

## USER'S GUIDE

### HORTIMETRE M & M Wireless

#### Information to User



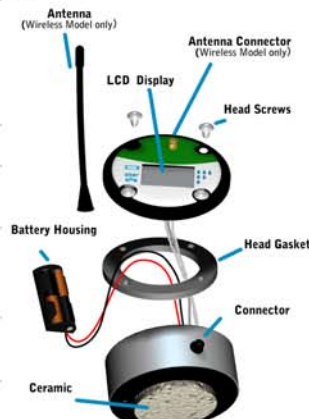
The user's manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

HORTIMETRE probes are derived from a new optical and digital patented technology that allows readings of capillary mats.



HANDLE THIS PROBE WITH CARE AT ALL TIME. AVOID ANY CONTACT WITH GREASE AND OIL. DO NOT COMPLETELY SUBMERGE IN A LIQUID.

## 1 WARNING



## 2 GETTING STARTED

### INSTALLING AND CHANGING THE BATTERIES



1. With hexagonal key included in the package, loosen the 4 screws placed on the head or the Hortimetre.
2. Carefully remove the head of the instrument from the metal receptacle.
3. Insert two(2) AA batteries in the Battery Housing, facing opposite directions, in accordance with the pattern indicated within the Battery Housing.

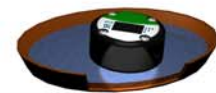
## 2 GETTING STARTED



4. Verify that the instrument is activated by checking if the display is working. If not, refer to the TROUBLESHOOTING section of this manual.

#### ACTIVATION

A-. Put the Hortimetre in a clean container filled with free water. The ceramic head of the Hortimetre should be in contact with the water.



NEVER IMMERSE THE HORTIMETRE

## 2 GETTING STARTED

2. Let the instrument rest, with ceramic head immersed, for 15 minutes.



3. Check that the display indicates a reading between 00.0 and 00.2. If this is not the case, refer to the TROUBLESHOOTING section of this manual.



**Battery indicator**  
If this indicator is displayed, it means that the power level of the battery will prove to be insufficient in the short run.



**Tension indicator**  
The label indicates the instrument's scale of measurement. The Hortimetres display soil tension on a centibar or kilopascal scale.



**Moisture indicator**  
This indicator is displayed according to the general moisture conditions of the soil. It does not give an accurate measurement, but rather an estimate based on the full spectrum of the instrument (0 to 1.5 cbar).  
3 drops : Wet  
2 drops : Mid-Range Spectrum  
1 drop : Dry

## 2 GETTING STARTED

**Analog connector**  
All HORTIMETRE models are equipped with a HR30-GR6F analog connector. It will be possible to connect it to an irrigation management system.

**Antenna connector**  
The receiver connector for the antenna (wireless model only) is located on the head of the HORTIMETRE.

**Antenna (wireless model)**  
The antenna screws on to the connector screw located on the head of the HORTIMETRE. This antenna must remain screwed on for the lifetime of the instrument.

Use the HORTAU Irricom Wireless Receiver to connect a wireless model.

**Dust Cap**  
In order to avoid any dust or water infiltration through the connector, leave the Dust Cap in place whenever the Hortimetre is not using this connector.

## 2 GETTING STARTED

**Head Screws**  
The screws on the head of the instrument must be tightened and loosened using the hexagonal key included in the package. These nuts must not be replaced with substitutes.

#### INITIALIZATION AND POWER-ON PROCEDURE

During the power-on procedure, the instrument goes through an initialization routine, the progression of which is displayed on the screen.

- 1) All LCDs displayed
- 2) One-second pause
- 3) Battery power level displayed (mV)
- 4) Tension char / kPa displayed

THIS EQUIPMENT SHOULD BE PROTECTED AGAINST FROST AT ANYTIME AND UNDER ANY CIRCUMSTANCE. ANY DAMAGE DUE TO FROST IS NOT COVERED BY THE WARRANTY.

## 2 GETTING STARTED

#### LOCATION & INSTALLATION

For a better interpretation of the readings, the Hortimetre should be placed in a representative location. The plants (growth stage, size, species, etc.) and the ambient conditions (brightness, wind, air moisture, etc.), as well as the characteristics of the soil or substrate, are variable parameters. Hence, the soil water tension (moisture) varies from one location to the next. Here is how to choose a location for the Hortimetre and determining the number of Hortimetres needed in a given situation.

CAPILLARY MAT TENSION IS A VARIABLE PARAMETER BASED ON CLIMATIC CONDITIONS AND DATA, AND SOIL OR SUBSTRATE CHARACTERISTICS. THE HORTIMETRE PERFORMS A MEASUREMENT FROM THE LOCATION WHERE IT HAS BEEN INSTALLED. THIS IN NO WAY GUARANTEES THAT THE TENSION READING WOULD BE THE SAME AT ANOTHER LOCATION, EVEN IF IT WERE CLOSE TO THE INSTRUMENT. CANNOT IN ANY CASE REPLACE PERSONAL ASSESSMENT.

## 2 GETTING STARTED

#### A-. Determine irrigation areas.

If your irrigation system is installed, this exercise must have been completed during the design stage of the system. Normally, an irrigation valve controls the watering of a specific area. Watering in this area is relatively consistent, such that the plants it contains must normally have similar water needs. If you water manually, define the areas where plants have similar water needs.

