

# THIN SETUP THE FRC CONTROL SYSTEM

For Embedded Software Development

ABSTRACT

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## WPIlib Installation Guide and Installing VS Code

Pick the installer from **the bottom of this page**, Windows32, Windows64, Linux, or Mac

<https://github.com/wpilibsuite/allwpilib/releases/tag/v2021.3.1>

Most users will pick **WPILib\_Windows64-2020.3.1.iso**

If this is your 1<sup>st</sup> install, and you are on windows, click on the downloaded iso image.

Then run **WPILibInstaller.exe**

The following webpage has instructions.

<https://docs.wpilib.org/en/latest/docs/getting-started/getting-started-frc-control-system/wpilib-setup.html>

## Installing the FRC Game Tools

<https://docs.wpilib.org/en/latest/docs/getting-started/getting-started-frc-control-system/frc-game-tools.html>

## Installing 3rd Party Libraries

### CTRE

<http://www.ctr-electronics.com/control-system/motor-control.html>

*Download the Phoenix installer here!*

[http://www.ctr-electronics.com/control-system/motor-control/talon-srx.html#product\\_tabs\\_technical\\_resources](http://www.ctr-electronics.com/control-system/motor-control/talon-srx.html#product_tabs_technical_resources)

CTRE Phoenix Framework Installer 5.18.3.1 (zip) or later

Unzip the file, then run it

Uncheck the **'Hero'** items, keep the **C++/Java** checked

### NavX

<https://pdocs.kauailabs.com/navx-mxp/>

click on the C++ library at:

<https://pdocs.kauailabs.com/navx-mxp/software/roborio-libraries/>

FRC RoboRio Libraries

C++

Download and extract the installer

./setup.exe

## How to Wire an FRC Robot

<https://docs.wpilib.org/en/latest/docs/getting-started/getting-started-frc-control-system/how-to-wire-a-robot.html>

