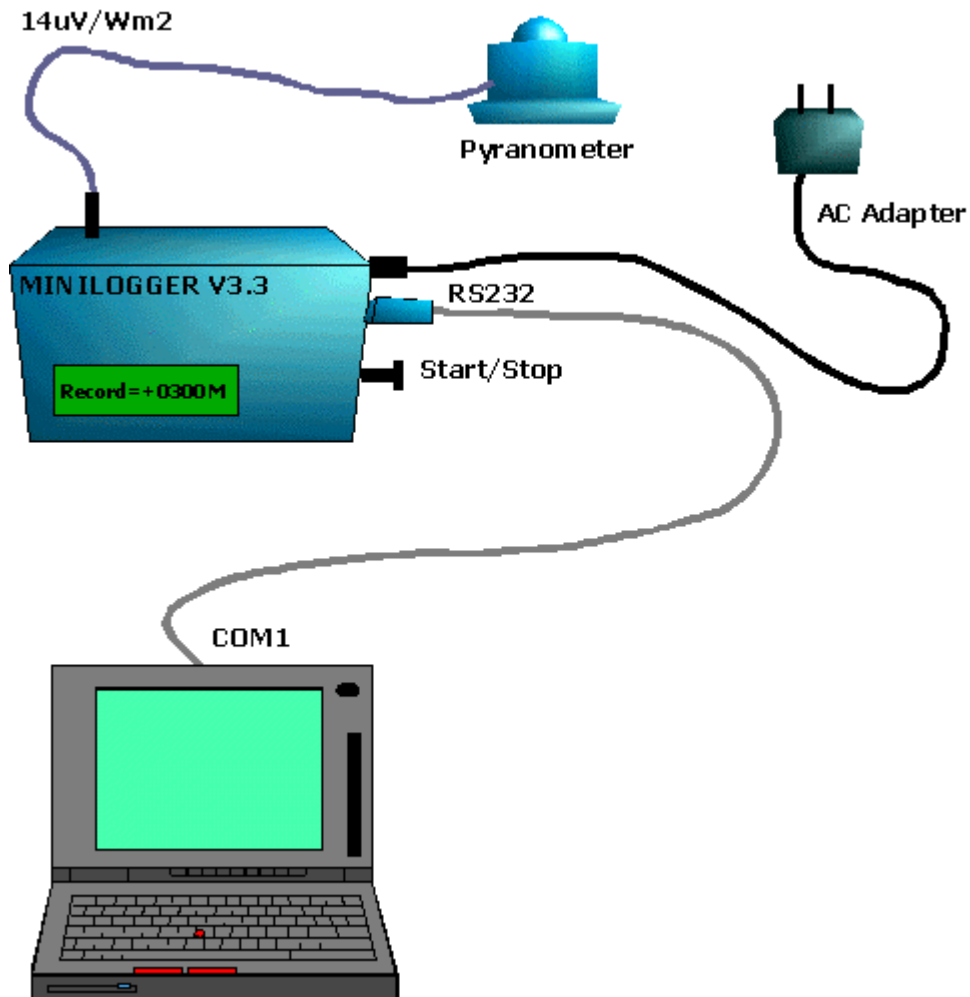


Using Minilogger for Measuring Daily Insolation

Wichit Sirichote, Applied Physics Department, Faculty of Science, KMITL

Equipment

1. Minilogger V3.3
2. RS232 cross cable
3. +9VDC 150mA AC adapter
4. Pyranometer: sensitivity $14.00\mu\text{V}/\text{Wm}^2$
5. Communication program running on PC



Setup procedures

1. Connect the Minilogger to PC COM port using RS232 cross cable,

2. Run hyperterminal with speed 9600, 8 data bit, no parity, one stop bit,
3. Press enter key to enter command mode,
4. Set the minilogger to Manual Mode with command 's', enter start and stop time to 99:99.
5. Set sampling interval to 300s (e.g., 5mins) with command 'i',
6. Set new record with command 'n', type the experiment details, press enter key to enter new record. The onboard LCD display will show Record=+0000 M.
7. Test analog reading with command '/', the reading of 4-channel will show on screen. Without exposing the pyranometer to the sunlight, the reading should be approx. 0mV. The paranometer is tied to channel 4. Channel 3 is LM35 temperature sensor. The LM35 provides 10mV/°C.
8. Now take the minilogger to the location where the measurement will be performed.
9. To measure total radiation, the pyranometer must be installed at horizontal to the ground. The pyranometer has three legs for tilt angle adjustment. Adjust the legs to make air bubble positioned at center maker.
10. Start record by pulling the manual switch, the LED blink rate will blink slower and the number of record will be incremented every time the sample was recorded.
11. To stop recording, push the plunger back, the LED will blink faster rate.
12. For solar radiation, measurement period must be 6:00 to 18:00.

Data uploading procedures

1. To upload records, connect minilogger with RS232 cable to PC COM port again.
2. Run hyperterminal the same settings and type command 'r' to see the number of record.
3. Click Transfer and Capture text, enter text file name,
4. The hyperterminal is now ready to capture the record and save to the file. Type command 'a' to read all.
5. Click Transfer and Capture text, Stop.
6. The text file is now ready for making graph and calculation.

Making Graph with Microcal Origin V5.0

The ASCII data text file can be imported into spreadsheet program for data analysis and plotting graph easily. The example graph shown below was made with Microcal Origin V5.0. The channel 3 output from temperature sensor, LM35 with 10mV/°C output was plotted with sample. Each sample is one-minute incrementing.

To import such ASCII data file, click File, Import, ASCII options, select SPACE for delimiter code, and then import now.

The data will enter into each cell. We can choose line graph and select column for axis X and Y.

