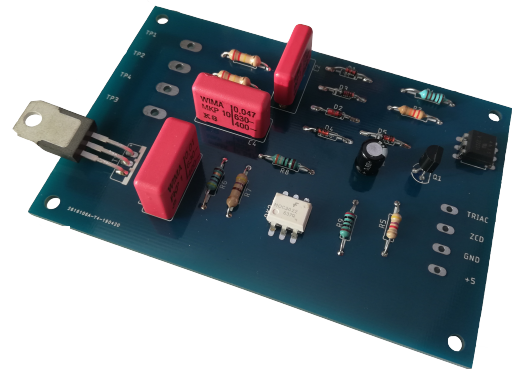Late Night
Works

AC phase control board ver.1

1 Overview

- Precise zero-cross detecting

- Input pin for triac firing

- Built-in optoisolation

- Suitable for loads up to 8A

- Low voltage supply

- Five volts logic levels

- Works with 50Hz and 60Hz current in a range between 110-240V

2 Description

- This board is designed in order to dim AC loads: it has an *output pin* that will provide precise signal on zero-crossing and an *input pin* wired to triac gate for output AC phases manipulation.

- Interpreting timing of zero-cross (by external components, as microcontroller for example), it's possible to activate the triac in precise moments in order to control AC sine waves and obtain different types of regulations:
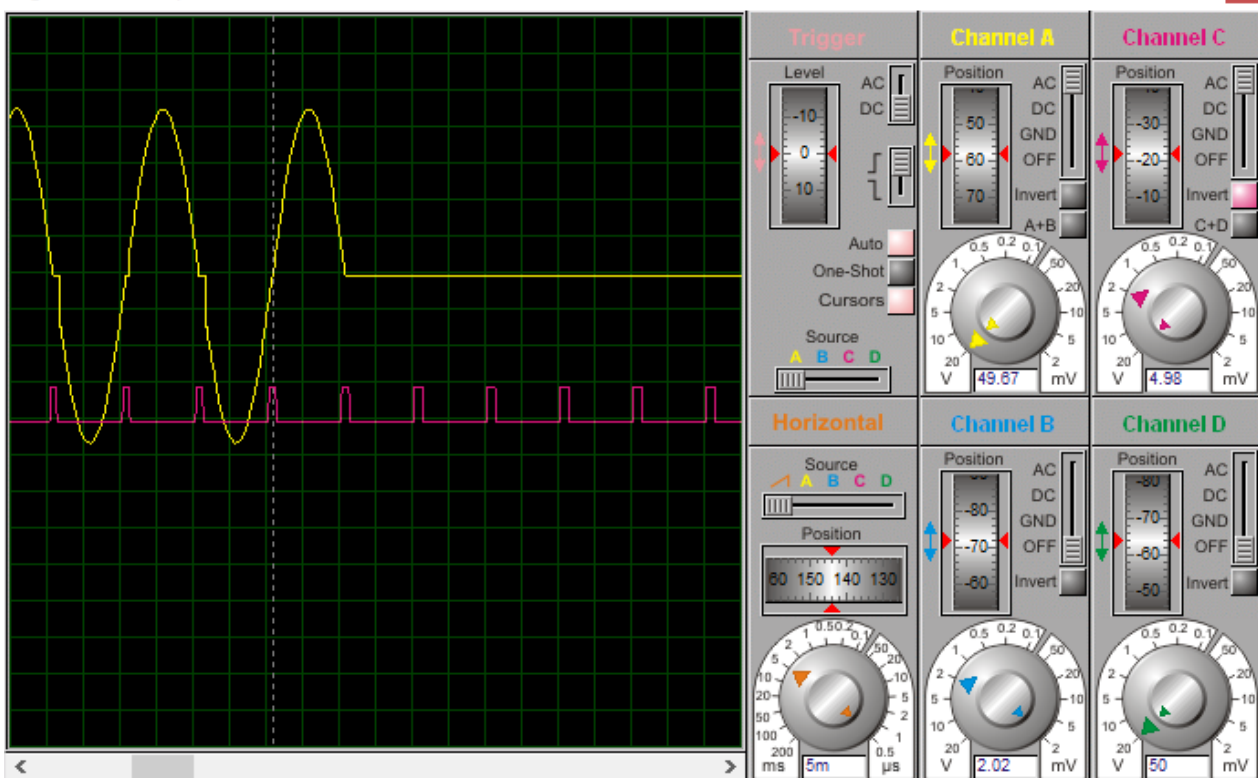
    - **Phase angle control**
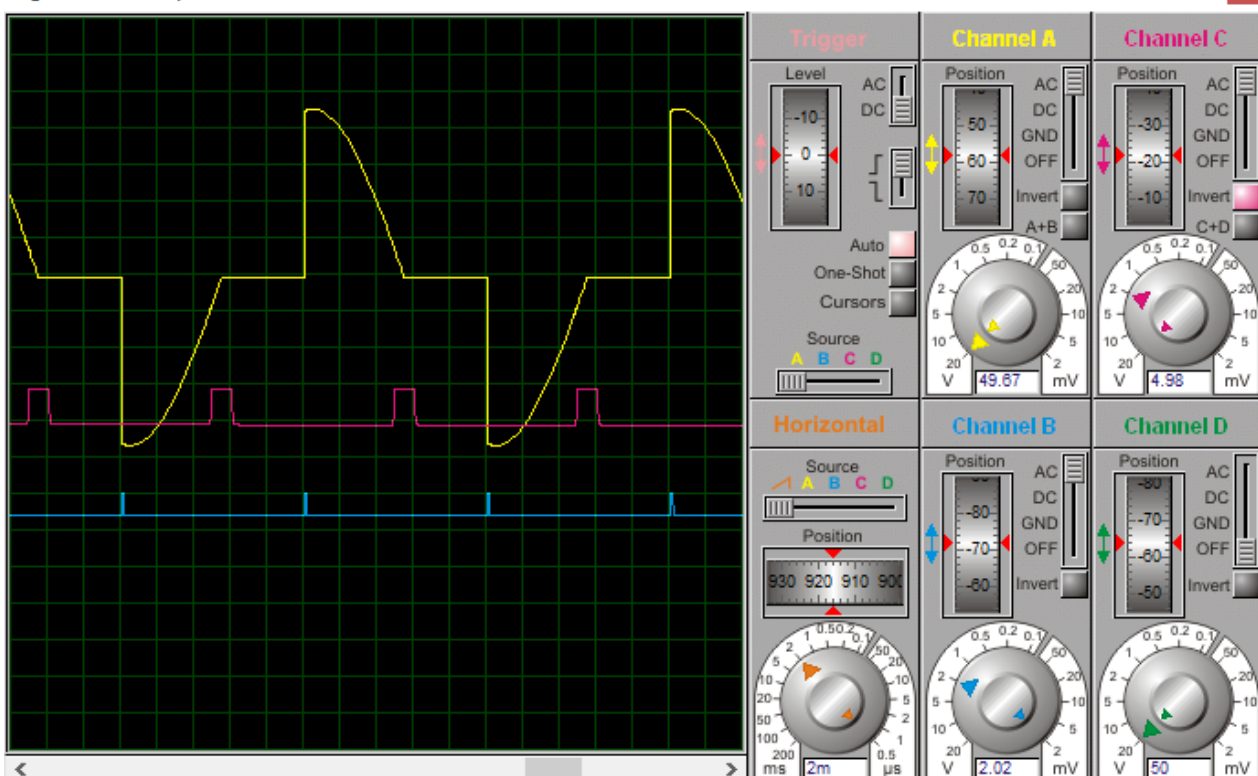
     – **Zero-crossing control**

