BASIC OPERATION OF L&L KILNS WITH A ONE-TOUCH™

Basic instructions are printed directly on the faceplate for easy reference.

Press the Enter button to start the program you have selected to fire.

Press and hold down Delay to enter a countdown time to delay the start of your program.

Press and hold down Review to see what program you are running.

The display area provides lots of information such as temperatures, program prompts, etc.

Choose one of either the Bisque or Glaze programs. They are preprogrammed for immediate no hassle use. Press for 5 seconds to bring up easy options like cone, heating & cooling rate and hold time

The Custom option allows more experienced users to create and save four of your own ramp/hold programs.

HOW YOUR KILN WORKS

The One-Touch™ Intuitive Kiln Control was designed for busy school teachers, contemporary studios, and hobbyists. No programming is necessary - simple adjustments are easy, yet sophisticated programming is also easy. The One-Touch automatic program control uses one thermocouple to measure temperature in the top, middle and bottom of the kiln (top and bottom in a two section kiln). (All kilns that use the One-Touch™ have one zone). The control automatically adjusts power to evenly heat up the kiln according to the program you are firing. The preprogramed Bisque and Glaze programs are set to fire to the most universally accept versions of these programs which makes firing basic ceramics hassle-free.

WATCH THE VIDEO

We highly recommend watching the video along with reading this instruction manual for quicker understanding of how this great control works. ***Go to hotkilns.com/one-touch-video***

FIRST FIRING

Three of the Custom Programs have been programmed by the factory to simplify the first firing process. Once this process has been completed they may be reprogrammed at will.

To do the First Firing in one firing (16 hours)

1. START. Start with the display reading IdLE and flashing a temperature or StOP and temperature.

2. CHOOSE CUSTOM PROGRAMMING. Select **CUSTOM**. See CUSt. Press **ENTER**.

3. PICK CUSTOM PROGRAM #1. You will see CUS1, CUS2, CUS3 or CUS4. These are the four custom programs. You can scroll to other ones with the **UP** and **DOWN** button. Select CUS1 with the **ENTER** button.

4. MOVE THROUGH THE PROGRAM AND START. Hit **ENTER** for each display prompt that you see as the control scrolls through the enter CUST1 program until you see FIrE. Hit **ENTER** again and the One-touch control will start the program. You will know it is firing because the display just reads the kiln temperature steadily. See the list of Preprgrammed Custom Programs later in this manual for a list of values you see while hitting **ENTER.**

5. REVIEW PROGRAM. Press the **REVIEW** button to review the program. You can do this when you see the FIrE display, CUS1, CUS2, CUS3, CUS4 or while firing (when you see the kiln temperature). The display will scroll though the name of the program (i.e. CUS4), then the number of segments, then all the ramps, temperatures and holds in sequence.

6. COMPLETE. When the program is complete, you will see CPLt. If the Beep option has been turned to "On" then the control will beep about 15 times. If it was set for "OFF," then there will be no beeping. If it was set for "FULL," it will beep until a button is pressed.

To do the First Firing in two firings
Go through the above process but do it in two programs (CUS2 is the first program and that takes about 9 hours, CUS3 is the second program and that also takes about 9 hours.)

See the list of Preprgrammed Custom Programs later in this manual for a list of values you see while hitting **ENTER.**

USING YOUR KILN

TURNING ON THE KILN

1) Make sure your circuit breaker or fused disconnect switch is turned on.

2) Turn on kiln with the toggle On/Off switch on the left side of the control box.

3) You will see a software code flash briefly. then you will see either IdLE or StOP alternating with a display of the current kiln temperature.

THREE DIFFERENT USAGE LEVELS

1) Easiest:
a) Press one of two buttons marked **BISQUE** and **GLAZE**.

b) You will then see either bISC or GLA depending on which button you pressed.

c) Press **ENTER** and the display reads FIrE.

d) You can add a delay time to the program by pressing the **DOWN** arrow when you see FIrE and before you press **ENTER**. After you press the **DELAY** button, you will see dELA flashing with a time value, typically 00.00 which represents 00 hours and 00 minutes. After you see this flashing display, you can press the **UP** or **DOWN** button to adjust the time. Once you have the value you want, press **ENTER** and you will see FIrE again (this will delay the start of the actual firing by the number of minutes and hours that you have chosen).

e) Press **ENTER** and the control will begin the firing cycle. The kiln will fire a slow Cone 04 Bisque or a slow 06 Glaze. If you have entered a delay, then you will see dLY flashing with a countdown of the time (for example 01:30 for 1 hour and 30 minutes)

f) Press the **REVIEW** button to review the program. You can do this when you see the FIrE display or while firing. The display will scroll though the name of the program (i.e. bISC), CndL (for candle followed by a time), C0nE followed by a number like 04, °F or °C to let you know what scale the temperature is in, then a temperature like 1945 which is the anticipated maximum temperature, then HLd followed by a time value like 00:00, which is any hold time you may have programmed into the control.

