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# **Oven Controller**

## **User Manual**

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## 2 Overview

### 2.1 Basics

The user interface is composed of an LED display with integrated buttons. The button functions are as shown in fig. 1. The 8-segment numerical display outputs various information, such as current oven mode, timer count down and control inputs. The LEDs above the buttons and below the 8-segment display are status indicators for various oven modes and functions (see fig. 2 on the next page.)

A secondary 8-segment LED display is included that allows longer length user messages (such as error and alarm output) as well as supplements various oven functions. Typically the secondary display outputs the current oven temperature as well as the current oven bake or broil set temperature. Alternatively, the display can be set to output the current control board's temperature and the current oven temperature. This alternative output mode can be easily determined due to the first display temperature having all decimal points lit.

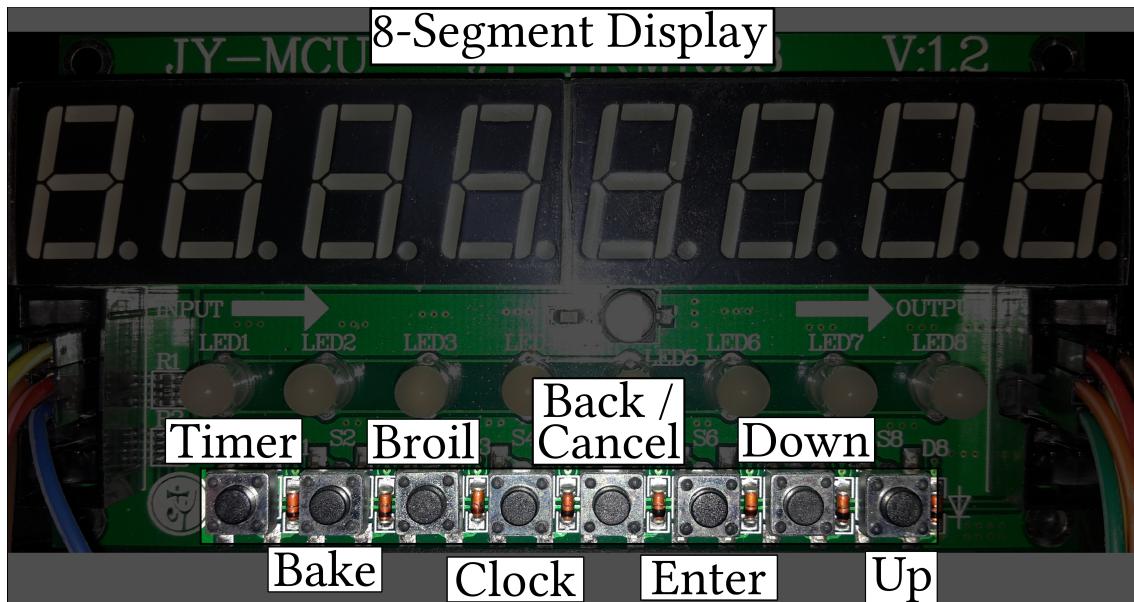


Figure 1: Primary user interface display. Buttons are as labeled.

