Installation &

Operations Manual

pacific data systems
Australia

FreshView EC12 Ripening Controller Operations Manual

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1

1 Getting Started

1.1 System Overview

Congratulations on the purchase of the *FreshView EC12 Ripening Controller*. The robust design of the system allows use in harsh environments. The weatherproof connectors and sockets protect the electronics and signals from damage and disturbance by moisture and dust typically found in a ripening room, and the hygienically designed enclosures mean they can be installed almost anywhere. The EC12 Ripening System consists of several components:

- **FreshView EC12 Ripening Controller**: The main controller.
- **Transmitter Interface Module (TXINT):** An interface between the controller and the transmitters.
- **Transmitters:** Sensors that reside inside the ripening room.
- **Digital Input/Output Module (DIOM):** Provide Inputs and Outputs for the controller, and injects 24V DC into the communications bus.

Figure 1: System Overview with an EC12 with two Transmitter Interfaces and two Digital I/O Modules.

- **Gas Delivery Module (GDM):** Contains solenoids for controlled delivery of gas to ripening rooms.
- **FreshView Server:** A web interface to access your *FreshView EC12 Ripening Controller*.

There are two software applications in the *FreshView EC12 Ripening Controller*, the software running on the controller and *FreshView.com.au* which provides remote access to the controllers. The application running on the controller allows the user to configure or view any part of an individual controller. Whereas *FreshView.com.au* will only allow users to configure room setpoints, gas delivery options, enable/disable control and view logged data for any controller they have access to.

1.2 Hardware Overview

The *FreshView EC12 Ripening Controller* can monitor and control up to six parameters in up to 12 rooms. To achieve this, the EC12 Controller must be connected to transmitters via the Transmitter Interface Module (TXINT) which the transmitters for that room connect to. There is also a Digital Input/Output Module (DIOM) that allows the main controller to interact with other sub-systems, such as coolers and heaters. The TXINT, Gas Delivery Module (GDM) and the DIOM are connected to the Main Controller through a Communications Bus. *See Figure 2: EC12 Connections.*
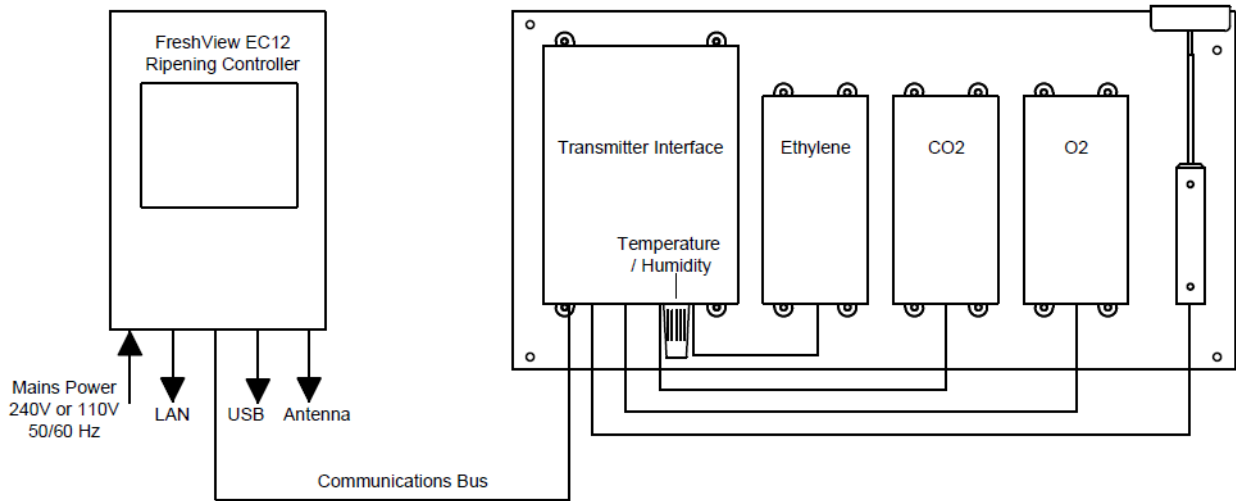
Figure 2: EC12 Connections.
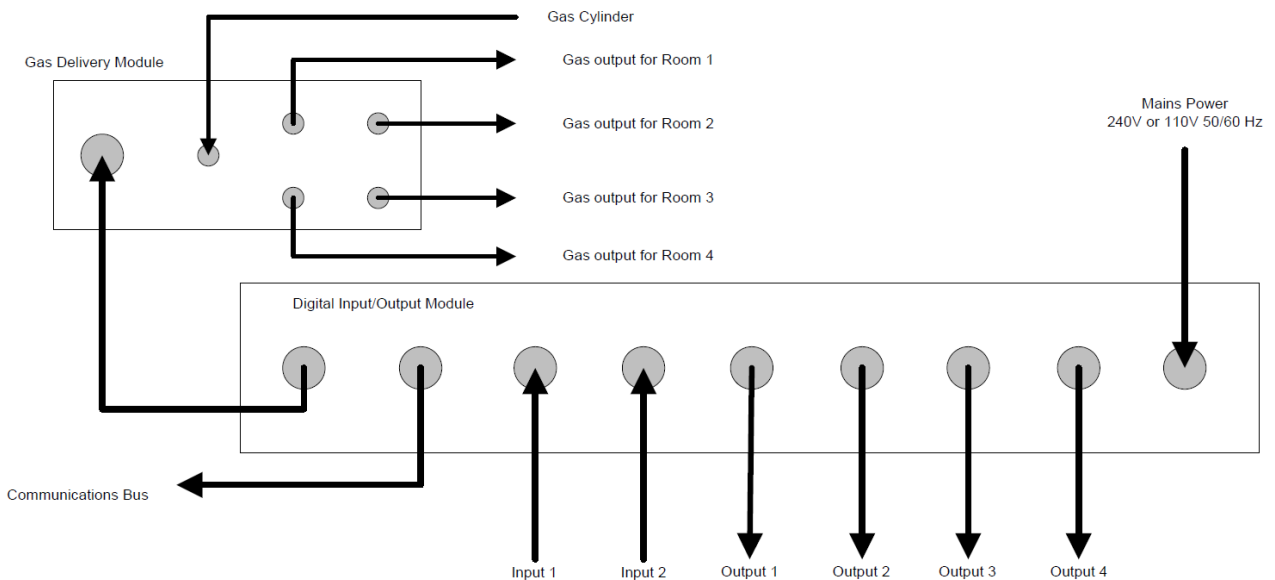
Figure 3: Digital Input/Output Module connected to Gas Delivery Module

Within each ripening room a TXINT is required; this allows the controller to read the data from the individual transmitters. The TXINT has an integrated temperature and humidity sensor. The transmitters are fastened to the Transmitter Mounting Rack, which keeps the transmitters orientated in the correct position for optimal performance. This arrangement also simplifies the installation of the system as it reduces the amount of cabling that needs to be done between the transmitters and the Main Controller. The TXINT and

the individual transmitters are powered over the communications bus, therefore there is no requirement for mains power to be run into the ripening room.

The DIOM allows the Main Controller to interact with other sub-systems. These modules come in various configurations which support various numbers of inputs and outputs. Since this module has relay contacts as well as being able to supply power to the communications bus, it must be connected to mains power. The inputs can be used for door switches and emergency stop buttons, while the outputs can be used to turn equipment on/off, e.g. coolers and heaters.

The GDM is connected to the bus. This allows the *FreshView EC12 Ripening Controller* to deliver gas to 4 rooms from a single gas source. Gas is delivered to the room using a shot process, which will deliver gas for a configurable amount of time followed by a configurable idle time between shots. For example, a room can be configured to deliver gas for 5 seconds and wait 30 seconds between shots. This delay between shots allows the gas to be distributed evenly throughout the room before delivering more gas. This reduces the possibility of over-gassing a room.

The *FreshView EC12 Ripening Controller* can be configured to monitor up to 12 rooms and 24/48/72 parameters (depending on your EC12 model), with up to 6 parameters in each room. This means that for a 24 parameter system you can have 4 rooms with 6 parameters in each, or 12 rooms with 2 parameters in each and every combination in between. In a single room, up to 6 parameters can be monitored; including Ripening Gas, Carbon Dioxide, Air Temperature, Relative Humidity, Pulp Temperature and Oxygen. Depending on the commodity that is stored in the room, you may need to monitor all these parameters or just a subset of them.

As the *FreshView EC12 Ripening Controller* operates, it will continually monitor all the rooms' parameters, and will enable/disable outputs to turn on and off equipment such as venting fans and compressors, to keep the room within its setpoints. If the room exceeds alarm thresholds, it will alarm and send notification SMS messages to the registered recipients. Each room has a set of independent settings which include:

- Parameter setpoints, and alarm thresholds.
- Enable/disable room control of single or multiple parameters.
- Inputs which disable all room control, useful for door switches and emergency stop buttons.
- Outputs to control equipment, such as venting fans and compressors.
- Alarm outputs to drive warning lights and sirens.

1.3 Ripening and Controlled Atmosphere Modes

Each room can be independently set to be in *Ripening* or *CA (Controlled Atmosphere)* mode. These modes are mostly the same except for three major differences:

- In Ripening Mode, venting cannot be disabled on Ripening Gas (RG)(Ethylene), Carbon Dioxide and Oxygen parameters. When the gas concentration level reaches the high setpoint or high alarm, the room will vent regardless if control is enabled to that parameter/room.
- In Ripening Mode, you must set your setpoints within non-lethal limits. The system will reject setpoints outside these ranges:
  - Ripening Gas: 0 – 1000 ppm
  - Carbon Dioxide: 0 – 4 %
  - Oxygen: 18 – 25 %
- In CA, mode there is no gas delivery start time or gas delivery duration. Since CA is used for long term storage of commodities, gas delivery will operate until it is manually disabled.

Ripening Mode

Temperature and Humidity parameters will only alarm when control is enabled. If control is disabled to a parameter or to the room, then the disabled parameter will not trigger alarms.

For safety High Ripening Gas, High Carbon Dioxide and Low Oxygen will alarm when control is enabled or disabled. And will also trigger safety venting.

CA Mode

All parameters will only alarm when control is enabled. If control is disabled to a parameter or to the room, then the disabled parameter will not trigger alarms or safety venting.

There is no gas delivery time period, gas will be delivered while control is enabled and will only be disabled, once control is disabled.

1.4 Setpoints and Alarm Thresholds

Configuring a room for ripening, degreening or for storage, starts with defining the room's desired environment. This involves setting up various setpoints and alarm thresholds which the *FreshView EC12 Ripening Controller* will attempt to maintain, by turning on/off external equipment such as venting fans, and compressors. Also, if a room exceeds alarm thresholds, possibly by equipment malfunction, then an alarm will be generated, which highlights the alarming parameter on the controllers' screen, as well as sending SMS messages to notify operators of the situation.

Alarm thresholds are fairly straight forward, if the parameter exceeds the low or high alarm threshold, then an alarm will be generated. Room setpoints are a little more complicated, since there are three of them, Low Setpoint, Setpoint and High Setpoint. There are three of them to allow for the different equipment/room response you get when either reducing a parameter's value or increasing it. For example, the heater in a room may require a larger acceptable range than what a cooler requires.

When the *FreshView EC12 Ripening Controller* is increasing a parameter's value to reach setpoint, it will keep increasing the parameter until the room hits the setpoint. The parameter will start to reduce as time passes, then once its value gets below the low setpoint, the controller will enable the appropriate output to increase the parameter's value once again. The same holds for when the controller is decreasing a parameter's value to reach setpoint, except it will keep decreasing the value once it exceeds the high setpoint and keep the output enabled until it hits the setpoint. *See Figure 4: Non-Temperature Control and Figure 5: Temperature Control.*
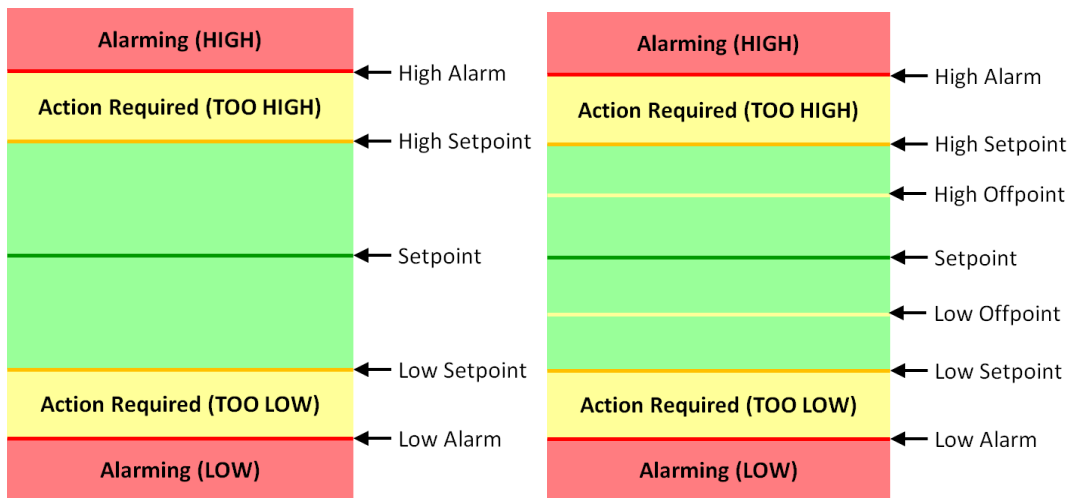
Figure 3: *FreshView EC12 Ripening Controller* setpoint and alarm thresholds.

Temperature parameters also have o*ffpoints* as well as setpoints. These *offpoints* allow for an overshoot to be configured which helps to decrease the amount of time it takes for the commodity to reach the desired temperature. For example, if you were targeting a pulp temperature of 15°C, and you were to set the air temperature to 15°C, then it would take a long time for the pulp to actually reach 15°C. But if you were to configure the overshoot to make it possible for the air temperature to reach 13°C, the pulp temperature would reach the target temperature much quicker. Also while avoiding skin damage of the commodity which is caused when the air temperature is too cold.

Figure 4: Non-Temperature Control shows the control of a non-temperature parameter, think of the blue curve to the right to be reducing the parameter value and the red curve to be increasing the parameter value. While the room is reducing the parameter, the room temperature will oscillate between the setpoint and the high setpoint, and while it is increasing the parameter the room will oscillate between the setpoint and the low setpoint.

Figure 4: Non-Temperature Control

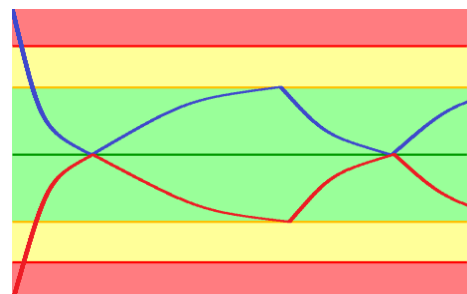*Figure 5: Temperature Control* shows the control for a temperature parameter. Think of the blue curve to be room cooling, and the red curve to be room heating. While the room is cooling, the room temperature will oscillate between the low offpoint and the high setpoint, and while it is heating the room will oscillate between the high offpoint and the low setpoint.
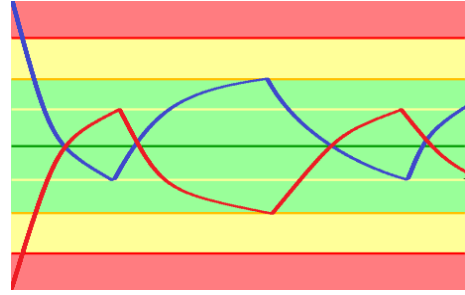

Figure 5: Temperature Control

1.5 SMS Message Format

Every SMS that is sent from the *FreshView EC12 Ripening Controller* follows a single message format which is:

```
EC12 – [SERIAL NUMBER]
YYYY-MM-DD HH:MM:SS
[Power Fail Alarm]                       Shown during power failure
[DIOM Disconnected Alarms]               Shown during DIOM disconnection


[Room List and Alarm Status]             See below for details
```

And here is an example SMS message, for a controller with 2 rooms, if a room is not mentioned in the message, then that is currently not alarming:

```
EC12 – [A0000000]                        Controller's serial number
+ POWER FAIL - SHUTTING DOWN IN 1 HOUR   Mains power fail warning message
+ DIOM Disconnected: PDS-EC-DIOM-4-01    Display's the disconnected DIOM's

+ Room2:                                 Room has active alarms
  *NEW* RG HIGH: 100ppm                  New alarm: RG is in high alarm
  *CUR* CO2 HIGH: 5.5%                   Alarm has triggered previously
  *REC* TEMP: 4 degC                     TEMP has recovered from an alarm state
  *CUR* HUM: U/R                         HUM is reading an under range value
  *NEW* PULP: O/R                        PULP is reading an over range value
  *NEW* O2: DIS                          O2 transmitter has been disconnected
```

There are several states for a parameter:

- ***NEW*** The parameter has just entered the alarm state and this SMS contains the first notification for this alarm.
- ***CUR*** The parameter has already triggered an alarm SMS, and is just appearing in this SMS as a summary of the state of the system.
- ***REC*** The parameter has just recovered from an alarm state, and is now within high/low setpoint.

There are many events that can trigger a SMS to be sent. All of these events can be individually enabled and disabled, so the notification system can be customised to suit your needs, *See Section 3.22 SMS Notification Configuration*. The following are SMS trigger events:

- Controller lost mains power.
- DIOM disconnected or controller is unable to communicate with it.
- DIOM re-connected or controller re-established communication with it.
- Transmitter disconnected or controller is unable to communicate with it.
- Transmitter re-connected or controller re-established communication with it.
- Transmitter reading a High Alarm or greater value.
- Transmitter reading a Low Alarm or lower value.
- Transmitter reading an Under Range value.
    - This indicates that the transmitter is not functioning correctly.
- Transmitter reading and Over Range value.
    - This indicates that the transmitter is not functioning correctly.
- Transmitter has recovered from a high or low alarm state.
- Ripening Gas delivery has timed out, *See Section 3.10 Gas Delivery Configuration*.
- Carbon Dioxide delivery has timed out, *See Section 3.10 Gas Delivery Configuration*.

1.6 Inputs and Outputs

The DIOM gives the *FreshView EC12 Ripening Controller* the ability to interact with external systems.

Up to 12 inputs can be configured per room, but generally only one or two are needed. When an input has been configured for a room, and it becomes active, either by a Normally Open (NO) relay closing, or a Normally Closed (NC) relay opening, the outcome is always the same; all control for that room will be disabled. This is useful for emergency stop buttons, or if you require the room to be disabled when the door is open, which most likely means someone is currently in the room.

Each room can have up to 26 outputs assigned to them, but generally only a subset is needed. These include control outputs for enabling subsystems such as:

- Ripening Gas/Carbon Dioxide/Nitrogen Delivery.
- Venting Fans.
- Heating/Cooling System.
- Humidifying/Dehumidifying System.
- Low/High Alarms (E.g. sounders, beacon lights)

There is also one general purpose output per room. This can be used for various purposes and provides a relay contact that can be enabled/disabled via the controller's touchscreen, or remotely via *FreshView.com.au*.

1.7 Manual Room Control

Through the controller (not available via *FreshView.com.au*) control outputs can be manually enabled provided that the room has this output control configured. Manually enabling an output is most useful for gas solenoid outputs under CA mode. For gas outputs it will allow for a continuous gas delivery, rather than

using a shot process which helps bring the room within setpoint values much faster. Manual control for an enabled output gets automatically disabled once all parameters that output depends on are no longer in an alarm state.

1.8 Gas Delivery

Ripening gas, carbon dioxide or nitrogen can be delivered to rooms via the Gas Delivery Module (GDM). This device communicates to the *FreshView EC12 Ripening Controller* though the bus. The GDM has four outputs which allows delivery of gas from a single gas bottle to up to four rooms. If you require delivery of both ripening gas and carbon dioxide in the same room, two GDMs are required, one for ripening gas and one for carbon dioxide. If you require nitrogen as well, then three GDMs are required.

Gas is delivered to the room via a 'shot' process, which means that gas is delivered for a pre-defined amount of time and then it waits for the room to reach equilibrium before delivering more gas. This helps prevent over gassing a room.

> **Ripening Gas, Carbon Dioxide and Nitrogen are delivered to the room via a 'shot' process.**

There are a set of options associated with gas delivery:

- **Vent On** – You can choose to vent the room on either high setpoint or alarm. When in Ripening mode this venting cannot be disabled, it will occur even if the room or parameter's control is disabled.
    - **High Setpoint:** Enable venting once the gas level hits the high setpoint.
    - **High Alarm:** Enable venting once the gas level hits the high alarm threshold.
- **Run Scrubber** (RG Only) – When the ethylene scrubber should be enabled. Can be used in conjunction with venting to reduce the unwanted effects from injecting air into the room.
    - **Never:** Do not ever enable the scrubber.
    - **Always:** Always run the scrubber. Used for when you need zero ripening gas in your room.
    - **High Setpoint:** Enable the scrubber once the gas level hits the high setpoint.
    - **High Alarm:** Enable the scrubber once the gas level hits the high alarm threshold.
- **Use Nitrogen** (RG & CO2) – Should nitrogen be used bring the gas concentration down.
    - **If O2 Above** – Only use nitrogen to bring the concentration down if the oxygen level is below this percentage.
- **Use RG/N2 Generator** – Should the RG/N2 generator be used to deliver gas.
    - **Gen On Time** – On time for relay output to the gas generator.
    - **Gen Off Time** – Off time for the relay output to the gas generator.
- **Use RG/CO2/N2 Cylinder** – Should the RG/CO2/N2 gas cylinder be used to deliver gas.
- **Cylinder/Generator Threshold** – If the gas concentration is below this level, then the gas cylinder will be used to inject gas. If the concentration is above this level, the gas generator will be used.
- **Shot Duration** – The length of time that a gas shot should last for.
- **Shot Delay** – The idle time between gas shots, this allows the room to reach equilibrium.
- **Delivery Start Time** – Allows for delaying the gas delivery till a specified date/time.
- **Delivery Duration** – Once delivery has started, the controller will deliver gas for the specified period.
- **Disable control if setpoint not reached in** – If the system has been delivering gas for this period of time, and the room has not hit setpoint then the gas delivery will time out and control will be disabled. This could mean the gas bottle is empty or there is some other issue with the room.

