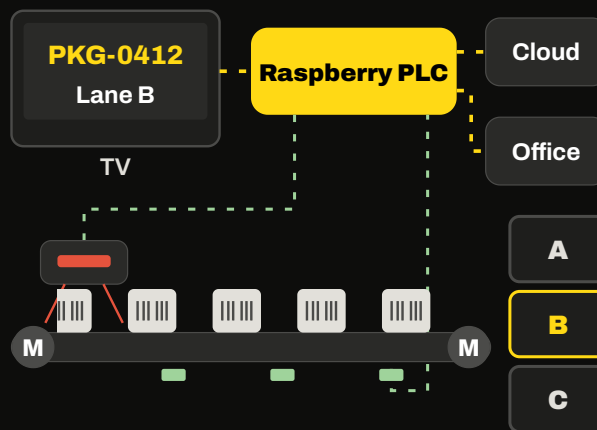


LOGISTICS · RASPBERRY PLC

Scan and sort every package at the entry. Control it from the office.

Barcode scan, conveyor sorting, own database, remote control.

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



Schematic illustration

1

Raspberry PLC: master controller, database and server

USB

barcode reader at the entry of the warehouse

2

copies of the data: on the PLC and in the cloud

Office

orders, on/off and emergency messages over the internet

THE CHALLENGE

Sort every package on entry. Know where it is.

To compete, a company must deliver a good product in the shortest time. In a warehouse, that means processes that get the most done in the least time. The case proposes electronic control: sensors on each stage of collection and distribution, plus communication elements, so that an old operation can become an Industry 4.0 warehouse.

01

Control at the entry

The case says it plainly: to keep control of the packages through the whole process, you need control at the moment of entry.

02

A place for every box

Each box has a specific place, controlled by sensors. That is how the warehouse keeps total control of the stock.

03

Data the office can reach

The data must be stored, backed up and visible from anywhere. The main office must also send orders to the warehouse.



Sorted by your own patterns

Packages are sorted according to the patterns you set, and stored so that their location is known at all times. The case does not fix the patterns. They are yours.

HOW IT WORKS

Three loops: scan, sort, report.

Loop 1 · Scan at the entry

A USB barcode reader identifies each package.

At the entry, a barcode reader connected by USB to the Raspberry PLC reads the information of each package. The PLC saves it in its own database. A TV with an HDMI connection shows the package data at all times. When the package is confirmed, it goes to the belt.

- Barcode reader on a USB port of the PLC
- A TV in the warehouse shows the package data at all times
- Every reading saved in the PLC database

Loop 2 · Sort on the belt

The PLC starts the motors. Sensors follow the package.

When a package is confirmed, the PLC activates the motors, and the conveyor belts carry the package to its destination. A frequency inverter drives the motors, so the PLC controls them without using unnecessary I/O. Sensors along the belt tell the PLC where the package is. The case suggests motion or weight detectors.

- Motors on a frequency inverter: no unnecessary I/O
- Sensors along the belt: motion or weight detectors
- Each box ends in its own place: total stock control

Loop 3 · Report and remote control

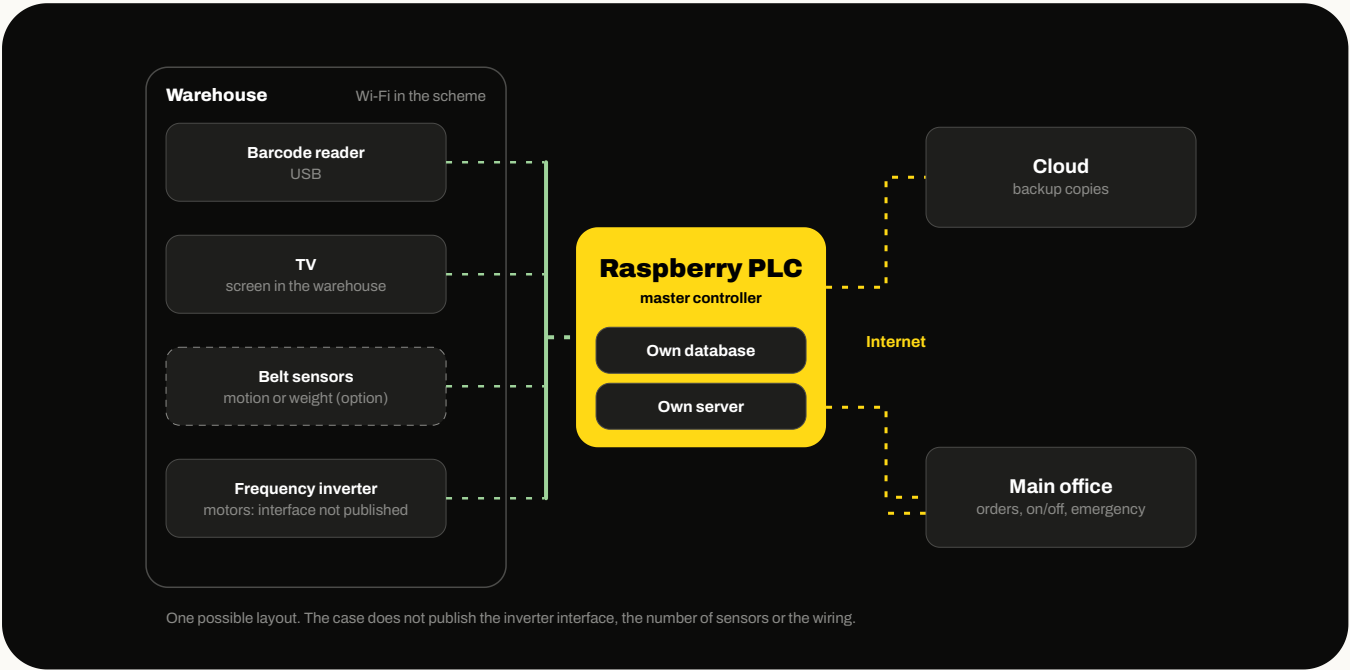
Own database, own server, a copy in the cloud.