Caution should be taken to make sure that no one can place anything around or on the kiln during the delay start. Treat the kiln as firing during the delay start.

g) Press **ENTER** anytime to stop the program.

h) When the program is complete, you will see CPLt. If the Beep option has been turned to "0n," then the control will beep about 15 times. If it was set for "0FF," then there will be no beeping. If it was set for "FULL," then it will beep until a button is pressed.

2) Simple but with changes:
It is easy to change simple options like candle time, cone to fire to, hold time at peak temperature, cool-down rate and heat-up rate (plus, you can restore the default values in case you lose track of where you are).

When you press **BISQUE** or **GLAZE** and hold it for 5 seconds, then you will see one of the displays below typically CndL or C0nE.

Once you see one of these displays remove you finger from the button.

CndL	Candle Time (this is a low temperature firing used to dry moisture from the clay)
C0nE	Cone to fire to
HLd	Hold or Soak time at peak temperature
C00L	Cool down rate. 0FF (natural cooling), SL0 (Slow), MEd (Medium), FASt (Fast)
rStr	Restore default original values
HtUP	Heat up rates. SL0 (Slow), MEd (Medium), FASt (Fast)

Once you see any of these displays you can scroll to other displays by pressing the **UP** or **DOWN** button.

Once you see the option you want to change hit **ENTER** to change the value of the option shown in the display.

Once you have entered a option to change, the **UP** and **DOWN** button will then allow adjustment of these values. Press **ENTER** to select and save the value you want.

The display will then cycle back to the starting display of the control. (IdLE or StOP alternating with a display of the current kiln temperature).

To change another option go through the process again. You can not change more than one option at a time.

EXAMPLE: CHANGE CONE OF BISQUE FIRE

Change the cone that the Bisque program goes to from Δ04 to Δ06:

1. Press the **BISQUE** Button for 5 seconds or more.
2. See CndL or COnE or HLd or COOL or rStr or or HtUP.
3. Release your finger from the button.
4. Scroll to COnE display by pressing the **UP** or **DOWN** button.
5. Press **ENTER** to change the value of the COnE option.
6. See 04 alternating with COnE
7. Press the **UP** button until you see 06
8. Press **ENTER**
9. See either IdLE or StOP alternating with a display of the current kiln temperature.

3) Advanced:

Press **CUSTOM** and you have four regular Ramp/Soak programs open for custom programming. Each program has eight segments with a ramp, set point and hold for each segment.

RESETTING TO FACTORY DEFAULTS

It is natural, when first learning a new technology, to get confused or to put in something you are no sure of and then not know where the beginning is. If you do this and you want to go back to the factory defaults so you begin from scratch do the following:

1. Press the **BISQUE** Button for 5 seconds or more.
2. See CndL or COnE or HLd or COOL or rStr or or HtUP.
3. Release your finger from the button.
4. Scroll to rStr display by pressing the **UP** or **DOWN** button.
5. Press **ENTER** to change restore the control to its factory default vaues
6. See either IdLE or StOP alternating with a display of the current kiln temperature.
7. Repeat the same process for **GLAZE.**

HOW TO CANCEL A FIRING

Just hit **ENTER** while the kiln is firing. You will see either IdLE or StOP alternating with a display of the current kiln temperature.

STANDARD (SIMPLE) PROGRAMS

The following show you exactly how the control is set up so you can understanding what is going on "under the hood". The "Default Bisque Program" is a Slow Bisque and the "Default Glaze Program" is a Medium Glaze. "Slow", "Medium" and "Fast" refer to the ramp speeds and lengths of the programs. When you change the speed of the Cooldown this goes from "Fast" (no controlled cooling or no heat at all when cooling), to "Medium" (some controlled cooling or heating while cooling) to "Slow" (more heat during cooling to give a slower cooldown). We recommend experiementing with slower cooldowns for interesting effects on glazing. It is usually irrelevant for bisquing. See the section about cooldown speeds for details on what the speeds are.

