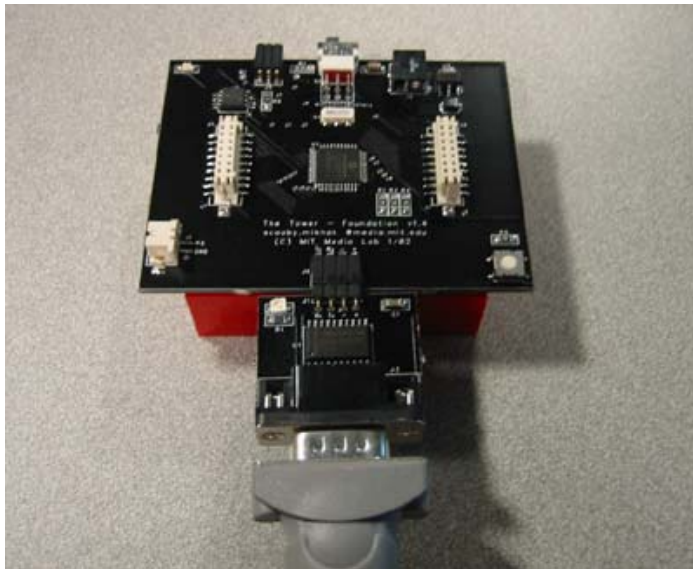
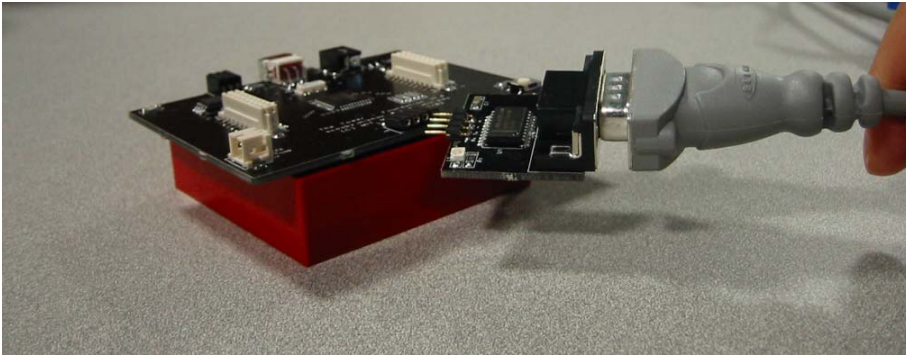


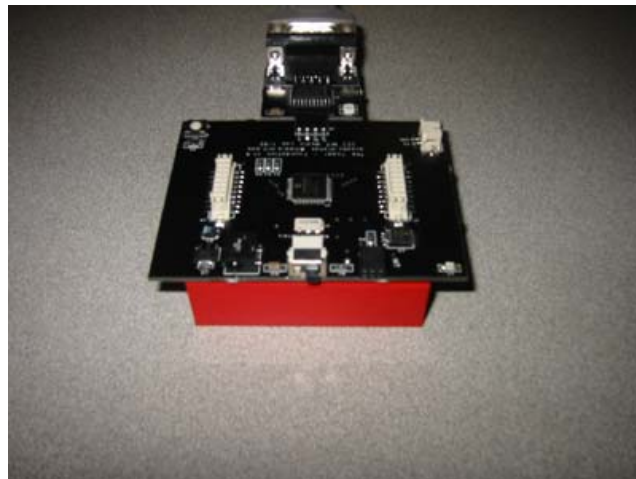
## The Tower – Using the PIC Foundation v1.4

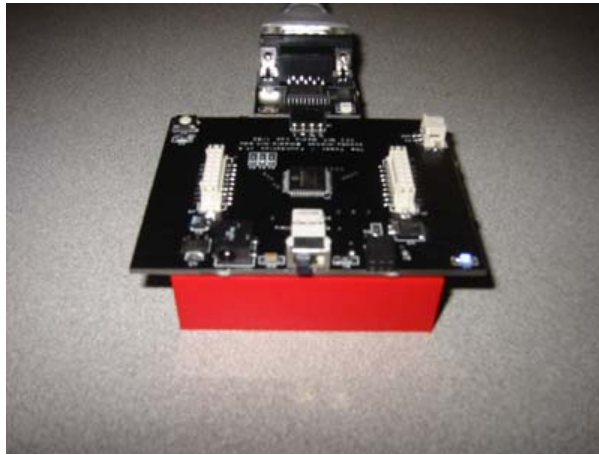
### Setting up the Tower

Plug in your Tower serial port to the back of your Tower.



