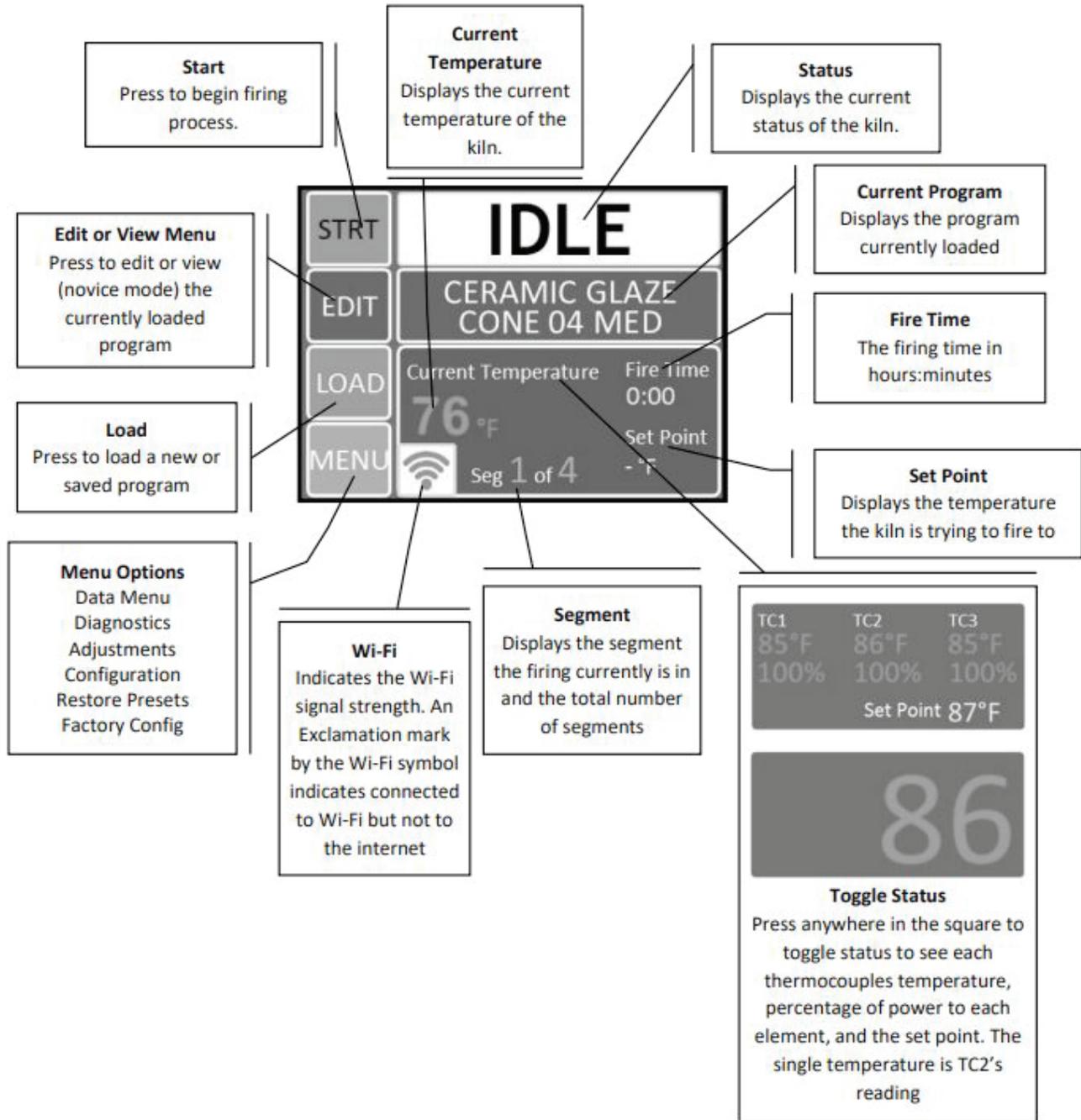


BASIC OPERATION OF L&L KILNS WITH A GENESIS CONTROL



HOW YOUR KILN WORKS

The Genesis LT3140 Controller on your kiln automatically adjusts power to evenly heat up the kiln according to the program you are firing. The Easy-Fire Programs available make firing most ceramics and glassware simple.

Your Easy-Fire Kiln uses the Orton Foundation's patented method to achieve the correct heat work, making these programs ideal for firing ceramics. The advantage of using the Easy-Fire controllers is that a complicated firing profile may be chosen with just a few keystrokes.

