

# Driver and software installation guide

for digital thermometer and 1-wire adapter DS9097 with DS18B20 digital probe attached

## 1 Web mirror

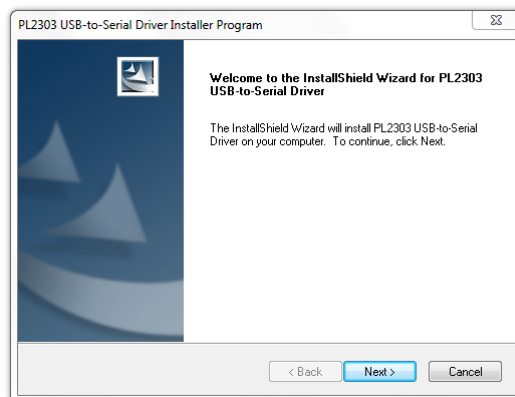
All drivers and software could be downloaded from USBTEMP homepage under Software section<sup>1</sup>.

## 2 Windows

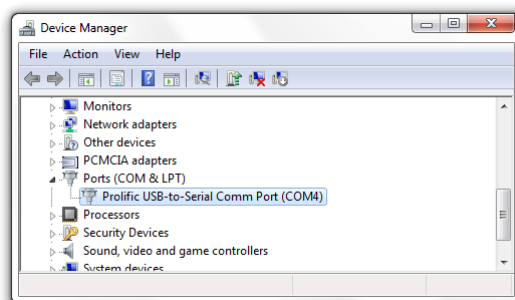
The following pictures are based on Windows 7. The same procedure applies for recent versions of Windows, e.g. Windows 10.

### 2.1 Driver installation

In some cases operating system (Windows) automatically detects USB serial interface PL-2303. If it does not, a manual installation of drivers is needed. Driver could be also downloaded from official Prolific webpage<sup>2</sup>. Start installation program.



After installation open Device Manager and under Ports (COM & LPT) obtain name of new serial port. In next picture, the serial port has name COM4 and hence number 4.



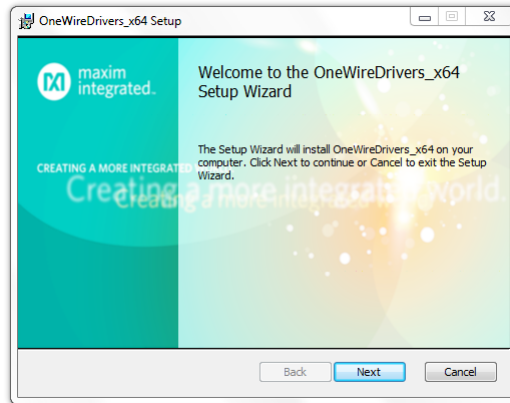
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<sup>1</sup><https://usbtemp.com/#software>

<sup>2</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)

### 2.1.1 Maxim 1-wire driver

If you're going to use LogTemp or OneWireViewer you need to install Maxim 1-wire drivers<sup>3</sup>.



## 2.2 Software installation

In following examples it is assumed that the device appeared under COM4 serial port.

### 2.2.1 Digitemp

Digitemp software requires no installation, just download the `digitemp.exe` binary or extract only mentioned file from a archive. Make sure you have downloaded version 1.7. On other versions USB thermometer might not get recognized.

Since Digitemp is a console only application, it should be started from command prompt, e.g. press Win-R and type „cmd“ in, then navigate to the directory where `digitemp.exe` is located.

#### Initialize probe

Before temperature acquirement, Digitemp needs an initialization. Type into a command prompt.

```
digitemp.exe -i -s4
```

If your virtual serial (COM) port has different number from 4; change the this number to the number of the COM port.

```
DigiTemp v1.7 [REGISTRED] Copyright 1996-2002 by Brian C. Lane  
All Rights Reserved - http://www.brianlane.com  
Turning off all DS2409 Couplers
```

```
.  
Searching the 1-Wire LAN  
28FFDB3F31170422 : DS18B20 Temperature Sensor  
ROM #0 : 28FFDB3F31170422
```

The last 2 lines tell that a 1-wire device (thermometer) was detected. The unique serial number is displayed as ROM. After initialization a Digitemp configuration file is created.

