# 2015-2016-V2TH06 notes

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1. Interfacing the Pi to the DB103

The Pi has a serial port, which is by default used to log the startup messages, and (in most distro's) enabled as a serial console (you can log in on it). The serial pins are available on the 2x13 pins extension connector. For V2TH06 the serial port is used to communicate with the DB103 (LPC1114) board. For this the DB101 board and a small cable is used. Fore testing, the DB100 board can be connected, in that case the Pi 'talks' to the PC virtual COM4 port. Note that for this configuration the DB100 is vertical, and the DB103 is NOT connected (see right picture).
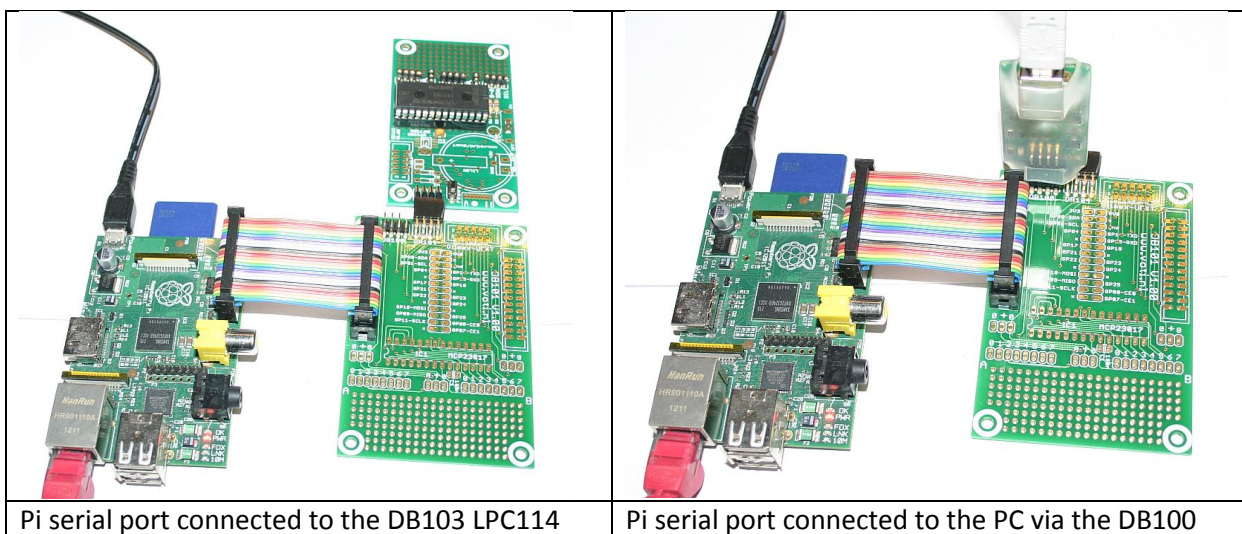
Pi serial port connected to the DB103 LPC114	Pi serial port connected to the PC via the DB100

2. The serial port on the Pi

You can use the 2015-09-24-raspbian-jessie.zip (or later) from http://www.raspberrypi.org/downloads and use Win32DiskImager (te downloaden van http://sourceforge.net/projects/win32diskimager/) to transfer the .img file to an 8 Gb SSD card.

If you don't have a monitor to connect to the Pi, use the DB101 + DB100 to log in via the serial port, using putty for Windows, at 115200 baud. Login name is *pi*, password is *raspberry*.

Powering the Pi from an USB port can give funny results: the Ethernet interface does'nt work, spontaneous reboots, hangs, kernel panics, etc. The Ethernet interface consumes a large part of the Pi's power budget, so when the 5V USB port can't provide enough power things go wrong when the Ethernet interface is started. In that case you have to use a separate power supply.

