



OIL & GAS

Data acquisition system for monitor and control **PEMEX** fuel distribution plants

INTEGRATOR: **Vrimsa**

CLIENT: **PEMEX**

Project

The project was based on covering the needs of **data centralization in a control and monitoring system**. Likewise, **guarantee the availability of information, preventing it from being lost due to failures in the communications network**. Data must be previously treated and processed before being delivered to the end applications such as **SCADAs** and **Web services**.

Solution

The implementation of **vNode Automation** platform, which is a comprehensive solution for field data acquisition, data management and delivery through multiple protocols, allows to meet the necessary requirements to carry out this project, in addition to creating a safe environment in unstable networks.

Integrator



Vrimsa is a Mexican company specialized in the integration of automated systems for the Oil & Gas industry. It is a company with extensive experience in these processes, which allows its divisions to cover equipment instrumentation, industrial networks, connectivity, and visualization.

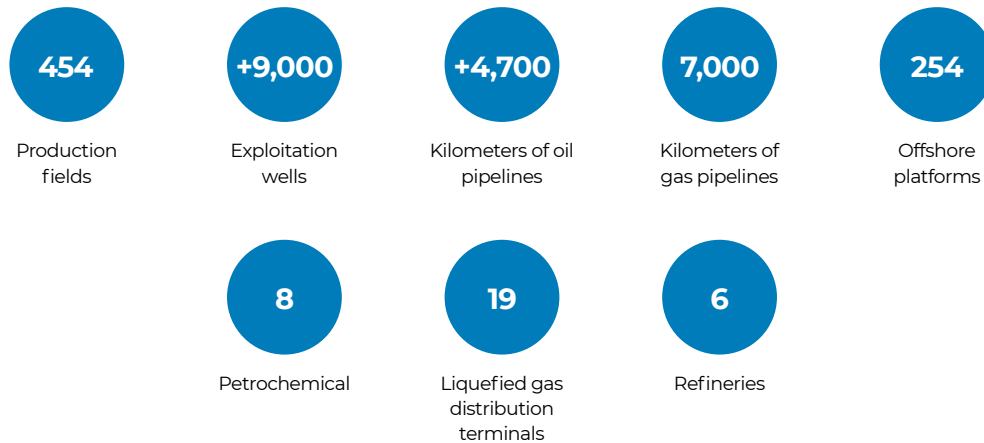
Client

The end customer corresponds to one of the most important refiners in Mexico, **PEMEX**, which has been dedicated for decades to the exploitation, production, refining and transportation of oil, as well as its derivatives. For the project in question, Vrimsa was a key player in the development and implementation of the required solution.



Oil & Gas industry

PEMEX is the biggest oil company controlled by the Mexican State that is dedicated to the exploration, production, transportation, refining, storage and commercialization of hydrocarbons and their derivatives. Its products include petrochemicals, natural gas, liquefied gas, sulfur, gasoline, paraffin, and diesel, among others. According to its statistical yearbook, it has:



The company maintains more than 10,400 service stations in the country and has proven reserves of 10,073 million barrels of crude oil equivalent (MMboe). Distributing fuel to multiple stations around the country.

The management of industrial communications in the Oil & Gas industry has allowed to the development of data acquisition systems for the monitoring and control of fuel distribution stations.

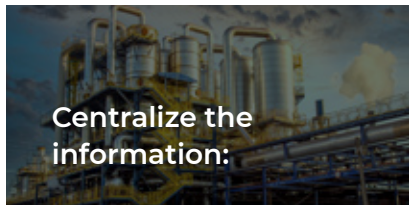


About the project

Today we present the project that **Vrimsa, which is part of vNode Automation partnership program**, has developed for PEMEX using the **modular platform vNode IoT Gateway**.

PEMEX needed to implement a solution that would allow it to establish an integrated communication with plant devices for monitor and control the fuel distribution stations. But they had two added difficulties: the solution had to be implemented in an agile way and in a very limited time.

Relevant project requirements



The 40 Distribution plants must be integrated in just one environment, allowing access from any network on PEMEX.



An important bunch of raw data need to be processed, adding some calculations, history and reports generation.



The data must be shared with third party applications outside the organization by using OPC UA protocol.



Project Main Target

Vrimsa started developing a solution to cover PEMEX needs. It consisted of designing a communications architecture in which all the pump stations and distribution environments will be linked to a unique data acquisition System for control and monitoring.

Vrimsa and **vNode Automation** provided multiple onsite visits for assessments, and get a plant floor devices inventory to pull the data from.

- **Flow Control computers.**
- **40 Distribution plants with UCL Stations.**

Device Communication

Most plant floor devices supports Standard Modbus RTU and TCP protocol. All data must be needed to approach to a Web SCADA System on the Cloud.

