

SUCCESS CASE 27.2026

ALARMÍSTICA IP

AI-POWERED PROACTIVE
FAILURE DETECTION FOR
PUBLIC LIGHTING NETWORKS



THE CHALLENGE

Public lighting networks are essential for citizens' safety, quality of life and urban operations. Traditionally, the detection of failures in public lighting infrastructure has depended on customer complaints, periodic manual inspections and contractual maintenance routines. This reactive approach often results in failures being identified only after service degradation becomes visible to municipalities or end users, leading to delayed interventions, increased operational costs and unnecessary customer contacts. Furthermore, maintenance and field operations are not always prioritized according to the actual condition of network assets, limiting operational efficiency and reducing the ability to anticipate emerging issues across the network. E-REDES therefore identified the need for a data-driven solution capable of proactively detecting anomalies and supporting predictive maintenance strategies.

THE SOLUTION

Alarmística IP is an Artificial Intelligence and Machine Learning solution developed to proactively detect anomalies in public lighting networks through the analysis of load curves and operational data. The platform continuously ingests telemetry information and load diagrams collected from the public lighting infrastructure and applies machine learning models to identify abnormal patterns, deviations and potential failure indicators.

Once anomalies are detected, the platform generates actionable alerts and operational insights that enable maintenance teams to prioritize interventions according to the severity and location of potential failures. By identifying issues before they become visible to customers or municipalities, Alarmística IP supports a transition from reactive maintenance practices to a predictive and proactive operating model.

The solution also improves oversight of maintenance contracts, enhances operational planning and optimizes the allocation of field resources, enabling a more efficient management of public lighting assets.

MAIN ACHIEVEMENTS

- More than 100,000 maintenance activities supported annually through AI-driven anomaly detection.

- Greater than 95% accuracy in fault detection, enabling reliable identification of emerging failures before they become visible to customers.
- Significant reduction in dependence on customer complaints and manual monitoring processes for failure identification.
- Improved prioritization of field interventions based on actual network conditions, increasing maintenance efficiency and operational effectiveness.
- Enhanced service quality and reliability through earlier detection and resolution of public lighting issues.

KEY SUCCESS FACTORS

The success of Alarmística IP is based on the combination of large-scale operational data collection and advanced machine learning algorithms capable of distinguishing normal operating conditions from early indicators of failure. The continuous analysis of historical and real-time data enables the platform to identify anomalies that would be difficult to detect through conventional monitoring approaches.

Another critical factor is the seamless integration of analytical outputs into operational processes. By converting detected anomalies into actionable insights and intervention triggers, the solution ensures that predictive analytics directly supports maintenance decision-making and field operations.

The initiative also benefits from the availability of extensive telemetry data from the public lighting network, providing the data foundation required to continuously improve model accuracy and operational effectiveness.

WAY FORWARD

Following the positive results achieved, E-REDES will continue expanding the use of artificial intelligence and predictive analytics to support smarter asset management and more efficient network operations. Future developments will focus on further improving anomaly detection capabilities, increasing automation of operational workflows and enhancing predictive maintenance strategies across the public lighting infrastructure.

Ultimately, Alarmística IP demonstrates how AI can support the digital transformation of distribution network operations, delivering higher service quality, improved operational efficiency and a more proactive approach to infrastructure management.