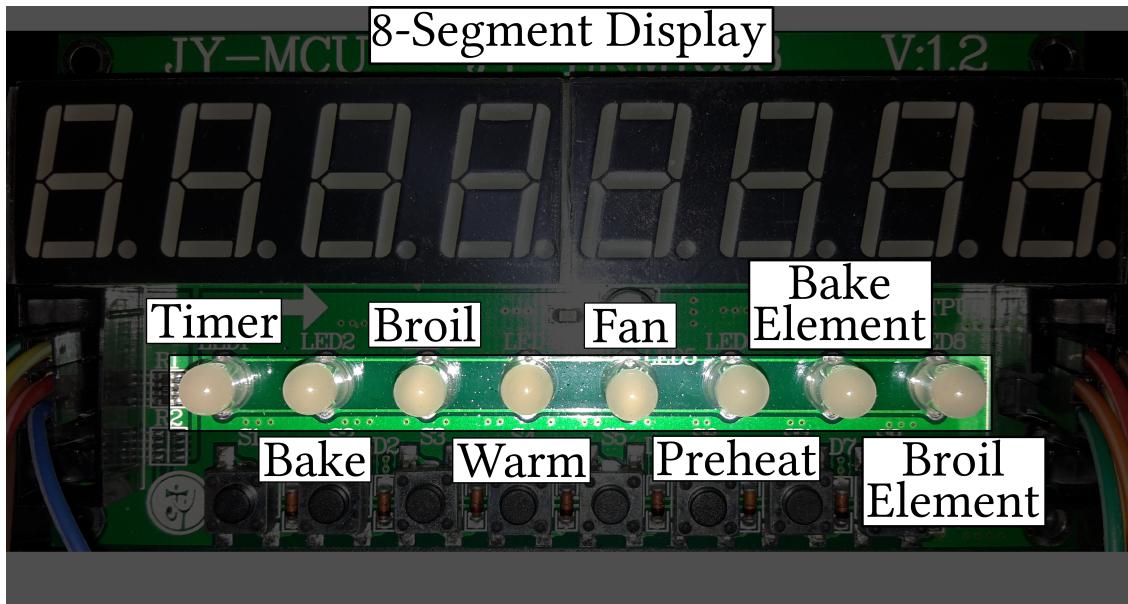


Figure 2: Primary user interface with status LEDs labeled.

Figure 3: Secondary display used for oven temperatures.

## 2.2 Control

### 2.2.1 Power Up

During initial power up (such as after plugging in or turning on the electric panel breaker) the oven controller will display a welcome message, and proceed to test output functions by illuminating all LED segments and sounding the alert beeper. The oven will then enter standby mode.

### 2.2.2 Modes

The oven has the following modes:

- Standby
  - ♦ Standby mode indicates the oven is not currently heating, tracking a timer and that the clock has not been set.
  - ♦ There is *no* status LED indicating standby mode.
    - ▶ Indicated by the display output of “standby” (fig. 4 on the facing page) or, if the clock is set, showing the current time with the status LEDs slowly counting up (in binary fashion.)
  - ♦ If oven was previously on, the temperature indicated by the secondary display should slowly decline.
- Timer
  - ♦ Timer mode allows tracking time
    - ▶ Depends on whether oven is currently on
      - If oven is not in bake or broil mode, timer mode functions as a traditional kitchen timer.
      - If oven is currently in bake or broil mode, the timer will *automatically* turn off the oven when the timer expires.
    - ♦ Timer mode is indicated by the “timer” status LED and a decreasing time display.
- Bake / broil

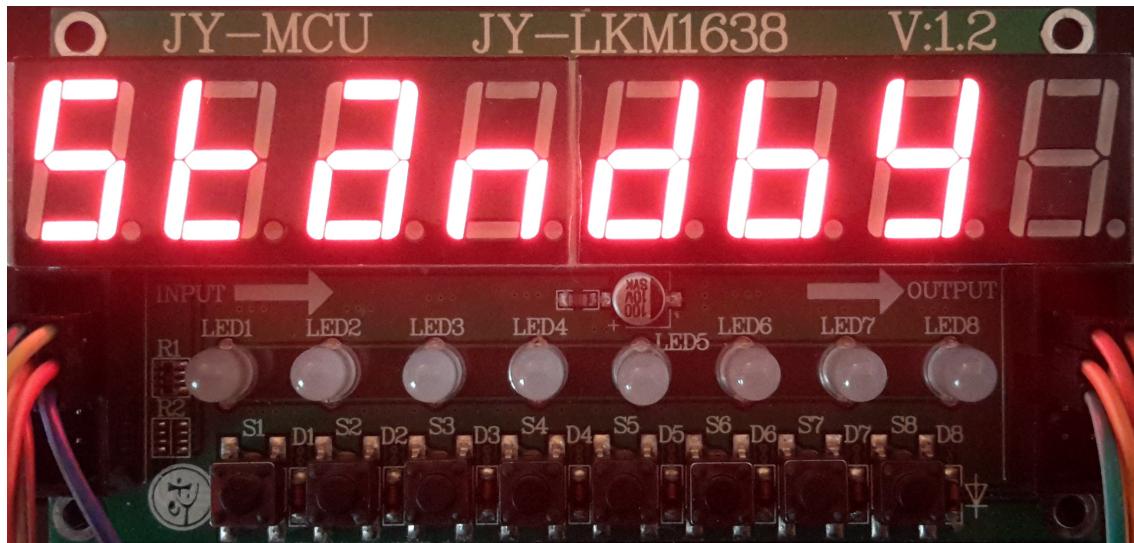


Figure 4: Standby mode is when the oven is currently not performing a task, in other words it is idle awaiting a command.

