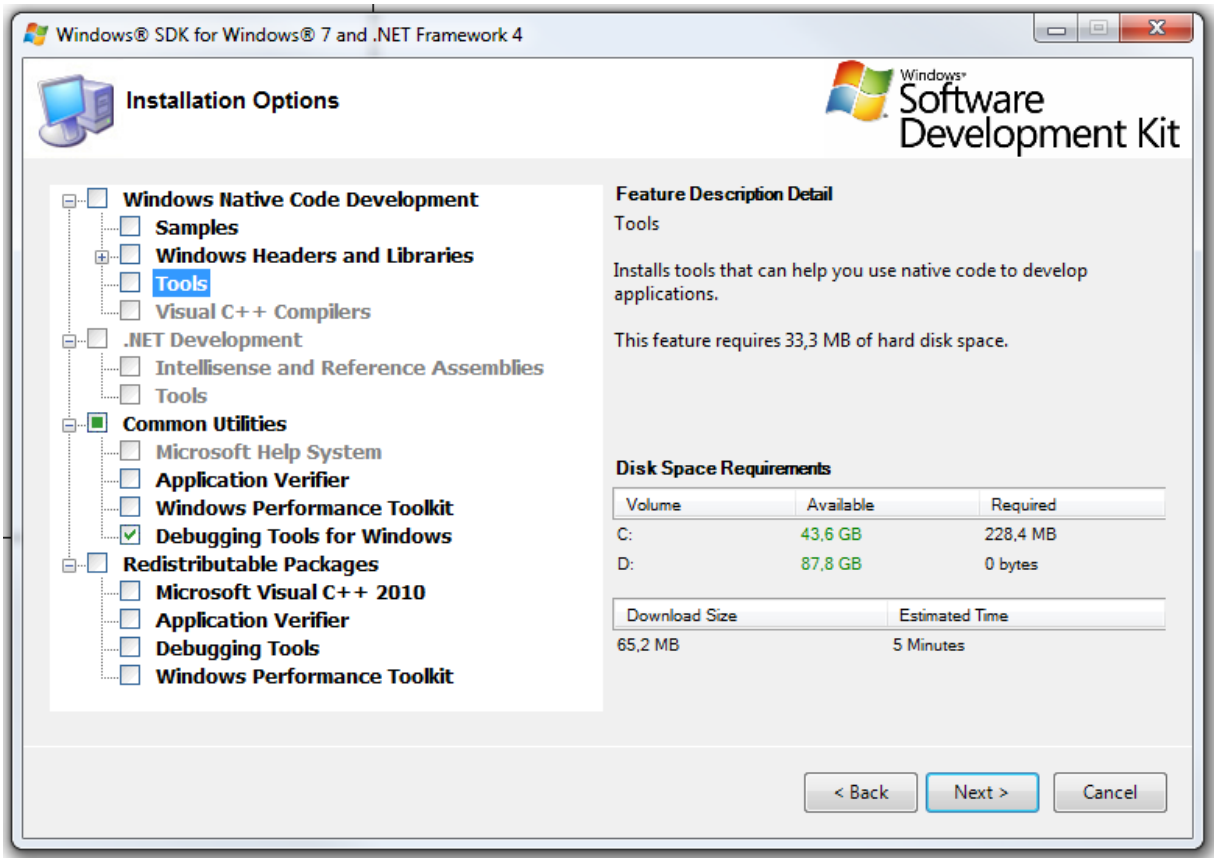
Please read the instructions carefully and pay attention to the complementary images.

Contents

1. Installing Debugging Tools from the Windows SDK

Windows SDK contains a CDB ***Debugger***, you will need it in case you want to debug the application on ***Qt***.

1.1. Go to the official Microsoft site https://www.microsoft.com/en-us/download/details.aspx?id=8279
1.2. Click on ***Download***, to download the installer.
1.3. ***Run*** the installer.
1.4. Read the licence and select ***I Agree***
1.5. Click next.
1.6. ***Select*** the Options like on the image, click next.

