Demonstration of the experimental setup
EE380 (Control Systems)

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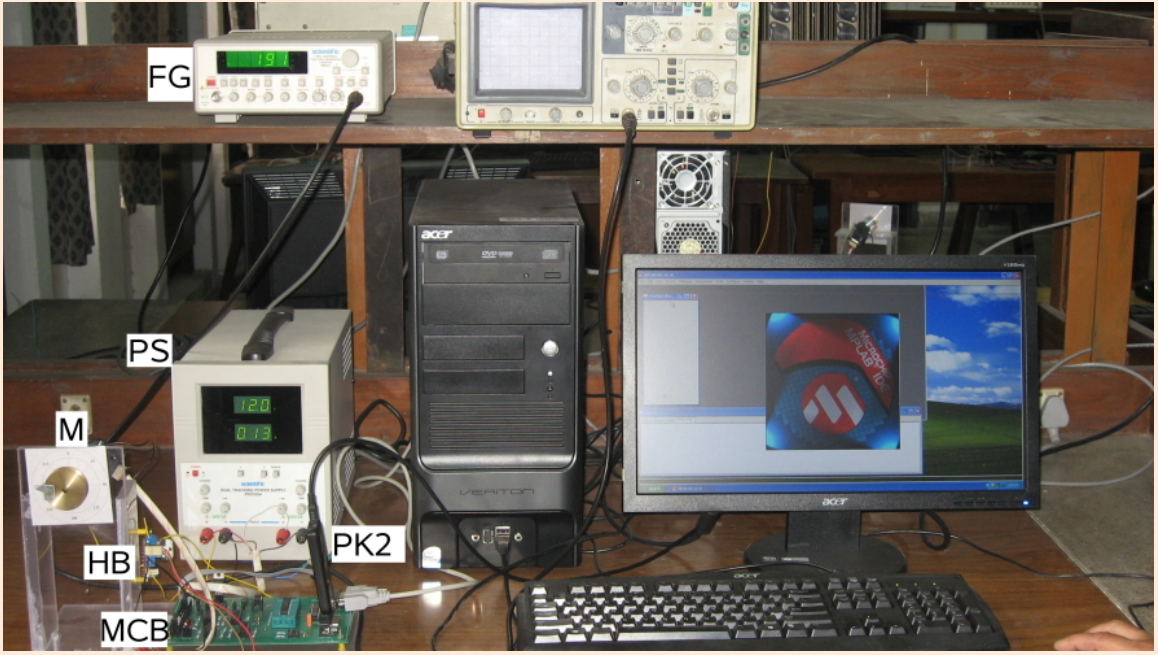
Components of the work bench



FG: Function Generator, PS: Power Supply, M: Motor with encoder, HB: H-bridge, PK2: PICkit 2, MCB: Motor Control Board. The PC is also part of the work bench.

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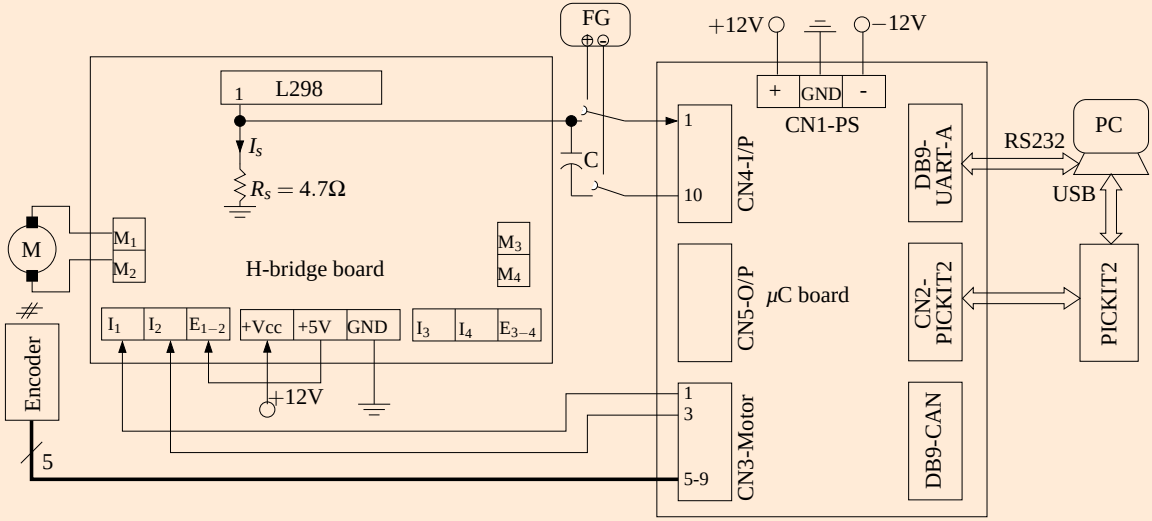
How the components are interconnected



