PRO-6 Multi Sensor unit

THIS MANUAL CONTAINS IMPORTANT SAFETY INSTRUCTIONS

User manual

PRO-6 Multi Sensor unit rev 6.2.4

PRO-6 Multi Sensor Unit

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PRO-6 Multi Sensor Unit

⚠ IMPORTANT SAFETY INSTRUCTIONS

01. General Safety Precautions for CTgrow Products

Please note that the following safety precautions apply to all the CTgrow sensor products:
Retain Instructions: Retain the safety and operating instructions provided with the product for future reference. Read and understand all operating and usage instructions. Observe and adhere to all warnings on the product and in the operating instructions.

1. Damage Requiring Service: If any of the following conditions occur, unplug the product from the electrical outlet and take it to an authorized CTgrow service provider:

   • The power cord, on-board connectors, or system's power inlets are damaged.
   • Liquid has been spilled or an object has fallen into the product.
   • The product has been dropped, exposed to water, or is damaged in any way.
   • The product does not operate normally when following the operating instructions.

2. Servicing: Do not attempt to service CTgrow products yourself, unless specifically instructed in the documentation. Opening or removing covers marked with warning symbols or labels may expose you to electric shock. Service required for components inside these compartments should be performed by an authorized CTgrow service provider.

3. Mounting: To ensure safe usage, avoid using the product on an unstable table, cart, stand, wall, or bracket. Instability may lead to the product falling, resulting in bodily injury or damage. Use appropriate mounting solutions and follow the manufacturer's recommendations for secure installation.

4. Ventilation: Proper ventilation is crucial for the reliable operation of CTgrow products. Ensure that slots and openings in the product are not blocked or covered. Blocking these openings may result in overheating and potential damage to the product. Do not place the product in a built-in apparatus, such as a bookcase or rack unless it is specifically designed to accommodate the product and provides proper ventilation according to the product's instructions.

5. Grounding (Earthing) Products: For your safety, only use ground fault circuit interrupters (GFCIs) on outlets used to power CTgrow devices. CTgrow products come with a three-wire electrical grounding-type plug that has a third pin for grounding. Do not attempt to insert the plug into a non-grounded outlet. If the plug cannot be inserted, contact an electrician to replace the outlet with a properly grounded one.

6. Water and Moisture: When using CTgrow electrical equipment in damp areas, take precautions to ensure personal safety. Wear insulated footwear and ensure you are protected by a GFCI. Keep the CTgrow equipment clear of direct contact with water or moisture to prevent any damage or electrical shock hazards. If the product comes into contact with liquid, immediately unplug it from the power source and contact an authorized CTgrow service provider.

7. Compliance with Local Regulations: Adhere to all relevant local regulations and safety standards when installing and operating CTgrow products. Ensure that the product is used in accordance with the applicable laws and regulations of your region.

Following these safety precautions will help minimize the risk of fire, bodily injury, electrical shock, and equipment damage. Always refer to the specific safety instructions provided by CTgrow for your particular product model, and seek professional assistance if needed. Your safety is of utmost importance.

PRO-6 Multi Sensor Unit

03. Introduction to the PRO-6 Multi sensor unit

The PRO-6 unit is a cutting-edge solution designed to revolutionize the way environmental conditions are monitored in grow rooms and greenhouses. With its array of high-precision sensors, this advanced monitoring system ensures optimal growth conditions for plants, enabling cultivators to maximize yields and achieve superior crop quality.

At the heart of the PRO-6 lies a sophisticated set of sensors that provide real-time data on key environmental variables.

Two temperature sensors, dedicated to air and water/soil monitoring, enable precise control of temperature levels, ensuring that plants thrive in the ideal climate for growth.

In addition to temperature monitoring, the PRO-6 unit includes a relative air humidity sensor. By precisely measuring humidity levels, cultivators can optimize the moisture content in the air, mitigating the risk of diseases and promoting healthy plant development.

The PRO-6 takes light measurements to the next level with its light level sensor. The light sensor allows cultivators to accurately measure the quantity of visible light present in the grow room or greenhouse. it assess PPFD (photosynthetic Photon Flux Density), providing valuable insights into the photosynthetic efficiency of plants.

The PRO-6's infrared VPD sensor sets it apart from conventional monitoring systems. By measuring Vapor Pressure Deficit with leaf/canopy temperature, this sensor provides valuable information about the transpiration rates and water needs of plants. This insight allows cultivators to fine-tune irrigation strategies, ensuring optimal water management and preventing the onset of water stress.

To combat the potential risks of mold and mildew, the PRO-6 unit incorporates a special DTM (Days to Mold) sensor. This innovative feature monitors the risk of mold and mildew growth, alerting cultivators to take preventive measures at the earliest signs. With this sensor, cultivators can protect their crops from harmful fungal infestations and maintain a healthy growing environment.

Durability and reliability are paramount in any monitoring system, and the PRO-6 delivers on both fronts. The HMX-3 digital relative air humidity sensor is shielded with a special splash-resistant shield, ensuring long-lasting performance even in challenging conditions. Built from UV-resistant materials, the PRO-6 withstands the rigors of the grow room or greenhouse environment, ensuring consistent and accurate data collection over time.

With its comprehensive range of sensors and features, the PRO-6 stands as a game-changer in environmental monitoring.

By providing cultivators with precise data on temperature, humidity, light levels, VPD, and mold risk, it empowers them to make informed decisions, optimize plant growth, and achieve unparalleled results. The PRO-6 is a reliable partner for cultivators seeking to push the boundaries of cultivation and unlock the full potential of their crops.

PRO-6 Multi Sensor Unit

03. The PRO-6 Multi sensor unit explained
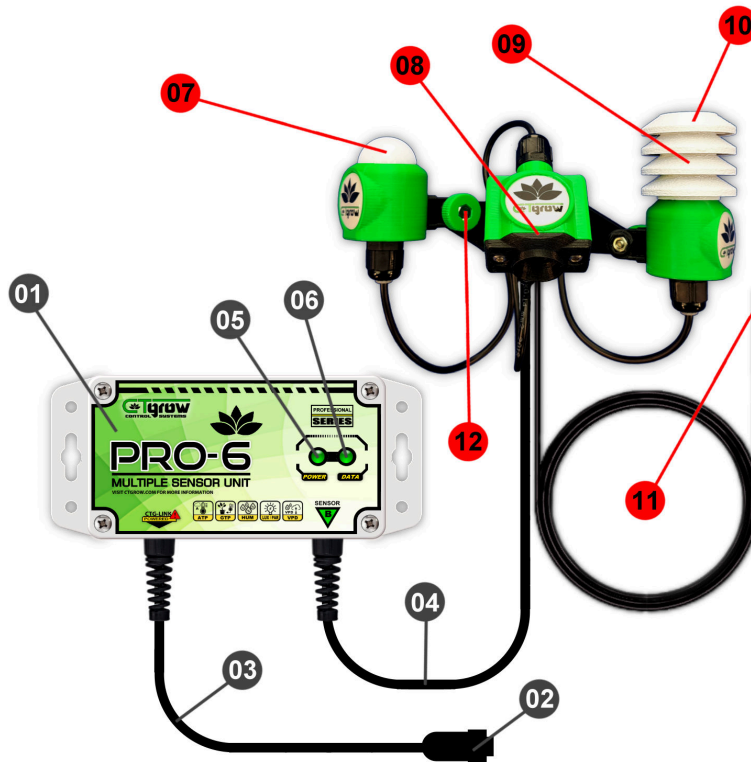
PRO-6 Sensor unit

01:     PRO-6 Sensor unit housing
02:     POWER CTG-LINK connector (connect to a powered ctg-link port)
03:     POWER CTG-LINK cable (3 meter total length)
04:     PRO-6 Sensor-array cable (3 meter total length)
05:     Power ON LED light (when lit the sensor unit has power)
06:     Data LED (when flashing shortly ON, unit is sending data)

