<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Warranty</td>
<td>4</td>
</tr>
<tr>
<td>2.</td>
<td>Warnings</td>
<td>5</td>
</tr>
<tr>
<td>3.</td>
<td>Ratings and Specifications</td>
<td>6</td>
</tr>
<tr>
<td>4.</td>
<td>Introduction</td>
<td>7</td>
</tr>
<tr>
<td>5.</td>
<td>Evolution Front Panel</td>
<td>8</td>
</tr>
<tr>
<td>5.1</td>
<td>Navigator Panel</td>
<td>9</td>
</tr>
<tr>
<td>5.1.1</td>
<td>Select System View</td>
<td>9</td>
</tr>
<tr>
<td>5.2</td>
<td>Editor Panel</td>
<td>10</td>
</tr>
<tr>
<td>5.2.1</td>
<td>Main Display Contrast</td>
<td>10</td>
</tr>
<tr>
<td>5.2.2</td>
<td>Page UP/DOWN</td>
<td>11</td>
</tr>
<tr>
<td>5.2.3</td>
<td>Language</td>
<td>11</td>
</tr>
<tr>
<td>5.3</td>
<td>Stage Switch</td>
<td>12</td>
</tr>
<tr>
<td>5.3.1</td>
<td>Inlet Stages</td>
<td>12</td>
</tr>
<tr>
<td>5.4</td>
<td>Status Display</td>
<td>13</td>
</tr>
<tr>
<td>5.5</td>
<td>Locks</td>
<td>13</td>
</tr>
<tr>
<td>6.</td>
<td>Viewing Navigator Status Screens</td>
<td>13</td>
</tr>
<tr>
<td>6.1</td>
<td>Current Conditions – MAIN SYSTEM</td>
<td>14</td>
</tr>
<tr>
<td>6.2</td>
<td>Target Conditions – MAIN SYSTEM</td>
<td>15</td>
</tr>
<tr>
<td>6.2.1</td>
<td>Target Conditions - Standard Screen With Optimum Mode OFF</td>
<td>15</td>
</tr>
<tr>
<td>6.2.2</td>
<td>Target Conditions – Optimum Screen With Optimum Mode ON</td>
<td>16</td>
</tr>
<tr>
<td>6.3</td>
<td>Timers &amp; Clocks – MAIN SYSTEM</td>
<td>17</td>
</tr>
<tr>
<td>6.4</td>
<td>Stage Conditions – MAIN SYSTEM</td>
<td>18</td>
</tr>
<tr>
<td>6.4.1</td>
<td>Inlet Conditions</td>
<td>20</td>
</tr>
<tr>
<td>6.4.2</td>
<td>On/Off Stages</td>
<td>21</td>
</tr>
<tr>
<td>6.4.3</td>
<td>Natural Ventilation Stages</td>
<td>22</td>
</tr>
<tr>
<td>6.4.4</td>
<td>Variable Stages</td>
<td>22</td>
</tr>
<tr>
<td>6.5</td>
<td>Historical Data – MAIN SYSTEM</td>
<td>23</td>
</tr>
<tr>
<td>6.5.1</td>
<td>Alarm Log</td>
<td>23</td>
</tr>
<tr>
<td>6.5.2</td>
<td>Room Temperature</td>
<td>23</td>
</tr>
<tr>
<td>6.5.3</td>
<td>Stage Run Times</td>
<td>24</td>
</tr>
<tr>
<td>6.5.4</td>
<td>Humidity #1 (Room) &amp; Humidity #2 (Cooler)</td>
<td>24</td>
</tr>
<tr>
<td>6.5.5</td>
<td>Water Usage (#1 or #2)</td>
<td>24</td>
</tr>
<tr>
<td>6.5.6</td>
<td>Ventilation Mode</td>
<td>24</td>
</tr>
<tr>
<td>6.6</td>
<td>Alarm Status – MAIN SYSTEM</td>
<td>25</td>
</tr>
<tr>
<td>6.6.1</td>
<td>High Temperature Alarm Details</td>
<td>26</td>
</tr>
<tr>
<td>6.6.2</td>
<td>Low Temperature Alarm Details</td>
<td>27</td>
</tr>
<tr>
<td>6.6.3</td>
<td>Tunnel Vent Alarm Details</td>
<td>27</td>
</tr>
<tr>
<td>6.7</td>
<td>Program Set-Up</td>
<td>28</td>
</tr>
<tr>
<td>6.8</td>
<td>Current Conditions – AUXILIARY SYSTEM</td>
<td>29</td>
</tr>
<tr>
<td>6.9</td>
<td>Historical Data – AUXILIARY SYSTEM</td>
<td>29</td>
</tr>
<tr>
<td>6.10</td>
<td>Alarm Status – AUXILIARY SYSTEM</td>
<td>30</td>
</tr>
<tr>
<td>6.11</td>
<td>Current Conditions – BACK-UP SYSTEM</td>
<td>30</td>
</tr>
<tr>
<td>7.</td>
<td>Setting Programming Functions</td>
<td>31</td>
</tr>
<tr>
<td>7.1</td>
<td>General Settings</td>
<td>31</td>
</tr>
<tr>
<td>7.2</td>
<td>Network Status</td>
<td>32</td>
</tr>
<tr>
<td>7.3</td>
<td>Temperature Sensors</td>
<td>32</td>
</tr>
<tr>
<td>7.4</td>
<td>Feed Level Sensors</td>
<td>32</td>
</tr>
<tr>
<td>7.5</td>
<td>Ventilation Inlets</td>
<td>33</td>
</tr>
<tr>
<td>7.6</td>
<td>Natural Ventilation</td>
<td>34</td>
</tr>
<tr>
<td>7.7</td>
<td>Growout Curve</td>
<td>35</td>
</tr>
<tr>
<td>7.7.1</td>
<td>Growout Curve With Optimum Mode OFF</td>
<td>35</td>
</tr>
<tr>
<td>7.7.2</td>
<td>Growout Curve With Optimum Mode ON</td>
<td>36</td>
</tr>
<tr>
<td>7.8</td>
<td>Tunnel Ventilation</td>
<td>39</td>
</tr>
<tr>
<td>7.9</td>
<td>ON/OFF Stages</td>
<td>39</td>
</tr>
</tbody>
</table>
7.9.1  On/Off Stage Details ................................................................. 40
7.10  Variable Stage Outputs ............................................................... 41
7.11  Stage Properties ........................................................................ 42
   7.11.1  Heat Properties ................................................................. 42
   7.11.2  Cool Stir Properties ........................................................... 42
   7.11.3  Cool Negative Properties .................................................. 42
   7.11.4  Cool Negative Tunnel Properties ....................................... 43
   7.11.5  Cool Tunnel Properties ..................................................... 43
   7.11.6  Cool Evaporative Properties .............................................. 44
   7.11.7  Natural Ventilation Properties .......................................... 44
7.12  Setup Feed Clocks ................................................................. 45
   7.12.1  Feed Clock Schedules ....................................................... 45
7.13  Setup Light Clocks ................................................................. 46
   7.13.1  Light Clock Details ........................................................... 46
7.14  Seasonal Programs & Security .................................................. 46
7.15  Diagnostics ............................................................................. 47
7.16  SD Card Operations ................................................................. 49
   7.16.1  Save/Load Programs ......................................................... 49
   7.16.2  Update Controller Software Version ................................... 51
8.  ALWAYS Back-Up Setting ............................................................ 53
9.  Wiring Diagrams ......................................................................... 54
   9.1  Inside the Evolution 4000 Enclosure ...................................... 54
   9.2  Voltage Selection Internal Wiring for the EV4000 Controller ... 55
   9.3  Setting Address Switches & LEDs on PCB 191 Stage Board ... 56
   9.4  Connecting Temperature Sensor to Evolution 4000 ............... 57
   9.5  Connecting Static Pressure Sensor to Evolution 4000 .......... 58
   9.6  Connecting Humidity Sensor to Evolution 4000 ................. 59
   9.7  Connecting HHnet PC Network to Evolution 4000 ............... 60
   9.8  Connecting Alarm Device to Evolution 4000 ....................... 60
   9.9  Connecting Water Meter to Evolution 4000 ....................... 61
   9.10  Connecting Stage Jumpers of Evolution 4000 .................... 62
   9.11  Applying Inlet Stage Labels to the Evolution 4000 Cover Label 63
   9.12  Connecting the PowerTrak to the Evolution 4000 ................ 64
   9.13  Connecting the PowerTrak and S-3 Back-Up to the Evolution 4000 65
   9.14  Connecting the PowerTrak Power Auxiliary Switches to Evolution 4000 66
   9.15  Connecting PowerTrak Natural Auxiliary Switches NV#1 & NV#2 to Evolution 4000 67
   9.16  Connecting PowerTrak Natural Auxiliary Switches NV#3 & NV#4 to Evolution 4000 68
   9.17  Evolution 4000 Power Connection .................................... 69
   9.18  Connecting Local Network & Backup to the Evolution 4000 .. 70
10. Temperature vs. Sensor Resistance Table .................................... 71
11. Label Quick-Reference Information ............................................ 72
12. Parts List .................................................................................. 73
Notes ......................................................................................... 79

Poultry House Layout and Specification ........................................ 80
1.  House Specification ................................................................. 80
2.  Stage Programming ................................................................ 81
3.  Temperature Curve ............................................................... 81
4.  Static Pressure Settings .......................................................... 82
5.  Minimum Vent ....................................................................... 82
6.  Tunnel Settings ...................................................................... 82
7.  Lighting Program ................................................................. 83
8.  Feed Program ........................................................................ 83
9.  Back-up Specifications ........................................................... 84
10. Alarm Specifications ............................................................... 84
11. Notes .................................................................................. 85
1. Warranty

The GSI Group, LLC. ("GSI") warrants products which it manufactures to be free of defects in materials and workmanship under normal usage and conditions for a period of 12 months after sale to the original end-user or if a foreign sale, 14 months from arrival at port of discharge, whichever is earlier. The end-user's sole remedy (and GSI's only obligation) is to repair or replace, at GSI's option and expense, products that in GSI's judgment, contain a material defect in materials or workmanship. Expenses incurred by or on behalf of the end-user without prior written authorization from the GSI Warranty Group shall be the sole responsibility of the end-user.

Warranty Extensions: The Limited Warranty period is extended for the following products:

<table>
<thead>
<tr>
<th>Product</th>
<th>Warranty Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP Fans and Flooring</td>
<td></td>
</tr>
<tr>
<td>Performer Series Direct Drive Fan Motor</td>
<td>3 Years</td>
</tr>
<tr>
<td>All Fiberglass Housings</td>
<td>Lifetime</td>
</tr>
<tr>
<td>All Fiberglass Propellers</td>
<td>Lifetime</td>
</tr>
<tr>
<td>Cumberland Feeding/Watering Systems</td>
<td></td>
</tr>
<tr>
<td>Feeder System Pan Assemblies</td>
<td>5 Years **</td>
</tr>
<tr>
<td>Feed Tubes (1.75&quot; &amp; 2.00&quot;)</td>
<td>10 Years *</td>
</tr>
<tr>
<td>Centerless Augers</td>
<td>10 Years *</td>
</tr>
<tr>
<td>Watering Nipples</td>
<td>10 Years *</td>
</tr>
<tr>
<td>Grain Systems</td>
<td></td>
</tr>
<tr>
<td>Grain Bin Structural Design</td>
<td>5 Years</td>
</tr>
<tr>
<td>Grain Systems Farm Fans Zimmerman</td>
<td></td>
</tr>
<tr>
<td>Portable &amp; Tower Dryers</td>
<td>2 Years</td>
</tr>
<tr>
<td>Portable &amp; Tower Dryer Frames and Internal Infrastructure †</td>
<td>5 Years</td>
</tr>
</tbody>
</table>

GSI further warrants that the frame, basket and excluding all auger and auger drive components of the portable and tower dryer shall be free from defects in materials for a period of time beginning on the twelfth (12th) month from the date of purchase and continuing until the sixtieth (60th) month from the date of purchase (extended warranty period). During the extended warranty period, GSI will replace the frame or basket components that prove to be defective under normal conditions of use without charge, excluding the labor, transportation, and/or shipping costs incurred in the performance of this extended warranty.

Conditions and Limitations:

THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE LIMITED WARRANTY DESCRIPTION SET FORTH ABOVE. SPECIFICALLY, GSI MAKES NO FURTHER WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE IN CONNECTION WITH: (i) PRODUCT MANUFACTURED OR SOLD BY GSI OR (ii) ANY ADVICE, INSTRUCTION, RECOMMENDATION OR SUGGESTION PROVIDED BY AN AGENT, REPRESENTATIVE OR EMPLOYEE OF GSI REGARDING OR RELATED TO THE CONFIGURATION, INSTALLATION, LAYOUT, SUITABILITY FOR A PARTICULAR PURPOSE, OR DESIGN OF SUCH PRODUCTS.

GSI shall not be liable for any direct, indirect, incidental or consequential damages, including, without limitation, loss of anticipated profits or benefits. The sole and exclusive remedy is set forth in the Limited Warranty, which shall not exceed the amount paid for the product purchased. This warranty is not transferable and applies only to the original end-user. GSI shall have no obligation or responsibility for any representations or warranties made by or on behalf of any dealer, agent or distributor.

GSI assumes no responsibility for claims resulting from construction defects or unauthorized modifications to products which it manufactured. Modifications to products not specifically delineated in the manual accompanying the equipment at initial sale will void the Limited Warranty.

This Limited Warranty shall not extend to products or parts which have been damaged by negligent use, misuse, alteration, accident or which have been improperly/inadequately maintained. This Limited Warranty extends solely to products manufactured by GSI.

Prior to installation, the end-user has the responsibility to comply with federal, state and local codes which apply to the location and installation of products manufactured or sold by GSI.
2. Warnings

**Warning!**

Maximum operating temperature of controller is 50° C (122° F). Use adequate ventilation to reduce the risk of overheating of controller!

**Warning!**

When this controller is used in a life support heating and ventilation system where failure could result in loss or injury, the user should provide adequate back-up, or accept the risk of such loss or injury!
3. Ratings and Specifications

<table>
<thead>
<tr>
<th>HHI Part Number</th>
<th>Model</th>
<th>Power Supply</th>
<th>Stage Output</th>
<th>ROOM TEMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>6607-8220</td>
<td>EV-4000 40 Stage Controller</td>
<td>120/230 VAC 50/60 Hz</td>
<td>1-1/2 HP @ 240 VAC</td>
<td>Minimum 32°F/0°C; Maximum 122°F/50°C</td>
</tr>
</tbody>
</table>

NOTE: Room Temperature Must Be Kept Between 32°F/0°C and 122°F/50°C.
4. Introduction

The Evolution 4000 Controller is the newest member of Hired-Hand's environmental controller line. The Evolution 4000 Controller has the same operational features as the 3001 except the 4000 has the following NEW features/capabilities:

- Stage capability is now increased to 40 stages; Consolidated inside one control box. The Evolution 4000 Controller can be expanded up to 56 stages using an EV-16 Expansion Module (p/n: 6607-8016).
- NEW user-friendly and versatile wire connection interface included with the I/O Board and Stage Relay Boards.
- Software upgrades to the main PCB197 control board are downloaded from a standard SD Card. **Part number 3701-6085** may be ordered which includes one SD card preloaded with the latest version software for the PCB197 control board.
- Updated and improved software functionality.
- Status and Power indication LED’s allow trouble-shooting at-a-glance.
- New & Improved Control Panel User Interface allows display contrast adjustment, scroll through displayed information a page-at-a-time, or toggle between English and Spanish languages quickly and easily.
- Quickly navigate to the Main, Auxiliary, or Backup System Views at the push of a button.

Features:

### Input Device Options

| Inside temperature sensors | Outside temperature sensor |
| 8                         | 1                         |
| Humidity sensors          | Static pressure transducer |
| 2                         | 1                         |
| Digital water meter input | HHNet connection for PC compatibility |
| 2                         |                            |
| PowerTrak auxiliary switch inputs |     |
| 2 Feed Bin Level Sensors | 2 Auger Runtime Sensors |

### Output Devices (Standard)

| On/Off output stages with manual override switches | 0-10 Vdc Analog Outputs |
| 40                                             | (2)                      |

| Alarm relay with both N.O. and N.C. contacts |
| 1                                             |

### Output Devices: (Optional)

| Variable speed output drive |
| 16 On/Off output stages with manual override switches |

| Patented integrated Evolution Back-up & Evolution S³ |
|                                                    |
5. **Evolution Front Panel**

The Evolution 4000 Controller cover is divided into two main areas. The main control user interface is located on the top-half of the panel and contains the Main Display, Editor and Navigator user interface controls. The Stage Switches are located on the bottom-half of the front panel. The Navigator is used to select the information to be displayed in the Main Display. Once the desired information is selected in the Navigator, the Editor is used to scan and modify the data, adjust the display contrast, page-scroll through the displayed information screens, or toggle the displayed information between English and Spanish languages.

---

**EVOLUTION 4000 FRONT PANEL**
5.1 Navigator Panel

The Navigator buttons are used to select a controller function. Press up or down button to toggle between functions. LED (light emitting diode) lights when a function is selected and the associated data is displayed in the Main Display.

5.1.1 Select System View

The Select System View SELECT button is used to toggle between the Main, Auxiliary, or Back-Up controller system views. LED (light emitting diode) lights when a function is selected and the associated data is displayed in the Main Display. Scroll through seven of the MAIN System View Navigator sections by using the Select UP and DOWN arrows. The Auxiliary System is used to monitor a separate room which is typically an egg/cooler room in certain applications. The Auxiliary System View has three Navigator sections (Current Conditions, Historical Data, & Alarm Status). The Back-Up System View has the one Current Conditions Navigator section which is a quick link to show the back-up system status information concerning back-up operation (Targets, limits, alarm status and other information detailed in Section 6.11).
5.2 **Editor Panel**

The Editor buttons are used to select functions that appear in the Main Display screen. The arrow buttons are used to scroll to variables that appear within the current screen of the Main Display. The plus (+) and minus (-) buttons are used to change or modify a variable’s value. The Enter button is used to link to a new display screen of a selected variable. NOTE: To return to the main function screen, press either Up (▲) or Down (▼) Navigator button.

---

### 5.2.1 Main Display Contrast

The main display contrast can be adjusted to adapt to various lighting conditions. The Contrast Control is located in the front panel Editor section. Use the Contrast Control to darken or lighten the screen text. The contrast button will change the contrast in both directions. If you press & hold the contrast button, it will move in one direction. If you would like to reverse directions, release button for at least one second and then press again. It will now adjust in the opposite direction.
5.2.2 Page UP/DOWN

The Page UP/DOWN button can be used to quickly scroll through pages/screens of information at a time instead of scrolling one line at a time. The Page UP/DOWN button is located in the front panel Editor section. After displaying the last line of information, pressing the Page UP/DOWN button once more will jump back to the top line of information.

5.2.3 Language

The LANGUAGE button can be used to quickly toggle all display content from English to Spanish or from Spanish to English with only the press of one button. This feature is a time-saver, especially when various language personnel either monitors and/or changes settings on a daily basis. No system setup menu’s to sort through each time that Spanish or English language is preferred. The LANGUAGE button is located in the front panel Editor section.
5.3 **Stage Switch**

The stage LED indicator lights when a stage is active. The stage switch is used to select Auto operation, On, or Off. If switch is in Auto position, the stage operation is controlled by the controller. That is, the stage may turn on and off according to settings selected from the Main Display screen. If switch is in the On position, a stage is On continuously. If switch is in the Off position, a stage is Off with the exception of Back-Up conditions.

