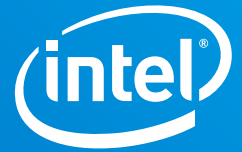


PRODUCT BRIEF

Agriculture

DataSoft™ Remote Soil Moisture Monitoring Solution with Intel® IoT Gateway



Optimize Water Management to Maximize Yields



“One partnership I’m really excited about is in Washington County, Oregon. We’re working with a local hazelnut farmer to pilot real-time remote moisture sensing that allows for better data to make decisions about the optimum time to water and plant crops. This technology can save the farmer resources and leave water in our rivers and lakes.”

—Fawn W. Bergen
Global Water Stewardship Manager
Intel Corporation

Challenges

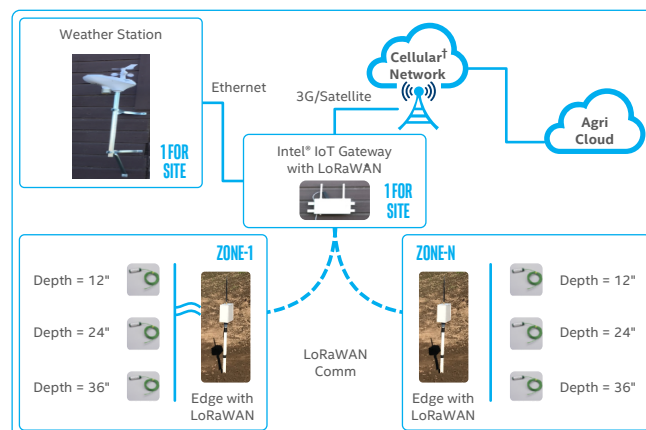
For growers operating medium-to-large farms, one of the biggest challenges is water management—specifically, getting adequate information on soil conditions to make the right irrigation decisions. Typically, this size farm includes multiple large fields spread over many miles. With such long distances to cover, it’s virtually impossible to take manual measurements—or if possible, very expensive in terms of labor and truck costs. Even if there is some monitoring, the data needs to be consolidated to be actionable. But remote locations don’t typically have electricity or cellular coverage, so the data cannot be aggregated or analyzed.

Without data-driven insight, growers are at a disadvantage. They are likely making reactive decisions, wasting water, and missing out on opportunities to maximize yields.

In order to make the best use of their resources, protect the environment, and maximize profitability, growers need to get an accurate picture of changing soil conditions across the farm. They need to collect, aggregate, and analyze data from widely dispersed fields, which can have different crops and even different irrigation methods. And they need to make sense of all the data at their disposal, efficiently and in time to take effective action.

Intel and DataSoft™ are collaborating on an end-to-end solution that helps growers get a precise understanding of growing conditions over miles of farmland. It complements farmers’ own observations, experience, and intuition with meaningful information that guides optimal decisions. The solution components are designed for ease of use, with minimal effort required to install, manage, and customize the system for the farm’s unique needs.

DataSoft remote soil moisture monitoring solution



† Leverage geo-specific carrier/cellular service provider capabilities

The basic solution kit includes soil moisture sensors, hubs, and Intel® IoT Gateway, preconfigured and customizable. More sensors can be added to cover more area or collect different data like soil temperature. The optional weather station collects ambient data like temperature and rainfall, which correlates with soil moisture data to give a better picture of growing conditions.



Solution

The DataSoft remote soil moisture monitoring solution enables growers to monitor soil conditions in multiple dispersed locations in real time and gain actionable insight from the data. It is available as a pre-configured kit to facilitate small installations and tests, and can also be customized and extended to adapt to the grower's needs.

The system components are battery operated to overcome the limits of remote locations with no electrical power. They are designed for battery life of a year or more.

The soil moisture sensors can be installed at whatever depths are best suited to crops and soil conditions in each field to obtain the most accurate, localized data. Groups of sensors connect to a sensor hub, where data is consolidated to transmit to the Intel® IoT gateway.

Sensors, hubs, and gateway are connected over a LoRaWAN* (long range, low power wide area network). LoRa is an ideal option for remote locations where there is either no cellular network coverage or the transmission costs would be prohibitive. The wireless LoRa radio sends data from sensors to hubs, then hubs to gateway. From there, the data can be uploaded to the cloud via cellular network for integration and analytics. The cloud computing and visualizations can be customized to the grower's needs. Data can be accessed via a dashboard or third-party API.

Benefits

Efficiency

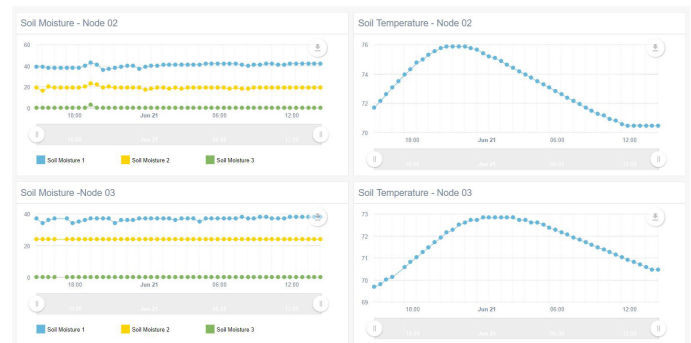
The DataSoft remote soil moisture monitoring solution connects widely dispersed fields without electricity or connectivity, allowing growers to monitor conditions continuously without having to measure site-by-site manually. Growers can see both the big picture of the farm and the details of specific fields and crops. Once the soil moisture data is consolidated and analyzed, charts and graphs allow growers to visualize accurate, timely information and make proactive, precise irrigation decisions—to conserve both financial and environmental resources. In addition to snapshot data in real time, growers can see trend data over hours or days for a more complete understanding of changing conditions.

Cost savings

When growers have this kind of information at their fingertips, they are in a better position to optimize water management, reduce resource waste, maximize crop yields, and ultimately run a more profitable farm. Precise water management can help reduce operational and input costs. And using LoRa minimizes the cost to transmit data across the farm.

Flexibility

This solution is designed for flexibility and to meet the individual circumstances of a range of farms. With open source interoperable components, growers can select the sensor brands, cloud, and data visualization best suited for their needs. The basic kit provides everything necessary to get started, but the solution is easily expanded to meet growing needs.



Data visualization shows soil moisture and optional soil temperature readings over different locations and times.

About DataSoft

Arizona-based DataSoft specializes in low-power, small form factor wireless solutions for IoT. They design, manufacture, integrate, and support real-time embedded solutions for defense, industrial, and agriculture communications. Their portfolio of programmable RF designs, tactical radio accessories, software libraries, and rapid prototyping capability was developed through DoD programs, IR&D, and Small Business Innovation Research.

Intel is working on IoT technologies to address the complex challenges of modernizing agriculture across the food value chain, from growing and processing to transport and retail. The technology used in the DataSoft remote soil moisture monitoring solution is well suited to other segments—like oil and gas, livestock management, and aquaculture—that face the challenges of remote equipment, rugged conditions, and lack of electrical power.



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