#### Acquire temperature

Then and each next time using the same USB thermometer on the same computer, the temperature could

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<sup>3</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)

be acquired by running: `digitemp.exe -q -t 0`

Feb 01 10:45:36 Sensor 0 C: 22.25 F: 72.05

## LogTemp (Windows)

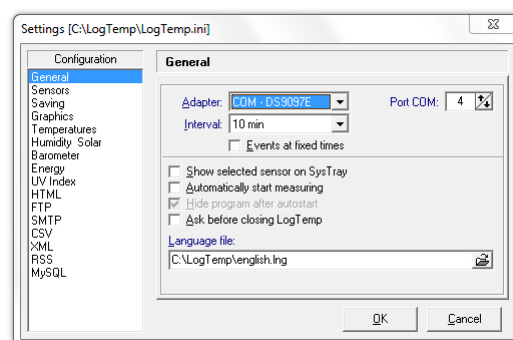
For periodic measurements and saving values to CSV file on Windows use LogTemp software<sup>4</sup>. Additionally, this program needs 1-wire driver from Maxim<sup>5</sup> installed.

### 2.2.2 LogTemp

Download LogTemp setup executable and run it.



After installation start the application and in the configuration set Adapter to **COM – DS9097E** and Port COM to match your serial port name.



### 2.2.3 OneWireViewer

This application requires Java RTE to be installed on the system.

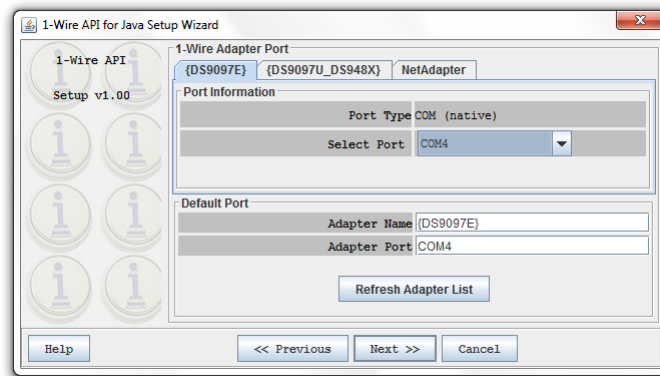
Extract two files: `OneWireViewer.jar` and `OneWireAPI.jar` to a folder. Then navigate Windows Command Line to folder and execute following:

```
java -classpath OneWireViewer.jar;OneWireAPI.jar;. OneWireViewer
```

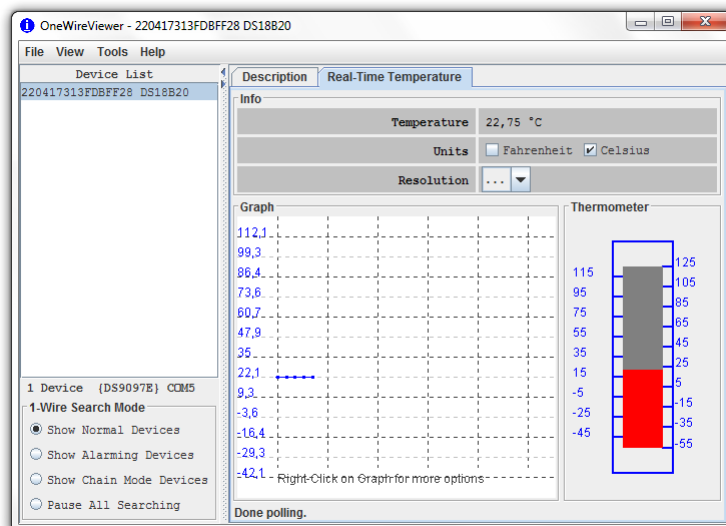
<sup>4</sup><https://www.mrsoft.fi/ohj01en.htm>

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

In the setup window make sure **DS9097E** tab is selected and set Select Port to match your serial port name.



After two more click to Next, a new window appears where connected 1-wire devices are given on left pane.



## 3 Linux

### 3.1 Driver installation

Driver for PL-2303TA serial interface is already included in mainline Linux Kernel. In most cases, after plugging the USB device into USB port, the system will automatically load a driver.

```
$ dmesg | tail
```

```
...
```

```
usb: new full-speed USB device number 24 using ehci-pci
usb: New USB device found, idVendor=067b, idProduct=2303
usb: New USB device strings: Mfr=1, Product=2, SerialNumber=0
usb: Product: USB-Serial Controller
usb: Manufacturer: Prolific Technology Inc.
pl2303: pl2303 converter detected
usb: pl2303 converter now attached to ttyUSB0
```

Right at the end of dmesg output you should see something like the 7 lines above. This means that the thermometer has been recognised by the pl2303 driver.

