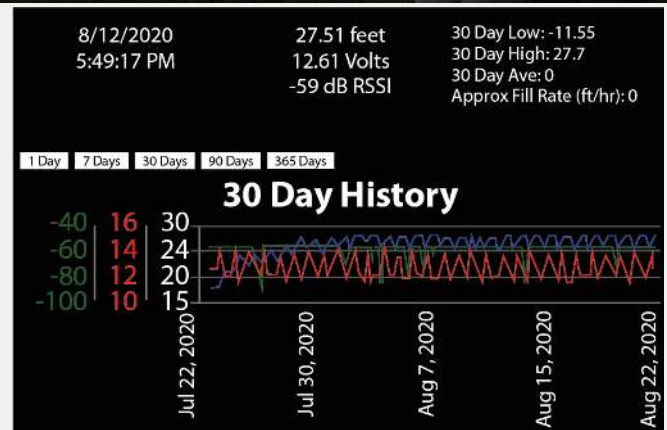# FREEWAVE

How data visualization boosts outcomes for the livestock industry

FreeWave's innovative ZumLink™ IQ Industrial Radio combines intelligence at the edge with a state of the art high speed radio communication platform. Now users can host custom applications and publish data points to the cloud or another host system via MQTT. It simplifies industrial equipment deployments, streamlines access to important data and reduces overall costs. Integrated into FreeWave's 900 MHz ZumLink radio, the IQ Application Environment is a secure Linux based environment where applications can be hosted in a similar fashion to a Raspberry Pi.

Background

The operator of a Rocky Mountain based livestock facility approached FreeWave to assist in remote data visualization of water tanks that are vital to its operations. The pain point was that the tank levels could only be observed visually on premise. After consideration of the terrain (mountainous, remote and big temperature swings), sensors and communications infrastructure, FreeWave engineers recommended a ZumLink Gateway, a ZumEdge Endpoint and FreeWave Edge software that publishes data points via MQTT to Amazon Web Services (AWS)

Problem to be Solved

The facility has minimal to zero staff most of the time. If a fault occurs such as a leak that prevents a tank from filling, the facility operators are unaware until they visually inspect the remote faulty tank, located a half mile from property headquarters. The operators wanted to reduce the number of trips to the tank facility and remotely monitor all tanks via web-based browser or mobile device.
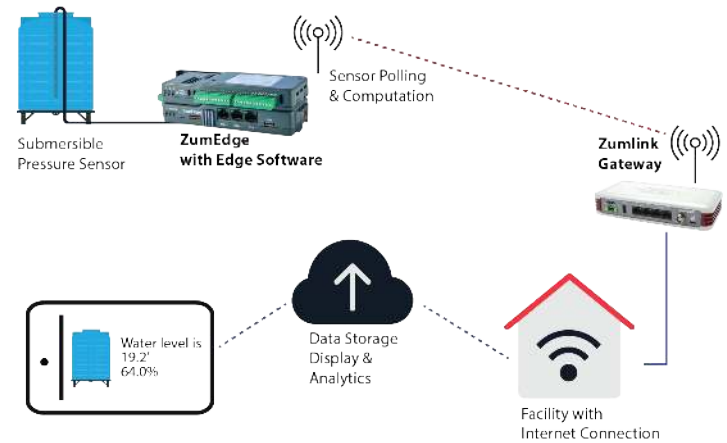
Special Challenges

Operators requested the need for data to be viewed by anyone with the proper credentials without holes in network security. Since the data was hosted on a cloud service external to the network, all connections were initiated intelligently by the radio when new data was published, and no changes to the existing firewall were needed.

Solution

With a ZumEdge Endpoint running FreeWave Edge, the operators were able to monitor water levels in the remote tanks from the cloud anywhere in the world with a wireless internet connection. A custom dashboard was developed in AWS that records and trends data from the onsite tank system.

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FREEWAVE

Details

A ZumEdge Endpoint running Edge is the foundation of this system, and allows operators to view tank levels and 7-day data trends from a mobile device anywhere in the world. First, the level is measured with a hydrostatic pressure sensor that feeds an analog signal into an IO channel on the ZumEdge Endpoint.

FreeWave Edge software reads the sensor at discrete time intervals, takes a hydrostatic pressure reading and converts the pressure data to a tank level measurement. It then publishes this data to the AWS hosting service via MQTT. A dashboard created on AWS accesses the stored data and presents the live tank reading.

Figure 2 – Using FreeWave Edge to publish data via MQTT

Conclusions

- Operators can now monitor tank levels on a mobile device or browser from anywhere in the world
- With a ZumEdge Endpoint running FreeWave Edge, a secure system was created to drive down operational costs by reducing the amount of travel to the site.

Why FreeWave?

With deployments in over 32 countries, FreeWave's products are leveraged by industrial end users and OEMs alike to connect, control and optimize remote machines and processes to impact smarter decision-making, improve operational efficiencies and drive cost savings. Throughout our 26-year history, Freewave's IIoT Connectivity and EDGE Solutions have solved thousands of customers' problems across numerous industries -- medical, energy, agriculture, municipalities and the Federal Government – and achieve reliable connectivity for data, telemetry, payload and command and control in some of the most challenging, remote and rugged environments in the world. Today, we are transforming the extreme edge of operations – and the proliferation of smart devices within it – into a connected part of the enterprise with our IQ edge computing platform and ecosystem of solutions evolved for IIoT. Are you ready to transform your operation? Visit freewave.com to get started.

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