The white space is used to affix a label indicating stage function (i.e. brooder, fan, light, cool, etc.).

NOTE: Stages 1-40 are marked on the controller front panel. For optional Inlet Stages, use stick-on label to apply to two side-by-side stages.

5.3.1 **Inlet Stages**

Optional inlet stages may be added to control vents & curtains. When Auto/Manual toggle switch is placed in Auto position, inlet opens and closes according to programmed instructions. Use the Open/Close toggle switch to manually open or close inlet when Auto/Manual toggle switch is placed in Manual position. The Notation area is for labeling the inlet. Refer to Section 9.11 for additional Inlet Stages details.

Under normal circumstances the machines should be left in automatic (Auto) as shown above.

**IMPORTANT!**

Stages that are programmed to be open/close stages must follow two rules. First, they must be consecutive, and second, they must start on an odd stage. The open output will always be the odd stage and the close stage will always be the even stage.
5.4 **Status Display**

The following is an example of Main Display screen displaying a portion of the standard Alarm status screen. The Main Display screen displays both status and programming screens.

<table>
<thead>
<tr>
<th>TEMPERATURE LIMIT</th>
<th>STATUS</th>
<th>LAST ALARM</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) High Temp</td>
<td>85.0°</td>
<td>OK</td>
</tr>
<tr>
<td>(2) Low Temp</td>
<td>65.0°</td>
<td>OK</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PRESSURE LIMIT</th>
<th>STATUS</th>
<th>LAST ALARM</th>
</tr>
</thead>
<tbody>
<tr>
<td>(3) Cycle Press</td>
<td>0.04</td>
<td>Off</td>
</tr>
<tr>
<td>(4) High Press</td>
<td>0.15</td>
<td>Off</td>
</tr>
<tr>
<td>(5) Low Press</td>
<td>0.03</td>
<td>Off</td>
</tr>
</tbody>
</table>

The Scroll Symbol is a flashing down arrow (▲) that indicates more text outside of display screen. Use up/down editor arrow keys to scroll text or use the Page Button.

The Link Symbol (→) is a right pointing arrow and indicates a link to another display screen.

5.5 **Locks**

A lock feature has been included for additional security to the Evolution 4000 settings. This feature locks the Program Setup screens to prevent changes. Locked screens are noted by a lock symbol (🔒) in the upper right of the screen. The Target Conditions and Minimum Vent screens are not lockable. When the lock feature is disabled (🔓), all screens will show unlocked until the password is changed. See Section 7.14.

NOTE: The Diagnostics screen can only be unlocked using the HHI Service Code; Contact your local dealer for assistance.

6. **Viewing Navigator Status Screens**

The following seven screens are available: Current Conditions, Target Conditions, Timers & Clocks, Stage Conditions, Historical Data, Alarm Status, Program Setup. The Navigator selects the desired status screen by pressing the up and down SELECT arrows. The first screens display status information and various setup options. The last screen is the Program Screen. To change program parameters the Program Setup Screen must be selected.
6.1 *Current Conditions – MAIN SYSTEM*

The current environmental conditions of the building are shown here. Below is a table describing the variables that can appear in the Current Conditions status screen.

The numbers in brackets e.g. (1) refer to the descriptions below the sample screen displays.

(1) Growout Day – The current day in the growout period. The Current Conditions LED on the Navigator panel will blink if the growout day is later than the current date.

(2) Vent Mode – Indicates the current ventilation mode: either Minimum, Natural, Power, Transition or Tunnel.

(3) Room Temp – The average temperature of the sensors for display. **Target**—Target Temperature.

(4) Pressure – The current atmospheric pressure internal to the building. **Target**—Target Pressure.

(5) Humidity – The percent of water vapor of the air inside the building.

(6) Outside (Temperature) – The outside temperature as indicated by the outside sensor.

(7) Enclosure (Temperature) – The temperature inside the controller.

<table>
<thead>
<tr>
<th>Sensor 1</th>
<th>Sensor 2</th>
<th>Sensor 3</th>
<th>Sensor 4</th>
<th>Sensor 5</th>
<th>Sensor 6</th>
<th>Sensor 7</th>
<th>Sensor 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>71.6°</td>
<td>71.2°</td>
<td>71.4°</td>
<td>---.-°</td>
<td>---.-°</td>
<td>---.-°</td>
<td>---.-°</td>
<td>---.-°</td>
</tr>
</tbody>
</table>

**NOTE:** In this manual, Reference numbers refer to descriptions given in text. These numbers do not appear on display.

<table>
<thead>
<tr>
<th>VENT MODE</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>Heat stages or timer fans operating. None of the negative stages are on because of temperature.</td>
</tr>
<tr>
<td>Natural</td>
<td>The main curtains are open.</td>
</tr>
<tr>
<td>Power</td>
<td>The curtains are up and there are negative fans on because of temperature.</td>
</tr>
<tr>
<td>Transition</td>
<td>The control is transitioning into tunnel ventilation from either power or natural ventilation. The control is making the adjustments needed to go into tunnel.</td>
</tr>
<tr>
<td>Tunnel</td>
<td>The tunnel signal has been activated and the system has entered into tunnel.</td>
</tr>
</tbody>
</table>

(8) Water Consumption – Water consumed for the current day; The total for the day is listed first then the units per hour is shown inside ( ). Two water meters may be monitored (Water Meter 1 & Meter 2).

(9) Feed Level – The Feed level is shown in number of feet from the bottom first then the percentage of feed remaining in the feed bin is shown inside ( ). Two feed bins may be monitored (Bin #1 & Bin #2).

(10) Sensor 1 through 8 – The current temperature read by each sensor.
6.2 **Target Conditions – MAIN SYSTEM**

The current target environmental conditions of the building are shown below. The specific Target Conditions screen features and setting options will depend on whether Optimum Mode is ON or OFF. Examples and details for both the Standard screen and Optimum screen are shown in the following two subsections.

6.2.1 Target Conditions - Standard Screen With Optimum Mode OFF

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Target Temp</td>
<td></td>
<td></td>
<td>(2) Ramping: On</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Ramping: On</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Target Press</td>
<td>0.04 wc</td>
<td>(4) Ramping: Off</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Ramping: Off</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Tunnel Press</td>
<td>0.00 wc</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Tunnel Press</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Target Humidity</td>
<td>&lt; 60%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(1) **Target Temp** - This is the desired temperature of the building.

(2) **Ramping** – Indicates if ramping of the Target Temperature is turned On or Off. You are also allowed to turn the temperature ramping on or off in the program set up screen. You use the Navigator to reach the Program Setup screen and then navigate down to “Temperature Ramp” and press enter. See Section 7.7.

(3) **Target Press** - This is the desired negative pressure in the building. See Section 7.5.

(4) **Ramping** – Indicates if ramping for the Target Pressure is turned on: On or Off. You are also allowed to turn the pressure ramping on or off in the program setup screen. See Section 7.5.

(5) **Tunnel Pressure** – Indicates the desired negative pressure in the building while in the Tunnel Mode. See Section 7.5.

(6) **Target Humidity** – The desired humidity inside the building (Humidity Sensor # 1) is less than this set number. For every percentage increase in humidity over the set %, the timer percentage will increase.

**EXAMPLE:**

Target Humidity < 65%

Timer Percentage is set to 20% of 5 minutes.

If Humidity in building is at 70%, the timer percentage will be at 25%.

**NOTE:** This only affects the variable timer %. Min1% and Min2% are unaffected.
6.2.2 Target Conditions – Optimum Screen With Optimum Mode ON

The target conditions screen shown below represents the display and options when the Optimum Mode is turned On. Refer to Section 7.1 for turning the Optimum Mode On or Off and Section 7.7.2 for the Optimum Mode Growout Curve.

Optimum Settings

<table>
<thead>
<tr>
<th>(1) Target Temp: 77.5°</th>
<th>(2) Adjust = +0.0°</th>
</tr>
</thead>
<tbody>
<tr>
<td>(3) Optimum Run%: 10%</td>
<td>(4) Adjust = +00%</td>
</tr>
<tr>
<td>(5) Target Press: 0.04 wc</td>
<td>(6) Tunnel = 0.00 wc</td>
</tr>
<tr>
<td>(7) Humidity &lt; 60%</td>
<td></td>
</tr>
</tbody>
</table>

(8) Growout Curve Settings
(9) Current Optimum Base %: 10%
(10) Optimum Timer Active: --6-4---
(11) Maximum Tunnel Fans Allowed: 4
(12) Tunnel Stage Adjustment: + 0.0°
(13) Heat Stage Adjustment: - 0.0°

(1) **Target Temp** – Displays the desired temperature of the building for the current growout day.

(2) **Adjust** – Adjusts the programmed Target Temperature by this amount until set otherwise. The displayed Target Temp to the left will increase or decrease as this number is adjusted.

(3) **Optimum Run%** – Displays the minimum vent run % for the current growout day. The Run % is the percentage of the Minimum Timer Cycle that the stage will run.

(4) **Adjust** – Adjusts the programmed Optimum Run% by this amount until set otherwise. The displayed Optimum Run% to the left will increase or decrease as this number is adjusted.

(5) **Target Press** - This is the desired negative pressure in the building. See Section 7.5.

(6) **Tunnel Pressure** – Indicates the desired negative pressure in the building while in the Tunnel Mode. See Section 7.5.

(7) **Humidity** – The desired target humidity inside the building (Humidity Sensor # 1) is less than this set number. For every percentage increase in humidity over the set %, the timer percentage will increase.

**EXAMPLE:**

Target Humidity < 65%

Timer Percentage is set to 20% of 5 minutes.

If Humidity in building is at 70%, the timer percentage will be at 25%.

**NOTE:** This only affects the variable timer % and Optimum Run %. Min1% and Min2% are unaffected.

(8) **Growout Curve Setting** – Links to the Optimum Growout Curve Setting screen. Refer to Section 7.7.2.

(9) **Current Optimum Base %** – The current optimum base run percentage based on the growout curve.

(10) **Optimum Timer Active** – Displays the current optimum timer active determined by the growout curve.

(11) **Maximum Tunnel Fans Allowed** – Displays the current maximum number of tunnel fans allowed as determined by the growout curve.

(12) **Tunnel Stage Adjustments** – Displays the current calculated tunnel stage adjustments as determined by the growout curve.

(13) **Heat Stage Adjustments** – Displays the current calculated heat stage adjustments as determined by the growout curve.
6.3 **Timers & Clocks – MAIN SYSTEM**

The Minimum Vent status screen display:

(1) **Light Schedule** – Displays the current Light Clock Schedule. See Section 7.13.

(2) **Feed Schedule** – Displays the current Feed Clock Schedule. See Section 7.12.

(3) **Minimum Timers**:
   - **Cycle**: 5 m (300s)
   - **Min1%**: 40% (215s)
   - **Min2%**: 20% (108s)
   - **Var%**: 20% (108s)

(4) **Variable Speed**:
   - **V1 Min%**: 50% (55s)
   - **V2 Min%**: 40% (100s)

(5) **Variable Timer**:
   - **Sensors = Outside-**
   - **Max Run %**: 65%
   - **Min Run %**: 20%
   - **Variable Timer** will vary the timer based on temperature. See chart shown below.
   - **Max Temp**: 85.0°
   - **Min Temp**: 70.0°

(6) **Cool Timer**:
   - **Max Run %**: 100%
   - **Cycle**: 10 m (600s)
   - **Min Run %**: 55%

**NOTE:** The Minimum timer one and two both share the same cycle time. Different timer percentages may be set for minimum 1 vs. minimum 2. If the vent anticipation is being used, the vents will start opening before a negative ventilation stage turns on and will adjust until the vent opening necessary for the desired target pressure is achieved.

(7) **Cycle** - The length of Timer 1 cycle. Cycle = 1 to 20 minutes.

(8) **Min1%** - The percentage of the Timer 1 cycle that the stage will run.

(9) **Min2%** - The percentage of the Timer 2 cycle that the stage will run.

(10) **V2 Minimum** - The minimum speed or minimum percentage of light intensity for V2; The value inside the parenthesis shows the current percentage.

(11) **Variable Timer** - The variable timer will vary the timer based on temperature. See chart shown below.

(12) **Sensors** - The sensors used to determine the run time. Active sensors will be indicated by a number starting with #1 from right to left. Inactive sensors will be indicated by a - or hyphen. When "outside-" is displayed, outside sensor is active. For example, If sensors 1, 2 and 3 are being used, "-----321" will be displayed. When "outside" is displayed, the outside sensor is active.

(13) **Max Run %** - The maximum Run Time percentage.

(14) **Max Temp** - The temperature at which the timer will run Maximum Run time % percentage.

(15) **Min Run %** - The minimum Run Time percentage.

(16) **Min Temp** - The minimum temperature. The timer will be at minimum Run %.
(17) **Cool Timer**: Cool timer is also allowed a different timer cycle if needed. This can be used for foggers or cool cell systems.

(18) **Max Run** - The Cool Timer Maximum Run Time percentage.

(19) **Cycle** - Cycle Time in Minutes. Cool timer is also allowed a different timer cycle if needed. This will be used for foggers or cool cell systems.

(20) **Min Run** - The Cool Timer Minimum Run Time percentage.

### 6.4 Stage Conditions – MAIN SYSTEM

When the Stage Conditions screen is selected by using the Navigator Select arrows, the following menu screen is shown. Use the up and down arrows in the Editor to view the desired information. The listing order from top to bottom is Inlet Stages, Feed, Light, or Aux Ventilation Stages. Notice that the Light Clock and Feed Clock Stages are listed after the Inlet Conditions section. The Heat Stages are then displayed in order of increasing ON Temperatures. The Cool stages, including the Variable Output stages, are listed below the Target Line in order of increasing ON Temperatures.
**STAGE CONDITIONS SCREEN EXAMPLE:**

<table>
<thead>
<tr>
<th>#</th>
<th>STATUS</th>
<th>MODE</th>
<th>RTEMP</th>
<th>ON</th>
<th>OFF</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>On</td>
<td>Attic</td>
<td>Open</td>
<td>&lt;ACTIVE&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Off</td>
<td>Attic</td>
<td>Close</td>
<td>&lt;CLOSED&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Off</td>
<td>Vent</td>
<td>Open</td>
<td>&lt;ACTIVE&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>On</td>
<td>Vent</td>
<td>Close</td>
<td>&lt;CLOSED&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Off</td>
<td>Tunnel 1</td>
<td>Open</td>
<td>&lt;CLOSED&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>On</td>
<td>Tunnel 1</td>
<td>Close</td>
<td>&lt;CLOSED&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Off</td>
<td>Tunnel 2</td>
<td>Open</td>
<td>&lt;CLOSED&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>On</td>
<td>Tunnel 2</td>
<td>Close</td>
<td>&lt;CLOSED&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Off</td>
<td>Natural 1</td>
<td>Open</td>
<td>&lt;ACTIVE&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>On</td>
<td>Natural 1</td>
<td>Close</td>
<td>&lt;ACTIVE&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>On</td>
<td>Light</td>
<td>Ramp</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>On</td>
<td>Light</td>
<td>Ramp</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Off</td>
<td>Feed</td>
<td>Sch1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Off</td>
<td>Feed</td>
<td>Sch2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Off</td>
<td>Heat</td>
<td>86.0°</td>
<td>77.5°</td>
<td>79.0°</td>
<td>None</td>
</tr>
<tr>
<td>16</td>
<td>Off</td>
<td>Heat</td>
<td>86.0°</td>
<td>77.5°</td>
<td>79.0°</td>
<td>None</td>
</tr>
<tr>
<td>17</td>
<td>Off</td>
<td>Heat</td>
<td>86.0°</td>
<td>77.5°</td>
<td>79.0°</td>
<td>None</td>
</tr>
<tr>
<td>18</td>
<td>Off</td>
<td>Heat</td>
<td>86.0°</td>
<td>75.0°</td>
<td>77.0°</td>
<td>None</td>
</tr>
</tbody>
</table>

**Maximum Tunnel Fans:** The maximum number of tunnel fans will be turning ON from this point downward with hotter temperatures.

<table>
<thead>
<tr>
<th>#</th>
<th>STATUS</th>
<th>MODE</th>
<th>RTEMP</th>
<th>ON</th>
<th>OFF</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>Off</td>
<td>Cstir</td>
<td>86.0°</td>
<td>82.0°</td>
<td>81.0°</td>
<td>Min1</td>
</tr>
<tr>
<td>20</td>
<td>Off</td>
<td>Cstir</td>
<td>86.0°</td>
<td>82.0°</td>
<td>81.0°</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Off</td>
<td>Cstir</td>
<td>86.0°</td>
<td>82.0°</td>
<td>81.0°</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Off</td>
<td>CNeg</td>
<td>86.0°</td>
<td>82.5°</td>
<td>81.0°</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Off</td>
<td>CNeg</td>
<td>86.0°</td>
<td>82.5°</td>
<td>81.0°</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Off</td>
<td>CNeg</td>
<td>86.0°</td>
<td>83.0°</td>
<td>81.5°</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>On</td>
<td>CNegT</td>
<td>86.0°</td>
<td>83.0°</td>
<td>82.0°</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>On</td>
<td>CTUN</td>
<td>86.0°</td>
<td>84.0°</td>
<td>83.0°</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>On</td>
<td>CTUN</td>
<td>86.0°</td>
<td>84.5°</td>
<td>83.0°</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>On</td>
<td>CTUN</td>
<td>86.0°</td>
<td>85.0°</td>
<td>84.0°</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>On</td>
<td>CTUN</td>
<td>86.0°</td>
<td>86.0°</td>
<td>85.0°</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Off</td>
<td>CTUN</td>
<td>86.0°</td>
<td>88.0°</td>
<td>86.0°</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Off</td>
<td>CTUN</td>
<td>86.0°</td>
<td>90.0°</td>
<td>88.0°</td>
<td></td>
</tr>
</tbody>
</table>

**Target:** The desired temp. of the building.

Refer to Section 7.9 and 7.11.1.

Refer to Section 7.11.2.

Refer to Section 7.11.3.

Refer to Section 7.11.4.

Refer to Section 7.11.5.

Refer to Section 7.11.6.

Refer to Section 6.4.1, 7.5, & 7.8. When Mode=Off, those stages will not be visible on the Stage Conditions Screen.

Refer to Section 6.4.2 & 7.9.

Refer to Section 6.4.3, 7.6, & 7.11.7.

--- On Exit Tun --- | ---- | 83.0 | ---- |
--- On Enter Tun --- | ---- | 86.0 | ---- |

**N/A:** The stage is not allowed to turn on with the current set conditions.

**Off:** The stage is currently OFF.

**On:** The stage is currently ON.

**Timed:** The stage is currently ON with a timer.

--- Exit Tun: Fans exit Tunnel at set temp. ---

--- Enter Tun: Fans enter Tunnel at set temp. ---

--- Maximum Tunnel Fans: ---

--- References: ---
6.4.1 Inlet Conditions

The Inlet Conditions part of the Stage Conditions screen is used to control Power Trak operation for power ventilation. U1 is normally for baffle boards and U2 controls tunnel inlets.

