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Getting Started Guide Acconeer XC112-XR112 Radar Sensor Evaluation Kit

Apr 2021

Installation guide

This is an installation quick guide for the Acconeer XC112-XR112 Radar Sensor Evaluation Kit (EVK). For a hands-on instruction video, please visit https://youtu.be/0uKrm_RAV_c.

Preparing the HW Installation

To complete a successful installation of Acconeer EVK, the following HW components will be required:

XC112

Connector Board

+

Radar Sensor Board

+

Raspberry Pi3*

Additionally*:

- SD Card
- SD Card Holder
- USB Keyboard
- USB Mouse
- Flex Cable, 1 per XR112
- Power Supply for Raspberry Pi**
- Monitor with HDMI cable

* Not provided by Acconeer except flex cable
** Raspberry Pi original Power Supply is recommended

Preparing the SW installation

The following applications will be required to complete an installation. Also, they will be very useful when working with the Radar Sensor EVK. Please download and install:

- Acconeer SW for EVK: Available from http://developer.acconeer.com

For all users (Windows, Linux, IOS)

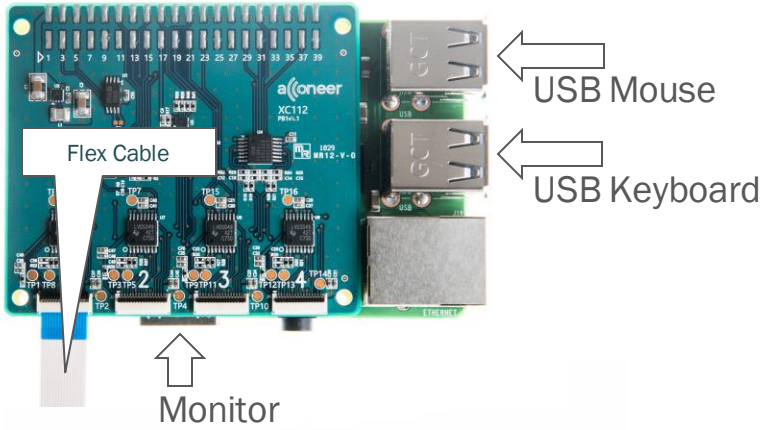
- Raspbian OS: Available from www.raspberrypi.org
- Etcher: Available from www.etcher.io for flashing the Raspbian OS

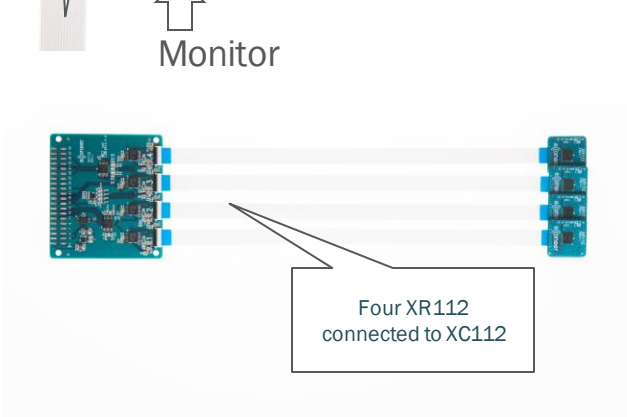
For Windows users (Linux/IOS users use SSH and SCP)

- PuTTY: Available from www.putty.org used for connecting to the Raspberry Pi
- WinSCP: Available from www.winscp.net used for transferring files to Raspberry Pi

Assemble the HW XC112/XR112

- Connect the XR112 Radar Sensor Board to the XC112 Connector Board using the provided flex cable.
- Connect the Raspberry Pi3 to the XC112 Connector Board.
- Also, connect mouse and keyboard in the same way as on previous page.





Installing the Raspbian

1. Insert the SD-Card in the PC. When prompted to format the card, please ignore/cancel.
2. Open Etcher.
3. Drag the Raspbian flash image, zipped, to Etcher.
4. Make sure the SD card is the selected destination.
5. Click flash. Flashing will begin and take a few minutes. When flashing is done, Etcher can be closed.

