



*"Manufactured in North America"*

# **MASTER SUPPLEMENTAL INSTALLER'S GUIDE**

**FOR  
2100, 3100, 4100  
and 5100 SERIES  
ETS HEATING  
EQUIPMENT**



**Microprocessor Function  
Location  
Descriptions and Values for Setup and Editing  
(Applicable to Software Versions 2.00-2.10)**

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# General Information

The Steffes 2100 series room heating units, the Comfort Plus (3100/4100 Series), and the Comfort Plus Hydronic (5100 Series) systems are microprocessor controlled with program locations to customize system functions to suit the needs of power companies and/or consumers.

This guide provides instructions on how to adjust location settings, location descriptions, and factory default values and ranges.

The tables are set up with the following information:

**ID. NO.:** Lists the programming location identifier within the "Location Edit" menu (Lxxx) as well as the "Configuration" menu (Cxxx) where applicable.

**Factory Default:** Lists the location value as programmed at the factory.

**Default Range:** Lists the range that each value can be adjusted within.

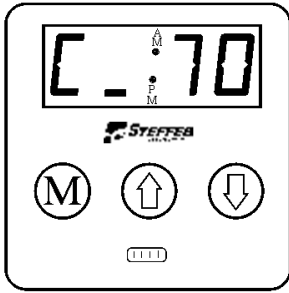
**Description/Function:** Description of each location and options available within that location.

## Help Menu

The Help Menu may be accessed by pressing and releasing the M button until the faceplate displays "HELP". Press the up or the down arrow button to scroll through the Help Menu items listed below.

Display Reading	Description
Fxxx	Firmware Version Number - Indicates the version of software installed.
O xx	Outdoor Temperature - Indicates current outdoor temperature as recognized by the heater.
tL:xx	Target Level - Indicates the percentage of brick core charge the heater is targeting. During peak periods, the value displays as "tL _".
CL:xx	Charge Level - Indicates the percentage of heat currently stored in the brick core.
HE x	Heating Elements Active - Indicates the total number of heating elements currently energized.
PC xx	Power Line Carrier Channel - Indicates the channel on which the heater is set to receive PLC communication signal.
P xxx	Power Line Carrier Net Hit Rate Percentage - Indicates the percentage of "GOOD" communication packets received by the heater from the PLC transmitting device.
PS x	Indicates which Specialty Timer the heater is currently using. The value displayed will be zero if the Specialty Timer is not being used. The Specialty Timer is not used in most applications.
CC_x	Charge Mode Operation - Indicates the method of charge control being used during off-peak periods (L010/C000).
CA_x	A-Peak Mode Operation - Indicates the method of charge control being used during anticipated peak periods. (L011).
C1_x	Specialty Timer #1 Charge Mode - Specialty Applications Only (L030-031).
C2_x	Specialty Timer #2 Charge Mode - Specialty Applications Only (L032-033).
HUxx	Heat Usage (L128) - Indicates the amount of input being dissipated by the system.
Axxx	Target Discharge Air Temperature (L112) - Indicates the output air temperature the heater is targeting as set in L048 (C010) and L049.
cxxx	Compressor Output Relay Delay Time – Indicates the time remaining before the heat pump compressor can be energized. It counts down from the value in L018 on power up or any time the compressor is disabled. A display of "c 0" indicates an expired timer and "c On" indicates that the compressor output is energized.

# Accessing Location Information



**NOTE:** Upon power up of the equipment, entry into all program locations is provided for the first two minutes of operation. After this time, the security lockout prevents changes from being made in any locations above 15 (L015). To release the security lockout, refer to L099 in this manual or de-energize the system and then energize again to reset the security free function.

## TO EDIT OR VIEW LOCATION SETTINGS:

1. Press and hold the **M** button. "EdIt" should be displayed on the faceplate.
2. While still holding the **M** button and with "EdIt" displayed on the faceplate, press and hold the up arrow button. Continue to hold both buttons simultaneously until "L000" appears on the faceplate.  
**NOTE: If the M button is released before the "L000" is displayed, start over from Step 1.**
3. Release the buttons. The display will flash between "L000" and the value in this location.  
The "L" indicates "location" and the last three numbers indicate the specific location number.
4. Press the up arrow button until the location to be edited is reached. (i.e., Location 8 reads "L008".)
5. After reaching the location to be edited, press and hold the **M** button. Use the up or the down arrow button to modify the value to the desired setting.
6. Once all changes have been made, release the **M** button. Press the down arrow button until "L000" is displayed. Then, press the down arrow button one more time and the normal display mode will be shown. Any changes made to the location settings will automatically be saved.

**NOTE:** If no buttons on the control panel are pressed, after a brief amount of time, the faceplate will automatically return to its normal operating mode and any changes made to the location settings will automatically be saved.

# Determine Value of Locations with Multiple Options

To determine the value, check the options desired from the list below. Then, add the numbers from the "Value" column and enter the sum into this location.

**NOTE:** The check marks (✓) shown in the list below are intended only to serve as an example of a user selection.

<u>Check</u>	<u>Value</u>	<u>Option Selected</u>
	1	Display Current Time. (Not recommended without optional time clock module.)
	2	Display Day of the Week. (Not recommended without optional time clock module.)
✓	4	Display Current Operating Mode (C, P, or A) and Current Room Temperature. (Format: Cxxx, Pxxx, or Axxx)
✓	8	Display Current Room Temperature Set Point. (Format: Cxxx, Pxxx, or Axxx)
	16	Display Current Outdoor Temperature. (Format: Oxxx)

**Example:** To display current room temperature set point and the current operating mode: Enter 12 (4 + 8)

# Short Cut Keys

M + Up	Edit Mode
M + Up + Down	Charge Control Override (8 bit in L035/C004)
Up + Down	Off Mode (16 bit in L035/C004)
M + Down	Setback Option (32 bit in L035/C004)

## Standard Installation/Configuration Locations (L000-L059)

ID. No.	Factory Default	Default Range	Description / Function
L000 / C011	70 (°F) 21 (°C)	Determined by values in L007/L008.	<p><b>2100 SERIES</b>  <b>Room Temperature Set Point</b> - Adjusts the room temperature set point. However, the set point is generally adjusted by simply pressing the up and down arrow buttons on the heater's control panel during normal operation.</p> <p><b>3100/4100 SERIES</b>  <b>Room Temperature Set Point</b> - Generally not used in the 3100/4100 systems as the room temperature set point is determined by the thermostat.</p>
	140 (°F) 60 (°C)	Determined by values in L007/L008.	<p><b>5100 SERIES</b>  <b>Maximum Outlet Water Temperature</b> - Maximum outlet water temperature to be targeted. This value cannot be set higher than L007 or lower than L008.</p> <p>The targeted outlet water temperature is also affected by L012 and L013.</p> <p><b>Example:</b> If the values of L012 = 60; L013 = 20; L000 = 180; L001 = 140, an outdoor temperature of 40°F would result in a targeted outlet water temperature of 160°F.</p> <p><b>NOTE: If an outdoor temperature sensor is NOT installed, the system targets the outlet water temperature as set in L000.</b></p>
L001 / C012	60 (°F) 16 (°C)	Determined by values in L007/L008.	<p><b>2100 SERIES</b>  <b>Room Temperature Setback</b> - Room temperature to be maintained in response to a setback signal. A setback signal can be initiated from a low voltage input or Steffes Power Line Carrier (PLC) system. This value may <u>not</u> be set below L008 value (Minimum Room Temperature Set Point).</p> <p><b>NOTE: In applications where a Steffes Time Clock Module is being used to signal room temperature setback, the value in this location is not applicable. (Reference L035, L060, and L074-L089.)</b></p> <p><b>3100/4100 SERIES - SPECIALTY APPLICATIONS ONLY!</b></p>
	140 (°F) 60 (°C)	Determined by values in L007/L008.	<p><b>5100 SERIES</b>  <b>Minimum Outlet Water Temperature</b> - Minimum outlet water temperature to be targeted. This value cannot be set higher than the value in L007 or lower than the value in L008.</p> <p>The targeted outlet water temperature is also affected by the values in L012 and L013.</p> <p><b>Example:</b> If the values of L012 = 60; L013 = 20; L000 = 180; L001 = 140, an outdoor temperature of 40°F would result in a targeted outlet water temperature of 160°F.</p> <p><b>NOTE: If an outdoor temperature sensor is NOT installed, the system targets the outlet water temperature as set in L000.</b></p>



## Standard Installation/Configuration Locations (L000-L059) continued...

ID. No.	Factory Default	Default Range	Description / Function
<b>L002</b>	<u>2100</u> 24  <u>31/41/5100</u> 16	0 to 255	<p><b>ALL SYSTEMS</b>  <b>Faceplate Display Configuration</b> - Specifies the end-user preferences for basic operating of the control panel and configuration of information displayed.</p> <p><u><b>Value</b></u>      <u><b>Option Selected</b></u></p> <p>1      Display temperatures in Celsius. Otherwise, temperatures are displayed in Fahrenheit.</p> <p>2      Display 24-hour clock. Otherwise, a 12-hour clock is used with an a.m./p.m. indicator.</p> <p>4      Faceplate display goes blank after one minute of inactivity.</p> <p>8      <b>2100 Series Only.</b> Room temperature set point can be edited at the faceplate by using the up and down arrow buttons. If this option is selected <i>it is recommended that only one option be selected in L003.</i></p> <p>16      Brick core charge set point can be edited at the faceplate.  <b>Only applicable if using a manual method of charge control in locations L010 and/or L011.</b></p> <p>32      Enables the Edit Mode Activation Delay (L022). To enter the Help Menu when the delay is activated, press and hold the M button for the duration of L022 and release.</p>
<b>L003</b>  <b>/</b>  <b>C013</b>	<u>2100</u> 4  <u>31/41/5100</u> 244	0 to 255	<p><b>ALL SYSTEMS</b>  <b>Faceplate Display Information</b> - Selects the items to display on the faceplate during the normal operating mode when pressing the up or down arrow button.</p> <p><u><b>Value</b></u>      <u><b>Option Selected</b></u></p> <p>1      Display Current Time. (<i>Not recommended without optional time clock module.</i>)</p> <p>2      Display Day of the Week. (<i>Not recommended without optional time clock module.</i>)</p> <p>4      Display Current Operating Mode (C, P, or A) and Current Room Temperature. (Format: <b>Cxxx</b>, <b>Pxxx</b>, or <b>Axxx</b>.)</p> <p>8      Not used. If set, the system will display "d 0".</p> <p>16      Display Current Outdoor Temperature. (Format: <b>Oxxx</b>.)</p> <p>32      Display Heat Call Status. If interfaced with an air conditioning system or heat pump, cooling status is also displayed. (Format: <b>HC_x</b> or <b>COOL</b>.)</p> <p>64      Display Current Core Charge Level Percentage. (Format: <b>CL:xx</b>.)</p> <p>128      Display Current Core Charge Level Target Percentage. (Format: <b>tL:xx</b>.)</p>
<p><b>FACEPLATE DISPLAY CHARACTER REFERENCE – (“x” represents a digit on the faceplate.)</b></p> <p><b>C xx</b> = Charge period (off-peak) and current room temperature if a freeze protection sensor is installed.</p> <p><b>P xx</b> = Peak period (on-peak) and current room temperature if a freeze protection sensor is installed.</p> <p><b>A xx</b> = Anticipated peak period (pre-peak) and current room temperature if freeze protection sensor is installed.</p> <p><b>Oxxx</b> = Current outdoor temperature.</p> <p><b>HC_x</b> = Type of heat call (F = Fan Only, 0 = No Heat Call, 1 = Stage 1, 2 = Stage 2, 3 = Emergency Heat or Hydronic, COOL = Cooling Call).</p> <p><b>CLxx</b> = Current charge level - Indicates the percentage of heat currently stored in the brick core.</p> <p><b>tLxx</b> = Target charge level - Indicates the percentage of brick core charge the heater is targeting.</p>			