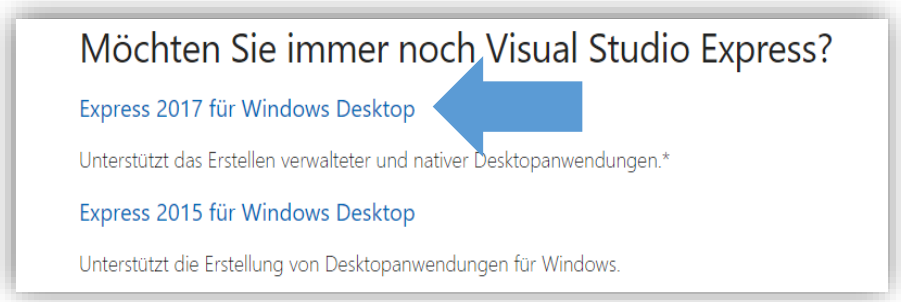


1.7. If the Installer Fails, you must close the installer, uninstall all versions of the Visual C++ 2010 Redistributable and try to install the Debugging Tools for windows again.

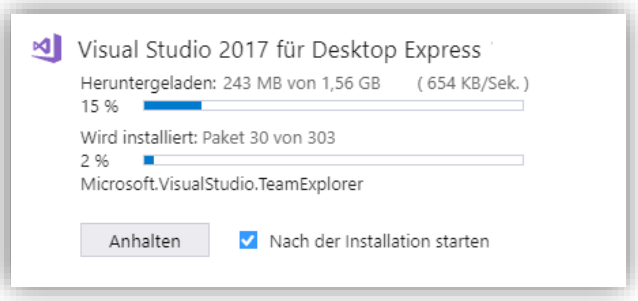
2. Installing Visual Studio

Installing Visual Studio Express 2017 for Windows Desktop

- Go to the Microsoft website https://visualstudio.microsoft.com/de/vs/express/
- Scroll to the bottom of the site and click on ***"Express 2017 for Windows Desktop",*** the installer will be downloaded.



- Go to the downloads folder, select the installer and run it as administrator.
- You may see a pop-up "We have to prepare some things..." click on ***continue.***
- ***Click on install.***

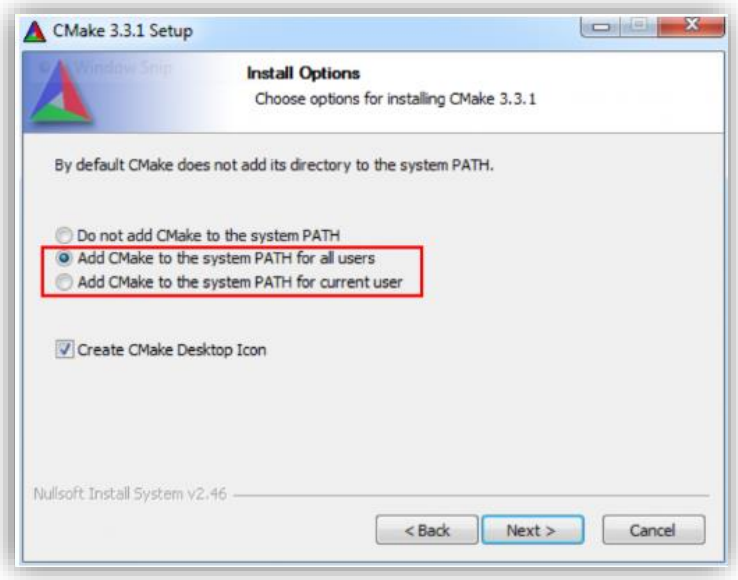


- Wait until the installer is done and close it.

3. Preparing CMake

This step is needed if you do not have a pre-installed CMake version on your system.

3.1. You can download a windows installer of CMake (cmake-3.12.1-win64-x64.msi) from the CMake download page. Follow the instructions provided on the CMake installation page for downloading and installing the software



Note: Add CMake to the system path.

4. Installing Qt

If you already have a Qt version on your system, just open the ***Qt Maintenance Tool***, click on ***next***, ***skip***, select ***add or remove components*** and ***continue, so continue with step 4.4***

4.1. Go to the download site https://www.qt.io/download, go to ***open source***, select ***go open source*** and then ***download.***

4.2. Run the installer, click on ***next***, ***skip, if the installer throw an error like "Failed to connect to server", so click on Options and select "no Proxy"***