<table>
<thead>
<tr>
<th>Stage Properties</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) #</td>
<td>(2) STATUS</td>
</tr>
<tr>
<td>1</td>
<td>On</td>
</tr>
<tr>
<td>2</td>
<td>Off</td>
</tr>
</tbody>
</table>

Apply Vent Label to cover label.
Refer to Section 9.11.

(1) # - Each Inlet will use a pair of stage banks. The specific pair of stage banks may be chosen from any of the 40 stages as long as the first stage is an odd number and the second stage is the very next adjoining even stage number. For example, Stages 1 and 2 are shown as Vent Inlets in the diagram above. After determining which pair of stages will be used, apply the Inlet Label (4501-0273) as shown in Section 9.11. One Inlet label will be used for each Inlet Stage pair.

(2) Status - Indicates if the Stage Inlet is either On or Off.

(3) Mode - The mode column tells you how the machine will be operating. If it will be an attic machine “ATTIC”, vent machine "VENT", a tunnel machine "Tunnel 1" OR “Tunnel 2”.

(4) RTEMP - Not Used for Inlet Stages.

(5) ON - Not Used for Inlet Stages.

(6) OFF & (7) TIME – Indicates the state of the machine whether it is fully open <OPENED>, fully closed <CLOSED>, currently active <ACTIVE>, or currently disabled DISABLED.

When the machine is fully open on the open auxiliary switch, this column will indicate <OPENED>. When the machine is fully closed on the closed auxiliary switch, this column will indicate <CLOSED>. When the machine is partially open and/or currently in movement, this column will indicate <ACTIVE>. When the machine has been disabled due to another Inlet operation currently in process, this column will indicate DISABLED.
### 6.4.2 On/Off Stages

The On/Off stages are used for devices that do not need a variable speed capability. This portion of the Stage Conditions screen shows how the On/Off Stages and are set.

<table>
<thead>
<tr>
<th>(1) #</th>
<th>(2) STATUS</th>
<th>(3) MODE</th>
<th>(4) RTEMP</th>
<th>(5) ON</th>
<th>(6) OFF</th>
<th>(7) TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tun</td>
<td>Off</td>
<td>Cstir</td>
<td>79.4°</td>
<td>85°</td>
<td>80°</td>
<td>Ramp</td>
</tr>
<tr>
<td>1</td>
<td>On Light</td>
<td>CSTIR</td>
<td>79.6°</td>
<td>76°</td>
<td>95°</td>
<td>None</td>
</tr>
<tr>
<td>2</td>
<td>On Cstir</td>
<td>79.6°</td>
<td>76°</td>
<td>95°</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>On Cstir</td>
<td>79.6°</td>
<td>76°</td>
<td>95°</td>
<td>Min1</td>
<td></td>
</tr>
</tbody>
</table>

(1) # - Identifies the On/Off stage number or Tunnel and lists them in the order of priority. Tunnel is not a stage like the Stage Master and Vent Master. This parameter is set in the tunnel ventilation of Program Setup screen. See Section 7.8, Tunnel Ventilation.

(2) Status - Indicates if the stage is currently Timed, On, Off, or N/A.

N/A: The stage is not allowed to turn on with the current set conditions.

Off: The stage is currently OFF.

On: The stage is currently ON.

Timed: The stage is currently ON with a timer.

(3) Mode - This column indicates how the stage is programmed. Any stage can be set to any of these modes. The available stage options are: Off, Heat, CSTIR, CNEG, CNEG'T, CTUN, LIGHT, FEED or CEVAP.

(4) Rtemp - The Rtemp column will indicate the current temperature from which the stage is operating.

(5) On – The current temperature setting for the on point temperature of the stage.

(6) Off - The current temperature setting for the off point temperature of the stage.

(7) Time - This column indicates if a stage is on a timer and shows the different timers you are allowed to put a stage on. The timer options are: None, Min1, Min2, Var, Cool, or Opt xx.

(8) Target – The desired Target Temperature of the building.

(9) Maximum Tunnel – The maximum number of tunnel fans will be turning ON from this point downward with hotter temperatures. Maximum Tunnel is not shown in the condensed display view above. Refer to Section 6.4.
6.4.3 Natural Ventilation Stages

Natural Ventilation stages are used to open and close side curtains to allow natural ventilation.

<table>
<thead>
<tr>
<th>#</th>
<th>STATUS</th>
<th>MODE</th>
<th>RTEMP</th>
<th>ON</th>
<th>OFF</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>U1</td>
<td>On</td>
<td>NAT1</td>
<td>CLOSE</td>
<td>73.0°</td>
<td>72.0°</td>
<td>CLOSED: No</td>
</tr>
<tr>
<td>U2</td>
<td>On</td>
<td>NAT2</td>
<td>CLOSE</td>
<td>73.0°</td>
<td>72.0°</td>
<td>CLOSED: No</td>
</tr>
<tr>
<td>U1</td>
<td>Off</td>
<td>NAT1</td>
<td>OPEN</td>
<td>73.0°</td>
<td>74.0°</td>
<td>CLOSED: No</td>
</tr>
<tr>
<td>U2</td>
<td>Off</td>
<td>NAT2</td>
<td>OPEN</td>
<td>73.0°</td>
<td>74.0°</td>
<td>CLOSED: No</td>
</tr>
</tbody>
</table>

(1) # - The stage bank either U1, U2, U3, or U4.
(2) Status - This column will indicate whether the machine is Off, Opening or Closing.
(3) Mode - There are four selectable modes for zoning Natural Ventilation curtains: "NAT1", "NAT2", "NAT3", and "NAT4". OPEN or CLOSE will be shown beside the mode to show whether the specific line refers to the Open or Close function.
(4) Rtemp - The Rtemp column will indicate the current temperature the curtain machine is operating from.
(5) ON - The temperature at which the stage operates.
(6) OFF and (7) TIME - This column indicates if the machine is fully closed, active, or disabled. When the machine is on the closed auxiliary switch, this column will display "Yes". When the machine is active or open, this column will display "No".

6.4.4 Variable Stages

The Variable stages are used to control devices (i.e. fans & lights) with a variable capability.

<table>
<thead>
<tr>
<th>#</th>
<th>STATUS</th>
<th>MODE</th>
<th>Rtemp</th>
<th>ON</th>
<th>OFF</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1</td>
<td>50%</td>
<td>Light</td>
<td>Ramp</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V2</td>
<td>75%</td>
<td>CSTir</td>
<td>88.7°</td>
<td>76.4°</td>
<td>74.0°</td>
<td>None</td>
</tr>
</tbody>
</table>

(1) # - The Stage bank either V1 or V2.
(2) Status - This is the current run percentage that the device is operating.
(3) Mode - Indicates how the stage is programmed: CSTIR, CNEG, CNEG, CTUN or LIGHT.
(4) Rtemp - The Rtemp column is programmed: CSTIR, CNEG, CNEG, CTUN or LIGHT.
(5) ON - The ON column indicates the maximum ON temperature at which the variable speed fan will reach full speed.
(6) OFF - The OFF column indicates the minimum ON temperature at which the fan will run at minimum speed.
(7) Time - None, Min1, Min2, Var or Always ON (ON). Always ON when Rtemp is below MIN ON.

Refer to Section 9.11.
6.5 **Historical Data – MAIN SYSTEM**

This screen provides access to historical data. Highlight the selection and press the ENTER button on the EDITOR panel.

**Select and Press ‘Enter’:**

- Alarm Log
- Room Temperature
- Stage RunTimes
- Humidity
- Water Usage #1
- Water Usage #2
- Ventilation Mode
- Feed History

### 6.5.1 Alarm Log

This screen shows the list of the past 20 alarms and status information starting with the most recent occurrence.

1. **Alarm Description** – The alarm problem area.
2. **Alarm Status** – The alarm status (Failure or Corrected).
3. **Date of Alarm** – The date the alarm occurred or was corrected.
4. **Time of Alarm** – The time the alarm occurred or was corrected.

**Alarm Log**

<table>
<thead>
<tr>
<th></th>
<th>Alarm Description</th>
<th>Status</th>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tunnel Vent</td>
<td>Corrected</td>
<td>2/5</td>
<td>1:26a</td>
</tr>
<tr>
<td>2</td>
<td>Low Press</td>
<td>Failure</td>
<td>2/ 5</td>
<td>1:09a</td>
</tr>
<tr>
<td>3</td>
<td>Lo Water Rate</td>
<td>Corrected</td>
<td>2/ 3</td>
<td>3:39a</td>
</tr>
<tr>
<td>4</td>
<td>Cycle Press</td>
<td>Failure</td>
<td>2/ 1</td>
<td>4:15a</td>
</tr>
<tr>
<td>5</td>
<td>Low Temp</td>
<td>Corrected</td>
<td>1/ 30</td>
<td>3:09a</td>
</tr>
<tr>
<td>6</td>
<td>Lo Water Rate</td>
<td>Corrected</td>
<td>1/ 27</td>
<td>12:38a</td>
</tr>
<tr>
<td>7</td>
<td>Lo Water Rate</td>
<td>Corrected</td>
<td>1/ 21</td>
<td>7:45a</td>
</tr>
<tr>
<td>8</td>
<td>Lo Water Rate</td>
<td>Corrected</td>
<td>1/ 17</td>
<td>9:52a</td>
</tr>
<tr>
<td>9</td>
<td>Low Pressure</td>
<td>Failure</td>
<td>1/ 15</td>
<td>5:21a</td>
</tr>
<tr>
<td>10</td>
<td>Max Runtime</td>
<td>Corrected</td>
<td>1/ 10</td>
<td>8:27a</td>
</tr>
</tbody>
</table>

### 6.5.1 Room Temperature

This screen shows the highest and lowest room temperature for each day for up to 99 days. The last day reported will appear at the top of the list. The list can contain data up to 99 days. After displaying 99 days, oldest data will be deleted.

1. **Day** – The specific day in the growout period. Values = 1 day to 99 days.
2. **High Temp** – The high recorded temperature and the time of day that it occurred.
3. **AVE** – The average recorded temperature for the day.
4. **Low Temp** – The low recorded temperature and the time of day low temperature occurred.

**Temperature Data**

<table>
<thead>
<tr>
<th></th>
<th>Day</th>
<th>High Temp</th>
<th>AVE</th>
<th>Low Temp</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>21</td>
<td>71.0°-12:34p</td>
<td>66.3°</td>
<td>61.6°-12:34a</td>
</tr>
<tr>
<td>20</td>
<td>20</td>
<td>71.0°-12:34p</td>
<td>66.3°</td>
<td>61.6°-12:34a</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>71.0°-12:34p</td>
<td>66.3°</td>
<td>61.6°-12:34a</td>
</tr>
</tbody>
</table>
6.5.2 Stage Run Times

This screen shows the length of time in hours and minutes that the individual stages have run, on the current day and previous day.

(1) Stage – Identifies the stage number.
(2) Current Day – The length of time in hours and minutes that the stage has run on the current day.
(3) Previous Day – The length of time in hours and minutes that the stage has run on the previous day.

6.5.3 Humidity #1 (Room) & Humidity #2 (Cooler)

This screen shows the highest room humidity & cooler humidity for each day for up to 99 days. The last day reported will appear at the top of the list. The list can contain data up to 99 days. After displaying 99 days, oldest data will be deleted.

(1) Day – The specific day in the growout period. Values = 1 day to 99 days.
(2) High Room – The highest recorded room humidity (Humidity #1) and the time of day that it occurred.
(3) High Cooler – The highest recorded cooler humidity (Humidity #2) and the time of day that it occurred.

6.5.4 Water Usage (#1 or #2)

This screen gives the Water Usage of the building per day of growout, high rate, and water total. The screen display format is the same for either water usage #1 or #2.

(1) Day – The specific day in the growout period. Values = 1 day to 99 days.
(2) High Rate – The highest recorded water rate and the time of day that it occurred.
(3) Total For Each Day – The total water usage for each day of growout.

6.5.5 Ventilation Mode

This screen shows the length of time in hours and minutes that the Control is in different ventilation modes. NOTE: Natural mode is when the system is in natural ventilation and the main curtains are open. Transition mode is when the control is between power and tunnel ventilation. The control is making the adjustments needed to go into tunnel. Tunnel mode is when the tunnel signal has been activated and the system has entered into tunnel.

(3) Natural Ventilation – The time the side wall curtains are open.
(4) Transition to Tunnel – The time required to transit to tunnel mode. (3 minutes per transition)
(5) Tunnel Ventilation – The time spent in the Tunnel mode.
6.5.6 Feed History

This screen shows the estimated daily amount of feed used and the total time that the feed line motors have been running.

(1) Day – The specific day in the growout period. Values = 1 to 99 days.

(2) Usage – The amount of feed used from Bin #1 and Bin #2 combined for each day of growout. Measurements = pounds (lb.).

(3) Run 1 – The total amount of run-time feed line #1 was running for each day of growout. Measurements = Hours and minutes.

(4) Run 2 – The total amount of run-time feed line #2 was running for each day of growout. Measurements = Hours and minutes.

(5) Status – The status of the auger current sensor whether the sensor is On or Off. ON indicates the motor is running and OFF indicates the motor is not running.

6.6 Alarm Status – MAIN SYSTEM

The ALARM column lists the elements and sensors that are available. For the High and Low temperatures and High and Low pressure, the Cycle Pressure the current Alarm Limits are shown. For all entries the STATUS and the LAST REPORTED alarm are indicated. To change the ALARM LIMIT use the Editor arrows to highlight the desired entry and the Plus (+) and Minus (-) buttons to increase or decrease the desired limit.

### TEMPERATURE LIMITS

<table>
<thead>
<tr>
<th></th>
<th>LIMIT</th>
<th>STATUS</th>
<th>LAST ALARM</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Temp</td>
<td>85.0°</td>
<td>OK</td>
<td>08/15-10:36p</td>
</tr>
<tr>
<td>Low Temp</td>
<td>65.0°</td>
<td>OK</td>
<td>08/10-03:36p</td>
</tr>
</tbody>
</table>

### PRESSURE LIMITS

<table>
<thead>
<tr>
<th></th>
<th>LIMIT</th>
<th>STATUS</th>
<th>LAST ALARM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cycle Press</td>
<td>0.04</td>
<td>Off</td>
<td>08/09-07:36p</td>
</tr>
<tr>
<td>High Press</td>
<td>0.15</td>
<td>Off</td>
<td>07/22-01:36p</td>
</tr>
<tr>
<td>Low Press</td>
<td>0.03</td>
<td>Off</td>
<td>07/13-06:36p</td>
</tr>
</tbody>
</table>

### WATER ALARMS LIMITS

<table>
<thead>
<tr>
<th></th>
<th>LIMIT</th>
<th>STATUS</th>
<th>LAST ALARM</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Rate #1</td>
<td>100/hr</td>
<td>OK</td>
<td>01/01-12:00a</td>
</tr>
<tr>
<td>Low Rate #1</td>
<td>25/hr</td>
<td>OFF</td>
<td>01/01-12:00a</td>
</tr>
<tr>
<td>High Rate #2</td>
<td>100/hr</td>
<td>OK</td>
<td>01/01-12:00a</td>
</tr>
<tr>
<td>Low Rate #2</td>
<td>25/hr</td>
<td>OFF</td>
<td>01/01-12:00a</td>
</tr>
</tbody>
</table>

### FEED ALARMS LIMITS

<table>
<thead>
<tr>
<th></th>
<th>LIMIT</th>
<th>STATUS</th>
<th>LAST ALARM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auger Run 1</td>
<td>10min</td>
<td>OFF</td>
<td>01/01-12:00a</td>
</tr>
<tr>
<td>Auger Run 2</td>
<td>10min</td>
<td>OFF</td>
<td>01/01-12:00a</td>
</tr>
</tbody>
</table>

### SYSTEM STATUS

<table>
<thead>
<tr>
<th></th>
<th>STATUS</th>
<th>LAST ERROR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tunnel Vent</td>
<td>-----</td>
<td>OK</td>
</tr>
<tr>
<td>Growout Day</td>
<td>-----</td>
<td>OK</td>
</tr>
<tr>
<td>Local Network</td>
<td>-----</td>
<td>OK</td>
</tr>
<tr>
<td>Back-Up Limits</td>
<td>-----</td>
<td>OK</td>
</tr>
<tr>
<td>Sensor 1</td>
<td>-----</td>
<td>OK</td>
</tr>
<tr>
<td>Sensor 2</td>
<td>------</td>
<td>OK</td>
</tr>
<tr>
<td>Sensor 3</td>
<td>------</td>
<td>OK</td>
</tr>
<tr>
<td>Sensor 4</td>
<td>------</td>
<td>OK</td>
</tr>
<tr>
<td>Sensor 5</td>
<td>------</td>
<td>OK</td>
</tr>
<tr>
<td>Sensor 6</td>
<td>------</td>
<td>OK</td>
</tr>
<tr>
<td>Sensor 7</td>
<td>------</td>
<td>OK</td>
</tr>
<tr>
<td>Sensor 8</td>
<td>------</td>
<td>OK</td>
</tr>
<tr>
<td>Outside</td>
<td>------</td>
<td>OK</td>
</tr>
</tbody>
</table>

NOTE: The High and Low temperature reading is taken from the Sensors for Display in "Sensor Setup" of the Program Setup Screen.
6.6.1 High Temperature Alarm Details

The High Temperature Alarm Details lists the settings for the alarm and the last time the alarm was sounded and the cause of the alarm.

(1) High Temperature Alarm Details – Identifies the following information:
(2) Alarm On/Off – The status of the alarm is On or Off.
(3) High Temperature Limit – The current temperature setting of the High Temperature alarm.
(4) Increase Limit In Tunnel – Increase high temperature limit during tunnel mode by this number.
(5) Last Alarm Statistics – Identifies the date, time and cause of the last alarm.
(6) Date & Time – The date and time of the last alarm. Date is given as Month/Day.
(7) Cause – Displays the reading of the high temperature that caused the alarm.

NOTE: Low Alarm is disabled when lights are off.

6.6.2 Low Temperature Alarm Details

The Low Temperature Alarm Details lists the settings for the alarm and the last time the alarm was sounded and the cause of the alarm.

(1) Low Temperature Alarm Details – Identifies the following information:
(2) Alarm On/Off – The status of the alarm is On or Off.
(3) Low Temperature Limit – The current temperature setting of the Low Temperature alarm.
(4) Increase Limit In Tunnel – Increase low temperature limit during tunnel mode by this number.
(5) Last Alarm Statistics – Identifies the date, time and cause of the last alarm.
(6) Date & Time – The date and time of the last alarm. Date is given as Month/Day.
(7) Cause – Displays the reading of the low temperature that caused the alarm.

NOTE: Low Alarm is disabled when lights are off.

6.6.3 Cycle Pressure Alarm Details

The Cycle Pressure Alarm Details lists the settings for the alarm and the last time the alarm was sounded and the cause of the alarm.

(1) Cycle Pressure Alarm Details – Identifies the following information:
(2) Alarm On/Off – The status of the alarm is On or Off.
(3) Cycle Pressure Limit – The current pressure setting of the Cycle Pressure alarm.
(4) Last Alarm Statistics – Identifies the date, time and cause of the last alarm.
(5) Date & Time – The date and time of the last alarm. Date is given as Month/Day.
(6) Cause – Displays the reading of the pressure that caused the alarm.

