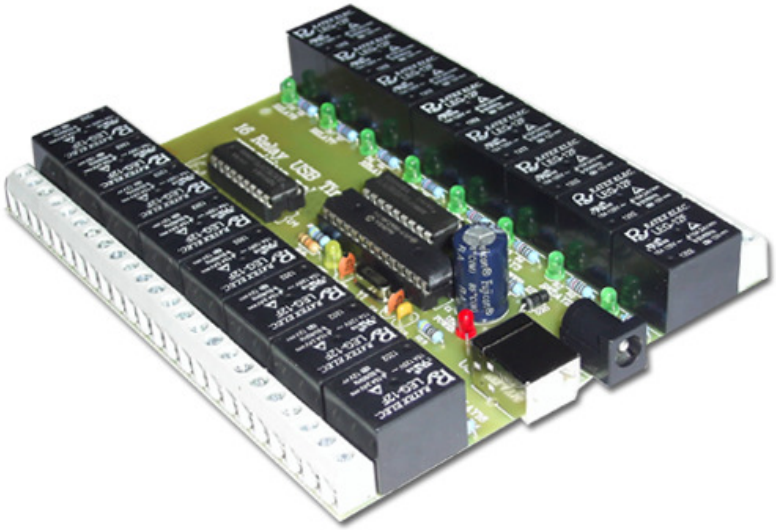
16 relays USB Controller



TECHNICAL SPECIFICATION:

- The module drives 16 relays (1NO, 1NC)
- Maximum parameters for relay contacts: 250V/10A.
- USB Port is used for communication between the computer and the device.
- The device must be powered with 12V/0.7A stable DC power (not included).
- Modes (The mode of each channel can be different!):

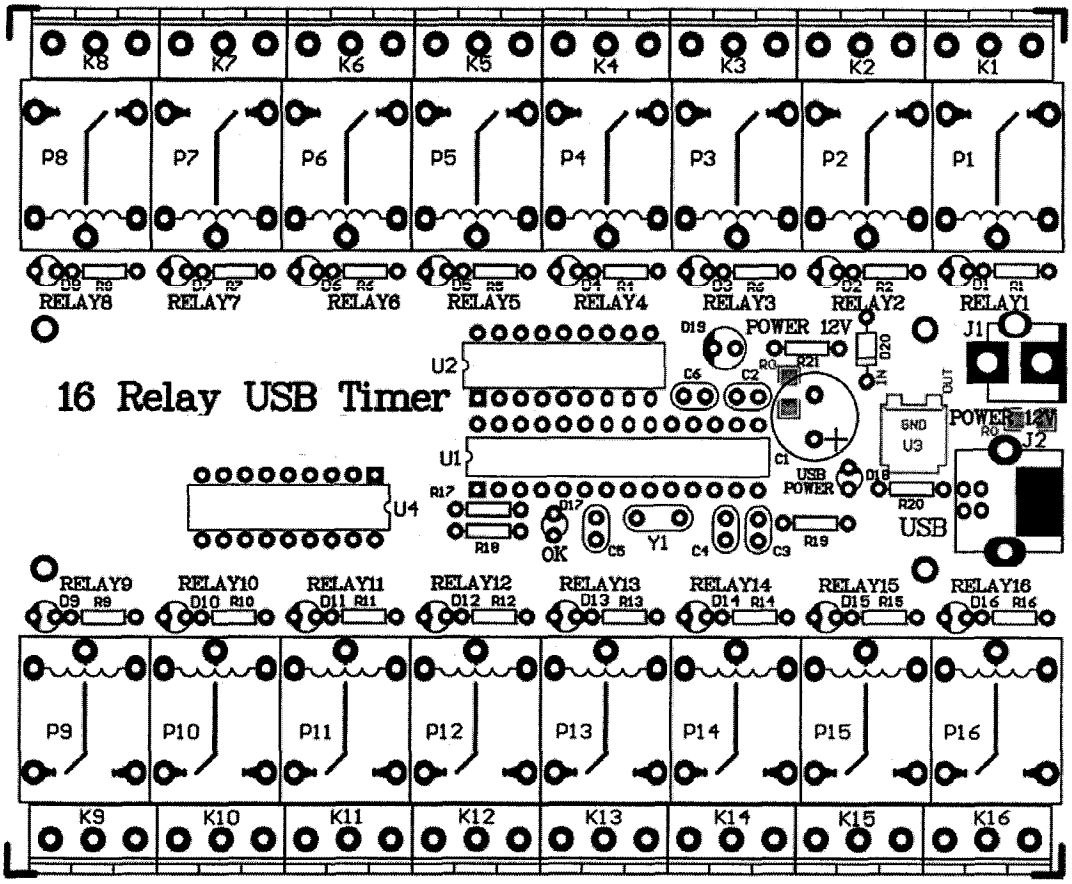
  MANUAL CONTROL (manual on/off channels);
  A SINGLE TIME CONTROL (setting year, month, day, hour, minutes);
  WEEKLY CONTROL (setting time for a daily, once a day turning on and off within the week);
  CYCLIC CONTROL (setting the cycle time for each relay individually and independent of each other);

