

Setting up your 3pi Robot

Welcome to the beginning of using your Pololu 3pi Robot! This set-up tutorial will show you a step-by-step process on how to prepare your 3pi Robot for programming.

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[Other useful Pololu links](#)

Google Chrome was used to access websites and download files in this tutorial. Windows 10 was the operating system used to set-up the 3pi Robot. Issues during the set-up may come from using different browsers or operating systems, but should be similar for Windows operating systems.

Necessary downloads

1. Navigate to the Pololu AVR Programming Quick Start Guide Webpage at <https://www.pololu.com/docs/0J51>

Here is the overview page on all the steps needed to set-up the robot in Windows, Linux, and Mac systems. This is how the page looks:

The screenshot shows a web browser displaying the Pololu AVR Programming Quick Start Guide. The page has a dark blue header with the Pololu logo and navigation links for Catalog, Forum, Blog, Support, Ordering, Distributors, About, and Contact. A search bar and a feedback link are also present. The main content area contains a table of contents for the quick start guide, including sections for Overview, Before Programming, Programming in Windows with Atmel Studio, Programming in Linux, and Getting Started on Mac OS X. To the right of the content, there is a large image of an Atmel ATmega328P AVR microcontroller chip. Below the chip, the text "Atmel ATmega328P AVR microcontroller" is displayed. On the far right, a "Related Products" sidebar lists various Pololu products with small thumbnail images.

Support »
Pololu AVR Programming Quick Start Guide

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Related Products

- Orangutan LV-168 Robot Controller
- Orangutan SV-328 Robot Controller (partial kit)
- Orangutan SV-328 + USB Programmer Combo
- Orangutan LV-168 + USB Programmer Combo
- Baby Orangutan B-328 + USB AVR Programmer Combo
- Baby Orangutan B-48 + USB Programmer Combo
- Pololu USB AVR Programmer
- Orangutan SV-328 Robot Controller
- Baby Orangutan B-48 Robot Controller
- Pololu 3pi Robot
- Baby Orangutan B-328 Robot Controller
- 3pi Robot + USB Programmer Combo

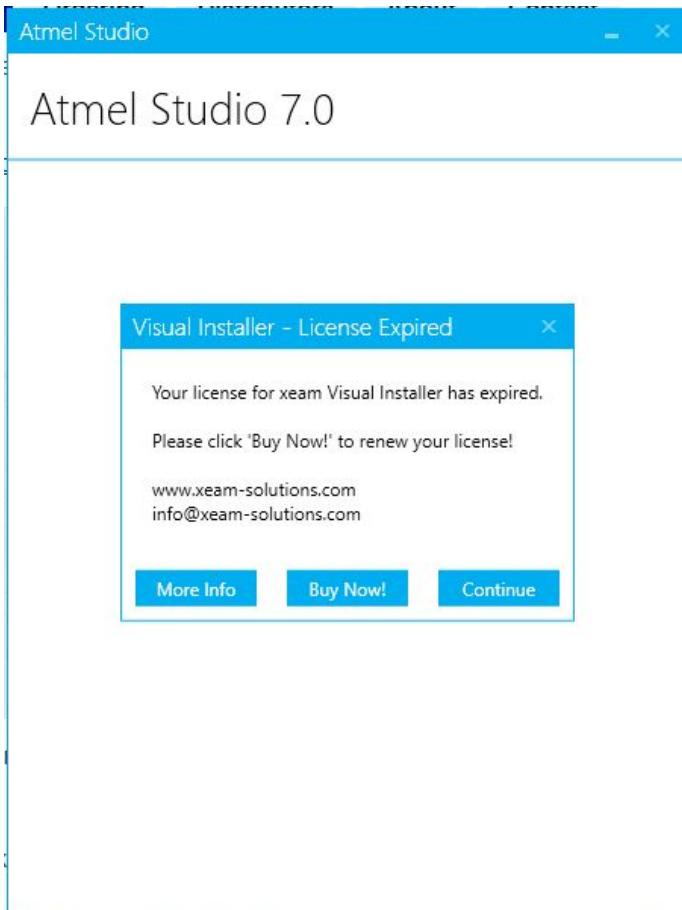
2. Click on “3.1 Installing Prerequisites”

We can go straight to section 3.1. This page contains the software needed to install and run the 3pi Robot. We'll need “Atmel Studio” and the “Pololu AVR Development Bundle”.

The screenshot shows a web browser window with the Pololu website. The URL is https://www.pololu.com/docs/0J51/3.1. The page title is "3.1. Installing Prerequisites". The main content area discusses the installation of Atmel Studio and the Pololu AVR Development Bundle. It includes links to download Atmel Studio 7.0 and the development bundle. A sidebar on the left lists categories like Services, Products, and Electronics. A sidebar on the right lists "Related Products" such as Orangutan LV-168 Robot Controller, Orangutan SVP-324 Robot controller (partial kit), Orangutan SV-328 + USB Programmer Combo, Orangutan LV-328 + USB Programmer Combo, Baby Orangutan B-328 + USB AVR Programmer Combo, Baby Orangutan B-48 + USB Programmer Combo, Pololu USB AVR Programmer, Orangutan SV-328 Robot Controller, Baby Orangutan B-48 Robot Controller, Pololu 3pi Robot, Baby Orangutan B-328 Robot Controller, and 3pi Robot + USB Programmer Combo. A small window titled "Pololu AVR C/C++ Library Setup" is shown, asking to "Install the library into the following toolchains:" with checkboxes for "WinAVR (not detected)" and "Atmel Studio 6.0 (not detected)".

