DataNet Solution – Wireless Monitoring Network in Syringe Manufacturing Plant

Application: Environmental monitoring in a medical equipment plant

Organization: PROESCA, C.A.

Background:

Monitoring environmental conditions in plants that manufacture medical-related products for the health sector is a crucial element for ensuring the quality, safety and aseptic packaging of products. Environmental monitoring systems enable evaluation and control of all the required conditions by providing online transmission of data and analysis reports, allowing implementation of preventive and corrective measures when needed.

About the Customer:

The "Promotora de Empresas Socialistas" (PROESCA) is a subsidiary of Pequiven, founded in 2008 to promote, support and develop socialist enterprises in the industrial processing of polymers, fertilizers and chemicals, including sustainable community projects in harmony with the environment and its surroundings. The syringe factory is located in the Industrial Field Ana Maria Campos (CIAMCA), in Venezuela. The factory produces syringes for the Venezuelan Institute of Social Security. Its current production capacity is 144 million syringes per year.

Fig. 1: PROESCA, C.A. syringe plant

Key Customer Challenges:

The PROESCA syringes plant required a monitoring system able to monitor the following parameters:

- Temperature: Between 10 to 40 °C, with an accuracy of ± 0.5 °C.
- Relative humidity: Between 10-90%, with an accuracy of ± 5%.
- Differential pressure: Between -60 to 60 Pascal, with an accuracy of ± 2.5 Pascal.
- Ethylene oxide: Between 0 to 2 ppm, with an accuracy of ± 0.1 ppm.

In addition, the system must be able to automatically record all the values of each parameter in a defined interval via a computerized system and produce reports for analysis purposes.

The environmental monitoring system must be interconnected with various systems and provide alarms allowing preventive or corrective actions:

- Fire detection, for generating a general alarm due to a leak of ethylene oxide.
- System RFID access control to block access to dangerous areas with concentrations of ethylene oxide.
- HVAC system for activating additional extractors for removing the ethylene oxide present in the area.

Fourtec Solution:

DataNet wireless data acquisition solution

DataNet Implementation:

Based on the demands from PROESCA, the following DataNet environmental monitoring system was implemented:

- 1 x DNR900 Receiver
- 3 x DNR800 Mini Repeaters
- 1 x DNL910-PA Temp logger, with power amplifier
- 11 x DNL920-PA Temp/RH logger with power amplifier
- 1 x GSM Modem, for SMS notifications
- 5 x Ethylene Oxide sensors
- 21 x Differential pressure transmitters

In addition, PROESCA implemented an additional system that can relay to RFID systems access control, emergency ventilation HVAC system and fire detection, enabling special actions in the event of an ethylene oxide leak alarm.

Figure 2 and 3 below show the layout of the equipment.

