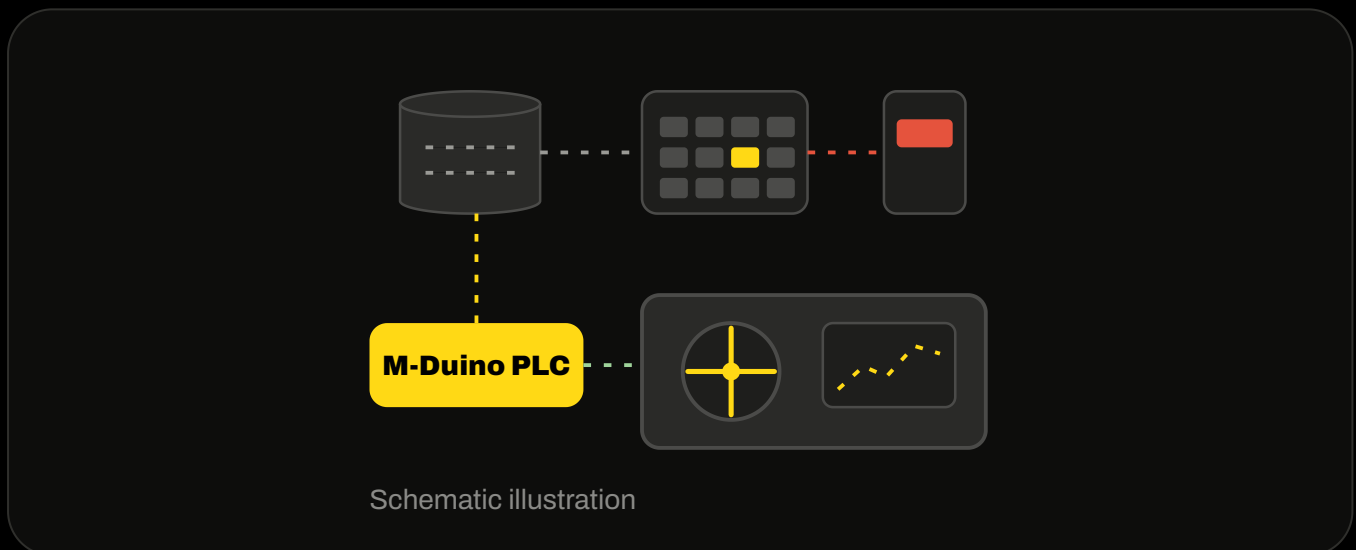


MACHINE MAINTENANCE · M-DUINO

Watch the machine. Plan the maintenance.

An M-Duino PLC reads the machine. MySQL keeps the history for maintenance.

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

2

kinds of maintenance:
preventive by set
parameters, predictive by
history

2

alert channels: email and
mobile messaging

1

MySQL database, linked to
the maintenance planning
tool

Ethernet

from the PLC to the
production network

THE CHALLENGE

Turn the data of the machine into maintenance work.

The company repairs and makes machines and spare parts for the textile industry, and its engineering department builds special machines. It had two goals: make its production more efficient, and move to preventive and predictive maintenance. For that, the data of the machine had to reach the operator, a database and the maintenance planning tool.

01

Read the machine

Encoders and sensors on the machine already give its state. The PLC reads them and controls the state of the machine.

02

See it live

A Panel PC shows indicators that the customer defines. When a value passes a set limit, it raises a warning or an alarm.

03

Keep a history

All data goes to a MySQL database. There it is analysed to control the performance and the efficiency of the machine, and its consumption.

04

Plan the work

The database is connected to the planning tool for machine maintenance: preventive warnings by set limits, predictive maintenance from the history.



Alerts that reach people

Warnings and alarms are sent by email or by mobile messaging, so they also reach people who are not at the machine.

HOW IT WORKS

Three stages: watch, plan, predict.

Stage 1 · Watch live

A value passes a limit. The panel shows it and the alert goes out.

The PLC reads the encoders and the sensors of the machine and sends the data over Ethernet. On the Panel PC, the operator sees the indicators in real time. Each indicator has parameters set by the customer: past a limit, the system raises a warning or an alarm and sends it by email or mobile messaging. The PLC and the Panel PC can also act on elements of the machine. Move the sliders.

Stage 2 · Store and plan

Every value goes to MySQL. Maintenance plans from it.

All the data goes to a MySQL database. There it is analysed to control performance, efficiency and consumption. The database is connected to the planning tool for machine maintenance, so preventive warnings follow the parameters set for the machine. A typical way to do it: count the run hours and warn before the service interval. Press Run one shift.