NOTE: Low Alarm is disabled when lights are off.

6.6.4 High Pressure Alarm Details

The High Pressure Alarm Details lists the settings for the alarm and the last time the alarm was sounded and the cause of the alarm.

(1) High Pressure Alarm Details – Identifies the following information:
(2) Alarm On/Off – The status of the alarm is On or Off.
(3) High Pressure Limit – The current pressure setting of the High Pressure alarm.
(4) Increase Limit In Tunnel – Increase high pressure limit during tunnel mode by this number.
(5) Last Alarm Statistics – Identifies the date, time and cause of the last alarm.
(6) Date & Time – The date and time of the last alarm. Date is given as Month/Day.
(7) Cause – Displays the reading of the high pressure that caused the alarm.

NOTE: Low Alarm is disabled when lights are off.

6.6.5 Low Pressure Alarm Details

The Low Pressure Alarm Details lists the settings for the alarm and the last time the alarm was sounded and the cause of the alarm.

(1) Low Pressure Alarm Details – Identifies the following information:
(2) Alarm On/Off – The status of the alarm is On or Off.
(3) Low Pressure Limit – The current pressure setting of the Low Pressure alarm.
(4) Increase Limit In Tunnel – Increase low pressure limit during tunnel mode by this number.
(5) Last Alarm Statistics – Identifies the date, time and cause of the last alarm.
(6) Date & Time – The date and time of the last alarm. Date is given as Month/Day.
(7) Cause – Displays the reading of the low pressure that caused the alarm.

NOTE: Low Alarm is disabled when lights are off.

6.6.6 High Rate Alarm Details

The High Rate Alarm Details lists the settings for the alarm and the last time the alarm was sounded and the cause of the alarm.

(1) High Rate Alarm Details – Identifies the following information:
(2) Alarm On/Off – The status of the alarm is On or Off.
(3) High Rate Limit – The current water usage rate setting of the High Rate alarm.
(4) Increase Limit In Tunnel – Increase high rate limit during tunnel mode by this number.
(5) Last Alarm Statistics – Identifies the date, time and cause of the last alarm.
(6) Date & Time – The date and time of the last alarm. Date is given as Month/Day.
(7) Cause – Displays the reading of the high rate that caused the alarm.

NOTE: Low Alarm is disabled when lights are off.

6.6.7 Low Rate Alarm Details

The Low Rate Alarm Details lists the settings for the alarm and the last time the alarm was sounded and the cause of the alarm.

(1) Low Rate Alarm Details – Identifies the following information:
(2) Alarm On/Off – The status of the alarm is On or Off.
(3) Low Rate Limit – The current water usage rate setting of the Low Rate alarm.
(4) Increase Limit In Tunnel – Increase low rate limit during tunnel mode by this number.
(5) Last Alarm Statistics – Identifies the date, time and cause of the last alarm.
(6) Date & Time – The date and time of the last alarm. Date is given as Month/Day.
(7) Cause – Displays the reading of the low rate that caused the alarm.

NOTE: Low Alarm is disabled when lights are off.

6.6.8 Auger Run1 Alarm Details

The Auger Run1 Alarm Details lists the settings for the alarm and the last time the alarm was sounded and the cause of the alarm.

(1) Auger Run1 Alarm Details – Identifies the following information:
(2) Alarm On/Off – The status of the alarm is On or Off.
(3) Auger Run1 Limit – The current runtime setting of the Auger Run1 alarm.
(4) Increase Limit In Tunnel – Increase auger run1 limit during tunnel mode by this number.
(5) Last Alarm Statistics – Identifies the date, time and cause of the last alarm.
(6) Date & Time – The date and time of the last alarm. Date is given as Month/Day.
(7) Cause – Displays the reading of the auger run1 that caused the alarm.

NOTE: Low Alarm is disabled when lights are off.

6.6.9 Auger Run2 Alarm Details

The Auger Run2 Alarm Details lists the settings for the alarm and the last time the alarm was sounded and the cause of the alarm.

(1) Auger Run2 Alarm Details – Identifies the following information:
(2) Alarm On/Off – The status of the alarm is On or Off.
(3) Auger Run2 Limit – The current runtime setting of the Auger Run2 alarm.
(4) Increase Limit In Tunnel – Increase auger run2 limit during tunnel mode by this number.
(5) Last Alarm Statistics – Identifies the date, time and cause of the last alarm.
(6) Date & Time – The date and time of the last alarm. Date is given as Month/Day.
(7) Cause – Displays the reading of the auger run2 that caused the alarm.

NOTE: Low Alarm is disabled when lights are off.

6.6.10 Tunnel Vent Alarm Details

The Tunnel Vent Alarm Details lists the settings for the alarm and the last time the alarm was sounded and the cause of the alarm.

(1) Tunnel Vent Alarm Details – Identifies the following information:
(2) Alarm On/Off – The status of the alarm is On or Off.
(3) Tunnel Vent Limit – The current pressure setting of the Tunnel Vent alarm.
(4) Increase Limit In Tunnel – Increase tunnel vent limit during tunnel mode by this number.
(5) Last Alarm Statistics – Identifies the date, time and cause of the last alarm.
(6) Date & Time – The date and time of the last alarm. Date is given as Month/Day.
(7) Cause – Displays the reading of the tunnel vent that caused the alarm.

NOTE: Low Alarm is disabled when lights are off.

6.6.11 Growout Day Alarm Details

The Growout Day Alarm Details lists the settings for the alarm and the last time the alarm was sounded and the cause of the alarm.

(1) Growout Day Alarm Details – Displays the status and last error (Warning only).
(2) Local Network – Displays the status and last error.
(3) Back-Up Limits – Displays the status and last error.
(4) Sensor 1 through 8 Limit & Status – If the sensor is disabled, this field will show “off”. If the sensor is enabled, this field will show “OK” if the sensor is functioning properly or “fail” if the sensor is not properly reporting the temperature. Check wiring for damage or bad connection.

NOTE: This is the status of the alarms. Once an error has occurred the LED for Alarm Status will start blinking. Use the Navigator arrows to move down to Alarm Status. You will see what has failed. For a detail of what caused the failure navigate down to highlight the alarm and press enter. This will give a detail of what caused it and when it happened. High Temp, Low Temp, and Tunnel Vent have an additional detail screen viewable by scrolling down and highlighting the desired alarm and pressing enter.

(15) Outside – If the sensor is disabled, this field will show “off”. If the sensor is enabled, this field will show “OK” if the sensor is functioning properly or “fail” if the sensor is not properly reporting the temperature. Check wiring for damage or bad connection.
Possible Reasons for High Temperature False Alarm Conditions:

- If the same sensor causes multiple alarms, check the location of the sensor and wiring for possible damage. Also ensure that the limit is properly set for the target and room temperature.

6.6.2 Low Temperature Alarm Details

The Low Temperature Alarm Details lists the settings for the alarm and the last time the alarm was sounded and the cause of the alarm.

(1) Low Temperature Alarm Details – Identifies the following information:
(2) Alarm On/Off – The status of the alarm is On or Off.
(3) Low Temperature Limit - The current setting of the Low Temperature alarm limit.
(4) Last Alarm Statistics - Identifies the date, time and cause of the last alarm.
(5) Date & Time – The date and time of the last alarm. Date is given as Month/Day.
(6) Cause - Displays the reading of the low temperature that caused the alarm.

Possible Reasons for Low Temperature False Alarm Conditions:

- If the same sensor causes multiple alarms, check the location of the sensor and wiring for possible damage. Also ensure that the limit is properly set for the target and room temperature.

6.6.3 Tunnel Vent Alarm Details

The Tunnel Alarm Details shows the settings for the alarm, the last time the alarm was sounded and the cause of the alarm.

(1) Tunnel Alarm Details – Identifies the following information:
(2) Alarm On/Off – The status of the alarm is On or Off due to tunnel. Not settable. Status indicator only. NOTE: This alarm is automatically set by the Evolution 4000 Controller.
(3) Last Alarm Statistics - Identifies the date, time and cause of the last alarm.
(4) Date & Time - The date and time of the last alarm.
(5) Cause - Displays the cause of the tunnel error. The following are the problems that could cause a Tunnel Error:

Tunnel Auxiliary would be when the controller has seen a closed signal from the tunnel curtain during tunnel. After 20 seconds the system will come out of tunnel and return to natural or power ventilation.

Nat Auxiliary would be when the controller has seen an open signal from the natural curtains during tunnel or that the curtains never closed from natural allowing the system to go into tunnel. This alarm would take 13 minutes from when it started to go into tunnel. After 20 seconds the system will come out of tunnel and return to natural or power ventilation.

Low Pressure would be when the pressure fell below the low pressure alarm setting during tunnel. This alarm will need to see the pressure below the limit for 45 seconds. At this point the Alarm Status LED will start blinking. Then after another 20 seconds the system will come out of tunnel and return to natural or power ventilation.

High Pressure would be when the pressure went above the high limit alarm setting during tunnel. This alarm will need to see the limit exceeded for 45 seconds. At this point the Alarm Status LED will start blinking. Then after another 20 seconds the system will come out of tunnel and return to natural or power ventilation.

Possible Reasons for Tunnel Vent Alarm Conditions:

- Tunnel Inlet failed to open.
- Natural Curtain failed to close.
• High Static Pressure due to lack of inlet opening.

**NOTE:** Due to the nature of these errors, the control tunnel enable must be reset in order for the control to re-enter tunnel. Be sure to check the cause if this is a reoccurring problem.

### 6.7 Program Set-Up

The Program Setup screen is used to select all of the Programming screens. Highlight an entry and press the ENTER button. See the next section of this manual for a description of the programming screen.

1. General Settings
2. Network Status
3. Temperature Sensors
4. Feed Level Sensors
5. Ventilation Inlets
6. Natural Ventilation
7. Growout Curve
8. Tunnel Ventilation
9. On/Off Stages
10. Variable Stage Outputs
11. Stage Properties
12. Setup Feed Clocks
13. Setup Light Clocks
14. Seasonal Programs & Security
15. Diagnostics
16. SD Card Operations

(1) **General Settings** – Parameters that usually need to be set when the system is installed. See Section 7.1.

(2) **Network Status** – See Section 0.

(3) **Temperature Sensors** – See Section 7.3.

(4) **Feed Level Sensors** – See Section 7.4.

(5) **Ventilation Inlets** – See Section 7.5.

(6) **Natural Ventilation** – See Section 7.6.

(7) **Growout Curve** – See Section 7.7.

(8) **Tunnel Ventilation** – See Section 7.8.

(9) **On/Off Stages** – Settings for Set up of stages. See Section 7.9.

(10) **Variable Stage Outputs** – Set-up for variable stages. See Section 7.10.

(11) **Stage Properties** – See Section 7.11.

(12) **Setup Feed Clocks** – See Section 7.12.

(13) **Setup Light Clocks** – This feature is added for those applications that desire light control. See Section 7.13.

(14) **Seasonal Programs & Security** – See Section 7.14.

(15) **Diagnostics** – See Section 7.15.

(16) **SD Card Operations** – See Section 7.16.
6.8 **Current Conditions – AUXILIARY SYSTEM**

The Current environmental Conditions of the Auxiliary System are shown here. The Auxiliary System is typically used to monitor the temperature and humidity of a separate room which is typically an egg/cooler room in certain applications.

The numbers in brackets e.g. (1) refer to the descriptions below the sample screen displays.

1. **Temp** – The current temperature for the Auxiliary Room.
2. **Target** – Target Temperature for the Auxiliary Room.
3. **Alarm Status** – Selecting **OK** will allow an Alarm condition if the temperature range is exceeded. Selecting **Off** will NOT allow an Alarm condition.
4. **Humidity** – The percent of water vapor of the air inside the Auxiliary Room.
5. **Range** – The allowable humidity range for the Auxiliary Room.
6. **Alarm Status** – Selecting **OK** will allow an Alarm condition if the Humidity range is exceeded. Selecting **Off** will NOT allow an Alarm condition.

### Auxiliary Room Conditions

**Mon 14 Sep 2009 8:32a**

<table>
<thead>
<tr>
<th>(1) Temp: 71.4°</th>
<th>(2) Target: 70.0°</th>
<th>(3) Humidity: 0%</th>
<th>(4) Range: 30%-50%</th>
<th>(5) Alarm Status: Off</th>
<th>(6) Alarm Status: Off</th>
</tr>
</thead>
</table>

6.9 **Historical Data – AUXILIARY SYSTEM**

The Historical Data of the Auxiliary System are shown here. This screen shows the highest and lowest room temperature for each day for up to 99 days. The last day reported will appear at the top of the list.

The list can contain data up to 99 days. After displaying 99 days, oldest data will be deleted.

1. **Day** – The specific day in the growout period. Values = 1 day to 99 days.
2. **High Temp** – The high recorded temperature and the time of day that it occurred.
3. **Low Temp** – The low recorded temperature and the time of day low temperature occurred.

<table>
<thead>
<tr>
<th>DAY</th>
<th>High Temp</th>
<th>Low Temp</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>71.0°-12:34p</td>
<td>61.6°-12:34a</td>
</tr>
<tr>
<td>20</td>
<td>71.0°-12:34p</td>
<td>61.6°-12:34a</td>
</tr>
<tr>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>1</td>
<td>71.0°-12:34p</td>
<td>61.6°-12:34a</td>
</tr>
</tbody>
</table>
6.10 **Alarm Status – AUXILIARY SYSTEM**

The Alarm Status of the Auxiliary System is shown here. This screen shows the High temperature, Low Humidity, and also the System Status for the Local Network and Cooler Sensor.

For the High temperature and Low Humidity, the current Alarm Limits are shown. For all entries the STATUS and the LAST REPORTED alarm or error are indicated. To change the ALARM LIMIT use the Editor arrows to highlight the desired entry and the Plus (+) and Minus (-) buttons to increase or decrease the desired limit.

1. **Cooler High Temperature Limit & Status** - The high temperature cooler setting at which the alarm relay will activate. This temperature is taken ONLY from temperature sensor #8.
2. **Cooler Low Humidity Limit & Status** - The low humidity setting at which the alarm relay will activate. This humidity is taken ONLY from humidity sensor #2.
3. **Local Network** - Status & last error.
4. **Cooler Sensor** - Status & last error.

---

6.11 **Current Conditions – BACK-UP SYSTEM**

The Back-Up status shows the status information concerning back-up operation.

---

**NOTE:** This is the high and low limit of the Evolution Back-Up system. These settings are set in the Back-Up system.

1. **Back-up High Limit** – The high temperature limit at which the Back-up stages will start turning on cool stages.
2. **Target Temperature** – Backup target temperature.
3. **Back-Up Low Limit** - The low temperature limit at which the Back-up will turn on the heat stage.
4. **Back-Up Run %** The Back-up timer percentage.
7. Setting Programming Functions

This section discusses the programming screens for the Evolution 4000.

7.1 General Settings

The General Settings contains parameters that usually only need to be set once when the system is installed. To change any of these parameters, use the EDITOR arrows to navigate through the list and the plus (+) and minus (-) buttons to increase or decrease the values.

1. **Software Version** – The “v0.xx” is the software version for PCB197 U8 and “BV: x” is the BootLoader software version currently in use.

2. **HHNET Address** - HH.Net permits up to 32 controllers to be addressed on a single communications port of a personal computer (PC). In order for the computer to recognize the communications from the controllers, each controller must have a unique network address. For example: If you have an Evolution 4000, a Stage Master, and two Power Vents you would need to set the Evolution to address 1, the Stage Master to address 2, the first Power Vent to address 3, and the second Power Vent to address 4. Valid settings are: 1 - 32. (You do not have to address the controllers in any particular order.)

3. **Optimum Mode** – On or Off. Refer to Section 7.7.2 for a detailed description of the Optimum Mode features and options.

4. **Growout Start Date** - Set the date desired to start the grow-out. Evolution will use this date to control the feed, light clock and ramping functions. NOTE: This must be set to the first day of grow-out. Your historical data will start at this date and go for 99 days or until the next grow-out date has been set and then that date has been passed.

5. **Preheat Mode** – On or Off

6. **Date** – The current date as Day/Month/Year.

7. **Day** – The current day of the week.

8. **Time** – The current time.

9. **Units of Measure** - The units of measure can be selected as English or Metric.

10. **Pressure Units** - Pressure units can be selected as inches of water column or Pascals.

11. **Water Meter-Pulses Per Unit** – HH standard water meter is one pulse per gallon. Select a value from 1 to 100.
7.2 **Network Status**

The Network Status shows the installed Evolution Stages and the Back-Up. The ENABLED indicator shows if the stage is enabled and the STATUS indicates OK or Failed.

(1) **Modules** – The Evolution modules that can be installed will appear here. EV-INPUT/OUTPUT - This is the PCB194 back board of the Evolution 4000. EV-8 is the five PCB191 boards on the lower portion of the Evolution 4000 enclosure door.

<table>
<thead>
<tr>
<th>Modules</th>
<th>Enabled</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>EV-INPUT/OUTPUT</td>
<td>Yes</td>
<td>OK</td>
</tr>
<tr>
<td>EV-8(1-8)</td>
<td>Yes</td>
<td>OK</td>
</tr>
<tr>
<td>EV-8(9-16)</td>
<td>Yes</td>
<td>OK</td>
</tr>
<tr>
<td>EV-8(17-24)</td>
<td>Yes</td>
<td>OK</td>
</tr>
<tr>
<td>EV-8(25-32)</td>
<td>Yes</td>
<td>OK</td>
</tr>
<tr>
<td>EV-8(33-40)</td>
<td>Yes</td>
<td>OK</td>
</tr>
<tr>
<td>EV-16(41-56)</td>
<td>No</td>
<td>OK</td>
</tr>
<tr>
<td>BACK-UP/33</td>
<td>Yes</td>
<td>OK</td>
</tr>
</tbody>
</table>

(2) **Enabled** – Those modules that are enabled will be indicated by Yes. This column lets you know which modules are turned on for the Evolution control to communicate with. When adding expansion back-up modules, the ENABLED must be set to “Yes” for proper operation.

(3) **Status** - OK or Failed. This column lets you know if you have lost communication with one of the modules.

7.3 **Temperature Sensors**

The Sensor Set-Up screen is used to set the temperature sensors that will be used to determine the internal temperature of the building.

(1) **Room Temperature Sensors** - Select any or all of the internal sensors. Your alarm high and low limits will use these sensors that are displayed here.

For example: If you wanted to display sensors 1,2,3,4,5 for your room temperature it would look like this: "---54321" If you turn all the sensors off (by setting it to -) the control would use the outside temperature and it would look like this: "Outside-".

(2) **Alarm on Outside Sensor Error** – On or Off.

(3) **Sensor** – Identifies up to eight inside and one outside sensor.

(4) **Enabled** – Yes or No.

(5) **Value** – Current temperature reading.

(6) **Adjusted** – This will indicate if the sensor temperature has been calibrated and the amount of recalibration.

7.4 **Feed Level Sensors**

The Feed Level Module Setup screen sets the parameters required to monitor feed bins.

(1) **Bin 1** - These settings provide the feed level sensor at Bin #1 with necessary information to calculate the approximate feed weight and height.