Note: The setup allows to connect another motor to H-bridge board between pins M_3 and M_4. Connector CN5-O/P can then be used to connect to I_3, I_4, E_{3-4}. But, as we have only one QEI module on dsPIC30F4012, we cannot use encoder signal from that motor. However, we can perform speed control by using armature current sensed at pin 15 of L298 similar to how it is being sensed at pin 1.

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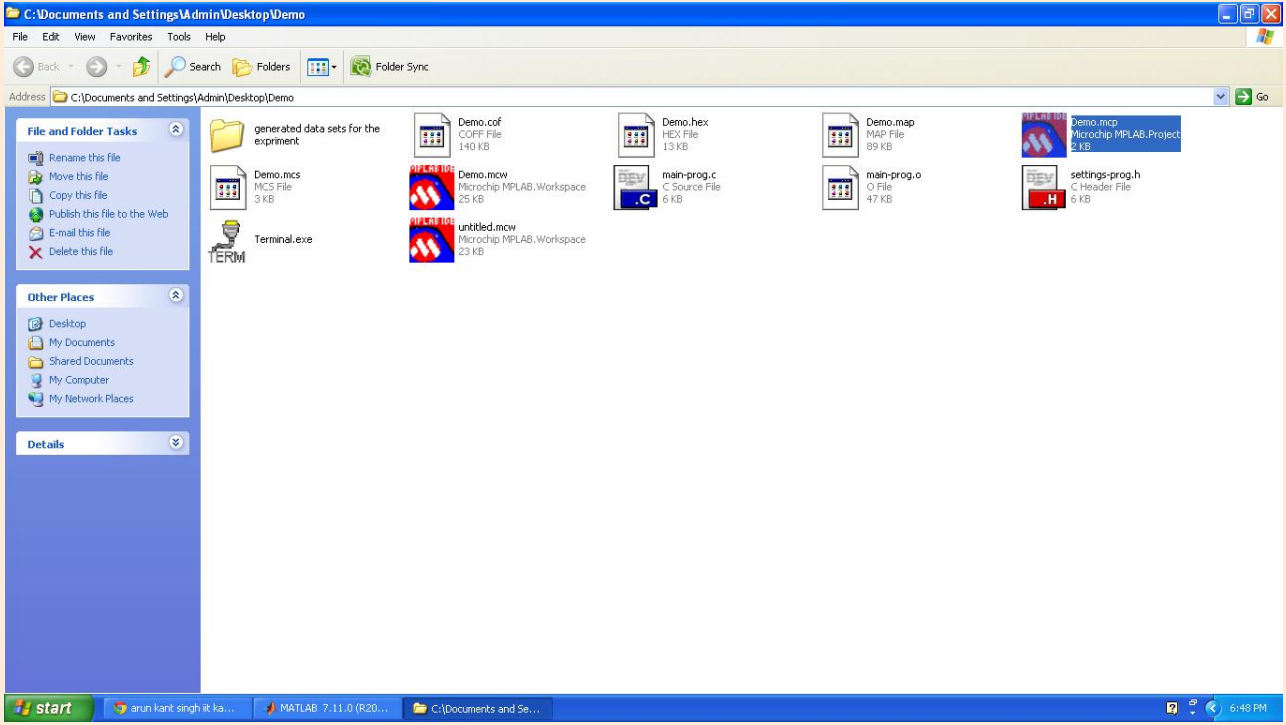
Use MPLAB IDE: Open project file



