Kuka Matlab Connector Windows Client Tutorial

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Inhaltsverzeichnis

1 Introduction

Matthias Seehauser Version 1.0

KMC Windows Client was build, to give the programmer who wants to use the KMC dll Files, an easier start. It is a step by step tutorial and based on that the principal connection between an emulated robot (KMCEmulator) and the KMCWindowsClient is described. To connect the client with your robot the steps are nearly the same but for that example look in the KMC Repository for further information.

This Tutorial has the following steps:

- Create TextLogger dll File
- Create KMC dll File
- Build KMC Windows Client
- Build KMC Emulator
- Copy XML Files into the right directorys
- Connect KMC Windows Client and KMC Emulator

2 Creating KMC

For KMCWindowsClient you need 2 DLL Files. The first one is the TextLogger DLL file which is needed by the KMC. Then KMC itself which is also only a dll and can be used in other applications. The KMC dll is now used in the KMCWindowsClient for usage.

2.1 Creating TextLogger dll

First of all start the TextLogger Solution in Microsoft Visual Studio 1.

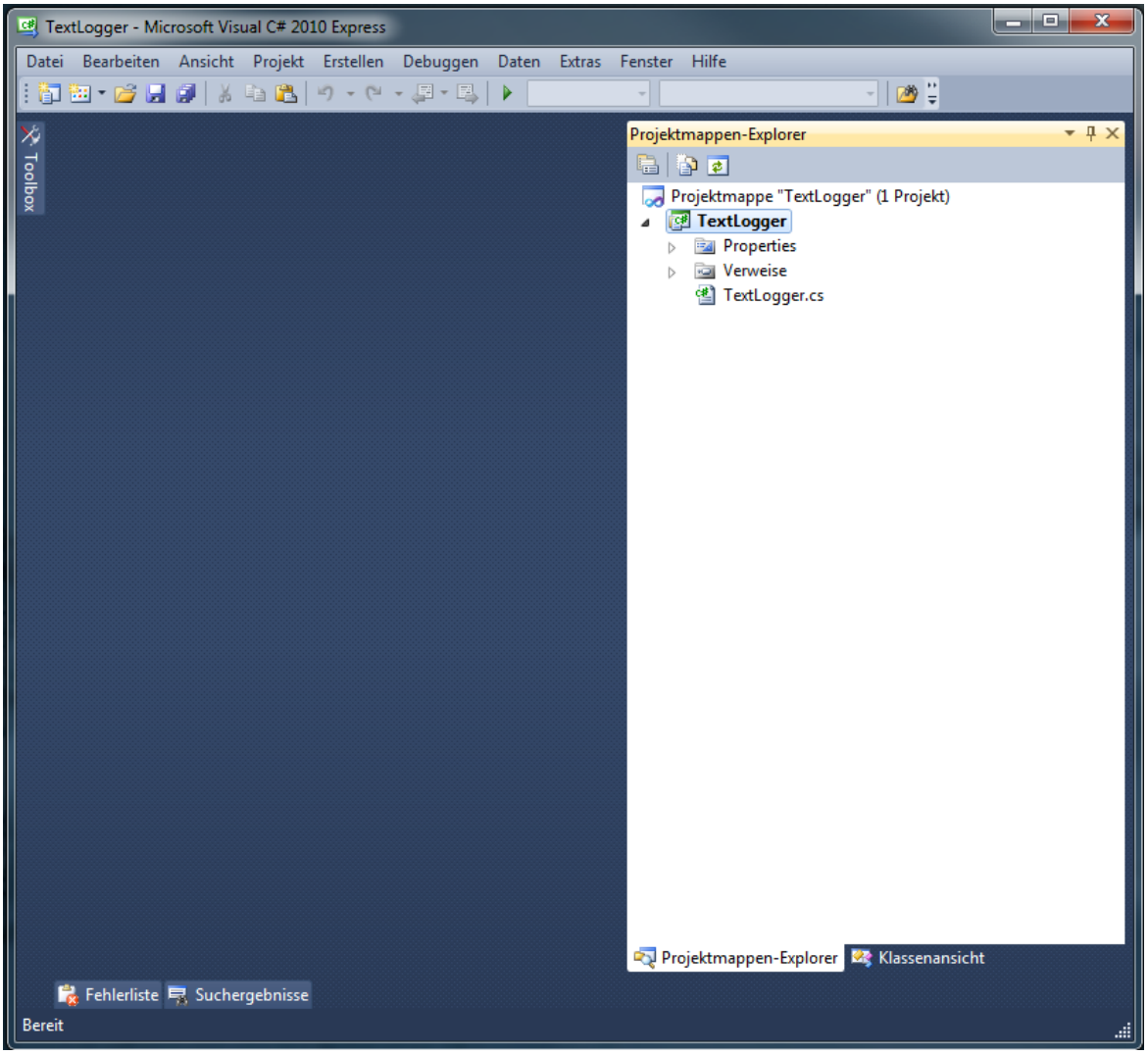

Abbildung 1: Start TextLogger Solution in Visual Studio

The TextLogger needs no other special files so you can Right Click on the Project and then choose Rebuild 2

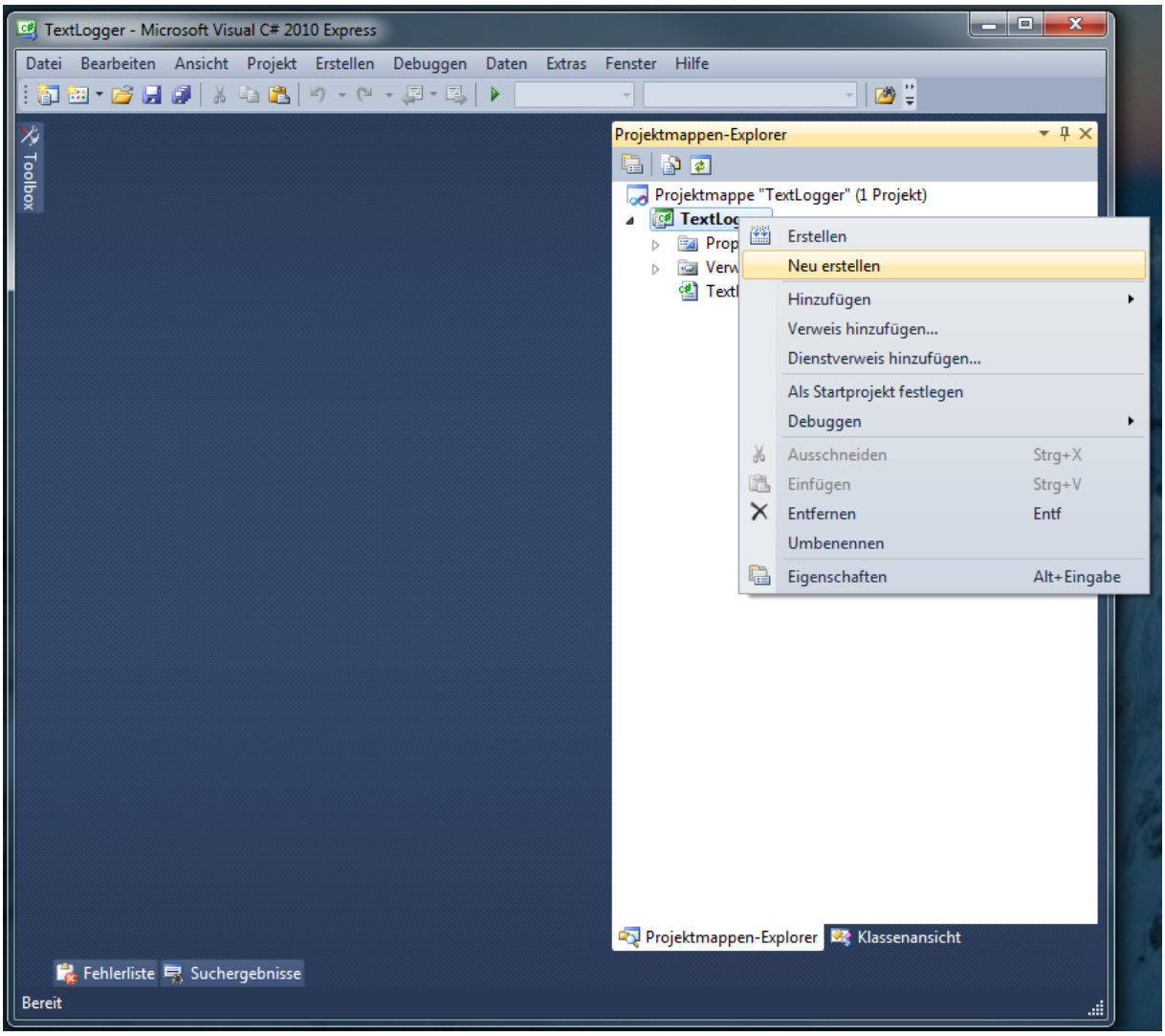

Abbildung 2: Rebuild Textlogger

After that go in Windows Eplorer in your TextLogger Workspace and change into `bin/Release` directory. There you should find the TextLogger Dll File 3

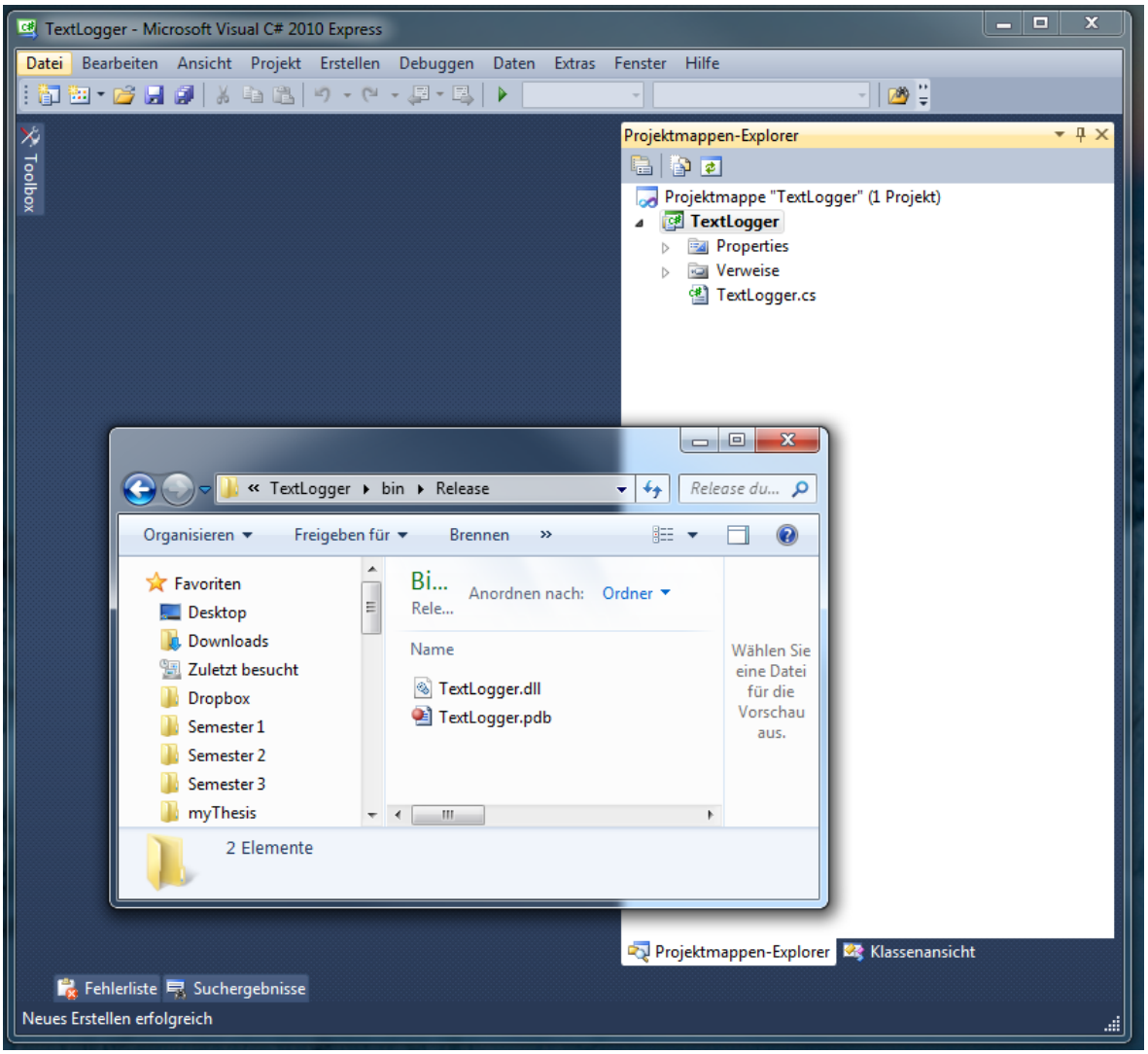

Abbildung 3: Look if TextLogger DLL is build

2.2 Creating KMC dll

TextLogger has been created in the previous step now we have to add this dll file to the KMC and then Rebuild it. So first of all start the KMC Visual Studio Solution 4.

