Task 0 - Instructions for Hardware Testing

Once you have installed the required software, you may test the hardware of the robot using the Firebird V GUI by following the instructions given in this section. The instructions are divided into 3 parts as follows:

1. Connecting the Robot with your PC
2. Writing the GUI Program to the Robot using Bootloader Software
3. Running the GUI Software on the PC

1. Connecting the Robot with your PC

- Take the USB cable from the Robot Accessories box and connect it to the Robot and the PC. Once it is connected successfully, you will see a message on the screen as follows:
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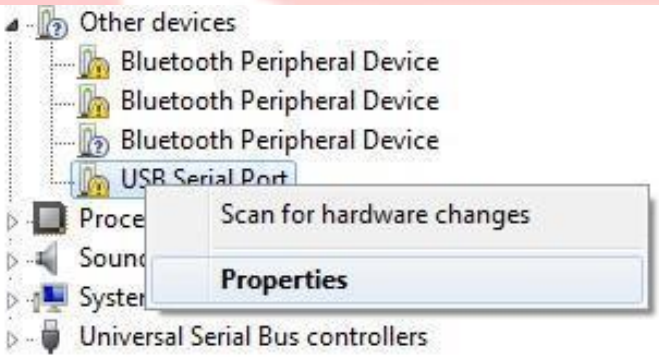
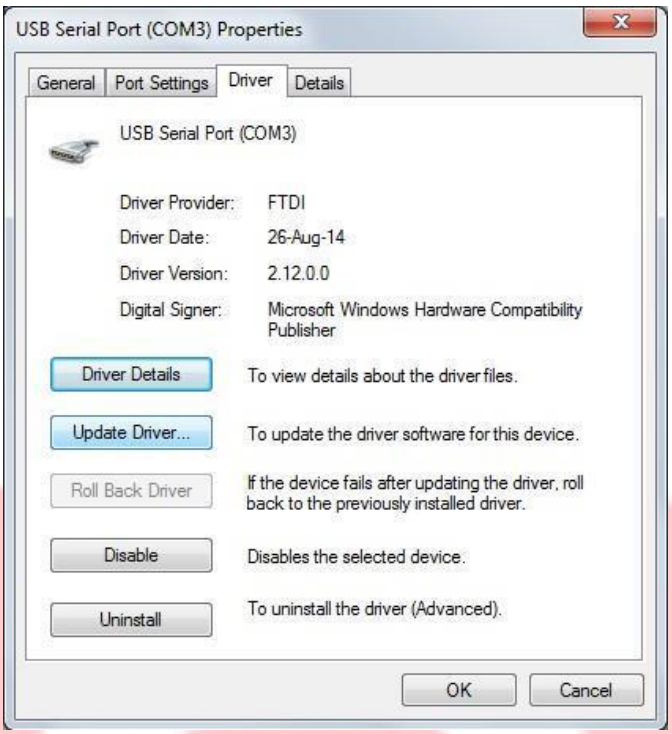
- If the device driver **DOES NOT get successfully installed**, please open the Device Manager and manually install the device drivers as follows.

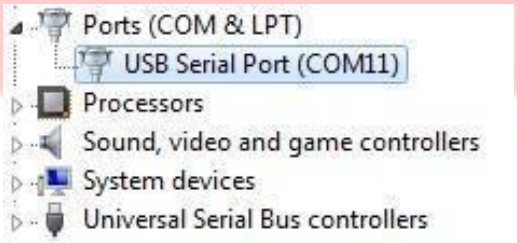
- In the Device Manager -> Other Devices: Select **FT232 USB UART** or **USB Serial Port** (whichever is visible)
- Right Click on this and select **Properties**.



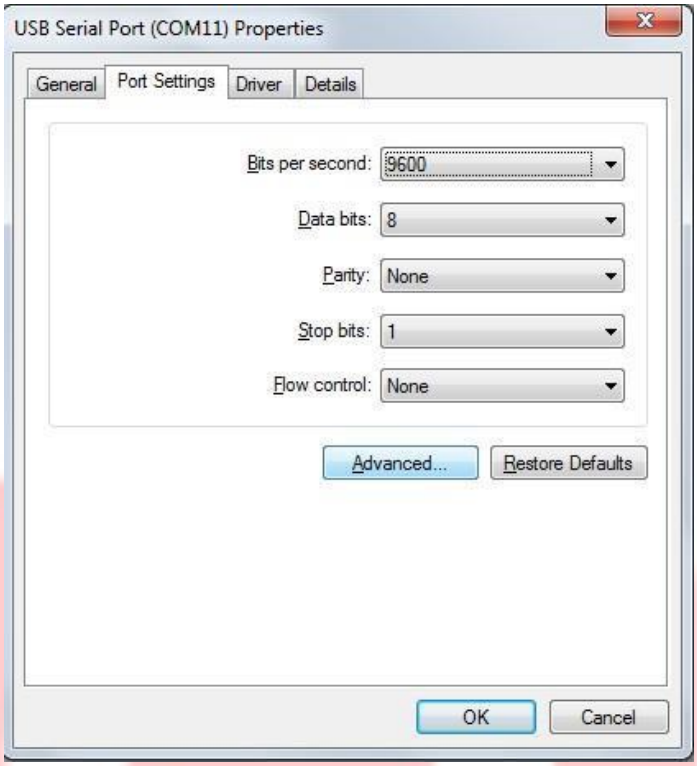
- In Properties, click on the **Driver** tab and select **Update Driver.**



