JasonKits Reflow Oven - User Manual

This board features:

ATMEGA328P processor clocked at 16 MHz

HD44780 16x2 LCD display

MAX31855 thermo-couple Sensor on board

Can be interfaced with a 2 button analogue keypad \*(Default)

Can be interfaced with a 4 button digital keypad

Has provision for heartbeat led \*(Default)

Transistor Buffered Buzzer output \*(Default)

Power input protected with inline PTC Fuse and Crowbar diode.

Transistor Buffered SSR Output to drive Solid state Relay Module : 5V Drive

Serial Output with formatted csv data for monitoring on PC.

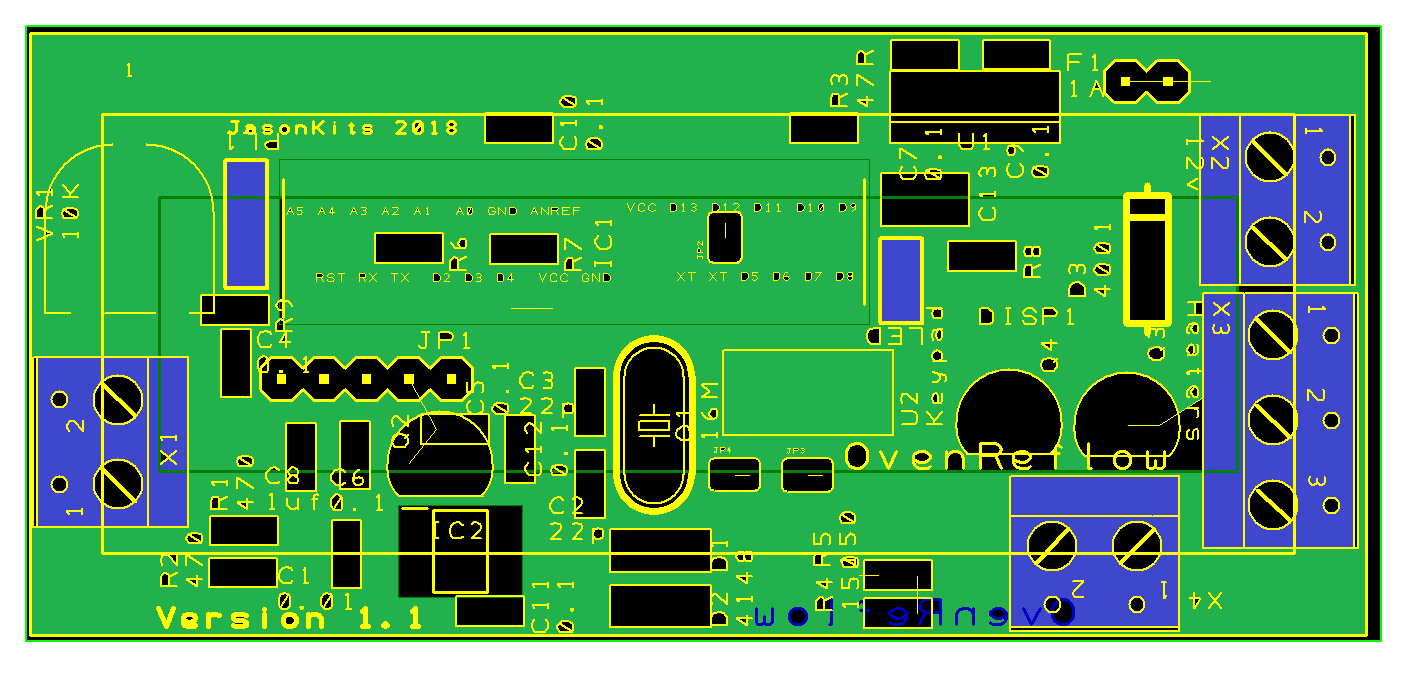
Control

Switch 1: Starts Oven Reflow Process - pressing it second time Stops Reflow Process.

Switch 2: Selects Profile, Lead Free Paste, Leaded Paste

Led: Shows State of controller – Heartbeat – Flashes when timer is on.

Buzzer: Beeps when booted, when timer starts, when an error detected, when Reflow is ready.



Connectors

|  |  |
| --- | --- |
| X1: THERMOCOUPLE K-Type | X2: POWER IN + 12V |
| X3: SSR OUTPUT 5 Volt | X4: BUZZER 5 Volt |
| JP1: Serial Logging Port/ Firmware Update Port. | LED: LED HEARTBEAT |

Reflow States

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| --- |
| **Ready** : Controller is in idle state and Ready to take Command |
| **Pre-Heat**: The first step is to increase the temperature from room temperature to 150 °C. The ramp up rate is 1 to 3°C per second. |
| **Soaking**: The second step used to activate the solder paste and allow the flux to clean the pads being soldered. |
| **Reflow** : The third step is used to allow solder paste to reach it's melting point Known as the 'liquidous temperature' which is about 218 °C for lead free solder paste (Sn-Ag-Cu based).Here the solder joins the component to the board. |
| **Cooling** : The third step is used to allow solder paste to reach it's melting point Known as the 'liquidous temperature' which is about 218 °C for lead free solder paste (Sn-Ag-Cu based).Here the solder joins the component to the board. |
| **Done** : The controller completed the reflow process |
| Error States: These error states are displayed on the lcd. |
| **Hot!** : Probe is too hot |
| **Error!** : An error was encountered. |

Profiles Temperatures

|  |  |
| --- | --- |
| Lead Free Profile SnAgCu(Sn96.5Ag3.0Cu0.5) | Leaded Profile SnPb (Sn63Pb37) |
| Soak Max : 200 Degrees | Soak Max : 180 Degrees |
| Reflow Max: 250 Degrees | Reflow Max: 224 Degrees |

**Display**

The LCD 16 characters by 2 lines display all the required information. These are as follows:

Line 1 : Displays the Re-flow state together with the Temperature it needs to Reach.

Line 2 : Displays the actual temperature being read from the sensor , the time count in seconds and the Soldering Profile selected.

**Power Supply Considerations**

The board accepts 9v to 24v input and protected with an inline PolyFuse and a reverse polarity protection.

**Serial Port**

The Board features a serial port TTL output (57600). A USB to serial converter is required to monitor and log the data. The controller board can be updated with new firmware by using the serial port.

**Keypads**

The board comes configured with two buttons.

Schematic

