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## **MT-MICRO USER MANUAL**

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Versie 1.2

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## MANUAL FOR IRRIGATION SETTINGS MT/MICRO

### version 1.2

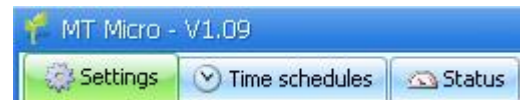
The MT/Micro is a very compact fully-fledged irrigation computer with a huge number of options. To enable the MT/Micro to be set up, connect it to a laptop or a PC. Programming is done using the MT/Micro software (free, see [www.mastop.nl](http://www.mastop.nl)) and the USB cable supplied.

In addition to the extensive irrigation settings, a low water contact can also be connected to the MT/Micro and it is even possible to connect a soil moisture sensor or temperature sensor to it. The alarm output notifies you if a limit value is being exceeded (no water, moisture level in the substrate too low, battery voltage too low). Optionally, a GSM alarm device can be connected. The menu allows you to set the desired language (German, French, English and Dutch).

The following describes step by step what all the options are for programming the MT/Micro. The numbers correspond to the numbers on the 'Overview of setting screen' on the last page.

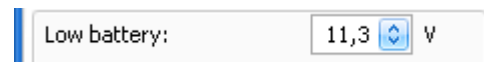
#### 1. Setting:

Click at the top of the menu bar of the settings screen on the "settings" tab.



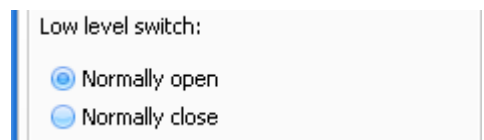
#### 2. Setting the lower limit for the battery voltage:

The MT/Micro can also operate on a battery (12V DC). Ideal for mobile projects or projects where there is no mains electricity supply to hand. You can choose for yourself how low the voltage may be before the MT/Micro issues a warning. Take care not to set it too low in connection with damage to the battery and/or the MT/Micro. If you use the accompanying AC adapter, this function will not work. In that case, set the low battery voltage to 11 V.



#### 3. Setting the "Water Level Low" contact:

The MT/Micro is capable of giving a warning the moment the water level in a buffer is too low. Here you can choose which type of low contact you wish: "Normally open" contact or "Normally close" contact



#### 4. Setting Continuous Alarm:

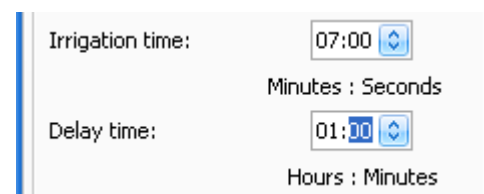
The moment you connect a (GSM) alarm device to the alarm output of the MT/Micro, you need to activate the "Continuous Alarm" setting. If you do not connect any (GSM) alarm signal, Continuous Alarm must be switched off.



#### 5. Irrigation settings

The irrigation time of the MT/Micro can be set in minutes and seconds.

The delay time of the MT/Micro can be set in hours and minutes.



## 6. Options menu for setting the sensors:

It is possible to connect a single sensor to the MT/Micro. This can be a soil moisture sensor (4-20 mA) or a temperature sensor (4-20 mA).

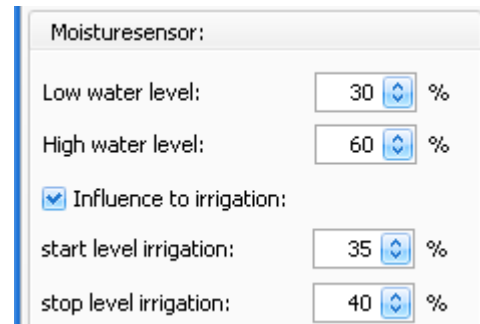


*Note It is not possible to connect both sensors simultaneously!*

## 7. Moisture Sensor Settings:

Activate the moisture sensor in the options menu for setting the sensors. (See No. 6)

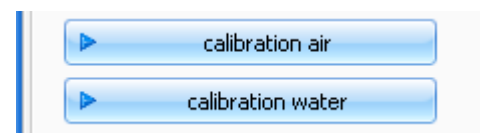
- Low moisture level = the lower limit of measurement at which the MT Micro will issue an alarm.
- High moisture level = the upper limit of measurement at which the MT Micro will issue an alarm.
- Influence on irrigation = By activating this, the MT/Micro will actually influence the irrigation settings. Starting and stopping an irrigation cycle is then determined by the moisture values you have set using:
- Start level irrigation = if the moisture value falls below this limit, the irrigation settings are activated.
- Stop level irrigation = if the moisture value rises above this limit, the irrigation settings are not activated! (skipped)



## 8. Calibration of the moisture sensor:

The associated MT/Micro moisture sensor is 4-20 mA and provides a linear measurement. It is important to calibrate the moisture sensor prior to use. This is done as follows;

- [a] make sure that the sensor is completely dry and press only once on Calibration Air.
- [b] immerse the sensor completely in water, and press only once on Calibration Water.



