FRC Development Software Installation and Code Deployment

# Introduction

These instructions are a simplification of the official FRC instructions located here:

<http://wpilib.screenstepslive.com/s/4485/m/13810>

with the addition of certain library and utilities that we commonly use.

# Software You Will Need

For all of this software, you can either get a copy of the files from the team’s Google drive (**recommended,** https://drive.google.com/open?id=0B6Oh68LLGJ6Id0FySFpNNzR1eW8) or download online using the links below. In total, there is over 1 GB worth of files.

These instructions assume that you have a 64-bit operating system (most recent computers).

# Installation

## For code development

In order to be able to write and build code on a new computer, you need to go through these steps.

**1. Toolchain (code compiler, etc.)**

<http://first.wpi.edu/FRC/roborio/toolchains/FRC-2017-Windows-Toolchain-4.9.3.msi>

1. Run "FRC-2017-Windows-Toolchain-4.9.3.msi" to install
2. Go to Control Panel -> System -> Advanced System Settings
3. Click Environment Variables and add C:\frc\bin\ to the system PATH (if it's not there already)

**2. Java Development Kit (needed for Java apps including Eclipse)**

<http://www.oracle.com/technetwork/java/javase/downloads/jdk8-downloads-2133151.html>

1. Run "jdk-8u*###*-windows-x64.exe" to install (*###* is currently 111).

**3. Eclipse (code development environment)**

<https://www.eclipse.org/downloads/download.php?file=/oomph/epp/neon/R2a/eclipse-inst-win64.exe&r=1>

1. Run "eclipse-inst-win64.exe"
2. Select Eclipse IDE for C/C++ Developers
3. Create an icon for C:\Program Files\eclipse\eclipse.exe
4. Click Install
5. Launch the program
6. Choose a place to create your workspace (default is fine)
7. Click the Workbench button in the top right
8. Go to Window -> Preferences
9. Go to General -> Workspace and check "Save automatically before build"
10. Click OK

**4. FRC Eclipse plugins (WPILib)**

<http://first.wpi.edu/FRC/roborio/release/EclipsePluginsV2017.1.1.zip> (or latest version)

1. In Eclipse, go to Help -> Install New Software
2. Click Add...
3. For Name, enter FRC Plugins
4. For Location, enter http://first.wpi.edu/FRC/roborio/release/eclipse/
5. Click OK
6. Click the drop-arrow next to WPILib Robot Development (in the middle window)
7. Check Robot C++ Development
8. Click Next, Next, accept, Finish and accept the warning
9. Restart Eclipse when prompted
10. Go to Window -> Preferences -> WPILib Preferences and enter 4917 for the Team Number
11. Click OK

**5. CTRE Toolsuite (CANTalon library)**

<http://www.ctr-electronics.com/downloads/installers/CTRE%20Toolsuite%20v4.4.1.9-nonadmin.zip> (or latest version)

1. Run “CTRE Toolsuite v4.4.1.9.exe”
2. Select robotRIO-FRC -> C++/Java
3. Unselect HERO C#
4. Click Next, I Agree, I Agree
5. Install device drivers as they pop up (accept warnings if they appear)
6. Click Finish

**6. navX Library (for the navX navigation board)**

<http://www.kauailabs.com/public_files/navx-mxp/navx-mxp.zip>

1. Unzip and install the navX software
2. If not automatically done (i.e. Eclipse can’t find AHRS.h):
   * Copy the files from C:\Users\<your username>\navx-mxp\cpp\include\ to C:\Users\<your username>\wpilib\user\cpp\include\
   * Copy the files from C:\Users\Software\navx-mxp\cpp\lib to C:\Users\Software\wpilib\user\cpp\lib\

**7. GRIP (for computer vision processing)**

<https://github.com/WPIRoboticsProjects/GRIP/releases>

1. Run “GRIP-v1.5.2-x64.exe” (or the latest installer)

**8. GitHub Desktop App (for source code collaboration and backups)**

<https://desktop.github.com/>

1. Create an account on github.com
2. See a coach or mentor for access to 4917’s code repositories
3. Run "GitHubSetup.exe" to install (it will download the rest of the program, 126 MB)
4. Login and do to your (empty) dashboard
5. Click the + in the upper left corner
6. Click clone and select 4917EDSS
7. Clone this season's repo (e.g. 2017repo) to your local drive (make note of the location)

**9. Import the code into Eclipse**

1. Open Eclipse and go to File -> Import...
2. General -> Existing Project into Workspace, Next
3. For Root directory, click Browse and go to the directory where you cloned the repo
4. Select the 4917 project(s) you are interested in and click Finish

**10. Build and deploy code**

1. Make sure you are connected to the robot via USB, Ethernet or Wi-Fi
2. To build, right-click the project in the Project Explorer and select Build Project
3. To deploy code to robot, right-click the project, select Run As..., and select WPILib C++ Deploy.

## To be able to drive the robot

**1. Labview software (driver station, etc)**

<http://lumen.ni.com/nicif/US/GB_NIDU/content.xhtml?du=http://www.ni.com/download/first-robotics-software-2015/5112/en/> You may have to login (see mentors/coaches for info)

* 1. Uninstall old version of FRC/Labview software (if you have any)
  2. Unzip FRCUpdateSuite\_2017.0.0.zip (if not already done). If a password is required, it’s **&Full$team^Ahead!**
  3. Run setup.exe
  4. Click Next, Next
  5. Uncheck the Search for updates box and click Next
  6. For user information enter
     1. Full Name: frc4917
     2. Organization: EDSS
     3. Serial Number: *(check for a readme file or ask a coach or mentor)*
  7. Accept and Next
  8. Accept and Next (again)
  9. Next
  10. You can choose to NOT disable Fast Startup. Next
  11. Wait for long install
  12. Next
  13. Automatically register via internet
  14. Next, Login (e-mail: frc4917@gmail.com, pass: *(see readme or ask a coach or mentor)*)
  15. Next, Finish
  16. Reboot
  17. Start FRC Driver’s Station
  18. Allow access through the firewall (if asked)
  19. Click the gear icon on the left side of the driver station
  20. Change the team number from xxyy to 4917
  21. From the Dashboard Type drop-down select C++
  22. Enter 4917 when prompted for the team number
  23. Close the driver’s station and smart dashboard (don’t need to save layout)

**2. Microsoft Application Compatibility Toolkit (optional)**

<https://www.microsoft.com/en-ca/download/details.aspx?id=7352>

This software is needed if you want to eliminate the “Do you want to allow this app to make changes to your device?” pop-up every time you start the FRC Driver’s Station.

* + 1. Run “ApplicationCompatibilityToolkitSetup.exe” (or similar) to install the utility
    2. If prompted to install the .NET framework, say Yes
    3. From your Start menu, run Compatibility Administrator (32-bit)
    4. Right-click it the New Database from the list in the left pane
    5. Select Create New -> Application Fix…
    6. For the name, use “FRC Driver Station”
    7. For the location, browse to the driver station executable (usually C:\Program Files (x86)\FRC Driver Station\DriverStation.exe)
    8. Click Next
    9. In the Additional compatibility modes box, scroll down to find and check RunAsInvoker
    10. Click Next, Next, Finish
    11. Click Save in the toolbar
    12. Call the database “uac\_whitelist”
    13. Save it to C:\Users\<your username>\uac\_whitelist.sdb
    14. Right-click the uac\_whitelist database in the left pane and select Install
    15. Click OK and close the app