4.3. Select the path where you want to install Qt, ***recommended on "D:\lib\Qt"***, click ***continue.***

4.4. Select the components you want to install, the ones you need are:

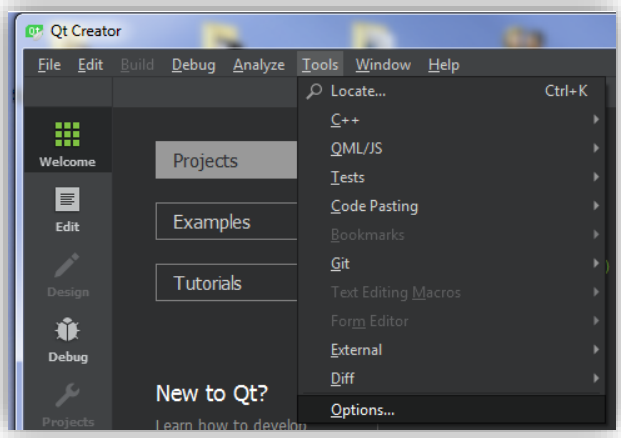
- Under *Qt 5.11.0:* ***MSVC 2015 64-Bit*** or ***MSVC 2017 64-Bit***
- Under Tools: ***Qt Creator 4.7.0 CBD Debugger Support 4.5.1***
- You can add or delete Tools every time using the Qt Maintenance Tool.

4.5. Finish the installation and ***not open*** QtCreator

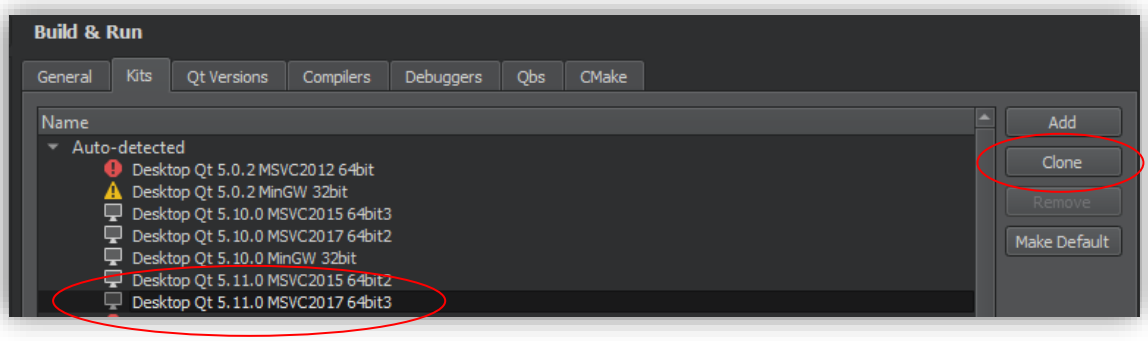
4.6. Add the ***D:\lib\Qt\Tools\QtCreator\bin path to the environments variables, like on step*** *Fehler! Verweisquelle konnte nicht gefunden werden.***.**

4.7. ***Setting the QT Creator up (NMake Generator)***

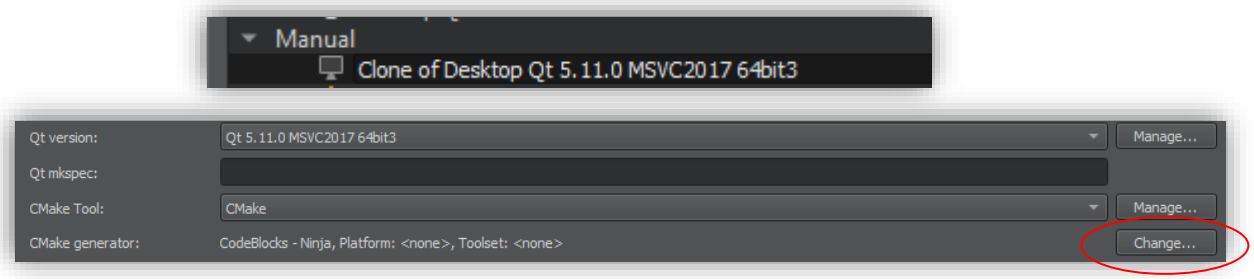
- Open the QtCreator, go to Tools and click Options



