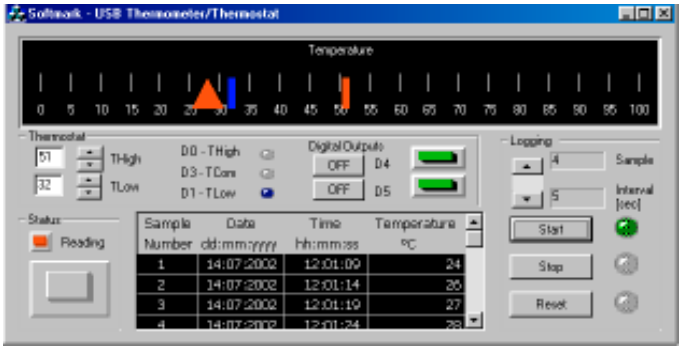
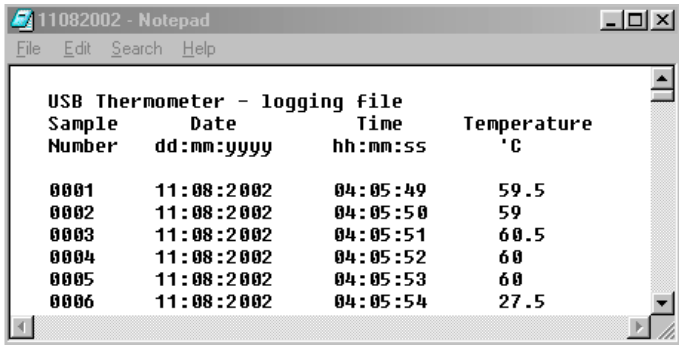
SOFTMARK

USB Thermometer/ Thermostat with DS1620





SOFTMARK
PO Box 1609
Hornsby NSW 2077
Australia
www.ar.com.au/~softmark
softmark@ar.com.au

The USB Thermometer/Thermostat is able to measure and log temperature from -30ºC to 120ºC. It has two settable threshold points: THigh and TLow. These settings can switch external devices (such as heaters, fans, relays and the like) on and off. The USB port controls this card. Windows automatically finds the card and the project is ready to be used immediately. Software for this card works on Windows98 /Windows2000/XP

