**Explore the next sense** 



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 <u>https://youtu.be/VLswgP2HFJg</u>



## **Preparing the HW Installation**

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



Additionally\*:

- SD Card
- SD Card Holder
- USB Keyboard
- USB Mouse
- Flex Cable, 1 perXR112
- 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 <a href="http://developer.acconeer.com">http://developer.acconeer.com</a>

For all users (Windows, Linux, IOS)

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

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

- PuTTY: Available from <u>www.putty.org</u> used for connecting to the Raspberry Pi
- WinSCP: Available from <u>www.winscp.net</u> 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 <u>Yes</u> in the confirmation popup to grant permission for the flashing process.



- 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.



- 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.





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

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- 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.







- 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* the 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 ethO*.
- In both cases, the Raspberry IP is visible as inet xxx.xx.x.xxx







- sudo apt install libgpiod2
- sudo nano /boot/config.txt
  - Add the line: dtoverlay=spi0-1cs,cs0\_pin=8
  - Close the document
  - Reboot



 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.

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## Installing the EVK Software

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

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## 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

pi@pi63:~/acconeer_rpi_	xc112_v2_8_0 \$ 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

```
pi@pi63:-/acconeer_rpi_xc112_v2_8_0/rpi_xc112 $ ./out/example_detector_distance
Acconeer software version v2.8.0
00:15:11.270 (I) (rss) Radar system software activated
00:15:11.271 (I) (base_configuration) sensor 1 config: 10 11 6 7 9 READY A 0 0 0
00:15:11.224 (I) (cpd_cbank_and_vana_calibration) Result: (4, 0)
00:15:11.424 (I) (dll_calibration) Result: (2, 3, 55, 27, 1092, 1120, 15, false)
00:15:11.424 (I) (radar_engine_linear) Sensor calibration successful
Found 0 peaks:
00:15:11.580 (I) (rss) Radar system software deactivated
pi@pi63:-/acconeer_rpi_xc112_v2_8_0/rpi_xc112 $
```



## Installation EVK SW

 The picture to the right shows how to start the envelope: ./out/example\_service\_envelope

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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/acco neer-python-exploration

There you will also find an Installation guide and support.