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Cap Angle</th>
<th># of Rings</th>
<th>Ring Height</th>
<th>Feed wt</th>
<th>Bin ht</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 ft</td>
<td>30°</td>
<td>1</td>
<td>2.67 ft</td>
<td>00 lb</td>
<td>9.07 ft</td>
</tr>
</tbody>
</table>

(2) **Bin 2** -

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Cap Angle</th>
<th># of Rings</th>
<th>Ring Height</th>
<th>Feed wt</th>
<th>Bin ht</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 ft</td>
<td>30°</td>
<td>1</td>
<td>2.67 ft</td>
<td>00 lb</td>
<td>9.07 ft</td>
</tr>
</tbody>
</table>
(5) **Ring Height** - Feed Bin #1 ring height = Measurement from the top/center of one ring to the top/center of the next ring.

(6) **Feed wt** - Feed Bin #1 feed weight = The feed weight is calculated by using the entered bin size information and the current feed level module results.

(7) **Bin ht** - Feed Bin #1 bin height = The bin height is calculated by using the entered bin size information.

(8) **Bin 2** - These settings provide the feed level sensor at Bin #2 with necessary information to calculate the approximate feed weight and height.

(9) **Diameter** - Feed Bin #2 diameter = 6, 7, or 9 ft.

(10) **Cap Angle** - Feed Bin #2 cap angle at the top of the bin = 30° or 40°

(11) **# of Rings** - Feed Bin #2 number of rings = 1, 2, 3, 4, or 5

(12) **Ring Height** - Feed Bin #2 ring height = Measurement from the top/center of one ring to the top/center of the next ring.

(13) **Feed wt** - Feed Bin #2 feed weight = The feed weight is calculated by using the entered bin size information and the current feed level module results.

(14) **Bin ht** - Feed Bin #2 bin height = The bin height is calculated by using the entered bin size information.

### 7.5 Ventilation Inlets

The Static Pressure setting sets the parameters necessary to operate the vents.

1. **Vent Anticipation** - When vent anticipation is turned ON, the vents will start opening before a negative ventilation stage turns on and continue to open until the vent opening necessary for the desired target pressure is achieved.

2. **Learn Times** - When learn times “Yes” is selected, the controller will automatically adjust the time (seconds) before and after the fans turn ON depending on the static pressure. NOTE: This feature is disabled in Optimum Mode.

3. **Time before fan starts** - The number of seconds before a negative ventilation stage turns ON that the vents will start opening.

4. **Time after fan starts** - The number of seconds after a negative ventilation stage turns ON that the vents will continue to open allowing the fans to increase to full speed.

5. **Reaction Delay** - The amount of time delay before the vent machine operates.

6. **Pressure Differential** - Number from target to start opening and closing vents.

Example: With Target 0.07 and Differential 0.02, the vents open when the pressure is above 0.08; The vents will close when the pressure is below 0.06.

7. **Attic Inlets Installed** - Select Yes or No; If Attic Inlets are installed, select Yes. Refer to Application Note # 4809-0011 for complete application details regarding the Inlet Operation with Attic Vents.

8. **Pressure Ramping** - Select On or Off to enable or disable pressure ramping.

9 & 10 **Target Press. @ High Temp** - The target pressure when the outside temperature is at the high temperature limit. Set both pressure and temperature limit.

11 & 12 **Target Press. @ Low Temp** - The target pressure when the outside temperature is at the low temperature limit. Set both pressure & temperature limit.

13 & 14 **Attic Pressure** - When the Attic Inlets Installed = “Yes”, the target pressure will be the selected pressure when the outside temperature is at the selected temperature. Set both pressure & temperature. The Attic Inlets become active when either the Outside Temperature is at or below the selected Attic Temperature OR any Heat Stage is activated. The Attic Inlets will remain active until the averaged house temperature reach the selected Tunnel Off-Point Temperature. After the Tunnel Off-Point Temperature is reached, the Attic Inlets will be disabled and remain disabled until any Heat Stage is activated.
7.6 Natural Ventilation

Natural Ventilation options are:

1. **Allow Natural Ventilation** – Yes or No. This must be set to yes before the control is allowed to enter into natural ventilation.

2. **Current** – This is the value currently being used derived from the cool and warm settings.

3. **Cool** – The desired operational settings for a cooler outside temperature.

4. **Warm** – The desired operational settings for warm outside conditions which would be very near the target temperature.

5. **Temp Diff (In-Out)** – The Temperature Differential which is the inside target minus the outside temperature.

6. **Cycle Time** – The length of time in minutes between the start of one curtain position adjustment, and the start of the next curtain position adjustment. (A Cycle time of 3 means that the curtain will move up or down, or remain stationary, depending upon temperature for its runtime once every 3 minutes).

7. **Initial Drop Delay** – The number of cycles that the curtain will be delayed after the Initial Drop.

8. **Initial Run Time** – When the controller determines that the curtains should run open and senses that they are closed, it uses this parameter for the 'first' run. This setting is used to allow the curtains to open enough on the first run to guarantee adequate ventilation.

9. **Open Run Time** – Period of time the curtain will run open each cycle.

10. **Close Run Time** – Period of time the curtain will run close each cycle.

11. **Aggressive Range** – If this Temperature limit is exceeded, the run times of the stages are doubled.

   NOTE: If the temperature is at the open setting, the control will run the machine for the runtime you have set. As the temperature moves up, your runtime will also increase. The runtime may ramp up to two times the selected Run Time depending on the amount of temperature difference past the Open or Closed set temperatures. As the temperature gets closer to the Aggressive Range tolerance, the Run Time gets closer to the maximum two times Run Time. Your runtime will have doubled once the temperature reaches the set Aggressive Range/tolerance. This is also true for the close side of the curtain machine.

12. **#** - Identify either Unit #1, Unit #2, Unit #3, or Unit #4.

13. **Sensors** – Identify the sensors used by the controller. This will be the sensor that the curtain machine will operate from. Active sensors will be indicated by a number starting with #1 from right to left. Inactive sensors will be indicated by a - or hyphen. When "outside-" is displayed, outside sensor is active. To use sensors 1, 2 and 3, "-----321" should be displayed. See (7).

14. **Mode** – Natural (NAT).

15. **Open** – This will be the temperature at which your curtain will open for natural ventilation.

16. **Close** – This will be the temperature at which your curtain will close from natural ventilation and start it back to minimum ventilation.
7.7 Growout Curve

The Growout Curve is used to adjust the temperatures and/or minimum vent requirements automatically by the grow-out day. The specific Growout Curve screen features and setting options will depend on whether the Optimum Mode feature is turned ON or OFF. The Optimum Mode feature is selected by entering “Program Setup” and then “General Settings”. Refer to Section 7.1.

7.7.1 Growout Curve With Optimum Mode OFF

(1) Number of Points – Select 2 through 10 points.
(2) Ramping – Select On or Off to enable or disable ramping.
(3) Preheat Target – Target Temperature for preheating.
(4) Preheat – On or Off. Preheat allows the controller to run the target to a higher set target temperature for preheating the house.

<table>
<thead>
<tr>
<th>POINT</th>
<th>DAY</th>
<th>TARGET</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>90.0°</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>88.0°</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
<td>86.0°</td>
</tr>
<tr>
<td>4</td>
<td>15</td>
<td>84.0°</td>
</tr>
<tr>
<td>5</td>
<td>20</td>
<td>82.0°</td>
</tr>
<tr>
<td>6</td>
<td>25</td>
<td>80.0°</td>
</tr>
<tr>
<td>7</td>
<td>30</td>
<td>78.0°</td>
</tr>
<tr>
<td>8</td>
<td>35</td>
<td>76.0°</td>
</tr>
<tr>
<td>9</td>
<td>40</td>
<td>74.0°</td>
</tr>
<tr>
<td>10</td>
<td>45</td>
<td>72.0°</td>
</tr>
</tbody>
</table>

(5) Target Temperature Differential – When enabled, this feature will adjust the target temperature either higher or lower by the selected number of degrees during the selected time of day.

a. Enabled – Select Yes to enable or No to disable Target Temperature Differential.
b. Target Adjust – The desired degrees above or below the Target Temperature.
c. Adjust Between – The selected time of day for which the Target Temperature Differential will occur.

**TEMPERATURE RAMPING**

(1) Number of Points = 10
(2) Ramping = Off
(3) Preheat Target = 95.0°
(4) Preheat = Off
(5) Target Temperature Differential

TARGET TEMPERATURE DIFFERENTIAL

(a) Enabled = Yes
(b) Target Adjust = +5.0°
(c) Adjust Between 11:00a and 1:00p
(6) **Point** – This table identifies the specific points. You are allowed up to 10 points at which you can change the target at these points. This allows you to keep the same target for a couple of days and then start ramping down. When the target temperature changes in the Target column, that target will start the day that is in the Growout day column.

(7) **Day** – The day of growout that starts the set Target Temp.

(8) **Target** – Set the specific target temperature for each of the growout days.

**NOTE:** The graph below shows an example of how the EV would adjust the target temperature based on the growout day.

![Graph showing target temperature adjustments](image-url)

### 7.7.2 Growout Curve With Optimum Mode ON

If Optimum Mode is enabled, the grow-out curve screen will expand to the following form. In addition to the Target Temperature Curve, the table expands to include a Heat Adjustment (HEAT AJST), a Tunnel Adjustment (TUNNEL AJST), a maximum number of tunnel fans, a minimum runtime percentage, and a minimum vent level. These allow the grower more automation when it comes to setting up their controller for the entire grow-out.

![Growing Curve Table](image-url)

<table>
<thead>
<tr>
<th>DAY</th>
<th>TARGET</th>
<th>HEAT AJST</th>
<th>TUNNEL AJST</th>
<th>FANS</th>
<th>BASE%</th>
<th>ACTIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>90.0°</td>
<td>-0.0°</td>
<td>+0.0°</td>
<td>2</td>
<td>10%</td>
<td>--6-4--</td>
</tr>
<tr>
<td>5</td>
<td>88.0°</td>
<td>-0.0°</td>
<td>+0.0°</td>
<td>2</td>
<td>10%</td>
<td>--6-4--</td>
</tr>
<tr>
<td>10</td>
<td>86.0°</td>
<td>-0.0°</td>
<td>+0.0°</td>
<td>3</td>
<td>10%</td>
<td>--6-4--</td>
</tr>
<tr>
<td>15</td>
<td>84.0°</td>
<td>-0.0°</td>
<td>+0.0°</td>
<td>3</td>
<td>10%</td>
<td>--6-4--</td>
</tr>
<tr>
<td>20</td>
<td>82.0°</td>
<td>-0.0°</td>
<td>+0.0°</td>
<td>4</td>
<td>10%</td>
<td>--6-4--</td>
</tr>
<tr>
<td>25</td>
<td>80.0°</td>
<td>-0.0°</td>
<td>+0.0°</td>
<td>5</td>
<td>10%</td>
<td>--6-4--</td>
</tr>
<tr>
<td>30</td>
<td>78.0°</td>
<td>-0.0°</td>
<td>+0.0°</td>
<td>6</td>
<td>10%</td>
<td>--6-4--</td>
</tr>
<tr>
<td>35</td>
<td>76.0°</td>
<td>-0.0°</td>
<td>+0.0°</td>
<td>7</td>
<td>10%</td>
<td>--6-4--</td>
</tr>
<tr>
<td>40</td>
<td>74.0°</td>
<td>-0.0°</td>
<td>+0.0°</td>
<td>8</td>
<td>10%</td>
<td>--6-4--</td>
</tr>
<tr>
<td>45</td>
<td>72.0°</td>
<td>-0.0°</td>
<td>+0.0°</td>
<td>9</td>
<td>10%</td>
<td>--6-4--</td>
</tr>
</tbody>
</table>

(1) **Number of Points** – Select 2 through 10 points.

(2) **Ramping** – Select On or Off to enable or disable ramping.

(3) **Preheat Target** – Target Temperature for preheating.

(4) **Preheat** – On or Off. Preheat allows the controller to run the target to a higher set target temperature for preheating the house.
(5) **Target Temperature Differential** – When enabled, this feature will adjust the target temperature either higher or lower by the selected number of degrees during the selected time of day.

   a. **Enabled** – Select Yes to enable or No to disable Target Temperature Differential.

   b. **Target Adjust** – The desired degrees above or below the Target Temperature.

   c. **Adjust Between** – The selected time of day for which the Target Temperature Differential will occur.

(6) **Max Reduction of Opt%** – The Evolution 4000 can reduce the optimum timers run time when the outside temperature falls below room temperature. This value is the maximum reduction allowed for this feature. The maximum is reached when the outside temperature is 40 degrees F below room temperature. From 0% up to 50% may be selected.

(7) **Day** – This table identifies the specific days of growout that starts the Target Temp. You are allowed up to 10 points at which you can change the target at these points. This allows you to keep the same target for a couple of days and then start ramping down. When the target temperature changes in the Target column, that target will start the day that is in the Growout day column.

(8) **Target** – Set the specific target temperature for each of the growout days. The target temperature ramps between growout days.

(9) **Heat Adjust** – Set the specific heat adjustment for each of the growout days. A young flock requires a tightly controlled and heated environment. As the flock grows older, heat is less important. The Heat Adjust feature ramps between growout days and saves heating costs by allowing the heaters to run less frequently and only turn on at cooler temperatures as the flock grows older. The Heat Adjust is the set amount (-x.x°) below the heat stages ON point at which the heat stages will operate. Refer to the following example charts and figures.

(10) **Tunnel Adjust** – Set the specific tunnel adjustment for each of the growout days. Older flocks require a tightly controlled and more cooled environment. As the flock grows older, fan cooling is more important. The Tunnel Adjust ramps between growout days and is the set amount (-x.x°) above the tunnel temperature at which the controller will allow tunnel ventilation. **NOTE:** The ON point for all cool tunnel stages will also be increased by this amount. Refer to the following example charts and figures.

(11) **Tunnel Fans** – The desired maximum number of Tunnel Fans which are allowed to turn On for the specific growout day. This refers to stages programmed as Cool Negative Tunnel or Cool Tunnel.

(12) **Optimum Timers Base %** – Set the specific minimum vent base % for each of the growout days. The Base % is the percentage of the Minimum Timer Cycle that the stage will run. This percentage ramps between growout days.

(13) **Optimum Timers Active** – This setting is used in conjunction with the 8 optimum timers. In addition to each stage being able to operate on a Min1, Min2, VAR, or Cool Timer, they now also have the option of being programmed to use an Optimum Timer (OPTx). These are labeled as OPT1, OPT2, …, OPT8. This setting relates to which of these OPTx timers are allowed to operate at this time. The OPTx timer uses the optimum timer percentage that is calculated by the controller with the run% being its minimum. This setting allows the user to add additional fans to their minimum ventilation as the animals age or even change fans completely.

**NOTE:** The following graphs and figure shows examples of how the EV Optimum Mode would adjust the target, heat, and tunnel temperatures, minimum run %, and vent level based off of the growout days and target temperatures.
EXAMPLE OF

Optimum Growout Curve

<table>
<thead>
<tr>
<th>DAY</th>
<th>TARGET</th>
<th>HEAT AJST</th>
<th>TUNNEL AJST FANS</th>
<th>MINIMUM VENT Run %</th>
<th>LEVEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>92.0°</td>
<td>-0.0°</td>
<td>+7.0°</td>
<td>2</td>
<td>10%</td>
</tr>
<tr>
<td>7</td>
<td>89.0°</td>
<td>-1.0°</td>
<td>+7.0°</td>
<td>2</td>
<td>10%</td>
</tr>
<tr>
<td>14</td>
<td>85.0°</td>
<td>-2.0°</td>
<td>+6.0°</td>
<td>3</td>
<td>20%</td>
</tr>
<tr>
<td>21</td>
<td>80.0°</td>
<td>-3.0°</td>
<td>+4.0°</td>
<td>4</td>
<td>30%</td>
</tr>
<tr>
<td>28</td>
<td>76.0°</td>
<td>-4.0°</td>
<td>+3.0°</td>
<td>5</td>
<td>35%</td>
</tr>
<tr>
<td>35</td>
<td>72.0°</td>
<td>-5.0°</td>
<td>+2.0°</td>
<td>6</td>
<td>40%</td>
</tr>
<tr>
<td>42</td>
<td>70.0°</td>
<td>-6.0°</td>
<td>+1.0°</td>
<td>8</td>
<td>40%</td>
</tr>
<tr>
<td>49</td>
<td>68.0°</td>
<td>-8.0°</td>
<td>+0.0°</td>
<td>10</td>
<td>40%</td>
</tr>
</tbody>
</table>

DAY 4

DAY 42
7.8 **Tunnel Ventilation**

The Tunnel Setup screen sets the parameters necessary to operate in the Tunnel mode.

(1) **Target** – Displays the target temperature of the building.

(2) **Tunnel Enabled** – Select either Yes or No to enable or disable going into the Tunnel mode.

(3) **Sensors** – The user is given the choice as to what sensors will be used to enter and exit Tunnel Mode; select any or all of the available sensors. To use the outside sensor when entering tunnel set the sensors to display the word “outside” by turning all the sensors off.

(4) **Tunnel ‘On Sensors’** – Selectable for 1-8 sensors. Select the sensors used for entering Tunnel Mode.

(5) **Tunnel ‘On Temperature’** – The temperature at which the controller will go into tunnel mode.

(6) **Tunnel ‘Off Sensors’** – Selectable for 1-8 sensors. Select the sensors used for exiting Tunnel Mode.

(7) **Tunnel ‘Off Temperature’** – The temperature at which the controller will go out of tunnel mode.

(8) **Use Tunnel Target Pressure** – Yes or No. This will allow a different Target Pressure to be used in the Tunnel mode.

(9) **Enable Tunnel Inlet #2** – Yes or No. Select YES if you have two separate Tunnel Inlet Machines.

(10) **Enable Low Pressure Alarm in Tunnel** – Yes or No. Set to Yes if it is desired to use a low pressure alarm while in the tunnel mode.

(11) **Increase High Temperature Limit +##° in Tunnel** – While in the tunnel mode the Evolution 4000 can adjust the High Temperature Limit. Enter the number of degrees that the limit is to be increased while in the tunnel mode. This increase will only be used while in tunnel.

(12) **Tunnel Timeout** – This feature prevents the controller from flip-flopping in and out of tunnel and also provides a means for the controller to retry tunnel ventilation after a tunnel error. The Tunnel Timeout counter forces the controller to wait at least 30 minutes between tunnel initiation. For example, if the controller is in tunnel and an error occurs, the controller will reload the tunnel timeout, exit tunnel ventilation, and sound the alarm. After the tunnel timeout expires, the controller will reset the tunnel error, turn off the alarm, and if the conditions allow, retry tunnel ventilation. The tunnel timeout will be reset during a power-on reset or if the Tunnel Enable is toggled from off to on. As long as “30:00” is displayed, tunnel ventilation is allowed. If it is in process of counting, then it is not allowing tunnel ventilation at this time due to a previous error or because it has recently made an attempt.

7.9 **ON/OFF Stages**

You must select the set of stages you want to set or edit. NOTE: When programming stages you are allowed to edit the settings from the main screen. You are also allowed to go into each stage and see a detailed screen. To do this have a stage number highlighted and then press enter.

(1) **Target** – Displays the current set Target Temperature.

(2) **Stage #** - Stage Numbers.

NOTE: Highlight and press ENTER to bring up details on each stage.
### Sensors
The sensors which may be used to control the ON or OFF point of a stage. Sensors 1 thru 8 may be selected or unselected for each stage. The specific stage will operate from the selected sensor/sensors.