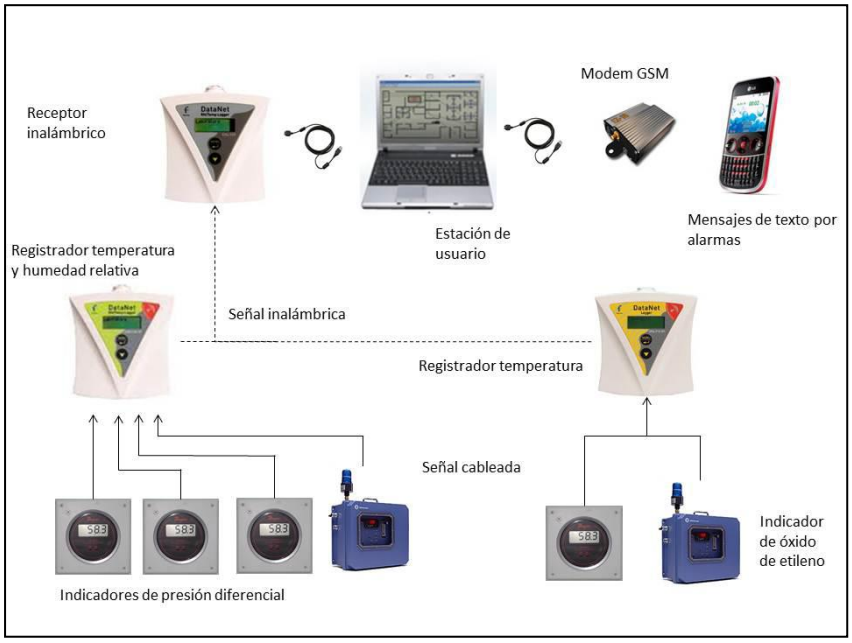

Fig. 2. Connection Diagram of environmental monitoring system

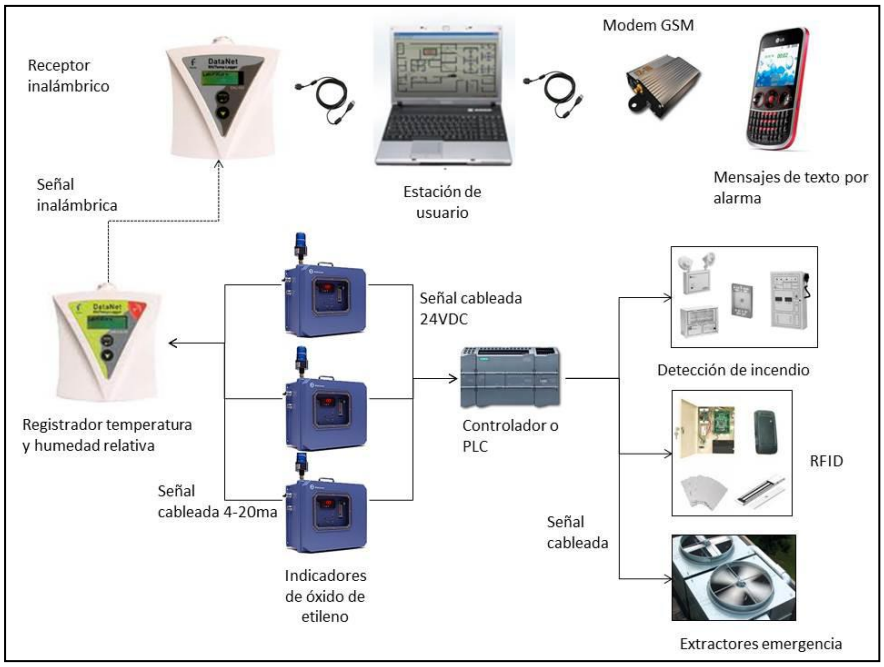

Fig. 3. Connection diagram of the alarm system of ethylene oxide

Measurable Results:

- The DataNet system automatically records the selected variables to verify they are within the pre-defined range.
- The contaminant concentration of ethylene oxide can be observed in the records over time to ensure control of this compound in the installation points.
- The DataSuite software provides a clear visual map of the network, deployment of units, alarm indications, force data and flow control at all points of the installation.
- Meeting standards and regulations - compliance with environmental regulations related to the area of supplies for health sector.
- In case of interruptions in online data transmission, the DataNet system implemented enables retrieval of measurements over time and transfer at any time.

Customer's Last Word:

"The DataNet system and DataSuite data analysis software allows us to save time when performing audits, data download and analysis of the recorded data in our storage area, sterilization and technical area. The alarm notifications allow us to immediately react and avoid damages."

Ing. Carlos Zambrano, Coordinador General Jeringas PROESCA

Fig. 4: Mini Repeater in installations

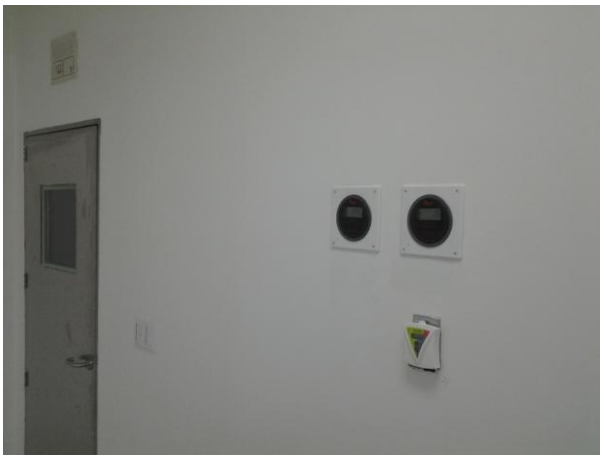

Fig. 5: Pressure transmitter and DataNet in installations

The application in PROESCA, C.A. was supplied by ***Rosemblak Scientific, C.A.****, a Fourtec distributor in Venezuela*