



## Altrac Soil Moisture Hub

Wind machines are placed in key positions in the grove. They are easy to find, provide ideal locations to measure soil moisture, and enable growers to monitor irrigation characteristics of individual orchard blocks. Altrac now offers a cost effective combination of wind machine remote control and moisture monitoring for permanent crops.

The Soil Moisture Hub enables growers to connect moisture probes to their wind machine remote monitoring device. Support for additional environmental sensors, such as leaf moisture, pyranometer, etc are planned. The Soil Moisture Hub uses the telemetry signal and solar panel of the wind machine, reducing equipment costs and maintenance. Altrac bundles 10 years of data into the hardware cost and there are no monthly fees. The Hub supports Sentek and EnviroPro moisture sensors.



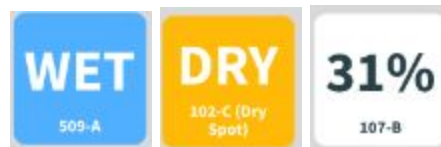
The Hub supports Sentek and EnviroPro moisture probes which are sold at different lengths. These probes typically have sensors every 4" along the access tube. The sensor readings at shallow depths (5" & 9") fluctuate more rapidly than those deeper below ground.

The Hub enclosure is waterproof, and mounts on a highway stake. Three IP67 cable glands provide inputs from the moisture probe and two pressure sensors.

### Intuitive Mobile Phone App

An intuitive software application provides fast, actionable information from the sensor to your phone or desktop.

Field personnel can learn the application in 10 minutes. A Spanish language version is available. For each probe, the application presents large Blue (WET), Yellow (DRY), and White (% above DRY) tiles to provide instant visual indication of soil moisture conditions.



Growers can set Maximum (WET) and Minimum (DRY) moisture levels within the application. These values are calibrated against traditional soil clump tests, or edge conditions such as when fields are flooded or dry.

A Create Rule function enables users to send SMS text messages as moisture levels approach Maximum or Minimum thresholds. The user can also set additional Set Points, which provide early warning that moisture levels are approaching Maximum or Minimum thresholds and provide advance notice to start/stop irrigation





## Combined and Individual Moisture Charts

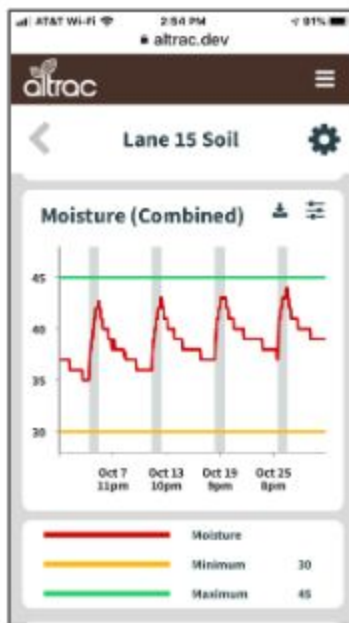
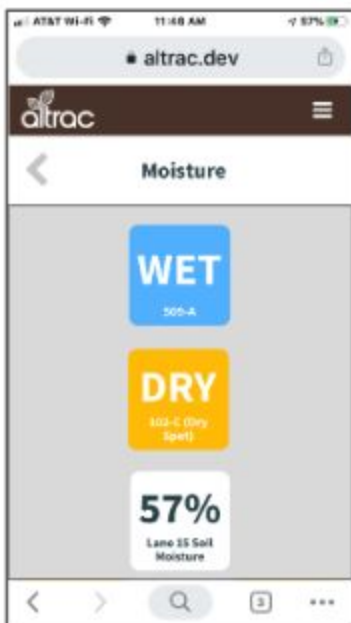
The application can display both Combined and Individual moisture level charts. The user can change the calendar settings to examine Combined or Individual moisture levels at different periods of time. The Combined chart presents the average of all individual sensors and provides rapid feedback that moisture levels are within the desired range.

The Individual chart provides color coded measurements of all sensors in the access tube. The system enables you to toggle different sensors on or off. The rate of change behavior at various sensor depths may be of interest to professional agronomists.