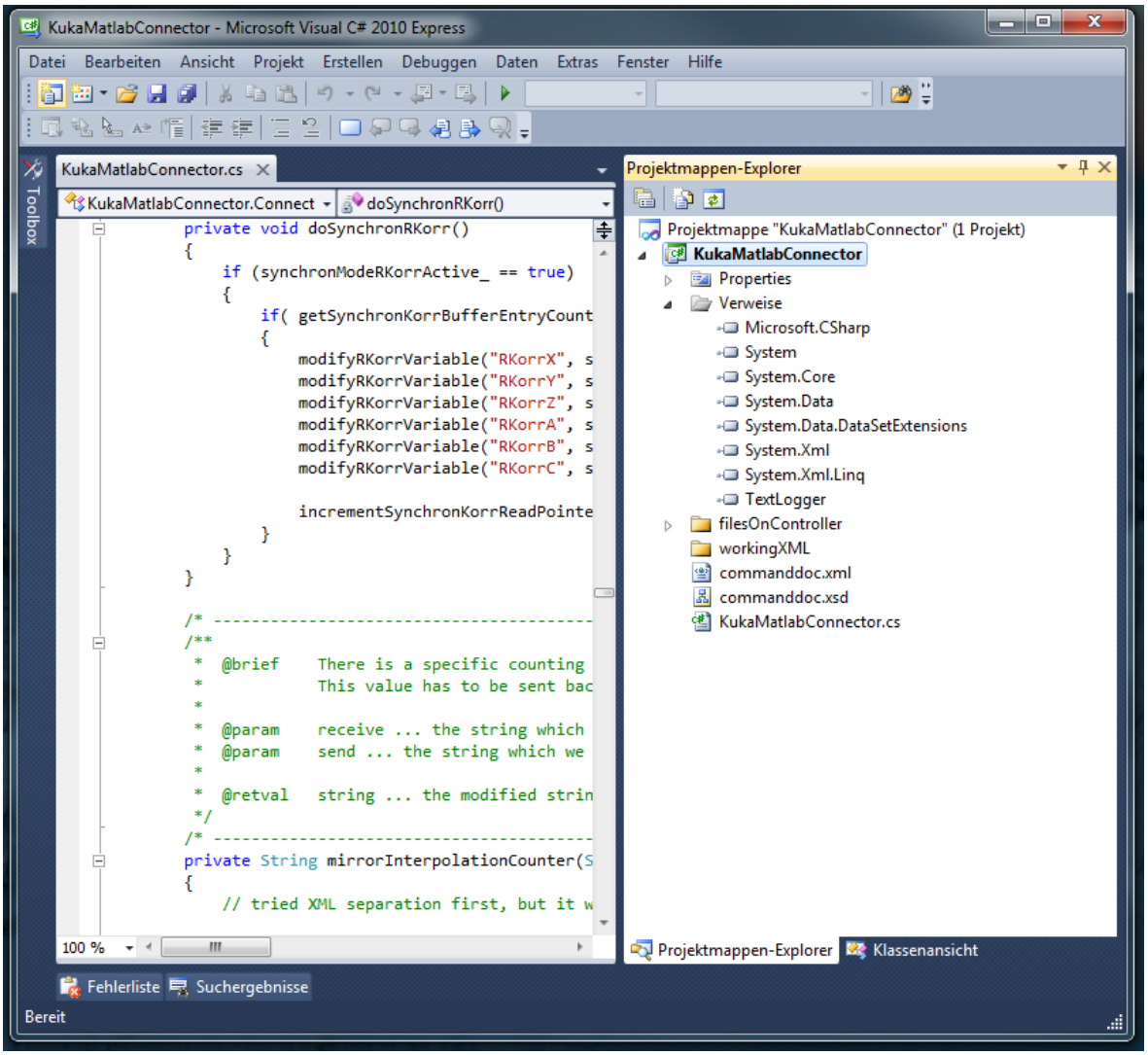

Abbildung 4: Start KMC Solution in Visual Studio

Now open the Solution Explorer and there open the References Subtree. You should see there one missing TextLogger Entry. Lets remove it and add newly add it 5

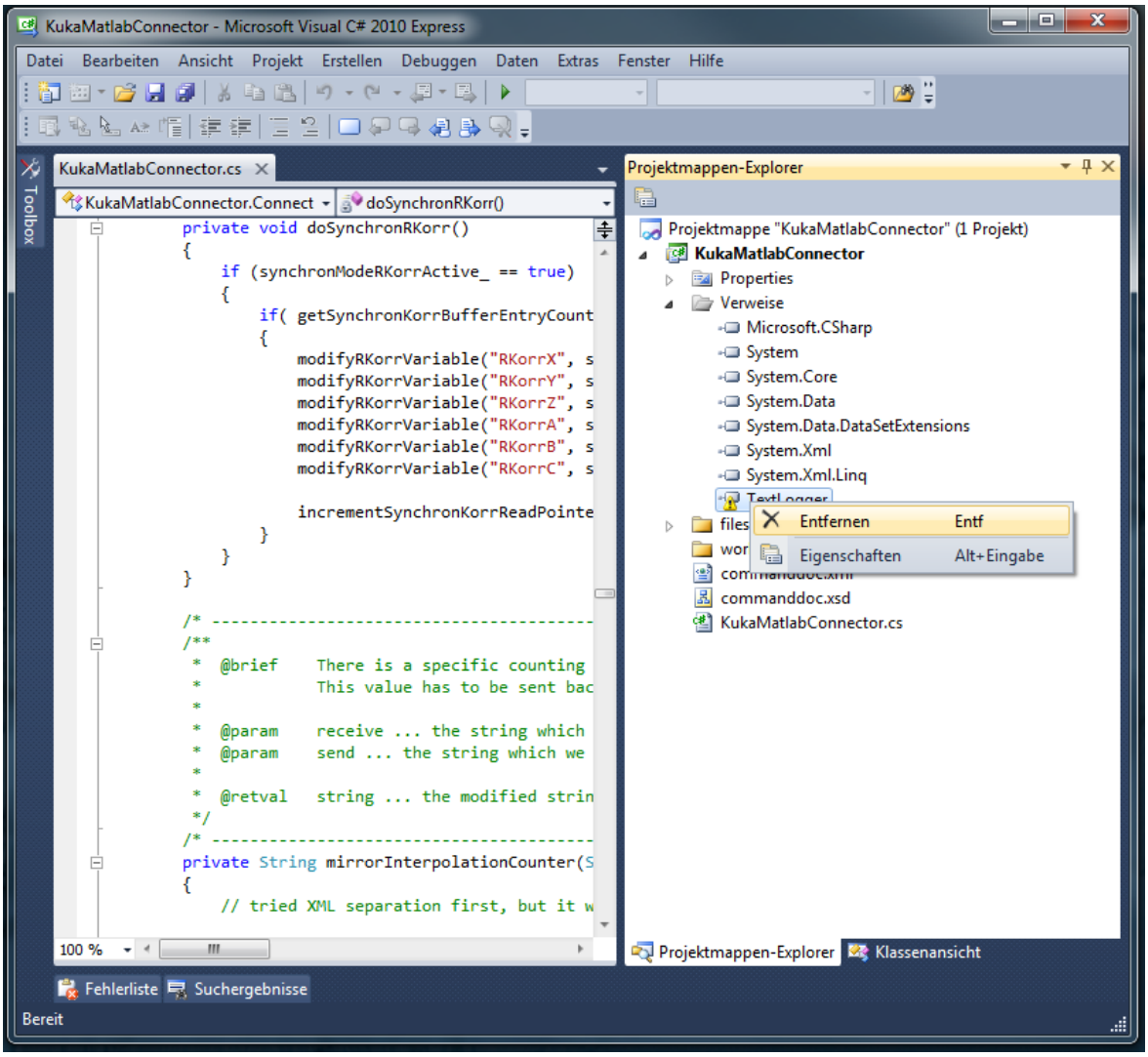

Abbildung 5: Remove TextLogger Reference in Reference Subtree

Lets add the TextLogger Reference now. Right Click on the Reference Folder and choose Add Reference 6

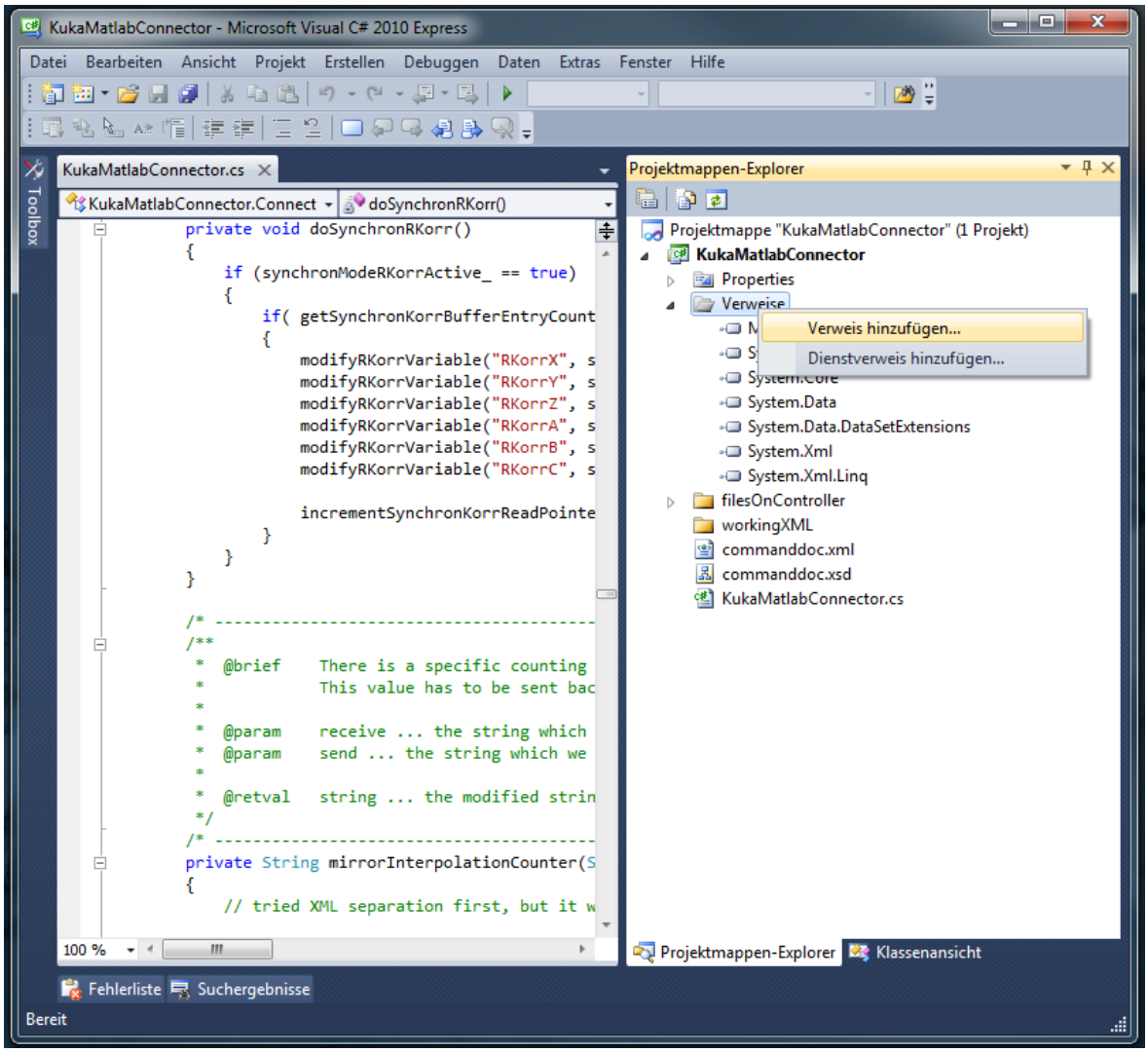

Abbildung 6: Add TextLogger Reference to Reference Folder

Choose the the Browser tab, now navigate to the directory of the TextLogger workspace with the dll binary (*/TextLogger/bin/Release/TextLogger.dll) 7