Active sensors will be indicated by a number starting with #1 from right to left. Inactive sensors will be indicated by a - or hyphen. When "outside-" is displayed, the outside sensor is active. To use sensors 1,2 and 3, "-----321" should be displayed.

### Mode
This mode column will indicate how the stage is programmed to operate.

- **OFF** Disables stage from operating during automatic operation.
- **Heat** Heat Mode: This method of heating only operates when the curtains are in the closed position and the operating sensor is below the on temperature.
- **CSTIR** Cool Stir Mode: This mode setting allows the cool stage to run whether the main curtain is open or closed.
- **CNEG** Cool Negative: Method of ventilation where air is drawn out of the building by fans, creating a negative static pressure which draws air into the house from all openings at a even pace. Will not operate in Tunnel or Nat.
- **CNEG T** Cool Negative Tunnel: A combination of the Cool Negative and the Cool Tunnel Modes.
- **CTUN** Cool Tunnel: Only operate during Tunnel operation with one exception being set as a minimum ventilation timer which will allow the stage to operate on a timer only, in minimum or power ventilation.
- **LIGHT** The LIGHT Mode: See Section 7.13.
- **FEED** The FEED mode: See Section 7.12.
- **CEVAP** Cool Evaporative mode: See Section 7.11.6
- **CHEAT** Cooler Heat mode: Heat stage for the Cooler.
- **CCOOL** Cooler Cool mode: Cool stage for the Cooler.
- **CHUM** Cooler Humidity mode: Humidifier for the Cooler.
- **ATTIC** Attic mode: Inlet Stage for the Attic Ventilation.
- **VENT** Vent mode: See Section 7.5.
- **TUN1** Tunnel #1 mode: See Section 7.8.
- **TUN2** Tunnel #2 mode: See Section 7.8.
- **NAT1** Natural #1 mode: See Section 7.6.
- **NAT2** Natural #2 mode: See Section 7.6.
- **NAT3** Natural #3 mode: See Section 7.6.
- **NAT4** Natural #4 mode: See Section 7.6.

### ON/OFF
The ON column will indicate the current setting for the onpoint temperature of the stage. Set this to the temperature you would like for the stage to come on at. The OFF column will indicate the current setting for the offpoint temperature of the stage. Set this to the temperature you would like for the stage to turn off at.

### TIMER
None, Min1, Min2, Var, Cool, OPT1-OPT8 This Timer column will indicate what type of timer you want the stage to operate from. If the stage doesn't need a timer then you must have this setting to none.

---

### 7.9.1 On/Off Stage Details

1. **ON/OFF STAGE #** – Stage number.
2. **Sensor(s)** – Sensors used.
3. **Mode** – See Section 7.9.
4. **Timer** – See Section 7.9.
5. **On/Point** – See Section 7.9.
6. **OffPoint** – See Section 7.9.
7.10 Variable Stage Outputs

(1) **Target** – Displays the target temperature.

(2) # - Identifies the Variable Stage unit below.

(3) **Sensors** – The selected sensor(s) to operate. Active sensors will be indicated by a number starting with #1 from right to left. Inactive sensors will be indicated by a - or hyphen. When "outside-" is displayed, outside sensor is active. To use sensors 1, 2, and 3, "-----321" should be displayed.

(4) **Mode** – CSTIR, CNEG, CNEGT, CTUN, LIGHT. NOTE: This mode column will indicate how the stage is programmed. You are allowed to set any stage at any of these modes. When the stage is used to control lighting then you must set the mode and curve to Light.

(5) **MaxON** – This MaxON column will indicate the current setting for the Maximum onpoint temperature of the stage. Set this to the temperature you would like for the stage to reach the desired maximum speed.

(6) **MinON** – This MinON column will indicate the current setting for the Minimum onpoint temperature of the stage. Set this to the temperature you would like for the stage to start running its minimum speed setting. Minimum speed setting is set at the Minimum Vent screen of the Navigator.

(7) **Curve** – This is the motor curve for the variable speed fans. If you are using the stage for lights then make sure the curve is set for Light.

  - **Light** Run lights. Sets light intensity to vary linearly with time.
  - Fan 1 For use with Hired Hand’s line of Funnel Flow fans that are 24” or less. Also, line voltage must be single phase.
  - Fan 2 For operation of 36” fans. The power distributed at each percentage is somewhat greater than that of Curve 1. Therefore, the speed will be a little greater than that of Curve 1.
  - Fan 3 For 3-Phase systems. Its purpose is to shift the voltage curve to give a much higher power from the varied phase. Conditions that would warrant the use of this curve is a variable speed fan that varies a great deal from 100% speed to 95% speed.
  - Fan 4 For 3-Phase systems. Its purpose is to shift the voltage curve to give much less power from the varied phase. Conditions that would warrant the use of this curve is a variable speed fan that varies very little from 100% speed to 5% speed.
  - Fan 5 For use with Hired-Hand’s newest Emerson fan motor, these motors are typically used on fans that are 24” or smaller.

(8) **Time** - None, Min1, Min2, Var, Always ON. This Timer column will indicate what type of timer you want the stage to operate from. If the stage doesn't need a timer then you must have this setting to none. Always ON sets the fan to always run at Minimum speed when operating temperature is below the set Minimum ON temperature.

---

**NOTE:** Highlight and press ENTER to bring up details on each stage.
**Stage Properties**

The Stage Properties screen is where you link to set up specific parameters for the heating and cooling modes.

Stage Properties gives you a definition of how a stage will operate and allows you to add additional variables to some of the properties.

1) Heat Properties – See Section 7.11.1
2) Cool Stir Properties – See Section 7.11.2
3) Cool Negative Properties – See Section 7.11.3
4) Cool Negative Tunnel Properties – See Section 7.11.4
5) Cool Tunnel Properties – See Section 7.11.5
6) Cool Evaporative Properties – See Section 7.11.6
7) Natural Ventilation Properties – See Section 7.11.7

**Heat Properties**

There is one heat property to be setup. Set to “Yes” if it is desired to operate the heat stage only during minimum ventilation. Otherwise the control will allow a heat stage to operate at the same time a cool stage is operating if they are looking at different sensors.

**Cool Stir Properties**

This allows stir fans to act as mixing fans during tunnel ventilation.

1) Allow to operate in Tunnel – Select Yes or No. 
   YES = The stir fans operate in any ventilation mode.
   NO = The stir fans will NOT operate during tunnel ventilation.

**Cool Negative Properties**

The following parameters can be set:

1) Transitional Stage Override – Yes or No
2) Override on Stage – Set to an available Stage Number.

This feature is used to turn Cool Negative Fans off before entering tunnel ventilation.

Functionality: When the Override is set (Override on Stage # XX) to a specific Cool Negative Tunnel Stage, the Stage turns all of the Cool Negative Fans OFF when the Stage comes ON.

Example: Turning 36” Sidewall Fans OFF when a 48” Negative Tunnel Fan comes ON while still pulling air through the vent boards.
7.11.4 Cool Negative Tunnel Properties

There are no additional parameters that can be set under this property display.

** Cool Negative Tunnel Properties **
These stages typically operate endwall fans since they are allowed to operate during both Power and Tunnel Ventilation.

7.11.5 Cool Tunnel Properties

The Cool Tunnel Properties provide for setting override functions. Take note when setting the properties. All options must be true before the stage is allowed to operate.

For example if all options are set to Only While, then all options will have to be true or in the range before the stage is allowed to operate. NOTE: Override parameter settings are "Only While" and "Always".

(1) **Time Override** – When set to Only While, the Time Override will allow the stages to operate only while the time is between the times you set. Otherwise when set to Always, the time will not affect the stages.

(2) **Growout Day Override** – During the first days of the growout period, especially during brooding, the Evolution 4000 can be set to only allow the cool tunnel stages to operate after a specified number of days in the growout period. When set to Only While, the Growout Day Override will allow the stages to operate only while the growout day is greater than the day you set. Otherwise when set to Always, the day of growout will not affect the stages.

(3) **Outside Temperature Override** - When set to Only While the Outside Temperature Override will allow the stages to operate only while the outside temperature is greater than the target plus or minus the desired setting. Otherwise when set to Always the outside temperature will not affect the stages.

** Cool Tunnel Properties **
These stages typically operate endwall fans only needed for tunnel Ventilation.

The following are additional properties:

(1) Time Override: 
Allow to operate Only While
Time falls between: 2:00p - 2:20p

(2) Growout Day Override: 
Allow to operate Always
Growout day > 14

(3) Outside Temperature Override: 
Allow to operate Always
Outside Temperature > Target +10.2°
7.11.6 Cool Evaporative Properties

Cool Evaporative Properties allow for setting several override functions. Take note when setting the properties. All options must be true before the stage is allowed to operate.
For example if all options are set to Only While, then all options will have to be true or in the range before the stage is allowed to operate.

(1) Only Operate During Tunnel Vent – Setting this to “Yes” will only allow the evaporative cooling stages to operate during tunnel. Otherwise on “No” will allow the stages to operate while not in tunnel. For example on misting Hogs during natural ventilation.

(2) Time Override – When set to Only While, the Time Override will allow the stages to operate only while the time is between the times you set. Otherwise when set to Always, the time will not affect the stages.

(3) Humidity Override - Run while humidity is less than XX%. When set to Only While, the Humidity Override will allow the stages to operate only while the humidity is less than the humidity you set. Otherwise when set to Always, the humidity will not affect the stages.

(4) Growout Day Override - When set to Only While, the Growout Day Override will allow the stages to operate only while the growout day is greater than the day you set. Otherwise when set to Always, the day of growout will not affect the stages.

(5) Outside Temperature Override - When set to Only While, the Outside Temperature Override will allow the stages to operate only while the outside temperature is greater than the target plus or minus the desired setting. Otherwise when set to Always, the outside temperature will not affect the stages.

7.11.7 Natural Ventilation Properties

(1) Time Override - When set to Only While, the Time Override will allow the Natural Curtain Stages to open while the time is between the times you set. Otherwise when set to Always, the time will not affect the Natural Curtain Stages.

(2) Growout Day Override - When set to Only While, the Growout Day Override will allow the Natural Curtain stages to operate only while the growout day is greater than the day you set. Otherwise when set to Always, the day of growout will not affect the stages.

(3) Outside Temperature Override - When set to Only While, the Outside Temperature Override will allow the stages to open only while the outside temperature is greater than the target plus or minus the desired setting. Otherwise when set to Always, the outside temperature will not affect the stages.
7.12 **Setup Feed Clocks**

The Feed Clock Setup establishes the parameters necessary to enable automatic feed control functions.

1. **Feed Cycle Light Override** – Turns the lights to a set intensity while running the feed program.
2. **Feed Cycle Light Intensity** – Sets the light intensity percentage to occur during the feed cycle.
3. **Growout Schedules Used by Ramp** - Set the number of growout schedules up to five.
4. **Schedule** – The schedule number will automatically be set by Evolution.
5. **Start Day** - Displays the growout day on which the selected schedule will start. The Start Day is settable on the Schedule screen.

7.12.1 **Feed Clock Schedules**

The Feed Clock Schedules screen contains options for the feeding period daily cycles, skip days and runtimes.

Select the individual schedules in the Feed Clock Setup screen.

This screen is also available from the Target Conditions screen as described in Section 6.2.

1. **Feed Schedule** – The feed schedule selected from the Feed Clock Setup screen will appear here.
2. **Start Day** – Set the growout day in which the specific schedule starts.
3. **Number of On/Off Cycles** – Enter the number of On/Off cycles desired (up to ten).
4. **Days in Operation** – This setting is used for special feeding cycles running the feed only every other day if set to odd or even days.
   - **Every Day** – No days skipped.
   - **Odd Days Only** – Runs the feed cycles ONLY on the ODD growout days (1, 3, 5, 7, etc.).
   - **Even Days Only** – Runs the feed cycles ONLY on the EVEN growout days (2, 4, 6, 8, etc.).
   - **Selected Days** – Runs the feed cycles only on the selected days chosen in item 5.
   - **Two On / One Off** – The controller will feed two days straight starting on Day 1 of the growout then it will be off for one day. The cycle will then repeat for the entire growout.
   - **One On / Two Off** – The controller will feed one day starting on Day 3 of the growout and be off for the next two days. The cycle will then repeat for the entire growout.
5. **Choose Days** – Select the specific days for operation. Used only when Days In Operation item 4 is set to “Selected Days”.
6. **Cycle** – This identifies the feed cycle.
7. **Start** – Enter the start time in hours and minutes of the feed schedule cycle.
8. **Runtime** – Enter the length of time in hours and minutes for the feeding cycle.
7.13 Setup Light Clocks

The Light Clock Setup establishes the parameters necessary to enable automatic control of the house lights. On each Schedule you will need to program a start day of when you want the control to start using this schedule. Then you will need to set the number of on/off cycles. This is how many times the light clock needs to come on in a 24-hour period. You are allowed 10 on/off cycles. Then you set the start time of each cycle and how long that cycle needs to run. When you are using a variable speed stage for the lights you are allowed to set the intensity and ramp. The intensity is the level you want the lights to be on when your cycle comes on. The ramp allows the light ramp up and down from off to the intensity you have set. The ramp applies at the beginning and the ending of the light cycle.

(1) Feed Cycle Light Override - Turns the lights to a set intensity while running the feed program.
(2) Feed Cycle Light Intensity - Set the light intensity percentage to occur during the feed cycle.
(3) Growout Schedules used by Ramp 1-4 - Set the number of schedules from one up to five. The next schedule will start after you have reached the growout day that your schedule starts on.
(4) Schedule - The schedule number will automatically be set by Evolution. After the number of Schedules have been set you will need to setup each schedule.
(5) Start Day - The starting day of each schedule.

7.13.1 Light Clock Details

Select the individual cycle in the Light Clock Details screen and enter the start day time that lighting is to begin and the length and intensity of the lighting period. This screen is also available from the Target Conditions screen as described in Section 6.2.

(1) Light Schedule - The selected schedule.
(2) Start Day - Set to the growout day to start program.
(3) Number of On/Off Cycles - Enter the number of On/Off cycles desired (up to ten).
(4) Cycle - The selected cycle within the schedule.
(5) Start - The start time of the lighting cycle.
(6) Runtime - The runtime of the lighting cycle. (hours : minutes)
(7) Intensity - Set the intensity of the lights from 0% to 100%. (For use with variable units only).
(8) Ramp - If it is desired to ramp the lights, that is to slowly turn the lights on and off, enter the time period (hours:minutes) over which to turn the lights on and off (For use with variable units).

7.14 Seasonal Programs & Security

The Seasonal Programs & Password Setup screen is used to change programs, copy the settings of one program into another program or set the password to access applicable screens.
7.15 Diagnostics

The Diagnostics screen is for qualified technician use only and can only be changed by using the service code. Contact the local dealer for assistance.

(1) Power Ventilation Auxiliary SWX - Setting these options to Yes will ignore the indication from the curtain switch. This feature will totally ignore the auxiliary switches on the PT machines when answered yes.

Note: This must be answered 'No' and the open auxiliary switch of the vent machine must be connected in order to use the feature of running the tunnel curtain with the vents during Power ventilation when the pressure is to high and the vents are completely open.

(2) Ignore Inlet #1 Auxiliary Switch - Yes or No

(3) Ignore Inlet #2 Auxiliary Switch - Yes or No

(4) Ignore Inlet #3 Auxiliary Switch - Yes or No

(5) Ignore Inlet #4 Auxiliary Switch - Yes or No

(6) Natural Ventilation Auxiliary SWX - Setting these options to Yes will ignore the indication from the curtain switch. This feature will totally ignore the auxiliary switches on the PT machines when answered "Yes".

Note: The auxiliary switches must be connected and this answered to no in order for the control to enter into natural ventilation.

(7) Ignore Unit #1 Auxiliary Switch - Yes or No

(8) Ignore Unit #2 Auxiliary Switch - Yes or No

(9) Feed Level Sensor – Settings for setting the maximum range and calibration of the feed level sensor.

(10) Maximum Range - Total sensing range of the sensor.

(11) Dead Zone - Distance from the top of the feed bin to the bottom of the sensor.
(12) **Soft Resets** - For HHI Use Only. Indicates that the control is sensing environmental problems which can cause controller malfunctions.

(13) **Voltage Resets** - For HHI Use Only.

(14) **Hard Resets** - For HHI Use Only.

(15) **Analog and Digital Input Status** – For HHI Service Technician Use ONLY.

**A/D Readings:**
These values will be used to troubleshoot your controller by a qualified service technician in the event that a problem occurs with your PCB194 I/O board or connected analog and digital input devices.
The display view shown below is the bottom portion of the Program Setup > Diagnostics screen. These values represent the information being received from various I/O connections.

- **Temp 1 through Temp 8** and the **Outside Temp** will display Analog-to-Digital values which represent the temperature for the specific temperature sensor. The value may be from 0-256. Refer to the A-to-D / Temperature chart provided in Section 10.
- **Humidity 1** and **Humidity 2** will display Analog-to-Digital values which represent the humidity for the specific Humidity Sensor. The value may be from 0 to 256 (0-100% Relative Humidity).
- **Feed 1** and **Feed 2** will display Analog-to-Digital values which represent the current feed level for the specific feed bin. The value may be from 0-256. Refer to the Feed Level Sensor Inputs chart below.
- The **GP 1** analog input is a spare input which can be used for alternate analog devices. The value may be from 0-256.
- The **Vent Opened**, **Tunnel Closed**, **Curt 1/2/3/4 Closed**, **Water 1&2**, **Run 1&2** are all digital inputs which are toggled from either No to Yes or from Off to On by an open circuit or closed circuit (shorted condition to ground). The conditions shown in the sample display window below are with open circuits or otherwise unconnected terminal blocks. The terminal block Natural Auxiliary U1 Close (Curt 1) & U2 Close (Curt 2) are quickly identified although Curt 3 and 4 connections are located at Vent Auxiliary Close (Curt 3) and Tunnel Auxiliary Open (Curt 4).

### Feed 1 & Feed 2 - Feed Level Sensor Inputs

<table>
<thead>
<tr>
<th>Range</th>
<th>Status</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-24</td>
<td>Bin is full</td>
<td>Feed is on or above proximity rod.</td>
</tr>
<tr>
<td>25-57</td>
<td>Loss of Echo</td>
<td>Bin may be empty or a sensor error.</td>
</tr>
<tr>
<td>58-239</td>
<td>Sensing Feed</td>
<td>Value should be based on level of feed with 58 being approximately full.</td>
</tr>
<tr>
<td>240-255</td>
<td>Error</td>
<td>Could represent empty but probably a defective sensor.</td>
</tr>
</tbody>
</table>

**Feed 1 = Bin 1**

**Feed 2 = Bin 2**
7.16 **SD Card Operations**

7.16.1 Save/Load Programs

Saving one controller's program settings and downloading those settings to another controller is easily achievable using a SD memory card. Insert the SD card into the PCB197 Control Board and refer to the Load and Save instruction screens for step-by-step details. Notice that specific settings as shown will not be copied and must be reviewed. All remaining settings are loaded from the SD Card but must be reviewed to ensure that the settings are correct for your current setup and livestock age. This Save/Load feature is available on software version 0.12 and later.
** SD Card Operations **

- Save/Load Programs
  - Load Program from SD Card
  - Save Program to SD Card
- Update Controller Software Version

** OR **

- Save Program to SD Card
- Load Program from SD Card

** WARNING:** The following settings are not included as part of the program loaded from the SD card and will need to be verified: Date, Day, Time, Vent Anticipation (Time before fan starts & Time after fan starts), and HHNet Address.

