In order to update Neuroon Open device you will need:

- NORDIC SEMICONDUCTOR NRF51-DK Development kit
- Charged Neuroon Open device
- 3 wires male to female
- PC with Linux operating system

Next, take the NRF51-DK board and solder a wire from GND to GND DETECT pin as shown on the photo (red line).

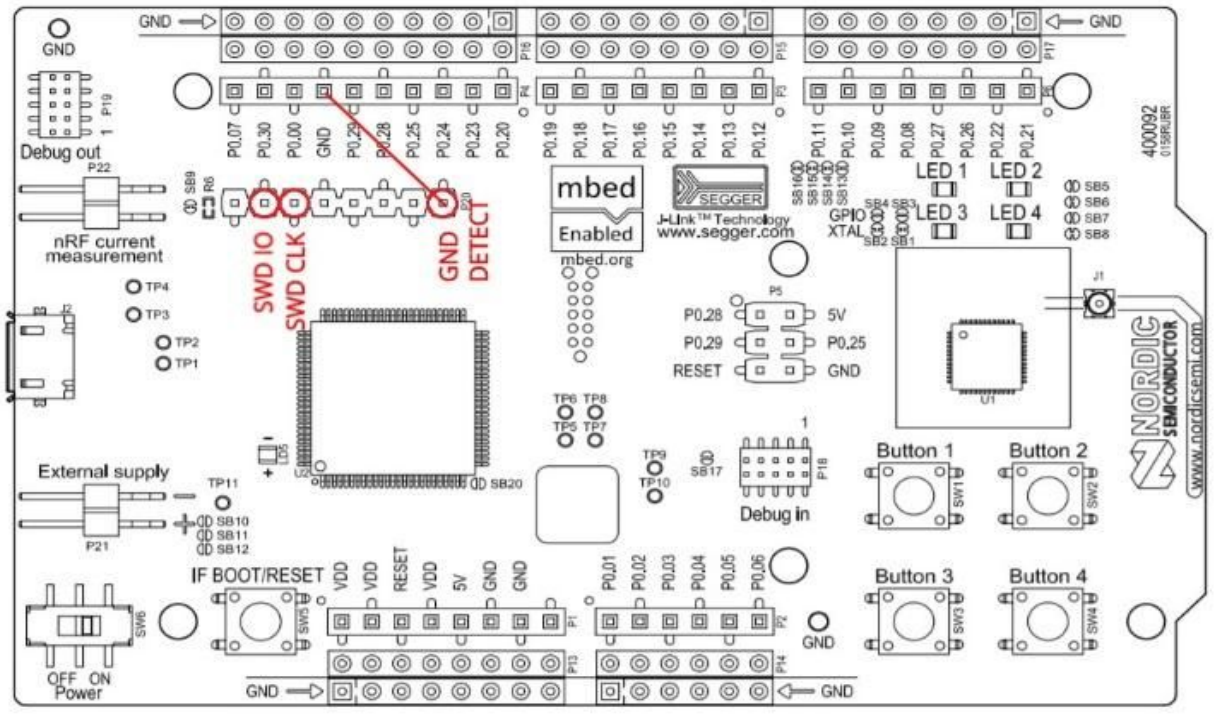


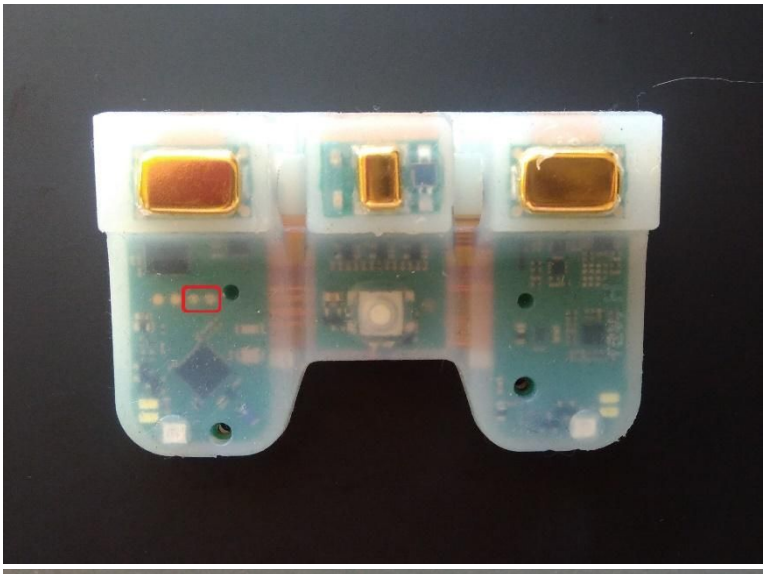
Figure 4 *nRF51 DK board top*

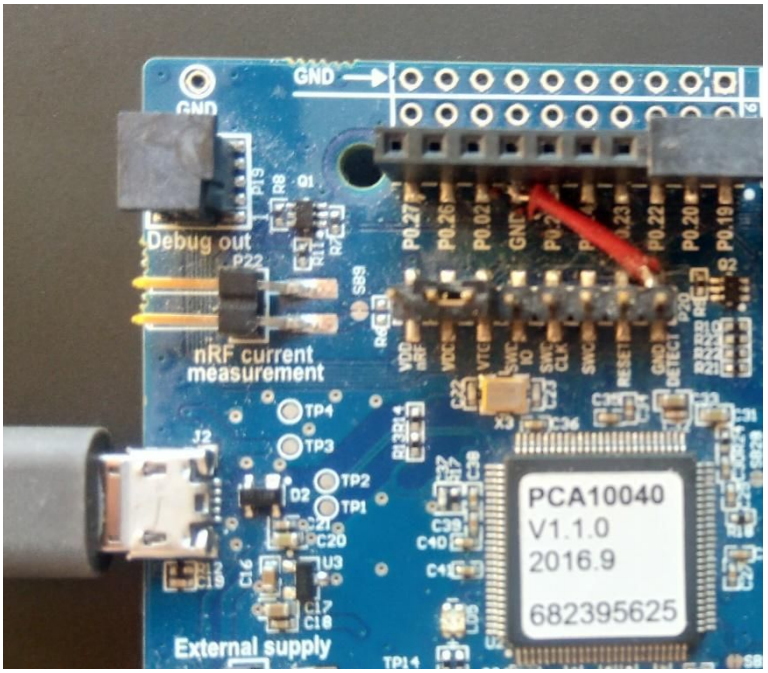