Turn on your Tower using the switch on the opposite side. There should be a blue light lighting up to the right of the switch.

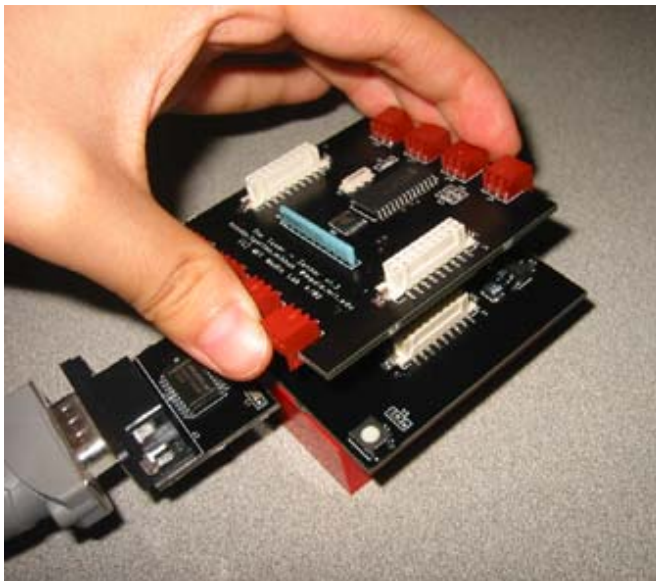


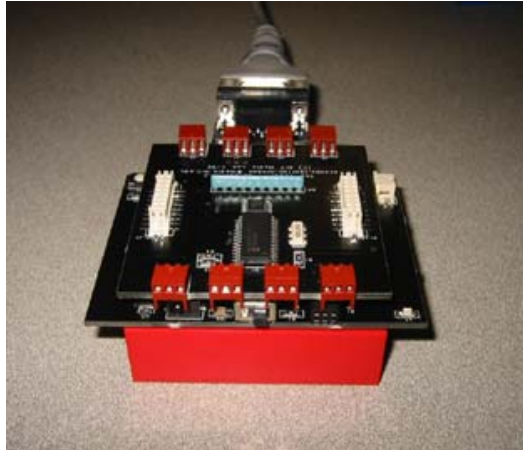


Now, the Tower is ready to go.

### Adding Layers

To add a layer, line up the connectors on your tower and your layer and try to attach the layer to the tower. Make sure the text on the layer faces the same way as the text on your foundation.





## Starting up the Tower

### Downloading Software from the Internet

Go to URL:

<http://gig.media.mit.edu/projects/tower/software/download.html>

Save the zip file.

Unzip the zip file by right clicking it and selecting WinZip.

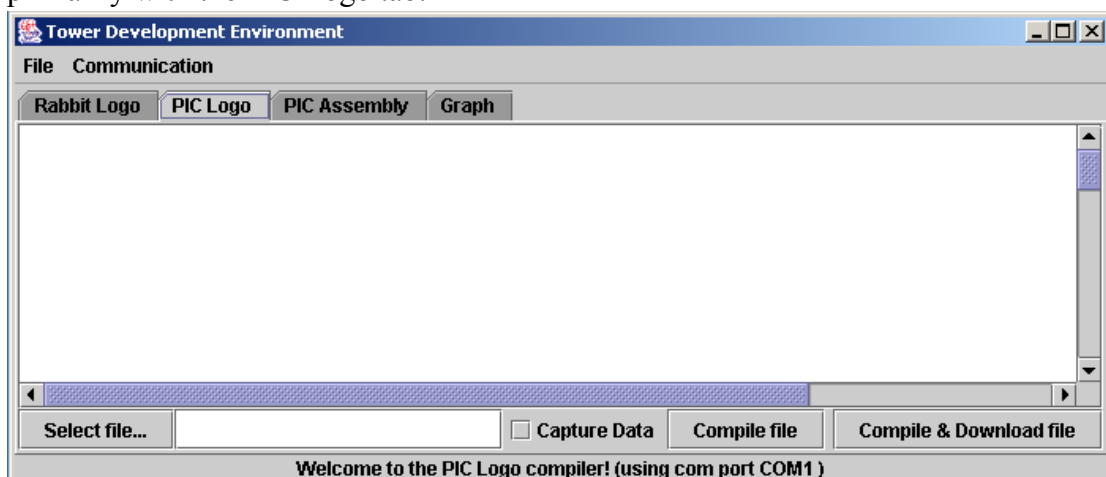
For more info on how WinZip works or to download WinZip,  
go to: <http://www.winzip.com/>