- Software allows changing the names of the timers.
- Option to save the settings to a file.
- When the PC is switched off, the module continues to work on preset settings until the power supply is applied to the board. In case of power supply breaking, the timer settings should be loaded again from the software.
- Choice of auto or manual loading of the software when the computer starts.
- Dimensions: 125x102mm

CONNECTION:

When connecting the controller to a power supply, it is important to **OBSERVE THE CORRECT POLARITY!**

Location of all controller LEDs and terminals is shown in the figure below:

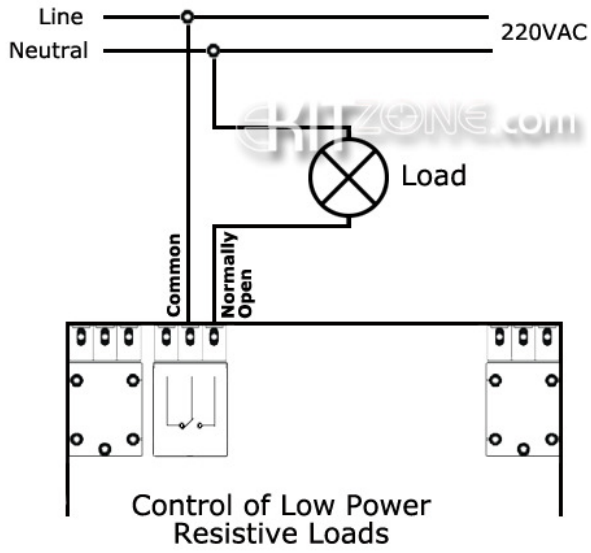


PART LIST

Resistors	R21-1,2k/0,25W	**Capacitors**	P15- LEG-12F	K15- TS-501-3pin
R0-0om/1206-2 pcs	**Diods**	C1-470mF/35V	P16- LEG-12F	K16- TS-501-3pin
R1-1,2k/0,25W	D1- LED 3mm GR.	C2-100nF/50V/2.54	**IC**	J1- PC-GK2.5
R2-1,2k/0,25W	D2- LED 3mm GR.	C3-100nF/50V/2.54	U1- PIC18F2550	J2- USB PCB
R3-1,2k/0,25W	D3- LED 3mm GR.	C4-22pF/50V/2.54	U2- ULN2803	**Quartz**
R4-1,2k/0,25W	D4- LED 3mm GR.	C5-22pF/50V/2.54	U3-78M05	Y1-20MHz
R5-1,2k/0,25W	D5- LED 3mm GR.	C6-100nF/50V/2.54	U4- ULN2803	**Other**
R6-1,2k/0,25W	D6- LED 3mm GR.	**Relays**	**Connectors**	DIP28L- Socket
R7-1,2k/0,25W	D7- LED 3mm GR.	P1- LEG-12F	K1- TS-501-3pin	DIP18 - Socket
R8-1,2k/0,25W	D8- LED 3mm GR.	P2- LEG-12F	K2- TS-501-3pin	DIP18 - Socket
R9-1,2k/0,25W	D9- LED 3mm GR.	P3- LEG-12F	K3- TS-501-3pin	
R10-1,2k/0,25W	D10-LED 3mm GR.	P4- LEG-12F	K4- TS-501-3pin	
R11-1,2k/0,25W	D11-LED 3mm GR.	P5- LEG-12F	K5- TS-501-3pin	
R12-1,2k/0,25W	D12-LED 3mm GR.	P6- LEG-12F	K6- TS-501-3pin	
R13-1,2k/0,25W	D13-LED 3mm GR.	P7- LEG-12F	K7- TS-501-3pin	
R14-1,2k/0,25W	D14-LED 3mm GR.	P8- LEG-12F	K8- TS-501-3pin	
R15-1,2k/0,25W	D15-LED 3mm GR.	P9- LEG-12F	K9- TS-501-3pin	
R16-1,2k/0,25W	D16-LED 3mm GR.	P10- LEG-12F	K10- TS-501-3pin	
R17-4,7k/0,25W	D17-LED 3mm YE.	P11- LEG-12F	K11- TS-501-3pin	
R18-330om/0,25W	D18-LED 3mm RE.	P12- LEG-12F	K12- TS-501-3pin	
R19-4,7k/0,25W	D19-LED 5mm RE.	P13- LEG-12F	K13- TS-501-3pin	
R20-330om/0,25W	D20-1N4007	P14- LEG-12F	K14- TS-501-3pin	