## Standard Installation/Configuration Locations (L000-L059) continued...

ID. No.	Factory Default	Default Range	Description / Function						
L004	0	0	<b>ALL SYSTEMS - <i>Specialty Applications Only!</i></b> <b>Background Faceplate Display Information</b> - Secondary set of display information. Same options as L003.						
L005	30	16 to 30	<b>ALL SYSTEMS</b> <b>Error Display "On" Time</b> - Sets the cycle (scroll) time of error messages. Value is in units of 1/20 <sup>th</sup> seconds. Background Faceplate Display Information (as set in L004) displays for twice the time entered in this location.						
L006	0	0 to 255	<b>ALL SYSTEMS</b> <b>Automatic Display of Faceplate Information</b> - Sets the cycle (scroll) time of the Faceplate Display Information (as set in L003). Value is in units of 1/10th seconds. A setting of 20 = 2 seconds.						
L007	85 (°F) 29 (°C)	45 to 195 (°F) 7 to 91 (°C)	<b>2100 SERIES</b> <b>Maximum Room Temperature Set Point</b> - Maximum temperature to which the room temperature set point can be adjusted in L000 and L001.						
			<b>3100/4100 SERIES - <i>Specialty Applications Only!</i></b>						
	185 (°F) 90.6 (°C)	45 to 195 (°F) 7 to 91 (°C)	<b>5100 SERIES</b> <b>Maximum Outlet Water Temperature Set Point</b> - Maximum temperature to which the outlet water temperature set point can be adjusted in L000 and L001. <b>NOTE: Outlet water temperatures above 185° are not recommended.</b>						
L008	45 (°F) 7 (°C)	32 to 80 (°F) 0 to 27 (°C)	<b>2100 SERIES</b> <b>Minimum Room Temperature Set Point</b> - Minimum temperature to which the room temperature set point can be adjusted in L000 and L001.						
			<b>3100/4100 SERIES - <i>Specialty Applications Only!</i></b>						
			<b>5100 SERIES</b> <b>Minimum Outlet Water Temperature Set Point</b> - Minimum temperature to which the outlet water temperature set point can be adjusted in L000 and L001.						
L009	0	0 to 1	<b>ALL SYSTEMS</b> <b>Off Mode</b> - Suspends all functions of the system and is indicated on the faceplate as "OFF". If enabled in L035, the system can be placed in off mode by pressing the up and down arrow buttons simultaneously. <table><tr><td><u>Value</u></td><td><u>Function</u></td></tr><tr><td>0</td><td>Normal Operating Mode</td></tr><tr><td>1</td><td>Off Mode</td></tr></table> <b>NOTE: If the system is being used to provide a peak control signal to other devices, or if an air conditioner or heat pump is being used in conjunction with the system, the off mode should not be used.</b>	<u>Value</u>	<u>Function</u>	0	Normal Operating Mode	1	Off Mode
<u>Value</u>	<u>Function</u>								
0	Normal Operating Mode								
1	Off Mode								

## Standard Installation/Configuration Locations (L000-L059) continued...

ID. No.	Factory Default	Default Range	Description / Function																						
L010 / C000	5	0 to 9	<p><b>ALL SYSTEMS</b></p> <p><b>Off-Peak Method of Charge Control</b> - Sets the method of brick core charging to be used during off-peak (charge) periods.</p> <p><b>NOTE:</b> <i>The values listed below are termed “subroutines” and will be referenced as such from this point forward.</i></p> <table><tr><th><u>Value</u></th><th><u>Function</u></th></tr><tr><td>0</td><td><b>Core Charging Disabled</b> - No core charging occurs.</td></tr><tr><td>1</td><td><b>Space Heating Mode</b> - System maintains the minimum core temperature (L041) if there has been a heat call during the last 22 hours. Minimum core temperature (L041) should be increased from default to effectively use this feature.</td></tr><tr><td>2</td><td><b>Manual Charge Control</b> - User is required to adjust the target level to desired value. This can be set in L015 or adjusted as required during normal operation via the faceplate buttons (see Owner’s Manual for more information).</td></tr><tr><td>3</td><td><b>Automatic Charge Control</b> - Target level adjusts automatically based on outdoor temperature relative to L012 and L013. <i>Example:</i> If L012 (Start Brick Core Charge Set Point) is set to 50° and L013 (Full Brick core Charge Set Point) is set to 10° then a 30° outdoor temperature would result in a 50% target level.</td></tr><tr><td>4</td><td><b>Sensorless Automatic Charge Control</b> - Target level adjusts automatically based on heating demand from previous time period (L042) multiplied by the charge factor (L043). Minimum Core Temperature (L041) should be increased from default to effectively use this feature.</td></tr><tr><td>5</td><td><b>Intellicharge</b> - Target level adjusts automatically based 75% on subroutine 3 and 25% on subroutine 4. If no heat calls have occurred within the past 22 hours, L012 (Start Brick Core Charge Set Point) and L013 (Full Brick core Charge Set Point) are temporarily set back based on subroutine 7.</td></tr><tr><td>6</td><td><b>Intelliman Charge Control</b> - Target level adjusts based 75% on subroutine 2 and 25% on subroutine 4.</td></tr><tr><td>7</td><td><b>Setback Charge Control</b> - Target level adjusts automatically according to outdoor temperature relative to L012 and L013. If there are no heat calls in the past 22 hours, the values in L012 and L013 will both be set back internally 20 degrees (the displayed values will remain as they previously set). Once a heat call is recognized, these location values return to their original set points. On start-up, the system assumes there have been no heat calls.</td></tr><tr><td>8</td><td><b>Reduced Automatic Charge Control</b> - Targets 2/3 of subroutine 3 to reserve capacity when renewable power is in excess. An “A” input signal is required for full capacity.</td></tr><tr><td>9</td><td><b>Reduced Intellicharge</b> - Target level adjusts based on subroutine 5 multiplied by the percentage in L015.</td></tr></table>	<u>Value</u>	<u>Function</u>	0	<b>Core Charging Disabled</b> - No core charging occurs.	1	<b>Space Heating Mode</b> - System maintains the minimum core temperature (L041) if there has been a heat call during the last 22 hours. Minimum core temperature (L041) should be increased from default to effectively use this feature.	2	<b>Manual Charge Control</b> - User is required to adjust the target level to desired value. This can be set in L015 or adjusted as required during normal operation via the faceplate buttons (see Owner’s Manual for more information).	3	<b>Automatic Charge Control</b> - Target level adjusts automatically based on outdoor temperature relative to L012 and L013. <i>Example:</i> If L012 (Start Brick Core Charge Set Point) is set to 50° and L013 (Full Brick core Charge Set Point) is set to 10° then a 30° outdoor temperature would result in a 50% target level.	4	<b>Sensorless Automatic Charge Control</b> - Target level adjusts automatically based on heating demand from previous time period (L042) multiplied by the charge factor (L043). Minimum Core Temperature (L041) should be increased from default to effectively use this feature.	5	<b>Intellicharge</b> - Target level adjusts automatically based 75% on subroutine 3 and 25% on subroutine 4. If no heat calls have occurred within the past 22 hours, L012 (Start Brick Core Charge Set Point) and L013 (Full Brick core Charge Set Point) are temporarily set back based on subroutine 7.	6	<b>Intelliman Charge Control</b> - Target level adjusts based 75% on subroutine 2 and 25% on subroutine 4.	7	<b>Setback Charge Control</b> - Target level adjusts automatically according to outdoor temperature relative to L012 and L013. If there are no heat calls in the past 22 hours, the values in L012 and L013 will both be set back internally 20 degrees (the displayed values will remain as they previously set). Once a heat call is recognized, these location values return to their original set points. On start-up, the system assumes there have been no heat calls.	8	<b>Reduced Automatic Charge Control</b> - Targets 2/3 of subroutine 3 to reserve capacity when renewable power is in excess. An “A” input signal is required for full capacity.	9	<b>Reduced Intellicharge</b> - Target level adjusts based on subroutine 5 multiplied by the percentage in L015.
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3	<b>Automatic Charge Control</b> - Target level adjusts automatically based on outdoor temperature relative to L012 and L013. <i>Example:</i> If L012 (Start Brick Core Charge Set Point) is set to 50° and L013 (Full Brick core Charge Set Point) is set to 10° then a 30° outdoor temperature would result in a 50% target level.																								
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9	<b>Reduced Intellicharge</b> - Target level adjusts based on subroutine 5 multiplied by the percentage in L015.																								

## Standard Installation/Configuration Locations (L000-L059) continued...

ID. No.	Factory Default	Default Range	Description / Function																						
L011	5	0 to 9	<b>ALL SYSTEMS</b> <b>Anticipated Peak (Pre-Peak) Method of Charge Control</b> - Sets the method of brick core charging to be used during anticipated peak times. For a detailed description of each subroutine, refer to L010.  <table><tr><th><u>Value</u></th><th><u>Function</u></th></tr><tr><td>0</td><td>Core Charging Disabled</td></tr><tr><td>1</td><td>Space Heating Mode</td></tr><tr><td>2</td><td>Manual Charge Control</td></tr><tr><td>3</td><td>Automatic Charge Control</td></tr><tr><td>4</td><td>Sensorless Automatic Charge Control</td></tr><tr><td>5</td><td>Intellicharge with Setback</td></tr><tr><td>6</td><td>Intelliman Charge Control</td></tr><tr><td>7</td><td>Setback Charge Control</td></tr><tr><td>8</td><td>Reduced Automatic Charge control</td></tr><tr><td>9</td><td>Reduced Intellicharge</td></tr></table>	<u>Value</u>	<u>Function</u>	0	Core Charging Disabled	1	Space Heating Mode	2	Manual Charge Control	3	Automatic Charge Control	4	Sensorless Automatic Charge Control	5	Intellicharge with Setback	6	Intelliman Charge Control	7	Setback Charge Control	8	Reduced Automatic Charge control	9	Reduced Intellicharge
<u>Value</u>	<u>Function</u>																								
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6	Intelliman Charge Control																								
7	Setback Charge Control																								
8	Reduced Automatic Charge control																								
9	Reduced Intellicharge																								
L012 / C001	<u>2100</u> 60 (°F) 16 (°C)  <u>31/41/5100</u> 50 (°F) 10 (°C)	0 to 90(°F) -18 to 32 (°C)	<b>ALL SYSTEMS</b> <b>Start Brick Core Charge Set Point</b> - Outdoor temperature at which core charging is targeted to begin.  <b>NOTE: 5100 systems – see L000 and L001 for additional information.</b>																						
L013 / C002	<u>2100</u> 20 (°F) -7 (°C)  <u>31/41/5100</u> 10 (°F) -12 (°C)	-20 to 90(°F) -29 to 32 (°C)	<b>ALL SYSTEMS</b> <b>Full Brick Core Charge Set Point</b> - Outdoor temperature at which a maximum (full) core charge level is to be targeted. <b>Must be lower than L012.</b>  <b>NOTE: 5100 systems – see L000 and L001 for additional information.</b>																						
L014	0	-20 to 20	<b>2100 SERIES</b> <b>Room Temperature Display Calibration</b> - Used to calibrate the room temperature thermostat on the heater. This value is the number of degrees the display will increase or decrease the room temperature reading by.  <b>Example:</b> <i>If the display is currently showing a room temperature of 68°F, increasing the current value in this location by four (4) changes the displayed room temperature to 72°F.</i>																						
	5	-20 to 20	<b>3100/4100 SERIES</b> - Only applicable if using freeze protection.  <b>5100 SERIES</b> <b>Water Temperature Display Calibration</b> - Used to calibrate the discharge water temperature displayed on the system. This value is the number of degrees the discharge water temperature reading will be increased or decreased by.  <b>Example:</b> <i>If the display is currently showing a water temperature of 120°F, increasing the current value in this location by ten (10) changes the displayed room temperature to 130°F.</i>																						