Details are given in both Degrees F and Degrees C.

BASIC OPERATION OF L&L KILNS WITH A ONE-TOUCH™

STANDARD BISQUE PROGRAMS (oF)

Slow, Medium and Fast Settings for the Bisque programs:

Note: Final temperatures are based on Orton cone charts. For instance, Cone 04 is 1945º F and Cone 06 is 1828º F. The second-to-last temperature is the cone temperature minus 256º F.

Note: Seg 1 is the candling segment (skipped if candling set to "0").

Slow Bisque (Default Bisque Program):

Δ04 Standard Slow Bisque – SEGS-6 (6 segments)

Seg 1-	10 Hrs	RA1 - 25ºF/Hr	º F1–150ºF	HOLD- 7.0
Seg 2-	4.15 Hrs	RA2 - 100ºF	º F2–185ºF	HOLD- 3.0
Seg 3-	4.10 Hrs	RA3 - 200ºF	º F3–1000ºF	HOLD- 00.00
Seg 4-	1.00 Hrs	RA4 - 100ºF	º F4–1100ºF	HOLD- 00.00
Seg 5-	2.50 Hrs	RA5 - 200ºF	º F5–1689ºF	HOLD- 00.00
Seg 6-	3.00 Hrs	RA6 - 108ºF	º F6–1945ºF	HOLD- 00.00

TOTAL FIRING TIME = 24.75 HRS

Medium Speed Bisque:

Δ04 Standard Medium Bisque – SEGS-6 (6 segments)

Seg 1-	0.88 Hrs	RA1 - 80ºF	º F1–150ºF	HOLD- 00.00
Seg 2-	0.44 Hrs	RA2 - 80ºF	º F2–185ºF	HOLD- 00.00
Seg 3-	2.5 Hrs	RA3 - 80ºF	º F3–250ºF	HOLD- 00.00
Seg 4-	3 Hrs	RA4 - 250ºF	º F4–1000ºF	HOLD- 00.00
Seg 5-	3.78 Hrs	RA5 - 180ºF	º F5–1689ºF	HOLD- 00.00
Seg 6-	1.00 Hrs	RA6 - 108ºF	º F6–1945ºF	HOLD- 00.00

TOTAL FIRING TIME = 11.60 HRS

Fast Speed Bisque:

Δ04 Standard Fast Bisque – SEGS-6 (6 segments)

Seg 1-	0.47 Hrs	RA1 - 150ºF	º F1–150ºF	HOLD- 00.00
Seg 2-	0.23 Hrs	RA2 - 150ºF	º F2–185ºF	HOLD- 00.00
Seg 3-	1.26 Hrs	RA3 - 150ºF	º F3–250ºF	HOLD- 00.00
Seg 4-	2.83 Hrs	RA4 - 300ºF	º F4–1100ºF	HOLD- 00.00
Seg 5-	1.34 Hrs	RA5 - 400ºF	º F5–1689ºF	HOLD- 00.00
Seg 6-	1.41 Hrs	RA6 - 108ºF	º F6–1945ºF	HOLD- 00.00

TOTAL FIRING TIME = 7.54 HRS

STANDARD GLAZE PROGRAMS (ºF)

Slow, Medium and Fast Settings for the Glaze programs:

Note: Seg 1 is the candling segment (skipped if candling set to "0").

Slow Glaze (ºF):

Δ06 Slow Glaze – SEGS–3 (3 segments)

Seg 1-	1.26 Hrs	RA1 - 400ºF	º F1–250ºF	HOLD- 00.00
Seg 2-	4.17 Hrs	RA2 - 400ºF	º F2–1572ºF	HOLD- 00.00
Seg 3-	1.57 Hrs	RA3 - 128ºF	º F3–1828ºF	HOLD- 00.00

TOTAL FIRING TIME = 7 HRS

Medium Glaze (Default Glaze Program) (ºF):

Δ06 Medium Glaze – SEGS–3 (3 segments)

Seg 1-	0 Hrs	RA1 - 400ºF	º F1–185ºF	HOLD- 00.00
Seg 2-	3.75 Hrs	RA2 - 400ºF	º F1–1572ºF	HOLD- 00.00
Seg 3-	1.66 Hrs	RA3 - 150ºF	º F2–1828ºF	HOLD- 00.00

