

ATS PANAMA · M-DUINO

Sonic barriers for birds. **On time, all year.**

One M-Duino PLC follows the seasonal schedule and logs its run hours.

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

Schematic illustration

1

PLC for all the sonic barriers

2

ways to switch on:
schedule or SCADA

0

site visits for a remote
switch-on

microSD

removable log of run hours

THE CHALLENGE

Switch the barriers when the authorities ask, and prove it.

Birds die when they hit wind turbine blades. The original case cites a US Fish and Wildlife Service estimate of 140,000 to 500,000 birds killed by wind turbines each year in the United States, and says that the figures must be interpreted. Even low mortality can be serious for endangered species, so wind farms must plan, build and monitor their projects to keep bird deaths low. At this wind farm, sonic barriers keep birds away. ATS Panama wanted to control them with one PLC, record the operating hours and manage the whole process remotely.

01

Follow the schedule

The environmental authorities set the hours when the barriers must work. The schedules change with the time of year.

02

Switch from a distance

The operator must be able to switch the barriers on from the SCADA, with no visit to the site.

03

Keep a record

The operating hours and the most important parameters must stay on a removable memory.

04

Fit what is there

The barrier design was already proven. The PLC had to fit into the existing system and leave room to grow.



Proof for the audit

With the log on the card, the authorities can check that the equipment worked as required.

HOW IT WORKS

Three jobs: the schedule, the remote order, the log.

Stage 1 · The seasonal schedule

The clock says when. The period says how long.

The M-Duino 38AR has a real-time clock. The program holds the schedules of the environmental authorities, which change with the time of year. When the clock enters a window of the current period, the PLC switches the barriers on, in this example through its relay outputs. When the window ends, it switches them off. Move the month and the time.

- Real-time clock in the PLC
- One table of windows for each period of the year
- Relay outputs switch the barriers

Stage 2 · The remote order

The SCADA can switch the barriers on. No one drives to the site.

The PLC talks to the customer's SCADA. When required, the operator switches the barriers on from the SCADA, and the PLC does it at once, with no on-site activation. A second order returns the barriers to the schedule. Press the buttons and cut the link.

- Remote switch-on from the SCADA
- No visit to the wind farm
- The schedule stays in the PLC

Stage 3 · The log for the audit

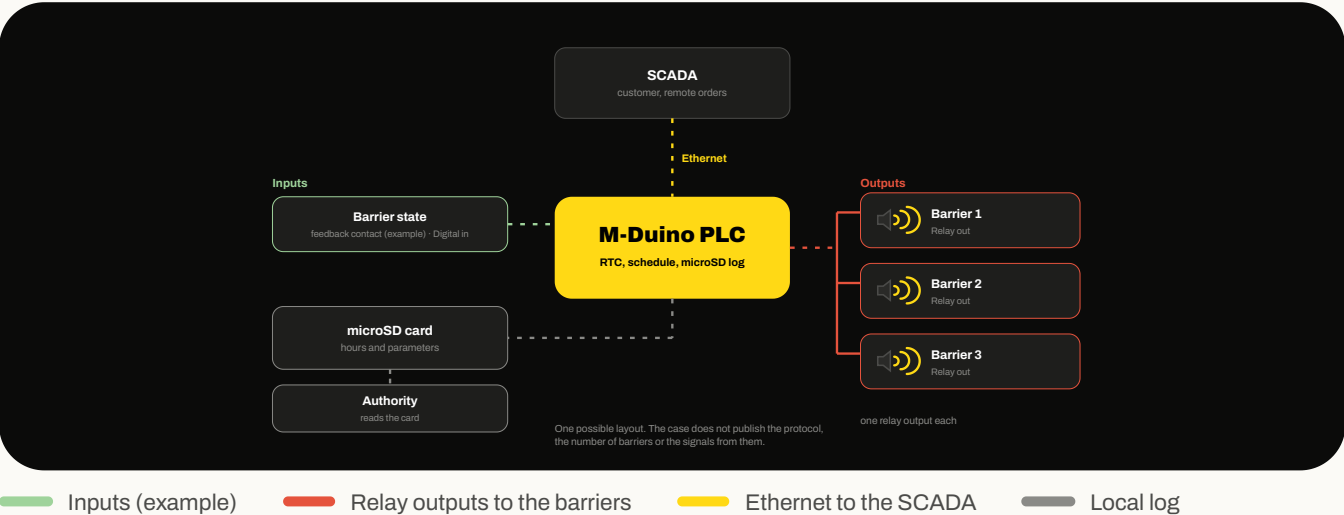
Every hour of work goes on the card.

The PLC writes a log on a removable microSD card: the operating hours and the most important operating parameters of the system. The authorities can take the card and check that the barriers worked when they had to. Run a few days and read the card.

- Operating hours of the barriers
- Main operating parameters
- A removable card for the audit

How does one PLC control sonic barriers at a wind farm?

One M-Duino PLC is the controller of the sonic barriers. Its program decides when the barriers must sound, by the schedules of the environmental authorities for each time of year, and the customer's SCADA can send a remote switch-on order. On a removable microSD card, the PLC logs the operating hours and the main parameters for the audit. In this layout, the real-time clock gives the date, relay outputs switch the barriers and the SCADA sends the remote order over Ethernet. The case does not publish the protocol, the outputs, the number of barriers or the signals from them.



Signals and data

Signal	Between	Type	Purpose
Barrier on and off	PLC → each sonic barrier	Relay out (example)	Switch on by the schedule or by a SCADA order
Date and time	Real-time clock → program	Internal	Find the period of the year and the window of the day
Remote switch-on	SCADA → PLC	Ethernet (example)	Order with no visit to the site. The case does not publish the protocol. A typical way to do it: a Modbus TCP coil
State and hours	PLC → SCADA	Ethernet (example)	Remote monitoring of the whole process
Barrier state	Barrier → PLC	Digital in (example)	A feedback contact per barrier, if the barrier has one. The case does not publish it
Operating log	PLC → microSD	Local file	Operating hours and main parameters for the audit

One PLC for the whole barrier system.



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. In this project it runs the seasonal schedules, takes remote orders from the SCADA and logs the operating hours on its microSD card. The case does not say which outputs or which link were used; on the 38AR, the usual way is its relays and its Ethernet port.

Role	Schedule, relay outputs to the barriers, SCADA link, log
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
Built in	Real-time clock, microSD slot
Programming	Arduino IDE
Power supply	12 to 24 Vdc
Mounting	DIN rail TS35, IP20, inside a cabinet

The case used the M-DUINO PLC Arduino Ethernet 38AR I/Os Analog / Digital / Relay PLUS. It is in the catalogue today as the M-DUINO ETHERNET PLC ARDUINO 38AR, reference IS.MDuino.38AR+.

[See the M-Duino 38AR ›](#)

One controller

One PLC runs the schedule, takes the SCADA orders and keeps the log. ATS Panama asked for one PLC.

Proof on a removable card

The operating hours and the main parameters stay on the microSD. The auditor reads the card.

A clock that knows the season

The program holds the windows for each time of year. When the authorities change the hours, you change the table.

Fits an existing design

Many inputs and outputs let the PLC fit a barrier design that was already proven.

Remote, not dependent

The SCADA adds a remote order. The schedule runs in the PLC itself.

Room to grow

More barriers or more signals: the M-Duino family scales, and the program is open in the Arduino IDE.

SIMILAR PROJECT?

Tell us what must switch, when, and who must check it.

Tell us which equipment must switch on and off, which schedules it must follow, which system must send remote orders and what your log must prove. We will tell you which controller fits and how to connect it.

FULL CASE STUDY ONLINE

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