## Standard Installation/Configuration Locations (L000-L059) continued...

ID. No.	Factory Default	Default Range	Description / Function
L015	100	0 to 100	<p><b>ALL SYSTEMS</b>  <b>Manual Charge Control Set Point</b> - Specifies the percentage of core charge the system targets during an off-peak or anticipated peak period when using a manual charge control method (subroutine 2 or 6 in L010, L011, L030 and L032). When using charge subroutines 2 or 6, L002 should be set to allow adjustment from the faceplate (Reference the 16 bit in L002), included in factory default of 24 for 2100 series.</p> <p><b><u>Value</u>      <u>Function</u></b>  0      Core Charging Disabled  50      Target 50% Core Charge Level  100      Target Maximum (Full) Core Charge Level</p> <p><b>NOTE: If using a charge subroutine of 2 or 6, the value in L099 must <u>NOT</u> be set lower than a value of fifteen (15).</b></p>
L016	170	10 to 255	<p><b>2100 SERIES</b>  <b>Damper Control Configuration</b> - Value entered in this location <b>MUST</b> be set in accordance to the voltage of the Blower/Control circuit in the heater. (Refer to the Unit Identification label on the lower left side panel of the heater for this information.)</p> <p><b><u>Value</u>      <u>Blower/Controls Configuration</u></b>  170      120/240V (standard heater configuration)  210      208V</p> <p><b>NOTE: 277V is not an option for this circuit.</b></p>
	255	10 to 255	<p><b>3100/4100 SERIES - Currently not used.</b></p> <p><b>5100 SERIES</b>  <b>Damper Control Configuration</b> - The value in this location <b><u>MUST</u></b> be set to 255. It is used for the control of the circulator pump feeding the air handler.</p>
L017	<u>2100</u> 20 <u>31/41/5100</u> 0		<p><b>ALL SYSTEMS</b>  <b>Board Rise/Room Rise as Core Heats</b> - If the temperature of the circuit board goes up X number of degrees ("X" being the value entered in this location), the room temperature reading will drop 1 degree.</p> <p><b>NOTE: Do not change setting from the default value without factory authorization.</b></p>
L018	255	0 to 255	<p><b>ALL SYSTEMS</b>  <b>Compressor Protection</b> - Minimum time, in seconds, the compressor remains "OFF" after a heating or cooling call has ended. This delay is important even if the thermostat has a delay because outdoor temperature changes could make this fluctuate quickly. 255 seconds is 4 minutes and 15 seconds.</p> <p><b>NOTE: Only applicable to installations where the system is being used in conjunction with a heat pump or air conditioner.</b></p>
L019	-1		<p><b>ALL SYSTEMS</b>  <b>Power Line Carrier (PLC) Seconds per Bit</b> - Factory use only.</p> <p><b>NOTE: Do not change setting from the default value without factory authorization.</b></p>

## Standard Installation/Configuration Locations (L000-L059) continued...

ID. No.	Factory Default	Default Range	Description / Function																																																							
L020 / C003	<u>2100</u> 3 <u>31/41/5100</u> 0	0 to 15	<p><b>ALL SYSTEMS</b> <b>Power Line Carrier (PLC) Channel Selection</b> - Indicates the channel on which PLC communication will occur. This value MUST match the setting in the PLC transmitting device. If PLC communication is not used, a value of “0” should be entered.</p> <p><u><b>Value</b></u>      <u><b>Function</b></u> 0      PLC Communication Disabled 1-2      PLC Channel 1, 2 (4 minute communication time) 3-11      PLC Channel 3, 4, 5, . . . etc. (1 minute communication time) 12-15      PLC Channel 12, 13, 14, 15 (4 minute communication time)</p> <p><b>NOTE 1: Channels 1 and 2 are original Steffes PLC communication channels. These two channels should not be used on the same distribution transformer or in areas with a high concentration of transmitters, as cross talk may occur</b></p> <p><b>NOTE 2: PLC Fail message displays after 15 minutes of no communication on startup and after 90 minutes of no communication once the system has received a communication signal.</b></p>																																																							
L021	<u>V2.04 and lower</u> 0 <u>V2.08 and higher</u> 100		<p><b>ALL SYSTEMS</b> <b>Maximum Percentage of Elements Allowed to Operate</b> - Limits the maximum percentage of elements that will be turned on at any one time. A value of 0 disables this feature. When used, this setting will allow an equal number of elements to turn on in each core relative to the value entered (see table below for more information).</p> <table><tr><th colspan="3">3100/4100/5100 Series</th><th colspan="2">2100 Series</th></tr><tr><th>L021 Value</th><th>Total Number of Elements Allowed</th><th>Elements Allowed per Core</th><th>L021 Value</th><th>Total Number of Elements Allowed</th></tr><tr><td>0</td><td>16</td><td>8</td><td>0</td><td>4</td></tr><tr><td>1-19</td><td>2</td><td>1</td><td>1-24</td><td>1</td></tr><tr><td>20-29</td><td>4</td><td>2</td><td>25-49</td><td>2</td></tr><tr><td>30-39</td><td>6</td><td>3</td><td>50-74</td><td>3</td></tr><tr><td>40-49</td><td>8</td><td>4</td><td>75-100</td><td>4</td></tr><tr><td>50-69</td><td>10</td><td>5</td><td></td><td></td></tr><tr><td>70-79</td><td>12</td><td>6</td><td></td><td></td></tr><tr><td>80-89</td><td>14</td><td>7</td><td></td><td></td></tr><tr><td>90-100</td><td>16</td><td>8</td><td></td><td></td></tr></table> <p><b><u>NOTICE:</u></b> <b>Changing the value in this location will not reduce the minimum ampacity requirements of feed circuits. The system must be connected to feed circuits that comply with the Unit Identification Label.</b></p>	3100/4100/5100 Series			2100 Series		L021 Value	Total Number of Elements Allowed	Elements Allowed per Core	L021 Value	Total Number of Elements Allowed	0	16	8	0	4	1-19	2	1	1-24	1	20-29	4	2	25-49	2	30-39	6	3	50-74	3	40-49	8	4	75-100	4	50-69	10	5			70-79	12	6			80-89	14	7			90-100	16	8		
3100/4100/5100 Series			2100 Series																																																							
L021 Value	Total Number of Elements Allowed	Elements Allowed per Core	L021 Value	Total Number of Elements Allowed																																																						
0	16	8	0	4																																																						
1-19	2	1	1-24	1																																																						
20-29	4	2	25-49	2																																																						
30-39	6	3	50-74	3																																																						
40-49	8	4	75-100	4																																																						
50-69	10	5																																																								
70-79	12	6																																																								
80-89	14	7																																																								
90-100	16	8																																																								

## Standard Installation/Configuration Locations (L000-L059) continued...

ID. No.	Factory Default	Default Range	Description / Function
L022	40	10 to 255	<b>ALL SYSTEMS</b> <b>Location Value Access Delay Time</b> - Amount of time it takes to access the location edit mode while pressing the <b>M</b> and the up arrow buttons simultaneously. If 32 bit is active in L002, accessing the Help menu by pressing the <b>M</b> button will also be delayed by this value. <b>NOTE: A value of 40 is approximately 8 seconds.</b>
L023	2		<b>ALL SYSTEMS</b> <b>Error Message Reset Time</b> - Minimum time, in minutes, before an error message resets. The maximum time is this value plus one minute.
L024	0 (°F) -18 (°C)	0 to 65 (°F) -18 to 18 (°C)	<b>2100/3100/4100 SERIES</b> <b>Freeze Protection Set Point</b> - Temperature at which brick core charging is enabled, even during a peak control period, so heat can be delivered. This may protect an application from freeze up due to unforeseen circumstances such as external equipment failure. In the event of system failure this will not provide protection. <b>NOTE 1: An optional room temperature sensor is required if using this feature with the 3100 or 4100 Series. This option may not be available in your area. Consult with a local power company representative for authorization prior to enabling.</b> <b>NOTE 2: Freeze protection will override the “MA” command for load management (version 2.06 or higher only)</b>
			<b>5100 SERIES</b> - Currently not used.
L025	0	0 to 65	<b>2100 SERIES</b> <b>Comfort Override Temperature Differential</b> - Number of degrees the room temperature must fall below room temperature set point before Comfort Override will occur. Comfort Override allows the heating elements to be energized, even during a peak period, provided the brick core is depleted and there is a heat call. If this value is set to zero, Comfort Override is disabled. <b>NOTE 1: As this option may not be available in your area, please consult with a local power company representative for authorization prior to enabling.</b> <b>NOTE 2: Comfort Override will override the “MA” command for load management (version 2.06 or higher only)</b>
			<b>3100/4100/5100 SERIES</b> - Currently not used.

## Standard Installation/Configuration Locations (L000-L059) continued...

ID. No.	Factory Default	Default Range	Description / Function												
L026	0:00	0:00 to 3:00	<p><b>ALL SYSTEMS</b> <b>Start Charge Delay Time</b> - Time, in 15 minute increments, the heating elements remain de-energized at the start of an off-peak (charge) period.</p> <p><b>NOTE:</b> <i>Space heating may be enabled during this time for all systems and auxiliary loads can also be delayed in Comfort Plus applications (see L052 for more information).</i></p>												
L027	0:00	0:00 to 3:00	<p><b>ALL SYSTEMS</b> <b>Start Charge Ramp Time</b> - Time, in 15 minute increments, over which the heating elements stage on after the Start Charge Delay Time (L026) has ended.</p> <p><b>Example:</b> <i>L027 set to 1:00 (1 hour) on a 2100 series room unit:</i> <i>Start of Charge time: 2 elements energized.</i> <i>15 min into C time = 2 elements</i> <i>30 min = 3 elements</i> <i>45 min = 4 elements</i> <i>60 min = 4 elements</i></p>												
L028	1	1 to 128	<p><b>2100 SERIES</b> <b>Minimum Blower Speed</b> - Minimum speed the blower runs during a heat call. Blower speed automatically varies in relation to heating requirements based upon this value and maximum speed (L029). The blower will operate at this speed if discharge air temperature is below the value in L048 or, the unit is receiving a stage 1 heat call when using a low voltage thermostat.</p> <table><tr><th><u>Value</u></th><th><u>Blower/Controls Configuration</u></th></tr><tr><td>1</td><td>120/240V (standard heater configuration)</td></tr><tr><td>5</td><td>208V</td></tr></table> <p><b>3100/4100/5100 SERIES</b> <b>Minimum Core Blower Speed</b> - Minimum speed the core blower operates during a heat call requiring stored heat from the system.</p> <table><tr><th><u>Value</u></th><th><u>Blower/Controls Configuration</u></th></tr><tr><td>1</td><td>120/240V (standard heater configuration)</td></tr><tr><td>5</td><td>208V</td></tr></table>	<u>Value</u>	<u>Blower/Controls Configuration</u>	1	120/240V (standard heater configuration)	5	208V	<u>Value</u>	<u>Blower/Controls Configuration</u>	1	120/240V (standard heater configuration)	5	208V
<u>Value</u>	<u>Blower/Controls Configuration</u>														
1	120/240V (standard heater configuration)														
5	208V														
<u>Value</u>	<u>Blower/Controls Configuration</u>														
1	120/240V (standard heater configuration)														
5	208V														



