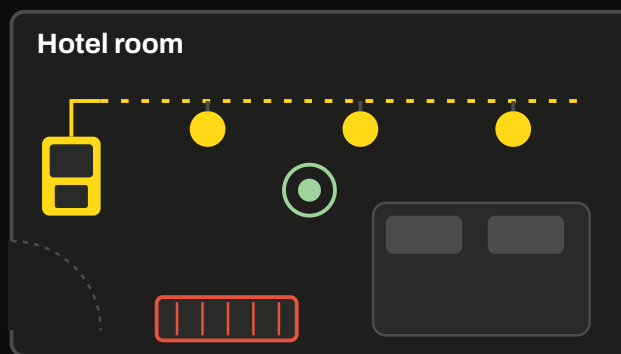


HOTEL ROOMS · ARDBOX DALI

One PLC and one panel per room. Less energy when it is empty.

Presence, heating and DALI lights, run from the door of each room.

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



presence, heating and DALI lights
Schematic illustration

1+1

PLC and touch panel at the door of each room

2

sensors: presence on Wi-Fi, wired temperature

3

actions in an empty room: heat, lights, cleaning

64

Up to 64 DALI drivers on one line (IEC 62386)

THE CHALLENGE

Give the guest more control. Stop heating empty rooms.

The customer runs a hotel chain. He wanted new options for his guests and a way to save energy, by controlling the temperature and the lights in the rooms and in the common areas. A monitoring system would also collect data from specific areas, to find where the hotel spends the most energy.

01

Control from the room

At the entrance of the room, a touch panel lets the guest set the temperature, choose the lights and send requests to the staff, without leaving the room.

02

Know if someone is in

A presence sensor over Wi-Fi tells the PLC if there are people in the room. A wired temperature sensor gives the real room temperature.

03

Save when it is empty

When the room stays empty for some time, the PLC sets an energy saving temperature and switches off the lights that were left on.

04

Clean without disturbing

At the same time, the staff get a notice: the room is empty, so the cleaning can be done without disturbing the guest.



Lights one by one, over DALI

The PLC talks DALI, a lighting protocol that controls each light on its own. So the guest can choose modes, such as a reading mode with a lower light.

HOW IT WORKS

Three loops: presence, lights, guest panel.

Loop 1 · Presence and energy

When the room is empty, it saves energy.

The Wi-Fi presence sensor tells the PLC if someone is in the room. If nobody is detected for a set time, the PLC lowers the heating set value, switches off the lights left on and sends a cleaning notice to the staff. Move the guest in and out, and change the empty time and the saving set value.

- Presence sensor over Wi-Fi
- Saving set value after a set empty time
- Lights off and cleaning notice in the same step

Loop 2 · DALI lights

Each light gets its own level.

Over DALI, the PLC sends a level to each light by its address, or one command to all of them. A mode is a set of levels: the case names a reading mode with a lower light. Pick a mode, or move the ceiling light by itself. For the DALI library and commands, see [how to work with DALI on an industrial PLC](#).

- One two-wire DALI line for the room lights
- Levels per address, from 0 to 254
- Modes such as reading, chosen on the panel

Loop 3 · Guest panel

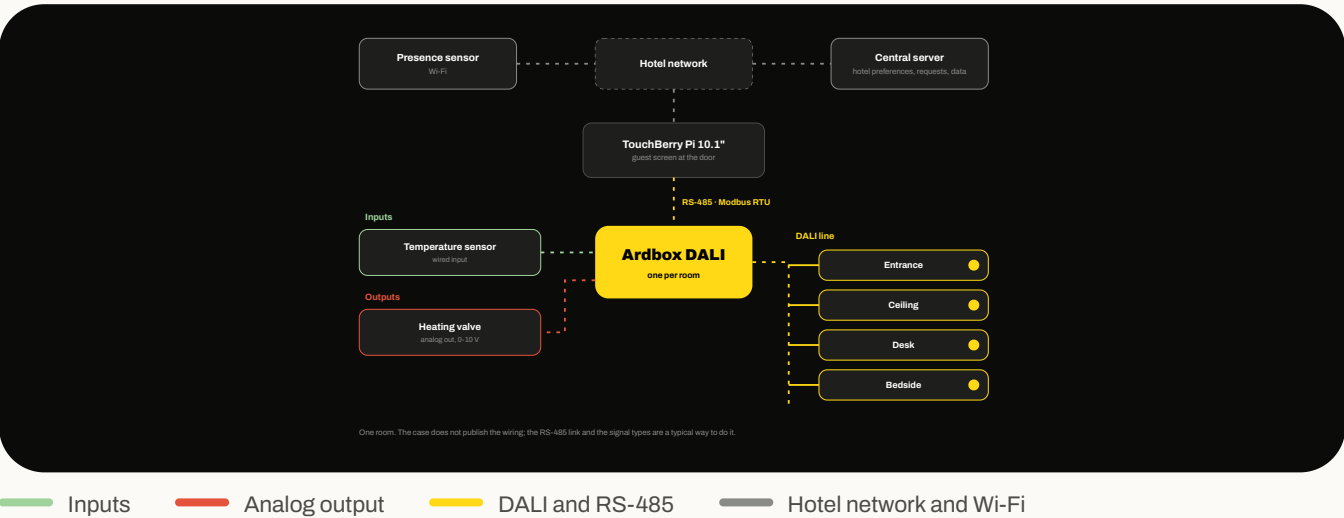
The guest sets the room. The staff get the requests.

