ER1000

The Burst Fire Controller for Zero Crossing Solid-State Relays with Analog Input Control

1 Features

- Burst Fire Controller
- Controls power through zero crossing solid-state relays
- Compatible with both 50Hz and 60Hz power systems
- Supports analog control inputs: 0-20mA, 4-20mA, 0-5V, 0-10V, 0-1.1V and potentiometer (POT)
- 10-step solid state relay control
- Operating input voltage: 7 – 24Vdc, 7-17Vac
- PCB size optimized for direct mounting on solid state relays
- Ideal for thermal management applications
- Built-in LED status indicator
- Output period time: 200ms
- No Coding or programming required
- Compact PCB Size: 44.00 x 38.00 mm

2 Description

The ER1000 is a burst fire controller designed for controlling the power of thermal systems, such as heaters. It operates by controlling a zero-crossing solid-state relay to switch the AC power to the load on and off. The output power cycles are regulated based on the analog input signal. The controller supports various types and ranges of analog signals, including 0–10V, 4–20mA, and a potentiometer (POT).

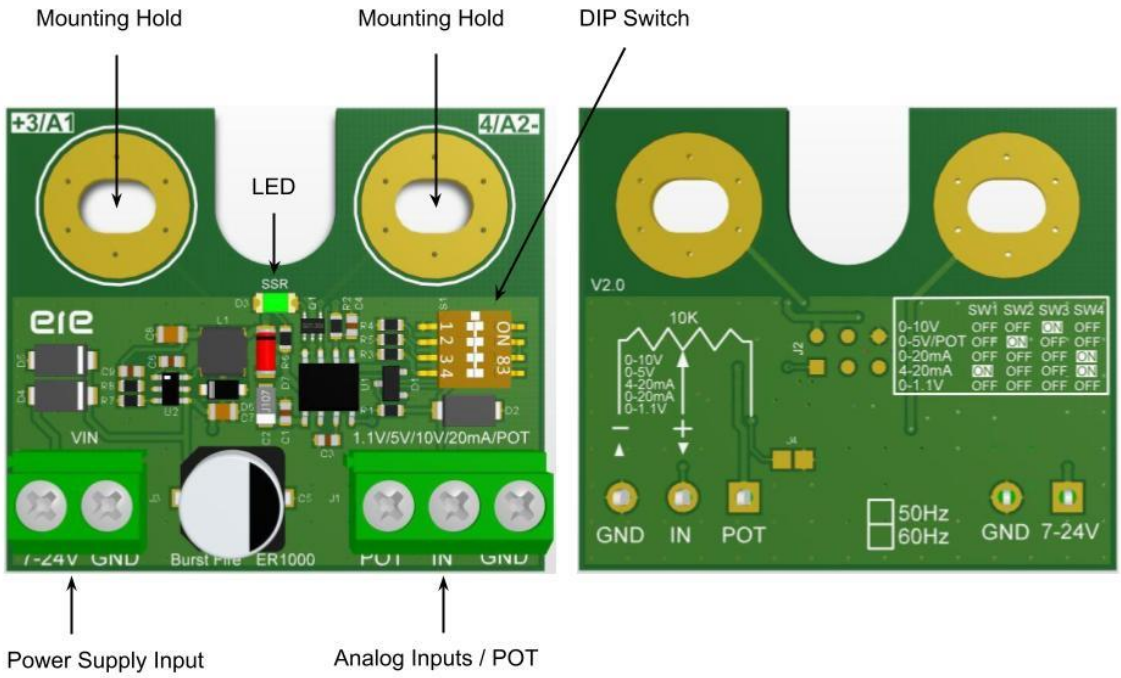


Figure 1: Board diagram

3 Output Cycles

The output of the solid-state relay controlled by the burst fire controller consists of 10 steps per period. The table below illustrates the output cycles of the load based on the corresponding analog input values.