PRO-6 Multi Sensor array

07:     Light sensor
08:     Temperature sensor (A) connector   (3-color flat-screw terminal)
09:     Temperature sensor (B) connector   (3-color flat-screw terminal)
10:     Temperature sensor (C) connector   (3-color flat-screw terminal)
11:     Relative Humidity sensor (D) connector (3-color flat-screw terminal)
12:     Lux (par at B-model) sensor (E) connector (4-color flat-screw terminal)

PRO-6 Multi Sensor Unit

04. PRO-6 Installation procedure (part 1)

IMPORTANT INSTALLATION NOTICE !!   **DO NOT MOUNT ANY OF THE PRODUCTS BEFORE READING THE FULL INSTALLATION PROCEDURE !!**

1. Mounting the PRO-6 sensor unit

For ease of use, the PRO-6 sensor unit is thoughtfully designed with multiple mounting holes on both sides of its backplate. The mounting holes offer flexibility in positioning the sensor unit to suit your specific location preferences and requirements. **(See Figure 4.0.1-1/2)**

Additionally, the connection and sensor array cables have an approximate length of 3 meters starting from the unit itself, granting you ample freedom to adjust the sensor unit and array location without limitations **(See Figure 4.0.2-1/2).**

This increased range allows for greater flexibility in finding the optimal position for the sensor unit within your growing setup.
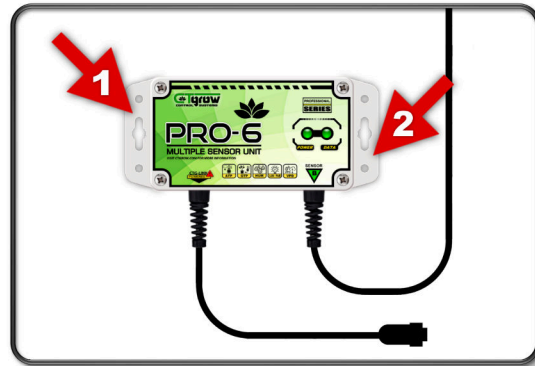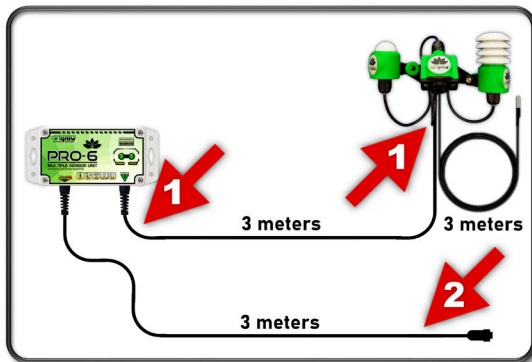

Figure 4.0.1

Figure 4.0.2

When mounting the PRO-6 sensor unit in its optimal position, pay particular attention to the placement of its cables. Take into account factors such as the monitored area, accessibility, and the intended purpose of the sensor unit and the areas it is intended to monitor. **(See Figure 4.0.2-1/2)**

It is imperative to avoid bundling the POWERED CTG-LINK cable together with any AC power cables. To prevent potential sensor malfunctions that can be caused by inductive AC loads. It is crucial to maintain a minimum distance of 5 centimeters between any AC power cables and the cables connected to the PRO-6 sensor unit. **(refer to Figure 4.0.2-3).**

2. Mounting the PRO-6 Sensor array (part 1)

The PRO-6 Sensor Array offers a user-friendly and adaptable mounting solution that utilizes two simple zip ties, allowing for easy installation and repositioning of the sensor array as needed. The zip ties are entered at one side of the sensor bracket and slide through the bracket to the other side, making it simple to slide the sensor array up and down to follow the plant canopy. **(refer to Figure 4.0.3-1/2).**

The sensor bracket also enables easy adjustment of each of the individual sensors, as users can turn their adjustment knobs to angle the individual sensors up or down to achieve optimal alignment with the target area or plant canopy.

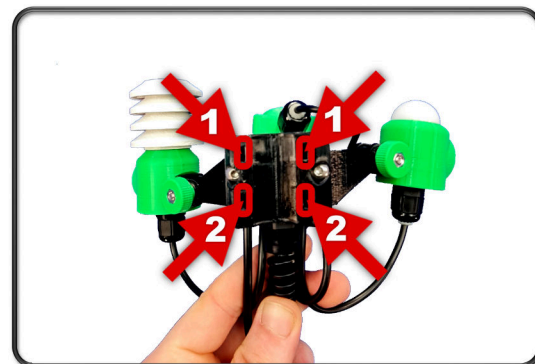**Continue to page 05 for more information!**

Figure 4.0.3

PRO-6 Multi Sensor Unit

04. PRO-6 Installation procedure (part 2)

IMPORTANT INSTALLATION NOTICE !! **DO NOT MOUNT ANY OF THE PRODUCTS BEFORE READING THE FULL INSTALLATION PROCEDURE !!**

2. Mounting the PRO-6 Sensor array (part 2)

To further enhance functionality, the Sensor Array features a specially designed adjustment bracket, that also serves as the main connection of the sensors to the cabling system, streamlining the cable installation process. This innovative array design optimizes cable management, reduces cable clutter and simplifies the overall setup.

The zip ties can also be easily replaced when reinstalling the sensor array in a different position. Always handle the sensor array with extreme care to not damage any of its individual sensor cables. The zip-ties are entered at one side of the sensor bracket and slide trough the bracket to the other side. **(See Figure 4.0.4-1/2)**
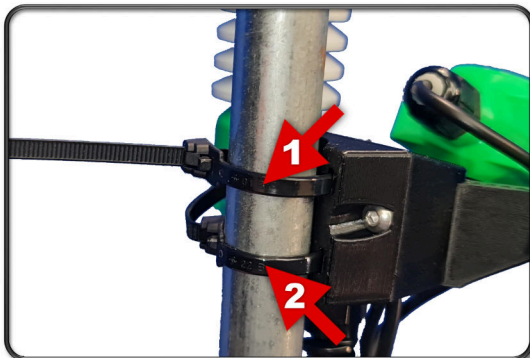

Figure 4.0.4

Figure 4.0.5

To mount the PRO-6 Sensor Array, Select a Suitable Mounting Pole: Choose a sturdy pole or support structure that can withstand the weight of the sensor array and provide stability throughout its operation. Place the sensor array onto the mounting pole, aligning it at the desired height to effectively capture data from the plant canopy.

Take one zip tie and weave it through the designated openings on the sensor array's body, ensuring a secure fit around the mounting pole. Tighten the zip tie to firmly hold the sensor array in place. Repeat the process with the second zip tie, securing it at a separate point on the sensor array and the mounting pole. **(refer to Figure 4.0.5-1/2).**

3. Positioning the PRO-6 sensor array (part 1)

Position the sensor array just above the canopy (max 10 cm) to ensure that all the sensor functions remain unobstructed.

Overhanging leaves or other objects can cast shadows or block direct exposure to light, humidity, or leaf temperature readings, leading to wrong results. **(See Figure 4.0.6-1).**

By placing the sensors above any potential obstructions, such as overhanging foliage, the sensors can capture accurate data without interference, providing a more precise assessment of the real environmental conditions.

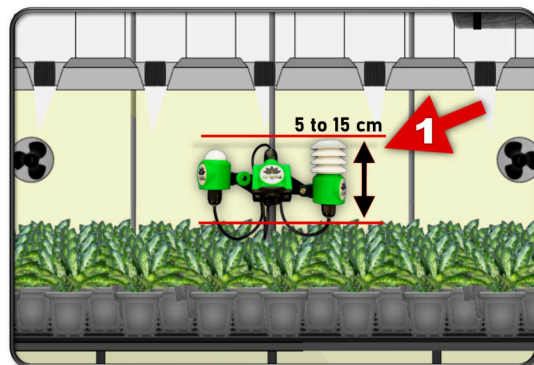**Continue to page 06 for more information!**

Figure 4.0.6

PRO-6 Multi Sensor Unit

04. PRO-6 Installation procedure (part 3)

IMPORTANT INSTALLATION NOTICE !!   DO NOT MOUNT ANY OF THE PRODUCTS BEFORE READING THE FULL INSTALLATION PROCEDURE !!