The following settings are loaded from the SD Card but should be reviewed to ensure that the settings are correct for your current setup and livestock age: Tunnel Enabled, Backup Enabled, & Sensor Setup.

Any time that you load a program, you should verify that all settings are correct. After you review Sensor Setup (Refer to Section 7.3), you will be returned to the Program Setup Screen (Refer to Section 6.7).

** Load / Save Instruction Screens **

** Loading Program... **

** Load Program Complete. **

** NOTE:** The number of Values Saved is a number which may vary for different software versions. Values Saved is the specific number of settings copied from the controller.

** WARNING:** The following settings are not included as part of the program loaded from the SD card and will need to be verified:

- Date: 26 Jan 2010
- Day: Tue
- Time: 1:08p
- Vent Anticipation:
  - Time before fan starts = 1 s
  - Time after fan starts = 1 s
- HHNet Address = 1

The following settings are loaded from the SD Card but should be reviewed to ensure that the settings are correct for your current setup and livestock age. Any time that you load a program, you should verify that all settings are correct. After you review Sensor Setup, you will be returned to the Program Setup Screen.

** Tunnel Enabled = Off **
** Backup Enabled = No **
** Sensor Setup: **
7.16.2 Update Controller Software Version

Software upgrades to the main PCB197 control board are downloadable using a computer, SD Card Reader, and a SD memory card. The software upgrade files may be obtained from the local dealer, distributor, or representative.

Requirements:
The following items are required to update the EV4000 PCB197 control board software:
• SD Card (Any common/standard size; 1 Meg or larger. FAT16/32 file system.)
• PC with SD Card Read/Writer

Instructions
1. Obtain the software upgrade files from the local dealer, distributor, or representative. Two files are required to update the PCB197 control board software; “loader.cfg” and “4000vxxx.hex”. The “xxx” will show the current software version.

IMPORTANT: The “loader.cfg” file and “4000vxxx.hex” files are MATCHED FILES WHICH MUST NOT BE SEPARATED AND/OR MODIFIED.

2. Copy (or detach) the 2 files (loader.cfg and 4000vxxx.hex) to the root folder (ex. f:\) of the SD card you are using to update.

IMPORTANT: During the update process, control function is disabled. It is recommended to lock ventilation equipment ON manually using override switches for duration of update process.

3. Software upgrades to the main EV4000 PCB197 control board are downloaded from a standard SD Card. Insert the SD card into the PCB197 Control Board SD card slot.
4. Using the EV4000 Navigator arrow buttons, go to Program Setup (Main System).
5. Using the Editor down arrow button, go to Software Updates and press the ENTER button.
6. Press the Editor down arrow button until HERE is highlighted and then press the ENTER button.
7. This locked screen requires that the unlock password “4000” be entered. Using the Editor + button, enter the unlock password “4000” and press the ENTER button.
8. The screen will then return to the unlocked Evolution Software Update screen. Press the Editor down arrow button until HERE is highlighted and then press the ENTER button.
9. While loading the new version software, the screen will display a progress bar graph until the software upgrade is completed.
** Evolution Software Update **

Select **HERE** if you wish to run the System software updater. You must have an SD card with the updated software inserted into the Evolution SD card socket.

** PASSWORD PROTECTED **

You must enter the current controller password to continue. Press the ENTER button to proceed.

Password: 0000

** SD Card Operations **

Save/Load Programs
- Load Program from SD Card
- Save Program to SD Card

Update Controller Software Version

** IMPORTANT: **

During the update process, control function is disabled. It is recommended to lock ventilation equipment ON manually using override switches for duration of update process.

** NOTE: **

Current Image ID is a unique identifier for the currently installed software revision. Card Image ID is the software revision to be installed.

** NOTE: **

Software Updating Process May Take Up To 10 Minutes.
8. **ALWAYS Back-Up Setting**

This is a new setting for relays introduced in the EV4000. It is used if the EV4000 power is lost. In this case, these stages will turn “ON” (if an Evolution Back-Up System is present). Therefore, this is a good setting for light, feed, or even fans that you would like to turn on in case of a failure. Operation of these outputs could be controlled using the breaker box.

![EV4000 PCB190 Stages Relay Card](image)
9. Wiring Diagrams

9.1 Inside the Evolution 4000 Enclosure

**View of Enclosure**

**Door Assembly**
- Display (6407-6058)
- PCB197 Control Board (6407-1619)
- PCB191 Stage Switch Boards (6407-1614)

**Bottom Assembly**
- PCB194 Input/Output Board (6407-1623)
- PCB198 Power/Isolation Board (6407-1621)
- PCB190 Stage Relay Boards (6407-1612) and Stage Connections

**WARNING!**
Keep All Low Voltage Wires Such As Sensors, Network, & Backup, Curtain Aux Switches Separate From AC Wires!
9.2 Voltage Selection Internal Wiring for the EV4000 Controller

**230 VAC Wiring**

The EV4000 controller is factory prewired for 240 VAC. For 115 VAC Power, disconnect both the orange and yellow wires from the orange jumper then connect the Yellow and Orange wires to the terminal block L1 & L2 as shown above.

**115 VAC Wiring**

The EV4000 controller is factory prewired for 240 VAC. For 115 VAC Power, disconnect both the orange and yellow wires from the orange jumper then connect the Yellow and Orange wires to the terminal block L1 & L2 as shown above.

**WARNING!!**
Ensure the Internal Voltage Selection Wiring is Connected As Required BEFORE Power Is Applied To The Controller.
9.3 Setting Address Switches & LEDs on PCB 191 Stage Board

Inset A

LOCAL NET ADDRESS

Local addresses are assigned by setting a series of three DIP switches on the PCB 191 circuit board. There are three switches that can be set as shown in the above table. For example, if all three DIP switches are set to "ON", the Stages are 1 through 8.

Inset B

D12 - Power (MultiColor LED)
- ORANGE: Both Relay & Logic Power are present.
- RED: Relay Power ONLY is present.

D11 - Board Status (MultiColor LED)
- GREEN: Receiving Data
- RED: Transmitting Data
- ORANGE: Error

Inset B: Light Emitting Diode (LED) Indicators

<table>
<thead>
<tr>
<th>Address Settings</th>
<th>Status</th>
<th>Stages</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWX 1 ON ON ON</td>
<td>1 - 8</td>
<td>9 - 16</td>
<td>25 - 32</td>
</tr>
<tr>
<td>SWX 1 OFF ON ON</td>
<td>17 - 24</td>
<td>33 - 40</td>
<td></td>
</tr>
<tr>
<td>SWX 1 ON OFF ON</td>
<td>41 - 48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SWX 1 OFF OFF ON</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
9.4 Connecting Temperature Sensor to Evolution 4000

**Warning!**
Tape Shields To Prevent Bare Wires From Touching!

**WARNING!**
LOW VOLTAGE!
Keep Separate From High Voltage Wires!

**NOTE:** Other sensors are connected similarly.
9.5 Connecting Static Pressure Sensor to Evolution 4000

WARNING!
LOW VOLTAGE!
Keep Separate From High Voltage Wires!

PCB 198

Remote Static Pressure Monitor

Prewired Connections

Green - Gnd
White - Sig
Red - +12v
9.6 Connecting Humidity Sensor to Evolution 4000

**WARNING!**
LOW VOLTAGE!
Keep Separate From High Voltage Wires!

Refer to 4802-5103 for Additional Humidity Sensor Wiring & Assembly Instructions.
9.7 Connecting HHnet PC Network to Evolution 4000

**WARNING!**
LOW VOLTAGE!
Keep Separate From High Voltage Wires!

HHnet: Light Emitting Diode (LED) Indicators

D7 - RCV (Green LED)
GREEN  | HHnet Receiving Data

D8 – TRMT (Red LED)
RED  | HHnet Transmitting Data

9.8 Connecting Alarm Device to Evolution 4000

**WARNING!**
LOW VOLTAGE!
Keep Separate From High Voltage Wires!

NOTE: The internal wiring shows the condition of the relay during normal conditions (no alarm present). During an alarm condition, the contact positions will be reversed.
9.9 Connecting Water Meter to Evolution 4000

**WARNING!** LOW VOLTAGE!
Keep Separate From High Voltage Wires!

Inset A

Inset B

Inset A

Inset B

Water Meter #1

Water Meter #2
9.10 Connecting Stage Jumpers of Evolution 4000

Pictured below is the 10 stage relay boards consisting of four stage relays per board and the associated stage jumper for each relay. The stage jumpers are labeled ALWAYS, COOL 1, COOL 2, COOL 3, and HEAT. Location of the jumper places the stage in one of these five modes, or if the jumper is NOT inserted, the stage is NOT placed on Back-up. The jumpers should be placed based on the operation of stage equipment and should be the same as assigned in the Master Controller.

Jumpers are placed according to the following table:

<table>
<thead>
<tr>
<th>Stage Operation</th>
<th>Jumper</th>
</tr>
</thead>
<tbody>
<tr>
<td>If EV4000 power is lost, this stage will ALWAYS be ON.</td>
<td>ALWAYS</td>
</tr>
<tr>
<td>Cool Negative</td>
<td>COOL 1</td>
</tr>
<tr>
<td>Cool Negative Tunnel Fan</td>
<td>COOL 2</td>
</tr>
<tr>
<td>Cool Tunnel Fan</td>
<td>COOL 3</td>
</tr>
<tr>
<td>Heat Stage</td>
<td>HEAT</td>
</tr>
<tr>
<td>Stage NOT in Back-up</td>
<td>No Jumper installed</td>
</tr>
</tbody>
</table>

The **ALWAYS** jumper setting is a new setting for relays introduced in the EV4000. It is used if the EV4000 power is lost. In this case, these stages will turn “ON” (if an Evolution Back-Up System is present). Therefore, this is a good setting for light, feed, or even fans that you would like to turn on in case of a failure. Operation of these outputs could be controlled using the breaker box.
9.11 Applying Inlet Stage Labels to the Evolution 4000 Cover Label

The Stages user interface below shows the toggle switches for controlling the 40 stage relay boards. Stages may be set/programmed as inlets to control vents & curtains. When the Manual/Auto toggle switch is placed in Auto position, inlet opens and closes according to programmed instructions. Use the Open/Close toggle switch to manually open or close inlet when Auto/Manual toggle switch is placed in Manual position. Under normal circumstances the machines should be left in automatic (Auto). The Notation area is for labeling the inlet. Each Inlet will use a pair of stage banks. The specific pair of stage banks may be chosen from any of the 40 stages as long as the first stage is an odd number and the second stage is the very next adjoining even stage number. After determining which pair of stages will be used, apply the Inlet Label (4501-0273) as shown below. One Inlet label will be used for each Inlet Stage pair.

**IMPORTANT!**

Stages that are programmed to be open/close stages must follow two rules. First, they must be consecutive, and second, they must start on an odd stage. The open output will always be the odd stage and the close stage will always be the even stage.
9.12 Connecting the PowerTrak to the Evolution 4000

WARNING!
Keep High Voltage (Or AC) Separate From Low Voltage Wires!

NOTE: If curtain is setup to pull curtain up to open, then reverse wires connected to "OPEN" and "CLOSE" terminals.

NOTE: Only 1 Power Trak can be connected to each Power Trak outlet. If Additional Power Traks are needed, Then use of relay boxes is necessary to separate the load.

NOTE: All PowerTrak units will connect the same.
9.13 Connecting the PowerTrak and S-3 Back-Up to the Evolution 4000

**WARNING!**
- Keep High Voltage (Or AC) Separate From Low Voltage Wires!
- Do not perform modifications or wiring with voltage applied!

**Secondary Sensing System**

**NOTE:**
- If connecting the Back-Up to a relay box instead of PowerTrak, Cut and discard the specific two or four components shown as needed.

**Inset A**
Unit #1 Vents

**Inset B**
S-3 Vent Override for Fail-Safe Action

**Inset C**
PowerTrak

**NOTE:**
- Refer to the S-3 Manual 4801-2997 for additional P5 & P6 S-3 Setting Instructions

**Inlet**
<table>
<thead>
<tr>
<th>MODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vent Override</td>
</tr>
<tr>
<td>Tunnel Override</td>
</tr>
</tbody>
</table>

Vents & Tunnel Will Wire The Same

**NOTE:**
- If curtain is setup to pull curtain up to open, then reverse wires connected to "OPEN" and "CLOSE" terminals.
- Only 1 Power Trak can be connected to each Power Trak outlet. If Additional Power Traks are needed, then use of relay boxes is necessary to separate the load.
- All PowerTrak units will connect the same.
9.14 Connecting the PowerTrak Power Auxiliary Switches to Evolution 4000

NOTES:

1. If curtain is setup to pull curtain up to open, then reverse wires connected to “Upper” and “Lower” terminals.

2. If using Natural Ventilation, D14 & D11 become Auxiliary Inputs for NV#3 and NV#4.

WARNING!
LOW VOLTAGE!
Keep Separate From High Voltage Wires!

NOTE: Vent auxiliary connects the same as tunnel auxiliary.
9.15 Connecting PowerTrak Natural Auxiliary Switches NV#1 & NV#2 to Evolution 4000

NOTE: If curtain is setup to pull curtain up to open, then reverse wires connected to 'Upper' and 'Lower' terminals.

WARNING!
LOW VOLTAGE!
Keep Separate From High Voltage Wires!

Inset B

Inset A

NOTE: Natural auxiliary NV#1 connects the same as NV#2.
9.16 Connecting PowerTrak Natural Auxiliary Switches NV#3 & NV#4 to Evolution 4000

**NOTES:**

1. If curtain is setup to pull curtain up to open, then reverse wires connected to 'Upper' and 'Lower' terminals.

2. If using Natural Ventilation, DI2 & DI3 become Auxiliary Inputs for NV#3 and NV#4.
9.17 Evolution 4000 Power Connection

Connecting Power from Breaker to a Heat Stage And a Cool Stage in the Evolution 4000

NOTE: Example above shows how to wire stages to heating & cooling equipment. Stage numbers are shown on label affixed to Cover over Relay Board area.

WARNING!

Keep High Voltage (Or AC) Separate From Low Voltage Wires!
Connecting Local Network & Backup to the Evolution 4000

NOTE: Harness to connect Local Network and Backup together are connected & included in the Backup and 16 Stage Expansion units.

WARNING!

LOW VOLTAGE!
Keep Low Voltage Wires Separate From High Voltage Wires

Tape Shield To Prevent Damage!

Evolution 4000 Control

Evolution Secondary Sensing System

Back-Up System

Local Network

PCB 198

PCB 179

Integrated Back-Up

Local Net

J9

J3

J11

J2

RCV TRMT

D15

nc

- +

Gnd

Data

Data

Cool

Cool

Cool

Heat

12V
10. Temperature vs. Sensor Resistance Table

The following chart gives the resistance when measured between the white and black sensor wires at a given temperature. To check a sensor, first know the temperature in the area, then use a multi-meter to check the resistance.

<table>
<thead>
<tr>
<th>Value</th>
<th>K Ohms</th>
<th>Temp (F)</th>
<th>Temp (C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>196</td>
<td>32.654</td>
<td>32.0</td>
<td>0</td>
</tr>
<tr>
<td>195</td>
<td>32.158</td>
<td>32.5</td>
<td>0.3</td>
</tr>
<tr>
<td>194</td>
<td>31.671</td>
<td>33.1</td>
<td>0.6</td>
</tr>
<tr>
<td>193</td>
<td>31.191</td>
<td>33.6</td>
<td>0.9</td>
</tr>
<tr>
<td>192</td>
<td>30.72</td>
<td>34.2</td>
<td>1.2</td>
</tr>
<tr>
<td>191</td>
<td>30.257</td>
<td>34.7</td>
<td>1.5</td>
</tr>
<tr>
<td>190</td>
<td>29.802</td>
<td>35.2</td>
<td>1.8</td>
</tr>
<tr>
<td>189</td>
<td>29.355</td>
<td>35.8</td>
<td>2.1</td>
</tr>
<tr>
<td>188</td>
<td>28.915</td>
<td>36.3</td>
<td>2.4</td>
</tr>
<tr>
<td>187</td>
<td>28.482</td>
<td>36.9</td>
<td>2.7</td>
</tr>
<tr>
<td>186</td>
<td>28.057</td>
<td>37.4</td>
<td>3.0</td>
</tr>
<tr>
<td>185</td>
<td>27.633</td>
<td>37.8</td>
<td>3.2</td>
</tr>
<tr>
<td>184</td>
<td>27.277</td>
<td>38.3</td>
<td>3.5</td>
</tr>
<tr>
<td>183</td>
<td>26.957</td>
<td>38.8</td>
<td>3.8</td>
</tr>
<tr>
<td>182</td>
<td>26.657</td>
<td>39.4</td>
<td>4.1</td>
</tr>
<tr>
<td>181</td>
<td>26.364</td>
<td>39.9</td>
<td>4.4</td>
</tr>
<tr>
<td>180</td>
<td>25.777</td>
<td>40.5</td>
<td>4.7</td>
</tr>
<tr>
<td>179</td>
<td>25.233</td>
<td>40.8</td>
<td>4.9</td>
</tr>
<tr>
<td>178</td>
<td>24.777</td>
<td>41.4</td>
<td>5.2</td>
</tr>
<tr>
<td>177</td>
<td>24.413</td>
<td>42.4</td>
<td>5.8</td>
</tr>
<tr>
<td>176</td>
<td>24.055</td>
<td>43.0</td>
<td>6.1</td>
</tr>
<tr>
<td>175</td>
<td>23.82</td>
<td>43.3</td>
<td>6.3</td>
</tr>
<tr>
<td>174</td>
<td>23.472</td>
<td>43.9</td>
<td>6.6</td>
</tr>
<tr>
<td>173</td>
<td>23.13</td>
<td>44.4</td>
<td>6.9</td>
</tr>
<tr>
<td>172</td>
<td>22.793</td>
<td>45.0</td>
<td>7.2</td>
</tr>
<tr>
<td>171</td>
<td>22.572</td>
<td>45.3</td>
<td>7.4</td>
</tr>
<tr>
<td>170</td>
<td>22.244</td>
<td>45.9</td>
<td>7.7</td>
</tr>
<tr>
<td>169</td>
<td>21.922</td>
<td>46.4</td>
<td>8</td>
</tr>
<tr>
<td>168</td>
<td>21.71</td>
<td>46.8</td>
<td>8.2</td>
</tr>
<tr>
<td>167</td>
<td>21.397</td>
<td>47.3</td>
<td>8.5</td>
</tr>
<tr>
<td>166</td>
<td>21.088</td>
<td>47.8</td>
<td>8.8</td>
</tr>
<tr>
<td>165</td>
<td>20.886</td>
<td>48.2</td>
<td>9</td>
</tr>
<tr>
<td>164</td>
<td>20.586</td>
<td>48.7</td>
<td>9.3</td>
</tr>
<tr>
<td>163</td>
<td>20.29</td>
<td>49.3</td>
<td>9.6</td>
</tr>
<tr>
<td>162</td>
<td>20.096</td>
<td>49.6</td>
<td>9.8</td>
</tr>
<tr>
<td>161</td>
<td>19.809</td>
<td>50.2</td>
<td>10.1</td>
</tr>
<tr>
<td>160</td>
<td>19.526</td>
<td>50.5</td>
<td>10.3</td>
</tr>
<tr>
<td>159</td>
<td>19.34</td>
<td>51.1</td>
<td>10.6</td>
</tr>
<tr>
<td>158</td>
<td>19.065</td>
<td>51.6</td>
<td>10.9</td>
</tr>
<tr>
<td>157</td>
<td>18.884</td>
<td>52.0</td>
<td>11.1</td>
</tr>
<tr>
<td>156</td>
<td>18.616</td>
<td>52.5</td>
<td>11.4</td>
</tr>
<tr>
<td>155</td>
<td>18.352</td>
<td>53.1</td>
<td>11.7</td>
</tr>
<tr>
<td>154</td>
<td>18.179</td>
<td>53.4</td>
<td>11.9</td>
</tr>
<tr>
<td>153</td>
<td>17.503</td>
<td>54.9</td>
<td>12.7</td>
</tr>
<tr>
<td>152</td>
<td>17.339</td>
<td>55.2</td>
<td>12.9</td>
</tr>
<tr>
<td>151</td>
<td>17.095</td>
<td>55.8</td>
<td>13.2</td>
</tr>
<tr>
<td>150</td>
<td>16.856</td>
<td>56.3</td>
<td>13.5</td>
</tr>
<tr>
<td>149</td>
<td>16.698</td>
<td>56.7</td>
<td>13.7</td>
</tr>
<tr>
<td>148</td>
<td>16.465</td>
<td>57.2</td>
<td>14.2</td>
</tr>
<tr>
<td>147</td>
<td>16.312</td>
<td>57.6</td>
<td>14.5</td>
</tr>
<tr>
<td>146</td>
<td>16.085</td>
<td>58.1</td>
<td>14.8</td>
</tr>
<tr>
<td>145</td>
<td>15.935</td>
<td>58.5</td>
<td>14.7</td>
</tr>
</tbody>
</table>
11. Label Quick-Reference Information

The following label is applied on the stage relay section cover. Notice that this label provides various quick-reference information such as LED status descriptions for troubleshooting the controller and individual circuit boards, includes an area for writing-in equipment and backup stage information for all 40 stages, points out the location of the stage relay connections, electrical information, and most of the main replacement part numbers.