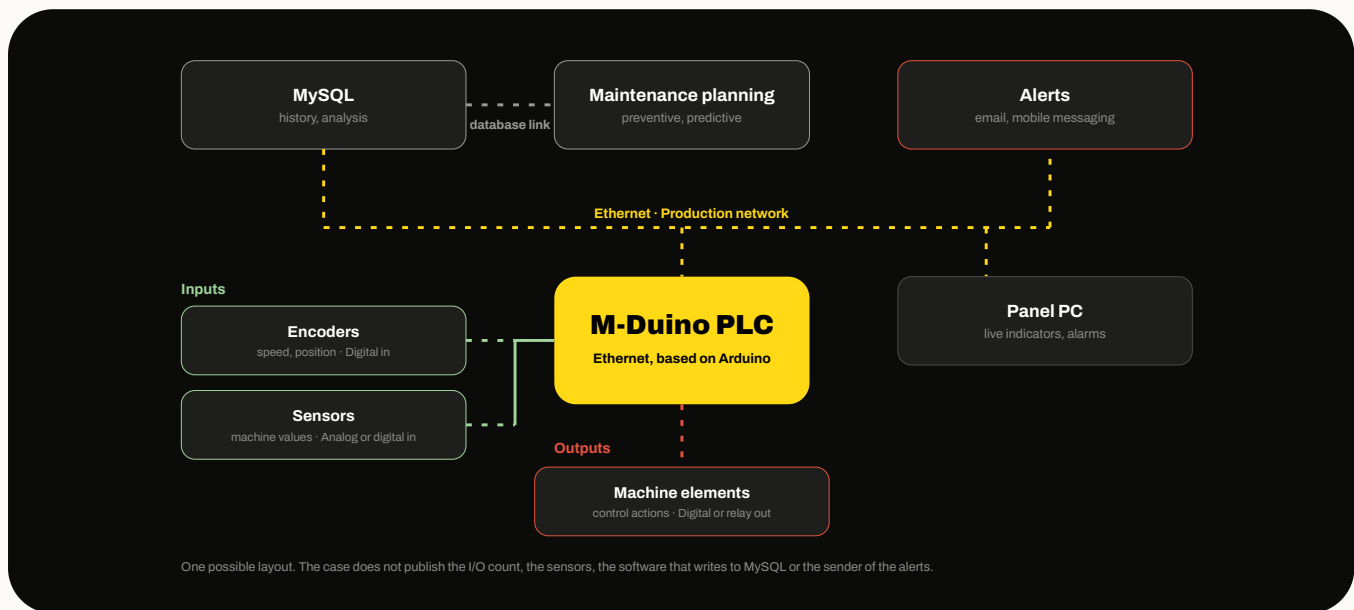
Stage 3 · Predict from history

The history shows where a value is going.

Some data needs analysis and a history. With the history of specific sensors, the maintenance team can do predictive maintenance and plan a stop before a value reaches its limit. The same history supports continuous improvement. Add weeks of history and watch the trend.

How does a PLC feed maintenance with machine data?

M-Duino PLCs read the encoders and the sensors of the machine and can act on its elements through their outputs. Over Ethernet, on the production network, the data goes to a Panel PC based on Raspberry Pi for live indicators, and to a MySQL database for history and analysis. The database is connected to the planning tool for machine maintenance. Warnings and alarms reach people by email or mobile messaging. The case speaks of M-Duino PLCs; the cabinet photo shows one.



Inputs Outputs and alerts Ethernet, production network Database links

Signals and data

Signal	Between	Type	Purpose
Speed and position	Encoders → PLC	Digital in (fast)	State of the machine. A typical way to do it: count pulses on the interrupt inputs
Machine sensors	Sensors → PLC	Analog or digital in	Values for the indicators. The case does not publish the sensors
Actions on the machine	PLC → machine elements	Digital or relay out	Control actions decided with the Panel PC
Live indicators	PLC → Panel PC	Ethernet	Real-time monitoring at the machine, warnings and alarms
All the data	PLC → MySQL	Ethernet	History; performance, efficiency and consumption
Maintenance data	MySQL → planning tool	Database link	Preventive warnings and predictive maintenance
Alerts	System → people	Email, mobile	Warnings and alarms away from the machine

A PLC at the machine. A Panel PC on its housing.



M-DUINO ETHERNET PLC ARDUINO 38AR

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. On this machine it reads the encoders and the sensors, can act on machine elements through its outputs, and sends the data over Ethernet to the Panel PC and to the database.

Inputs	19: 10 analog/digital (0-10 V, 10-bit), 9 digital optoisolated (5 to 24 Vdc), 4 with interrupt
Outputs	19: 6 analog/digital/PWM (0-10 V), 5 digital optoisolated, 8 relays (230 Vac 4 A / 24 Vdc 2 A, resistive)
Communications	Ethernet (W5500, RJ45), RS-485, RS-232, I2C, SPI

The text of the case names M-Duino PLCs and does not fix the model. The PLC in the cabinet photo has two I/O zones, one with relay outputs. The terminal labels in the photo (I0.0 to I0.12, Q0.0 to Q0.7, R1.1 to R1.8) match the I/O map of the M-Duino 38AR, which is still in the catalogue. Size it for your machine: count the encoders, the sensors and the outputs you need. The M-Duino family has smaller and larger models.

[See the M-Duino 38AR >](#)



TouchBerry Pi Panel PC 10.1" FLEX

For the live view at the machine, a current option is an industrial Panel PC with a Raspberry Pi 4 and a touchscreen, connected over Ethernet. It shows the indicators in real time, raises warnings and alarms when a value passes its limit, and works with the PLC on control actions.

Screen	10.1", capacitive touch
Computer	Raspberry Pi 4
Network	Gigabit Ethernet

The case uses a Panel PC based on Raspberry Pi and does not publish the model or the screen size. The photo shows a panel built into the machine housing. The current family has 7", 10.1" and 18.5" models.

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

One path for the data

Encoders and sensors, PLC, MySQL, planning tool: the same data serves the live view, the analysis and the maintenance plan.

Indicators that the customer sets

The customer customises the indicators and adjusts the parameters that trigger warnings and alarms.

Preventive and predictive

Preventive warnings by set parameters. Predictive maintenance from the history of specific sensors.

SIMILAR MACHINE?

Tell us your machine and what maintenance needs to know.

Tell us which encoders and sensors your machine has, which values the operator must see, which alerts maintenance needs and where your data must go. We will tell you which controller fits and how to connect it.

READ IT ONLINE

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