The Hub accommodates two pressure sensors (transducers or switches) which monitor the drip and frost water or overhead sprinkler lines. These sensors measure pressure in the line, represented by a vertical blue bar on the moisture chart; and provide temporal confirmation of irrigation cycles.

The grower can see moisture levels rise and fall between the watering events, and make judgements how often to irrigate. Two years of data are stored in the Altrac cloud, and reports are available to confirm that ranch personnel are following the irrigation schedule based on pressure switch data.

### Combined Moisture Chart



Click on the tile to display the Combined moisture level chart. This chart presents the average of all sensors (Red) vs. user defined Maximum (Green) and Minimum (Orange) moisture levels.

Values above the Maximum turn the tile Blue (**WET**). Values below the Minimum turn the tile Orange (**DRY**).

The system calculates the percentage above the Minimum (**DRY**), 57% in this case, and displays the value in a White tile.

The Hub accommodates two pressure sensors. The vertical blue bars on the chart above shows positive pressure sensor activity for the calendar period displayed. Growers can view how quickly moisture levels drop between watering events and adjust their irrigation schedule accordingly.

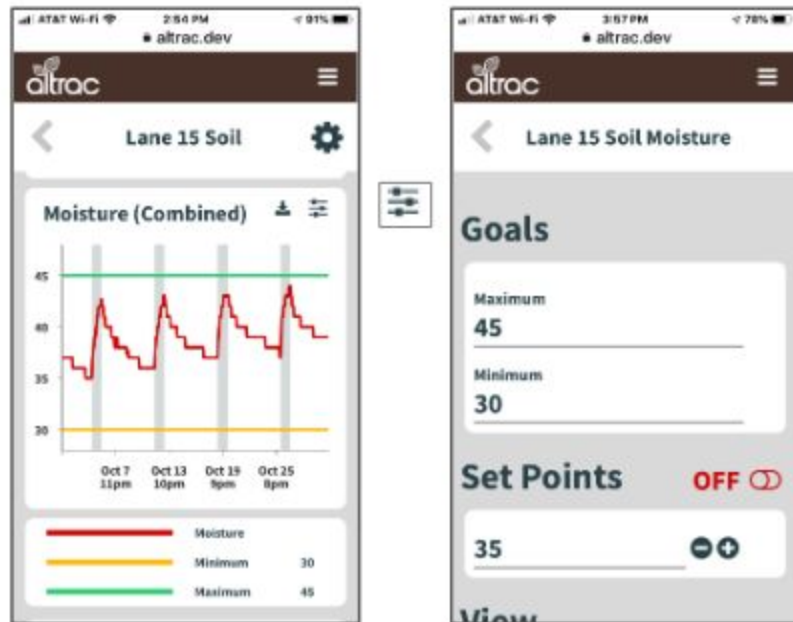


## Set Maximum / Minimum / SetPoints

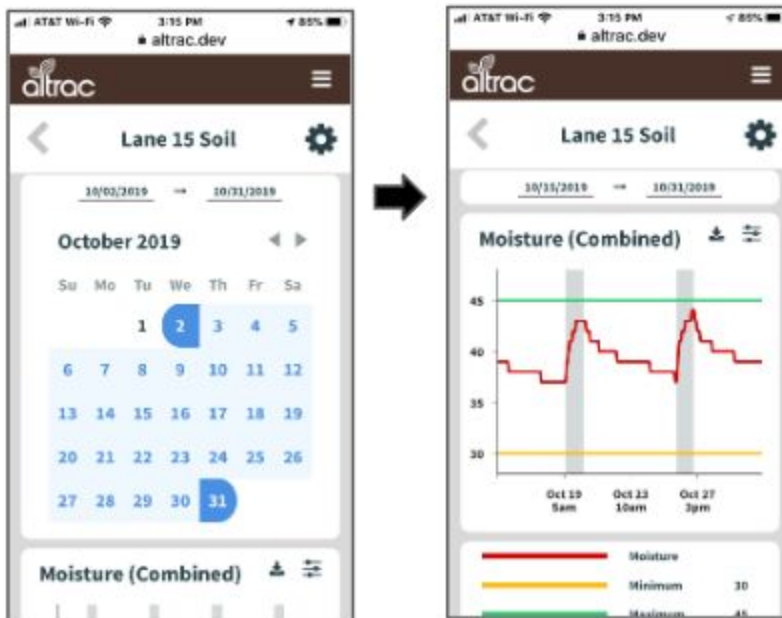
Press the icon to reset the Maximum and Minimum moisture levels within the application.