### Run: run-towerdev.bat

Do this by either double-clicking on this file or writing `run-towerdev.bat` in your command prompt

This should bring up an application called The Tower Development Environment (TDE). When the TDE starts running, it will load `default.tde` if it exists. You can load other projects through going to the File menu and selecting `open`. When you are done working on a project, you can save your project as a `tde` file under any name by going to the File menu.

Since you are using a PIC Foundation, you probably want to work primarily with the PIC Logo tab.



## Downloading Logo files

You will almost always need to define procedures and use library procedures found in include files. To load and have access to these procedures, you should compile and download files.

### To download or compile a file:

- click on the `Select file...` button

An Open dialog box should show up

- Double-click on the `PIC` folder and select you file
- (in this case, your file will probably be: `test.pl`.

This file contains such useful methods as `sensor` and `print`

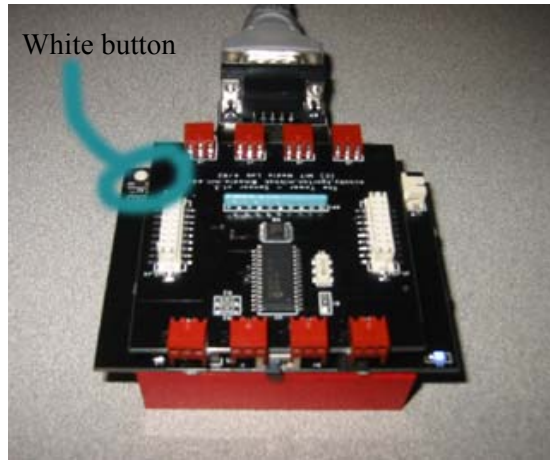
- `print` prints out the value following it
- `sensor` returns sensor values from the sensor layer )
- Your files full path name should show up in the text area next to the `Select file...` button.
- click `Compile & Download file` to download the file to the Tower. If you have downloaded this file previously during this session of running the Tower Development Environment, click `Compile File`.

## Running Your Program

Once you have downloaded the necessary files, you should be able to run your procedures.

The command center, the text field in the middle of the PIC Logo tab, is where you should run your program. The Tower Development Environment (TDE) compiles and runs each line of code individually, when it is done being written. That is, every time you press return, the Tower runs the line of code you have just written.

The blue light on the tower will pulse while your code runs (it may happen too fast to see). When your code stops running, the blue light will stop pulsing. To stop your code, press the white button located at the back left corner of the Tower Foundation.