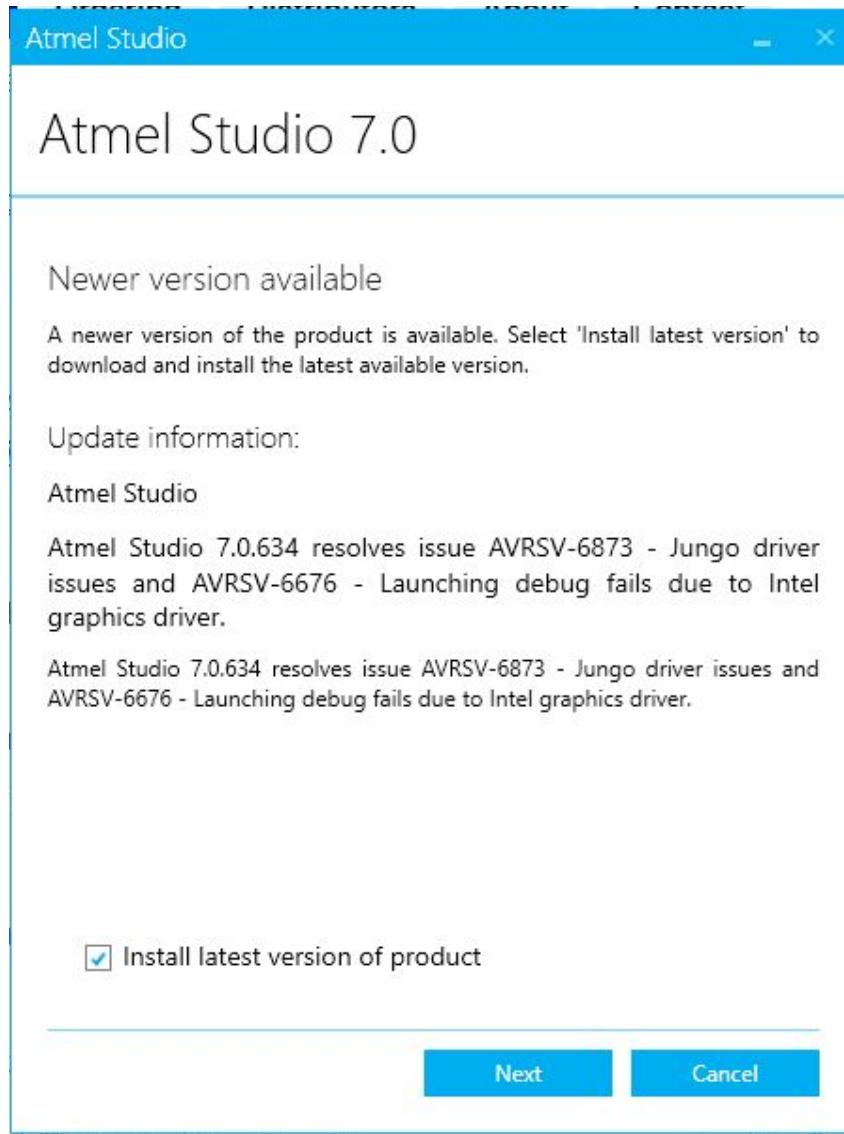
3. Click on “direct download link for Atmel Studio 7.0”

A window telling you a license has expired may ask you to renew the license, but you may simply click continue.



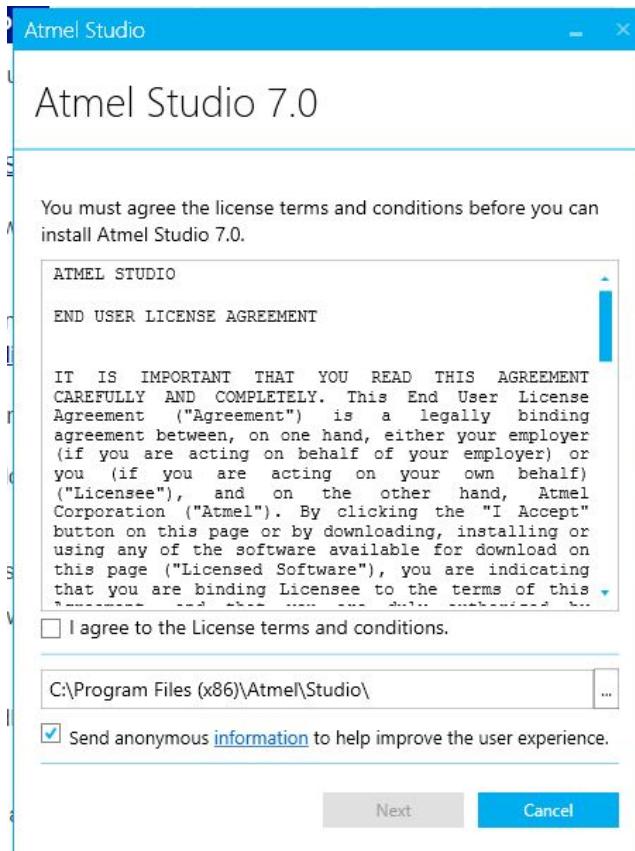
4. Install latest version of product

The next window will tell you about the newest version of Atmel Studio. Check the “Install latest version of product” checkbox and click continue. A short loading period follows.



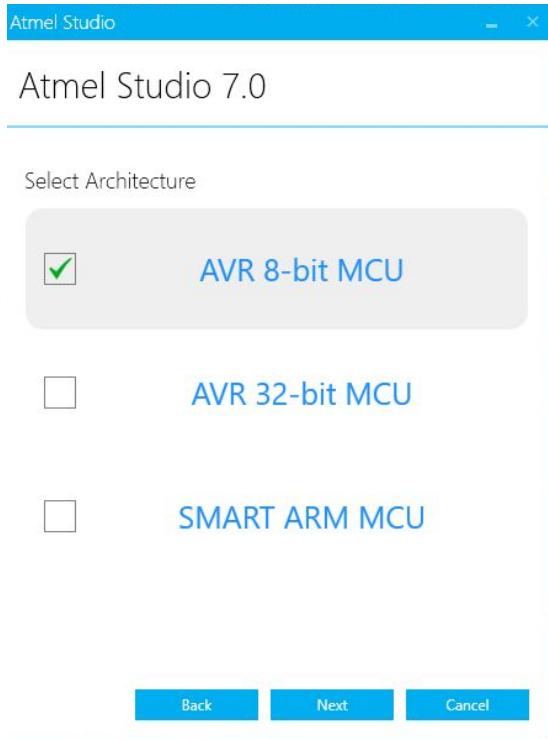
5. Agree to the License terms and conditions

You will be asked to agree to the terms and conditions. Check the box and click next. You may also optionally send information, but this is not required for downloading the software.



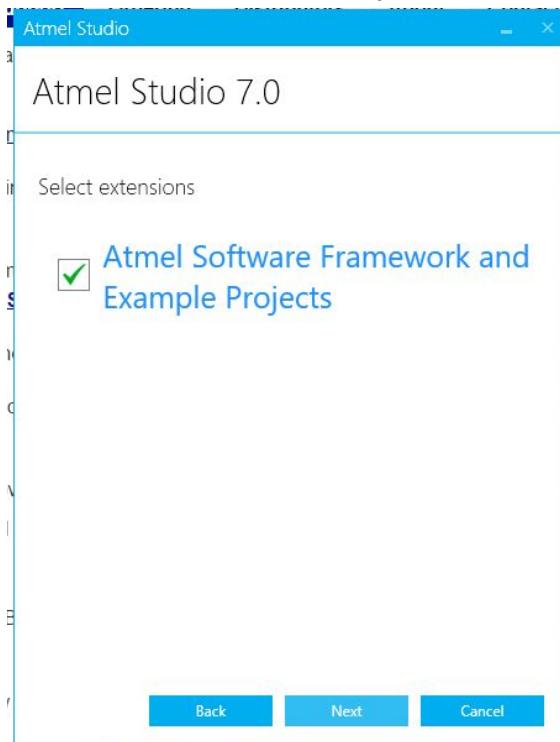
6. Select AVR 8-bit MCU

These robots use an 8-bit microcontroller unit. It's a computer that helps run the robot. Check the AVR 8-bit MCU checkbox and click next.