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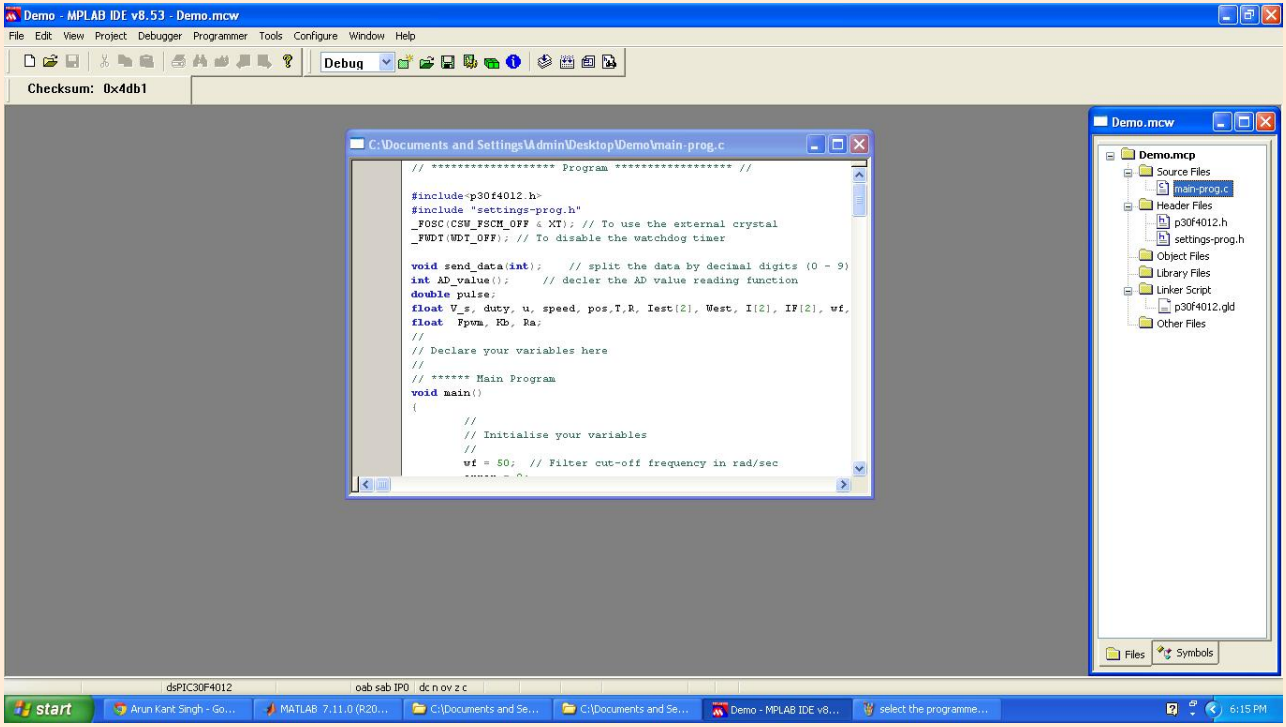
Use MPLAB IDE: Open program in project