TOTAL FIRING TIME = 5.41 HRS

Fast Glaze (ºF):

Δ06 Fast Glaze – SEGS–3 (3 segments)

Seg 1-	0 Hrs	RA1 - 570ºF	º F1–185ºF	HOLD- 00.00
Seg 2-	2.63 Hrs	RA2 - 570ºF	º F2–1572ºF	HOLD- 00.00
Seg 3-	1.25 Hrs	RA3 - 200ºF	º F3–1828ºF	HOLD- 00.00

TOTAL FIRING TIME = 3.88 HRS

SIMPLE COOL DOWN SPEEDS (ºF)

Note: These are entered as one of the simple options in the Simple Programming (COOL).

Cool Down options are as follows:

Slow = 125°F/hour

Med = 250°F/hour

Fast = 500°F/hour

PREPROGRAMMED CUSTOM PROGRAMS (ºF)

There are four programs that can be fully customized. Three of these have been programmed by the factory to simplify the first firing process. Once this process has been completed they may be reprogrammed at will.

CUSTOM PROGRAM 1 (ºF):

Standard First Firing Program:

Δ5 Standard Slow Bisque – SEGS–5 (5 segments)

Seg 1-	2.15 Hrs	RA1 - 80ºF	º F1–250ºF	HOLD- 00.00
Seg 2-	3.75 Hrs	RA2 - 200ºF	º F2–1000ºF	HOLD- 00.00

Seg 3- 1.00 Hrs RA3 - 100-ºF º F3–1100ºF HOLD- 00.00

Seg 4- 4.58 Hrs RA4 - 180-ºF º F4–1915ºF HOLD- 00.00

Seg 5- 3.12 Hrs RA5 - 80-ºF º F5–2165ºF HOLD- 00.00

TOTAL FIRING TIME = 15.6 HRS

CUSTOM PROGRAM 2 (ºF):

Split First Firing (First Segment):

Seg 1- 2.15 Hrs RA1 - 80ºF º F1–250ºF HOLD- 00.00

Seg 2- 3.75 Hrs RA2 - 200ºF º F2–1000ºF HOLD- 00.00

Seg 3- 1.00 Hrs RA3 - 100-ºF º F3–1100ºF HOLD- 00.00

Seg 4- 2.22 Hrs RA4 - 180-ºF º F4–1500ºF HOLD- 00.00

TOTAL FIRING TIME = 9.12 HRS

CUSTOM PROGRAM 3 (ºF):

Split First Firing (Second Segment):

Seg 1- 0.85 Hrs RA1 - 200ºF º F1–250ºF HOLD- 00.00

Seg 2- 2.50 Hrs RA2 - 500ºF º F2–1500ºF HOLD- 00.00

Seg 3- 2.30 Hrs RA3 - 180-ºF º F3–1915ºF HOLD- 00.00

Seg 4- 3.12 Hrs RA4 - 80-ºF º F4–2165ºF HOLD- 00.00

TOTAL FIRING TIME = 8.77 HRS

CUSTOM PROGRAM 4 (ºF):

Blank

STANDARD BISQUE PROGRAMS (ºC)

Slow, Medium and Fast Settings for the Bisque programs:

Note: Final temperatures are based on Orton cone charts. For instance, Cone 04 is 1063º C and Cone 06 is 998º C. The second-to-last temperature is the cone temperature minus 124º C.

Note: Seg 1 is the candling segment (skipped if candling set to "0").

Slow Bisque (Default Bisque Program) (ºC):

Δ04 Standard Slow Bisque – SEGS-6 (6 segments)

Seg 1- 10 Hrs RA1 - 4ºC/Hr º C1–66ºC HOLD- 7.0

Seg 2- 4.15 Hrs RA2 - 38ºC º C2–85ºC HOLD- 3.0

Seg 3- 4.10 Hrs RA3 - 93ºC º C3–538ºC HOLD- 00.00

Seg 4- 1.00 Hrs RA4 - 38ºC º C4–593ºC HOLD- 00.00

Seg 5- 2.50 Hrs RA5 - 93ºC º C5–921ºC HOLD- 00.00

Seg 6- 3.00 Hrs RA6 - 42ºC º C6–1063ºC HOLD- 00.00

TOTAL FIRING TIME = 24.75 HRS

Medium Speed Bisque (ºC):