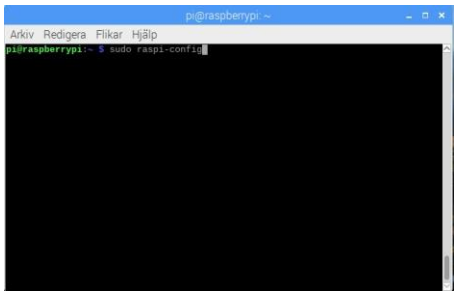
Depending on the security settings in Windows, you may need to click Yes in the confirmation popup to grant permission for the flashing process.

Installing Raspbian, cont.

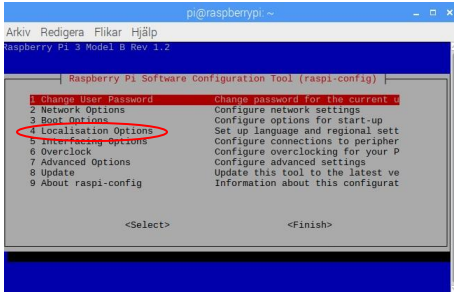
1. Pull the SD card from the PC.
2. Insert into the Raspberry Pi.
3. Plug in the monitor, using the HDMI cable.
4. Plug in the power supply to the Raspberry Pi.
5. Boot of the Raspberry Pi will initiate automatically.

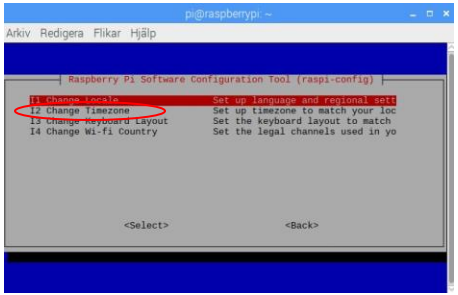
Installing Raspbian, cont.

- Once booting is complete, you can start up the Raspberry Pi Terminal Window.
- On the prompt, type *sudo raspi-config*. The configuration menu will appear.



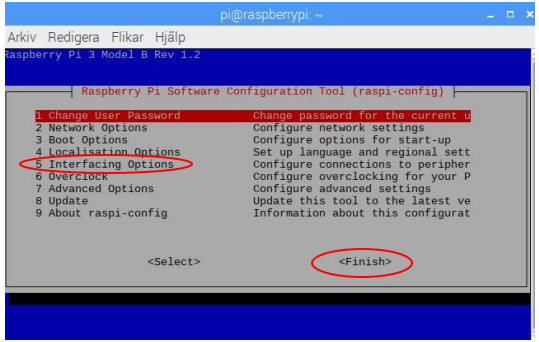
- From the menu, choose #4 Localization options.
- From the next menu choose #2 Change Time zone.
- Set the appropriate Time zone.

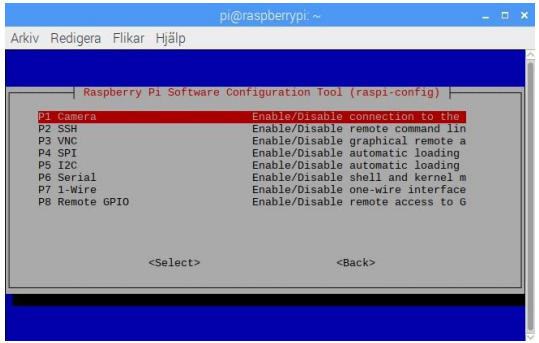




Installing Raspbian, cont.

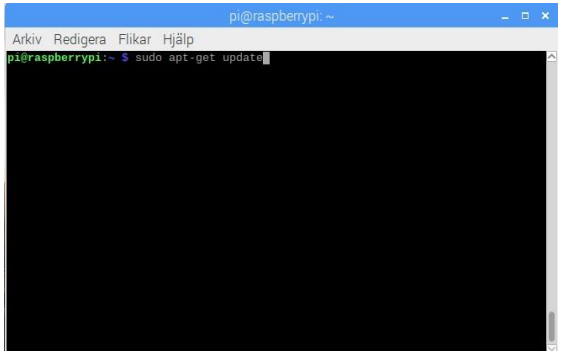
- Go to #5 Interfacing options.
- Enable the following interfaces:
  - P2 SSH
  - P4 SPI
  - P5 I2C
- When done, click <finish> to close the config menu.