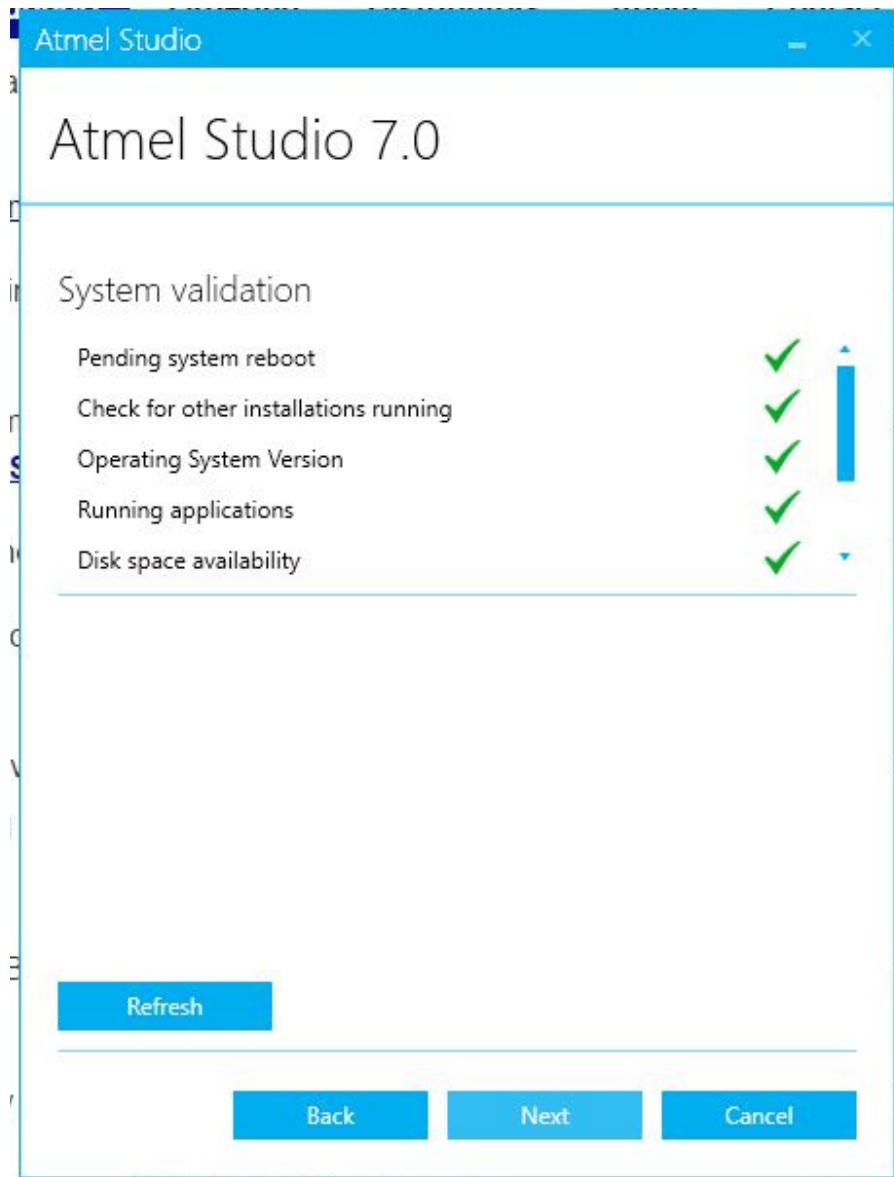
7. Select Atmel Software Framework and Example Projects

The next window ask you to select extensions to Atmel Studio. Check the Atmel Software Framework and Example projects checkbox and click next.



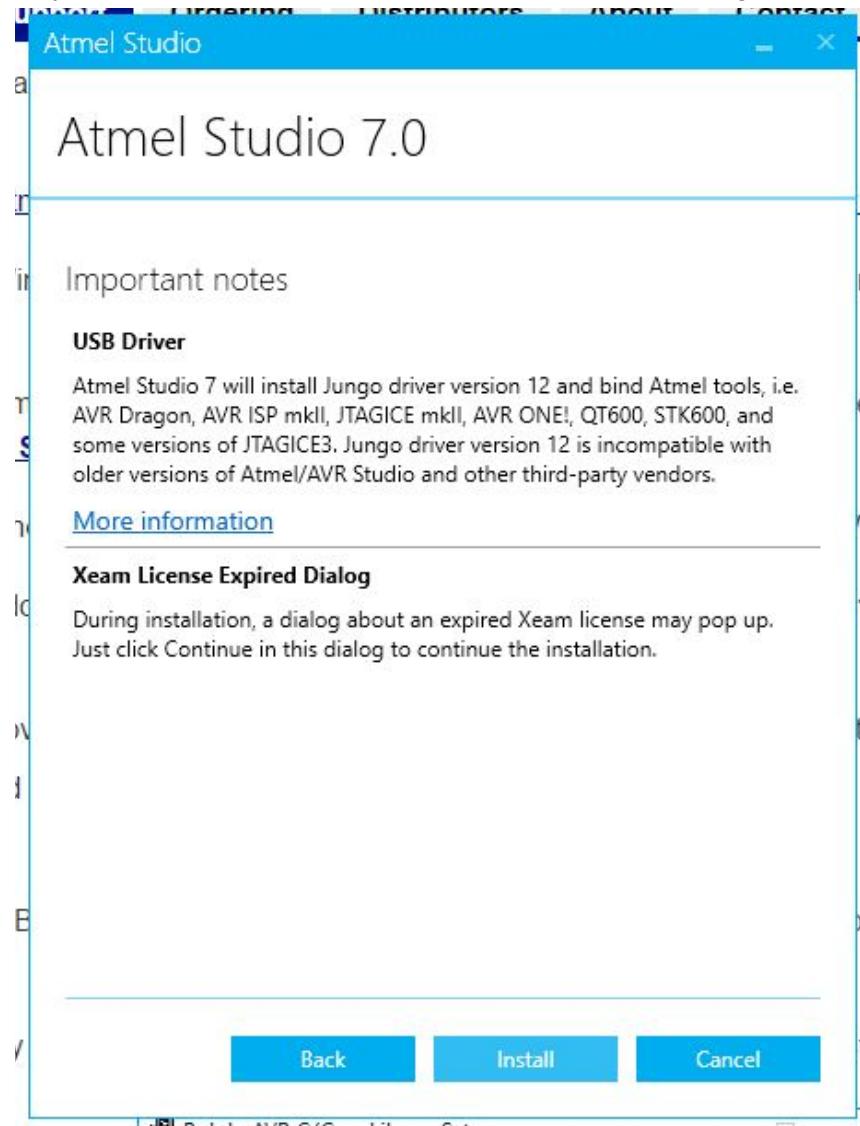
8. System validation

Atmel Studio will validate your system to make sure the installation process will run smoothly.
After the validation is finished click next.



