# Case Study

Monitoring of the Electrical Network

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The monitoring of the electrical network is a typical industrial IoT solution in which the advantages of the new smart IoT devices are used to detect failures in the power supply. Thanks to the early detection of electrical problems, bigger problems are avoided through rapid and effective action. This happens thanks to the collection of real-time information on fault indicators with smart modems that transmit the information through LTE/4G. This case study is based on an actual project in the Southeast Asia Pacific (APAC) area.

Device: **MTX-IoT-S, 4G programmable IoT modem with 8x digital I/Os, 2x ADC and battery**

Platform: **Cervello IoT Platfotm or Owner IoT Platfotm**
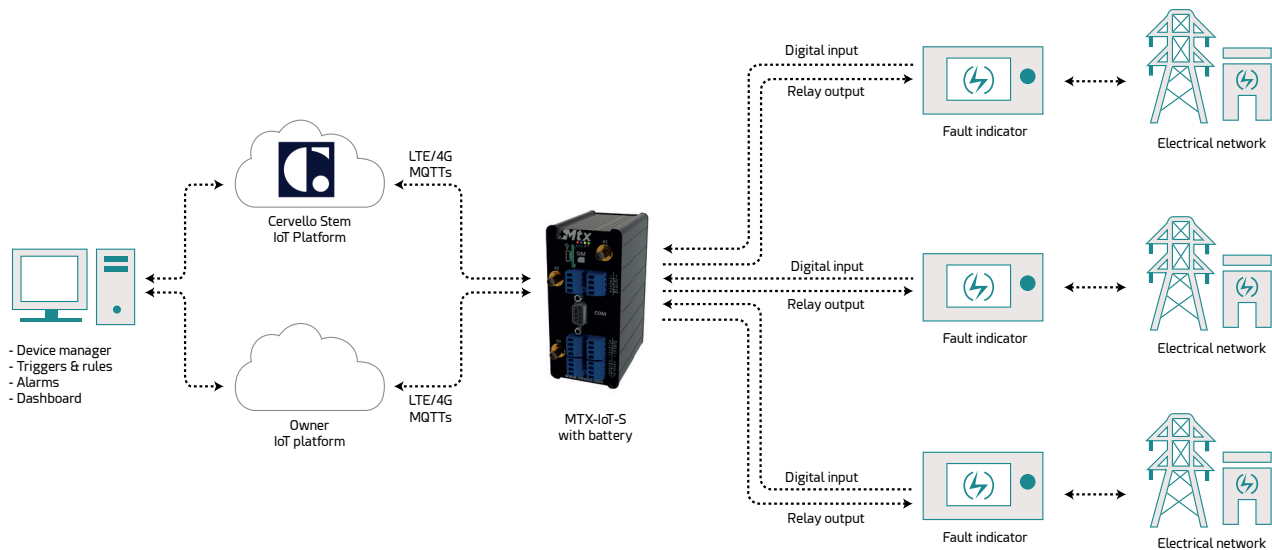
In these cases, the maintenance manager needs to know in real time, the status of each of the critical points. To do this, several fault indicators are used. These devices contain an internal relay that opens when the sensor detects ground faults or short circuits. In case of detection, the internal relay opens and sends a digital fault signal. Once the fault has been signaled, an external relay is required to reset the device to return to the initial monitoring point.

This solution needs a device with the greatest number of digital inputs possible (in order to monitor more than one fault indicator), a battery so that the communications equipment continues to function in the event of a power failure, control of the relays to perform the reset of the fault indicator, and an industrial box with DIN rail mounting, to be able to install it easily. Due to this list of requirements, the ideal MTX device for this solution is the MTX-IoT-S modem, which has 8 digital inputs, DIN rail mounting, and the possibility of including an internal battery directly in the modem box. To cover the need of relays control, our development department made some modifications to the hardware and firmware, adapting the standard equipment to match the requirements of the solution perfectly.

The description of the operation of the solution would be: the fault indicator contains an internal relay that is closed. In the event of a network failure, the sensor detects it and opens the internal relay. This change is detected by the MTX-IoT-S modem through one of its digital inputs, which sends a specific frame through MQTTs to the management platform. An automatic trigger activates one of the relays of the MTX-IoT-S that returns the fault tndicator to its initial state, leaving it ready to continue with the monitoring.

Since the sending of frames is done through MQTTs, the MTX-IoT-S is compatible both with an integral solution using the Cervello IoT platform, and with a solution in which the management platform is provided

by the company that is in charge of monitoring the power grid.

Thanks to the bidirectional communication, it is possible to act directly on the fault indicators from the platform with the discretionary activation of the MTX-IoT-S relay, allowing the devices to restart. Also, both from Cervello IoT Platform and from the client's proprietary platform, Device Manager management can be carried out, knowing the status of all deployed devices and being able to perform remote management tasks such as firmware updates or configurations.

Thanks to this intelligent solution for monitoring the electrical network, the energy supply maintenance concession companies can have real-time information on the status of the grid, detecting faults and breakdowns at the very moment they happen, significantly improving the overall state of the network and carrying out a more efficient maintenance.