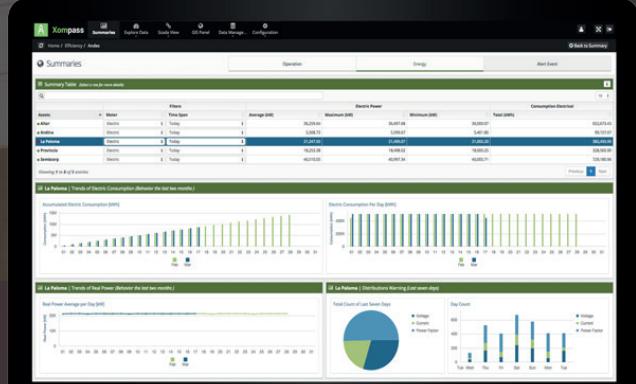


Smart Industry

Industrial Water Pumps - Compressors - HVAC

XIWP Overview

Xompass collects, stores and analyses sensor data in real-time to offer unprecedented capabilities of visualization, operational intelligence, maintenance and IoT monitoring, configuration and administration management and compliance.



Xompass Industrial Water solution (XIWPs)

Water is the most important resource for life and many industrial processes. As life and industry grows, the demand of water and energy also increases. Due to the climatic change water and energy have become even more limited resources, so a better usage of it is a must. These factors mean that equipments like water pumps have to maintain a constant and high efficiency within the parameters required by the user to optimize the usage of energy and water in his processes. To achieve this, we can monitor the performance of the pumps in terms of the different Xompass perspectives:

- **Energy:** Know the theoretical vs actual data of energy consumption.
- **Operation:** Monitoring water flow expected vs real data and machine theoretical performance.
- **Maintenance:** To determine the reliability of the water pump in time.

Many IoT solutions do not provide this information and are limited to raw data delivery. Xompass provides cloud solutions to monitor, analyze and visualize the efficiency of industrial equipment in an industrial plant based on multiple indicators.

XIWP Platform helps manufacturer companies, integrators and end users to analyze and predict the efficiency levels of their industrial water pumps. XIWP allows the user to monitor the total extracted liquid volume over time, performance curve of the water pumps and its operation point over time, performance comparison between different water pumps over time, generation and transmit of real-time alarms, historical data analysis, raw data visualization, geospatial information services, 2D/3D SCADA system and mobile data application.



XIWPUs Use Case

Smart-Tec, technology integrator chose Xompass platform to implement a solution for monitoring and analyzing efficiency of submersible pumps manufactured in USA and India. The VAR account of the Xompass Industrial Water Pumps solutions (XIWPUs) helps to improve the given to their customers, allowing remote control and administration of the pumps, adding value to the service. Smart-Tec has implemented Xompass XIWPUs with three big customers in Chile.

Figure 1: Xompass 2D SCADA layout for water pumps monitoring



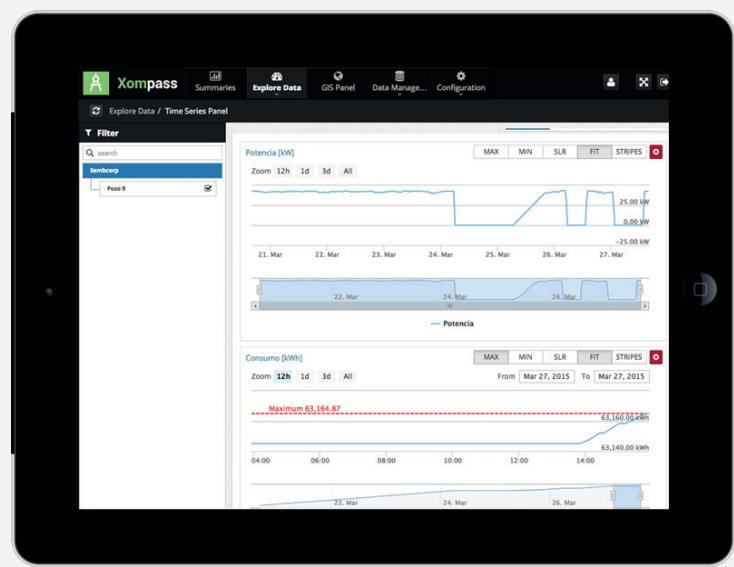
In figure (2) is presented how is measured the pressure of a company pump in order to control the operation range for this equipment. From figure, it is possible to appreciate that, as a consequence of the monitoring process is possible to see when the down-time occurs. Additionally, Xompass allows to identify different operation ranges which can be further integrated with several regression methods capable to forecast future equipment trends. For instance, energy consumption trends can be developed, average consumption and operational range as well. The final outcome of Xompass is to provide different type of analysis to support companies' decisions.

Figure 2: Application of Xompass to monitor pump pressure. Different elapsed time can be monitored



In figure (3) is showed how different variables can be combined in order to recognize patterns among the monitored variables. In this case is monitored the temperature of the equipment which fluctuate according the environmental conditions. The normal operational range is around 25[°C]. Nevertheless, it is possible to appreciate variations which are a consequence of not predicted temperature variations of the monitored process. For instance, the 24 of June of 2014 exist a big temperature variation in the system for a short period of time, alarming the maintainers to check the causes of this temperature change.

Figure 3: Application of Xompass to monitor pump pressure and temperature. Not regular events can be identified as well by integrating specific customers' algorithm if it is required.



Other feature of Xompass is to summarize the operational and energy consumption resources. For example, in the next figure is presented an overall month results for the energy consumption of a pump in kilowatts. Additionally, different events can be registered in order to enrich Xompass platform with more relevant company information.



Figure 4: The performance curve (case of a vertical submersible pump) enables the analysis of the state of the pump with respect to their performance from fabrication

According to Claudio Pavanati CEO of Smar-Tec , benefits of end user about using Xompass XiWP platform were:

- **Client 1.** Lowered the operational cost in 6 month, by reducing 30.000 USD in corrective maintenance program.
- **Client 1.** 50% efficiency pump efficiency increase (submersible pump), correcting the frequency of starting and stopping of the pump by adjusting the flow to prevent the well runs dry.
- **Client 2.** Lowered energy consumption cost by reducing the number of start-ups of the industrial power pumps.
- **Client 3.** Reduced to 0 hours of field workers monitoring time. One visit to a pump cost 30 min for two workers, and movilization. In one year they estimate more than 40 visits to the field before using Xompass (almost 2.000 USD per pump a year).



30.000 USD

Cost reductions associated
to corrective maintenance
program.



50%

Efficiency pump increase by
correcting the frequency of
starting and stopping



0 Hrs

Reduced to 0 hours of
monitoring equipment by
field workers



2.000 USD

Cost reductions in one
year associated to field
visits



The screenshot shows the Xompass software interface on a tablet. The top navigation bar includes 'Home / Efficiency / Off-Summary', 'Logout', 'Explore Data', 'Scaling View', 'Data Aggregation', and 'Configuration'. Below this is a 'Summaries' section with tabs for 'Overview', 'Energy', and 'Alert Events'. A summary table for 'POTENCIAS CLOSERIA' shows metrics like Average (kWh), Maximum (kWh), Minimum (kWh), and Total (kWh) for different time spans. Below the table are several charts: 'Electric Consumption Per Day (kWh)', 'Electric Consumption Per Day (kWh)', 'Total Power Average per Day (kWh)', and 'Total Count of Last Seven Days' for Voltage and Current.

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