Δ04 Standard Medium Bisque – SEGS-6 (6 segments)

Seg 1- 0.88 Hrs RA1 - 27ºC º C1–66ºC HOLD- 00.00

Seg 2- 0.44 Hrs RA2 - 27ºC º C2–85ºC HOLD- 00.00

Seg 3- 2.5 Hrs RA3 - 27ºC º C3–121ºC HOLD- 00.00

Seg 4- 3 Hrs RA4 - 121ºC º C4–538ºC HOLD- 00.00

Seg 5- 3.78 Hrs RA5 - 82ºC º C5–921ºC HOLD- 00.00

Seg 6- 1.00 Hrs RA6 - 42ºC º C6–1063ºC HOLD- 00.00

TOTAL FIRING TIME = 11.60 HRS

Fast Speed Bisque (ºC):

Δ04 Standard Fast Bisque – SEGS-6 (6 segments)

Seg 1- 0.47 Hrs RA1 - 66ºC º C1–66ºC HOLD- 00.00

Seg 2- 0.23 Hrs RA2 - 66ºC º C2–85ºC HOLD- 00.00

Seg 3- 1.26 Hrs RA3 - 66ºC º C3–121ºC HOLD- 00.00

Seg 4- 2.83 Hrs RA4 - 149ºC º C4–593ºC HOLD- 00.00

Seg 5- 1.34 Hrs RA5 - 204ºC º C5–921ºC HOLD- 00.00

Seg 6- 1.41 Hrs RA6 - 42ºC º C6–1063ºC HOLD- 00.00

TOTAL FIRING TIME = 7.54 HRS

STANDARD GLAZE PROGRAMS (ºC)

Slow, Medium and Fast Settings for the Glaze programs:

Note: Seg 1 is the candling segment (skipped if candling set to "0").

Slow Glaze:

Δ06 Slow Glaze – SEGS–3 (3 segments)

Seg 1- 1.26 Hrs RA1 - 204ºC º C1–121ºC HOLD- 00.00

Seg 2- 4.17 Hrs RA2 - 204ºC º C2–856ºC HOLD- 00.00

Seg 3- 1.57 Hrs RA3 - 53ºC º C3–998ºC HOLD- 00.00

TOTAL FIRING TIME = 7 HRS

Medium Glaze (Default Glaze Program) (ºC):

Δ06 Medium Glaze – SEGS–3 (3 segments)

Seg 1- 0 Hrs RA1 - 204ºC º C1–85ºC HOLD- 00.00

Seg 2- 3.75 Hrs RA2 - 204ºC º C1–856ºC HOLD- 00.00

Seg 3- 1.66 Hrs RA3 - 66ºC º C2–998ºC HOLD- 00.00

TOTAL FIRING TIME = 5.41 HRS

Fast Glaze (ºC):

Δ06 Fast Glaze – SEGS–3 (3 segments)

Seg 1- 0 Hrs RA1 - 299ºC º C1–85ºC HOLD- 00.00

Seg 2- 2.63 Hrs RA2 - 299ºC º C2–856ºC HOLD- 00.00

Seg 3- 1.25 Hrs RA3 - 93ºC º C3–998ºC HOLD- 00.00

TOTAL FIRING TIME = 3.88 HRS

SIMPLE COOL DOWN SPEEDS (°C)

Note: These are entered as one of the simple options in the Simple Programming (COOL).

Cool Down options are as follows:

Slow = 52°C/hour

Med = 121°C/hour

Fast = 260°C/hour

PREPROGRAMMED CUSTOM PROGRAMS (°C)

There are the same four programs (shown in Degrees C) that can be fully customized. Three of these have been programmed by the factory to simplify the first firing process. Once this process has been completed they may be reprogrammed at will.

