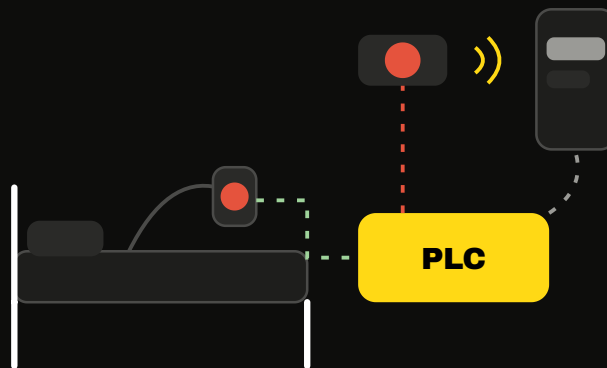


HEALTHCARE BUILDINGS

The patient presses once. The nurses know at once.

A PLC turns on two alarms in the room and sends the call to the nurses on Telegram.

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


Schematic illustration

1

push button at the patient's bed

2

local alarms: one audible, one visible

N

nurses get the call on their phones through one Telegram bot

1

rule from the case: the visible alarm stays on after the audible one

THE CHALLENGE

A call that reaches the room and the phones.

The case shows a way to activate a hospital alarm and to send the emergency to the nurse team with a Telegram bot. The patient has a push button. The alarm must be heard by a nurse nearby, seen from the corridor, and reach the team on their phones, even if nobody is next to the room.

01

One button for the patient

A push button at the disposal of the patient starts the call.

02

Heard in the room

An audible alarm lets a nurse nearby hear the call. It stays on until someone pushes the button again.

03

Seen from the corridor

A visible alarm turns on at the same time, and stays on for a certain time after the audible one is off.

04

On every phone

The PLC sends a message to a Telegram bot, and the bot shares it with all the nurses who have the app.



The visible alarm outlasts the sound

The case follows a hospital rule: the visible alarm must stay active even after the audible alarm is switched off.

HOW IT WORKS

Three parts of one program: the room, the message, the ward.

Part 1 · The room

Press to call. Press again to silence.

When the patient presses the button, the PLC turns on the audible and the visible alarm and sends the call. When a nurse presses the same button again, the sound stops, but the visible alarm stays on for a hold time before it goes off. Make a call, then answer it.

- One input, two outputs
- The same button switches the sound off
- The light stays on for a hold time

Part 2 · The message

One bot, the whole team, and the room never waits for the network.

The PLC connects to the Telegram bot with its token and sends one message, and the bot shares it with every nurse who has the app. The local alarms do not depend on the network: if the link drops, the room still rings and lights up, and the PLC sends the message when the link is back.

- The token links the PLC with the bot
- One message reaches N phones
- Local alarms first, message as soon as possible

