

iPonic[®] 624

DUAL-ROOM HYDROPONIC ENVIRONMENTAL CONTROLLER



INSTALLATION AND USER'S GUIDE

September 2019 v2.0 Edition

Copyright © 2019 **Link4[®]** Corporation

TABLE OF CONTENTS

- Gold Package Customers..... 4
- Contact Us 4
- Terms and Conditions 4
 - Limited Warranty 4
 - Return, Exchange or Refund..... 5
- Install the iPonic® 624 Controller..... 6
 - Choosing Location..... 6
 - Mounting the iPonic® 624 Controller 6
 - Connect the Indoor Sensor Modules 7
- Connecting to the Internet 9
- Firmware Update..... 12
- Internal Layout 16
- Before You Begin – Some Basics 17
 - Setpoints..... 17
 - Temperature Control..... 17
 - Deadbands..... 18
 - Ramping..... 18
 - Programming Instructions 19
 - Control Panel..... 20
- Soft Button Shortcuts 21
- 1.0 Main Menu — SETPOINTS..... 24
 - 1.1 SETPOINTS Menu — *Temperature Setpoint* 25
 - 1.2 SETPOINTS Menu — *Humidity Setpoint* 27
 - 1.3 SETPOINTS Menu — *CO2 Setpoint* 28
 - 1.4 SETPOINTS Menu — *Light Setting* 31
 - 1.5 SETPOINTS Menu — *Setpoint Times* 32
- 2.0 Main Menu — REPORTS..... 33
 - 2.1 Reports – Sensor Report..... 33
 - 2.2 Reports – *Graphs* 34
- 3.0 Main Menu — SYSTEM SETUP 35
 - 3.1 SYSTEM SETUP Menu — *Equipment Setup* 37
 - 3.1.1 Quick Setup..... 37
 - 3.1.2 Advanced..... 38
 - 3.1.2.1 Equipment Settings — *Timed Override* 39
 - 3.1.2.2 Equipment Settings — *Initial Settings* 41
 - 3.1.2.2.1 *Equipment Settings* — *Set Name* 41

3.1.2.2.2 <i>Equipment Settings — Set Type</i>	42
3.1.2.2.3 <i>Equipment Settings — Assign Stage</i>	45
3.2 SYSTEM SETUP Menu — <i>Sensor Setup</i>	46
3.3 SYSTEM SETUP Menu — <i>Alarms Setup</i>	49
3.4 SYSTEM SETUP Menu — <i>Time/Date Setup</i>	50
3.5 SYSTEM SETUP Menu — <i>Advanced</i>	51
3.5.1.1 <i>Advanced Room 1 or Room 2 — Humidity Settings</i>	52
3.5.1 — <i>Advanced Room 1 or Room 2</i>	52
3.5.1.2 <i>Advanced Room 1 or Room 2 — Temperature Settings</i>	53
3.5.1.3 <i>Advanced Room 1 or Room 2 — CO2 Settings</i>	53
3.5.1.4 <i>Advanced Room 1 or Room 2 — Light Settings</i>	54
3.5.1.5 <i>Advanced Room 1 or Room 2 — Air Exchange Settings</i>	55
3.5.1.6 <i>Advanced Room 1 or Room 2 — Advanced Stage Settings</i>	55
3.5.1.7 <i>Advanced Room 1 or Room 2 — Adv. Setpoint Settings</i>	56
3.5.2 <i>Advanced Shared</i>	57
3.5.2.1 <i>Display Setting</i>	58
3.5.2.2 <i>Controller Version</i>	59
3.5.2.3 <i>Clear Data</i>	59
3.5.2.4 <i>Boot Load</i>	59
3.5.2.5 <i>Password</i>	60
3.5.2.6 <i>Start Wizard</i>	60
3.5.2.7 <i>Diagnostics</i>	60
3.6 SYSTEM SETUP Menu — <i>Save/Restore</i>	61
3.7 SYSTEM SETUP Menu — <i>Communication Setup</i>	63
3.8 SYSTEM SETUP Menu — <i>Measurement Units</i>	64
4.0 Main Menu — <i>SAVE/RESTORE CONFIGURATION</i>	64
5.0 Main Menu — <i>STAGES</i>	66
Appendix A — <i>CO₂ Fuzzy Logic</i>	68
iPonic 624 [®] User Manual Index	1

Customer Service

At Link4[®], we are committed to providing professional, efficient and high-quality solutions and support for your grow room business. For Technical Support service during Monday to Friday (not including holidays), from 6:00 a.m. to 6:00 p.m. PST, please call 714-975-9474 or email support@link4controls.com. For after hours, weekends and holidays, please leave a message and your call or email will be responded to by the next business day.

If a highly critical need arises during non-business hours, please call our main office line at 866-755-5465 and leave a message. These calls are screened, and if they meet the criteria for an emergency, a call will be returned before the next business day.

Gold Package Customers — please refer to the private phone number on your warranty letter to access emergency support after hours, on weekends and holidays.

Contact Us

Address:

Link4 Corporation
175 East Freedom Avenue
Anaheim, CA 92801

Website:

<http://www.link4controls.com>

Telephone:

(714) 524-0004 Main Telephone
(866) 755-5465 Toll Free
(714) 975-9474 Customer Service
(714) 854-7244 Facsimile

Email:

Sales: sales@link4controls.com
Customer Service: support@link4controls.com

Terms and Conditions

Limited Warranty

Link4 warrants that the goods sold will be free from defects in material and workmanship for a period of 12 months after the date of purchase. This warranty will be limited to the repair and replacement of parts and the necessary labor and services required to repair the goods. IT IS EXPRESSLY AGREED THAT THIS WARRANTY WILL BE IN LIEU OF ALL WARRANTIES OF FITNESS AND IN LIEU OF THE WARRANTY OF MERCHANTABILITY.

Moreover, any description of the goods contained in this Installation and User's Guide is for the sole purpose of identifying them, is not part of the basis of the bargain, and does not constitute a *warranty* that the goods will conform to that description. The use of any sample or model in connection with this Installation and User's Guide is for illustrative purposes only, is not part of the basis of the

bargain, and is not to be construed as a *warranty* that the goods will conform to the sample or model. No affirmation of fact or promise made by Link4, whether or not in this Installation and User's Guide, will constitute a *warranty* that the goods will conform to the affirmation or promise.

Link4 shall not be responsible for replacement(s) or repair(s), which become defective from user negligence, modification, abuse, any types of improper usage, acts of God and/or force majeure. Nonconformance to any of the specifications in the product manual will void the warranty. Furthermore, Link4's liability to the goods sold, whether on warranty, contract, or negligence, will be released upon the expiration of the warranty period when all such liability shall terminate.

Link4 shall not be responsible for any loss or claims due to consequential damages afford by the Buyer. Link4 also reserves the right to make any necessary changes to features and specifications to condition or warranty.

Return, Exchange or Refund

Please refer to Link4's *Return and Exchange Policy* at <http://link4controls.com/support>.

Inspect Your Package

Upon arrival, check the contents with the packing list to ensure that you have all the items, all associated hardware and the necessary tools to begin installation. Make sure nothing is damaged or missing. If there is any visible damage or missing parts, please contact your point-of-purchase customer service department immediately. The package should come complete with the items listed below:

<u>Item</u>	<u>Quantity</u>
iPonic 624 controller	1
Digital Integrated Sensor Modules (DISM) with 16 ft. cable*	2
Preinstalled internet communication module	1
Quick start guide	1
User manual	1

Grow Room 1



Grow Room 2



*DISM 50ft. extension cable (PN 995-0020-00) is available for purchase from Link4:
(714) 524-0004; sales@link4controls.com

Install the iPonic® 624 Controller

Choosing Location

Find a location outside the grow room to mount your iPonic 624 controller. The following factors should be taken into consideration:

- secure and easily accessible;
- have a sturdy surface to hold the weight of the controller and the additional weight of the equipment power cords;
- away from direct sunlight and grow lights;
- dry area with no condensation, moisture, humidity, rain and extreme temperatures; and
- have at least ten inches of workspace below the controller.

Mounting the iPonic® 624 Controller

There are four (4) mounting holes on the outside of the iPonic 624 enclosure to help you attach it to a suitable surface. Make sure you use appropriate tools.

The iPonic 624 controller comes with a 115 VAC power cord. Make sure there is an outlet within approximately six (6) feet of the controller. It is highly recommended that you use an outlet that is not shared with another high-voltage equipment. You must disconnect all equipment from the iPonic 624 controller before its initial start-up.

SAFETY WARNING

The iPonic 624 controller supports a maximum of 15 amps at 115 VAC. It is recommended that the total current for both rooms be no more than 12 amps. To avoid electric shock, always keep the hinged door closed and locked when the controller is powered on.

If the total current for the equipment connected to the iPonic exceeds 12 amps, then external relays/contactors are required. See Appendix B for a suggested wiring diagram.

Connect the Indoor Sensor Modules

The iPonic 624 controller comes with two Digital Integrated Sensor Modules (DISM) – one for each room.

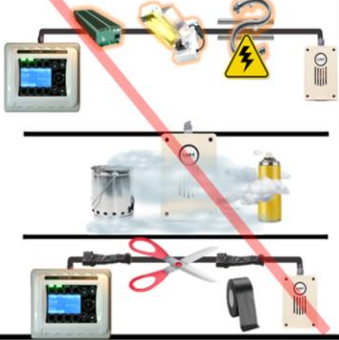
These sensors measure humidity, temperature, CO₂ and light. It is recommended that you hang each sensor in a central location within the grow room facility. Ideally, you want to hang the module near the crop level and towards the center point of the controlled environment to produce accurate readings. You may want to keep the module away from irrigation emitters, unit heaters, and/or any other type of equipment that may affect the accuracy of the sensors.



Securely connect the sensor modules to the plug-in connectors at the bottom of the iPonic 624 controller. For accurate Light Sensor readings, make sure the Light Sensor, which is at the top of the DISM module near the cable, is facing upward and toward the lighting sources in the room. Because of the sensitivity of the sensors, you may want to experiment with different locations and positions to determine the best area for getting the most accurate light sensor readings.

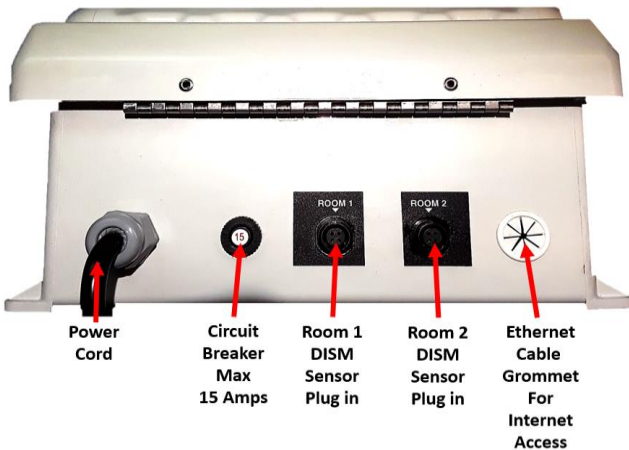
Each sensor module comes with a 16-foot cable. You may lengthen and extend the cables as needed but make sure to use Link4 Extension Cables, Junction Boxes and wires approved by Link4. Cutting and splicing can result in unstable sensor readings and failures.

CAUTION: Keep the cables away from high-voltage wiring, power inverters, motor controllers, mercury arc and/or sodium lamp circuits.