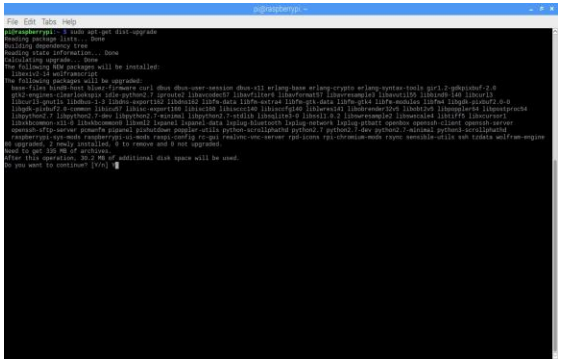




Installing Raspbian, cont.

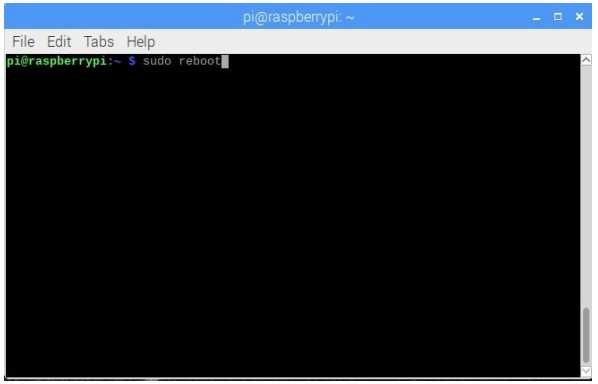
- Make sure your PC and Raspberry Pi is connected to wifi. If that is not an option, use an Ethernet cable to connect your PC to the Raspberry Pi.
- To make sure that you are using the latest version of Raspbian, type *sudo apt-get update*. This command will present the latest update.
- Type *sudo apt-get dist-upgrade* to start the upgrade and confirm, when prompted, with a Y.

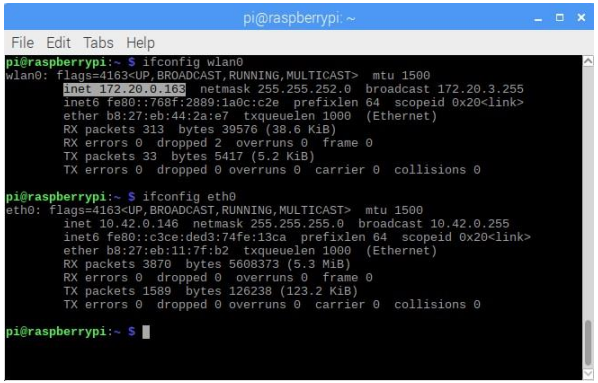




Installing Raspbian, cont.

- Once the command prompt appears, the installation is complete.
- To reboot the Raspberry Pi, type *sudo reboot* in the console.
- Once the reboot has been done, open the terminal window again. Now we need to find the Raspberry Pi IP adress.
  - Type *ifconfig wlan0 - t*he IP adress will appear in the terminal window.
  - If you do not use a wifi but have your raspberry connected by means of an Ethernet cable, type *ifconfig eth0.*
- In both cases, the Raspberry IP is visible as inet xxx.xx.x.xxx





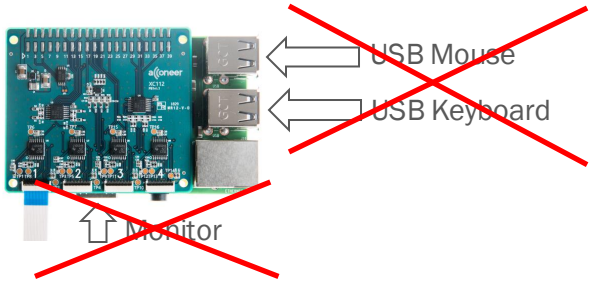
Installing Raspbian, cont.

- sudo apt install libgpiod2
- sudo nano /boot/config.txt
  - Add the line: dtoverlay=spi0-1cs,cs0_pin=8
  - Close the document
  - Reboot

Installing Raspbian, cont.

