ADALM Pluto with external clock

ssh login:

user: root
password: analog

external clock:

Pluto Rev.B:

the internal level at the AD93xx chip should be max. +/-700mV. The minimum level is very small, even below +/- 100mV it still works fine.

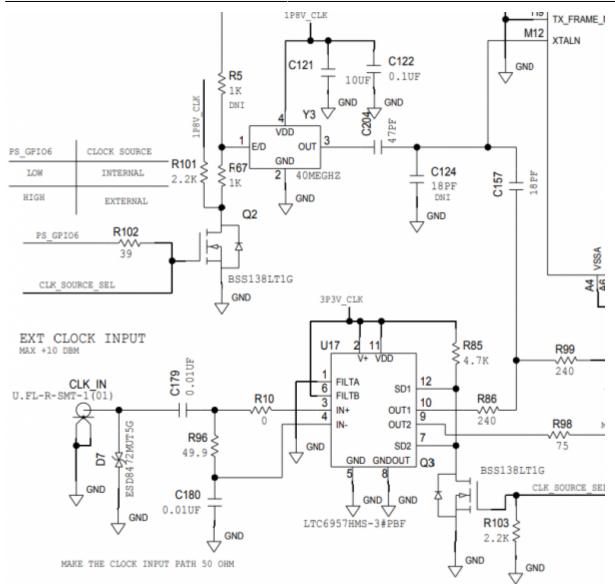Depending on the external level a reduction is necessary.

Example: the 40 MHz output level of the Amsat downconverter is about +/- 1V. If you connect a 10pF capacitor in series, you get a suitable level.

Pluto Rev.C:

no soldering is necessary, you only need a SMA/U.fl adapter cable.

Level: the maximum level for Pluto Rev.C is given with about 3Vpp. But it works also with very low levels of <100mV, so you should not give too much voltage to the ext. clock connector.

Here is an excerpt of the Pluto Rev.c schematic:

You can see that the ext. clock input is 50 ohms and there is also a DC block capacitor.

Activating the ext. clock on the Pluto Rev.B

Software commands are not required because the external clock on a Rev.B pluto is just an additional hardware cable.

Activating the ext. clock on the Pluto Rev.C

between internal and external clock is switched by a control line in the Pluto. This is operated by the following commands (log in to Pluto as root using ssh):

```
fw_setenv refclk_source external
fw_setenv ad936x_ext_refclk_override "<40000000>"
pluto_reboot reset
```

And switch back to the internal TCXO:

```
fw_setenv refclk_source internal
pluto_reboot reset
```

Alternative clock frequencies

with the above command you can also set alternative frequencies.

E.g. 25 MHz, because you need this frequency for the LNB anyway. So you can feed LNB and Pluto with the same reference and save some effort with portable stations.

Pluto Rev.B

```
fw_setenv ad936x_ext_refclk "<25000000>"
fw_setenv xo_correction 25000000
fw_setenv qspiboot_extraenv true
pluto_reboot reset
```
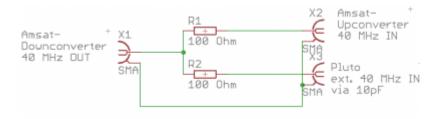
Pluto Rev.C

```
fw_setenv refclk_source external
fw_setenv ad936x_ext_refclk_override "<25000000>"
pluto_reboot reset
```

Note: on the Internet you can find many reports that operation with 10 MHz is not possible, and only works from about 13 MHz. In my tests, I could confirm this in the meantime. But even with 13 MHz the PLL in Pluto was not always stable. Only from 20 MHz (up to 80MHz) trouble-free operation was possible.

Operation at the Amsat downconverter:

at the 40 MHz output of the downconverter the Amsat upconverter is already connected.

It is possible to connect the Pluto additionally to this line, but you have to take measures to damp overshoots:

From:
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