

SUCCESS STORY

Retrofitting Pumpjacks

IIoT, SCADA and sensor-based monitoring of assets have already been successfully introduced in the oil and gas industry for some time.

Find out how it is possible to further optimize the production operations and what role Revolution Pi plays here.

Continuous monitoring of wells in real-time helps to enable optimal economic and operational performance. This therefore means working and planning as effectively and efficiently as possible, and thereby helping lower the costs.

The pumps are often thousands of feet below the surface, and sophisticated algorithms are required to accurately control and diagnose the downhole pump. Existing methods worked well in vertical wells. However, the deposits do not necessarily always lie vertically under the drilling rig. Thus, additional horizontal wells, so-called deviated wells, are often needed to reach the deposit. Diagnosing downhole conditions in modern deviated wells required a much more sophisticated set of mathematical tools than had been previously developed.

The Canadian company DV8 Energy identified this problem and developed a mathematical solution that revolutionizes the diagnostics available for deviated and horizontal wells. Using this technology, downhole conditions for rod pumped wells are calculated in real-time at the edge. Furthermore, fluid level, pump intake pressure, dynamic rod stress, pump fillage, produced gas,

gearbox torque and emulsion production can be calculated as well.

Project Implementation

In order to do this, DV8 needed a platform that allowed to implement very sophisticated mathematical algorithms, beyond the capabilities of traditional PLC's and the code should be written in C. Moreover, it should be possible to update these algorithms based on the user input on the cloud and make periodic improvements to fleets of devices. The development platform must have industrial suitability, temperature resistance and traceability. Due to these requirements, the RevPi Core together with the analog expansion module, RevPi AIO, were chosen.

DV8 takes advantage of the connectivity available in the RevPi to automatically program and diagnose Variable Frequency Drives, Coriolis meters, and other instruments, simplifying the setup and maintenance of remote oil field sites. The AIO module in particular is a key element of this solution because the integrated high quality 24-bit ADC allows for fast 160 Hz and reliable sampling.



REVOLUTION PI

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Retrofit Box “Edge POC”

Both modules are installed in the “Edge POC”, a retrofit box, which can be integrated in a VFD or a starter cabinet. DV8 Energy gave the RevPi Core its own software image so that the setup and the connection to the cloud can be carried out very easily and every pumping cycle is sent to the cloud for storage and analysis.

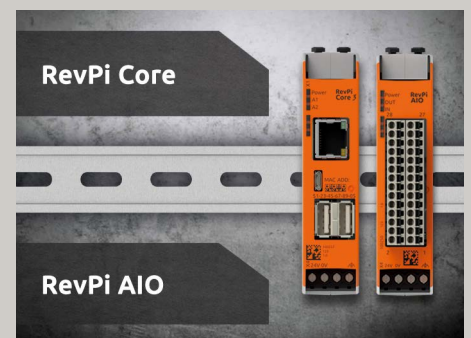
Via the AIO module existing load cells, position sensors, and tubing and casing pressure transducers can be connected and communicate with the RevPi using Modbus TCP. The well can be controlled from the Props field portal software. This RevPi based tool has already generated millions of dollars in increased production and operational efficiencies for many Production and Operations Teams.

About D8 Energy

DV8 Energy has leveraged a deep understanding of the physics of rod pumping, advanced mathematics, computer science, cloud and IIoT technologies to bring operators, production engineers and data science teams together to unlock their combined potential.



Modules used



REVOLUTION PI

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