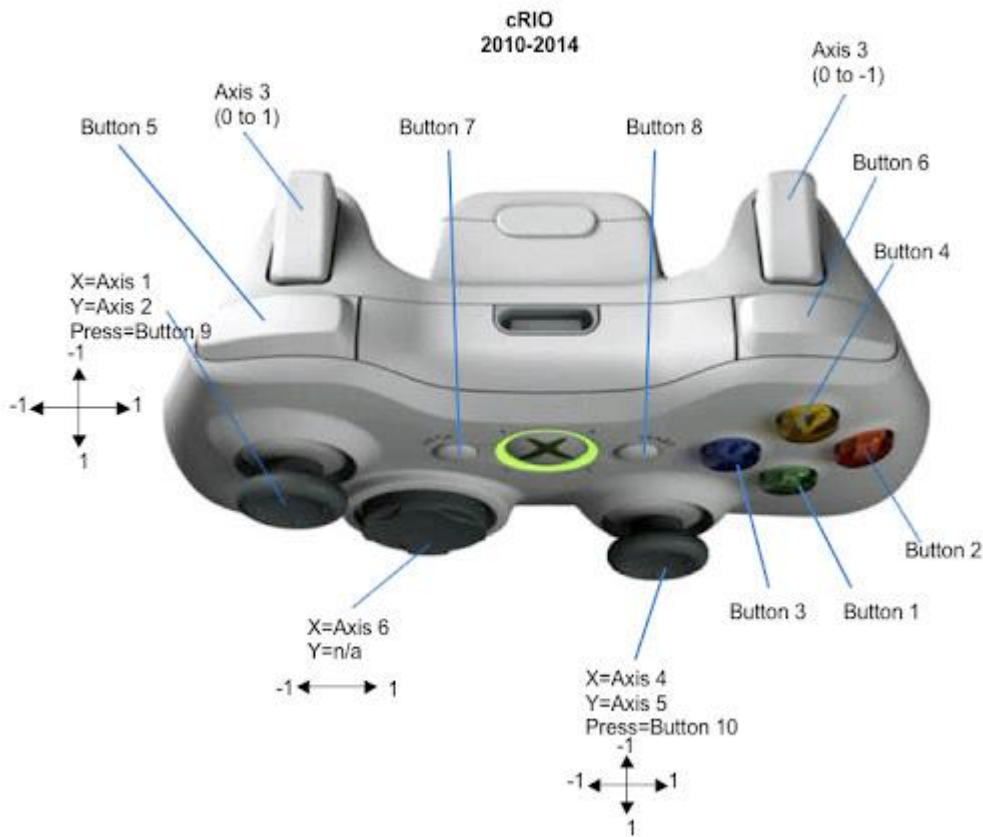
## Imaging your roboRIO

<https://docs.wpilib.org/en/latest/docs/getting-started/getting-started-frc-control-system/imaging-your-roborio.html>

## Programming your Radio

<https://docs.wpilib.org/en/latest/docs/getting-started/getting-started-frc-control-system/radio-programming.html>

## Xbox Controller Mapping



Wait till after we start programming sessions to do the steps on this page !!

## 3rd Party Libraries

<https://docs.wpilib.org/en/latest/docs/software/wpilib-overview/3rd-party-libraries.html>

## CTRE

### IN VS CODE

- Inside a project
  - Type control-shift P
    - Wpilib: Manage Vendor Libraries
      - Install new libraries 'offline'
        - CTRE-Phoenix

## NavX

### IN VS CODE

- Inside a project
  - Type control-shift P
    - Wpilib: Manage Vendor Libraries
      - `Install new libraries 'offline'
        - KauaiLabsz-navX\_FRC

## WPILIB – next gen

### IN VS CODE

- Inside a project
  - Type control-shift P
    - Wpilib: Manage Vendor Libraries
      - Install new libraries 'offline'
        - WPILIB-New-Libraries

## CTRE Phoenix Documentation

[https://phoenix-documentation.readthedocs.io/en/latest/ch05a\\_CppJava.html#frc-c-java-add-phoenix](https://phoenix-documentation.readthedocs.io/en/latest/ch05a_CppJava.html#frc-c-java-add-phoenix)

## Resolving Intellisense squiggles

<https://docs.wpilib.org/en/stable/docs/software/wpilib-overview/known-issues.html>

## WPILIB C++ Documentation

<file:///C:/Users/Public/wpilib/2020/documentation/cpp/index.html>

## Motor Controllers for FRC

<b>VictorSPX</b>	PWM, CAN	\$ 50	
<b>TalonSRX</b>	PWM, CAN	\$ 90	direct sensor input
<b>SparkMax</b>	PWM, CAN	\$ 75	some direct sensor input
<b>SD540</b>	PWM	\$ 50	some direct input

### obsolete

VictorSP	PWM	obsolete	
Jaguar	PWM	obsolete	
Spark	PWM	obsolete	direct sensor input
Talon	PWM	obsolete	
Victor	PWM	obsolete	
VictorSP	PWM	obsolete	

## Common Header Files

```
#include "AHRs.h"           // for the navx IMU
#include <frc/Encoder.h>
#include <frc/Joystick.h>
#include <frc/TimedRobot.h>
#include <frc/AnalogInput.h>
#include <frc/DigitalInput.h>
#include <frc/PWMVictorSPX.h>
#include <frc/MedianFilter.h>
#include <frc/XboxController.h>
#include <frc/controller/PIDController.h>
#include <frc/smartdashboard/SmartDashboard.h>
#include <frc/smartdashboard/SendableChooser.h>
```

## Getting to the good stuff in VS Code

Type **control-shift P**

Then start typing **WPILIB**: until you see commands like:

- WPILIB: Open API Documentation
- WPILIB: Create New Project
- WPILIB: C++ Refresh C++ Intellisense
- WPILIB: Build Robot Code
- WPILIB: Deploy Robot Code