ID	Component	Use	Qty
C1	Polarized capacitor	AC to DC sourcing	1
C2	Unpolarized capacitor	Noise filter	1
C4,C5	Unpolarized capacitor	Debouncer,Transient and noise filter	2
D1	Full bridge rectifier	AC to DC sourcing	1
R1	Resistor	Current limiting	1
R2	Resistor	Voltage division and current limiting	1
RV1,RV2,RV3,RV4	Potentiometer	Signal dimming,VDC dimmer,VDC level fine tunning,Zero/ground reference	4
SW1	Push button switch, generic, two pins	User interface (UI)	1
T1	Transformer	AC to DC sourcing	1
U1	Signal comparator	Detect mains full-wave rectified signal	1
V1	Mains VAC	General system power source	1
D2	Diode bridge	Mains full-wave signal rectification	1
A1	Arduino Nano v3.x	Zero-crossing digital processing	1

Further reading:
FR1. Atmel (2015). ATmega328P 8-bit AVR Microcontroller with 32K Bytes In-System Programmable Flash DATASHEET. [online]
    Available at: https://ww1.microchip.com/downloads/en/DeviceDoc/Atmel-7810-Automotive-Microcontrollers-ATmega328P_Datasheet.pdf.
FR2. Texas Instruments (2025). LM393B, LM2903B, LM193, LM293, LM393 and LM2903 Dual Comparators. (2025). [online] Texas Instruments.
    Available at: https://www.ti.com/lit/ds/symlink/lm2903b.pdf [Accessed 31 Mar. 2025].

https://sites.google.com/view/b-eng-jarl/home

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File: Mains zero-crossing detector.kicad_sch

Title: Mains zero-crossing detector

Size: A4 | Date: 2025-05-07 | Rev: A
KiCad E.D.A. 9.0.1 | | Id: 1/1