The sensor is now ready for use.

## 9. Stop button Irrigation non-active:

By activating this button, the entire scheme is stopped. If you press the button again, the entire scheme is reactivated.



## 10. Use lighting:

Activating this gives you the option to connect lighting (up to 2 A) by way of the alarm output of the MT/Micro, (for example: shining light on a plant wall). With this, you can set the times when the lighting may be active.

The alarms are indicated by having the lighting flash on and off. Larger capacities should be connected via a relay (12 V DC), (to be done by a qualified electrician).



**Note: Do not use this if your light source cannot withstand being switched rapidly on and off (gas discharge and/or fluorescent lamps). Using a GSM alarm device or connecting a buzzer alarm is no longer possible with this application.**

### 11. Settings for water pump (or solenoid valve):

With this setting, you have the option of letting the pump be controlled by the irrigation program or activating it manually. The latter may be useful when testing the system. The pump output of the MT/Micro has a rating of 12 V DC and max. 4 A. Larger pumps can be activated via a 12 V DC relay. It is also possible to connect a solenoid valve (12 V DC) to this output.



Waterpump:

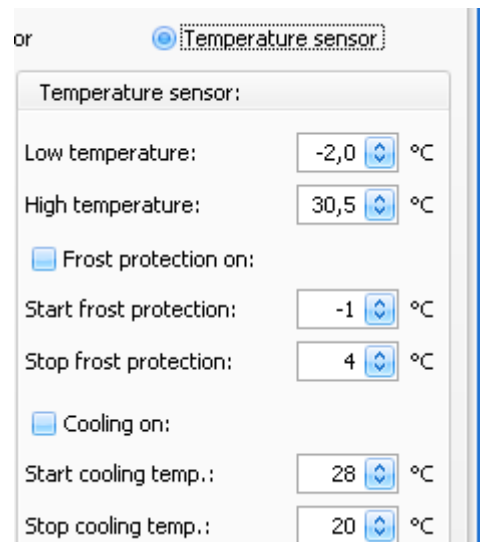
Automatic

On

### 12. Settings for the Temperature sensor:

Activate the temperature sensor in the options menu for setting the sensors. (See No. 6)

- ◆ Low temperature = the lower limit of measurement at which the MT Micro will issue an alarm.
- ◆ High temperature = the upper limit of measurement at which the MT Micro will issue an alarm.
- ◆ Frost protection on = By activating this, the MT/Micro will switch off the irrigation settings if the temperature falls below the set value which is indicated by: Start frost protection. Irrigation is reactivated if the value exceeds the set value indicated by: Stop frost protection.
- ◆ Cooling on = In fact the same as the frost protection but in this case irrigation can be activated as a cooling function (for example: roof irrigation).



or  Temperature sensor

Temperature sensor:

Low temperature:  °C

High temperature:  °C

Frost protection on:

Start frost protection:  °C

Stop frost protection:  °C

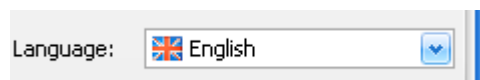
Cooling on:

Start cooling temp.:  °C

Stop cooling temp.:  °C

### 13. Language selection menu:

Select the language you want here: German, English, French, Dutch



Language:

### 14. Settings for time schedules:

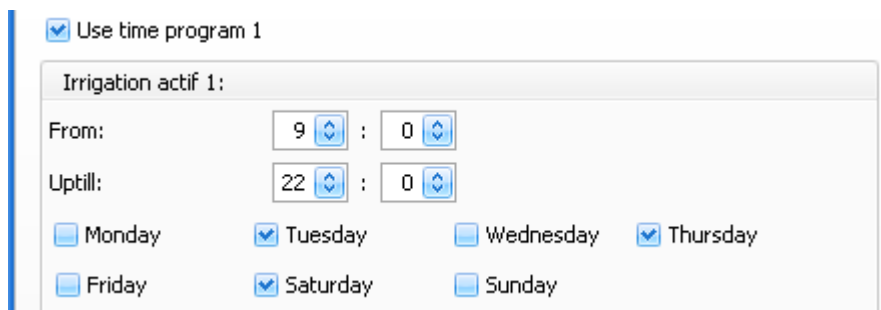
Click at the top of the menu bar of the settings screen on the 'Time schedules' tab to set the irrigation periods.