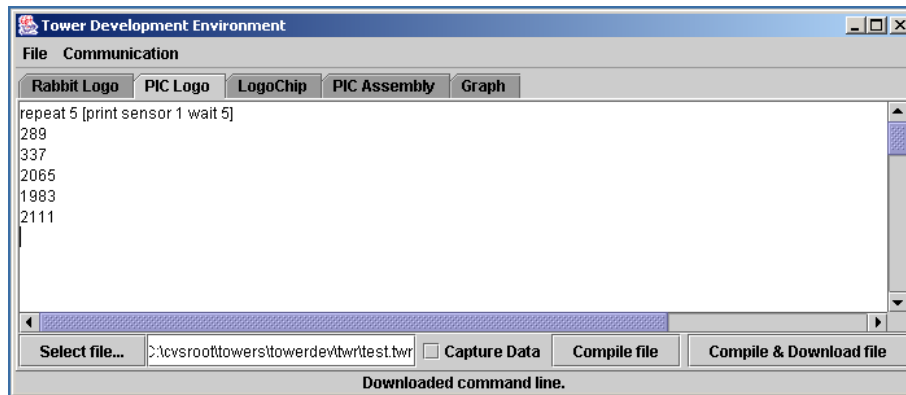


The blue light should stop pulsing and your code should stop running. If this doesn't work, power cycle the Tower.

## Output from the Tower

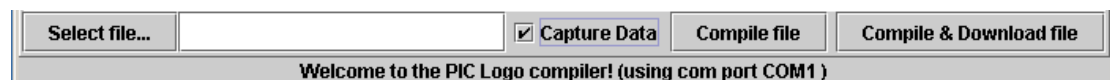
Everything that the Tower outputs is printed in the command center on the PIC Logo and Rabbit tabs.

### Example:

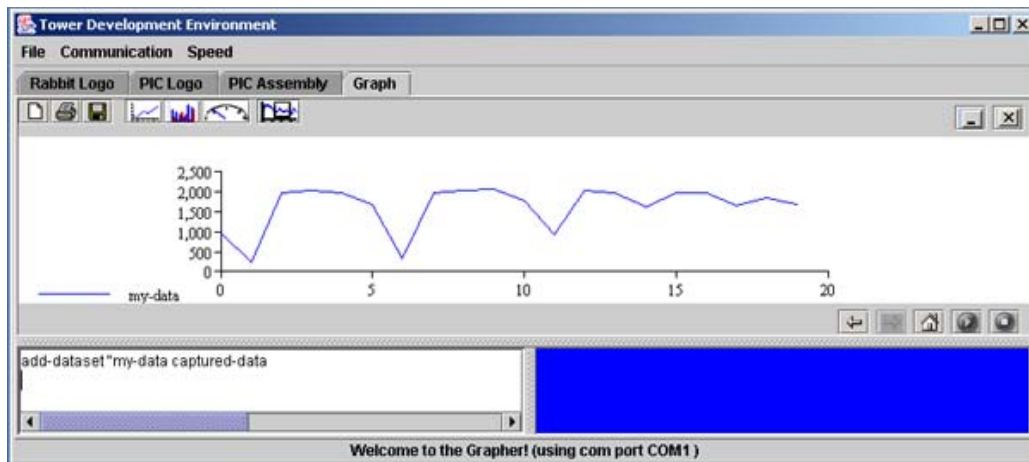


All sensor values outputted from the Tower are displayed in the command center.

You can have your TDE store this data instead of printing it by clicking on the Capture Data checkbox.



## Graphing Stored Data

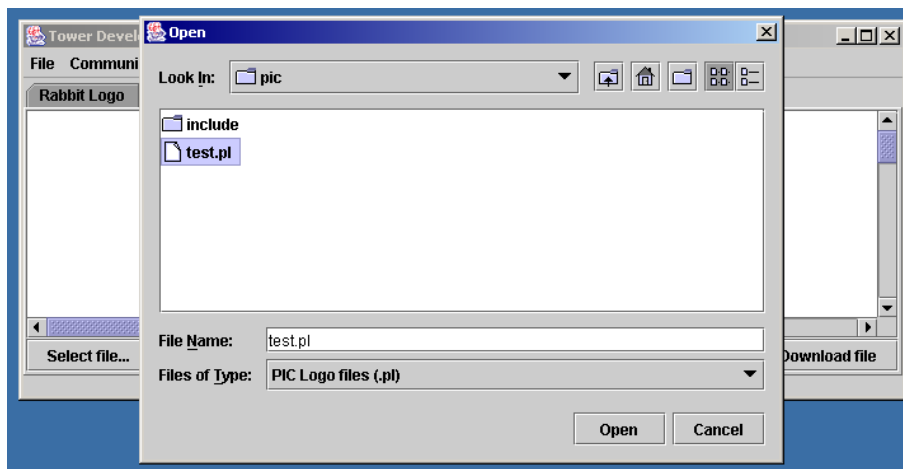


To add data to the graph, you should use either `add-dataset` or `add-data-point`. (Refer to the graphing manual.) To add your stored data to the chart just type the line shown in the textfield above into the textfield of your graph tab.