3. Positioning the PRO-6 sensor array (part 2)

airflow plays a critical role in preventing the accumulation of localized humidity and stagnant air, both of which can adversely impact the accuracy of the measurements. **(See Figure 4.0.7-2)**

In addition to airflow, it's important to ensure that the light sensor has an unobstructed line of sight from above. The light sensor relies on a clear path to accurately measure light levels. It is essential to check for any leaves or plants that may block the light sensor's measurement path. Maintaining an open sight-line, free from obstructions, allows the light sensor to provide accurate readings. **(See Figure 4.0.7-1)**
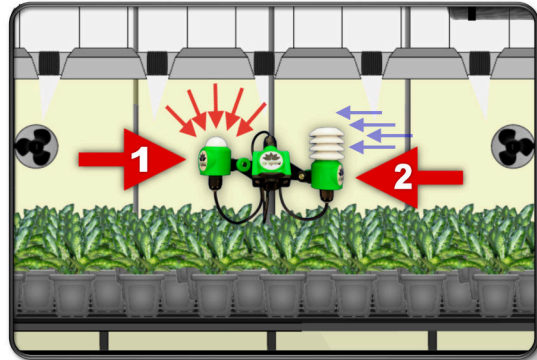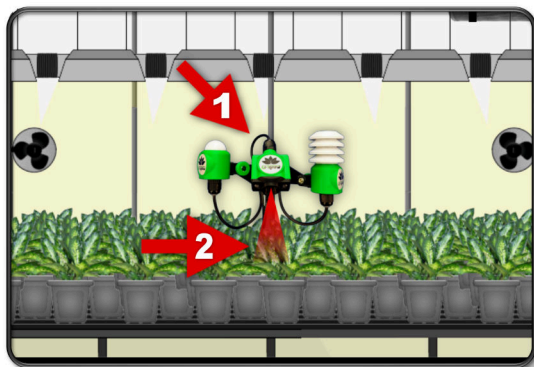

Figure 4.0.7

Figure 4.0.8

The leaf temperature camera, also referred to as the "VPD sensor" **(See Figure 4.0.8-1)**, employs narrow-beamed infrared imaging technology to accurately measure leaf temperatures at frequent intervals **(See Figure 4.0.8-2)**. It should be in an angled position facing down towards the leafs, or canopy

This advanced VPD sensor provides valuable information about the thermal properties of plants and their overall well-being. It serves as an indispensable tool for monitoring and analyzing plant physiology and responses. Detailed information about its usage, calibration and functionality will be discussed extensively later in this manual, along with all of the other PRO-6 sensors.

4. Adjusting the PRO-6 sensor angle

The sensor angles on the PRO-6 sensor array play a crucial role in ensuring accurate measurements. Specifically, the humidity and light sensors should be angled at 90 degrees from the canopy, perpendicular to the plant surface. This arrangement allows for optimal detection of humidity levels and light intensity, capturing representative readings that reflect the conditions around the canopy. **(refer to Figure 4.0.9-1/2)**.

In contrast, the VPD (Vapor Pressure Deficit) sensor should be angled downward, towards the leaves or canopy. This positioning facilitates the measurement of the temperature and relative humidity in close proximity to the foliage, providing valuable insights into the plant's transpiration and water stress levels. **(refer to Figure 4.0.9-3)**.
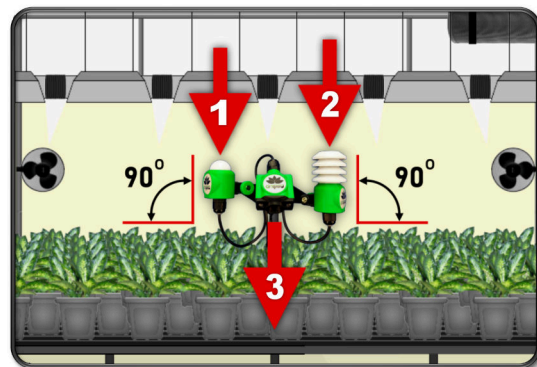

Figure 4.0.9

PRO-6 Multi Sensor Unit

05. Pro-6 Connection & dashboard setup (part 1)

01. Setup the PRO-6 on the system dashboard

Adding the PRO-6 sensor unit to a CTgrow controller is a straightforward process. You can connect up to 4 sensor units in total to a CTgrow controller. If you need to connect a PRO-6 sensor unit, simply follow the steps outlined on this page for each unit until the PRO-6 unit is connected and functioning.

The PRO-6 sensor unit will be automatically recognized and displayed in room 1 on the controller's dashboard. To add multiple units to the controller, follow this procedure step by step. To begin, please ensure that the system controller is powered on **(See Figure 5.0.1-1)** and that the green active light is illuminated, indicating that the controller is operational **(See Figure 5.0.1-2)**.
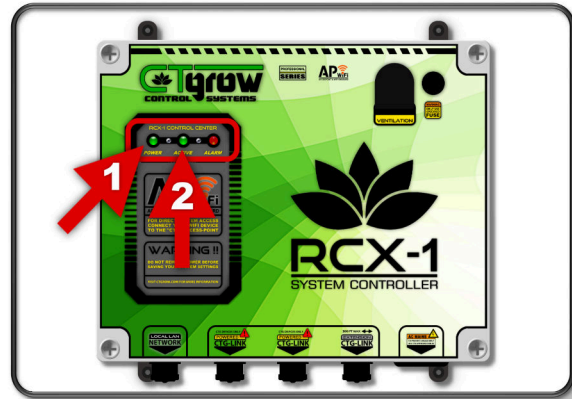

Figure 5.0.1

Once your new PRO-6 unit has been securely mounted in its designated location, as per the instructions provided in the previous chapter in this manual, you can proceed to connect it to the Master controller **(See Figure 5.0.2-1/2)**.

Carefully remove the waterproof protection cap from one of the two on-board **POWERED CTG-LINK** port on the controller. Be carefully to avoid any damage to the connector or the controller itself. **(See Figure 5.0.2-1)**.

Gently and unscrew the cap counter-clock wise. It is recommended to use clean and dry hands to prevent any moisture or debris from coming into contact with the connector, as this may affect the performance or longevity of the sensor unit and the controller.
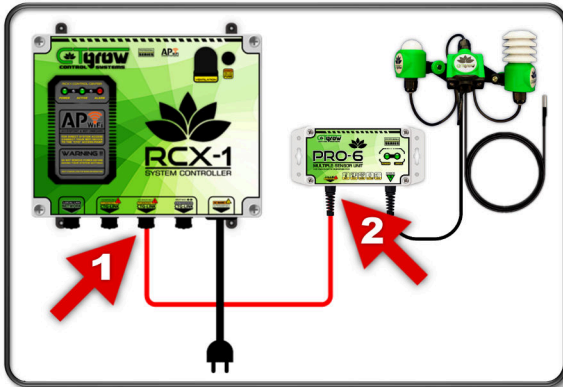

Figure 5.0.2

Gently plug in and fasten the **POWER CTG-link** connector provided with the PRO-6 sensor unit, **(See Figure 5.0.3-1)** into a **[POWERED CTG-LINK]** ports on the controller, as shown in **(See Figure 5.0.3-1)**. Ensure that the connection is tight and secure, but avoid to over-tighten to prevent any damage to the connector or the connector port.