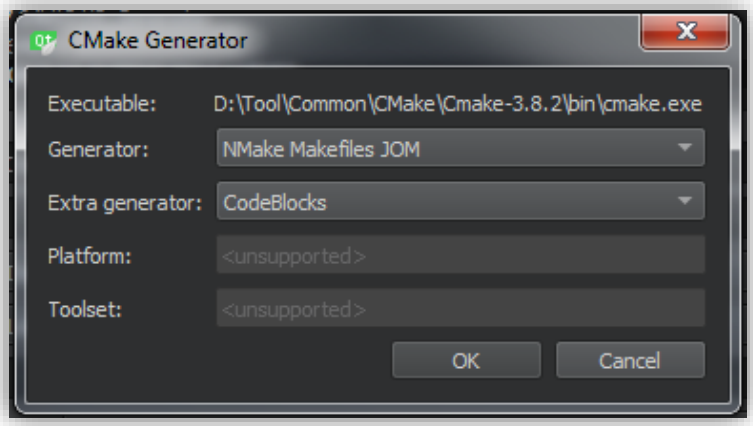
- On the left pane, go to ***Build & Run***
- On the right you will see different tabs, go to ***"Kits",***
- Select the ***MSVC precompiled tool***, you have installed on step 4.4 and want to use an on the right site click on ***clone***.



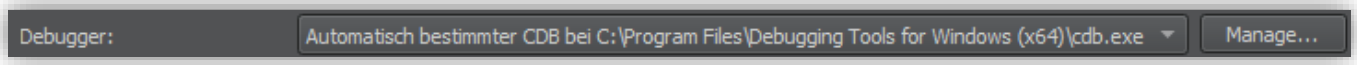
- You will see the ***cloned kit*** will appears on the bottom side of the window, ***select it*** and go to ***"CMake generator" and click on change:***



- Select ***NMake MakeFiles JOM as generator, and CodeBlocks as Extra generator.***



- Click on ***Apply*** and ***ok.***
- ***If you want to debug, make sure you select the correct path to the debugger like on the follow snip.***



- ***Close QtCreator.***
- ***Add the following path to the env variables D:\lib\Qt\5.11.0\msvc2017_64\bin***

5. Installing and Build ITK

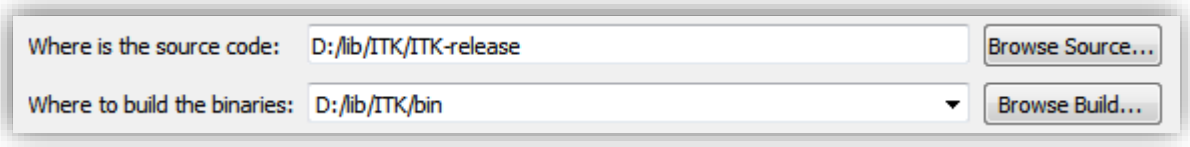
5.1. Create a folder **"*ITK*"** with a subfolder **"*bin*"** (recommended on D:\lib\)

5.2. Go to https://github.com/InsightSoftwareConsortium/ITK

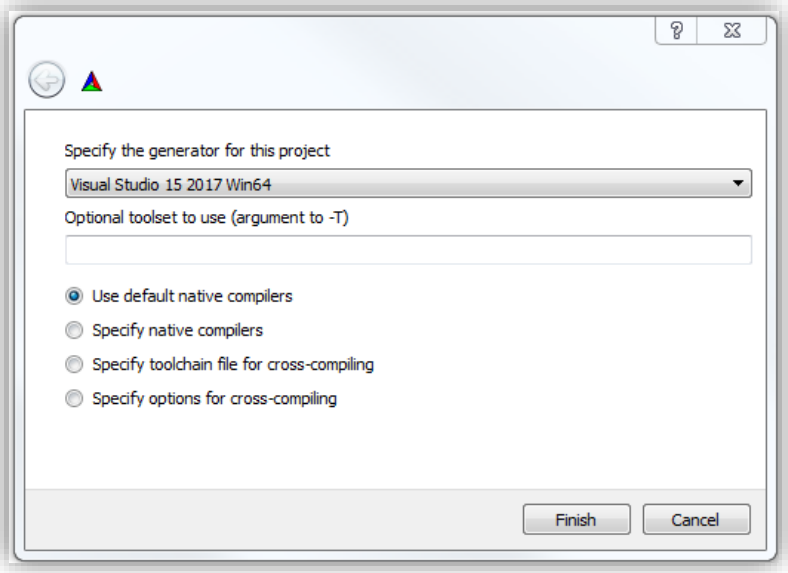
- On the left site on ***Branch*** select "*release*" and on the right, click on clone or download, then click **download zip**
- **Move** the Zip file to the *ITK* folder
- Right-click the Zip file and select **unzip it here**, so it will be a folder "ITK-release" created, this will be the source folder.