> **If the gas delivery process times out, then it will be highlighted in red on the screen and control must be re-enabled manually before gas delivery will continue.**

> **You should always check the room's RG, CO2 and O2 levels before entering the room. Espcially when the room is in CA mode, as there could be lethal levels of these gasses in the room.**

1.9 Data and Event Logging

Data logging records all events that the *FreshView EC12 Ripening Controller* is capable of monitoring. These events include Supervisor / Operator logons, *FreshView.com.au* logons, transmitter values and any parameter or room changes (parameter/room control, set point levels etc.). All logged transmitter values and log messages can be viewed/downloaded either on the controller or remotely via *FreshView.com.au*.

Pacific Data Systems Australia deletes data from the server after two (2) years. Users are advised to download data to keep in their own storage if required.

1.10 Users

There are two types of users within the controller and *FreshView.com.au*; Supervisor and Operator users. A single user within a company can be synchronised to every controller within their company as well as *FreshView.com.au*. This allows for centralised user management via *FreshView.com.au* and a single username/password combination for a single user that is valid on all EC12 devices that they are assigned to. All actions performed by users are logged in the system and are visible via the controller or website.

- **Supervisor Users:** Can configure/view any part of the controller/website and create new users.
- **Operator Users:** Can configure room setpoints and enable/disable control and view logged data on controllers they are assigned to.

> **Supervisor users have complete control over the EC12 Ripening Controller, whereas Operator users can only view logged data or edit room setpoints and enable/disable control.**

1.11 Remote Access

An internet connection is required to enable the controller to communicate to *FreshView.com.au*. This internet connection can be provided via the internal modem, or via LAN connection. The controller will poll the website every 30 seconds so that data can be synchronised. During this request the controller updates the website with new transmitter values, room configuration changes, user modifications and log messages. The website will send down any room configuration changes and user modifications.

Due to this 30 second interval on the controllers polling time, it means that changes that are done on the website may take up to 30 seconds before changes appear on the controller and vice versa for updates performed on the controller.   The website will only show updates that have been confirmed by the controller. This means that if you make a change on the website, it may take up to 1 minute for that change to be visible on the website. This is because you must wait for two polling cycles before the change has completely propagated. *See Figure 6: Communication flow for an update via the FreshView EC12* controller and *Figure 7: Communication flow for an update via FreshView.com.au.*
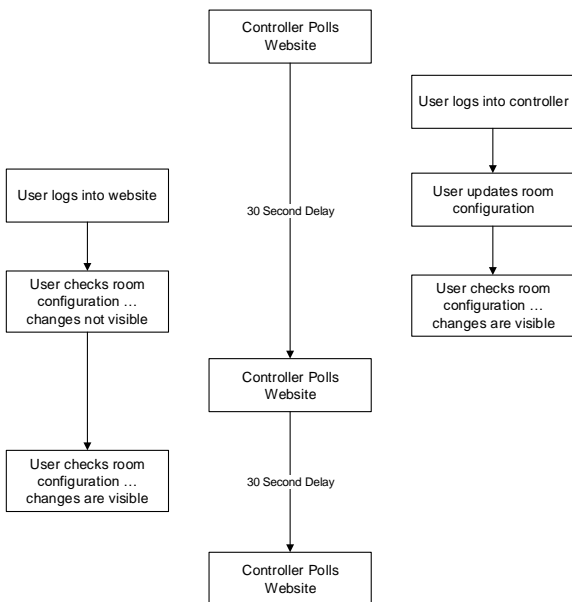
Figure 6: Communication flow for an update via the
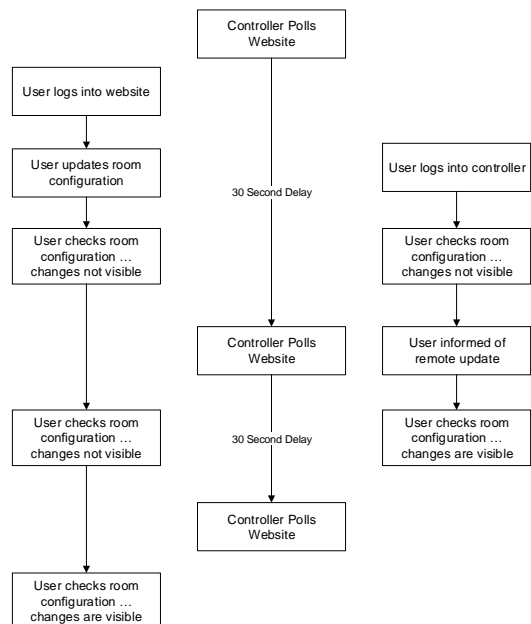*FreshView EC12 controller*

Figure 7: Communication flow for an update via
FreshView.com.au

It can take up to 30 seconds for a remote website update to appear on the controller, and up to 1 minute for that update to be visible on *FreshView.com.au*.

Chapter

2

2   Installation

The EC12/DIOM/TXINT installation requires a qualified electrician and a minimum of two people to safely install the equipment.

Supplied with each unit is an installation kit.

The following tools may be required for installation:

- Hammer drill with 10mm masonry bit, if mounting to masonry.
- Set of drill bits
- Set of metric spanners up to 24mm
- Allen Key M4, M5
- Screwdrivers
- Pliers
- Spirit level
- Silicone sealant
- Masking tape
- Marking pen
- Tape measure
- Wire strippers or side cutters
- EWP (elevated work platform) or ladder

2.1 Communication Bus Considerations

The communications bus carries both 24V dc for powering the transmitters and a data bus for sending and receiving data. The maximum length of this communications bus is restricted by the data bus since the data signal deteriorates over the length of the cable. This creates a hard limit of the communications bus cable of 500m.

The 24V dc on the communications bus is used to power the Transmitter Interface Module(s), so that mains power does not need to run to these modules which are located inside the Ripening/CA rooms. This simplifies the install as well as reducing the workload for the electrician who is connecting the mains power to the *FreshView EC12 Ripening Controller* and the Digital Input/Output Module(s). Both the *FreshView EC12 Ripening Controller* and Digital Input/Output Module(s) inject 24V dc into the communications bus, which helps to maintain close to 24V dc on the bus. Since the Digital Input/Output Module(s) will most likely be installed close to the ripening rooms and therefore close to the Transmitter Interface module(s), this avoids large voltage drops across the communications bus.

Once a Transmitter Interface Module is installed and powered, its supply voltage should be checked, to ensure the module has **at least 16V DC** across the power terminal blocks. See ① and ② below (the red and black terminal blocks) for where to test this voltage. If this voltage is less than 16V DC, the transmitters may give erroneous values or not respond to the controller at all.
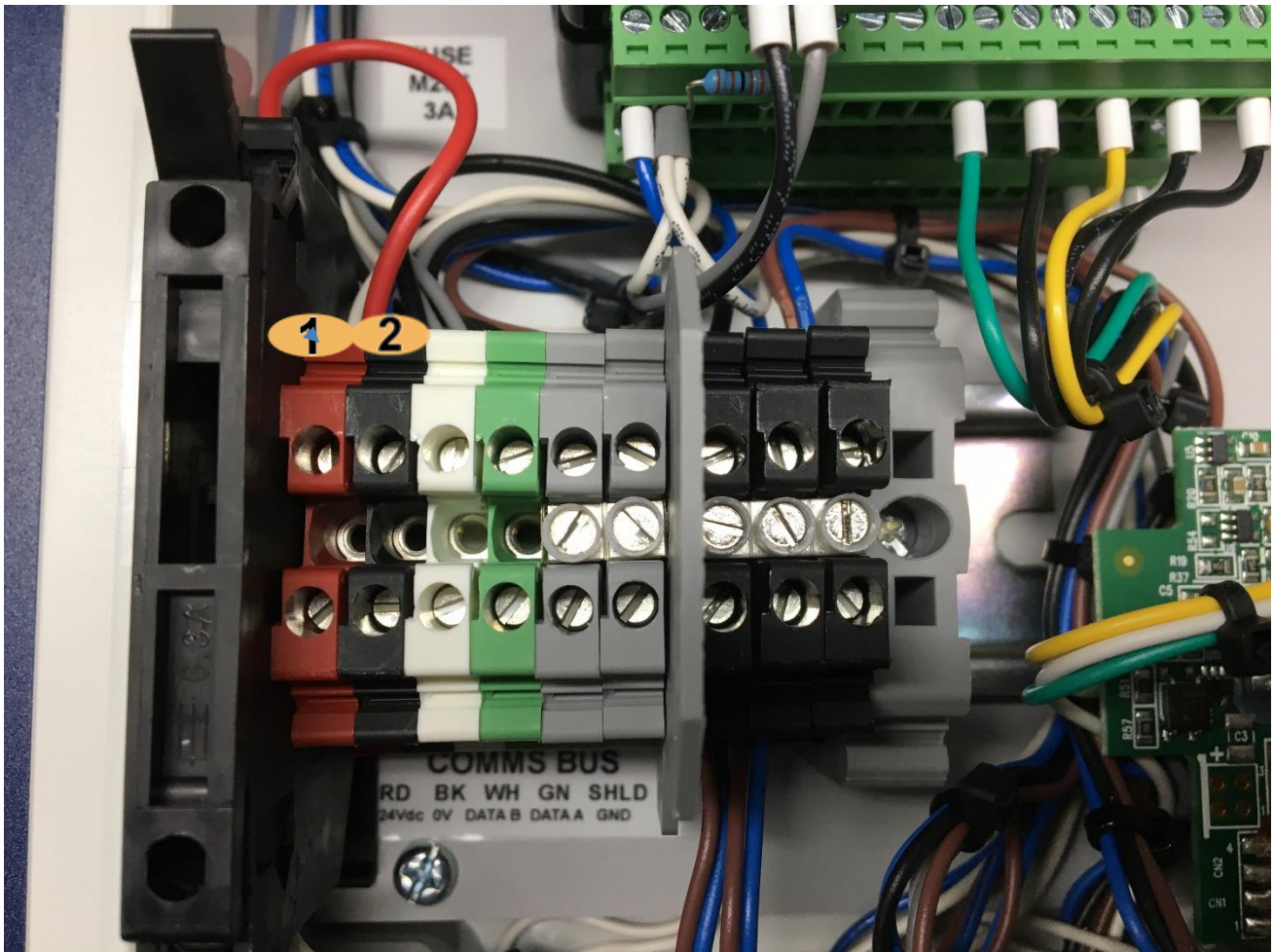

Figure 8: Test voltage in Transmitter Interface Module.

2.2 Communication Bus Wiring

The Communications Bus can either be wired in using the 5 pin M12 connectors at the bottom of the EC12, Transmitter Interface, Digital I/O Modules and Gas Delivery Module or via the 5 coloured terminal blocks inside these units. Using the M12 connectors gives you the flexibility to easily move units around and disconnect parts of the system if you wish. Keep in mind that using M12 connectors instead of the terminal blocks will require the use of many M12 connectors and T-pieces which are only supplied at request. The wiring of all these connectors can add significate time to the install, see Section *6.1 Communications Bus*.

The recommended way is to wire the Communications Bus in using the coloured terminal blocks. The terminal blocks are the same colours as the wires in the supplied cable. Two grey terminal blocks have been provided to ease the connection of the shield. See below for an example. It is important the Shield wire is kept intact around the system.

All modules in the FreshView EC12 Ripening Controller have uniformly wired and coloured terminal blocks.

2.3 Ripening Controller

Find an easily accessible location, out of direct sunlight, to mount the EC-12 Ripening Controller. This will be the location you monitor the ripening process and can make adjustments when near the ripening rooms.

Keep in mind the maximum length of control cable is 500m between the controller and the last device.

The Communications Bus must be wired into this unit

<div style="background-color:red;color:white;text-align:center;font-weight:bold;">

AC power is required for this unit.

</div>

2.4 Transmitter Interface (TXINT)

The Transmitter Interface can be mounted to the inside of the ripening room next to the transmitters or fitted to the Transmitter mounting rack. Install it well up on the wall so it's not likely to be in the way of forklifts or stock.

The Communications Bus must be wired into this unit, see Section *2.2 Communication Bus Wiring*.

1. Remove the lid with a half turn, anti-clockwise, using a Phillips Screwdriver. Remove the lid off, taking care not to damage the seal.

2. Connect the transmitter interface the same way as the EC-12 Ripening Controller in *Section 2.2 Communication Bus Wiring*.

3. Ac power is not required as it is powered via the control cable.

4. Check the Transmitter Interface Module's supply voltage. See *Section 2.1 Communication Bus Considerations*.

<div style="background-color:red;color:white;text-align:center;font-weight:bold;">

Please check Transmitter Interface Module supply voltage after the module is installed and transmitters are connected.

</div>

2.5 Transmitters

The Transmitter mounting frame is to be mounted to the inside wall of the ripening room. Install it well up on the wall so it's not likely to be in the way of forklifts and stock. Select a position in free air but not in direct path of fans or the ethylene feed. (I.8 metres above the floor is suggested for easy access)

1. Install the transmitters to the mounting frame in their correct positions. Their label colours correspond with the mounting positions.

2. Connect the transmitters to the Transmitter Interface in their correct positions. Their label colours correspond with the positions.

2.6 Digital Input/Output Module (DIOM)

The Digital I/O Module should be mounted outside the ripening room in a suitable position for simplicity of cable runs from any inputs or outputs and AC power.

The Communications Bus must be wired into this unit, see Section *2.2 Communication Bus Wiring*.

1. Open the door using the supplied key with a half turn, anti-clockwise.

2. Install the Digital I/O Module the same way as the EC-12 Ripening Controller in *Section 2.2 Communication Bus Wiring.*

AC power is required for this unit.

2.7 Gas Delivery Module (GDM)

The Digital Gas Delivery Module should be mounted outside and above the ripening room in a suitable position for simplicity of cable and gas tube runs.

1.   Open the door using the supplied key with a half turn, anti-clockwise.

Install the Gas Delivery Module the same way as the EC-12 Ripening Controller in 2.3 Ripening Controller.

Note regarding gas tube installation: Use the supplied tube cutter to cut the gas tube making sure it is cut straight and clean. Ensure there are no rough ends as seals could be damaged when inserting the tube into the quick connect fittings. The tube has to go into the fittings at a depth of 12mm. Ensure tube runs are clear of sharp edges and are not bent sharply around corners or stretched. The tube has to be checked for deterioration yearly and replaced if damaged.

Figure 9: Gas Delivery Module wiring.

The Gas Delivery Module is powered by the Communications Bus so doesn't require AC power.

The Communications Bus must be wired into this unit, see Section *2.2 Communication Bus Wiring*.

If for any reason the connection between the GDM and the bus is severed or power is lost, the solenoids will automatically turn themselves off and gas injection to the room will cease.

> **Use the supplied tube cutter to cut the gas tube making sure it is cut straight and clean.**

3   Controller Operation

3.1 Onscreen Keyboard and Numpad

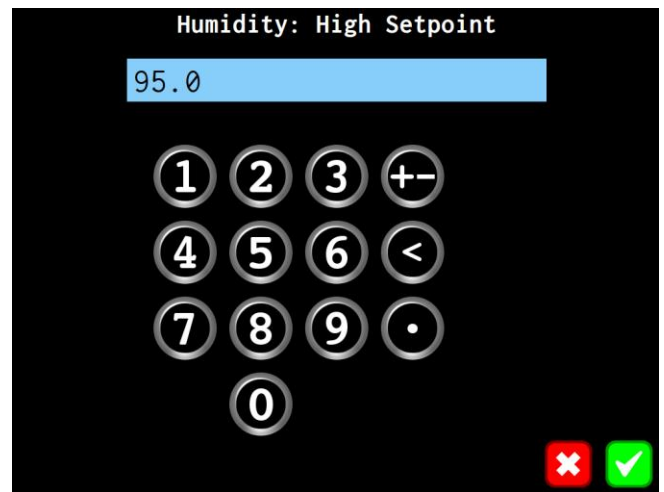
Figure 10: Onscreen keyboard.

Figure 11: Onscreen numpad.

To allow for user input, there is an onscreen keyboard and numpad, which are displayed when required. The user simply enters a value then taps the ✅ to submit the new value. Or if the ❌ is tapped, then the keyboard/numpad is closed and the value is unchanged.
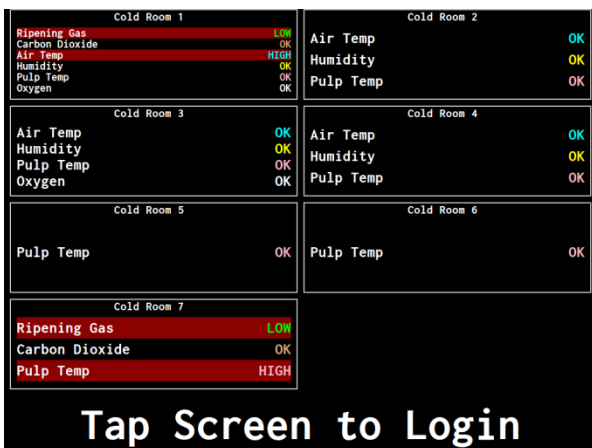
3.2 Lock Screen & Logging in

Figure 12: Lock screen.

When Password Protection is enabled and there is no user logged in, the Lock Screen will be displayed. This screen does not show any detailed information, instead it just shows the rooms' status and if any alarms are active. When a parameter is in an alarm state, then that parameter will be highlighted red.

To view more detailed information or edit settings the user must login by tapping anywhere on the screen. This will open a keyboard to allow the user to enter their username and password.

3.3 Main Screen

The main screen is shown if Password Protection is disabled, or as the first page seen after a user logs in when Password Protection is enabled. It displays a detailed overview of all the rooms attached to the controller. It will try to display as much information as possible, therefore the layout of each room will differ depending on the number of rooms you have, and the number of parameters in each room. When a parameter is in an alarm state, then that parameter will be highlighted red. Tapping on a room will open its configuration screen, *See Section: 3.8 Rooms.*
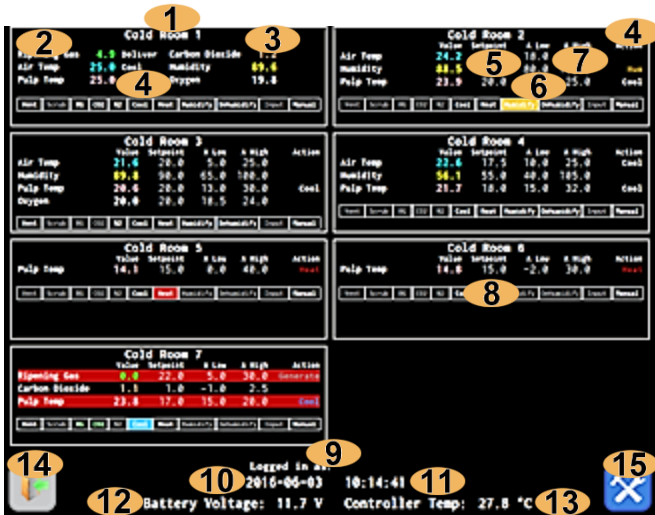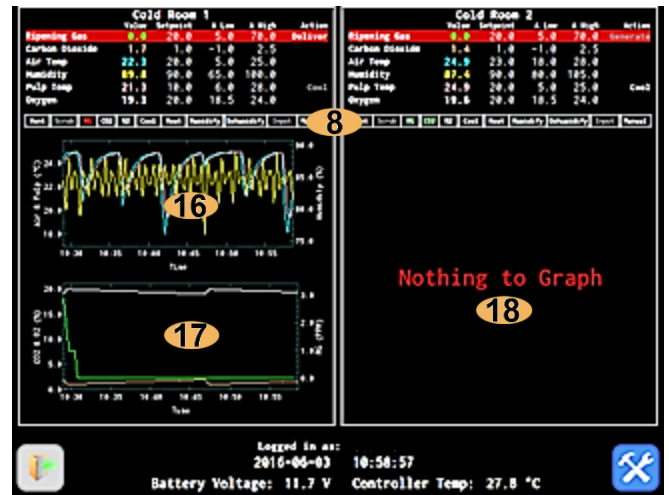

Figure 13: Main screen with 8 rooms.

Figure 14: Main screen with 2 rooms.

1 **Room Name:** The name defined in the room's configuration.

2 **Parameter Type:** The monitored parameter's type.

3 **Parameter Value:** The monitored parameter's value.

4 **Action to Reach Setpoint:** The action required for the parameter to reach setpoint. This text will be GREY if control is disabled; WHITE if control is enabled, but output is not active; and COLOURED if control is enabled and the output is active.

5 **Parameter Setpoint:** The parameters configured setpoint.

6 **Parameter Alarm Low Setpoint:** The parameters configured low alarm setpoint.

7 **Parameter Alarm High Setpoint:** The parameters configured high alarm setpoint.

8 **Active Inputs/Output Indicator:** Displays which outputs are active and if there is an active input.

9 **Logged in User:** The name of the user that is currently logged in.

10 **Current Date:** The current date set on the controller.

11 **Current Time:** The current time set on the controller.