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### 15. Use time program 1:

With this program, you actually determine the period within which the set irrigation scheme (which you have already entered in the settings tab) may be active. In this case, it is from 09:00 to 22:00 on Tuesday, Thursday and Saturday.



Use time program 1

Irrigation actif 1:

From:  :

Uptill:  :

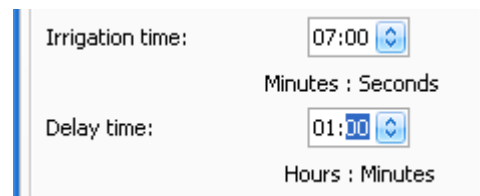
Monday  Tuesday  Wednesday  Thursday

Friday  Saturday  Sunday

◆ Example 1:

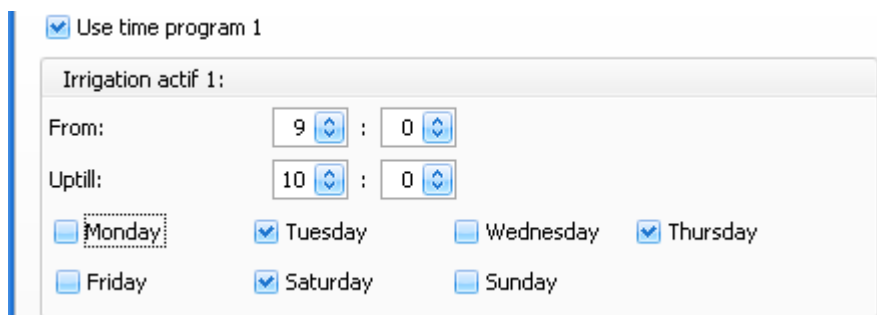
To the right, you see the settings screen that you find on the Settings tab. (See No. 5 setting the irrigation time and delay time). The irrigation time is set here to 7 minutes and the delay time to 1 hour.

In “time program 1” set above, this means that at 09:00, water will first be given for 7 minutes followed by a delay period of 1 hour. This continues repeating until 22:00 on Tuesdays, Thursdays and Saturdays.



◆ Example 2:

We keep the same irrigation and delay times as in Example 1 but we now set the time program from 09:00 to 10:00. This means that at 09:00, water will first be given for 7 minutes followed by a delay period of 1 hour. After this time, the irrigation period has ended and no further irrigation will take place that day.



🌿 16. Using several time programs simultaneously:

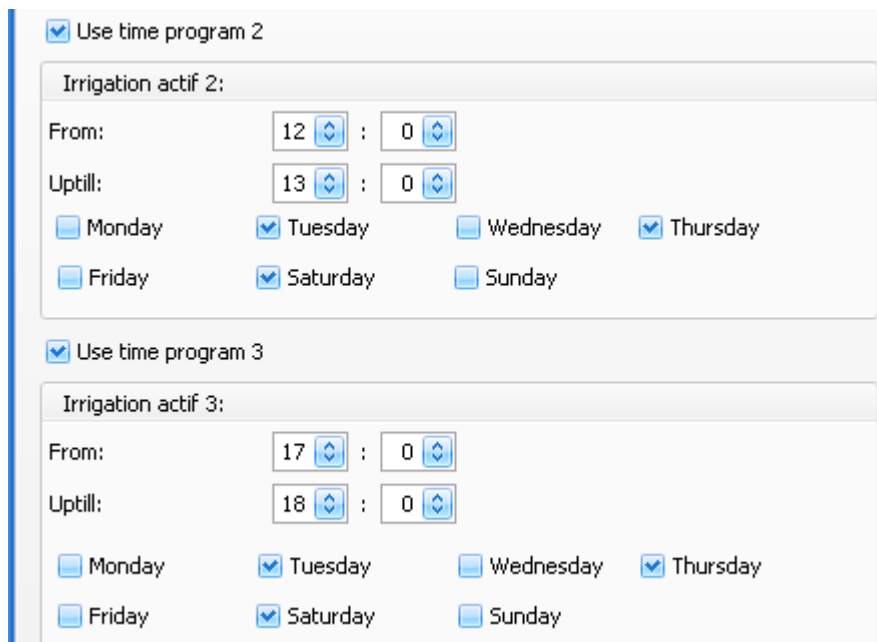
With the MT/Micro, you have the option of operating multiple time programs simultaneously. As a result, the options are virtually unlimited.