## Standard Installation/Configuration Locations (L000-L059) continued...

ID. No.	Factory Default	Default Range	Description / Function												
L029	Based on Heater Model	1 to 255	<b>2100 SERIES</b> <b>Maximum Blower Speed</b> - Maximum speed the blower runs during a heat call. Blower speed automatically varies in relation to heating requirements based upon this value and minimum speed (L028). If using a low voltage thermostat and the system is receiving a stage 2 heat call, the blower will operate at this speed. <b>NOTE: Increasing the maximum speed of the fan will result in a higher heat output and increased volume of airflow. In turn the heat stored in the brick core will be depleted sooner, potentially resulting in unsatisfactory performance and noise issues.</b> <table><tr><th><u>Value</u></th><th><u>Heater Series</u></th></tr><tr><td>20</td><td>Model 2102</td></tr><tr><td>65</td><td>Model 2103</td></tr><tr><td>110</td><td>Model 2104</td></tr><tr><td>155</td><td>Model 2105</td></tr><tr><td>200</td><td>Model 2106</td></tr></table>	<u>Value</u>	<u>Heater Series</u>	20	Model 2102	65	Model 2103	110	Model 2104	155	Model 2105	200	Model 2106
	<u>Value</u>	<u>Heater Series</u>													
20	Model 2102														
65	Model 2103														
110	Model 2104														
155	Model 2105														
200	Model 2106														
255	1 to 255	<b>3100/4100/5100 SERIES</b> <b>Maximum Core Blower Speed</b> - This value <u>MUST</u> be set to 255. <b>NOTE: Lowering this value decreases the overall output of the system. Blower speed may be lowered to temporarily reduce a high RPM motor noise until the core blower can be replaced.</b>													
L030	0	0 to 8	<b>ALL SYSTEMS</b> <b>Specialty Timer #1 Charge Mode</b> - Specifies the core charge operating mode to be used during timed period #1. Values are interpreted the same as L010. This timer activates at the start of any peak period and runs for the duration of L031. <b>NOTE: An upper bar “<sup>~</sup>” on the 2<sup>nd</sup> digit of the display indicates an active timer.</b>												
L031	0:00	0:00 to 16:00	<b>ALL SYSTEMS</b> <b>Specialty Timer #1 Charge Mode Duration</b> - Length of time Specialty Timer #1 Charge Mode (L030) is active.												
L032	0	0 to 8	<b>ALL SYSTEMS</b> <b>Specialty Timer #2 Charge Mode</b> - Specifies the core charge operating mode to be used during timed period #2. Values are interpreted the same as L010. This mode activates at the end of Specialty Timer #1 and lasts for the duration of L033. <b>NOTE: An upper bar “<sup>~</sup>” on the 2<sup>nd</sup> digit of the display indicates an active timer.</b>												
L033	0:00	0:00 to 16:00	<b>ALL SYSTEMS</b> <b>Specialty Timer #2 Charge Mode Duration</b> - Length of time Specialty Timer #2 Charge Mode (L032) is active.												

## Standard Installation/Configuration Locations (L000-L059) continued...

ID. No.	Factory Default	Default Range	Description / Function																		
L034	0	0 to 16	<b>2100/5100 SERIES</b> - Currently not used.																		
			<b>3100/4100 SERIES</b> <b>Heat Call Relay Function</b> - Specifies how the heat call relay will react to a heat call. The value entered determines how many elements must be active before the heat call relay opens. The number of elements active varies based on the target level of the system (L108).  <table><tr><th><u>Value</u></th><th><u>Function</u></th></tr><tr><td>0</td><td>Heat call relay closes during all heat calls.</td></tr><tr><td>1-16</td><td>Heat call relay acts as a load management device. It will remain closed until the number of elements selected in this location are energized and will then open.</td></tr></table> <b>Example:</b> If a value of four (4) is entered, the heat call relay remains closed until four or more of the elements are energized. If at least four elements are energized, the heat call relay opens.  <b>NOTE: If Maximum Percentage of Elements Allowed to Operate (L021) is enabled, this value (L034), must be lower than L021. A value in L034 that is higher than L021 may result in the heat call relay never being opened.</b>	<u>Value</u>	<u>Function</u>	0	Heat call relay closes during all heat calls.	1-16	Heat call relay acts as a load management device. It will remain closed until the number of elements selected in this location are energized and will then open.												
<u>Value</u>	<u>Function</u>																				
0	Heat call relay closes during all heat calls.																				
1-16	Heat call relay acts as a load management device. It will remain closed until the number of elements selected in this location are energized and will then open.																				
L035 / C004	<u>2100</u> 154 <u>31/41/5100</u> 9	0 to 255	<b>ALL SYSTEMS</b> <b>Optional Controls Configuration</b> - Interfaces the system with optional sensors and controls that may be used in the application. Shortcuts to some user control functions are also enabled in this location.  <table><tr><th><u>Value</u></th><th><u>Option Selected</u></th></tr><tr><td>1</td><td>Enable Hard Wired Outdoor Temperature Sensor. (Only applicable if using a charge subroutine of 3, 5, 7, 8 or 9 in L010, L011, L030, and/or L032).</td></tr><tr><td>2</td><td>Enable Room Temperature Sensing System. (Built-in or hard wired remote sensor.)</td></tr><tr><td>4</td><td>Enable the Time Clock Module Option and add both "CLOC" and "DAY" to the menu on the display. (Refer to L060-L089 for setting desired function and operation of the time clock module.)</td></tr><tr><td>8</td><td>Ability to Enable/Disable Charge Control Override Option from faceplate. (This option allows user to initiate a one-time full core charge. When used, all charge control settings are temporarily overridden to force the heater to its maximum charge during the off-peak period.) <b>NOTE: This is not a Peak override.</b></td></tr><tr><td>16</td><td>Ability to Enable/Disable "OFF" Mode from faceplate. (Reference L009.)</td></tr><tr><td>32</td><td><b>2100 Series Only</b> - Ability to Enable/Disable Room Temperature Setback Option from faceplate. (Reference L001.) <b>Not Used in 3100, 4100, or 5100 Series.</b></td></tr><tr><td>64</td><td><b>2100 Series Only</b> - Ability to Enable/Disable Room Temperature Setback Editing Option from faceplate when utilizing the Steffes Time Clock Module.</td></tr><tr><td>128</td><td><b>2100 Series Only</b> - Enable Output Temperature Control. <b>(MUST be enabled in 2100 Series.)</b></td></tr></table>	<u>Value</u>	<u>Option Selected</u>	1	Enable Hard Wired Outdoor Temperature Sensor. (Only applicable if using a charge subroutine of 3, 5, 7, 8 or 9 in L010, L011, L030, and/or L032).	2	Enable Room Temperature Sensing System. (Built-in or hard wired remote sensor.)	4	Enable the Time Clock Module Option and add both "CLOC" and "DAY" to the menu on the display. (Refer to L060-L089 for setting desired function and operation of the time clock module.)	8	Ability to Enable/Disable Charge Control Override Option from faceplate. (This option allows user to initiate a one-time full core charge. When used, all charge control settings are temporarily overridden to force the heater to its maximum charge during the off-peak period.) <b>NOTE: This is not a Peak override.</b>	16	Ability to Enable/Disable "OFF" Mode from faceplate. (Reference L009.)	32	<b>2100 Series Only</b> - Ability to Enable/Disable Room Temperature Setback Option from faceplate. (Reference L001.) <b>Not Used in 3100, 4100, or 5100 Series.</b>	64	<b>2100 Series Only</b> - Ability to Enable/Disable Room Temperature Setback Editing Option from faceplate when utilizing the Steffes Time Clock Module.	128	<b>2100 Series Only</b> - Enable Output Temperature Control. <b>(MUST be enabled in 2100 Series.)</b>
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## Standard Installation/Configuration Locations (L000-L059) continued...

ID. No.	Factory Default	Default Range	Description / Function
L036 / C005	0	0 to 255	<p><b>2100 SERIES</b>  <b>Control Switch Configuration</b> - Determines how the heater reacts to a control switch signaling device. In standard configuration, a “closed” control switch indicates an on-peak (control) period, an anticipated peak period, or room temperature setback period. Each of these signals can be inverted.</p> <p><u><b>Value</b></u>    <u><b>Option Selected</b></u></p> <p>0    A CLOSED control switch indicates a Peak (Control) time, Anticipated Peak time, or Room Temperature Setback period.</p> <p>1    An OPEN control switch indicates a Peak (Control) time.</p> <p>2    An OPEN control switch indicates an Anticipated Peak time.</p> <p>4    An OPEN control switch indicates a Room Temperature Setback period.</p> <p>8    Not used in 2100 Series.</p> <p>16    An OPEN thermostat switch enables Y, Stage 1 heat call, when using a low voltage thermostat.</p> <p>32    An OPEN thermostat switch enables W, Stage 2 heat call, when using a low voltage thermostat.</p> <p>64    An OPEN thermostat switch enables E, Emergency Heat, when using a low voltage thermostat.</p>
	1	0 to 255	<p><b>3100/4100/5100 SERIES</b>  <b>Control Switch Configuration</b> - Determines how the system reacts to a control switch signaling device. In standard configuration, a “closed” control switch indicates an off-peak (charge) period, an anticipated peak period, a room temperature setback period or a cooling call (the “O” wiring position on compressor is energized).</p> <p><u><b>Value</b></u>    <u><b>Option Selected</b></u></p> <p>0    A CLOSED control switch indicates a Peak (Control) time, Anticipated Peak, Room Temperature Setback period or cooling call.</p> <p>1    An OPEN control switch indicates a Peak (Control) time.</p> <p>2    An OPEN control switch indicates an Anticipated Peak time.</p> <p>4    Not used in 3100, 4100, or 5100 Series.</p> <p>8    An OPEN thermostat switch enables O, reversing valve.</p> <p>16    An OPEN thermostat switch enables Y, Stage 1.</p> <p>32    An OPEN thermostat switch enables W, Stage 2.</p> <p>64    An OPEN thermostat switch enables E, Emergency Heat.</p>

## Standard Installation/Configuration Locations (L000-L059) continued...

ID. No.	Factory Default	Default Range	Description / Function
L037 / C006	$\frac{2100}{6}$	0 to 255	<b>2100 SERIES</b> <b>Output Control Configuration</b> - Configures the output controls of the system.  <u><b>Value</b></u> <u><b>Option Selected</b></u> 2      Output temperature reaction setting. <b>Must be used in all models.</b> 4      Helps maintain room temperature set point.
	$\frac{3100}{2}$  $\frac{4100}{3}$  $\frac{5100}{2}$	0 to 255	<u><b>Value</b></u> <u><b>Option Selected</b></u> 1 <b>4100 Series Only</b> - Allows the core blowers to run independently. 2      Output temperature reaction setting. <b>Must be used in all models.</b> 8      Enables compressor control if there is a "Cool" call during a peak (control) period. 16      Enables Comfort Override (Comfort override allows the heating elements to be energized, even during peak control periods, provided brick core is depleted and there is a Stage 2 or Stage 3 heat call.) <b>NOTE: Comfort Override will override the "MA" command for load management (version 2.06 or higher only)</b> 32      Enables compressor cycling. If it is a peak (control) period and the system receives a cooling call, the compressor turns off and on in 20 minute intervals. 64      Currently not used. 128      Interfaces the system with a heat pump that has a reversing valve which is energized for heating (i.e., Rheem, Ruud, etc.) Most heat pumps energize the reversing valve for cooling and will not require this bit.
L038	1		<b>ALL SYSTEMS</b> <b>Multiple of 9600 Baud for RS232 Communication.</b>  <b>NOTE: Do not change without factory authorization.</b>
L039	5:00	2:00 to 23:45	<b>ALL SYSTEMS</b> <b>Time to go to Full Charge</b> - Amount of time the system is expected to go from minimum to full charge. The shorter the amount of time, the more aggressively the heater calculates the usage of the system (L128).  <b>NOTE: Do not change without factory authorization. This factor is important to charging subroutines 4, 5, 6 and 9 as set in L010, L011, L030, and/or L032).</b>