12 **Battery Voltage:** The internal battery's voltage. Indicates how charged the battery is when it is not charging.

13 **Controller Temperature:** The current temperature of the air within the controller.

14 **Logout:** Logs out the current user.

15 **Settings:** Open the settings screen. *See Section: 3.4* Settings*.*

16 **Temperature/Humidity Graph:** Displays the Air Temperature, Pulp Temperature and Humidity graphs.

17 **Gas Concentration Graph:** Displays the Ripening Gas, CO2 and O2 graphs.

18 **Nothing to Graph:** Indicates that there is no logged data within the time period for that room.

Figure 15: Main Screen, room I/O display

1 **I/O enabled, but not active:** The I/O has control enabled, but it is not currently active.

2 **Gas Delivery has timed out:** The gas concentration has not hit setpoint in the specified time.

3 **Gas Delivery scheduled:** Gas Delivery has been scheduled to start in the future.

4 **I/O enabled and active:** The I/O has control enabled, and is currently active.

5 **I/O disabled:** The I/O is not enabled; it will never be activated.
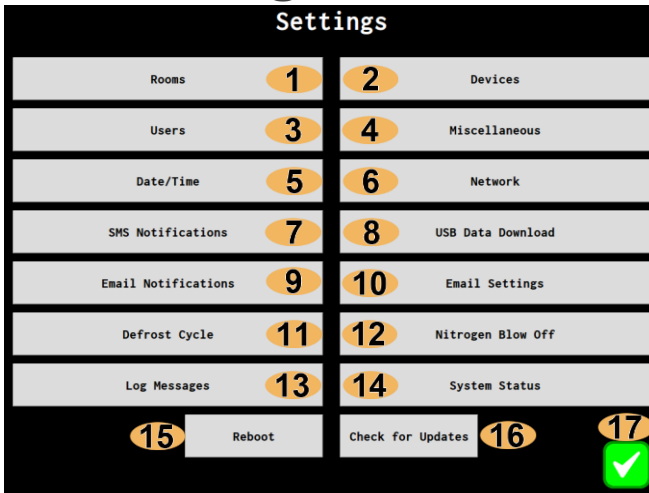
3.4 Settings

Figure 16: Settings screen.

1 **Rooms:** *See Section: 3.8 Rooms.*

2 **Devices:** *See Section: 3.5 Device Configuration.*

3 **Edit Users:** *See Section: 3.19 User Configuration.*

4 **Miscellaneous Options:** *See Section: 3.23 Miscellaneous Options.*

5 **Set Time:** *See Section: 3.20 Date/Time and Timezone Configuration.*

6 **Network:** *See Section: 3.21 Network Configuration.*

7 **SMS Notifications:** *See Section: 3.22 SMS Notification Configuration.*

8 **USB Data Download:** *See Section: 3.24 USB Data Download.*

9 **Email Notifications:** See Section: *3.25 Email Notifications*.

10 **Email Settings:** See Section: *3.26 Email Settings*.

11 **Defrost Cycles:** *See Section 3.27 Defrost Cycles*.

12 **Nitrogen Blow Off:** See Section *3.28 Nitrogen Blow Off*.

13 **Log Messages:** See Section 3.29 Log Messages.

14 **System Status:** *See Section: 3.30 System Status.*

15 **Reboot:** Reboots the controller.

16 **Check for Updates:** Check if there are any software updates available.

17 **Submit Button:** Closes this screen and re-opens the Main Screen.
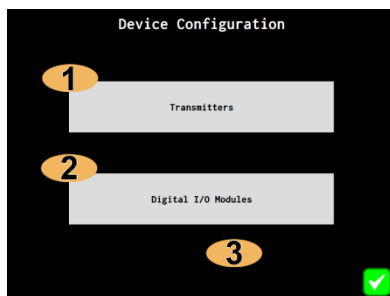
3.5 Device Configuration

Figure 17: Device configuration screen.

1 **Transmitters:** *See Section: 3.6 Transmitter* Interface Module Configuration.

2 **Digital I/O Modules:** *See Section: 0*
.

3 **Submit Button:** Closes this screen and re-opens the Settings screen.

3.6 Transmitter Interface Module Configuration

Note: The EC-12 system will be shipped to you already configured with the settings you have provided in the system proposal.
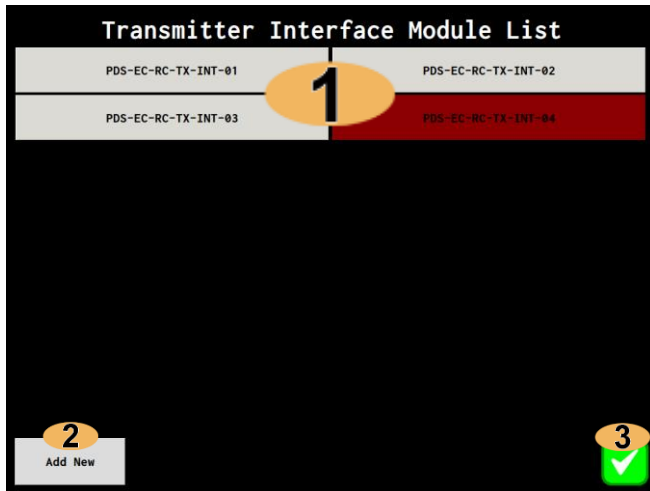

Figure 18: Transmitter Interface Module list.

1. **Transmitter Interface Module List:** Opens the TXINT configuration screen. When the button is red, the TXINT is disconnected. *See Figure 19: Transmitter Interface Module configuration screen.*

2. **Add New:** Adds a new TXINT, tapping on this will opens the TXINT configuration screen, *See Figure 19: Transmitter Interface Module configuration screen.*

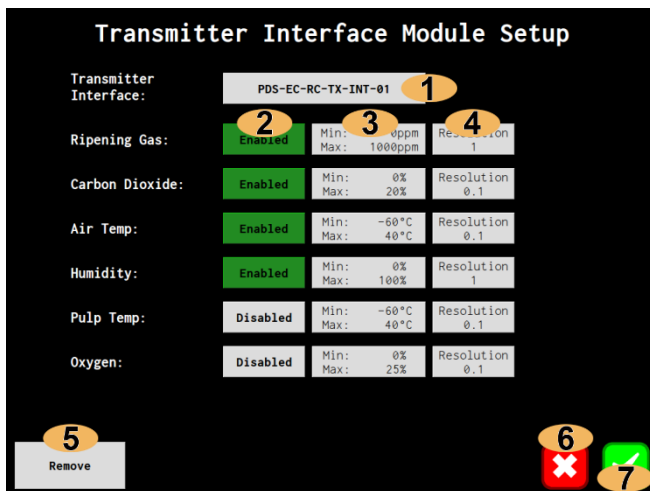3. **Submit Button:** Closes this screen and re-opens the Settings screen.

Figure 19: Transmitter Interface Module configuration screen.

1. **Transmitter Interface Module:** Tapping on this will cycle through supported modules.

2. **Attached Transmitters:** Allows selection of which transmitters are attached to the Transmitter Interface Module.

3. **Sensor Range:** Allows the entry of the attached sensors range. The value from the sensor will be scaled to this range.

4. **Sensor Resolution:** Allows the specification of the sensor's resolution, the values from the sensor will be rounded to the specified resolution.

5. **Remove:** Removes the current Transmitter Interface Module from the controller.

6. **Cancel Button:** Discards changes, closes this screen, and re-opens the Transmitter List screen.

7. **Submit Button:** Save changes, closes this screen, and re-opens the Transmitter List screen.
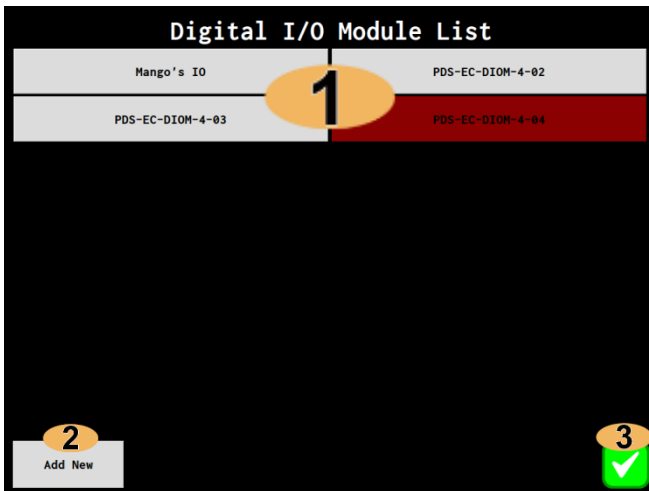
3.7 Digital I/O Module Configuration

Figure 20: Digital I/O Module list.

1 **Digital I/O Module list:** Opens DIOM configuration screen. When the button is red the DIOM is disconnected. *See Figure 21: Digital I/O Module configuration screen.*

2 **Add New:** Adds a new DIOM, tapping on this will opens the DIOM configuration screen, *See Figure 21: Digital I/O Module configuration screen.*

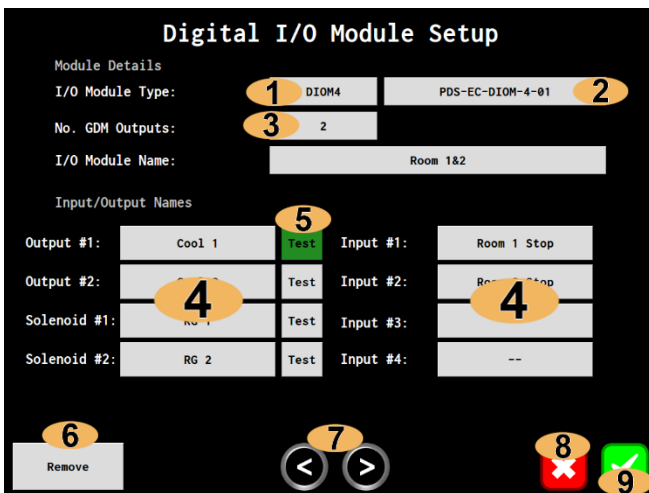**3** **Submit Button:** Closes this screen and re-opens the Settings screen.

Figure 21: Digital I/O Module configuration screen.

1 **Digital I/O Module Type:** Tapping on this will cycle though supported module types.

2 **Digital I/O Module:** Tapping on this will cycle though supported modules.

3 **DIOM Name:** Allows naming of the module.

4 **Input/Output Names:** Allows naming of the module's outputs.

5 **Test Output:** When enabled the button turns green to signify the output is currently enabled for testing. Usually used to test a control output during installation.

6 **Remove:** Removes the current Digital I/O Module from the controller

7 **Previous/Next Paging:** For DIOMs with more than 8 inputs and outputs, these buttons allow navigation to more pages of inputs and outputs, so they can be named.

8 **Cancel Button:** Discards changes, closes this screen and re-opens the DIOM List screen.

9 **Submit Button:** Save changes, closes this screen and re-opens the Settings screen.

3.8 Rooms

Room configuration will likely be the most common configuration interfaces you utilise within the FreshView EC12 Ripening system. There are two ways to reach a room's configuration screen. The first is through the Main Screen, by tapping on the room you wish to view. The other is using the Room List screen, which lists all rooms on the controller, see *Figure 22: Room list*. You can only add new rooms though the Room List screen.

Figure 22: Room list.

1. **Room List:** Lists all the rooms, tapping on one will open its configuration screen, *See Section: 3.9 Room Setpoint & Control Configuration.*

2. **Add New:** Adds a new room, tapping on this will open the room configuration screen, *See Section: 3.9 Room Setpoint & Control Configuration.*

3. **Submit Button:** Closes this screen and re-opens the Settings Screen.

There are several screens used to configure a room:

- **Setpoint & Control Configuration:** The main room screen. This is where the parameter setpoints can be changed and room or parameter control can be enabled/disabled. See Section: *3.9 Room Setpoint & Control Configuration.*
- **Gas Delivery Configuration:** Allows configuration of how gas should be delivered to a room. *See 3.10 Gas Delivery Configuration.*
- **Transmitter Selection:** Allows selection of which Transmitter Interface Module is connected to which rooms. *See Section 3.13 Room Transmitter Selection.*
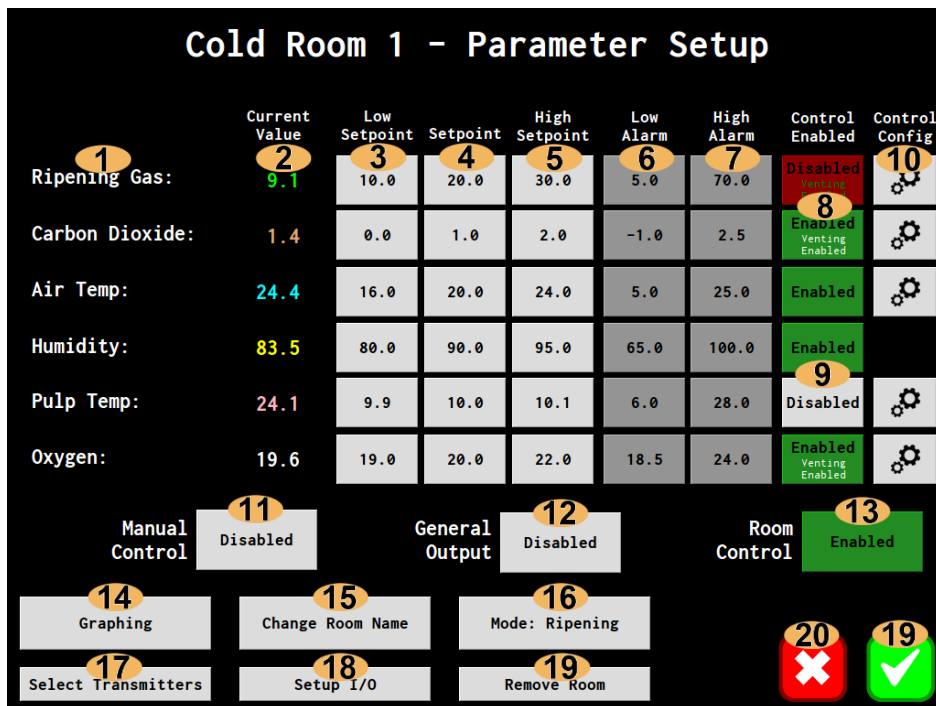
3.9 Room Setpoint & Control Configuration

Figure 23: Room Setpoint & Control configuration screen.

1 **Parameter Type:** The monitored parameter's type.

2 P**arameter Value:** The monitored parameter's value.

3 **Low Setpoint:** The parameter's low setpoint setting.

4 **Setpoint:** The parameter's setpoint setting.

5 **High Setpoint:** The parameter's high setpoint setting.

6 **Low Alarm:** The parameter's low alarm threshold.

7 **High Alarm:** The parameter's high alarm threshold.

8 **RG/CO2 Control:** Enables/Disables RG/CO2 control and opens gas delivery options. Red = Gas Delivery Timed out, Light Green = Gas Delivery scheduled.

9 **Temp/Hum/O2 Control:** Enables/Disables Temp/Hum/O2 control.

10 **Parameter Configuration:** *See Section: 3.10 Gas Delivery Configuration or 3.11 Temperature Overshoot Settings.*

11 **Manual Control:** *See Section: 3.12 Manual Room Control.*

12 **General Output:** Enables/Disables the general room output.

13 **Room Control:** Enables/Disables control to the room.

14 **Graphing:** *See Section: 3.18 Room Graphing*

15 **Change Room Name:** Opens the on screen keyboard to change the room's name.

16 **Room Mode:** Toggles between *Ripening* or *CA* modes when tapped.

17 **Select Transmitters:** *See Section: 3.13 Room Transmitter Selection.*

18 **Setup I/O:** *See Section: 3.14 Room Input/Output Configuration.*

19 **Remove Room:** Removes the current room.

20 **Cancel Button:** Discard all changes and return to main screen.

21 **Submit Button:** Save all changes and return to main screen.

3.10   Gas Delivery Configuration

Each RG and CO2 room parameters have a Delivery Start Time and a Delivery Duration which can be set to delay the start of the gassing cycle, and will automatically stop gassing once the Delivery Duration has elapsed. There is also a gassing timeout, defined below under 'Disable control if setpoint not reached in'. If the controller has been gassing the room to reach setpoint for the defined number of minutes, and the room has not reached setpoint, then control for this parameter will be disabled, and gassing will cease. The main reason for a room to not reach setpoint would be an empty gas bottle, but could also indicate other more serious issues.
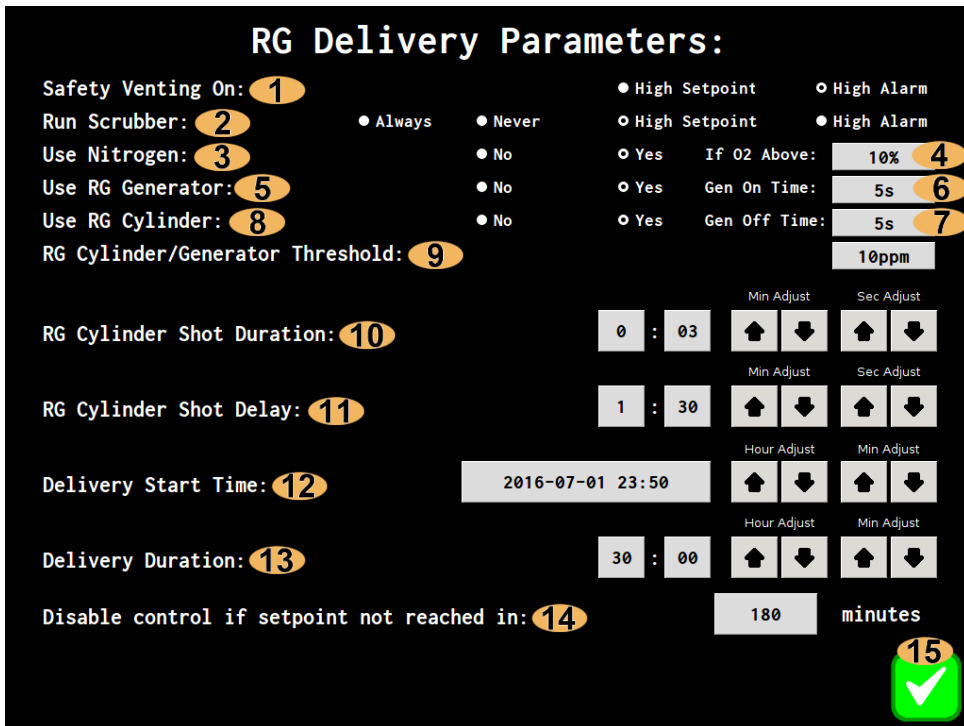

Figure 24: Gas Delivery configuration.

1   **Vent on:** Should venting occur on High Setpoint or High Alarm.

2   **Run Scrubber**: When should the scrubber be turned on, Always, Never High Setpoint or High Alarm.

3   **Use Nitrogen:** Should nitrogen be used to bring the gas concentration down.

4   **If O2 Above:** If using N2, only injects N2 if O2 is above this threshold, otherwise inject air or vent.

5   **Use Generator:** Should a gas generator be used for gas delivery.

6   **Gen On Time:** On time for generator enable relay. Pulse Width Modulated Signal (PWM).

7   **Gen Off Time:** Off time for generator enable relay. Pulse Width Modulated Signal (PWM).

8   **Use Cylinder:** Should a gas cylinder be used for gas delivery.

9   **Cylinder/Generator Threshold:** If gas concentration is below this use cylinder else use generator.

10   **Shot Duration:** The number of minutes/seconds the gas shot lasts for.

11   **Shot Delay:** The number of minutes/seconds between gas shots.

12   **Delivery Start Time:** The date/time of when gas delivery should start.

13   **Delivery Duration Hours:** Gas delivery duration. Stop gas delivery this amount of time after start time.

14   **Disable Control if setpoint not reached:** The gas delivery timeout value. Must hit setpoint in this time.

15   **Submit Button:** Save changes and return to Room Configuration screen.
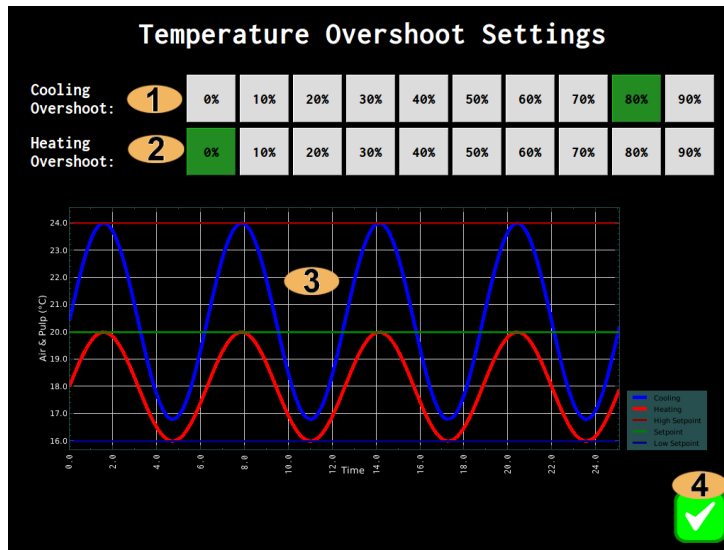
3.11 Temperature Overshoot Settings

Figure 25: Temperature Overshoot Settings

1   **Cooling Overshoot:** 0% = Setpoint, 100% = Low Setpoint.

2   **Heating Overshoot:** 0% = Setpoint, 100% = High Setpoint.

3   **Cooling/Heating Graph:** Summary of how the system will cool and heat the room.