Part 3 · The ward

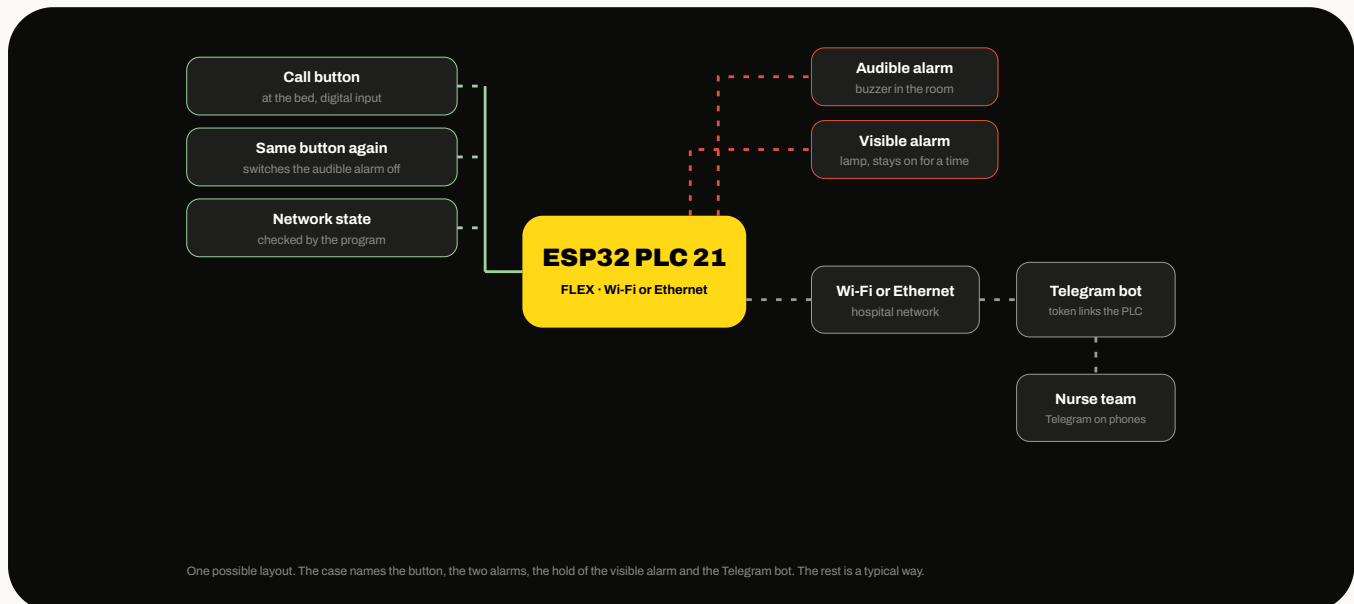
One PLC for several rooms, and a reminder for a long wait.

The same program repeats for each room: one input and two outputs per bed. A typical way adds a reminder: if a call stays open for more than a few minutes, the PLC sends it again.

- One input and two outputs per room
- Open calls and their waiting time
- A reminder after a long wait, typical way

How does a PLC send a hospital alarm to the nurses?

An ESP32 PLC 21 FLEX reads the call button of each bed. It drives the audible and the visible alarm of the room on two outputs, and holds the visible one after the sound is off. Over the hospital network it sends the call to a Telegram bot, which shares it with the phones of the nurse team.



Inputs to the PLC Local alarms Network and messages

Signals

Signal	Between	Type	Purpose
Call	Push button at the bed → ESP32 PLC 21	Digital in	Starts the alarms and the message
Silence	Same button, pressed again → PLC	Digital in	Switches the audible alarm off
Audible alarm	PLC → buzzer in the room	Digital out, through a relay if the load needs it	A nurse nearby hears the call
Visible alarm	PLC → lamp at the room	Digital out, through a relay if the load needs it	Seen from the corridor, held for a time
Call message	PLC → Telegram bot	Wi-Fi or Ethernet, HTTPS	Reaches every nurse in the bot
Link state	Network → PLC program (typical way)	Program	Queue the message while the link is down

One ESP32 PLC with Wi-Fi and Ethernet.



ONE CURRENT OPTION

ESP32 PLC 21 FLEX

An industrial controller built on the dual-core ESP32, for DIN rail, programmed with the Arduino IDE. It reads the call buttons, drives the audible and visible alarms, and talks to the Telegram bot over Wi-Fi or Ethernet.

Role	Call buttons, local alarms, hold time, messages to the bot
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	Wi-Fi, Bluetooth LE, Ethernet, RS-485, RS-232
Programming	Arduino IDE

The 2019 case used an M-Duino and does not name the model. The Telegram Bot API works over HTTPS, and the ESP32 handles the secure connection on its own, so today an ESP32 PLC is the simple choice.

[See the ESP32 PLC 21 FLEX ›](#)

One input per bed

A push button on a digital input is all the patient needs. The program does the rest.

Local first

The room rings and lights up from the PLC outputs. The message adds reach, it does not replace the local alarms.

A rule for switching off

The same button silences the sound, and the light stays on for the hold time, as the case says hospital rules ask.

SIMILAR PROJECT?

Tell us about your building. An engineer will answer.

Tell us how many rooms or points you need, which alarms must sound or light, and who must get the messages. We will tell you which controller and which link fit, next to the systems you already have.

READ IT ONLINE

industrialshields.com/case-study-hospital-room-alarm-telegram-plc

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