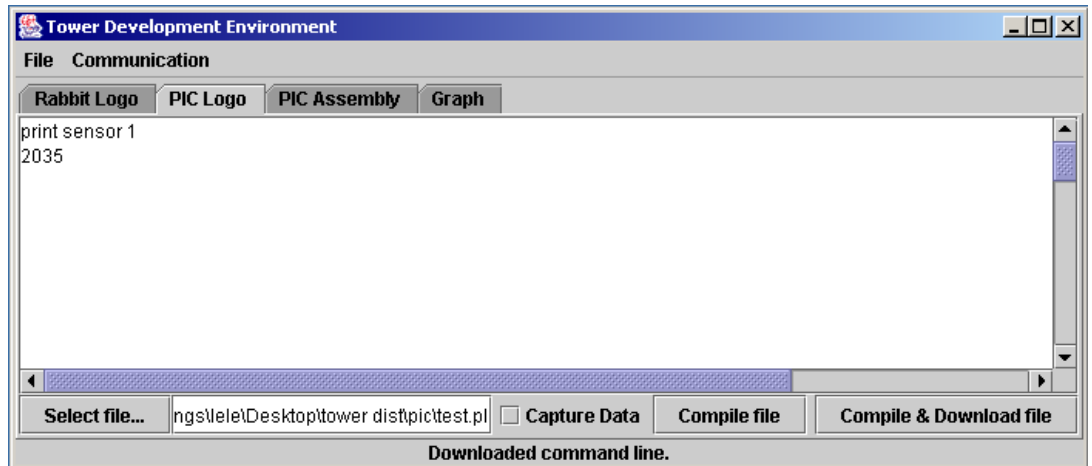
`my-data` indicates the name of the stored dataset. You may change `my-data` to be a custom name.

## Example: Graphing Light Sensor Values

- **print data from the light sensor onto the PIC Logo Panel**
  - Use the procedure `print` followed by the sensor. This will return the light sensor value.
  - Download a file that defines sensor and print.
    - Go to `Select file...`
    - Select `pic` and open it
    - Select `test.pl` and open it
    - Click on `Compile` and `Download file`



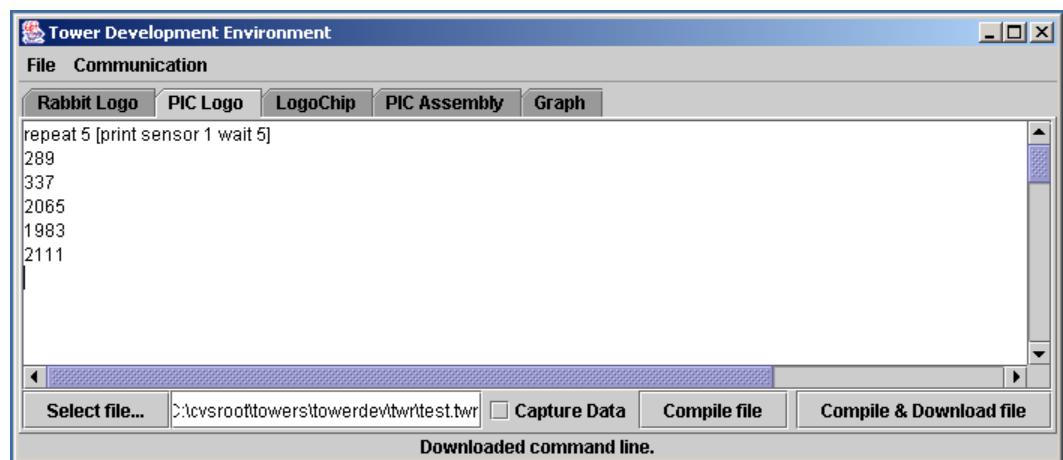
ine: print followed by the sensor  
Example: print sensor 1  
Example result: 2035