- ♦ Bake mode is for normal oven baking.
  - ▶ During bake preheat *both* oven elements (bake and broil) are used to quickly and evenly heat the oven.
  - ▶ Bake mode occasionally cycles the broil element on to help even out cooking.
- ♦ Broil mode utilizes *only* the broil element, both during preheat and normal broil operation.
- ♦ Status LEDs
  - ▶ Bake mode is indicated by the “bake” status LED.
  - ▶ Broil mode is indicated by the “broil” status LED.
- ♦ Once a temperature is entered the oven will heat to the set temperature and cycle the bake and broil elements on and off.<sup>1</sup>
- Clock
  - ♦ If the clock time is set, during standby the display will show the current time.
  - ♦ Times are set in 24 hour mode (military time.)
  - ♦ The clock function does not utilize a battery backup, and will lose the time if power is lost.
    - ▶ If power is lost, the controller will not display the clock during standby. Instead the display will simply state “standby” indicating the oven is idle.

### 2.2.3 Operation

Please see fig. 1 on page 3 for button locations, and fig. 2 on page 4 for status LEDs.

#### 2.2.3.1 Bake

##### Entering a bake temperature

- Bake mode can be entered by pressing the “bake button.”
  - ♦ The “bake” status LED will light by itself to signify the user is in the bake setting menu.
  - ♦ The display will change to show the set temperature the user desires for the oven.
  - ♦ See fig. 5 on the next page.
- The user may press, or hold the up and down buttons to enter the desired temperature.
- Once the desired temperature is displayed, pressing enter will start the bake mode.

<sup>1</sup>There is an automatic safety timer. Please see the oven temperature section.

- The display will flash the status LEDs to indicate acknowledgment of the users entry.
- If the oven was *not previously* in a bake or broil mode, the oven will now enter preheat mode.
  - ▶ Display will state “preheat”<sup>2</sup> and the “preheat” LED will light.
- If the oven was already in bake or broil mode, the oven will *not* preheat, and instead follow the normal thermostat setting.

### Warning

Preheat mode utilizes *both* oven elements to quickly heat the oven. Due to the extended times required to heat a cold oven, and the fact that the broil element will be on, food placed inside the oven before the preheat cycle is done will burn.

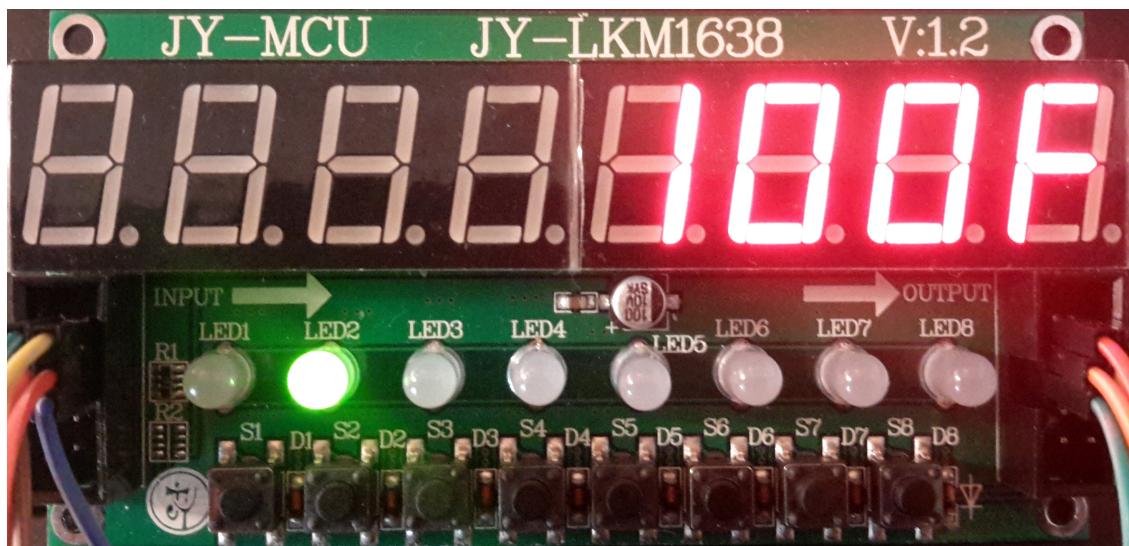


Figure 5: Display of the bake temperature setting menu. We note the current temperature setting is 100°F and that the “bake” LED status light is lit.

