



ENGLISH

Tensiometer TNS-03

Datatrasmision over
LoRaWan



**Datatransmission
LoRaWAN
Art. 46-46-273**

Tensiometer TNS-03

via Datatransmission over LoRaWAN

In **fruit growing and viticulture**, but also in other areas of agriculture, products should meet ever **higher quality** criteria. In order to be able to continuously guarantee these standards, technical aids that can measure all environmental influences are increasingly being used. **Optimizing the irrigation system helps to maximize yields and minimize costs.**

Functionality

The tube of the **tensiometer** is filled with water. The probe and tube are then placed next to the plants up to the root depth. The soil begins to absorb the water until a balance of suction tension and soil water is reached.

The higher the suction pressure, the drier the soil - and the lower the suction pressure, the wetter the soil. Depending on the type and variety of plant. If the pressure is kept within a certain range by irrigation.

The current data as well as graphical recordings are displayed via the **cloud** on your **browser** and **smartphone**.

In addition, an **alarm** can be sent via email or app if the limit you have set is exceeded or not reached.

Constant soil moisture during the vegetation phase leads to optimum growth and therefore to a higher quality harvest.

Soil moisture can be **measured with high precision** using the TNS-03 tensiometer in order to intervene accordingly. To do this, the probe is inserted into the soil and the suction pressure is determined.

Communication

The tensiometer communicates via radio (**LoRaWAN**). A LoRaWAN gateway bridges the measured data via the internet to the cloud.

The range can extend over several kilometers. Depending on the conditions, data can be transmitted over 20 km.

All measured values are **periodically** sent to the Elmed cloud via the internet connection. These are accessible via the **Elmed web interface** and **SmartMeteo** (available for Android and iOS) and are displayed graphically.

The following additional sensors can be connected to the TNS-03 tensiometer via the **integrated plug connection**:

- Watercounter
- Pressostat for watering recognition
- 2x Analoginput 4-20mA
- 12V Digitaloutput toggling bistable valves



LoRaWAN Gateway - what is it used for?

The LoRaWAN Gateway serves the LoRaWAN soil moisture as a path to the Internet - via a SIM card, but also, for example, at home via a network cable, the LoRaWAN Gateway forwards the soil moisture data. The LoRaWAN radio link can connect several devices over several kilometers (depending on the condition).



**Tektelic Gateway
Art. 36-36-0378**

Der Structure

The **TNS-03 tensiometer** consists of a cylindrical PVC tube with a porous ceramic cell and the upper part. The upper part contains the entire electronics with **battery, solar panel, radio antenna, processor and sensors**.

Thanks to its low energy consumption and the integrated solar panel, the **Tensiometer TNS-03** is particularly low-maintenance.

Assembly

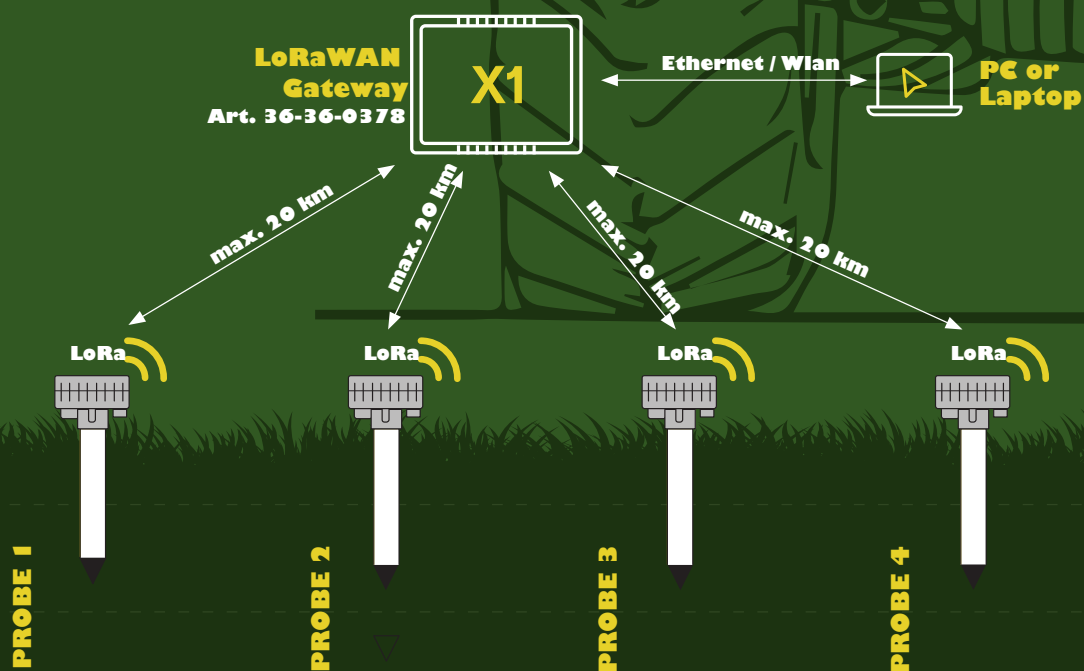
The installation is carried out by **preparing a drilling a hole** in the field using a special drill.