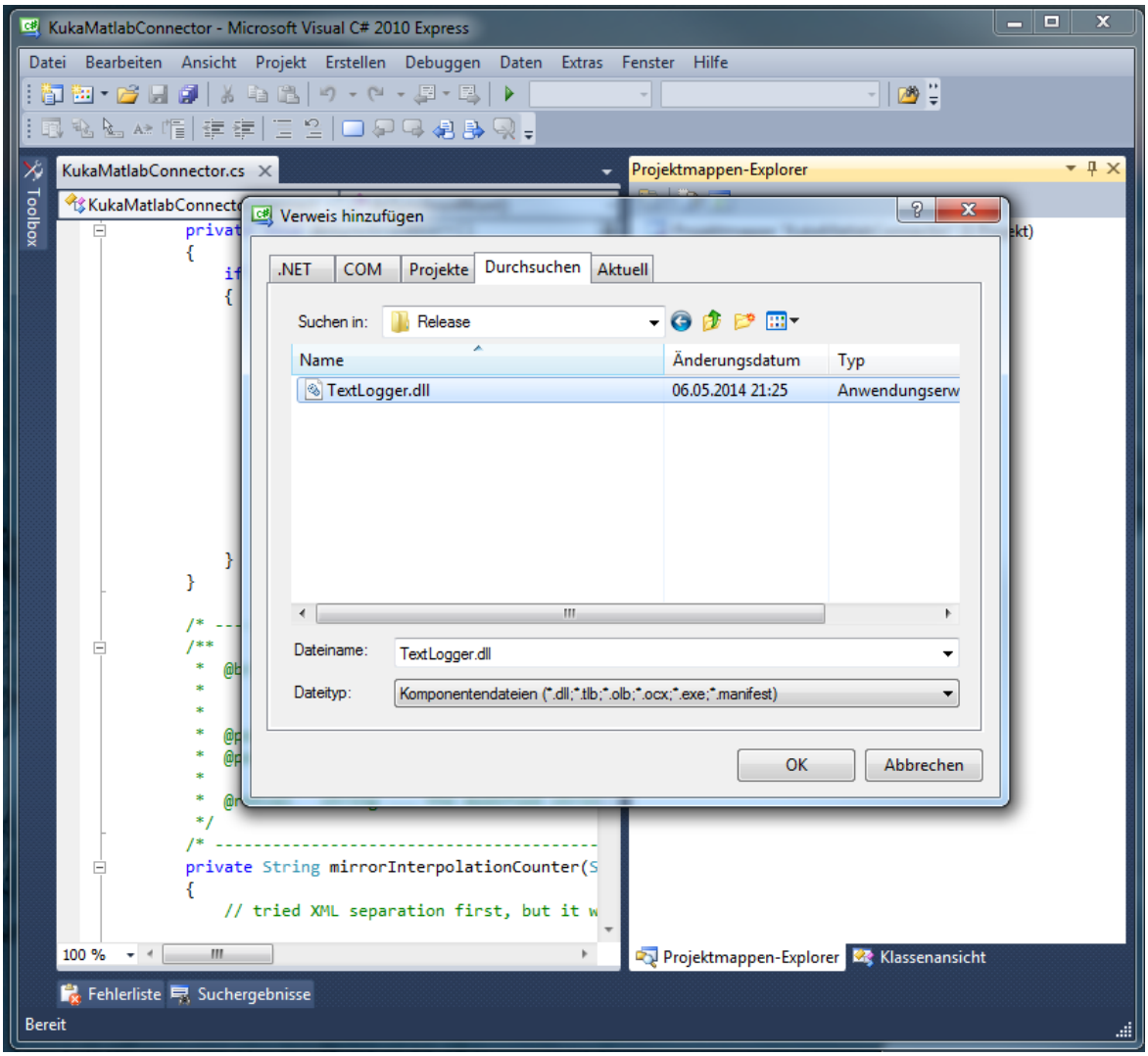

Abbildung 7: Choose TextLogger directory and add TextLogger dll

We should be ready now to rebuild the KMC. Just go to the Project and then Right click on it. Choose Rebuild to make the KMC dll 8

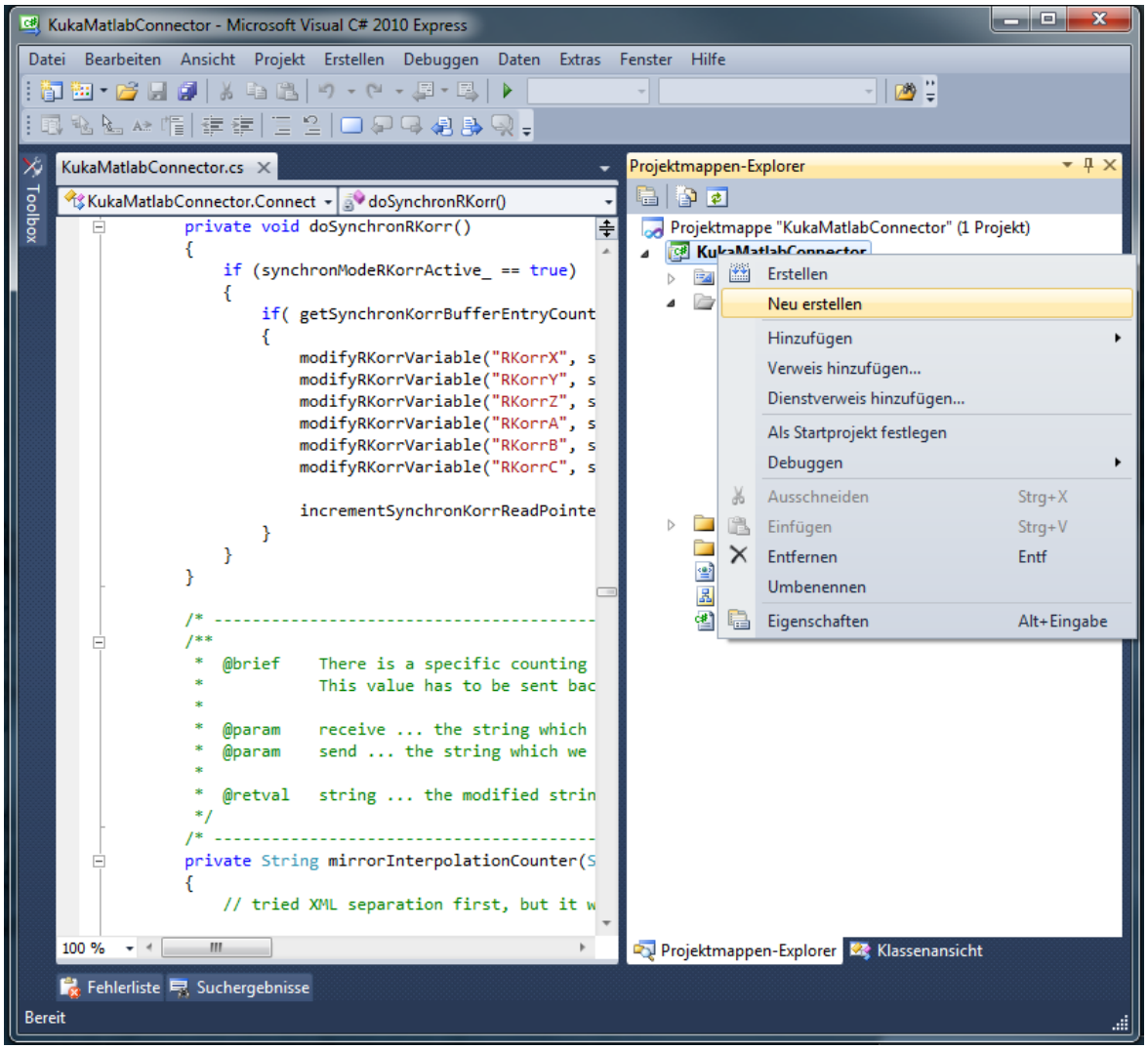

Abbildung 8: Rebuild KMC Dll

Navigate to your KMC workspace and go into `KMC/bin/Release` there you should see now the TextLogger.dll and the KukaMatlabConnector.dll 9

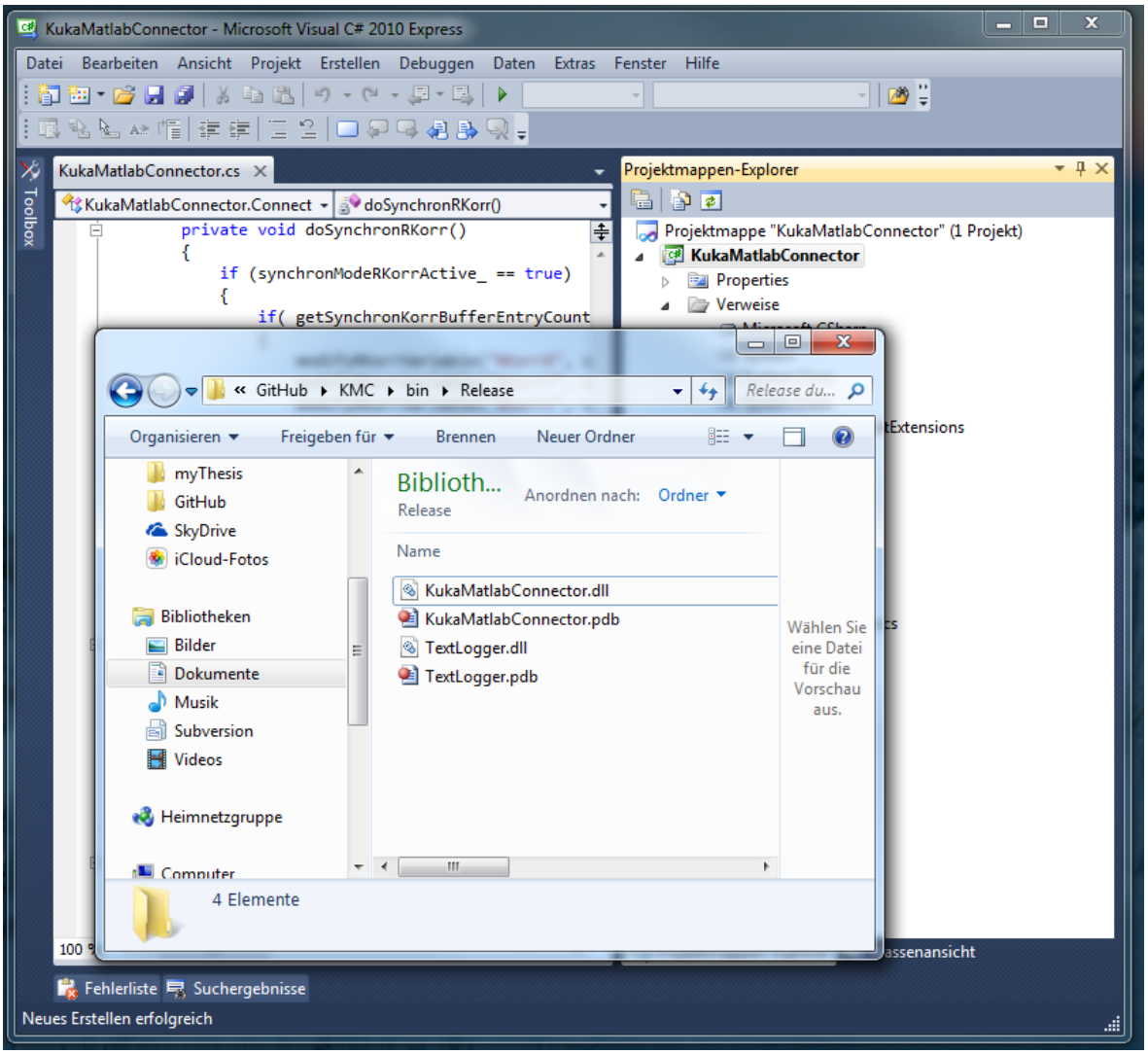

Abbildung 9: Check if all Files are available

3 Build KMC Client

Now lets open the solution file. In the Solution Explorer you see now the whole project. Open it and then open the subtree References. There you will see 2 Libraries which cannot be loaded by Visual Studio so we have to add it manually (see picture 10)

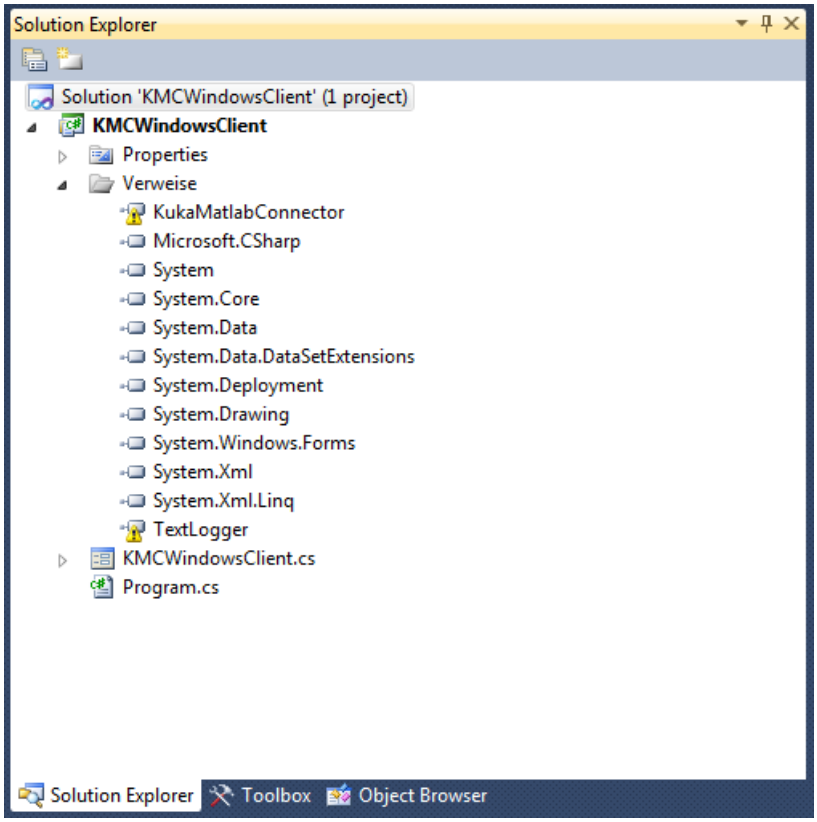

Abbildung 10: Missing References

Now lets get rid of those missing References and lets add them manually. First of all Right click on the Missing KMC and Textlogger Reference and then Remove (see picture 11 and 12)