<p>CAUTION</p>	<p>CAUTION</p>
<p>Keep sensor cables away from: INTERFERENCE SOURCES high-voltage power wiring inverters motor controllers mercury arc sodium lamp circuits</p>	
<p>DO NOT EXPOSE TO CHEMICALS</p>	
<p>DO NOT CUT, MODIFY OR SPLICE CABLE This will void product warranty</p>	

Wiring the iPonic® 624

At the base of the iPonic 624 controller are the two sensor plugs and the Ethernet cable grommet for internet access. Adding extra holes elsewhere on the enclosure can result in condensation or moisture inside the unit and cause irreparable damages to your iPonic 624 controller. **Failure to install the iPonic 624 controller to Link4’s specifications will void the warranty.**



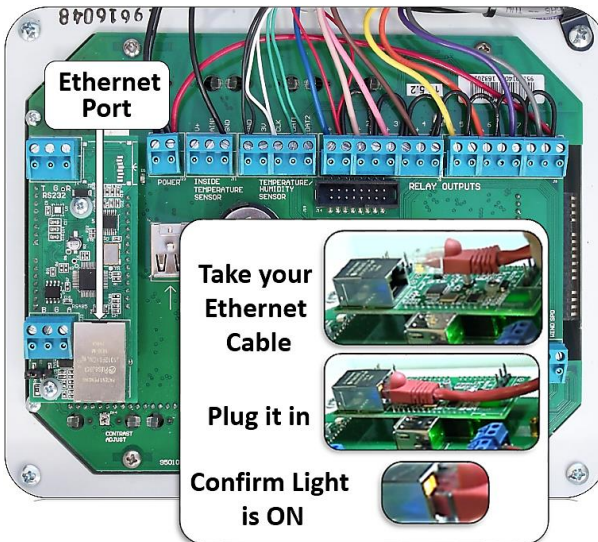
The iPonic 624 controller has eight 115 VAC electrical outlets. The default setting is four outputs for each of two rooms. With the program you can modify the number of outputs for each room, or even have all eight outputs in one room.



Connecting to the Internet

The iPonic 624 controller comes with a preinstalled **Communication Module**, which can be used to access the Internet via a standard CAT 5 cable linked to your router.

Note: The Ethernet port for the Internet is inside the iPonic 624 controller. Before



proceeding, make sure the Ethernet cable is functioning properly.

To connect your iPonic 624 controller to the Internet:

- Power down the controller
- Open up the hinged door
- Route cable through opening at the base

- Locate Ethernet port at upper left corner
- Plug in the cable to Ethernet port
- Plug in the other end to your router
- Close and lock the controller door
- Power up the controller

Once you are connected to the Internet, the iPonic 624 controller will automatically link up to the **iPonic Cloud** server at <https://iponic.link4cloud.com> and the Server Setup screen connection status will display “**Check Account.**”



Once you add your iPonic 624 controller onto the **iPonic Cloud****, the connection status will display **OK**.

Use the instructions below to access the iPonic 624 controller’s Serial Number and Registration Passcode to add your controller onto the **iPonic

Cloud.

- From the Main Menu, Press **Soft Button No. 3** or use the **Navigation Menu** to highlight **System Setup**
- Press **Soft Button No. 7** or use **Navigation Menu** to highlight **Communication Setup**
- Press **Soft Button No. 2** or use **Navigation Menu** to highlight **Server Setup**
- View your **Serial Number** and **Registration Passcode**

Go to the browser on your computer or mobile phone and visit the **iPonic Cloud** at <https://iponic.link4cloud.com>. If you have not done so already, create an account.

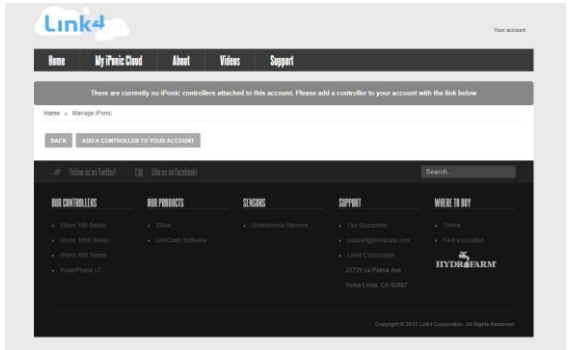
Remote Access

To set up your iPonic 624 controller for remote access through your computer or smartphone, follow these 3 steps:

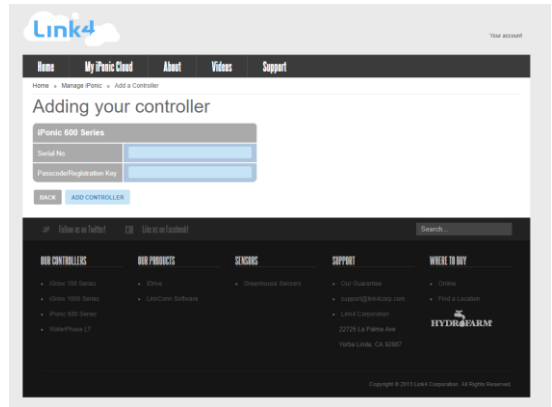
Step 1 – Login to your account and click on “My iPonic Cloud”



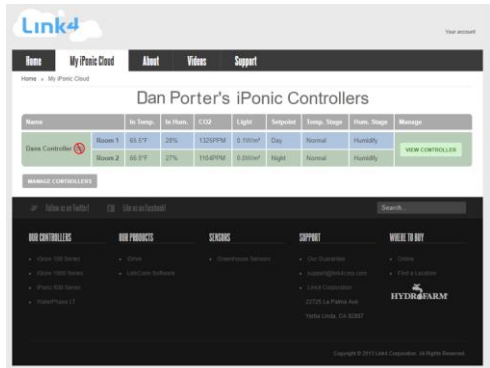
Step 2 – Click on “Add a Controller to Your Account”



Step 3 – Enter the Serial Number, Registration Passcode and select “ADD CONTROLLER”



Congratulations! You now can remotely access your iPonic 624 controller through your computer or smartphone.



Firmware Update

To update the firmware on your iPonic 624 controller, please follow the instructions below:

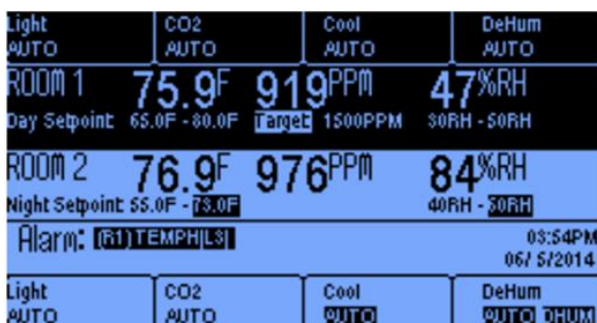
- From the **Home** screen of your Link4's **iPonic Cloud** account, click on the **Support** tab and select **Firmware Download**
- On Firmware Download screen click on **Latest iPonic Firmware**
- Create a **New Folder** on your desktop and name it **PRG**
- Retrieve **iPonic Firmware UPDATE** and move it to your **PRG** folder
- Move the **PRG** folder to an empty **USB** drive
- Safely remove your **USB** drive from your computer
- Insert your **USB** drive into your iPonic 624 controller
- Turn the **Navigation Menu** to launch the **Main Menu**
- Press **Soft Button No. 3** or use the **Navigation Menu** to select **System Setup** option
- Press **OK** to confirm selection and proceed to the **System Setup Menu**
- Press **Soft Button No. 5** or use the **Navigation Menu** to select **Advanced** option
- Press **OK** to confirm selection and proceed to **Room Select**
- Use the **Soft Buttons** or **Navigation Menu** to select **Shared**
- In the **Advanced Setup** menu, press **Soft Button No. 4** for **Bootload**
- You will be asked to begin **Bootload**

- Use the **Navigation Menu** to answer **Yes**
- Press **OK** to confirm your settings
- You will be asked if you want to **Reprogram**
- Use **Navigation Menu** to answer **Yes**
- Press **OK** to confirm your settings
- You will be asked if you want to **Configure** from the **USB** drive
- Use **Navigation Menu** to answer **Yes**
- Press **OK** to confirm your settings
- A status message will appear, and the iPonic 624 controller will restart

WARNING: The iPonic 624 controller is equipped with a USB port (use the slot on top). For your safety, please shut down and unplug your iPonic 624 controller before inserting the USB drive. You can use the USB drive to import schedules, install programs and upgrade your firmware. Please refer to this User Manual for more information.

Main Status Screens

The iPonic 624 controller has three **Main** status screens. The default status screen is divided between two rooms. The top section displays the current status for **Room 1**, and the bottom section displays the current status for **Room 2**.

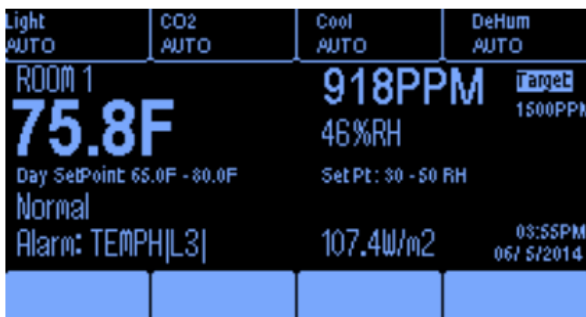


Split screen view featuring two rooms

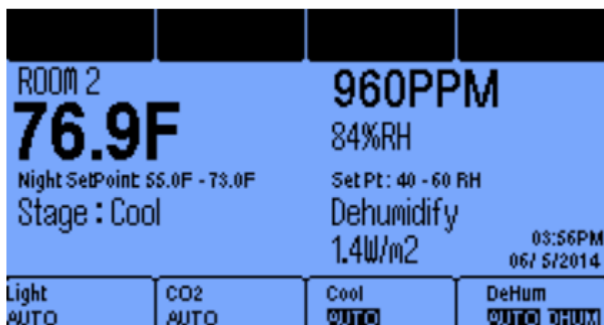
If you press the **Home** button, the whole screen will contain detailed information for **Room 1**. Pressing the **Home** button, a second time will give you the detailed information for **Room 2**. The two screens are shown on the next page.

The names of the equipment being controlled, and their current control status are displayed at the top of Room 1 screen and the bottom of the Room 2 screen. All of the numerical values shown below are samples only and will differ for each user.

Room 1 Main Screen with Day Setpoints



Room 2 Main Screen with Night Setpoints



Temperature – Each room has its own temperature sensor with its value displayed to one decimal point. (Fahrenheit or Celsius are selectable options)

CO₂ – Carbon dioxide levels are measured in parts per million (ppm) in each room.

Humidity – Relative humidity is displayed for each room as a percentage.

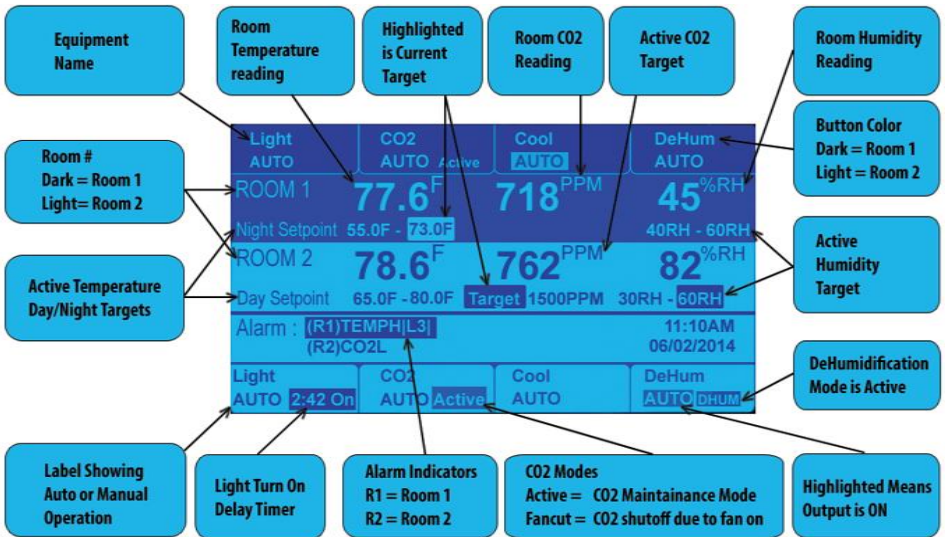
Setpoint – If the controller is in Daytime mode, it will display Day cooling and heating setpoints. Similarly, if the controller is in Night mode, it will display both the night heat and night cool setpoints.