4   **Submit Button:** Save changes and go back to room screen.
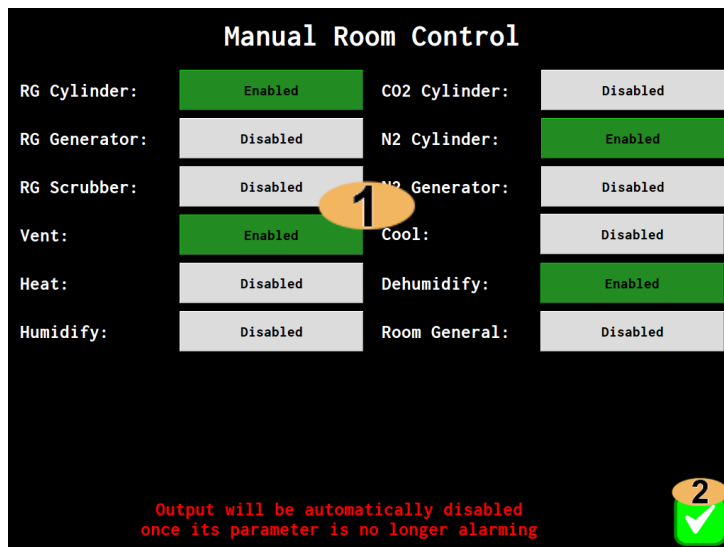
3.12 Manual Room Control

Figure 26: Manual Outputs Enable

1   Outputs Enable: Individually select which outputs to enable. All outputs except venting will automatically disable when its parameter's value is between the Low and High Setpoints.

2   Submit Button: Save the changes and go back to the room screen.

<div style="background:red;color:white">
The output will not be enabled until the room configuration is also saved.
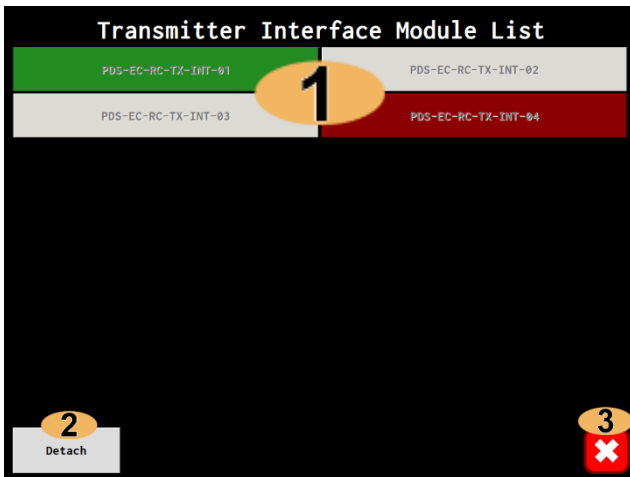</div>

3.13 Room Transmitter Selection

Figure 27: Room Transmitter Selection screen

1 **TXINT List:** Transmitter Interface Modules attached to controller. The selected TXINT is highlighted with green. When red the module is disconnected.

2 **Detach:** Detaches a TXINT from the current room.

3 **Submit Button:** Go back to room configuration screen without selecting TXINT.
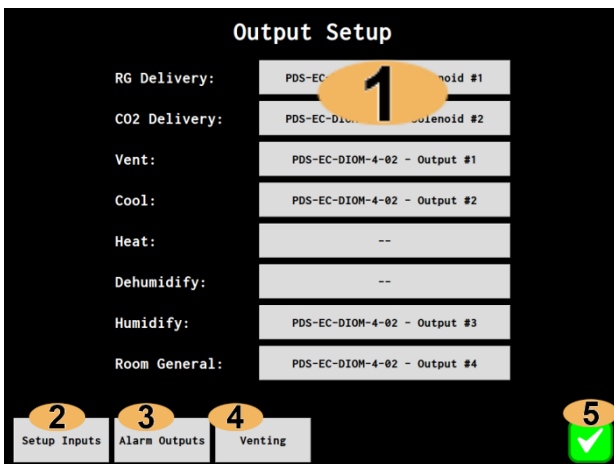
3.14 Room Input/Output Configuration

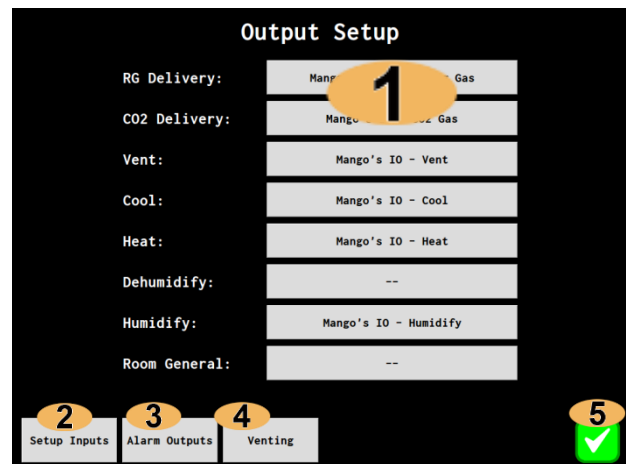Figure 28: Output configuration, DIOM Outputs unnamed.

Figure 29: Output configuration, DIOM Outputs named.

1 **Selected Outputs:** DIOM Outputs select for room action. *See Section 3.14 Room Input/Output Configuration.*

2 **Setup Inputs:** *See Section: 3.14 Room Input/Output Configuration.*

3 **Alarm Outputs:** *See Section: 3.14 Room Input/Output Configuration.*

4 **Venting:** *See Section: 3.14 Room Input/Output Configuration.*

5 **Submit Button:** Go back to Room Configuration screen. Changes are saved once the room configuration screen is saved.
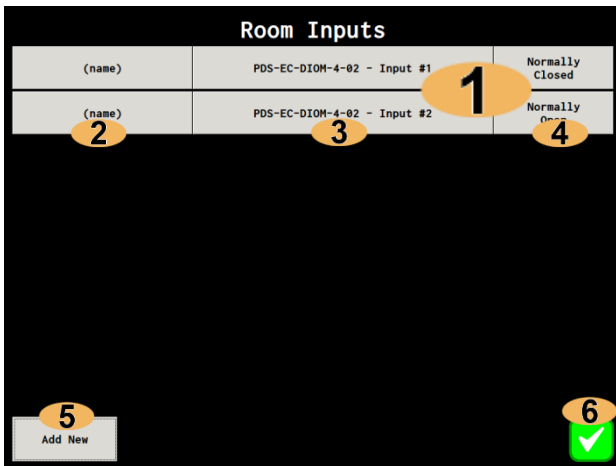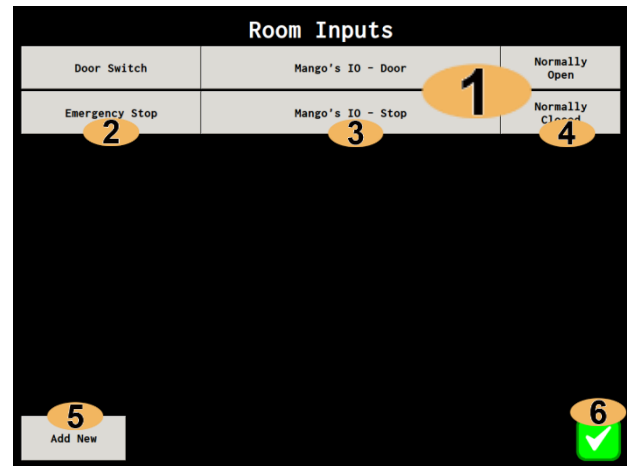
Figure 30: Inputs configuration, DIOM inputs unnamed.

Figure 31: Input configuration, DIOM inputs named.

1 **Inputs List:** Lists all the configured inputs for the current room.

2 **Input Name:** Shows the keyboard, so that the input can be named.

3 **DIOM Input:** Allows for selection of an input on an attached DIOM. *See Section 3.14 Room Input/Output Configuration.*

4 **Input Type:** Is the input Normally Open (NO) or Normally Closed (NC).

5 **Add New:** Add a new input to the list.

6 **Submit Button:** Go back to Room Configuration screen. Changes are saved once the room configuration screen is saved.
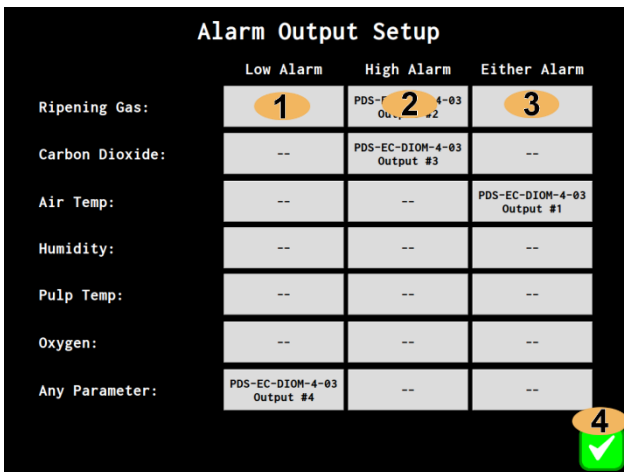

Figure 32: Alarm Output configuration

Figure 33: Allowed Outputs while venting.

1 **Low Alarm Output:** Select output for when the low alarm is active.

2 **High Alarm Output:** Select output for when high alarm is active.

3 **Both Alarms Output:** Select output for when either alarm is active.

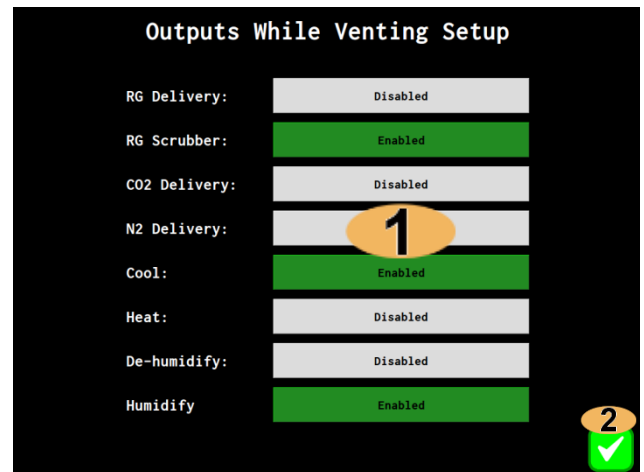**4** **Submit Button:** Go back to Room Configuration screen.

1 **Action List**: Set which actions are allowed while the room is venting.

2 **Submit Button:** Go back to Room Configuration screen. Changes are saved once the Room Configuration screen is saved.

3.15   RG Zero – Using an Offset

When using a Volatile Organic Compound (VOC) Sensor (-RG and -RG2 Sensors only) for ethylene detection. The sensor does not solely respond to ethylene, instead it will respond to any gaseous Volatile Organic Compound (VOC) that is in the atmosphere. The RG Zero feature allows you to zero an RG sensor in a room, in order to cancel out any background VOC levels.

Once an RG offset is configured, if the room drops below this offset value, then the RG value will go negative. If the value is often negative, then you may have to check the RG offset, as the background VOC level may have dropped.

PDSA recommends discussing use of this feature with our team before implementing.
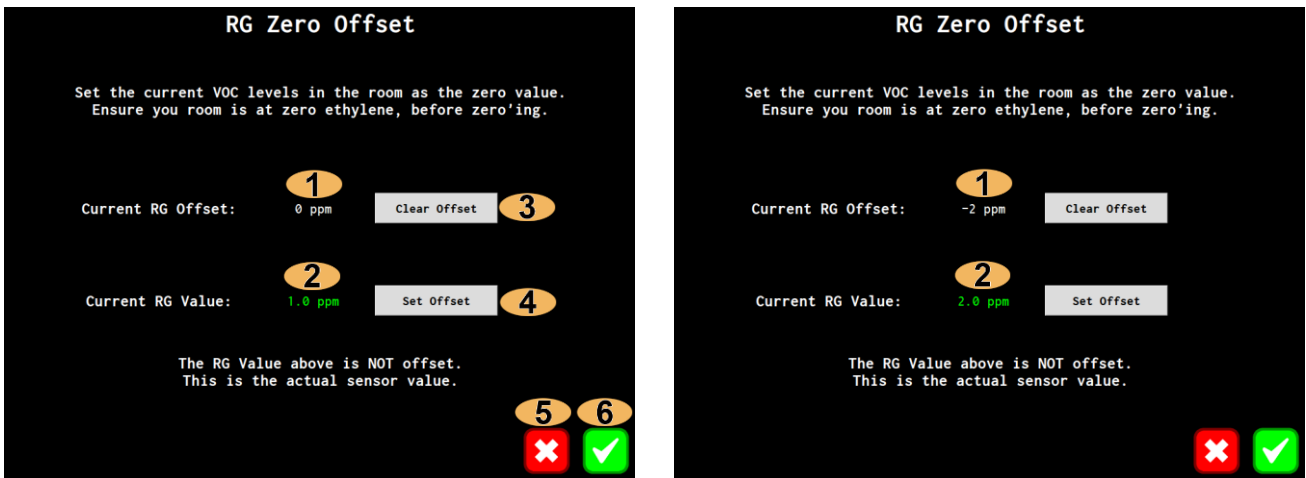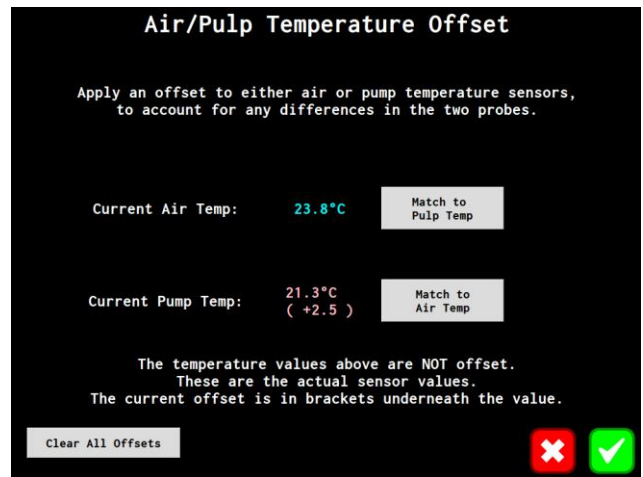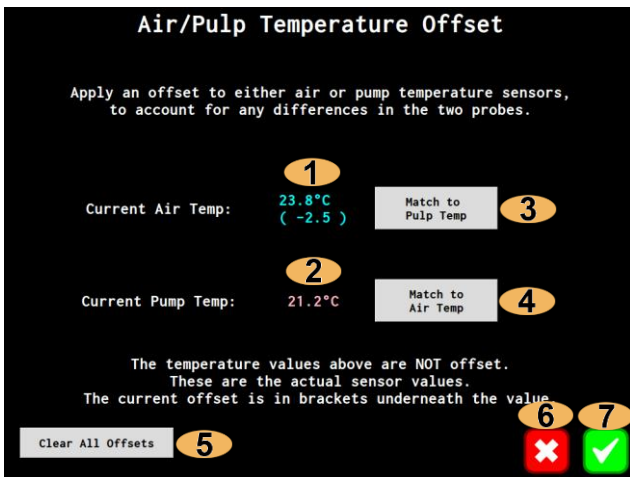

1. **Current Offset:** The current configured RG offset.
2. **Current RG:** The current RG value from the sensor.
3. **Clear Offset:** Tapping on this will zero the current configured RG offset.
4. **Set Offset:** Tapping on this will set the current RG value as the current offset and will therefore be the new zero value.
5. **Cancel Button:** Discard any changes to the RG offset and return to Room IO screen.
6. **Submit Button:** Save any changes to the RG offset and return to Room IO screen.

3.16   Temperature Offset
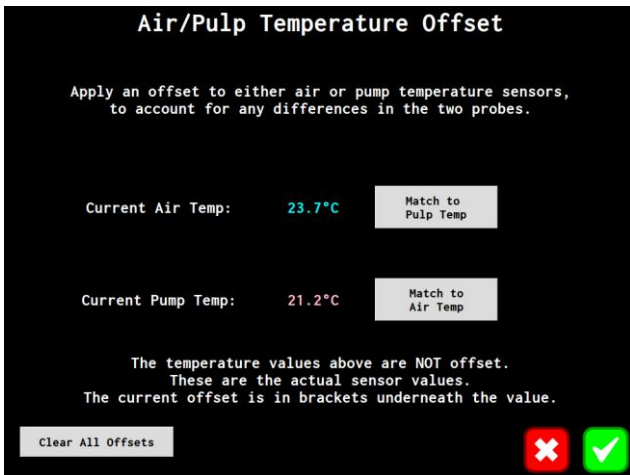
Due to the accuracy of RTD temperature probes, typically ±0.1°C, two probes may read up to 0.2°C differently to each other. In order to make the two temperature probes match each other the temperature offset feature can be used.

1. **Current Air Temperature & Offset:** The current air temperature and configured offset is shown here.
2. **Current Pulp Temperature & Offset**: The current pulp temperature and configured offset is shown here.
3. **Offset Air Temp to Match Pulp Temp:** Tapping on this will create an air temperature offset, so it matched the pulp temperature.
4. **Offset Pulp Temp to Match Air Temp:** Tapping on this will create a pulp temperature offset, so it matched the air temperature.
5. **Clear the Configured Offset:** Tapping on this will clear the configured temperature offset.
6. **Cancel Button:** Discard any changes to the temperature offset and return to Room IO screen.
7. **Submit Button:** Save any changes to the temperature offset and return to Room IO screen.
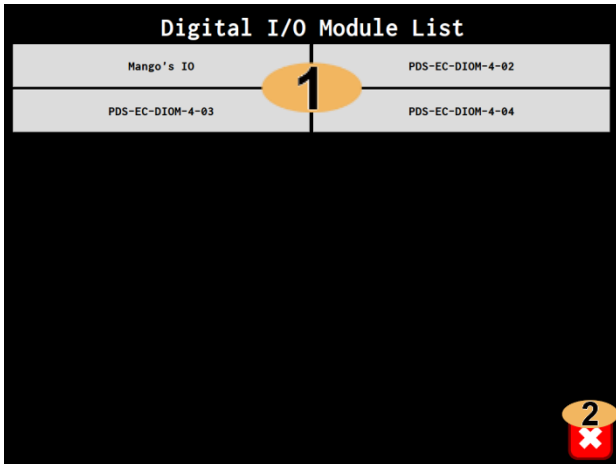
3.17   DIOM I/O Selection and Detaching

Figure 34: DIOM List.

1 **DIOM List:** Lists all DIOMs attached to this controller.

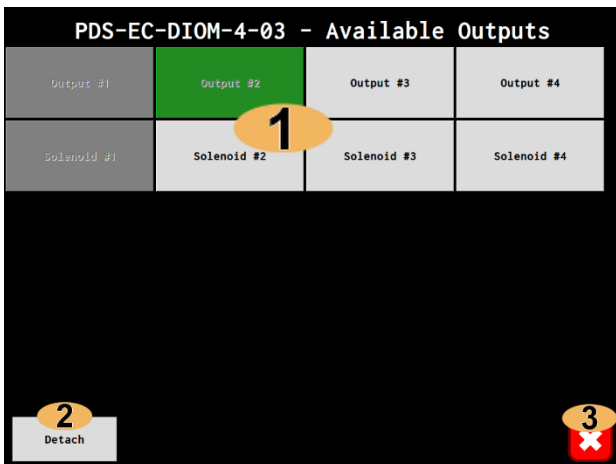**2** **Cancel Button:** Cancel I/O selection and go back to the previous screen.

Figure 35: DIOM's outputs list.

1 **DIOM Output List:** Lists the outputs on the DIOM. If the button is grey, then that output is already used. A green button highlights the current selection.

2 **Detach Output:** When editing an output's port, instead of selecting a different port, it can be detached, thus removing the output.

3   **Cancel Button:** Cancel I/O selection and go back to the previous screen.

Figure 36: DIOM's input list.

1   **Input List:** Lists the configured inputs. If the button is grey, then that input is already used. A green button highlights the current selection.

2   **Detach Input:** When editing an input's port, instead of selecting a different port, it can be detached, thus removing the input.