TIP!! Make sure that the PRO-6 sensor unit's screw connector is straight on the treads when you start to fasten it. If you cant get the connector straight on to the **[POWERED CTG-LINK]** port, try turning it the opposite direction for a few turns until you feel a click, then try to screw it straight back on again!
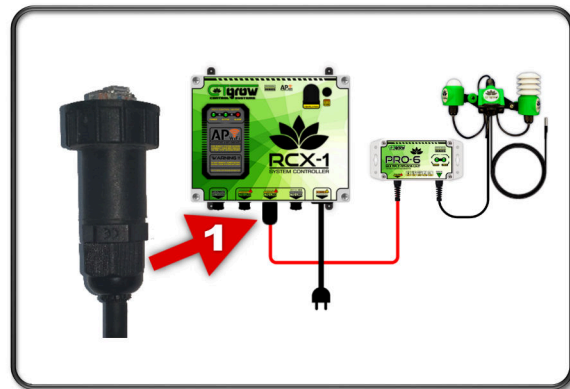
See the next page for more information!

Figure 5.0.3

PRO-6 Multi Sensor Unit

05. Pro-6 Connection & dashboard setup (part 2)

02. Adding a sensor unit to the dashboard

When installing a new PRO-6 sensor unit, it is crucial to also follow the specific installation recommendations outlined in the Master controller's user-manual. Each controller may have unique procedures to follow for optimal performance.

Once the sensor unit has been successfully connected to one of the controller's powered CTG-LINK ports, the power light on the PRO-6 sensor unit should turn on, indicating a successful connection **(see Figure 5.0.4-1)**. Keep in mind that it may take up to 30 seconds for the controller to fully recognize and install the PRO-6 sensor unit. Once the PRO-6 starts transmitting data to the controller, the green data LED should light up for one second every few seconds. **(see Figure 5.0.4-2)**.

Figure 5.0.4

Figure 5.0.5

To confirm that the PRO-6 sensor unit is functioning properly, you can refresh the controller's dashboard by clicking on the CTgrow logo on the top left corner of the screen, **(See Figure 5.0.5-1)**. Once the PRO-6 unit is detected, it will be automatically added to room/zone-1 and shown on the dashboard. **(See Figure 5.0.5-2/3)**

To get access to the sensor settings menu, simply press the **[sensor menu]** button located on the sensor, **(See Figure 5.0.5-4)**. **(This button is available on all sensors)**. Once inside the sensor menu, you can easily program each sensor according to your desired minimum and maximum values for both day and night periods.

(More instructions on setting up the individual day & night sensor values will be provided in more detail in the upcoming chapters of this user manual).
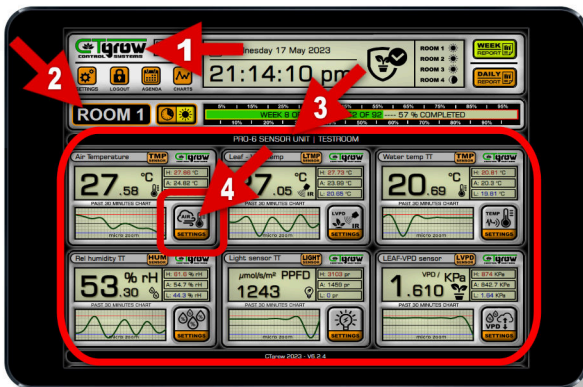
03. Change the sensor unit's name and room

To access the PRO-6 sensor unit settings menu on the controller's dashboard, simply click on **[SETTINGS]** button **(See to Figure 5.0.6-1)** located on the left-hand side of the dashboard. Then, click on **[UNIT SETUP]** and select **[SENSOR UNITS]** to enter the sensor unit menu **(refer to Figure 5.0.6)**.

Within the sensor-unit menu, you can view all the connected sensor unit's numbers and models **(refer to Figure 5.0.6-2)** and customize the sensor unit's name **(See Figure 5.0.6-3)** and it's room assignment **(See Figure 5.0.6-4)**. To assign a new name and room for the sensor unit, enter the desired information and click save **(See Figure 5.0.6-5)**.

Continue to the next page!

Figure 5.0.6

PRO-6 Multi Sensor Unit

05. Pro-6 Connection & dashboard setup (part 3)

04. Delete the PRO-6 sensor unit's data*

*(only removes stored sensor values)

This option allows you to reset and clear all stored PRO-6 sensor values on the controller, providing a fresh start for monitoring and recording new sensor data. Please note that deleting sensor values will not affect your saved sensor settings, ensuring that your configured preferences and settings remain intact.

From within the sensor unit settings menu, you will find the **[CLEAR]** button, **(see Figure 5.0.7-6)**. Press the **[CLEAR]** button to delete all stored sensor values for your PRO-6 sensor-unit. After the deletion process is completed, the sensor unit will show that all 24H averages will be reset to 0, and it will take about 30 minutes before the charts become available again.
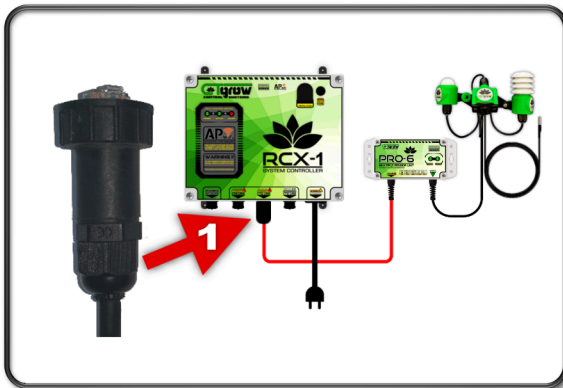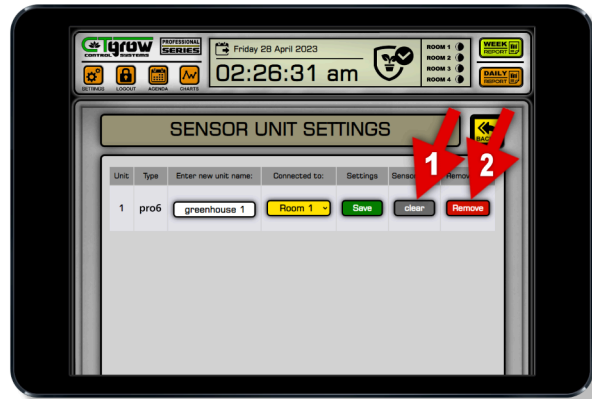

Figure 5.0.7

05. Permanently remove a sensor-unit

Before we can delete the PRO-6 sensor-unit from the dashboard, we need to unscrew and remove the connector of the PRO-6 sensor unit from the system **(See Figure 5.0.8)**. Once the sensor-unit is disconnected, you may proceed!

In the sensor-unit settings menu, locate the PRO-6 sensor-unit that you want to remove/delete **(See Figure 5.0.7-7)** Press the red **[REMOVE]** button associated with the sensor unit that you want to remove, **(see Figure 5.0.7)** This will permanently remove the sensor unit from the dashboard and delete all the stored values and settings from the controller. **(see Figure 5.0.9-1)**

BEWARE this action cannot be undone !!.

Figure 5.0.8

REMINDER!

It's very important to screw the waterproof caps back on any CTG-LINK PORT that is not in use, to ensure proper protection against water damage.

Please note that removing/deleting a sensor unit will completely remove all of its values and settings from the RCX-1 controller.

This action should be taken with caution, and you should make sure to backup any important data before proceeding. Once a sensor unit is removed, it will no longer be available for monitoring and recording sensor data on the RCX-1 controller.

Figure 5.0.9

PRO-6 Multi Sensor Unit

06. Pro-6 General sensor value settings (part 1)

01. Unit of measurements & Value setup

The PRO-6 unit, comes with advanced value settings that unlock a world of flexibility and sensor customization. It enables you to set other units of measurement for the sensors, tailoring them precisely to your requirements.