- **repeatedly print sensor values**

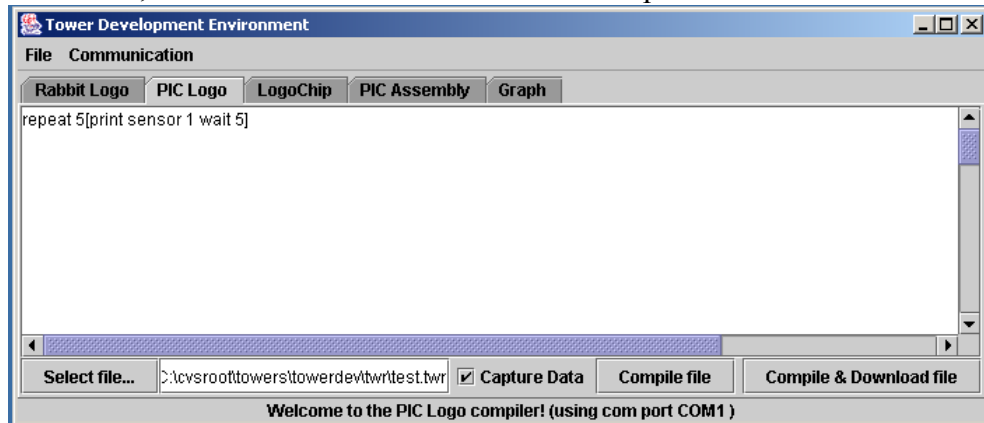
- run: repeat followed by the number of times then print, followed by the sensor, both in brackets  
Example: `repeat 5[print sensor 1]`  
Example: `repeat 5[print sensor 1 wait 5]`

Wait takes input that indicates how many tenths of a second you would like to wait between printing the sensor values



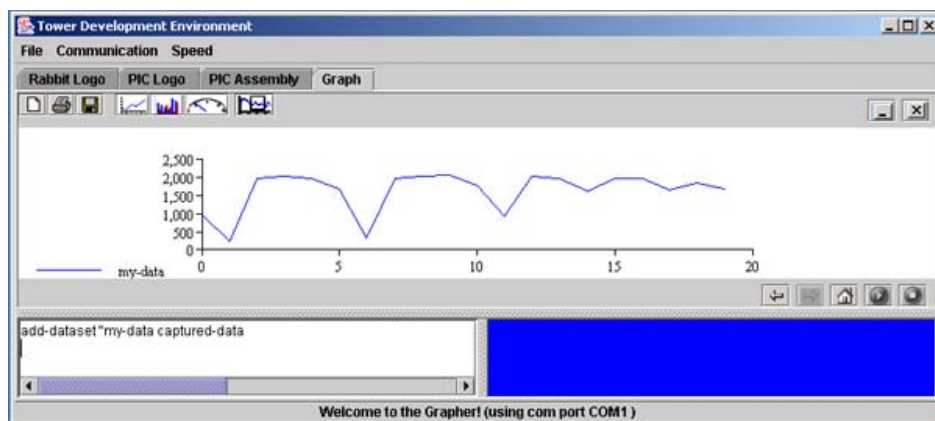
- **store light sensor values**

- When storing sensor values, click on the Capture Data check box
- Instead of being printed to the command center, the data will be stored
- click on the checkbox again when finished with capturing data
- Below, all the data has been stored instead of printed



- **graph stored values**

- Go the graph tab and run add-data followed by the name of your dataset then followed by captured-data
- Example: add-data "my-data captured-data
- captured-data returns the data previously stored data



## Manually Graphing Data

- **graph a set of y-values**

Run: add-data "NameofYourSet [values]

Values can be the y values of your chart or x-y coordinates

Example: add-data "|I am your set| [2 4 6 7]

Example:

```
add-data "|I am your set| [[1 2][3 5][2 1][4 6]]
```

- **zoom**  
Use the mouse to indicate the area to zoom into. The chart's range will become the range indicated by the mouse.