Current Temperature and or Humidity Stage – The real-time temperature stage will be displayed below the temperature display. It will be either Normal, Heat 1 or 2, or Cool 1 thru 6, depending on number of stages you assign. If the controller is in humidify or dehumidify state, this real-time condition will be displayed below the relative humidity reading.

Soft Buttons – The buttons at the top and bottom of the screen correspond to the equipment being controlled. Below the name of the equipment is the current status

of the output. The normal condition is **Auto** mode. Pressing a button will highlight the override options for that piece of equipment, the most basic being **Manual Override of the output**. Each output can be forced **ON or OFF**.

An alternative to forcing the equipment **ON or OFF** is to use the manual override switches that are inside the controller. These switches are shown in the figure of the internal layout on pages 17 and 20.

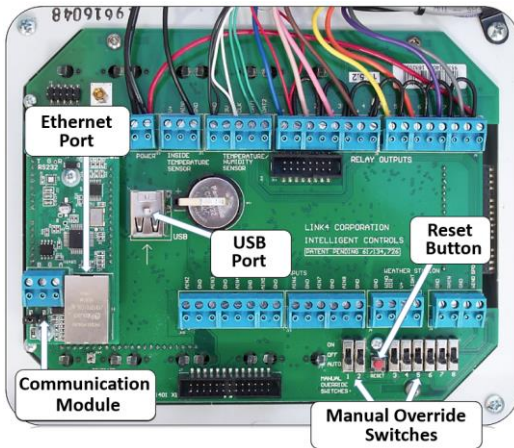


Very Important:

Note: The manual switches inside the controller take precedence over the soft button override. Therefore, when the system is running normally, the **Manual Override** switches inside the controller must be in the **AUTO** position. **If not, they will override all programmed settings**

Internal Layout

The diagram below shows the iPonic 624 controller’s internal layout and components. There are eight **Manual Override Switches**, a **Reset Button** that clears all configurations, a preinstalled **Communication Module** with an **Ethernet** port, and a **USB** slot (use the slot on top). Make sure the power is turned off before opening your iPonic 624 controller to avoid electric shock or irreparable damages.



Before You Begin – Some Basics

Setpoints

The iPonic 624 controller lets you program up to three different temperature and humidity **Setpoint pairs** over a twenty-four-hour period. For both temperature and humidity control you can select a low setpoint and a high setpoint. Typically, if the room temperature is above the high setpoint, the system will be in a cooling stage. Similarly, if the room temperature is below the low setpoint, the system will be in a heating stage. For each stage certain equipment's can be programmed to be on for the purpose of driving the temperature or humidity in the room to the Normal stage, that is, the temperature or humidity between the high and low setpoints.

If you want the setpoint pairs to change during the 24-hour period (which you can do up to three times), then you have the option of ramping between the setpoint pairs. This gives you the option of a smooth transition between the two setpoints from one time period to the next.

Below is an example of a setpoint worksheet for temperature and relative humidity. If you want separate day-night setpoints, then for setpoint 1 enter the day start time and setpoint 2, the night start time. Then fill in the data for the two setpoints.

SET POINTS	START TIME	TEMPERATURE		RAMP TIME	HUMIDITY	
		Low Set Pt. (°F/°C)	High Set Pt. (°F/°C)		Low Set Pt. (%)	High Set Pt. (%)
1						
2						
3						

Temperature Control

With the iPonic 624 controller, you can set a normal temperature range for your cooling and heating equipment by programming a cooling temperature target (**Cool Setpoint**) and a heating temperature target (**Heat Setpoint**), respectively. The temperature-control equipment will not be activated when the grow room temperature is within the normal range. Some circulation fans, which are also known as horizontal air flow or HAF fans, may be activated to maintain air movement within the grow room environment.

Anytime the temperature within the grow room deviates from the normal temperature range, whether above the **Cool Setpoint** or below the **Heat Setpoint**, the controller will activate the temperature-control equipment to enter either a cooling stage or a heating stage to drive the grow room environment to the desired normal temperature range. With the iPonic 624 controller, you can program up to 6 cooling stages and 2 heating stages.

When the temperature in the grow room rises above the **Cool Setpoint**, the system enters the first stage of cooling (referred to as **Cool 1**). If the temperature continues to rise, the system will enter the second stage (**Cool 2**), then the third stage (**Cool 3**) and so forth. The goal is to drive the temperature to the normal temperature range.

The same occurs when the temperature drops below the **Heat Setpoint**. The only difference is that there is a maximum of two heating stages.

Deadbands

If the room temperature rises above the **Cool Setpoint**, the cooling equipment will be activated to bring the temperature back to the normal temperature range. Without a deadband, this can cause the system to “short cycle” – that is, oscillate rapidly between the cooling stage and the normal stage. To limit the oscillations, a temperature band (deadband), often 1-2 degrees, is set below the temperature cool setpoint. As the temperature rises in the room and exceeds the cool setpoint, the first stage of cooling is engaged. When the room temperature drops below the cool setpoint, it remains in its first stage of cooling until the temperature drops below the cool setpoint – the deadband. Then it goes into the Normal stage. The narrower the deadband, the more the equipment goes on and off, but the tighter the temperature control.

The same process occurs with the **Heat Setpoint**. In this case, as the room temperature falls below the heat setpoint, the heating equipment is engaged. When the heat rises above the heat setpoint, it stays on until the temperature exceeds the heat setpoint + the deadband.

The temperature staging, deadbands and ramping are illustrated in the figure below.

Deadbands are also used with humidity control, CO₂ control and light control.

Ramping

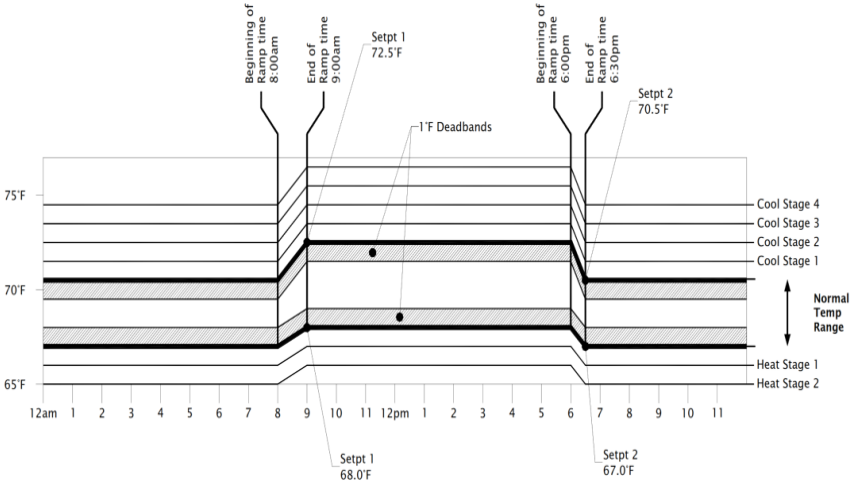
Ramping lets you control how gradually or rapidly you want to change the temperature and humidity targets between setpoint periods. If the night temperature targets are less than the day targets, for example, you may want to gradually adjust the setpoints so as not to shock the plants. Besides being good for the plants, it can also save on energy.

However, there are cases, depending on the crop, where sharp ramping, or a quick increase or decrease of the plant temperature is desirable. This is sometimes referred to as DIF.

By default, the Ramp time is set to 0 and in this case, there will be an immediate step transition in the setpoints. If you enter a Ramp time, it will always occur at the beginning of the Set Point time period. Example of temperature ramping is illustrated below:

In this Example:

Setpoint 1 is set to 8:00 a.m. with a 60 minutes Ramp, Temp is set as 68 to 72.5°F
Setpoint 2 is set to 6:00 p.m. with a 30 minutes Ramp, Temp is set as 67 to 70.5°F



Programming Instructions

Before programming the iPonic 624 controller, make sure the equipment has been properly connected and tested with the **Manual Override Switches**. After all equipment is tested, the switches must be placed back to the **AUTO** position.



Control Panel

The iPonic 624 controller has a **Navigation Menu** and four (4) **Soft Buttons** (**HOME**, **CANCEL**, **OK**, and **BACK**). Their functions are as follows:

MENU



Use the **Navigation Menu** to highlight a selection. Press **OK** to confirm the selection. The center of the **Navigation Menu** is **NOT** a button. If an alphanumeric field is highlighted. The **Navigation Menu** can increase or decrease the value of the entry or move between the options on the screen.

HOME



The **Home** button always takes you back to the **Main** status screen. If changes have been made, you will be prompted to save the data.

CANCEL



Pressing **CANCEL** in the middle of an entry will bring you back to the previous level without making any changes.

OK



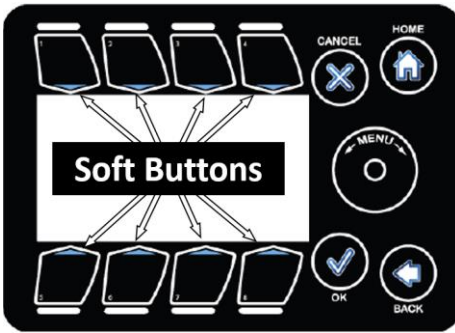
Pressing **OK** will prompt the system to accept the selected **MENU** entry or save your data.

BACK



The **BACK** button will take you up one level. You will be prompted to save data if needed.

SOFT BUTTONS



The eight **Soft Buttons** surrounding the display serve as controls for the outputs and shortcuts to the **Equipment Settings**.

You can control each of the eight outputs by pressing the corresponding **Soft Button** for the channel.

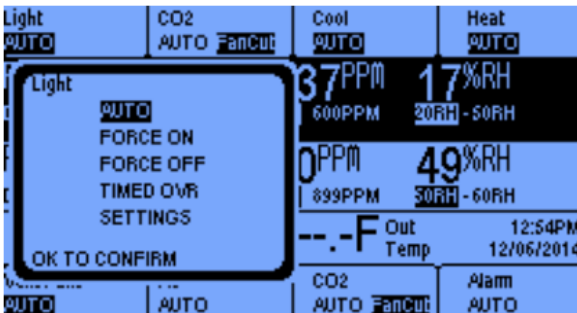
The **Manual Override Switches** on the inside of the controller must always be in the **AUTO** positions. You can use them to turn **ON** or to shut **OFF** the outputs. They will then override all programmed settings.

Note that the display area is not a touch screen.