Virtual panel description

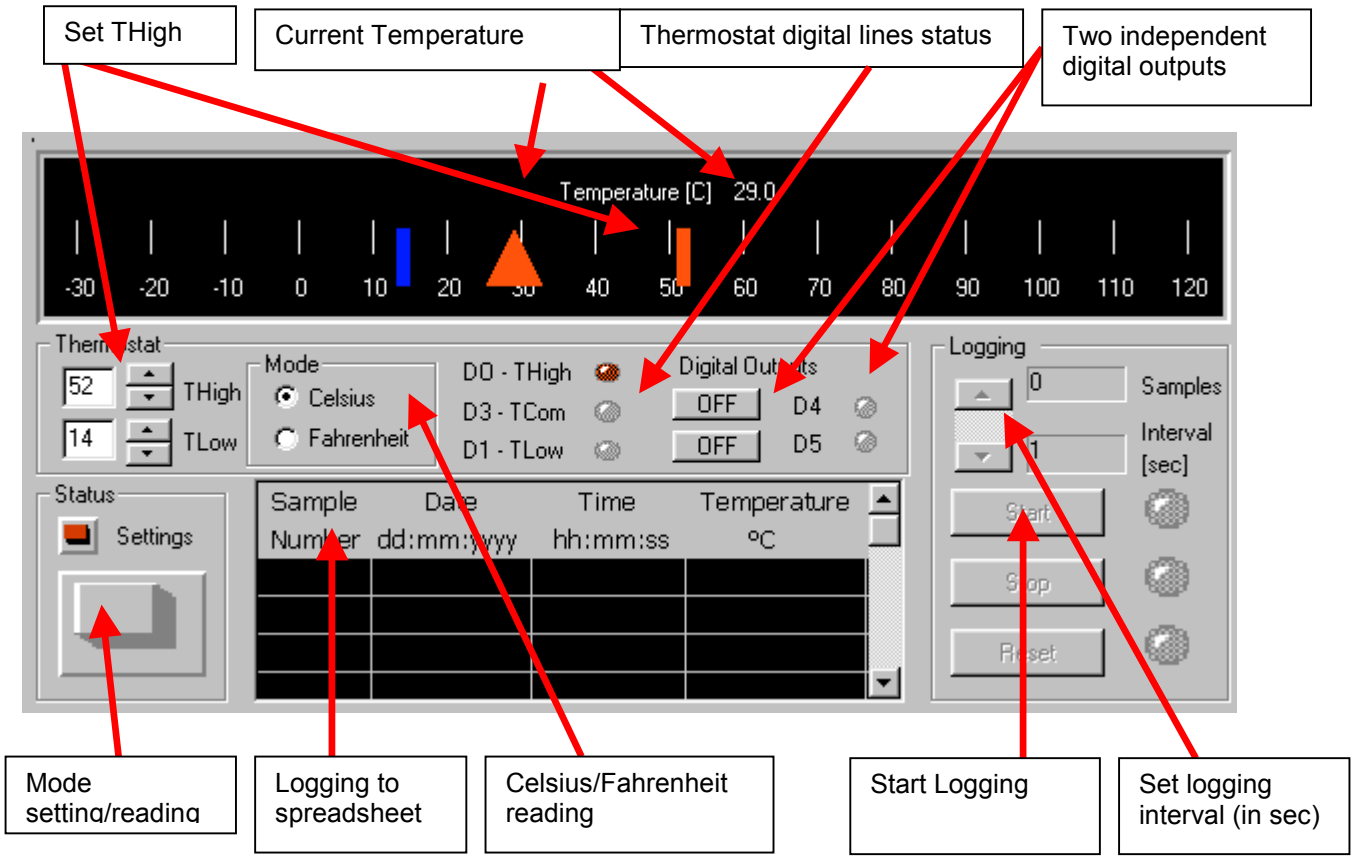


Figure 1. Software virtual panel

THigh and T Low setting is done by adjusting the slider value up/down. These settings will be saved to your PC and will appear next time you start the program. However, the settings can also be edited. These settings are used by the thermostat. If temperature reaches above Thigh, the D0 LED will light up. If the temperature goes below TLow, the D1 LED will light up. You can also see these changes on the PCB (see Figure 2).

If the measured temperature is between the two threshold settings (TCom), then the D3 LED will light up. At that time, THigh and TLow will stay off. This operation will be used if you employ this project for its thermostat function. For example, the thermostat can use the THigh line to switch an electric fan on, and if temperature goes below the THigh setting, the thermostat can switch the fan off.

This project also has two separate I/O digital lines which are not linked with the thermostat. As independent lines, they can be used to switch different devices just by pressing the D4 or D5 buttons. The status of those lines is indicated on the virtual screen and also on the PCB board (see Figure 2).

This project also features temperature logging. The logging interval can be set from 1 second to 360 seconds. Logging is started by pressing the “Start” button. The “Stop” button stops the logging. The “Reset” button clears the spreadsheet. All logged values are copied to a log file which you can find on the C drive of your PC.

The name of this file will be different every day as the format for its name relates to the date (MMDDYYYY.TXT). Any text editor (for instance, Notepad in Windows) can view the file.

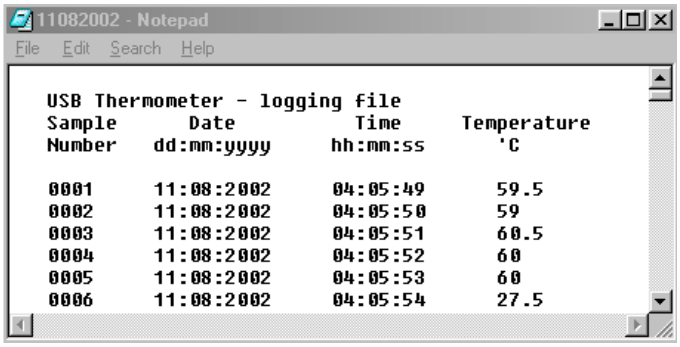


Figure 2. The log file (open with Notepad in Windows)

The “Settings/Reading” button is used to separately control those modes. However, if you are in the reading mode, you will also be able to modify various settings.