5.3. Open the CMake GUI

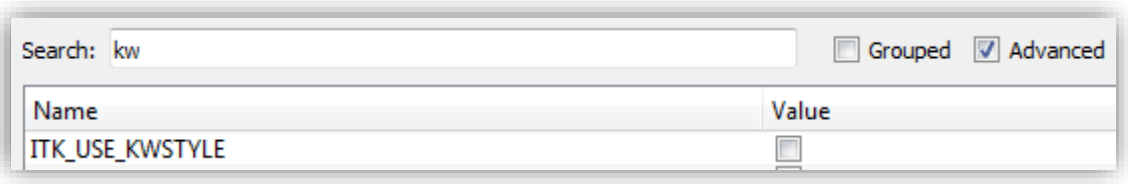
- On "*Where is the source code*" set the path to the unzipped "***ITK-release***" folder
- On *"Where to build the binaries"* set the path to the ***bin*** folder you created before



- Click on ***Generate*** so on the pop-up window select **"*Visual Studio 15 2017* Win64"** (see the image below, if you have Visual Studio 2015, then select **Visual studio 14 2015 Win64**) as generator and click finish, it will take a couple of minutes to configure the project.



- **The output window will tell you the configuring is done,** so search for the component **BUILD_TESTING and uncheck it! then click on configure:**
- **The output window will tell you the configuring is done,** so search for the component **KWSTYLE and uncheck it! then click on configure:**

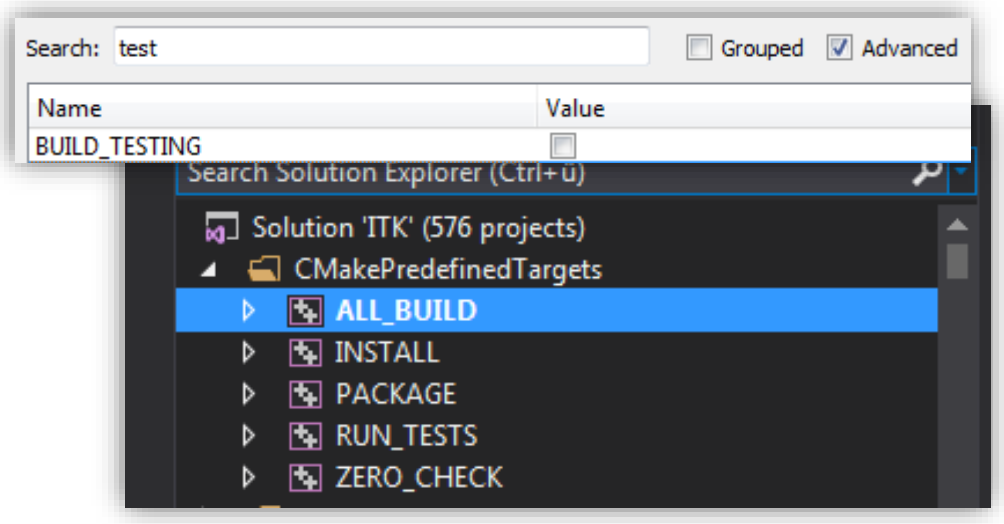


- When the configuration is done, then ***click on generate***, so it will generate a Visual studio project.

5.4. When it finishes the generation, so you can click on “Open Project” and it will be open with Visual studio.

5.5. **On Visual Studio**

- Wait until the project initializes and parses the files. (you can read it on the blue bar on the bottom)