Whether you're an agriculturalist, scientist, researcher, horticulturist, or just a hobby grower, the PRO-6 unit will accommodate you with your preferred values and scales, allowing for accurate long-term data interpretation and analysis.

The individual PRO-6 sensors can each be programmed to present data in the unit of measurement that aligns with your preferences and requirements, thanks to the intuitive sensor value setup menu.
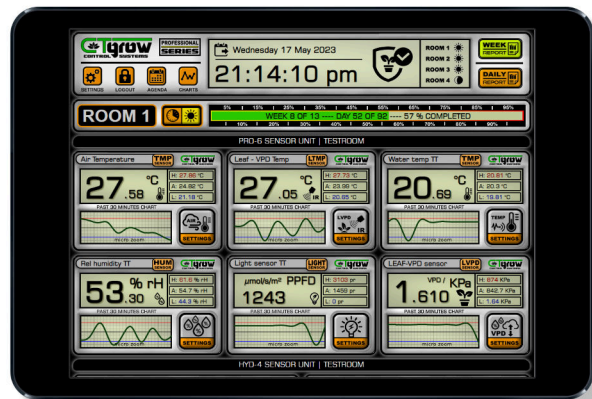

Figure 6.0.1

Figure 6.0.2

02. Changing the Sensor values (part 1)

To get easy access to the controller's sensor value setup menu, click on the **[SETTINGS]** button located on the left-hand side of the dashboard. **(See Figure 3.0.2-1)**.

Then, click on the **[VALUE SETUP]** button to enter the sensor value setup menu **(See Figure 3.0.2-2)**.

The sensor value setup menu, **(See Figure 3.0.3)**, offers advanced value settings that can be easily changed to unlock a world of flexibility and sensor customization. Whether you need your sensor values presented in Celsius or Fahrenheit for air temperature, or need a specific unit for light measurement such as PPFD, the PRO-6 unit can adapt seamlessly to your needs.
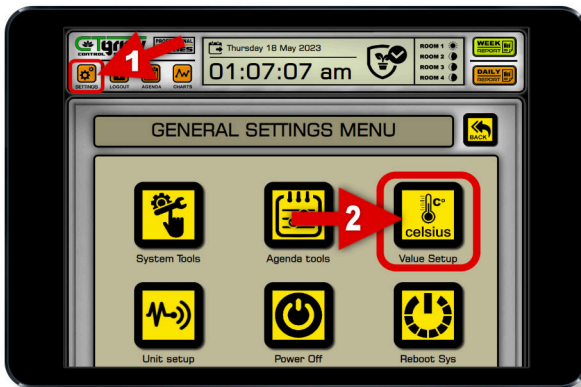
The sensor value setup menu acts as your gateway to sensor customization, allowing you to fine-tune each sensor to its preferred unit of measurement. Whether you require specific scales, percentages, or other units, the PRO-6 unit adapts effortlessly, ensuring accurate and consistent data output.

The intuitive design of the sensor value setup menu makes the customization process a breeze, empowering you to make changes with ease and efficiency. The visual reference provided in the figure assists in navigating the menu and selecting the desired units of measurement for each parameter, further enhancing the user experience. **(See Figure 3.0.3)**.
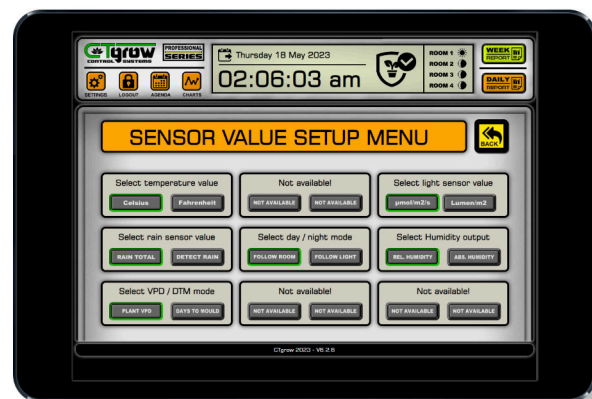
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Figure 6.0.3

PRO-6 Multi Sensor Unit

06. Pro-6 General sensor value settings (part 2)

The PRO-6 unit is designed to cater to a wide range of users, whether they are professional horticulturists, agriculturalists, scientists, or hobby growers. Regardless of your level of expertise, the PRO-6 unit ensures that you can configure it according to your preferred values and scales, enabling accurate long-term data interpretation and analysis. **(See Figure 6.0.4)**.

03. Select the temperature value/scale

When it comes to temperature, the PRO-6 unit offers the option to choose between Celsius and Fahrenheit scales. Whether you're measuring leaf temperature or soil/water temperatures, the sensor value setup menu allows you to select the most appropriate unit of measurement. **(See Figure 6.0.4-1/3)**.

Figure 6.0.4

04. Select the humidity value/scale

Humidity measurement is a vital aspect of environmental monitoring, and the PRO-6 unit offers customizable options to suit your specific needs. **(See Figure 6.0.5-1/3)**.

Percentage (%) is a commonly used unit to represent relative humidity, This value unit is widely recognized and provides a basic understanding of humidity readings.

On the other hand, grams per cubic meter (g/m³) is a unit that offers a more precise measurement of absolute humidity. This unit is useful in applications where accurate quantification of moisture content is essential, such as industrial laboratories, or special environmental studies.
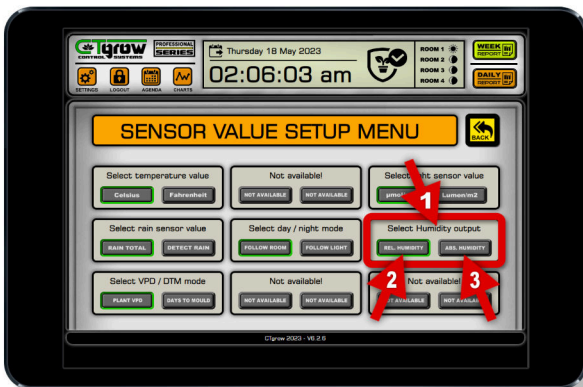

Figure 6.0.5

05. Select the VPD or Special DTM sensor

Vapor Pressure Deficit, **(VPD) (See Figure 3.0.6-2)** helps to assess the water vapor pressure difference between the plant's leaf surface and the surrounding air. It provides valuable information about the plant's transpiration rate and water uptake efficiency. By monitoring VPD, you can optimize your irrigation strategies to ensure good plant hydration.

DTM (Days to Mold) **(See Figure 3.0.6-3)** is a very unique feature associated with CTgrow's VPD sensor. This metric focuses specifically on the risk of mold formation within the growing environment. It takes into account factors such as temperature, humidity, and the duration of unfavorable conditions that could promote mold growth.
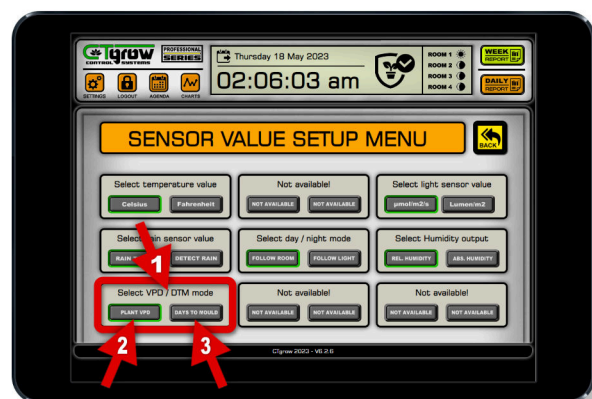
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Figure 6.0.6

PRO-6 Multi Sensor Unit

06. Pro-6 General sensor value settings (part 3)

06. Select the light sensor value/scale

When it comes to measuring light, the two most common metrics used are PPFD **(Photosynthetic Photon Flux Density)** and lumen **(lux) (See Figure 6.0.7-1)**.

