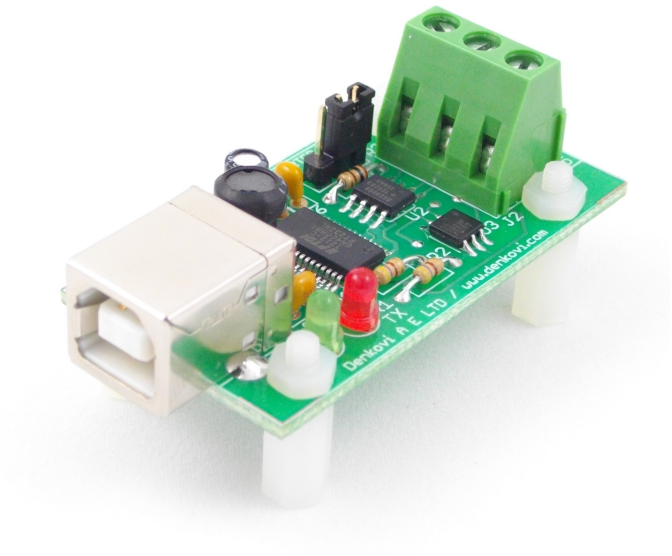
USB to One Wire interface module

User Manual
Date: 03 Mar 2013



Content

1. Features

This adaptor connects your 1-Wire network to your computer. It appears as Virtual Com Port (VCP) and it is based on the FT232RL (USB-UART converter) and DS2480B Dallas-Maxim (RS232-One Wire converter). It has selectable RC filter for improving communication for lines between 1 and 100 meters and ESD line protection. It is compaitable with DS9097U of Maxim-Dallas with the difference that this adaptor is connected to your USB port.

- USB port (type B)
- 3 pin output screw terminal (GND, 1 Wire Line, +5V)
- Chipset: FT232RL and DS2480B
- ESD line Protection based on DS9503P
- Emulates the Maxim Dallas DS9097U converter
- Works with all iButton® and 1-Wire Slave Devices*
- Reliable network weight: up to 200 meters**
- Selectable RC filter for improving communication for middle lines (between 1 and 100 meters)
- Rx and Tx leds for the serial communication
- Fully supplied from computer USB port
- It is shown as Virtual Com Port (VCP)
- Large number of free software and source code
- Supported by One Wire Viewer and TMEX of MAXIM-DALLAS, Home Automation by Lanmisoft (download links - on www.denkovi.com) and many others.
- Operating temperature range: -40°C to +85°C
- Dimensions: 58.0mm / 26.5mm
- Product code: DAE-USB_1WIRE

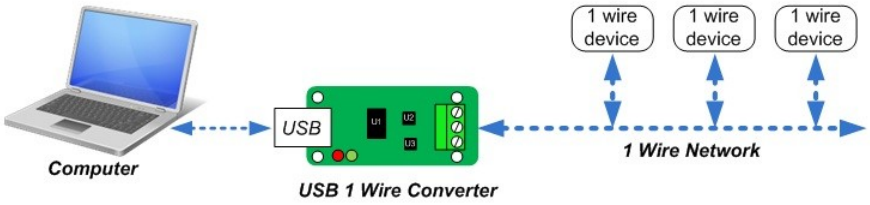


Figure 1. Connecting One Wire network to computer USB port

* The device can not program 1-wire EPROM devices
** The network weight is the length + devices weight. For example iButtons devices have weight 1m and non-iButtons have 0.5m. If the length is 100m and there are 200 sensors DS18S20 connected then the total weight is 200m.

2. Block diagram

2.1. With RC filter off

By default the RC filter is turned off. In this case the adaptor can be used to work stable on networks weight up to 1m. The block diagram is shown bellow.

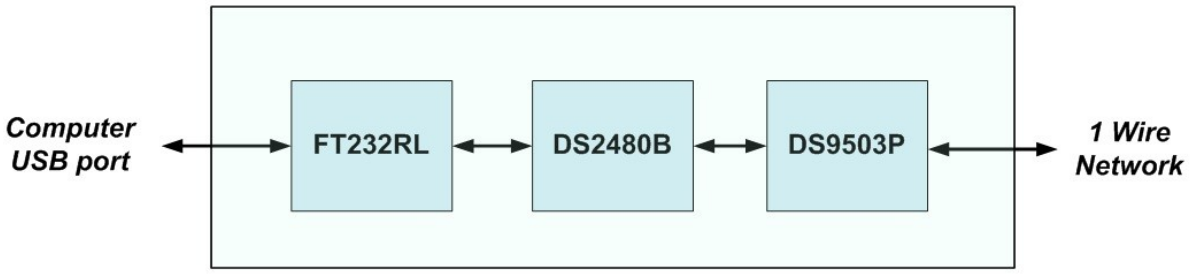


Figure 2. Block diagram when RC filter is off

2.2. With RC filter on

When the adaptor is used on networks weight over 1m and up to 200m, the RC filter should be ON. That is the Dallas recommendation for reliable long one wire networks. This can be done when the jumper is placed on position RC. The block diagram is bellow.

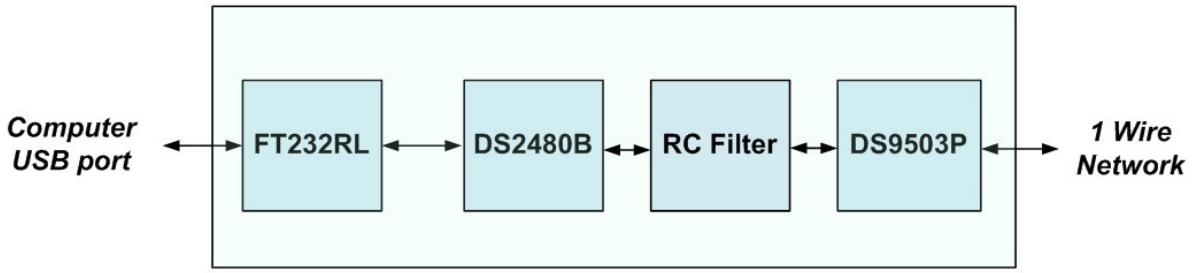
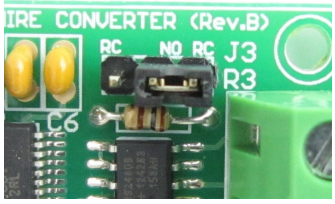


Figure 3. Block diagram when RC filter is on

2.3. How to turn on/of the RC filter

Just place the jumper on the desired position. By default is is off.



3. What is the maximum One Wire network length?

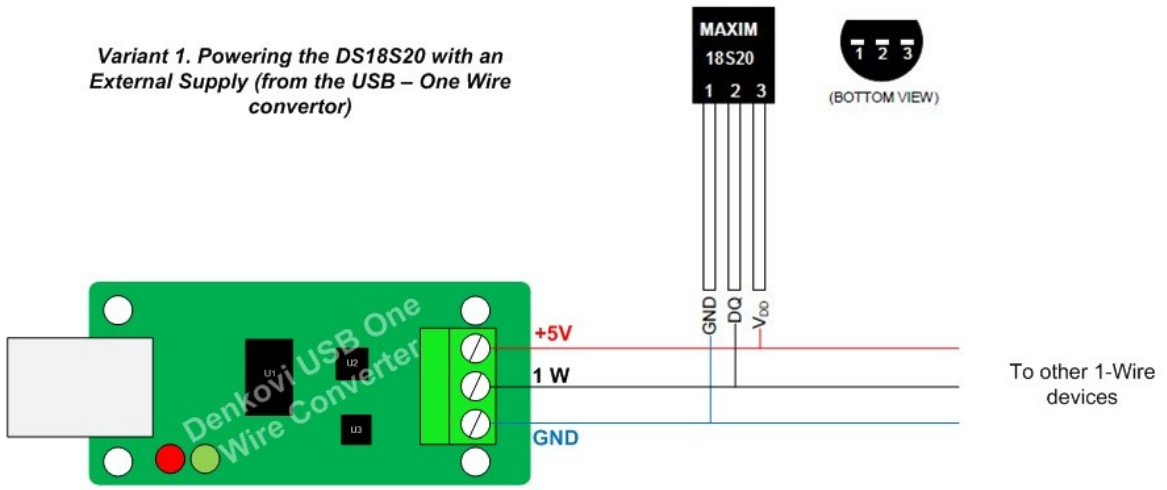
There is no exact answer of this question. The most correct answer is that it depends. Dallas have dozens of documents describing how to build reliable one wire networks with longer length, what cables to use, how many one wire devices can be connected and in which way.
The Denkovi USB to One Wire interface module is based on DS2480B chipset and that's why all the DS2480B chip distance limits are valid for this adaptor also. So 200m is the maximum reliable network weight (length + one wire devices count) for this adaptor. Of course it can work on a larger network but the stable work of the adaptor is not guaranteed. In our laboratory, the converter is tested with 300 meters twisted pair cable with 20 DS18S20 sensors and worked stable.
The distance generally could depends on several factors:

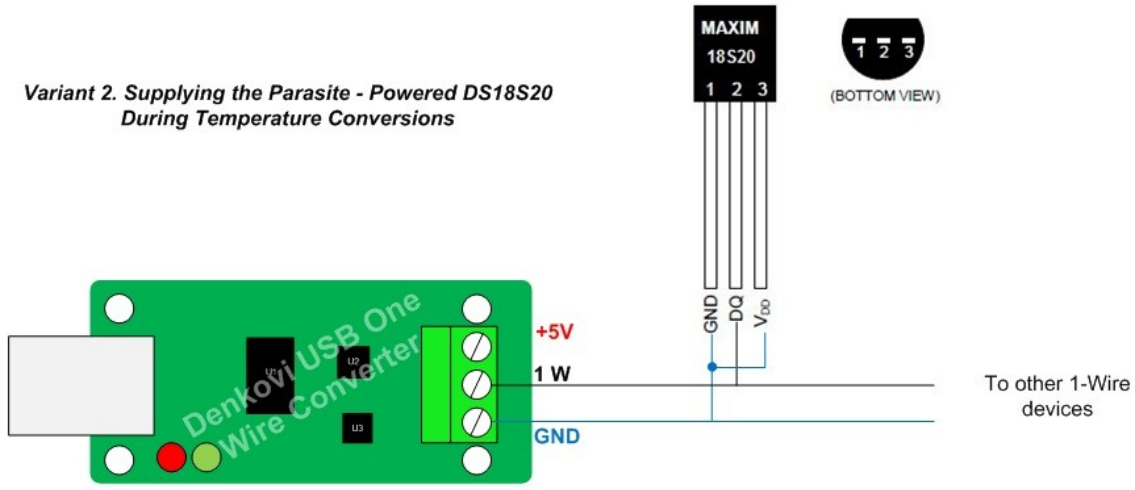
- how many one wire devices (iButton or non i-Button) are there connected
- what is the EMI
- what is the used network cable
- what mode is used - capacitive power supply or not
- controlling software (if support slew rate control or not)

For more information you can reference with http://www.maximintegrated.com/

4. Installation

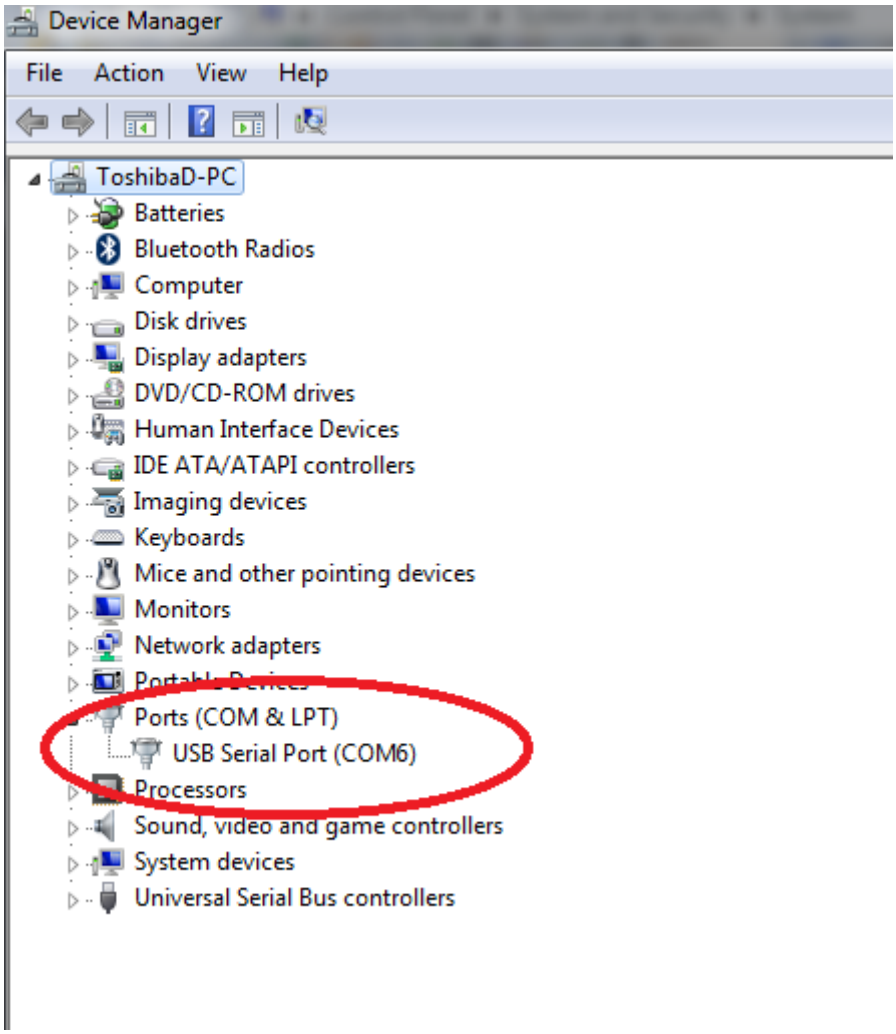
1. Connect the One Wire Network to the converter terminal. For example bellow it is shown connection of one DS18S20 sensor to the converter.