You can check whether driver has been loaded if the last two lines appear.

```
$ lsmod |grep pl2303
pl2303                16384  0
usbserial             28672  1 pl2303
```

### 3.1.1 Vanilla Linux Kernel

If the driver is not included into kernel, it has to be included and then, depending on your system, the kernel recompiled or the module compiled.

```
Device Drivers --->
    [*] USB support --->
        <M> USB Serial Converter support --->
            <M> USB Prolific 2303 Single Port Serial Driver
```

Or in .config file:

```
CONFIG_USB_SUPPORT=y
CONFIG_USB=y
CONFIG_USB_SERIAL=m
CONFIG_USB_SERIAL_PL2303=m
```

### 3.1.2 Openwrt/LEDE

On the configuration menu of OpenWrt the following modules have to be included.

```
Kernel modules --->
    USB Support --->
        <M> kmod-usb-serial
            <M> kmod-usb-serial-pl2303
```

Or in .config file:

```
CONFIG_PACKAGE_kmod-usb-core=m
CONFIG_PACKAGE_kmod-usb-serial=m
CONFIG_PACKAGE_kmod-usb-serial-pl2303=m
```

## 3.2 Software installation for Debian & Ubuntu

It is assumed that /dev/ttyUSB0 is the USB device.

### 3.2.1 Digitemp

Digitemp software is available as a software package *digitemp*, that could be installed by the following command.

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

### **Initialize probe**

Before temperature acquirement Digitemp software needs an initialization, this is done by executing next command.

```
$ digitemp_DS9097 -i -s /dev/ttyUSB0
DigiTemp v3.6.0 Copyright 1996-2007 by Brian C. Lane
GNU General Public License v2.0 - http://www.digitemp.com
Turning off all DS2409 Couplers
.
Searching the 1-Wire LAN
28FFDB3F31170422 : DS18B20 Temperature Sensor
ROM #0 : 28FFDB3F31170422
Wrote .digitemprc
```

Here /dev/ttyUSB0 is character special file representing digital thermometer. After initialization a Digitemp configuration file is created. This initialization is only needed for the first time for a given computer. If you want to save configuration to a different file, use -c switch.

### **Acquire temperature**

Then and each next time, using the same USB thermometer on the same computer, the temperature could be acquired by the following command.

```
$ digitemp_DS9097 -a
DigiTemp v3.6.0 Copyright 1996-2007 by Brian C. Lane
GNU General Public License v2.0 - http://www.digitemp.com
Feb 01 10:45:36 Sensor 0 C: 22.25 F: 72.05
```

Text before last row (all except the line with the temperature) could be suppressed by using -q switch.

## **OWFS 1-wire File System (Linux)**

Install software package.

```
$ sudo apt-get install owfs
```

Mount 1-wire filesystem.

```
$ mkdir ~/1w
$ owfs --passive /dev/ttyUSB0 ~/1w
```

List all 1-wire devices.

```
$ ls ~/1w/
```

The temperature probe starts with 28.:

```
$ cat ~/1w/28.FFDB3F311704/type
DS18B20
```

Display the temperature.

```
$ cat ~/1w/28.FFDB3F311704/temperature
26.75
```

When using the USB thermometer with *owserver*<sup>6</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
```

### 3.2.2 OneWireViewer

For installation see Maxim's application note 5917<sup>7</sup>.

## 3.3 Software installation for Openwrt/LEDE

Make sure you have build-in support for pl2303 driver, otherwise kernel image (and Openwrt image) must be recompiled (and router reflashed). In some cases, installing via `opkg` might work:

```
opkg install kmod-usb-serial-pl2303
```

### 3.3.1 Digttemp

Install package *digttemp*.

```
opkg install digtemp
```

If the package is not available follow manual for *openwrt-packages-digttemp*<sup>8</sup>.

Before last step make sure you have `CONFIG_PACKAGE_digttemp=y` in `.config` file and you have ran `make menuconfig`. In LEDE the last step must be

```
make package/feeds/hnw_digttemp/digttemp/compile
```

Usage is similar to that one for Debian (Section 3.2.1).

### 3.3.2 owfs

Install package *owfs*.

```
opkg install owshell owfs
```

See tutorial for Debian (Section 3.2.1).

Document last update: Thursday 13<sup>th</sup> December, 2018

**USBTEMP**

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<sup>6</sup><http://owfs.org/>

<sup>7</sup><https://www.maximintegrated.com/en/app-notes/index.mvp/id/5917>

<sup>8</sup><https://github.com/hnw/openwrt-packages-digttemp>