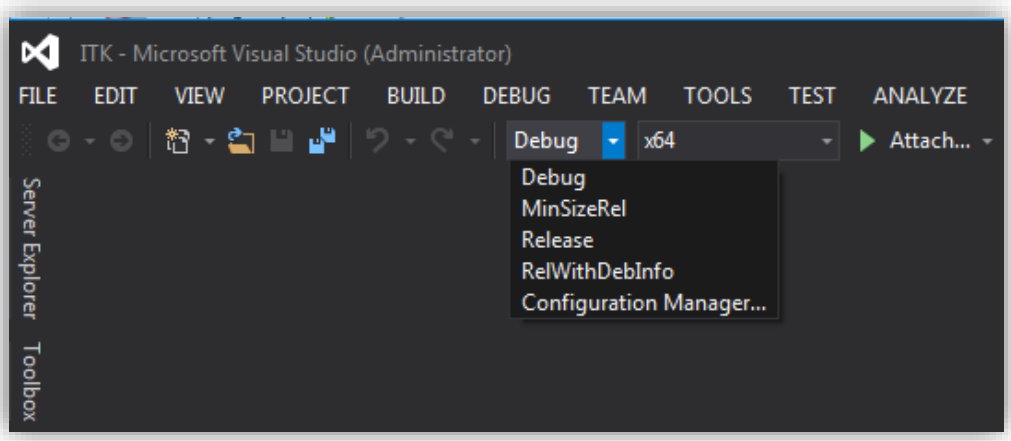


- You see on the solution explorer several project files, go to the ***“CMakePredefinedTargets”*** folder, so right-click on ***ALL_BUILD*** and select ***“build”****, it will take several minutes to complete the process.*

- Make sure you make this step for both **Debug** and **Release** configuration, so Visual studio will generate the appropriated libraries for each of them.
- Right-click on ***INSTALL*** and select ***"build"***, *m*ake sure you make this step for both **Debug** and **Release** configuration. (This step is needed for the CMake to find the properly paths to ITK)
- **If Visual Studio fails to compile the Installation subproject, consider trying it again running visual studio as administrator.**

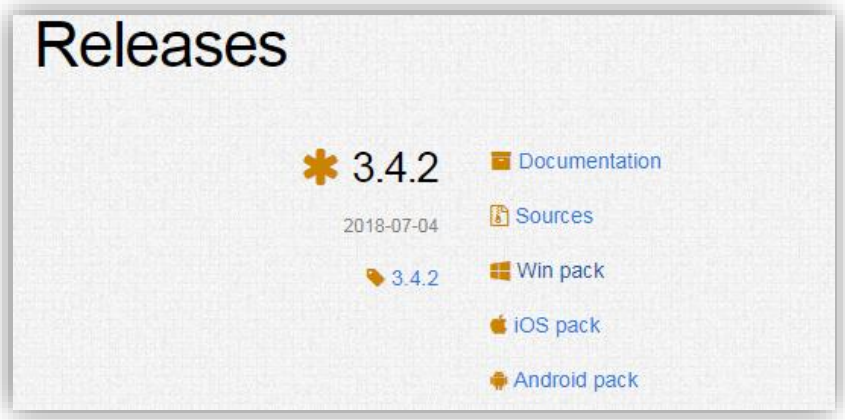
6. Installing and Build OpenCV:

This Step performs the OpenCv build and install, you can download and use the pre-compiled binaries from OpenCv online following the step 6.1 (Recommended) or you can build the binaries from yourself on step 6.2 using the same procedure like with ITK on step 5 but it will take a long time.



6.1. **USING THE MSVC BINARIES: On the Website from OpenCv (https://opencv.org/releases.html) you can find the already build binaries package for Windows or IOS:**

- Select ***Win pack*** from the latest version, the download ***will take up to 2 Hours for each configuration***.



- Go to the download folder and click on the opencv….exe you downloaded.
- Set the path where you want to extract the package (***D:\lib\).***

- Extract the files.
- A ***opencv*** folder will be created on ***D:\lib***
- Make sure you add the build ***path to the environment variables (D:\lib\opencv\build).***

6.2. **BUILDING OF OpenCv BINARIES with MSVC:**
Follow the same Steps like on 5 with following changes:

- **For 5.1 create a Folder OpenCv** with a subfolder **"*bin*" *(recommended on D:\lib\).***
- **For 5.2 Download the OpenCv from** https://opencv.org/releases.html, select sources.
- **Move** the Zip file to the **OpenCv** folder
- Right-click the Zip file and select **unzip it here**, so it will be a "opencv-3.4.2" folder created, this will be the source folder, ***rename*** it to "opencv".
- **For 5.3 omit to uncheck the KWSTYLE component on the CMake Configuration from OpenCv.**
- **Configure and generate with Cmake and continue making the same procedure as step 5.3**