Configure a fixed IP address. Edit /etc/network/interfaces:

```
sudo nano /etc/network/interfaces
```

In the example below the gateway is at 192.168.0.9, and the Pi gets 192.168.0.42:

```
auto lo

iface lo inet loopback
iface eth0 inet static
  address 192.168.0.42
  netmask 255.255.255.0
  gateway 192.168.0.9

allow-hotplug wlan0
iface wlan0 inet manual
wpa-roam /etc/wpa_supplicant/wpa_supplicant.conf
iface default inet dhcp
```

Enable SSH (remote login over Ethernet) run "sudo raspi-config", select 8 (Advanced Options) and A4 (SSH) and select Enable. While you are in raspi-config, extend the SSD use to the full card, 1 (Expand Filesystem) in the main menu. The Pi will reboot.

Verify that remote login works, you can usedputty again. You can use the windowed interface, or start an SSH terminal directly from the command line:

```
putty 192.168.0.42
```

Disable the login on the serial port (following http://www.hobbytronics.co.uk/raspberry-pi-serial-port). Edit /etc/inittab, insert a # at the start of the last line:

```
. . .
#Spawn a getty on Raspberry Pi serial line
# T0:23:respawn:/sbin/getty -L ttyAMA0 115200 vt100
```

Now disable the logging to the serial port during startup. Edit /boot/cmdline.txt, remove the console= and kgboc= parameters:

```
dwc_otg.lpm_enable=0 console=ttyAMA0,115200 kgdboc=ttyAMA0,115200 console=tty1
root=/dev/mmcblk0p2 rootfstype=ext4 elevator=deadline rootwait
```

Now the serial port is free for use by applications. You can test it using minicom. First install it

```
sudo apt-get install minicom
```

Then start it:

```
minicom -b 9600 -o -D /dev/ttyAMA0
```

You can exit minicom by crtl-A X.

On Windows, start a serial terminal on COM4. Now the characters that are typed at the Pi should appear in the PC window, and vice versa.

3. Connecting the Pi to the internet

The Pi can use the wireless connection of your PC if you share this connection.

Select Control Panel → Network and Internet → Network Connections, right click the Wireless Network Connection and select Status. Then the left dialog below appears.

Now select Properties and the Sharing tab. In the Sharing tab mark the option *Allow …* and select the Local Area Connection.
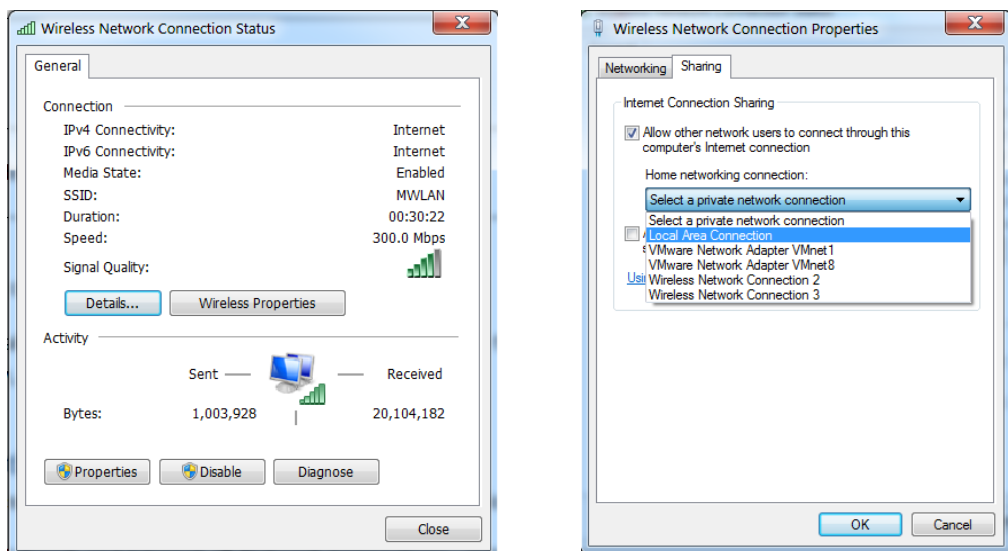
By default your local area connection gets the IP address 192.168.137.1 so you have to assign the static IP address 192.168.137.xxx to the Pi, e.g. 192.168.137.10, and the netmask 255.255.255.0.