The PLC updates its database with each new reading and makes backup copies to the cloud. It also runs its own server, so the main office sees the warehouse over the internet. From the office you can send orders, act on the chain, and send on/off or emergency messages.

- Database and server on the Raspberry PLC
- Backup copies to the cloud
- Office: orders, on/off and emergency messages

How does one Raspberry PLC scan, sort and report?

The Raspberry PLC is the master controller of all the sensors. It reads the barcode reader on USB, shows the status on a TV in the warehouse, drives the conveyor motors through a frequency inverter and reads the sensors along the belt. It keeps its own database and runs its own server. The data goes to the cloud as a backup, and the main office connects over the internet. In the original scheme, the PLC, the cloud and the offices all show Wi-Fi. The case does not publish the inverter interface, the number of sensors or the wiring.



- Data: database, cloud and office
- Signals from and to the warehouse
- Example elements, not published by the case

Signals and data

Data	Between	Type	Purpose
Package code	Barcode reader → Raspberry PLC	USB	Reads the information of each package at the entry
Live view	Raspberry PLC → TV (screen in the warehouse)	Display	Shows the package data and the system status at all times. HDMI connection named in the case. The Raspberry PLC datasheet lists no HDMI port
Package position	Belt sensors → Raspberry PLC	Sensor	Tells the PLC where the package is. Motion or weight detectors are one option
Conveyor motors	Raspberry PLC → frequency inverter → motors	Inverter	Moves the package to its destination. Interface not published
Records	Raspberry PLC → own database	Local	Saves every package and its place
Backup	Raspberry PLC → cloud	Internet	Backup copies of the database
Remote control	Main office ↔ PLC server	Internet	View, orders, on/off and emergency messages

One Raspberry PLC as master controller.



Raspberry PLC

Industrial PLCs built around a Raspberry Pi, for your DIN rail. In this design, one Raspberry PLC is the master controller: it reads the barcode reader and the sensors, drives the motors through the inverter, keeps the database and runs the server.

Role	Master controller, database and server
Computer	Raspberry Pi 4, quad core 64-bit
Operating system	Debian 64-bit, preinstalled
Programming	Python, Node-RED, C/C++
Network	2 x Ethernet, Wi-Fi, Bluetooth LE
USB	2 x USB 2.0, 2 x USB 3.0
Serial	2 x RS-485
Family	19R, 21, 38AR, 38R, 42, 57R, 58, CPU-Gateway

The case does not publish the exact Raspberry PLC model. The values above are for the Raspberry PLC 21, and the image shows the [RASPBERY PLC 21 FLEX](#). Count your sensors and motor signals first, then choose the model of the family.

[See the Raspberry PLC family ›](#)

Control from the first second

The package is identified at the entry, before it moves. Every later step builds on that reading.

PLC, database and server in one device

The Raspberry PLC runs Linux. The design uses that to keep its own database and its own server on the controller, next to the I/O.

Two copies of the data

The PLC writes each new reading to its database and makes backup copies to the cloud.

Fewer I/O for the motors

A frequency inverter drives the motors, so the PLC controls them without using unnecessary I/O.

Sensors that fit the package

Motion or weight detectors tell the PLC where each package is. Choose the type that fits your boxes.

Fast to put in place

The case points to the power of the Raspberry PLC: one controller covers all these goals with a rapid implementation of the components.

SIMILAR INBOUND FLOW?

Tell us your packages and your destinations. An engineer will answer.

Tell us how packages enter, which codes you read (barcode, QR or RFID), how many destinations you have, how the belts are driven, and where the data must go. We will tell you which controller fits and how to connect it.

READ IT ONLINE

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