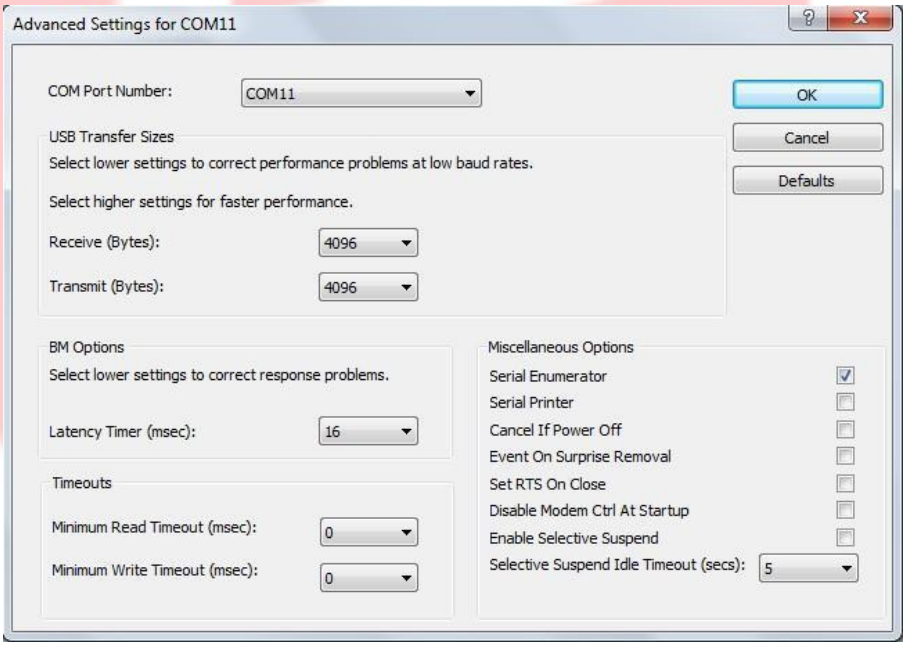
- You will see a window asking where to install the drivers from. Select the **'Browse my computer for driver software'** option. Browse the computer and select the **CDM 2.06.00 WHQL Certified** folder. Its path is **Software and Drivers\CDM 2.06.00 WHQL Certified\CDM 2.06.00 WHQL Certified**.
- Click **Next** and it will begin to install. Once the installation of USB Serial Port Driver is complete, the device will now appear under the Ports (COM & LPT) section of the device manager. **(Note: If you installed the FT232 USB UART Driver first, you have to repeat the same procedure once again for USB Serial Port Driver).**
- **Please refer to section 6.5 of the Hardware Manual for any further clarifications of the procedure.**
- When the device driver is finished installing, you may open the device manager to check the COM Port number of the device as follows



- It is important that the COM number of the USB Serial Port be less than 8. If it is not (as seen in the image above), follow these steps to change the COM Number:
- Right Click on the **USB Serial Port Device** and select **Properties.**
- In the **Port Settings** tab click on the '**Advanced…**' button.



You will see the following window.