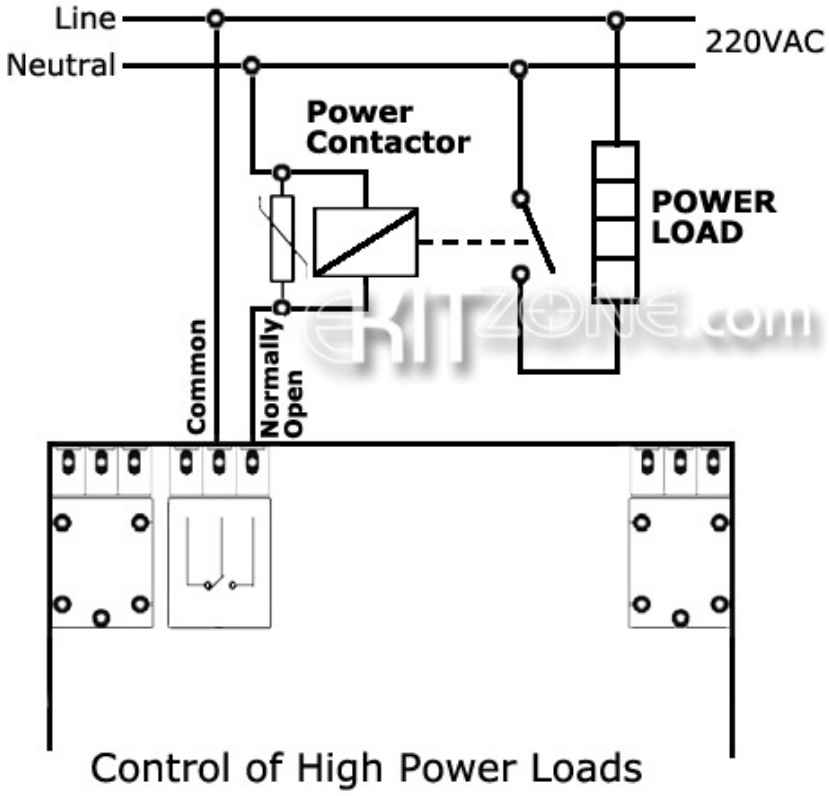
CONTROL OF LOW POWER 220VAC RESISTIVE LOADS

Resistive loads **up to 500W** could be connected directly to the module relay output.
Typical resistive loads are electric filament bulbs, halogen lamps, electric water heaters and space heaters.



CONTROL OF HIGH POWER 220VAC LOADS

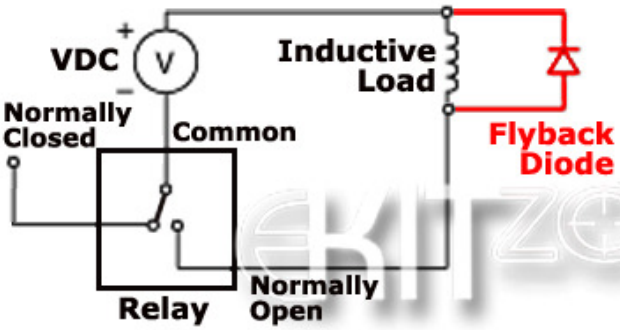
More powerful loads should be connected via power contactor as it's shown on the following figure:



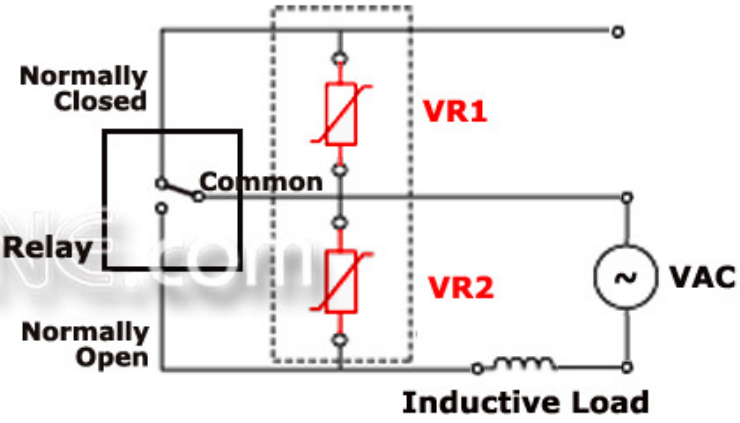
CONTROL OF INDUCTIVE LOADS

When inductive loads are connected to the relays, a large counter electromotive force may occur when the relay actuates because of the energy stored in the load. These flyback voltages can severely damage the relay contacts and greatly shorten the relay life. Limit these flyback voltages at your inductive load by installing a flyback diode for DC loads or a metal oxide varistor for AC loads, as shown in the following figures:

DC Inductive Loads



AC Inductive Loads



Typical inductive loads are transformers, electric motors (fans, pumps and shutters), solenoids, power contactors and relays, fluorescent ballasts, UPS, FL and ES lamps, switching power supplies.

SOFTWARE

USB Control Software is available in English, Russian and Bulgarian languages.

Sample Screen demo: