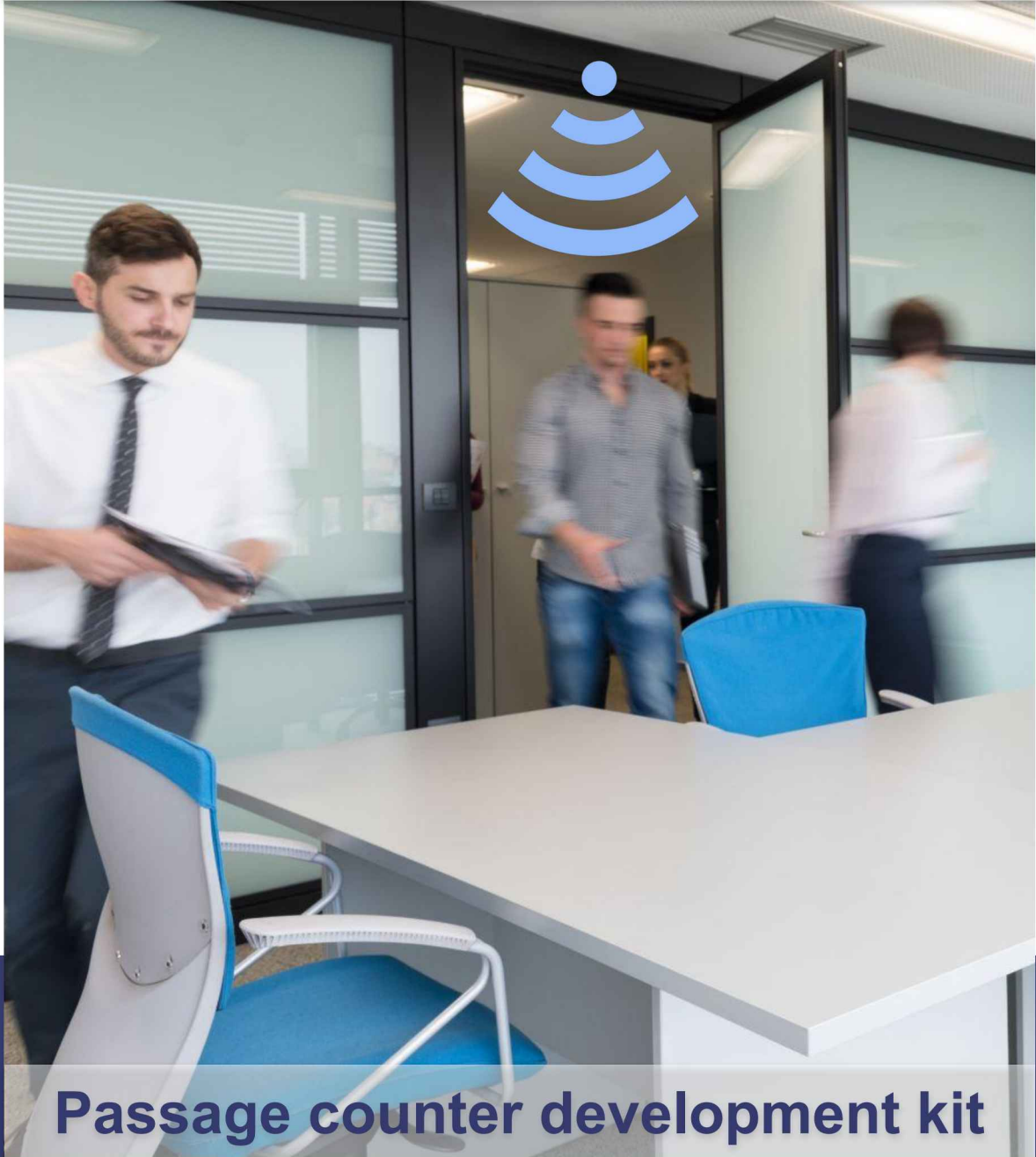


EC Solutions People Counter



Passage counter development kit



EC SOLUTIONS
trust the experts

a((oneer



About EC Solutions

EC Solutions is a development company working within everything from front to backend. We are especially skilled within embedded development. We develop both onsite with our customers and our in-house team delivers complete solutions and prototypes to our customers.