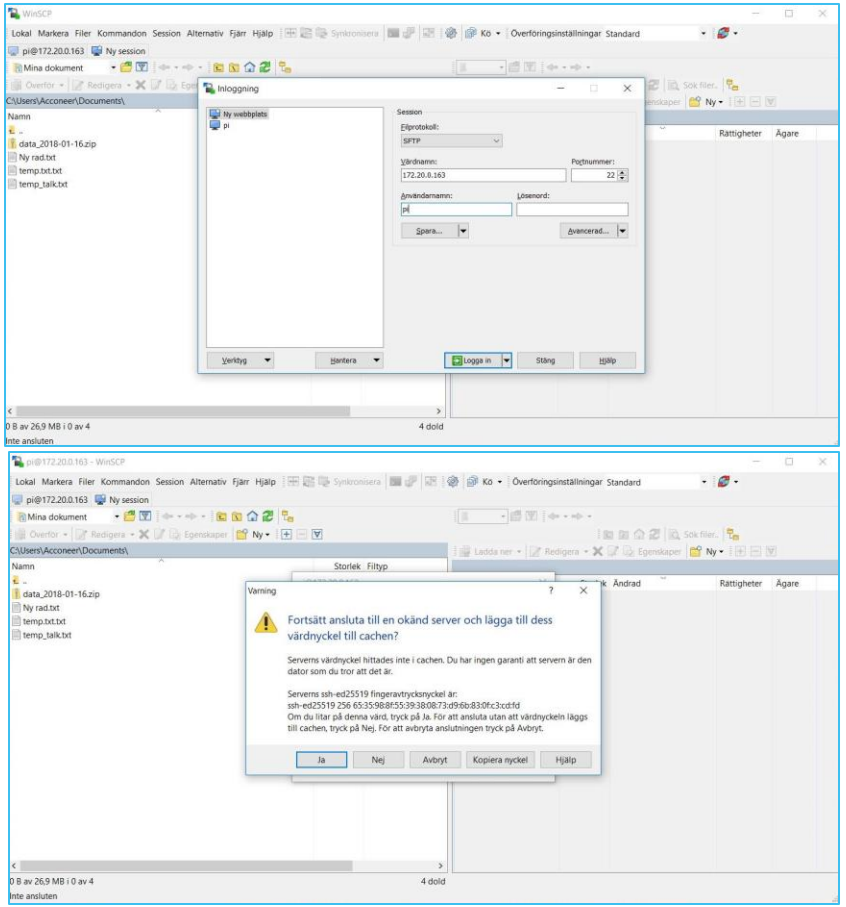
- If everything is completed up to this point, you could disconnect both mouse and keyboard, as you now can control the setup remotely.

- Now let us continue by installing the Acconeer SW.



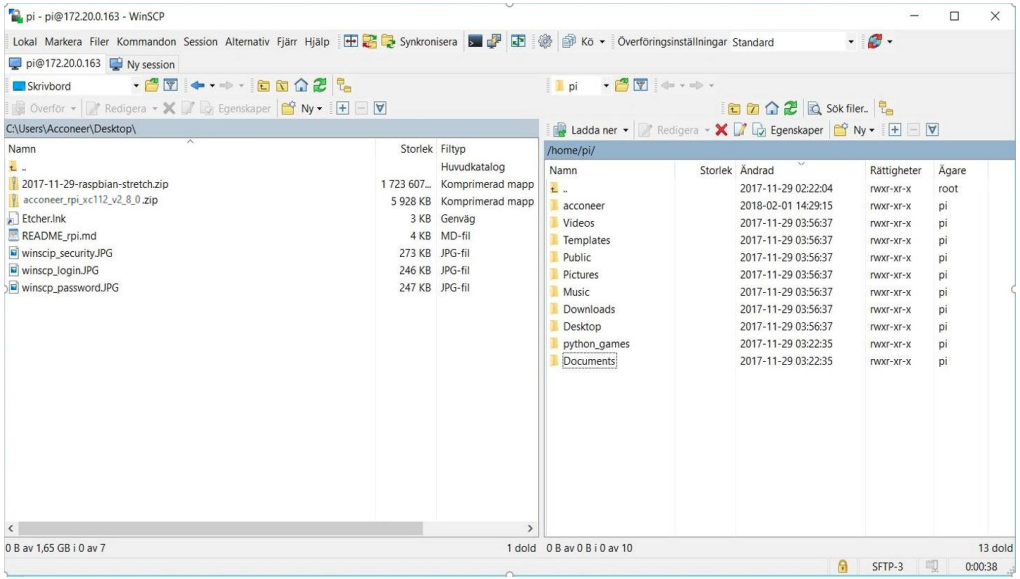
Installing the EVK SW

- Open up WinSCP.
- For Host name, enter the IP address retrieved from the Raspberry Pi.
- The Port should remain as default: 22
- Username and password are by default:
  - Username: pi
  - Password: raspberry
- Click Login.
- If you receive a Warning, simply click Yes or Update.