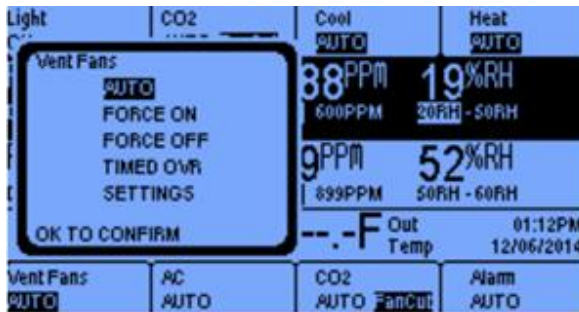
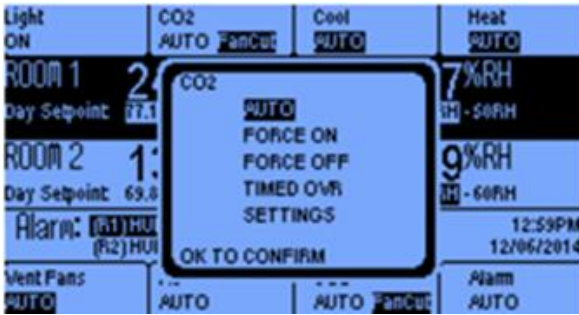
Soft Button Shortcuts

The iPonic 624 controller is equipped with eight **Soft Buttons** surrounding the interface, which serve as controls for the eight outputs and shortcuts to the **Equipment Settings** without using the **Main Menu**.

By default, your iPonic 624 controller has four outputs assigned for Room 1 and four outputs assigned for Room 2. If Room 1 needs more outputs than Room 2 or vice versa, you can change the outputs room assignment as well as the type of equipment used (see pages 49-54).



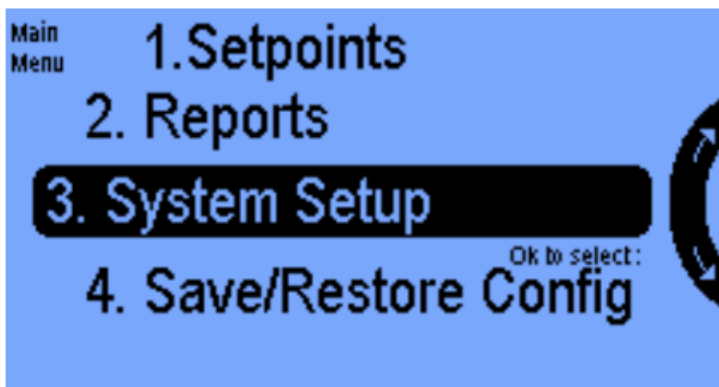
Soft Buttons No. 1, No. 2, No. 3 and No. 4 are shortcuts to the designated Equipment Settings for **Room 1**. In these two pictures, they are the Light and CO2 settings.



Soft Buttons No. 5, No. 6, No. 7 and No. 8 are shortcuts to the designated Equipment Settings for **Room 2**. In these examples, they are the **Air Conditioner**, **Vent Fan** and **Alarm** settings.

Note: You can see here how useful these Soft Buttons are: Once you have gone through the program you can make most of your changes by selecting the settings option from the Soft buttons on the front (**Home**) screen.

The **Main Menu** will appear when the **Navigation Menu** or **OK** button is activated.



The following four options are on the **Main Menu**:

1. **Setpoints** – This section allows you to configure preferred operating conditions for two grow rooms (see pages 26-33).
2. **Reports** – All user data information, graphs and reports are viewable in this option (see pages 34-35).
3. **System Setup** - Initial programming and advanced parameters are set here (see page 36-62).
4. **Save/Restore Configuration** – Configuration data can be saved or restored on a USB drive (see pages 65-66).

A fifth option, **Stages**, is hidden by default and can be activated in the Advanced settings (see pages 67-68).

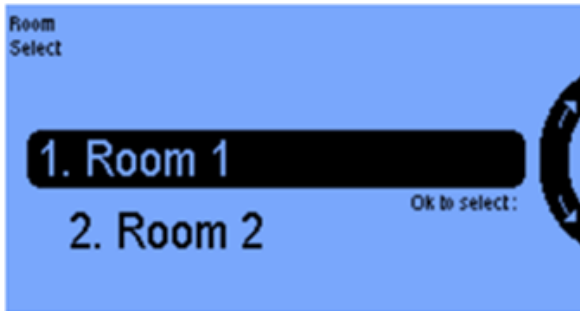
**THE FOLLOWING PAGES WILL COVER THE PROGRAMMING
DETAIL FOR EACH OF THE FIVE OPTIONS. PLEASE BE
ADVISED THAT MANY SETTINGS ARE ROOM SPECIFIC
(EITHER ROOM 1 OR ROOM 2) AND SOME ARE SHARED
SETTINGS (BOTH ROOM 1 AND ROOM 2).**

1.0 Main Menu — SETPOINTS



From the 4 selections on the **Main Menu**, select **1. Setpoints** by pressing the **OK** button.

Select a room to program, then press the **OK** button.



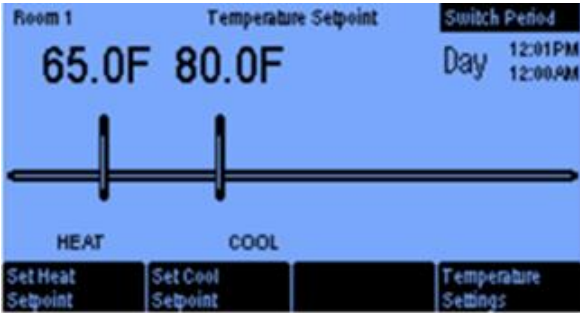
Once you select the room, you have 5 setpoint options:

1. Temperature Setpoint
2. Humidity Setpoint
3. CO2 Setpoint
4. Light Setting
5. Setpoint Times

1.1 SETPOINTS Menu — *Temperature Setpoint*



Select the **Temperature Setpoint** option. By pressing **OK** you will get the next screen.



In this **Temperature Setpoint** screen for the Day Mode, you can program a cool temperature target by selecting the **Set Cool Setpoint** button and the heat temperature target by selecting the **Set Heat Setpoint** button. The temperature range between your heat and cool setpoints is the **Normal** stage.

The **Switch Period** button #4 lets you select the settings for the Night Mode. If you have DIF enabled, then the time settings for this option will also appear.



By selecting the **Set Heat Setpoint button** you get this screen. Here you set the heat temperature target for your room. If the room temperature drops below the **Heat Setpoint**, the heating equipment will be activated.

Pressing Button 1 will let you change the setpoint in increments from 0.1 degree to 1.0 degree.



The **Set Cool Setpoint** enables you to select the cool target for your room. If the temperature in the room rises above the **Cool Setpoint**, the cooling equipment will be activated. Pressing button 8, takes you to the next screen.



This **Temperature Settings** screen lets you select a **Deadband** for heating and cooling to prevent excessive equipment oscillation. (See the Deadband discussion on page 19.)

The **OutTemp Ovr Threshold** button only appears if in your advanced settings section, you have an outside temp sensor enabled.

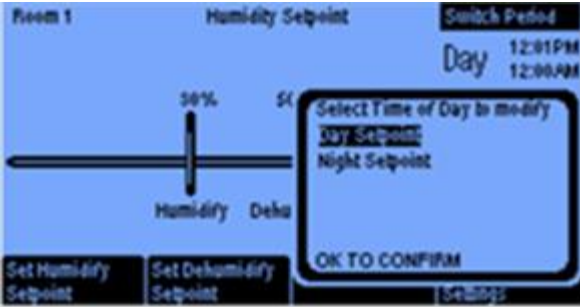
1.2 SETPOINTS Menu – *Humidity Setpoint*



The **Humidity Setpoint** option of the **Setpoint Menu** is where you program the relative humidity targets.



On this **Humidity Setpoint** screen you select your **Humidify and Dehumidify Setpoints** by pressing the appropriate button. If the humidity goes above your Dehumidify setpoint, the dehumidification equipment will be activated. If the humidity goes below the humidify setpoint, the humidification equipment will be activated.



With the **Switch Period** option, you can program separate Relative Humidity setpoints for your day and night periods.

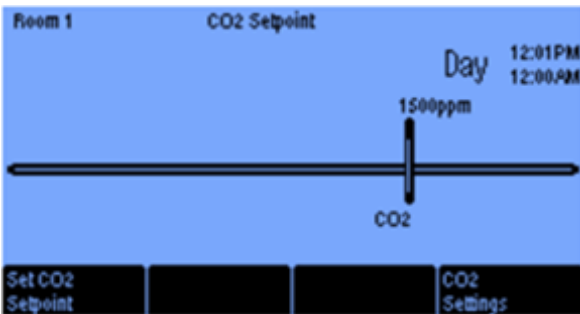


When you press the **Humidity Settings** button (#8 above), you can set an **On Time** and an **Off Time** in minutes and seconds to create a cycle. By carefully selecting ON and OFF times, you hopefully can avoid overshooting your humidity target. If you want your equipment to run continuously until your setpoints are reached, set the Off Time to 0 minutes 0 seconds. Selecting the **Deadband** button lets you set the humidity and dehumidify deadband. See page 19 for a more detailed discussion.

1.3 SETPOINTS Menu – CO2 Setpoint



The **CO2 Setpoint** option is where you set your target CO2 level. Selecting this option takes you to the next screen.



From this **Set CO₂ Setpoint** screen, configure CO₂ levels for the room.

Pressing button 5 (**CO₂ Settings**) takes you to the screen, where you set your desired CO₂ target. **The CO₂ equipment shuts off by default in the nighttime period.**

Pressing Button #8 takes you to the **CO₂ Settings** screen to customize advanced features for control of CO₂ levels.

Button 1 lets you change the CO₂ targets in increments of 1ppm or 10 ppm.



The **Deadband** is discussed in some detail on page 19.

The **Fan Cut Off** button lets you enable or disable this option. When the option is enabled the CO₂ injection goes Off when the fan goes On.

When you press the **Switch to Generator** (#5 Button) it will take you to the 3rd screen below.



CO₂ Cycle Period – this option is only available if you are injecting from a CO₂ tank. In this case, by controlling the On Time and Off Times, you can cycle the injection so as to limit its overshoot. Pressing button #6, takes you to the next screen.

CO2 Fuzzy Settings —this is a very efficient technique for control of your CO2 injection process.

The details of this feature and the programming instructions are in Appendix A.



The **CO2 On Time** cycle is the run time when CO2 is injected into the room from a tank, given that the CO2 level is below its target and the light threshold is met.



The **CO2 Off Time** helps avoid saturation and enables the CO2 to fill the room gradually. The Off Time can be set to hours, minutes and seconds.



You will have this screen, where you select the “**Switch to Generator**” Option. If you are on this screen and are using a CO2 Tank then Select Button #5.

1.4 SETPOINTS Menu – *Light Setting*



In the **Setpoint Menu**, select the **Light Setting** to control the lighting sources in the selected room.



Once selected, you get this screen where you can configure the **Start Time** to turn the lights on to initiate the daytime period. To turn the lights off, you can configure the **End Time** to initiate the nighttime period.

Note 1: The Start Time and End Time set here will become the same as the Start and End times for temperature, humidity, CO2 control.

The start time determines:

When the Day setting begins and similarly, the End Time determines when the night setting begins.

Note 2: During the Night time period the lights will automatically be OFF.

1.5 SETPOINTS Menu – *Setpoint Times*



In the **Setpoint Menu**, select **Setpoint Times** to program when you want the daytime and nighttime periods to begin.

This provides the same function as the previous screen for light Settings.



Press Button #2 to set your Day Start Time and Button #3 for your night Start Time.



In the **Set DAY Start Time** screen, you can program your daytime settings.