Today we are about 40 colleagues and some of our customers are:

VOLVO

ERICSSON 

BOSCH

AXIS
COMMUNICATIONS

MASSIVE
MASSIVE ENTERTAINMENT | A UBISOFT STUDIO

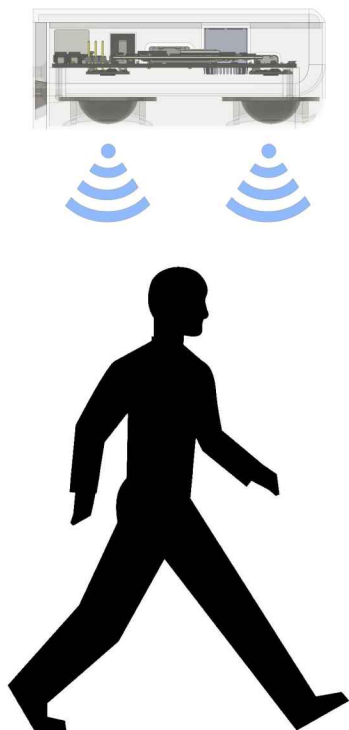
SONY



We believe that successful developer companies are made up of happy colleagues. People who love what they do, with the assignments they want.

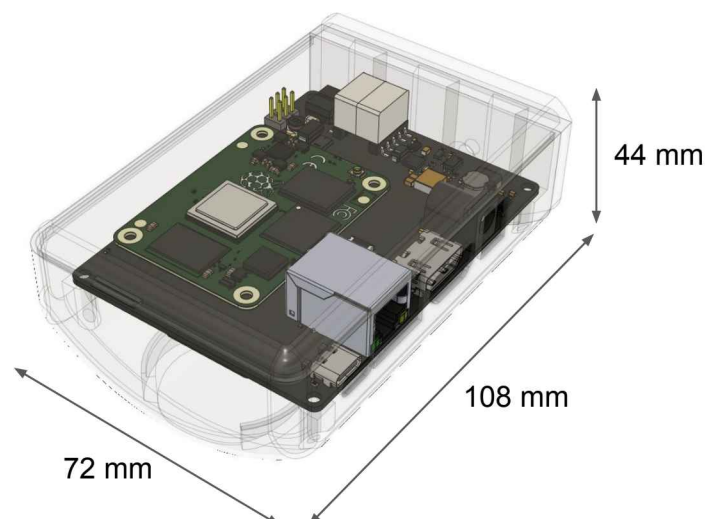
The People Counter

Based on the Acconeer Pulsed Coherent Radar



- Development kit for quickly creating an automated passage detector
- Hardware and software available, with trained Machine Learning model
- Detect when people are passing through door openings
- Determine direction of passage
- Filter our events if someone is turning around and walk back in the door
- Keep track of the number of people that occupy a room
 - Right now
 - During the day
 - Over period of time
- Works with rooms with more than one door

- Demo-kit available
- Development kit available
 - Add use cases
 - Detect other objects
 - Customize hardware



Watch a sensor live:
counter.ecsolutions.se

The People Counter

Based on the Acconeer Pulsed Coherent Radar

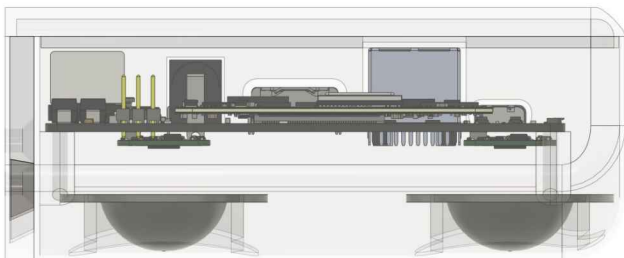
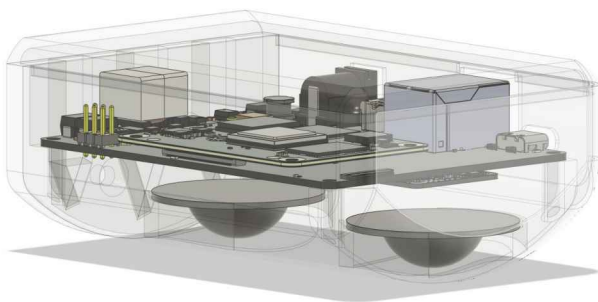
The People Counter is a sensor for detecting passages through door openings, it detects passage events and direction of passage.

The event is sent to a server backend for storing, processing and presenting the data.

If a room has more than one door, a sensor above each passageway enables monitoring of room occupancy for rooms with multiple doors.

The solution monitors current room occupancy, occupancy during the day, and which doors have been used for entering and exiting the room.

