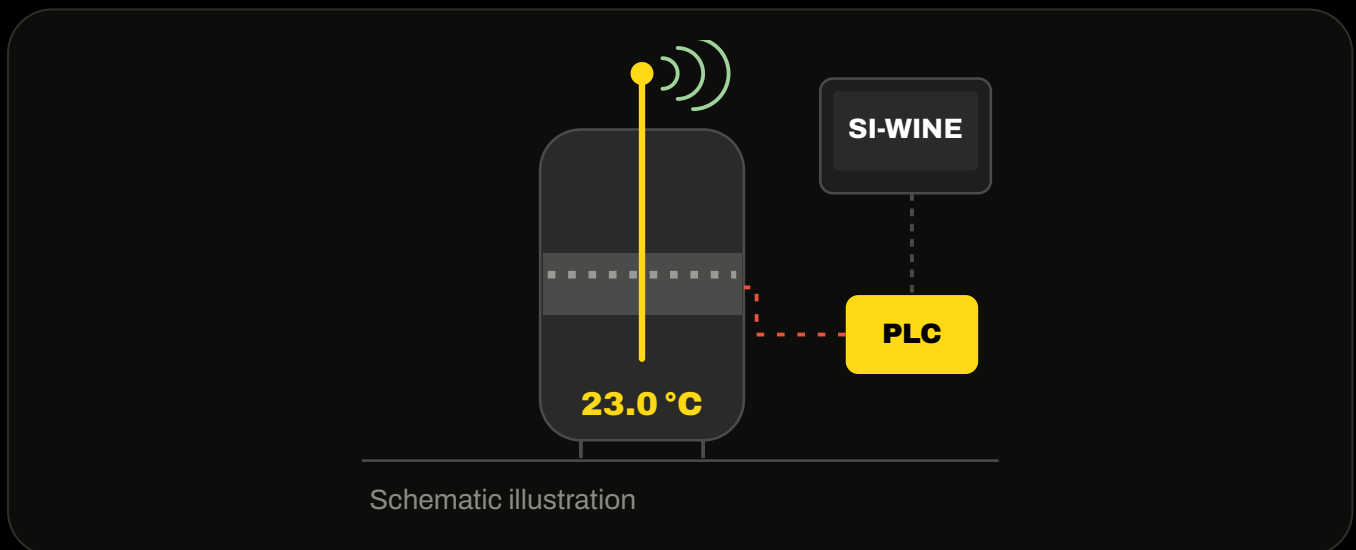


SIRA · SI-WINE

Wine fermentation. **Every tank in its range.**

SI-WINE by SIRA keeps each tank at its own temperature, with no one on watch.

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


32

tanks per control unit

2 min

between probe readings

5 min

between records in the log

3

alert channels: email, Telegram, WhatsApp

THE CHALLENGE

Keep each tank in range, day and night.

Fermentation is a key part of wine production: it decides the quality and the taste of the final product. To make it run without incidents, the winery needs a precise and reliable control system. The difficulty is that the key indicators must be monitored all the time, to prevent unexpected or unwanted results. And when something goes wrong, the damage to the wine can be irreversible.

01

Measure inside the tank

The temperature must come from inside each tank, from probes that can be in contact with the wine.

02

Limits for each tank

Each tank can hold a different wine, so each one needs its own temperature limits.

03

Cool without empty runs

The cooling machine must only run when a cooling circuit is open.

04

Know at once

A failed valve, a fault in the cooling machine or a bad probe must reach the team at once.



A record of every fermentation

All tank temperatures are logged, and the data exports to a CSV file that opens in Excel.

HOW IT WORKS

Three jobs: the limits, the cold, the alerts.

Stage 1 · The limits of each tank

Each probe has its own maximum and minimum.

Wireless probes inside the tanks send the temperature every 2 minutes. The controller checks each reading against the limits of that probe and, when needed, opens the solenoid valve of that tank's cooling jacket. Because the limits are set per probe, tanks with different wines are controlled independently.

- Wireless probes, Wi-Fi or LoRa
- A maximum and a minimum per probe
- One jacket valve per tank

Stage 2 · The cooling machine

The cold only runs when a circuit is open.