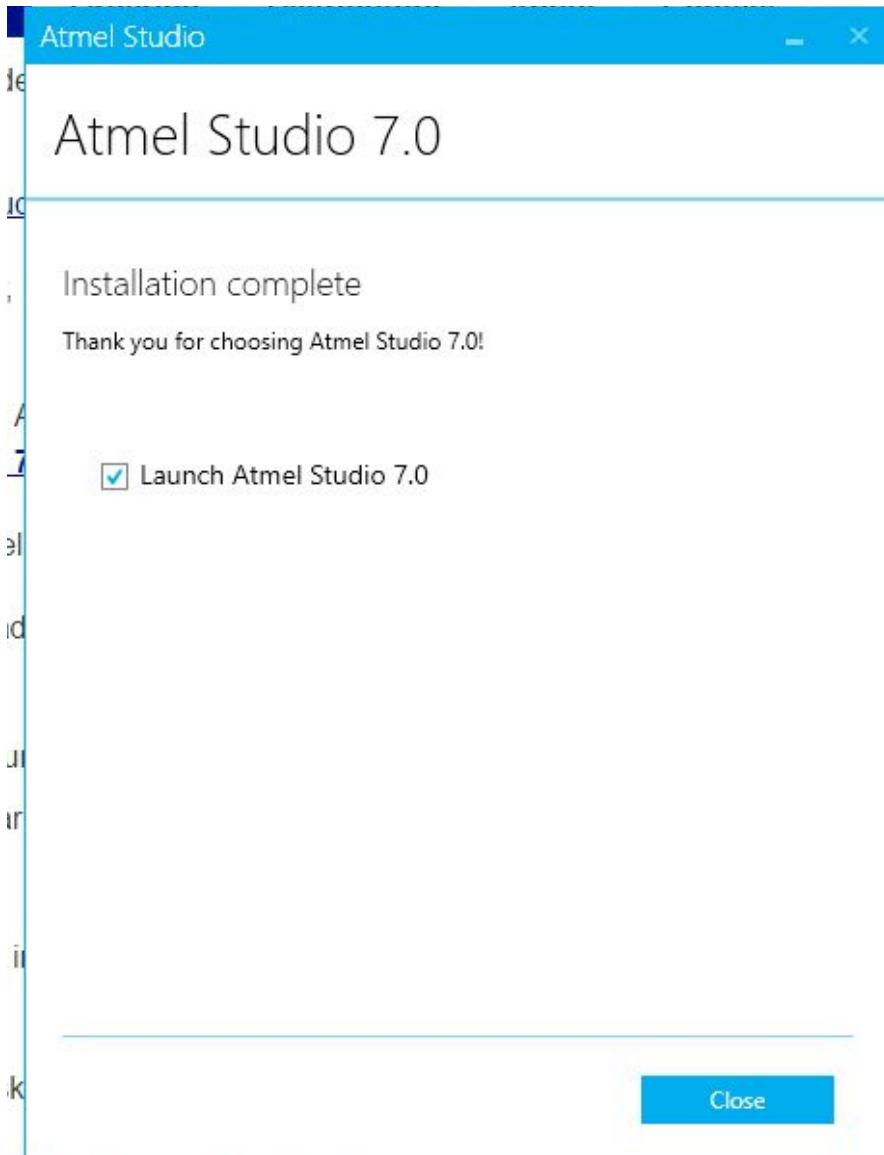
9. Important notes

The next window tells you what may be important to know for this version of Atmel Studio. You may click on install. The installation process will then begin and be done after a few minutes.



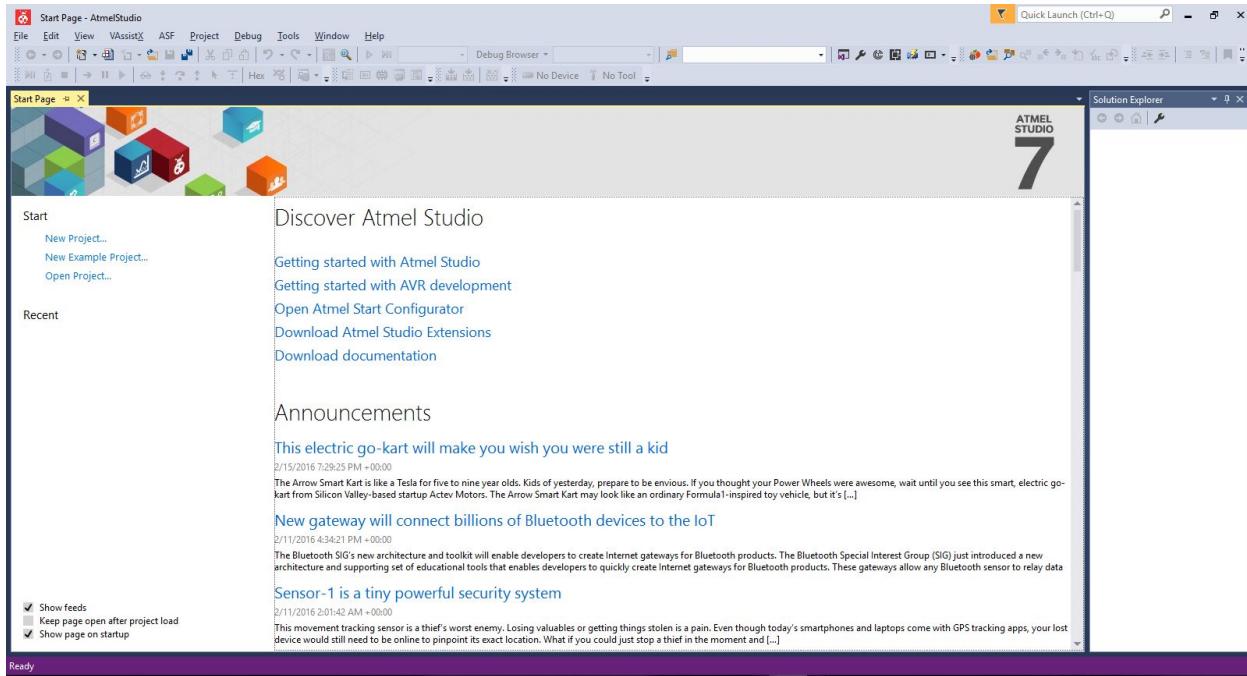
10. Launch Atmel Studio

After installation is complete, you will be able to launch Atmel Studio right afterwards. Check the "Launch Atmel Studio" checkbox and click close.