How the kit works in thermostat mode

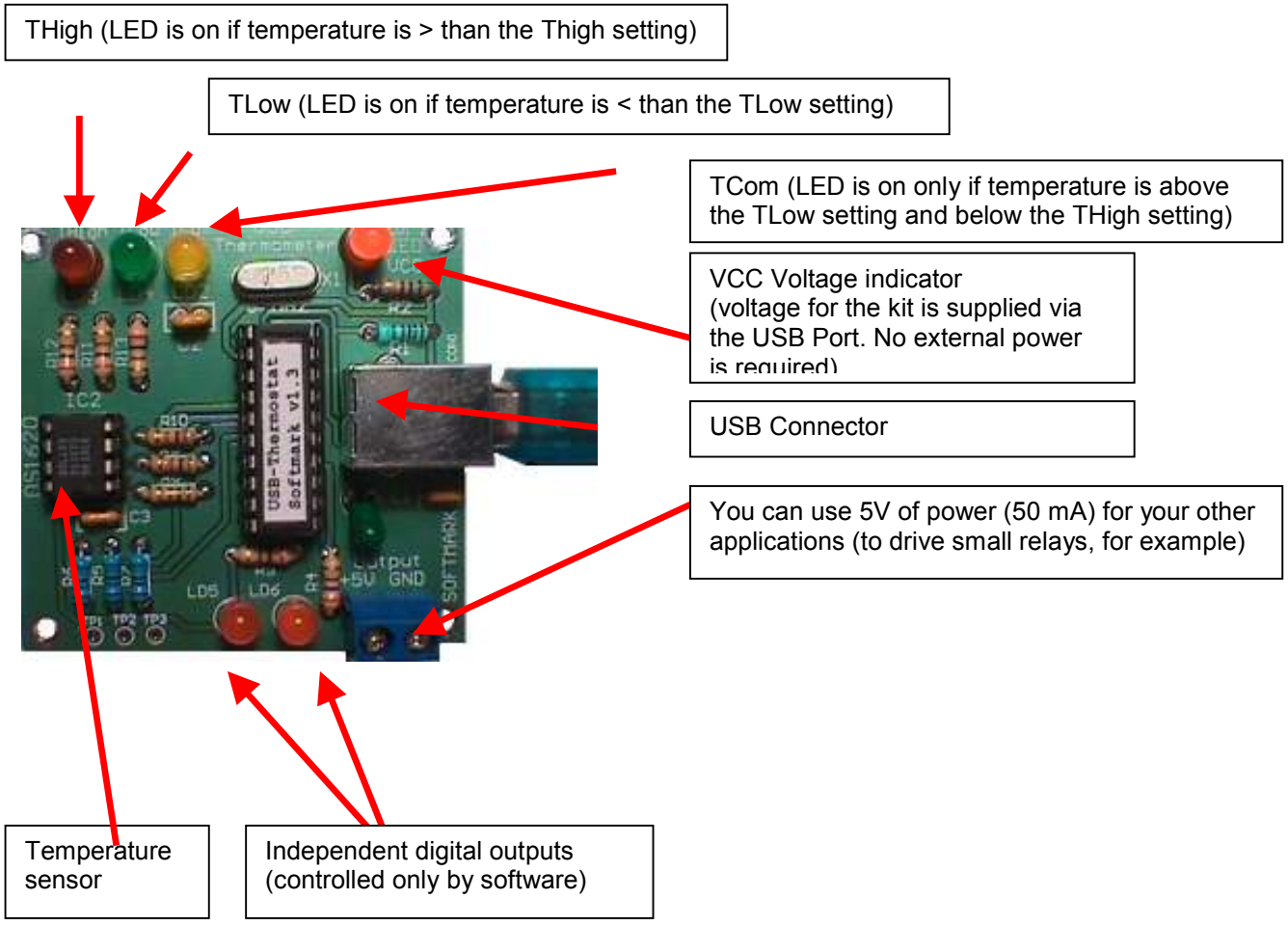


Figure 3. USB Thermostat project - hardware description

Building the card

The PCB top view (element side) is shown in Figure 4 below.

Figure 4. The PCB top view

Firstly, fit resistors, then all LEDs, IC sockets, the USB connector and then plug the ICs into the sockets. Remember to check the soldering once you finish.

Note that the kit is also available assembled.

Testing the card and installation

Connect the USB Thermometer/Thermostat card to the USB port in your PC. Use a USB cable (A-B type) to do this. The red LED, LD1, should be on. This diode only shows that voltage from the USB bus is being applied to your board. If LD1 is off, check the voltage (using a voltmeter) on the USB connector's pin 1 or IC1's pin 12. LD1 could be off because of incorrect polarity or over-soldering. In this case, you should examine the polarity of the diode and PCB soldering. If the VCC line was soldered to ground then the USB controller (Host) in your PC will automatically disconnect voltage to the USB bus and to your kit. If the problem was rectified, reconnect the USB cable to your kit. If LD1 (VCC) is on, that means your board is receiving 5V.

Next, the Windows operating system will try to find, and talk to, the USB controller (IC1). After a few seconds (usually 1-2 seconds), you will get a message on your screen that a new device was found. Following this, Windows will start installing the driver for this kit. This will only take a minute and does not have to be done again.

Note that information about installing drivers can be found on the CD ROM/disks supplied with the kit.

After the driver is installed, the next time you use the card the Windows operating system will automatically find the driver for your card. No other setup will be required.

Important

On the PCB there is a VCC connector which can be used to supply 5V and a maximum of 50mA for your other applications. Do not supply voltage to this connector. The USB Thermometer/Thermostat card does not need a power supply as voltage is supplied from the USB bus in your PC.

Power supply not required
The card has a connector which supplies 5V (+5V and GND line). This voltage is taken from the USB bus. The maximum current is about 50mA.