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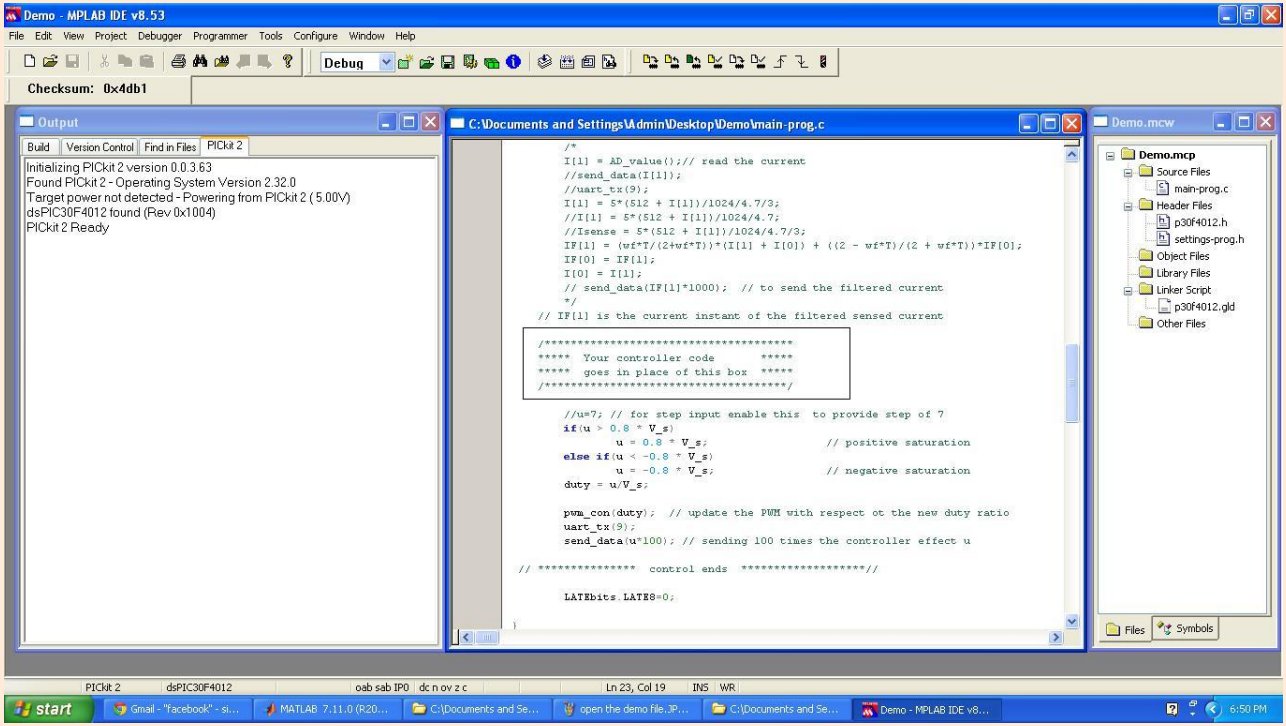
Use MPLAB IDE: Insert controller code



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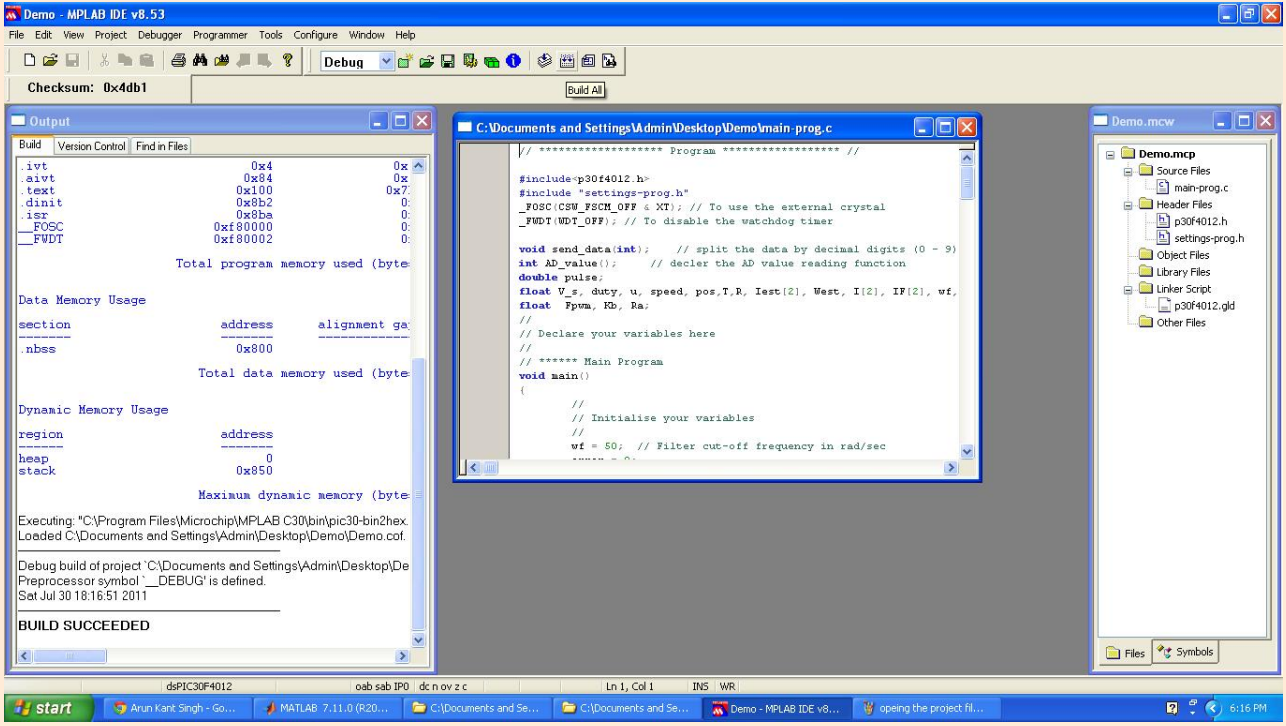
Use MPLAB IDE: Build project