◆ Example 3:

We keep the same irrigation and delay times as in Example 1 but in addition to time program 1, we also set time programs 2 and 3.

The result is that the irrigation times start at 09:00 as in Examples 1 and 2 with 7 minutes of watering followed by a delay period of 1 hour. After this, the irrigation period of time program 1 has ended.

The settings for “clock program 2”, however, ensure that at 12:00, another irrigation period is activated. The result is that at 12:00, yet again 7 minutes of watering takes place followed by a delay period of 1 hour. Afterwards, this period has also ended. Time program 3 actually repeats yet again the same irrigation period at 18:00.



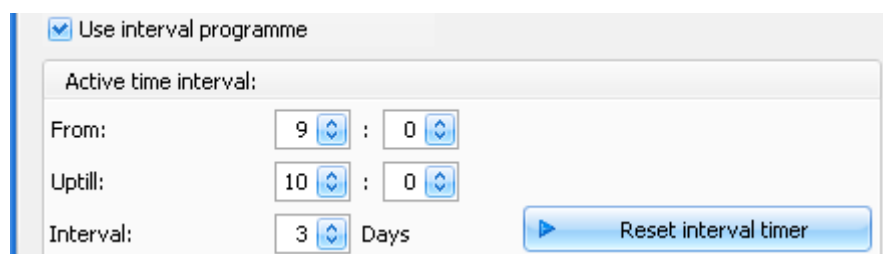
On that day, therefore, watering takes place three times and as you can see from the settings, those are always on the same days. However, it goes without saying that you are free to choose, so you understand that there is an infinite number of possibilities to achieve the most ideal irrigation setting for your project

### 17. Using the Time Interval Program:

This program gives you the option of setting an interval. We are thus no longer looking at specific days of the week but at a fixed number of days between irrigation periods.

#### Example 4:

Taking as starting point the same irrigation and delay times as in the previous examples, here too watering will take place at 09:00 for 7 minutes followed by a delay period of 1 hour. After this, the active irrigation period has ended.

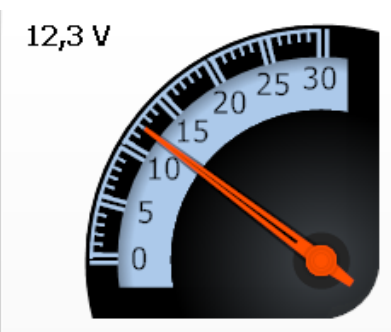


This cycle is repeated every 3 days. By pressing the “Reset interval timer” button the interval period goes into operation from that day.

**Note:** You can moreover use both the time programs and the interval program simultaneously and in no particular order.

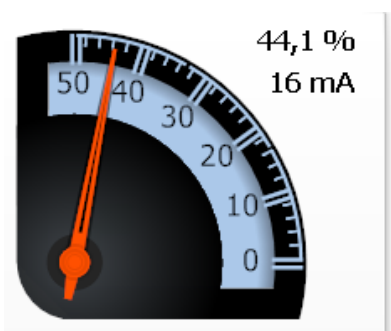
### 18. Viewing the status of the MT/Micro:

Click on the “status” tab on the menu bar



### 19. Battery voltage/Supply voltage:

Here you can check the current supply voltage to the MT/Micro.



### 20. Moisture values or Temperature:

Here you can see the actual moisture values that the associated moisture sensor is indicating. (If you have a temperature sensor connected, it will tell you the current temperature.)



### 21. Status of Alarms:

Here you can see an overview of the alarms. The water level alarm turns red the moment the alarm is activated, and means that there is not enough water in the buffer. The second alarm relates to the moisture or temperature sensor (depends on which of these is connected). This also turns red the moment the alarm is activated, which means that a limit that has been set has been exceeded.