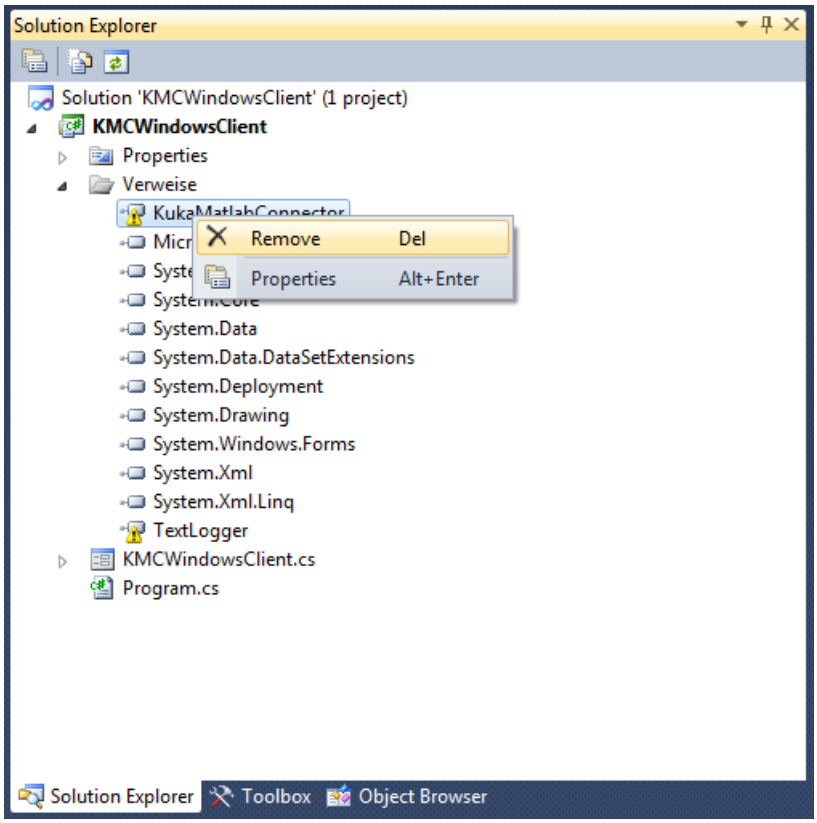

Abbildung 11: Remove Missing KMC Reference

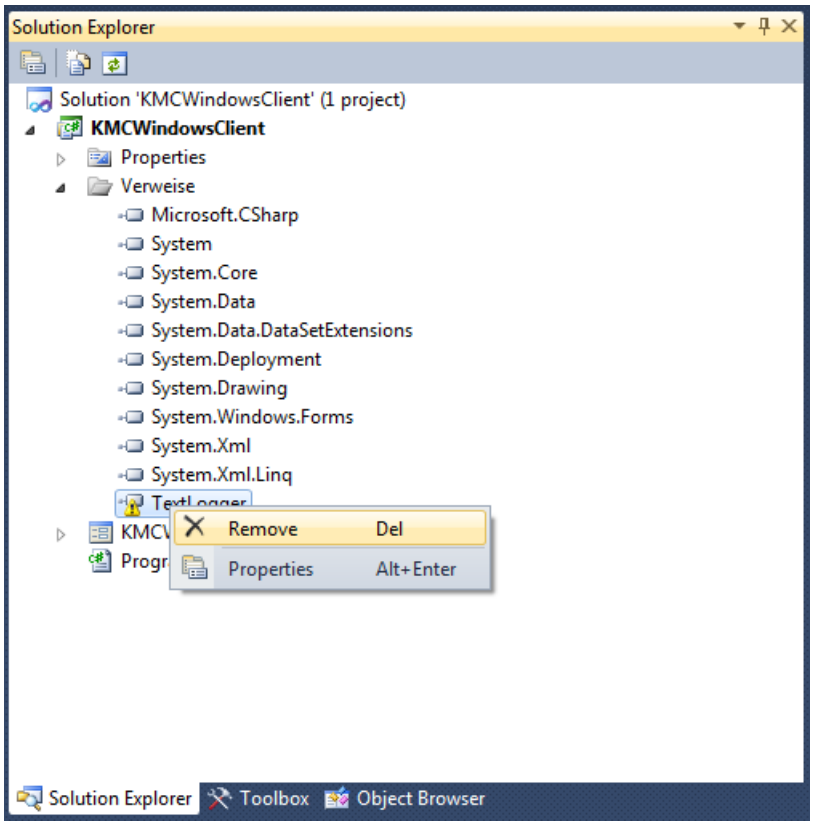

Abbildung 12: Remove Missing TextLogger Reference

In the previous section we downloaded the needed KMC and textlogger files and build them now we have to add those dll's to this project. So Right click on References Folder and then click on Add Reference. (13)

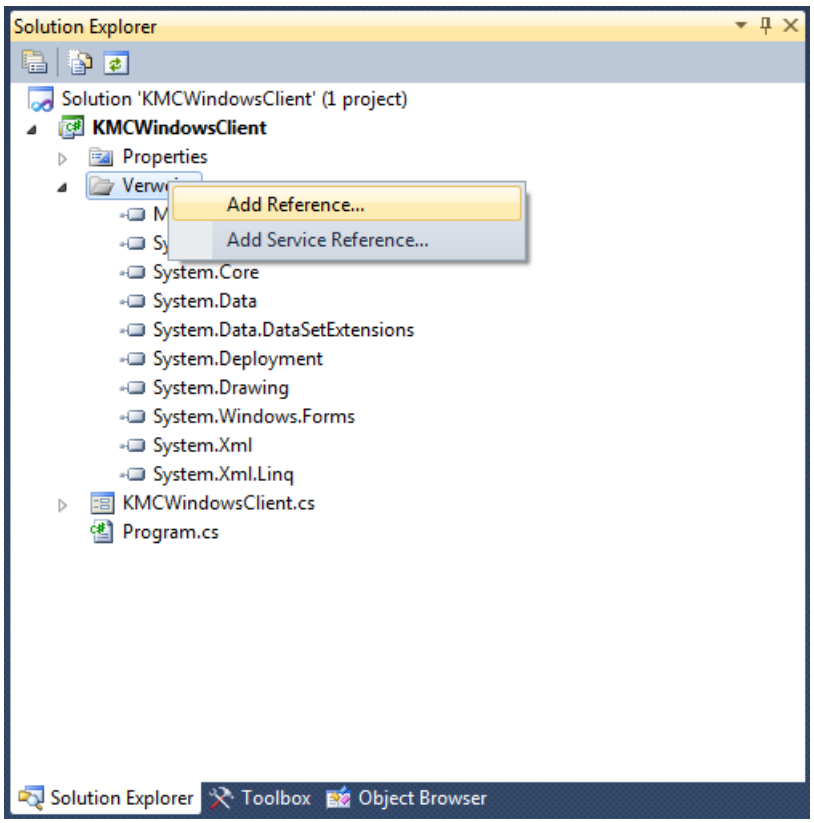

Abbildung 13: Add Textlogger Reference

Then in the following window click on Browse Tab and search the folder where the TextLogger dll is located. (14) Now Click on OK and the Reference should be loaded normally.

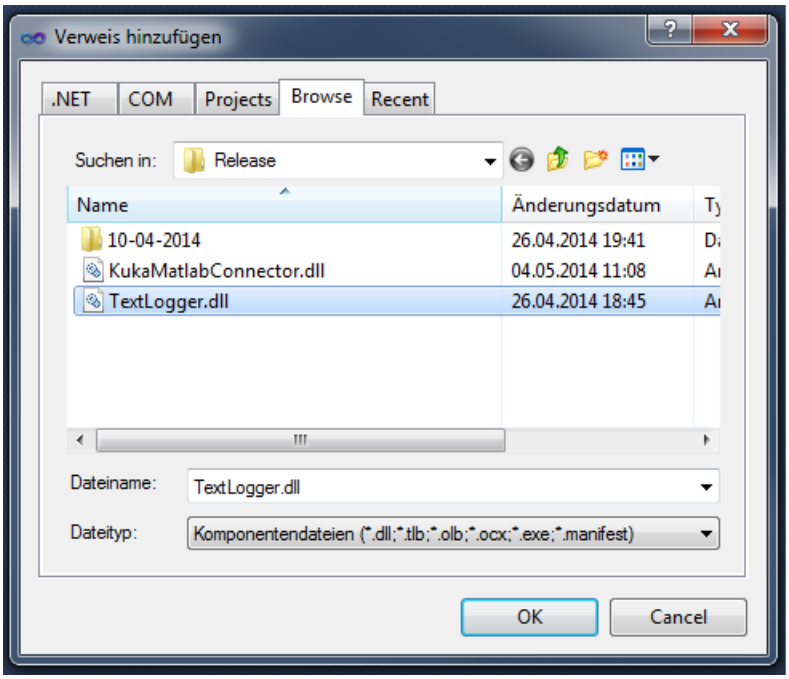

Abbildung 14: Search directory where TextLogger DLL is located

Do the same steps for KMC as you see in picture 15 and 16.

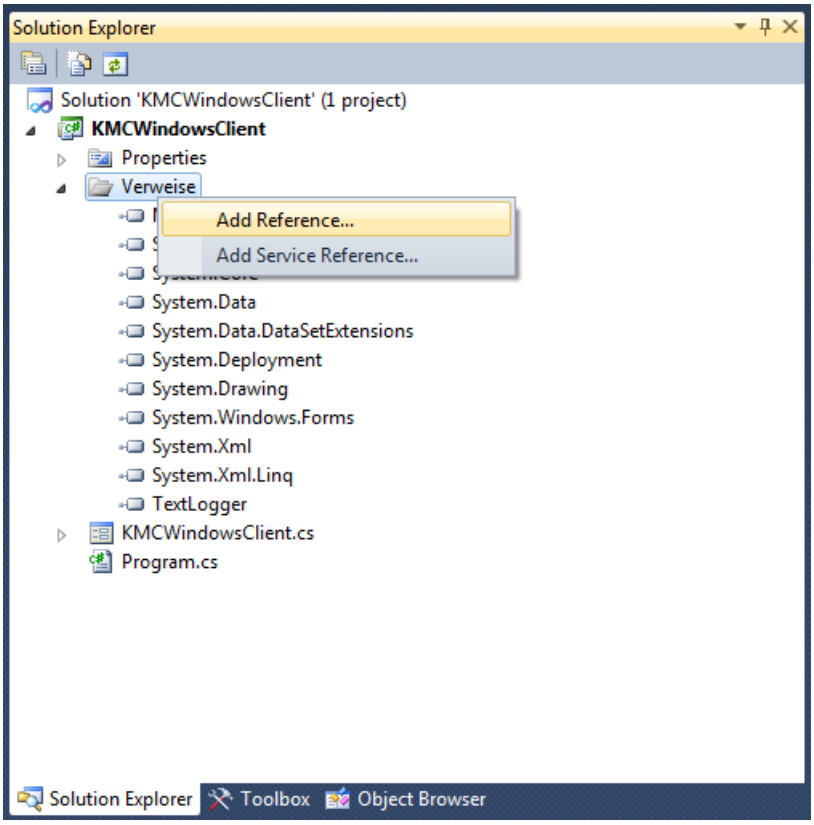

Abbildung 15: Add KMC Reference

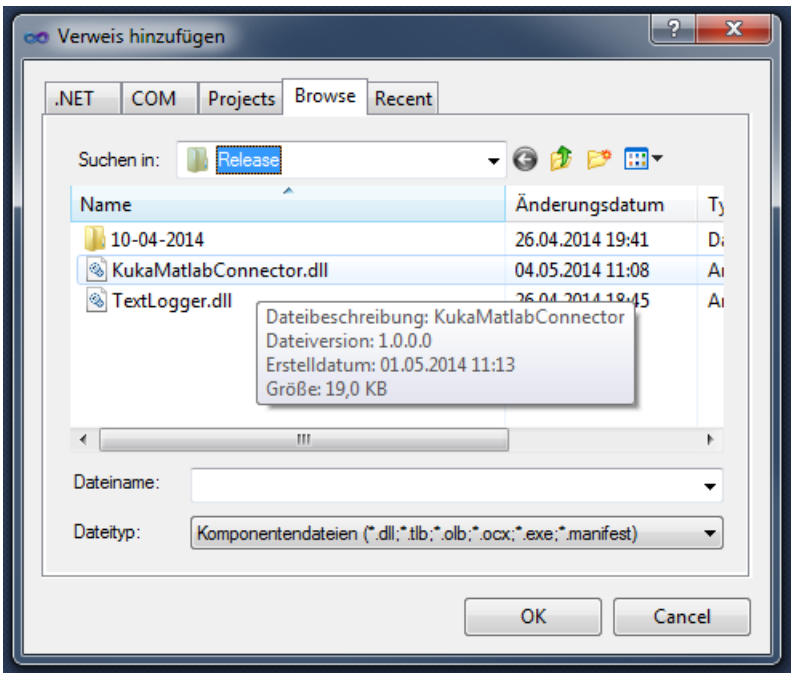

Abbildung 16: Search directory where KMC DLL is located

To finish this Sub Chapter check if the References are correct and it looks like in picture 17