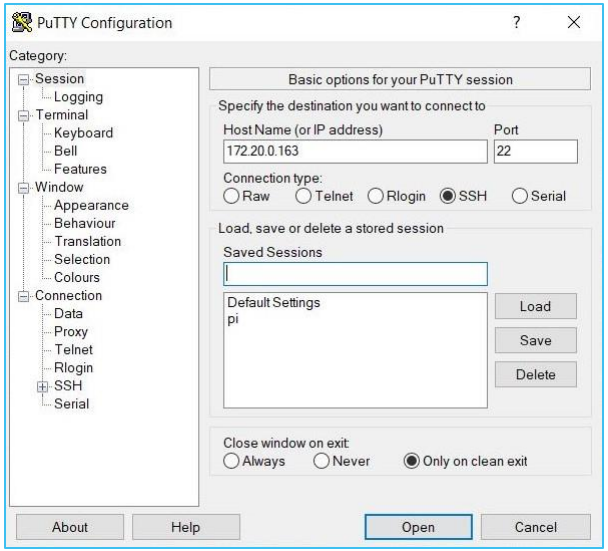
Installing the EVK Software

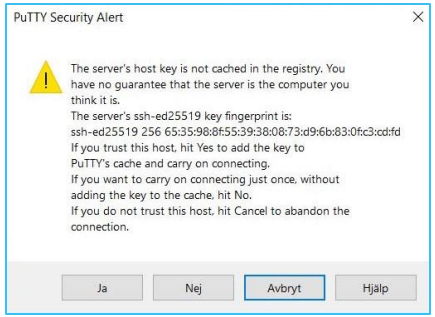
- Once logged in, you can see your local PC to the left and the Raspberry to the right.
- Locate the Acconeer SW zip on your local computer.
- Drag the file to the raspberry and release it in the /home/pi/ folder, as shown in the picture.



Installing the EVK Software

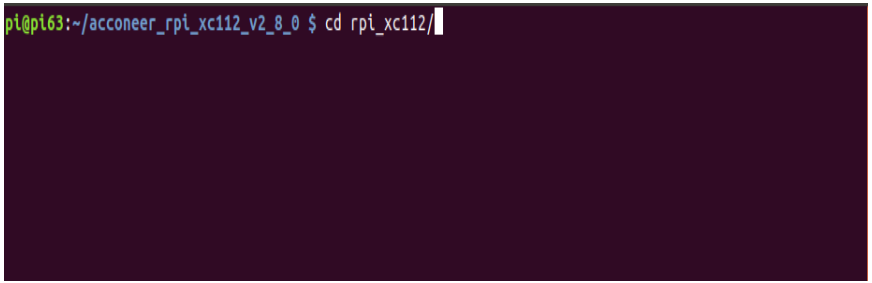
- Now open PuTTY.
- Enter the same IP address as previously and click Open.
- If prompted by a Warning, click Yes.