The control unit has the connections for the solenoid valves of the tank jackets and for the cooling machine. It switches the cooling machine on and off by the open valves, so there is always a working circuit and the machine never runs empty. It also tracks the energy use of the fermentation, so the winery knows its energy cost.

- A solenoid valve per cooling jacket
- Cooling machine on only with an open circuit
- Energy cost of each fermentation

Stage 3 · Alerts and records

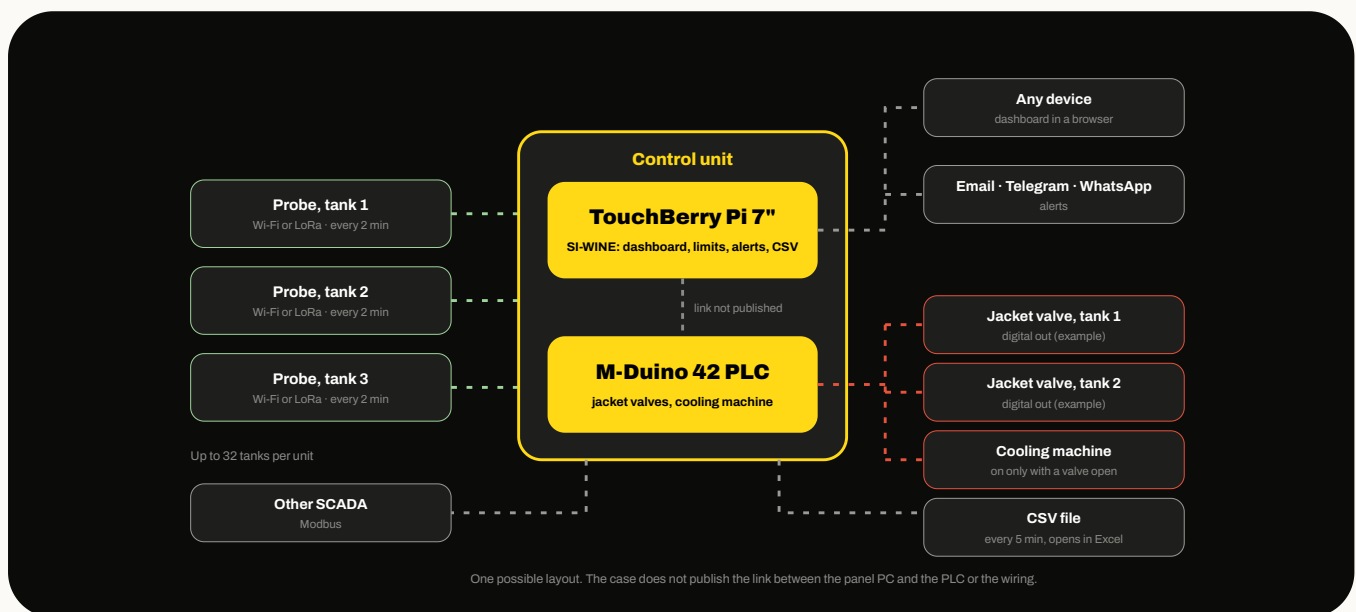
A fault reaches the phone. Every reading goes to the record.

When something can break the temperature control, SI-WINE sends an alert by email, Telegram or WhatsApp: an error in a solenoid valve, a fault in the cooling machine or a probe that does not work. It also warns when a probe battery must be charged. Every 5 minutes it records all the temperatures, and the data exports to a CSV file for Excel. Cause a fault and log the data.

- Email, Telegram or WhatsApp
- Valve, cooling machine and probe faults
- A record every 5 minutes, CSV for Excel

How does SI-WINE control the temperature of each fermentation tank?

Wireless probes inside the tanks send the temperature every 2 minutes over Wi-Fi or LoRa. The control unit has two parts: a 7-inch TouchBerry Pi panel PC that runs the SI-WINE dashboard and processes the data, and an M-Duino 42 PLC that acts on the cooling, the solenoid valve of each tank jacket and the cooling machine. The dashboard opens from any device, and alerts go out by email, Telegram or WhatsApp. The control units are Modbus compatible, so they can join other SCADA systems. Each unit controls up to 32 tanks, and several units work side by side. The case does not publish how the panel PC and the PLC are linked or how the outputs are wired.



