Success story

Indoor Precision Farming in American medical marijuana plantations

Intro

Indoor Precision Farming in American medical marijuana plantations

The legalization of marijuana in various US States, coupled with the emergence of several new markets and continued overall growth on the medical side could boost overall state-legal cannabis recreational and medical sales between 6 billion US dollars and 11 by 2020 (Marijuana Business Factbook 2016).

Phoenix, Arizona (US)

SensorInsight, an American company that provides Industrial Internet of Things complete solutions, has been working for a medical marijuana operator with Libelium Waspmote Sensor Platform to develop a wireless sensor network to produce the highest quality of marijuana through the management and analysis of the entire medicinal marijuana growing process.

Maximum yield and high quality results

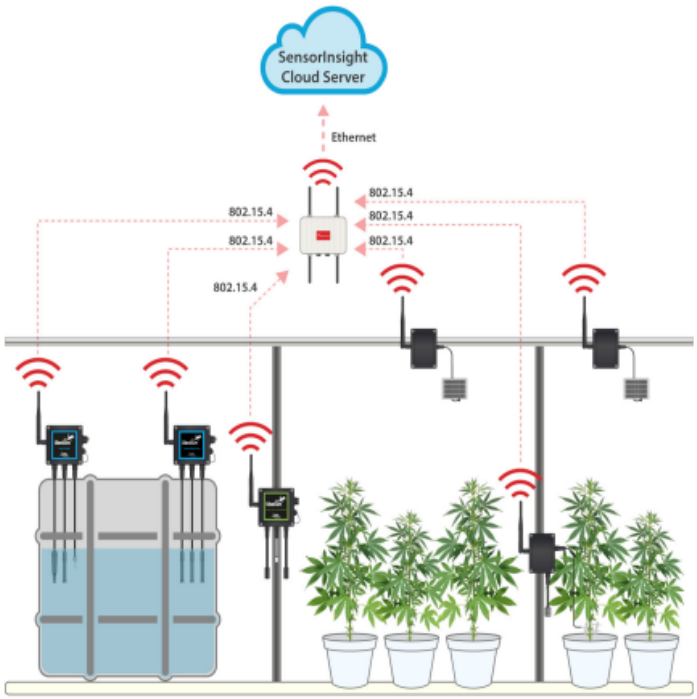
To achieve precision farming is essential to invest in the latest technology to get information directly from crops. This project has been developed to reach Smart Agriculture in medical marijuana plantations by investing in best practices to provide maximum yield and high quality results that deliver the best quality product in the industry.

Medical marijuana plants require the precise balance of light, temperature, environmental and soil conditions. The operator needed a fiscally sustainable way to manage and eventually scale their operations while tracking and adjusting changing growing conditions to improve crops.

Technicians installing Waspmote Sensor Platforms in the indoor marijuana plantation

The result was to develop a wireless sensor network based on Libelium Waspmote Sensor Platform to build a connected farm able to monitor conditions in real-time with less manual intervention to save time and resources. The indoor farming system has monitor parameters from:

- Environment: They were deployed several Air Quality monitoring stations based on Waspmote Gases Sensor Board to measure luminosity in different areas of the room. Waspmote Plug & Sense Smart Environment was installed to track environmental conditions such as temperature, humidity, methane (CH4) and CO2 levels.
- Agriculture: Soil and crops conditions were monitored with the Waspmote Agriculture Sensor Board PRO by solar radiation, leaf wetness and stem diameter sensors.
- Water: The company has installed Waspmote Plug & Sense! Smart Water to control water quality parameters such as pH, Oxidation Reduction Potential (ORP) and salinity and Waspmote Plug & Sense! Smart Water Ions to measure ions levels like calcium (Ca2+), nitrate (NO3-) or Chloride (Cl-).



Indoor Precision Farming deployment for medical marijuana plantations in Phoenix

Data can be analyzed over multiple crop cycles to identify the parameters of light, temperature, humidity and time that allow each crop to grow to its fullest capabilities. All the information monitored by the sensors is sent through 802.15 Xbee protocol to the Meshlium Gateway where data is gathered and send to MQTT. The platform where the medical marijuana operator can visualize and analyze the information is Sensorinsight dashboard.

Savings between 15-20% in two years

SensorInsight wireless system collects and monitors data on critical factors throughout the grow cycle. Users of the system can receive alerts via email or SMS so adjustments can be made and continuous, optimal conditions for growth can be achieved. The access to real-time data throughout the farm allows growers to audit the key components of the growth process 24 hours a day and adjust as needed to maintain maximum quality and efficiency

Sensorinsight Dashboard

Medical marijuana operator hopes to see between 15% and 20% increase in savings over the next 2 years with the wireless sensor network deployments. The savings are in terms of water, electrical supply, chemicals and grow cycle optimization of the plantations.

In this growing and newly regulated industry, there is additional emphasis on growers for compliance and transparency, such as the requirement for facilities to account for each plant on a daily basis. With large operations this can become problematic keeping up with the demand to constantly monitor and track each plant.

Medical marijuana plantation

The solution developed by SensorInsight with Libelium technology is prototyping a low cost state-of-the-art plant sensor that will tag each plant individually so that it can be tracked and reported as it moves through the growth stages within the facility. In addition, basic plant conditions can be monitored, such as soil moisture and temperature, alerting growers if any individual plant needs corrective action.

Contact Libelium Sales Department for more information about our products.

More info:

- For technical details on Waspmote hardware, sensors and how to program a Smart Environment application: Smart Gases 3.0 Technical Guide
- For technical details on Waspmote hardware, sensors and how to program a Smart Agriculture application: Smart Agriculture 3.0 Technical Guide
- For technical details on Waspmote hardware, sensors and how to program a Smart Water application: Smart Water Technical Guide
- For technical details on Waspmote hardware, sensors and how to program a Smart Water Ions application: Smart Water Ions Technical Guide
- Read more about Libelium sensor product lines in the Waspmote, Waspmote Plug & Sense! Sensor Platform and Meshlium Gateway websites.

References:

- SensorInsight: sensorinsight.io/es

Discover our Smart Agriculture IoT Kits at The IoT Marketplace

More case studies at: http://www.libelium.com/resources/case-studies

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