## Standard Installation/Configuration Locations (L000-L059) continued...

ID. No.	Factory Default	Default Range	Description / Function
L040	<u>2100</u> 1100(°F) 593(°C)  <u>3100</u> 1000(°F) 537(°C)  <u>4100/5100</u> 1200(°F) 648(°C)	0 to 1650(°F) 0 to 898(°C)	<b>ALL SYSTEMS</b> <b>Maximum Core Temperature</b> - Maximum brick core charge temperature allowed.  <b>NOTE: Do not set values higher than factory default. Operating the core at maximum temperatures higher than those specified will cause heating element damage and improper operation.</b>
L041	200(°F) 93(°C)	0 to 600(°F) 0 to 315(°C)	<b>ALL SYSTEMS</b> <b>Minimum Core Temperature</b> - Minimum core charge temperature the system will target ("tL: 0") during any charging period, Comfort Override (L025 for 2100 Series and L037 for 3100, 4100, and 5100 Series) or when utilizing Space Heating Mode (subroutine 1 in L010 and L011).  <b>NOTE: It is recommended to set this value to 400°F (204°C) if using a charge subroutine of 1 or 4 in L010, L011, L030 and/or L032.</b>
L042	6:00	2:00 to 8:00	<b>ALL SYSTEMS</b> <b>Sensorless Averaging Period</b> - Number of hours of history to use when averaging energy usage.  Upon power up the system begins collecting history immediately. It will maintain a maximum history of data based upon this value.  <b>NOTE: Only applicable if using a charge subroutine of 4, 5, 6, or 9 in L010, L011, L030, and/or L032.</b>
L043 / C007	30	10 to 255	<b>ALL SYSTEMS</b> <b>Sensorless Auto Charge "Charge Factor"</b> - Represents the charging factor used to determine the targeted brick core charge level based on the number of off-peak hours during a 24-hour period. The lower the value, the less aggressive the target level.  <b>NOTE: Only applicable if using a charge subroutine of 4, 5, 6, or 9 in L010, L011, L030, and/or L032.</b>
L044	10:00	0 to 10:00	<b>ALL SYSTEMS</b> <b>Discharge Air Cycling Control for Anticipated Peak Mode</b> - Controls the maximum number of minutes the blower (core blower in 3100, 4100, and 5100 Series) is allowed to operate within a 10-minute period during an anticipated peak time.  <b>NOTE: Not active during Specialty timer operation (L031 and L033).</b>
L045	1	0 to 255	<b>ALL SYSTEMS</b> <b>Delay from Heat Call to Blower Activation</b>  <b>NOTE: Do not change without factory authorization.</b>

## Standard Installation/Configuration Locations (L000-L059) continued...

ID. No.	Factory Default	Default Range	Description / Function
L046 / C008	5(°F) -15(°C)	-50 to 120(°F) -45 to 49(°C)	<b>ALL SYSTEMS</b> <b>Compressor Lock-Out Set Point for Off-Peak or Anticipated Peak Modes</b> - Indicates the outdoor temperature at which the heat pump's compressor is to be locked out (not allowed to operate) during an off-peak or anticipated peak period.
L047 / C009	5(°F) -15(°C)	-50 to 120(°F) -45 to 49(°C)	<b>ALL SYSTEMS</b> <b>Compressor Lock-Out Set Point for On-Peak Mode</b> - Outdoor temperature the heat pump's compressor is to be locked out (not allowed to operate) during an on-peak period.
L048 / C010	90(°F) 32(°C)	55 to 300(°F) 13 to 149(°C)	<b>ALL SYSTEMS</b> <b>Minimum Discharge Air Temperature</b> - Minimum discharge air temperature the system will target.  <i><b>NOTE: If using a 3100, 4100, or 5100 Series with an air handler as a "stand-alone" furnace (no heat pump), this value should be set to 115. If combining the systems with a heat pump, optimum efficiency and comfort is usually achieved with a value of 90.</b></i>
L049	<u>2100</u> 200 (°F) 93 (°C)  <u>31/41/5100</u> 120 (°F) 49 (°C)	55 to 300(°F) 13 to 149(°C)	<b>ALL SYSTEMS</b> <b>Maximum Discharge Air Temperature</b> - Maximum discharge air temperature the system will target during a heat call.
L050	-5	-20 to 20	<b>ALL SYSTEMS</b> <b>Outdoor Temperature Offset</b> - Calibrates the hard wired outdoor temperature sensor reading as sensed by the system (L113).
L051	0	0-1200	<b>2100/3100/4100 SERIES</b> - Currently not used.  <b>5100 SERIES</b> <b>Static Heat Recovery Relay</b> - Threshold for energizing the Static Heat Recovery relay.  <u><b>Value</b></u> <u><b>Description</b></u> 0            Energizes relay during any hydronic "H" heat call. Primarily used to operate secondary loop pumps with the orange and white wires.  1-1200      The relay will energize when the average brick core temperature is greater than this value. Primarily used to operate the Static Heat Recovery Unit.

## Standard Installation/Configuration Locations (L000-L059) continued...

ID. No.	Factory Default	Default Range	Description / Function																		
L052	<div>2100</div> <div>10</div> <div>31/41/5100</div> <div>8</div>	0-255	<div>ALL SYSTEMS</div> <div>Optional Features</div> <table><thead><tr><th><u>Value</u></th><th><u>Description</u></th></tr></thead><tbody><tr><td>1</td><td>The system will not decrement L040 if “CORE FAIL” is detected.</td></tr><tr><td>2</td><td>“CORE FAIL” MESSAGE is not displayed even if a core fail is detected.</td></tr><tr><td>4</td><td>Disables proportional charging; therefore, if the system is charging, all elements are energized.</td></tr><tr><td>8</td><td>Enables Clock Editing Security, making it so the clock settings can only be edited for the first two (2) minutes of operation.</td></tr><tr><td>16</td><td>Enables space heating during a charge delay time (reference L010 subroutine 1, L026 and L041).</td></tr><tr><td>32</td><td><b>3100/4100/5100 Series Only</b> - Enables Charge Delay (L026) for loads controlled by the peak control relay (COM, NO, NC positions on the 6-position terminal block).</td></tr><tr><td>64</td><td>Invert the reversing valve relay so that it can output an A Peak signal to the Master Control Module.</td></tr><tr><td>128</td><td>Output the percentage of Core charge with the 3 Control board relays to communicate to the Small BACNet device analog input</td></tr></tbody></table>	<u>Value</u>	<u>Description</u>	1	The system will not decrement L040 if “CORE FAIL” is detected.	2	“CORE FAIL” MESSAGE is not displayed even if a core fail is detected.	4	Disables proportional charging; therefore, if the system is charging, all elements are energized.	8	Enables Clock Editing Security, making it so the clock settings can only be edited for the first two (2) minutes of operation.	16	Enables space heating during a charge delay time (reference L010 subroutine 1, L026 and L041).	32	<b>3100/4100/5100 Series Only</b> - Enables Charge Delay (L026) for loads controlled by the peak control relay (COM, NO, NC positions on the 6-position terminal block).	64	Invert the reversing valve relay so that it can output an A Peak signal to the Master Control Module.	128	Output the percentage of Core charge with the 3 Control board relays to communicate to the Small BACNet device analog input
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L053	0	0-255	<div>ALL SYSTEMS</div> <div>Load Management Features</div> <table><thead><tr><th><u>Value</u></th><th><u>Description</u></th></tr></thead><tbody><tr><td>128</td><td>Enables the “MA” command to control the maximum percentage of elements allowed to operate. Command received via the communication port on the system or via PLC communications.</td></tr></tbody></table>	<u>Value</u>	<u>Description</u>	128	Enables the “MA” command to control the maximum percentage of elements allowed to operate. Command received via the communication port on the system or via PLC communications.														
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L054			Currently not used.																		

## Standard Installation/Configuration Locations (L000-L059) continued...

ID. No.	Factory Default	Default Range	Description / Function
L055	0		<b>2100/3100/4100 SERIES - Version 2.04 and Higher</b> <b>Optional Control Functions</b> <u><b>Value</b></u> <u><b>Description</b></u> 4      Detect the pulse width of the A Peak input to set the maximum percent of elements allowed to operate. <i>Do Not use in conjunction with the 32 bit.</i> 32      Detect the pulse width of the A Peak input to simulate outdoor temperature. <i>Do Not use in conjunction with the 4 bit (version 2.08 or higher only).</i> 64 <b>2100 Series Only</b> – Output solid state relay control signals on the peak relay outputs. <i>Requires modified processor control board with Kluge jumpers (version 2.08 or higher only).</i>
			<b>5100 SERIES - Version 2.04 and Higher</b> <b>Optional Control Functions</b> <u><b>Value</b></u> <u><b>Description</b></u> 2      Enables the use of the “TW” command via the system communication port to set target water as a percentage between L000 and L001. 4      Detect the pulse width of the A Peak input to set the maximum percent of elements allowed to operate. 8      Activates relay when outlet water temperature drops 10 degrees below target for at least 10 minutes to signal secondary fuel source to turn on. 16      Sets the “MA” command for PLC communication only ( <b>version 2.08 or higher only</b> ). 32      Detect the pulse width of the A Peak input to simulate outdoor temperature. <i>Do Not use in conjunction with the 4 bit (version 2.08 or higher only).</i>
L056	45	0-60	<b>ALL SYSTEMS</b> <b>Heating Element Input - The kW input of a single element times ten (kW X 10).</b> Required for use with “MA” and pulse width modulation load control inputs.
L057 – L059			Currently not used.



## Time Clock Module Installation Locations (L060-L089)

**NOTE:** Locations L060 through L089 are time clock related programs. The optional Steffes Time Clock Module must be installed in order to utilize the features described in these locations.

ID. No.	Factory Default	Default Range	Description / Function
L060	1	0 to 255	<p><b>ALL SYSTEMS</b>  <b>Time Clock Module Function Enable</b> - Indicates which function(s) the optional time clock module is to be used for.</p> <p><u><b>Value</b></u>   <u><b>Option Selected</b></u></p> <p>0   Time clock module not used for control purposes.</p> <p>1   Enable time clock module to be used for peak control purposes.</p> <p>2   Enable time clock module to be used for anticipated peak control purposes (Specialty Applications only).</p> <p>4   <b>2100 Series Only</b> - Enables the Steffes Time Clock Module to be used for room temperature setback purposes and adds "Schd" to the menu on the display. "Schd" is the schedule for room temperature setback (L074-L089). "D1sp" is the weekday set point and "D1c1" is the weekday time. "E1sp" is the weekend set point and "E1c1" is the weekend time.</p> <p>8   Enable calendar function, allows user to edit YEAR and Date.</p> <p>16   Enables Specialized Time Schedule-Ont. V2.02 and V2.04 and higher have different time schedules. Refer to the appropriate configuration guide for more information.</p> <p>32   Clock schedules show "Schd" mini menu.</p> <p>64   Configures the "Schd" menu item so changes can be made at the faceplate by holding the <b>M</b> button in and using the up or down arrow button to change the value. If not enabled, changes are made by pressing the up arrow and using the <b>M</b> button to scroll.</p>
L061	0:00	0:00 to 16:00	<p><b>ALL SYSTEMS</b>  <b>Anticipated Peak Duration</b> - Initiates an anticipated peak time prior to each scheduled peak time as programmed in the time clock module and sets the duration of the anticipated peak period. The value entered is specified in 15-minute intervals.</p>
L062 / C014	0:00	0 to 23:45	<p><b>ALL SYSTEMS</b>  <b>Weekday Peak Time #1</b> - Specifies the time at which the first peak period is to begin on weekdays (Monday - Friday). The value is set in military time (24-hour clock period).</p>
L063 / C015	0:00	0 to 16:00	<p><b>ALL SYSTEMS</b>  <b>Weekday Peak Time #1 Duration</b> - Sets duration of the 1st weekday time clock scheduled peak time (as set in L062). Value is specified in 15-minute intervals.</p>
L064 / C016	0:00	0:00 to 23:45	<p><b>ALL SYSTEMS</b>  <b>Weekday Peak Time #2</b> - Specifies the time (military) at which the 2nd time clock scheduled peak time is to begin each weekday (Monday - Friday).</p>