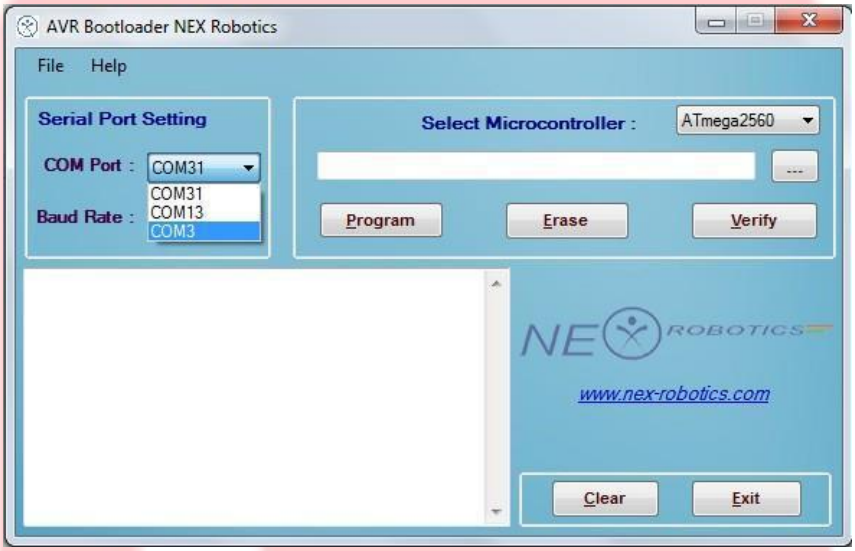
- Select the COM Port Number as any number between 1 to 8, and click on **OK.**

Refer to section 6.6 of the Hardware Manual for any further clarifications on the procedure.

2. Writing the GUI Program to the Robot using Bootloader Software

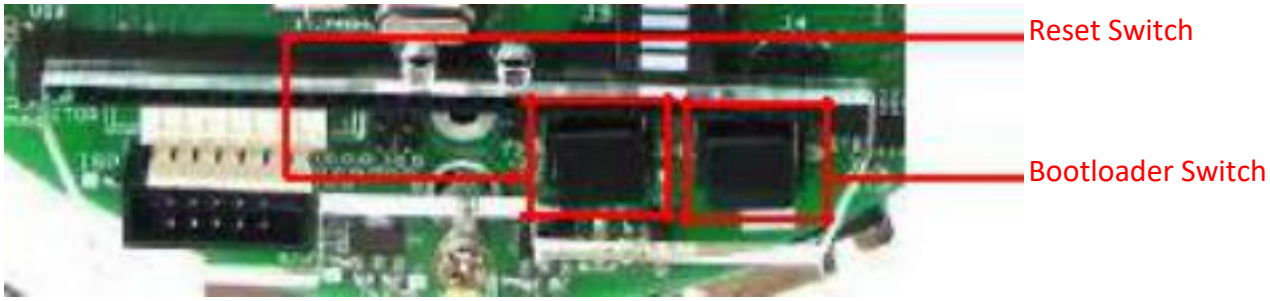
Now we will write the GUI Program to the Robot's Memory. For this we will use the Bootloader Software provided by Nex Robotics (which we have already installed as seen earlier in this tutorial). Please follow the steps given below to burn the GUI program on the Robot:

- Connect the Robot to the PC with the USB cable provided to you. As you have already configured the COM Port Number to between 1 and 8, there is no need to do that again.
- Run the AVR Bootloader Software on your PC and you will see the window shown below. Select the correct COM Port of the Robot.

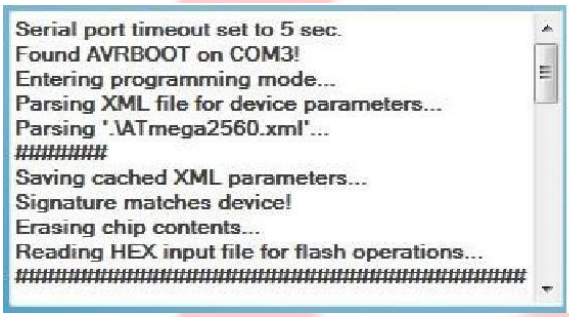


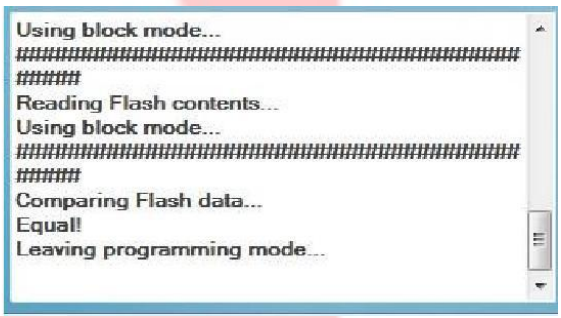
- To select the .hex file to be burned, click on the browse button and select the **FB5_USB_GUI.hex** file. This is located at the following location: Feeder Weeder Task_0\Robot Hardware Testing\2. Firebird V Robot GUI

- To burn the program into the robot's memory, we must first put the robot in the bootloader mode. As you can see, there are two large buttons present on the Robot, as seen below



- The button on the left is the RESET Button and the one on the right is the BOOTLOADER Button.
- To put the robot in the bootloader mode, switch ON the Robot and follow the sequence mentioned below:
  - ✧ Press and hold the Bootloader Button.
  - ✧ Without releasing the Bootloader Button, press the Reset Button.
  - ✧ Without releasing the Bootloader Button, release the Reset Button.
  - ✧ Release the Bootloader Button.
- Now that the robot is in the Bootloader mode, we can press the **Program** button on the Bootloader Window to program the robot. The PC will begin to communicate with the robot and you may see a series of flashes. If the program is successfully burned, you will be able to see the following message on the Bootloader Window by scrolling down.