- The status LEDs will show that the “bake” LED is lit, signifying that the oven is in bake mode.
- The secondary display will show the set point temperature (or internal board temperature) and current oven temperature (see fig. 6 on the facing page.)
- The oven will *automatically* enter a safety timer to prevent leaving the oven on for long periods unattended. See important notice regarding the mandatory timer.

### Mandatory Preheat Timer

Once preheat mode is entered, an automatic safety timer of 20 minutes is started to reach oven set point temperature. If the oven does not reach the set temperature in that time frame the timer alarm will sound and the oven will shut off.

Additionally, once the oven reaches the desired temperature, the safety timer is reset to 20 minutes and the oven will shut down **unless** the user enters a time using the timer function.

Once a timer has been started, the mandatory timer is deactivated and the stove will heat until the user supplied timer is exhausted.

<sup>2</sup>Unless the timer function is already active.



Figure 6: Secondary display showing internal (board) temperature (73°F, indicated by three decimal points) and current oven temperature (71°F).

### Warning

**Do not** attempt to bypass or deactivate the mandatory safety timer. Ovens and stoves are the *number one* cause of household fires and unattended cooking is a safety hazard.

Do not rely on the mandatory timer to turn off the oven. **Always** shutdown and **confirm** the oven is off, the status LEDs indicate no heating modes, the “warm” status LED is off and that the temperature is approximately at **ambient** (room) temperature before leaving the oven unattended.

#### 2.2.3.2 Preheat

- If the oven is in preheat mode, once the oven reaches the entered temperature, the preheat alarm will sound.
  - ♦ The oven will beep and flash the status LEDs to let the user know the oven has reached temperature.
  - ♦ The preheat alarm can be canceled by pressing any button.
  - ♦ The user is encouraged to enter a time into the oven timer to avoid automatic oven shutdown due to the mandatory timer.

### Tip

Always remember to enter a timer when cooking to prevent automatic shutdown.

#### 2.2.3.3 Broil

- Broil mode operates in the same manner as bake mode.
  - ♦ The bake element is never used during heating.
  - ♦ There is no preheat mode.
- All operations function similarly, including the mandatory safety timer.

#### 2.2.3.4 Canceling or turning off the oven

- To turn off the oven in either bake or broil modes, press the appropriate button (bake if baking, broil if broiling) and *again* press the same button to cancel that mode.
  - ♦ The display will flash and the appropriate bake or broil status LED will go out.

### 2.2.3.5 Timer

1. Pressing the “timer” button will enter the timer setting menu.
  - a) The timer status LED will light alone to signify one is in the timer menu.
2. The display will show “Hr” signifying that the user is now entering the number of hours required (fig. 7.)
  - a) The hour decimal point will flash as well to additionally confirm entry.
3. Using the up and down buttons enter the required number of hours.
4. Pressing enter confirms the number of hours.
5. The display will now show “Min” to signify entering minutes (fig. 8 on the facing page.)
  - a) The minute decimal point will flash to confirm minutes are being entered.
6. Pressing enter a second time confirms the time and starts the timer.
  - a) The status LEDs will flash and the display will now show the countdown timer.
  - b) The “timer” status LED will now be lit, indicating a timer is running.
7. When the timer is exhausted, the controller will enter an alarm state.
  - a) The display will show “timer.”
  - b) A status LEDs will flash and a beeper will sound indicating that the timer has expired.
  - c) If the oven is currently in bake or broil mode, *the oven will shutdown*.

**Tip**

When the timer expires while cooking in the oven, the oven will *automatically* shutdown. This helps to prevent over cooking or burning of food.