3   **Cancel Button:** Cancel I/O selection and go back to the previous screen.
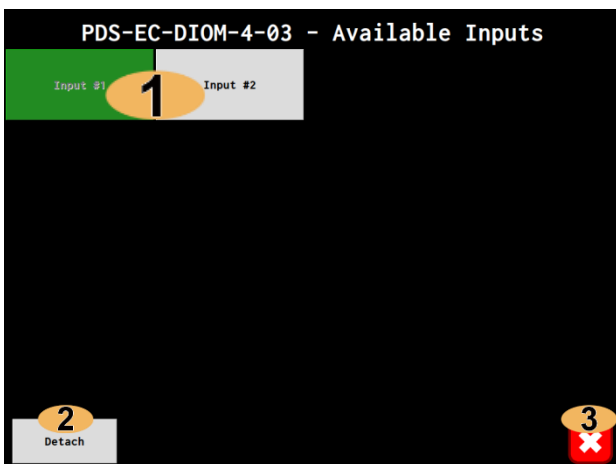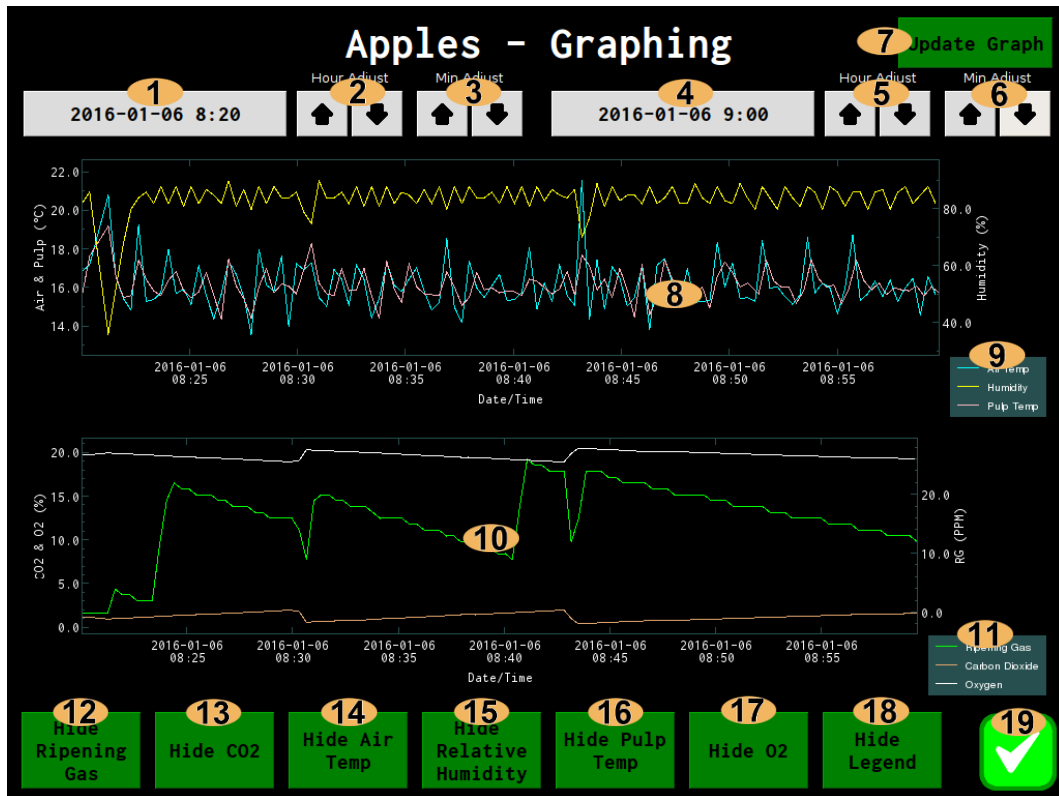
3.18   Room Graphing

Figure 37: Room graphing screen.

1   **Start Date/Time:** Displays start date/time. Tapping here will open a calendar to change the date.

2   **Start Time Hour Adjust:** Increment/decrement the start time hours by 1 hour.

3   **Start Time Minute Adjust:** Increment/decrement the start time minutes by 1 minute.

4   **End Date/Time:** Displays end date/time. Tapping here will open a calendar to change the date.

5   **End Time Hour Adjust:** Increment/decrement the end time hours by 1 hour.

6   **End Time Minute Adjust:** Increment/decrement the end time minutes by 1 minute.

7   **Update Graph:** Update the graphs, need to tap here after changing start/end date/times.

8   **Temperature/Humidity Graph:** Shows the temperatures and relative humidity plots.

9   **Temperature/Humidity Graph Legend:** The legend for the temperature/humidity graph.

10   **Gas Graph:** Shows the gas plots.

11   **Gas Graph Legend:** The legend for the gas graph.

12   **Hide/Show Air Temperature:** Show/hide the air temperature graph.

13   **Hide/Show Pulp Temperature:** Show/hide the pulp temperature graph.

14   **Hide/Show Relative Humidity:** Show/hide the relative humidity graph.

15   **Hide/Show Ripening Gas:** Show/hide the ripening gas graph.

16   **Hide/Show O2:** Show/hide the oxygen graph.

17   **Hide/Show CO2:** Show/hide the carbon dioxide graph.

18   **Hide/Show Legend:** Show/hide the graph legends.

19   **Cancel Button:** Go back to the Room Configuration screen.

3.19   User Configuration

Figure 38: User list screen.

1. **User List:** Lists all the users on this controller. If the button is red, that user cannot be synchronised to *FreshView.com.au*. Use *FreshView.com.au* to look for duplicate username, email or mobile phone number.

2. **Add New:** Adds a new user, *See Figure 39: Edit user screen.*

3. **Submit Button:** Return to the Settings screen.
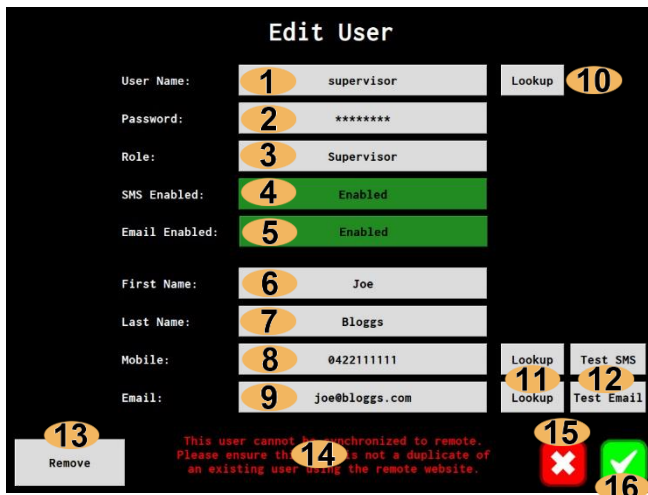

Figure 39: Edit user screen.

1. **Username:** Displays the users' username, tap to enter a new value.

2. **Password:** The users' password, tap to enter a new value.

3. **Role:** Displays the users' role, tap to cycle though Supervisor/Operator.

4. **SMS Enabled:** Displays if user should receive SMS messages, tap to toggle value.

5. **Email Enabled:** Displays if user should receive Email messages, tap to toggle value.

6. **First Name:** The users' first name, tap to enter a new value.

7. **Last Name:** The users' last name, tap to enter a new value.

8. **Mobile:** The users' mobile phone number, tap to enter a new value.

9. **Email:** The users' email address, tap to enter a new value.

10. **Lookup Username:** Lookup the current username on the FreshView server and populate fields.

11. **Lookup Email/Mobile:** Lookup the current email address or mobile phone number on the FreshView server and populate fields.

12. **Send Test Email/SMS:** Tapping on these buttons will send either a test email or SMS to the this user.

13. **Remove User:** Remove the current user from the controller.

14. **User not Synchronizable:** Due to duplicate username, mobile phone number or email address, this user cannot be synchronized to the FreshView server or to other controllers.

15. **Cancel Button:** Discard any changes made and return to the User List screen.

16. **Submit Button:** Save changes and return the Users List screen.
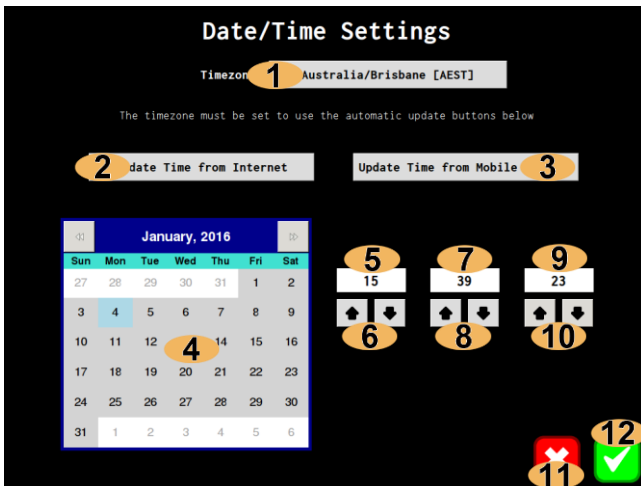
3.20 Date/Time and Timezone Configuration

Figure 40: Date/time configuration screen.

1 **Current Timezone:** The controllers' current timezone.

2 **Update Time from Internet:** Fetch the current time from an Internet time server.

3 **Update Time from Mobile Network:** Fetch the current time from the mobile phone network.

4 **Current Date:** The current date; can be changed by tapping on the desired date.

5 **Current Time (Hours):** Displays the 'hours' part of the time.

6 **Hour Adjust:** Increment/decrement the hours.

7 **Current Time (Minutes):** Displays the 'minutes' part of the time.

8 **Minutes Adjust:** Increment/decrement the minutes.

9 **Current Time (Seconds):** Displays the 'seconds' part of the time.

10 **Seconds Adjust:** Increment/decrement the seconds.

11 **Cancel Button:** Discard changes and return to the Settings screen.

12 **Submit Button:** Saves changes, and restarts the FreshView EC12 application.
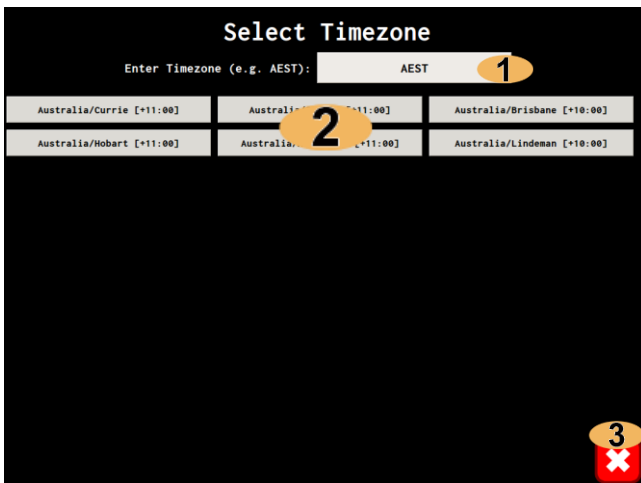
Figure 41: Timezone selection screen.

1 **Timezone Search:** Enter your timezone abbreviation here, for example AEST (Australian Eastern Standard Time) for Brisbane, Australia.

2 **Timezone List:** A list of all the timezone matching your Timezone search. Tapping on one will select it and return you to the date/time configuration screen.

3 **Cancel Button:** Discard any changes and return to Date/Time configuration screen.

3.21   Network Configuration

For remote access via *FreshView.com.au*, the controller must have an Internet connection. This connection can be provided using the internal 4G modem, or via a LAN connection. The network configuration screen allows the selection of which type of connection should be used. If you are using a LAN connection instead of 4G then the controller can either obtain its IP address automatically using DHCP or you can define a static IP address.
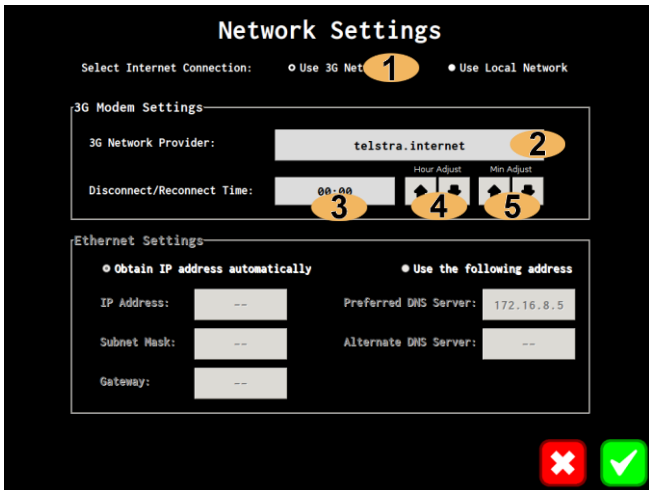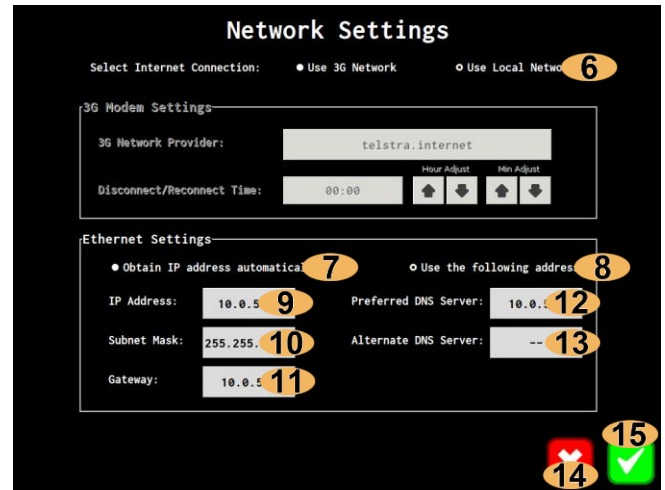

Figure 42: Network configuration, using 4G modem.

Figure 43: Network configuration, using LAN connection

1   **Use 4G Network:** Use the 4G modem and mobile phone network for an Internet connection.

2   **4G Network Provider:** The APN to which to connect your SIM card to.

3   **Reconnection Time:** Time of day when the 4G is disconnected and reconnected to the network.

4   **Adjust Reconnection Time (Hours):** Increment/decrement the reconnection time hours.

5   **Adjust Reconnection Time (Minutes):** Increment/decrement the reconnection time minutes.

6   **Use Local Network:** Use a local network over Ethernet for the Internet connection.

7   **Obtain IP Address Automatically:** If this is checked, DHCP is used to obtain an IP address.

8   **Manual IP Address Configuration:** If this is checked, then the fields below must also be populated.

9   **IP Address:** Displays the manual IP address, tap to change its value.

10   **Subnet Mask:** Displays the subnet mask, tap to change its value.

11   **Gateway:** Displays the gateway IP address, tap to change its value.

12   **Preferred DNS Server:** Displays the primary DNS IP address, tap to change its value.

13   **Alternate DNS Server:** Displays the secondary DNS IP address, tap to change its value.

14   **Cancel Button:** Discard changes and return to Settings screen.

15   **Submit Button:** Save changes, restart network interfaces and return to Settings screen.

> ## After changing Network Configuration, the System Status screen should be checked to ensure it has connected to the network.
>
> ### See Section 3.30 System Status

OPERATION

3.22   SMS Notification Configuration
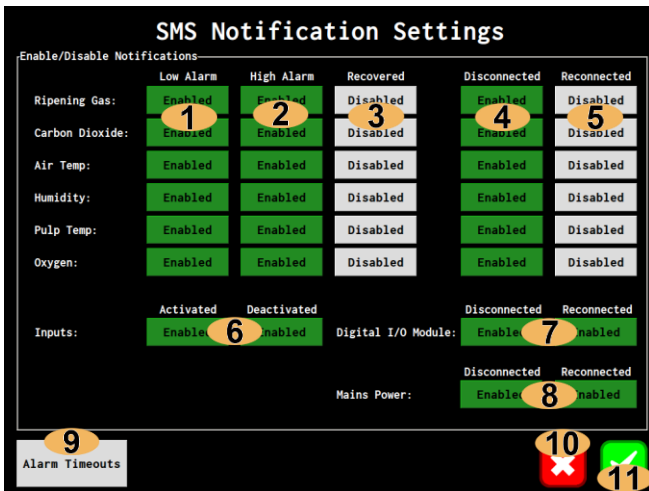

Figure 44: SMS notifications configuration screen.

1   Low Alarm Notifications: Enable/disable SMS notifications on parameter low alarm.

2   High Alarm Notifications: Enable/disable SMS notifications on parameter high alarm.

3   Recovered from Alarm Notifications: Enable/disable SMS notifications when parameter recovers from a low or high alarm.

4   Transmitter Disconnected Notifications: Enable/disable SMS notifications when a

parameter's transmitter or DIOM is disconnected.

5   Transmitter Reconnected Notifications: Enable/disable SMS notifications when a parameter's transmitter or DIOM is reconnected.

6   Power Fail Notifications: Enable/disable SMS notifications when power is lost or restored.

7   Low Alarm Timeout: The number of minutes a parameter's low alarm must be active for before an SMS notification is sent.

8   High Alarm Timeout: The number of minutes a parameter's high alarm must be active for before an SMS notification is sent.

9   Alarm Timeouts: The number of minutes an input must be active for before an SMS notification is sent.

10   Cancel Button: Discards changes and return to Settings screen.

11   Submit Button: Saves changes and return to Settings screen.

> **Only users who have SMS messages enabled will receive text messages.**

> **SMS messages are only sent when control is enabled.**
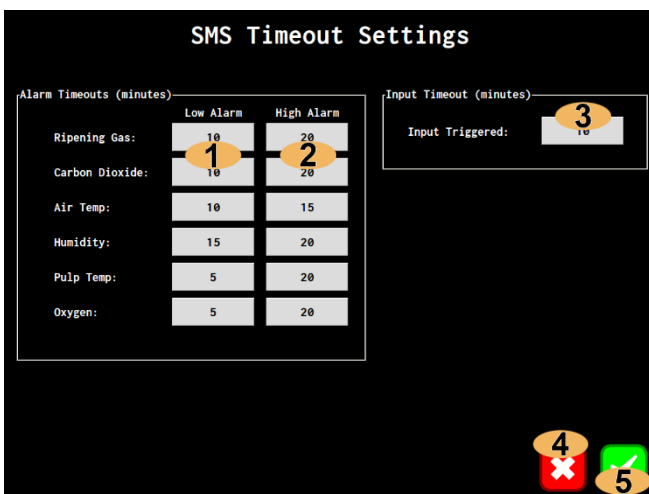
Figure 45: SMS Timeout Screen

1   Low Alarm Timeouts: Set the timeouts for parameters Low Alarms.

2   High Alarm Timeouts: Set the timeouts for parameters High Alarms.

3   Input Timeout: Set the timeout for an active input.

4   Cancel Button: Discards changes and return to SMS Notifications screen.

5   Submit Button: Saves changes and return to SMS Notifications screen.

> **SMS alarm messages will be sent once the timeout expires.**
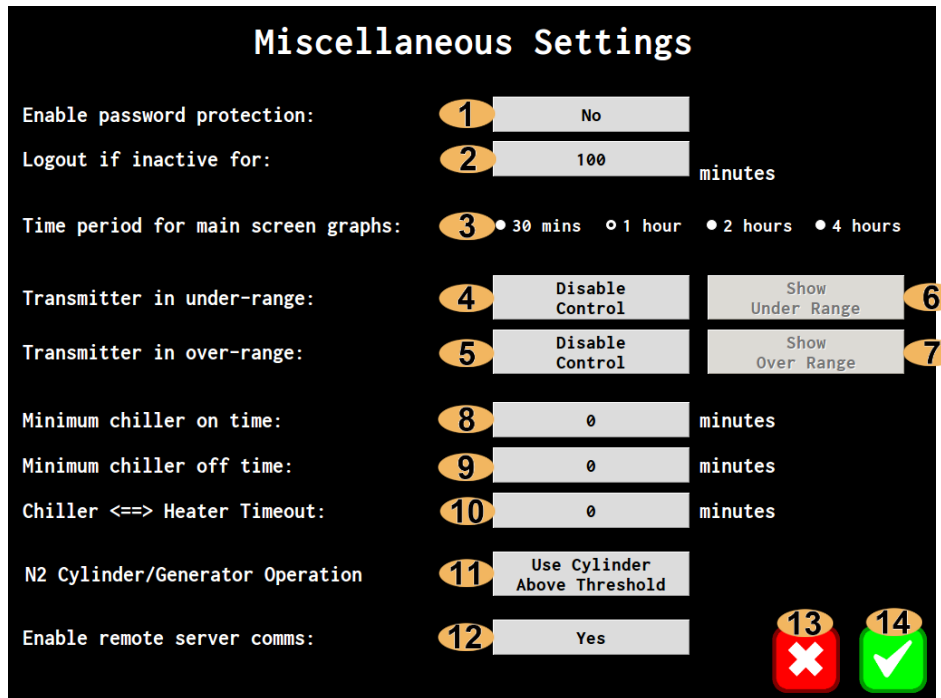
3.23 Miscellaneous Options

Figure 46: Miscellaneous options screen.

1 **Password Protection:** Enable/Disable password protection.

2 **Automatic Logout Inactivity Period:** The number of minutes a user must be idle for, before they are automatically logged out.

3 **Time period for Main Screen Graphs:** The duration of the time axis on the main screen room graphs.

4 **Disable Control on Under Range:** Should parameter control be disabled if a transmitter is reading under range values. This could indicate the transmitter is in an error state.

5 **Disable Control on Over Range:** Should parameter control be disabled if a transmitter is reading over range values. This could indicate the transmitter is in an error state.

6 **Transmitter Value for Under Range:** Should the transmitter read 'Under Range' or the minimum valid value when transmitter is reading under range.

7 **Transmitter Value for Over Range:** Should the transmitter read 'Over Range' or the maximum valid value when transmitter is reading over range.

8 **Minimum chiller on time:** The minimum number of minutes the chiller can be on for.

9 **Minimum chiller off time:** The minimum number of minutes the chiller can be off for.

10 **Chiller <==> Heater Timeout:** Chiller/heater inactive time between heating and cooling cycles.

11 **N2 Cylinder/Generator operation:** Selects the N2 source when the O2 is above its threshold, as defined in the room's O2 Gas Delivery parameters.

12 **FreshView Server Communications:** Allow communications with *FreshView.com.au*.

13 **Cancel Button:** Discard changes and return to the Settings screen.

14 **Submit Button:** Save changes and return to the Settings screen.

If remote server comms is disabled, then *FreshView.com.au* cannot be used to view rooms or modify the controller's configuration.
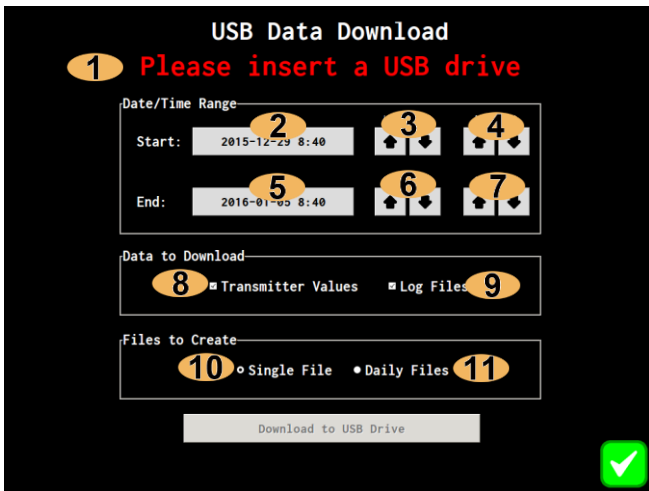
3.24   USB Data Download

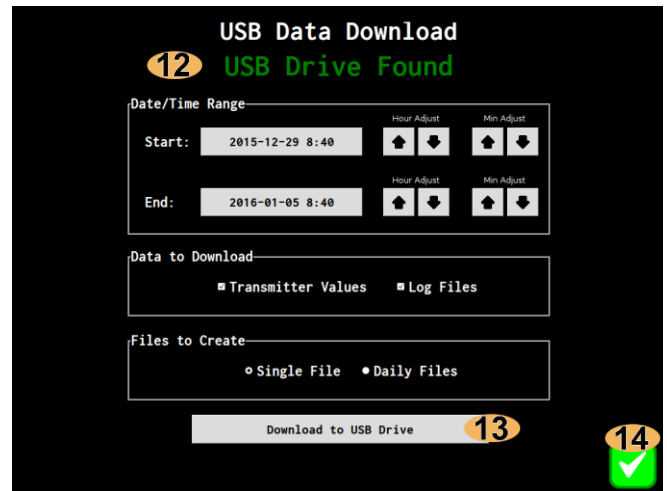Figure 47: USB Data Download screen, no USB drive connected.

Figure 48: USB Data Download screen, with USB drive connected.

1   **No USB Drive Message:** No USB drive has been found to download data to.

2   **Start Date/Time:** Start date/time for the data to download.

3   **Adjust Start Time (Hours):** Increment/Decrement the start time hours.

4   **Adjust Start Time (Minutes):** Increment/Decrement the start time minutes.

5   **End Date/Time:** End date/time for the data to download.

6   **Adjust End Time (Hours):** Increment/Decrement the end time hours.

7   **Adjust End Time (Minutes):** Increment/Decrement the end time minutes.

8   **Download Transmitter Values:** If selected, transmitter values will be downloaded to the USB drive.

9   **Download Log Files:** If selected, log messages will be downloaded to the USB drive.

10   **Download as Single File:** Download data as a single CSV file.

11   **Download as Daily Files:** Download data as multiple daily CSV files.

12   **Found USB Drive Message:** A USB drive has been found.

13   **Download to USB:** Download selected data to USB drive.

14   **Submit Button:** Returns to Settings screen.
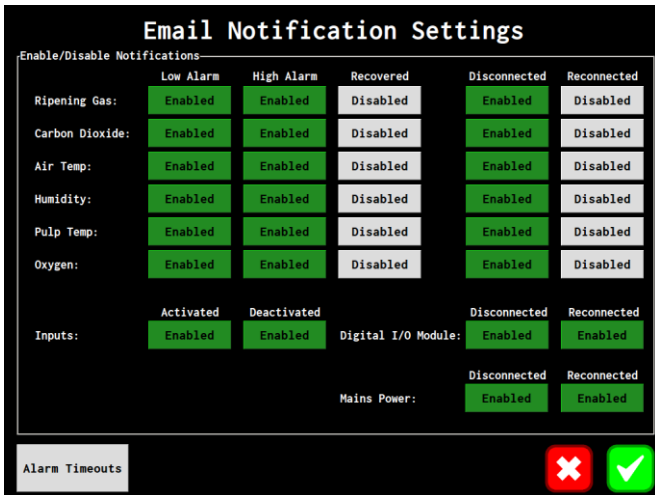

Shown when loading the data.

Shown when writing to the USB drive. **DO NOT REMOVE USB DRIVE.**

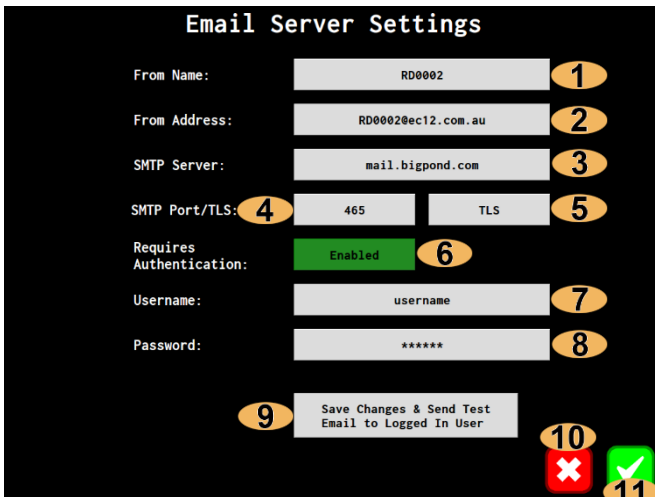Shown when the data download is complete.

3.25   Email Notifications

This screen has the same functionality as the SMS Notifications Screen, except this screen is for emails instead.

For more information see section: *3.22 SMS Notification Configuration.*

3.26   Email Settings

1. **Name for FROM address:** The name used in the FROM address for the email.
2. **Email for FROM address:** The email address used in the FROM address for the email.
3. **SMTP Server:** The SMTP server hostname.
4. **Port:** The port to connect to on the SMTP server.
5. **Encryption:** If TLS is selected, the email will be sent over an encrypted connection, otherwise it will be sent over a clear text connection.

6. **Requires Authentication:** If this is enabled, then the EC12 will authenticate itself with the SMTP server with a username and password.
7. **Username:** The username to use for authentication on the SMTP server.
8. **Password:** The password to use for authentication on the SMTP server.
9. **Save & Send Test Email:** Tapping on this will save the changes and then send a test email to the logged in user.
10. **Cancel Button:** Discard changes and return to the Settings screen.
11. **Submit Button:** Save changes and return to the Settings screen.
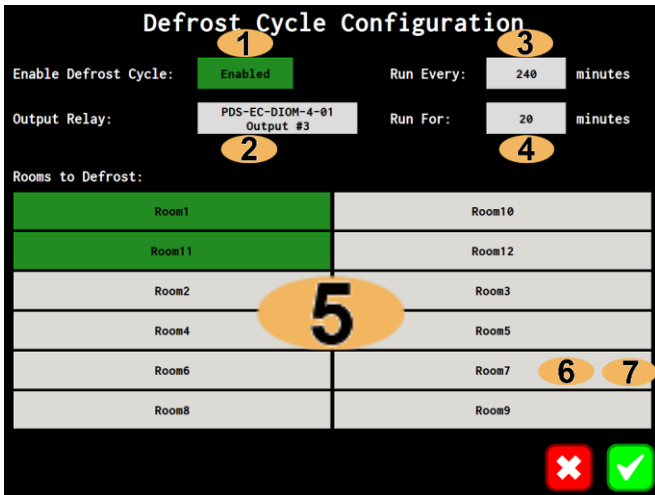
3.27 Defrost Cycles

Figure 49: Defrost Cycle Configuration.

Ice can build up on the outside heat exchanger of the room's chiller. This reduces the airflow across it, which will affect the efficiency.

The FreshView EC12 Ripening Controller implements Defrost Cycle functionality where it can be as simple as just turning the chiller off for a short time periodically. Or a relay output can also be triggered to enable a heater or some other function to aid the de-icing process.

All rooms are defrosted at the same time.

1. **Enable/Disable:** Toggles enabling or disabling the Defrost Cycles for all rooms.
2. **Output Relay:** Allows for selection of a relay which is enabled during defrost cycles.
3. **Run Every:** Defines the number of minutes to run the chiller for between defrost cycles.
4. **Run For:** Defines the number of minutes to run the defrost cycle for.
5. **Rooms:** Select the rooms which require the defrost cycle to be enabled.
6. **Cancel Button:** Discard changes and return to the Settings screen.
7. **Submit Button:** Save settings and return to the Settings screen.
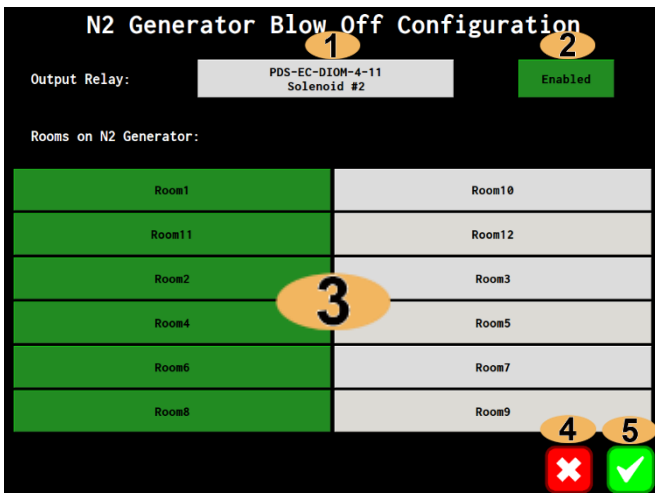
3.28 Nitrogen Blow Off

Figure 50: Nitrogen Blow Off Configuration.

Some nitrogen generators will always create nitrogen from the atmosphere and cannot be switched on/off as required. With these generators, a blow off solenoid must be used to allow the generated nitrogen gas to escape without building up dangerously high pressures within the generator.

The FreshView EC12 Ripening Controller implements some functionality to aid this process. This will enable a relay when there are no rooms injecting nitrogen, thus allowing the excess nitrogen gas to escape.

1. **Output Relay:** Allows for selection of a relay which when no rooms are injecting nitrogen gas.
2. **Enable/Disable:** Toggles enabling or disabling the Nitrogen Blow Off for all rooms.
3. **Rooms:** Select the rooms which require the Nitrogen Blow Off to be enabled.
4. **Cancel Button:** Discard changes and return to the Settings screen.
5. **Submit Button:** Save settings and return to the Settings screen.

3.29 Log Messages
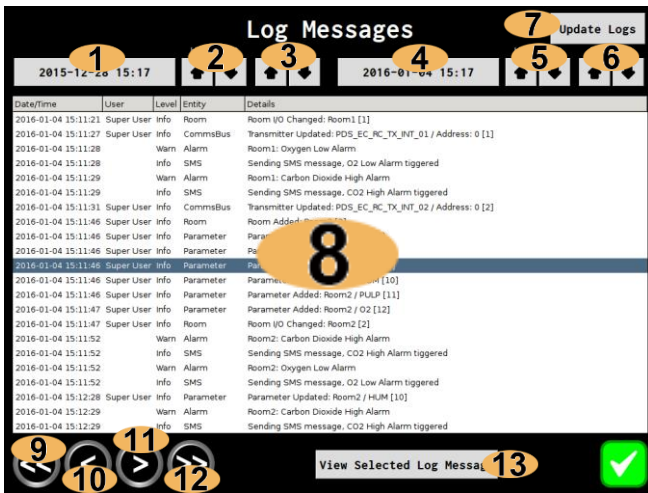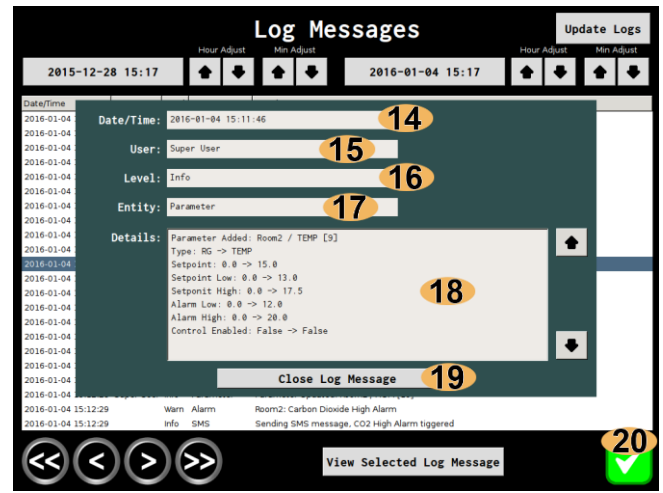

Figure 51: Log messages list.

Figure 52: View log message details.

1. **Start Date/Time:** Start date/time for the log messages to view.
2. **Adjust Start Time (Hours):** Increment/Decrement the start time hours.
3. **Adjust Start Time (Minutes):** Increment/Decrement the start time minutes.
4. **End Date/Time:** End date/time for the log messages to view.
5. **Adjust End Time (Hours):** Increment/Decrement the end time hours.
6. **Adjust End Time (Minutes):** Increment/Decrement the end time minutes.
7. **Update Log Messages:** Update the screen. Tap here after changing start/end date/times to update log message list.
8. **Log Messages:** The list of log messages.
9. **First Page:** Show the first page of log messages, in the selected date range.
10. **Previous Page:** Show the previous page of log messages, in the selected date range.
11. **Next Page:** Show the next page of log messages, in the selected date range.
12. **Last Page:** Show the last page of log messages, in the selected date range.
13. **View Selected Log Message:** Show details of the highlighted log message.
14. **Log Message Date/Time:** The date/time of the log message.
15. **Log Message User:** The user that generated the event.
16. **Log Message Level:** The priority level of the log message.
17. **Log Message Entity:** The sub-system that generated the log message.
18. **Log Message Details:** The log message's message.
19. **Close Log Message:** Close the log message details popup.
20. **Submit Button:** Return to the Settings screen.

3.30   System Status
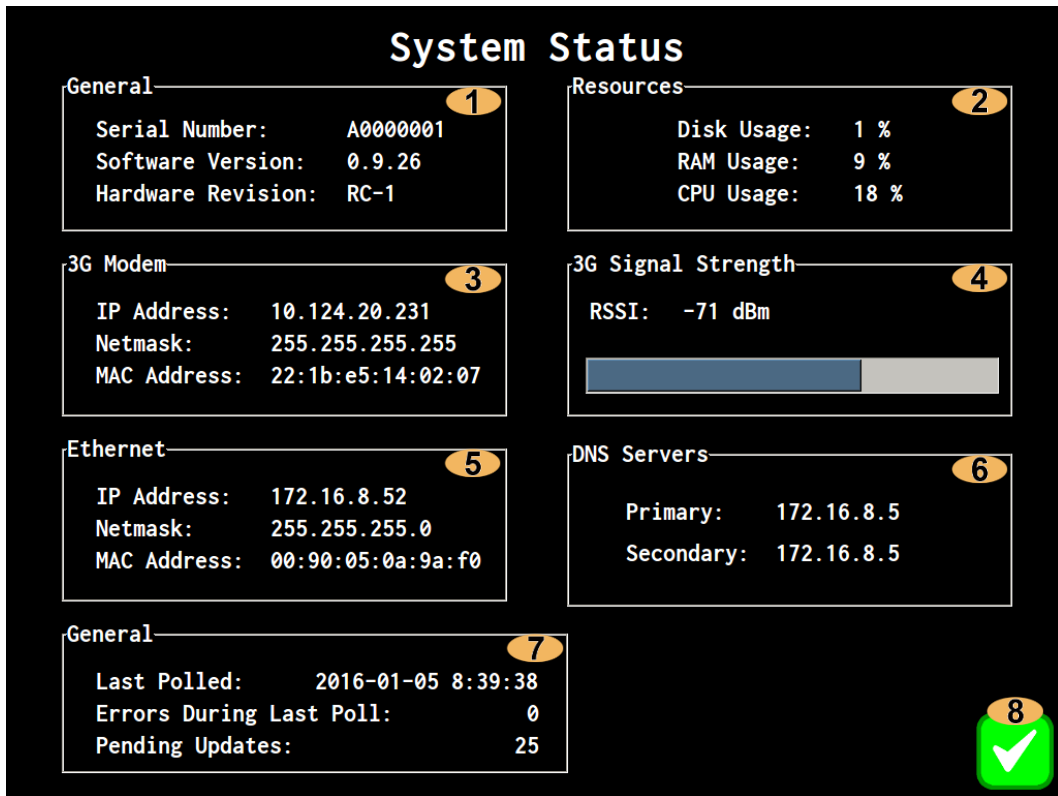
Figure 53: System status screen.

1 **General Information:** The controller's serial number and software/hardware versions.

2 **Resource Status:** Current system Disk/RAM/CPU usage.

3 **4G Modem Status:** The 4G modem's IP address, subnet mask and MAC address.

4 **4G Modem Signal:** The 4G modem's signal strength.

5 **Ethernet/LAN Status:** The Ethernet/LAN IP address, subnet mask and MAC address.

6 **DNS Servers:** Configured DNS servers, either from manual configuration or DHCP.

7 **Remote Server Status:** Status of the communications with the FreshView webserver.

8 **Submit Button:** Return to the Settings screen.

4   Remote Access

4.1   Logging In & Retrieving Login Details

Figure 54: Login web page.

Figure 55: Forgot login details web page.

1 **Company Code:** Enter your company code supplied by PDS or your local distributor.

2 **Username:** Enter your username here.

3 **Password:** Enter your password here.

4 **Remember Me:** If this is checked, a token will be stored as a cookie on your computer, which will allow you to login later without entering your login details.

5 **Login Button:** Once you have entered your login details, click here to view your account.

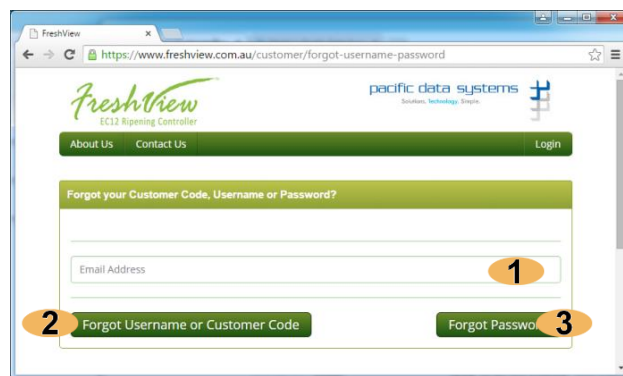**6** **Forgot Login Details:** See *Figure 55: Forgot login details web page.*

1 **Email Address:** Enter the email address associated with your account.

2 **Forgot Username or Company Code:** Clicking here will send you an email containing your username and company code.

3 **Forgot Password:** Clicking here will send you an email containing a link, which will allow you to change your password.

4.2 User Dashboard
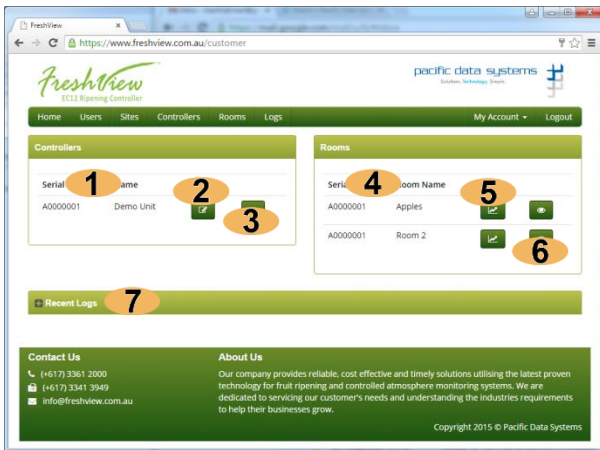
Figure 56: Dashboard web page, with log messages collapsed.
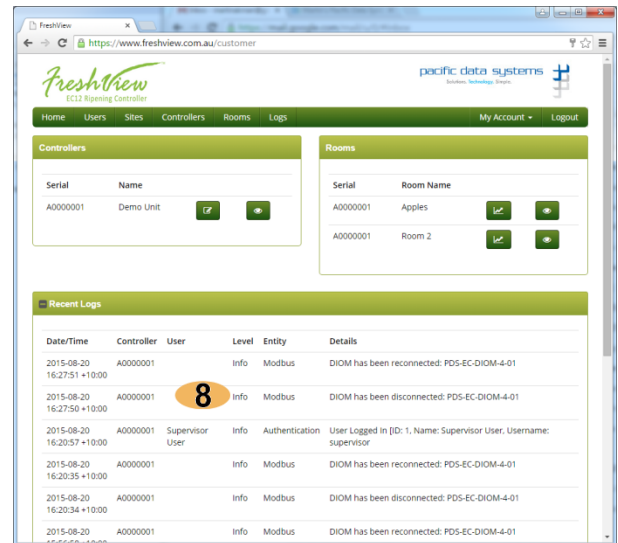
Figure 57: Dashboard web page, with log messages expanded.

1 **Controller List:** Lists all the controllers assigned to your account.

2 **Edit Controller:** *See Section: 4.6 Controllers.*

3 **View Controller:** *See Section: 4.6 Controllers.*

4 **Room List:** Lists the rooms on the controllers you have access to.

5 **Room Graph:** See Section: *4.8 Room Graphing.*

6 **View Room:** See Section: *4.7 Rooms.*

7 **Recent Logs (collapsed):** Click this green bar to show/hide recent log messages.

8 **Recent Logs (expanded):** Lists the 10 most recent log messages from the controllers assigned to your account.

4.3 Change Contact Details and Password
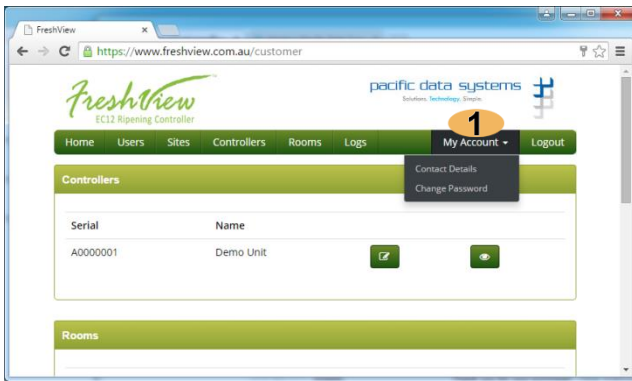
Figure 58: The 'My Account' menu.

1 **My Account Menu:** Here you will find links to edit your contact details and change your password.
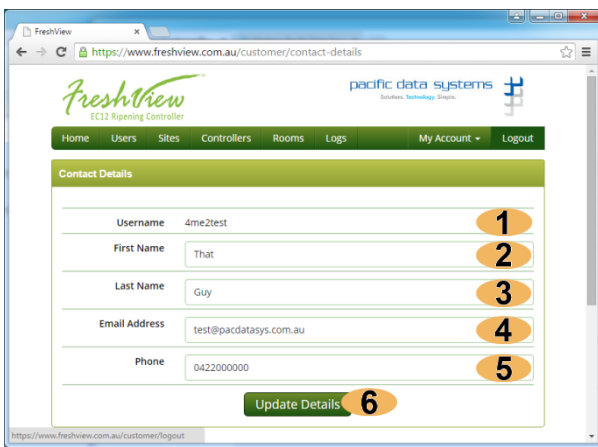
Figure 59: Change contact details web page.