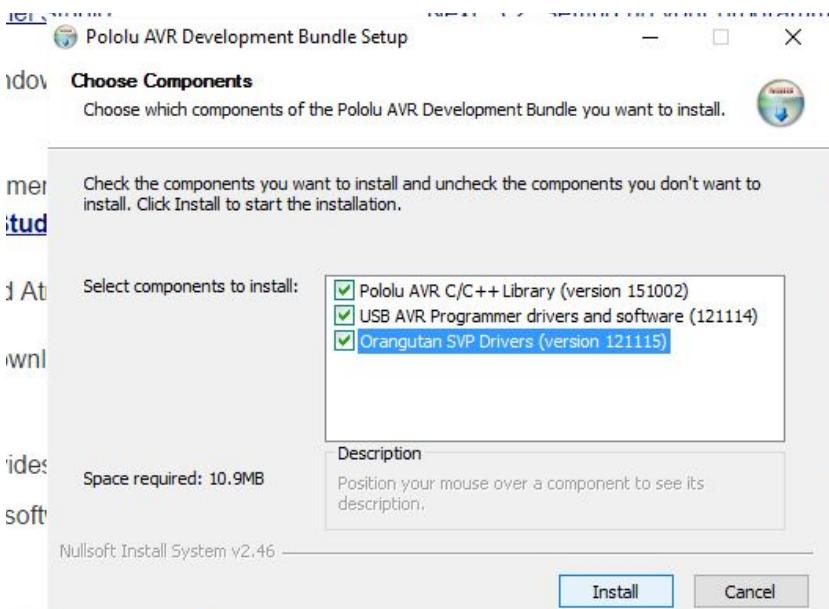
11. First look at Atmel Studio

Atmel Studio is used program the 3pi Robot. By the end of the tutorial we will use it to program the robot, but for now we must download other necessary software. This is what Atmel Studio 7.0 looks like:



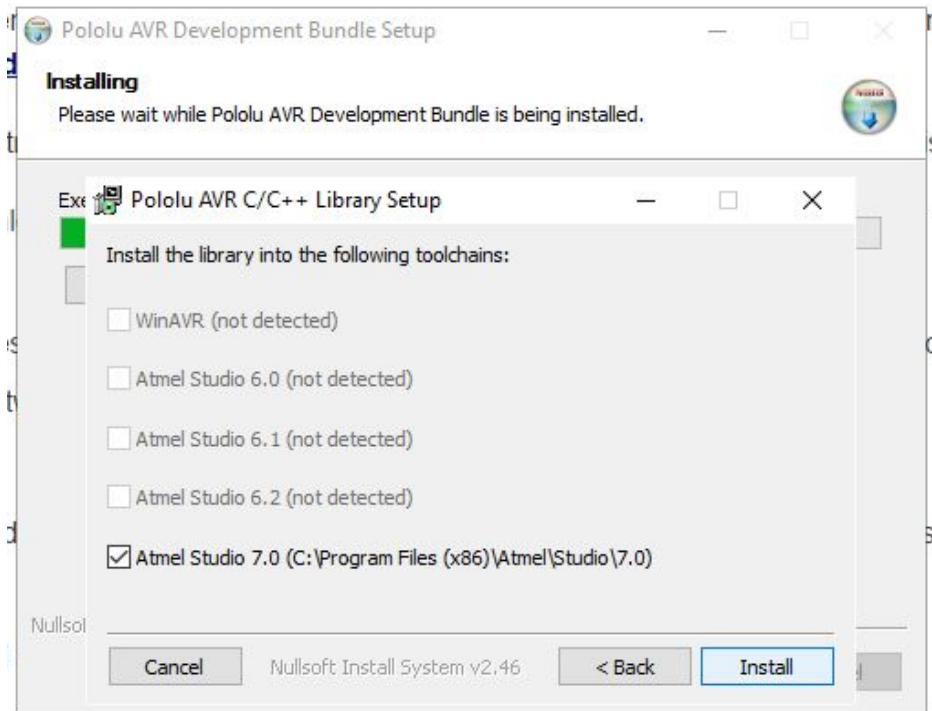
12. Click on “Pololu AVR Development bundle” on the “3.1 Installing Prerequisites” page

Looking back at the Pololu website, the 4th paragraph on the “3.1 Installing Prerequisites” page will have a link to the Pololu AVR Development bundle. First an executable will be downloaded. Click on it to start the download process. The process will start with a “Choose components” window. Check all the boxes and click Install.



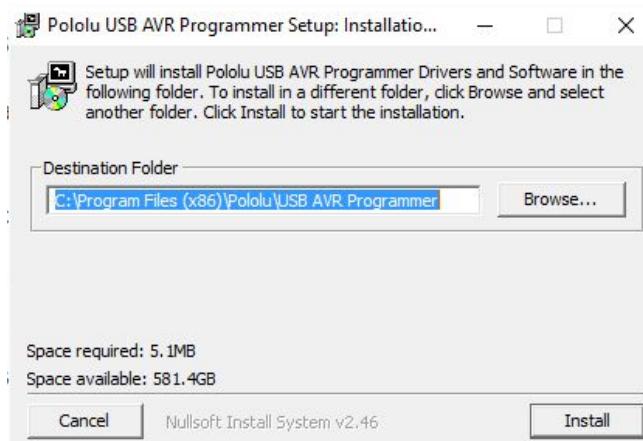
13. Install latest library

The next window will ask you to select a library to install. It should detect which version of Atmel Studio you downloaded and have it checked for you. You may click install. An installation period will follow as it installs the library.



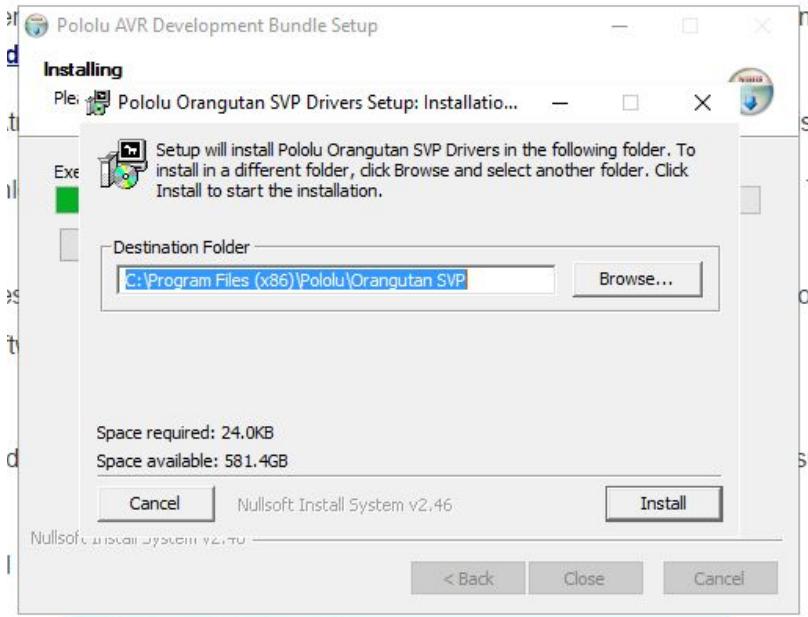
14. Install Pololu USB AVR Programmer Drivers and Software

The next window tells you which folder it will install software; it's recommended to let it install in the folder already listed in the text box. You may click install. An installation period follows.



