



# USB Thermometer

## Description

Digital thermometer with USB connection based on DS18B20 1-wire probe and PL2303TA serial interface. Optional version with waterproof stainless steel shell in two lengths (3 cm and 6 cm) is available.

Sensor measuring range:	<b>-55 °C — +125 °C</b>
Accuracy:	<b>0.5 °C (from -10 °C to +85 °C), 2 °C</b>
Resolution:	<b>0.0625 °C</b>
Data record frequency:	<b>above 750 milliseconds</b>
Cable length:	approximate <b>82 cm</b>

System requirements:

- a free USB port
- Linux, or Windows 7, 8, 10 (with PL2303 Driver)
- Digitemp software, or LogTemp (for taking periodic measurements)

## Drivers

On Linux based operating system, a serial driver is usually provided by the kernel (pl2303.c) and, after connecting the USB thermometer, the serial device usually appears under `/dev/ttyUSB0` device file. Since this device file is owned by group `dialout`, there might be permission mismatch, i.e. access denial. To solve this issue add user to this group, e.g. `adduser user dialout`

On Windows system, a PL2303 serial driver<sup>1</sup> is needed, but our tests have shown that enabled Windows Update driver discovery service (on Windows 7 & 10) is also able to find appropriate driver. After installation a new (virtual) serial (COM) port is detected. Usually that would be COM3 or COM4.

USB device vendor ID: 0x067b, product ID: 0x2303

## Usage

### Digitemp (Linux)

On Debian based distributions, e.g. Ubuntu, Digitemp software is available as a software package `digitemp`, that could be installed by the following command.

```
sudo apt-get install digitemp
```

Before temperature acquirement Digitemp software needs an initialization, this is done by executing:

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<sup>1</sup>[http://www.prolific.com.tw/US/ShowProduct.aspx?p\\_id=225&pcid=41](http://www.prolific.com.tw/US/ShowProduct.aspx?p_id=225&pcid=41)



`digitemp_DS9097 -i -s /dev/ttyUSB0` , where `/dev/ttyUSB0` is character special file representing digital thermometer. After initialization a Digitemp configuration file is created.

Then and each next time, using the same USB thermometer, the temperature could be acquired by executing: `digitemp_DS9097 -q -t 0`

## OWFS 1-wire File System (Linux)

When using the USB thermometer with `owserver`<sup>2</sup>, `owhttpd` ... make sure you're using `passive` option (and not `serial` or `device`). The configuration file `/etc/owfs.conf` should have the following line.

```
server: passive = /dev/ttyUSB0
```

## Digitemp (Windows)

Digitemp software for Windows is available at `digitemp.com`<sup>3</sup>. From the archive, only `digitemp.exe` file is needed.

Before temperature acquirement Digitemp software needs an initialization. Obtain serial (COM) port number (from Windows device manager) and open command prompt, eg. press Win-R and type „cmd“ in. Navigate to the directory where `digitemp.exe` was extracted to and execute: `digitemp.exe -i -s4` , if virtual serial (COM) port has number 4; otherwise change the this number to the number of the COM port. After initialization a Digitemp configuration file is created.

Then and each next time using the same USB thermometer, the temperature could be acquired by running: `digitemp.exe -q -t 0`

## LogTemp (Windows)

For periodic measurements and saving values to CSV file on Windows use LogTemp software<sup>4</sup>. Additionally, this program needs 1-wire driver from Maxim<sup>5</sup>, installed.

## Python package

For scripting purposes a `pydigitemp` python package<sup>6</sup> could be used. Since the package uses `fcntl` package (for exclusive locking of serial port) which is not available under Windows OS, you should comment out three lines (commands) which refer to this package in `digitemp/master.py` file before installation of the package.

Next code snippet acquires temperature from the probe connected at COM3.

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<sup>2</sup><http://owfs.org/>

<sup>3</sup><https://www.digitemp.com/software/windows/dtreg17.zip>

<sup>4</sup><https://www.mrsoft.fi/ohj01en.htm>

<sup>5</sup>[https://www.maximintegrated.com/en/products/ibutton/software/tmex/download\\_drivers.cfm](https://www.maximintegrated.com/en/products/ibutton/software/tmex/download_drivers.cfm)

<sup>6</sup><https://github.com/neenar/pydigitemp>



```
from digitemp.master import UART_Adapter
from digitemp.device import DS18B20
bus = UART_Adapter('COM3')
sensor = DS18B20(bus)
print(sensor.get_temperature())
```

## Cautions

Do not expose the temperature probe to temperatures higher than 110 °C and longterm higher than 90 °C. Do not expose the probe to any corrosive substance or use it in environments with threats to human health.

This device shall not be used in or be a part of equipment that requires an extremely high level of reliability and safety, such as nuclear reactor control, aerospace or life support equipment.

USB connector is not waterproof.

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