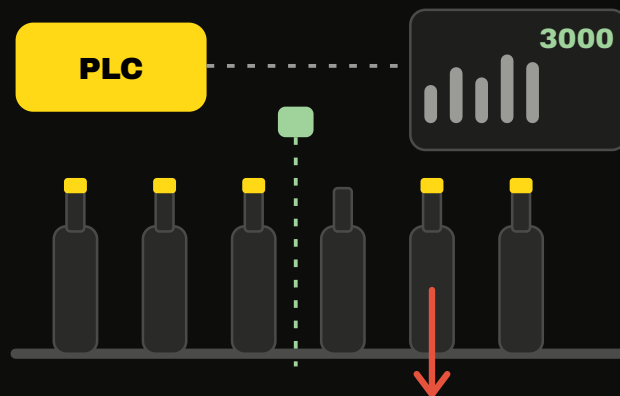


WINERY · ESP32 PLC

It started with one sensor. It became the data of the whole line.

One ESP32 PLC: reject, line speed, lots and reports to Google Sheets.

[Read the interactive success story online ›](#)



Schematic illustration

3,000

bottles per hour on the bottling line

1

ESP32 based PLC in place of the old timers and relays

3

parts of Care4.0 on the same hardware: control, web page, reports

0

extra servers: the PLC serves the page and sends the data

THE CHALLENGE

A small fix that asked for more.

Bodegas Care, a Spanish winery, runs a bottling line at 3,000 bottles per hour. The starting point was modest: improve the detector that rejects bottles without a cap. The fix replaced old timers and relays with an Industrial Shields ESP32 based PLC. Once it was counting bottles, the team saw it could do much more on the same hardware.

01

Reject every uncapped bottle

A reliable detector and reject, run by the PLC instead of timers and relays.

02

Know the speed of the line

Line speed and cycle times in real time, calculated by the same PLC.

03

Never overproduce a lot

A second counter at the start of the line, on spare I/O, tracks the exact labelling of each lot.

04

Data for everyone, history for later

Live data on any PC of the company network, and every lot recorded automatically.



Built step by step

Care4.0 grew in three parts on top of the same hardware: control and metrics, a web page inside the PLC, and automatic reports to Google Sheets.

HOW IT WORKS

Three parts of Care4.0: reject and measure, run the lot, report.

Part 1 · Reject and measure

One sensor rejects, the same counts give the speed.

The cap detector checks each bottle. A bottle without a cap is taken out of the line. The PLC counts the good bottles and the defects, and from the time between bottles it calculates the line speed and the cycle time. Send an uncapped bottle, then slow the line down.

- Reject of uncapped bottles
- Correct and defect counters
- Line speed and cycle time in real time

Part 2 · Run the lot

A target per lot, and a second counter at the start of the line.

From the web page, the operator sets the product and the target of the lot and starts production. The second counter, at the start of the line, counts the bottles that enter the lot, so the line does not label more than the target. Stops longer than a few seconds ask for a reason. Start a lot and follow it.

- Product and target set from any PC
- Second counter on spare I/O
- Stops logged with a reason