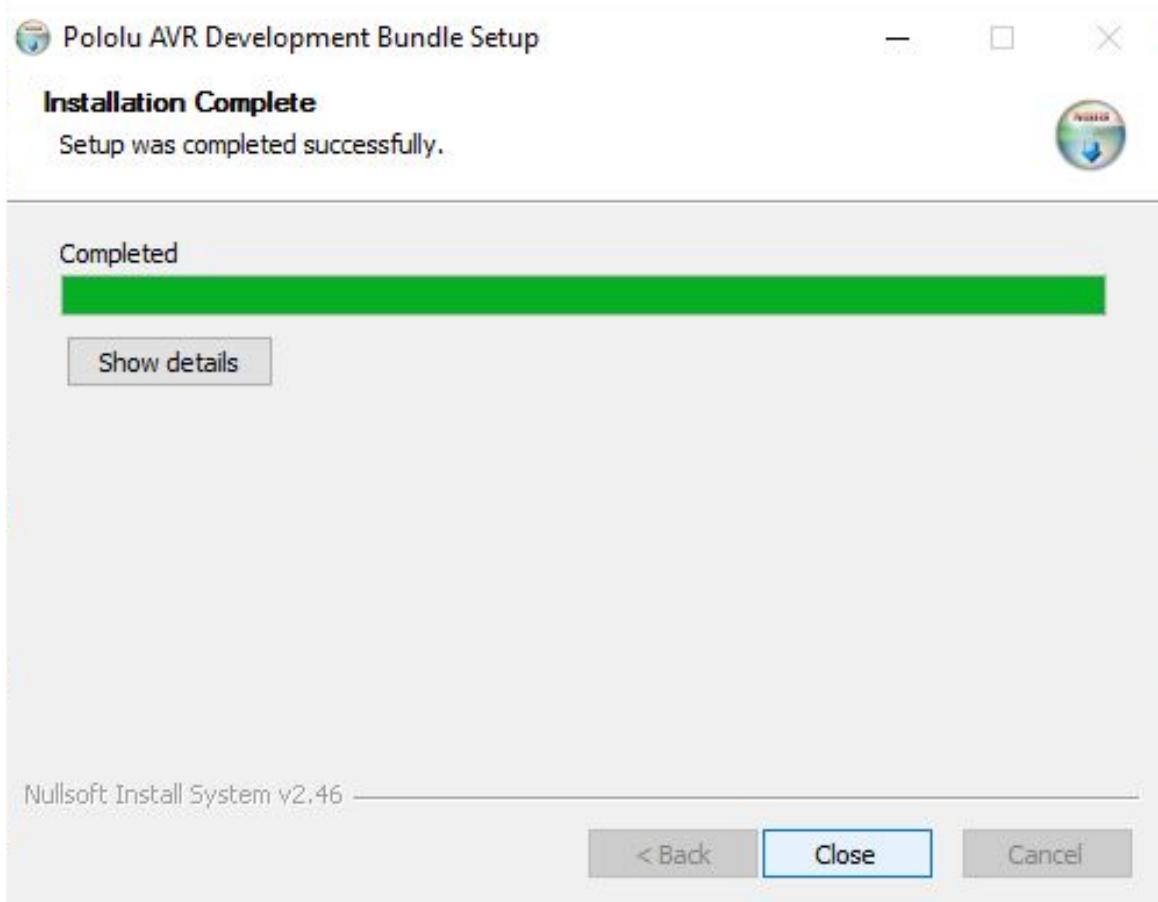
15. Install Pololu Orangutan SVP Drivers

The next window tells you which folder it will install more software; it's recommended to let it install in the folder already listed in the text box. You may click install. An installation period follows.



16. Installation complete

The next window simply tells you the installation process is complete. All the needed software is downloaded and installed at this point. You may click on close and open up Atmel Studio again. Your system may need to reset. Atmel Studio may also need to be closed and opened again.

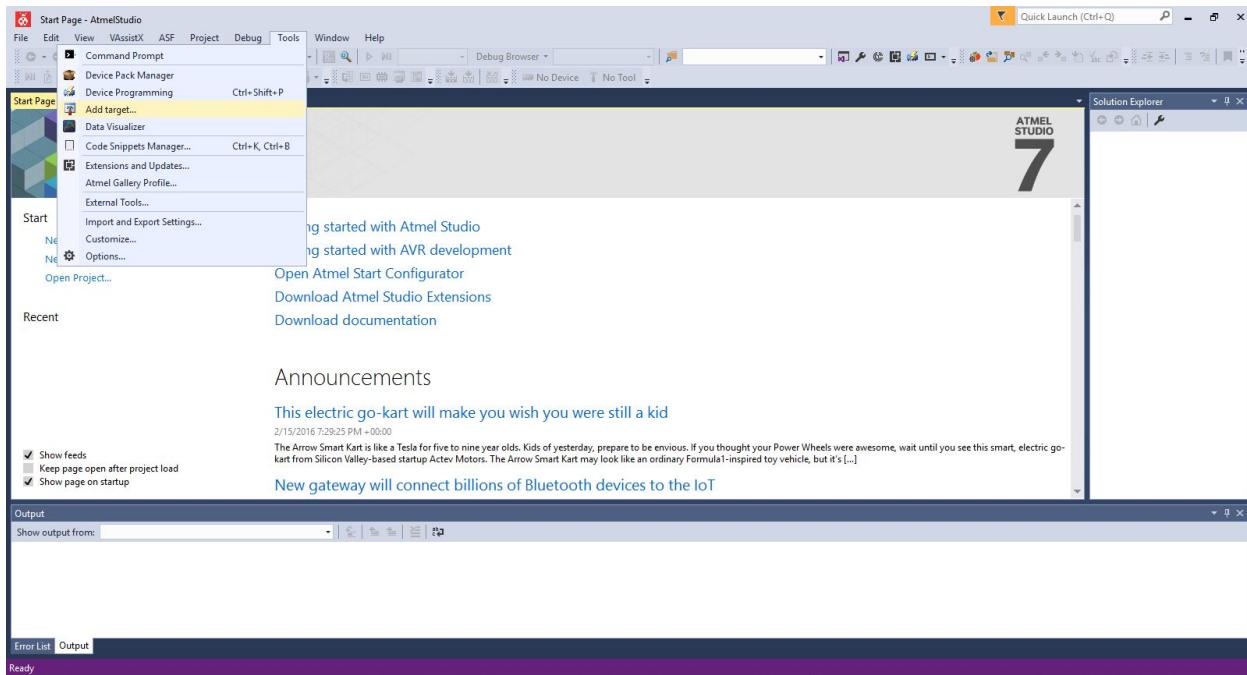


Programming your 3pi Robot

Next step is to set-up Atmel Studio to program the robot. You'll need to plug in the programmer to the 3pi Robot and plug in the usb to your computer.