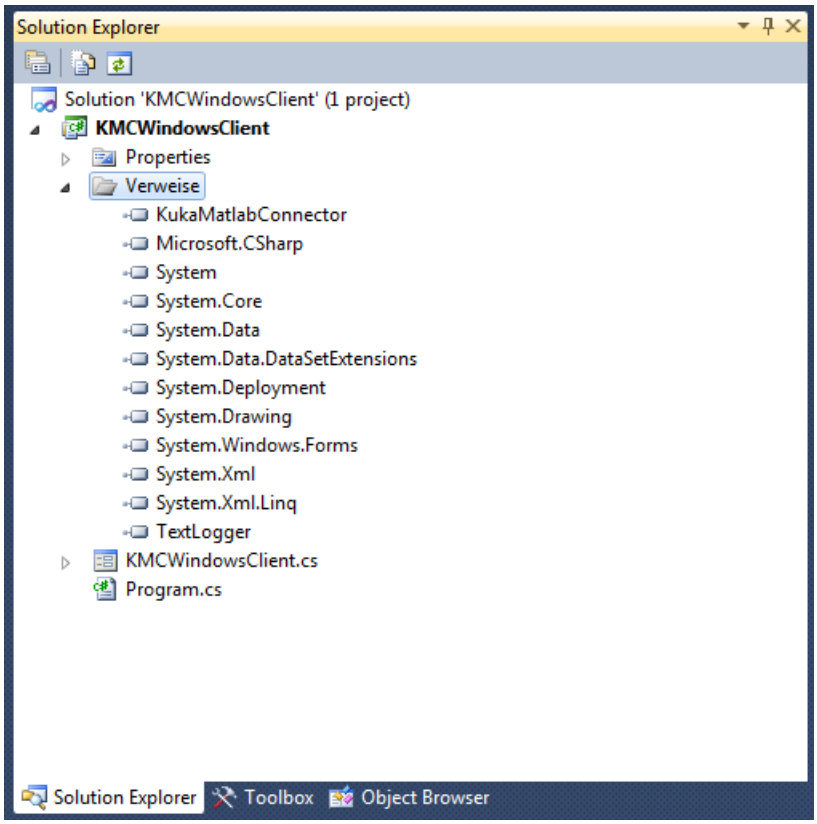

Abbildung 17: Check if all References are correctl loaded

If it all works correctly you should be able to build the KMC Client like in 18 and then start it with the green arrow in 19

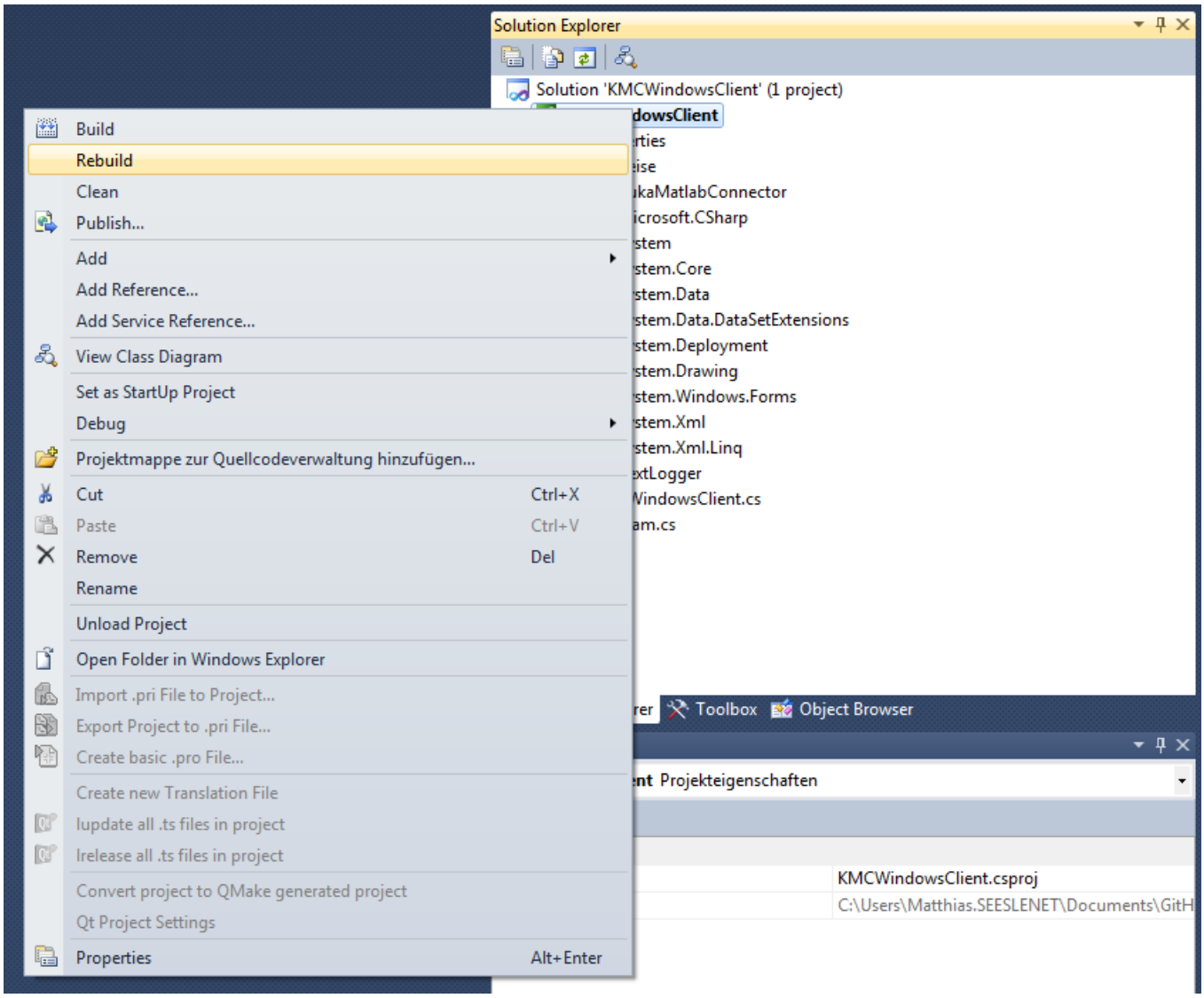

Abbildung 18: Build KMC

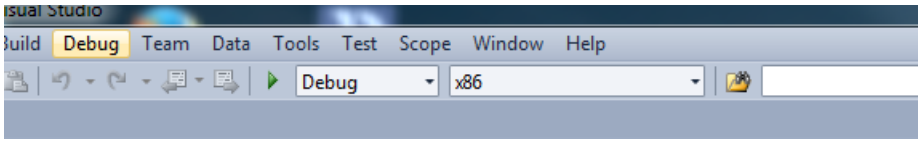

Abbildung 19: Start KMC Client

If the window in 20 is shown now all should work correct for KMC Windows Client.

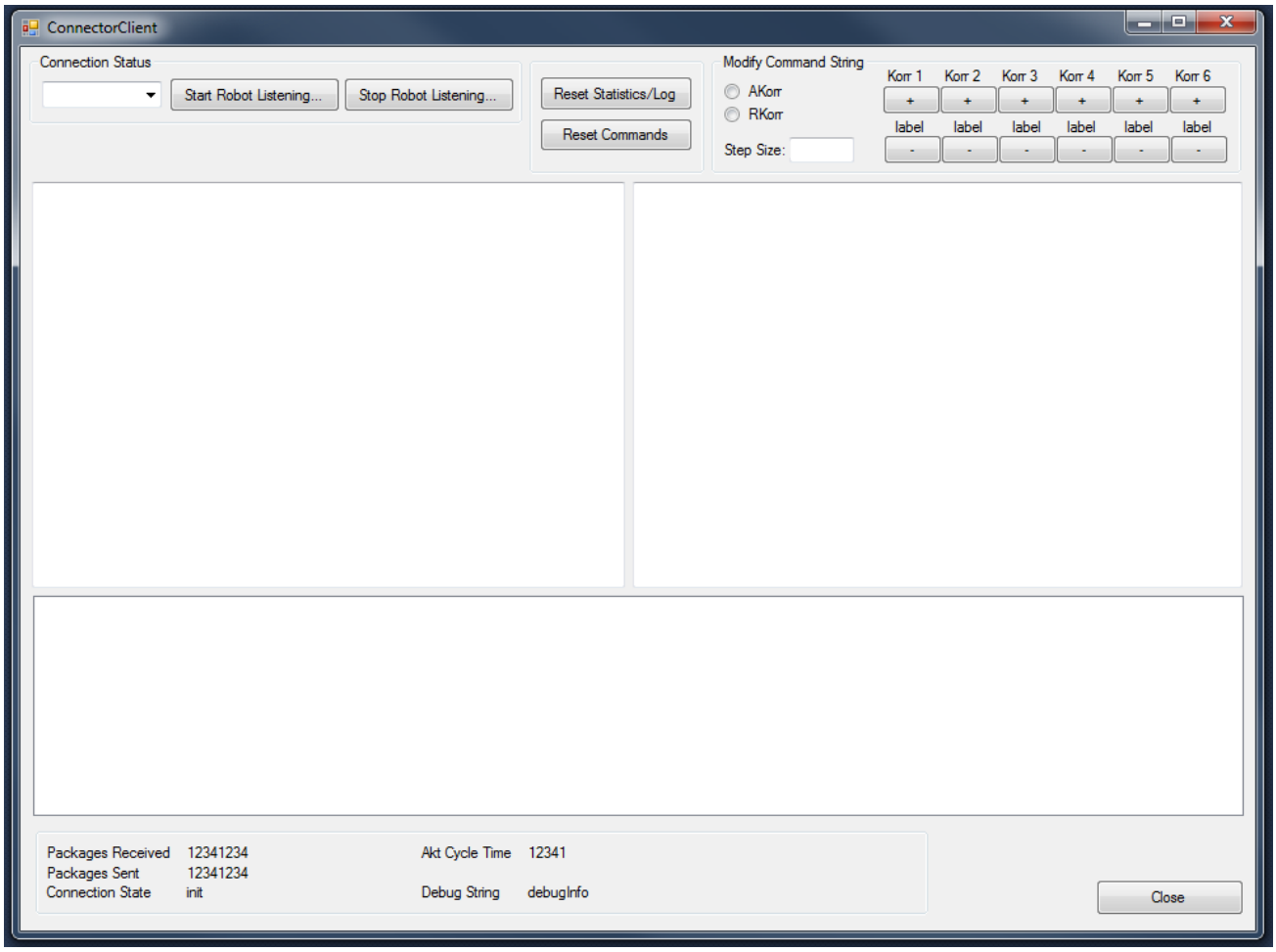

Abbildung 20: Check if Window is starting and it shows KMC Windows Client

You can also start the client from now on in the binary directory of your KMC Workspace. Just goto `C:\yourworkspace\KMCWindowsClient\bin\Debug` or to the Release directory. (see 21

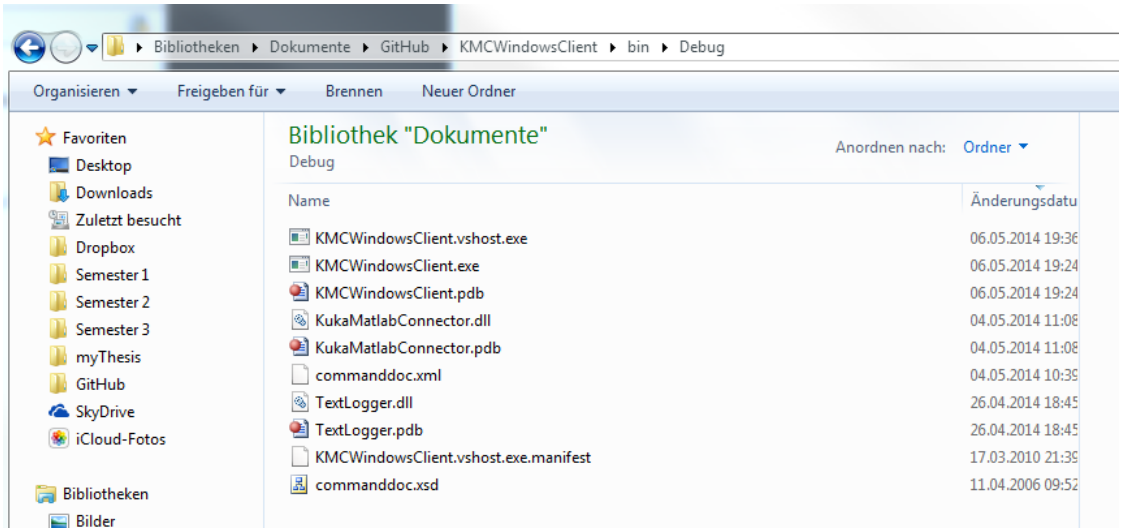

Abbildung 21: Start Application directly out of the binary directory

4 Build KMC Emulator

Now lets build the Emulator for the first time. Start KMCEmulator Solution and then in the Solution Explorer click with Right Mouse button on the Project and Rebuild it. This project should not need any other fancy libs so you can build it right out of your Visual Studio without adding any References 22.