Lumen or lux is a unit of measurement that quantifies the luminescence or the amount of light that reaches a surface. It is commonly used in light sensing applications and provides a general indication of the brightness perceived by the human eye. **(See Figure 6.0.7-3)**.

PPFD, on the other hand, is a more specific metric that measures the number of photons within the Photo-synthetically Active Radiation (PAR) range (400-700 nm) that fall on a specific area per unit of time. **(See Figure 6.0.7-2)**.
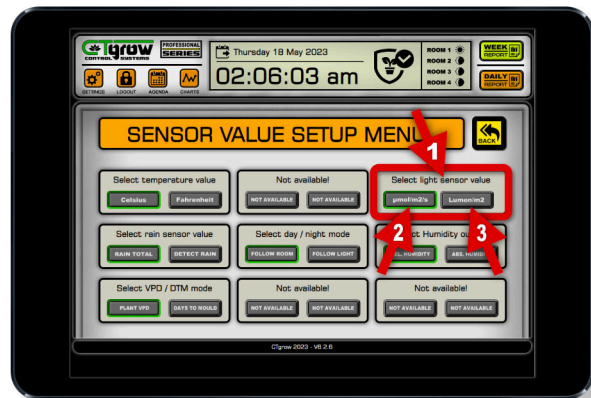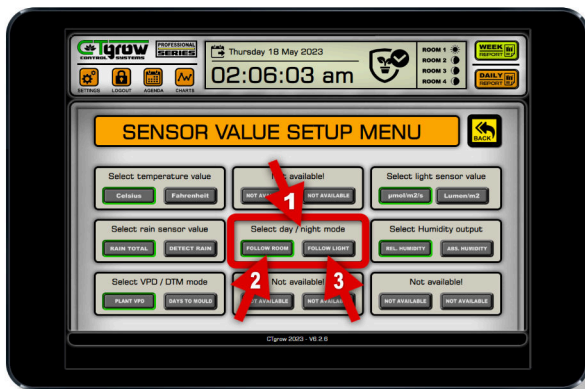

Figure 6.0.7

Figure 6.0.8

The CTgrow "Follow Light" mode is primarily used for greenhouses without any artificial lighting, that rely on natural sunlight to function effectively.

When the follow light mode is selected **(See Figure 6.0.8-3)**, the PRO-6 unit utilizes its built-in clock to monitor the light during the morning hours. If the light rises above 50 PPFD, all rooms/zones automatically switch to day-time. **(See Figure 6.0.9-1)**

By assessing the light strength, the PRO-6 captures the threshold at which plants typically react to light, ensuring they receive the minimum required light intensity. During the evening hours, the PRO-6 unit detects the drop in light intensity below 50 PPFD (Photosynthetic Photon Flux Density) and switches all rooms to night-time mode. **(See Figure 6.0.9-2/4)**

For precise and targeted plant growth optimization, PPFD is the preferred metric. By monitoring PPFD, you can can fine-tune your lighting system and measure to adjust light intensity to meet the specific requirements of your preferred plant species. It provides specific information about the light energy available to drive photosynthesis, which directly influences plant growth, and overall yield.

07. Select the Special day/night follow mode

The PRO-6 unit not only provides advanced value settings for accurate measurements but also offers a special feature that allows users to modify the behavior of a room or zone based on the actual current light conditions. **(See Figure 6.0.6-1)**.
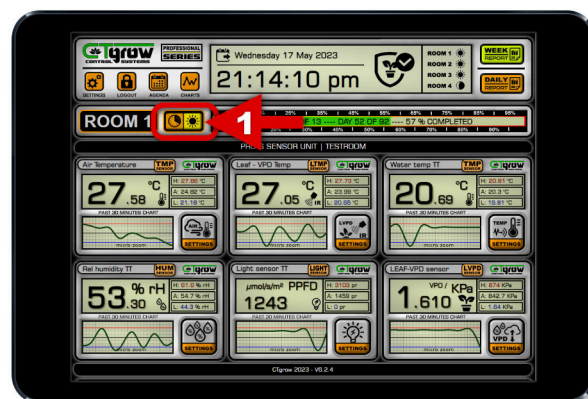

Figure 6.0.9

PRO-6 Multi Sensor Unit

08. Pro-6 Individual sensor displays (part 1)

01. Air-temperature sensor (sensor 1)

The PRO-6 Air-temperature display presents the air-temperature value that is real-time measured by the combined temperature/humidity sensor that is mounted on the PRO-6 sensor-array. **(see Figure 7.0.1)**.

Within the sensor display you find all basic information thats related to the sensor. On top of the sensor display you find the sensor name **(see Figure 7.0.1-1)**. The current temperature value **(see Figure 7.0.1-2)**, and the sensors scale/unity **(see Figure 7.0.1-3)**. On the right-side of the sensor display you will find the minimum, maximum, and average 24 hour values. **(see Figure 7.0.1-4)**. and below that, the **[sensor settings]** menu button, that opens the sensors settings menu **(see Figure 7.0.1-6)**.
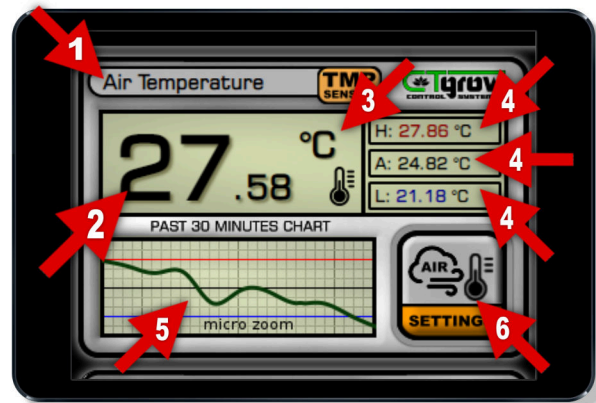

Figure 7.0.1

02. Leaf-IR temperature sensor (sensor 2)

The PRO-6 Leaf-IR temperature display presents the leaf-temperature value that is real-time measured by the Special VPD camera sensor that is mounted on the PRO-6 sensor-array. **(see Figure 7.0.2)**.

Within the sensor display you find all basic information thats related to the sensor. On top of the sensor display you find the sensor name **(see Figure 7.0.2-1)**. The current temperature value **(see Figure 7.0.2-2)**, and the sensors scale/unity **(see Figure 7.0.2-3)**. On the right-side of the sensor display you will find the minimum, maximum, and average 24 hour values. **(see Figure 7.0.2-4)**. and below that, the **[sensor settings]** menu button, that opens the sensors settings menu **(see Figure 7.0.2-6)**.
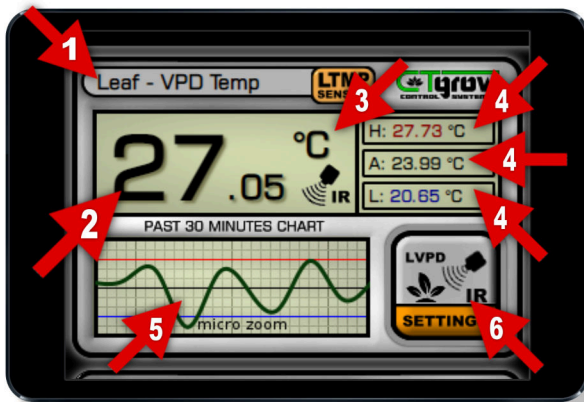

Figure 7.0.2

03. External temperature sensor (sensor 3)

The PRO-6 External temperature display presents the temperature value that is real-time measured by the external (3 meter wired) temperature sensor that is mounted on the PRO-6 sensor-array. **(see Figure 7.0.3)**.