17. Click on Tools -> Add Target

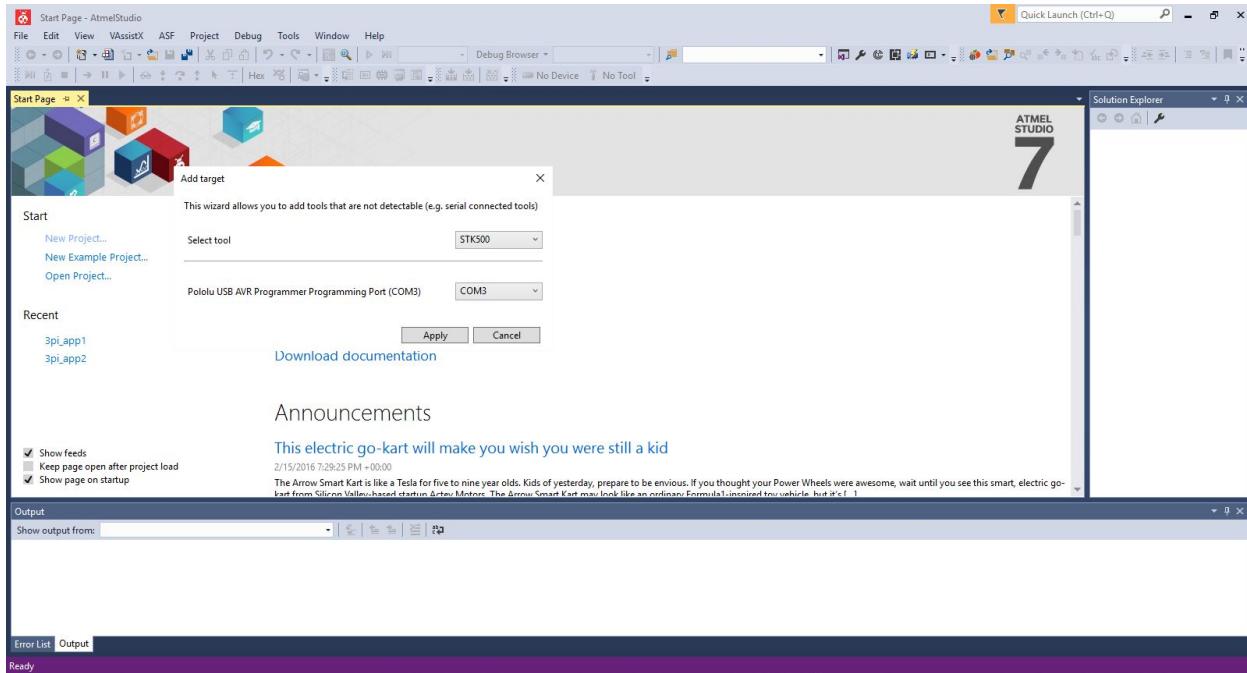
First we must Atmel Studio recognize your “programmer”. Navigate to “Tools” near the top left of Atmel Studio and click on Tools then Add Target.



18. Select “COM3” for the “Select Serial Port” drop down list

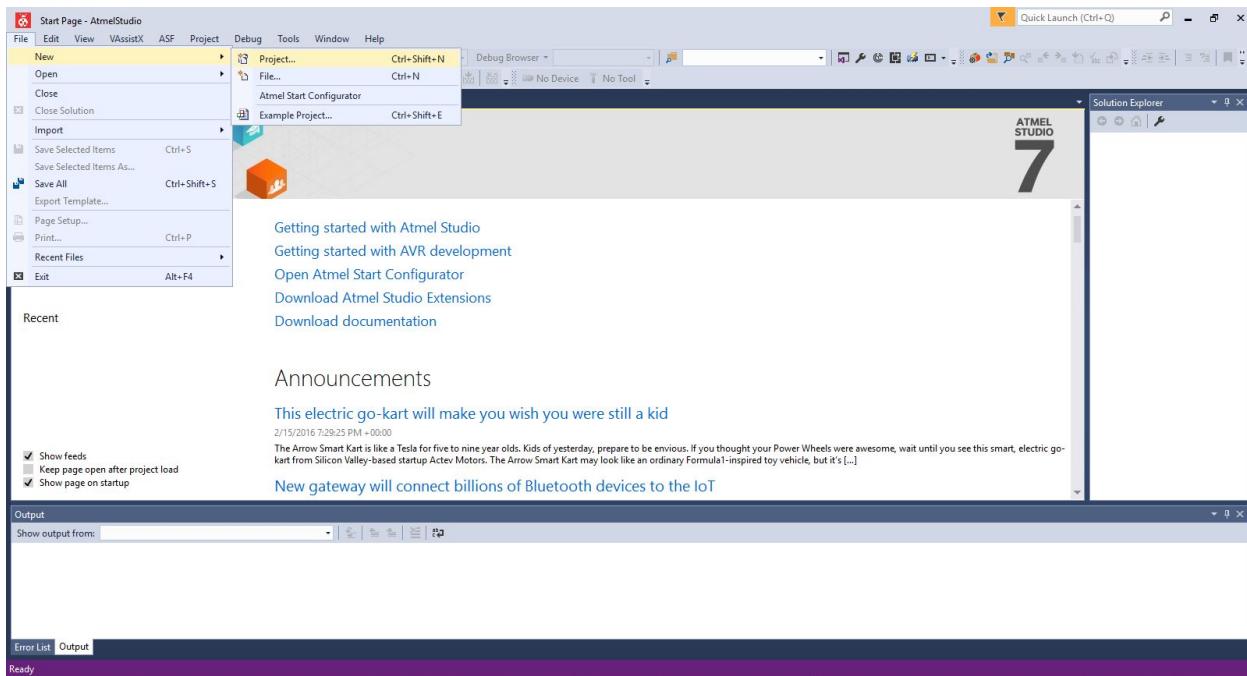
In the add target window you'll have options to “Select tool” and to “Select Serial Port”. You do not have to select a tool, but for Select Serial Port you may have more than one option (like COM3, COM4). Select the option that results with this text popping up: “Pololu USB AVR Programming Port” which is likely COM3. Click apply.

Programming the 3pi Robot will only work when there is only one target and when the port selected results in the text mentioned above. Incase you want to see what targets you have added you may click on View -> Available Atmel Tools. You can right-click and click remove to remove the target and re-add it later if needed.