Take three wires and connect them to pins GND DETECT, SWD IO, SWD CLK.

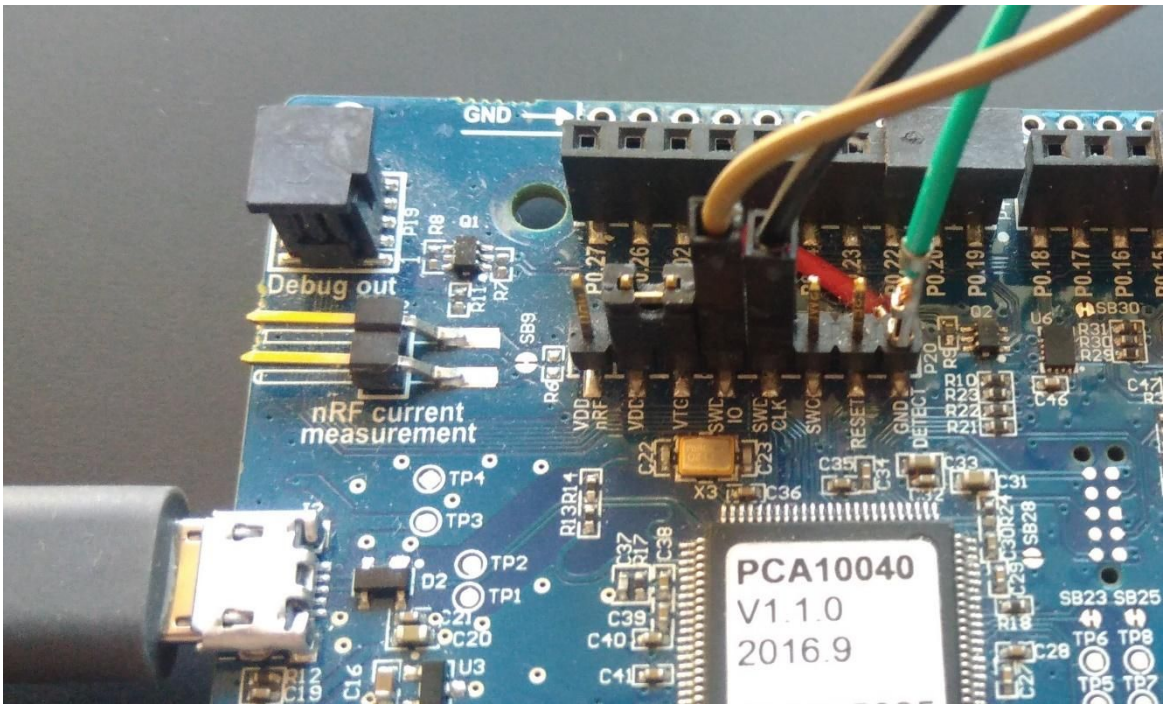
Take a look at Neuroon and find four test points placed in a horizontal line on the left side of the device. For the update you will need only 3rd and 4th pin counting from the left. You have to break through the silicone in order to touch the test points. Take wires connected with NRF51-DK board and connect as listed below:

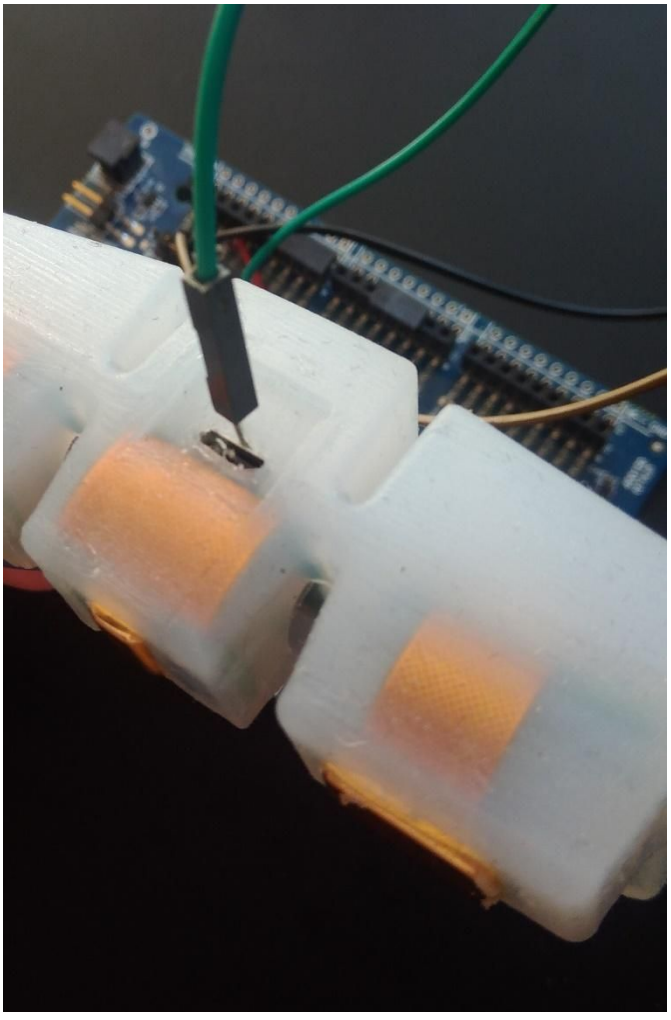
- SWD IO connects with 3rd test point
- SWD CLK connects with 4th test point
- GND DETECT connects with the ground placed between silicone and USB micro connector.