Figure 60: Change password web page.

1 **Username:** Displays your username. You cannot edit your username from this page.

2 **First Name:** Allows editing of your first name.

3 **Last Name:** Allows editing of your last name.

4 **Email Address:** Allows editing of your email address.

5 **Mobile Number:** Allows editing of your mobile phone number.

6 **Submit Button:** Clicking here will save your changes. Any controllers you are assigned will also get updated.

1 **Current Password:** As a security measure, you must enter your current password when changing your password.

2 **New Password:** Enter your new password here.

3 **Confirm Password:** Enter your new password again here.

4 **Submit Button:** Clicking here will save your changes. Any controllers you are assigned will also get updated.

4.4   User Management

Figure 61: Users list web page.

1   **Search First Name:** Allows for searching on the users first name.

2   **Search Last Name:** Allows for searching the users last name.

3   **Search Email Address:** Allows for searching on the users email address.

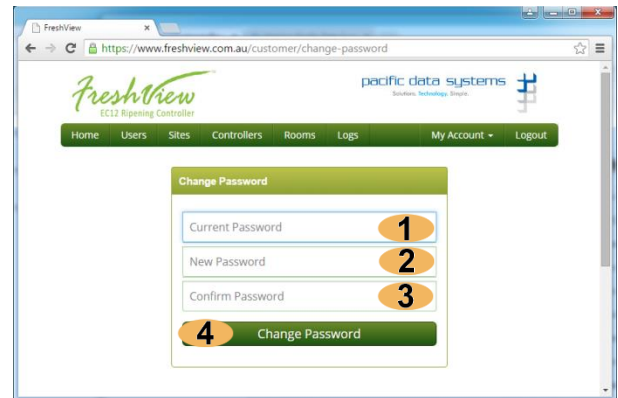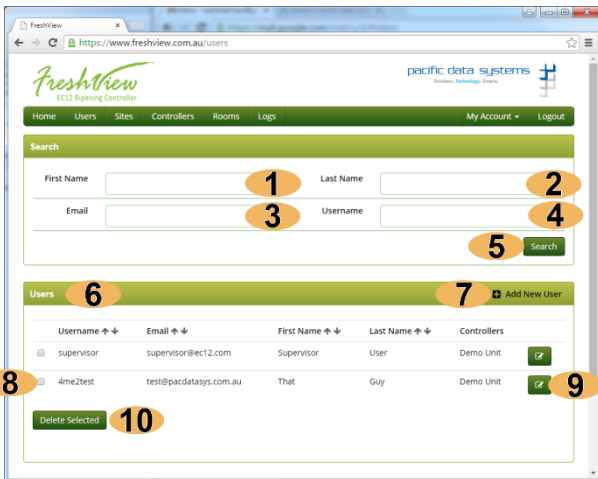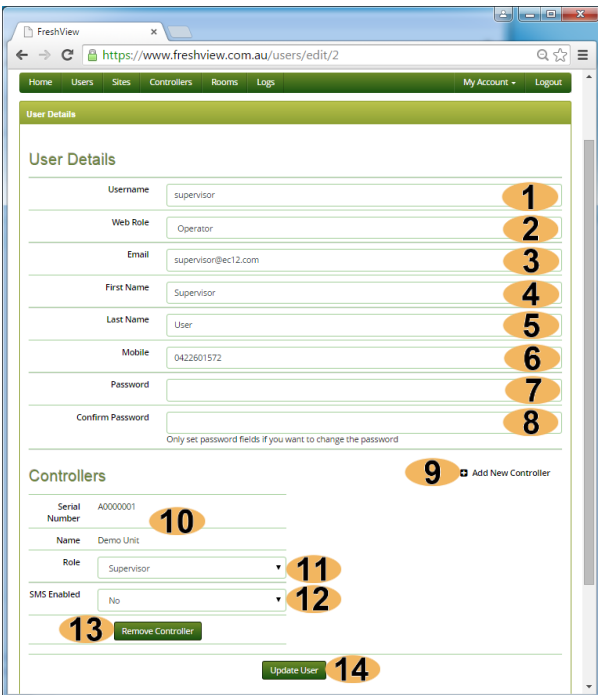**4**   **Search Username:** Allows for searching on the users username.

5   **Submit Search:** Submit your search.

6   **User List:** Lists the users matching your search or all users if the search has not been submitted.

7   **Add New User:** Add a new user. See *Figure 62: Add/Edit user web page.*

8   **Select User:** Check this checkbox to select the user. Only used for deleting users.

9   **Edit User:** Open the edit user page for the selected user, See *Figure 62: Add/Edit user web page.*

10   **Delete Selected Users:** Deletes the selected users. You cannot reverse this action.

Figure 62: Add/Edit user web page.

1   **Username:** Enter the username here, must be unique to your company.

2   **Web Role:** The role this user has on *FreshView.com.au*.

3   **Email Address:** The user's email address.

4   **First Name:** The user's first name.

5   **Last Name:** The user's last name.

6   **Mobile Number:** The user's mobile phone number.

7   **Password:** Only enter a value here when you want to change the user's password.

8   **Change Password:** Only enter a value here when you want to change the user's password.

9   **Assign Controller:** Assign another controller to the user. See *Figure 63: Assign user to controller web page.*

10   **Assigned Controller Details:** Details of the controller assigned to the user.

11   **Assigned Controller Role:** The role this user has on the controller.

12   **Assigned Controller SMS:** Should this user receive SMS messages from this controller.

13   **Remove Assigned Controller:** Un-assign the user from this controller.

14   **Submit Button:** Save your changes. Changes will also be synchronized to the controllers this user is assigned to.
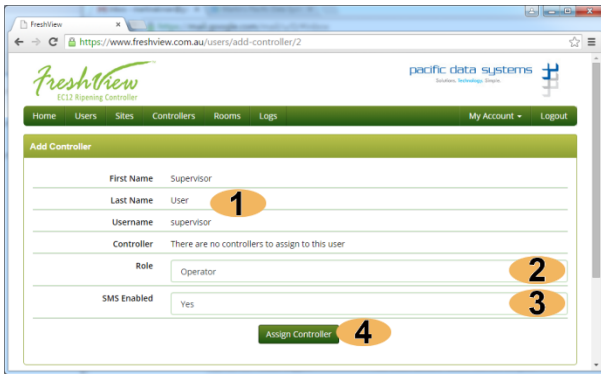
Figure 63: Assign user to controller web page.

1. **User Details:** The user that you are assigning a controller to.
2. **Role:** The role this user should have on the controller.
3. **SMS Enabled:** Should this user receive SMS messages from this controller.
4. **Submit Button:** Assigns the selected controller to the user.

4.5 Site Configuration
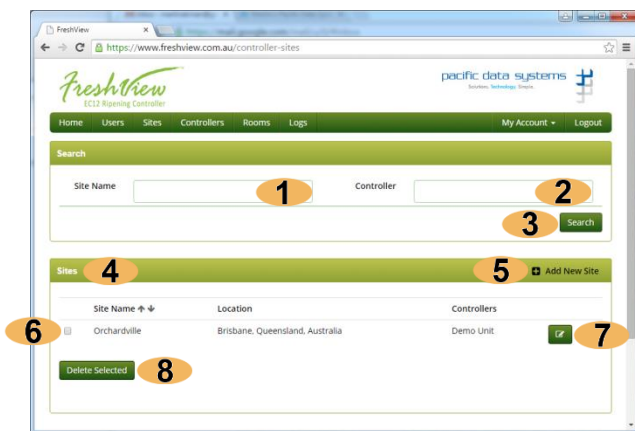
Figure 64: Sites list web page.

1. **Search Site Name:** Allows for searching by site name.
2. **Search Controller:** Allows for searching by controller.
3. **Submit Search Button:** Submit your search and displays the results.
4. **Sites List:** Sites matching your search, or all sites if no search has been submitted.
5. **Add New Site:** Add a new site, see *Figure 65: Site add/edit web page.*
6. **Select Site:** Check this checkbox to select a site. Only used for deleting sites.
7. **Edit Site:** Edit the site, see *Figure 65: Site add/edit web page.*
8. **Delete Selected Sites:** Deletes the selected sites. You cannot reverse this action.

Figure 65: Site add/edit web page.

1. **Site Name:** The site's name.
2. **Contact First Name:** The site's contact person's first name.
3. **Contact Last Name:** The site's contact person's last name.
4. **Email Address:** The site's email address.
5. **Phone:** The site's phone number.
6. **Fax:** The site's fax number.
7. **Address Line 1:** The site's address.
8. **Address Line 2:** The site's address.
9. **Postcode:** The site's postcode.
10. **City:** The city the site is located.
11. **State:** The state the site is located.
12. **Country:** The country the site is located.
13. **Submit Button:** Save changes and go back to the site list screen.

4.6 Controllers
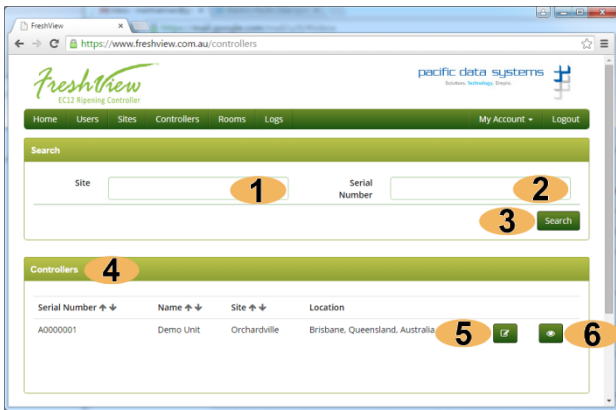
Figure 66: Controllers list web page.

Figure 67: Edit controller web page.

1 **Search Site:** Search for controller in a site.

2 **Search Serial Number:** Search for a controller using its serial number.

3 **Submit Search:** Submit your search and display the results.

4 **Controllers List:** Controllers matching your search, or all controllers if no search has been submitted.

5 **Edit Controller:** Edit the controller, see *Figure 67: Edit controller web page.*

6 **View Controller:** View the controller, using the controller view page, see *Figure 68: Controller view web page.*

1 **Controller Info:** Displays the controller's basic information.

2 **Controller Name:** Allows you to name your controllers to meaningful names.

3 **Controller Site:** Sets which physical site the controller is located.

4 **Request Full Configuration Update:** Sends a request to the controller asking it to send its configuration settings to *FreshView.com.au*.

5 **Update Controller:** Saves the changes and returns to the controller's list page.
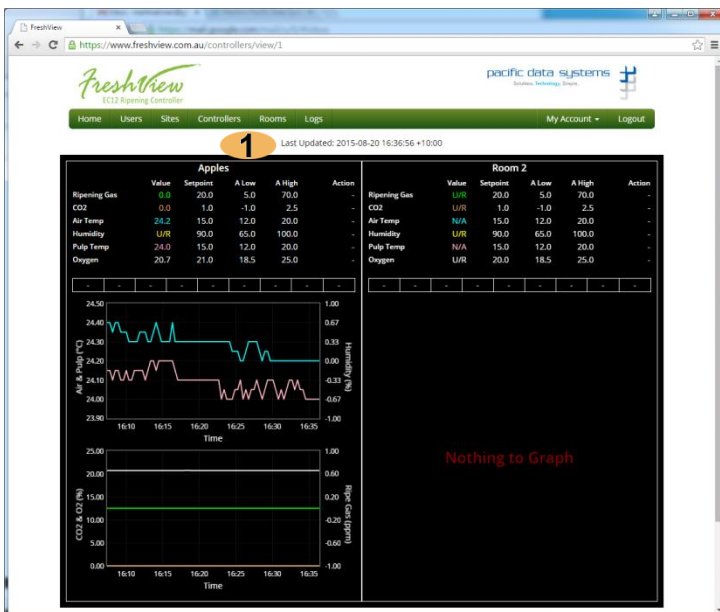
Figure 68: Controller view web page.

1 **Last Updated:** Display the date/time when the controller last polled the FreshView webserver.

See Section: *3.3 Main Screen* for a description of all other aspects of this page, as this page mostly mimics the controller screen.

4.7 Rooms
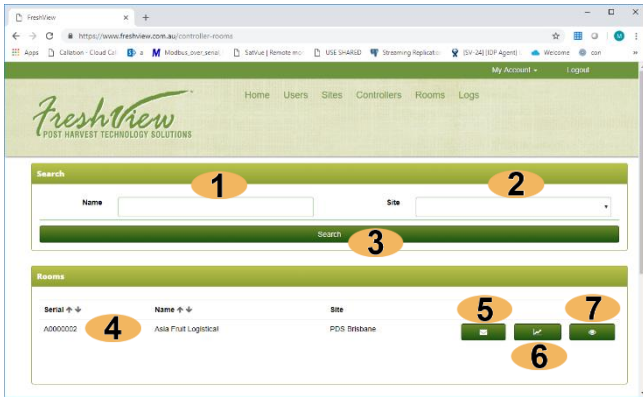
Figure 69: Rooms list web page.

To download data for long time periods, it is recommended you use the "Email CSV" feature.

1 **Search Room Name:** Search for a room by its name.

2 **Search Site:** Search for rooms at a particular site.

3 **Submit Search:** Submit the search and display the results.

4 **Rooms List:** Rooms matching your search, or all rooms if no search has been submitted.

5 **Email CSV:** Generate a CSV for the room's data and email it once generated.

6 **Room Graph:** See Section: *4.8 Room Graphing.*

7 **View Room:** View the room, using the room view page, see *Figure 58: Room view web page.*
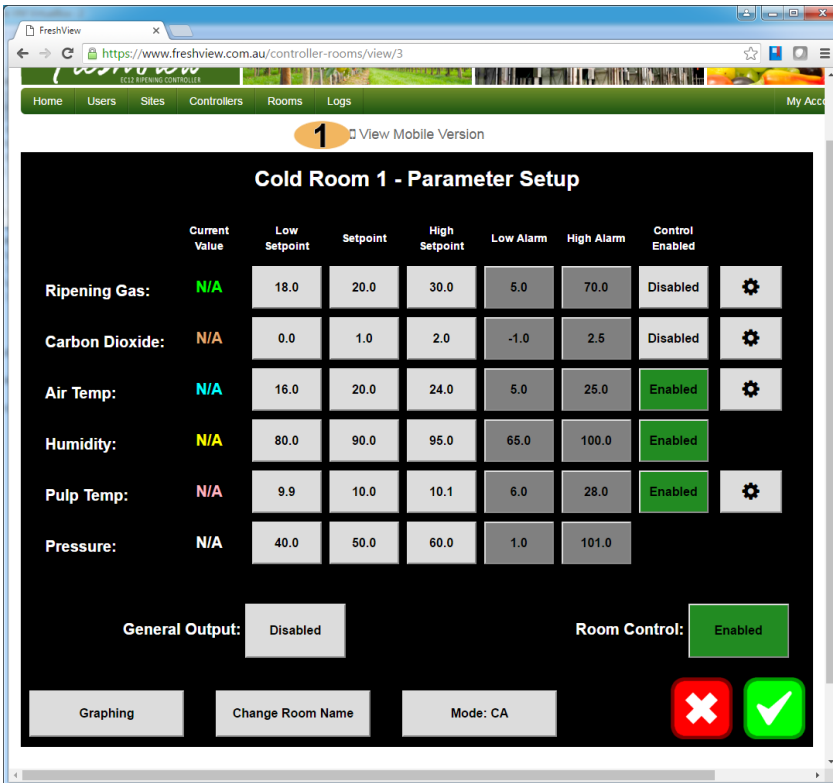
Figure 70: Room view web page.

1 **View Mobile Version:** Displays the mobile friendly version of this page, see *Figure 71: Mobile friendly edit room web page,* room settings.

See Section: 3.8 Rooms for a description of all other aspects of this page, as this page mostly mimics the controller screen.
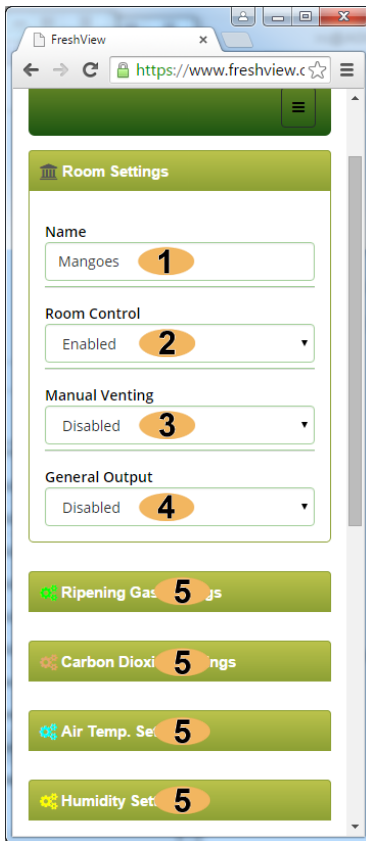
Figure 71: Mobile friendly edit room web page, room settings.
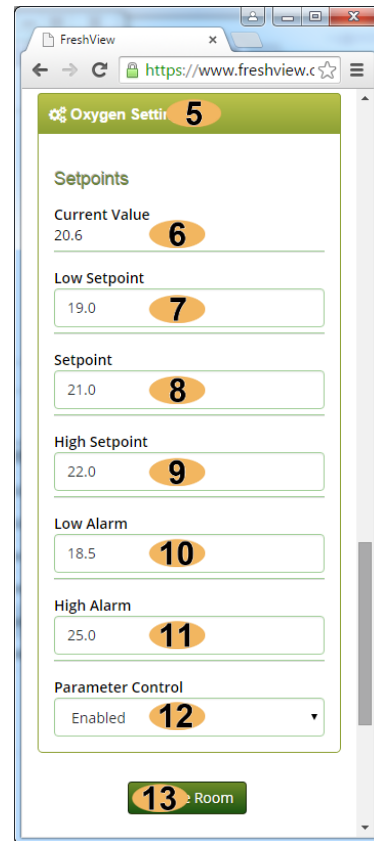
Figure 72: Mobile friendly edit room web page, parameter setpoints.

1   **Room Name:** The room's name.

2   **Room Control:** Enables/Disables control to the room.

3   **Manual Venting:** Enables/Disables manual room venting.

4   **General Output:** Enables/Disables the general room output.

5   **Parameter Type:** The monitored parameter type.

6   P**arameter Value:** The monitored parameter value.

7   **Low Setpoint:** The parameters low setpoint setting.

8   **Setpoint:** The parameters setpoint setting.

9   **High Setpoint:** The parameters high setpoint setting.

10   **Low Alarm:** The parameters low alarm threshold.

11   **High Alarm:** The parameters high alarm threshold.

12   **Parameter Control:** Enables/Disable parameter control.

13   **Submit Button:** Save all changes and return to controller view page.
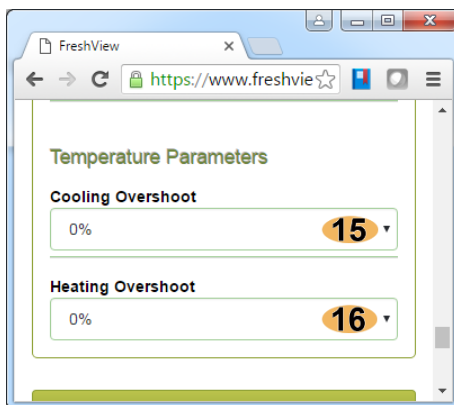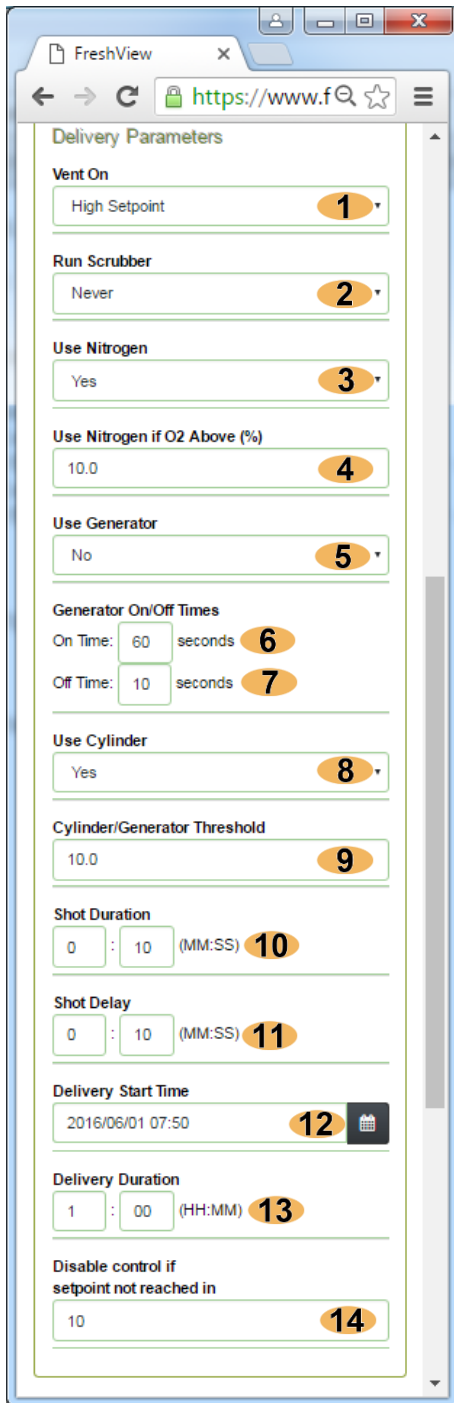
1. **Vent on:** Should venting occur on High Setpoint or High Alarm.

