**TUTORIAL**  
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Subject: Initialize Raspberry Pi 3 for HMI and Control Development  
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**Purpose**

The purpose of this tutorial is to outline a way to Initialize a Raspberry Pi 3 for HMI and control development.  
Note: $ indicates rpi terminal and is not actually typed by user. ↵ indicates pressing enter.

**Requirements**

* rpi
* Internet connection for program download

**Steps**

1. Download the latest version of Raspbian from raspberrpi.org and extract img file.
2. Using Win32 Disk Imager (or imilar), write img file to SD card.
3. Connect to wireless
4. Update
5. Restart
6. Vnc tut
7. Upgrade

Update modprobe.d conf blacklist

Edit config.txt to enable dtparams

Reboot

1. Once your display is oriented to your liking, the touchscreen is probably oriented incorrectly. To fix this, first download and install xinput:

$ sudo apt-get install xinput ↵

1. Then List your current displays:  
     
    $ xinput --list ↵
2. You should see something like “FT5406 memory based driver”.
3. Type into the rpi console:

$ xinput set-prop ‘FT5406 memory based driver’ ‘Evdev Axes Swap’ 1 ↵  
Then:  
 $ xinput --set-prop ‘FT5406 memory based driver’ ‘Evdev Axis Inversion’ 0 1↵  
OR:  
 $ xinput --set-prop ‘FT5406 memory based driver’ ‘Evdev Axis Inversion’ 1 0 ↵  
  
Until the touch screen responds correctly.

1. Once you have found a display and touch configuration that works, the desired xinput commands must be entered upon every boot for changes to take effect.   
   The approach to resolving this issue, since booting to GUI, is to create a .desktop file to run a custom script. First, create a .desktop file (assumes default user of pi):  
     
    $ sudo nano /home/pi/.config/autostart/xinput.desktop ↵  
     
   Then enter:  
     
    [Desktop Entry]  
    Type=Application  
    Exec=/home/pi/.config/autostart/xinput\_script  
     
   And save and exit via Ctrl+X.
2. Create a script file to run:  
     
    $ sudo nano /home/pi/.config/autostart/xinput\_script ↵   
     
   And enter:  
     
    xinput set-prop ‘FT5406 memory based driver’ ‘Evdev Axes Swap’ 1  
    xinput --set-prop ‘FT5406 memory based driver’ ‘Evdev Axis Inversion’ **XXX**  
     
   Replacing the **XXX** with the correct 1 0 or 0 1 that performs the desired inversion.  
   Ctrl+X to save and exit.
3. Change the read/write/execute permissions on the created script file:  
     
    $ sudo chmod 777 /home/pi/.config/autostart/xinput\_script ↵
4. Restart the rpi.
5. If everything worked correctly, enjoy your newly configured touchscreen!

**Closing Notes**

This may, or may not, work for you.