2. Connect the converter to the computer USB port. Once the device is recognized, its drivers must be installed. If this is not done automatically the drivers must be downloaded manually. Its chip set is FT232RL based, so the drivers must be downloaded from here: http://www.ftdichip.com/Drivers/VCP.htm and after that installed. For installation guides - http://www.ftdichip.com/Support/Documents/InstallGuides.htm

3. After successful installation of the drivers, the converter is shown in Windows as Virtual Com Port with the next available com port number:

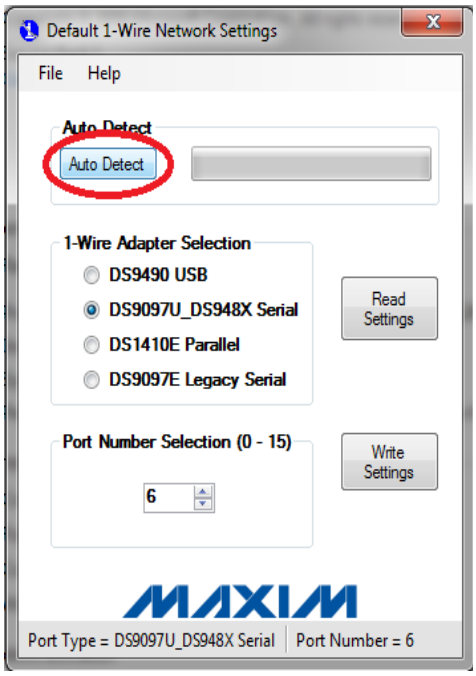


If it is necessary the com port number may be changed to lower (for example COM2, COM3, COM4) because some software applications do not work with higher com port numbers.

4. Now the converter is installed correctly and each time when it is plugged in the computer USB port it will be recognized with its com port number. The rest part of the instructions is about of OneWire Viewer software installation. Note that the device can work with any One Wire software allowing work with converter based on DS2480B (for example the popular Dallas DS9097U converter).
5. Download and install 1 Wire drivers from this link:

http://www.maximintegrated.com/products/ibutton/software/tmex/index.cfm

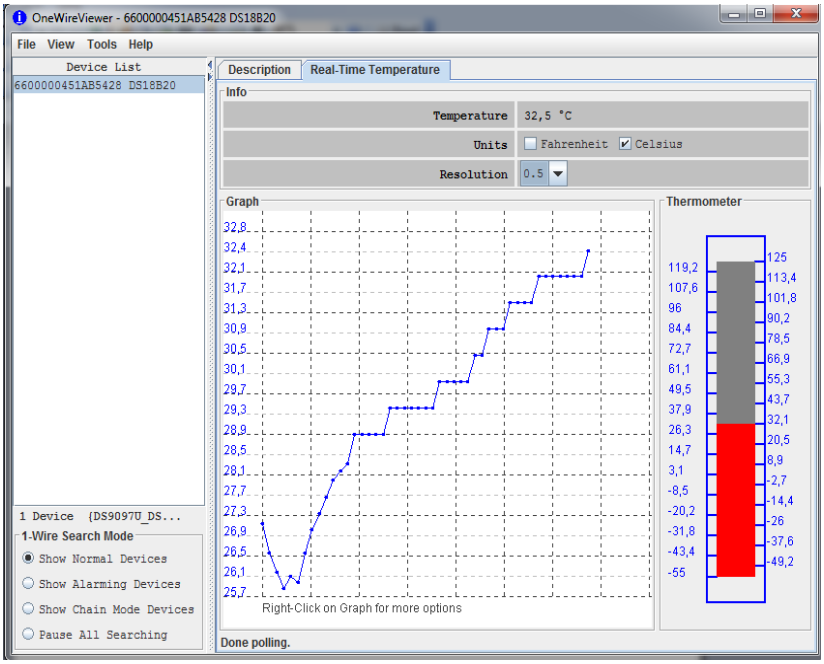
6. Start the Default 1-Wire Net (it will appear as software in your computer) and then click Auto Detect. The interface must be recognized as DS9097U. Once the adaptor is found and saved, later each time the OneWire Viewer will search for this adaptor:



7. Install OneWire Viewer from this link:

http://www.maximintegrated.com/products/ibutton/software/1wire/OneWireViewer.cfm

8. Run the OneWireViewer



5. PCB dimensions