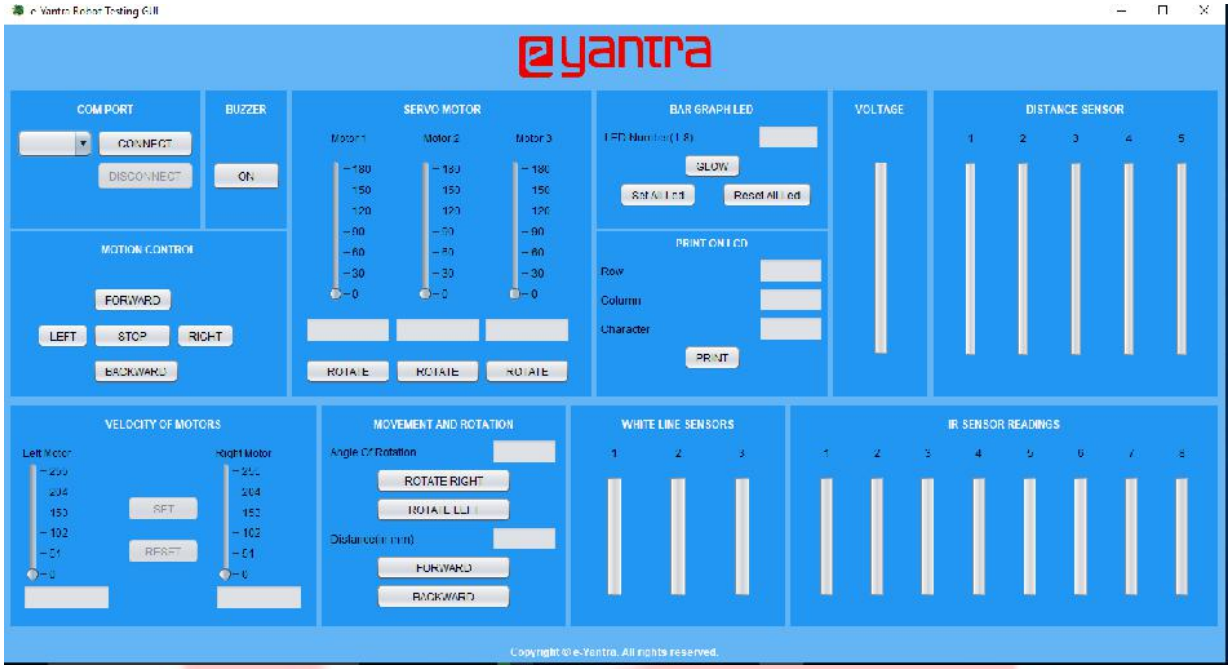




- If this message is not displayed, put the robot in the bootloader mode again and try to burn the program again. Repeat the process a few times till you see the message as seen in the image above.
- If upon repeated trials, the program does not get burned, you may try burning the program using the STK500V2 USB ISP provided with the robot accessories. To program the robot using the ISP, refer to the AVR USB Programmer ManualV3 provided in the Hardware and Software Manuals Folder.

3. Running the GUI Software on the PC

Install the GUI software using the file **e-YantraRoboTestSetup.exe** from the **Feeder Weeder Task_0\Robot Hardware Testing\2. Firebird V Robot GUI** folder. Run the software and you will see a window as follows:



- Connect the Robot with your PC using the USB cable and switch it ON. You should see the message “FB5 GUI MODE NEX ROBOTICS INDIA” printed on the LCD Screen of the Robot.
- In the COM Port drop down menu in the GUI, select the COM Port Number of the Robot and press “Connect”.
- Immediately, you will see a pair of LEDs flashing Yellow and Red lights on the Robot. This indicates that the PC is communicating with the Robot through the USB.
- You must now test the hardware components of the Robot provided to you by your college by clicking on the different buttons in the GUI and verify the working in the Excel Sheet checklist provided to you. If any hardware component is not working, please make sure that it is repaired as soon as possible, so that your team may complete the subsequent tasks.