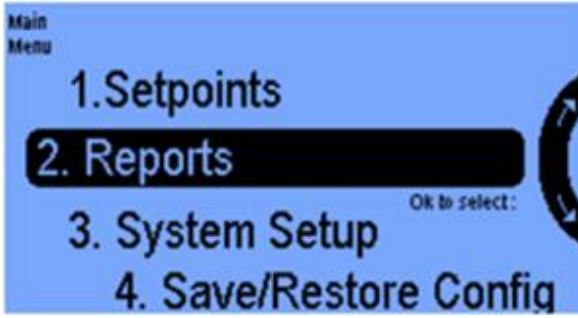
Note: To program a room other than the one you just did, you must go back to 1. Main Menu and select Setpoints.



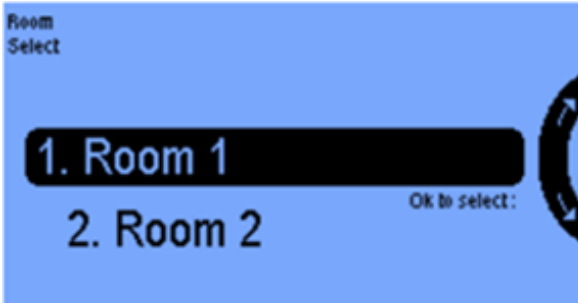
In the **Set NIGHT Start Time** screen, you can program your nighttime settings.

Note: Setting the Day and Night Start times here applies to the temperature, humidity, CO2, and light control.

2.0 Main Menu — REPORTS



In the **Reports** option, you can retrieve detailed data about each room's performance.



From the **Room Select** menu, highlight **Room 1** or **Room 2** with the **Navigation Menu**.

2.1 Reports – Sensor Report

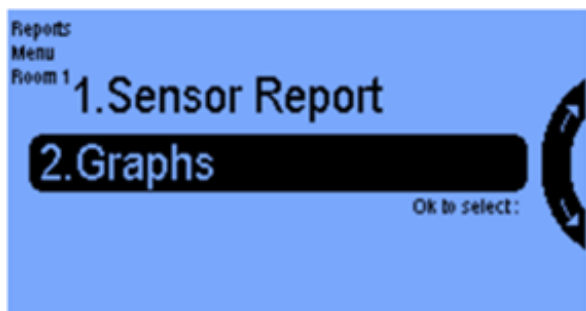


In the **Reports Menu** screen, highlight the **Sensor Report** option to instantly review all data collected by the sensor module in numerically summarized formats.

2.2 Reports – Graphs

Last 24 Hours		
Room 1	Min	Max
Temperature	73.0F	78.5F
Humidity	42%	48%
CO2	530.0PPM	951.0PPM

The **Sensor Report** shows data collected by the sensor module for temperature, humidity, CO2 and light. **Soft Button No. 1** and **No. 4** allow you to toggle between the **Last 24 Hours** and **Since Reset** (the last time the unit was powered on or when the **Reset** button was activated).



In the **Reports Menu**, select **Graphs** to view data for temperature, humidity, CO₂, and lighting levels in a graphical format.



In the **Graphing Menu**, you can view graphs illustrating temperature, humidity, light, and CO₂ levels.



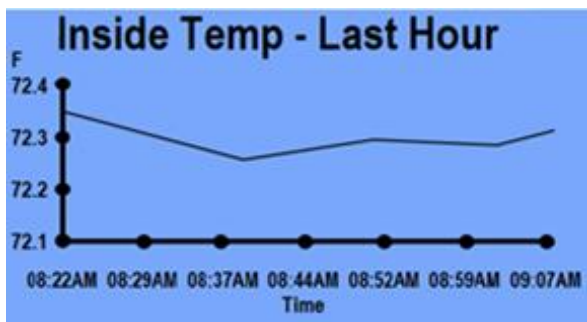
In the **Temperature Graph Menu**, you can view graph illustrations showing data collected by the sensor modules for the **Inside Temperature** the **Heat Setpoints** and the **Cool Setpoints** for the Room selected.



When you make one of the 3 selections in the above screen, you can view graphing information collected by the sensor modules.

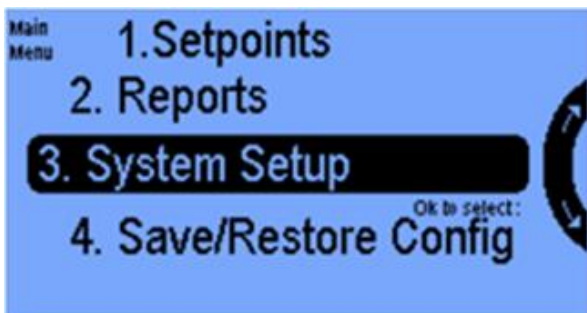
You have four options:

1. **Since Reset** (the last time the unit was powered on or when the **Reset** button was activated)
2. **Last Hour**
3. **Last 24 Hours**
4. **Last 7 Days**.



This example shows a graph of the Inside Temp reading for the Last Hour.

3.0 Main Menu — SYSTEM SETUP



System Setup in the **Main Menu** enables you to set up the grow room equipment, the sensors and the alarms and other features as listed below:



Systems Setup Menu:

1. **Equipment Setup** allows you to customize the equipment type for each of the eight outlets.

2. **Sensor Setup** lets you map and calibrate the sensor module that is used to read inside temperatures, humidity, CO2 and lighting;

3. **Alarms Setup** allows you to create different alerts for up to 8 channels;

4. **Time/Date Setup** lets you program the time and date.

5. **Advanced** lets you configure specialized settings for each equipment type.

6. **Save/Restore** enables you to save and restore configurations, history, log files and data logging setup;

7. **Communication Setup** lets you set up Internet access.

8. **Measurement Units** allows you to set the desired units of measurement for temperature and lighting.

3.1 SYSTEM SETUP Menu — *Equipment Setup*



The **Equipment Setup** option is where you identify the equipment you have connected to each of the controller ports (outlets) that you will be using. It is also where you program the way you want to use the equipment to achieve your control objectives.

Selecting 1 gives you two options: Quick Setup and Advanced.

3.1.1 Quick Setup



Quick Setup lets you link the iPonic outputs to particular equipment types for control of the two rooms.

The **Advanced** option is more detailed and flexible. This is where you program equipment, set overrides, and customize the equipment names that will be displayed on your front screen.

Selecting 1. gives the following screen.

This **Basic Equipment Setting** screen for the Quick Setup begins with the factory defaults shown. You can select the equipment that you actually have from the list by using the navigation cursor buttons at the bottom of the screen and then checking or unchecking the highlighted position using Soft Button #3.

You have a maximum of 8 boxes you can check between the 2 rooms. This corresponds to the 8 outlets of the iPonic.

Equipment	Room 1	Room 2	Uncheck
Light	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
CO2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Cool	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Heat	<input type="checkbox"/>	<input type="checkbox"/>	
DeHum	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Hum	<input type="checkbox"/>	<input type="checkbox"/>	
Info Pump	<input type="checkbox"/>	<input type="checkbox"/>	

Basic Equipment Setting



By default, your iPonic 624 controller has 4 outputs assigned for Room 1 and 4 outputs assigned for Room 2. If Room 1 needs more outputs than Room 2 or vice versa, you can change the outputs room assignment as well as the type of equipment used as described above.

3.1.2 Advanced



Selecting the **Advanced** option opens the following screen:

When you are programming your iPonic for the first time and if your controller was not factory pre-programmed to your specific equipments, then you will see a screen as follows:



Scrolling through this **Equipment Menu Screen** you will see the default equipments for the 8 channels. Four for Room 1 and four for Room 2. These correspond to the **Quick Start** equipment table show above and match the 8 outlets of the iPonic 624 controller.

Use the **Menu Wheel** to select Light for Room 1 and press OK. This will take you to the following screen.



The **Equipment Settings Light** screen allows you to set a Timed Override (button #1), Initial Settings (button #3), and select which room (Room Select) (button #8) you want the output to control.

Selecting button 1 takes you to the following screen:

3.1.2.1 Equipment Settings — Timed Override



The **Override Setup Light** screen allows you to force the equipment to turn on [**Override On**] or off [**Override Off**] regardless of the programmed setting.

Button 1 – enable or disable the override.

Button 2 – select whether you want the override to force the output ON or OFF.

Button 5 – select the Start Time for the override.

Button 6 – set the override duration.

Button 7 – select either a daily override or a one-time override.

Note: You can get to this same screen from the Home screen by pressing Soft Button #1.



Selecting the Duration button #6 on the previous screen gets you this screen:

The **Override Duration** can be programmed from hours to seconds

Going back to the **Override Setup** screen and assuming you selected the **Enable** option (Button 1), then when you select the **Daily's/OneTime** (button 7), you will see the following screen:



This is where you select whether to have the override on a **Daily** basis or **One Time only**. For one time only, the **Override** will default to **Disabled** at the end of the duration. Once the output has been overridden, the indicator on the front screen will change from **AUTO** to either **ON** or **OFF** depending on your selection.

3.1.2.2 Equipment Settings — Initial Settings



Going back to the Equipment Settings screen for light and selecting the Initial Settings button, you will get this Initial Settings Light screen.

In this screen, you have a Set Type (button #1) and a Set Name (button #3)

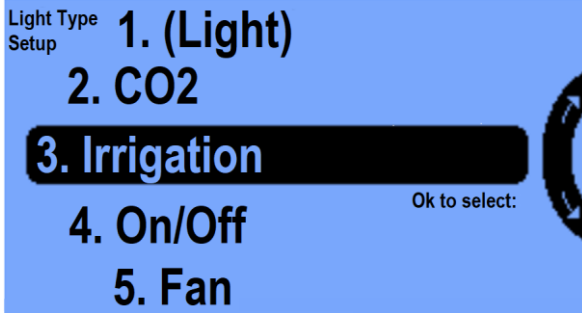
If you press the **Set Type** button, you will be able to change the output from controlling light to one of the other 6 options. (More on this below) If you press **Set Name**, you will get the following:

3.1.2.2.1 Equipment Settings — Set Name



For this example, we will name the output **Light Bank**. Select OK to confirm the change and return to the Initial Settings screen. Press Home and save your settings.

3.1.2.2.2 Equipment Settings — Set Type



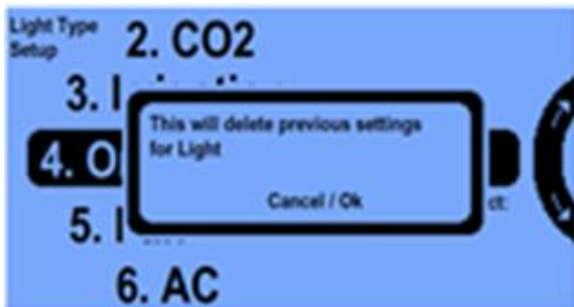
When you go back to the “**Initial Settings Light**” screen and press the **Set Type** you will get this screen.

Notice that there are parentheses around (Light). This indicates the equipment type of the output with which you are working. In this case (looking back at the Equipment Menu) it is output 1 (Light in Room 1).

This list has 7 different equipment types. You can assign any one of these equipment types to any of the outputs based on how you have connected your equipment to your outputs.

A description of the equipment types is shown below:

1. **Light** – with different modes and multiple bank control.
2. **CO2** – used as a tank or generator with normal or fuzzy logic control.
3. **Irrigation** – runs an irrigation cycle, turning it On and Off between a start and end time within a 24-hour period.
4. **On/Off** - for Temperature and Relative Humidity control.
5. **Fan** – for Temperature, Relative Humidity control, and Air Exchange. It temporarily turns CO2 off when running.
6. **AC** - to be utilized for Temperature and relative Humidity control.
7. **Alarm** - this output can be programmed to trigger an onsite Alarm if High/Low CO2, Temperature, Relative Humidity values go beyond your set alarm thresholds.