Challenges

After evaluating the project and the client's requirements, Vrimsa faced the following challenges:

- **Centralize the information of the 40 distribution plants, guaranteeing access from any PEMEX network.**
- **Treat and process the acquired information (report generation and data analysis).**
- **Send the information to the data acquisition systems through the OPC UA protocol and web services.**
- **Guarantee the reliability of communications and avoid data loss.**

“I never imagined that a migration of control systems with vNode would be so easy and simple. Being able to work without tags and connectivity limitation has allowed us to streamline the workflow.”

Luis Encinas

Vrimsa Engineer and project leader

Project needs

As requested, data couldn't be lost due to critical environment. All distribution plants must need to be linked to a Central System.

There is required to process data directly to the end application, to perform reports based on profit & lost for fuel distribution. Real time data monitoring.

vNode Solution

Solar plants sites:

- **40 remote nodes**, one per plant, reading from the Modbus protocol devices, by implementing **vNode Modbus Client Module**.
- **Secure the connectivity over SSL protocol and Digital Certificates** for central link connections.

Central environment, several modules:

- **vNode Derived Tags Module** for performing advanced calculations to raw data, for process and treatment.
- **vNode OPC UA Server**, for sharing all the data pulled from the controllers and the one already calculated with an OPC UA SCADA on the cloud.
- **vNode Rest API Serve Module**, to provide POST AND GET commands within third party applications.



vNode Modbus Client Module

vNode Automation Modbus Client Module **allows communication with multiple plant floor devices via Modbus TCP/IP and RTU.** By behaving as a Modbus Master it allows communication with any device that supports this protocol.

vNode REST API Server Module

vNode REST API Server Module **provides an easy way to send data to services or web applications,** using a JSON format under the HTTP or HTTPS protocol.

vNode OPC UA Server Module

vNode OPC UA Server Module is the most widely used way to **standardize field data by sharing it with industrial applications using the standard OPC UA protocol.**



Why did customer choose vNode IIoT solution?

During the platform evaluation, customer and integrator realized that vNode approached within a minimum of complexity all the requirements for the project.

Likewise, vNode's technical support provided a trusted environment based on the full experience from the support team.

Prices were very competitive within the extra bonus of unlimited tags and connectivity. It is a big differentiator from the other competitors.

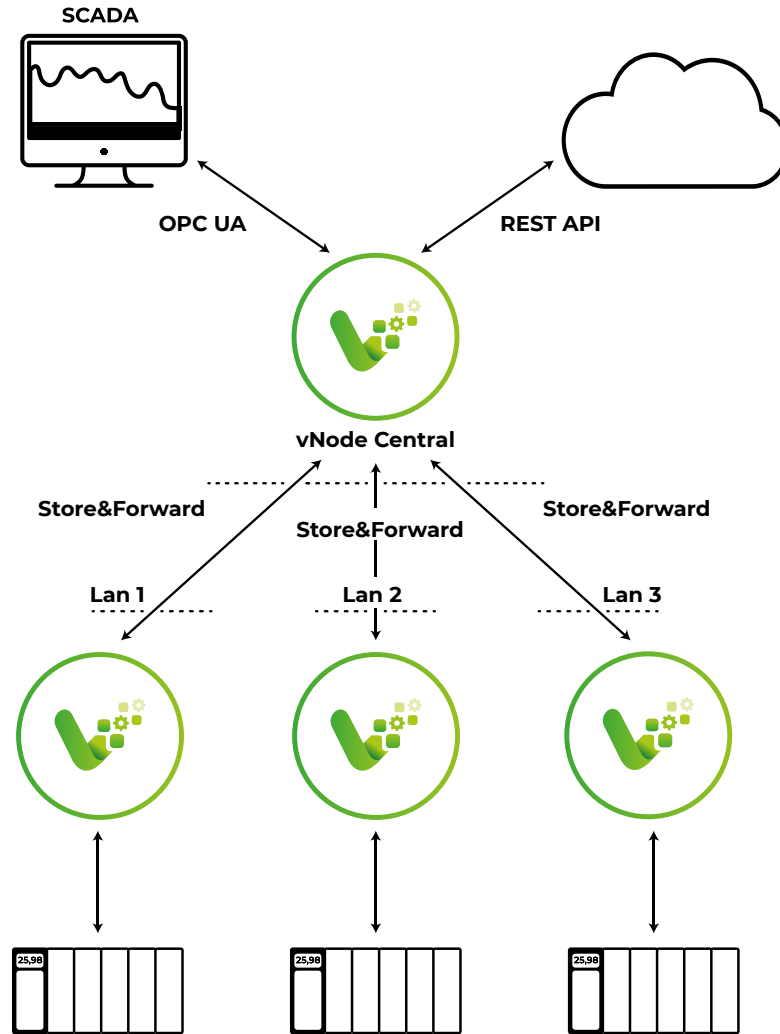
How effective has been the project after implementing vNode Solutions?

vNode has become an extremely reliable tool for plant communications, by allowing to centralize all the devices in just one single system.

Providing an accurate data acquisition and reducing times and costs by simplifying duties in a single solution environment.

Communications has been turned reliable since vNode was implemented.

System Architecture



**Download vNode IIoT Gateway
for a free trial**

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