## Time Clock Module Installation Locations (L060-L089) continued...

ID. No.	Factory Default	Default Range	Description / Function
<b>L065</b> / <b>C017</b>	0:00	0:00 to 16:00	<b>ALL SYSTEMS</b> <b>Weekday Peak Time #2 Duration</b> - Sets duration of the 2nd weekday time clock scheduled peak time (as set in L064). Value is specified in 15-minute intervals.
<b>L066</b>	0:00	0:00 to 23:45	<b>ALL SYSTEMS</b> <b>Weekday Peak Time #3</b> - Specifies the time (military) at which the 3rd time clock scheduled peak time is to begin each weekday (Monday – Friday).
<b>L067</b>	0:00	0:00 to 16:00	<b>ALL SYSTEMS</b> <b>Weekday Peak Time #3 Duration</b> - Sets duration of the 3rd weekday time clock scheduled peak time (as set in L066). Value is specified in 15-minute intervals.
<b>L068</b> / <b>C018</b>	0:00	0:00 to 23:45	<b>ALL SYSTEMS</b> <b>Weekend Peak Time #1</b> - Specifies the time at which the 1st time clock scheduled peak interval is to begin each weekend day (Saturday and Sunday). The value is set in military time (24-hour clock period).
<b>L069</b> / <b>C019</b>	0:00	0:00 to 16:00	<b>ALL SYSTEMS</b> <b>Weekend Peak Time #1 Duration</b> - Sets duration of the 1st weekend time clock scheduled peak time (as set in L068). Value is specified in 15-minute intervals.
<b>L070</b> / <b>C020</b>	0:00	0:00 to 23:45	<b>ALL SYSTEMS</b> <b>Weekend Peak Time #2</b> - Specifies the time (military) at which the 2nd time clock scheduled peak interval is to begin each weekend day (Saturday and Sunday).
<b>L071</b> / <b>C021</b>	0:00	0:00 to 16:00	<b>ALL SYSTEMS</b> <b>Weekend Peak Time #2 Duration</b> - Sets duration of the 2nd weekend time clock scheduled peak time (as set in L070). Value is specified in 15-minute intervals.
<b>L072</b>	0:00	0:00 to 23:45	<b>ALL SYSTEMS</b> <b>Weekend Peak Time #3</b> - Specifies the time (military) at which the 3rd time clock scheduled peak interval is to begin each weekend day (Saturday and Sunday).
<b>L073</b>	0:00	0:00 to 16:00	<b>ALL SYSTEMS</b> <b>Weekend Peak Time #3 Duration</b> - Sets duration of the 3rd weekend time clock scheduled peak time (as set in L072). Value is specified in 15-minute intervals.

## Time Clock Module Installation Locations (L060-L089) continued...

ID. No.	Factory Default	Default Range	Description / Function
L074	0:00	0:00 to 23:45	<b>2100 SERIES</b> <b>Weekday Room Temperature Set Point Start Time #1</b> - Specifies the weekday (Monday – Friday) time at which the room temperature set point is to automatically adjust to the temperature set in L075.
			<b>3100/4100/5100 SERIES</b> - Currently not used.
L075	0 (°F) -18 (°C)	0 to 99 (°F) -18 to 37 (°C)	<b>2100 SERIES</b> <b>Weekday Room Temperature Set Point Temperature #1</b> - Sets the room temperature set point to be maintained at the start time specified in L074.
			<b>3100/4100/5100 SERIES</b> - Currently not used.
L076	0:00	0:00 to 23:45	<b>2100 SERIES</b> <b>Weekday Room Temperature Set Point Start Time #2</b> - Specifies the weekday (Monday – Friday) time at which the room temperature set point is to automatically be adjusted to the temperature set in L077.
			<b>3100/4100/5100 SERIES</b> - Currently not used.
L077	0 (°F) -18 (°C)	0 to 99 (°F) -18 to 37 (°C)	<b>2100 SERIES</b> <b>Weekday Room Temperature Set Point Temperature #2</b> - Sets the room temperature set point to be maintained at the start time specified in L076.
			<b>3100/4100/5100 SERIES</b> - Currently not used.
L078	0:00	0:00 to 23:45	<b>2100 SERIES</b> <b>Weekday Room Temperature Set Point Start Time #3</b> - Specifies the weekday (Monday - Friday) time at which the room temperature set point is to automatically be adjusted to the temperature set in L079.
			<b>3100/4100/5100 SERIES</b> - Currently not used.
L079	0 (°F) -18 (°C)	0 to 99 (°F) -18 to 37 (°C)	<b>2100 SERIES</b> <b>Weekday Room Temperature Set Point Temperature #3</b> - Sets the room temperature set point to be maintained at the start time specified in L078.
			<b>3100/4100/5100 SERIES</b> - Currently not used.
L080	0:00	0:00 to 23:45	<b>2100 SERIES</b> <b>Weekday Room Temperature Set Point Start Time #4</b> - Specifies the weekday (Monday – Friday) time in which the room temperature set point is to automatically be adjusted to the temperature set in L081.
			<b>3100/4100/5100 SERIES</b> - Currently not used.

## Time Clock Module Installation Locations (L060-L089) continued...

ID. No.	Factory Default	Default Range	Description / Function
L081	0 (°F) -18 (°C)	0 to 99 (°F) -18 to 37 (°C)	<b>2100 SERIES</b> <b>Weekday Room Temperature Set Point Temperature #4</b> - Sets the room temperature set point to be maintained at the start of time specified in L080.
			<b>3100/4100/5100 SERIES</b> - Currently not used.
L082	0:00	0:00 to 23:45	<b>2100 SERIES</b> <b>Weekend Room Temperature Set Point Start Time #1</b> - Specifies the weekend (Saturday/Sunday) time at which the room temperature set point is to automatically be adjusted to the temperature set in L083.
			<b>3100/4100/5100 SERIES</b> - Currently not used.
L083	0 (°F) -18 (°C)	0 to 99 (°F) -18 to 37 (°C)	<b>2100 SERIES</b> <b>Weekend Room Temperature Set Point Temperature #1</b> - Sets the room temperature set point to be maintained at the start of time specified in L082.
			<b>3100/4100/5100 SERIES</b> - Currently not used.
L084	0:00	0:00 to 23:45	<b>2100 SERIES</b> <b>Weekend Room Temperature Set Point Start Time #2</b> - Specifies the weekend (Saturday/Sunday) time at which the room temperature set point is to automatically be adjusted to the temperature set in L085.
			<b>3100/4100/5100 SERIES</b> - Currently not used.
L085	0 (°F) -18 (°C)	0 to 99 (°F) -18 to 37 (°C)	<b>2100 SERIES</b> <b>Weekend Room Temperature Set Point #2</b> - Sets the room set point to be maintained at the start of time specified in L084.
			<b>3100/4100/5100 SERIES</b> - Currently not used.
L086	0:00	0:00 to 23:45	<b>2100 SERIES</b> <b>Weekend Room Temperature Set Point Start Time #3</b> - Specifies the weekend (Saturday/Sunday) time at which the room temperature set point is to automatically be adjusted to the temperature set in L087.
			<b>3100/4100/5100 SERIES</b> - Currently not used.
L087	0 (°F) -18 (°C)	0 to 99 (°F) -18 to 37 (°C)	<b>2100 SERIES</b> <b>Weekend Room Temperature Set Point #3</b> - Sets the room temperature set point to be maintained at the start of time specified in L086.
			<b>3100/4100/5100 SERIES</b> - Currently not used.

## Time Clock Module Installation Locations (L060-L089) continued...

ID. No.	Factory Default	Default Range	Description / Function
<b>L088</b>	0:00	0 to 23:45	<b>2100 SERIES</b> <b>Weekend Room Temperature Set Point Start Time #4</b> - Specifies the weekend (Saturday/Sunday) time at which the room temperature set point is to automatically be adjusted to the temperature set in L089.
			<b>3100/4100/5100 SERIES</b> - Currently not used.
<b>L089</b>	0 (°F) -18 (°C)	0 to 99 (°F) -18 to 37 (°C)	<b>2100 SERIES</b> <b>Weekend Room Temperature Set Point #4</b> - Sets the room temperature set point to be maintained at the start of time specified in L088.
			<b>3100/4100/5100 SERIES</b> - Currently not used.

## Equipment Series Specific Configuration Locations (L090-L099)

**NOTE:** L090 through L099 are Configuration Locations. These locations are for setting up the system and can be changed only if editing mode is entered within the first 4 minutes after powering up the system.

ID. No.	Factory Default	Default Range	Description / Function
<b>L090</b>	Based on Heater Model	10 to 59	<b>ALL SYSTEMS</b> <b>Model Type</b> - Specifies the series.  <u>Value</u> <u>Heater Series</u> 20   2100 Series (Models 2102-2106) 30   3100 Series (Model 3120) 40   4100 Series (Models 4120, 4130, 4140) 50   5100 Series (Models 5120, 5130, 5140)
<b>L091</b>	Based on Heater Model	1 to 8	<b>ALL SYSTEMS</b> <b>Heating Elements per Core Sensor</b> - Specifies the number of heating elements contained in each brick core of the system.  <u>Value</u> <u>Heater Series</u> 4   Models 2102-2106 and Model 3120 6   Models 4130 and 5130 8   Models 4120, 4140, 5120 and 5140
<b>L092</b>	Based on Heater Model	1 to 2	<b>ALL SYSTEMS</b> <b>Brick Core Sensors per Heater</b> - Specifies the number of brick core sensors (i.e. thermocouples) contained in the system.  <u>Value</u> <u>Heater Series</u> 1   Models 2102-2106, 4120, and 5120 2   Models 3120, 4130, 4140, 5130, and 5140
<b>L093</b>	<u>2100</u> 150 (°F) 66 (°C)  <u>31/4100</u> 170 (°F) 76 (°C)  <u>5100</u> 125 (°F) 52 (°C)	100 to 200(°F) 38 to 93(°C)	<b>ALL SYSTEMS</b> <b>Maximum Temperature of Control Board - Factory Purposes Only.</b> If the temperature of the control board goes 5 degrees or more above this temperature and Error 7 ("ER07") will be displayed and on 2100 Series and Comfort Plus systems with PSC supply air blowers, the blower will energize. The blower will not energize on 3100/4100/5100 Series systems with variable speed supply air blowers.  <b>NOTE: Do not change setting from default value without factory authorization.</b>
<b>L094</b>	<u>2100</u> 220  <u>3100/4100</u> 178  <u>5100</u> 195	150 to 245	<b>ALL SYSTEMS</b> <b>Portion of Range Used in Blower - Factory Purposes Only.</b> Wave chopping factor for blower in 2100 Series and core blower(s) in Comfort Plus.  <b>NOTE: Do not change setting from default value without factory authorization.</b>

## Equipment Series Specific Configuration Locations (L090-L099) continued...

ID. No.	Factory Default	Default Range	Description / Function
L095	<u>2100</u> 150 <u>31/41/5100</u> 80	0 to 255	<b>ALL SYSTEMS</b> <b>Jump Start</b> - Establishes the speed that the fan starts in when energized. For instance, if a value of 80 is selected, the fan starts in speed 80 and then adjusts to the appropriate speed.  <b>NOTE: Changing this setting affects the minimum output of the system. It can be used in conjunction with L028 (minimum blower speed) for troubleshooting purposes.</b>
L096	0	0 to 255	<b>ALL SYSTEMS</b> <b>Power Line Carrier Channel Scan for Channels 1-7</b> - If the PLC Test (L098) is running, this is used to indicate which channels (1-7) are available. The 1 bit is active as long as the test is in process.  <u><b>Value</b></u> <u><b>Channel Available</b></u> 1   Indicates the PLC Channel Test is running 2   Channel 1 is available 4   Channel 2 is available 8   Channel 3 is available 16   Channel 4 is available 32   Channel 5 is available 64   Channel 6 is available 128   Channel 7 is available
L097	0	0 to 255	<b>ALL SYSTEMS</b> <b>Power Line Carrier Channel Scan for Channels 8-15</b> - If the PLC Test (L098) is running, this indicates which channels (8-15) are available.  <u><b>Value</b></u> <u><b>Channel Available</b></u> 1   Channel 8 is available 2   Channel 9 is available 4   Channel 10 is available 8   Channel 11 is available 16   Channel 12 is available 32   Channel 13 is available 64   Channel 14 is available 128   Channel 15 is available