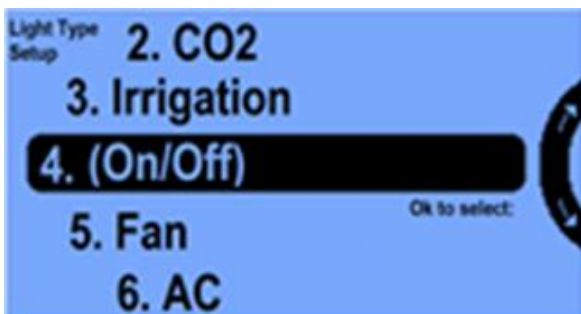


We will now go through an example where we will change the first output from a light to an On/Off device for controlling temperature or humidity.

Go back to Equipment Setup, select Advanced.

Use the Menu Wheel to highlight **On/Off** and select **OK**. A confirmation banner will pop-up to confirm the change, select **OK**.

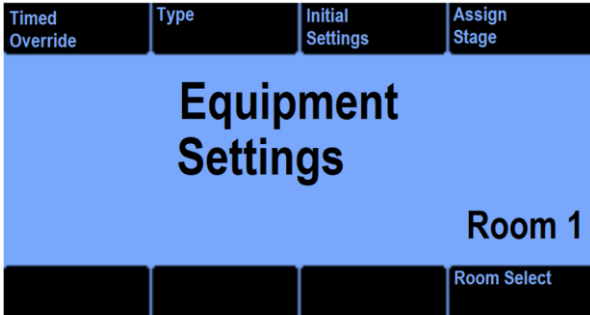
You will see this screen. When you Press OK you will get the next screen.



You now see the parentheses on the **On/Off** indicating that this output is now programmed to be an On/Off equipment type device.

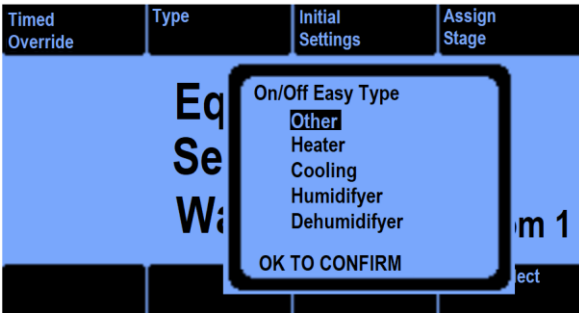
You then need to press Home to save your On/Off selection. Then go back to the System Setup, Equipment setup, Advanced and select the highlighted Channel.

You will then get the following screen:



As you will see, there are more options for **On/Off** equipment types.

If you select the type button 2, you get the next screen.



The **Type** option screen will give you choices for the On/Off device where you can assign it for Heat, Cool, Humidify, and Dehumidify stages.

For example, the On/Off output might be a heater or a fan for cooling, or perhaps a humidifier for humidity control.



As we saw above, if you select the “**Initial Settings**” button #3, you can change the name for your output which will then appear on your front screen.

3.1.2.2.3 Equipment Settings — Assign Stage



Going back to the **Equipment Settings** screen and pressing button #4 will get you the **Assign Stage** screen. Here you will set the options to view and change your stage settings for Temperature and relative Humidity.



1, is for assigning the stages of operation for the particular equipment.

2, is where you can assign the stages for all the temperature and humidity related equipments in the particular room.

	Setup			
Stages →	H1	N	C1	C2
Wall Fan	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Cool	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
DeHum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

In this screen you can assign the temperature stages that you want the **Wall Fan** to be ON.

In this example, we have 1 heating stage and 2 cooling stages. To set the number of stages, you would need to go back to the “**Main Menu**”, select “**System Setup**”, “**Advanced**”, “**Room**”, and then “**Adv Stage Settings.**”

Select DeSelect	Selected
Assign Temperature Stage for Wall Fan (Room1)	Selected
Heat 1	<input type="checkbox"/>
Normal	<input type="checkbox"/>
Cool 1	<input checked="" type="checkbox"/>
Cool 2	<input checked="" type="checkbox"/>

Selecting Room 1 stages option you will get the next screen:

Here you can setup all the **On/Off** equipment for Room 1. In other words, which stage you want which equipments to be ON.

Note: You will get the same screens by going to 5. Stages on the Main Menu which is covered in section 5.

3.2 SYSTEM SETUP Menu — *Sensor Setup*



Sensor Setup is where you tell your controller what sensors you have connected and what kind.

It is also where you can calibrate your sensors.



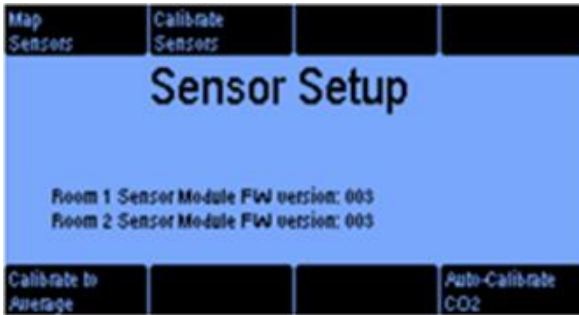
Selecting 2 above gives you this **Sensor Setting** screen. The first three buttons let you enable or disable the sensor module for each of the two rooms and the outdoor temperature sensor.



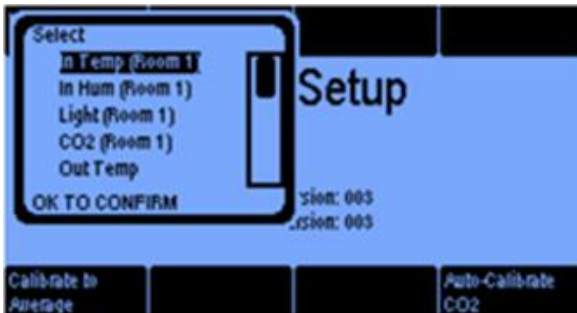
Pressing buttons 1, 2 and 3 bring up screens similar to the Room 1 Sensor Module screen shown here. If you have the sensor module and it is connected, select the Enable option. Otherwise, leave it disabled.



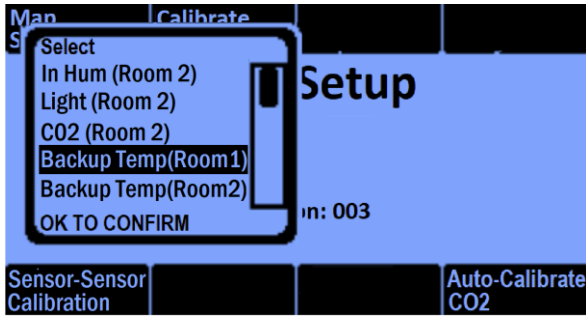
This is an analog temperature sensor that can be used for outdoor temperature readings. You will need to wire the Link4 to this sensor to one of the controller's Analog inputs.



When you press button 4 of the Sensor Setting screen (Advanced Settings), you will get this **Sensor Setup** screen that enables you to Map your sensors, Calibrate, Calibrate to Average and Auto Calibrate your CO₂ Sensor.



Pressing the **Map Sensors** button lets you manually assign sensors to inputs on your iPonic 624 controller. Use the **Menu Wheel** to highlight the sensor to be setup and select **OK**.



It is highly recommended that you have a backup sensor.

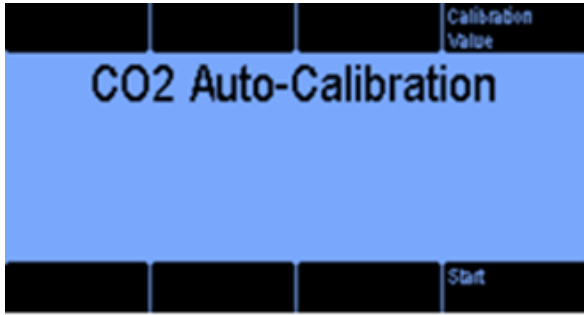


After you select the backup temp sensor, a pop-up window will give you the sensor options: **Analog**, **Digital**, **Software** (if you want your reading to be a constant value), **None**, **Average**, or **Alternate**

Previous	Next	Edit		
Sensor Calibration				
	SENSOR	RAW	CAL	ADJ
	CO2 LSB (Room 1):	1.0	1.0	1.0
	In Temp (Room 2):	76.9F	0.0F	76.9F
	Humidity (Room 2):	43%	50%	83%
	Light (Room 2):	0.1u/m2	16.6	1.4u/m2

The **Sensor Calibration** option lets you manually adjust collected data. The **Raw** value is the direct reading from the sensor. The **calibrate (CAL)** value is added to the **Raw** value to generate the **adjust (ADJ)** value. The **ADJ** value will be reflected on the Main Home screen.

The **Previous** and **Next** buttons let you navigate up and down through the sensors. Use the **Edit** button when you want to manually calibrate the highlighted sensor.



If you go back to the **Sensor Setup** screen, and you select the Auto-Calibrate CO₂ button you will get this screen. You can calibrate the sensor to a specific CO₂ measurement reading. One way to do this is by placing the sensor outdoors and pressing **Start**. It will automatically calibrate to the outdoor CO₂ level which is always a default setting of 400. This default setting is adjustable.

3.3 SYSTEM SETUP Menu – Alarms Setup



Select 3. for **Alarms Setup**. You will then select the Room number after which you will get the following screen.



The **Alarm Settings** features 6 alerts that can be designated to warn you of high / low temperatures, humidity, and/or CO₂ levels. An **Alarm Delay** (button 4) is the amount of time an undesirable condition must persist before the alarm is triggered.

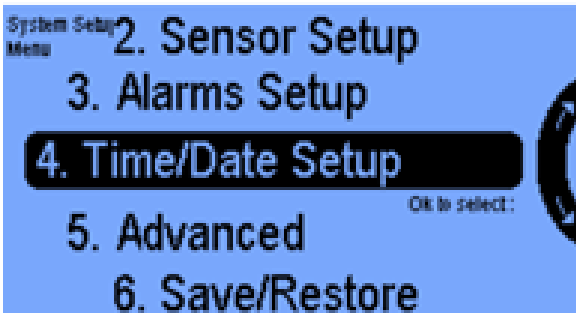
Pressing button #8 takes you to the light off Delay.



Lights are a source of heat that can raise temperatures beyond acceptable levels. If the temperature rises above the **High Temp Alarm** threshold, the **Light Off Delay** is the length of time after the Temp alarm threshold is triggered when the lights will go off. In the example this time is 60 sec.

Note: These alarms must be setup separately for each of the two rooms.

3.4 SYSTEM SETUP Menu — *Time/Date Setup*



The **Time/Date Setup** lets you change the time and date of your iPonic 624 controller.



From this screen you can **Set Time**, **Set Date**, and set it up with the **Internet Time Server**.

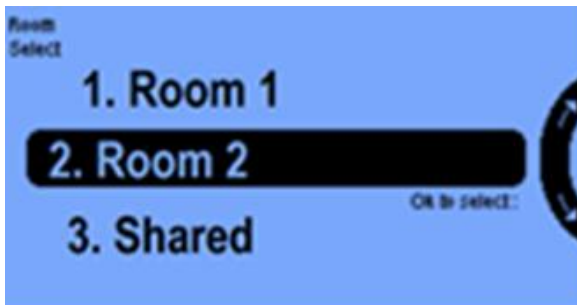


The **Internet Time Server** option lets you synchronize the time and date of your controller with the time and date on the Internet. This can only be done after you manually set the time and date.

3.5 SYSTEM SETUP Menu — *Advanced*



There are 3 Advanced screens: **Room 1**, **Room 2**, and **Shared**.