Part 3 · Report

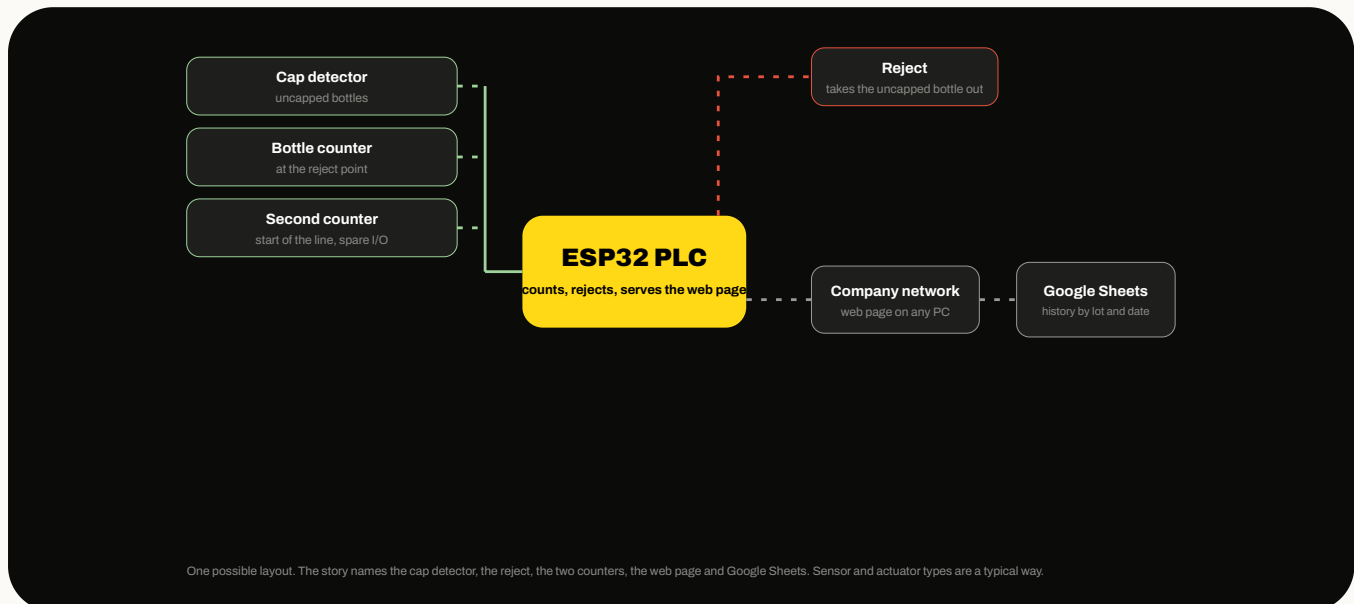
Every lot ends up in Google Sheets.

When a lot ends, the PLC sends the data to Google Sheets: date, product and quantity. The history by lot and by product builds itself, with no extra server. Close a lot and look at the day.

- Automatic report by lot and date
- History by product
- No additional servers

How does one ESP32 PLC digitalise a bottling line?

An ESP32 based PLC reads the cap detector and two bottle counters, one at the reject point and one at the start of the line, and drives the reject. It serves the Care4.0 web page to any PC on the company network, and sends the data of each lot to Google Sheets.



Inputs to the PLC Output Network and reports

Signals

Signal	Between	Type	Purpose
Cap present	Cap detector → ESP32 PLC	Digital in	Find uncapped bottles
Bottle passing	Sensor at the reject point → PLC	Digital in	Counters, line speed, cycle time
Bottle entering	Second counter at the start of the line → PLC	Digital in	Lot tracking, no overproduction
Reject	PLC → relay or valve driver → reject actuator (typical way)	Digital out	Take the uncapped bottle out
Live data, targets, stops	PLC web page ↔ PCs	Company network	Operators see and set the production
Lot report	PLC → Google Sheets	Internet	History by lot, product and date

An ESP32 based PLC at the heart of Care4.0.



ONE MODEL THAT FITS

ESP32 PLC 21 FLEX

The story names an Industrial Shields ESP32 based PLC and does not publish the model. One model with the I/O and the network for this line is the ESP32 PLC 21 FLEX: it reads the sensors, drives the reject, serves the web page and sends the reports.

Role in this design	Reject, counters, speed, lot targets, web page, reports
Processor	ESP32 dual core, up to 240 MHz
Inputs	13: 6 analog/digital (0-10 V, 11-bit), 7 digital optoisolated (5 to 24 Vdc), 2 of them with interrupt
Outputs	8: 3 analog/digital/PWM (0-10 V, 12-bit), 5 digital optoisolated (5 to 24 Vdc)
Communications	Ethernet, Wi-Fi, Bluetooth LE, RS-485, RS-232
Programming	Arduino IDE

At 3,000 bottles per hour a bottle passes every 1.2 s, well within what an optoisolated input reads; the two interrupt inputs suit faster lines. The whole ESP32 PLC family shares the same programming, so the model depends on the I/O of your line.

[See the ESP32 PLC 21 FLEX ›](#)

Timers and relays become a program

The reject logic moved into the PLC. Changing it is a change in the code, not in the wiring.

The counts were already there

The bottles counted for the reject also give the line speed and the cycle time.

Spare I/O, new value

A second counter on free inputs at the start of the line closed the gap between lots and labelling.

SIMILAR PROJECT?

Tell us about your line. An engineer will answer.

Tell us what your line makes, how fast it runs, what you want to detect or count, and where the data must go. We will tell you which controller and which signals fit.

READ IT ONLINE

industrialshields.com/success-story-bottling-line-digitalisation-bodega-s-care

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