The touch panel at the entrance shows the real temperature from the wired sensor and lets the guest set the comfort temperature. The PLC drives the heating. The panel also sends requests to the staff. Move the set value and send a request.

- Wired temperature sensor shown on the panel
- Heating on an analog output
- Requests to the staff from the room

How do you automate a hotel room with a PLC?

In each room, an Ardbox DALI reads the temperature, drives the heating and talks DALI to the lights. A TouchBerry Pi panel at the entrance is the screen of the guest. Every room connects to a central server with the hotel preferences. The case scheme draws Ethernet between the panel and the PLC; this page uses the default port of the DALI version, RS-485 with Modbus RTU. The case does not say which device reads the Wi-Fi presence sensor; here the panel reads it through the hotel network.



Signals and data for one room (example)

Signal	Between	Type	Purpose
Presence	Wi-Fi presence sensor → hotel network → room panel → Ardbox	Wi-Fi	Room occupied or empty
Room temperature	Wired temperature sensor → Ardbox	Input (digital in the case scheme)	Heating control and real temperature on the panel
Heating	Ardbox → heating valve actuator	Analog out, 0-10 V	Comfort or saving set value
Room lights	Ardbox → DALI drivers	DALI line	A level for each light, and modes such as reading
DALI bus power	Bus power supply → DALI line	250 mA at most	Each DALI line needs one; check with us if it must be external
Guest settings and room state	Room panel ↔ Ardbox	RS-485, Modbus RTU	Set value, light mode, presence, empty time
Requests and cleaning notice	Room panel → central server	Hotel network	Requests to the staff; room free to clean
Preferences and energy data	Central server ↔ room panels	Hotel network	Hotel preferences; data to find where the energy goes

HARDWARE USED

One PLC with DALI. One touch panel at the door.



ARDBOX Analog ARDUINO based PLC

Role	Presence logic, heating, DALI lights, data to the panel
Inputs	10: 8 analog/digital (0-10 V, 10-bit), 2 digital optoisolated (7 to 24 Vdc), 1 with interrupt
Outputs	10: 7 analog/digital/PWM (0-10 V, 8-bit), 3 digital optoisolated (5 to 24 Vdc)
Lighting	DALI line in the DALI version (Ardbox Analog HF+ DALI, 004001001200)
Comms	RS-485, RS-232, TTL serial, I2C, SPI
Programming	Arduino IDE, Industrial Shields boards package
Power and mounting	12 to 24 Vdc, DIN rail TS35, IP20, inside a cabinet, 100 x 45 x 115 mm

[See the Ardbox Analog >](#)



TouchBerry Pi Panel PC 10.1" CORE

Role	Guest interface, presence data, requests, link to the central server
Screen	10.1" IPS, 1280 x 800, capacitive, 900 nits
Software	Linux preinstalled; HMI in Node-RED, Python or a browser
Comms	Gigabit Ethernet, 4 x USB, one serial port (RS-485, RS-232 or TTL, chosen at order); Wi-Fi and Bluetooth on request
Power	12 to 24 Vdc, UPS for safe shutdown
Environment	0 to 45 °C, 10 to 90 % RH without condensation, IP20 front

[See the TouchBerry Pi 10.1" >](#)

Saving only when nobody is in

The PLC lowers the heating and switches off the lights only after the room stays empty for a set time. When the guest comes in, the room goes back to comfort.

The same room, many times

Each room has the same PLC, panel and program. The case says the system can grow to all the common areas of the hotel.

One command for many lights

DALI drivers store the levels of each mode. One broadcast command sets the whole room, and each light keeps its own address for fine control.

Data to find the waste

Every room reports to the central server. With data per area, the hotel can see where it spends the most energy, which was a goal of the customer. See a [Node-RED MQTT concentrator for many PLCs](#).

Housekeeping knows first

The empty room sends its own notice. The staff clean when the guest is out, without disturbing.

Code that you own

The PLC is programmed with the Arduino IDE and open source libraries, with no licence fees. You can add a sensor, a light or a new room type later.

AUTOMATING ROOMS IN A HOTEL OR A BUILDING?

Tell us about your rooms. An engineer will answer.

Tell us how many rooms you have, how they are heated or cooled, which lights and drivers you use, and what the staff need to see. We will propose the inputs and outputs, the controller and the panel.

FULL CASE STUDY ONLINE

industrialshields.com/case-study-hotel-room-automation-arduino-plc

EMAIL

info@industrialshields.com

PHONE

[\(+34\) 938 760 191](tel:+34938760191)