Table 1: An example of output cycles in a 50Hz system

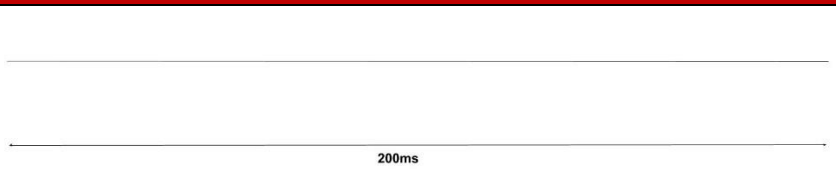
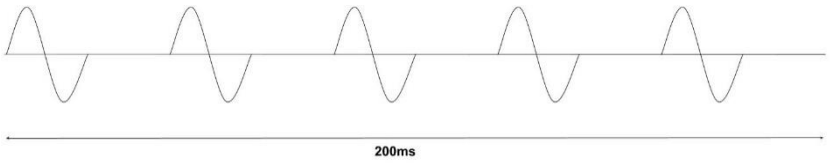
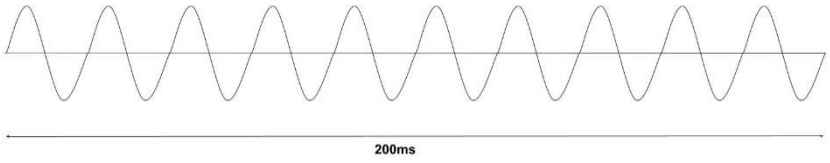
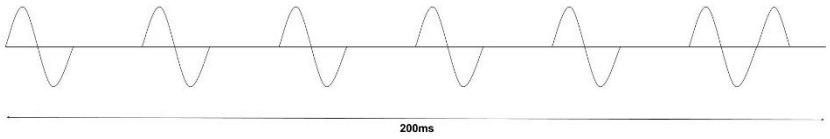
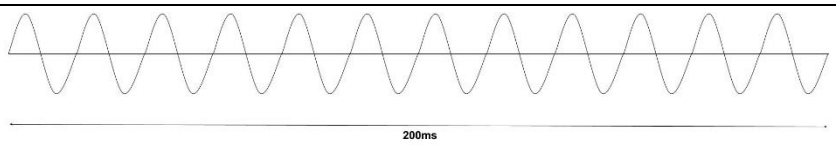
Voltage (0-10Vdc)	Output Steps	Duty Cycles	Graphs
0Vdc	0	0.00%	
5Vdc	5	50.00%	
10Vdc	10	100.00%	

Table 2: An example of output cycles in a 60Hz system

Voltage (0-10Vdc)	Output Steps	Duty Cycles	Graphs
0Vdc	0	0.00%	
5Vdc	5	54.16%	
10Vdc	10	100.00%	

4 Mounting Instructions

The controller board is designed to be mounted on a solid-state relay (SSR). It drives the SSR using a 5VDC control signal, so the selected SSR must be capable of accepting a 5V input signal.

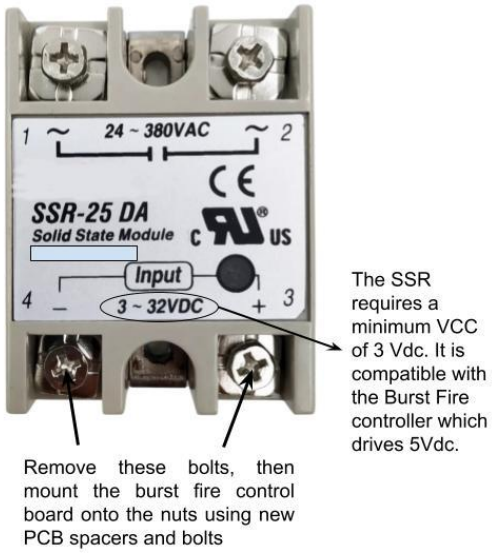


Figure 2: An example of a solid-state relay (SSR) used with the controller board

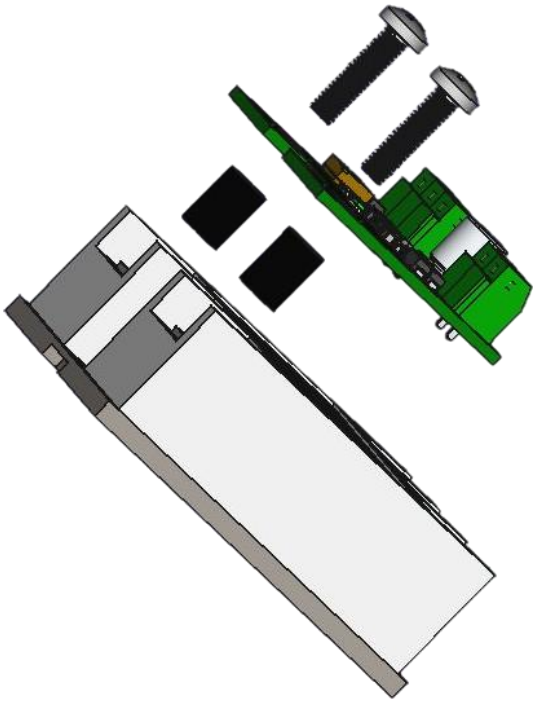
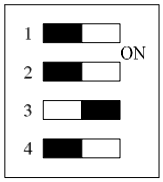
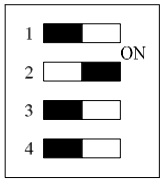
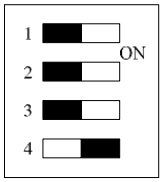
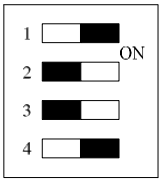
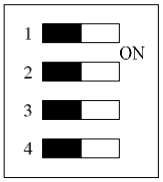
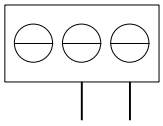
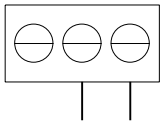
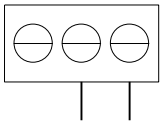
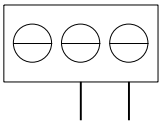
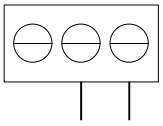
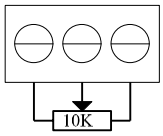