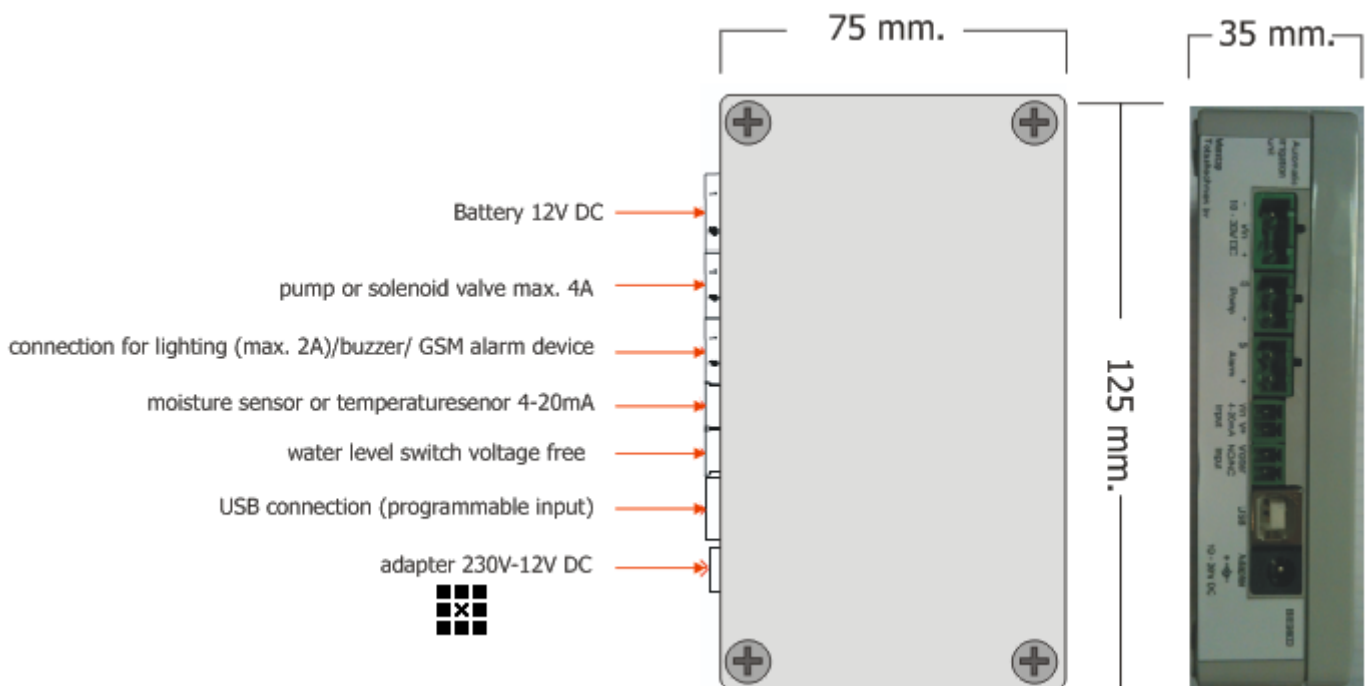


### 22. Status of pump and delay time:

Here you can see whether the pump is activated and the status of the delay time set.