Within the sensor display you find all basic information thats related to the sensor. On top of the sensor display you find the sensor name **(see Figure 7.0.1-1)**. The current temperature value **(see Figure 7.0.1-2)**, and the sensors scale/unity **(see Figure 7.0.1-3)**. On the right-side of the sensor display you will find the minimum, maximum, and average 24 hour values. **(see Figure 7.0.1-4)**. and below that, the **[sensor settings]** menu button, that opens the sensors settings menu **(see Figure 7.0.1-6)**.
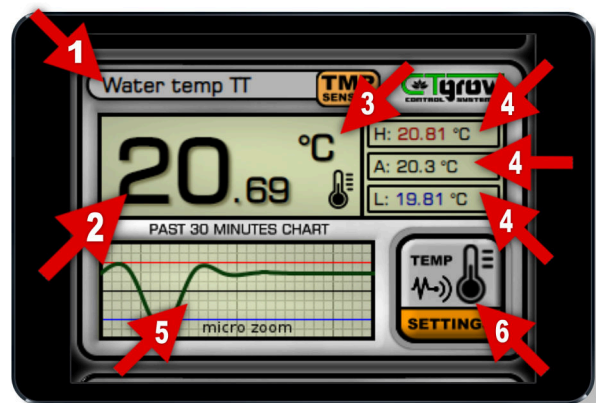

Figure 7.0.3

PRO-6 Multi Sensor Unit

07. Pro-6 Individual sensor displays (part 2)

01. Humidity sensor (sensor 4)

The PRO-6 Humidity display presents the Humidity value that is real-time measured by the PRO-6 humidity sensor. **(see Figure 7.0.1)**. **The humidity sensor can present its value/unity in either absolute or relative humidity.**

Within the sensor display you find all basic information thats related to the sensor. On top of the sensor display you find the sensor name **(see Figure 7.0.1-1)**. The current humidity value **(see Figure 7.0.1-2)**, and the sensors scale/unity **(see Figure 7.0.1-3)**. On the right-side of the sensor display you will find the minimum, maximum, and average 24 hour values. **(see Figure 7.0.1-4)**. and below that, the **[sensor settings]** menu button, that opens the sensors settings menu **(see Figure 7.0.1-6)**.
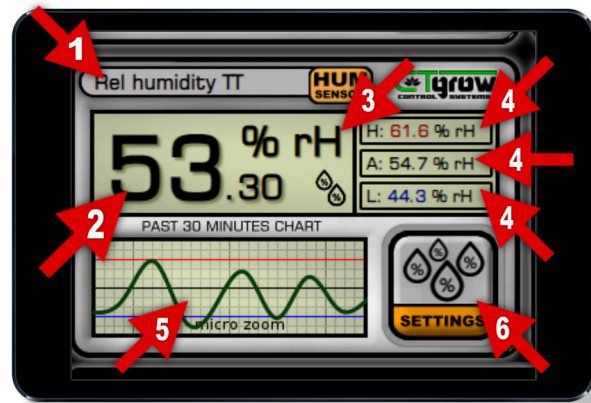

Figure 7.0.4

02. Light sensor (sensor 5)

The PRO-6 Light sensor display presents the current light strength value that is real-time measured by the Special Light sensor. **(see Figure 7.0.2)**. **The light sensor can present its value/unity in either PPFD or lux.**

Within the sensor display you find all basic information thats related to the sensor. On top of the sensor display you find the sensor name **(see Figure 7.0.2-1)**. The current light level value **(see Figure 7.0.2-2)**, and the sensors scale/unity **(see Figure 7.0.2-3)**. On the right-side of the sensor display you will find the minimum, maximum, and average 24 hour values. **(see Figure 7.0.2-4)**. and below that, the **[sensor settings]** menu button, that opens the sensors settings menu **(see Figure 7.0.2-6)**.
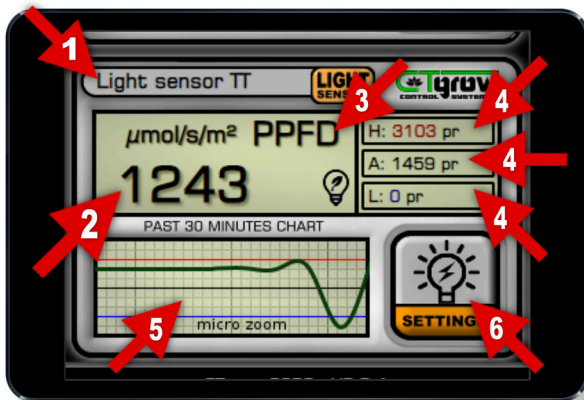

Figure 7.0.5

03. Special IR-VPD / DTM sensor (sensor 6)

The PRO-6 VPD/DTM sensor display presents the VPD or DTM value that is real-time calculated by the controller **(see Figure 7.0.3)**. **The VPD/DTM sensor can present its value/unity in either VPD (Vapor Pressure Deficit) or CTgrow's special DTM (Days To Mold) mode.**

Within the sensor display you find all basic information thats related to the sensor. On top of the sensor display you find the sensor name **(see Figure 7.0.1-1)**. The current VPD or DTM value **(see Figure 7.0.1-2)**, and the sensors scale/unity **(see Figure 7.0.1-3)**. On the right-side of the sensor display you will find the minimum, maximum, and average 24 hour values. **(see Figure 7.0.1-4)**. and below that, the **[sensor settings]** menu button, that opens the sensors settings menu **(see Figure 7.0.1-6)**.
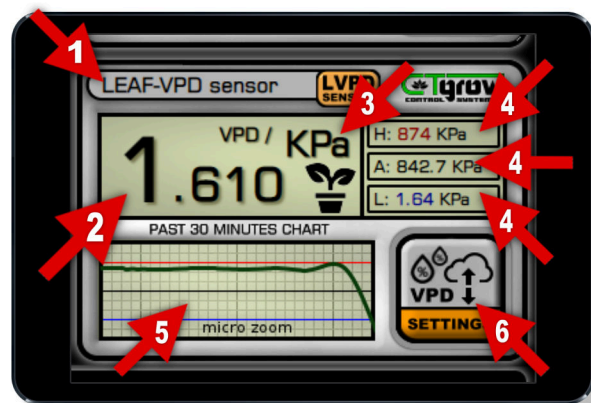

Figure 7.0.6

PRO-6 Multi Sensor Unit

08.Pro-6 Sensor settings menu (part 1)

(This procedure applies to all the PRO-6 sensors)

01. The 24-hour sensor reference chart

Before proceeding with the sensor values setup, please ensure that the **SYSTEM CLOCK** and the **DAY/NIGHT** settings in the individual rooms of your controller are configured correctly.

In the sensor setting menu, there is a 24-hour chart available **(refer to Figure 7.0.2-1)**. By reviewing this chart, you can easily observe sensor trends and daily patterns. This information can be very useful when programming or adjusting the minimum and maximum values for your specific needs.

Having access to this data in a graphical format simplifies the process of configuring the sensor and fine-tuning the sensors settings. It empowers you to make informed decisions and adjustments based on the observed trends.

02. Programming the sensor day and night values

The sensor values setup menu consists of two sections: the left-side columns for DAY-TIME settings **(See Figure 7.0.2-2 and Figure 7.0.2-4)**, and the right-side columns for NIGHT-TIME **(See Figure 7.0.2-3 and Figure 7.0.2-5)**.

To configure the sensor limits, enter your preferred maximum and minimum values, along with alarm values, for both DAY-TIME and NIGHT-TIME operations in the corresponding boxes **(See Figure 7.0.2-2/3 and Figure 7.0.2-5/6)**.