#### B-. Install at least one Hortimetre per irrigation area.

Five Hortimetres are ideally needed to manage irrigation and get an average representation of the water needs of plants. However, three Hortimetres are enough to ensure proper management.

THE NUMBER OF HORTIMETRES PER IRRIGATION ZONE IS GIVEN BY WAY OF INDICATION ONLY. EVERY SITUATION INVOLVES PARTICULAR CIRCUMSTANCES THAT CANNOT BE ESTABLISHED IN THIS MANUAL. THESE INDICATIONS CANNOT IN ANY WAY REPLACE PERSONAL JUDGMENT.

## 2 GETTING STARTED

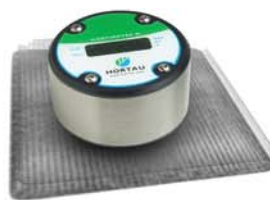
#### INSTALLATION ON CAPILLARY MAT

#### A-. Determine the location

Install the Hortimetre on the piece of substrate by following the irrigation area concept.

For a better contact between the mat and the ceramic, pour water around the Hortimetre and let the mat absorb it.

The instrument will give a reliable reading within 15 minutes



## 2 GETTING STARTED



#### B-. Wetting the ceramic

Wet the ceramic by letting it soak in drinking water for 10 minutes. The theory of operation of the Hortimetre is based on the balance between the water tension (moisture) of the ceramic and that of the soil. By wetting the ceramic before installing it onto the mat, this balance will be established within about 15 minutes. Without this initial wetting, the Hortimetre would need several hours in order to reach a balance with the mat. If the mat is very dry, it could even be necessary to wait until the next watering or rainfall before reaching that balance.

#### C-. Preparing the mat

Prepare the surface of the mat on which the instrument will rest. Make sure the surface is clean and corresponds to the irrigation area concept.

## 3 IMPORTANT NOTICE

Operation is subject to the following two conditions: (1) This device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power(EIRP) is not more than that required for successful communication.

This equipment has been tested and found to comply with the limits for Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This device has been designed to operate with an antenna having a maximum gain of 2.2 dB. Antenna having a higher gain is strictly prohibited per regulations of Industry Canada. The required antenna impedance is 50 ohms.

## 4 COMMUNICATIONS



#### Autonomous Mode

The Hortimetre is exclusively battery-operated. The tension measurement of the growing environment can be read directly on the Hortimetre display. The display is refreshed every five minutes.



#### Connected Mode

The Hortimetre is connected to an irrigation monitoring system by a wire linked to the connector located under the head of the Hortimetre. While operating in connected mode, it is recommended to use Ni-Cd type rechargeable batteries. These batteries keep the display working even when the Hortimetre is not being supplied by the irrigation monitoring system.

#### Wireless Mode

Only Hortimetre W/L can be used in wireless mode. In wireless situation, the force of the signal, as well as the level of remaining power available, are transmitted to the Irricom Wireless Receiver from Hortau. Then, the Irricom Wireless Receiver could be hook-up to a Long Range Emitter Receiver(enabling a wide area of monitoring) or connected to a PC or portable PC using the Irricollis software from Hortau.

## 4 COMMUNICATIONS

**Irricom Wireless Receiver**  
The Irricom Wireless Receiver is a dedicated device that receives the RF signal from the Hortimetre and that convert it into RS-232 communication protocol.

**Irricom Long Range Wireless Emitter/Receiver**  
The Irricom Long Range Wireless Emitter/Receiver enables a non-stop communication over a 25 000 feet distance, from an Hortimetre to your PC.

**Irricom DC Battery Pack**  
Using 8 D batteries, the Irricom Battery Pack provides 12 DC Volts to any Hortimetre peripheral, such as Irricom Long Range Emitter/Receiver or Irricom Wireless Receiver. The Irricom Battery Pack provides its power through a HR30GR6F connector.

## 5 TROUBLESHOOTING

#### No Display

- a. Verify that the batteries are not dead by replacing them with new ones.
- b. If the batteries are good, shake the instrument from left to right while maintaining in a vertical position. If the display comes back on, it was a case of bad battery contact.
- c. If the problem continues, use the attached warranty form.

#### Ceramic end piece does not wet

- a. Let the ceramic soak in a thin layer of water(half inch) for 24 hours. The display should gradually return to 0.00.
- b. If the problem continues, use the attached warranty form.

#### Worn or broken ceramic

- a. The material used for the end piece is brittle. Minute splinters and scratches may appear at its surface with extended use. These do not hinder the good operation of the instrument.

## 5 INFORMATIONS

All Models	Specs
Display:	LCD
Power Supply:	2.4 to 3.3 DC
	50 mAmp
Data Output :	Analogic
Signal :	0 - 3 Volt DC
Connector	HR30-GR6F
Battery :	2 x AA
Weight :	1,25 kg
Height:	14cm
Length:	6 cm
<b>Wireless Models</b>	<b>M-WL</b>
Frequency :	418 mHz
Communication Protocol :	RS232
<b>Sampling Spectrum</b>	
cbar/kPa :	0.00 to 1.50



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