The Genesis Controller actually calculates when it should shut off based on what cone number was programmed, and how many degrees per hour the kiln was rising at the end of the firing. The Genesis actually adjusts the final set point using Orton's patented formula in each program. (NOTE: This is not always true for custom programs where you can set and absolute final temperature set point).

BASIC OPERATION OF L&L KILNS WITH A GENESIS CONTROL

DYNAMIC ZONE CONTROL

The Genesis uses one, two, or three separate thermocouples to measure temperature in each of the sections of the kiln, depending on the number of sections set up. Each zone of control adjusts power to each heated zone in the kiln to maintain even temperatures from top to bottom.

FIRST TEST FIRING OF THE KILN

See pages 5 and 6 of the Genesis Model LT3140 Controller Operation Manual for simple and detailed instructions on this process.

USING YOUR KILN

TURNING ON THE KILN

- 1) Make sure your circuit breaker or fused disconnect switch is turned on.
- 2) Turn on the kiln with the toggle On/Off switch on the left side of the control box.

UNDERSTANDING THE INTERFACE

You'll notice that there are four main buttons on the left side of the screen. The way the Genesis works is that there are many default programs coded into the controller. You first need to upload one using the Load button, and then after you can start adjusting settings.

If you want to review or change the main program properties such as cone number or ramp times, the Edit/View button is the place to go. Note that loading and reviewing programs is slightly different for "Novice Mode" and the "Normal Mode," which can be changed as you see fit.

The Menu button on the Home Screen, detailed in Figure 1, allows you to go and adjust various properties of the controller such as thermocouple offsets, which are explained in further detail later on, alarms, and more. You are also given different menus that allow you to manage wifi, software updates, and pretty much whatever else the Genesis has to offer.

You can use the Start button and run your chosen program once you have everything else taken care of.

LOADING AND REVIEWING CERAMIC PROGRAMS

- 1) Press the Load button on the Home Screen.
- 2) Press the Ceramic Bisc or Ceramic Glaze button.
- 3) Use the scroll bar to choose the desired cone number for the firing.

CAUTION: Follow the recommendations of the clay and glaze manufacturer for proper cone to fire to - and keep in mind that if you don't fire to the proper cone you can cause a major meltdown of your work).

Remember, cone numbers starting with a 0 are a lower temperature than cone numbers not starting with a 0. Don't mistake a cone 6 for a cone 06!

- 4) Press the Next button and choose the firing speed, which can be either Fast, Medium, MedSlo, or Slow.
- 5) Choose the preheat time, which can be either: None, 4 Hr, 8 Hr, or 12 Hr
- 6) Press the OK button to return to the Home Screen.
- 7) Press the View button to verify that the program settings are correct.

LOADING AND REVIEWING GLASS PROGRAMS

- 1) Press the Load button on the Home Screen, detailed in Figure 1.
- 2) Press the Glass button.
- 3) Choose the type of firing, which can be either: Slump, Tac Fuse, Full Fuse, or Cast.
- 4) Choose the firing speed, which can be either Fast, Medium, MedSlo, or Slow.
- 5) Press the OK button to return to the Home Screen.
- 6) Press the View button to verify that the program settings are correct.

RUNNING YOUR PROGRAM

- 1) Press the Start button on the Home Screen once you have a program selected and are sure the program settings are correct.
- 2) You will be asked to enter a "start code." The default start code is "1," but this can be changed depending on user preferences.
- 3) Press the Go button once it appears to start your firing.
- 4) If at any point during the firing you need to stop running the program, press the Stop button.
- 5) The controller will immediately return to the main menu. If you wish to resume the firing, flip the off switch on your kiln and back on again.
- 6) If the kiln does not restart in the segment it was stopped in, press the ADJ button and skip to the desired segment

BASIC OPERATION OF L&L KILNS WITH A GENESIS CONTROL

END OF FIRING

- 1) When the firing is complete, an alarm will sound and the controller will display COMPLETE with the current temperature and firing time.
- 2) To return to IDLE, press "CLR". You may open the kiln when the temperature has cooled to 150°F.

DEFAULT CUSTOM PROGRAMS

- 1) See Appendix C in the Genesis LT3140 Operation Manual for a list of all default custom programs

USER CUSTOM PROGRAMMING

- 1) The Genesis has 30 custom user programs to store and reuse.
- 2) Writing your own ceramics program combines the versatility of the custom program with the heat work calculation of a ceramics firing.
- 3) To edit a custom program, first load a default custom program name, which you can change later.
- 4) Press the Edit button to display a very intuitive interface, which enables you to tap each part of the program and change what you would like about it, including fan activation and hold times.