### LED Troubleshooting Descriptions

<table>
<thead>
<tr>
<th>PCB199 - Power Board</th>
<th>PCB197 - Control Board</th>
<th>PCB194 - Input/Output Board</th>
<th>PCB190 - Relay Board</th>
</tr>
</thead>
<tbody>
<tr>
<td>12V Power MultiColor LED</td>
<td>12V Power Supply MultiColor LED</td>
<td>12V Power MultiColor LED</td>
<td>12V Power MultiColor LED</td>
</tr>
<tr>
<td>12V Power</td>
<td>12V Power</td>
<td>12V Power</td>
<td>12V Power</td>
</tr>
<tr>
<td>Yellow + Both 10V &amp; 12V are present.</td>
<td>Orange + Relay Power is present.</td>
<td>Green + Relay Power is present.</td>
<td>Red = Relay Power is present.</td>
</tr>
<tr>
<td>Green + Relay Power is present.</td>
<td>Red = Relay Power is present.</td>
<td>Yellow + Both Relay B &amp; Logic Power are present.</td>
<td>Orange + Both Relay B &amp; Logic Power are present.</td>
</tr>
<tr>
<td>Red = Relay Power (0V) is present.</td>
<td>Red = Relay Power (0V) is present.</td>
<td>Red = Relay Power (0V) is present.</td>
<td>Red = Relay Power (0V) is present.</td>
</tr>
<tr>
<td>Green + Relay Power is present.</td>
<td>Red = Relay Power is present.</td>
<td>Yellow + Both Relay B &amp; Logic Power are present.</td>
<td>Orange + Both Relay B &amp; Logic Power are present.</td>
</tr>
<tr>
<td>Red = Relay Power (0V) is present.</td>
<td>Red = Relay Power (0V) is present.</td>
<td>Red = Relay Power (0V) is present.</td>
<td>Red = Relay Power (0V) is present.</td>
</tr>
<tr>
<td>Green + Relay Power is present.</td>
<td>Red = Relay Power is present.</td>
<td>Yellow + Both Relay B &amp; Logic Power are present.</td>
<td>Orange + Both Relay B &amp; Logic Power are present.</td>
</tr>
<tr>
<td>Red = Relay Power (0V) is present.</td>
<td>Red = Relay Power (0V) is present.</td>
<td>Red = Relay Power (0V) is present.</td>
<td>Red = Relay Power (0V) is present.</td>
</tr>
</tbody>
</table>

### Electrical Information

- **Input Voltage**: 12, 15VDC, 5 Amps
- **Output Voltage**: 13, 15VDC, 4 Amps
- **External Supply**: 5VDC, 120VAC or 120VDC
- **Relay Rating**: 120V, 240V AC
- **Room Temperature Rating**: Minimum 32°F / 0°C, Maximum 122°F / 50°C

### Replacement Part Numbers

#### Temperature Sensors
- MML-004: 4180-110001-00 Left Sensor/LCD/BEACON SENSOR
- MML-004: 4180-110001-00 Right Sensor/LCD/BEACON SENSOR

#### Humidity Sensors
- 6147-0800: 4180-110001-00 Left Sensor/LCD/BEACON SENSOR
- 6147-0800: 4180-110001-00 Right Sensor/LCD/BEACON SENSOR

#### Static Pressure Module
- 4180-110001-00 Left Sensor/LCD/BEACON SENSOR
- 4180-110001-00 Right Sensor/LCD/BEACON SENSOR

#### Display
- 4180-110001-00 Left Sensor/LCD/BEACON SENSOR
- 4180-110001-00 Right Sensor/LCD/BEACON SENSOR

#### Board Assemblies
- PCB189: 4180-110001-00 Left Sensor/LCD/BEACON SENSOR
- PCB189: 4180-110001-00 Right Sensor/LCD/BEACON SENSOR

#### Cable Assemblies
- 4180-110001-00 Left Sensor/LCD/BEACON SENSOR
- 4180-110001-00 Right Sensor/LCD/BEACON SENSOR

#### Miscellaneous
- 4180-110001-00 Left Sensor/LCD/BEACON SENSOR
- 4180-110001-00 Right Sensor/LCD/BEACON SENSOR

#### Transformers
- 4080-110001-00 Left Sensor/LCD/BEACON SENSOR
- 4080-110001-00 Right Sensor/LCD/BEACON SENSOR

#### Evolution 4000

- 4801-5338 Rev 01-10
## 12. Parts List

### Main Controls

<table>
<thead>
<tr>
<th>HHI Part Number</th>
<th>HHI Part</th>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6607-8220</td>
<td></td>
<td>EV4000 40 stage Controller</td>
<td></td>
</tr>
<tr>
<td>6607-8039</td>
<td></td>
<td>EV-S3-16</td>
<td>Secondary Sensing System Control Expansion with 16 stages</td>
</tr>
<tr>
<td>6607-8013</td>
<td></td>
<td>EV Secondary Sensing System Plus</td>
<td>With Relay Card</td>
</tr>
<tr>
<td>6607-8014</td>
<td></td>
<td>EV Secondary Sensing System</td>
<td></td>
</tr>
<tr>
<td>6607-8015</td>
<td></td>
<td>EV-Back-up</td>
<td></td>
</tr>
<tr>
<td>6607-8016</td>
<td></td>
<td>EV-16 Expansion</td>
<td></td>
</tr>
</tbody>
</table>

### Accessories

<table>
<thead>
<tr>
<th>HHI PN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6450-5103</td>
<td>KIT EV Humidity Sensor</td>
</tr>
<tr>
<td>3025-0101</td>
<td>MTR Wtr 5/8x3/4 w/ 1g Reed SWX (Water Meter)</td>
</tr>
<tr>
<td>6407-6084</td>
<td>Temperature Sensor Junction Box Assembly</td>
</tr>
<tr>
<td>6407-6038</td>
<td>EV-S3 Stand Alone Relay Card (for 6607-8014 controllers)</td>
</tr>
</tbody>
</table>

### Variable/Dimmer Modules

<table>
<thead>
<tr>
<th>HHI PN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6607-8031</td>
<td>EV-Variable 4KW/4HP(2 Outputs)</td>
</tr>
<tr>
<td>6607-8032</td>
<td>EV-Variable 8KW/8HP(4 Outputs)</td>
</tr>
<tr>
<td>6607-8033</td>
<td>EV-VAR Manual/Auto 4KW/HP(2 Outputs)</td>
</tr>
<tr>
<td>6607-8034</td>
<td>EV-VAR Manual/Auto 8KW/HP(4 Outputs)</td>
</tr>
</tbody>
</table>

### Feed Management

<table>
<thead>
<tr>
<th>HHI PN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6407-6036</td>
<td>Feed Bin Level Sensor</td>
</tr>
<tr>
<td>6407-6070</td>
<td>Current Sensor .35-100A (For use with belts, motors, or feed augers.)</td>
</tr>
</tbody>
</table>

### Farm Manager Network

<table>
<thead>
<tr>
<th>HHI PN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6626-0000</td>
<td>Software Kit FH Explorer (Wired)</td>
</tr>
<tr>
<td>6626-0100</td>
<td>Software Kit with 2-900SS (Wireless)</td>
</tr>
</tbody>
</table>

### Farm Manager Accessories

<table>
<thead>
<tr>
<th>HHI PN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6407-5110</td>
<td>HHI Router / Repeater</td>
</tr>
<tr>
<td>6407-5111</td>
<td>900SS Wireless Repeater</td>
</tr>
<tr>
<td>6626-3500</td>
<td>Wireless Installation Kit</td>
</tr>
</tbody>
</table>
Circuit Boards (*Refer to Section 9.1 for board locations)

- 6407-6058 /EV-3001/EV4000 Display-White (LCD Only)
- 6407-1612 /PCB190 EV4000 Relay Bd w/QA
- 6407-1614 /PCB191 EV4000 SwitchBd w/QA
- 6407-1619 /PCB197 EV4000 Cntrl Bd w/QA
- 6407-1621 /PCB198 EV4000 PWR w/QA
- 6407-1623 /PCB194 EV4000 I-O Bd w/QA

Chips

- N/A EV4000 Software Update Files for PCB197 Control (**Contact Local Dealer/Distributor/Rep.)
- 3701-6083 PIC EV4000 EV8 Rev x.xx (For PCB191 Boards)
- 3701-6084 PIC EV4000 I/O Rev x.xx (For PCB194 Boards)
- 3540-0149 DIGITAL IC LTC1483CN8 (For PCB 197=U100, PCB191=U1, PCB194=U1, and PCB198=U2)

Fuses

- 3010-2990 FUSE 4 AMP 5mmX20mm SlowBlow (For PCB 198 Power Supply Board, F101)

Replacement Harnesses and Cables

- 1903-5060 HRNS EV4000 Relay Card 11" (From PCB191 to PCB190)
- 1903-5061 HRNS EV4000 Relay Card 1.25" (Jumper From PCB190 to PCB190)
- 1903-5062 HRNS EV4000 10P STAGE SWX (From PCB191’s to PCB198)
- 1903-5063 HRNS EV4000 20P LNET (From PCB197 to PCB194 to PCB198)
- 1903-5064 HRNS EV4000 Setra CBL (From Pressure Module to PCB198)
- 1903-5065 HRNS EV4000 PCB POWER (Transformer to PCB198)
- 1901-6506 W1526 3" C1#0231 C2#0107 GN
- 1901-6507 W1520 6" C1#0136 C2#0107 WH
- 1901-6508 W2536 8" C1#0136 C2#0107 YL
- 1901-6509 W2535 8" C1#0136 C2#0107 OR
- 1901-6510 W1523 8" C1#0136 C2#0107 BK
- 1901-6511 W2535 3" C1#0134 C2#0134 OR
- 1903-5058 HRNS Evo. 20pin Cable Assy (PCB197 Interface to Display)
- 1903-5052 HRNS EV. Local Network 6ft.
- 1702-5190 WC&S 6' 18/5 Back-up connection

Replacement Parts

Hardware

- 1053-3027 BOOT Switch cover Blk 1/4-40
- 1001-1462 #6 Nylon nut (For Mounting PCB191’s and PCB197)
- 1001-1463 #4 Nylon nut (Mounting Display)
- 1018-2062 Snap Fasteners (at PCB190)
- 1018-2063 Slide Fasteners (at PCB190)

Labels

- 4501-0273 LBL EV4000 Inlet Stage Label
- 4501-6120 LBL Evolution Icons

Misc

- 3008-2860 XFMR FD7-16 120/240-16VAC 56VA
- 3591-2252 MODULE Static pres xmitr Setra
Replacement Harnesses and Cables (Transformer/AC Power Connections)

**230 VAC Wiring**

![Diagram showing 230 VAC wiring connections with notes on Jumper Connection Required for 230 VAC Power and Jumper Connection Not Required for 115 VAC Power.]

**115 VAC Wiring**

![Diagram showing 115 VAC wiring connections with notes on Jumper Connection Not Required for 115 VAC Power.]

The EV4000 controller is factory prewired for 240 VAC. For 115 VAC Power, disconnect both the orange and yellow wires from the orange jumper then connect the Yellow and Orange wires to the terminal block L1 & L2 as shown above.
Terminal Blocks & Jumpers

- **3006-5129** CONN TBLK 4pos IDC (On PCB194)
- **3006-5130** CONN TBLK 6pos 5mm (On PCB194)
- **3006-5132** CONN TBLK 8pos IDC (On PCB194)
- **3006-5133** CONN TBLK 10pos IDC (On PCB194)
- **3006-5135** CONN TBLK 12pos IDC (On PCB194)
- **3006-5137** CONN TBLK 18pos IDC (On PCB194)
- **3006-2984** CONN IDC 2 pin MINI JUMPERS (On PCB194 and PCB190)
- **3006-5119** CONN TBLK 4pos 1975600 (On PCB190)
- **3006-5082** CONN TBLK 3 pos Magnum (on PCB198, J1 & J3)
- **3006-5084** CONN TBLK 4pos Magnum (on PCB198, J5)
- **3006-5088** CONN TBLK 6pos Magnum (on PCB198, J9)
- **3006-2140** CONN AC TBLK EV4000
Tools

0605-0107 TOOL PLCC Extraction Tool (For Removal of Chips)

Manuals

4801-5338 MANUAL EVOLUTION 4000 40 Stage Controller
4801-5328 MANUAL Temp Sens Junction Box
4801-5309 MANUAL EVOLUTION BACK-UP
4801-5315 MANUAL EV-Variable drives
4801-2997 MANUAL Secondary Sensing System
4801-3001 MANUAL Secondary Sensing System Expansion
4801-2998 MANUAL Feed Management
4801-2995 MANUAL 900SS Wireless
4801-2996 MANUAL HHI Repeater
4801-5152 EV High Temperature Monitor

Application Notes

4809-0010 Application Note – EV4000 Software Updates
4809-0011 Application Note – Inlet Operation (for Attic Inlets)
# Poultry House Layout and Specification

## 1. House Specification

<table>
<thead>
<tr>
<th>Stage</th>
<th>Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td></td>
</tr>
<tr>
<td>23.</td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td></td>
</tr>
<tr>
<td>26.</td>
<td></td>
</tr>
<tr>
<td>27.</td>
<td></td>
</tr>
<tr>
<td>28.</td>
<td></td>
</tr>
<tr>
<td>29.</td>
<td></td>
</tr>
<tr>
<td>30.</td>
<td></td>
</tr>
<tr>
<td>31.</td>
<td></td>
</tr>
<tr>
<td>32.</td>
<td></td>
</tr>
<tr>
<td>33.</td>
<td></td>
</tr>
<tr>
<td>34.</td>
<td></td>
</tr>
<tr>
<td>35.</td>
<td></td>
</tr>
<tr>
<td>36.</td>
<td></td>
</tr>
<tr>
<td>37.</td>
<td></td>
</tr>
<tr>
<td>38.</td>
<td></td>
</tr>
<tr>
<td>39.</td>
<td></td>
</tr>
<tr>
<td>40.</td>
<td></td>
</tr>
</tbody>
</table>

### Building Size

<table>
<thead>
<tr>
<th>Vents</th>
</tr>
</thead>
</table>

### Legend

- **Sensors**
  - S Main
  - B Backup
  - A Alarm

- **Equipment**
  - O Brooders
  - F Fans
  - H Heaters
  - T Tunnel Machine
  - V Vent Machine

* Indicates distance from end wall on equipment

* Mark fans with size and number

### Inlet Size

---

HIRED-HAND, INC. • 1733 County Road 68 • Bremen, AL 35033 USA • Phone 256-287-1000 • Fax 256-287-2000
2. Stage Programming

Target ______

<table>
<thead>
<tr>
<th>Stage</th>
<th>Sensors</th>
<th>On Point</th>
<th>Off Point</th>
<th>Mode</th>
<th>Timers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>37.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>38.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>39.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Modes: Heat, Cool Stir, Negative, Negative Tunnel, Tunnel, Feed, Lights
Timers: Minimum 1, Minimum 2, Variable, Cool
3. **Temperature Curve**

<table>
<thead>
<tr>
<th>Target Growout Day</th>
</tr>
</thead>
</table>

4. **Static Pressure Settings**

Vent Inlet Static Pressure ___

*Pressure Ramping off of Outside Temperature*

Pressure ____ at ____ High Temperature.
Pressure ____ at ____ Low Temperature.

Vent Delay _____ (seconds) Vent Anticipation _____ (seconds)

5. **Minimum Vent**

Timer Cycle _____ (minutes)

<table>
<thead>
<tr>
<th>Day</th>
<th>Timer % Stages</th>
</tr>
</thead>
</table>

6. **Tunnel Settings**

Tunnel Sensors: ____
Tunnel On Temperature: ____ (Based off of Target Temperature from Section 2)
Tunnel OFF Temperature: ____ (Based off of Target Temperature from Section 2)
Tunnel Target Pressure: ____
Use Low Pressure Alarm in Tunnel: ____
Disable Tunnel until Growout day: ____

Cool Timer for Evaporative cooling

Timer Cycle ____ (minutes)
Max. Run % _____
Min. Run % _____
7. Lighting Program

<table>
<thead>
<tr>
<th>Day</th>
<th>On Time</th>
<th>Run Time (hours: minutes)</th>
<th>Intensity</th>
<th>Schedule/Ramp</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. Feed Program

<table>
<thead>
<tr>
<th>Day</th>
<th>On Time</th>
<th>Run Time (hours: minutes)</th>
<th>Schedule/Ramp</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Part No. 4801-5338 Rev 01-10  Evolution 4000  83 of 86
9. **Back-up Specifications**

<table>
<thead>
<tr>
<th>Back-Up Stages</th>
<th>Equipment (Stage Number)</th>
<th>Other Requirements:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cool 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cool 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cool 3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10. **Alarm Specifications**

<table>
<thead>
<tr>
<th>Alarm</th>
<th>Settings</th>
<th>Other Requirements:</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Temperature</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Temperature</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cycle Pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Pressure (If used in Tunnel)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Water Usage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Water Usage</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>