Figure 3: Mounting diagram

5 Analog Signals

To control the power delivered to the load using the burst fire controller, one of the supported analog signals must be connected to the analog input terminals. The controller accepts five types of analog signals: 0–10VDC, 0–5VDC, 0–20mA, 4–20mA, and 0–1.1VDC. Additionally, the board supports the use of a potentiometer (POT) for load control. Only one type of analog signal can be connected at a time. The DIP switches on the board must be configured according to the type of analog signal being used. The table below provides the DIP switch settings and connection methods for each analog signal type and the potentiometer.

Table 3: Analog signals for controlling an output signal

0-10Vdc	0-5Vdc/POT	0-20mA	4-20mA	0-1.1Vdc
				
				
				

6 Interfacing

The burst fire controller board requires a power supply and can operate with either an AC or DC power source.

6.1.1 DC Power Supply

Although the burst fire controller board can operate with an AC power supply, using a DC power supply provides more stable operation and better protection against electrical noise. The board accepts a DC voltage input range of 7–24VDC. It also supports a variety of analog input signals used to control the output. The compatible analog input signals include 0–10VDC, 0–5VDC, 0–1.1VDC, 4–20mA, and 0–20mA. Additionally, the board can control the output signal without any analog input by using a potentiometer (POT). When using analog signals or a potentiometer, the DIP switches on the board must be configured according to the selected input type.

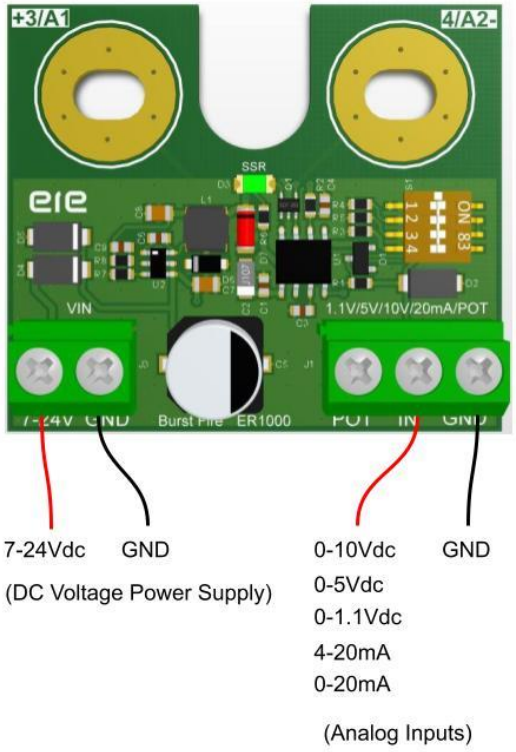


Figure 4: Using DC power supply

6.1.2 AC Power Supply

The burst fire controller board supports an AC voltage power supply. It can accept an AC voltage range from 7Vac to 17Vac, the 12Vac is recommended. Therefore, the board can operate using only a transformer for its AC power supply and does not require a DC power source.