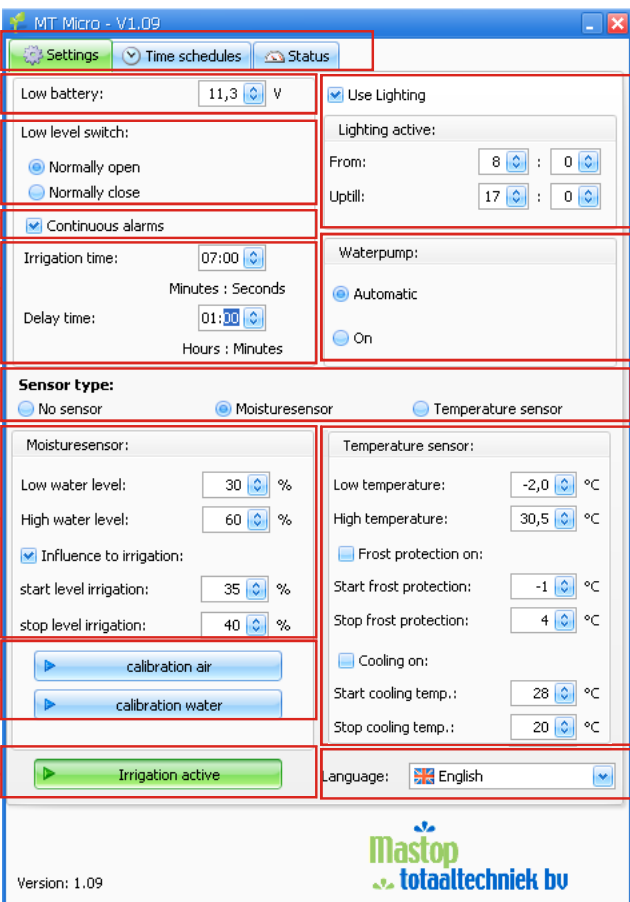


### 23. Connection diagram:





 Overview of setting screen



1 ← Settings | Time schedules | Status

2 ← Low battery: 11,3 V

3 ← Low level switch:  
 Normally open  
 Normally close

4 ←  Continuous alarms

5 ← Irrigation time: 07:00  
 Minutes : Seconds  
 Delay time: 01:00  
 Hours : Minutes

6 ← **Sensor type:**  
 No sensor  Moisturesensor  Temperature sensor

7 ← **Moisturesensor:**  
 Low water level: 30 %  
 High water level: 60 %  
 Influence to irrigation:  
 start level irrigation: 35 %  
 stop level irrigation: 40 %

8 ← calibration air  
 calibration water

9 ←  Irrigation active

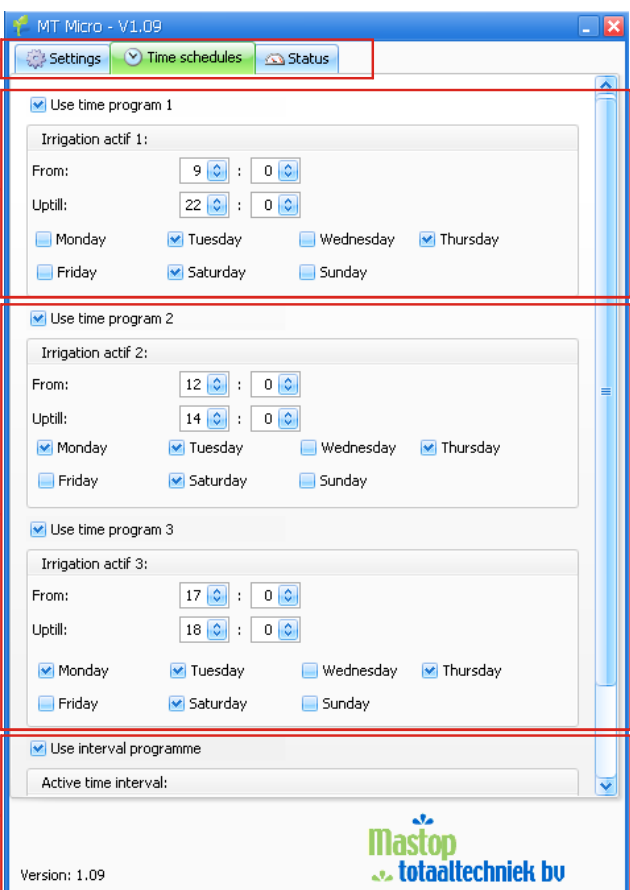
**Lighting active:**  
 From: 8 : 0  
 Uptill: 17 : 0

**Waterpump:**  
 Automatic  
 On

**Temperature sensor:**  
 Low temperature: -2,0 °C  
 High temperature: 30,5 °C  
 Frost protection on:  
 Start frost protection: -1 °C  
 Stop frost protection: 4 °C  
 Cooling on:  
 Start cooling temp.: 28 °C  
 Stop cooling temp.: 20 °C

Language: English

Version: 1.09



14 ← Settings | Time schedules | Status

15 ←  Use time program 1  
 Irrigation actif 1:  
 From: 9 : 0  
 Uptill: 22 : 0  
 Monday  Tuesday  Wednesday  Thursday  
 Friday  Saturday  Sunday

16 ←  Use time program 2  
 Irrigation actif 2:  
 From: 12 : 0  
 Uptill: 14 : 0  
 Monday  Tuesday  Wednesday  Thursday  
 Friday  Saturday  Sunday

Use time program 3  
 Irrigation actif 3:  
 From: 17 : 0  
 Uptill: 18 : 0  
 Monday  Tuesday  Wednesday  Thursday  
 Friday  Saturday  Sunday

17 ←  Use interval programme  
 Active time interval:

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