2. **Run Scrubber:** When should the scrubber be turned on, Always, Never High Setpoint or High Alarm.

3. **Use Nitrogen:** Should nitrogen be used to bring the gas concentration down.

4. **If O2 Above:** If using N2, only inject N2 if O2 is above this threshold, otherwise inject air or vent.

5. **Use Generator:** Should a gas generator be used for gas delivery.

6. **Gen On Time:** On time for generator enable relay. Pulse Width Modulated Signal (PWM).

7. **Gen Off Time:** Off time for generator enable relay. Pulse Width Modulated Signal (PWM).

8. **Use Cylinder:** Should a gas cylinder be used for gas delivery.

9. **Cylinder/Generator Threshold:** If gas concentration is below this use cylinder else use generator.

10. **Shot Duration:** The number of minutes/seconds the gas shot lasts for.

11. **Shot Delay:** The number of minutes/seconds between gas shots.

12. **Delivery Start Time:** The date/time of when gas delivery should start.

13. **Delivery Duration Hours:** Gas delivery duration. Stop gas delivery this amount of time after start time.

14. **Disable Control if setpoint not reached:** The gas delivery timeout value. Must hit setpoint in this time.

15. **Cooling Overshoot:** 0% = Setpoint, 100% = Low Setpoint.

16. **Heating Overshoot:** 0% = Setpoint, 100% = High Setpoint.

4.8 Room Graphing
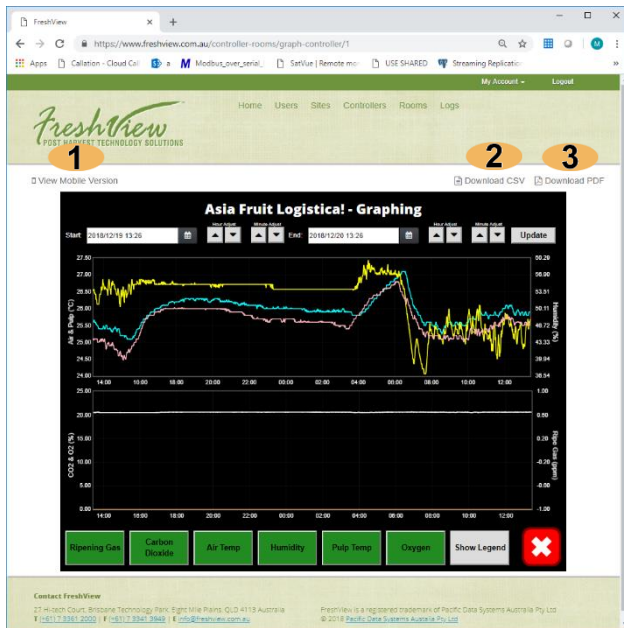
Figure 73: Room graphing web page.

① **View Mobile Version:** Display the mobile friendly version of this page, see *Figure 74: Mobile friendly room graphing web page.*

② **Download CSV:** Generate and download a CSV of the current graph. This can be emailed or stored as reference material, after it is downloaded.

② **Download PDF:** Generate and download a PDF of the current graph. This can be emailed or stored as reference material, after it is downloaded.

See Section: *3.18 Room Graphing* for a description of all other aspects of this page, as this page mostly mimics the controller screen.
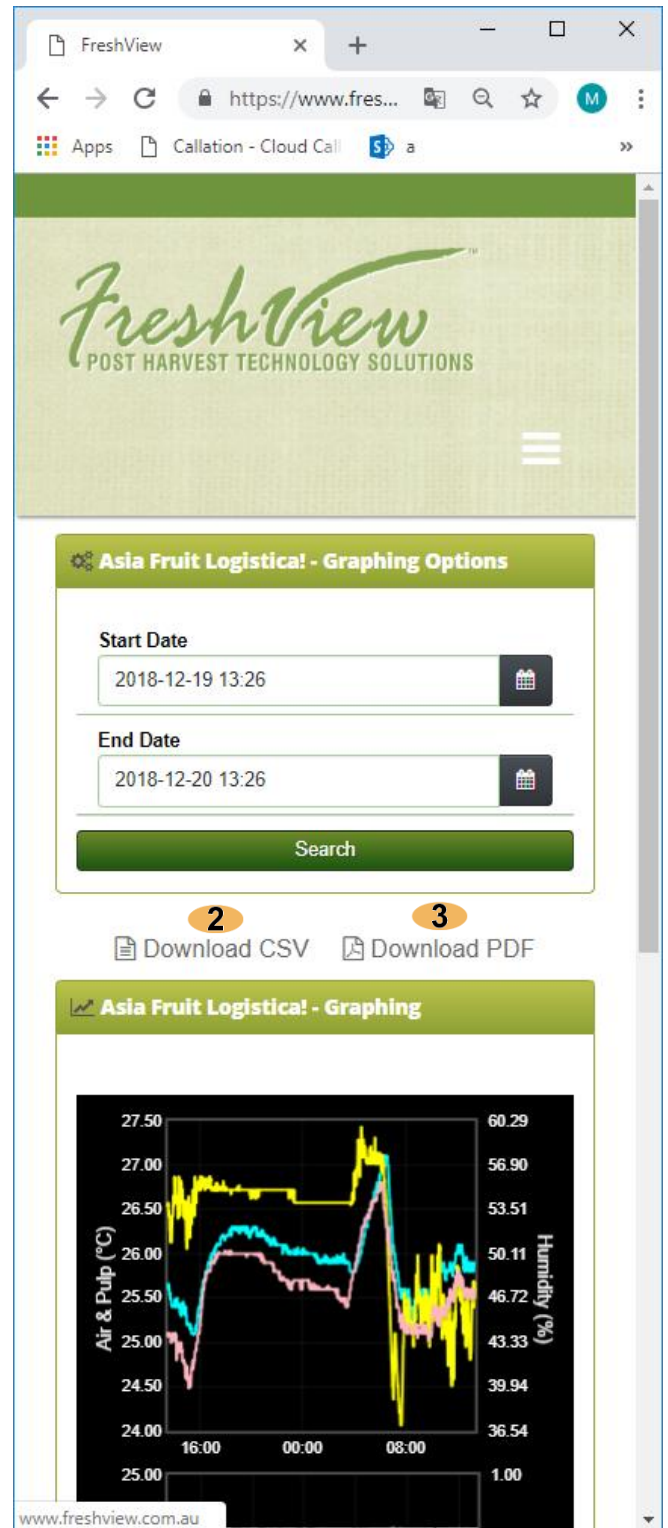
Figure 74: Mobile friendly room graphing web page.

4.9 Logs
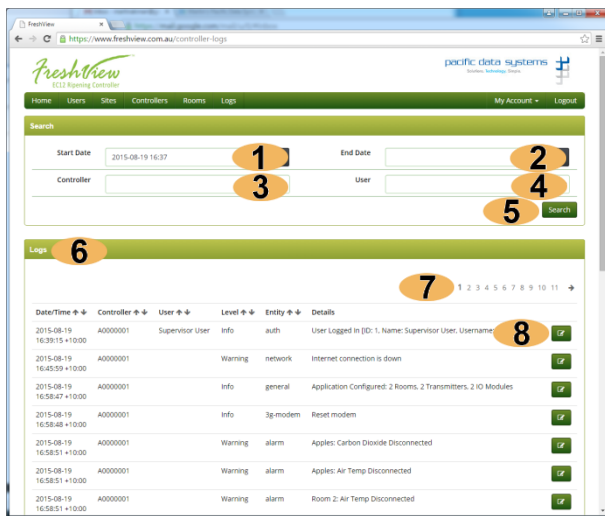
Figure 75: Logs list web page.
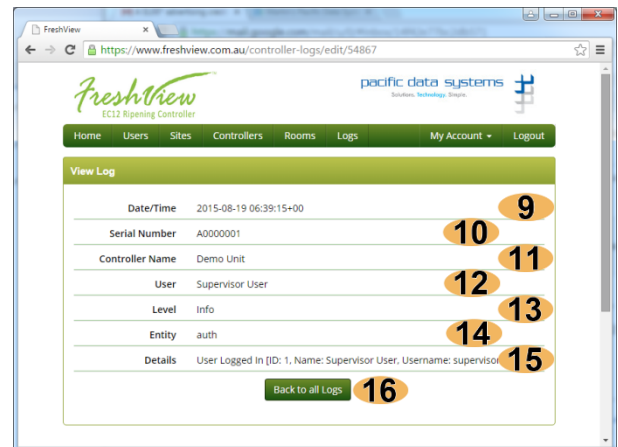
Figure 76: View log message web page.

1 **Search Start Date:** List logs after this date/time.

2 **Search End Date:** List logs before this date/time.

3 **Search Controller:** List logs for this controller.

4 **Search User:** List logs generated by this user.

5 **Submit Search:** Submit your search and list the results.

6 **Logs List:** Logs matching your search, or logs messages in the past 24 hours if no search has been submitted.

7 **Page List:** Used to navigate through the pages of log messages.

8 **View Log Message:** View an individual log message, see *Figure 76: View log message web page.*

9 **Date/Time:** The date and time the log message was logged.

10 **Serial Number:** The serial number of the controller the log message is from.

11 **Controller Name:** The name of the controller the log message is from.

12 **User:** The user who generated the log message.

13 **Level:** The log message level, either *Info* or *Warning*.

14 **Entity:** The subsystem that generated the log message.

15 **Details:** The actual log message.

16 **Back to all Logs:** Returns you to the log message list page.

Chapter

5

5   Maintenance and Care

5.1   General Maintenance

As a part of general maintenance, periodically check the following:

Weekly

- The Ripening Gas ppm value does not exceed the setpoint value.
- When the door opens check the Ripening Gas ppm value for that room decreases.
- When the door shuts, check the value stops at the known level.

Annually

- With Ripening Gas control disabled, and the door open, the Ripening Gas ppm value decreases and comes to read zero.
- Test the operation of the alarm: Hold a cloth dampened with a little methylated spirits near the Ripening Gas transmitter. The alarm will activate within a few seconds and last for 10-20 seconds after the cloth is removed. Check that the alarm can be clearly heard at the door entrance and is not muffled by machinery noise.
- Check all gas lines and replace if damaged.

5.2   Precautions and Interference

While every effort has been made to make the *FreshView EC12 Ripening Controller* as robust as possible, it does contain sensitive electronic circuitry which can be damaged by lack of appropriate care and attention. Excessive exposure to fumes from strong chlorine cleaning solutions has been found to cause accelerated corrosion in transmitter components.

5.3 Do's and Don'ts

Do's

To ensure the safe and reliable operation of the *FreshView EC12 Ripening Controller*, do:

- Protect from extremes of temperature.
- Protect from direct sunlight.
- Protect from exposed electrical wires.
- Protect from excess water and dust.
- Treat equipment with care.
- Use fingers or stylus on the touch-screen.
- Clean with damp cloth only.
- Keep connector dust-caps in place when not in use.
- Take care when cleaning the equipment.
- Use clean un-interrupted mains power as a supply to the system.
- Follow the correct procedures when installing or moving equipment.
- Take care when wiring any connectors.
- When making any modifications to the bus turn off the circuit breakers in the Controller, disconnect the AC power from the Controller, all DIOMs and power boosters. Check there is no voltage on any of the bus wires.

Don'ts

To ensure the safe and reliable operation of the *FreshView EC12 Ripening Controller*, don't:

- Mount or install the instrument in extremes of temperature.
- Mount or install the instrument in direct sunlight.
- Mount or install the instrument near exposed electrical wires.
- Hose directly with water or submerge.
- Allow prolonged moisture to condense on enclosure.
- Subject the controller to excessive shock.
- Use excessive force on touch-screen.
- Use sharp or hard instruments on the touch-screen in place of a stylus.
- Make sharp bends in any of the associated cabling.
- Cut any powered cables. This may damage the controller or lead to injury.
- Pull on the cabling to remove from the sockets.
- Put downward pressure on the cable.
- Clean the case with chemical or abrasive products.
- Allow the USB port to become blocked. Always keep dust-cap in place when not in use.
- Connect unapproved transmitters to the transmitter input sockets.
- Connect high-drain equipment directly to the relay outputs. They are rated for a maximum of 1A at 24VDC
- Connect non 12 or 24 VDC equipment directly to the relay outputs.
- Connect inputs greater than 12VDC to the digital input pins.
- Open the instrument or attempt any repairs; doing so will void warranty/service agreements.

5.4 Risks

During rigorous testing, results have shown that the machines have worked safe and trouble-free continuously and completely unattended and appear being able to continue indefinitely. The system has been designed with all the inbuilt safety checks and gas-line filters, to be as safe as possible in a ripening room system. However, as a precaution, supervisors and regular workers should be aware of the conceivable danger from delivering gas in an enclosed space.

With a direct gas connection to any enclosed space, the risk can never be said to be eliminated. All ripening gases can cause suffocation in sufficiently high concentrations.

When the room is being opened daily the chance of a gas build-up from a faulty system is extremely low, as the small diameter gas line and the low pressure prevent any rapid flow of gas (for this reason these components should never be changed by unauthorised personnel). A higher risk would come when the room has been sealed for an extended period of time, which can conceivably result in a build-up of gas from the small gas lines.

Additionally, any stored fruit in any enclosed space can deplete the oxygen to such an extent that a potential danger of suffocation exists. Room operators need to be aware of the risk. Never enter a room full of fruit that has been sealed. If necessary to do so, the room must be well ventilated by opening the doors widely for 30 minutes prior to entry.

It is the manufacturer's recommendation of establishing a code of safe practice when using the *FreshView EC12 Ripening Controller*.

If any malfunction occurs with the electronics internally or externally including lightning strike, fire, flood, mechanical damage by pests or insects, power outs, brown outs, the Gas Delivery Module would no longer hold the gas solenoids open and the gas would be automatically shut off to prevent any human injury risk.

Caution Keep door open when not in use. Always keep the door open when entering the room. There is a possible risk of undetectable suffocating atmosphere. If door is closed, check the gas delivery system is not in alarm. If in doubt, wait 30 minutes from door opening before entering, with caution. With a direct gas connection, the risk of mishap can never be reduced entirely. If the room is required for other purposes the gas delivery line should be disconnected.

6   Wiring

6.1   Communications Bus

The communications bus uses RS485 Modbus RTU for communications between each unit. The communication bus is the same on every unit and the cable wires are colour coordinated with the terminal blocks inside each unit. Alternatively, a M12 connector can be used for communication.

Figure 77: M12 Connector.
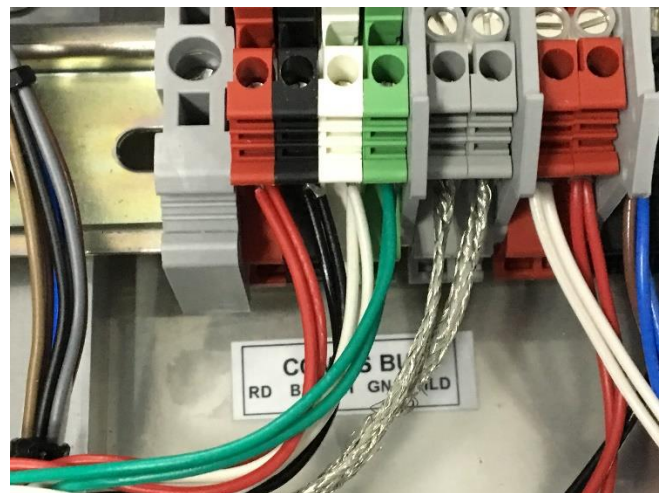

Figure 78: Communication bus wiring.
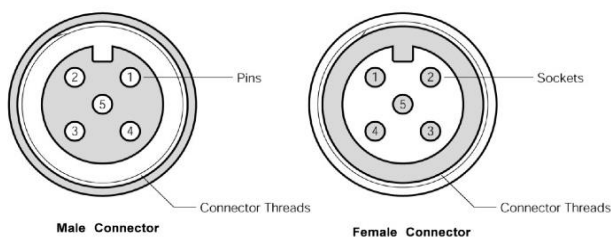
M12	Description	Colour
Pin 1	Shield	Braid
Pin 2	24V dc	Red
Pin 3	0V dc	Black
Pin 4	RS485 A -	White
Pin 5	RS485 B +	Green

Chapter

7

7 Specifications

7.1 FreshView EC12 Ripening Controller

Size:	H770mm x W390mm x D220mm
IP Rating:	IP65
Screen Size:	12" Touchscreen
Max Rooms:	12
Max Parameters:	24
Network:	4G Modem or Ethernet
USB:	1 x USB socket
Battery:	12V 12Ah
Power Input:	AC 110/240V 50/60Hz. 680W
Power Output:	24Vdc. 2.5A (On communications bus)

7.2 Transmitter Interface Module (TXINT)

Size:	H250mm x W152mm x D97mm
IP Rating:	IP54
Analogue Inputs:	3 x 4-20mA Inputs
RTD Inputs:	1 x 3WRTD Inputs
Temperature Input:	Refer 7.7
Relative Humidity:	Refer 7.8
Power Input:	24Vdc. 2.6W (Supplied via communications bus)

7.3 Digital Input/Output Module (DIOM)

Size:	H380mm x W380mm x D210mm
IP Rating:	IP23
Digital Inputs:	2 x 5-12V Inputs
Relay Outputs:	4 x 24V 1A Relay Outputs
Power Input:	110/240V AC 50/60Hz. 500W
Power Output:	24Vdc. 2.A (On communications bus)

7.4 Gas Delivery Module (GDM)

Size:	H300mm x W200mm x D155mm
IP Rating:	IP23
GDM Input:	1 x GDM Input
Gas Solenoids:	4
Gas Input:	1 x Gas Input. 4mm OD
Gas Outputs:	4 x Individually controlled gas outputs. 4mm OD
Power Input:	24Vdc. 3.6W
Max Pressure	100 psi

7.5 Ethylene Transmitter (RG)

Size:	H200mm x W82mm x D62mm
IP Rating:	IP54
Measuring range:	0 to 10 / 0 to 200 / 0 to 1500 ppm (C2H4)
Sensor technology:	Electro Chemical
Sensitivity:	0.1 / 1 / 5 ppm (C2H4)
Power Input:	11 to 30 VDC. 2W
Warm up:	1 minute
Signal Output:	*Analogue:* 4 to 20 mA

7.6 Carbon Dioxide Transmitter (CO2)

Size:	H200mm x W82mm x D62mm
IP Rating:	IP54
Measuring range:	0 to 20 %CO_2
Sensor technology:	NDIR
Accuracy:	+/- 0.5 %CO_2
Sensitivity:	0.05 % CO_2
Long-term Stability:	Within 5% of range over 5 years
Warm-up time:	<30 minutes to reach specifications
Power Input:	10 to 30 VDC
Signal Output:	*Analogue:* 4 to 20 mA

7.7 Air Temperature Transmitter (TEMP)

Size:	H250mm x W152mm x D97mm (Incorporated in the TXINT)
IP Rating:	IP54
Measuring Range:	-40 to +60 degrees C
Sensor Technology:	Electronic Circuit
Accuracy:	+/- 0.5 degrees C
Long-term Stability:	+/- 0.1 degrees C
Power Input:	12 to 30 VDC
Signal Output:	*Analogue:* 4 to 20 mA

7.8 Relative Humidity Transmitter (HUM)

Size: H250mm x W152mm x D97mm (Incorporated in the TXINT)
IP Rating: IP54
Measuring Range: 0 to 100 %RH
Sensor Technology: Electronic Circuit
Accuracy: +/- 2 %RH
Long-term Stability: +/- 2 %RH over two years
Power Input: 12 to 30 VDC
Signal Output: *Analogue:* 4 to 20 mA

7.9 Pulp Temperature Transmitter (PULP)

Enclosure Size: 200mm x 82mm x 62mm
Enclosure IP Rating: IP65
Probe Size: 220mm x 22mm x 22mm
Probe IP Rating: IP65
Measuring Range: -40 to +60 degrees C
Sensor Technology: Pt100 platinum RTD
Accuracy: +/- 0.2 degrees C
Long-term Stability: 0.2 degrees C over two years
Signal Output: 3WRTD
Probe Cable Length: 10 metres (as standard; other lengths available to order)
Probe Construction: 316 stainless-steel body, 4 mm (OD), 150 mm (L), with tapered chisel-end tip

7.10 Oxygen Transmitter (O2)

Size: H200mm x W82mm x D62mm
Probe IP Rating: IP54
Measuring Range: 0 to 25 %O_2
Sensor Technology: Zirconium oxide
Accuracy: +/- 2%O_2
Long-term Stability: +/- 0.5 %O_2 full scale over one year
Power Input: 10 to 28 Vdc. 17W Power on peak. 6W typ.
Warm up: 3 minutes
Signal Output: *Analogue:* 4 to 20 mA

Chapter

8

8   Fault Diagnostics and Service

For all fault diagnostics and servicing of your *FreshView EC12 Ripening Controller*, please contact Pacific Data Systems Australia or your local distributer.

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