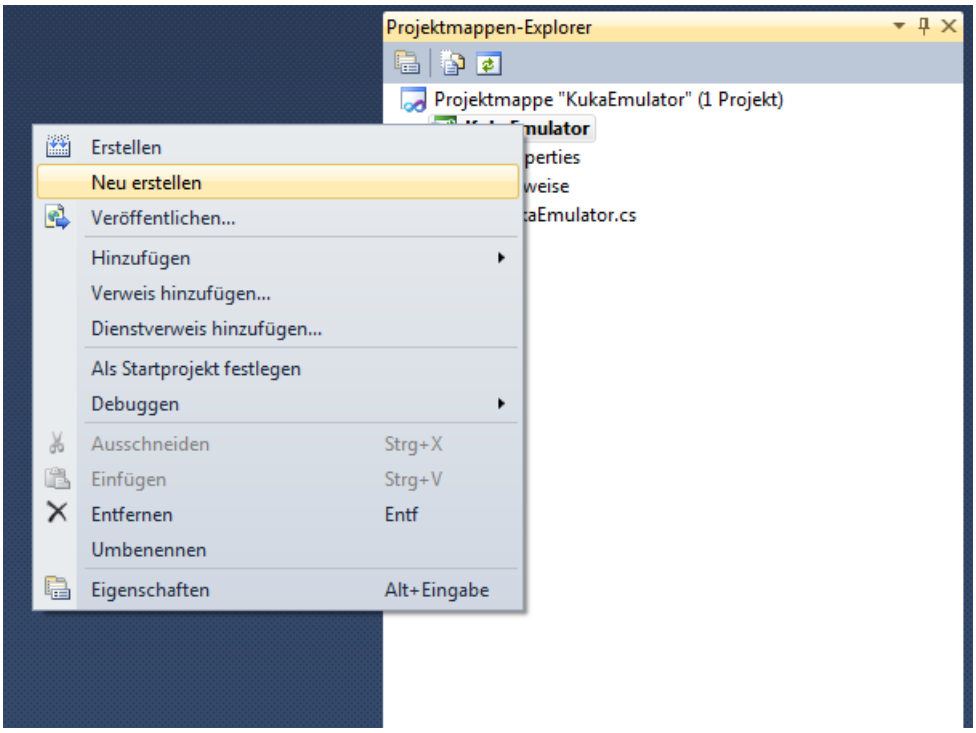

Abbildung 22: Rebuild KMC Emulator

Now run the application as said before either locally on the same PC as KMCWindowsClient or on a different which is connected to this machine 23.

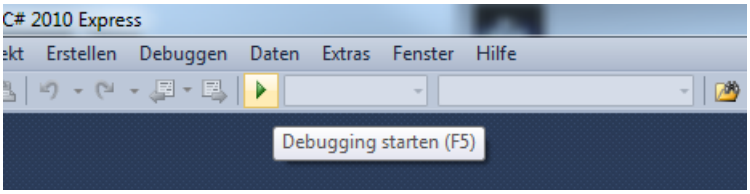

Abbildung 23: Run the KMC Emulator

A Windows CommandLine Window should open (yes it is only an emulator, so no fancy Windows Forms...) 24.

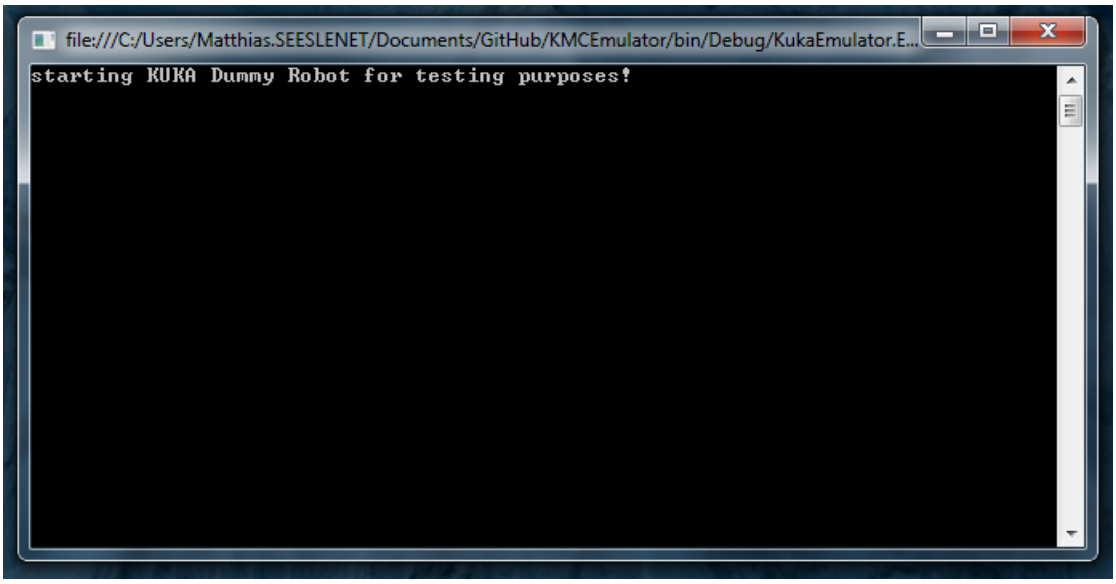

Abbildung 24: Emulator Commandline Window should open

5 Copy XML Files into Directorys

5.1 Files for KMCWindowsClient

Its not usefull to save binary files on github. This is only done with releases. So now we have to prepare our binary directory for first communication use. When you open the KMCWindowsClient Workspace you will see the following structure 25. NOTE: The KMCWindowsClient has to be build for the first time, so that the binary directory gets created.

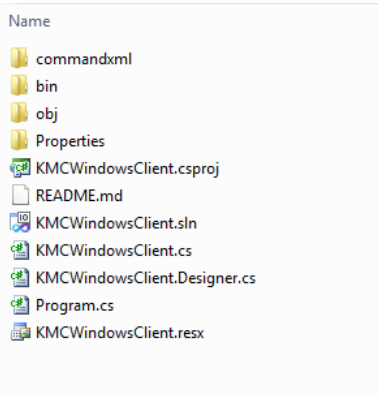

Abbildung 25: Folder structure of KMCWindowsClient Workspace

Go into the commandxml directory and there copy the two files 26

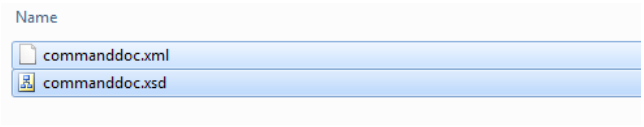

Abbildung 26: Copy files inside commandxml directory

Then go to base directory of KMCWindowsClient and double click on bin. Now insert the copied files into the Release and Debug directory 27

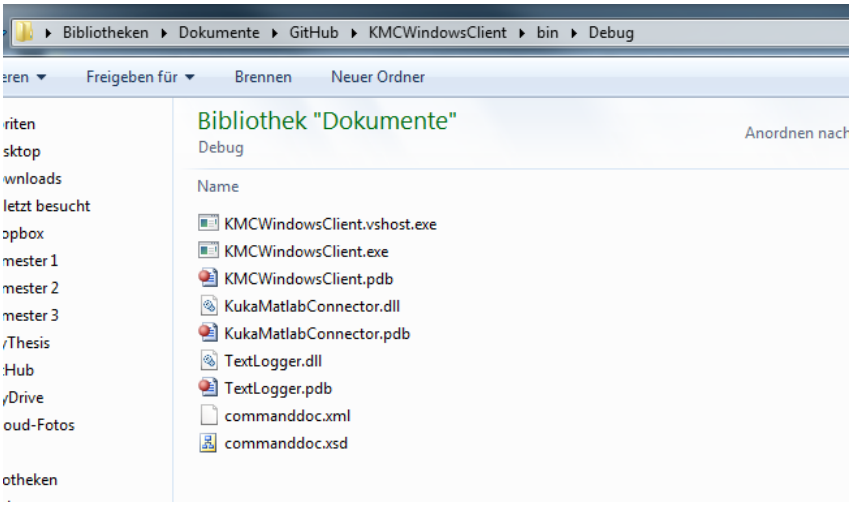

Abbildung 27: Insert Files in Release and Debug directory

5.2 Files for KMCEmulator

The same procedure has to be done for the Emulator. The files are a bit different but the procedure is the same. NOTE: The Emulator has to be build for the first time, so that the binary directory gets created. Now go into the Workspace of the Emulator 28

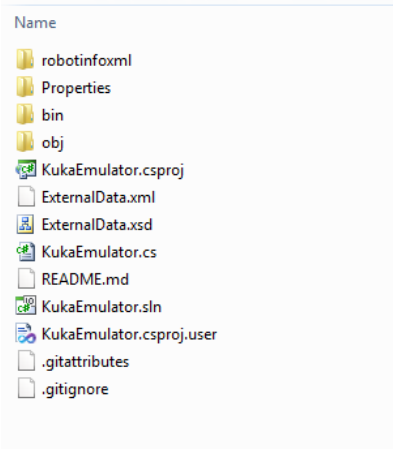

Abbildung 28: Folder structure of KMCEmulator Workspace

Go into the robotinfoxml directory and there copy the two files 29

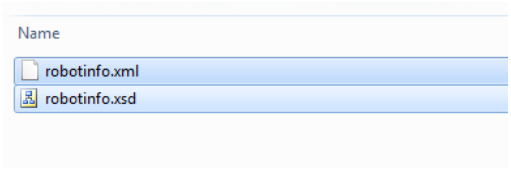

Abbildung 29: Copy files inside robotinfoxml directory

Then go to base directory of the KMCEmulator workspace and double click on bin. Now insert the copied files into the Release and Debug directory 30

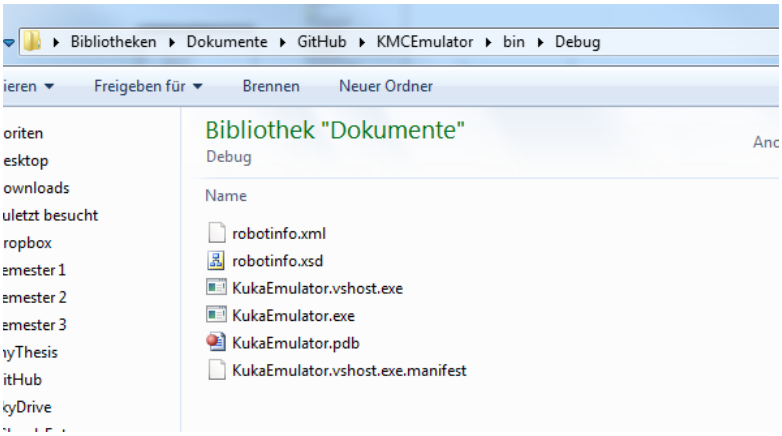

Abbildung 30: Insert Files in Release and Debug directory of KMCEmulator Workspace

6 Connect KMC Client to Emulator

The next step is to make a test on your local system. You can try this on your own PC or if you have on your notebook and PC. You only need to have network contact between the emulator and the KMCWindowsClient. It can be over localhost 127.0.0.1 or over your home router or something else.

First of all start your KMCWindowsClient (maybe you wanna do this like in the last steps of section 3). You should have now the window opened like in picture 31