The user can also set any number of additional Set Points. Set Points are used to provide early warning that irrigation is required.

Saved Set Points appear as a dashed line on the chart.



## Changing the Calendar Display



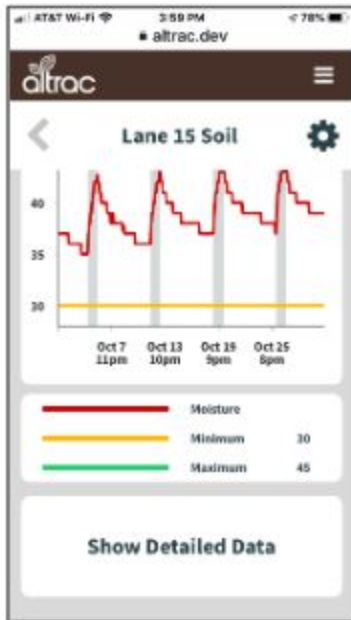
The user can change the calendar display by clicking on the Start / End Date hyperlinks.

Highlight the period of interest and reset the display from 30 days to 2 weeks.

Altrac saves two years of moisture probe data in our cloud. You can run reports of positive pressure sensor activity to check irrigation schedule compliance.



## Individual Moisture Chart



You can view the behavior of individual moisture and temperature sensors by clicking the Show Detailed Data button.

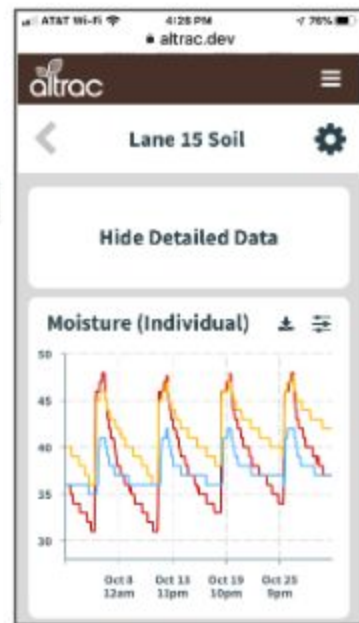
Hide Detailed Data presents the Combination chart.

Color coded curves for sensors at different depths will appear. Depending on the number of sensors in the tube, these charts can be difficult to interpret.

## View Individual Sensors

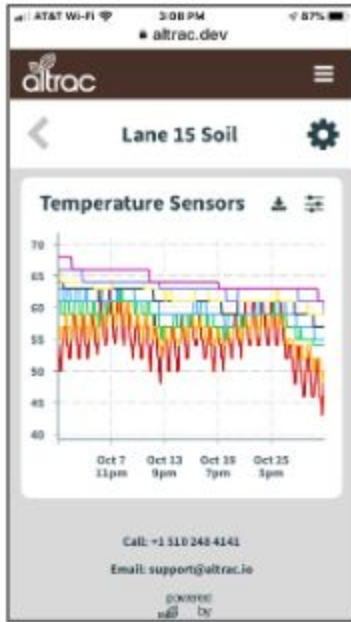
Click the icon to display the individual sensor depth labels. You can deselect individual sensors from the label box.

Click the icon again to view the sensors of interest and evaluate their behavior in detail.





## Configure SMS Text Alerts



The application also presents temperature data at different probe depths.

Click the gear icon to access the Create Rule function. Users can send SMS text messages based on temperature or moisture levels to their cell phones.

## Clients

Altrac the leading provider of IoT controllers for agricultural equipment. Clients include:

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