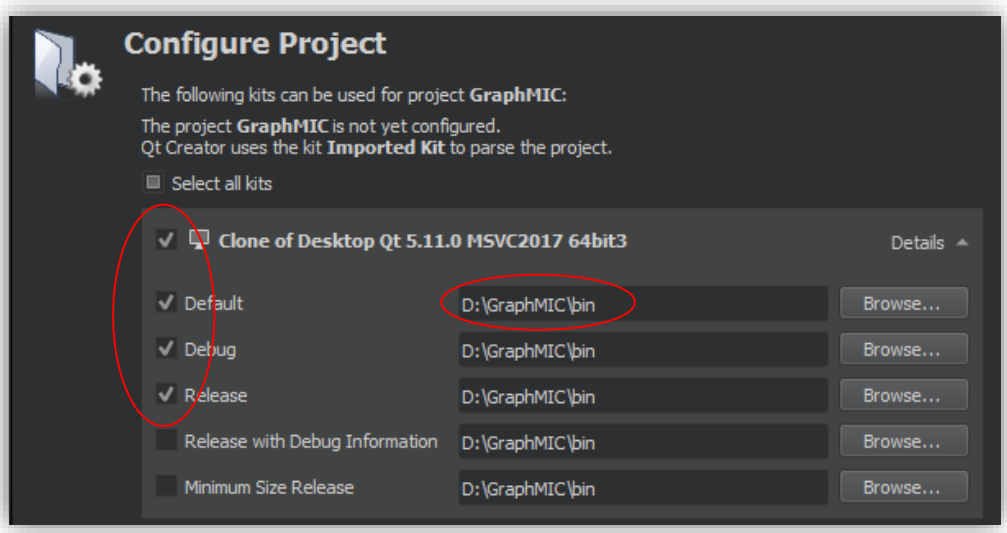
7. Download and configure the project (GraphMIC):

7.1. Clone the project from the following repository: http://github.conti.de/CES/I_CES_MED_1__GraphMIC to you folder ***(D:\GraphMIC)***

7.2. Open the Qt Creator and click ***open project*** on the *Welcome* tab.

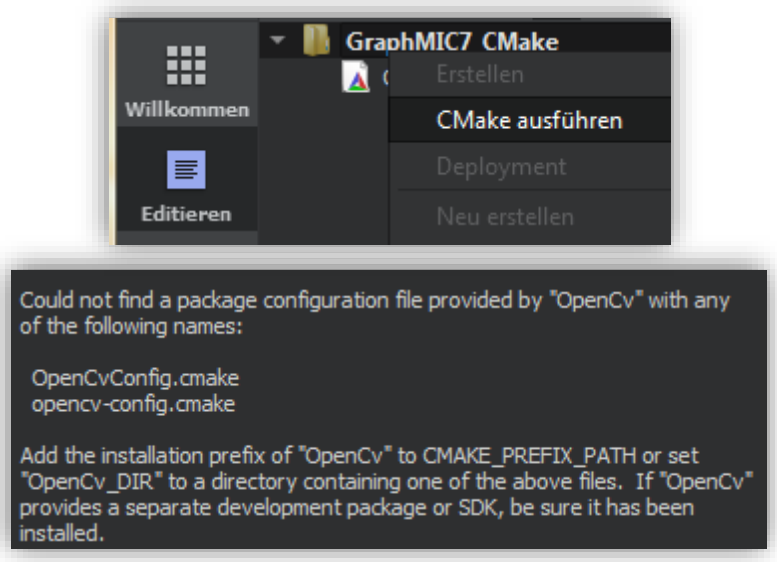
7.3. Go to the path of the project ***(D:\GraphMIC)*** and select the ***CMakeLists.txt*** file

7.4. Qt Creator will show you the possible configurations you can use for your project, **Select the kit you cloned on step 4.7 installing Qt.** then click on ***details*** select *Default, Debug and Release*
and click on *"configure project"*



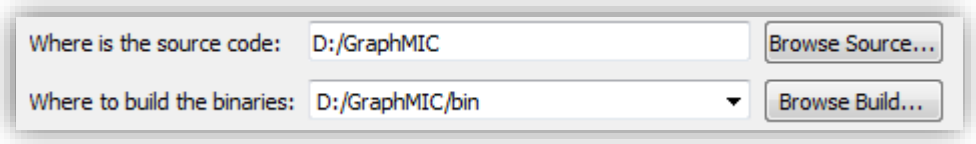
7.5. Make sure as build folder on ***Qt Creator*** is set the **bin** folder **of the project**, if not, then **change to it or create it** like on the following image and go to the tab ***edit*** right-click on the project folder and ***run CMake.***

7.6. ***(Optional)***If you have another configuration and it fails, so make sure you delete the created ***CMakeCache.txt*** on the ***GraphMic0.7\bin*** folder and the ***CMakeLists.txt.user*** on the ***source*** folder before you try it again.