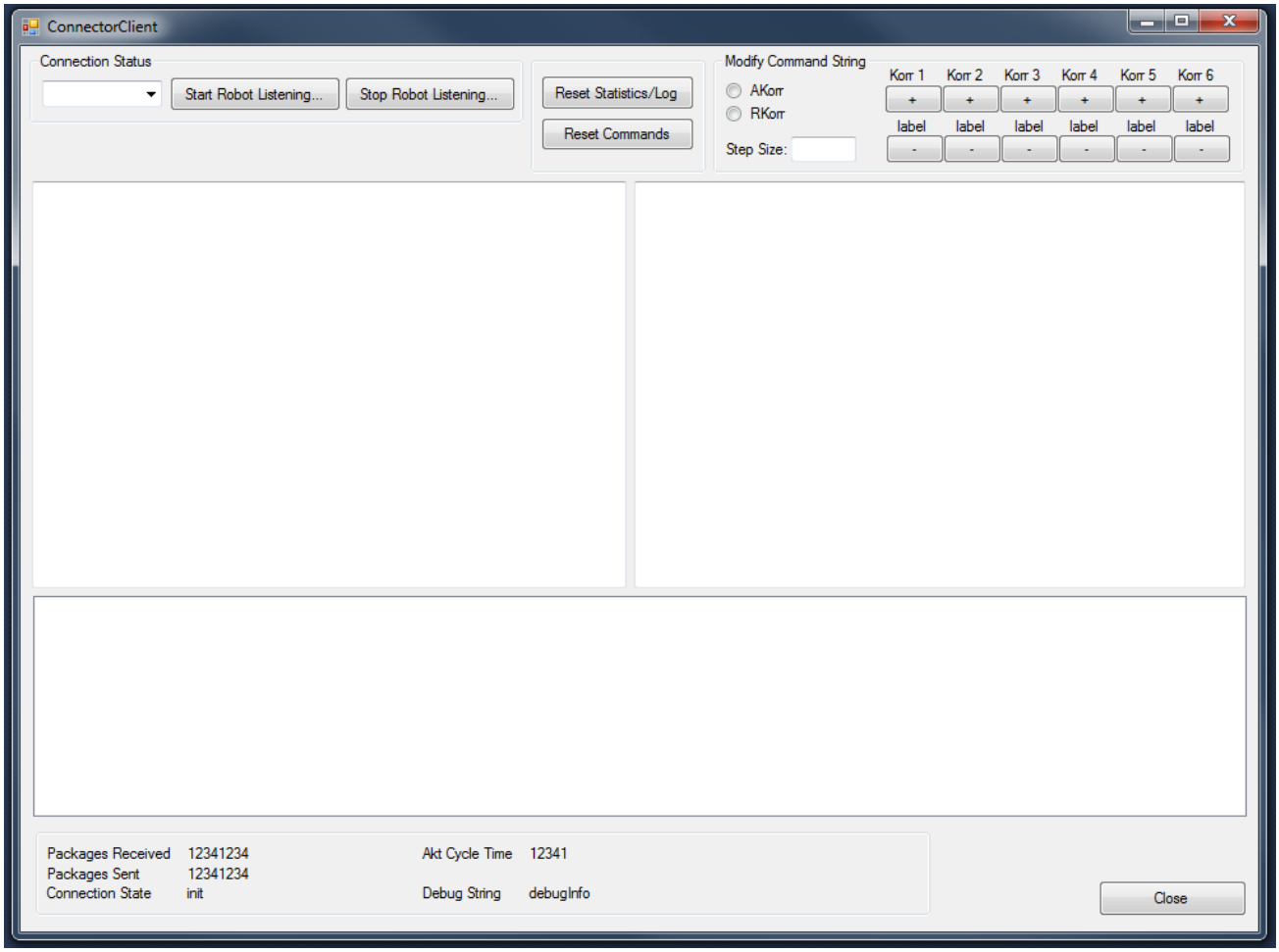

Abbildung 31: Open KMCWindowClient Application

Now you have to choose the network adapter on which you want to connect with the emulator 32.

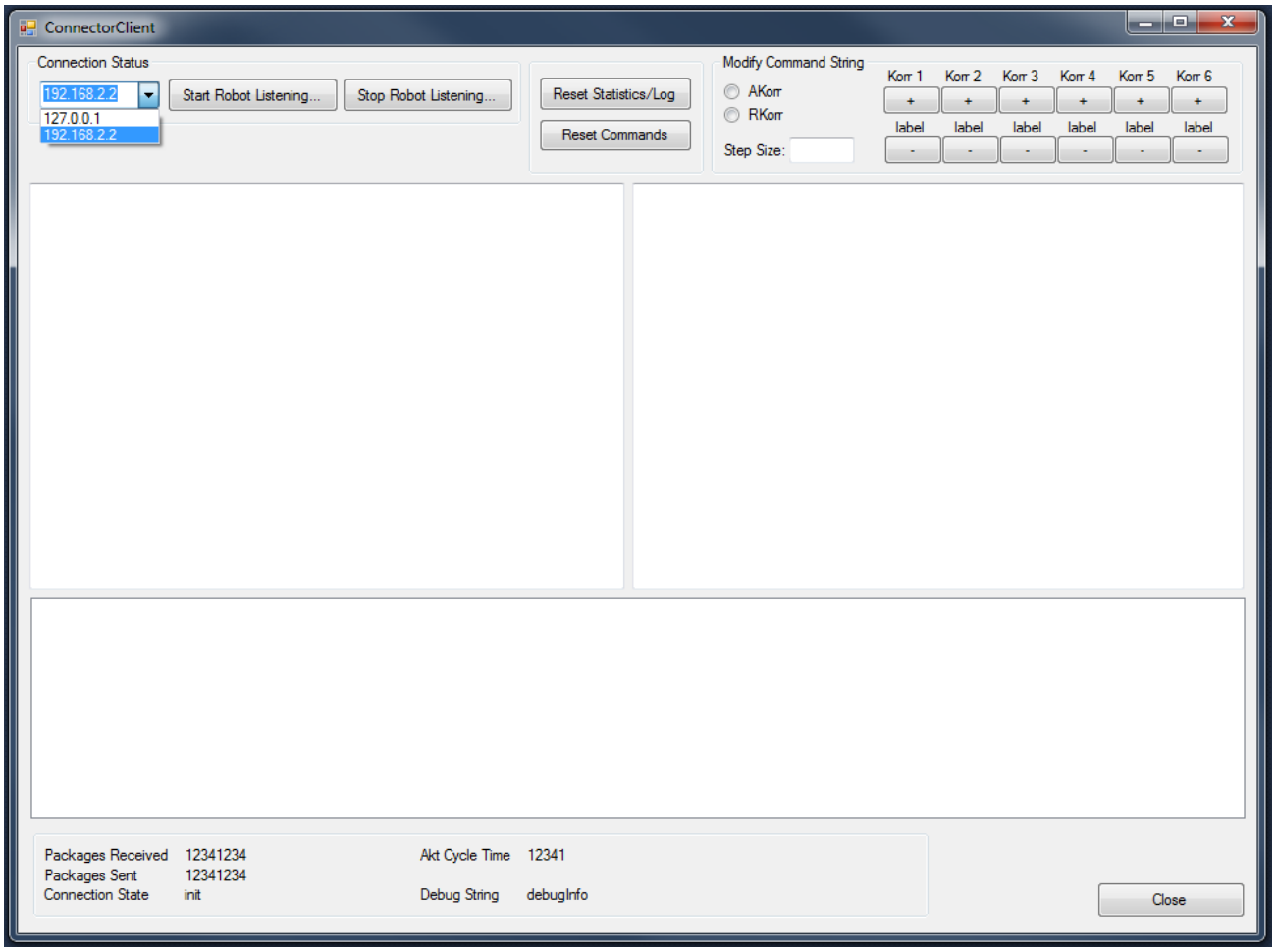

Abbildung 32: Choose Network Adapter for communication

After choosing it, press the Start Robot Listening... Button 33. Now the window should show on the right half the commanddoc.xml file with all values set to zero. If not you will have to check if the file is copied in the right directory as in chapter 5. On bottom there are some default values shown.

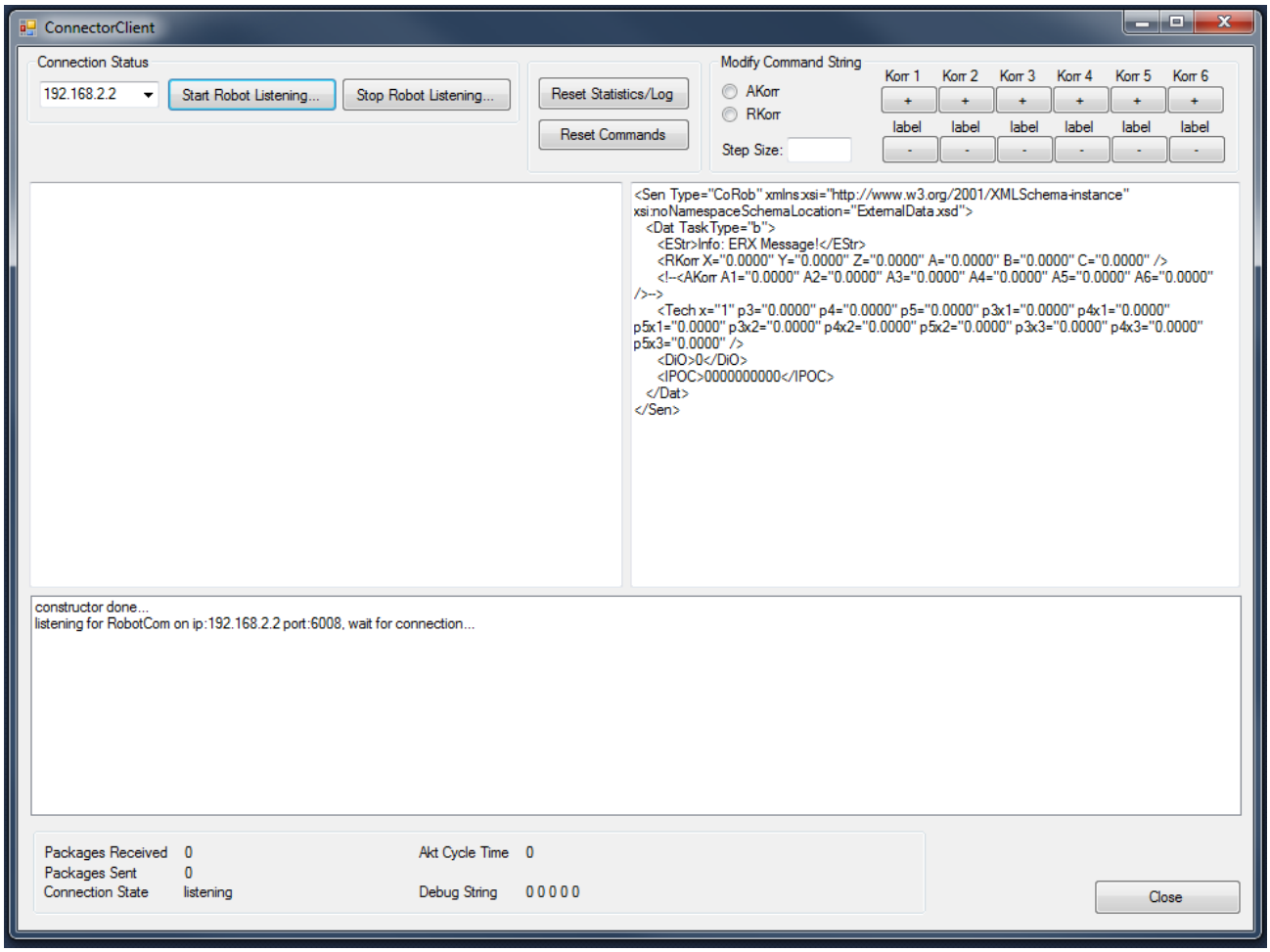

Abbildung 33: Press on Robot Listening Button, after that it should look like this

Now start the Emulator. You can start it directly out of the binary directory of your workspace or over the Microsoft Visual Studio Debug Run Button. Here i will describe the Visual Studio way. Start KMCEmulator Solution and then in the Solution Explorer click with Right Mouse button on the Project and Rebuild it. This project should not need any other fancy libs so you can build it right out of your Visual Studio without adding any References 34.

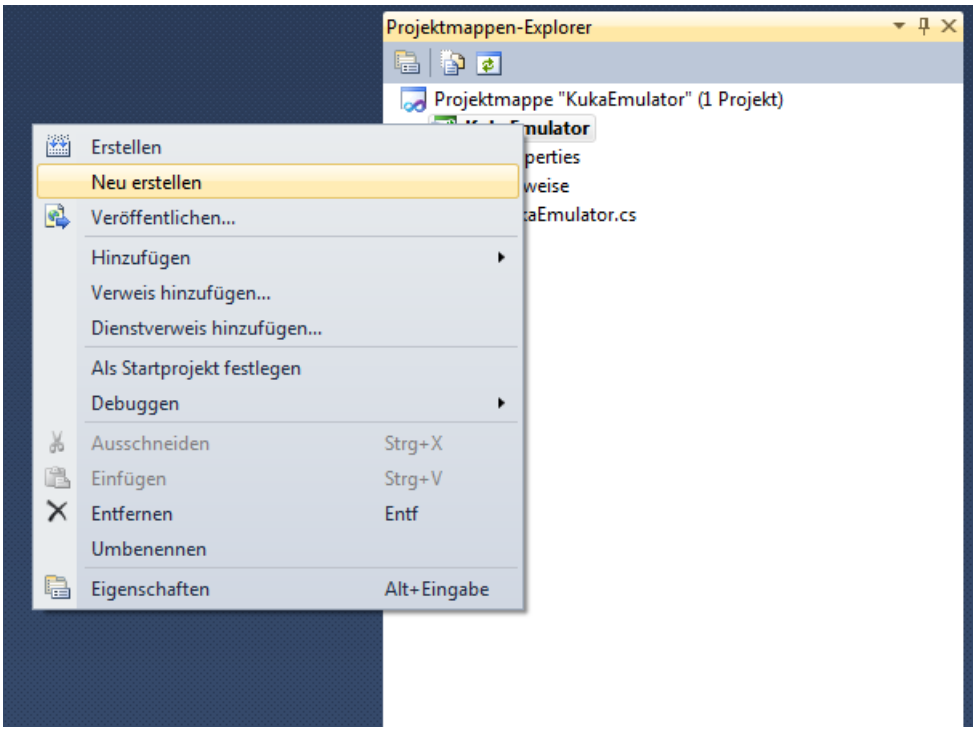

Abbildung 34: Rebuild KMC Emulator

Now run the application as said before either locally on the same PC as KMCWindowsClient or on a different which is connected to this machine 35.

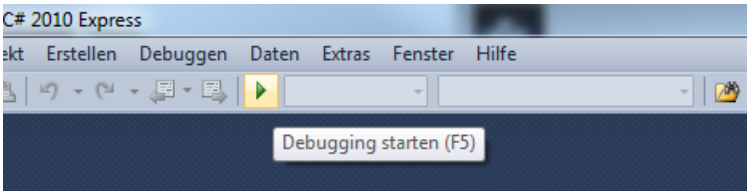

Abbildung 35: Run the KMC Emulator

A Windows CommandLine Window should open (yes it is only an emulator, so no fancy Windows Forms...) 36.

