

Remote Wellhead Surveillance and Data Acquisition

Company: Terra Ferma

Location: Colorado, U.S.A

Project Introduction

Twenty wellhead applications link directly to a remote central server and control center, allowing for remote operations control, surveillance, and systems diagnostics from miles (or even continents) away. Field technicians and site managers are notified of critical wellhead events by SMS or email, and may access remote video feeds and sensor readings from the field using any web enabled smartphone, laptop or tablet. The legacy SCADA is fully integrated with the customer's industry-standard flow meters, sensors and IP cameras over both wireless and serial links, allowing for detailed monitoring of site production. Detailed real-time overviews of injection, pipeline, or water and fracking fluid processes are all available. At the control center, a central cellular modem receives feeds from a network of UL Class 1, Division 2 IP cameras, automatically storing event-driven images and video feed to the network server.



Application Requirements

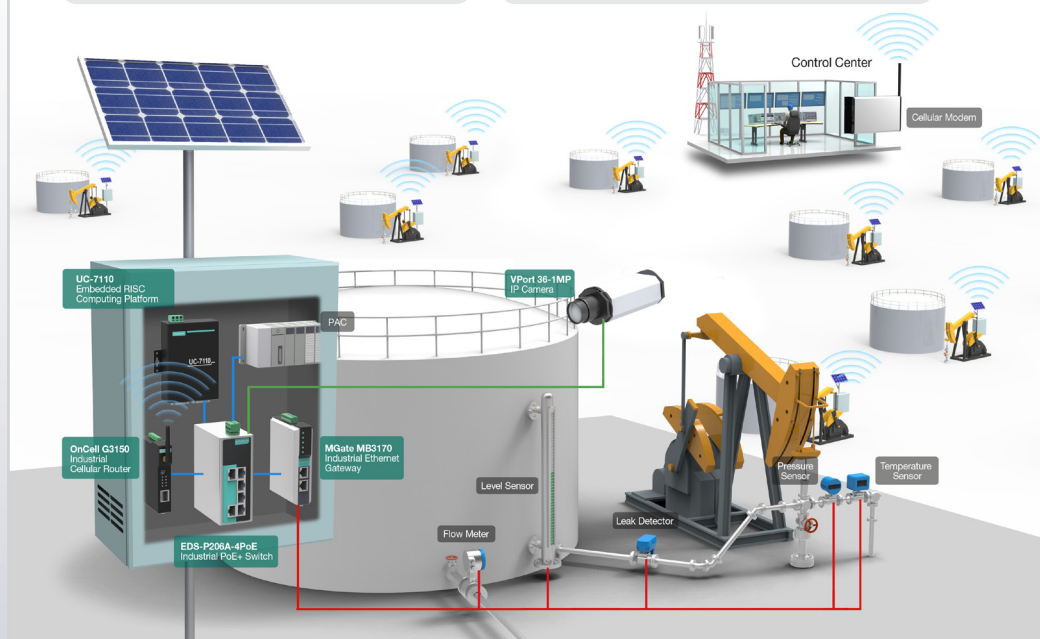
- Self-contained power with backup
- C1D2 certifications for hazardous oil and gas environments
- Persistent 24-7 connections
- Real-time delivery of exception notifications and key metric readouts
- Flexible, cloud-based data infrastructure for redundancy and accessibility
- Remote monitoring and data logging
- Low power consumption
- -40 to 70°C temperature tolerance with no fans
- Remote configuration

Wellhead Telemetry and Control

- Oil Pump / Pressure Sensors
- Crude Oil / Tank Level Sensors
- Pipeline / Temperature Sensors
- Solar Power Panel
- Electrical Storage and Metering
- Wireless Radio System
- NEMA Enclosure

Moxa's Products Per Wellhead

- OnCell G3150 Cellular Gateway
- EDS-P206A-4PoE PoE+ Switch
- UC-7110 Embedded Computer
- MGate MB3170 Ethernet Gateway
- VPort 36-1MP IP Camera



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Solution Description

Terra Ferma was challenged with bringing remote video surveillance and data acquisition to multiple wellheads scattered throughout the cold, harsh Rocky Mountains of the Central United States. Each wellhead was equipped with various sensors and meters that needed to be monitored and controlled from a central HMI, often miles away from the assets in the field. Redundant solar and wind generators were installed at each wellhead to support the electrical needs of the pump-stations, temperature meters, cameras and cellular modules. In addition to asset management and remote control capabilities, data logging for remote surveillance and alarm notifications was a key demand from the customer. Terra Fema's solution needed to be power efficient, reliable, and capable of supporting high-bandwidth data-feeds.

Requiring full integration of SCADA with remote monitoring capabilities, Terra Ferma searched out Moxa to meet their networking demands. The decision was an easy one: Moxa's vertically-integrated oil and gas products provide a variety of end-to-end solutions that all feature strong certifications for harsh environments, low power consumption, and also the industry's only UL Class 1, Division 2 IP video camera.

Terra Ferma and Moxa, along with MSI TEC, a premiere Moxa distributor, are extending enterprise IT communications from the corporate offices out to the most remote and harsh industrial environments the oil and gas industries have to face. From in-the-field sensors at the very edge of the network all the way up to remote data acquisition and SCADA integration, Terra Ferma, Moxa, and MSI TEC are enabling the digital oil field across the globe, pushing industrialized Ethernet, wireless communications, embedded computing, and industrialized IP video out to the harshest extremes the industry has to offer.



"Because of the mission-critical nature of our systems, we rely only on best-of-breed in technology. For that reason, we have complete confidence in Moxa components to protect our customers and our reputation." said Dennis Roark, President of Terra Ferma.

Business Benefits

Twenty wellheads kitted out with a full array of automated data logging, monitoring, and control devices link to a miles-distant central server and control room, where remote operations surveillance, system diagnostics, and control routines are collected and acted upon. Live, event-triggered video feeds and complete reports on all available sensor data are accessible using over wired or wireless Ethernet, and may be easily accessed using smart phones, tablets, or laptops.

PACs serve as strongly intelligent RTUs, logging real time pressure, flow-rate, and temperature data, and storing it for analysis of historical trends. These PACs are capable of pushing emergency alerts to system operators over SMS and/or email whenever production anomalies occur. At the control center, a central cellular modem monitors a network of rugged UL Class 1, Division 2 IP cameras, automatically storing images and video feed to the network server and pushing video feeds onto the control center's main HMI whenever certain event triggers are logged. Terra Ferma and Moxa were able to integrate this vertically integrated remote monitoring and control system with the legacy SCADA system already installed on the site, giving the customer significant savings on deployment costs, both in terms of infrastructure outlay and system downtime.

Your Trusted Partner in Automation

Moxa is a leading manufacturer of industrial networking, computing, and automation solutions. With over 25 years of industry experience, Moxa has connected more than 30 million devices worldwide and has a distribution and service network that reaches customers in more than 70 countries. Moxa delivers lasting business value by empowering industry with reliable networks and sincere service for automation systems.

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Highlights

- 20 wellhead applications link to a distantly remote control and data center
- Flow meters, sensors, and IP cameras are fully integrated into a legacy SCADA system
- Central cellular modem monitors network of UL Class 1, Division 2 IP camera feeds, automatically storing event-driven images and video at the network server