The sensor isn't limited to only detecting people passing through doors. The machine learning platform makes it well suited for adapting it to detect and count other objects in various environments.



Multiple Software Detection Models

The embedded software consists of multiple mathematical models to detect passage events and determine direction of passage.

There is also a Machine Learning (ML) model that is trained for single passages in both directions, and for events of people turning around under the door and walking back from where they came.

The People Counter

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Development Kit

For further expansion of the functionality of the sensor the complete development kit is included in the delivery. Software for improving or expanding the data set for the ML is included, it can also be used to train it for other implementations.

The software for expanding the data set uses a camera for creating the base truth of the passage directions. The direction of the passage is written into the title of the data files for post processing.

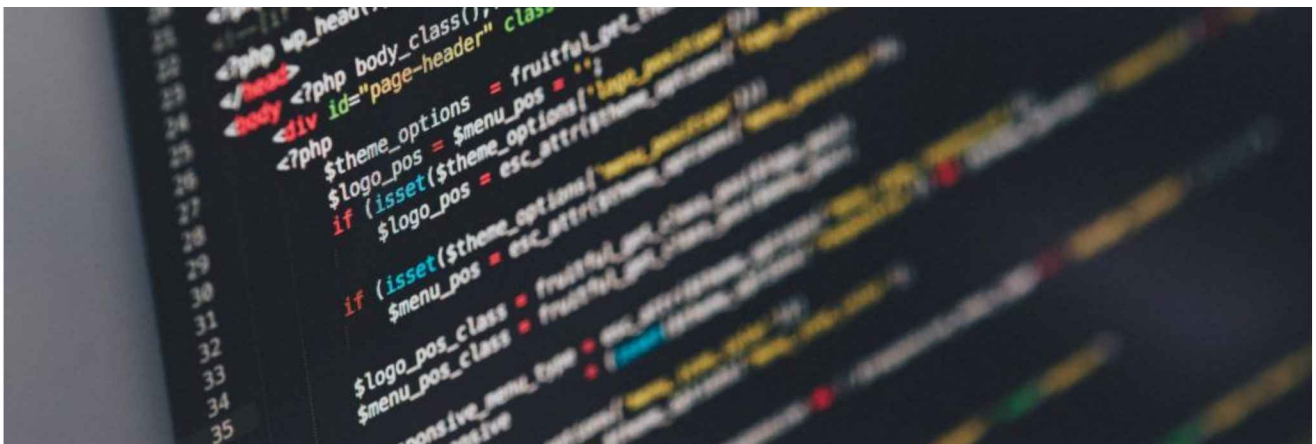
All other implementations based on different mathematical algorithms are included.

The server software for basic room occupancy and the design files for the Base PCB are included.

Business model

The complete intellectual property (IP) comes with a full right to use, with no restrictions, limitations or further claims attached. EC Solutions keeps the right to sell the IP to other clients, unless otherwise agreed.

EC Solutions offers support in additional development of functionality of the software after signed agreement of definition of work and terms.



The People Counter

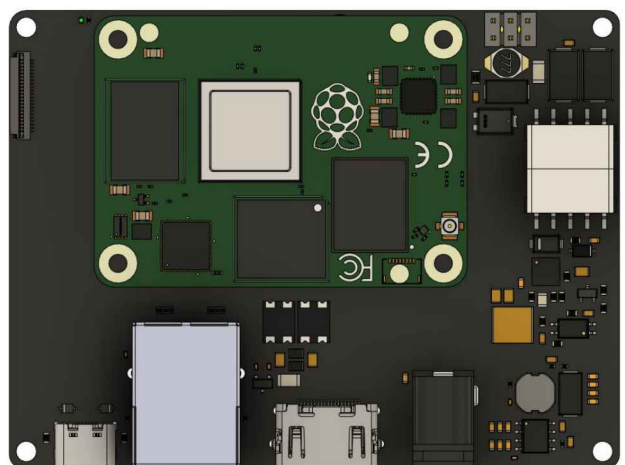
Based on the Acconeer Pulsed Coherent Radar