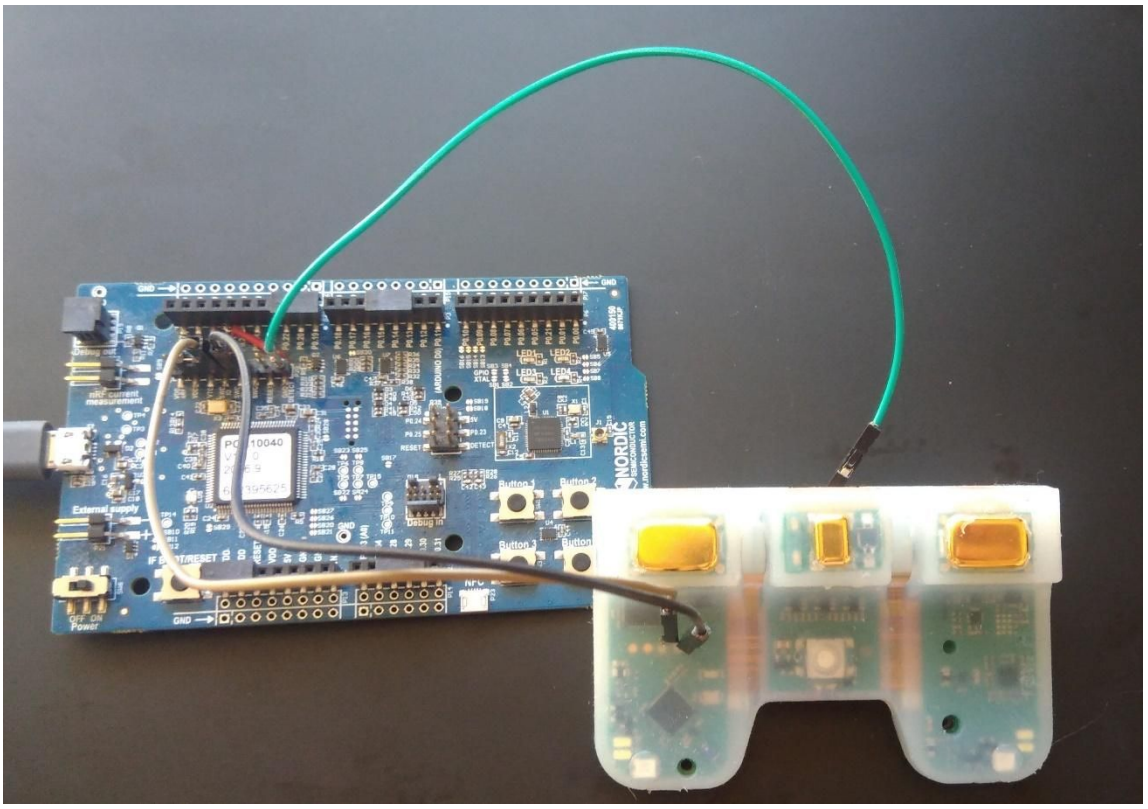
Hold the connection still during the update.






GND
Debug out
nRF current
measurement
TP4
TP3
TP2
TP1
D2
PCA10040
V1.1.0
2016.9





In the terminal run following commands – make sure you type them in this very order:

1. **make erase**

   If the operation was successful there will be a feedback message:

```
[iza@lenovo NeuroonOpenFirmware]$ make erase
nrfjprog --eraseall -f nrf51
Erasing user available code and UICR flash areas.
Applying system reset.
```

2. **make flash**

   If the operation was successful there will be a feedback message:

```
Erasing page at address 0x30000.
Erasing page at address 0x30400.
Erasing page at address 0x30800.
Erasing page at address 0x30C00.
Applying system reset.
Checking that the area to write is not protected.
Programing device.
nrfjprog --reset -f nrf51
Applying system reset.
Run.
```

3. **make flash_softdevice**

   If the operation was successful there will be a feedback message:

```
Erasing page at address 0x1A000.
Erasing page at address 0x1A400.
Erasing page at address 0x1A800.
Erasing page at address 0x1AC00.
Applying system reset.
Checking that the area to write is not protected.
Programing device.
nrfjprog --reset -f nrf51
Applying system reset.
Run.
```

4. **make boot_flash** *(it is optional, may not work)*

   If the operation was successful there will be a feedback message:

```
Erasing page at address 0x3F000.
Erasing page at address 0x3F400.
Erasing page at address 0x3FC00.
WARNING: A UICR write operation has been requested but UICR has not been
WARNING: erased. Please verify that the result is correct.
Applying system reset.
Checking that the area to write is not protected.
Programing device.
nrfjprog --reset -f nrf51
Applying system reset.
Run.
```

After the last command there should appear a sequence of flashing LEDs, finished by a short period of vibration. The update is finished and the device is ready for use.

Common update problems:

1. **No USB connection**

```
ERROR: There is no debugger connected to the PC.
make: *** [bootloader_secure/makefile.boot:199: boot_flash] Error 41
```

Solution: Check USB connection with NRF DK board and PC

2. **Neuroon's battery is drained**

```
[iza@lenovo NeuroonOpenFirmware]$ make erase
nrfjprog --eraseall -f nrf51
ERROR: Cannot connect to any nRF device. Please make sure a device is
ERROR: connected to the debugger and supplied.
make: *** [Makefile:335: erase] Error 42
```

Solution: Connect Neuroon to a source of energy for a couple minutes.

3. **Not enough pressure on test points**

```
[iza@lenovo NeuroonOpenFirmware]$ make erase
nrfjprog --eraseall -f nrf51
ERROR: Cannot connect to any nRF device. Please make sure a device is
ERROR: connected to the debugger and supplied.
make: *** [Makefile:335: erase] Error 42
```

Solution: Make sure that you go through the silicone and touch test points still during the update.

4. **Commands typed in the wrong order.**

Solution: If you changed the command order, start all over from command **make erase**.