## CGN Materials and Electric Engineering



**KIO (Klemsan Internet Objects) Platform** Case Studies

## Name of the project:

Control, monitor and reporting system for public water and sewerage service of the Belén municipality - **Costa Rica** 





**Belén** municipality Costa Rica



### CGM, MATERIALS AND ELECTRIC ENGINEERING

# With KIO implementation, CGM now offers to their customers all the visualization and control advantages of SCADA systems, as well as multiples real time monitoring and analyzing and reporting tools!

Real time monitoring and control is of great importance for most of industrial processes, especially for those who are in remote sites, where any intervention imply a considerable resources expenditure. Due to that, the companies that offers this kind of services are forced to add to its range of products systems of latest technology able to perform a reliable real time monitoring and whose architectures save data to be used for statistics analysis in order to identify the weaknesses and increase efficiency and productivity in each activity. For CGM Materials and Electric Engineering, this situation is highly known and its solution for the lack of a system with all these features is **KIO** (Klemsan Internet Objects).

For more than 1 0 years **CGM** is leading the industrial sector in **Costa Rica**. Its main activity is the design and integration of control, power, distribution and automation switchgear.

Our partner **CGM** is providing a control, monitor and reporting platform for water pump systems. Through **KIO**, the 3 water wells are being managed at Belen municipality.



Before KIO implementation, the control and automation activities were demanding CGM's technicians on premises. **The SCADA** working at that moment was not efficient enough due to its limited visualization and data analysis, besides a lack of a notification system. The main goal of KIO was to upgrade their current system as close as possible to an **IoT solution** with a comprehensive tool, whose algorithms allows an easier acquisition, visualization and notification of the details of the system that were not being taken into account before.

The projects consists of gathering data from PLCs in three different water well locations in Costa Rica. The system has **3 PLC's** and **3 gateways**. Two PLC's receive data from **7 measuring points**, one of them got the data from **8 measuring points**. All PLC's gather data from **22 measuring points** from the water wells. Every water well has several sensors whose values are being send to the local SCADA system.

## **Topología de conexiones Pozo Don Chico 2**





In the set of measured variables, we can find water pressure, critical electrical values, water flow, presence signal, etc. For this solution it was a must to have a system able to perform remote control between each water well and the monitor & control center. The distance among the water wells are around 2 kilometers, while the distance to the central station is approximately **8 kilometers**. We overcome this scenario deploying a GSM connectivity network.



#### Figure 2

Using an initial design sent by the customer (Figure 2) and the flexibility of KIO, we added each value and replaced the SCADA diagram for a versatile mimic diagram with multiples pop-ups that let the users to see the values one by one without saturating the interface of information. Different type of user authentication is a plus, letting certain users to make changes in the systems and other to just observe the behave of the sensors and actuators. The added value of the mobile app for Android and IOS, allow the users to access the system much faster than common systems in the industry.



#### Figure 3

In addition, a set of alarms were created and configurated to notify to in-charge technician via email in case of any event, making easier the attention and prevention of critical situation for the system.



## Nowadays, security is a concern for engineers getting involve with Industry 4.0 and IoT connected system. We are using private APN's for the communication network and VPN's that protect the data from any third party.



## **AIM OF THE PROJECT**

 Monitor the sensors values in real time in a fast way with a compressive visualization.
Access to the whole data in the past and correlate certain values to identify failures and improvement opportunities in the system.

 To increase energy efficiency, minimizing or avoiding unnecessary uses of machinery.
To configure alarms for making easier the attention and prevention of critical situations.

#### Solution:

KIO Basic Module Advanced Reporting Module Advanced Monitoring Module Sensor and I/O Module WEB-SCADA Module Mobile Application Multi Conditional Status

Number of measurement points: 22

#### BENEFITS

► A remote and reliable control and monitoring brings to both customer and tech team an efficient way to ensure the quality and security of the process.

In case of any alarm condition, quick notification via email is possible thanks to KIO's alarm management.

A suitable interface with all the advantages of a SCADA system as well as the analysing possibilities of KIO's tools brings to the customer a comprehensive knowledge of the process.



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