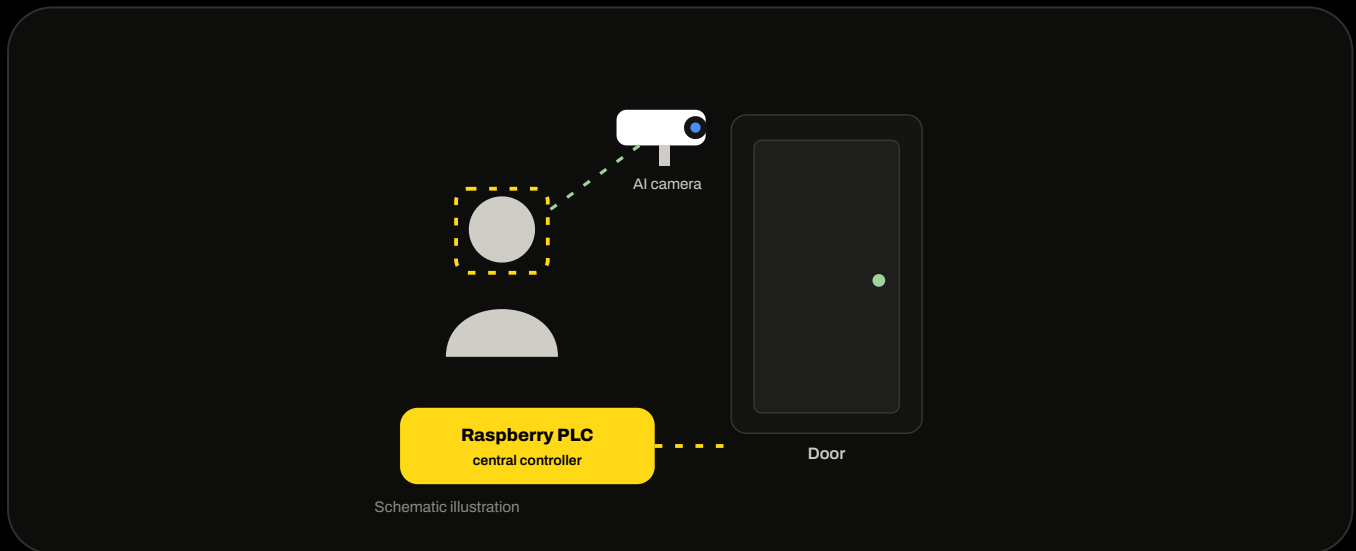


BUILDING ACCESS · RASPBERRY PLC + AI

Only authorised faces open the door. **A Raspberry PLC** controls who enters each floor.

How an office building uses a presence sensor, an AI camera and a Raspberry Pi based PLC as the central controller to let only authorised people into the building and onto their floors.

[Read the interactive case study online ›](#)


AI

facial recognition against a database of authorised faces

2

outcomes: the door opens or an alarm alerts security

Offline

an internal database keeps validating without internet

1 PLC

Raspberry PLC as the central controller

THE CHALLENGE

Recognise each person at the entrance and at the door of every floor.

The system has to capture the face of whoever approaches, decide whether that person may enter that specific building or floor, open the door or raise an alarm, and keep a record of every access.

01

Security

Protection against theft and intruders, while employee privacy is kept: no personal information such as fingerprints is captured.

02

Access records

Entry and exit times are recorded, which makes it easier to manage timetables and check that they are kept.

03

Granular access

Each employee can move only through the areas allowed by their access level, set according to role and responsibility.



Lower operating costs

No additional security guards are needed and ID cards are avoided, which reduces the cost of the security system.

HOW IT WORKS

From face detection to door opening.

Step 1 · Detection and capture

Presence sensor and AI camera

The presence sensor included in the camera detects a person approaching the entrance of the building or the access door of a floor. The AI camera then captures an image of the face and sends it to the system for analysis.

- Input: presence sensor in the camera
- Capture: face image from the AI camera
- Central controller: Raspberry PLC

Step 2 · Decision

Open the door or raise the alarm

The system compares the image with a database of authorised faces. If the person is authorised for that building or floor, the corresponding door opening mechanism is activated. If not, an alarm is triggered and an alert is sent to the security officers.

- Comparison with the set of authorised people
- Authorised: door opening mechanism
- Not authorised: alarm and alert to security

Step 3 · Records

Storage server and access reports

A storage server keeps the access information of each employee: identification, name, job title and permissions. Accesses are tracked to generate reports, and if someone enters with unusual objects such as parcels or bags, the event is recorded for further analysis.

- Server: identification, name, job title, permissions
- Reports from the tracked accesses
- Unusual objects recorded for analysis

Every request, end to end.