CUSTOM PROGRAM 1 (°C):

Standard First Firing Program:

Δ5 Standard Slow Bisque – SEGS–5 (5 segments)

Seg 1-	2.15 Hrs	RA1 - 27ºC	º C1–121ºC	HOLD- 00.00
Seg 2-	3.75 Hrs	RA2 - 93ºC	º C2–538ºC	HOLD- 00.00
Seg 3-	1.00 Hrs	RA3 - 38-ºC	º C3–593ºC	HOLD- 00.00
Seg 4-	4.58 Hrs	RA4 - 82-ºC	º C4–1046ºC	HOLD- 00.00
Seg 5-	3.12 Hrs	RA5 - 27-ºC	º C5–1185ºC	HOLD- 00.00

TOTAL FIRING TIME = 15.6 HRS

CUSTOM PROGRAM 2 (°C):

Split First Firing (First Segment):

Seg 1-	2.15 Hrs	RA1 - 27ºC	º C1–121ºC	HOLD- 00.00
Seg 2-	3.75 Hrs	RA2 - 93ºC	º C2–538ºC	HOLD- 00.00
Seg 3-	1.00 Hrs	RA3 - 38-ºC	º C3–593ºC	HOLD- 00.00
Seg 4-	2.22 Hrs	RA4 - 82-ºC	º C4–816ºC	HOLD- 00.00

TOTAL FIRING TIME = 9.12 HRS

CUSTOM PROGRAM 3 (°C):

Split First Firing (Second Segment):

Seg 1-	0.85 Hrs	RA1 - 93ºC	º C1–121ºC	HOLD- 00.00
Seg 2-	2.50 Hrs	RA2 - 260ºC	º C2–816ºC	HOLD- 00.00
Seg 3-	2.30 Hrs	RA3 - 82-ºC	º C3–1046ºC	HOLD- 00.00
Seg 4-	3.12 Hrs	RA4 - 27-ºC	º C4–1185ºC	HOLD- 00.00

TOTAL FIRING TIME = 8.77 HRS

CUSTOM PROGRAM 4 (°C):

Blank

CUSTOM RAMP/HOLD PROGRAMMING

Each fully customizable program has eight segments. Each segment has a ramp, a hold and a temperature set point.

STEP BY STEP DESCRIPTION

1. START. Start with the display reading IdLE and flashing a temperature or StOP and temperature.

2. CHOOSE CUSTOM PROGRAMMING. Select **CUSTOM**. See CUSt. Press **ENTER**.

3. PICK A PROGRAM. You will see CUS1, CUS2, CUS3 or CUS4. These are the four custom programs. You can scroll to other ones with the **UP** and **DOWN** button. Select one with the **ENTER** button.

4. IF YOU WANT TO REUSE A PREVIOUS PROGRAM. To reuse a previously entered program, simply press **ENTER** for each value. To change a program, just adjust the displayed value.

5. SPECIFY NUMBER OF SEGMENTS. Once you have chosen a program, you need to specify the total number of segments that you will use. All programs consist of 1 or more segments, as shown in the sample profiles in this manual. Each segment has 3 parts: a ramp rate (speed of temperature rise in degrees per hour), hold temperature, and hold time at hold temperature. It is helpful to draw your profile to see how many segments you will need. Then, use the arrow keys to display the desired number of segments, and press enter to store the value.

6. ENTER RAMP RATE. You will see rA1, followed by a value like 150. The rA1 stands for Ramp One. The value represents a rate of temperature rise expressed in degrees per hour (either Degrees F or Degrees C depending on how you have set up your control). Use the arrow keys to adjust the rate and press **ENTER** to store the value.

To help you visualize what is typical of various ramps: slow rates range from 1-50 degrees per hour, and are used for thick glass projects. Medium rates range from 60 to 200 degrees per hour, and are used for thick, hand-built ceramics. Fast rates range from 250–1000 degrees per hour, and are used for glazes, thin ceramics

and small glass projects. A rate of 9999 sets the kiln to ramp as fast as possible. Also, see the various ramps in the standard programs for an idea of what works.

7. ENTER HOLD TEMPERATURE. You will see °F1 followed by a value like 0300. The °F1 stands for Temperature One. For a single segment program, this is the top temperature of the firing. For multi-segment programs, this can be a temperature where you want to hold to dry the ware or for carbon burn-out, or equalize the temperature across the item or it can be where you just want to switch ramp rates without a hold. Adjust the temperature with the arrow keys and press enter to store the displayed value.

8. ENTER HOLD TIME. You will see HLd1 followed by a value like 00:00. The HLd1 stands for Hold One. Use the arrow keys to adjust the hold time at the soak temperature. Hours are displayed to the left of the decimal point and minutes to the right (HH.mm). Use a zero (00.00) hold time to change rates and move to the next segment. Drying ware can take several hours, while holds at peak temperature usually range 10–15 minutes to even out the kiln.