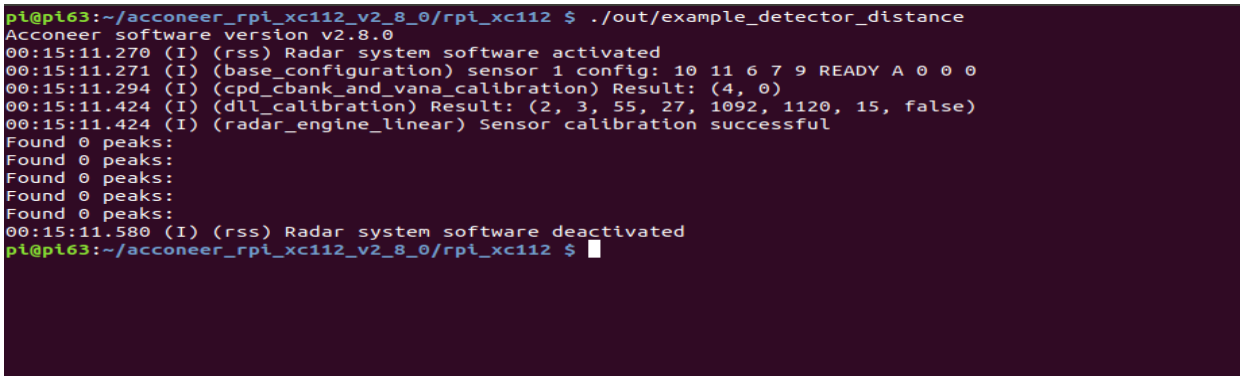
Installation the EVK Software

- A terminal window opens and you can login with the user name *pi* and password *raspberry*.
- The command *ls* will give you a list of all files/folders in the root of the raspberry.
- To unzip the Acconeer SW, type: *unzip* [filename]
- Once unzipped, you can enter the SW directory by using: *cd rpi_xc112*



Installation the EVK Software

- From within the directory, you can activate different services.
- The illustration below shows activation of the distance detector: ./out/example_detector_distance



Installation EVK SW

- The picture to the right shows how to start the envelope:
  ./out/example_service_envelope

```
pi@pi63:~/acconeer_rpi_xc112_v2_8_0/rpi_xc112 $ ./out/example_service_envelope
Acconeer software version v2.8.0
00:16:09.708 (I) (rss) Radar system software activated
00:16:09.709 (I) (base_configuration) sensor 1 config: 10 11 6 7 9 READY A 0 0 0
00:16:09.732 (I) (cpd_cbank_and_vana_calibration) Result: (4, 0)
00:16:09.865 (I) (dll_calibration) Result: (2, 3, 55, 27, 1106, 1115, 15, false)
00:16:09.865 (I) (radar_engine_linear) Sensor calibration successful
Start: 200 mm
Length: 499 mm
Data length: 1033
Envelope data:
   112   114   116   118   120   122   124   126
   128   130   132   134   136   138   140   140
   140   140   140   140   140   140   140   140
   140   140   140   140   140   140   140   140
   140   140   140   140   140   140   140   140
   140   140   140   140   140   140   140   140
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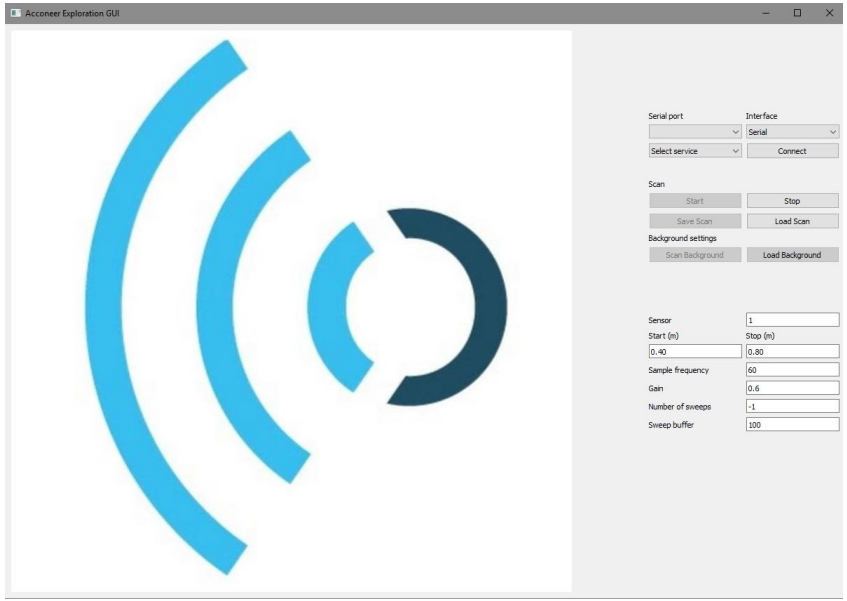
Exploration Tool

Acconeer has developed a tool that let the user view the data from our service and detectors.

The tool can be downloaded from:

https://github.com/acconeer/acconeer-python-exploration

There you will also find an Installation guide and support.

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