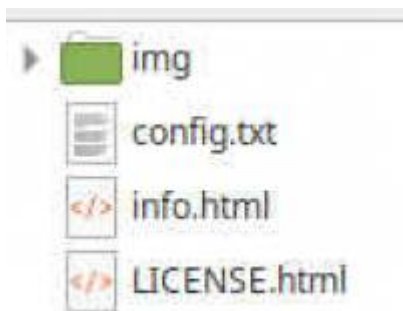# Adalm-PLUTO basic settings

Connecting a brand new Pluto via USB:

Connect the middle USB socket to a PC using the USB cable.

The Pluto reports to the PC as a new USB storage device with the following files

Open the config.txt file with a text editor:

If you want to work with the Pluto seriously, you will get a USB Ethernet adapter and address the Pluto via Ethernet. That saved me a lot of problems, as Ethernet is a lot more robust and less susceptible to interference than USB. However, there could be problems with the maximum data rate. If you want to work with very high sample rates, you have to check whether ETH or USB are more suitable.

In config.txt there is the section [USB_ETHERNET]. Here you enter the desired fixed IP address under which the Pluto should be accessible in the home network. A fixed IP is strongly recommended if you want to save time for searching the IP. So for example:

ipaddr_eth = 192.168.0.44

Save the changed file and now AND **! IMPORTANT :** you have to unmount the Pluto drive using the unmount function provided by the operating system (eject function). Immediately after ejection, the Pluto logs in again and the Pluto drive is visible again. You can check config.txt whether the entered IP address is correct. You will also notice that a new file has been added, ipaddr-usb0.

That is all that had to be done via USB, the USB cable can now be removed from the middle socket.

Connecting a Pluto via Ethernet:

now we plug a USB ethernet adapter into the middle USB socket of the Pluto. A suitable adapter is included with the Pluto. We only need the USB cable for the 5V power supply. It is plugged into the second USB socket (the one closer to the edge) and connected to a 5V power supply or a PC USB socket.

The ethernet socket is connected to the home network.

The Pluto will now boot and after a few seconds the LEDs of the Ethernet adapter light up, everything is ready for use.

Test: we ping the Pluto on its IP with: ping 192.168.0.44 and see whether the ping command runs

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correctly. This is usually the case and the Pluto can therefore be addressed via Ethernet.

Log in to Pluto:

We make the other settings via Ethernet udn with SSH. With a Linux PC this is very easy, under Windows you have to install an ssh program such as putty.

Login: ssh -l root 192.168.0.44

Password: analog

after logging in you are in the command line and can enter the following settings.

Activation of the second CPU core:

the Pluto has a CPU with two cores. For whatever reason, only one of them is activated upon delivery. You can check this by entering: cat / proc / cpuinfo. A list is printed out for processor 0, i.e. only for one processor core.

To activate the second one enter the following: fw_setenv maxcpus
Then the Pluto has to be restarted with: pluto_reboot reset

Of course, you will be logged out automatically and then have to log in again. If you enter cat / proc / cpuinfo again, you will see that 2 CPU cores are displayed.

Extension of the working frequencies (optional, does not have to work for every Pluto):

To increase the frequency range and bandwidth, enter the following:

Check whether this modification has already been made:

fw_printenv attr_name
fw_printenv attr_val

in a new Pluto both entries bring an error message "not defined"

now let's make these missing definitions:

fw_setenv attr_name compatible
fw_setenv attr_val "ad9364"

and reboot the Pluto again: pluto_reboot reset

After logging in again

fw_printenv attr_name
fw_printenv attr_val

check whether the change was successful.

Problems can almost always be traced back to typing errors, so enter everything carefully.

There are some rumors as to whether or not this frequency expansion will work. I have a Pluto built in 2020 and here it works. I can tune it to just under 60 MHz. Always use a harmonic filter for transmission, the harmonic waves are almost as powerful as the usable frequency.

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