3.5.1 – Advanced Room 1 or Room 2



The **Advanced Setup** screen for **Room 1** or **Room 2** allows you to customize different functions. The examples below will explain each of the eight buttons.

3.5.1.1 Advanced Room 1 or Room 2 — Humidity Settings



The **Humidity Settings** lets you set a cycle timer for humidity control. You can set the **ON** time in min. and sec. You can do the same for the **OFF** time.

The **Low Outside Temperature** threshold allows you to configure the dehumidification override to deactivate if the outside temperature falls below the programmed level. This button only shows up when you have an outdoor temperature sensor enabled.

The purpose for the humidity injecting cycle timer is to avoid overshoot. A common problem when misting/fogging is to raise the humidity that the humidifier is on too long and way overshoots the desire target. By selecting on and off times appropriate to the particular humidifier system, you can avoid sever overshoots.

The **Deadband** can be set to prevent frequent humidity stage changes. The smaller the deadband, the tighter the control, but the more frequent switching on and off of the equipment.

3.5.1.2 Advanced Room 1 or Room 2 — Temperature Settings



The **Deadband** can be set to prevent frequent temperature stage changes. The **Stage Width** is the number of degrees the temperature must change before going to the next stage. The smaller the number, the tighter the temperature control, but the more the equipment goes on and off. The OutTemp override threshold (Button #3) only appears if you have an outdoor temperature sensor. In this case, you may want to set a low outdoor temp threshold below which you will not let the Vent Fan turn ON.

3.5.1.3 Advanced Room 1 or Room 2 — CO2 Settings



The **CO2 Settings** screen lets you set a **Deadband** to minimize the on and off frequency of the equipment. The **Fan Cut Off** is explained with the next screen. The controller supports two types of CO2 injectors. One is a tank, the other a CO2 generator. Button 5 lets you switch between the two. If you are using a tank, then you have the option of using a cycle timer (buttons 6 & 7) to minimize the CO2 overshoot.



To prevent waste, your CO2 equipment will not run when the **CO2 Fan Cut Off** option is enabled and the fan goes on. The Fan Cut Off feature only responds if your fan is a **Vent Fan** equipment type.

3.5.1.4 Advanced Room 1 or Room 2 — Light Settings



Light Settings are advanced light control features that enable you to 1) prevent equipment damage in the event of a power surge, 2) control the **Day Setpoint**, and 3) control lights from a **Separate Light Bank**.



The **Power Cool Down Time** is a safety feature that protects lighting equipment. When you plug in the controller or when there is a power surge, you can program a delay of up to 15 minutes before the light banks will be turned on, which will give the lights time to cool down. This is done to extend bulb life.



Normally, **Light Settings** operate concurrently with your **Day Setpoints**. However by selecting **Yes**, you can program your lights to run independently from the Day setpoints.



Separate Light Bank (Button 4). If you are using a separate Light Controller from the iPonic, then you will want to indicate such.

3.5.1.5 Advanced Room 1 or Room 2 — Air Exchange Settings



The **Air Exchange Settings** allows you to program your ventilation system to circulate fresh air inside your growing environment. **Air Exchange** only works with the **Vent Fan** equipment type.

Button #1 is to enable or disable the air exchange option. Buttons #5 & 6 set start and end time, and buttons #7 & #8 cycle the air exchange within the enabled time window.

3.5.1.6 Advanced Room 1 or Room 2 — Advanced Stage Settings



The **Advanced Stage Settings** option lets you program settings for when you have more than one heating and cooling stage. Pressing button 1 and selecting the **“Show”** option will add a 5th line to the **Main Menu** (page 67) called **“Stages”**. This will enable you to quickly setup your equipment for temperature and your humidity stages.

The **Stage Delay** is the minimum time for the system to change stages. In this example, it will have to remain in the current stage for at least 15 seconds.



If you have a room with vents, dampers and fans, you will want the vents and dampers to open before fans are turned on. Otherwise, you might have a static pressure problem/ To achieve this, program the vents and dampers in the first stage of cooling and the fans in a higher stage.



When you select button #4, you will see this screen where you set the number of cooling stages for Room 1. Selecting button #3 will let you do the same for the heating stages.

3.5.1.7 Advanced Room 1 or Room 2 — Adv. Setpoint Settings



The **Advanced Setpoint Settings** option allows you to either **Enable** or **Disable** the **CO2 Night Setpoint**, **DIF Setpoint**, **Ramping** and **CO2 Fuzzy Settings**.

The **CO2 Night Setpoint** lets you maintain a specific CO2 level during your night time period. The **DIF Setpoint** lets you set a third time-period for use on occasion when the normal settings are not sufficient (e.g., setting a lower temperature target at sunrise).

Ramping, which dictates the rate of change of the setpoint when transitioning between the night-to-day or day-to-night time periods. The longer the ramp, the more gradual the change of the target temperature and humidity setpoints.

Enabling **CO2 Fuzzy Settings** is when the user modifies CO2 levels based on the needs of the room rather than a fixed setpoint. **(See Appendix A for a more detailed explanation.)**



The **CO2 is cutoff when lights are off** option allows you to cut off CO2 when the lights are turned off. If you select the “CO2 Cutoff with light meter” option, then you will get the next screen.



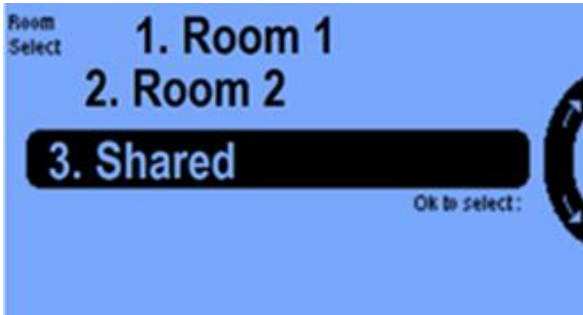
The **CO2 cutoff with light meter** option allows you to shut off CO2 based on the level of darkness in the room (e.g., light sensor reading from the DISM sensor). Pressing button #3 lets you set the **Light Threshold**.

To minimize turning on and off the lights, you can set a **Light Deadband** (button 4).

3.5.2 Advanced Shared



From the **System Setup Menu** → select **Advanced** screen.



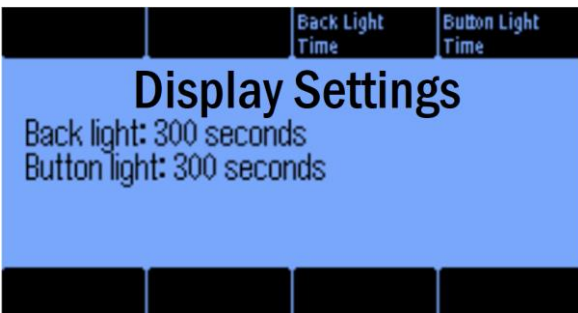
On the **Room Select** screen, select **Shared**.



This **Advanced Setup** screen lets you configure a variety of settings on your iPonic 624 controller. They are:

- **Display Settings**
- **Controller Version**
- **Clear Data**
- **Boot load**
- **Password**
- **Start Wizard**
- **Diagnostics**

3.5.2.1 Display Setting



Advanced Setup — Button #1

In this **Display Settings** screen, you can use the **Back Light Time** (button 3) and the **Button Light Time** (button 4) to adjust the length of time you want the screen and/or the buttons to have the backlighting on.

3.5.2.2 Controller Version



Advanced Setup — Button #2

The **Controller Version** is the same screen that appears when your unit is activated. It contains important information about your iPonic 624 controller, including:

- Firmware Version
- Serial Number and Mac Address

3.5.2.3 Clear Data



Advanced Setup — Button #3

You have 3 options after pressing the **Clear Data**:

1. **Clear History**,
2. **Format File System**,
and
3. **Restore to Factory Defaults**.

When restoring to factory defaults, you can also enable and rerun the **Startup Wizard**.

3.5.2.4 Boot Load

Advanced Setup — Button #4

The **Bootload** option (button 4) is used when you update your iPonic 624 controller with Link4's latest software.

The instructions for this option are on page 13.

3.5.2.5 Password

Advanced Setup — Button #5

The **Password** option (button 5) lets you add a password of up to 11 characters or numbers. The password will lock the entire unit. However, you can still access the unit via your computer.

Do Not Forget Your Password

3.5.2.6 Start Wizard

Advanced Setup — Button #6

The **Start Wizard** (button 6) will reset your controller and enable you to start all over. It will take you to the **Quick Start** option. Be sure this is what you want to do.

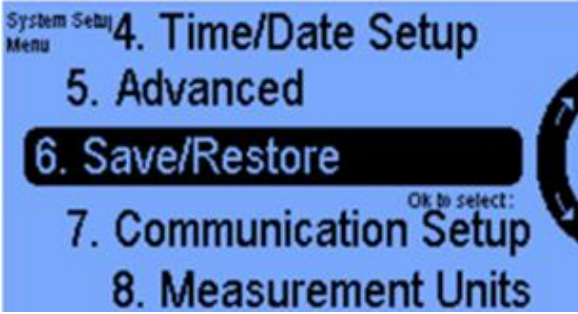
3.5.2.7 Diagnostics



Advanced Setup — Button #7

In the **Diagnostics** option (button 7), you can perform tests and receive diagnostic information for troubleshooting. Using this screen would be most helpful with a call to the Link4 customer service helpline.

3.6 SYSTEM SETUP Menu — *Save/Restore*



Save/Restore allows you to Save and Restore your **Configurations**, **Save History** and **Event Log files**, as well as set up **USB Logging**. All settings and data files can be saved on a USB drive.



In the **Save/Restore Configuration** option, you can save and restore system settings and data files.

In the **Save Log Files** option, you can save configuration logs of controller events to a USB drive. **Note: This Save/Restore Configuration feature can also be reached off the Main Menu. See section 4.0 below.**



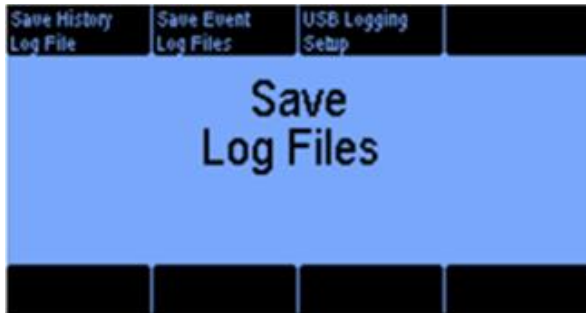
The **Configuration Save and Restore** option is very convenient. It allows you to store settings for different crops and seasons with the ability to restore deleted programs. You will need to insert a USB drive.



When you go to **Save Configuration** (button 1), you can enter a file name by pressing the corresponding letters with the **Soft Buttons**. Press **OK** when you are done.



From the **Save and Restore Configuration** menu, you can select specific files to store and recall.

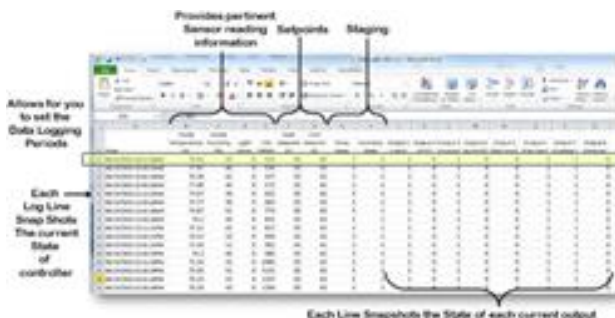


The **Save Log Files** screen allows you to save the data measured by the sensors in .csv or .xml format. The information can be viewed in Excel.