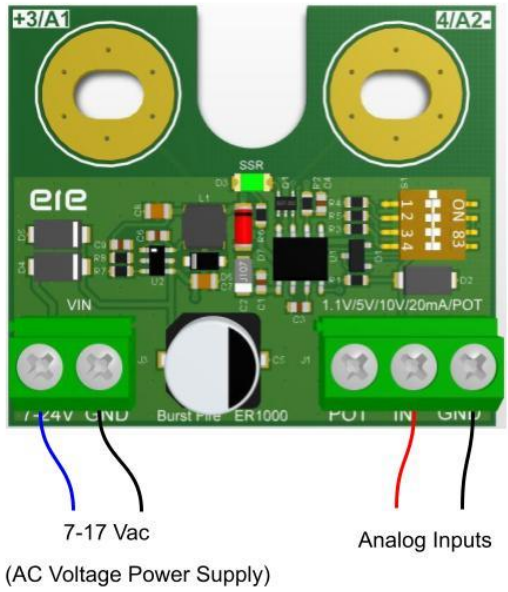


Figure 5: Using AC power supply

7 Dimensions

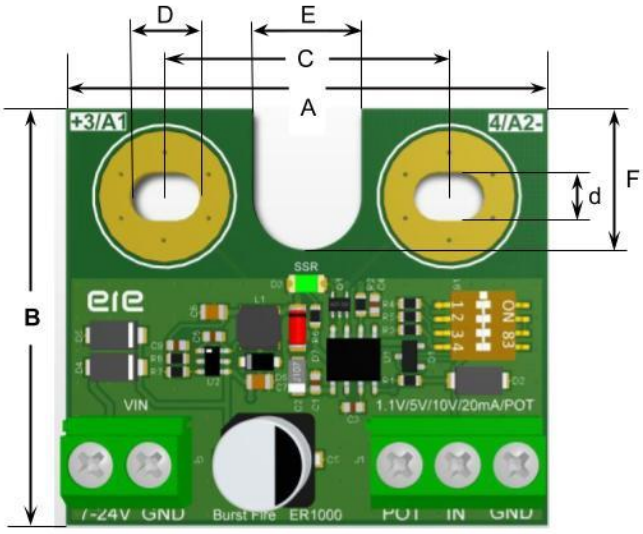


Figure 6: Board dimensions

Table 4: Board dimensions

Units	mm	inch
A	44.00	1.7323
B	38.00	1.4961
C	26.00	1.0236
D	6.50	0.2559
d	4.50	0.1772
E	10.00	0.3937
F	12.89	0.4724

8 Applications

The picture below shows how easily a burst fire controller board is used to control a heater with a potentiometer.

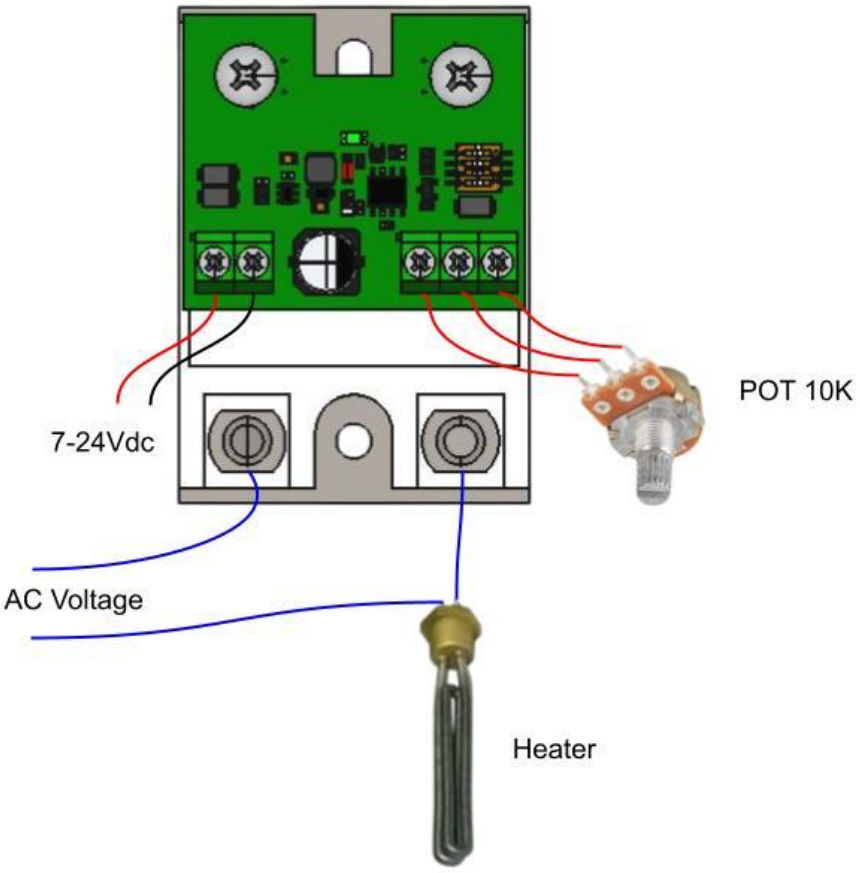


Figure 7: Heater control with POT