IMPORTANT NOTE ABOUT HOLD TIMES: Be careful with hold times - this will add to the heat work and will actually fire the work to a higher cone which will not be compensated by the Easy-Fire program. In general we do not recommend using a hold time unless you are carefully monitoring the kiln performance with actual cones.

- 5) Press the Save button to overwrite any of the features that are in the default custom program.

KILN FIRING SPEEDS

- 1) Fast is the fastest firing speed and is used for glaze firings on thin ware, china paint firings, and decal firings. Firing times range from 4 to 5 hours.
- 2) Medium is used for firing glaze on thicker ware or for bisque firing very thin ware. Typical firing time is 6-8 hours depending on the cone number.
- 3) MedSlo is used to bisque medium pieces or thinner ware that requires less time for water smoking and carbon burnout. Typical firing time is 9-11 hours, depending on cone number

- 4) Slow is used to bisque thicker, hand thrown ware. The slow speed gives extra time for release of water and carbon burnout. Typical firing times range from 13-17 hours depending on the cone number. Hand built pieces may need a preheat stage.

- 5) No preheat time is needed when the pieces are a thin, bone dry bisc or glaze.

PREHEAT TIMES

- 1) Use a 4 hour preheat time for thicker, slightly wet pieces.
- 2) Use an 8 hour preheat time for thick, wet pieces.
- 3) Use a 12 hour preheat time for hand built, kids pieces.

CALIBRATING THE CONTROL

THERMOCOUPLE OFFSETS

The industrial thermocouple protection tubes that are used in your Easy-Fire kiln have many advantages such as long thermocouple life, clean operation (no metallic spalling), and inexpensive replacement cost. However, they do introduce a known error into the system.

The thickness of the ceramic tube creates an offset in measured temperature vs. the actual kiln temperature. The composition of the tube makes a difference in the necessary offsets.

This has changed over time as we have improved the tube and the offsets pre-programmed into the control reflect the testing that we do in the factory. It is currently +18°F when it leaves the factory. Note that at room temperature, the control will display a high temperature. This is because it is adding the thermocouple offset to the actual room temperature. You can always change the thermocouple and cone offsets.

To adjust your thermocouple offset, use the following steps:

- 1) From the Home Screen, press the Menu button.
- 2) Press the Adjustments button.
- 3) Press the Thermocouple Offset button.
- 4) Press the button for which thermocouple you would like to change the offset for (TC1 for the top section of your kiln, TC2 for the section below that, etc).
- 5) The maximum TC Offset is 99°F (37°C).
- 6) To correct an under-firing set, use a negative TC Offset.
- 7) To correct an over-firing, set, use a positive TC Offset.
- 8) Enter the desired number and press the Save button.

BASIC OPERATION OF L&L KILNS WITH A GENESIS CONTROL

CONE OFFSETS

Tune your kiln using the thermocouple offset for your most critical firings. Then use the cone offset to adjust for other cones that you fire to, to get them just right. Doing this for bisque firings is typically not very critical.

To adjust your cone offset, use the following steps:

- 1) From the Home Screen, press the Menu button.
- 2) Press the Adjustments button.
- 3) Press the Cone Offset button.
- 4) To correct an under-firing set, use a positive cone offset.
- 5) To correct an over-firing set, use a negative cone offset.
- 6) Enter the desired number and press the Save button.

EMPTY KILN VS FULL KILN FIRINGS

One difference between an empty and full kiln is that an empty kiln cools a lot quicker, which will freeze the cone very quickly. In a full kiln, there is a lot of mass in the kiln that is just as hot as the kiln around it. This mass radiates heat as well and will continue to melt the cone for a little longer after the program has ended. Once the kiln is fine-tuned, it is this variable - how you have loaded the kiln - that will account for many of the variations you will see from firing to firing - an empty kiln will fire differently than a full one. Although the control compensates for this, that compensation is not completely perfect.

ERROR CODES AND DIAGNOSTICS

See Appendix A in the Genesis LT3140 Operation Manual for a list of all possible error codes and their meanings.

The Genesis controller also has a unique "Full Power Test" feature, which you can read more about in the manual. It can be used to isolate different aspects of your kiln to see if there is a specific component that may be giving you problems.