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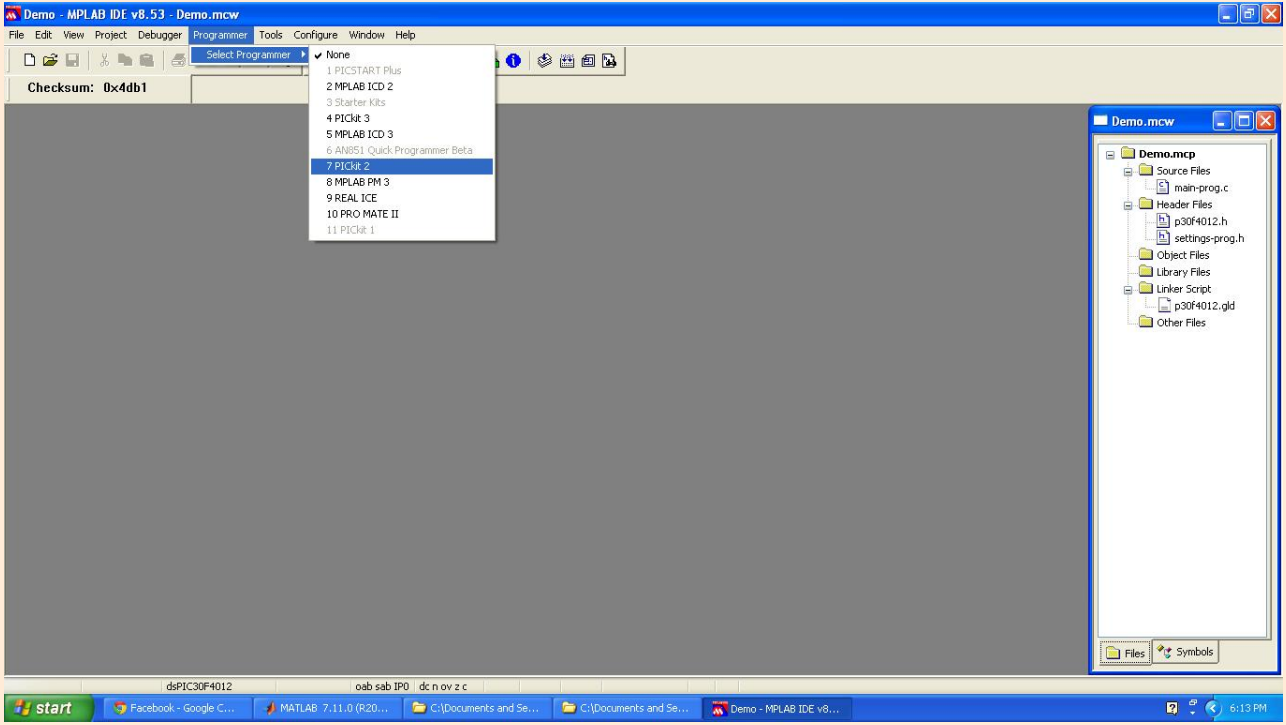
Use MPLAB IDE: Select programmer