9. REPEAT STEPS 6-8 for each segment. For segment two, the display will read rA2, °F2 and HLd2 etc.

10. DISPLAY WILL SHOW FIrE (ready to fire) when all segments have been entered. Press **ENTER** to start the firing.

11. SET A DELAY IF YOU WANT TO. If you want to set a delay, you can do it when the display says FIrE. You can add a delay time to the program by pressing the **DOWN** arrow when you see FIrE and before you press **ENTER**. After you press the **DELAY** button you will see dELA flashing with a time value, typically 00.00 which represents 00 hours and 00 minutes. After you see this flashing display, you can press the **UP** or **DOWN** button to adjust the time. Once you have the value you want, press **ENTER** and you will see FIrE again. (This will delay the start of the actual firing by the number of minutes and hours that you have chosen.)

Caution should be taken to make sure that no one can place anything around or on the kiln during the delay start. Treat the kiln as firing during the delay start.

12. REVIEW PROGRAM. Press the **REVIEW** button to review the program. You can do this when you see the FIrE display, CUS1, CUS2, CUS3, CUS4 or while firing. The display will scroll though the name of the program (i.e. CUS4), then the number of segments, then all the ramps, temperatures and holds in sequence.

13. COMPLETE. When the program is complete, you will see CPLt. If the Beep option has been turned to "On" then the control will beep about 15 times. If it was set for "OFF," then there will be no beeping. If it was set for "FULL," it will beep until a button is pressed.

KILN OPERATION DURING A CUSTOM FIRING PROGRAM

At the start of a firing, the controller sets its moving set-point to the current temperature in the kiln. The moving set-point is where the controller wants the kiln temperature to be. The controller will then move the moving set-point up at the programmed rate, and cycle power to the elements to make the temperature follow the moving set-point. You will hear the relays clicking to regulate the kiln temperature. The elements will receive power when the temperature is below the moving set-point. The relays will click off when the temperature is above the moving set-point. The current segment and moving set-point can be viewed by pressing the **UP** arrow during a firing.

Options During Firing

Displaying the current set-point and accessing the following options. During a firing, you may advance from the current segment to the next ramp rate by using Skip Step; or, if you are in a hold period, you may add time and temperature to the hold period. When the **UP** key is pressed during a firing, the current ramp or hold is displayed, followed by the current or moving set-point, then SStP is displayed. If you do not press a key within several seconds, the display will return to showing the current temperature in the kiln.

Skip Step. This option allows you to skip from the present segment to the next ramp rate. Press the **UP** key, the display will show the current segment, then the set-point, then SStP. When SStP is displayed, press **ENTER** to skip to the next ramp rate.

Add Time to Hold Period (available only during a

hold period). This option allows you to add time in 5 minute increments to a hold (soak) period. During a hold or soak, the temperature in the kiln will be alternating in the display with the remaining hold time. When in a hold period, press the **UP** key. When SStP is displayed, press the **UP** key again and tME will be displayed. Press **ENTER** and 5 minutes will be added to the hold time. You may use this procedure as many times as necessary to get the hold time that you want.

Add Temperature to Hold Period (available only during a hold period). This option allows you to add temperature in 5 degree increments to a hold (soak) period. During a hold or soak, the temperature in the kiln will be alternating in the display with the remaining hold time. When in a hold period, press the **UP** key. When SStP is displayed, press the **UP** key twice more and tMP will be displayed. Press **ENTER** and 5 minutes will be added to the hold time. You may use the add temperature procedure as many times as necessary to get the hold temperature desired.

OPTIONS

Options are accessed by holding the **ENTER** key while turning the power onto the control. This activates the Options Menu.

The first thing you will see is LL-G. or 1t-1 (This is the software version).

Then you will see 2350 if it is a Cone 10 control or 2280 if it is a Cone 6 control.

Then you will see EdIt and you will hear a beep.

Sound: Beeping on or off at end of program. The first thing to change is the action of the beeper. OFF turns off the beeper. FULL makes the beeper stay on until any button is pushed. On makes the beeper sound 15 times and then turn off. If you don't want to change this option then hit **ENTER.**

Maximum Temperature (Deg F)**:** 1700, 2000, and 2280 are options, in Deg F. (One-Touch-10 models) have a preset maximum temperature limit of 2350 and you will not see this option come up. (In Degrees C the options will show as 927, 1093, and 1249). Cone 10 model will have a preset maximum temperature in Deg C of 1288.