The operating diagram of the project, redrawn. The camera captures the subject, the Raspberry PLC runs the API module, and the API talks to the facial recognition, the database and the recognition system.

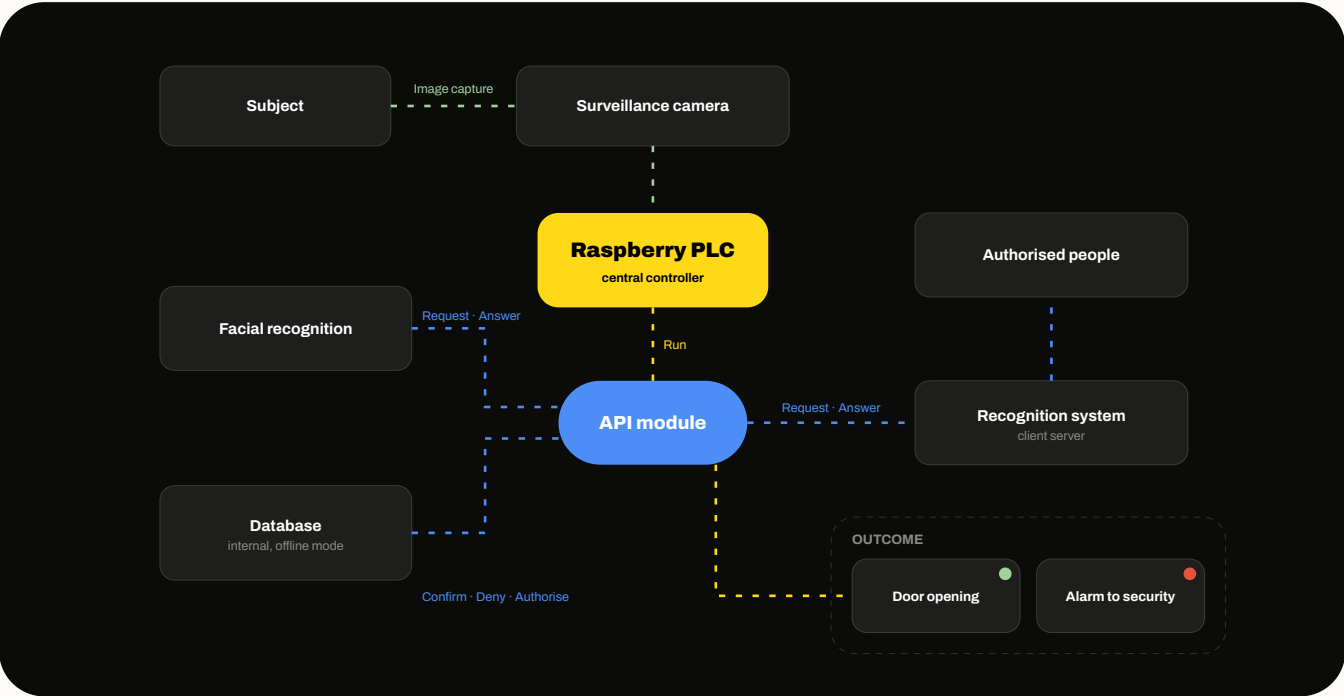


Image capture Request and answer (sockets) Decision

Data flow

Flow	Between	Type	Purpose
Image capture	Subject → camera	Presence sensor and AI camera	Captures the face of the person approaching
Run	Raspberry PLC → API module	Program	The PLC runs the API that coordinates the process
Request and answer	API ↔ facial recognition	Socket	Analyses the captured face
Request and answer	API ↔ recognition system	Socket	Compares the visitor with the authorised people stored on the server
Confirm, deny, authorise	API ↔ database	Internal database	Keeps validating when there is no internet connection
Door opening	System → door	Opening mechanism	Lets an authorised person in
Alarm	System → security	Alert	Warns the security officers when the person is not authorised

One industrial Raspberry Pi as the central controller.



Raspberry PLC

An industrial PLC based on Raspberry Pi acts as the central controller: it receives the capture from the camera and runs the API module that coordinates recognition, database and server.

Role	Central controller, runs the API module
Communication	Sockets with the client server
Offline mode	Internal database
Base	Raspberry Pi with Linux

The case does not publish the exact Raspberry PLC model. The image shows the Raspberry PLC 21 FLEX.

[See the Raspberry PLCs >](#)

Open solution

No licence fees for the software that runs the system.

Modular

The system can be expanded in the future, for example with more doors or floors.

Built for industrial use

Equipment designed and manufactured for industrial use, at affordable prices.

SIMILAR PROJECT?

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