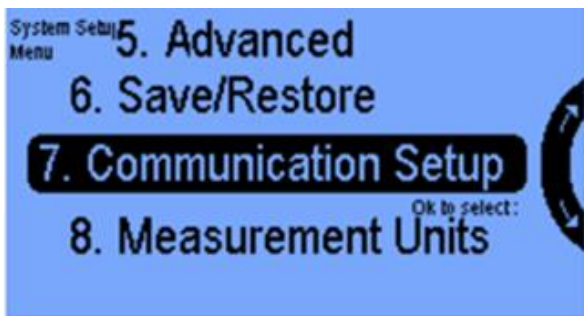


The **USB Data Log** can be enabled to transfer information to a USB drive. The **Log File Format** allows you to choose between .csv and .xml. The **Set Data Logging Period** can be set for a specific time.

Here is an example of what data logging produces using .csv format viewable from an excel spreadsheet:



3.7 SYSTEM SETUP Menu — *Communication Setup*



Communication Setup allows you to configure your iPonic 624 controller to connect to the Internet for remote access through the **iPonic Cloud**.



From the **Communication Setup Menu**, you can configure your iPonic 624 controller to be accessible from any internet connected device with the IP Address on your router.



The **IP Address Setup** screen allows you to remotely access your iPonic 624 controller through the **iPonic Cloud**. Using **Auto DHCP**, the settings from your router will appear once you plug in your Ethernet cable. You can also **Manual IP** by pressing soft button No 1., then manually input your router information.



From the **Server Setup** screen, you will enter the **Registration Passcode** and **Serial Number** to add your iPonic 624 controller to the **iPonic Cloud**. The connection status after adding your controller to the cloud should change from **Check Account** to **OK**.

3.8 SYSTEM SETUP Menu — *Measurement Units*



Measurement Units allows you to set the desired units of measurement for temperatures and lighting.



From the **Measurement Units Setup** option, you can select Fahrenheit or Celsius for temperatures and W/m² or klux for light units.

4.0 Main Menu — SAVE/RESTORE CONFIGURATION

When saving and restoring Configurations, you will need to insert a USB drive into the top USB port:





Save/Restore Configuration allows you to save and restore system settings.



The **Save and Restore Configuration** allows you to store settings for different crops and seasons with the ability to restore saved programs.



The **Configuration** setting allows you to save different files and programs that can easily be restored.

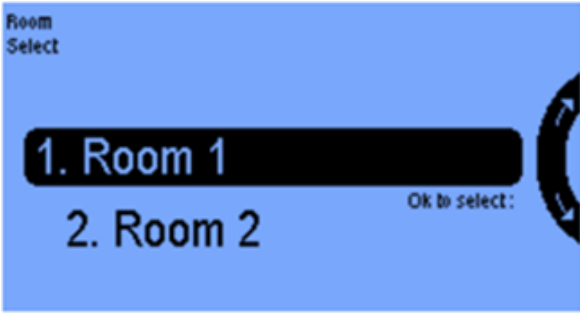


From the **Save and Restore Configuration** menu, you can select specific files to store and recall.

5.0 Main Menu — STAGES



The use of more than one temperature or humidity **Stage** with your controller is optional. This feature is normally hidden unless you have activated it in the **Advanced Stage Settings** screen. You get there by selecting “System Setup” from the Main Menu then “Advanced” and Room 1 or Room 2, then “Add Stage Settings” (button 6.) Selecting 5 Stages is where you assign equipment to particular cooling, heating, humidification and dehumidification stages.



From this **Room Select** menu you select which room you wish to program.

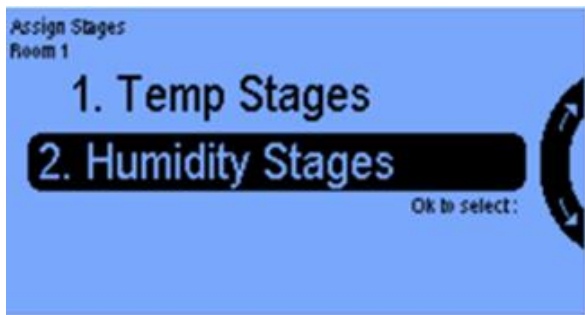


You can set up to a maximum of 6 cooling and 2 heating stages. These numbers of stages are set in the **Advanced Stage Settings** screen

Stages →	Setup			
	H1	N	C1	C2
Cool	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
DeHum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

This table shows the temperature stages and the equipment for Room 1. C1 is the lowest stage of cooling. The normal stage (N) is when neither heating nor cooling is required.

Use the arrows to move the highlighted cursor, then press the Setup button to set the output to be On or Off for that stage. The checkmark in box symbolizes ON and no checkmark OFF.



For humidity control you have up to 2 dehumidification stages and one humidification stages. The second dehumidification stage assumes an outside temperature sensor. If the outside temperature is below a threshold (that you can set), then the second dehumidification stage will be triggered. These numbers of stages are set in the **Advanced Stage Settings** screen.

Stages →	Setup		
	Humi dify	De-Hum	Cold De-Hu
Cool	No Change	No Change	No Change
Humidify	Override On	Override On	No Change

This table shows the humidity control stages versus the equipment in Room 1. Pressing the Setup button gives you 3 options: **Override Off, Override ON and No Change**. From the example, when the humidity is above its programmed threshold, DeHum equipment is set to Override ON. The other equipment remains as is or No Change. If the humidity is below the desired threshold, then you may want to shut the Vent Fans and the Dehumidifier OFF as shown.

Use the arrows Soft Button 5,6,7,8 to navigate the highlight cursor.

Appendix A — CO₂ Fuzzy Logic

Employing “Fuzzy Logic” with your iPonic 624 controller’s advanced settings will allow your CO₂ target to be met based on the amount of CO₂ needs, rather than treating every situation where the CO₂ falls below your setpoint target as equal.

Amount Error (Short of CO ₂ Target)	Delay Ratio (Ratio On to Off time during Cycle Period)		
>50ppm	0.05	CO ₂ Cycle Period	Takes These Multiple Proven Truths
>75ppm	0.10		
>150ppm	0.40		
>250ppm	0.75		
>500ppm	1.00		
			To control CO ₂ Based On Need

This is done by taking into consideration the size of the CO₂ error (in parts per million (ppm)) and assigning the error range a ratio which translates to the actual percentage of time the CO₂ equipment is programmed on during a CO₂ cycle. When you enable Fuzzy Logic, there is already a default program in the controller’s system to get you up and running.

When you enable Fuzzy Logic, you will also enable a CO₂ cycle period that you will need to set. The ratio of time the CO₂ tank is on to time off will always be a function of the amount of CO₂ error measured by the sensor. This CO₂ budgeting will keep you from constantly overshooting your CO₂ target.

Enabling and Creating Your Fuzzy Logic Settings

To enable, from the Home screen, Press Ok button

Press 3 or use menu wheel to select **3. System Setup**, press OK

Press 5 or use menu wheel to select **5. Advanced**, press OK

Select **Room 1 or 2** (the room you want it to be enabled in), press OK

Select **Button 7. Adv. Setpoint settings**

Select **Button 4.** followed by **Button 1. Enable/Disable CO₂ fuzzy**

Highlight **Enabled** and press OK

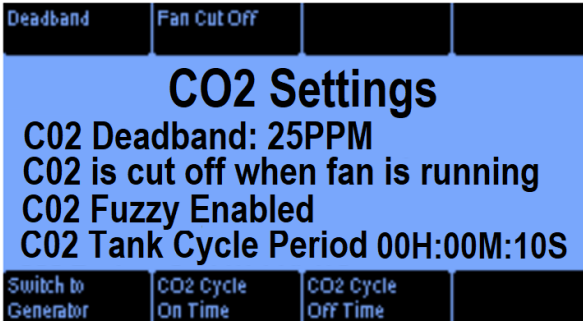
Enable/Disable CO ₂ Fuzzy	Edit
CO ₂ Fuzzy Enabled	
Error:	Delay:
Error: > 75PPM	0.10
Error: > 150PPM	0.40
Error: > 250PPM	0.75
Error: > 500PPM	1.00

Once you enable Fuzzy Logic the Delay Ratio screen will display:

We recommend that you keep the factory default settings and adjust only as needed. You can change the values by pressing Edit; and to navigate by pressing 5,6,7,8 buttons.

Setting Your Fuzzy Logic Cycle Period

You can set up the Fuzzy Cycle Period from the Home screen CO₂ Soft Button settings or the Advance CO₂ settings.



iPonic 624[®] User Manual Index

- AC, **30, 43**
- Advanced, **39, 46, 54, 56, 57, 58, 67, 68**
- Alarm, **43**
- Alarm Delay, **50**
- Alarms Setup, **37, 50**
- Assign Stage, **46**
- Backup Sensor, **49**
- Bootload, **13, 60**
- Calibrate, **48,**
- CAT 5 cable, **6**
- Communication Setup, **37, 64**
- CO2, **8, 15, 19, 26, 30, 31, 43, 48, 52, 54, 57**
- CO2 Fuzzy Logic, **31, 57, 69**
- Deadbands, **19, 28, 29, 30, 53, 54**
- DIF, **19, 57**
- DISM, **7, 8**
- Equipment Settings, **22, 40**
- Equipment Setup, **38**
- Ethernet, **6, 11, 17**
- Event Log, **62**
- Fan, **30, 43**
- Fan Cut Off, **30, 54**
- Firmware, **13**
- Gold Package Customers, **5**
- Graphing Menu, **26, 35**
- HAF Fan, **18**
- Home, **15**
- Humidity, **8, 15, 18, 26, 28, 50, 53**
- Humidity Stage, **10**
- Internet Time Server, **51, 52**
- IP Address, **64**
- iPonic Cloud, **8, 11, 12, 13, 64**
- Irrigation, **43**
- Light, **3, 8, 19, 26, 32, 43, 55**
- Limited Warranty, **5**
- Log File, **63,**
- Main Menu, **11, 13, 22, 25, 26, 36, 46**
- Manual Override, **15, 17, 20**
- Map Sensors, **48**
- Measurement Setup, **61**
- Navigation Menu, **11, 13, 20, 21, 25, 34**
- Normal, **27,**
- On/Off, **29, 43, 44, 45**
- OutTemp Ovr Threshold, **28**
- Override, **40, 41**
- Power Cool Down Time, **55**
- Ramping, **19, 57**
- Remote Access,
- Reports, **25, 34, 35**
 - Sensor, **25, 26, 34, 35**
- Reset, **17, 35**
- Save/Restore, **4, 25, 37, 53, 62, 63, 65, 66**
- Save History, **62**
- Sensor Calibration, **49**
- Sensor Report, **34, 35**
- Sensor Setup, **37, 47, 48, 50**
- Setpoint, **15, 18, 25, 26, 32, 33**
 - Advanced,
 - Cool, **18, 19, 27, 35**
 - CO2, **3, 29**
 - Dehumidify, **28.**
 - Heat, **18, 19, 27, 35**
 - Humidity, **3, 28**
 - Temperature, **3, 26**
 - Times, **3, 26, 33**
- Set Name, **42**
- Set Type, **43**
- Shortcuts,
- Soft Buttons, **16, 20, 22, 35, 62**
- Stages, **4, 15, 56, 67**
- Stage Delay, **52, 56**
- Stage Width, **54**
- Switch Period, **28, 29**
- System Setup, **25, 36, 46, 58**
- Temperature, **35, 47, 48, 50, 54**
- Time/Date Setup, **37, 51**
- Timed Override, **40**
- USB, **17, 62, 63**