## Equipment Series Specific Configuration Locations (L090-L099) continued...

ID. No.	Factory Default	Default Range	Description / Function
L098	0	0 to 255	<p><b>ALL SYSTEMS with Processor Control board rev. G or lower</b>  <b>Save / Restore Program Location Default Settings</b> - Used to save preferred default values or to load previously saved or factory default values. When one of the following values is entered, the action listed is taken and the location resets to a value of zero (0).</p> <p><u><b>Value</b></u>    <u><b>Action Triggered</b></u></p> <p>1    Start PLC Channel Scan Testing.</p> <p>20    Load configuration saved with value of 120.</p> <p>30    Load configuration saved with value of 130.</p> <p>40    Load configuration saved with value of 140.</p> <p>50    Load configuration saved with value of 150.</p> <p><b>NOTE: Saves can only be performed once without downloading new Firmware</b></p> <p>99    Save configuration to be retrieved from 199.</p> <p>120    Save configuration to be retrieved from 20.</p> <p>130    Save configuration to be retrieved from 30.</p> <p>140    Save configuration to be retrieved from 40.</p> <p>150    Save configuration to be retrieved from 50.</p> <p>199    Load configuration saved with value of 99.</p> <p>255    Load the "Factory Defaults".</p> <p><b>NOTE: Factory Defaults for 255 bit will be overwritten if saving the the 99 bit.</b></p>
			<p><b>ALL SYSTEMS with Processor Control board rev. H with version 2.08 software only.</b>  <b>Save / Restore Program Location Default Settings</b> - Used to save preferred default values or to load previously saved or factory default values. When one of the following values is entered, the action listed is taken and the location resets to a value of zero (0).</p> <p><u><b>Value</b></u>    <u><b>Action Triggered</b></u></p> <p>1    Start PLC Channel Scan Testing.</p> <p>20-92    Load configuration saved with value of 120-192 respectively.</p> <p><b>NOTE: Saves can only be performed once without downloading new Firmware</b></p> <p>99    Save configuration to be retrieved from 199.</p> <p>120-192    Save configuration to be retrieved from 20-92 respectively.</p> <p>199    Load configuration saved with value of 99.</p> <p>255    Load the "Factory Defaults".</p> <p><b>NOTE: Factory Defaults for 255 bit will be overwritten if saving the the 99 bit.</b></p>
L099	15	0 to 89	<p><b>ALL SYSTEMS</b>  <b>Editing Locations Security Lock-Out</b> - Specifies which program locations can be edited from the faceplate after the first minute of operation. Only locations equal to or lower than the value in this location can be edited from the faceplate.</p> <p><b>NOTE: This location can always be edited, regardless of what value it is set to.</b></p>



## Read Only Locations (L100-L163)

**NOTE:** Locations L100 through L163 are used to determine current operating status of the heater.

ID. No.	Factory Default	Default Range	Description / Function
L100			<p><b>ALL SYSTEMS</b>  <b>Current Effective Inputs</b> - Indicates which digital inputs are currently being used to control space heating and core charging algorithms. The value shown is based on the values in locations L101, L102, L103, and L104. When more than one digital input source is present, this location displays the most recently received input.</p> <p><u><b>Value</b></u>   <u><b>Input</b></u></p> <p>1   Peak Interval Signal</p> <p>2   Anticipated Peak Interval Signal</p> <p>4   Fan ON or Setback ("G" Thermostat Input)</p> <p>8   Reverse Signal ("O" Thermostat Input)</p> <p>16   Stage One Heat Call (if 2-stage HP, stage one and two compressor calls)</p> <p>32   Stage Two Heat Call (if using a 2-stage HP, this is a stage three heat call)</p> <p>64   Emergency Heat call (H in 5100 series)</p> <p>128   Active core failure</p>
L101			<p><b>ALL SYSTEMS</b>  <b>Low Voltage Inputs</b> - Indicates the sum of values based on the current state of each of the input signals received from low voltage inputs. Interpret same as L100 with the exception of:</p> <p><u><b>Value</b></u>   <u><b>Input</b></u></p> <p>128   J2 jumper is installed to allow editing of locations.</p>
L102			<p><b>ALL SYSTEMS</b>  <b>Power Line Carrier (PLC) Signal Inputs</b> - Indicates a value based on the current state of each of the input signals received from a Steffes PLC. Refer to L100 for an interpretation of the value.</p>
L103			<p><b>ALL SYSTEMS</b>  <b>Communication Inputs for Palm/Computer Interface</b> - Indicates a value based on the current state of each of the input signals received from ETS Tender (Palm or PC Version). Refer to L100 for an interpretation of the value.</p>
L104			<p><b>ALL SYSTEMS</b>  <b>Microprocessor Based Time Clock Module Signal Inputs</b> - Indicates a value based on the current state of each of the input signals received from the optional microprocessor based time clock module (if installed). Refer to L100 for an interpretation of the value.</p>
L105			<p><b>ALL SYSTEMS</b>  <b>Current Power Line Carrier (PLC) Outdoor Temperature</b> - Current outdoor temperature (°F or °C) as received from the PLC transmitting device.</p>

## Read Only Locations (L100-L163) continued...

ID. No.	Factory Default	Default Range	Description / Function
L106			<b>ALL SYSTEMS</b> <b>Power Line Carrier Success Rate Percentage</b> - This location contains the power line carrier success rate percentage based on all the PLC packets received up to 33 packets of information.  <b>NOTE: If power to the system is disconnected, the value in this location resets.</b>
L107			<b>ALL SYSTEMS</b> <b>Highest Consecutive "BAD" PLC Information Packets Received</b> - Value shown indicates the most consecutive "bad" packets received by the system from the PLC transmitting device since the system was energized.  <b>NOTE: If power to the system is disconnected, the value in this location resets.</b>
L108			<b>ALL SYSTEMS</b> <b>Targeted Brick Core Charge Level</b> - Indicates the amount of heat storage the system is targeting. This value represents a percentage of brick core charge.  <b>NOTE: When in peak mode, the value in this location is -50 unless Comfort Override is enabled and active.</b>
L109			<b>ALL SYSTEMS</b> <b>Outdoor Temperature Reading Used by System</b> - Indicates the current outdoor temperature reading the system is using. This value should match L105 if using PLC or L113 if using a hardwired outdoor sensor.
L110			<b>ALL SYSTEMS</b> <b>Brick Core A Thermocouple Temperature</b> - Indicates the actual brick core temperature (°F or °C) of brick Core A at any given time.  <b>NOTE: On Models 3120, 4130, 4140, 5130 and 5140, brick core A is the lower core. Models 2102-2106, 4120, and 5120 have only one core (Core A).</b>
L111			<b>2100 SERIES</b> <b>Output Thermocouple Temperature</b> - This location indicates the actual discharge air temperature (°F or °C) of the system at any given time.
			<b>3100/4100/5100 SERIES</b> <b>Brick Core B Thermocouple Temperature</b> - Indicates the actual brick core temperature (°F or °C) of brick core B at any given time.  <b>NOTE: Only Models 3120, 4130, 4140, 5130, and 5140 have an upper core (Core B).</b>

## Read Only Locations (L100-L163) continued...

ID. No.	Factory Default	Default Range	Description / Function
L112			<b>2100 SERIES</b> - Currently not used.
			<b>3100/4100/5100 SERIES</b> <b>Current Discharge Air Temperature</b> - Indicates the current discharge air temperature (°F or °C) as sensed by the discharge air sensor.
L113			<b>ALL SYSTEMS</b> <b>Current Hard Wired Outdoor Temperature (if using hard wired outdoor temperature sensor only)</b> - Current outdoor temperature (°F or °C) as received from a hard-wired outdoor sensor. A shorted outdoor sensor will show a reading of 200 and an open sensor will show -36. <b>NOTE:</b> <i>Heat and cold sources will affect the accuracy of the outdoor sensor. Placement of the sensor should be considered during installation, as well as sealing the outdoor-to-indoor wire route opening to ensure the most accurate temperature readings.</i>
L114			<b>2100/3100/4100 SERIES</b> <b>Current Room Temperature</b> - Displays the current room temperature as sensed by the room temperature sensor, if enabled in L035, plus the value in L014.
			<b>5100 SERIES</b> <b>Current Outlet Water Temperature</b> - Displays current outlet water temperature as sensed by the outlet water temperature sensor plus the value of L014.
L115			<b>ALL SYSTEMS</b> <b>Microprocessor Control Board Current Operating Temperature</b> - Indicates the current temperature (°F or °C) the microprocessor control board is operating in.
L116			<b>ALL SYSTEMS</b> <b>Current Day of the Week</b> - When utilizing the microprocessor based time clock module option, this location indicates current day of the week in accordance to the settings in the module.
L117			<b>ALL SYSTEMS</b> <b>Current Hour of the Day</b> - When utilizing the microprocessor based time clock module option, this location indicates the current hour of the day in accordance to the settings in the module. Value shown in military time.
L118			<b>ALL SYSTEMS</b> <b>Current Minute of the Hour</b> - When utilizing the microprocessor based time clock module option, this location indicates the current minute of the hour in accordance to the settings in the module.

## Read Only Locations (L100-L163) continued...

ID. No.	Factory Default	Default Range	Description / Function
L119			<b>ALL SYSTEMS</b> <b>Current Second of the Minute</b> - When utilizing the microprocessor based time clock module option, this location indicates the current second of the minute in accordance to the settings in the module.
L120			<b>ALL SYSTEMS</b> <b>Core Blower #1 Activation Level</b> - Indicates the blower speed of the core blower. This is the only blower in 2100, 3100, or 5100 series systems.
L121			<b>2100 SERIES</b> <b>Power to Damper Actuator</b> - Amount of power (pulsed voltage) being applied to the damper actuator to determine blower speed.
			<b>4100 SERIES</b> <b>Core Blower #2 Activation Level</b> – Indicates the blower speed of the second core blower in 4100 Series systems.
			<b>5100 SERIES</b> <b>Pump Activation Level</b> - Amount of power (pulsed voltage) being applied to the air handler circulator pump circuit.
L122			<b>2100 SERIES</b> - Currently not used.
			<b>3100/4100/5100 SERIES</b> <b>Current House Blower Speed</b> - Indicates which supply air blower speed relay is currently active. This determines the speed at which the house (supply air) blower is currently operating. <b>NOTE: Applicable to PSC motors only.</b> <u>Value</u> <u>Speed</u> 0   House (Supply Air) Blower is OFF. 1   Low Speed Relay is closed. 2   High Speed Relay is closed.
L123			<b>ALL SYSTEMS</b> <b>Brick Core A Active Heating Elements</b> - Number of heating elements energized in Core A. The number of elements per core (L091) indicates how many elements are available. <u>Value</u> <u>Description</u> 1   Element 1 is energized. 2   Element 2 is energized. 4   Element 3 is energized. 8   Element 4 is energized. 16   Element 5 is energized. 32   Element 6 is energized. 64   Element 7 is energized. 128   Element 8 is energized. <b>NOTE: Core A is the lower core on Models 3120, 4130, 4140, 5130, &amp; 5140.</b>