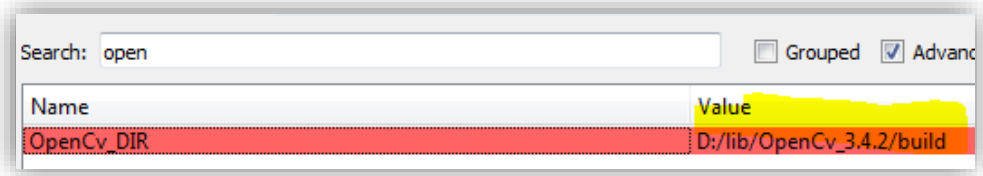


7.7. **(This step can be optional if you add the *opencv build directory* to the environment path variables)** If the CMake ***don't find the ITK or OpenCv*** libraries automatically, then you will see the error on the ***common output*** tab below like on the following image, so you must set the paths manually using the **CMake GUI:**

- **Open CMake Gui**, ***set the GraphMIC source folder and the binary*** folder, click on ***file*** and ***reload cache***



- ***CMake GUI*** and set the correct build path of the ***OpenCv*** directory on the field ***OpenCv_Dir*** and click on ***configure***



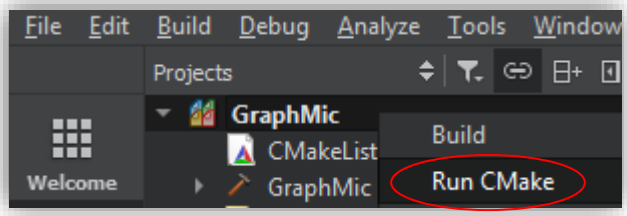
- ***(Repeat the proces for ITK_Dir) Go back to*** Set the correct build path of the ***ITK*** directory on the field ***ITK_Dir*** and click on ***configure, click on reload cache.***
- ***Go to Qt Creator, Edit tab*** and click on ***Run Cmake.***

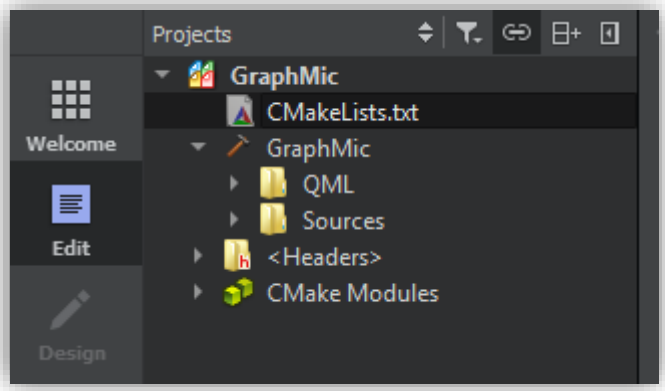
- (Optional)CMake might will throw an error, but the path should be already set, so ***you can ignore it.***

```
CMake Error: Error: generator : Visual Studio 14 2015 Win64
```

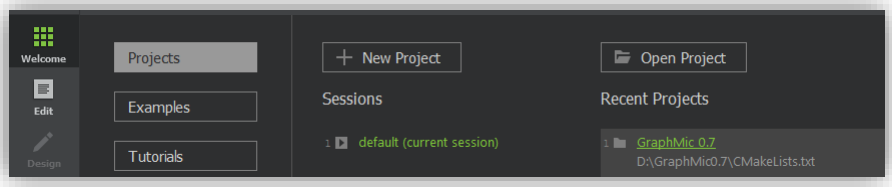
- **Close CMake GUI**

7.8. **Go to Qt Creator** to the tab ***edit*** right-click on the project folder and ***run CMake,*** *the project should be configured jet and* you will see all the folders and files corresponding to the project on the left tab:





7.9. You should be able to build and run the project, maybe you should restart the Qt Creator und re-open it and the project from the recent used projects pane.



7.10. If you want to debug the application in C++ and QML go to ***Projects***, and on the ***Run*** option, click on ***enable QML.***