The probe can be protected **against mechanical damage** by **attaching a protective tube**.
mechanical damage.

Precipitation can pass unhindered pass through.

Technical data

Measurement principle:	Suction tension
Powersupply:	3xAA rechargeable battery
Solarpanel:	Internal 0.5 W Photovoltaic
Measurementrange:	$\pm 1034\text{mBar}$ ($\pm 15\text{psi}$)
Resolution:	$\pm 0,25\%$
Datatransmission:	LoRa 868Mhz LoRaWAN
Connectors:	<ul style="list-style-type: none">• Watercounter• Pressostat for recognizing watering• 2x Analoginput 4-20mA• 12V Digitaloutput to toggle bistate valves
Dimension:	120x440x22mm

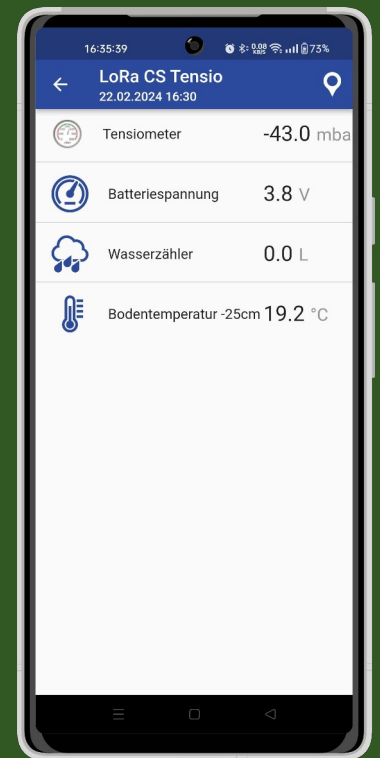


App- & Webapplication for Tensiometer TNS-03

Mobile

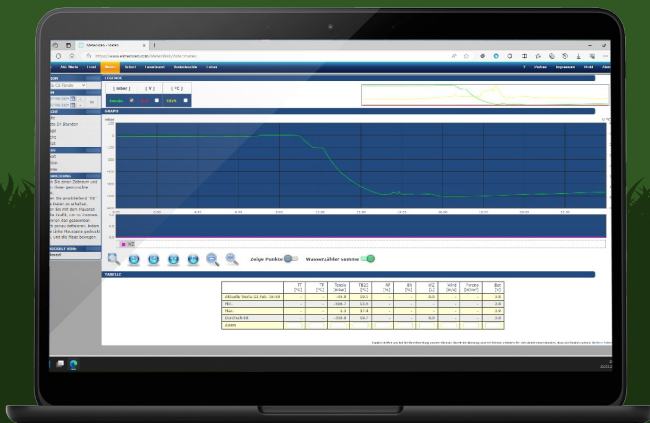
The measurements of the **TNS-03 tensiometer** can be viewed quickly at any time on a **smartphone** or **tablet** (app available in the Apple AppStore and Google PlayStore) at any time.

The current values are displayed as a quick overview. A click on a sensor shows a daily graph. A longer period can also be viewed in landscape format.



PC

Using a browser, you can graphically record all measurements at a glance. It is also possible to export the data and evaluate it further.

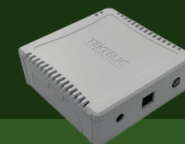


Alarm

You can set an upper and lower limit so that you are automatically automatically (notification via the app and/or email) if the suction pressure exceeds/falls below the limits.

Art. 36-36-378

LoRaWan Gateway



Art. 46-46-273

Elmed Software