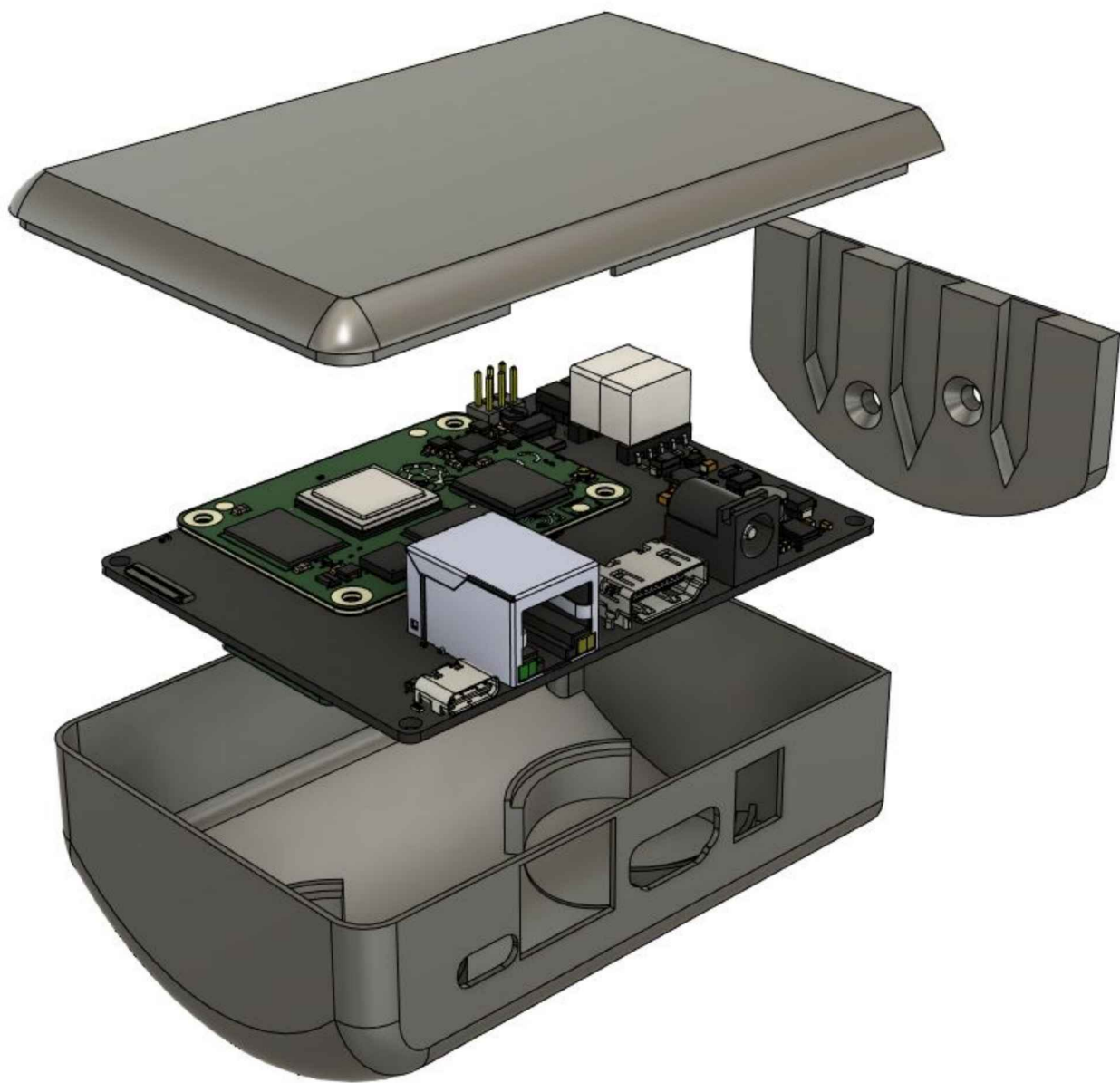
What is included?

- Development hardware for the sensor
 - Base PCB
 - Raspberry Pi Compute Module 4
 - 2 x Acconeer XM112 Radar Sensors
 - Wall mount box
- Software for the Raspberry Pi
- Server software
- Front end software
- Altium design files for the Base PCB, that carries the CM4 and Radar Sensors
- Lenses for focusing the radar beam
- 3D models for the wall mount box
- Development software for expanding the ML data set. Including software to use a camera for determining the passage direction of the passage event data sets generated.
- Three working days, a total of 24 hrs, of support time is included. Additional support is available on request.

Technical specifications

- Base PCB
 - MiniMIPI/DSI for connecting camera for automated ML dataset expansion
 - Power supply inputs
 - Power Over Ethernet
 - 5-42 Vdc input(?)
 - HDMI connector, for debugging
 - USB-C, for debugging
 - Ethernet 10/100 Mbit/s
- Raspberry Pi Compute Module 4
- Acconeer XM112 radar modules
- Size of wall mount: 108 x 72 x 44 mm







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