

How-To Build Meteohub on SheevaPlug (the easy way)

The SheevaPlug is a low power, small form factor device that can be seen as the successor of the famous NSLU2. Meteohub has now been experimentally ported to the SheevaPlug. Please be aware that this port is rather alpha, but it seems to work. At the moment Meteohub on SheevaPlug has these limitations:

- no WebCam support: This is also not planned for the future
- no WLAN support: Might be added via USB WLAN sticks in the future (low priority)
- no Labjack support: unclear if this can be added by a home-brew kernel module, low priority

Meteohub on SheevaPlug makes use of a SD card where operating system, Meteohub application and data are stored. Capacity is 4GB. It should be a SLC based card. As not all SD cards are working with the plug, you might have some experiments in front of you. SLC-based SD card that is proven to be working

- Transcend SDHC Class 6 150x: TS4GSDHC150

Weather stations are connected to the Meteohub by USB connector. This one USB port can be extended with an USB hub. It looks like it can be a passive USB hub, as the Meteohub provides the 500mA on USB and this should be enough to drive a few weather station USB connections and/or RS232-USB converter. Meteohub on SheevaPlug consumes about 5 watts , which is really effective. Meteohub's performance looks fine. It can do about 900 records per second during recomputation (NSLU2 is about 200, x86 Geode platforms are up to 2000).

So overall SheevaPlug looks like a quite attractive Meteohub platform, but there still is one major problem. Conversion of a SheevaPlug into a Meteohub is still a complicated procedure and needs some limited Linux knowledge and a Linux PC at your hand. If you just have a Windows machine, go with a Linux Live CD (of one of the major distributions) and you don't have to install Linux on your hard disk.

Files you need:

You find the needed files in the Wiki at: <http://wiki.meteohub.de/Images#SheevaPlug>

1. Meteohub installer for SheevaPlug:
<http://www.meteohub.de/files/sheevaplug-installer.tgz>
2. Meteohub SD card image for SheevaPlug:
<http://www.meteohub.de/files/mhplug-v4.6j.rar>

Remark: Meteohub image for SheevaPlug is based on a Debian Lenny Distribution for Kirkwood platform as instructed here: <http://www.cyrius.com/debian/kirkwood/sheevaplug/>

STEP 1: Bring Installer to your Linux PC

SheevaPlug's boot loader will be modified by a program on your Linux PC that establishes a JTAG connection to the flash memory of your plug via USB. This sounds complicated, but it works quite straight forward.

1. Login as user "root" on your Linux PC. If you don't have one, make use of one of the live Linux CDs that allow to use Linux right from a CD without having to install something on your hard disk. Take one of the major distributions that works well with your PC's hardware.
2. Goto to directory `"/home"` by giving the command `"cd /home"`
3. Copy downloaded installer archive `"sheevaplug-installer.tgz"` to directory `"/home"` and extract the files with command `"tar xzpf sheevaplug-installer.tgz"`.
4. Goto to directory `"sheevaplug-installer"` by command `"cd sheevaplug-installer"`

STEP 2: Flash the Plug

5. Connect ScheevaPlug to your Linux PC with USB cable.
6. Now power-cycle the SheevaPlug. Look out that the USB cable does not flip out of the SheevaPlug as it does not fit well there.
7. Read boot loader environment settings from SheevaPlug by command `"/.meteoflash.sh read"`. This can take up to 30 minutes. Reading 128KB data from flash this way is slow.
8. Power-cycle SheevaPlug again. Look out for the USB cable not to flip out.
9. Flash new boot loader and environment settings by command `"/.meteoflash.sh preserve"`. This takes less than 5 minutes.

Instead of doing steps 7-9 you can also manually type in the MAC (which is printed on the bottom of your SheevaPlug) by giving command `"/.meteoflash.sh mac 00:00:00:00:00:00"` (where `00:00:00:00:00:00` is a place holder for your SheevaPlug's specific MAC). This short cut saves a lot of time and is less error-prone in situations where your rig has trouble in reading the old data.

STEP 3: Setup SD Card

Previous steps did a preparation of the SheevaPlug to boot from SD card. Last step is to prepare a SD card. This can be most easily done by using "DiskImage" from an Windows XP machine or by "dd" on a Linux PC environment. Download and un-rar SD card image file. Resulting Meteohub SD card image (`mhplug-vx.x.img`) includes disk 3 partitions and it is essential that you copy this data in raw mode to your SD card. You do that on a Linux machine by `"dd if=mhplug-vx.x.img of=/dev/sde bs=1M"` assuming that Meteohub image file is named `"mhplug-vx.x.img"` and SD card is recognized as `"/dev/sde"` on your Linux PC. When using DiskImage on Windows, please make sure that you select the target drive as "physical drive" (you have to scroll down the list of target drives until the very end to find these).

SD card must have a capacity of 4GB. If it is bigger, just 4GB are used. When it is smaller, Meteohub will not work.

STEP 4: Start Meteohub

1. Insert prepared SD card into SheevaPlug (contact side up) and press reset "button". Don't care about boot errors regarding "mtdblock", internal NAND Flash is not used by Meteohub.
2. When boot has finished, Meteohub can be reached by it's IP exactly like any other Meteohub.