--- Wireless probes
 --- Outputs to valves and cooling machine
 Control unit
 --- Dashboard, alerts, Modbus and records

Signals and data

Signal	Between	Type	Purpose
Tank temperature	Probe in the tank → control unit	Wireless, Wi-Fi or LoRa	A reading every 2 minutes, 24 hours a day
Probe battery	Probe → control unit	Wireless	Warn when a battery must be changed or charged. A charge lasts 2 weeks
Jacket valve	M-Duino PLC → solenoid valve of each tank	Digital out (example)	Cool a tank that goes above its limit. The case does not publish the wiring
Cooling machine	M-Duino PLC → cooling machine	Digital out (example)	On and off by the open valves, never with all valves closed
Limits	Dashboard → each probe	Set point	A maximum and a minimum per tank
Energy use	Cooling → control unit	Not published	Energy cost of each fermentation
Alerts	Control unit → team	Email, Telegram, WhatsApp	Valve error, cooling machine fault, probe failure, high or low temperature
Record	Control unit → CSV file	File	All temperatures every 5 minutes, opens in Excel
Integration	Control unit ↔ other SCADA	Modbus	Energy efficiency, presence control or lighting

One PLC for the cold, one panel for the people.



M-DUINO ETHERNET PLC ARDUINO 42

An industrial PLC built around an original Arduino Mega 2560, with Ethernet, RS-485 and RS-232, for DIN rail. It is programmed with the Arduino IDE.

Role	Jacket valves and cooling machine
Inputs	26: 12 analog/digital (0-10 V, 10-bit), 14 digital optoisolated (5 to 24 Vdc), 4 with interrupt
Outputs	16: 6 analog/digital/PWM (0-10 V), 10 digital optoisolated (5 to 24 Vdc)
Communications	Ethernet (W5500, RJ45), RS-485, RS-232, TTL serial, I2C, SPI
Built in	Real-time clock, microSD slot
Programming	Arduino IDE

The case names it M-Duino PLC Arduino 42+. It is in the catalogue today as the M-DUINO ETHERNET PLC ARDUINO 42, reference IS.MDuino.42+.

[See the M-Duino 42 ›](#)



TouchBerry Pi Panel PC 7" CORE

An industrial panel PC: a Raspberry Pi 4 behind a 7-inch capacitive touchscreen, with Gigabit Ethernet, 10 I/O of its own and a UPS for a safe shutdown. In SI-WINE it is the screen to monitor and control the system, and it processes and analyses the data of the probes.

Role	SI-WINE dashboard, data processing
Display	7-inch IPS, 1024 x 600, capacitive touch, 900 nits
Computer	Raspberry Pi 4, 4 GB RAM (CORE)
Inputs and outputs	3 digital in, 2 analog in (0-10 V or 4-20 mA), 5 digital out
Communications	Gigabit Ethernet, USB 2.0 and 3.0, one serial port (RS-485, RS-232 or TTL)
Built in	UPS with supercapacitors, real-time clock

The case used a 7-inch TouchBerry Pi Panel PC and does not publish its version. Today the 7-inch model comes as CORE, the standard configuration, or as FLEX, with more RAM, an IP65 front or one expansion board (LoRa, 4G or CAN).

[See the TouchBerry Pi 7" CORE ›](#)

Partner software, industrial hardware

SIRA writes SI-WINE. The control unit runs on an M-Duino PLC and a TouchBerry Pi panel PC, built for a control cabinet.

Limits per tank

Each probe has its own maximum and minimum, so different wines ferment side by side.

No empty runs

The cooling machine follows the open valves. There is always a working circuit.

SIMILAR PROJECT?

Tell us what you must keep in range.

Tell us how many tanks or zones you control, what you must measure, what must switch and who must get the alerts. We will tell you which controller and panel fit and how to connect them.

READ IT ONLINE

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