

PiCUS Tension

Prevent dry stress in trees with PiCUS Tension





Monitoring of soil parameters using suction tension, soil moisture, and soil analysis sensors

Easy, remote monitoring available through the IML Cloud enabling you to water your trees efficiently and resource-friendly.

The PiCUS Tension System can be installed both above and below ground – either directly during the planting of young trees or retroactively for existing trees that are particularly vulnerable or valuable. With its seven sensor connections, the system offers maximum flexibility: various sensor types such as suction tension, soil moisture, or soil analysis sensors can be individually combined and used. The suction tension sensors measure soil water tension, providing valuable information on water availability for the tree. Thanks to its flexible positioning - whether distributed over a wide area or specifically placed in the root ball at varying depths-soil conditions can be analyzed in a targeted manner. By combining suction tension and moisture sensors, precise irrigation recommendations can be derived. This enables resource-efficient watering, minimizing the risk of over- or under-supply. Additionally, moisture sensors can be precisely calibrated to the soil conditions by using suction tension sensors, often eliminating the need for elaborate soil analysis. With the optional connection of soil analysis sensors, a comprehensive, systematic assessment of soil conditions is possible, ensuring sustainable tree care and optimal site conditions.



Precise measurements for a better understanding of tree site conditions

Easy handling, simple installation, and immediate measurement results distinguish the PiCUS Tension.

Installation & Handling

The PiCUS Tension sensors can be installed directly at the site during the planting of young trees or retrospectively on mature trees that are particularly at risk or worth preserving. If desired, the sensor elements can be placed at different depths or positions around the tree. The central electronics can be attached above ground, for example on the planting stake of a young tree, or buried in the ground. The sensors can be positioned correctly with the help of an auger and the IML installation aid.

Soil water tension indicates the force with which

Measurement variables

water is held in the soil's pores - in other words, how much effort a plant must exert to access that water. The lower the soil water tension, the more easily water is available to plants. At high soil water tension, water becomes scarcely accessible for plant uptake. The suction tension measured by the PiCUS Tension is expressed as a pF value and is also color-coded on a traffic light scale for better visualization. In addition to soil water tension, the transmission unit also records the current temperature, which is visualized alongside the other measured values in a graph. The moisture sensor provides precise data on soil moisture, electrical conductivity, and soil temperature. These parameters allow for a reliable determination of the soil's or substrate's maximum water-holding capacity.

Additionally, the soil analysis sensor delivers key information on salt, phosphorus, potassium, and nitrogen content – essential values for targeted nutrient assessment and sitespecific tree care.

When using LTE, the hourly collected data is automatically stored in the IML Cloud every 12 hours. Data can be accessed easily at any time and from anywhere via the IML App or the WebGIS application.

PiCUS Tension evaluation:

The overall result of the Tension is the soil water tension, expressed as a pF value.

pF value
4,2
4,0
3,5
3,0
2,5
1,8

lue Irreversible damage, dying off Dry damage to be expected Severe drought stress Mild drought stress Water available Plenty water available





Individually configured for a variety of applications

The PiCUS Tension can be equipped with up to seven different sensors and connected via LTE or LoRaWAN[®].

Hardware

Depending on the application, the following components can be individually configured when ordering:

- Number of sensors: 1-7 units
- Measured parameters: Suction tension, soil moisture, temperature, and soil properties such as salt, phosphorus, potassium, and nitrogen
- Above-ground or below-ground installation: Optional cable protection minimizes the risk of damage from mowing, vandalism, or animal activity
- Wireless connectivity: Via LTE or LoRaWAN®
- Reusable transmission unit through replaceable battery and sensors
- Battery life up to 3 years
- Worldwide usable SIM card including 500 MB of data volume

Data Analysis

When using the LTE wireless standard, measurement data is automatically stored in the IML Cloud. The data can be accessed daily and independently of location via the IMLService-App or the browser-based WebGIS application. The cloud server is hosted by IML Electronic in Rostock, ensuring additional data security in accordance with German standards.

Data analysis is supported by customizable export functions, allowing for seamless further processing and in-depth evaluation.

In the LoRaWAN[®] version, the PiCUS Tension System transmits measurement data hourly to the customer's own LoRaWAN[®] network. Data can also be forwarded to the IML WebGIS for convenient visualization and further processing.



The PiCUS Tension can be equipped with up to seven robust sensors.

Efficient irrigation management through innovative data analysis

The IML Cloud and the browser-based IML WebGIS provide a clear visualization and structured analysis of all measurement data.

In-depth analysis

Thanks to the intuitive tree location registration and the clear map view, tree owners and responsible parties always have a clear overview of all deployed sensors. This allows for continuous monitoring of water availability for the trees and targeted, needs-based control of irrigation measures. During installation, the app captures not only the key tree parameters and GPS location but also the planned irrigation measures. The current measurement data is immediately visible and can be accessed directly. The IML WebGIS offers a variety of useful features such as filtering options, chart creation, comparison with other locations, and export functions. These tools enable precise analysis and easy handling of measurement data. The setup is particularly simple thanks to pre-

configured and pre-wired units that are ready for immediate use.

> More information via QR code!



Do you have any questions? We are happy to assist you personally

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With Passion and Precision

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Product information via QR code!