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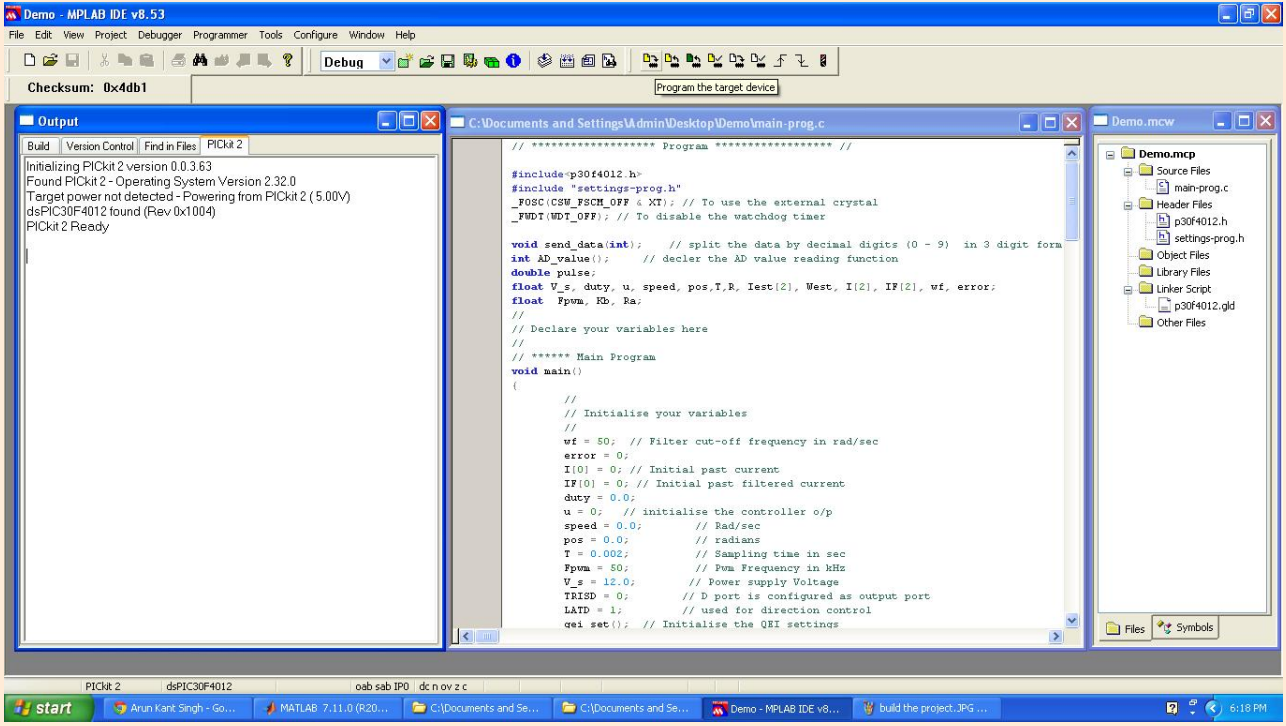
Use MPLAB IDE: Program dsPIC30F4012