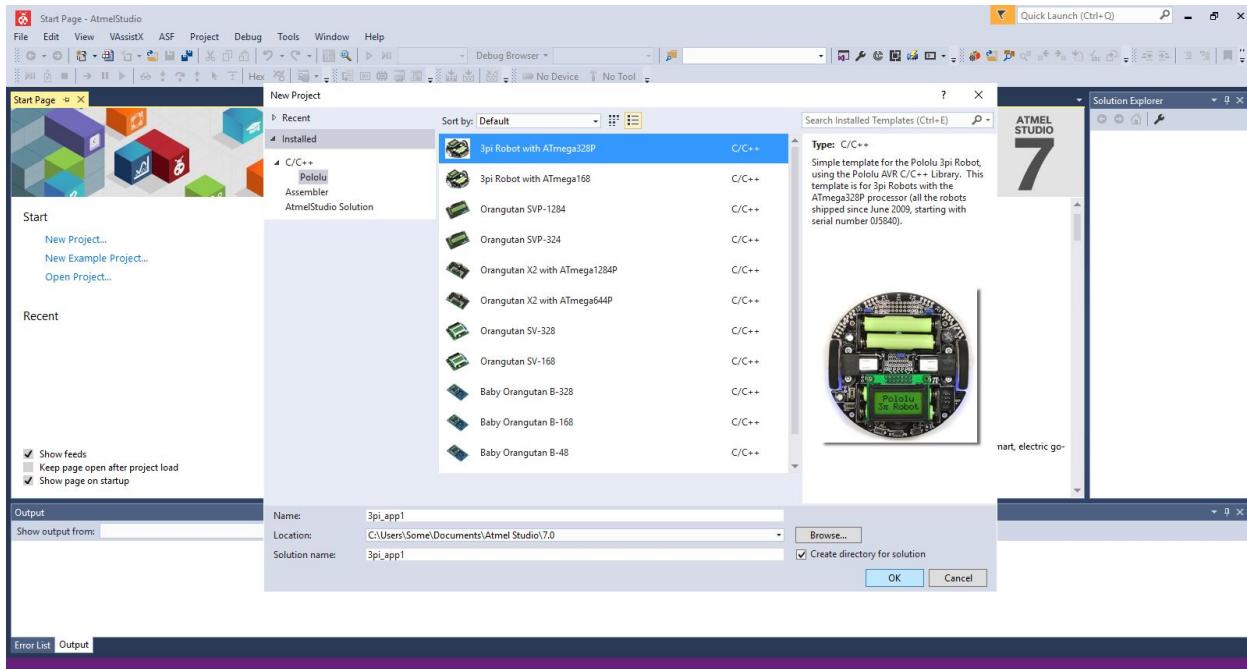
19. Run a test program by clicking on File -> New -> Project

Navigate to “File” near the top left of Atmel Studio and click on File then hover over New then click on Project to create a new project.



20. Click ok

The next window gives you options for robot you want to create a new project for. Atmel Studio is made for many different types of robots, so you'll see many options. The option for your robot should already be selected and you can simply click ok; the option name is "3pi Robot with ATmega328P" should you need to find and select it yourself.



21. Click the green play button



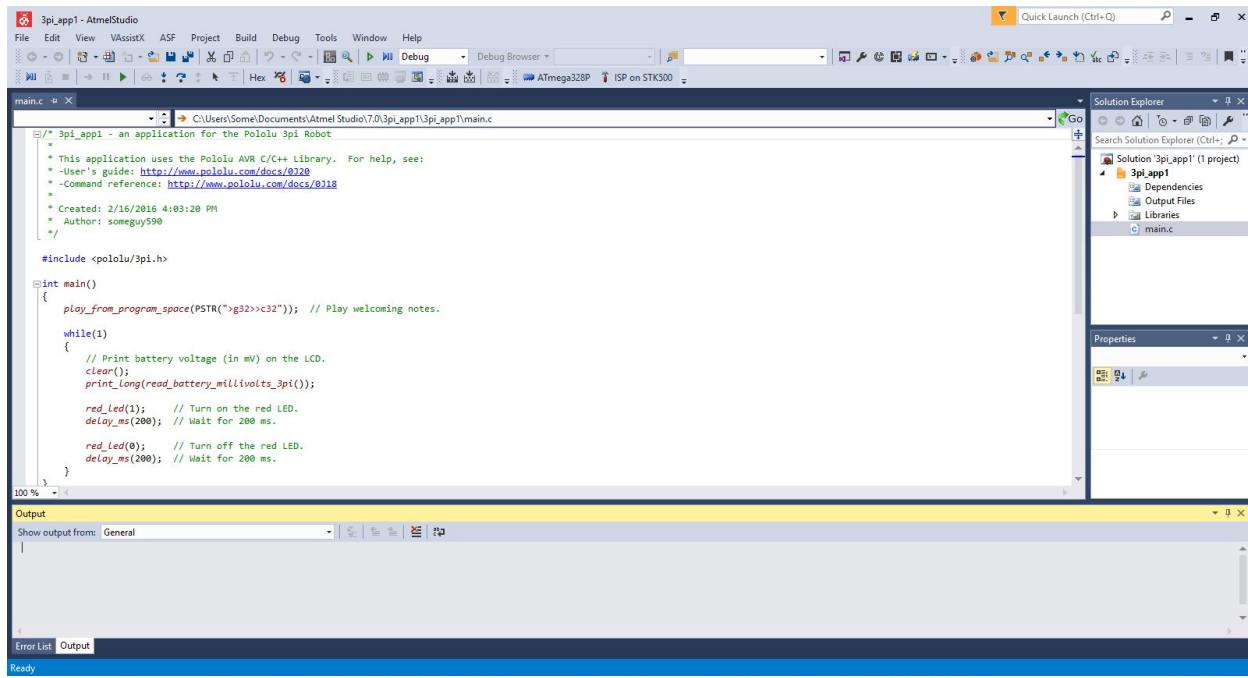
MAKE SURE THE BATTERY LEVEL FOR THE ROBOT IS NOT LOW!

It is urgent that the robot does not have batteries that have low power while programming the robot. Running out of power while programming may render the robot useless, so make sure old batteries are not used while programming.

Here you see the default program for these robots. Making sure your robot is on, you can click the green arrow to apply the program you see to your robot. Shortly after clicking the arrow the robot should play a sound and on the display will be numbers. You can read the code and see exactly what instructions are being given.

For example, `print_long(read_battery_millivolts_3pi());` will print the battery voltage on the screen. You may even replace the "read_battery_millivolts_3pi()" part and input your own

number to have the robot display something different. After any change you make you must click the arrow again to apply the change.



Other useful Pololu links

Pololu 3pi Robot User's Guide - <https://www.pololu.com/docs/0J21>