## Read Only Locations (L100-L163) continued...

ID. No.	Factory Default	Default Range	Description / Function
L124			2100 SERIES - Currently not used.
			<p><b>3100/4100/5100 SERIES</b>  <b>Brick Core B Active Heating Elements</b> - Number of heating elements energized Core B. The number of elements per core (L091) indicates how many elements are available.</p> <p><u><b>Value</b></u>   <u><b>Description</b></u></p> <p>1   Element 1 is energized.  2   Element 2 is energized.  4   Element 3 is energized.  8   Element 4 is energized.  16   Element 5 is energized.  32   Element 6 is energized.  64   Element 7 is energized.  128   Element 8 is energized.</p> <p><b>NOTE: Only Models 3120, 4130, 4140, 5130, and 5140 have an upper core (Core B).</b></p>
L125			<p><b>ALL SYSTEMS</b>  <b>Brick Core A Charge Level</b> - Indicates the amount of heat storage currently in Core A. This value represents a percentage of core charge.</p> <p><b>NOTE: Core A is the lower core on Models 3120, 4130, 4140, 5130, &amp; 5140.</b></p>
L126			2100 SERIES - Currently not used.
			<p><b>3100/4100/5100 SERIES</b>  <b>Brick Core B Charge Level</b> - Indicates the amount of heat storage currently in Core B. This value represents a percentage of core charge.</p> <p><b>NOTE: Only Models 3120, 4130, 4140, 5130, and 5140 have an upper core (Core B).</b></p>
L127			<p><b>2100/3100/4100 SERIES</b>  <b>Current Room Temperature Set Point</b> - Indicates the room temperature set point currently being targeted. On the 3100 and 4100 Series, this would only be used in Specialty Applications.</p>
			<p><b>5100 SERIES</b>  <b>Current Outlet Water Temperature Set Point</b> - Indicates the outlet water temperature set point currently being targeted.</p>
L128			<p><b>ALL SYSTEMS</b>  <b>Energy Usage</b> - Indicates energy usage during a charge period. This is used in conjunction with L042 and L043 to set a targeted core charge level when using a charge subroutine of 4, 5, 6, or 9.</p>
L129			<p><b>ALL SYSTEMS</b>  <b>Software Version Number</b> - Indicates the software version number.</p>

## Read Only Locations (L100-L163) continued...

ID. No.	Factory Default	Default Range	Description / Function
L130			<b>ALL SYSTEMS</b> <b>Core Fail Count</b> - Indicates the number of core fails.  <b>NOTE: This number is reset anytime the system is restarted Powered off.</b>
L131			<b>ALL SYSTEMS</b> <b>Core A (Lower Core) Temperature At Last Core Fail</b> - Indicates the lower core (Core A) temperature at the time of the last core fail. This value is written at the time the display starts showing "CORE FAIL" and will reset to -500 if system power is reset.
L132			<b>ALL SYSTEMS</b> <b>Core B (Upper Core) Temperature At Last Core Fail</b> - Indicates the upper core (Core B) temperature at the time of the last core fail. This value is written at the time the display starts showing "CORE FAIL" and will reset to -500 if system power is reset.
L133			<b>ALL SYSTEMS</b> <b>Base I/O Circuit Board Firmware Version</b> - Indicates the firmware version of the Base I/O relay board.
L134			<b>ALL SYSTEMS</b> <b>First Expansion Board Firmware Version</b> - Indicates the firmware version of the first expansion board.
L135			<b>ALL SYSTEMS</b> <b>Second Expansion Board Firmware Version</b> - Indicates the firmware version of the second expansion board.
L136 – L144			Currently not used.
L145			<b>ALL SYSTEMS</b> <b>4-20mA Input</b> – Indicates the mA reading that the load management system is applying to the port on the relay driver board. This value is indicated as a percentage.  <u><b>Value</b></u> <u><b>Description</b></u> 0%   =   No heating elements allowed to operate. 50%   =   Half of heating elements allowed to operate as needed. 100%   =   All heating elements allowed to operate as needed.
L146			<b>ALL SYSTEMS</b> <b>System Load (kW)</b> – Displays the current system load in kW ( <i>version 2.06 or higher only</i> ).
L147 – L159			Currently not used.

**Read Only Locations (L100-L163) continued...**

ID. No.	Factory Default	Default Range	Description / Function
L160			<b>ALL SYSTEMS</b> <b>Current Year</b> - Indicates the current year.
L161			<b>ALL SYSTEMS</b> <b>Current Month</b> - Indicates the current month.
L162			<b>ALL SYSTEMS</b> <b>Current Day of the Month</b> - Indicates the current day of the month.
L163			<b>5100 SERIES</b> <b>Active TW Command</b> - Percentage between the water temperatures set in L000 and L001 being targeted by the "TW" command.

## ERROR CODES

Steffes heating systems have an on-board diagnostic system to monitor various operating conditions. If operating conditions move outside the normal operating range, an error code will display on the faceplate. If there are multiple errors simultaneously, only the highest priority error code will appear. Once corrected, the next highest priority code will be displayed. Error codes display as "Er--" (i.e. Er05).



### WARNING

**HAZARDOUS VOLTAGE:**  
Risk of electric shock. Can cause injury or death. System may be connected to more than one branch circuit. Disconnect power to all circuits before servicing. Equipment must be serviced by a qualified technician.

Error Code	Description
01	The core thermocouple temperature is out of normal operating range. An open, shorted, or otherwise defective thermocouple or a circuit board which is out of calibration can cause this. <i>See flowchart for troubleshooting.</i>
02	The upper core (Core B) thermocouple temperature is out of normal operating range. This can be caused by an open, shorted, or otherwise defective thermocouple or a circuit board which is out of calibration. <i>See flowchart for troubleshooting.</i>
03	<b>2100 Series and 3100/4100 series if using freeze protection</b> - Room temperature sensor is out of normal operating range. This may indicate an open sensor, a short in the wiring, or a circuit board which is out of calibration. Take an ohm reading across the sensor to ensure proper operation, check the wiring, and verify the value in L035. The room temperature sensor should be connected to the purple low voltage wires. Compare the sensor reading to the value in L114 to verify proper calibration of the circuit board. <i>Approximate ohm readings are 60°F (16°C) = 1552 ohms; 70°F (21°C) = 1199 ohms; 80°F (27°C) = 941 ohms.</i> If this error is displayed on a <b>5100 series</b> or <b>3100/4100 series</b> without freeze protection verify that the 2 bit is not set in L035.
04	Discharge air temperature is out of normal operating range. <b>2100 Series</b> - An open, shorted, or otherwise defective thermocouple or a circuit board which is out of calibration could cause this. The discharge air thermocouple should be checked and the value in L035 verified. Compare the thermocouple reading to the value in L111 to verify proper calibration of the circuit board. <i>Approximate DC mV readings are 200° F = 3.8 mV; 700° F = 15.2 mV; 1200° F = 27.0 mV.</i> <b>3100/4100/5100 Series</b> - An open, shorted, or otherwise defective thermistor or a circuit board which is out of calibration could cause this. The discharge air sensor (thermistor) should be checked. <i>See flowchart for troubleshooting.</i>
05	Outdoor sensor (direct wired) temperature reading is out of normal operating range. The sensor circuit may be shorted, the processor control board may be out of calibration, or there may be an incorrect value in L035. If using power line carrier control, make sure values in L020 and L035 have been set appropriately. If not using power line carrier, the outdoor sensor should be connected to the gray wires. Compare the sensor reading to the value in L113 to verify proper calibration of the circuit board. <i>Approximate ohm readings are 5° F = 7,646 ohms; 50° F = 2,024 ohms; 95° F = 646 ohms. If using Pulse Width Modulation for outdoor temperature this error will be presented if the signal is flat for 2 or more minutes</i>
06	Outdoor sensor temperature from the transmitting device (PLC system) is out of normal operating range. Check the outdoor sensor attached to the transmitting device and the transmitter for proper operation.
07	Main processor control board temperature sensor is out of normal operating range. Verify that none of the clearances have been violated and inspect the condition of the processor control board. Verify that L093 is set properly.
10	Discharge air temperature has exceeded the maximum standard operating temperature.



## Error Codes continued...

Error Code	Description
19	There is no communication occurring with the relay driver board. 2100, 3100, 4100, 5100 Series do not have a relay driver board. Verify that the values in L090, L091, and L092 are correct for the application.
20	There is no communication occurring between the Base I/O board and the processor control board. This may be caused by a defective RJ45 board interface cable or an unresponsive Base I/O board. <i>See flowchart for troubleshooting.</i>
21	There is no communication occurring with the first relay expansion board. <b>2100 Series</b> - As the relay expansion board is not installed, verify the values in L090, L091, and L092. <b>3100/4100/5100 Series</b> - The interface cable may be defective or the first expansion board may be configured incorrectly or unresponsive. <i>See flowchart for troubleshooting.</i>
22	There is no communication occurring with the second relay expansion board. <b>2100 Series</b> - As the relay expansion board is not installed, verify the values in L090, L091, and L092. <b>3100/4100/5100 Series</b> - The interface cable may be defective or the first expansion board may be configured incorrectly or unresponsive. <i>See flowchart for troubleshooting.</i>
23	There is no communication occurring with the Time Clock Module. Is this module installed? If so, verify the value in L035. If this value is correct, the RJ45 interface cable or the time clock module may be defective.
24	Temperature sensor offset/reference is out of range and indicates that one of the sensors, or the discharge air sensor, may be shorted to ground; or the processor control board may be out of calibration.
25	The heater is configured for power line carrier; however, is not receiving a valid power line carrier communication signal.
26	Insufficient main control board memory. Contact a qualified service technician or Steffes Technical Support.
27	Insufficient Permanent Memory. Contact a qualified service technician or Steffes Technical Support.
28	Permanent memory change has been made. Press the <b>M</b> button to accept. This error message indicates a change has been made to the software program; therefore, it is important to verify that all location settings are correct for the application.
29	On-board communication system is not fully operable. Contact a qualified service technician or Steffes Technical Support.
30	Base I/O board is in test mode. Check the jumper configuration on the Base I/O board.
38	Core Fail. <i>See flowchart for troubleshooting.</i>
39	If the value in Location 13 (L013) is set to a value greater than the value in Location 12 (L012), error 39 (Er 39) is displayed and the system doesn't charge until the values are corrected.
40	Memory corruption has occurred. Replace the processor control board.
41	You have attempted to write to the Flash memory a second time which is not permitted. You may only write to the Flash memory one time after reprogramming. If you need to write to the Flash memory again, reprogram the heating system with ETS208 software or greater and then reconfigure. Reference Locations 98 and 99 (L098 and L099).
42	If the check sum fails in the Flash copy of the settings or if the initial write to the Flash fails, Er42 is displayed. Reprogram the system or replace the processor control board.
43	An attempt to load configuration using L098 set to 20, 30, 40, or 50 has failed. All location values will need to be manually set. Press and release the "M" button to clear the error. <i>Er43 is only applicable to processor control boards with a revision level of G or lower.</i>

## Error Codes continued...

<b>Error Code</b>	<b>Description</b>
44	The check sum of the entire Flash is corrupt. Reprogram the heating system or replace the processor control board.
45	An attempt was made to load memory from an unsaved location in L098. <i>Applicable to processor control boards with a revision level of H or higher only.</i>
46	MA signal or Pulse Width Modulation has timed out. No input for 30 minutes.
Cold Core	Temperature of the brick core is below 40 degrees or the core sensing thermocouple may be open. Check to make sure the core thermocouple wiring is connected properly. Check the value in L110. If the value is reading 30 degrees, the thermocouple is open. Verify that the values in L090, L091, and L092 are correct for the application.
Core Fail	Core charging and/or clearance violation high limit switch may be open.
PLC Fail	The heater is configured for power line carrier; however, is not receiving a valid power line carrier communication signal.
LoAd CAP	All controllable loads have been shed and Maximum Load Capacity is still exceeded. May be caused by freeze protection when using the MA signal or Pulse Width Modulation for load management.