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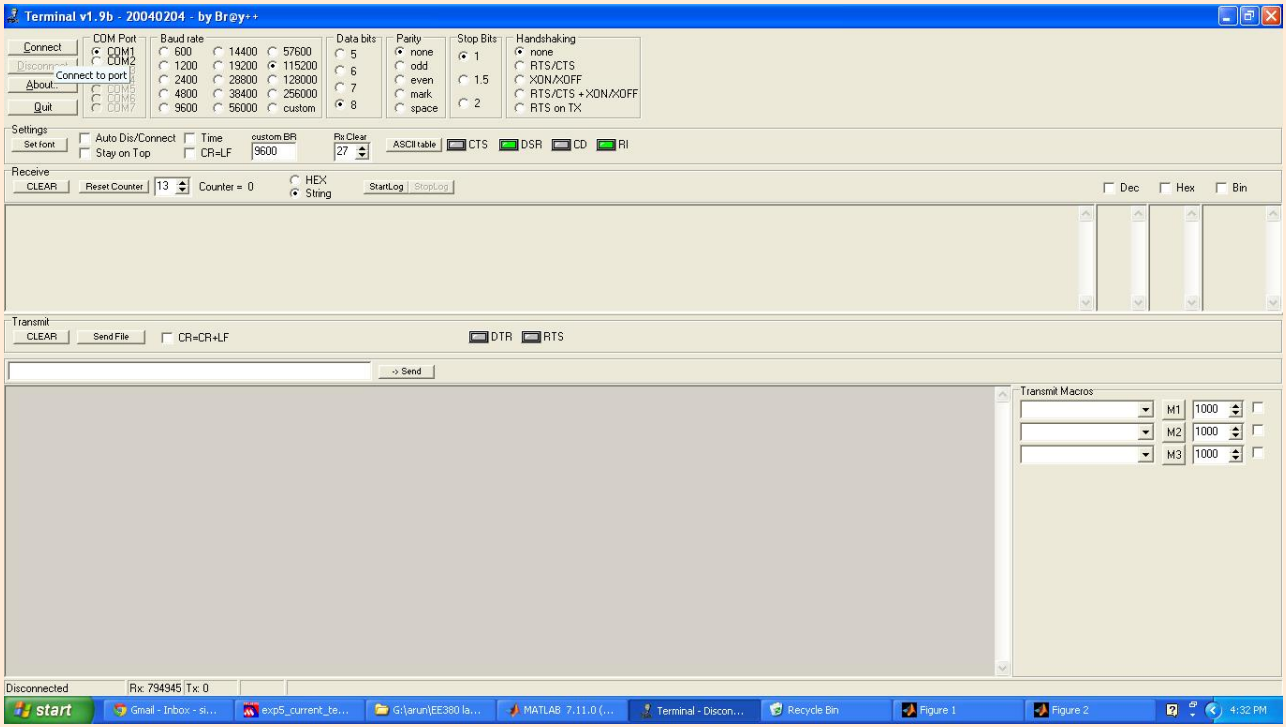
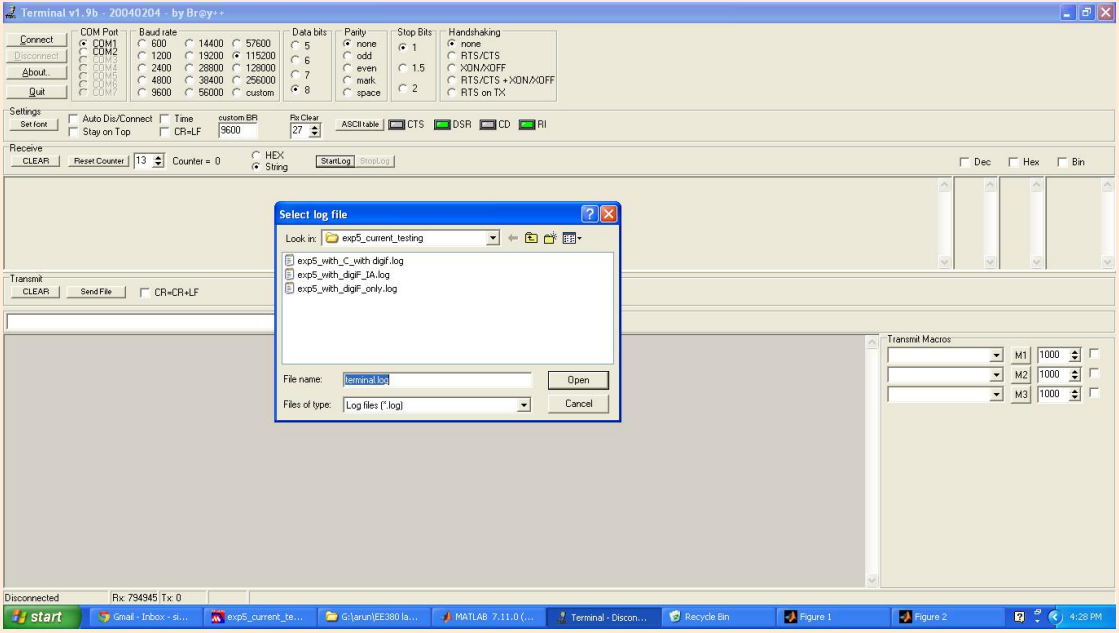
How to read data

Start `terminal.exe`. Configure the GUI as shown.



How to store data

- Click on `Start Log` button; provide a file name and location to store this file.



- Hold down reset button on MCB; click on `Connect` button on `terminal.exe`.
- Release reset button; read in data for a little longer than t_s of your control sytem.
- When done, click on `Stop Log` button on `terminal.exe`.

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How to plot data

- Let log file created by `terminal.exe` be `testdata.txt`.
- Remove the parts of the text from the beginning and end of the file that is not the data about variables of interest from the μC.
- Place m-file `readplot.m` in folder that contains `testdata.txt`.
- Start up GNU Octave in this folder.
- Execute `readplot.m` in GNU Octave.
- If plots have problems appearing, apply correction given in `readplot.m`.