Channel	Signal
Channel A	AC output wave
Channel B	TRIAC gate input pin
Channel C	zero-crossing output pin

- Input ad Output pins are on 5V logic level and they are optoisolated, this makes the board safe to wire with other components and fully compatible with commons microcontrollers and development boards.

3 Setup

The board is ready when load, 5V supply and AC supply are connected (to pins described in the next table). At this point, input and output pins of the board can be used:

- Zero-crossing signal can be detected by an interrupt on **falling edge**. As it is noticeable in the previous images, the signal falls from 5V. (notice that *Channel C* is **inverted**, so the signal falls upward)

- TRIAC can be triggered by applying HIGH logic (5V) on his dedicated pin. So, everytime zero-crossing occurs, must be send a pulse. (minimum recommended duration of a pulse: 100 microseconds)

4 Application notes

- TRIAC can shut off applied loads but it's not recommended. For "on-off" purposes, a relais can be connected between TP1 and AC supply in order to disconnect the whole board.

- The board can work in a wide range of voltages however, if the supply is not stable (or if applied load is not protected) a fuse can be connected between TP1 and AC supply.

- Heat sinks can be placed on TRIAC in order to dissipate more heat. The dimension and typology are related to the load applied.

5 Technical specification

	Unit	Value
Supply voltage	V	5.0
Maximum current through Low Voltage side	A	0.025
Maximum load voltage	V	600
Maximum load current	A	8.0
Triac gate fire signal voltage	V	5.0
Dimensions	$mm * mm * mm$	99*66*25
Temperature range	$^{\circ}C$	-40 ÷ 125*
n° of driveable loads	$--$	1

* Recommended heat sink on TRIAC (not included)

6 Pinout

Pin	Signal
GND	GND
+5	+5V Input (from power supply)
TRIAC	Input firing pin for TRIAC control
ZCD	*zero crossing* output signal
TP1	AC input (phase)
TP2	AC input (neutral)
TP3	AC controlled output (phase)
TP4	AC controlled output (neutral)

7 Measures

Units in mm