

A p p e n d i x A

Intruduction

The Laboratory (MBL) is an LOGAL product designed to collect data electronically and send this data directly to a computer. With appropriate software, the user can then plot the data while the data is being collected. Being able to see a plot of the data while an experiment is taking place greatly enhances the student's perception of the concepts the experiment is designed to elucidate. The MBL equipment consists of a base unit powered by a battery pack that plugs into an standard electrical outlet. Data gathering probes are connected to the base unit with telephone type plugs. Another cable connects the base unit directly to the serial port at the back of the computer. At present, the manufacturer supports a large array of probes including

- A sonar type distance probe for measuring distance and velocity vs. time.
- A light probe to measure light intensity.
- A temperature probe.
- A pH probe.

A.1 Connecting the MBL Unit to a PC

(This section is a direct copy from the help files provided by the manufacturer)

Use the enclosed communication cable to connect the MBL unit to either COM port on the back of the computer.

Connecting the MBL Unit to the Power Supply

Plug the lead from the low voltage end of the transformer into the POWER socket at the back of the MBL unit. Plug the high voltage end into the wall socket.

Note: The MBL unit does not have an on/off switch. When you plug in the power supply, it is on. Whenever the unit is not in use, unplug it from the supply. Do not unplug the power cord from the back of the MBL unit while leaving the transformer in the wall socket. The transformer continues to drain current and may cause a fire.

Figure A.1: MBL Setup

How to Collect Data

Set up the initial values that you want to use to run your experiment. In the Work window, use the **HAND** tool to change the numerical values in the input boxes by dragging the scroll bar or by clicking on the box and typing in a new value. Change an option parameter setting by choosing the desired option from its pop-up menu, by clicking on its radio button, or by clicking on its checkbox, as appropriate. Some input values can also be set directly in the Model window with the tools provided on the side. These tools vary from model to model. When you have set the values that you want to use for the experiment, click on the **RESET** tool to enter them into the model. These input values are called the initial values. The animation setup in the Model window might also change to reflect the new initial values. To start the experiment, click on the **GO** tool. The computer uses the mathematical model to calculate new values for the output variables. For each cycle of calculations, it updates the animation in the Model window and the displays in the Work window.

When you halt the simulation by clicking on the **STOP** tool, the calculations stop and the current output values are frozen. If you click on **GO** again, the experiment continues from the point at which it stopped, i.e., using the current output values. If you click on **RESET**, all of the current output values are set back to the initial input values that you set before beginning the experiment. You can then click on **GO** to repeat the experiment, or you can set new values to simulate a new case. You can click on the **SINGLE STEP** tool to run the experiment one cycle at a time in order to see fine movements in the Model window.