Temperature Indication: °F (Deg F) or °C (Deg C). When you are in Deg C, you will always see a little dot in the display at the bottom right to remind you. Use the **UP** or **DOWN** key to change the value and then hit **ENTER.**

TC offset (Deg F): OFFS (+/- 99 deg) (+/-37 deg C). Display shows OFFS. Press the **UP** arrow to enter a positive offset. Press the **DOWN** arrow to add a negative sign to the offset, and then the **UP** arrow to add negative offset to the control. The control comes with a pre-programmed +18 Deg F (+8 Deg C) offset to compensate for the thermocouple protection tube. Note: if you first hit the **DOWN** button you can only set a negative value or if you first hit the **UP** button you can only enter a positive value. You can go back and change this later if you make a mistake.

MESSAGES & DISPLAYS

Messages and their Meaning

CndL Candle Time (this is a low temperature firing used to dry moisture from the clay)

COnE Cone to fire to

COOL Cool down rate. OFF (natural cooling), SLO (Slow), MEd (Medium), FASt (Fast)

CPLt Firing Cycle Complete (firing time is alternately displayed).

dELA Delay. Displays when entering the delay time (hour:minutes) until the start of the firing.

DLy Delay. Alternates with the remaining delay time until the start of the kiln.

°F# Segment temperature in °F–Set temperature for a user program. (# stands for numbers 1 through 8)

°C# Segment temperature in °C–Set temperature for a user program. A decimal point will display in lower right corner. (# stands for numbers 1 through 8)

EdIt Edit the default options (beeping at complete, temperature scale, cone fire, delay, maximum programmable temperature)

ErrP There has been a power interruption that has stopped the firing. Press any key to clear.

FASt Fast (Heat up or Cool down rate)

FIrE Ready to fire current program. Press **START** to begin firing.

FULL Beeps continuously at end of firing until a key is pressed.

HtUP Heat up rates. SL0 (Slow), MEd (Medium), FASt (Fast)

HLd Hold or Soak time at peak temperature

HLd# Soak time in hours:minutes at a hold temperature. (# stands for numbers 1 through 8)

IdLE This shows up when the control is not firing or is not being programmed. Message alternates with the current kiln temperature. Similar to St0P.

lt-1 This comes on when you first turn on the control if it is a Cone 10 control.

LL-F This comes on when you first turn on the control if it is a Cone 6 control.

MEd Medium (Heat up or Cool down rate)

0FF No beeping when firing is complete. Or could be that an option is off when setting options.

0n Beeps for 15 seconds at end of firing.

rA# Ramp Number (rate per hour of temperature increase or decrease). (# stands for numbers 1 through 8)

rStr Restore default original values

SEG Short for Segments. You can enter up to 8 segments in a program.

SL0 Slow (Heat up or Cool down rate)

SStP Skip Step (used to advance to the next ramp)

St0P The kiln is at idle and ready to be programmed. Message alternates with the current kiln temperature.

CUS1, CUS2, CUS3, CUS4 Custom program number displayed.

ERROR CODES

tC FAIL tC alternating with FAIL indicates the thermocouple has failed. Replace the defective thermocouple. To clear the error, press any key.

Errd Displayed whenever the kiln temperature is 100°F (38°C) above the traveling set-point, which is the current desired temperature in the kiln. The traveling set-point will increase or decrease according to the programmed rate.

Err1 Displayed whenever the kiln temperature is rising during an up ramp slower than 15°F/hr. (9°C/hr) If this rate continues for 8 minutes the firing will be stopped. Err1 may be an indication that the elements are worn or that a relay has stopped working.

ErrP Displayed whenever there is a power interruption that is long enough to stop the firing. If the power interruption is brief, the kiln will continue to fire when power is restored; in this case, there will be no indication of a power failure. To clear the error, press any key.

ErrF Displayed whenever the kiln temperature is decreasing during a down ramp slower than 15°F/hr (9°C/hr). If this rate continues for 8 minutes the firing will be stopped. ErrF may be an indication that a relay has stuck in the on position.

tC-- The red and yellow thermocouple wires are reversed.

SOFTWARE VERSION

These instructions apply to software version LL-G for the Cone 6 version of the control or lt-1 for the Cone 10 version of the control. You will see this code flash when you first turn on the control.