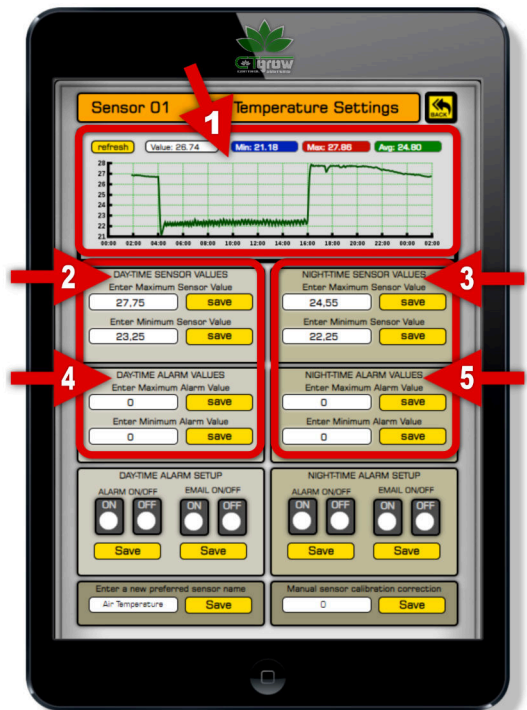**NOTE! only numbers and decimal points are allowed in the value input fields!**

Fig. 7.0.3

Figure 7.0.2

The sensor value settings are closely tied to their corresponding limits, **(refer to Figure 7.0.3)**. These settings determine how the sensor behaves and how the displayed values are visually represented.

When the sensor value falls below the set threshold, the value in the sensor display on the dashboard will change to blue **(See Figure 7.0.3)**. In cases where an alarm is configured for the sensor, the value may blink to draw attention.

Conversely, if the sensor value exceeds the preset maximum value, the value on the sensor display will turn red. **(See Figure 7.0.3)**. Similarly, when an alarm level is set and reached, the value may blink in red, indicating a critical condition. This color-based system enhances the visibility and intuitiveness of the sensor readings, allowing users to quickly identify when the sensor goes beyond the desired range.

Continue to the next page.

PRO-6 Multi Sensor Unit

08.Pro-6 Sensor settings menu (part 2)

(This procedure applies to all the PRO-6 sensors)

03. Changing the sensor name

To modify the name of the sensor, navigate to the name field within the settings interface **(See Figure 7.0.3-3)**. This allows you to assign a new name to the sensor. By clicking on the name field, you can enter a desired name of your choice for the sensor.

Once you have entered the new name, simply click the save button to finalize the changes. The updated name will then be associated with the sensor, making it easier to identify and differentiate it from other sensors within your system.

03. Enabling the sensor alarms and email warnings

Before proceeding with the email alarm warnings, ensure that the **USER-EMAIL** settings of your controller are configured correctly.

The sensor alarm and email functions are a fundamental aspect of the PRO-6 sensors. By configuring the sensor alarm values, you can establish thresholds for the monitored parameter, triggering an alarm when those thresholds are exceeded.

To activate the day or night sensor alarms, press the ALARM ON button and press the save button. **(See Figure 7.0.4-1/2).**

when the alarm function is set to ON the sensor and controller will show a blinking display value when an alarm threshold is exceeded **(See Figure 7.0.5).**

The same applies to the Email ON/OFF button, once ON, the sensor will send an alarm warning to your email address, when an alarm threshold is exceeded **(See Figure 7.0.4-1/2)**.
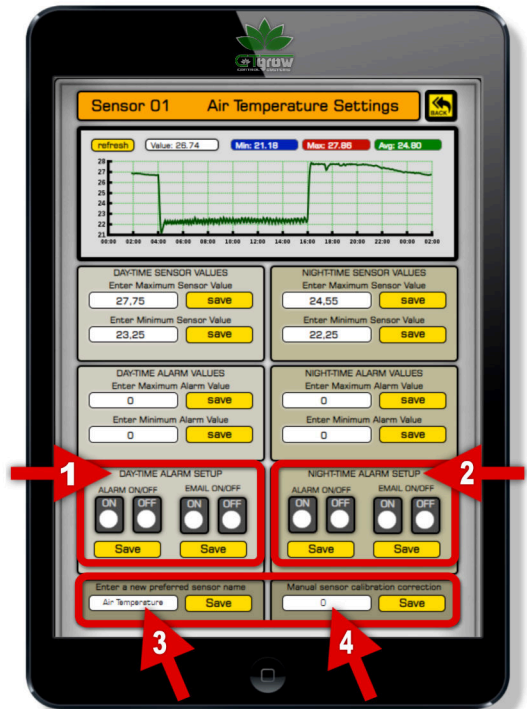
Figure 7.0.3

Fig. 7.0.5

03. Manual sensor calibration / correction

In general, manual sensor calibration is not necessary for any of the PRO-6 sensors. This is because all CTgrow sensors are meticulously calibrated by the factory to meet CTgrow's high standards. The calibration performed during the manufacturing process generally eliminates the need for manual calibration.

When applying a manual calibration offset value, the entered calibration value **(See Figure 7.0.3-4)**. a positive (regular) number will be adding a positive value to the sensor, while the minus sign (-) needs to be used before the correction value to indicate a negative calibration value. **(example: current sensor value is 20, calibration value is 2, new sensor value is 22).**

PRO-6 Multi Sensor Unit

09. Pro-6 Specifications and Dimensions

PRO-6 unit Specifications:

Dimensions HxWxD (unit only)	: ± 13.5 x 20.0 x 10.0	: ± 5.31 x 7.87 x 3.93 Inch
Dimensions HxWxD (unit only)	: ± 18.0 x 12.0 x 12.0	: ± 7.09 x 4.72 x 4.72 Inch
CTG-LINK Cable length	: ± 3 Mtr	: ± 9.5 Feet
Number of sensors	: 6	: Optional: 0
Sensor-arry cable length	: ± 3 Mtr	: ± 9.5 Feet
Unit warm-Up Time	: <180 seconds at 22°C	: <180 seconds at 72°F
Working temperature	: 0°C ~ 60°C	: 32°F ~ 140°F
Avg sensor/unit lifespan	: >5 years	: >5 years
PRO-6 Sensor unit Warranty	: 1 Year unit + array	:1 Year unit + array

Air-temperature Sensor Specifications:

Measurement Range	: -10°C ~ 90°C	: 14°F ~ 194°F
Resolution ratio	: 0.01°C	: 0.03°F
Accuracy	: ± 0.3°C	: ± 0.8°F
Response Time	: <5 seconds	: <5 seconds
Working temperature	: 0°C ~ 60°C	: 32°F ~ 140°F
Avg sensor lifespan	: >5 years	: >5 years

Humidity Sensor Specifications:

Measurement Range	: 0 ~ 99.9 %RH	: 0 ~ 99.9 %RH
Resolution ratio	: 0.01 %RH	: 0.01 %RH
Accuracy	: ± 3 %RH	: ± 3 %RH
Response Time	: <5 seconds	: <5 seconds
Working temperature	: 0°C ~ 60°C	: 32°F ~ 140°F
Avg sensor lifespan	: >5 years	: >5 years

VPD-IR Sensor Specifications:

Measurement Range	: 0.01 ~ 5.0 k Pa	: 0.01 ~ 5.0 k Pa
Resolution ratio	: 0.005 k Pa	: 0.005 k Pa
Accuracy	: ±2% of reading	: ±2% of reading
Response Time	: <5 seconds	: <5 seconds
Warm-Up Time	: <10 seconds at 22°C	: <10 seconds at 72°F
Working temperature	: 0°C ~ 60°C	: 32°F ~ 140°F
Avg sensor lifespan	: >5 years	: >5 years

Light Sensor Specifications:

Measurement Range	: 0.1 ~ 3400 PPFD	: 0.1 ~ 3400 PPFD
Resolution ratio	: 0.1 PPFD	: 0.1 PPFD
Accuracy	: ±5% of reading	: ±5% of reading
Response Time	: <5 seconds	: <5 seconds
Working temperature	: 0°C ~ 60°C	: 32°F ~ 140°F
Avg sensor lifespan	: >5 years	: >5 years