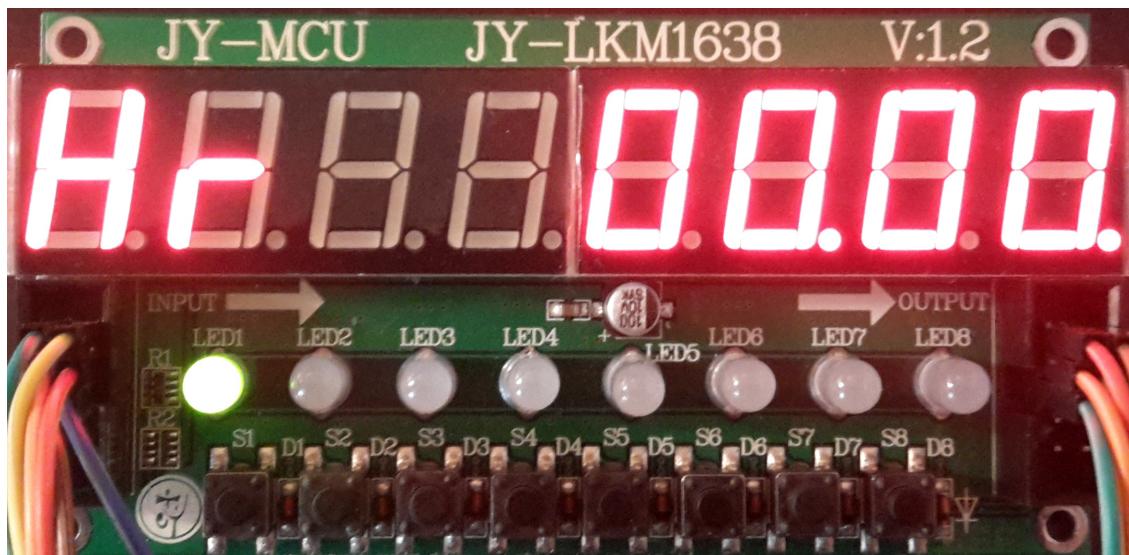


Figure 7: Timer entry showing prompt for desired number of hours.

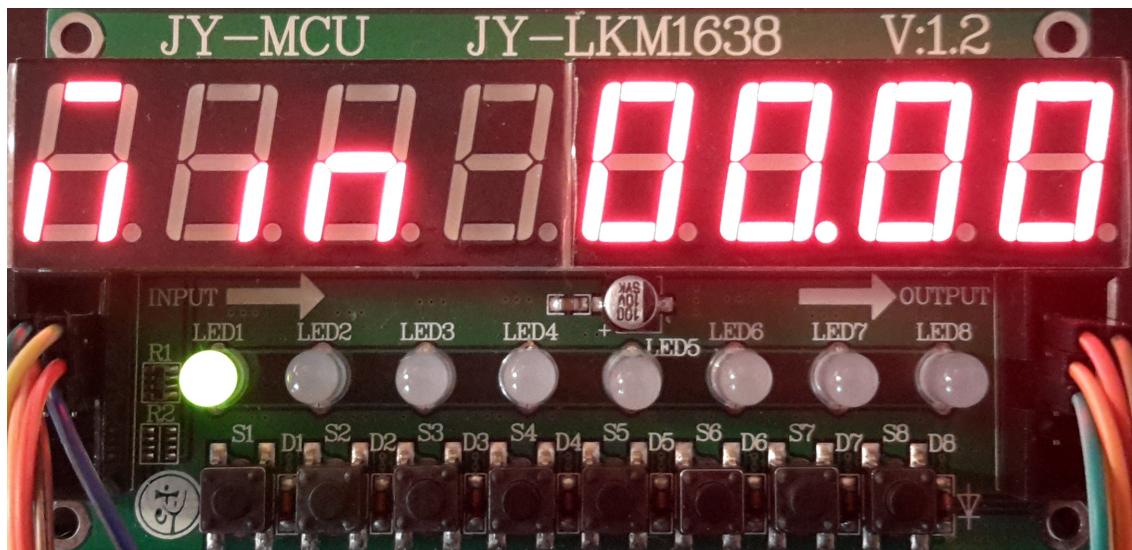


Figure 8: Timer entry showing prompt for desired number of minutes. The unusual “M” is due to the limited possibilities for character display on 8-segment LEDs.

#### 2.2.3.6 Exiting a menu

- To cancel entering a temperature or time press the “cancel / back.”
- Additionally, if no button is pressed for approximately 10 seconds, the controller will automatically cancel and exit the temperature menu.

#### Tip

Pressing “back” or allowing the menu to time out, *will not* cancel the appropriate oven function (such as turning off a timer or shutting off the oven.) Canceling the setting menu will simply *exit* the menu without changing any settings. The oven will continue to operate in any modes it was currently in, such as baking or timing.