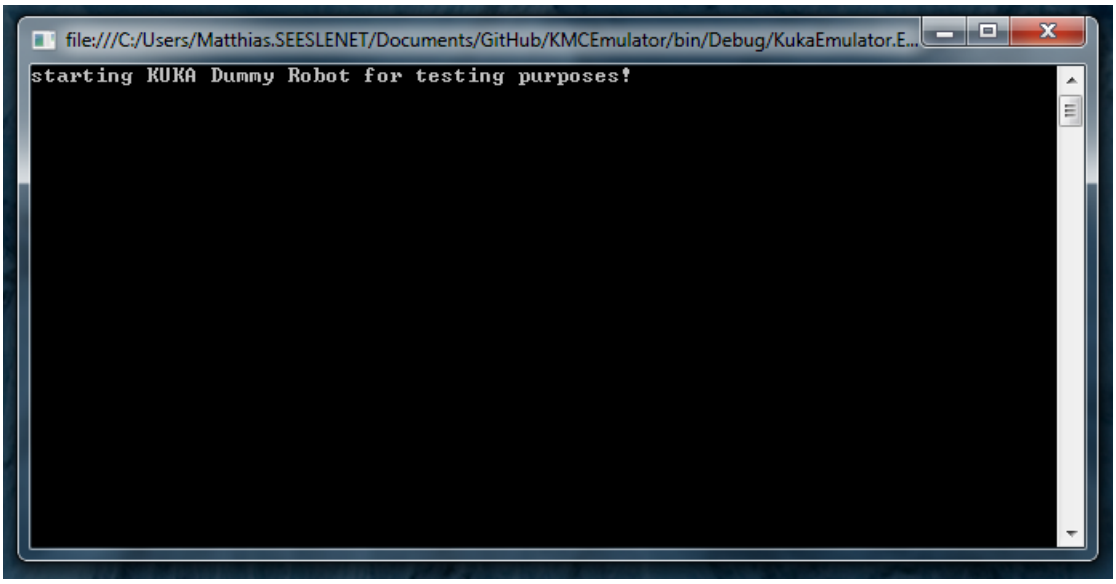

Abbildung 36: Emulator Commandline Window should open

Press enter to enter the IP Address on which KMCWindowsClient is listening (remember picture 32, you should enter same IP here). 37.

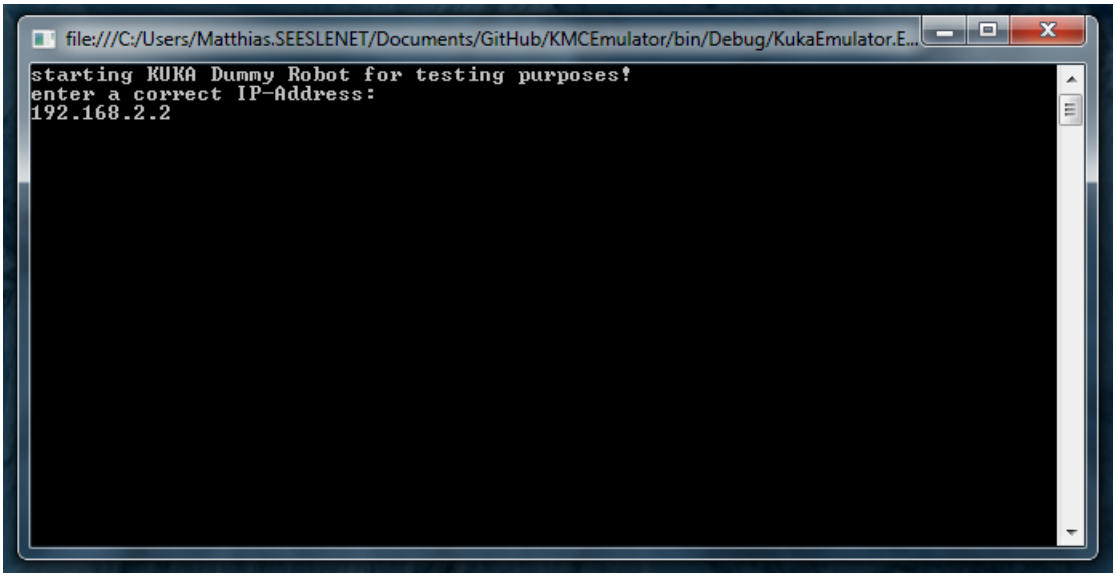

Abbildung 37: Enter IP Address

Now another Enter is needed to give him the entered IP, note if the IP Address was not found or is incorrect, KMCEmulator will stop. Then you will have to start from new => Start with Green button and so on...38

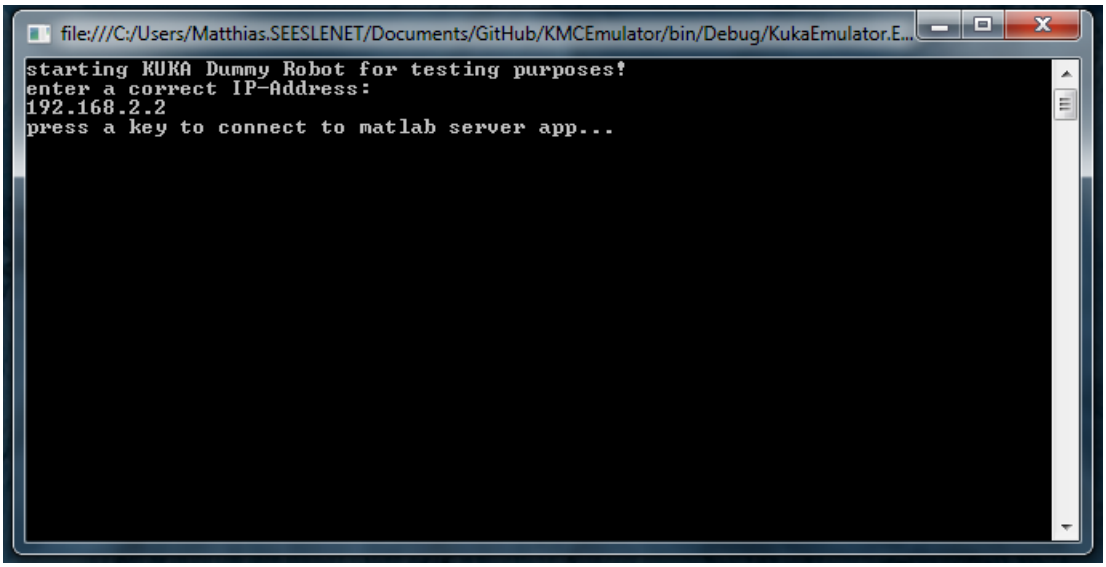

Abbildung 38: Now the Emulator waits for the Final Hit

Now press Enter to establish communication 39

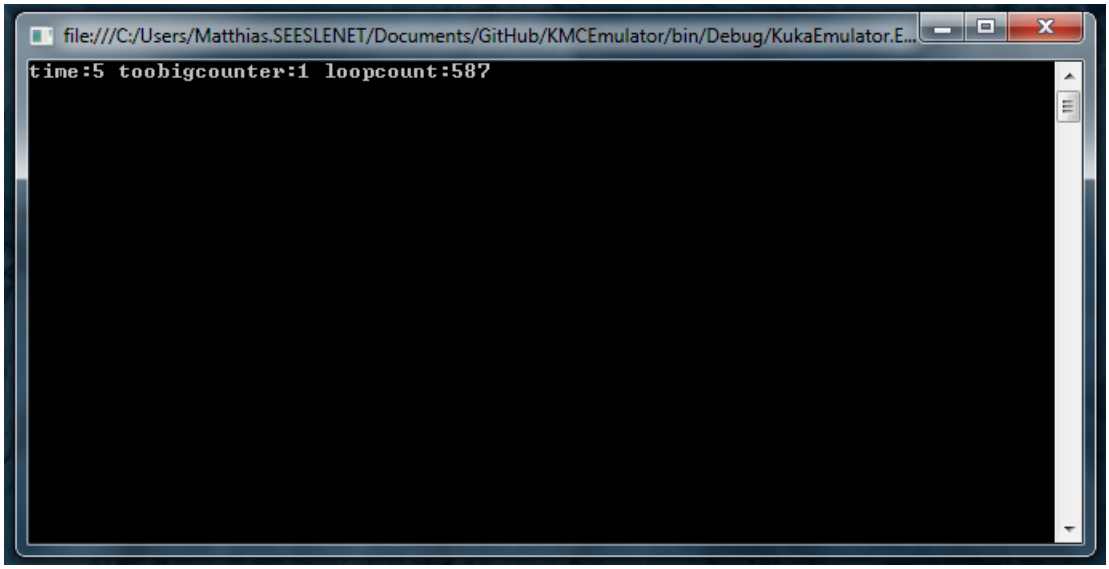

Abbildung 39: After Last Enter Emulator is communicating with KMCWindowsClient

Here in the Emulator window you will only see some debug messages... Change now to KMCWindowsClient and see what it is showing 40

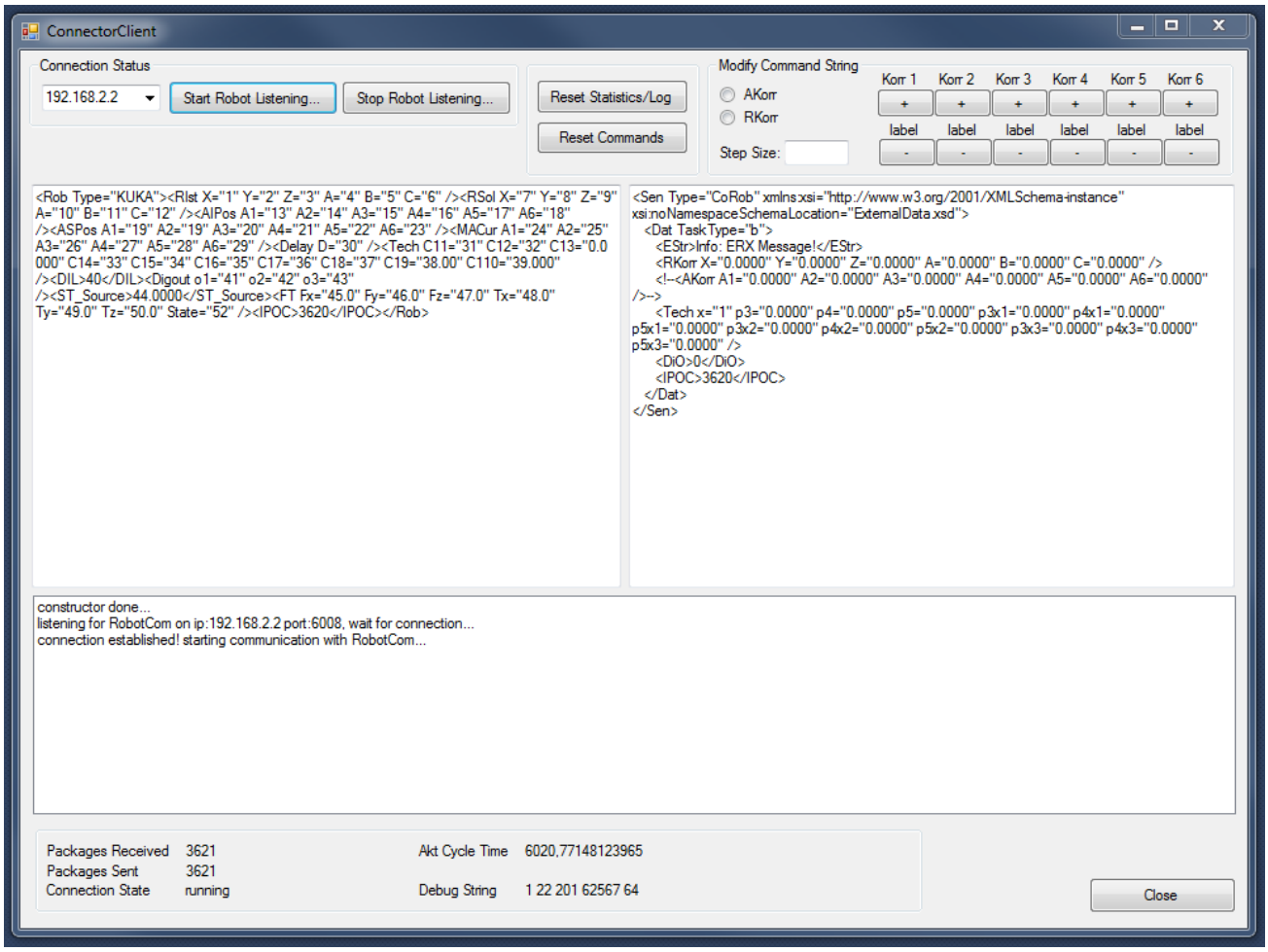

Abbildung 40: KMCWindowsClient with all the commmunication information

7 Info

Abbildungsverzeichnis